December 16, 2005

Mr. Devender Narala
California Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: Final Corrective Action Plan
Commissary/PX Study Area
Presidio of San Francisco - San Francisco, California

Dear Mr. Narala:

Enclosed please find one copy of the *Final Corrective Action Plan, Commissary/PX Study Area, Presidio of San Francisco, California* dated December 2005. This document was prepared by Treadwell & Rollo for the Presidio Trust. A copy of the Draft Corrective Action Plan (CAP) was submitted on July 30, 2004 for RWQCB and public review and comment. The Draft CAP received extensive comments and the Trust's responses to comments are presented in Appendix A of the enclosed Final CAP.

The resolution of comments and preparation of the enclosed Final CAP required a lengthy period of time. The Trust acknowledges and appreciates the RWQCB's patience and willingness to coordinate with the Trust concerning this CAP during this period. The Trust would like to schedule a time to meet with you to present the primary differences between the Draft and Final CAPs and the rationale for the corrective actions selected in the Final CAP.

The Trust has also begun preparation of the Implementation Work Plan associated with the selected corrective actions required by the Final CAP. Currently, the Trust is required to commence construction for the selected corrective actions at the Commissary PX Site by February 21, 2006.

Please do not hesitate to call me at (415) 561-4259 with any questions.

Sincerely,

Craig Cooper
Environmental Remediation Program Manager
THE PRESIDIO TRUST

Enclosure

CC: Brian Ullensvang, NPS — Robert Boggs, DTSC
Doug Kern, RAB — Mark Youngkin, RAB (CD only)

FINAL
CORRECTIVE ACTION PLAN
COMMISSARY/PX STUDY AREA

PRESIDIO OF SAN FRANCISCO, CALIFORNIA

Prepared For:

The Presidio Trust
34 Graham Street, P.O. Box 29052
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Prepared For:

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December 2005

Dorinda Shipman, P.G., C.HG., Treadwell & Rollo, Inc.

16 December 2005

Date

PROFESSIONAL GEOLOGIST
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NO. 215
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FINAL
CORRECTIVE ACTION PLAN
COMMISSARY/PX STUDY AREA
PRESIDIO OF SAN FRANCISCO, CALIFORNIA

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List of Acronyms and Abbreviations

AHPA	Archeological and Historic Preservation Act
Army	U.S. Army
As	arsenic
AST	above ground storage tank
BAAQMD	Bay Area Air Quality Management District
B(a)A	benzo(a)anthracene
B(a)P	benzo(a)pyrene
B(b)F	benzo(b)fluoranthene
B(g,h,i)P	benzo(g,h,i)perylene
B(k)F	benzo(k)fluoranthene
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylenes
CAP	Corrective Action Plan
CCR	California Code of Regulations
Cd	cadmium
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CHHSLs	California Human Health Screening Levels
Cleanup Levels Document	*Development of Presidio-Wide Cleanup Levels for Soil, Sediment, Groundwater, and Surface Water*
cm^3/cm^3	cubic centimeters per cubic centimeters
cm^3/g	cubic centimeters per gram
COC	contaminants of concern
Cr	chromium
Cu	copper
CZMA	Coastal Zone Management Act
DAF	Dilution Attenuation Factor
D(a,h)A	dibenz(a,h)anthracene
1,2-DCE	1,2-dichloroethylene

List of Acronyms and Abbreviations
(Continued)

DTSC	California Department of Toxic Substances Control
EKI	Erler & Kalinowski, Inc.
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Acts
ESL	Environmental Screening Level
FDS	Fuel Distribution System
g/cm^3	grams per cubic centimeter
g/g	grams per gram
GCL	geosynthetic clay liner
GMPA	General Management Plan Amendment
GSA	Federal General Services Agency
GW	groundwater monitoring well
HG	hydride generation
HSC	Health & Safety Code
ICP	Inductively coupled plasma
ICPMS	Inductively coupled plasma mass spectrometry
I(1,2,3-c,d)P	Indeno(1,2,3-c,d)pyrene
IT	IT Corporation
L/m^3	liters per cubic meter
LTTD	Low Temperature Thermal Desorption
LUCs	Land use controls
LUCMRR	Land Use Control Master Reference Report
MCLs	maximum contaminant levels
mg/kg	milligrams per kilogram
Main Installation FS	*Presidio Trust Revised Feasibility Study Main Installation Sites*
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
Motor Pool	Presidio Consolidated Motor Pool
MTBE	methyl tert-butyl ether
NAGPRA	Native American Graves Protection and Repatriation Act
NBAR	non-binding allocation of responsibility
NEPA	National Environmental Policy Act

List of Acronyms and Abbreviations (Continued)

NHPA	National Historic Preservation Act
Ni	nickel
NPS	National Park Service
O&M	Operation and Maintenance
ORC®	Oxygen Release Compound
Order	RWQCB Order No. R2-2003-0080
ORP	Oxidation Reduction Potential
PAHs	Polycyclic aromatic hydrocarbons
Parsons	Parsons Brinckerhoff
PCBs	Polychlorinated biphenols
Pb	lead
PCOCs	potential contaminants of concern
PLLW	Presidio Lower Low Water Datum of 1907
Presidio	Presidio of San Francisco
PRGs	preliminary remediation goals
PTMP	Presidio Trust Management Plan
PX	Post Exchange
QAPP	Quality Assurance Project Plan
R	Retardation Factor
RAB	Restoration Advisory Board
RAOs	Remedial Action Objectives
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RUs	remedial units
RWQCB	California Regional Water Quality Control Board
SB	Soil Boring
scfm	standard cubic feet per minute
SCRs	Site Cleanup Requirements
sf	square feet
SFCTA	San Francisco County Transportation Authority
SI	Site Investigation
SI Report	*Draft Site Investigation Report for the Commissary/Post Exchange Study Area*
Study Area	Commissary/PX Study Area (Former Motor Pool Area) as defined on Figure 1

List of Acronyms and Abbreviations (Continued)

SVE	soil vapor extraction
TBC	to be considered
Tetra Tech	Tetra Tech EM Inc.
Title 27	Title 27 of the California Code of Regulations
TMV	toxicity, mobility, and volume
TPH	Total petroleum hydrocarbons
TPHg	Total petroleum hydrocarbons as gasoline
TPHd	Total petroleum hydrocarbons as diesel fuel
TPHfo	Total petroleum hydrocarbons as fuel oil
TPHmo	Total petroleum hydrocarbons as motor oil
trans-1,3-DCP	Trans-1,3-dichloropropene
Treadwell & Rollo	Treadwell & Rollo, Inc.
Trust	Presidio Trust
Trust Act	Section 103 of Omnibus Parks and Public Lands Management Act of 1996, Public Law 104-333, 110 State 4097
TSDFs	treatment, storage, and disposal facilities
UCL	Upper Confidence Limit
UST	underground storage tank
µg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
µg/L	micrograms per liter
VOCs	Volatile organic compounds
Work Plan	*Site Investigation Work Plan for the Commissary/Post Exchange Study Area*
yd^3	cubic yards
Zn	zinc

1.0 INTRODUCTION

On behalf of the Presidio Trust (Trust), Treadwell & Rollo, Inc. (Treadwell & Rollo) has prepared this *Final Corrective Action Plan (CAP) for the Commissary/Post Exchange Study Area* encompassing the vicinity of the current Commissary and Main Post Exchange (Commissary/PX), also known as the Former Motor Pool (Study Area) at the Presidio of San Francisco (Presidio), California (Figure 1). A Site Investigation (SI) has been conducted to characterize the nature and extent of potential soil and groundwater contamination at the Study Area. The SI was performed in accordance with the approved *Site Investigation Work Plan for the Commissary/Post Exchange Study Area, Presidio of San Francisco, California* (Work Plan) (Treadwell & Rollo, 2002b). Results of the SI were presented in the *Draft Site Investigation Report for the Commissary/Post Exchange Study Area* (SI Report) (Treadwell & Rollo 2003c). As documented in the SI Report, the Study Area historically, contained a number of structures that constituted the Presidio Consolidated Motor Pool (Motor Pool). The Trust investigated the Study Area in accordance with the California Regional Water Quality Control Board (RWQCB) orders and by the California Department of Toxic Substances Control (DTSC) requirements to assess the impact of the storage, use, and release of petroleum and possible hazardous substances related to the former Motor Pool.

Using the information obtained during the SI, this CAP has been prepared to evaluate potential remedial alternatives to address adverse effects of the release of petroleum-related contamination and to select corrective action for implementation at the Commissary/PX Study Area. The corrective action selected under this CAP will adequately protect human health, safety and the environment. As described in Section 1.2 of this CAP, certain releases of hazardous substances within the Study Area are discrete sites that are being addressed by the Trust under different environmental cleanup authority in an appropriate regulatory decision document.

On 30 July 2004, the Trust issued a Draft CAP to stakeholders for review and comment. Appendix A presents comments received from stakeholders and the Trust's response to the comments. This Final CAP incorporates several changes that were made in response to comments (Section 1.5).

1.1 Background

The Presidio is located at the northern tip of the San Francisco peninsula (Figure 1). The Presidio occupies approximately 1,491 acres and is bounded by San Francisco Bay on the north and the Pacific Ocean on the west. Densely populated residential areas of San Francisco border the Presidio to the south and east.

The Presidio was a U.S. Army (Army) installation from 1848 through 1994, serving as a mobilization and embarkation point during several overseas conflicts, a medical debarkation center, and a coastal defense for the San Francisco Bay area. Industrial operations formerly performed at the Presidio are associated with maintenance and repair of vehicles, aircraft, and base facilities. The Presidio also contains a number of landfills used by the Army for the disposal of municipal waste and construction debris.

In December 1988, the Secretary of Defense's Commission on Base Realignments and Closures recommended closure of the Presidio. Under Public Law 92-589, the Presidio was transferred to the National Park Service (NPS) on 1 October 1994 and became part of the Golden Gate National Recreational Area. As required by the Base Realignment and Closure Act, the Army initiated environmental studies in conjunction with the transfer of the property.

Section 103 of the Omnibus Parks and Public Lands Management Act of 1996, Public Law l04-333, 110 State 4097 (Trust Act) created the Trust. The Trust is a federal government corporation established for the purpose of managing the leasing, maintenance, rehabilitation, and improvement of the non-coastal portions of the Presidio (Area B). The Trust manages Area B in accordance with the Trust Act, including the general objectives of the General Management Plan Amendment (GMPA) (NPS, 1994), section 1 of the Golden Gate National Recreation Area Act (Public law 92-589, 86 Stat. 1299, 16 USC 460bb), and the Presidio Trust Management Plan (PTMP) (Trust, 2002). The NPS retained responsibility for Area A of the Presidio and manages Area A in accordance with the GMPA (Figure 1). The Trust assumed responsibility for remediation of both Areas A and B of the Presidio on 24 May 1999 by signing the Presidio Memorandum of Agreement (MOA) and the Area A MOA. In addition, the Trust also entered into a Consent Agreement with DTSC and NPS on 30 August 1999 (DTSC, Trust, and NPS, 1999).

1.2 Commissary/PX Background

The Commissary/PX Study Area is situated between Mason Street and Doyle Drive (U.S. Highway 101) at the northern end of the Presidio (Figure 1 and Figure 2A). Prior to the development of the Commissary and PX, the Study Area housed a number of Army structures, which no longer exist, as part of the Motor Pool. Potential contamination sources ("sites") in the Motor Pool are shown on Figure 3 and include the following:

- Former Motor Pool Shops,
- Former Fuel Dispensing and Storage Area,
- Former Grease Racks, Wash Racks, Waste Oil Tanks, Oil/Water Separators,
- Former Fuel Distribution Pipelines,
- Former Storm Drains,
- Former Railroad Tracks and Coal Storage Bin, and
- Former Building 633 Firing Range and Low Temperature Thermal Desorption (LTTD) Area.

These sites were used at various times to store supplies, equipment, and fuels to service and maintain vehicles for the Presidio. Reviews of historical records, aerial photographs, interviews, and site reconnaissance have identified approximately 30 structures that were present in the Study Area. Additionally, numerous underground storage tanks (USTs) and above ground storage tanks (ASTs), fuel dispensers, and associated conveyance pipelines were reported active at various times between 1900 and 1984 (IT Corporation [IT], 1998). The Motor Pool was demolished in 1984. Site histories are summarized in the SI Report (Treadwell & Rollo, 2003c).

Four Commissary/PX Study Area sites were determined to be associated with releases of hazardous substances as defined under the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA). These four CERCLA sites are the Former Railroad Tracks Area, Former Coal Storage Bin Area, Former Building 633 Firing Range, and Former Building 609 Area. The evaluation and selection of remedial alternatives for these four CERCLA sites are documented in the *Draft Remedial Action Plan (RAP), Baker Beach Disturbed Areas 1, 1A, 2, and 2A and Twenty-Seven Other Main Installation Sites* (MACTEC, 2004) and their remediation will be addressed independently but in coordination with the actions authorized by this CAP.

The Commissary/PX Study Area is directly south of the former Crissy Airfield, now a 100-acre open space recreational area located within Area A of the Presidio, as shown on Figure 2A. Restoration of the Crissy Field area was conducted between 1998 and 1999, which included removing more than 87,000 tons of hazardous fill material and 70 acres of asphalt and concrete. The landscape was reshaped to create an 18-acre tidal marsh, a 28-acre grassy field (the restored "airfield"), several picnic areas, and a promenade that is part of the 400-mile Bay Trail (EKI, 2004b). The Commissary/PX Study Area is directly adjacent to the Crissy Field Marsh and associated dune habitat. The northwest portion of the Study Area extends partially into the restored grassy field of Crissy Field.

1.3 Regulatory Framework

As detailed in the RWQCB (2003) Order No. R2-2003-0080 (Order), the Commissary/PX is a known petroleum site requiring preparation and implementation of a CAP. The RWQCB Order presents Site Cleanup Requirements (SCRs) for the protection of human health, ecological receptors, and water quality which have been used to develop the CAP cleanup levels.

This CAP has been prepared in accordance with Task 6 of the RWQCB Order. The CAP also fulfills the California requirements of Title 23, California Code of Regulations (CCR), Division 3, Chapter 16, Article 11; and California Health and Safety Code, Chapter 6.8. Cleanup levels for the Commissary/PX Study Area are specified in this CAP. Petroleum contaminant cleanup levels are based on the SCRs listed in the RWQCB Order. Cleanup levels for non-petroleum contaminants are based on the planned land use and site lithology(ies) and were developed in the *Development of Presidio-Wide Cleanup Levels for Soil, Sediment, Groundwater, and Surface*

Water (Erler & Kalinowski, Inc. [EKI], 2002) (Cleanup Levels Document). Applicable state and federal laws are identified and presented in Section 5.3.

1.4 Public Participation

A Draft CAP was prepared for public review and comment. On 30 July 2004, the Draft CAP was distributed to stakeholders, including the Presidio Restoration Advisory Board (RAB), NPS and regulatory agencies. The Draft CAP also was available for public review in the Presidio Library. Comments were invited through 30 September 2004. Comments received from stakeholders were carefully considered by the Trust and the Trust has interacted with stakeholders to discuss comments. This Final CAP includes several revisions that were made to address stakeholder comments. Stakeholder comments and the Trust's response to comments are presented in Appendix A and briefly summarized in Section 1.5 below. Copies of this Final CAP are available for review at the Presidio Library, 34 Graham Street, Presidio of San Francisco, weekdays between the hours of 8 am and 5 pm.

1.5 Response to Stakeholder Comments and Cleanup Level Updates to CAP

After review of all comments received from stakeholders on the Draft CAP, several changes were incorporated into this document to address four broader considerations:

- Schedule for implementation of the corrective action,
- Cleanup of polycyclic aromatic hydrocarbons (PAHs) in soil,
- Cleanup of metals in soil, and
- Dissolved arsenic detected in groundwater.

This section presents discussions regarding these four considerations. These discussions also are included in Appendix A along with responses to specific comments. In addition, although no stakeholder comments were received on the cleanup levels used in the Draft CAP, specific cleanup levels have been updated in this Final CAP, as summarized below.

<u>Implementation Plan and Schedule</u>

After careful consideration of all comments, the Trust re-evaluated and modified the approach for implementing the corrective action and revised the implementation schedule to address several important issues. A number of present uncertainties (discussed below) make it difficult to accurately define, at this time, the full extent of necessary cleanup. To address the uncertainties, the Trust plans to implement the corrective action in two phases. The phased approach will allow uncertainties regarding future land use (including the planned expansion of the Crissy Field Marsh), the volume and extent of contamination, and the potential presence of culturally significant artifacts in the subsurface to be addressed. As part of the phased approach, the Trust has divided the Study Area into two areas, which will be managed separately during implementation of the corrective action. The Phase 1 and 2 Areas are shown on Figure 2A.

The Phase 1 Area encompasses all portions of the site within Area A and portions of Area B within an approximate 150-foot buffer zone along the current Crissy Field Marsh shoreline (Figure 2A). The Order used a 150-foot buffer along the Crissy Field shoreline to establish the Saltwater Ecological Protection Zone. The primary objective of correction actions within the Phase 1 Area is to address the soil RUs that potentially pose a current threat to the Crissy Field Marsh and land uses within Area A.

The Phase 2 Area encompasses the remaining portions of the site which fall outside of the approximate 150-foot buffer zone and are within Area B (Figure 2A). The primary objective of correction actions within the Phase 2 Area is to address the RUs that potentially pose a threat to anticipated land use (i.e., recreational use) within Area B and could pose a threat to the Crissy Field Marsh if it were expanded into the area in the future.

During Phase 1, soil which poses a threat to the Crissy Field Marsh will be removed at all Remedial Units (RUs) located within the Phase 1 Area. Implementation of Phase 1 is currently planned to commence no later than 21 February 2006 (date pending RWQCB approval).

Phase 2 will commence following decisions regarding the potential expansion of the Crissy Field Marsh into the Phase 2 Area. During Phase 2, soil will be removed from RUs located within the Phase 2 Area consistent with land use decisions, subject to RWQCB approval. If the Crissy Field Marsh is expanded into the area, cleanup will be conducted to protect the marsh and human land use, as applicable. If the Crissy Field Marsh is not expanded into the area, cleanup may be conducted to protect the anticipated land use (i.e., recreational use). These cleanup decisions will be made in consultation with the RWQCB prior to implementation of Phase 2. The Trust will proceed with Phase 2 work no later than the end of 2008.

The present uncertainties that warrant conducting the corrective action work in two phases include:

- Uncertainties about Crissy Field Marsh Expansion. Along Crissy Field, the RWQCB Order specifies separate zones with different cleanup levels. The majority of the Commissary/PX Study Area is in the Order's Saltwater Ecological Protection Zone (Figure 2A). The Zone was drawn to allow for the potential expansion of the Crissy Field Marsh into the Commissary/PX Area. However, the extent and location of potential expansion is currently unknown, but is being considered by the Trust and NPS. The proposed expansion project will be evaluated in an upcoming National Environmental Policy Act (NEPA) process. Although it is possible that the Crissy Field Marsh could be expanded to include the Commissary/PX Area, it is likely that alternate locations for expansion will be selected. Therefore, cleanup of the Phase 2 Area to the most stringent levels required to support an ecologically sensitive marsh is unwarranted until the proposed marsh expansion project is studied under NEPA and a decision is made regarding expansion into the Phase 2 Area. If instead, the future use of the Phase 2 Area involves a land use other than marsh expansion, then alternative cleanup levels, consistent with actual land use, may be more appropriate.

The Saltwater Ecological Protection Zone cleanup levels are considerably more stringent than other potentially applicable cleanup levels (i.e., protection of human health, Table 1 of the Order; protection of terrestrial receptors, Table 2 of the Order; and protection of groundwater in Crissy Field Groundwater Area, Table 5 of the Order).[1] Therefore, remediation costs to remove all soil exceeding the Saltwater Ecological Protection Zone cleanup levels within the Phase 2 Area would be considerably higher than costs of cleanup assuming an alternate land use. Because of these considerable costs, it is prudent to defer cleanup of affected soil within the Phase 2 Area until a decision is made regarding expansion of the Crissy Field Marsh.

If the Crissy Field Marsh later expands into the corrective action site, petroleum-affected soil in the Phase 2 Area could be removed at the time of marsh expansion. This phased approach to remediation avoids "double excavation" of soil, once now and again later, thus unnecessarily duplicating mobilization and administrative costs.

The Trust recognizes that there may be administrative issues to be addressed before petroleum can be left in place at concentrations above the Saltwater Ecological Protection Zone cleanup levels within the Phase 2 Area; however, the effort to address the administrative issues may be warranted in light of the high cost to remediate all soil with concentrations above the Saltwater Ecological Protection Zone cleanup levels.

- Uncertainties about Total Volume of Affected Soil and Associated Remediation Costs. As pointed out by commenters, the actual extent of affected soil is uncertain and could be much larger than what was depicted in the July 2004 Draft CAP. Accordingly, remediation costs could be considerably higher than originally estimated in the Draft CAP. To further assess this uncertainty, a second, more conservative interpretation of soil RUs has been added to this Final CAP which shows larger potential cleanup areas of soil containing petroleum hydrocarbons at concentrations above Saltwater Ecological Protection Zone cleanup levels (see Section 3.3). Because remediation costs could significantly increase under this alternate scenario, it is prudent to defer the final cleanup decision for the Phase 2 Area until future land use determinations about the Crissy Field Marsh expansion have been made.

- Uncertainties about Archaeological Issues. Portions of the Commissary/PX Study Area are known to be archaeologically sensitive. Subsurface excavations and activities within the Study Area could disturb or damage sensitive artifacts. The Trust is currently working with Presidio archaeologists to develop an approach for monitoring and processing archaeological artifacts to avoid adverse impacts on the artifacts (see Section 5.4). Implementation of

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[1] The Commissary/PX Study Area also falls within the area designated as an "Ecological Buffer Zone" in the Cleanup Levels Document (EKI, 2002; Figure 7-2). However, these cleanup levels are not applicable to the petroleum-related COCs at this site (TPH, BTEX, and PAHs) because no TPH or BTEX cleanup levels were developed for the "Ecological Buffer Zone" (Table 7-2) and the applicable PAH cleanup levels developed under the Order are considerably lower than those developed for the "Ecological Buffer Zone." For metals, Ecological Buffer Zone cleanup levels are considered (along with all other applicable cleanup levels) because there are no cleanup levels for these contaminants under the RWQCB Order.

Phase 1 will provide an opportunity to evaluate this approach before commencing subsurface excavations within the Phase 2 Area. Because such archaeological monitoring and processing may be time consuming and costly, phasing the work and controlling the total amount of soil to be excavated in a given year should minimize the potential construction delays such monitoring and processing may cause.

Cleanup of PAHs

The primary objective of this CAP is to evaluate potential remedial alternatives to address adverse effects from petroleum-related contamination and select a corrective action for implementation at the Commissary/PX Study Area. Contaminants considered to be related to petroleum releases in this CAP are total petroleum hydrocarbons (TPH) as gasoline, diesel, and fuel oil; polycyclic aromatic hydrocarbons (PAHs); and benzene, toluene, ethylbenzene and xylenes (BTEX). However, although PAHs are a component of petroleum hydrocarbon mixtures, they can also be derived from other anthropogenic sources, such as asphalt pavement, contaminated fill, particulates from burning, and vehicle exhaust (Agency for Toxic Substances and Disease Registry, 1995; see website at http://www.atsdr.cdc.gov/toxprofiles/tp69.html). PAHs may be present in soil at the Study Area from these sources, particularly from past disposal activities or placement of contaminated fill. Therefore, PAHs may potentially be present in any fill material or material potentially moved and reburied during past site demolition, construction, and grading activities. If present throughout the fill, the extent of PAH contamination would be difficut to define and potentially costly to remediate. Thus, the following approach has been developed in this CAP to address PAHs in soil, consistent with the Phase 1 and 2 Areas identified above:

- Phase 1 Area: Within Area A portions of the Phase 1 Area, the Trust will remediate TPH and BTEX contamination to achieve cleanup levels for unrestricted land use. The Trust will also remediate PAHs to achieve unrestricted land use within Area A, to the extent practicable, but will consult with the NPS and RWQCB regarding further excavation decisions related to these compounds during implementation of the remedy. To the extent practicable, remediation will be conducted so that no land use control (LUC) is necessary within Area A. It is noted that if contamination is left in-place above cleanup levels for unrestricted use in Area A, an LUC for the area may need to be adopted and would be subject to management of the LUC by the NPS. Within Area B portions of the Phase 1 Area, an LUC will be implemented to prohibit unrestricted human land use of the property and PAHs above human health cleanup levels will be maintained under caps (e.g., pavement).

- Phase 2 Area: Within the Phase 2 Area (which is entirely within Area B), an LUC will be implemented to prohibit unrestricted human land use of the property and PAHs above human health cleanup levels will be maintained under caps (e.g., pavement and buildings) or in landscaped areas (Figure 2B). Once a decision is made regarding expansion of the Crissy Field Marsh into the area, cleanup decisions for PAHs will be made in consultation with the RWQCB, prior to implementation of Phase 2.

Cleanup of Metals

As stated above, this CAP addresses contamination associated with petroleum releases, including TPH, PAHs, and BTEX. Certain metals are present in Study Area soil at levels above background concentrations and cleanup levels. These metals include cadmium, chromium, copper, lead, nickel, and zinc which are associated with shallow fill material present beneath the Study Area. The alternatives developed in this CAP for Area B include LUCs to address metals that may be left in place at concentrations above cleanup levels (Figure 2B). To the extent practicable, remediation of metals will be conducted so that no LUC is necessary within Area A. It is noted that if contamination is left in-place above cleanup levels for unrestricted use in Area A, an LUC for the area may need to be adopted and would be subject to management of the LUC by the NPS.

Dissolved Arsenic in Groundwater

The Trust received several comments regarding detections of arsenic in groundwater above the identified cleanup level of 10 micrograms per liter (µg/L), which is based on the cleanup level for drinking water. Arsenic concentrations in groundwater intermittently exceed this cleanup level in samples from two seep locations (610SP01 and 610SP02, Figure 3) and two monitoring wells upgradient of the seeps (610GW102 and 610GW103, Figure 3).[2] To address reviewer comments, a detailed analysis of dissolved arsenic in groundwater at the Study Area was performed. This evaluation is presented in Appendix A, Attachment A-1. Section 2.4.4 includes a summary of how naturally occurring arsenic in soil may become dissolved because of reducing groundwater conditions. This section and Attachment A-1 also discuss the association of reducing groundwater conditions and dissolved arsenic at the Commissary/PX Study Area and other sites at the Presidio.

The Trust notes that dissolved arsenic concentrations[3] in all groundwater samples from these four locations, are below the Saltwater Ecological Protection Zone cleanup level of 36 µg/L and, therefore, dissolved arsenic in groundwater does not pose a significant risk to ecological receptors in Crissy Field Marsh. It is extremely unlikely that shallow groundwater adjacent to Crissy Field Marsh will be used for drinking water purposes. This point was acknowledged by RWQCB when soil cleanup levels were developed for Crissy Field. The Order states:

> "Crissy Field is treated differently because there is a low probability of groundwater being used for municipal supply purposes in the near future. Although groundwater in certain areas within Crissy Field meets the criteria of this Board's drinking water policy (Board Resolution 89-39), the probability of use for such purposes is minimal. Pumping

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2 Arsenic also was detected at 17 µg/L in one grab groundwater sample near the Former Railroad Tracks/Coal Bin area (600RRGG02).

3 One arsenic detection of 220 µg/L was reported in an unfiltered quality control duplicate sample sent to a Control Lab from seep 610SP01. Arsenic was detected at 6.6 µg/L in the primary sample and was not detected (<5 µg/L) in a duplicate sample, both sent to the primary lab (both unfiltered samples). The elevated arsenic in the Control Lab sample is likely the result of turbidity in the sample and not representative of dissolved arsenic in groundwater.

groundwater in those portions of Crissy filed [sic] where artificial fill lie [sic] on top of bay mud is likely to cause seawater intrusion and land subsidence, thus limiting the probability of developing these waters for such use."

The instances where dissolved arsenic in groundwater exceeds the drinking water cleanup level conforms to the conditions described above in the RWQCB Order. Although the drinking water cleanup levels apply to all groundwater in a strict sense, it is reasonable to treat the achievement of cleanup levels at Crissy Field differently due to the low probability of using the groundwater at this location as a drinking water supply. Thus, in this CAP, arsenic concentrations above the drinking water level of 10 µg/L are also evaluated against the Salt Water Ecological cleanup level of 36 µg/L to determine if arsenic poses a potential threat to the Crissy Field Marsh and assess the need for further action related to arsenic in groundwater.

Cleanup Level Updates

It is noted that the following cleanup levels have been updated or added to this Final CAP:

- Groundwater cleanup levels for Saltwater Ecological Protection Zone: The saltwater cleanup levels used in the Draft CAP for metals were obtained from the Presidio-Wide Cleanup Levels Document (EKI, 2002), which are based on water quality criteria from the RWQCB's Basin Plan. These values have been updated in this Final CAP to reflect the updated marine water quality objectives from the RWQCB's Basin Plan, November 2004 (Section 3.2.2). Groundwater data have been re-screened to these updated values to evaluate groundwater impacts and select contaminants of concern (COCs).

- SCRs for Crissy Field Groundwater Basin: The SCRs in the RWQCB Order for groundwater protection at Crissy Field are applicable to the Commissary/PX Study Area, but were not applied in the Draft CAP. This Final CAP incorporates these values to determine appropriate soil cleanup levels (Section 3.2.1).

- Saltwater Ecological Protection Zone Boundary: Soil data collected in the western portion of the Study Area were previously screened against the most stringent cleanup levels for saltwater protection. However, as shown on Figure 2A, the western portion of the Study Area falls outside of the Saltwater Ecological Protection Zone. Therefore, soil and groundwater data collected in this area have been re-screened against more applicable cleanup levels to select COCs and identify RUs (Section 3.2).

2.0 SITE BACKGROUND

This section discusses the geology and hydrogeology, summarizes site history, previous investigations, and corrective actions completed at the Commissary/PX Study Area, and describes the source, nature and extent of contamination found in the SI as well as more recent groundwater sampling results.

2.1 Site Geology and Hydrogeology

The following sections discuss the geologic and hydrogeologic results collected during the SI.

2.1.1 Geology

SI soil boring locations are shown on Figure 4. The materials encountered during the SI included silty sandy gravelly fill material overlaying sand, peat, and highly plastic silt and clay (Bay Mud). The general geologic conditions are illustrated on Figure 5. The sand underlying the fill material is fine to medium grained and typical of the sand which was hydraulically placed from offshore sources to fill the former tidal marsh area (referred to as the 1915 sand). The 1915 sand is laterally continuous over Crissy Field and locally ranges between 3 to 6 feet thick. Native peat and Bay Mud underlie the 1915 sand. Towards the southern Study Area boundary, the 1915 sand overlays naturally occurring interbedded fine-grained estuarine and sand deposits (Figure 5). The Bay Mud does not appear to be continuous across the Study Area. Although the Bay Mud is observed fairly consistently along the northern portion of the Study Area east to west along Mason Street it is not found in the southern portion. In the southern portion of the Study Area, the Bay Mud may pinch out towards the bedrock bluffs and becomes discontinuous with localized areas of peat. Detailed geologic cross sections are presented in the SI Report (Treadwell & Rollo, 2003c).

2.1.2 Hydrogeology

As part of the *Basewide Groundwater Monitoring Plan* for the Presidio, Montgomery Watson (1996b) identified four distinct water-bearing zones (A1, A2, B, and C) beneath the Commissary/PX Study Area. Groundwater was encountered in the A1 zone during the SI at depths ranging between 2 and 5 feet bgs with the depth to groundwater increasing to the south. The A1 zone represents the first groundwater bearing zone encountered beneath the Study Area. Based on the nature of the potential contaminants (petroleum hydrocarbons and related constituent that are lighter than water) and the results of the SI (denser chlorinated volatile organic compounds were not present), the A1 zone is the water-bearing zone of interest for this CAP. Groundwater monitoring wells installed within the Study Area during the SI are screened in the shallow A1 zone. Groundwater elevations collected during the First and Second Quarter 2005 sampling events were evaluated with Study Area wells including Building 610 wells and former Building 637 wells to understand better A1 zone groundwater flow directions and gradients (Figures 6 and 7). Groundwater elevations for Study Area wells and Building 610 wells are shown in Table 1. Groundwater elevation measurements were collected at all site wells on 14 March 2005 and 23 May 2005 (Treadwell & Rollo, 2005b). During the First Quarter 2005, groundwater elevations at the Commissary/PX Area ranged from 6.43 to 14.49 feet above Presidio Lower Low Water Datum of 1907 (PLLW) in groundwater monitoring wells 600GW102 and 600GW105, respectively. Groundwater flowed generally north towards the Crissy Field Marsh and San Francisco Bay (Figure 6). Groundwater gradients at low tide in the Commissary/PX Area were calculated to be approximately 0.011 feet per foot on the western half of the area and 0.010 feet per foot on the eastern half of the area.

During the Second Quarter 2005, groundwater elevations at low tide at the Commissary/PX Area ranged from 7.13 to 14.44 feet above PLLW in monitoring wells 600GW103 and 600GW105, respectively. Groundwater generally flowed in a northerly direction during the Second Quarter 2005 (Figure 7). Groundwater gradients at low tide in the Commissary/PX Area were calculated to be approximately 0.012 feet per foot on the western half of the area and 0.011 feet per foot on the eastern half of the area during the Second Quarter 2005 (Treadwell & Rollo, 2005b).

2.2 Site History

This section presents background information on the potential sources of contaminant releases at the Commissary/PX Study Area, including operational histories and SI potential contaminants of concern (PCOCs). In the SI, PCOCs were defined as constituents that would be potentially present in site media as a result of previous Motor Pool operations conducted at the Study Area. A summary of each Motor Pool source group (Figure 3), including activities and potential contaminant source areas are presented below.

- Former Motor Pool Shop Structures were used primarily for the maintenance and repair of motor vehicles. The activities generally associated with these buildings included the use of fuels, cleaning solvents, and paints. The PCOCs for this group included TPH as gasoline (TPHg), TPH as diesel fuel (TPHd), TPH as fuel oil (TPHfo), volatile organic compounds (VOCs), PAHs, and 6 metals (cadmium [Cd], chromium [Cr], copper [Cu], lead [Pb], nickel [Ni], and zinc [Zn]).

- Former Fuel (gasoline and diesel) Dispensing and Storage Areas. These include USTs, ASTs, and conveyance pipelines. Several historical structures in the Study Area were used to dispense or store fuels (gasoline, diesel fuel, and fuel oil). This source group includes known or suspected USTs, ASTs, and conveyance pipelines. The PCOCs for this group included TPHg, TPHd, TPHfo, BTEX, MTBE (methyl tert-butyl ether), PAHs, and 6 metals (Cd, Cr, Cu, Pb, Ni, and Zn).

- Former Grease Racks, Wash Racks, Waste Oil Tanks, and Oil/Water Separators include structures or processes that involved the degreasing and cleaning of vehicles, and the collection and storage of oily wastes and solvents. The activities generally associated with these buildings included the use of fuels, and cleaning solvent and waste oil storage. The PCOCs for this group included TPHg, TPHd, TPHfo, VOCs, PAHs, polychlorinated biphenols (PCBs), and 6 metals (Cd, Cr, Cu, Pb, Ni, and Zn).

- Former Fuel Distribution Pipelines included underground distribution pipelines which may have transported gasoline, diesel fuel, and Presidio fuel oil. Several pipelines have been removed during past remedial activities in the Study Area. This source group included a suspected former FDS pipeline along the southern boundary of the Study Area (Pipeline A), the FDS pipeline to UST FDS-1, suspected gasoline and diesel fuel pipeline from Building 637 to Building 626 (Pipeline C), and FDS Sections BRG-5, CF-3, CF-4 and CF-12. The PCOCs for this group included TPHg, TPHd, TPHfo, BTEX, MTBE, PAHs, and Pb.

- Former Storm Drain System provided the primary catchment basins and surface runoff collection for the Motor Pool. This source group consists of the former storm drain system for the Motor Pool. Most of the surface runoff within the Motor Pool would have been directed to the former storm drain system. Additionally, it is likely that floor sumps and oil/water separators would have been plumbed to discharge to the storm drain system. This system would collect and convey oily wastes and solvents. The PCOCs for this grouping included TPHg, TPHd, TPHfo, VOCs, PAHs, and 6 metals (Cd, Cr, Cu, Pb, Ni, and Zn).

- Former Railroad and Spur tracks were used to deliver and transport petroleum products and coal to the Motor Pool and the Coal Storage Bin area. This source group consists of the former railroad tracks and Coal Storage Bin located along the south side of Mason Street and a former spur track which entered the former Motor Pool area near Halleck Street and ended adjacent to Building 610. Historical records document coal storage from at least late 1915 through 1942 in the vicinity structure 604. Historically, some of the fuel and coal deliveries to the Motor Pool were made via railcar (IT, 1998). The PCOCs for this group included TPHg, TPHd, TPHfo, VOCs, BTEX, PAHs, 6 metals (Cd, Cr, Cu, Pb, Ni, and Zn), and arsenic (As). Arsenic is a PCOC due to possible coal transport and storage. As described in Section 1.2, the evaluation and selection of remedial alternatives for these CERCLA sites are documented in a Draft RAP (MACTEC, 2004) and their remediation will be addressed independently and separately from the actions authorized by this CAP.

- Former LTTD Area where baseline soil sampling detected petroleum hydrocarbons and metals. The former LTTD Area is near the former Building 633 Firing Range and includes AST 634. No history of Motor Pool use of the area has been identified. However, soil sampling results from the LTTD treatment area that were collected prior to the area being used for soil treatment by the Army included detections of TPH (diesel fuel and motor oil carbon ranges) and metals (IT, 1998). The PCOCs for this group included TPHg, TPHd, TPHfo, BTEX, PAHs, and six metals (Cd, Cr, Cu, Pb, Ni, and Zn).

2.3 Past Corrective Actions

A number of investigations and soil removal actions have been conducted in and around the Study Area as summarized in the *Site Investigation Work Plan for the Commissary/Post Exchange Study Area* (Treadwell & Rollo, 2002b), in Table 2, and on Figure 3. The previous removal actions have included:

- Building 626 waste oil UST removal,
- Building 603 UST removal,
- FDS-1 UST (Building 617) removal,
- FDS pipeline to FDS-1 removal (BR6-5),
- Contingency Site 171199-1100 and the Commissary Seeps Interim Source Removal Action,
- FDS pipelines CF-3, CF-4, and CF-12, and
- Contingency Site 111098-1100.

The results of each previous removal action are incorporated into this CAP as described below.

In 1985, a waste oil UST was discovered and removed during the demolition of Building 626 prior to the construction of the Commissary (Building 610) (IT Corporation, 1997a) (Figure 3). Despite a thorough search, little information documenting the size of the UST, location and extent of the soil excavation and volume of soil removed has been found. The total volume of soil removed is unknown. The 10 confirmation soil samples collected, (exact location unknown) report “total fuel hydrocarbons” ranging between 96 milligrams per kilogram (mg/kg) and 5,900 mg/kg (Youngkin, 1996a). One soil sample analyzed for VOCs reported non-detect concentrations for all tested analytes. This site was included in the Commissary/PX SI and is being addressed by and incorporated into this CAP.

In 1996, two fuel storage USTs were removed and over-excavated within the Study Area. A 1,000-gallon diesel UST, located adjacent to Building 603 was removed on 15 July 1996. The excavation limits measured approximately 25 feet long by 21 feet wide and 5.5 feet deep (Figure 3). Approximately 98 cubic yards (yd^3) of soil was excavated and removed. A total of 5 confirmation soil samples and 1 groundwater grab sample were collected from the excavation. Concentrations of TPHd (up to 600 mg/kg) and total petroleum hydrocarbons as motor oil (TPHmo) (up to 96 mg/kg) were detected in soil from the limits of the excavation. TPHd (6,800 µg/L) and TPHmo (220 µg/L) concentrations in groundwater were reported from the groundwater grab sample (Montgomery Watson, 1998b). These sites were included in the Commissary/PX SI and are being addressed by and incorporated into this CAP.

The second UST, a 1,000-gallon fuel oil UST (FDS-1) was removed on 29 October 1996, with a final excavation measuring 21 feet long by 19 feet wide and 5.5 feet deep (Figure 3). A total of 70 yd^3 of soil was excavated and removed. A total of 6 soil confirmation samples and 1 groundwater grab sample were collected from the excavation. The maximum concentrations for TPHd of 1,900 mg/kg and TPHmo at 1,900 mg/kg were reported in soil from the excavation limits, and the groundwater grab sample results detected TPHd (99 µg/L) and TPHmo (1,100 µg/L) (Montgomery Watson, 1998b). These sites were included in the Commissary/PX SI and are being addressed by and incorporated into this CAP.

As part of the Army base-closure environmental activities, many of the Presidio's FDS pipelines were systematically removed. In April 1997, one section of FDS pipeline in the vicinity of the former UST FDS-1 (BR6-5), was removed and the area over-excavated (Figure 3). Approximately 674 yd^3 of soil was removed during the over-excavation activities. A total of 28 confirmation soil samples was collected from the limits of the excavation and analyzed for TPH and PAHs. Detected concentrations up to >1,925 mg/kg for TPH and 3.245 mg/kg for total carcinogenic PAHs were reported from the excavation limits (IT Corporation, 1999). This area was also included in the Commissary/PX SI and is being addressed by and incorporated into this CAP.

Contingency Site 171199-1100 was identified on 17 November 1999 when petroleum odors were observed at water seeps entering the southwestern corner of the Crissy Field wetlands (Trust, 1999b). No sheen was observed on the water surface of the seeps or wetlands. No stained or discolored soil was present. The Trust sampled the seeps in accordance with the Contingency Action Plan (Trust, 1999a). Analyses of grab surface water samples from two surface water seeps to the Crissy Field tidal marsh contained low concentrations of TPHg and TPHd. A potential historical Motor Pool source was identified as the former Buildings 621 through 624 fueling area and Building 655 area. The Interim Source Removal Action Plan was implemented during summer of 2001 north of the Commissary (Building 610) (Figure 3) (Treadwell & Rollo, 2002a). Approximately 2,900 yd^3 of soil was excavated and removed. All soil confirmation sample results at the excavation limits indicated concentrations below the proposed cleanup levels. Groundwater monitoring has been performed since removal action completion as part of Presidio-wide Quarterly Groundwater Monitoring Program (Treadwell & Rollo, 2005b). SI and quarterly groundwater and seep sample TPH results have been below cleanup levels (Treadwell & Rollo, 2005b), and therefore this site requires no further action for TPH. This area was also included in the Commissary/PX SI and is being addressed by and incorporated into this CAP.

In the northwestern portion of the Study Area on the north side of Mason Street, three sections of FDS pipeline (CF-3, CF-4, and CF-12) were removed and over excavated in 1999 (Figure 3). Confirmation samples for FDS lines CF-3, CF-4, and CF-12 indicated cleanup level exceedances within and near the Study Area. The CF-3 exceedance areas were included in the Building 637 corrective action (EKI, 2004a). The CF-4 and CF-12 areas are being addressed by and incorporated into this CAP.

Contingency Site 111098-1100 consisted of fuel impacted soil and was discovered in 1998 (Golden Gate National Park Association [GGNPA], 1998) during communication line excavation work. The western portion of this site was excavated as part of the Commissary Seeps Interim Source Removal Action. SI and Trust groundwater grab samples collected south and north of the site were non-detect for TPH (Treadwell & Rollo, 2002a and 2003c), and therefore the western portion of this site requires no further action. The eastern portion of this site has not yet been addressed and has been incorporated into an RU being addressed by this CAP.

2.4 Nature and Extent of Contamination

This section presents a summary of SI and quarterly groundwater sampling results. Figures B-1 through B-7 (Appendix B) illustrate sample locations where no concentrations were detected, where detected concentrations were below SI screening levels, and where SI soil screening levels were exceeded. Tables C-1 through C-14 (Appendix C) present the compounds detected in soil and groundwater.

2.4.1 Nature and Extent of Contamination in Soil

The SI results indicated that TPH (primarily TPHfo), PAHs (primarily benzo(a)pyrene [B(a)P]), and six metals (Cd, Cr, Cu, Pb, Ni, and Zn) were present at concentrations of concern in the Study Area. The remainder of PCOCs, including VOCs, PCBs, and arsenic, were either not detected above laboratory reporting limits and/or detected above soil SI screening levels.
A comparison of these soil data against applicable cleanup levels and the selection of soil COCs is provided in Section 3.3. SI soil results are summarized below.

2.4.1.1 TPH

TPH results are summarized in Figures B-1 and B-2 and Table C-1.

- TPHg was detected in 11 of 212 samples at concentrations ranging between 1 mg/kg and 2,600 mg/kg.
- TPHd was detected in 48 of 315 samples at concentrations ranging between 1.9 mg/kg and 1,500 mg/kg.
- TPHfo was detected in 191 of 296 samples at concentrations ranging between 10 mg/kg and 12,000 mg/kg.

Overall shallow soil impacts were widely spread in the central portion of the Study Area, but are limited west of Building 610 and further east at former railroad soil boring 600RRSB03 (Figure B-1). The deep soil exceedances occurred directly below or adjacent to the shallow soil exceedances, but have a smaller lateral extent (Figure B-2). Detected concentrations decreased with depth.

2.4.1.2 VOCs, BTEX, and MTBE

Detections of VOCs, BTEX, and MTBE are summarized in Table C-1 and C-2. With the exception of the following compounds, VOCs were not detected above laboratory reporting limits.

- Carbon disulfide was detected in 610SB01[5.0] and in duplicate sample DUP080502D (parent sample 600SB103[4]) at concentrations of 0.005 mg/kg and 0.007 mg/kg, respectively.
- Acetone was detected at two locations 619SB03[4.5] and 628SB06[4]. Detections ranged from 0.14 mg/kg to 0.28 mg/kg.
- Trans-1,3-dichloropropene (trans-1,3-DCP) was detected at 0.015 mg/kg in sample 628SB06[2].
- 2-Butanone was detected in soil samples 610SB02[7.5] and 626SB04[11.0] at 0.017 mg/kg and 0.021mg/kg, respectively.
- 1,2-dichloroethylene (1,2-DCE) was detected in soil sample 610SB04[7.5] at a concentration of 0.13 mg/kg.

With the exception of a single detection of MTBE (0.008 mg/kg in 628SB09[5]), BTEX and MTBE were not detected above the laboratory reporting limits in any of the soil samples.

2.4.1.3 PAHs

PAH detections are summarized on Figures B-3 and B-4 and Table C-3. Of the 354 SI soil samples analyzed for PAHs, 204 samples had PAHs detected. PAH compounds with soil cleanup levels ranging between 0.027 to 0.27 mg/kg, were found at the following concentrations:

- Benzo(a)anthracene [B(a)A] was detected in 164 of 354 samples analyzed at concentrations ranging between 0.0041 and 3.4 mg/kg.
- B(a)P was detected in 194 out of 354 samples analyzed at concentrations ranging between 0.004 and 2.9 mg/kg.
- Benzo(b)fluoranthene [B(b)F] was detected in 166 out of 354 samples analyzed at concentrations ranging between 0.0037 to 3.4 mg/kg.
- Benzo(k)fluoranthene [B(k)F] was detected in 139 of 354 samples analyzed at concentrations ranging between 0.0034 to 1.6 mg/kg.
- Dibenz(a,h)anthracene [D(a,h)A] was detected at concentrations ranging between 0.0039 to 1.3 mg/kg.

- Indeno(1,2,3-c,d)pyrene [I(1,2,3-c,d)P] was detected at concentrations ranging between 0.004 to 1.8 mg/kg.

All other PAH compounds, with soil cleanup levels ranging between 2.7 mg/kg and 40 mg/kg were reported near or well below 1 mg/kg. The deep soil impacts occurred directly below or adjacent to the shallow soil exceedances, but have a smaller lateral extent (Figures B-3 and B-4). Detected compounds and concentrations also decreased with depth.

2.4.1.4 PCBs

PCBs were not detected above laboratory reporting limits in any soil samples collected during the SI (Table C-4).

2.4.1.5 Six Metals and Arsenic

Metals results are presented on Table C-5 and Figures B-5 and B-6.

- Arsenic was detected in 25 of 26 soil samples ranging between 1.2 mg/kg and 5.6 mg/kg.
- Cadmium was detected in 11 of 132 samples at concentrations ranging between 0.6 mg/kg and 2.8 mg/kg.
- Chromium was detected in 271 out of 272 samples analyzed at concentrations ranging between 6.3 and 1,000 mg/kg.
- Copper was detected in 206 out of 208 samples analyzed at concentrations ranging between 1.9 and 130 mg/kg.
- Lead was detected in 293 of 343 samples at concentrations ranging between 0.98 mg/kg and 1,300 mg/kg.
- Nickel was detected in 276 of 278 samples analyzed at concentrations ranging between 2.2 and 1,800 mg/kg.
- Zinc was detected 248 of 266 samples analyzed at concentrations ranging between 12 mg/kg and 520 mg/kg.

As indicated in Table C-5 and on Figures B-5 and B-6, cadmium, chromium, copper, lead, nickel, and zinc are present at levels above background concentrations and SI screening levels. Correlation coefficients and 95% Upper Confidence Limit (UCL) analyses conducted as part of the SI indicate that elevated metal concentrations in soil exceeding SI screening levels were not associated with releases from the Motor Pool. Elevated metals are likely associated with shallow fill material placed within the Study Area (Figures B-5 and B-6).

Lead exceedances at the Former Building 633 Firing Range CERCLA site (LTTDSB01 and LTTDSB07) and at the Coal Storage Bin Area and Former Railroad Tracks CERCLA site (604SB03) will be addressed during the CERCLA process. The selected remedial action for these sites is documented in the *Draft Remedial Action Plan (RAP), Baker Beach Disturbed*

Areas 1, 1A, 2, and 2A and Twenty-Seven Other Main Installation Sites (MACTEC, 2004). Two lead exceedances (613SB07 and 617SB06) occur within RUs identified in this document and will be addressed during CAP implementation. Two remaining lead exceedances (600GW105 and 600GW106) are beneath the Doyle Drive elevated roadway and are outside the formal Study Area boundary. However, the alternatives evaluated and selected in this CAP for metals address these two lead exceedances.

The fill material in the shallow subsurface of Crissy Field is known to contain chert and shale fragments and such fragments were observed in the SI soil borings. Higher copper and zinc concentrations may be related to the presence of chert and shale fragments in the fill material and/or fill material that may have mixed into the sand. Correlation coefficients developed as part of the SI indicated that none of the six metals is co-located with TPHd, TPHfo, or any of the detected PAHs. Correlation between nickel and chromium was high indicating that elevated levels of nickel may be attributable to the same source as elevated levels of chromium such as the presence of serpentinite in the fill material present beneath the Study Area. Thus, the metals do not appear to be attributable to anthropogenic sources related to Motor Pool activities, but are likely consistent with locally derived fill material (Treadwell & Rollo, 2003c). Based on the elevated concentrations, these metals are retained as COCs.

2.4.1.6 Pesticides

With one exception, all six primary soil samples and one duplicate soil sample had no detectable concentrations of pesticides above the laboratory reporting limits (Table C-6). Alpha-chlordane and gamma-chlordane were detected at 0.006 mg/kg in sample T609SB01[2]. The summed value of these concentrations, 0.012 mg/kg is below the cleanup level of 0.04 mg/kg.

2.4.2 Soil Impact Summary

Based on the SI soil analytical results, generalized impacted areas were identified in the Study Area that may require corrective action as shown on Figure 8. The generalized areas of impact are described below.

- Building 613 Area

  The western portion of former Building 613 had reported detections for TPH and PAHs (Figure 8). These detections may be attributed to the former use of the building for vehicle repair activities. The impacted area is generally limited vertically to the upper five feet.

- Building 628 Areas 1 and 2

  The southern section of former Building 628 located west of existing Building 610 had reported detections for TPH (Figure 8). These exceedances may be attributed to the former use of the building for vehicle maintenance activities. The impacted area is limited vertically to the upper five feet.

The second area, impacted with TPH and PAHs, was identified downgradient and north of former Building 628 (Figure 8). This impact area is limited in depth to the upper five feet.

- Building 619 Area

  TPH impacts have been identified downgradient of the former Building 619 sediment/oil separator located in the south central portion of existing Building 610 (Figure 8). The impacted area is generally limited in depth to the upper five feet.

- Building 626 Area

  TPH and PAH impacts were in the vicinity of former Building 626 (Figure 8). These impacts are likely attributed to the former fueling and fuel distribution piping associated with Building 626. The impact area is limited vertically to the upper ten feet.

- Site 15 Area

  Data from the vicinity of Site 15 indicates soil impacts from TPH and PAHs. Fuel oil was reportedly stored at Site 15 (Figure 8). The impacted area is generally limited in depth to the upper six feet.

- TPHg Source Area

  Analytical results from the field sampling program identified one area of TPH and PAH impact at a location with no apparent historic contaminant source. The area is located northeast of existing Building 610 in an area where railroad tracks were historically located and includes Contingency Site 111098-1100 (Figure 8). The impacted area is limited vertically to the upper five feet.

- FDS Pipeline Area

  TPH and PAH detections in this impacted area may be attributed to the former FDS pipeline and UST located directly upgradient. Fuel oil was reportedly stored in former FDS UST No. 1 (Figure 8). The impacted area is limited in depth to the upper five feet.

- Pipeline A Areas 1 and 2

  Two areas with TPH and PAH impacts have been identified along the southern boundary of the Study Area south of existing Building 610 (Figure 8). These detections may be attributed to FDS Pipeline A formerly located in this area. Historically, fuel oil was conveyed through the pipeline as part of the FDS. The impacted area is generally limited in depth to the upper five feet.

- LTTD Area

  The PAH detections in the impacted area are generally limited in depth to the upper three feet with the western portion extending to five feet bgs (Figure 8).

- FDS Pipeline Residuals and AST 634 Area

  The FDS Pipeline Residuals Area is located in the northwestern portion of the Study Area on the north side of Mason Street. Three impact areas have been identified which are related to fuel residuals remaining following removal and over excavation conducted by the Army in 1999 (Figure 8). A TPH impact was also identified in the shallow soil at the former AST 634 during the Commissary/PX SI. Former AST 634 was located directly north of Pipeline C and adjacent to removed FDS pipelines (Figure 8). The impact areas are limited in depth to the upper three feet.

These generalized areas of soil impacts are further discussed in detail in Section 3.3. Volume estimates for the above described impacted areas can be found in Tables 5A and 5B.

In addition to the corrective action soil RUs, Figure 8 also shows the CERCLA sites where the evaluation and selection of remedial alternatives are documented in a Draft RAP (MACTEC, 2004). A summary of the soil impacts related to these areas is presented below. Remediation at these areas will be addressed independently but in coordination with the actions authorized by this CAP.

- Former Railroad Tracks Area and Former Coal Storage Bin Area

  Potential soil impacts from the historic railroad tracks and coal storage have been identified in the eastern portion of the Study Area just south of Mason Street near existing Building 605 (Figure 8).

- Building 633 Firing Range

  Soil at the Building 633 Firing Range former backstop and firing line is impacted by metals and B(a)P.

The fourth and final CERCLA site in the Commissary/PX Study Area is Former Building 609. The Former Building 609 Area has been recommended for a “No Further Action” remedy in a Draft RAP (MACTEC, 2004) because there is no impacted soil that requires a remedial action at this site.

2.4.3 Nature and Extent of Contamination in Groundwater

Groundwater analytical results for the Study Area were collected during the SI and as part of the Presidio-wide Quarterly Groundwater Monitoring Program as documented in the *Semi-annual Groundwater Monitoring Report Third and Fourth Quarters 2004* (Treadwell & Rollo, 2005a) and the *Semi-annual Groundwater Monitoring Report First and Second Quarters 2005* (Treadwell & Rollo, 2005b). Tables C-7 through C-14 present the SI and quarterly sampling results. Figure B-7 summarizes the SI analytical results for the groundwater grab samples and Study Area wells. These tables and the discussion in this section include surface water results from two seeps: 610SP01 and 610SP02.

Detected compounds in groundwater and/or surface water include:

- PAHs: anthracene, B(a)A, B(a)P, B(b)F, benzo(g,h,i)perylene (B(g,h,i)P), B(k)F, chrysene, D(a,h)A, I(1,2,3-c,d)P, fluorene, fluoranthene, and pyrene;
- TPH: TPHd, TPHfo, and TPHg;
- VOCs: benzene, chlorobenzene, chloroform, ethylbenzene, MTBE, toluene, and xylenes; and
- Metals: arsenic, cadmium, chromium, copper, lead, nickel, and zinc.

A comparison of these results with applicable cleanup levels for the Study Area is provided below and in Section 3.3.

2.4.3.1 TPH

TPH was detected in four of the 52 groundwater grab samples, 3 of the 12 monitoring wells, and both seeps (Table C-7). The detected concentrations of TPHg, TPHd, and TPHfo are outlined below.

- TPHg has been detected at monitoring well 600GW101 at concentrations ranging from 230 to 630 µg/L. Historically, TPHg has been detected in samples from 610GW102 (and 610GW103. In 2004 and 2005, concentrations have ranged from <50 µg/L to 67 µg/L at 610GW102 and <50 µg/L to 69 µg/L in 610GW103. TPHg has also been detected in samples from both surface water seeps 610SP01 and 610SP02. In 2004 and 2005, concentrations ranged from <50 µg/L to 99 µg/L at 610SP01 and <50 µg/L to 150 HY µg/L at 610SP02.

- TPHd was detected in one groundwater grab sample (619GG04) at 84 µg/L during the SI and historically in samples from three groundwater monitoring wells (600GW107, 610GW101, and 610GW103). In 2003, TPHd was only detected at 600GW107 where concentrations ranged from <50 µg/L to 170 HY µg/L and at 610GW103 where concentrations ranged from <50 µg/L to 62 Y µg/L. Although TPHd has historically been detected in samples from both seeps, it was not detected in the 2003 samples. TPHd has not been detected in any wells or seeps during 2004 and 2005 monitoring.

- TPHfo was detected in three SI groundwater grab samples 613GG11, 613GG12, and 619GG01 at concentrations of 350, 270 and 310 µg/L. TPHfo has also been detected in 610GW101 at concentrations ranging up to 1,400 µg/L. In 2003, TPHfo was present at 610GW101 at <240 µg/L to 450 µg/L, but has not been detected in this well during 2004 and 2005 sampling. TPHfo has not been detected in the seep samples.

Only TPHfo has been detected above its respective cleanup level at monitoring well 610GW101 and only in the First Quarter 2003. Subsequent sample results for TPHfo have generally been non-detect with one detection of 450 µg/L in the Third Quarter 2003.

2.4.3.2 VOCs, BTEX, and MTBE

Except for toluene at 0.5 µg/L (0.6 µg/L in the duplicate sample) in 601GG02 and total xylenes at 1.7 µg/L in 600SDGG03, BTEX were not detected in the SI groundwater grab samples (Table C-8). Benzene has only been detected once at well 610GW102 at 0.53 µg/L in the Fourth Quarter 2003. Historical detections of ethylbenzene have ranged from 0.69 µg/L to 4.9 µg/L in samples from 610GW103. During 2003, ethylbenzene was only detected at seep 610SP02 at 1.7 µg/L and at 610GW103 at 0.69 µg/L. In 2004 and 2005, ethylbenzene was detected at 600GW101 at 2.2 µg/L, but was not detected at other wells and seeps. Total xylenes have been detected between 0.54 and 5 µg/L at wells 600GW101, 610GW101, and 610GW103 and both seeps. Toluene has been detected between 0.69 and 6.4 µg/L at well 610GW101 and both seeps. MTBE has been detected at 600GW101, 610GW101, 610GW102, 610GW103, and both seep locations at concentrations ranging from 2 to 15 µg/L.

Except for one detection of chlorobenzene at 1.1 µg/L in SI groundwater grab sample 610GG01 and low level detections of chloroform at 2.6 µg/L to 11 µg/L at monitoring well 600GW108, no other VOCs were detected in any of the groundwater samples (Table C-8). The SI screening levels for chlorobenzene and chloroform are 70 and 80 µg/L, respectively.

Only MTBE has been detected above its respective CAP cleanup level at seep 610SP02 in Third Quarter 2003 at 15 µg/L, just above the 13 µg/L cleanup level. It has been detected below the cleanup level at this location in previous or subsequent sampling events.

2.4.3.3 PAHS

PAH results in groundwater are summarized in Table C-9. Of the 49 groundwater grab samples and nine monitoring wells sampled, a total of 14 PAHs have been detected including the following.

- Acenaphthene has been detected only at 600GW103 with concentrations ranging from 5.6 to 9 µg/L.
- Two detections (600AG001and 600GW107) of B(a)A at 0.2 and 0.24 µg/L respectively.
- Six detections (600AGG01, 600GW102, 600GW103, 600GW107 and 600GW109) of B(a)P ranging from 0.15 in 600GW109 to 0.34 µg/L in 600GW103.
- Chrysene was detected in 600AGG01, 600GW104 and 600GW107 at concentrations ranging from 0.1 µg/L to 0.62 µg/L.
- Single detections of anthracene, B(b)F, B(k)F, B(g,h,i)P, D(a,h)A, I(1,2,3-c,d)P, and phenanthrene, all found in the first sample collected at 600GW107 at the following respective concentrations: 0.19, 0.34, 0.4, 0.15, 0.4, 0.21, and 0.51 µg/L.
- One detection of fluorene (600AGG01) at 0.3 µg/L.

- Two detections of fluoranthene, both in 600GW107, at concentrations ranging from 0.05 to 0.49 µg/L.
- Two detections of pyrene in 600AGG01 and 600GW107 at 0.4 and 0.53 µg/L, respectively.

Acenaphthene was the only PAH detected in groundwater samples in 2004 and 2005, at well 600GW103 at 7.3 and 7.7 µg/L. B(a)A, B(a)P, B(b)F were detected at concentrations slightly above CAP cleanup levels in the First Quarter 2003 at 600GW107. In previous and subsequent sampling events, these PAHs were not detected at this location. B(a)A was also detected above the cleanup level at groundwater grab sample 600AGG01. B(a)P was also detected above CAP cleanup levels in the Fourth Quarter 2002 at 600GW103, but was below the 0.2 µg/L cleanup level in the First Quarter 2003 and has not been detected in subsequent sampling events.

2.4.3.4 Six Metals and Arsenic

Metals detected in groundwater or surface water seep samples above CAP cleanup levels include arsenic, cadmium, chromium, copper, lead, nickel, and zinc (Figure 9). A summary of dissolved and total metals results in groundwater is presented in Table C-10. Beginning with the Third Quarter 2003 sampling event, seep samples were analyzed for total metals instead of dissolved metals. The total metal results in the seep samples are generally higher than those previously reported for dissolved metals likely due to increased particulates in the unfiltered samples. Beginning in the Third Quarter 2004, seep samples were analyzed for both dissolved and total metals.

Dissolved arsenic was detected above the 5 µg/L detection limit in one of the five grab groundwater samples tested at 17 µg/L at 600RRGG02, which exceeded the cleanup level of 10 µg/L. Dissolved arsenic was also detected in samples from downgradient monitoring wells 600GW101 through 600GW104, Building 610 wells 610GW101 through 610GW103 and the two surface water seeps. Dissolved arsenic has also been detected in upgradient monitoring well 600GW107 at concentrations ranging from <5 to 7.1 µg/L. In the downgradient monitoring well samples, detected concentrations ranged from 1.1 µg/L at 610GW101 to 13 µg/L at 610GW102 and 610GW103; one control duplicate sample collected in March 2005 at 610GW102 had a dissolved arsenic concentration of 22.1 µg/L, but this concentration was not confirmed in the primary and duplicate samples (6.9 and 6.5 µg/L). In the seep samples, dissolved concentrations have ranged from <5 µg/L in 610SP02 to 19 µg/L in 610SP01. Total arsenic concentrations in the seep samples have ranged from <5 in both seeps to 34 µg/L at 610SP01, though a control duplicate sample showed a total arsenic concentration of 220 µg/L in December 2003 at 610SP01.

Dissolved cadmium has not been detected in any of the groundwater samples. In the Third and Fourth Quarters 2003, total cadmium concentrations in seep sample 610SP01 were 1.2 and <1 µg/L, respectively, though the duplicate and control laboratory duplicate sample concentrations were <1 and 5.5 µg/L, respectively.

Dissolved chromium was detected in SI groundwater grab samples 600RRGG02, 613GG02, and 613GG03 at concentrations of 18 µg/L, 16 µg/L, and 20 µg/L, respectively. In monitoring well samples, dissolved concentrations have ranged from 1.1 µg/L to 6.3 µg/L, but dissolved chromium has not been detected since the First Quarter 2003. In the seep samples, dissolved chromium concentrations ranged from 1.2 to 3.2 µg/L. Total chromium concentrations have ranged from <10 µg/L to 180 µg/L at 610SP01, though a control laboratory duplicate sample concentration was 1,000 µg/L in March 2003.

In monitoring well samples, dissolved copper concentrations have ranged from 1 µg/L to 4.2 µg/L. Dissolved copper has also been detected in seep samples at concentrations ranging between 1.1 and 1.4 µg/L. Total copper in the seep samples has ranged from <1 to 44 µg/L at 610SP01 and <1 to 29 µg/L at 610SP02, though a control laboratory duplicate sample result was 320 µg/L in March 2003.

Dissolved lead has not been detected in groundwater or seep water samples except for one control laboratory duplicate sample result at 5.89 µg/L in March 2005. Total lead concentrations in seep samples have ranged between 6.4 to 25 µg/L at 610SP02 and 9.7 to 190 µg/L at 610SP01; though a control laboratory duplicate sample result was 300 µg/L in March 2003.

Dissolved nickel has been detected in groundwater samples at concentrations ranging between 1.1 µg/L at 610GW101 to 11 µg/L at 600GW105. Total nickel in the seep samples has ranged from 37 to 330 µg/L at 610SP01 and 25 to 77 µg/L at 610SP02, though a control laboratory duplicate sample result was 1,400 µg/L in March 2003.

Dissolved zinc was not detected in the 45 primary or seven duplicate groundwater grab samples collected during the SI. However, zinc was detected in eight of the monitoring well samples collected in September 2002 at concentrations ranging from 55 to 260 µg/L (Table C-10 and Figure B-7). Treadwell & Rollo collected the Phase 1 groundwater grab samples using QED Quickfilter™ and Blaine Tech collected the September 2002 groundwater monitoring well samples using Clearwater Engineering™ filters. Zinc has also been detected at higher than historic concentrations at other sites in the Presidio-wide Groundwater Monitoring Program sampled quarterly by Blaine Tech. It appears that the Clearwater Engineering™ filters used by Blaine Tech are associated with the zinc concentrations detected in the September 2002 monitoring round.

Based on the Phase 1 SI results and at the request of Treadwell & Rollo, Blaine Tech began using the QED Quickfilter™ brand filters in December 2002 for the Fourth Quarter 2002 sampling event. All groundwater samples collected for metals analyses during the Fourth Quarter 2002 and Phase 2 SI were field filtered by Blaine Tech using the QED Quickfilter™, prior to being placed in preserved containers.

Following the use of the QED Quickfilter™, dissolved zinc concentrations have ranged from <20 to 36 µg/L in Study Area wells. Based on the zinc results from subsequent quarterly monitoring events, it is likely that the elevated zinc concentrations observed in the September 2002 samples are related to use of the Clearwater Engineering™ filters. The Clearwater Engineering™ filters were either not effectively filtering the sample water or were contributing to concentrations of zinc in the samples, although the later scenario is not likely based on the filter blank sample results collected during the Third Quarter 2002. A more detailed discussion can be found in Section 5.4.3.4 of the *Draft Semi-annual Groundwater Monitoring Report, First and Second Quarters 2003, Presidio-wide Groundwater Monitoring Program* (Treadwell & Rollo, 2003d).

Total zinc results in the seep samples ranged from 58 to 300 µg/L at 610SP01 and <20 to 85 µg/L at 610SP02, though again the control laboratory duplicate sample concentration in March 2003 was much higher at 920 µg/L.

2.4.3.5 PCBs

PCBs were not detected above laboratory reporting limits in any of the SI groundwater grab samples (Table C-11).

2.4.4 Groundwater Impact Summary

The SI concluded that groundwater impacts at the Study Area were minor (Figure B-7). Analytical results for all tested groundwater samples reported TPHfo, MTBE, B(a)A, B(a)P, B(b)F, and dissolved arsenic, copper, nickel, and zinc concentrations above SI screening and CAP cleanup levels (Figure 9). The majority of the exceedances have been non-reoccurring, single exceedances over a timeframe of 12 consecutive quarterly groundwater sampling events.

<u>Organic Compounds</u>

To comply with the RWQCB Order Number 96-070, the Army conducted a Petroleum Hydrocarbon Bioassay and Point of Compliance Concentration Determination Study in this area in 1997 which included the installation and sampling of a series of small-diameter microwells using direct-push drilling methodologies (microwells EBPP01 through EBPP6A, Figure 3). Groundwater samples collected from the microwells in March 1997 did not contain detectable levels of TPHg and BTEX (IT, 1997b).

In mid-November 1999, the Trust became aware that groundwater seeps in the southwest corner of the new Crissy Field tidal marsh (610SP01 and 610SP02), contained detectable concentrations of TPHg (Figure 3). Throughout 2000, the Trust conducted a series of investigations to identify and delineate the source of TPHg in the seeps including monthly sampling of the seeps (Table C-7). The Trust also collected shallow groundwater grab samples within Mason Street and near the seep locations using direct-push drilling and HydroPunch™ sampling methods. As documented in the Trust's *Commissary Seeps Interim Source Removal Action Plan* (Trust, 2000), TPHg in the seep samples ranged up to 810 µg/L and shallow groundwater TPHg concentrations up to 3,400 µg/L. Soil in the majority of this area was excavated as part of the Commissary Seeps Interim Source Removal Action (Figure 3) conducted in 2001. Since removal was conducted, the highest TPHg concentration detected in seep samples has been 240 µg/L and the highest concentration detected in monitoring wells upgradient of the seeps (610GW101 through 610GW103) has been 430 µg/L.

Although not detected at concentrations above the cleanup levels, TPHg, ethylbenzene, toluene, and xylenes have been reported, primarily in the northwestern corner of the Study Area, where these compounds had been present prior to the Commissary Seeps Interim Source Removal Action (Section 2.3 and Figure 3) (Treadwell & Rollo, 2002a). Detection of these compounds may also be related to a former fueling area located upgradient of 600GW101. The detections and concentrations have decreased over time, as residual hydrocarbons undergo degradation. Other VOC detections (MTBE and chlorobenzene) were consistently below cleanup levels and were also isolated in extent and occurrence.

Groundwater detections of chloroform (2.6 to 11 µg/L) appear to be upgradient of the site and were all below screening levels. The source of the chloroform detected at well 600GW108 may be related to a leaking irrigation, water supply, or sewer line. Small amounts of chloroform are formed during the process of adding chlorine to potable water to destroy bacteria (http://www.eco-usa.net/toxics/chcl3.shtml) (Hietkemper, 2001). Typical chloroform levels present in treated drinking water range from 2 to 44 µg/L. Chloroform detections at this and other sites at the Presidio (Building 1065, Building 207/231, Battery Howe Wagner, Directorate of Engineering and Housing) have generally ranged from 0.08 to 19 µg/L, well below the chloroform cleanup level of 80 µg/L (Treadwell & Rollo, 2005b).

Six Metals

As described in Section 2.4.3.4, the exceedance concentrations for dissolved zinc appear to have been related to the type of groundwater filter previously used by Blaine Tech in the quarterly sampling. Additionally, the total metal exceedances detected in the seep samples (610SP01 and 610SP02) are related to unfiltered total metals analysis. These results are for "total" metals, including the metals associated with sediments in the water rather than for dissolved metals. At the request of DTSC, those seep samples were not filtered in order to collect data that can be used in ecological risk comparisons. However, because the saltwater ecological criteria used in this CAP from the Basin Plan are expressed in terms of dissolved concentrations, rather than total concentrations, it is more appropriate to compare the dissolved concentrations to the saltwater criteria in this CAP to assess the potential for water quality impacts for ecological receptors.

Dissolved copper has been detected only once at a concentration above the CAP cleanup level (3.1 µg/L). The exceedance was reported from one of the 12 samples analyzed from upgradient well 600GW105 (4.2 µg/L) in December 2002. Dissolved copper has not been detected above the cleanup level since that time (Figure 9).

Nickel (ranging between 5.1 and 11 µg/L) has been detected at concentrations slightly above the cleanup level (8.2 µg/L) in samples from downgradient well 600GW104 (one of 12 samples) and upgradient well 600GW105 (two of 12 samples). These concentrations are similar to those detected at other Presidio sites (Building 1349 and Fill Site 6) where nickel is not a COC (Treadwell & Rollo, 2005b) and appear to be within historical Presidio groundwater concentration ranges.

Arsenic

Dissolved arsenic has been detected above the cleanup level of 10 µg/L (drinking water cleanup level) in monitoring well and seep samples collected in the vicinity and downgradient of the Commissary Seeps Excavation (Figures 9 and 10). Monitoring well 610GW101 is located on the southern excavation boundary where concentrations have ranged from < 5 to 7.3 µg/L. Monitoring well 610GW102 is located in the former Commissary Seeps Excavation where concentrations ranged from 6.1 to 22.1 µg/L. Dissolved arsenic concentrations at 610GW103 have ranged between 4.6 to 13 µg/L. During these same sampling events, dissolved arsenic has consistently been detected at both seeps (610SP01 and 610SP02) at concentrations ranging from 5.9 to 23 µg/L. None of these dissolved arsenic concentrations exceed the Saltwater Ecological cleanup level of 36 µg/L, and therefore, dissolved arsenic concentrations are not high enough to adversely affect Crissy Field Marsh. It is extremely unlikely that shallow groundwater adjacent to Crissy Field Marsh will be used for drinking water purposes.

Elevated dissolved arsenic concentrations in the Commissary Seeps Interim Source Removal Area likely are the result of reducing conditions created by a former petroleum release. The relationship between reducing conditions in groundwater and elevated dissolved arsenic concentrations is widely recognized (Dragun, 1988, Fetter, 1993, Saxena, et al., 2004, and Kirk, et al., 2004). Reducing conditions can mobilize naturally-occurring arsenic that is present in soil. Arsenic is mobilized by reductive dissolution of iron and manganese oxides/hydroxides on which it adsorbs (i.e., reduction of iron III to iron II and reduction of manganese IV to manganese II) and the reduction of arsenic from arsenate (arsenic V) to arsenite (arsenic III). Arsenate is more adsorptive on iron and manganese oxides/hydroxides than is arsenite.

When reducing conditions mobilize arsenic, elevated dissolved arsenic would be expected to be accompanied by elevated dissolved (reduced) iron (i.e., ferrous iron or iron II). At a neutral pH, ferric iron (iron III) reduces to ferrous iron (iron II) at an Eh (oxidation-reduction potential relative to the standard hydrogen reference electrode) similar to that where arsenate (arsenic V) reduces to arsenite (arsenic III; i.e., approximately +0.2 volts for iron compared to 0.0 volts for arsenic). Therefore, dissolved iron measurements in groundwater provide a useful tool for assessing whether groundwater conditions would favor mobilization of naturally-occurring arsenic. When ambient conditions return following the removal of petroleum, dissolved (ferrous [iron II]) iron should oxidize to form ferric oxides/hydroxides, which strongly adsorb arsenic, and arsenite should oxidize to arsenate.

Groundwater general chemistry results are summarized in Table C-12, dissolved gases and TOC in Table C-13, and arsenic speciation results in Table C-14. Appendix A, Attachment A-1 provides a detailed discussion of arsenic in groundwater at the Commissary/PX Study Area. The evaluation presented in Attachment A-1 supports the following conclusions:

- The dissolved arsenic and redox groundwater data collected at the Commissary/PX Study Area indicate that reducing conditions are present in areas with former petroleum releases. The elevated dissolved arsenic concentrations above the cleanup level of 10 µg/L in the vicinity of the Commissary Seeps Interim Source Removal Area are likely the result of reducing conditions in the area.

- Reducing conditions are also apparent at other petroleum-release sites at the Presidio, including the Building 1065, Building 1349, and Building 207/231 Areas.

- Dissolved arsenic concentrations are expected to decrease (when reducing conditions are caused by petroleum) after the petroleum in soil is remediated and groundwater returns to ambient conditions.

A comparison of the groundwater data to CAP cleanup levels is presented in Section 3.2.4.

3.0 SUMMARY OF SITE RISKS

This section presents the project's remedial action objectives (RAOs) and identifies the cleanup levels, COCs, and RUs.

3.1 Remedial Action Objectives (RAOs)

RAOs are statements of the general goals of an environmental cleanup. For the cleanup remedies to be conducted at the Commissary/PX Area, the RAOs include the following:

- Protection of human health and the environment, including Crissy Field Marsh, consistent with future planned land use.
- Cost-effective cleanup of petroleum releases in the Study Area, consistent with planned land use.
- Recycling excavated materials, such as concrete and asphalt, to the extent practicable.
- Compliance with State and Federal environmental laws.
- Consistency of the selected remedial alternatives at the Study Area with the overall transformation of the Presidio into a national park site.
- Preference for permanent ("clean closure") remedies whenever practicable, cost-effective, and consistent with current or anticipated land use.

3.2 Development of Applicable Cleanup Levels and Identification of COCs

Cleanup levels for petroleum hydrocarbons and related constituents are determined by the SCRs as adopted in the RWQCB Order. Cleanup levels for non-petroleum contaminants are based on the planned land use and site lithology(ies) for the Study Area and have been developed consistent with the processes detailed in the Cleanup Levels Document (EKI, 2002).

The key factors that are used to develop cleanup levels for a given site are human health and ecological exposure as well as background metal concentrations. Cleanup levels are defined by the most sensitive population that is reasonably associated with the planned land use identified for a particular area (EKI, 2002). As described in the Cleanup Level Document, background metals concentrations are based on the predominant soil lithologies found in the Presidio. For any given site, the applicable cleanup level incorporates the impacted media, predominant soil or sediment lithologies and associated background metal concentrations, planned human land use (residential, recreational, or commercial/industrial), planned ecological land use (including the presence of special-status species), the presence of petroleum-related chemicals, depth to groundwater, and resources to be protected.

3.2.1 Soil Cleanup Levels

The following soil cleanup levels are applicable to the Study Area:

- Human Health (Recreational and Residential Use): The GMPA and PTMP call for recreational land use at the Study Area. It is noted that cleanup levels for recreational use are more stringent than cleanup levels for commercial land use (EKI, 2002). Thus, cleanup to recreational use standards would be protective of commercial site use as well. Residential cleanup levels are also being considered in this CAP so that the site may be available for unrestricted use.

- Ecological (Saltwater Ecological Protection Zone): The majority of the Study Area is included in the Saltwater Ecological Protection Zone defined in the RWQCB Order because of its proximity to the Crissy Field Marsh and potential expansion. The potential expansion is currently being considered and will be evaluated in the upcoming NEPA process. However, as described in Section 1.5, if the Trust determines that the Crissy Field Marsh will not expand into the Phase 2 Area, future cleanup may be conducted, subject to RWQCB approval, to be more consistent with actual future land use.

- Ecological (Buffer Zone): Per the Cleanup Levels Document, the Study Area also falls within an Ecological Buffer Zone.

- Metals Background Concentrations for Beach/Dune Sand: The predominant lithology in the area is Beach/Dune Sand.

- Groundwater Protection at Crissy Field (<5 feet above groundwater): The Study Area is within the Crissy Field Groundwater Area of the Marina Groundwater Basin. SCRs from the RWQCB Order for protection of groundwater at Crissy Field are applicable to the Study Area. Shallow groundwater at the Study Area has been encountered between 2 and 5 feet bgs (Section 2.1.2); therefore, a depth to groundwater of <5 feet is assumed to evaluate the leaching potential from soil to groundwater.

These site-specific applicable soil cleanup levels are presented in Table 3. Tables 1, 2, 5, and 6 of the RWQCB Order and Tables 7-2 and 7-5 of the Cleanup Levels Document provide the soil cleanup levels presented in this table. For each compound, the most stringent of these criteria has been selected as the applicable cleanup level for the majority of the Study Area, which is within the Saltwater Protection Zone. For the western portion of the site outside of the Saltwater Protection Zone, the most stringent of the above criteria (excluding Saltwater Protection Zone values) have been applied. In the case of metals, the background concentration for beach/dune sand has been selected as the cleanup level if it is higher than the other more stringent cleanup level. The Quality Assurance Project Plan (QAPP) analytical reporting limits and laboratory detection limits are also listed in Table 3. Although in several cases the QAPP analytical reporting limit exceeds the cleanup level, the laboratory detection limits are below the cleanup level for all compounds listed.

The applicable soil cleanup levels presented in Table 3 are the most stringent cleanup levels for the site and have been used in this CAP to select COCs and evaluate corrective action associated with unrestricted site use. Section 3.4 below presents the effective soil cleanup levels that will be used for corrective action at the Study Area, according to anticipated future land use and location of the Crissy Field Marsh.

3.2.2 Groundwater Cleanup Levels

Protection of groundwater as a potential drinking water source and of the saltwater of the Crissy Field tidal marsh governs the selection of groundwater cleanup levels.

Site-specific groundwater cleanup levels are presented in Table 4. Cleanup levels for saltwater at the Presidio are listed, as well as those for drinking water. The saltwater cleanup levels for metals, which were compiled from the Cleanup Levels Document (EKI, 2002) in the Draft CAP, have been updated to reflect the marine water quality objectives from the RWQCB's Basin Plan, November 2004. The most stringent of the two criteria has been selected as the groundwater cleanup level for the Study Area. The QAPP analytical reporting limits and laboratory detection limits are also listed. Although in several cases the QAPP analytical reporting limit exceeds the cleanup level, the laboratory detection limits are below the cleanup level for all compounds listed.

3.2.3 Soil COCs

Soil cleanup levels required by this CAP are found in Table 3. Analytical results from previous Trust soil tests at the Study Area (described in Section 2 above) and from the SI are provided and are compared to Commissary/PX CAP cleanup levels in Tables C-1 through C-6 (Appendix C). As noted in Tables C-1 through C-6 and Figures 11 through 14, TPHg, TPHd, TPHfo, and benzene, as well as the following six PAHs were detected in soil at concentrations greater than applicable cleanup levels (Table C-3): B(a)A, B(a)P, B(b)F, B(k)F, D(a,h)A, and I(1,2,3-c,d)P.

As shown on Table C-5, metals were detected during the SI above CAP cleanup levels. As discussed in Section 2.4.1.5, the SI concluded that elevated metal concentrations were not associated with Motor Pool releases but are associated with the shallow fill material present beneath the Study Area. However, potential risk associated with these metals must be managed; therefore, cadmium, chromium, copper lead, nickel, and zinc are also retained as soil COCs for the Commissary/PX Study Area.

PAHs have been retained as COCs. Although PAHs are a component of petroleum hydrocarbon fuels, they could also be derived from other anthropogenic sources such as asphalt pavement, contaminated fill, particulates from burning, and vehicle exhaust (Agency for Toxic Substances and Disease Registry, 1995; see website at http://www.atsdr.cdc.gov/toxprofiles/tp69.html). All of these non-petroleum sources could have affected soil at the Commissary/PX Study Area.

The COCs in soil at the Study Area are TPHg, TPHd, TPHfo; benzene; the following six PAHs: B(a)A, B(a)P, B(b)F, B(k)F, D(a,h)A, and I(1,2,3-c,d)P; and the following metals: cadmium, chromium, lead, nickel, and zinc. These COCs have been subdivided by area of the site and for specific soil RUs within the Study Area, as identified below in Section 3.4. Figures 15 and 16 illustrate the cleanup level exceedances in shallow and deep soil, respectively.

3.2.4 Groundwater COCs

Table 4 presents groundwater cleanup levels for the Study Area required by this CAP. Analytical data for groundwater at the Study Area were collected during the SI and as part of the Presidio-wide Quarterly Groundwater Monitoring Program as documented in the *Semi-annual Groundwater Monitoring Report Third and Fourth Quarters 2004* (Treadwell & Rollo, 2005a) and *Semi-annual Groundwater Monitoring Report First and Second Quarters 2005* (Treadwell & Rollo, 2005b) and. Figure 9 presents the potential COCs and groundwater cleanup level exceedances. These data are summarized in Tables C-7 through C-14 (Appendix C).

Chemicals detected at concentrations above site cleanup levels in groundwater include TPHfo, MTBE, B(a)A, B(a)P, B(b)F, and the metals arsenic, chromium, copper, lead, nickel, and zinc. In general, the analytical results for all groundwater samples reported very few concentrations above the cleanup levels.

The First Quarter 2003 TPHfo cleanup level exceedance at 610GW101 (1,400 μg/L) may be related to residual hydrocarbons from the former Commissary Seeps Interim Source Removal remedial excavation area (Figure 9) (Treadwell & Rollo, 2003d). TPHfo concentrations for the subsequent 2003 sampling events have been less than the 1,200 μg/L cleanup level and ranged from <250 to 450 μg/L. TPHg has been detected nearby at 610GW102 and 610GW103 as well as at the two seep locations, though detections have been well below the 770 μg/L cleanup level. TPHd has been detected infrequently at these locations. TPHg has been consistently detected at 600GW101, but has remained below the cleanup level. MTBE has only been detected once above the cleanup level of 13 µg/L at one location, 610SP02, with a concentration of 15 µg/L and has not been detected above the cleanup level in previous or subsequent sampling events. Therefore, TPH and MTBE are not retained as groundwater COCs.

The PAH exceedances at 600AGG01, 600GW103, and 600GW107 (upgradient well) were only slightly above the cleanup levels and are single occurrences (Table C-9, Figure 9). 600AGG01 is a groundwater grab sample location. Groundwater grab sample data was excluded from COC determination for the Main Installation Sites FS if monitoring well data was available for the same site. Thus, 600AGG01 results were not used in the COC determination process. For the monitoring wells, B(a)A and B(b)F have been detected only once at one location where PAHs are soil COCs and in previous and subsequent sampling events were not detected. B(a)P has not been detected or was present at concentrations below the cleanup levels in previous and/or subsequent sampling events. Therefore, PAHs are not retained as groundwater COCs.

As discussed in Section 2.4.4, the source of the arsenic exceedances at 610GW102, 610SP01, and 610SP02 may be linked to naturally occurring arsenic in area soils and the existing geochemical subsurface environment. As shown on Figure 10, dissolved arsenic concentrations at well 610GW102 from the Fourth Quarter 2002 through the Second Quarter 2005 have ranged from 6.1 to 22.1 µg/L, with results from five of the eleven sampling events ranging above the 10 µg/L cleanup level. Arsenic concentrations at 610GW103 over the same time period have ranged between 4.6 to 13 µg/L, with results from two of the eleven sampling events ranging above the 10 µg/L cleanup level. During these same sampling events, dissolved arsenic has been detected at both seeps (610SP01 and 610SP02) at concentrations ranging from <5 to 19 µg/L with two of the dissolved arsenic results at 610SP02 and three of the dissolved arsenic results at 610SP01 ranging above the 10 µg/L cleanup level. The arsenic cleanup level is based on the drinking water criterion (maximum contaminant level [MCL]; Table 4). It should be noted that all dissolved arsenic concentrations are below the saltwater cleanup level of 36 µg/L. Therefore, dissolved arsenic in groundwater does not currently pose a significant risk to ecological receptors in the Crissy Field Marsh. Furthermore, it is very unlikely that water from the seeps or groundwater immediately adjacent to the seeps will be used for drinking water purposes. Nevertheless, the drinking water cleanup level applies to this area and arsenic is retained as a groundwater COC.

As described previously in Section 2.4.3.4, zinc cleanup level exceedances appear to have been related to the type of groundwater filter initially used by Blaine Tech in the quarterly sampling. No zinc exceedances have occurred since a change was made in the type of field filter used, with the exception of a single sample from seep 610SP01 that was not filtered. Therefore, zinc is not retained as a COC in groundwater at this site.

As described previously in Section 2.4.4, the total metals results for the unfiltered samples do not reflect dissolved concentrations. Dissolved metals concentrations are more appropriate for use in this CAP because the saltwater criteria from the Basin Plan, which are used as cleanup levels, are expressed in terms of the dissolved fraction. Dissolved chromium and lead were not detected above cleanup levels in the previously collected filtered samples. Therefore, chromium and lead are not retained as groundwater COCs.

Dissolved copper was only detected once above the Saltwater Ecological Protection Zone cleanup level of 3.1µg/L at well 600GW105 in December 2002 and has not been detected above the cleanup level in the well since that time. Additionally, dissolved copper concentrations are significantly below the drinking water cleanup level of 1,000 µg/L. Therefore, copper is not retained as a groundwater COC.

The dissolved nickel exceedances at wells 600GW104 and 600GW105 appear to be at concentrations which are consistent with groundwater concentrations for these metals at other Presidio sites such as Fill Site 6, located south and upgradient of the Commissary/PX (Treadwell & Rollo, 2005b). The exceedances at 600GW104 and 600GW105 also reflect the lower cleanup levels required for the ecological buffer zone status. The detected concentrations are well below the drinking water cleanup level of 100 µg/L. Additionally, the upgradient concentrations are similar to concentrations detected in downgradient wells. Therefore, nickel is not retained as a groundwater COC.

In summary, arsenic is the only groundwater COC for the Commissary/PX CAP.

3.3 Identification of Remedial Units (RUs)

Based on the SI soil analytical results, data associated with past corrective actions described in Section 2.3, and the applicable cleanup level exceedances discussed above, several RUs have been identified for the Study Area. An RU is a distinct area of contaminated soil or groundwater caused or created by a petroleum-related release that may require corrective action.

3.3.1 Soil RUs

Because there is considerable uncertainty about the actual extent of affected soil, two interpretations of soil RUs have been developed in this CAP:

1. Scenario I (Lesser Impact Scenario): Figures 17A and 18A show an interpretation of site data with relatively small impacts at 13 distinct soil RUs (excluding RUs within the CERCLA areas). These RUs are defined by known sample locations with TPH and benzene exceeding applicable cleanup levels. PAHs above cleanup levels are also included in the RUs where they are collocated with TPH contamination. Under Scenario I (Figures 17A and 18A), the total estimated volume of impacted soil requiring corrective action is approximately 11,611 yd^3. As shown on Figures 17A and 18A, each soil RU developed under Scenario I is identified according to the Motor Pool source group (Section 2.2) that the contamination is likely associated with or portion of the Study Area where the contamination is located (e.g., FDS Pipeline Area, Building 613 Area). This soil RU nomenclature is used hereafter in this CAP to describe specific soil RUs.

2. Scenario II (Greater Impact Scenario): Figures 17B and 18B show an alternative interpretation of site data with much larger areas of affected soil, resulting in 10 distinct soil RUs (excluding RUs within the CERCLA areas). Under this alternative interpretation, the RUs under Scenario I were joined together to include areas between sample locations where there are a lack of TPH data. Under this scenario, many of the 13 RUs shown on Figures 17A and 18A were joined together, resulting in fewer (10 total), but much larger RUs. Only TPH and benzene data were used to interpret this scenario because PAHs are expected to be present throughout the fill material at the site and the extent of PAH-impacted soil is uncertain. For the FDS Residuals Areas and AST 634 Area, the soil RUs were not extended under Scenario II as the contamination in these areas is expected to be limited to the locations of the former FDS pipelines and AST. It is also noted that TPH contamination could extend beyond the RUs defined under Scenario II, as some boundaries of the larger RUs are not well delineated by samples.

Under Scenario II (Figures 17B and 18B), the total estimated volume of impacted soil requiring corrective action is approximately 33,611 yd^3.

In general, the soil at the Study Area is impacted with petroleum-related compounds, TPH (primarily TPHfo) and PAHs (primarily B(a)P). Metals and PAHs are also expected to be present throughout the fill material at the Study Area. The evaluation and selection of remedial alternatives for the CERCLA areas (Figure 8) are presented in a Draft RAP (MACTEC, 2004). The soil impacts associated with the Former LTTD Area (two soil locations with B(a)P above the B(a)P cleanup level) are within the Building 633 Firing Range Area CERCLA site and addressed under a Draft RAP (MACTEC, 2004); therefore, the Former LTTD Area is not included in this CAP.

For purposes of evaluating remedial alternatives in this CAP, the soil RUs have been further subdivided into two main areas by location: "Accessible" and "Less Accessible" Locations. The Accessible Locations consist of RUs or portions of RUs that are overlain by grass, pavement, or asphalt, which can be readily excavated, making these areas relatively accessible for remediation. The Less Accessible Locations consist of RUs or portions of RUs that underlie the foundation slab of existing Building 610 (former Commissary), which unless the building were destroyed or moved, makes access far more difficult or infeasible.

Tables 5A and 5B present a summary of the following for each of the two interpretations of soil RUs: the estimated soil volume requiring remediation (subdivided by Accessible and Less Accessible Locations and Phase 1 and Phase 2 Areas), the associated COCs, the depth of soil impacts, access considerations, and type of surface cover. As described in Tables 5A and 5B, the depth of COC contamination extends to 10 feet below the ground surface, which is approximately 5 feet below the groundwater table (i.e. in the capillary fringe or "smear zone" for petroleum contaminated sites). Smear zones are created when petroleum contamination comes in contact with a groundwater table and moves vertically as it rises and falls with fluctuations in the water table. In this CAP, smear zone contamination is being addressed as part of each soil RU.

3.3.2 Groundwater

Arsenic is the only groundwater COC and is only detected in the vicinity of the Former Commissary Seeps Interim Removal Action area and was detected in one grab groundwater sample at the former Coal Storage Bin Area. As discussed in section 3.2.4, dissolved arsenic concentrations in the Removal Action area sporadically exceed the drinking water cleanup level, however, they are all below the Saltwater cleanup level of 36 µg/L (Figure 10). Therefore, dissolved arsenic in groundwater does not currently pose an actionable threat to the Crissy Field Marsh. Furthermore, it is extremely unlikely that shallow groundwater adjacent to Crissy Field Marsh will be used for drinking water purposes. As acknowledged in the RWQCB Order: "Although groundwater in certain areas within Crissy Field meets the criteria of this Board's drinking water policy (Board Resolution 89-39), the probability of use for such purposes is minimal. Pumping groundwater in those portions of Crissy Field where artificial fill lies on top of bay mud is likely to cause seawater intrusion and land subsidence, thus limiting the probability of developing these waters for such use." The area where dissolved arsenic in groundwater exceeds the drinking water cleanup level conforms to the conditions described above in the RWQCB Order. Although the drinking water cleanup levels apply to this area in a strict sense, it is reasonable to treat the achievement of cleanup levels at Crissy Field differently due to the low probability of using the groundwater at this location as a drinking water supply. As discussed in Section 2.4.4, the elevated dissolved arsenic concentrations likely are the result of biogeochemical changes caused by a historical petroleum release and are expected to decrease following remediation of the petroleum. Therefore, groundwater monitoring has been incorporated into each remedial alternative for the Accessible Locations of the soil RUs and no formal groundwater RU has been established.

3.4 Phased Approach for Corrective Action (Phase 1 and 2 Areas) and Effective Soil Cleanup Levels

Based on the analyses conducted in this CAP, several uncertainties have been identified which make it difficult to accurately estimate the extent of contamination or level-of-effort required to perform corrective action at the Study Area. These uncertainties were discussed in Section 1.5 and are as follows:

- <u>Future Land Use and Expansion of Crissy Field Marsh</u>: The extent and location of the Crissy Field Marsh expansion is currently unknown.
- <u>Extent and Volume of Affected Soil</u>: As discussed in Section 3.3, the actual extent of affected soil at the Study Area is highly uncertain. Thus, two interpretations of soil RUs were developed in this CAP: Scenario I (Lesser Impact Scenario) and Scenario II (Greater Impact Scenario). The extent and volume of affected soil vary considerably between these two scenarios. Under Scenario II, remediation costs would be very large.
- <u>Non-petroleum Related Contamination</u>: PAHs and metals may be present in soil at the Study Area in part from past disposal activities or placement of contaminated fill. If present throughout the fill, the extent of PAH- and metal-contamination would be difficult to define and potentially costly to remediate.
- <u>Archaeological Issues</u>. Portions of the Commissary/PX Study Area are known to be archaeologically sensitive.

Given these uncertainties and in consideration of the RAOs described above in Section 3.1, the Trust has developed a phased approach for corrective action at the Study Area and has divided the site into two areas (Figure 2A):

1. **The Phase 1 Area** encompasses all portions of the site within Area A and portions of Area B within an approximate 150-foot buffer zone along the current Crissy Field Marsh shoreline or MHHW level, measured at the NOAA Presidio tidal station

(http://co-ops.nos.noaa.gov/benchmarks/benchmarks_old/9414290.html). The Order used a 150-foot buffer along the Crissy Field shoreline to establish the Saltwater Ecological Protection Zone. The primary objective of correction actions within the Phase 1 Area is to address the RUs that potentially pose a current threat to Crissy Field Marsh water quality and land uses within Area A. Under Scenario I (Lesser Impact Scenario), the soil RUs and associated COCs within the Phase 1 Area are (Figure 2A):

- FDS Pipeline Residuals Areas 1 and 3 (Area A): COCs for these soil RUs are TPH, benzene, and metals. PAHs are not considered COCs at these soil RUs as PAHs were not detected in soil confirmation samples collected from these areas.
- FDS Pipeline Residuals Area 2 and Accessible Locations of the Building 626 Area (Area B): COCs within these soil RUs are TPH, PAHs, and metals.
- TPHg Source Area (Areas A and B): COCs within this RU are TPH, PAHs, and metals.

These soil RUs are all within Accessible Locations (not underneath buildings). All remaining soil RUs at the Study Area are within the Phase 2 Area.

2. **The Phase 2 Area** encompasses the remaining portions of the site which fall outside of the approximate 150-foot buffer zone and are within Area B (Figure 2A). The primary objective of correction actions within the Phase 2 Area is to address the RUs that potentially pose a threat to anticipated land use (i.e., human recreational use) within Area B and could pose a threat to the Crissy Field Marsh if it were expanded into the area in the future. The soil RUs within the Phase 2 Area include Accessible Locations, as well as Less Accessible Locations underneath Building 610. COCs for the Phase 2 Area RUs are TPH, PAHs, and metals.

This phased approach of dividing the Study Area into the Phase 1 and 2 Areas and implementing corrective actions to be consistent with these areas meets the RAOs and goals of the RWQCB Order. It also addresses the uncertainties identified above by: (1) allowing for flexibility with respect to the future expansion of the Crissy Field Marsh and cleanup decisions within the Phase 2 Area associated with the marsh expansion; (2) providing an opportunity to evaluate the approach for monitoring and processing of archaeological artifacts during Phase 1 and before Phase 2 is implemented; and (3) minimizing the volume of potentially impacted soil to be removed under the corrective action.

Based on this approach, the following effective cleanup levels have been identified for the Study Area and were developed based on four potential land use scenarios across the site:

1. *Unrestricted land use with protection of Crissy Field Marsh water qual*ity: Lowest of (1) Human health (Residential); (2) Ecological (Buffer Zone/Saltwater Ecological Protection Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater). These cleanup levels are the most stringent, applicable soil cleanup levels

identified above in Section 3.2.1 and would allow for unrestricted human land use and sensitive ecological uses associated with the Crissy Field Marsh.

2. *Unrestricted land use without protection of Crissy Field Marsh water quality*: Lowest of (1) Human health (Residential); (2) Ecological (Buffer Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater). These cleanup levels would allow for unrestricted human land use and terrestrial ecological uses outside of the sensitive marsh area.

3. *Restricted land use with protection of Crissy Field Marsh water quality*: Lowest of (1) Human health (Recreational); (2) Ecological (Buffer Zone/Saltwater Ecological Protection Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater). These cleanup levels would allow for ecologically sensitive site uses associated with the Crissy Field Marsh, but would restrict human land use to recreational purposes, which is the anticipated human land use for the Study Area.

4. *Restricted land use without protection of Crissy Field Marsh water quality*: Lowest of (1) Human health (Recreational); (2) Ecological (Buffer Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater). These cleanup levels are representative of the current anticipated land use for the Phase 2 Area which is within an ecological buffer zone as defined in the Cleanup Levels Document. However, the Study Area is currently covered by pavement, buildings, or landscaped areas which provide only limited ecological value. Therefore, cleanup levels protective of terrestrial ecological receptors may not be applicable under the anticipated land use (consistent with Figure 8 of the RWQCB Order).

These effective cleanup levels are presented in Table 3 and will be applied for corrective actions implemented under this CAP, as discussed in Section 5.1.

4.0 EVALUATION OF ALTERNATIVES

The following section identifies potential remedial technologies that could be used to achieve the RAOs identified in Section 3.1, discusses the screening of these remedial technologies pursuant to screening criteria, organizes combinations of viable technologies into corrective action alternatives, and evaluates these alternatives against the corrective action selection criteria. For purposes of evaluating and screening remedial technologies in this CAP, the Accessible and Less Accessible Locations of the soil RUs, discussed in Section 3.3, are evaluated separately. In addition, in the development, evaluation, and selection of corrective action alternatives, the phased approach and corresponding Phase 1 and 2 Areas, developed in Section 3.4, are considered.

4.1 Identification and Screening of Potential Soil Remedial Technologies

Factors that will ultimately be used in evaluating corrective action alternatives were also applied to initially screen potential remedial technologies identified for the Accessible and Less Accessible Locations of the Study Area soil RUs. The primary screening criteria are technical effectiveness, implementability, and cost.

1. Technical Effectiveness

Technical effectiveness refers to the ability of a technology to address: 1) the estimated area or volumes of media requiring remediation to meet the RAOs; 2) the potential impacts to human health and the environment during implementation and any construction; and 3) the long-term reliability and proven history of the technology with respect to the types of chemicals and conditions at the site.

2. Implementability

Implementability refers to both the technical and institutional feasibility of implementing a particular remedial technology, including: 1) the likelihood of obtaining permits and approvals from regulatory agencies; 2) availability of appropriate treatment, storage, and disposal facilities (TSDFs); and 3) availability of the equipment, materials and skilled workers necessary to implement the particular technology.

3. Cost-Effectiveness

Cost-effectiveness includes assessment of the relative capital and operation and maintenance (O&M) costs associated with a particular technology. Costs are estimated using best engineering judgment at the time of the estimate. Cost-effectiveness weighs required expenditures against potential benefits, and is used to eliminate options that are substantially more expensive than other process options providing the same level of protection.

Not all potential remedial technologies are applicable to both Accessible and Less Accessible Locations. The potential technologies are:

- No action;
- Land Use Controls;
- Capping;
- *In situ* soil treatment;
- *Ex situ* soil treatment; and
- Excavation and off-site disposal, including recycling.

After screening, those technologies that become part of a comprehensive alternative (Section 4.2) are identified below as being suitable for the soil RUs at Accessible Locations, Less Accessible Locations, or both types of Locations.

As explained in Section 3.3, no formal groundwater RU has been established for the Study Area. Thus, no groundwater remedial technologies or groundwater remedial alternatives were deemed warranted for this CAP. Groundwater monitoring has been incorporated into the remedial alternatives for the soil RUs.

4.1.1 No Action

The "no action" option is included in the evaluation as a baseline for comparison of other alternatives. The "no action" option serves as a reference for evaluating and comparing the technical effectiveness, implementability, and cost of other alternatives. The "no action" technology has therefore been retained for further analysis. It is applicable to both Accessible and Less Accessible Locations of the soil RUs.

4.1.2 Land Use Controls (LUCs)

LUCs refer to restrictions on the potential future use of land or groundwater based on the levels of contaminants in soil or groundwater. Implementation of LUCs for soil would restrict site use, restrict disturbance of soil, or maintain site cover in order to minimize risks due to potential exposure to COCs. LUCs for groundwater would include restrictions on the use of groundwater as a drinking water supply.

The Commissary/PX soil RUs are generally located in Area B of the Presidio with a few in Area A. Existing and planned land uses in Area B are directed by the Trust through its comprehensive land use and management plan, the PTMP (Trust, 2002). LUCs for Area B remediation sites include restricting or controlling site uses by administrative procedures such as preparing a site-specific addendum to the Presidio Trust's Land Use Control Master Reference Report (LUCMRR). Trust planning/project proponents and members of the public may review all existing LUCs for the Presidio by reviewing the LUCMRR in the Trust Library. The Trust would notify DTSC and RWQCB of any proposed action that may disrupt the effectiveness of the LUCs, and any proposed action that could alter or eliminate the continued need for LUCs. For the portion of the corrective action sites in Area A, LUCs would be implemented according to NPS Area A requirements.

The Trust generally does not consider LUCs by themselves to meet RAOs for Area B sites where contaminated materials remain left in-place and pose a potential risk to human health or ecological receptors. LUCs may be used in combination with certain engineering controls (e.g., capping) that create a physical barrier between the contaminated material and human or ecological receptors. LUCs are used to protect the engineering controls by preventing soil disturbance and exposure.

The relative cost of this technology for moderate to large sized areas is low. LUCs are retained for further analysis for both Accessible and Less Accessible Locations of the soil RUs in combination with other remedial technologies.

4.1.3 Capping

Capping involves either placing a synthetic surface layer (geotextile) or enhancing an existing surface cover (soil, asphalt, or concrete) over a site as a barrier to isolate and prevent exposure of human and/or ecological receptors to contaminants in the soil. A cap needs to be maintained, and intrusive activities would be restricted by specific LUCs. Groundwater monitoring would be included in any alternative using this technology. The purpose is to monitor for potential future impacts caused by remaining soil contamination.

Capping is retained for further analysis and consideration. It is applicable to both Accessible and Less Accessible Locations of the soil RUs.

4.1.4 In Situ Soil Treatment

Soil treatment technologies involve the reduction of the toxicity, mobility, or volume of COCs present in the subsurface soil without their removal from the site soil. *In situ* soil treatment technologies involve treating the soil in place without excavation. Table 6 provides a detailed assessment of the site-specific effectiveness of the various *in situ* treatment technologies and summarizes the relative effectiveness, implementability, and cost of the *in situ* remedial technologies considered. Soil treatment technologies evaluated include:

- Bioremediation technologies: biosparging, bioventing, and enhanced bioremediation with an oxygen release product;
- Sparging and extraction technologies: air sparging, ozone sparging, and soil vapor extraction; and
- Chemical oxidation technologies: hydrogen peroxide and sodium persulfate.

As described in Table 6, based on an evaluation of the site-specific effectiveness of the various *in situ* treatment technologies, as well as a consideration of their implementability and relative cost, bioventing combined with biosparging, oxygen release product injection, ozone sparging, and sodium persulfate injection are retained for further analysis for the Less Accessible Locations of the soil RUs.

Based on the high cost associated with application of *in situ* technologies for the larger Accessible Locations of the soil RUs, *in situ* treatment technologies are not retained for the Accessible Locations . The volume of soil requiring treatment in both the shallow and deep zones of the Accessible Locations is approximately 12,000 yd^3, assuming the interpretation of affected soil shown on Figures 17A and 18A (Scenario I - Lesser Impact Scenario). The range of TPHg concentrations exceeding cleanup levels in shallow soil (0 to 3 feet bgs) is 30 to 520 mg/kg; for TPHd is 180 to 1,400 mg/kg; and for TPHfo is 170 to 7,900 mg/kg (Figure 11). The range of TPHg concentrations exceeding cleanup levels in deep soil (3 to 10 feet bgs) is 1,100 to 2,600 mg/kg; for TPHd is 230 to 1,500 mg/kg; and for TPHfo is 150 to 1,800 mg/kg (Figure 12).

For the purposes of calculating the amount of ORC-Advanced™ needed for soil treatment, an average concentration of TPHg, TPHd, and TPHfo for the entire treatment area needs to be estimated. Based on the available data, an average concentration of 70 mg/kg TPHg, 100 mg/kg TPHd, and 1,100 mg/kg TPHfo, for an overall average of 1,270 mg/kg of total TPH was assumed. Using the proprietary software provided by a manufacturer of oxygen release compound (ORC-Advanced™ by Regenesis, Inc. [Regenesis, 2004]), the calculated quantity of ORC required to treat 12,000 yd^3 of soil with an average concentration of 1,270 mg/kg TPH is 863,628 pounds at a cost of $8 per pound or a total materials cost of $6,909,026 (plus California sales tax and shipping). The cost of applying the ORC, whether by means of excavation, mixing with a pugmill, and backfilling or direct injection via soil borings; construction management; reporting, and so forth, would be in addition to this cost. If the area of impact is greater than that shown on Figures 17A and 18A (i.e., similar to that shown on Figures 17B and 18B), the costs would be considerably higher. Clearly, this approach is infeasible for a variety of reasons, most importantly excessive cost. The vendor contacted concurs with this assessment and does not recommend using this product to treat gross soil contamination. Therefore, *in situ* treatment technologies are not retained for the Accessible Locations as a single remediation option.

4.1.5 Ex Situ Soil Treatment

Ex situ soil treatment technologies treat contaminated site soil after they are excavated from the site. *Ex situ* soil treatment technologies include landfarming, ex-situ soil vapor extraction (SVE), biopiles, or low-temperature thermal desorption. *Ex situ* technologies have certain advantages over *in situ* methods, typically including easier verification sampling, greater process control, and lower unit cost. However, under current disposal market conditions in California, treating Class II soil to meet Class III acceptance criteria, whether performed onsite or offsite, is not cost effective. The difference between the unit rate disposal costs for Class II soil ($35/ton) and Class III soil ($24/ton) is approximately $9 /ton. The cost for treating soil to meet Class III acceptance criteria (either onsite or offsite) is likely much greater than $9/ton. *Ex situ* treatment would only address TPH and PAHs. Low-level metals in the soil would remain, resulting in a need to perform sampling and analysis, including leaching testing, for disposal purposes. Even after treatment for TPH and PAHs, the soil may not qualify for Class III disposal because of metals present in the soil. This additional sampling and analysis would also add to the cost of the ex situ treatment option. Other disadvantages for on-site and off-site treatment are discussed below.

Ex-situ On-Site Soil Treatment Prior to Disposal Off-Site

There are numerous logistical reasons why on-site treatment is not desirable. Construction and operation of high-profile *ex situ* soil treatment units is undesirable in this public, highly used and visited area. Stockpiling and treating affected soil would cause nuisance issues (visual impact, odors) and utilize needed parking areas.

Ex-situ Off-Site Soil Treatment Prior to Disposal

There are a limited number of facilities that will treat petroleum-affected soil prior to disposal as Class III waste. Transportation to such facilities would increase costs by an additional $25 or more per ton. Treatment costs at off-site facilities also are very high. For example, Envirogreen Recycling located in Vancouver, Canada would treat and recycle the treated soil for other industrial uses at a cost of $65 to $85 per ton, not including transportation costs. Transportation and treatment costs would be much greater than the additional $9/ton to simply dispose the soil at a Class II facility.

For these reasons, *ex situ* treatment prior to off-site disposal is not retained for further consideration.

4.1.6 Excavation and Off-Site Disposal (supplemented by oxygen releasing product, if necessary)

Excavation is a practical source control measure that would be applicable to the conditions at the Commissary/PX Study Area sites. Conventional excavation technologies (e.g. excavators, backhoes, etc) can remove soil contamination to a depth of approximately 15 feet without shoring. Fifteen feet bgs is beyond the maximum anticipated depth of contamination at each soil RU including any smear zone contamination. The majority of the contamination is located in the upper 5 feet of the subsurface. In addition, the presence of the Bay Mud at approximately 7 to 8 feet bgs in the northern portion of the Study Area limits the depths to which contaminants might have migrated. Wood, asphalt, concrete and vegetative waste are not thought to be present in sufficient volumes at each soil RU to make recycling practicable. Off-site disposal moves petroleum-affected soil from its current location to an approved off-site disposal facility. As stated above, it is anticipated that conventional excavation technologies would be able to remove smear zone contamination. However, in the unlikely event that excavation technologies could not completely remove the deeper petroleum contamination, oxygen releasing product (e.g. ORC®) could be placed in the excavation area to complete the remediation of any remaining contamination. This product is selected over the other *in situ* technologies described above in Section 4.1.4 because it can be easily spread or applied in an open excavation without the use of specialized equipment, injection wells, or piping required by other *in situ* technologies. A detailed outline of the potential application of an oxygen releasing product in combination with excavation would be presented in the CAP Implementation Work Plans (Section 5.0). This technology is retained for further evaluation for both Accessible and Less Accessible Locations of the soil RUs.

4.2 Corrective Action Alternatives Considered

Based on screening of technologies for soil remediation described above, the following alternatives have been created for evaluation for the Accessible and Less Accessible Locations of the soil RUs. Groundwater monitoring is considered as a component of specific soil RU alternatives.

- Alternative 1 – No Action and Groundwater Monitoring-Well Abandonment (All Soil RUs)
- Alternative 2 – Capping and Land Use Controls with Groundwater Monitoring (All Soil RUs)
- Alternative 3 – *In Situ* Soil Remediation and Land Use Controls (Less Accessible Locations of Soil RUs Only)
- Alternative 4 – Excavation and Off-Site Disposal, Capping and Land Use Controls, and Groundwater Monitoring (All RUs)

Only Alternatives 2 and 4 expressly include groundwater monitoring. Because Alternative 2 does not involve the removal of petroleum-impacted soil, the alternative includes monitoring groundwater across the entire Commissary/PX Study Area for petroleum-related constituents. For Alternative 4, groundwater monitoring would be limited to the vicinity of the Commissary Seeps Interim Removal Area and Building 610. Alternative 3, does not include groundwater monitoring because it is only considered in combination with Alternatives 2 and 4.

For Alternative 4, Excavation and Off-Site Disposal was not considered implementable as a single remediation option, but was developed as an alternative in combination with Capping and LUCs (see Section 4.4.4). Although Excavation and Off-Site Disposal would be technically effective as a sole remediation option, it would be difficult to implement across the Study Area and could have extremely high cost given the uncertainties associated with the actual extent and volume of impacted soil and potential expansion of the Crissy Field Marsh, as described in Section 3.4. It would include large-scale removal of pavement, landscaped areas, and excavation of up to approximately 34,267 yd^3 of soil and additional excavation to remove PAH- and metal-impacted soil. Appropriate precautions would need to be taken to prevent damage or loss of culturally significant artifacts during excavation that may be present in the subsurface of all soil RUs. Therefore, Excavation and Off-Site Disposal of the soil RUs throughout the Study Area could have significant impacts on cultural resources and would need to be coordinated and monitored through the Programmatic Agreement for the Presidio between the Trust and the State Historic Preservation Officer (for work in Area B) and the Programmatic Agreement for the Presidio between the NPS and the State Historic Preservation Officer (for work in Area A). Based on these concerns, Excavation and Off-Site Disposal, only in combination with Capping and LUCs, was developed as an alternative for the Study Area for further evaluation in this CAP.

For Alternative 3, LUCs was also included as a component of the *In Situ* Soil Remediation alternative (see Section 4.4.3), primarily due to the presence of non-petroleum related PAH- and metal-impacted soil in fill material beneath the building. The costs for these LUCs are included in Alternatives 2 and 4 for Phase 1 Accessible Areas.

The comparative evaluation of alternatives is summarized in Tables 7A and 7B for Accessible and Less Accessible Locations of soil RUs, respectively.

4.3 Criteria for the Evaluation of Corrective Action Alternatives

The three criteria in Section 4.1 used to screen technologies – technical effectiveness, implementability, and cost-effectiveness – are also applied in evaluating the corrective action alternatives. Encompassed within the evaluation of these criteria is the extent to which a proposed remedy mitigates the adverse effects of any unauthorized petroleum release. The evaluation looks at whether the remedy protects human health, ecological receptors, and water quality as well as whether it controls long-term risks, source contamination, and volume of contaminants. The remedy selected must be cost-effective.

Also to be considered will be the likelihood of applicable regulatory agency acceptance of the proposed corrective actions as well as public acceptance of the proposed action. The Draft CAP was made available for stakeholder review and comment. All comments received were considered prior to finalizing the CAP, and comments are summarized and responded to in Appendix A.

4.4 Evaluation of Corrective Action Alternatives

The remedial alternatives evaluation for both the Accessible and Less Accessible Locations of the soil RUs is summarized in Tables 7A and 7B, respectively. As discussed in Section 3.3, the extent of impacted soil is uncertain and two interpretations of RUs have been developed: Scenario I (Lesser Impact Scenario) shown on Figures 17A and 18A and Scenario II (Greater Impact Scenario) shown on Figures 17B and 18B. Cost estimates have been developed for both scenarios. For purposes of comparing alternatives in the following sections and in Tables 7A and 7B, the costs developed for Scenario I (Lesser Impact Scenario) were used. Summaries of the estimated costs for the alternatives under Scenario II (Greater Impact Scenario) are presented in Tables 8A through 8C. Detailed cost estimates for each alternative under Scenario I are presented in Tables 9A through 9I. Summaries of the estimated costs for the alternatives under Scenario II are presented in Tables D-1A through D-1C and detailed cost estimates for each alternative are presented in Tables D-2 through D-10 (Appendix D).

Each soil remedial alternative is evaluated based on the extent to which it meets the evaluation criteria. Groundwater monitoring and monitoring well abandonment costs are included in alternatives for Accessible Locations only, because Less Accessible Location alternatives will always be combined with an Accessible Location corrective action for implementation at the Study Area.

The following sections identify and evaluate remedial alternatives for soil RUs.

4.4.1 Alternative 1 - No Action (All Soil RUs)

Alternative 1 provides no additional control or protection to human health or the environment for the contamination that exists at the Study Area. This alternative abandons existing groundwater monitoring wells. Consequently, the groundwater would not be monitored to assess any impacts due to existing contamination and all existing potential exposure pathways would remain uncontrolled. This alternative does not prevent visitor, tenant, or resident exposures, does not protect against impacts to groundwater, and therefore does not protect human health, safety and the environment. This alternative also does not protect the Crissy Field Marsh in the Phase 1 Area and its potential expansion into the Phase 2 Area. The “no action” alternative provides no technical effectiveness, since no remedial action is undertaken and COCs would not be reduced. The total estimated cost of this alternative for both the Accessible and Less Accessible Locations of the soil RUs (combined) is $65,000 (Tables 8A and 9A). It is not considered effective because, although low in cost, it fails to address any site impacts of the petroleum releases.

4.4.2 Alternative 2 - Capping and Land Use Controls with Groundwater Monitoring (All Soil RUs)

Alternative 2 maintains existing asphalt and concrete cover over the soil RUs and places caps over uncovered portions of soil RUs to isolate the contaminated soil from human exposure. Because the contaminated soil is not removed, this alternative includes the development and implementation of an LUC (as described in Section 4.1.2) to safeguard the cap, provide advance notice of site conditions in the event of future ground disturbing activity, and restrict future land uses to those compatible with safeguarding the integrity of the cap. Separate LUCs would be required for Area A and Area B portions of the Study Area, which would be implemented separately according to NPS and Trust protocols, respectively. At unpaved landscape areas, impacted soil would be excavated to a depth that would allow placement of a geosynthetic clay liner (GCL) which would be covered with a vegetative soil layer. Impacted soil would be removed for off-site disposal. The Study Area is located within a Historic Sensitivity Zone (Section 5.4). To protect cultural resources, work at the Study Area would be monitored as outlined in Section 5.4. Such monitoring is not expected to significantly impact the associated cost of this alternative.

The alternative also includes groundwater monitoring for potential impacts due to remaining soil contamination. The LUCs would prohibit use of groundwater as a drinking water supply until chemical concentrations are below drinking water cleanup levels (e.g., MCLs).

Capping of contaminants would be protective of human health and safety within the Phase 2 Area, as it would eliminate the potential for contaminant exposure through soil ingestion, dermal contact, and inhalation. Protection of groundwater within the Phase 2 Area would be evaluated through groundwater monitoring. For the Phase 1 Area, this alternative would not be protective of the environment, as it would leave contamination in-place within an ecologically sensitive area which poses a threat to the current Crissy Field Marsh. Under this alternative, an LUC would be required to prevent direct contact with the contaminated soil, restrict future land uses inconsistent with levels of contamination remaining on site, establish procedures for the management of contaminated soil if encountered in the future, and prohibit use of groundwater as a drinking water supply. The LUC would not protect the Crissy Field Marsh in its current location. Therefore, this alternative is considered technically effective only for the Phase 2 Area if caps are maintained, an LUC imposed, and groundwater monitoring conducted. The alternative is not considered technically effective for the Phase 1 Area. Groundwater monitoring would be required to provide a long-term assessment of groundwater quality. Although no active treatment of soil would be performed, the potential for migration of COCs from soil into groundwater would be reduced based on the reduced potential for surface water infiltration provided by the cover. Capping with LUCs would be readily implementable, particularly because part of the Study Area is already capped with asphalt and concrete. Construction of the cap would involve some design and construction improvements to existing cover. The cost for this alternative under Scenario I (Lesser Impact Scenario) for both the Accessible and Less Accessible Locations of the soil RUs (combined), including O&M costs, is $ 1,500,000 (Tables 8A and 9B).

4.4.3 Alternative 3 – In Situ Soil Remediation and Land Use Controls (Less Accessible Locations of Soil RUs)

This remedy alternative involves the *in situ* treatment of impacted soil to reduce the existing concentrations of COCs below cleanup levels. Technologies that would be considered for future implementation under this alternative include: 1) oxygen release product injection, 2) bioventing/biosparging, 3) ozone sparging, and 4) sodium persulfate injection. As discussed in Section 4.1, *In Situ* Soil Remediation is limited in its application to Less Accessible Locations of the soil RUs as a sole remediation option.

As discussed in Section 3.3, the Less Accessible Locations consist of RUs or portions of RUs that underlie the foundation slab of existing Building 610 (former Commissary within the Phase 2 Area). Building 610 is currently leased and occupied by a leasehold tenant. With the exception of bioventing/biosparging, *in situ* treatment technologies could not be implemented practicably until Building 610 is unoccupied. This alternative includes an interim LUC that would be in place during tenant occupancy. The LUC would restrict site and soil disturbance and maintain cover until the building is vacated in order to protect potential receptors from exposure to COCs.

Application of this alternative would be protective of human health, ecological receptors, and water quality since the *in situ* technologies available under this alternative would reduce the concentration of contaminants in the soil. As discussed above in Section 2.4.4, reducing conditions in groundwater at Presidio petroleum sites are associated with elevated dissolved arsenic concentrations. Thus, the addition of oxidizing *in situ* treatments should result in less reducing conditions, which would be favorable for decreasing the concentrations of soluble arsenic in groundwater and surface water seeps. Confirmation soil sampling would be required approximately 6 months after commencement of *in situ* treatment. Additional treatment and confirmation sampling could be required if cleanup levels were not achieved with the first application. This alternative would be technically effective in the long-term because active treatment of soil contamination would reduce petroleum contaminants until cleanup levels were met. The LUC would be applied to restrict soil disturbance due to non-petroleum-fuel-related PAHs and metals associated with fill materials beneath Building 610 that would remain above cleanup levels. The LUC would also apply if the *in situ* technology is unable to achieve cleanup levels. The decision regarding which *in situ* technology to implement under this alternative would be made at the remedial design phase. Subject to the *in situ* technology selected, the cost of this alternative for the Less Accessible Locations of the soil RUs is estimated at a total cost of $262,000 to $505,000 under Scenario I (Lesser Impact Scenario) (Tables 8A and 9C through 9F). This estimate does not include O&M costs for the Area B LUC, as they are included in alternatives for Accessible Locations under Phase 1. Less Accessible Location alternatives will always be combined with an Accessible Location corrective action for implementation at the Study Area.

4.4.4 Alternative 4 – Excavation and Off-Site Disposal, Capping and Land Use Controls, and Groundwater Monitoring (All Soil RUs)

Alternative 4 involves conducting corrective action in two phases. Under Phase 1, the following would be conducted: (1) excavation and removal of contaminanted soil above cleanup levels within the Phase 1 Area (includes all portions of the site within Area A and portions of Area B within the 150-foot buffer zone along the current Crissy Field Marsh shoreline); (2) implementation of an LUC for Area B portions of the Phase 1 and 2 Areas to maintain containment of contaminated soil beneath existing pavement and buildings, prevent unrestricted site uses, and restrict use of groundwater as a drinking water supply; and (3) groundwater monitoring. Phase 2 would not be implemented until future land use decisions regarding the expansion of the Crissy Field Marsh are made. During Phase 2, excavation and removal of contaminated soil within the Phase 2 Area would be conducted, consistent with future site use. These key elements of Alternative 4 are further described below:

1. Excavation Work (Phase 1): Soil with contaminant concentrations exceeding cleanup levels within the Phase 1 Area boundaries would be excavated, transported, and disposed at an approved off-site diposal facility. This would include (a) excavation of soil within the RUs associated with Scenario I (Lesser Impact Scenario) within the Phase 1 Area boundaries; (b) collection of verification samples from the sidewalls and floors of the excavations to ensure that soil with contaminants exceeding cleanup levels were removed; (c) placing an oxygen releasing product (e.g. ORC®) in the excavation areas to complete the remediation of any remaining contamination, if necessary; (d) backfilling of the excavations with clean soil; and (e) off-site disposal of the excavated soil at a permitted waste mangement facility. Within Area A portions of the Phase 1 Area, cleanup would be conducted to achieve ecological, groundwater protection, and human health cleanup levels. Within Area B, cleanup would be conducted to achieve ecological and groundwater protection levels for protection of the Crissy Field Marsh, however, PAHs above human health cleanup levels would be allowed to remain in-place and an LUC would be implemented (as described below).

2. Area B LUC (Phase 1): An LUC would be implemented for Area B portions of the Study Area to prevent unrestricted use of the property (including residences, schools, day care facilities, and other sensitive uses), prohibit permanent removal of pavement or buildings that currently cover soil containing contaminants above human health cleanup levels, and restrict use of groundwater as a drinking water supply. The LUC would also prohibit expansion of the saltwater tidal marsh from its current location into the Phase 2 Area or similar habitat restoration projects. The LUC would be contingent upon decisions regarding expansion of the Crissy Field Marsh into the Phase 2 Area, future land uses, achievement of drinking water cleanup levels, and the completion of Phase 2 excavation activities, as discussed below. It is noted that the LUC would be extended beyond the Study Area boundaries to include the area underneath Doyle Drive (where lead has been detected above cleanup levels).

3. Groundwater Monitoring (Phase 1): Semi-annual groundwater monitoring for TPH constituents would be conducted in the vicinity of the Commissary Seeps and Building 610. Arsenic and related analytical constituents would be also be monitored quarterly in the vicinity of the Commissary Seeps and Building 610. Additional semi-annual monitoring of these constituents in the vicinity of the Commissary Seeps and Building 610 would be conducted until implementation of Phase 2. Continuation of the groundwater monitoring program would be assessed under Phase 2 of the corrective actions. This alternative also includes the eventual abandonment of existing groundwater monitoring wells upon regulatory approval.

4. Excavation Work (Phase 2): Excavation activities within the Phase 2 Area would not be conducted until future land use decisions are made, including the potential expansion of the Crissy Field Marsh. If the Crissy Field Marsh expands into the Phase 2 Area, cleanup would be conducted to protect the marsh and human land use, as applicable. If the Crissy Field Marsh is not expanded into the area, cleanup may be conducted to protect the anticipated

land use (i.e., recreational use). Future remedial decisions within the Phase 2 Area would be made in consultation with the RWQCB at that time. The following general activities would be conducted for the Phase 2 Area excavation activities: (a) excavation of soil containing contaminants above effective cleanup levels within the Phase 2 Area boundaries; (b) collection of verification samples from the sidewalls and floors of the excavations to ensure that soil with contaminants exceeding cleanup levels were removed; (c) placing an oxygen releasing product (e.g. ORC®) in the excavation areas to complete the remediation of any remaining contamination, if necessary; (d) backfilling of the excavations with clean soil; and (e) off-site disposal of the excavated soil at a permitted waste mangement facility. Under this alternative, if the marsh is not expanded into the area, petroleum-related contamination in the Phase 2 Area would be removed. Non-petroleum related contamination (i.e., PAHs and metals) would be left in-place under existing caps (e.g., pavement and buildings). The LUC previously applied for Area B (as described above) would remain in-effect and modified, as necessary, to prohibit uses of the property and groundwater and maintain caps covering soil containing contaminants above human health cleanup levels. If the marsh is expanded into the area, the extent of removal of PAHs and metals would be determined in consultation with the RWQCB at that time.

Accessible Locations

Application of Alternative 4 for the Accessible Locations would be protective of human health, safety, and the environment by (1) removing soil contaminants that pose a risk to groundwater, ecological receptors, and the Crissy Field Marsh within the 150-foot buffer zone along the current Crissy Field Marsh shoreline (Phase 1 Area) and removing contaminants that pose a risk to humans within Area A portions of the Phase 1 Area; (2) instituting an LUC for Area B to maintain pavement covers, prohibit unrestricted land use, and restrict use of groundwater; (3) in the future, removing soil contaminants that have potential adverse effects to groundwater, humans, ecological receptors, and/or the Crissy Field Marsh (to-be-determined at that time) within the Phase 2 Area; and (4) and monitoring groundwater to ensure that chemical concentrations in groundwater decrease or are maintained below cleanup levels. By conducting excavation activities in a phased approach and limiting the extent of excavation, this alternative would minimize disturbance of culturally sensitive artifacts potentially present in the subsurface and would be implemented using methods that would comply with regulations related to the culturally sensitive status of this site (e.g., National Historic Preservation Act [NHPA], the NPS Organic Act, and the Archeological and Historic Preservation Act [AHPA]). In addition, Alternative 4 would offer flexibility with respect to the future expansion of the Crissy Field Marsh and minimize costs associated with excavation of soil until a determination is made by the Trust and NPS regarding whether the marsh will be expanded into the Phase 2 Area. Alternative 4 would be effective in the long-term for the Phase 1 Area through removal and off-site management of soil that could potentially impact groundwater and ecological receptors. In the short-term, the LUC for Area B would provide mitigation of risks associated with the impacted soil beneath pavement. In the long-term, the petroleum-contaminated soil in the Phase 2 Area would be excavated and transferred to an off-site permitted waste management facility.

The LUC would be maintained for residual contamination above cleanup levels for unrestricted use left in-place within Area B. The LUC would also restrict use of groundwater as a drinking water supply until chemical concentrations are below drinking water levels.

Under Alternative 4, although the volume of contaminants would not be reduced because the impacted material would not be treated, potential exposure of workers and the public to contaminated materials during excavation and loading for off-site transport would be mitigated by engineering and dust control measures. This alternative would be implementable and no significant obstacles have been identified. This alternative also includes groundwater monitoring for TPH, arsenic, and related constituents. Long term O&M would be required to maintain the capping and LUC requirements and for groundwater monitoring.

Assuming excavation of all soil RUs under Scenario I (Lesser Impact Scenario) the cost for this alternative for the Accessible Areas of the soil RUs, including O&M costs, would be $2,580,000 (Tables 8A and 9G).

Less Accessible Locations

Application of Alternative 4 for the Less Accessible Locations (underneath Building 610) would be protective of human health, safety, and the environment. In the short-term, the LUC would provide mitigation of risks associated with the impacted soil beneath the building. In the long-term, if the Crissy Field Marsh and/or buffer zone were expanded into the area of the building in the future, the petroleum-contaminated soil underneath the building would be excavated and transferred to an off-site permitted waste management facility. The LUC would be maintained for any non-petroleum, residual contamination above cleanup levels left in-place. Under Alternative 4, although the volume of contaminants would not be reduced because the impacted material would not be treated, potential exposure of workers and the public to contaminated materials during excavation and loading for off-site transport would be mitigated by engineering and dust control measures. Groundwater monitoring is included under the alternative for the Accessible Locations.

Due to the contamination occurring beneath the Building 610 foundation slab, excavation activities would not be easily implementable with the building in-place. However, Alternative 4 would be easily implementable if the building were demolished.

Two cost estimates have been developed under Scenario I (Lesser Impact Scenario) for the Less Accessible Locations, depending on the status of Building 610. The cost for this alternative with Building 610 in-place is $648,000 (Tables 8A and 9H). The cost for this alternative following demolition of Building 610 is $168,000 (Tables 8A and 9I). This estimate does not include O&M costs for the Area B LUC, as they are included in alternatives for Accessible Locations. Less Accessible Location alternatives will always be combined with an Accessible Location corrective action for implementation at the Study Area.

4.5 Selected Alternatives

The selected corrective action alternatives for the Accessible and Less Accessible Locations are summarized below. Detailed descriptions of the Phase 1 and 2 corrective actions are included in Section 5.1.

4.5.1 Accessible Locations

The selected alternative for the Accessible Locations is Alternative 4, *Excavation and Off-Site Disposal, Capping and LUCs, and Groundwater Monitoring*. This alternative represents the best balance between costs, uncertainty concerning future land uses, and uncertainty related to the extent and volume of contamination (including PAHs) in soil at this site. Although Alternative 4 does not contain treatment as a principal element, the alternative is protective of human health, safety, and the environment; the phased excavation will minimize disturbance of culturally sensitive artifacts potentially present in the subsurface and will be implemented using methods that comply with regulations; and it is the most cost effective approach to meet the RAOs. This alternative provides for the cleanup and long-term management of TPH-, BTEX-, PAH-, and metal-contaminated soil. In addition, Alternative 4 offers flexibility with respect to the future expansion of the Crissy Field Marsh and minimizes costs associated with excavation of soil by implementing an LUC until a determination is made by the Trust and NPS regarding whether the Crissy Field Marsh will be expanded into the area. Once the determination is made, additional corrective action in the area will be implemented to remove soil containing COCs, as appropriate, to be consistent with actual land use.

4.5.2 Less Accessible Locations

A combination of three alternatives has been selected for the Less Accessible Locations underneath Building 610, dependent on the future status of Building 610 and potential Crissy Field Marsh expansion into the area, as follows:

- <u>No Marsh Expansion (Selected Alternative: Alternative 2, *Capping and LUCs*)</u>: Building 610, which overlies and covers the Less Accessible Locations, is planned for retail or recreational use for the foreseeable future. Concentrations of COCs in soil underneath the building do not exceed the effective cleanup levels for *Restricted land use without protection of Crissy Field Marsh water quality*, except for PAHs which exceed human health cleanup levels. Under this alternative, Building 610 will provide an effective cap to prevent exposure to PAHs in soil underneath the building and the LUC will limit use of the property to recreational uses. In addition, as outlined in Appendix E, an evaluation of potential vapor intrusion from residual VOCs in the subsurface under and around Building 610 was conducted using available soil and groundwater data. This evaluation indicates that there is no significant potential for vapor intrusion into Building 610 under an unrestricted land use scenario (i.e., including residential, commercial/industrial, and recreational uses of the building). Thus, *Capping and LUCs* is considered protective of the Less Accessible Locations underneath Building 610, if the marsh or associated buffer zone is not expanded into the area of the building.

- Marsh Expansion with Demolition of Building 610 (Selected Alternative: Alternative 4, *Excavation and Off-Site Disposal and Capping and LUCs*): Although not anticipated, if the Crissy Field Marsh were expanded into the area of Building 610, in the future and the building demolished, excavation activities could be conducted to achieve the more stringent cleanup levels for saltwater protection under this alternative. The excavation and disposal activities would be conducted as described above for the Accessible Locations within the Phase 2 Area.
- Marsh Expansion with Building 610 In-Place (Selected Alternative: Alternative 3, *In Situ Soil Remediation and LUCs*): If the marsh buffer zone were expanded into the area but the building remains in-place, *in situ* soil treatment could be conducted for contamination underneath the building. This alternative provides the only cost-effective technology to remediate contamination underneath the building, while the building remains in-place.

This combination of alternatives represents the best balance between costs, uncertainty concerning future land uses and the status of Building 610, and uncertainty related to the extent and volume of contamination (including PAHs and metals) in soil at this site. Although Alternatives 2 and 4 do not contain treatment as a principal element, the alternatives are protective of human health, safety, and the environment. This combination of alternatives is the most cost effective approach to meet the RAOs. These alternatives provide for the cleanup and long term management of TPH-, PAH-, and metal-contaminated soil beneath the building. In addition, the combination of the three alternatives offers flexibility with respect to the future expansion of the Crissy Field Marsh and the future status of Building 610. By implementing an LUC for the area covered by the building until a determination is made by the Trust and NPS regarding whether the Crissy Field Marsh will be expanded into the area, significant costs associated with remediation of soil underneath the building are minimized.

4.5.3 Summary of Selected Alternatives

In summary, the alternatives selected in this CAP for the Commissary/PX Area are as follows:

- Accessible Locations of the soil RUs: Alternative 4, Excavation and Off-Site Disposal, Capping and LUCs, and Groundwater Monitoring.
- Less Accessible Locations of the soil RUs:
  - No Marsh Expansion - Alternative 2, *Capping and LUCs*
  - Marsh Expansion with Demolition of Building 610 – Alternative 4, *Excavation and Off-Site Disposal and Capping and LUCs*

– Marsh Expansion with Building 610 In-Place - Alternative 3, *In Situ Soil Remediation and LUCs*.

Below is a summary of estimated costs for the selected alternatives, including a breakdown of costs by Phases 1 and 2 of the corrective action (see Tables 8A through 8C).

Soil RUs	Selected Alternative	Estimated Cost
Accessible Locations	Alternative 4 - *Excavation and Off Site Disposal, Capping and LUCs, and Groundwater Monitoring*	Phase 1 - $1,224,000[1] Phase 2 - $432,000 - $1,861,000[2]
Less Accessible Locations	Alternative 2 - *Capping and LUCs* Alternative 4 - *Excavation and Off-Site Disposal and Capping and LUCs* Alternative 3 - *In Situ Soil Remediation and LUCs*	$0[3] $168,000 $262,000 to $505,000
Combined Range of Costs for Accessible and Less Accessible Locations	Accessible (Alternative 4) + Less Accessible (Alternatives 2 through 4)	$1.7 to 3.1 million

[1] Phase 1 costs are based on the cleanup of TPH and benzene impacted soil under Scenario I (Lesser Impact Scenario) for saltwater ecological protection. The total cost includes O&M costs associated with groundwater monitoring and the Area B LUC that will be required under Alternative 4.

[2] Phase 2 costs are dependent upon future land use decisions for the Phase 2 Area. The Phase 2 costs range from estimated cost to cleanup for protection of human health recreational land use with no saltwater ecological protection (i.e., Restricted land use without protection of Crissy Field Marsh water quality) to the estimated cost to cleanup under Scenario II (Greater Impact Scenario) for saltwater ecological protection (i.e., Unrestricted land use with protection of Crissy Field Marsh water quality).

[3] No additional cost would be necessary for this alternative because the LUC for Area B would be implemented under Phase 1 during the implementation of Alternative 4 at the Accessible Locations of the soil RUs.

5.0 IMPLEMENTATION OF SELECTED CORRECTIVE ACTION ALTERNATIVES

Tasks associated with implementation of the CAP remedies, including Phase 1 and Phase 2 procedures, soil confirmation sampling, applicable laws and regulatory requirements, archaeological monitoring, groundwater and surface water monitoring, LUC implementation and maintenance, and schedule, are discussed below.

5.1 Remedy Implementation

The corrective actions set forth in Section 4.5.1 for the Accessible Locations of the soil RUs and in Section 4.5.2 for the Less Accessible Locations of the soil RUs will be implemented by the Trust. Upon regulatory agency approval of the Final CAP, separate implementation Work Plans (called CAP Implementation Work Plans) will be prepared for Phase 1 and Phase 2 of the project. These CAP Implementation Work Plans will be coordinated with implementation of Design Work Plans for the CERCLA sites located within the Study Area (i.e., Building 633 Firing Range, Former Coal Storage Bin Area, and Former Railroad Tracks Area).

Corrective actions that will be implemented in the Phase1 and 2 Areas are discused in detail below. Specific components of the Phase 1 and 2 corrective actions are also discussed in the following sections: Soil Confirmation Sampling Program (Section 5.2), Groundwater and Surface Water Monitoring Program (Section 5.5), and LUCs (Section 5.6).

5.1.1 Phase 1 Area

The Phase 1 Area encompasses all portions of the site within Area A and portions of Area B within an approximate 150-foot buffer zone along the current Crissy Field Marsh shoreline. Corrective actions will be implemented in the Phase 1 Area to address the soil RUs that pose a threat to the Crissy Field Marsh and land uses within Area A. The Scenario I (Lesser Impact Scenario) interpretation of the soil RUs in the Phase 1 Area are shown on Figure 2A. These soil RUs are within Accessible Locations and include the following:

- FDS Pipeline Residuals Areas 1 and 3 (Area A);
- FDS Pipeline Residuals Area 2 and a portion of the Accessible Locations of the Building 626 Area (Area B); and
- TPHg Source Area (Areas A and B).

Corrective actions within the Phase 1 Area will commence during Phase 1 of the project (see Implementation Schedule, Section 5.7) and consist of: (a) excavation of soil within these RUs beginning with the Scenario I (Lesser Impact Scenario) interpretation (Figure 2A); (b) collection of verification samples from the sidewalls and floors of the excavations to ensure that soil with contaminants exceeding effective cleanup levels are removed; (c) placing an oxygen releasing product (e.g. ORC®) in the excavation areas to complete the remediation of any remaining contamination, if necessary; (d) backfilling of the excavations with clean soil; and (e) off-site disposal of the excavated soil at a permitted waste mangement facility.

Effective soil cleanup levels applied to the Phase 1 Area will depend on land use. The effective soil cleanup levels for the Study Area were presented in Section 3.4. For the Phase 1 Area, three of the cleanup level scenarios have been selected as effective cleanup levels for the RUs as follows:

- RUs within Area A and the 150-foot marsh buffer zone: Cleanup levels for these areas will be *Unrestricted land use with protection of Crissy Field Marsh water quality*: Lowest of (1) Human health (Residential); (2) Ecological (Buffer Zone/Saltwater Ecological Protection Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater). These cleanup levels will allow for unrestricted human land use and sensitive ecological uses associated with the Crissy Field Marsh. The only RU that falls under this scenario is the Area A portion of the TPHg Source Area (Figure 2A).

- RUs within Area A and outside of the 150-foot marsh buffer zone: Cleanup levels for these areas will be *Unrestricted land use without protection of Crissy Field Marsh water quality*: Lowest of (1) Human health (Residential); (2) Ecological (Buffer Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater). These cleanup levels will allow for unrestricted human land use and terrestrial ecological uses outside of the sensitive marsh area. The two RUs that fall under this scenario are FDS Pipeline Residuals Areas 1 and 3 (Figure 2A).

- RUs within Area B and within the 150-foot marsh buffer zone: Cleanup levels for these areas will be *Restricted land use with protection of Crissy Field Marsh water quality*: Lowest of (1) Human health (Recreational); (2) Ecological (Buffer Zone/Saltwater Ecological Protection Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater). These cleanup levels allow for ecologically sensitive site uses associated with the Crissy Field Marsh, but will limit human land use to recreational purposes, which is the anticipated human land use for the Study Area. Three RUs fall under this scenario: FDS Pipeline Residuals Area 2, Accessible Locations of the Building 626 Area, and the Area B portion of the TPHg Source Area (Figure 2A).

The numeric effective cleanup levels for each RU are presented in Table 3. Soil confirmation/verification sampling will be conducted to document residual concentrations of COCs during the excavation program. The soil confirmation/verification sampling program is presented in detail in Section 5.2. Concentrations of TPH compounds, BTEX, PAHs, and/or metals in soil confirmation samples will be compared with the effective cleanup levels above to assess if further excavation is required within the Phase 1 Area.

Within Area A, the Trust will remediate TPH and BTEX contamination to achieve the effective cleanup levels listed above. The Trust will also remediate known areas with PAHs and metals above effective cleanup levels to achieve unrestricted human land use within Area A, to the extent practicable, but will consult with the NPS and RWQCB regarding further excavation decisions related to these compounds during implementation of the remedy. To the extent practicable, remediation will be conducted so that no human land use LUC is necessary within Area A. It is noted that if contamination is left in-place above cleanup levels for unrestricted use in Area A, an LUC for the contaminated area may need to be adopted and would be subject to management of the LUC by the NPS.

Within Area B, the Trust will remediate TPH contamination to achieve the effective cleanup levels listed above. PAHs will also be remediated to achieve the ecological and groundwater protection cleanup levels. However, PAHs above human health cleanup levels will be allowed to remain in-place underneath caps. No further capping will be necessary for landscaped areas. Current landscaped areas with PAHs exceeding human health effective cleanup levels will be excavated, because they are collocated with TPH contaminants above cleanup levels (i.e., borings 600SB101 and 600RRSB09; Figure 19). Thus, existing landscaped areas with fill material potentially containing PAHs are not expected to pose a risk to human recreational use of the Phase 1 Area following Phase 1 corrective action. An LUC will be implemented to prohibit unrestricted human land use (including residences, schools, day care facilities, and other sensitive uses) of the property and maintain caps over areas with PAHs exceeding human health cleanup levels. The LUC for Area B portions of the Phase 1 Area is also intended to protect against exposure to metals in fill material. The metals within the Phase 1 Area exceed cleanup levels for ecological buffer zone protection but are below human health cleanup levels (Table 3). The LUC will establish restrictions on expansion of the marsh from its current location into Area B, which will protect sensitive ecological uses of the area. Metals and PAHs are non-mobile compounds and as such, are not expected to migrate via groundwater movement from Area B into the current location of the marsh.

During implementation of the Phase 1 remedy, if it is determined that contamination from the Phase 1 Area extends into the Phase 2 Area (based on soil confirmation/verification sampling), the excavation activities will generally stop at the Phase 2 Area boundary, except where it would only take minimal effort and cost to continue with a small-scale excavation over the boundary limits or if there is signficiant contamination that poses a risk to land uses and the Crissy Field Marsh within the Phase 1 Area. These further excavation decisions will be made in consultation with the RWQCB and NPS.

At this time, it is anticipated that excavation activities within the Phase 1 Area (primarily at the TPHg Source Area RU) will not extend into the current limits of the Crissy Field Marsh and associated dune habitat, using the fence as a boundary (Figure 2A). The Army previously conducted remedial actions within Fill Site 7 to allow for restoration of the 18-acre tidal marsh. As discussed in the *Crissy Field OU4 Implementation Report* (EKI, 2004), the chemical data representing current soil within the marsh area meet Crissy Field RAP cleanup levels for unrestricted use, including TPH, PAHs, and metals. In addition, soil from Fill Site 7 was mixed with surrounding soil and relocated to other parts of Crissy Field and the area has been regraded and restored as a tidal marsh. If excavation sidewall samples along the border of the marsh area indicate COCs above cleanup levels, excavation activities may proceed into the marsh area, if necessary to address human health or ecological risk posed by the sidewall contamination. However, this decision will be made in consultation with the NPS and RWQCB during implementation of the remedy and in a manner to avoid destruction, loss of habitat, or adverse impacts to the sensitive marsh area.

5.1.2 Phase 2 Area

The Phase 2 Area encompasses the remaining portions of the site which fall outside of the approximate 150-foot buffer zone and are within Area B (Figure 2A). Corrective actions will be implemented in the Phase 2 Area to address the soil RUs that potentially pose a threat to anticipated land use (i.e., human recreational use) within Area B and could pose a threat to the Crissy Field Marsh if it were expanded into the area in the future. The Scenario I (Lesser Impact Scenario) interpretation of the soil RUs in the Phase 2 Area are shown on Figure 2A. The soil RUs within Accessible Locations include Site 15 Area; FDS Pipeline Residuals Areas 1, 2, and 3 (with AST 634 Area); Pipeline A Areas 1 and 2; Building 613 Area; a portion of Building 628 Area 1; Building 628 Area 2; and a portion of Building 626 Area. The soil RUs within Less Accessible Locations include Building 619 Area; a portion of Building 628 Area 1; and a portion of Building 626 Area. It is noted that these RUs were developed based on the strictest applicable cleanup levels for the Study Area (i.e., Unrestricted land use with protection of Crissy Field Marsh water quality; Section 3.4).

Corrective actions within the Phase 2 Area will be conducted following the two-phase approach developed in this CAP (see Implementation Schedule, Section 5.7). During Phase 1, an LUC will be instituted for the Phase 2 Area (Area B) to maintain existing caps, restrict use of the property, and prohibit use of groundwater as a drinking water supply. Once future land use decisions are made regarding the potential expansion of the Crissy Field Marsh into the area, excavation and off-site disposal activities will commence in the area under Phase 2, consistent with the actual land use and subject to RWQCB approval. Phase 2 remediation activities for contamination underneath Building 610 will depend on the status of Building 610 and marsh expansion plans into the area, as discussed below. These two phases are discussed in detail below.

Under Phase 1, an LUC will be instituted for the Phase 2 Area (Area B) to prohibit sensitive site uses including residences, schools, day care facilities, and other sensitive uses. The LUC will also prohibit removal of existing caps (e.g., pavement and buildings) where concentrations of COCs exceed cleanup levels for unrestricted use. In addition, the LUC will restrict use of groundwater as a drinking water supply. The LUC will also prohibit expansion of the saltwater tidal marsh or similar habitat restoration projects into the Phase 2 Area. The exact boundaries of the LUC (i.e., “LUC Zone”) are presented in Section 5.6. It is noted that the LUC Zone will cover the entire Phase 2 Area, as well as the area underneath Doyle Drive.

Once decisions are made concerning the expansion of the Crissy Field Marsh into the Phase 2 Area, Phase 2 excavation activities will commence as follows: (a) soil containing contaminants above effective cleanup levels within the Phase 2 Area boundaries will be excavated; (b) verification samples from the sidewalls and floors of the excavations will be collected to ensure that soil with contaminants exceeding cleanup levels are removed; (c) oxygen releasing product (e.g. ORC®) will be placed in the excavation areas to complete the remediation of any remaining contamination, if necessary; (d) the excavations will be backfilled with clean soil; and (e) the excavated soil will be disposed off-site at a permitted waste mangement facility.

The effective soil cleanup levels applied to the Phase 2 Area will be not be determined until future decisions regarding the Crissy Field Marsh expansion project into the area have been made. If the marsh is expanded into the area, cleanup will commence to be protective of the marsh and human land uses, as applicable. If the Crissy Field Marsh is not expanded into the area, cleanup levels may be selected to be protective of the anticipated land use (i.e., *restricted land use without protection of Crissy Field Marsh water quality*; see Section 3.4). Cleanup level decisions will be made in consultation with the RWQCB, in addition to the NPS for contamination that has the potential to impact Area A.

Soil confirmation/verification sampling will be conducted to document residual concentrations of COCs during the excavation program. Concentrations of TPH compounds and PAHs in soil confirmation samples will be compared with the effective cleanup levels to assess if further excavation is required within the Phase 2 Area. However, if confirmation samples indicate that TPH concentrations achieve cleanup levels while the PAH concentrations fail, PAHs above human health cleanup levels will be allowed to remain in-place. The LUC will provide protection for PAHs that are left in-place above effective cleanup levels. The LUC is also intended to protect against exposure to metals remaining in fill material.

Under the selected corrective action for the Phase 2 Area, current landscaped areas with PAHs exceeding human health effective cleanup levels will be left in-place and not capped or excavated, unless collocated with TPH contaminants above cleanup levels. As shown on Figure 19, within the Phase 2 Area, PAHs are present in soil above recreational cleanup levels within the upper 3 feet of soil in landscaped areas at only two boring locations: 600ASB07 and 600ASB09. Soil around boring location 600ASB07 will be excavated during Phase 2 because TPH is also elevated (7,900 mg/kg) above human recreational and groundwater protection levels at this location. Soil around boring 600ASB09 will not be excavated, assuming the area is not cleaned up to saltwater protection levels for the Crissy Field Marsh. No additional surface cover will be provided for this one location because it is localized (i.e., surrounded by samples with PAHs below cleanup levels or underneath caps) and not expected to pose an unacceptable risk to recreational receptors. Also, it is noted that PAHs in fill material within the landscaped areas of the Phase 2 Area that have not been sampled are also not expected to pose a significant risk to recreational receptors. These landscaped areas cover a relatively small portion of the site

(Figure 19) and consist primarily of small "grow strips" within the parking lot east of Building 610 and a narrow strip of land west of the building. Recreational exposure at the site is not expected to be limited to these small areas, but would be distributed throughout the Study Area for the duration of exposure.

To further demonstrate that leaving PAHs in-place within landscaped areas at the Study Area (including both Phase 1 and 2 Areas) is protective of future site uses, a 95% UCL concentration for benzo(a)pyrene, the risk-driving PAH in soil at the site, was calculated to obtain an estimate of the upper-bound average concentration to which recreational receptors would be exposed at the Study Area following planned remediation (Appendix F). Using surface data from 0 to 3 feet bgs within landscaped areas across the Study Area and assuming removal of soil with PAHs collocated with TPH above cleanup levels (noted above), the 95% UCL for benzo(a)pyrene is 0.054 mg/kg (Appendix F), which is below the recreational cleanup level of 0.065 mg/kg, further indicating that leaving PAHs in soil within landscaped areas does not pose a risk to recreational receptors at the Study Area. It is noted, however, that the PAHs may pose a risk to landscape or maintenance workers who would have the highest degree of exposure to contaminants in the landscaped areas during working activities. The LUC adopted for Area B portions of the site will include requirements and restrictions to ensure worker safety at these landscaped areas (Section 5.6).

No additional surface capping will be required for metals remaining in fill material within the Phase 2 Area for protection of human health and ecological receptors. The applicable cleanup levels for all metal COCs at the Study Area are driven by ecological buffer zone protection (Table 3), except for arsenic which is driven by human health (although the background concentration for beach/dune soil is selected as the cleanup level for arsenic). Figure 19 presents the metals exceeding cleanup levels in landscaped areas of the Phase 2 Area. As shown in this figure, only cleanup levels for ecolgocial buffer zone are exceeded by site metal concentrations in landscaped areas. The LUC for the site will restrict sensitive ecological uses within the Phase 2 Area and underneath Doyle Drive. Also, the Phase 2 Area and the area underneath Doyle Drive do not provide useful habitat for terrestrial ecological receptors, as the area is currently covered by pavement, buildings, or non-native landscaping which provide only limited ecological value. Thus, consistent with Figure 8 of the RWQCB Order, cleanup of the landscaped areas to ecological cleanup levels is not warranted, as long as the LUC for sensitive ecological protection is implemented and maintained.

Human health cleanup levels for metals are not exceeded in landscaped areas within the Phase 2 Area. Thus, metals exceeding cleanup levels within landscaped areas of the Phase 2 Area do not pose a risk to human health and additional surface caps are not required to prevent exposure to this contamination. It is noted that underneath the elevated Doyle Drive roadway, there has been one detection of lead at 510 mg/kg in a landscaped area at 600SB106 (Figure B-5). This lead concentration only slightly exceeds the cleanup level for recreational use of 500 mg/kg. Also, given that all other lead concentrations in soil throughout the Study Area are 400 mg/kg or less (excluding areas within the CERCLA RUs), and well below 400 mg/kg in other landscaped areas, lead in soil is not expected to pose a risk to recreational receptors at the site. The LUC will restrict sensitive human land uses within the Study Area and underneath Doyle Drive.

It is also noted that the Doyle Drive overpass is over 60 years old and approaching the end of its useful lifespan due to structural degradation (Jones & Stokes, 2001b). The San Francisco County Transportation Authority (SFCTA) is proposing to replace a 1-1/2-mile portion of Doyle Drive, from Marina Boulevard and Lombard Street to the southern approach to the Golden Gate Bridge. The SFCTA is currently developing alternatives to replace Doyle Drive to improve the seismic, structural, and traffic safety of the roadway within the setting and context of the Presidio and its designation as a national park. Several potential conceptual options for the replacement structure have been developed, including combinations of replacement, tunnels, and bridges (Parsons, 2004a,b). Currently, the following three alternatives are being considered: No-Build, Replace and Widen, and Presidio Parkway. The No-Build alternative serves as a baseline and is not likely to be considered. The Replace and Widen alternative would replace and widen the footings and viaducts in generally the same location. The Presidio Parkway alternative involves reconstruction of one viaduct and the construction of four tunnels and two low causeway structures. Both replacement alternatives would likely require excavation for the installation of roadway foundations and would likely encounter soil with COC concentrations above cleanup levels underneath and adjacent to the roadway. The selection of the final Doyle Drive replacement alternative is currently scheduled for December 2006, assuming there are no delays. The construction of the replacement structure is anticipated to begin no sooner that 2009 to 2010. The LUC that will be implemented under this CAP will restrict sensitive human and ecological land uses underneath the roadway and in the Study Area directly adjacent to the roadway until construction of the Doyle Drive overpass is completed.

For Building 610, the LUC for Area B, which will be implemented under Phase 1, will limit use of the property to recreational (and associated commercial) uses and maintain the building which provides an effective cap for contamination underneath the building. Phase 2 actions for contamination underneath Building 610 will depend on the future status of the building and potential Crissy Field Marsh expansion into the area, as follows:

- If the marsh and associated buffer zone are not expanded into the area, the LUC will remain in-place to limit use of the property and prohibit permanent removal of the building or surface cover;
- If the marsh is expanded into the area of the building and the building demolished, soil excavation activities will proceed in the area (as discussed above for other Phase 2 Area soil RUs); or
- If the marsh buffer zone is expanded into the area but the building remains in-place, *in situ* soil treatment will be conducted for contamination underneath the building.

Upon resolution of land use decisions in the Phase 2 Area, final details regarding Phase 2 implementation, including effective cleanup levels, cleanup areas, soil confirmation sampling, ongoing LUC maintenance, and *in situ* treatment technologies for Building 610 and within open excavations, will be included in the Phase 2 CAP Implementation Work Plan. The Phase 2 CAP Implementation Work Plan will also evaluate the effectiveness of the groundwater and surface water monitoring program conducted under Phase 1 (see Section 5.5).

The Fuel Distribution System Closure Report (IT, 1999), index map indicates that Pipeline A has been removed and Sheet CF-4 of that report documents that Pipeline C has also been removed. However, if portions of the pipelines are found during soil excavation activities, the pipelines will be removed and confirmation samples will be collected as outlined in the Phase 2 CAP Implementation Work Plan.

5.2 Soil Confirmation Sampling Program

It is anticipated that after the impacted materials have been removed in accordance with this CAP and associated CAP Implementation Work Plans, the exposed land surface will consist of excavation "bottom" with the perimeter of the excavation having "sidewalls."

Bottom sampling will be based on the actual size of the excavation with a minimum of one sample per excavation and at least one per 625 square feet (sf). A 25- by 25-foot sampling grid will be used to guide the collection of excavation bottom samples. Sidewalls will be sampled at the midpoint of the excavation's height every 25 feet of its lateral extent or to obtain at least one sample per excavation sidewall. The actual physical dimensions of the excavation will determine the number of bottom and sidewall samples collected. At least one bottom and four sidewall samples will be collected from each excavation. For areas outside of the 150-foot Crissy Field Marsh buffer zone, if a single excavation becomes considerably larger than anticipated (greater than 50,000 square feet), the sampling frequency will be changed to 50 feet of excavation sidewall and once per every 2,500 square feet of excavation bottom.

Consistent with the COCs for the soil RUs, as described in Sections 3.1 and 3.4, soil confirmation samples from the excavations will be analyzed for the COC constituents listed below. The analytical results will be compared to the target effective cleanup levels listed in Table 3 to assess if further excavation is necessary, in accordance with the process described herein. Professional judgment will be used to determine how much additional soil will be over-excavated in the vicinity of the confirmation soil samples showing COCs above cleanup levels. The size of the over-excavation will be based on the type of contaminant, the magnitude of the exceedance relative to the cleanup level, the results of field monitoring (if applicable to the COC), as well as other observations made in the field as to the extent of soil discoloration, soil type, olfactory evidence, extent of debris, etc. The NPS and RWQCB will be consulted regarding over-excavation decisions.

Confirmation samples will be collected from the over-excavated area at the same frequency as the confirmation soil samples that were collected from the initial excavation. At a minimum, one floor and four perimeter samples will be collected from the over-excavated area. Samples *collected from the over-excavation will be analyzed for the COC suite associated with the chemical(s) that exceeded cleanup levels in the initial confirmation soil sample.*

Phase 1 Area (Area A)

- PAHs by EPA Method 8270C (for TPHg Source Area only);
- BTEX by EPA Method 8260B (for FDS Residuals Areas only);
- TPHg, TPHd and/or TPHfo by EPA Method 8015 modified and EPA Method 3630A - Silica Gel Cleanup; and
- Metals by EPA Method 6010/6020.

As discussed in Section 5.1.1, within Area A, the Trust will remediate TPH and BTEX contamination to achieve the effective cleanup levels. The Trust will also remediate known areas with PAHs and metals above effective cleanup levels to achieve unrestricted human land use within Area A, to the extent practicable, but will consult with the NPS and RWQCB regarding further excavation decisions related to these compounds during implementation of the remedy.

Phase 1 Area (Area B)

- PAHs by EPA Method 8270C; and
- TPHg, TPHd and/or TPHfo by EPA Method 8015 modified and EPA Method 3630A - Silica Gel Cleanup.

As discussed in Section 5.1.1, within Area B, the Trust will remediate TPH contamination to achieve the effective cleanup levels. PAHs above human health cleanup levels will be allowed to remain in-place under existing caps (e.g., pavement) and in landscaped areas and an LUC will be implemented. The LUC is also intended to protect against exposure to metals in fill material.

Phase 2 Area (Area B)

- PAHs by EPA Method 8270C; and
- TPHg, TPHd and/or TPHfo by EPA Method 8015 modified and EPA Method 3630A - Silica Gel Cleanup.

As discussed in Section 5.1.2, within the Phase 2 Area (Area B), the Trust will remediate TPH contamination to achieve the effective cleanup levels. PAHs above human health cleanup levels will be allowed to remain in-place under caps (e.g., pavement) and in landscaped areas and an LUC will be implemented. The LUC is also intended to protect against exposure to metals in fill material. The Phase 2 CAP Implementation Work Plan will provide more details regarding necessary soil confirmation sampling within the Phase 2 Area.

If *in situ* treatment technologies are used for remediation, additional soil confirmation sampling and/or soil gas sampling will need to be conducted. Details on confirmation sampling for *in situ* treatment will be provided in the CAP Implementation Work Plans.

5.3 Applicable State and Federal Laws and Regulatory Requirements

Implementation of the selected corrective action alternatives will comply with applicable state and federal laws and regulations including the requirements of Title 23, Division 3, Chapter 16, Article 11, which are the primary regulations establishing the requirements and standards for petroleum-related corrective action in the State of California. The alternatives will also comply with applicable laws and regulations regarding management and disposal of excavated soil, including transport to and treatment at regulated and permitted facilities. As detailed in the RWQCB Order, the Commissary/PX Study Area is a known petroleum contamination site requiring preparation and implementation of this CAP meeting the requirements of 23 CCR § 2725 (2004). The RWQCB Order presents cleanup standards as SCRs for the protection of human health, ecological receptors, and water quality, which have been used to set the applicable CAP cleanup levels. In addition, the RWQCB Water Quality Control Plan for the San Francisco Bay Region (known as the Basin Plan) (RWQCB, 2004), pertaining to water quality within the state, has been taken into account in establishing the CAP cleanup levels.

The Presidio as a whole is within the Golden Gate National Recreation Area (GGNRA) and is listed in the National Register of Historic Places as a Historic Landmark, which affords its historic resources and cultural landscapes certain protection under the NHPA.

The Commissary/PX Study Area is located in the Crissy Field Planning Area of the Presidio where the Crissy Field Restoration Project, a tidal marsh area, is located. As part of the tidal marsh restoration work, a major archaeological recovery project was carried out by the NPS at Crissy Field to research and identify potential cultural resources present in this area. The research indicates the Commissary/PX Study Area is located within a “Historic Sensitivity Zone” (Figure 6 of *Jones & Stokes, 2001a*). In addition, the Commissary/PX Study Area is in or adjacent to an approximate 12-acre area designated as the former 19^{th} Century Quartermaster Depot & Landfill (Figure 10 of *Jones & Stokes, 2001a*), shown on Figure 2B. The cultural resources in this area could be of potential contributive value to the National Historic Landmark (NHL) and potentially eligible for the National Register of Historic Places (*Holman & Associates, 1999a* in *Jones & Stokes, 2001a*). In addition, the Building 628 Area 2 RU is in an archaeological sensitive area related to a Native American burial site and cultural relics identified in prior studies (Treadwell & Rollo, 2002b). As required by the NHPA, if ground-disturbing activities are conducted within a Historic Sensitivity Zone to address environmental contamination, potential impacts to these cultural resources should be avoided if possible, and be mitigated by archaeological monitoring during any excavation activities. The Trust is developing protocols for management of significant cultural resources discovered during the excavation monitoring program in the Study Area. To protect these resources, work at the Commissary/PX Study Area will be monitored per the Programmatic Agreement for the Presidio between the Trust and the State Historic Preservation Officer (for work in Area B) and per the Programmatic Agreement for the Presidio between the NPS and the State Historic Preservation Officer (for work in Area A).

During corrective action implementation, the Trust will also comply with applicable provisions of the AHPA and the Native American Graves Protection and Repatriation Act (NAGPRA). Other federal and state statutes, such as the federal and state Endangered Species Acts (ESA and CESA), the Migratory Bird Treaty Act (MBTA), and the Coastal Zone Management Act (CZMA) also provide standards for protection of natural resources found on the Presidio that will be followed during this corrective action.

For portions of the Commissary/PX within Area A of the Presidio, the Trust will protect park resources in accordance with the GGNRA Act and the Organic Act while performing corrective actions at the Commissary/PX. The corrective action will be completed in a manner consistent with land uses established by the GMPA and the Area A MOA. For portions of the Commissary/PX within Area B of the Presidio, the corrective action will be completed in a manner consistent with land uses established by the PTMP. NPS Management Policies and the Presidio Vegetation Management Plan (Trust and NPS, 2001) apply to corrective action work in both Area A and Area B.

With regard to soil excavation and disposal, state laws and regulations implement the federal Resource Conservation and Recovery Act (RCRA) standards and are applicable to the corrective actions at the Commissary/PX Study Area. These provisions include standards for properly storing, handling and transporting excavated soil that may contain hazardous constituents. These regulations also set standards for testing of potential hazardous wastes prior to management and proper off-site disposal.

The impacted soil at the Study Area is not believed to be hazardous waste. The transport and disposal of non-hazardous waste that may be generated during the corrective action will be performed in accordance with the pertinent sections of Title 27 of the California Code of Regulations, which addresses the proper management of solid wastes.

The corrective actions at Commissary/PX Study Area take into account the RWQCB Basin Plan policy of no loss of wetlands as well as Presidio wetlands resources (NPS and Trust, 2003). Any applicable discharge prohibitions and erosion control measures will protect surface water and wetland resources. Also, Bay Area Air Quality Management District (BAAQMD) regulations pertinent to dust suppression and onsite air monitoring during excavation work will be met to prevent air quality impacts from the selected remedial actions. Although not anticipated to be present, if unknown USTs are found during remedial activities, removal will comply with applicable state and local requirements.

5.4 Archaeological Monitoring

As described in Section 5.3, the Commissary/PX Study Area is within a Historic Sensitivity Zone. Corrective Action work pursuant to this CAP will be monitored per the Programmatic Agreement for the Presidio between the Trust and the State Historic Preservation Officer (for work in Area B) and per the Programmatic Agreement for the Presidio between the NPS and the State Historic Preservation Officer (for work in Area A).

Work will only be performed following coordination with Trust and NPS historians and archaeologists. Internal and external communications will be specified in the protocols for management of significant cultural resources discovered during the remedial activities. Such protocols are currently under preparation by the Trust and are anticipated to be provided as an appendix to the Phase 1 CAP Implementation Work Plan. As required by these protocols, if items of potential archeologically or historically sensitive importance are found or suspected to be present, Trust field personnel will contact the appropriate Trust and NPS cultural resources points of contact immediately. Work in the area will also be immediately halted until the potential discovery is evaluated.

5.5 Groundwater and Surface Water Monitoring

Groundwater and surface water monitoring will be conducted as part of the selected remedy for the soil RUs to effectively demonstrate that the soil remedy is protective of groundwater and Crissy Field Marsh water quality. As noted above in Section 5.1, a component of the remedy is implementation of an LUC for Area B to restrict use of groundwater in the area as a drinking water supply until contaminant concentrations are below drinking water cleanup levels. This section describes the groundwater and surface water monitoring program that will commence following completion of Phase 1 construction activities. The need for additional monitoring following completion of the Phase 2 construction activities will be made in consultation with the RWQCB and NPS during development of the Phase 2 CAP Implementation Work Plan.

Following completion of Phase 1 construction activities, groundwater and surface water samples will be collected on a quarterly basis from the following monitoring wells and seep locations in the vicinity of the Commissary Seeps and Building 610:

- Downgradient monitoring wells: 600GW101 (600GW101R after replacement), 610GW101, 610GW102, and 610GW103;
- Upgradient monitoring well: 600GW106; and
- Surface water seeps: 610SP01 and 610SP02.

Well 600GW101 will be removed during Phase 1 excavation of the TPHg Source Area. Replacement well 600GW101R will be re-installed following soil excavation activities and monitored.

Groundwater and surface water samples from the wells and seep locations listed above will be analyzed for the following petroleum-related constituents on a semi-annual basis:

- TPHg, TPHd and/or TPHfo by EPA Method 8015/EPA 3630A, and
- BTEX and MTBE by EPA 8021B or 8020.

Groundwater and surface water samples from the well and seep locations listed above will also be analyzed for arsenic and related constituents on a quarterly basis to assess whether arsenic concentrations in wells and seep samples at the site show trends over time and further evaluate the relationship between arsenic concentrations, TPH concentrations, Bay Mud, or other factors that affect redox conditions and therefore, the solubility of arsenic in groundwater. Samples collected from the wells and seep locations above will be analyzed for the following parameters:

- Dissolved arsenic, iron, manganese, and aluminum (EPA 6010-6020);
- Total arsenic, iron, manganese, and aluminum (EPA 6010-6020), at seep locations only;
- General chemistry parameters: alkalinity (total), bicarbonate, carbonate, chloride, fluoride, nitrate as N, and nitrite as N, and sulfate (by various analytical methods);
- Sulfide (EPA 376.2/SW9030);
- Total dissolved solids (EPA 160.1);
- TOC (SW 9060); and
- Field parameters including DO, specific conductance, and pH.

Iron, manganese, sulfide, sulfate, nitrate as N, and nitrite as N will be analyzed, and DO and pH will be field-measured to evaluate the redox state of the groundwater. TOC will be evaluated to assess the relative concentrations of organic compounds available for biodegradation. Aluminum will be monitored for quality control (QC) purposes, to evaluate if there has been breakthrough of the filters used for sampling.

During each sampling event, water levels will be measured in all existing onsite groundwater monitoring wells and groundwater elevations calculated.

Groundwater, surface water, and quality assurance/quality control (QA/QC) samples (duplicates, equipment blanks, and trip blanks), will be collected and analyzed in accordance with the Presidio-wide Quality Assurance Project Plan (*Tetra Tech, 2001*).

Table 10 presents the detailed groundwater/surface water monitoring program for each well and seep location included in the program. The groundwater cleanup levels for the Commissary/PX Area are presented in Table 4. For the petroleum-related constituents in the vicinity of the Commissary Seeps and Building 610, the semi-annual sampling will be conducted until implementation of Phase 2 corrective actions so that levels of petroleum-related constituents can be assessed over time following Phase 1 corrective action and until Phase 2 is implemented.

This monitoring is expected to demonstrate that the two-phased approach for corrective action at the Study Area is protective of groundwater and the Crissy Field Marsh.

Arsenic and the related constituents above will be monitored for four quarters to evaluate if the concentrations show trends and refine the conceptual model for arsenic in groundwater. Following the one-year monitoring period, analyses of arsenic and related constituents will be reduced to a semi-annual basis until Phase 2 implementation, assuming arsenic levels are maintained at consistent levels or have decreased to concentrations below the cleanup level.

In the Phase 2 CAP Implementation Work Plan, the Phase 1 groundwater and surface water monitoring data will be reviewed to assess the need for further monitoring. The following general criteria will be used to determine the need for further monitoring or action for contaminants in groundwater:

- If cleanup levels are achieved or maintained within the monitoring period specified above, the monitoring program will be discontinued;

- If it is demonstrated that constituent concentrations are moving towards cleanup levels (i.e., showing a consistent decreasing trend) within a reasonable time period, the groundwater monitoring program will either be discontinued or continued for a specified time period to confirm attainment of cleanup levels, as appropriate; or

- If constituent concentration(s) are above cleanup levels and not showing a decreasing trend, the LUC restricting use of groundwater in the area for drinking water purposes may be retained for long-term management of groundwater. As discussed in Section 3.2, constituents in groundwater do not currently pose an actionable threat to the Crissy Field Marsh, as concentrations are below saltwater cleanup levels. The Order specifies that it is extremely unlikely that shallow groundwater adjacent to Crissy Field Marsh could be used for drinking water purposes. Thus, leaving constituents in groundwater at concentrations above drinking water standards, but below levels for protection of the marsh, and restricting use of groundwater in the area for drinking water purposes would not pose a risk to humans or the environment at the Study Area.

Further groundwater and surface water monitoring decisions will be made in consultation with the RWQCB and NPS.

All Study Area wells will remain in-place until decisions are made regarding the Phase 2 corrective action program. Once it is determined that a well will be no longer be monitored under Phase 1 or 2, the Trust will request approval from the RWQCB for abandonment of the well.

5.6 Land Use Control

A primary component of the selected corrective action for the Study Area is implementation and maintenance of an LUC within Area B portions of the site. The LUC is a non-engineering measure designed to (1) limit human and/or ecological exposure to contaminants left in-place in soil above levels considered protective of unrestricted use of the site (including residences, schools, hospitals, and day care centers); (2) restrict use of groundwater as a drinking water supply until constituent concentrations are below drinking water cleanup levels; and (3) require the notification of present and future owners and tenants of the property concerning the potential presence of COCs remaining in soil and/or groundwater at concentrations above risk-based cleanup levels for unrestricted site use, including protection of sensitive ecological receptors. The LUC requirements and restrictions are binding on current and subsequent property owners and remain in effect until they are formally removed or modified.

The LUC for the Commissary/PX Study Area is consistent with land uses specified in the PTMP (Trust, 2002). The allowable land use for the Commissary/PX Study Area is recreational. Recreational land use, as well as commercial, office, institutional, and cultural land uses, will be allowable under the LUC. Non-allowable land uses under the LUC are specified below.

Under the selected corrective action for the Commissary/PX Study Area, an LUC will be adopted for Area B portions of the Study Area (within the Phase 1 and 2 Areas) to protect site uses due to the following elements of the corrective action.

- Phase 2 excavation activities will not commence until a decision is made regarding the future expansion of the Crissy Field Marsh into the Phase 2 Area. The Trust will proceed with Phase 2 construction activities no later than the end of 2008. An LUC will be required for the Phase 2 Area to restrict sensitive human land uses and prohibit removal of existing caps (e.g., pavement and buildings) where concentrations of COCs exceed cleanup levels for unrestricted use. The LUC is also required to prohibit expansion of the saltwater tidal marsh or similar habitat restoration projects into the Phase 2 Area.

- Following corrective action within Area B, PAHs, which are present in fill materials throughout the Study Area and are not mobile COCs, may remain in soil under existing caps (e.g., pavement or buildings) or landscaped areas at concentrations above cleanup levels.

- Metals, which are not associated with Motor Pool releases and are not mobile COCs, are present in fill materials throughout the Study Area and beneath the elevated Doyle Drive. The metals are present at concentrations above cleanup levels under caps (e.g., pavement or buildings) and landscaped areas.

- Dissolved arsenic has been routinely detected above drinking water cleanup levels in groundwater and/or seep water samples collected in the vicinity of the Commissary seeps.

The LUC for the Area B portions of the Commissary/PX Study Area will fulfill the following goals:

- Prevent inappropriate land use of the property with soil containing residual COCs at concentrations above applicable human health or ecological cleanup levels in soil;
- Prevent use of groundwater as a drinking water supply until constituent concentrations are demonstrated to be below drinking water cleanup levels;
- Provide a means (through the Trust's LUC program) for conveying the use restriction to Trust personnel (including land use decision makers), property managers, tenants, and regulators;
- Provide a framework for long-term monitoring to verify that asphalt, landscaping, and buildings capping contaminated soil are maintained and not removed;
- Provide a mechanism for any subsequent property owners or transferees to assume responsibility for complying with the requirements of the site use restrictions if or when the property is transferred; and
- Require that the DTSC and RWQCB be contacted prior to a change in sensitive land use or in the selected remedy.

The "LUC Zone" at the Commissary/PX Study Area is illustrated on Figure 2B. The LUC Zone will encompass all portions of the Study Area within Area B, in addition to the area underneath Doyle Drive. The LUC is bounded to the north by the foot/bike path which runs along the Crissy Field Marsh on the north side of Mason Street (includes Mason Street); to the east by Halleck Street; to the south by the southern edge of Doyle Drive (includes the area underneath Doyle Drive); and to the west by Building 638 and the western edge of the Building 633 Firing Range backstop.

The LUC Zone includes the following CERCLA sites which are present within the Commissary/PX Study Area boundaries: Former Railroad Tracks Area, Former Coal Storage Bin Area, Building 633 Firing Range, and Former Building 609 Area. The evaluation and selection of remedial alternatives for these CERCLA sites are documented in a Draft RAP (MACTEC, 2004); the Final RAP is in progress. In the Final RAP, any LUC that is selected as a component of the remedies at the CERCLA sites to address PAHs and metals in fill material will limit expansion of the marsh during Phase 1, similar to the remedy selected in this CAP. Although remediation for the CERCLA sites are addressed independently and separately from the actions authorized by this CAP, the LUC will be coordinated, implemented, and managed as one LUC Zone for the entire property.

It is also noted that the LUC Zone includes a large portion of the former 19th Century Quartermaster Depot & Landfill (Figure 10 of *Jones & Stokes, 2001a*), as shown on Figure 2B.

The remainder of the depot and landfill outside of the LUC Zone defined in this CAP has been or will be addressed in separate decision documents.

The LUC will include the following restrictions and requirements:

- **Non-Allowable Land Uses –** No sensitive uses (including housing, schools, hospitals, day care facilities, playgrounds, or any other uses involving the regular and constant use by children, the infirm, or the elderly) will be allowable for the site. Regular and constant use is defined as one individual being present on the site more than 3 hours per day, 150 days per year. As such, recreational and educational uses of the site by children, the infirm, or the elderly, not exceeding 3 hours, 150 days per year per individual, will be allowable. General recreational, commercial, office, institutional, and cultural land uses will be allowable as well. No homegrown produce may be grown at the site. Use of the LUC Zone as a saltwater ecological habitat restoration area will be prohibited. Use of groundwater as a drinking water supply will also be prohibited.

- **Administrative Controls –** For any project that involves excavation or intrusion into the subsurface within an LUC Zone, a project permit, including excavation clearance and project conditions and mitigations, will be applied for and approved through the Trust's dig permit program as well as NEPA and the NHPA (N^2 process) prior to commencement of subsurface disturbance in the LUC Zone. Soil disturbance activities within the LUC Zone will be required to adhere to a Health and Safety Plan that is consistent with applicable health and safety standards. Workers in the area will be required to follow the Health and Safety Plan, have the appropriate level of health and safety training, and use the appropriate level of personal protective equipment specified in the Health and Safety Plan.

- **Removal of LUC –** If, in the future, the Trust chooses to remove the LUC, a portion of the LUC Zone, or the entire LUC Zone, and excavates soil at concentrations above cleanup levels, soil sampling will be required to verify that effective cleanup levels have been achieved. Groundwater monitoring will be required to demonstrate that drinking water cleanup levels have been achieved to remove the LUC restriction on groundwater.

- **Management of Excavated Soil/Materials –** All soil excavated from an LUC Zone will be managed and/or disposed in accordance with then applicable federal, state and local laws governing excavation, handling, management, and disposal of the excavated material.

- **Imported Fill –** Imported fill used within an LUC Zone will meet the cleanup levels for unrestricted human health land use.

The procedures described below will be followed to ensure that the specified LUC for the Commissary/PX Study Area is adhered to by present and future owners and users of the site:

- **Project Permit Process –** In advance of implementation, all Presidio plans and projects must be screened for compliance with NEPA and the N^2 process. The Trust or NPS, as applicable, will use its interdisciplinary NEPA/NHPA environmental screening process to notify planning/project proponents of the LUC and require adherence to the restrictions and requirements set forth in this CAP for any plan/project involving the LUC Zone. In addition, for any project involving excavation or subsurface intrusion within the LUC Zone, the Trust must approve an Excavation Clearance Permit (dig permit) to ensure that subsurface utilities (water, gas, sewer, fiber optic) are not damaged. The dig permit process will be used to notify and require adherence by excavation project proponents of the LUC restrictions and requirements.

- **LUCs Master Reference Report –** The LUC Zone and the specific restrictions and requirements will be described in a site-specific addendum to the Trust's LUCMRR. The LUCMRR, which includes a master map showing all Presidio-wide LUC Zones and a compilation of Presidio LUCs' requirements and restrictions, is maintained and kept current at the Trust Library. Planning/project proponents and other members of the public may review existing LUCs for the Presidio by reviewing the LUCMRR in the Trust Library.

- **LUC Tracking in the Trust's GIS Database –** The Trust will include the LUC Zone in the GIS database that the Trust is preparing to monitor its LUC sites. This database will be available to Trust staff to facilitate decision making and land use planning for Presidio sites.

- **Notification and Annual Monitoring –**The Trust will prepare an annual Presidio LUCs Report to confirm that land uses within the Presidio are consistent with the restrictions and requirements of the specified LUC Zones. The LUC for the Commissary/PX Study Area will be included in this report. The Trust will provide DTSC and RWQCB with a copy of the annual report.

- **Transfer of Ownership or Control –** The Trust will notify DTSC and RWQCB of any anticipated transfer of ownership or control of any portion of the LUC Zone. Any transfer of ownership or control of the LUC Zone, in whole or in part, will be handled as outlined in the LUCMRR. The Trust would likely record the LUCMRR with the City and County of San Francisco Recorder's Office and the Federal General Services Agency (GSA) to place subsequent Presidio owners or managers on notice of the existence of the LUC Zones at the Presidio. As part of the administrative transfer of the site, the Trust will notify the subsequent owner or manager of the duty to comply with the LUCs and provide them with a current copy of the LUCMRR.

5.7 Implementation Schedule

As discussed in Sections 3.4 and 4.5, the Trust plans to implement the corrective action in two phases. Implementation of Phase 1 construction activities will commence no later than 21 February 2006 (pending RWQCB approval). The groundwater and surface water monitoring program specified in Section 5.5 will commence at the completion of Phase 1 construction activities. It is noted that the Study Area will continue to be monitored under the current Presidio-wide Groundwater Monitoring Program until that time.

During Phase 1, the LUC will be implemented for Area B portions of the Study Area (includes the Phase 2 Area), as discussed in Section 5.6. Following a final decision regarding the expansion of the Crissy Field Marsh into the Phase 2 Area, Phase 2 excavation activities will commence in the Phase 2 Area to be consistent with the land use decisions at that time. The Trust will proceed with Phase 2 construction activities no later than the end of 2008. The LUC will be retained for long-term management of Area B.

As outlined in Appendix G, the dilution attenuation factors (DAFs) and retardation factors estimated as part of the Commissary Seeps Interim Removal Action support the Trust's current proposed Phase 1 and Phase 2 CAP implementation approach. The analysis shows that TPH in the Phase 2 Area soil and in groundwater would not migrate to the Crissy Field Marsh at levels that pose a risk to water quality within the marsh, prior to Phase 2 construction implementation in 2008. In addition, groundwater and surface water monitoring will be conducted under Phase 1 to demonstrate that the two-phased approach for corrective action at the Study Area is protective of groundwater and the Crissy Field Marsh.

Upon final regulatory approval by RWQCB of the Final CAP, all deliverables and corrective actions authorized by the CAP will be prepared and implemented according to the schedule, as amended, required by the RWQCB Order. The Phase 1 CAP Implementation Work Plan for the selected alternative will be submitted within two months following regulatory approval of the Final CAP. The Phase 2 CAP Implementation Work Plan will be prepared within 6 months of a determination concerning the Crissy Field Marsh expansion or submitted no later than 1 September 2008. The Trust will proceed with Phase 2 construction activities no later than the end of 2008.

As required by the current RWQCB Order, a report documenting implementation of the Phase 1 Area RU corrective actions and construction completion, including ongoing groundwater monitoring results, will be issued on or before 15 September 2006. An addendum report will be prepared documenting implementation of the Phase 2 corrective actions and construction completion. This addendum report will be issued to the RWQCB within 6 months of Phase 2 construction completion.

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TABLES

Table 1
Groundwater Elevation Summary
Commissary/PX Area
Presidio of San Francisco, California

Location ID	Date	Tidal Cycle	Average Depth to Water [1] (feet)	Top of Casing Elevation (feet PLLW)	Groundwater Elevation (feet PLLW)	Well Type
600GW101	05/23/05	--	3.52	10.66	7.14	MW
	03/14/05	--	3.94	10.66	6.72	MW
	12/13/04	--	3.73	10.66	6.93	MW
	08/09/04	--	4.65	10.66	6.01	MW
	05/24/04	--	4.43	10.66	6.23	MW
	03/08/04	--	4.04	10.66	6.62	MW
	12/01/03	--	4.38	10.66	6.28	MW
	08/11/03	Low	4.52	10.66	6.14	MW
	06/02/03	Low	4.51	10.66	6.15	MW
	03/10/03	Low	3.21	10.66	7.45	MW
	12/02/02	Low	4.62	10.66	6.04	MW
600GW102	05/23/05	--	2.90	10.10	7.20	MW
	03/14/05	--	3.67	10.10	6.43	MW
	12/13/04	--	3.64	10.10	6.46	MW
	08/09/04	--	4.35	10.10	5.75	MW
	05/24/04	--	3.39	10.10	6.71	MW
	03/08/04	--	3.88	10.10	6.22	MW
	12/01/03	--	4.12	10.10	5.98	MW
	08/11/03	Low	4.12	10.10	5.98	MW
	06/02/03	Low	4.21	10.10	5.89	MW
	03/10/03	Low	2.75	10.10	7.35	MW
	12/02/02	Low	4.21	10.10	5.89	MW
600GW103	05/23/05	--	2.50	10.31	7.81	MW
	03/14/05	--	2.95	10.31	7.36	MW
	12/13/04	--	2.96	10.31	7.35	MW
	08/09/04	--	2.94	10.31	7.37	MW
	05/24/04	--	2.90	10.31	7.41	MW
	03/08/04	--	3.03	10.31	7.28	MW
	12/01/03	--	3.41	10.31	6.90	MW
	08/11/03	Low	2.86	10.31	7.45	MW
	06/02/03	Low	2.95	10.31	7.36	MW
	03/10/03	Low	2.79	10.31	7.52	MW
	12/02/02	Low	3.37	10.31	6.94	MW
600GW104	05/23/05	--	2.93	10.48	7.55	MW
	03/14/05	--	3.25	10.48	7.23	MW
	12/13/04	--	3.00	10.48	7.48	MW
	08/09/04	--	3.35	10.48	7.13	MW
	05/24/04	--	3.94	10.48	6.54	MW
	03/08/04	--	3.20	10.48	7.28	MW
	12/01/03	--	3.51	10.48	6.97	MW
	08/11/03	Low	3.08	10.48	7.40	MW
	06/02/03	Low	2.98	10.48	7.50	MW
	03/10/03	Low	2.95	10.48	7.53	MW
	12/02/02	Low	3.58	10.48	6.90	MW

Table 1
Groundwater Elevation Summary
Commissary/PX Area
Presidio of San Francisco, California

Location ID	Date	Tidal Cycle	Average Depth to Water [1] (feet)	Top of Casing Elevation (feet PLLW)	Groundwater Elevation (feet PLLW)	Well Type
600GW105	05/23/05	--	3.20	17.64	14.44	MW
	03/14/05	--	3.15	17.64	14.49	MW
	12/13/04	--	4.24	17.64	13.40	MW
	08/09/04	--	4.15	17.64	13.49	MW
	05/24/04	--	4.29	17.64	13.35	MW
	03/08/04	--	3.47	17.64	14.17	MW
	12/01/03	--	4.83	17.64	12.81	MW
	08/11/03	Low	4.87	17.64	12.77	MW
	06/02/03	Low	5.55	17.64	12.09	MW
	03/10/03	Low	3.30	17.64	14.34	MW
	12/02/02	Low	4.60	17.64	13.04	MW
600GW106	05/23/05	--	3.35	16.04	12.69	MW
	03/14/05	--	3.45	16.04	12.59	MW
	12/13/04	--	4.37	16.04	11.67	MW
	08/09/04	--	3.88	16.04	12.16	MW
	05/24/04	--	4.00	16.04	12.04	MW
	03/08/04	--	3.45	16.04	12.59	MW
	12/01/03	--	4.51	16.04	11.53	MW
	08/11/03	Low	4.41	16.04	11.63	MW
	06/02/03	Low	4.51	16.04	11.53	MW
	03/10/03	Low	3.22	16.04	12.82	MW
	12/02/02	Low	4.50	16.04	11.54	MW
600GW107	05/23/05	--	3.80	16.76	12.96	MW
	03/14/05	--	3.62	16.76	13.14	MW
	12/13/04	--	4.58	16.76	12.18	MW
	08/09/04	--	5.19	16.76	11.57	MW
	05/24/04	--	4.72	16.76	12.04	MW
	03/08/04	--	4.94	16.76	11.82	MW
	12/01/03	--	5.23	16.76	11.53	MW
	08/11/03	Low	4.98	16.76	11.78	MW
	06/02/03	Low	4.48	16.76	12.28	MW
	03/10/03	Low	4.08	16.76	12.68	MW
	12/02/02	Low	4.82	16.76	11.94	MW
600GW108	05/23/05	--	3.98	12.29	8.31	MW
	03/14/05	--	3.90	12.29	8.39	MW
	12/13/04	--	4.20	12.29	8.09	MW
	08/09/04	--	4.79	12.29	7.50	MW
	05/24/04	--	4.72	12.29	7.57	MW
	03/08/04	--	4.41	12.29	7.88	MW
	12/01/03	--	4.12	12.29	8.17	MW
	08/11/03	Low	4.72	12.29	7.57	MW
	06/02/03	Low	4.39	12.29	7.90	MW
	03/10/03	Low	3.82	12.29	8.47	MW
	12/02/02	Low	4.23	12.29	8.06	MW

Table 1
Groundwater Elevation Summary
Commissary/PX Area
Presidio of San Francisco, California

Location ID	Date	Tidal Cycle	Average Depth to Water [1] (feet)	Top of Casing Elevation (feet PLLW)	Groundwater Elevation (feet PLLW)	Well Type
600GW109	05/23/05	--	3.70	11.67	7.97	MW
	03/14/05	--	3.54	11.67	8.13	MW
	12/13/04	--	4.05	11.67	7.62	MW
	08/09/04	--	4.71	11.67	6.96	MW
	05/24/04	--	4.46	11.67	7.21	MW
	03/08/04	--	3.90	11.67	7.77	MW
	12/01/03	--	4.87	11.67	6.80	MW
	08/11/03	Low	4.65	11.67	7.02	MW
	06/02/03	Low	4.31	11.67	7.36	MW
	03/10/03	Low	3.85	11.67	7.82	MW
	12/02/02	Low	4.52	11.67	7.15	MW
610GW101	05/23/05	--	2.61	9.91	7.30	MW
	03/14/05	--	2.90	9.91	7.01	MW
	12/13/04	--	2.93	9.91	6.98	MW
	08/09/04	--	5.21	9.91	4.70	MW
	05/24/04	--	3.40	9.91	6.51	MW
	03/08/04	--	3.17	9.91	6.74	MW
	12/01/03	--	3.28	9.91	6.63	MW
	08/11/03	Low	3.49	9.91	6.42	MW
	06/02/03	Low	3.55	9.91	6.36	MW
	03/10/03	Low	2.39	9.91	7.52	MW
	12/02/02	Low	3.44	9.91	6.47	MW
	08/26/02	Low	3.68	9.91	6.23	MW
	05/28/02	High	3.59	9.91	6.32	MW
	05/28/02	Low	3.63	9.91	6.28	MW
	03/04/02	High	3.85	9.91	6.06	MW
	03/04/02	Low	3.32	9.91	6.59	MW
	11/26/01	High	3.25	9.91	6.66	MW
	11/26/01	Low	3.25	9.91	6.66	MW
	08/27/01	High	3.60	9.91	6.31	MW
	08/27/01	Low	3.64	9.91	6.27	MW
610GW102	05/23/05	--	3.00	10.29	7.29	MW
	03/14/05	--	3.30	10.29	6.99	MW
	12/13/04	--	3.42	10.29	6.87	MW
	08/09/04	--	4.13	10.29	6.16	MW
	05/24/04	--	3.86	10.29	6.43	MW
	03/08/04	--	3.69	10.29	6.60	MW
	12/01/03	--	3.82	10.29	6.47	MW
	08/11/03	Low	3.92	10.29	6.37	MW
	06/02/03	Low	4.10	10.29	6.19	MW
	03/10/03	Low	2.75	10.29	7.54	MW
	12/02/02	Low	3.94	10.29	6.35	MW

Table 1
Groundwater Elevation Summary
Commissary/PX Area
Presidio of San Francisco, California

Location ID	Date	Tidal Cycle	Average Depth to Water [1] (feet)	Top of Casing Elevation (feet PLLW)	Groundwater Elevation (feet PLLW)	Well Type
610GW102	08/26/02	Low	4.16	10.29	6.13	MW
	05/28/02	High	4.08	10.29	6.21	MW
	05/28/02	Low	4.12	10.29	6.17	MW
	03/04/02	High	5.02	10.29	5.27	MW
	03/04/02	Low	3.83	10.29	6.46	MW
	11/26/01	High	3.72	10.29	6.57	MW
	11/26/01	Low	3.74	10.29	6.55	MW
	08/27/01	High	4.11	10.29	6.18	MW
	08/27/01	Low	4.13	10.29	6.16	MW
610GW103	05/23/05	--	4.00	11.13	7.13	MW
	03/14/05	--	4.30	11.13	6.83	MW
	12/13/04	--	4.45	11.13	6.68	MW
	08/09/04	--	3.65	11.13	7.48	MW
	05/24/04	--	4.85	11.13	6.28	MW
	03/08/04	--	4.78	11.13	6.35	MW
	12/01/03	--	4.67	11.13	6.46	MW
	08/11/03	Low	4.88	11.13	6.25	MW
	06/02/03	Low	4.19	11.13	6.94	MW
	03/10/03	Low	3.20	11.13	7.93	MW
	12/02/02	Low	4.79	11.13	6.34	MW
	08/26/02	Low	5.26	11.13	5.87	MW
	05/28/02	High	5.13	11.13	6.00	MW
	05/28/02	Low	5.11	11.13	6.02	MW
	03/04/02	High	3.37	11.13	7.76	MW
	03/04/02	Low	4.94	11.13	6.19	MW
	11/26/01	High	4.83	11.13	6.30	MW
	11/26/01	Low	4.85	11.13	6.28	MW
	08/27/01	High	5.29	11.13	5.84	MW
	08/27/01	Low	5.33	11.13	5.80	MW
610SP01	05/23/05	--	Not flowing	--	--	Surface
	03/14/05	--	Not flowing	--	--	Surface
	12/13/04	--	Not flowing	--	--	Surface
	08/09/04	--	Not flowing	--	--	Surface
	05/24/04	--	Not flowing	--	--	Surface
	03/08/04	--	Not flowing	--	--	Surface
	12/01/03	--	Not flowing	--	--	Surface
	08/11/03	Low	Not flowing	--	--	Surface
	06/02/03	Low	Not flowing	--	--	Surface

Table 1
Groundwater Elevation Summary
Commissary/PX Area
Presidio of San Francisco, California

Location ID	Date	Tidal Cycle	Average Depth to Water [1] (feet)	Top of Casing Elevation (feet PLLW)	Groundwater Elevation (feet PLLW)	Well Type
610SP02	05/23/05	--	Not flowing	--	--	Surface
	03/14/05	--	Not flowing	--	--	Surface
	12/13/04	--	Not flowing	--	--	Surface
	08/09/04	--	Not flowing	--	--	Surface
	05/24/04	--	Not flowing	--	--	Surface
	03/08/04	--	Not flowing	--	--	Surface
	12/01/03	--	Not flowing	--	--	Surface
	08/11/03	Low	Not flowing	--	--	Surface
	06/02/03	Low	Not flowing	--	--	Surface

Notes
1 - All depth to water measurements are an average of three measurements recorded in the field.
MW- Monitoring well
feet PLLW - feet above Presidio lower low water vertical datum
-- Groundwater level measurements were not collected on a tidal schedule beginning with Fourth Quarter 2003.

Table 2
Previous Investigation Results and Corrective Actions Summary
Commissary/PX Study Area
Presidio of San Francisco, California

Building Number and Investigation Site Designation	Investigation and Removal Action Description	Potential Contaminant of Concern Identified	Status
T609 Commissary Sampling	Household pesticide container breaks in former Commissary (T609). Cleanup contracted. Soil samples collected during Remedial Investigation (RI) at Building 610, west of former T609. The results from 3 soil samples collected indicated low levels for dieldrin (up to 0.012 µg/g) and ppDDT (up to 0.13 µg/g) and 1,1-dichloro-2,2-di(4-chlorophenyl)ethane (DDE) (0.008 µg/g) (Dames & Moore, 1997) (Youngkin, Mark, 1996a).	1,1-dichloro-2,2-di(4chlorophenyl)ethene (DDT)	These detections exceed possible screening levels. Recommended soil sampling conducted and reported as part of the Commissary/PX SI. Included in *Remedial Action Plan, Baker Beach Disturbed Areas 1, 1A, 2, and 2A and Twenty-Seven Other Main Installation Sites* (MACTEC, 2004).
633 Pistol Range Sampling	20 shallow soil samples (<2.5 feet) collected during Base-wide RI at site detected lead up to 659 µg/g (Dames & Moore, 1997).	Lead	Included in *Remedial Action Plan, Baker Beach Disturbed Areas 1, 1A, 2, and 2A and Twenty-Seven Other Main Installation Sites* (MACTEC, 2004).
Low Temperature Thermal Desorption (LTTD) Facility Sampling	This area served as a gasoline refueling facility serviced by AST 634. The area has recently been used for a low-temperature thermal desorption (LTTD) facility for soil remediation. A baseline soil condition investigation prior to LTTD startup collected 20 near-surface (12 to 16 inches deep) soil samples throughout the LTTD area (Montgomery Watson, 1996a). Analytical results report soil containing diesel in the area.	TPHg, TPHd, BTEX, PAHs, Pb	Included in Commissary/PX CAP.
637 Corrective Action Plan (CAP) Implementation	Adjacent to the Study Area, historical records show this was a main fuel storage area for the Motor Pool. Above ground storage tanks (ASTs) and USTs and piping were removed. Site was investigated and CAP implemented (EKI, 2000). Groundwater monitoring as part of Presidio	TPHg, TPHd, BTEX, and Pb	*Building 637 Area Completion Report* currently under regulatory review (EKI, 2004).

Table 2
Previous Investigation Results and Corrective Actions Summary
Commissary/PX Study Area
Presidio of San Francisco, California

Building Number and Investigation Site Designation	Investigation and Removal Action Description	Potential Contaminant of Concern Identified	Status
	Quarterly Groundwater Monitoring Program (Treadwell & Rollo, 2001).		
Crissy Field Remedial Action Plan (RAP) Implementation	Investigation and remedial action performed at former Fill Site 7, Crissy Field Rifle Institute and Skeet Ranges (on-shore area) and Building 900's Area (including Buildings 923/937, 924 Firing Range, 950, and 979) (Army and DTSC, 1998).	TPHg, TPHd, TPHfo, PAHs, VOCs, metals	Groundwater monitoring at Building 900s is ongoing. *Crissy Field Operable Unit 4 Implementation Report, Presidio of San Francisco* (EKI, 2004) under regulatory review.
UST 603 Removal	A 1,000-gallon diesel UST was removed in 1996 with an excavation 25 feet long by 21 feet wide by 5.5 feet deep. 5 soil samples and 1 groundwater sample were collected. TPHd (600 mg/kg) and TPHmo (96 mg/kg) Maximum concentrations were in soil and TPHd (6,800 µg/L) and TPHmo (220 µg/L) in groundwater (Montgomery Watson, 1998b).	TPHd, TPHfo, toluene, xylenes, PAHs	Included in Commissary/PX CAP.
626 Waste Oil Tank Removal	Waste oil tank identified and removed during Commissary construction.10 soil samples collected, (exact location unknown) report "total fuel hydrocarbons" range between 96 mg/kg and 5,900 mg/kg (Youngkin, 1996).1 soil sample analyzed for VOCs was non-detect for all analytes.	TPHd, benzene, toluene, xylenes, PAHs	Included in Commissary/PX CAP.
Underground Storage Tank (UST) No. FDS-1 Removal	A 1,000-gallon diesel UST removed in 1996 with an excavation 21 feet long by 19 feet wide by 5.5 feet deep. 6 soil and 1 groundwater sample collected, Maximum concentrations were TPHd (1,900 mg/kg) and TPHmo (1,900 mg/kg) in soil and TPHd (99 µg/L) and TPHmo (1,100 µg/L) in groundwater (Montgomery Watson, 1998b).	TPHd, TPHfo, toluene, xylenes, PAHs	Included in Commissary/PX CAP.

Table 2
Previous Investigation Results and Corrective Actions Summary
Commissary/PX Study Area
Presidio of San Francisco, California

Building Number and Investigation Site Designation	Investigation and Removal Action Description	Potential Contaminant of Concern Identified	Status
FDS Pipeline BR6-5 Removal	Section of FDS pipeline removed and over-excavated. 28 soil samples collected from the limits of the excavation and analyzed for TPH and PAHs. Detected concentrations up to >1,925 mg/kg for TPH and 3.245 mg/kg for total carcinogenic PAHs (Montgomery Watson, 1999).	TPH, PAHs	Included in Commissary/PX CAP.
Contingency Site 171199-1100 and Commissary Seeps Interim Source Removal Action	Seep sampling performed in 1999 by the Trust detected TPHg, toluene, ethylbenzene, and xylenes at concentrations below cleanup levels for saltwater aquatic organisms. The Trust continued to monitor the seeps, and investigations were performed to identify the source area. Groundwater seeps to the new Crissy Field tidal marsh contained low concentrations of TPHg and TPHd. Source identified in vicinity of former Buildings 621 through 624 fueling area and 655. Interim Source Removal Action Plan implemented during summer of 2001 (Treadwell & Rollo, 2002a). Area excavated, sampled, and backfilled. All soil confirmation sample results at excavation limits were below proposed cleanup levels. *Draft Interim Source Removal Action Report* (Treadwell & Rollo, 2002a).	TPHg, TPHd, BTEX, and Pb	Included in Commissary/PX CAP to determine whether additional corrective action is required. Ongoing groundwater monitoring as part of Presidio Quarterly Groundwater Monitoring Program (Treadwell & Rollo, 2000).
FDS Pipelines CF-3, CF4, and CF-12 Removal	Three sections of FDS pipeline (CF-3, CF-4, and CF-12) were removed and over-excavated. At CF-3, 2 of 5 soil samples exceeded soil action level (SAL) for TPHfo (1,000 mg/kg) and one for TPHd at 3 feet bgs. At CF-4, 4 of 10 soil samples exceeded SAL for TPHg (640 and 1,500 mg/kg) and TPHd (870 mg/kg) at 2 feet bgs. At CF-12, 2 of 8 samples exceeded SAL for TPHg (2,700 mg/kg), TPHfo (1,500 mg/kg), benzene (12 mg/kg), Ethylbenzene (12 mg/kg), and toluene (44 mg/kg) at 2.5 feet bgs (IT, 1999).	CF-3 - TPHfo CF-4 - TPHg, TPHd CF-12 - TPHg, TPHfo, benzene, toluene	–CF 4 and CF-12 are included in Commissary /PX CAP. CF-3 exceedances were remediated as part of the Building 637 Corrective Action.

Table 2
Previous Investigation Results and Corrective Actions Summary
Commissary/PX Study Area
Presidio of San Francisco, California

Building Number and Investigation Site Designation	Investigation and Removal Action Description	Potential Contaminant of Concern Identified	Status
Contingency Site 111098-1100	Fuel-impacted soil was discovered in 1998 during communication line excavation work. The western portion of this site was excavated as part of the Commissary Seeps Interim Source Removal Action. SI and Trust groundwater grab samples collected south and north of the site were non-detect for TPH.	TPH	No further action is necessary for the western portion of the site where source removal completed under Commissary Seeps Interim Source Removal Action. The eastern portion is included in the Commissary/PX CAP.

Notes

BTEX - benzene, toluene, ethlyene, and xylenes
FDS - Fuel Distribution System
mg/kg - milligrams per kilogram
Pb - lead
PAHs - polycyclic aromatic hydrocarbons
TPHd - total petroleum hydrocarbons as diesel
TPHfo - total petroleum hydrocarbons as fuel oil (using a motor oil standard with carbon range C_{24}-C_{36})
TPHg - total petroleum hydrocarbons as gasoline.
TPHmo - total petroleum hydrocarbons as motor oil
VOCs - volatile organic compounds
µg/g - micrograms per gram
µg/L - micrograms per liter

Army and DTSC, 1998. *Final Remedial Action Plan, Crissy Field Area, Presidio of San Francisco*. April.
Dames & Moore, 1997. *Final Remedial Investigation Report, Presidio Main Installation, Presidio of San Francisco.* January.
EKI, 2000. *Excavation Report for the Building 637 Area, Presidio of San Francisco, California.* June.
EKI, 2002. *Development of Presidio-Wide Cleanup Levels for Soil, Sediment, Groundwater, and Surface Water.* October.
EKI, 2004. *Building 637 Area Completion Report, Presidio of San Francisco, California.* March.
IT, 1999. *Fuel Distribution System Closure Report, Presidio of San Francisco, California, Volumes 1 through 3*. May.

Table 2
Previous Investigation Results and Corrective Actions Summary
Commissary/PX Study Area
Presidio of San Francisco, California

Notes (Continued)

MACTEC, 2004. *Remedial Action Plan, Baker Beach Disturbed Areas 1, 1A, 2, and 2A and Twenty-Seven Other Sites, Presidio of San Francisco, California.* Includes updates through April 2005.

Montgomery Watson, 1996a. *Low Temperature Thermal Desorption (LTTD), Pretreatment Baseline Soil Sampling at Motor Pool Area Letter Report, Presidio of San Francisco, California.* 1 May.

Montgomery Watson, 1998b. *Tank Removal Documentation Reports, (UST No. FDS-1, UST Number 603), Presidio of San Francisco, California.* July.

Montgomery Watson, 1999a. *Additional Investigation of Fuel Distribution Systems, Presidio of San Francisco, California.* August.

Treadwell & Rollo, 2001. *Draft Quarterly Groundwater Monitoring Report Second Quarter 2001, Quarterly Groundwater Monitoring Program, Presidio of San Francisco*. November.

Treadwell & Rollo, 2002a. *Draft Commissary Seeps Interim Source Removal Action Report, Presidio of San Francisco*. January.

Youngkin, 1996a. Youngkin, Mark, Letter to Mr. Dave Wilkins re: Comments on Draft Final Remedial Investigation (RI) Report, Building 609, Commissary Investigation, Presidio of San Francisco. 17 June.

Youngkin, 1996b. Youngkin, Mark, Letter to Mr. Dave Wilkins re: *Submittal of Historical Environmental Document Survey.* 24 June.

FDS Pipeline CF-3 Removal - Section of FDS Pipeline removed and over-excavated.

Table 3
Summary of Soil Cleanup Levels
Commissary/PX Study Area
Presidio of San Francisco, California

Constituent	**Applicable Cleanup Levels**					**Effective Cleanup Levels [4]**				**Reporting/Detection Limits**	
	Human Health Recreational Cleanup Level (mg/kg)	**Human Health Residential Cleanup Level (mg/kg)**	**Ecological Buffer Zone (Terrestrial) Cleanup Level (mg/kg)**	**Saltwater Ecological Protection Zone Cleanup Level (mg/kg)**	**Groundwater Protection at Crissy Field Cleanup Level (<5 feet above groundwater) (mg/kg)**	**Unrestricted land use with protection of Crissy Field Marsh water quality (mg/kg)**	**Unrestricted land use without protection of Crissy Field Marsh water quality (mg/kg)**	**Restricted land use with protection of Crissy Field Marsh water quality (mg/kg)**	**Restricted land use without protection of Crissy Field Marsh water quality (mg/kg)**	**QAPP Analytical Reporting Limits (mg/kg)**	**Laboratory Detection Limit (mg/kg)**
Petroleum Hydrocarbons and Gasoline-related VOCs [1]											
TPH as gasoline (C_7-C_{12})	2,400	1,030	610	11.6	1,690	11.6	610	11.6	610	1.0	0.001
TPH as diesel (C_{12}-C_{24})	3,200	1,380	700	144	1,950	144	700	144	700	10	0.001
TPH as fuel oil (C_{24}-C_{36}) [5]	4,500	1,900	980	144	2,730	144	980	144	980	10	0.005
Benzene	1.5	0.6	40	50	1	0.6	0.6	1	1	0.005	0.005
Toluene	1,200	840	270	260	14	14	14	14	14	0.005	0.005
Ethylbenzene	1,900	530	125	5	19	5	19	19	19	0.010	0.005
Total Xylenes	2,500	1,080	55	22	4,340	22	55	22	55	0.005	0.005
MTBE	--	--	--	190	--	190	--	190	--	--	0.020
Metals [2]											
Arsenic	0.88	0.36	64	--	--	5.9 [6]	5.9 [6]	5.9 [6]	5.9 [6]	0.2	0.25
Cadmium	4.2	1.7	0.23	--	--	1.7 [6]	1.7 [6]	1.7 [6]	1.7 [6]	0.1	0.25
Chromium	2,800	1,200	23	--	--	120 [6]	120 [6]	120 [6]	120 [6]	0.2	0.5
Copper	--	--	120	--	--	120	120	120	120	0.2	0.5
Lead	500	400	300	--	--	300	300	300	300	0.1	0.15
Nickel	3,500	1,400	71	--	--	71	71	71	71	0.2	1
Zinc	52,000	22,000	50	--	--	66 [6]	66 [6]	66 [6]	66 [6]	0.2	1
PAHs [3]											
Anthracene	13,800	5,900	40	--	1,120	40	40	40	40	0.33	0.005
Benzo(a)anthracene	0.65	0.27	40	--	23	0.27	0.27	0.65	0.65	0.33	0.005
Benzo(a)pyrene	0.065	0.027	0.3	--	9	0.027	0.027	0.065	0.065	0.33	0.005
Benzo(b)fluoranthene	0.65	0.27	40	--	64	0.27	0.27	0.65	0.65	0.33	0.005
Benzo(g.h.i)perylene	1,400	620	40	--	19,500	40	40	40	40	0.33	0.005
Benzo(k)fluoranthene	0.65	0.27	40	--	64	0.27	0.27	0.65	0.65	0.33	0.005
Chrysene	6.5	2.7	40	--	151	2.7	2.7	6.5	6.5	0.33	0.005
Dibenz (ah) anthracene	0.19	0.78	40	--	--	0.19	0.19	0.19	0.19	0.33	0.005
Fluoranthene	1,900	820	40	--	1,160	40	40	40	40	0.33	0.005
Fluorene	1,800	770	40	--	220	40	40	40	40	0.33	0.005
Indeno(1,2,3-cd)pyrene	0.65	0.27	40	--	--	0.27	0.27	0.65	0.65	0.33	0.005
Naphthalene	1,100	480	40	--	140	40	40	40	40	0.33	0.005
Phenanthrene	1,400	600	40	--	410	40	40	40	40	0.33	0.005
Pyrene	1,400	620	40	--	910	40	40	40	40	0.33	0.005
Soil RUs Selected for Each Effective Cleanup Level Category [4]						(1) TPHg Source Area (Area A only)	(1) FDS Pipeline Residuals Area 1, (2) FDS Pipeline Residuals Area 3	(1) FDS Pipeline Residuals Area 2, (2) Building 626 Area (Accessible Locations), (3) TPHg Source Area (Area B only)	Phase 2 Area RUs		

Notes

[1] Applicable cleanup levels for TPH, BTEX, and MTBE compiled from Tables 1, 2, 5, and 6 in Order No. R2-2003-0080 Site Cleanup Requirements, Presidio of San Francisco (RWQCB, 2003).

[2] Applicable cleanup levels for metals compiled from Table 7-2 of the Cleanup Levels Document (EKI, 2002).

[3] Applicable cleanup levels for PAHs compiled from Tables 1, 2, and 5 in Order No. R2-2003-0080 Site Cleanup Requirements, Presidio of San Francisco (RWQCB, 2003) for petroleum-related PAHs and Table 7-2 from the Cleanup Levels Document (EKI,2002) for non-petroleum related PAHs. Because PAHs at the Study Area could be derived for petroleum or non-petroleum related sources (e.g., fill material), the lowest applicable cleanup levels from these two sources are selected as the applicable cleanup levels for PAHs.

[4] Target effective cleanup levels used for corrective action (shaded):

- Unrestricted land use with protection of Crissy Field Marsh water quality: Lowest of (1) Human health (Residential); (2) Ecological (Buffer Zone/Saltwater Ecological Protection Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater).
  These cleanup levels will be used for soil RUs within Area A and the 150-foot marsh buffer zone (includes the Area A portion of the TPHg Source Area).
- Unrestricted land use without protection of Crissy Field Marsh water quality: Lowest of (1) Human health (Residential); (2) Ecological (Buffer Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater).
  These cleanup levels will be used for soil RUs within Area A and outside of the 150-foot marsh buffer zone (includes FDS Pipeline Residuals Areas 1 and 3).
- Restricted land use with protection of Crissy Field Marsh water quality: Lowest of (1) Human health (Recreational); (2) Ecological (Buffer Zone/Saltwater Ecological Protection Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater).
  These cleanup levels will be used for soil RUs within Area B and within the 150-foot marsh buffer zone (includes FDS Pipeline Residuals Area 2, Accessible Locations of the Building 626 Area, and the Area B portion of the TPHg Source Area).
- Restricted land use without protection of Crissy Field Marsh water quality: Lowest of (1) Human health (Recreational); (2) Ecological (Buffer Zone); and (3) Groundwater Protection at Crissy Field (<5 feet above groundwater).
  These cleanup levels may be used for the Phase 2 Area RUs, assuming the Crissy Field Marsh is not expanded into the area. This determination will be made in consultation with the RWQCB.

[5] TPH as fuel oil uses a motor oil standard for carbon range C24-C36.

[6] In the case of metals, if the background concentration for Beach/Dune Sand is greater than the most stringent cleanup level, then the background concentration applies as the cleanup level. Source: Table 7-2 (non-petroleum compounds) in the Cleanup Levels Document (EKI, 2002).

mg/kg - milligrams per kilogram
MTBE - Methyl tert-butyl ether
PAHs - Polycyclic aromatic hydrocarbons
Shading indicates target effective cleanup levels used for corrective action.
TPH - Total petroleum hydrocarbons
-- - No cleanup level available
RU - Remedial unit

Table 4
Groundwater Cleanup Levels
Commissary/PX Study Area
Presidio of San Francisco, California

Constituent	Saltwater Cleanup Level (µg/L)[1]	Drinking Water Cleanup Level (µg/L)[2]	Effective Groundwater Cleanup Level (µg/L)[3]	QAPP Analytical Reporting Limits (µg/L)	Laboratory Detection Limit (µg/L)
Petroleum Hydrocarbons and Gasoline-related VOCs					
TPH as gasoline (C_7-C_{12})[4]	1,200	770	770	50	50
TPH as diesel (C_{12}-C_{24})[4]	2,200	880	880	50	50
TPH as fuel oil (C_{24}-C_{36})[4,5]	2,200	1,200	1,200	300	300
Benzene	510	1	1	0.01	0.5
Toluene	1,000	150	150	0.05	0.5
Ethylbenzene	43	700	43	0.5	0.5
Xylene	130	1,750	130	0.5	0.5
MTBE	4,400	13	13	--	0.5
Metals					
Arsenic	36	10	10	2	1
Cadmium	9.3	5	5	1	1
Chromium	50	50	50	2	1
Copper	3.1	1,000	3.1	2	1
Lead	8.1	15	8.1	1	1
Nickel	8.2	100	8.2	2	1
Zinc	81	5,000	81	2	10
PAHs					
Anthracene	--	770	770	10	0.5
Benzo(a)anthracene	--	0.1	0.1	10	0.1
Benzo(a)pyrene	--	0.2	0.2	10	0.1
Benzo(b)fluoranthene	--	0.2	0.2	10	0.2
Benzo(g,h,i)perylene	--	150	150	10	0.2
Benzo(k)fluoranthene	--	2	2	10	0.1
Chrysene	--	20	20	10	0.1
Dibenz (a,h) anthracene	--	--	--	10	0.2
Fluoranthene	--	300	300	10	0.4
Fluorene	--	300	300	10	1
Indeno(1,2,3-cd)pyrene	--	--	--	10	0.14
Naphthalene	--	300	300	10	5
Phenanthrene	--	230	230	10	0.5
Pyrene	--	230	230	10	0.2

Notes

[1] Cleanup levels for saltwater protection compiled from Table 6 in Order No. R2-2003-0080 Site Cleanup Requirements, Presidio of San Francisco (RWQCB, 2003) for TPH, BTEX, and MTBE; and compiled from Table 7-6 of the Cleanup Levels Document (EKI, 2002), in addition to Basin Plan (RWQCB, 2004) updates, for metals.

[2] Cleanup level listed is a promulgated or proposed federal Maximum Contaminant Level (MCL), or promulgated or proposed MCL or action level specific to the State of California. MCLs obtained from U.S. EPA Region IX, Drinking Water Standards and Health Advisories Tables, dated February 2000. Drinking water cleanup levels apply to groundwater and surface water at the Presidio.

[3] "Effective" cleanup levels for groundwater and Crissy Field Tidal Marsh seeps are based on the most stringent of the values for maintaining water quality criteria for saltwater and drinking water. Source: Table 7-6 in the Cleanup Levels Document (EKI, 2002).

[4] Cleanup Levels from *Fuel Product Action Level Development Report, Presidio of San Francisco, California* (FPALDR) (Montgomery Watson, 1995c) and represent Practical Quantitation Limits.

[5] TPH as fuel oil uses a motor oil standard for carbon range C_{24}-C_{36}.

Shading indicates target effective cleanup levels used for corrective action.
MTBE - Methyl tert-butyl ether
PAHs - Polycyclic aromatic hydrocarbons
TPH - Total petroleum hydrocarbons
µg/L - micrograms per liter
-- - No cleanup level available.

Table 5A
Summary of Soil Remedial Units (Scenario I - Lesser Impact Scenario)
Commissary/PX Study Area
Presidio of San Francisco, California

Soil Remedial Units	Estimated Total Volume for Accessible Locations (cubic yards)		Estimated Total Volume for Less Accessible Locations (cubic yards)		COCs[1]		Depth		Soil Access		Surface Cover	
	Phase 1 Area	Phase 2 Area	Phase 1 Area	Phase 2 Area	TPH	PAHs	0 to 3 feet	3 to 10 feet	Accessible	Less Accessible[2]	Slab / Paved	Grass
Site 15 Area	--	1,818	--	--	g,d,fo	X	d, fo, PAHs	g, d, fo, PAHs	X		X	
FDS Pipeline Area	--	1,449	--	--	d, fo	X	d, fo, PAHs	fo, PAHs	X		X	
Pipeline A Area 1	--	403	--	--	g, fo	X	g, fo, PAHs	fo	X			X
Pipeline A Area 2	--	308	--	--	fo	X	fo, PAHs	PAHs	X			X
Building 613 Area	--	1,726	--	--	g, d, fo	X	fo, PAHs	g, d, fo, PAHs	X		X	X
TPHg Source Area	3,583	--	--	--	g, fo	X	fo, PAHs	g, fo, PAHs	X		X	
Building 619 Area	--	--	--	583	fo			fo		X[3]	X	
Building 628 Area 1	--	295	--	113	g, d, fo		g, d, fo	fo	X	X[3]	X	X
Building 628 Area 2	--	175	--	--	d, fo	X	d, fo, PAHs	fo	X		X	
Building 626 Area	164	171	--	514	g, d, fo	X	g, d, fo, PAHs	d, fo, PAHs	X	X[3]	X	X
FDS Pipeline Residuals Area 1	87	--	--	--	g, fo, benzene		g, fo, benzene		X			X
FDS Pipeline Residuals Area 2	50	--	--	--	fo		fo		X		X	
FDS Pipeline Residuals Area 3/AST 634 Area	172	--	--	--	g, d		g, d		X			X
TOTAL	**4,056**	**6,345**	**0**	**1,210**								

Notes
[1] Only petroleum-related COCs are listed. Metals are also COCs for fill material at the site.
[2] Soil in Less Accessible Locations lie under existing building slab.
[3] Underlies Building 610, the Former Commissary, currently occupied by retail facility.
AST - above ground storage tank
COCs - Contaminants of Concern
d - TPH as diesel fuel
FDS - Fuel Distribution System
fo - TPH as fuel oil
g - TPH as gasoline
PAHs - Polycyclic aromatic hydrocarbons
TPH - Total petroleum hydrocarbons (as gasoline, as diesel fuel, and as fuel oil)

Table 5B
Summary of Soil Remedial Units (Scenario II - Greater Impact Scenario)
Commissary/PX Study Area
Presidio of San Francisco, California

Soil Remedial Units	Estimated Total Volume for Accessible Locations		Estimated Total Volume for Less Accessible Locations		COCs[1]		Depth		Soil Access		Surface Cover	
					TPH	PAHs	0 to 3 feet	3 to 10 feet	Accessible	Less Accessible[2]	Slab / Paved	Grass
	Phase 1 Area	Phase 2 Area	Phase 1 Area	Phase 2 Area								
Central RU (Site 15, Bldg 613, TPHg Source, FDS Pipeline)	3,840	14,462	--	374	g,d,fo	X	d, fo, PAHs	g, d, fo, PAHs	X	X	X	X
Pipeline A Area 1	--	2,256	--	--	g, fo	X	g, fo, PAHs	fo	X		X	X
Pipeline A Area 2	--	147	--	53	fo	X	fo, PAHs	PAHs	X	X[3]	X	X
Building 619 Area	--	--	--	9,398	fo			fo		X[3]	X	
Building 628 Area 1	--	--	--	306	g, d, fo		g, d, fo	fo	X	X[3]	X	X
Building 628 Area 2	--	637	--	--	d, fo	X	d, fo, PAHs	fo	X		X	
Building 626 Area	--	1,331	--	498	g, d, fo	X	g, d, fo, PAHs	d, fo, PAHs	X	X[3]	X	X
FDS Pipeline Residuals Area 1	87	--	--	--	g, d, fo, benzene		g, d, fo, benzene		X			X
FDS Pipeline Residuals Area 2	50	--	--	--	fo		fo		X		X	
FDS Pipeline Residuals Area 3/AST 634 Area	172	--	--	--	g, d, fo		g, d, fo		X			X
TOTAL	**4,149**	**18,833**	**0**	**10,629**								

Notes
[1] Only petroleum-related COCs are listed. Metals are also COCs for fill material at the site.
[2] Soil in "Less Accessible" Locations lie under existing building slab.
[3] Underlies Building 610, the Former Commissary, currently occupied by retail facility.
AST - above ground storage tank
COCs - Contaminants of Concern
d - TPH as diesel fuel
FDS - Fuel Distribution System
fo - TPH as fuel oil
g - TPH as gasoline
PAHs - Polycyclic aromatic hydrocarbons
TPH - Total petroleum hydrocarbons (as gasoline, as diesel fuel, and as fuel oil)

Table 6
Screening of *In Situ* Soil Technologies
Commissary/PX Study Area
Presidio of San Francisco, California

Technology	Description	Effectiveness @ Commissary/PX[1]	Screening
Bioremediation			
Biosparging[2]	▪ Utilizes indigenous microorganisms to biodegrade organic constituents in the saturated zone. ▪ Used to reduce concentrations of petroleum constituents that are dissolved in groundwater, adsorbed to soil below the water table, and within the capillary fringe.	▪ Primarily addresses groundwater and saturated soil contamination; "excess" air rises into the unsaturated zone soil for additional remediation. ▪ Method is appropriate to remediate saturated zone soil contamination at Commissary/PX Study Area. Purpose is to target smear zone.	▪ Effective: Yes (Moderate – High). ▪ Implementable: Yes. ▪ Cost: Moderate to High. ▪ *Technology is* ***retained*** *for further evaluation in alternatives.*
Bioventing[2]	▪ Utilizes indigenous microorganisms to biodegrade organic constituents absorbed to soils in the unsaturated zone. Air injection wells are installed by standard well-drilling methods (vertical, angled, or horizontal). ▪ The increased supply of oxygen (as air) serves to accelerate the rate of naturally occurring aerobic contaminant biodegradation.	▪ Method is appropriate to remediate soil contamination at Commissary/PX Study Area. ▪ Low-profile, low-tech equipment. ▪ Pavement/building "cap" assists in lateral spreading of injected air. ▪ Effective at degrading TPH and PAHs; will continue to degrade even low concentrations of COCs. ▪ Implementable with minimal disturbance to building occupants. ▪ Does not require handling of chemicals. ▪ Can be monitored (soil gas sampling) during system operation, prior to confirmation (soil) sampling.	▪ Effective: Yes (High)[3]. ▪ Implementable: Yes; may have some challenges with horizontal drilling beneath building, due to closely spaced foundation piles. ▪ Cost: Moderate to High. ▪ *Technology is* ***retained*** *for further evaluation in alternatives.*

[1] Site-specific considerations include: widely-varying soil permeabilities (1.71×10^{-2} to 3.6×10^{-7} cm/s); relatively low contaminant concentrations; relatively high carbon content (up to 50,000 mg/kg TOC); accessibility; asphalt pavement or building "cap" across most of the site; building occupancy and use; nature of contaminants (PAHs and heavy TPH); absence of detected impacts to groundwater; and shallow groundwater table.
[2] EPA, 2004. Website: *CLU-IN – Bioventing/Biosparging*: http://www.clu-in.org/techfocus; Accessed 7/23/04.
[3] If a technology has the potential to be effective at the Commissary/PX Site, it's anticipated degree of effectiveness (Moderate vs. High) is a function of the technology's ability to reduce the COCs to the prescribed Cleanup Levels and the required precision needed to affect all the contamination present in an RU.

Table 6
Screening of *In Situ* Soil Technologies
Commissary/PX Study Area
Presidio of San Francisco, California

Technology	Description	Effectiveness @ Commissary/PX[1]	Screening
Enhanced Bioremediation[4] (ORC™)	▪ Uses oxygen-releasing product to time-release oxygen into the subsurface via soil borings. The increased supply of oxygen serves to accelerate the rate of naturally occurring aerobic contaminant biodegradation.	▪ Method is appropriate to remediate soil contamination at Commissary/PX Study Area. ▪ Uses standard drilling equipment. ▪ Effective at degrading TPH and PAHs; yields diminishing results with lower COC concentrations. ▪ Relies on chemical injection under pressure to obtain adequate distribution in the subsurface.	▪ Effective: Yes (Moderate). ▪ Implementable: Yes. ▪ Cost: Moderate to High. ▪ *Technology is* ***retained*** *for further evaluation in alternatives.*
Sparging & Extraction			
Air Sparging[5]	▪ Strategically placed air injection wells are positioned in the saturated and unsaturated zones and connected to a blower, which supplies compressed air to the subsurface zone of impact. ▪ Air bubbles from sparging well volatilize contaminants in the saturated zone. ▪ Vapor extraction system (SVE) removes sparged contaminants from the unsaturated zone.	▪ Method is not appropriate for Commissary/PX Study Area due to absence of lighter (more volatile) petroleum products. ▪ Primarily addresses contamination in the saturated zone; may contribute to unsaturated zone soil remediation.	▪ Effective: No. ▪ *Technology is* ***not retained*** *for further evaluation in alternatives.*

4 Regenesis, 2003. *Oxygen Release Compound Overview*. October 10.
5 EPA, 2004. Website: *CLU-IN – Air Sparging*: http://www.clu-in.org/techfocus; Accessed 7/23/04.

Table 6
Screening of *In Situ* Soil Technologies
Commissary/PX Study Area
Presidio of San Francisco, California

Technology	Description	Effectiveness @ Commissary/PX[1]	Screening
Ozone Sparging[6]	▪ A chemical oxidation system that is applied by injecting ozone gas into the saturated zone. Ozone serves as a chemical oxidant to degrade contaminants. Appropriate for contamination in both the saturated and unsaturated zones.	▪ Method is appropriate to remediate soil contamination at Commissary/PX Study Area. However, remedial system (i.e., equipment, piping, injection points) would remain in place for a period of time (months) until effectiveness is achieved, whereas other technologies require only a brief application period (days).	▪ Effective: Yes (Moderate). ▪ Implementable: Yes. ▪ Cost: High. ▪ *Technology is **retained** for further evaluation in alternatives.*
Soil Vapor Extraction[7] (SVE)	▪ Volatile constituents absorbed to soils in unsaturated zone are volatilized by applying a vacuum. Resulting vapors are extracted for treatment.	▪ Method is not appropriate for Commissary/PX Study Area due to absence of lighter (more volatile) petroleum products; method is not effective for heavier TPH fractions. ▪ Presence of shallow groundwater table could result in mounding and lateral spreading of contaminants.	▪ Effective: No. ▪ *Technology is **not retained** for further evaluation in alternatives.*
Chemical Oxidation			
Hydrogen Peroxide[8]	▪ A process using hydrogen peroxide and a chelated iron catalyst to produce hydroperoxide anion and super oxide hydrogen peroxide. Due to highly reactive nature of mixture peroxide and catalyst are injected in two separate phases.	▪ Method may be appropriate to remediate soil contamination at Commissary/PX Study Area. ▪ Requires specialized equipment. ▪ Effective at degrading TPH and PAHs; yields diminishing results with lower COC concentrations.	▪ Effective: Yes (Moderate). ▪ Implementable: Yes; may be problematic due to soil sterilization and if breakthrough and heave is excessive. ▪ Cost: High.

6 KVA, 2004. *Perozone™ Chemical Oxidation System*: http://www.kva-equipment.com; Accessed 7/23/04.
7 EPA, 2004. Website: *CLU-IN – Soil Vapor Extraction:* http://www.clu-in.org/techfocus; Accessed 7/23/04.
8 Brown, 2003. *In Situ Chemical Oxidation: Performance, Practice, and Pitfalls*; paper presented at Air Force Center for Environmental Excellence (AFCEE) Technology Transfer Workshop, 25 February.

Table 6
Screening of *In Situ* Soil Technologies
Commissary/PX Study Area
Presidio of San Francisco, California

Technology	Description	Effectiveness @ Commissary/PX[1]	Screening
	▪ Reacts with the carbon in the soil making biodegradation no longer possible. ▪ Due to the exothermic nature of the reaction, high concentrations of reagent can result in violent subsurface reactions, sometimes adversely affecting pavement and buildings. ▪ Specialized equipment is required for the application of this reagent to the subsurface (e.g., stainless steel components, high-pressure equipment).	▪ Relies on chemical injection under pressure to obtain adequate distribution in the subsurface. ▪ Near-instantaneous reaction; chemical does not persist in the environment for continued remediation. ▪ High-carbon (TOC) soils increase quantity of reagent required to affect remediation. ▪ Violent reaction may damage pavement, underground utilities, or building foundations.	▪ *Technology is **not retained** for further evaluation in alternatives.*
Sodium Persulfate[9]	▪ A process using sodium persulfate with an iron catalyst to produce sulfate radicals which are more stable than hydroxyl radicals. Persulfate and catalyst are mixed in a tank and injected into the subsurface in a single phase. ▪ Applied using conventional (e.g., direct-push) drilling technology.	▪ Method is appropriate to remediate soil contamination at Commissary/PX Study Area. ▪ Effective at degrading TPH and PAHs; yields diminishing results with lower COC concentrations. ▪ Relies on chemical injection under pressure for initial distribution in the subsurface. ▪ Relatively slower reaction; does not react with soil carbon; chemical persists in the environment for continued remediation. ▪ Slower reaction poses less risk to pavement, underground utilities, or building foundations.	▪ Effective: Yes (Moderate – High) ▪ Implementable: Yes. ▪ Cost: High. ▪ *Technology is **retained** for further evaluation in alternatives.*

Table 7A
Evaluation of Alternatives Summary
Accessible Locations
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative 1	Alternative 2	Alternative 4
No Action for Soil and Groundwater (Including Abandonment of Groundwater Monitoring Wells)	**Capping Soil with Land Use Controls and Groundwater Monitoring**	**Soil Excavation and Off-site Disposal, Capping and Land Use Controls, and Groundwater Monitoring**
Objective		
The objective of this alternative is to provide no additional control or protection to human health or the environment for contamination that exists in the soil at the Commissary/PX Study Area.	The objective of this alternative is to maintain existing asphalt and concrete cover over the site soil remedial units (RUs), place soil caps[1] over uncovered RUs to isolate the contaminated soil from human exposure, monitor groundwater for potential impacts due to soil contamination, and implement a Land Use Control (LUC) to safeguard the cap and restrict site and groundwater uses.	The objective of this alternative is to conduct the corrective action in two phases. Under Phase 1, the following would be conducted: (1) excavate and remove soil contamination within the Phase 1 Area; (2) implement an LUC for Area B portions of the Phase 1 and 2 Areas to maintain containment of contaminated soil beneath existing caps (e.g., pavement), prevent unrestricted site uses, and restrict use of groundwater as a drinking water supply; and (3) monitor groundwater. Under Phase 2, soil contamination within the Phase2 Area would be removed, consistent with future site uses. Soil contamination and waste materials removed from the site would be disposed off-site at a permitted recycling and/or disposal facility, as appropriate.
CAP CRITERIA		
1) Technical Effectiveness		
This alternative would not be able to address the area or volumes of impacted soil requiring remediation. There would be no impacts to human health and the environment during implementation. There are no long-term technical reliability issues.	This alternative is not considered effective for the Phase 1 Area, because contamination would be left in-place within an ecologically sensitive area which poses a threat to the Crissy Field Marsh. This alternative is considered effective for the Phase 2 Area if the caps are maintained, an LUC imposed, and groundwater monitoring conducted. Potential adverse impacts to human health and the environment during implementation could be readily mitigated using standard construction practices (e.g., dust control during excavation). The long-term	This alternative is able to address the entire area and volume of impacted soil requiring remediation. Potential adverse impacts to human health and the environment during implementation could be readily mitigated using standard construction practices (e.g., dust control during excavation). Excavation and off-site disposal has a proven history with respect to the types of chemicals at this site.

Table 7A
Evaluation of Alternatives Summary
Accessible Locations
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative 1	**Alternative 2**	**Alternative 4**
	reliability of capping within the Phase 2 Area is acceptable with respect to the types of chemicals at this site, provided the cap is properly constructed and maintained.	
2) Implementability This alternative is unlikely to obtain approvals from regulatory agencies. This technology does not require any treatment, storage, and disposal facilities (TSDFs). The equipment, materials, and skilled workers for the abandonment of monitoring wells are readily available.	This alternative is unlikely to obtain approvals from regulatory agencies for the Phase 1 Area. For the Phase 2 Area, this alternative may obtain approvals from regulatory agencies. Appropriate TSDFs for off-site disposal of excavated soil are available. The equipment, materials, and skilled workers for excavation and off-site disposal of impacted soil and capping of the site are readily available.	This alternative would likely obtain approvals from regulatory agencies. Appropriate TSDFs for off-site disposal of excavated soil are available. The equipment, materials, and skilled workers for excavation and off-site disposal of impacted soil are readily available.
3) Cost-Effectiveness This alternative, implemented for both Less Accessible and Accessible Locations of the soil RUs, is estimated to cost $65,000. Although relatively low-cost, this remedy provides very little protection to human health and the environment.	This alternative, implemented for both Less Accessible and Accessible Locations of the soil RUs, is estimated to cost $1,500,000 (including operation and maintenance [O&M] costs). This alternative is lower in cost but does not provide the same level of protection to human health and the environment as Alternative 4.	This alternative, implemented for only the Accessible Locations of the soil RUs, is estimated to cost $2,601,000 (including O&M costs). This alternative provides a greater level of protection to human health and the environment than Alternative 2.
SUMMARY OF EVALUATION CRITERIA		
Alternative is Not Recommended. COC concentrations in soil may be greater than applicable cleanup levels and may pose unacceptable risks to human health and the environment.	**Alternative is Not Recommended.** Alternative is unlikely to be protective of the environment nor acceptable to RWQCB and DTSC for the Phase 1 Area. This alternative is protective of human health and	**Alternative is Recommended as the Preferred Remedy for Accessible Locations of the Soil RUs.** This alternative would provide for the cleanup and long-term management of contaminated soil. It represents the best balance between cost, uncertainty concerning future land

Table 7A
Evaluation of Alternatives Summary
Accessible Locations
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative 1	Alternative 2	Alternative 4
	the environment for the Phase 2 Area and may be acceptable to RWQCB and DTSC; however, it does not provide the same level of protection to human health and the environment nor offers flexibility associated with future land uses as Alternative 4.	uses, and uncertainty related to the extent and volume of contamination in soil at the site. The alternative is protective of human health, safety, and the environment. The LUC will provide long-term protection for contamination remaining in-place above cleanup levels. The phased excavation will minimize disturbance of culturally sensitive artifacts potentially present in the subsurface. This alternative offers flexibility with respect to the future expansion of the Crissy Field Marsh and minimizes costs associated with soil excavation until a determination is made regarding future land use.

[1] A two-foot thick soil cap would be placed in the landscaped areas after a two-foot thick layer of soil has been excavated. The excavated soil would be disposed of off-site at a permitted disposal facility.

Table 7B
Evaluation of Alternatives Summary
Less Accessible Locations
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative 1	Alternative 2	Alternative 3	Alternative 4
No Action for Soil and Groundwater	**Capping Soil and Land Use Controls**[1]	**In Situ Soil Remediation and Land Use Controls:**[1] • **Oxygen Release Product Injection** • **Bioventing and Biosparging** • **Ozone Sparging** • **Sodium Persulfate Injection**	**Soil Excavation and Off-site Disposal with Capping and Land Use Controls**[1]
Objective The objective of this alternative is to provide no additional control or protection to human health or the environment for contamination that exists in the soil at the Commissary/PX Study Area.	The objective of this alternative would be to maintain existing cover (Building 610) over the site soil remedial units (RUs) to isolate the contaminated soil from human exposure and implement a land use control (LUC) to safeguard the cap and restrict site uses.	The objective of this alternative is to add oxygen to the soil to promote bioremediation or to add oxidizing chemicals to react with the contaminants. The bioremediation or oxidation would decrease petroleum-related contamination below cleanup levels. An LUC would be implemented to prohibit unrestricted use of the site and maintain soil cover for contaminants associated with fill material that may remain in-place underneath the building.	The objective of this alternative is to remove petroleum-related soil contamination and dispose of waste materials off-site at a permitted recycling and/or disposal facility, as appropriate. An LUC would be implemented to prohibit unrestricted use of the site and maintain soil cover for contaminants associated with fill material that may remain in-place underneath the building.
CAP CRITERIA			
1) Technical Effectiveness This alternative would not be able to address the area or volumes of impacted soil requiring remediation. There would be no impacts to human health and the environment during implementation. There are no long-term technical reliability issues.	This alternative is able to address the entire area and volume of impacted soil requiring remediation. There would be no impacts to human health and the environment during implementation. The long-term reliability of capping is acceptable with respect to the types of chemicals at this site, provided the cap is maintained.	This alternative is able to address the entire area and volume of impacted soil requiring remediation. In order to reach the stringent saltwater ecological cleanup levels, multiple applications or longer operating periods may be required. Potential adverse impacts to human health and the environment during implementation could be readily mitigated (e.g., wearing personal protective equipment [PPE]).	This alternative is able to address the entire area and volume of impacted soil requiring remediation. Potential adverse impacts to human health and the environment during implementation could be readily mitigated using standard construction practices (e.g., dust control during excavation). Excavation and off-site disposal has a proven history with respect to the types of chemicals at this

Table 7B
Evaluation of Alternatives Summary
Less Accessible Locations
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative 1	Alternative 2	Alternative 3	Alternative 4
		The long-term reliability of the *in situ* treatment technologies is adequate with respect to the petroleum contaminated soil at this site, as treatment is a permanent solution, provided all the petroleum-related contamination can be reached during treatment.	site. There are no long-term technical reliability issues.
2) Implementability This alternative is unlikely to obtain approvals from regulatory agencies. This technology does not require any treatment, storage, and disposal facilities (TSDFs). The equipment, materials, and skilled workers for the abandonment of monitoring wells are readily available.	This alternative would likely obtain approvals from regulatory agencies if the Crissy Field Marsh is not expanded into the area. The soil cap required by this alternative is provided by the Building 610 foundation. The LUC is readily implementable. This alternative does not require the use of TSDFs.	This alternative would likely obtain approvals from regulatory agencies. This alternative does not require the use of TSDFs. The equipment, materials, and skilled workers for implementation of *in situ* treatment technologies are readily available, although longer lead times may be required for some technologies. The LUC is readily implementable.	This alternative would likely obtain approvals from regulatory agencies. Appropriate TSDFs for off-site disposal of excavated soil are available. The equipment, materials, and skilled workers for excavation and off-site disposal of impacted soil are readily available. Implementation of this alternative would be extremely difficult with Building 610 in-place and demolition of Building 610 is not anticipated at this time. The LUC is readily implementable.
3) Cost-Effectiveness This alternative, implemented for both Less Accessible and Accessible Locations of the soil RUs, is estimated to cost $65,000. Although relatively low-cost, this remedy provides no additional protection to human health and the environment.	This alternative, implemented for both Less Accessible and Accessible Locations of the soil RUs, is estimated to cost $1,500,000 (including operation and maintenance [O&M] costs). The cost for this alternative for the Less Accessible Locations alone is considered to be negligible, as the building already provides an effective cap and the LUC would be implemented for all Area B portions of	The cost for this alternative for the Less Accessible Locations of the soil RUs is estimated to range between $262,000 and $505,000 (this estimate does not include O&M costs for the Area B LUC, as they are included in alternatives for Accessible Locations). This remedy provides a greater level of protection to human health and the environment than Alternative 2, but at a significantly higher cost relative to	Two cost estimates have been developed for this Alternative: 1. Soil Excavation with Building 610 In-Place: $648,000. 2. Soil Excavation with Demolition of Building 610: $168,000 These estimates do not include O&M costs for the Area B LUC, as they are included in alternatives for Accessible

Table 7B
Evaluation of Alternatives Summary
Less Accessible Locations
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative 1	Alternative 2	Alternative 3	Alternative 4
	the site (included under alternatives for Accessible Locations). This remedy is cost-effective for the Less Accessible Locations because it provides an adequate level of protection to human health and the environment at negligible cost compared to Alternatives 3 or 4. Because Building 610 is planned to remain for retail or recreational use for the foreseeable future, this alternative is appropriate for the Less Accessible Locations.	the small volume of contaminated soil.	Locations. This remedy would provide a greater level of protection to human health and the environment than Alternative 2 and provides a greater degree of certainty than Alternative 3. If Building 610 were to remain in-place, this remedy would be extremely difficult to implement and would have a significantly higher cost relative to the small volume of contaminated soil.
SUMMARY OF EVALUATION CRITERIA			
Alternative is Not Recommended. COC concentrations in soil are greater than applicable cleanup levels and may pose unacceptable risks to human health and environment.	**Alternative is Selected as the Preferred Remedy if the Crissy Field Marsh is Not Expanded into the Area.** This alternative is protective of human health and the environment, readily implementable, and cost-effective. The alternative would not be protective of the environment if the Crissy Field Marsh or associated buffer zone is expanded into the area of the building.	**Alternative is Selected as the Preferred Remedy if the Crissy Field Marsh is Expanded into the Area and Building 610 Remains In-Place.** This alternative is protective of human health and the environment. Although it is not as cost-effective as Alternative 2, it would be the only implementable alternative to cleanup petroleum-related soil underneath the building for protection of the Crissy Field Marsh.	**Alternative is Selected as the Preferred Remedy if the Crissy Field Marsh is Expanded into the Area and Building 610 Demolished.** This alternative is protective of human health and the environment. It is cost-effective and implementable only if Building 610 were demolished for expansion of the marsh.

[1] Groundwater monitoring is included in Alternatives 2 and 4 for the Accessible Locations. Alternative 3 does not include groundwater monitoring because it is only considered in combination with Alternatives 2 and 4 for the Accessible Locations.

Table 8A
Summary of Estimated Costs for Corrective Action Alternatives - Phases 1 and 2
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative		**Capital Cost[1]**		**Annual O&M Cost[1]**		**O&M Period (years)**		**Total Cost[2] (NPV[3])**	
Accessible RUs	**Less Accessible RUs**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**
1) No Action[4]		$65,000		$ --		--		**$65,000**	
2) Capping with Land Use Controls[5]		$675,000		$89,000 $23,000		5 * 30 ** ***		**$1,500,000**	
	3) In Situ Soil Remediation[6]								
	• Oxygen Release Product Injection		$262,000		$ --		--		**$262,000**
	• Bioventing and Biosparging		$505,000		$ --		--		**$505,000**
	• Ozone Sparging		$323,000		$ --		--		**$323,000**
	• Sodium Persulfate Injection		$354,000		$ --		--		**$354,000**
4) Excavation and Off-Site Disposal with Groundwater Monitoring[5]		$2,304,000		$90,000 $30,000 $7,000		1 * 2 * 30 **		**$2,580,000**	
	4) Excavation and Off-Site Disposal[6]								
	• With Building 610 in place		$648,000		$ --		--		**$648,000**
	• Without Building 610		$168,000		$ --		--		**$168,000**
Phase 1 Cost of Preferred Alternative for Accessible RUs (Alternative 4):								**$1,224,000**	
Phase 2 Cost Range for Accessible RUs (Alternative 4) and Less Accessible RUs (Alternative 2 [low] or 3 [high])[7]:								**$432,000 - $1,861,000**	
Combined Cost Range of Preferred Alternative for Accessible RUs - Phases 1 and 2 (Alternative 4) and Less Accessible RUs (Alternative 2 or 3)[8]:								**$1.7 - 3.1 million**	

Notes

[1] Detailed estimates for capital and annual O&M costs are presented in Tables 9A through 9I with Unit Costs, Areas, and Volumes detailed in Tables 9J through 9L.

[2] Total Cost is calculated using a 3.5 percent interest rate per OSWER guidance (EPA, 2000b) and Federal guidelines (EPA, 2000a).

[3] NPV = Net Present Value

[4] Alternative includes groundwater monitoring well abandonment.

[5] Alternative includes seeps and groundwater monitoring and land use controls for 30 years.

[6] Alternative includes land use controls for 30 years (costs included under Alternatives 2 and 4, Phase 1). Alternative does not include groundwater monitoring (monitoring is included under Alternatives 2 and 4, Phase 1).

[7] Phase 2 costs are dependent upon future land use decisions. For cost estimating purposes only, the Phase 2 costs range from cleanup of petroleum to protect human health recreational land use (i.e., Restricted land use without protection of Crissy Field Marsh water quality, Alternative 4 - Accessible RUs and Alternative 2 - Less Accessible RUs) to cleanup for Saltwater ecological protection (i.e., Unrestricted land use with protection of Crissy Field Marsh water quality, Alternative 4 - Accessible RUs and Alternative 3 - Less Accessible RUs).

[8] Alternative includes seep and groundwater monitoring until Phase 2 corrective action; includes Area B land use controls for 30 years to restrict soil disturbance due to PAHs and metals associated with Fill Material, restrict marsh or similar habitat restoration, and restrict potable use of groundwater.

* Groundwater monitoring costs

** Land use control costs

*** Includes cost for maintenance of caps.

Table 8B
Summary of Estimated Costs for Corrective Action Alternatives - Phase 1
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative		**Capital Cost[1]**		**Annual O&M Cost[1]**		**O&M Period (years)**		**Total Cost[2] (NPV[3])**	
Accessible RUs	**Less Accessible RUs**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**
1) No Action[4]		$65,000		$ --		--		**$65,000**	
2) Capping with Land Use Controls[5]		$334,000		$89,000 $16,000		5 * 30 ** ***		**$1,030,000**	
	3) In Situ Soil Remediation[6] • Oxygen Release Product Injection • Bioventing and Biosparging • Ozone Sparging • Sodium Persulfate Injection								**NA** **NA** **NA** **NA**
4) Excavation and Off-Site Disposal with Groundwater Monitoring[5]		$948,000		$90,000 $30,000 $7,000		1 * 2 * 30 **		**$1,224,000**	
	4) Excavation and Off-Site Disposal[6] • With Building 610 in place • Without Building 610								**NA** **NA**
Cost of Preferred Alternative for Accessible RUs - Phase 1 (Alternative 4)[5]:								**$1,224,000**	

Notes

[1] Detailed estimates for capital and annual O&M costs are presented in Tables 9A through 9I with Unit Costs, Areas, and Volumes detailed in Tables 9J through 9L.
[2] Total Cost is calculated using a 3.5 percent interest rate per OSWER guidance (EPA, 2000b) and Federal guidelines (EPA, 2000a).
[3] NPV = Net Present Value
[4] Alternative includes groundwater monitoring well abandonment.
[5] Alternative includes seep and groundwater monitoring and land use controls for 30 years.
[6] Alternative does not apply to Phase 1 Area.
* Groundwater monitoring costs
** Land use control costs
*** Includes cost for maintenance of caps for Phase 1 area.
NA - Not applicable

Table 8C
Summary of Estimated Costs for Corrective Action Alternatives - Phase 2
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative		Capital Cost[1]		Annual O&M Cost[1]		O&M Period (years)		Total Cost[2] (NPV[3])	
Accessible RUs	**Less Accessible RUs**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**
1) No Action[4]				$ --		--		**$0**	
2) Capping with Land Use Controls[5]		$341,000		$0 $7,000		30 ** ***		**$470,000**	
	3) In Situ Soil Remediation[6]								
	• Oxygen Release Product Injection		$262,000		$ --		--		**$262,000**
	• Bioventing and Biosparging		$505,000		$ --		--		**$505,000**
	• Ozone Sparging		$323,000		$ --		--		**$323,000**
	• Sodium Persulfate Injection		$354,000		$ --		--		**$354,000**
4) Excavation and Off-Site Disposal[5]		$1,356,000		$0 $0 $0				**$1,356,000**	
	4) Excavation and Off-Site Disposal[6]								
	• With Building 610 in place		$648,000		$ --		--		**$648,000**
	• Without Building 610		$168,000		$ --		--		**$168,000**
Cost Range of Preferred Alternative for Accessible RUs - Phase 2 (Alternative 4) and Less Accessible RUs (Alternative 2 [low] or 3 [high])[6,7,8]:								**$432,000 - $1,861,000**	

Notes

1 Detailed estimates for capital and annual O&M costs are presented in Tables 9A through 9I with Unit Costs, Areas, and Volumes detailed in Tables 9J through 9L.

2 Total Cost is calculated using a 3.5 percent interest rate per OSWER guidance (EPA, 2000b) and Federal guidelines (EPA, 2000a).

3 NPV = Net Present Value

4 Alternative includes groundwater monitoring well abandonment (costs included under the No Action alternative for Phase 1).

5 Alternative includes land use controls for 30 years (Phase 2) to restrict soil disturbance due to PAHs and metals associated with Fill Material and to restrict marsh or similar habitat restoration.

6 Alternative includes land use controls for 30 years (costs included under Alternatives 2 and 4, Phase 1). Alternative does not include groundwater monitoring (monitoring is included under Alternatives 2 and 4, Phase 1).

7 Phase 2 costs are dependent upon future land use decisions. For cost estimating purposes only, the Phase 2 costs range from cleanup of petroleum to protect human health recreational land use (i.e., Restricted land use without protection of Crissy Field Marsh water quality, Alternative 4 - Accessible RUs and Alternative 2 - Less Accessible RUs) to cleanup for Saltwater ecological protection (i.e., Unrestricted land use with protection of Crissy Field Marsh water quality, Alternative 4 - Accessible RUs and Alternative 3 - Less Accessible RUs).

8 The detail for the lower cost estimate for cleanup of petroleum to human health recreational land use is included in Appendix D.

** Land use control costs

*** Includes cost for maintenance of caps for Phase 2 area.

Table 9A
All Locations - Alternative 1:
Estimated Costs Associated with No Further Action
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Abandon Existing Groundwater Monitoring Wells					
Abandon 2-inch PVC monitoring wells	ea	12	$ 3,300	$ 39,600	
Dispose of well abandonment residuals	ea	12	$ 200	$ 2,400	
					$ 42,000
Design and Construction Management Services					
Engineering/Project Management/Office Support	ls	1	$ 1,000	$ 1,000	
Construction Observation and Coordination	day	3	$ 1,000	$ 3,000	
Prepare well abandonment letter report	ls	1	$ 5,000	$ 5,000	
					$ 9,000
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 51,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 3,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 54,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 11,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 65,000**

Notes
1. Totals may not sum exactly because of rounding.
2. Derivation of unit rates is presented in Table 9J.

Table 9B
Accessible Locations - Alternative 2:
Estimated Costs for Capping Soil with LUCs and Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 1					
			Estimated Costs		
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Erect and maintain perimeter temporary fence	ft	1,000	$ 1.09	$ 1,090	
Remove 5' to 6' trees and save for replanting	ea	10	$ 48	$ 480	
Pre-excavation, post-excavation and confirmation sample survey	acre	4.0	$ 1,500	$ 6,000	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
					$ 31,070
Construct Cap					
Mobilize contractor equipment and supplies to site	ls	1	$ 5,000	$ 5,000	
Repair/Upgrade Permeable Cover (Asphalt Area)					
Asphalt Sealing	sy	1,075	$ 1.25	$ 1,343	
Excavate Impacted Soil (12 inches); small equipment	cy	75	$ 8.75	$ 656	
Collect soil profile samples for disposal	ea	2	$ 26	$ 52	
Disposal Characterization					
Six metals (EPA Method 6010B)	ea	2	$ 100	$ 200	
Total Extractable Petroleum Hydrocarbons (EPA 8015M)	ea	2	$ 105	$ 210	
Dispose of non-hazardous soil at Class II facility	ton	120	$ 35	$ 4,196	
Compact soil subgrade; small equipment	sf	2,023	$ 0.25	$ 506	
Furnish and install geosynthetic clay liner (GCL) [see Note 5]	sf	2,023	$ 0.75	$ 1,517	
Import and Place Clean Topsoil (12 inches)	cy	75	$ 30	$ 2,248	
Restore Parking Curbs	ft	222	$ 26	$ 5,772	
Restore landscaping compatible with GCL liner [see Note 5]	ls	0.40	$ 10,000	$ 4,000	
Vegetate Imported Cover (grass)	acre	0.05	$ 30,000	$ 1,500	
					$ 27,199
Land Use Controls					
Prepare Presidio LUC Master Reference Report	ls	1	$ 5,000	$ 5,000	
Prepare Site-Specific Addendum to LUCMRR (Area B)	ls	1	$ 10,000	$ 10,000	
Implement Land Use Controls for Area A RUs	ls	1	$ 5,000	$ 5,000	
Add Site-Specific Land Use Controls to Trust GIS System	ls	1	$ 500	$ 500	
					$ 20,500
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	1.0	$ 5,000	$ 5,000	
Provide office support	wk	1.0	$ 2,000	$ 2,000	
Provide vehicles and equipment	wk	1.0	$ 1,300	$ 1,300	
Perform air monitoring	wk	1.0	$ 1,000	$ 1,000	
Prepare Remediation Completion Report	ls	1.0	$ 50,000	$ 50,000	
					$ 165,800
Abandon Existing Groundwater Monitoring Wells (deferred)					
Abandon 2-inch PVC monitoring wells	ea	12	$ 500	$ 6,000	
Dispose of well abandonment residuals	ea	12	$ 200	$ 2,400	
Subtotal				$ 8,400	
Discount subtotal at 3.5% annually for 10 years				$ (2,518)	
					$ 5,882
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 14,922

Table 9B
Accessible Locations - Alternative 2:
Estimated Costs for Capping Soil with LUCs and Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Subtotal Estimated Costs (w/ contractor overhead and profit):	$	265,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):	$	13,000
Subtotal Estimated Costs (w/ legal and administrative costs):	$	278,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):	$	56,000
Total Preliminary Estimated Capital Costs of Remedial Alternative - Phase 1:	**$**	**334,000**

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Erect and maintain perimeter temporary fence	ft	1,000	$ 1.09	$ 1,090	
Remove 5' to 6' trees and save for replanting	ea	10	$ 48	$ 480	
Pre-excavation, post-excavation and confirmation sample survey	acre	6.3	$ 1,500	$ 9,450	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
					$ 34,520
Construct Cap					
Mobilize contractor equipment and supplies to site	ls	1	$ 5,000	$ 5,000	
Repair/Upgrade Permeable Cover (Asphalt Area)					
Asphalt Sealing	sy	2,255	$ 1.25	$ 2,819	
Excavate Impacted Soil (12 inches); small equipment	cy	189	$ 8.75	$ 1,654	
Collect soil profile samples for disposal	ea	2	$ 26	$ 52	
Disposal Characterization					
Six metals (EPA Method 6010B)	ea	2	$ 100	$ 200	
Total Extractable Petroleum Hydrocarbons (EPA 8015M)	ea	2	$ 105	$ 210	
Dispose of non-hazardous soil at Class II facility	ton	302	$ 35	$ 10,587	
Compact soil subgrade; small equipment	sf	5,104	$ 0.25	$ 1,276	
Furnish and install geosynthetic clay liner (GCL) [see Note 5]	sf	5,104	$ 0.75	$ 3,828	
Import and Place Clean Topsoil (12 inches)	cy	189	$ 30	$ 5,672	
Restore Parking Curbs	ft	333	$ 26	$ 8,658	
Restore landscaping compatible with GCL liner [see Note 5]	ls	0.60	$ 10,000	$ 6,000	
Vegetate Imported Cover (grass)	acre	0.12	$ 30,000	$ 3,600	
					$ 49,556
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	1.5	$ 5,000	$ 7,500	
Provide office support	wk	1.5	$ 2,000	$ 3,000	
Provide vehicles and equipment	wk	1.5	$ 1,300	$ 1,950	
Perform air monitoring	wk	1.5	$ 1,000	$ 1,500	
Prepare Remediation Completion Report	ls	1.0	$ 50,000	$ 50,000	
					$ 170,450
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 15,341

Table 9B
Accessible Locations - Alternative 2:
Estimated Costs for Capping Soil with LUCs and Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 270,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 14,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 284,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 57,000
Total Preliminary Estimated Capital Costs of Remedial Alternative - Phase 2:					**$ 341,000**

Annual Costs (5 years) - Phase 1

Task Description	Unit	Quantity	Estimated Costs Unit Cost	Subtotal	Total
Conduct Groundwater Monitoring					
Sample wells (12 wells, 2 seeps, and 2 dup. samples; semi-annually)	ea	32	$ 800	$ 25,600	
Dispose of groundwater sampling residuals	ls	1	$ 800	$ 800	
Analyze groundwater samples from wells					
General Water Chemistry	ea	32	$ 259	$ 8,288	
Total Dissolved Solids	ea	32	$ 27	$ 864	
4 Metals, dissolved (EPA Method 6010/6020) [see Note 6]	ea	32	$ 105	$ 3,360	
4 Metals, total (EPA Method 6010/6020) [2 seeps and 1 duplicate]	ea	6	$ 85	$ 510	
Total Sulfide (EPA Method 376.2)	ea	32	$ 46	$ 1,472	
BTEX and MTBE (EPA Method 8021B or 8020)	ea	32	$ 56	$ 1,792	
Total Petroleum Hydrocarbons as Gasoline, as Diesel Fuel, and as Motor Oil (EPA 8015 + EPA 3630A, silica gel cleanup)	ea	32	$ 206	$ 6,592	
Perform independent data validation	ea	32	$ 20	$ 640	
Input analytical results into Presidio database	ea	32	$ 15	$ 480	
Prepare quarterly monitoring reports	ea	4	$ 5,000	$ 20,000	
					$ 70,398
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 70,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 4,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 74,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 15,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 89,000**

Annual Costs (30 years) - Phase 1

Task Description	Unit	Quantity	Estimated Costs Unit Cost	Subtotal	Total
Inspect and Repair Cap [Apportioned with Phase 2 by Volume @ 40%]					
Repair damage to low-permeability cover caused by erosion	ls	0.40	$ 3,600	$ 1,440	
Repair periodic breaches/damage to cover	ls	0.40	$ 4,000	$ 1,600	
Inspect and clear vegetation from drainage ditches	ls	0.40	$ 2,000	$ 800	
					$ 3,840
Land Use Controls					
Annual administrative cost of Land Use Controls (Area B)	ls	1	$ 1,000	$ 1,000	
Coordinate with NPS for Area A site (TPHg Source Area Only)	ls	1	$ 1,000	$ 1,000	
Annual administrative cost of Land Use Controls (Area A)	ls	1	$ 1,000	$ 1,000	
Annualized cost of Five-Year Review (6 occurrences)	ls	1	$ 5,000	$ 5,000	
					$ 8,000
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 12,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 1,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 13,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 3,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 16,000**

Annual Costs (30 years) - Phase 2

Task Description	Unit	Quantity	Estimated Costs Unit Cost	Subtotal	Total
Inspect and Repair Cap [Apportioned with Phase 1 by Volume @ 60%]					
Repair damage to low-permeability cover caused by erosion	ls	0.60	$ 3,600	$ 2,160	
Repair periodic breaches/damage to cover	ls	0.60	$ 4,000	$ 2,400	
Inspect and clear vegetation from drainage ditches	ls	0.60	$ 2,000	$ 1,200	
					$ 5,760

Table 9B
Accessible Locations - Alternative 2:
Estimated Costs for Capping Soil with LUCs and Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Subtotal Estimated Costs (w/ contractor overhead and profit):	$	6,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):	$	-
Subtotal Estimated Costs (w/ legal and administrative costs):	$	6,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):	$	1,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:	**$**	**7,000**

Notes and Assumptions

1. Totals may not sum exactly because of rounding.
2. Groundwater and surface water monitoring will include 12 monitoring wells and 2 seeps sampled semi-annually for five years.
3. Derivation of unit rates is presented in Table 9J.
4. Areas and volumes are presented in Tables 9K and 9L.
5. Landscaping options for 12-inch vegetative layer overlying geosynthetic clay liner (GCL) are limited. Salvaged or new tress or shrubs may be placed in sub-surface "planters" consisting of a hole sized to accommodate the root ball, lined with GCL, and backfilled with clean topsoil and any necessary soil amendments. The locations and depths of such "planters" would require coordination with the Revegetation Plan, which is not currently available.
6. 4 Metals include: Al, As, Fe, and Mn.

Table 9C
Less Accessible Locations - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Oxygen Release Product Injection
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$20,000	$ 20,000	
Pre-excavation, post-excavation, and confirmation sample survey	ls	1	$ 4,500	$ 4,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
Decontamination area for personnel and equipment	1s	1	$ 1,500	$ 1,500	
					$ 28,000
ORC® application in 2-inch diameter DPT borings					
Concrete cutting (12" core up to 11" thick)	ea	49	$ 113	$ 5,537	
Mobilize Direct-push Rig	ls	1	$ 400	$ 400	
ORC Injection with Direct-push Rig	day	2	$ 1,500	$ 3,000	
(49 locations x 10 ft = 490 ft; 490 ft/300 ft/day = 2 days)					
ORC® material (quantity based on using ORC-Advanced)	lb	6,325	$ 8.25	$ 52,181	
(490 ft x 12.9 lbs/ft = 6325 lbs)					
					$ 61,118
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$20,000	$ 20,000	
Prepare Remedial Design (workplan and figures)	ls	1	$25,000	$ 25,000	
Construction Observation					
Provide resident engineer	wk	0.40	$ 5,000	$ 2,000	
Provide office support	wk	0.40	$ 2,000	$ 800	
Perform air monitoring	wk	0.40	$ 1,000	$ 400	
Collect soil confirmation samples with DPT	ea	6	$ 865	$ 5,190	
Total Petroleum Hydrocarbons as Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	12	$ 80	$ 960	
Total Petroleum Hydrocarbons as Diesel Fuel (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	12	$ 85	$ 1,020	
Total Petroleum Hydrocarbons as Fuel Oil (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	12	$ 85	$ 1,020	
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	12	$ 200	$ 2,400	
Perform independent data validation (Level III plus 10% Level IV)	ea	12	$ 20	$ 240	
Input analytical results into Presidio database	ea	12	$ 15	$ 180	
Prepare Remediation Completion Report	1s	1	$50,000	$ 50,000	
					$ 109,210
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 9,829
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 208,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 10,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 218,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 44,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 262,000**

Notes and Assumptions
1.Totals may not sum exactly because of rounding.
2. Field effort for ORC application is assumed to be 10 days in duration.
3. Total number of ORC injection points based on a 9 foot by 9 foot grid and 7 rows in each direction.
4. Estimated cost of ORC is $10/pound. Assumed using 2.5 pounds of ORC per cubic yard of soil, per manufacturer's recommendations. By comparison, at Building 637, 2,700 pounds of ORC were injected in 96 borings located on a 10-foot by 20-foot grid, between 3 and 7 feet bgs (EKI, 2004), for an average application rate of 1.1 pounds per cubic yard, per manufacturer's recommendations. The relatively lower application rate for Building 637 may be attributable to ORC application over a large, contiguous area from which hot spots had previously been excavated.
5. In situ remediation is assumed to be complete in six months after ORC application.
6. Drilling costs quoted from Gregg Drilling and Testing, Inc. ORC costs quoted from Regenesis.
7. Post-remediation confirmation samples will be collected at SI exceedance locations. Samples will be analyzed for contaminants of concern exceeding cleanup levels.
8. Derivation of unit rates is presented in Table 9J.
9. Areas and volumes are presented in Tables 9K and 9L.

Table 9D
Less Accessible Locations - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Bioventing and Biosparging
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Pre-excavation, post-excavation, and confirmation sample survey	ls	1	$ 4,500	$ 4,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
Decontamination area for personnel and equipment	1s	1	$ 1,500	$ 1,500	
					$ 28,000
Install Injection (4)/Venting Wells (3) in 626/628 Areas					
Concrete cutting (12" core up to 11" thick)	ea	7	$ 113	$ 791	
Contractor (7 31-ft-long 2-in inclined wells, to 9-ft (4) and 4-ft (3) depths)	ft	217	$ 75	$ 16,275	
					$ 17,066
Install Injection (1)/Venting Wells (1) in 619 Area					
Concrete cutting (12" core up to 11" thick)	ea	4	$ 113	$ 452	
Contractor (2 550-ft long 2-in horizontal wells, to 9-ft (1) and 3-ft (1) depths)	ft	1,040	$ 120	$ 124,800	
					$ 125,252
Surface Installation (piping in trenches, manifold, blowers, controls)					
Contractor - Trenching (1-in piping,1-ft deep)	ea	550	$ 50	$ 27,500	
Contractor (skid-mounted blowers, controls, noise shed)	ls	1	$ 30,000	$ 30,000	
					$ 57,500
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare Remedial Design (workplan and figures)	ls	1	$ 25,000	$ 25,000	
Construction Observation					
Provide resident engineer	wk	2	$ 5,000	$ 10,000	
Provide office support	wk	2	$ 2,000	$ 4,000	
Installation Monitoring					
Field monitoring for O2, CO2	dy	10	$ 100	$ 1,000	
Field Monitoring for VOCs	dy	5	$ 100	$ 500	
Performance Monitoring (Year 1)					
Field monitoring for O2, CO2	dy	26	$ 500	$ 13,000	
Performance Monitoring (Years 2 thru 5)					
Field monitoring for O2, CO2	dy	48	$ 500	$ 24,000	
Collect soil confirmation samples with DPT	ea	6	$ 865	$ 5,190	
Total Petroleum Hydrocarbons as Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	12	$ 80	$ 960	
Total Petroleum Hydrocarbons as Diesel Fuel (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	12	$ 85	$ 1,020	
Total Petroleum Hydrocarbons as Fuel Oil (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	12	$ 85	$ 1,020	
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	12	$ 200	$ 2,400	
Perform independent data validation (Level III plus 10% Level IV)	ea	12	$ 20	$ 240	
Input analytical results into Presidio database	ea	12	$ 15	$ 180	
Prepare Start Up Report	1s	1	$ 50,000	$ 50,000	
					$ 158,510
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 14,266
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 401,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 20,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 421,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 84,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 505,000**

Table 9D
Less Accessible Locations - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Bioventing and Biosparging
Commissary/PX Study Area
Presidio of San Francisco, California

Notes and Assumptions

1.Totals may not sum exactly because of rounding.

2. Field effort for bio-sparging application is assumed to be 10 days in duration.

3. Cost estimate is based upon the following conceptual design:

Building 626 Area - Three 2-inch inclined injection wells, 31 feet long, end-cap depth of 9 feet bgs; screen at 29 to 31 feet; angle about 6 degrees from horizontal (84 degrees from vertical). Two 2-inch inclined venting wells, 31 feet long, end-cap depth of 3 feet bgs; screen at 16 to 31 feet; angle about 5 degrees from horizontal.

Building 628 Area - One 2-inch inclined injection well, 31 feet long, end-cap depth of 9 feet bgs; screen at 29 to 31 feet; angle about 6 degrees from horizontal (84 degrees from vertical). One 2-inch inclined venting well, 31 feet long, end-cap depth of 3 feet bgs; screen at 16 to 31 feet; angle about 5 degrees from horizontal.

Building 619 Area - Two 2-inch horizontal wells, one injection at 9 ft bgs and one extraction at 3 ft bgs, installed by drilling completely under building from one site (Doyle Drive side) to the other (Mason Street side); total length approx. 520 feet; screened interval from approx. 120 ft to 210 ft (90 ft screen length) along horizontal boring.

All three Areas - Manifolded together for air injection and air extraction; approx. 550 feet of piping in subsurface trench, 2 low volume blowers (1 to 5 scfm each well), controls, power. Operated by injecting air at 1 to 2 scfm into injection wells, extracting at 4 to 5 scfm from venting wells; Inlet and exhaust air stream monitored for O_2, CO_2, and VOCs (initially); Monitoring daily first week, every other day second and third week.

4. Areas and volumes are presented in Tables 9K and 9L.

5. Derivation of unit rates is presented in Table 9J.

Table 9E
Less Accessible Locations - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Ozone Sparging
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Pre-excavation, post-excavation, and confirmation sample survey	ls	1	$ 4,500	$ 4,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
Decontamination area for personnel and equipment	1s	1	$ 1,500	$ 1,500	
					$ 28,000
Ozone Injection					
Ozone sparge system enclosure (behind Bldg. 610); installed					
Concrete pad, 5'x8'x6" (field mix; incl. forms; 2,250 psi)	ls	1	$ 500	$ 500	
Wood posts, 4"x4"x5' (to mount sparge panels), incl. connectors	ea	2	$ 83	$ 166	
Enclosure fencing, incl. 1 gate (6-foot, chain link, vinyl clad)	ls	1	$ 1,025	$ 1,025	
Ozone sparge system					
System installation and start-up (subcontractor, includes site review & training)	ls	1	$ 13,500	$ 13,500	
Concrete cutting (for 12"x12" Christy boxes)	day	1	$ 129	$ 129	
Concrete cutting, shallow (for 1/2-in. dia. piping)	day	1	$ 129	$ 129	
Wall penetrations (cut small opening for piping)	ea	3	$ 100	$ 300	
Contractor (drill with HSA six 15-foot borings for sparge points)	ea	8	$ 465	$ 3,719	
Christy box, 12"x12", furnish & install	ea	8	$ 428	$ 3,427	
C-Sparge panel, 10-well	ea	1	$ 38,600	$ 38,600	
C-Sparge panel and well materials, crating and shipping	ls	1	$ 950	$ 950	
Mixing tank, pump, level, starter peroxide	ea	1	$ 1,250	$ 1,250	
Laminar sparge points (incl. couplings, Teflon tubing, check valves)	ea	8	$ 700	$ 5,600	
3/8-in. dia. HDPE tubing	lf	1,410	$ 0.95	$ 1,340	
1/2-in. dia. HDPE tubing	lf	1,410	$ 1.95	$ 2,750	
Temporary floor covering (over piping)	ls	1	$ 1,000	$ 1,000	
System O&M (9 months)					
Labor (4 hrs/week)	hr	156	$ 80	$ 12,480	
Hydrogen peroxide (35%, 55-gallon drum, incl. sales tax)	ea	1	$ 346	$ 346	
Site/building restoration					
Dismantle sparging equipment and enclosure	ls	1	$ 3,000	$ 3,000	
Remove temporary floor covering and piping	ls	1	$ 500	$ 500	
Patch floor with neat cement grout, finish	ls	1	$ 500	$ 500	
Abandon Christy boxes in place	ea	8	$ 50	$ 400	
Patch wall penetrations	loc	3	$ 100	$ 300	
Abandon sparge points	ea	8	$ 500	$ 4,000	
Dispose of sparge point abandonment residuals	ea	8	$ 200	$ 1,600	
					$ 97,509
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare Remedial Design (workplan and figures)	ls	1	$ 25,000	$ 25,000	
Construction Observation					
Provide resident engineer	wk	2	$ 5,000	$ 10,000	
Provide office support	wk	2	$ 1,000	$ 2,000	
Perform air monitoring	wk	2	$ 1,000	$ 2,000	
Collect soil confirmation samples with 2 inch diameter DPT	ea	6	$ 865	$ 5,190	
Total Petroleum Hydrocarbons as Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	12	$ 90	$ 1,080	
Total Petroleum Hydrocarbons as Diesel Fuel	ea	12	$ 85	$ 1,020	
Total Petroleum Hydrocarbons as Fuel Oil	ea	12	$ 85	$ 1,020	
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	12	$ 200	$ 2,400	

Table 9E
Less Accessible Locations - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Ozone Sparging
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Perform independent data validation (Level III plus 10% Level IV)	ea	12	$ 20	$ 240	
Input analytical results into Presidio database	ea	12	$ 15	$ 180	
Prepare Remediation Completion Report	ls	1	$ 50,000	$ 50,000	
					$ 120,130
Engineering Project Management					
9% of Design and Construction Management Services	ls	9%			$ 10,812
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 256,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 13,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 269,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 54,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 323,000**

Notes and Assumptions
1. Totals may not sum exactly because of rounding.
2. Field effort for installing ozone sparge points and remedial system assumed to be two weeks in duration. This estimate includes having a remedial system supplier on-site to set-up and start system, drilling 8 borings with a hollow-stem auger and engineering oversight. The borings will be converted to ozone sparge points.
3. Estimated cost includes all equipment required to build the ozone sparge system. Assumed 3 sparge points for Building 619 Area, 3 sparge points for Building 626 Area, and 2 sparge points for Building 628 Area, or a total of 8 points. A single sparging panel will be required.
4. Assumed each ozone sparge point has an estimated 40-foot diameter zone of influence. Targeted sparge point placement to overlap 20% to 30%.
5. In situ remediation is assumed to be complete in nine months after ozone sparge system is operational. Vendor (KVA) estimates that 300 gallons of 6.5% hydrogen peroxide solution will be required to treat impacted soil to achieve cleanup levels.
6. Drilling costs quoted from Gregg Drilling and Testing, Inc. Cost of ozone injection system is quoted from MEES and KVA.
7. Post-remediation confirmation samples will be collected at SI exceedance locations. Samples will be collected 9 months after system start-up and will be analyzed for contaminants of concern exceeding cleanup levels.
8. Estimated cost to collect soil confirmation samples with DPT includes driller mobilization, concrete coring, DPT rig, and field engineer. Field effort for soil confirmation sample collection is assumed to be 1 day.
9. Derivation of unit rates is presented in Table 9J.
10. Areas and volumes are presented in Tables 9K and 9L.

Table 9F
Less Accessible Locations - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Sodium Persulfate Injection
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$20,000	$ 20,000	
Pre-excavation, post-excavation, and confirmation sample survey	ls	1	$ 4,500	$ 4,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
Decontamination area for personnel and equipment	1s	1	$ 1,500	$ 1,500	
					$ 28,000
Activated Sodium Persulfate application in 2-inch diameter DPT borings					
Concrete cutting (12" core up to 11" thick)	ea	51	$ 113	$ 5,763	
Contractor (10-foot DPT borings for Sodium Persulfate application)	ea	51	$ 1,425	$ 72,695	
Activated Sodium Persulfate (713 gallons applied at each location)	gal	36,363	$ 1.03	$ 37,563	
					$ 116,021
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$20,000	$ 20,000	
Prepare Remedial Design (workplan and figures)	ls	1	$25,000	$ 25,000	
Construction Observation					
Provide resident engineer	wk	2.5	$ 5,000	$ 12,500	
Provide office support	wk	2.5	$ 2,000	$ 5,000	
Perform air monitoring	wk	2.5	$ 1,000	$ 2,500	
Collect soil confirmation samples with 2 inch diameter DPT	ea	6	$ 865	$ 5,190	
Total Petroleum Hydrocarbons as Gasoline	ea	12	$ 80	$ 960	
Total Petroleum Hydrocarbons as Diesel Fuel	ea	12	$ 85	$ 1,020	
Total Petroleum Hydrocarbons as Fuel Oil	ea	12	$ 85	$ 1,020	
(EPA 8015M + EPA 3630A, silica gel cleanup)					
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	12	$ 200	$ 2,400	
Perform independent data validation (Level III plus 10% Level IV)	ea	12	$ 20	$ 240	
Input analytical results into Presidio database	ea	12	$ 15	$ 180	
Prepare Remediation Completion Report	1s	1	$50,000	$ 50,000	
					$ 126,010
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 11,341
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 281,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 14,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 295,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 59,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 354,000**

Notes and Assumptions
1.Totals may not sum exactly because of rounding.
2. Field effort for bioremediation enhancement application is assumed to be 10.5 days in duration.
3. Total number of activated sodium persulfate application points was calculated using 10-foot linear spacing (5 feet radius of influence). Assumed drilling 51 borings to 10 feet.
4. Assumed using 5% sodium persulfate solution activated with chelated iron.
5. In situ remediation is assumed to be complete in six months after sodium persulfate application.
6. Drilling costs and sodium persulfate application costs quoted from Vironex.
7. Post-remediation confirmation samples will be collected at SI exceedance locations. Samples will be analyzed for contaminants of concern exceeding cleanup levels.

8. The requirement for 713 gallons of 5% sodium persulfate per boring was estimated by the contractor/vendor (Vironex, Inc.) based on a stoichiometric relationship between the mass of contaminants estimated to be in the soil (based on site data) and the amount of sodium persulfate that would be required to treat the mass in addition to the estimated oxygen demand from the soil. The volume estimate also assumes that approximately 38% of the pore volume could be filled with the solution (slightly more in the vadose zone and slightly less in the saturated zone), with the intent of achieving maximum contact between the solution and contaminants.
9. Derivation of unit rates is presented in Table 9J.
10. Areas and volumes are presented in Tables 9K and 9L.

Table 9G
Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Erect and maintain perimeter temporary fence	ft	1,000	$ 1.09	$ 1,090	
Remove 5' to 6' trees and save for replanting	ea	10	$ 48	$ 480	
Pre-excavation, post-excavation and confirmation sample survey	acre	4.0	$ 1,500	$ 6,000	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
					$ 31,070
Excavate Waste and Soil					
Break and remove asphalt, stockpile	sf	10,640	$ 1.00	$ 10,640	
Break and remove concrete, stockpile (6-in. pavement)	sf	2,229	$ 10.68	$ 23,801	
Excavate, segregate soil from asphalt and concrete, stockpile (Assume 20% of Vol.)	cy	811	$ 8.50	$ 6,895	
Excavate soil no segregation (Assume 80% of Vol.)	cy	3,245	$ 3.50	$ 11,356	
Collect soil profile samples for disposal	ea	14	$ 26	$ 351	
Disposal characterization					
Six metals (EPA Method 6010B)	ea	14	$ 100	$ 1,350	
Total Extractable Petroleum Hydrocarbons (EPA 8015M)	ea	14	$ 105	$ 1,418	
Dispose of non-hazardous soil at Class II facility	ton	5,191	$ 35	$ 181,693	
Waste Characterization and Recycling, Concrete	ton	771	$ 20	$ 15,411	
Waste Characterization and Recycling, Asphalt (waste + pvmt.)	ton	1,024	$ 20	$ 20,488	
					$ 273,403
Dewatering Activities					
Trash Pump Rental	mo	0.8	$ 900	$ 900	
Tank Rental (Assuming 18,100 gallon tank weir tank)	day	20	$ 26	$ 520	
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	0.8	$ 250	$ 250	
Collect water disposal samples	ea	11	$ 26	$ 286	
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	11	$ 150	$ 1,650	
pH	ea	11	$ 10	$ 110	
Cyanide	ea	11	$ 35	$ 385	
Phenols	ea	11	$ 150	$ 1,650	
Sulfides	ea	11	$ 25	$ 275	
					$ 6,026
Restoration Activities					
Import and place drain rock	cy	1,792	$ 32.50	$ 58,234	
Import and place clean fill	cy	1,748	$ 20.00	$ 34,963	
Import and place topsoil (12 inches)	cy	516	$ 30.00	$ 15,471	
Replant selected trees	ea	10	$ 80	$ 802	
Restore Asphalt	sf	10,640	$ 2.25	$ 23,939	
Restore paint to parking spaces	stall	10	$ 9.96	$ 100	
Restore paint to bike path	ft	470	$ 0.80	$ 376	
Restore Concrete (6-inch thick slab)	cy	41	$ 675	$ 27,858	
Restore Parking Curbs	ft	222	$ 26	$ 5,772	
Restore Landscaping (grass)	acre	0.05	$ 30,000	$ 1,500	
					$ 169,014
Abandon & Replace Existing Groundwater Monitoring Wells					
Abandon 2-inch PVC monitoring wells [600GW101, -105, -107]	ea	3	$ 500	$ 1,500	
Dispose of well abandonment residuals	ea	3	$ 200	$ 600	
Install replacement well, 2-inch [600GW101]	ea	1	$ 1,000	$ 1,000	
					$ 3,100

Table 9G
Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Abandon Existing Groundwater Monitoring Wells (deferred)					
Abandon 2-inch PVC monitoring wells	ea	10	$ 500	$ 5,000	
Dispose of well abandonment residuals	ea	10	$ 200	$ 2,000	
Subtotal				$ 7,000	
Discount subtotal at 3.5% annually for 6 years				$ (1,347)	
					$ 5.653
Land Use Controls (Area B)					
Prepare Presidio LUC Master Reference Report	ls	1	$ 5,000	$ 5,000	
Prepare Site-Specific Addendum to LUCMRR (Area B)	ls	1	$ 10,000	$ 10,000	
Add Site-Specific Land Use Controls to Trust GIS System	ls	1	$ 500	$ 500	
					$ 15,500
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	3	$ 5,000	$ 15,000	
Provide office support	wk	3	$ 2,000	$ 6,000	
Provide vehicles and equipment	wk	3	$ 1,300	$ 3,900	
Perform air monitoring	wk	3	$ 1,000	$ 3,000	
Collect soil confirmation samples	ea	81	$ 26	$ 2,106	
BTEX by EPA Method 8260B	ea	21	$ 100	$ 2,100	
PAHs by EPA Method 8081/8082	ea	58	$ 200	$ 11,600	
Total Petroleum Hydrocarbons as Diesel Fuel, Fuel Oil, Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	81	$ 135	$ 10,935	
Metals by EPA Method 6000/7000	ea	47	$ 280	$ 13,160	
Perform independent data validation	ea	81	$ 20	$ 1,620	
Input analytical results into Presidio database	ea	81	$ 15	$ 1,215	
Prepare Remediation Completion Report	ls	1.00	$ 50,000	$ 50,000	
					$ 227,136
Engineering Project Management					
9% of Design and Excavation Management Services	ls	9%			$ 20,442
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 751,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 38,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 790,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 158,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 948,000**

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Erect and maintain perimeter temporary fence	ft	1,000	$ 1.09	$ 1,090	
Remove 5' to 6' trees and save for replanting	ea	10	$ 48	$ 480	
Pre-excavation, post-excavation and confirmation sample survey	acre	6.3	$ 1,500	$ 9,450	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
					$ 34,520

Table 9G
Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Excavate Waste and Soil					
Break and remove asphalt, stockpile	sf	22,325	$ 1.00	$ 22,325	
Break and remove concrete, stockpile (6-in. pavement)	sf	5,648	$ 10.68	$ 60,321	
Excavate, segregate soil from asphalt and concrete, stockpile (Assume 20% of Vol.)	cy	1,269	$ 8.50	$ 10,785	
Excavate soil no segregation (Assume 80% of Vol.)	cy	5,075	$ 3.50	$ 17,764	
Collect soil profile samples for disposal	ea	21	$ 26	$ 546	
Disposal characterization					
Six metals (EPA Method 6010B)	ea	21	$ 100	$ 2,100	
Total Extractable Petroleum Hydrocarbons (EPA 8015M)	ea	21	$ 105	$ 2,205	
Dispose of non-hazardous soil at Class II facility	ton	8,121	$ 35	$ 284,220	
Waste Characterization and Recycling, Concrete	ton	1,205	$ 20	$ 24,108	
Waste Characterization and Recycling, Asphalt (waste + pvmt.)	ton	1,781	$ 20	$ 35,627	
					$ 460,001
Dewatering Activities					
Trash Pump Rental	mo	0.7	$ 900	$ 900	
Tank Rental (Assuming 18,100 gallon tank weir tank)	day	25	$ 26	$ 650	
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	0.7	$ 250	$ 250	
Collect water disposal samples	ea	14	$ 26	$ 364	
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	14	$ 150	$ 2,100	
pH	ea	14	$ 10	$ 140	
Cyanide	ea	14	$ 35	$ 490	
Phenols	ea	14	$ 150	$ 2,100	
Sulfides	ea	14	$ 25	$ 350	
					$ 7,344
Restoration Activities					
Import and place drain rock	cy	2,067	$ 32.50	$ 67,193	
Import and place clean fill	cy	3,127	$ 20.00	$ 62,536	
Import and place topsoil (12 inches)	cy	1,150	$ 30.00	$ 34,498	
Replant selected trees	ea	10	$ 80	$ 802	
Restore Asphalt	sf	22,325	$ 2.25	$ 50,231	
Restore paint to parking spaces	stall	20	$ 9.96	$ 199	
Restore paint to bike path	ft	0	$ 0.80	$ -	
Restore Concrete (6-inch thick slab)	cy	105	$ 675	$ 70,601	
Restore Parking Curbs	ft	333	$ 26	$ 8,658	
Restore Landscaping (grass)	acre	0.12	$ 30,000	$ 3,600	
					$ 298,317
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	4	$ 5,000	$ 20,000	
Provide office support	wk	4	$ 2,000	$ 8,000	
Provide vehicles and equipment	wk	4	$ 1,300	$ 5,200	
Perform air monitoring	wk	4	$ 1,000	$ 4,000	
Collect soil confirmation samples	ea	156	$ 26	$ 4,056	
PAHs by EPA Method 8081/8082	ea	156	$ 200	$ 31,200	
Total Petroleum Hydrocarbons as Diesel Fuel, Fuel Oil, Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	156	$ 135	$ 21,060	
Perform independent data validation	ea	156	$ 20	$ 3,120	
Input analytical results into Presidio database	ea	156	$ 15	$ 2,340	

Table 9G
Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Prepare Remediation Completion Report	ls	1	$ 50,000	$ 50,000	
					$ 255,476
Engineering Project Management					
9% of Design and Excavation Management Services	ls	9%			$ 22,993
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 1,079,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 54,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 1,130,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 226,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 1,356,000**

Annual Costs (Year 1) - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total[a]**
Conduct Groundwater Monitoring - quarterly for 1 year					
Sample wells (5 wells, 2 seeps, and 1 duplicate; quarterly)	ea	32	$ 800	$ 25,600	
Dispose of groundwater sampling residuals	ls	1	$ 800	$ 800	
Analyze groundwater samples from wells					
General Water Quality	ea	32	$ 259	$ 8,288	
Total Dissolved Solids	ea	32	$ 27	$ 864	
4 Metals, dissolved (EPA Method 6010/6020) [see Note 13]	ea	32	$ 105	$ 3,360	
4 Metals, total (EPA Method 6010/6020)	ea	12	$ 85	$ 1,020	
Total Sulfide (EPA Method 376.2)	ea	32	$ 46	$ 1,472	
BTEX and MTBE (EPA Method 8021B or 8020)	ea	32	$ 56	$ 1,792	
Total Petroleum Hydrocarbons as Gasoline, as Diesel Fuel, and as Motor Oil (EPA 8015 + EPA 3630A, silica gel cleanup)	ea	32	$ 206	$ 6,592	
Perform independent data validation	ea	32	$ 20	$ 640	
Input analytical results into Presidio database	ea	32	$ 15	$ 480	
Prepare quarterly monitoring reports	ea	4	$ 5,000	$ 20,000	
					$ 70,908
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 71,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 4,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 75,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 15,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 90,000**

Annual Costs (Years 2 - 3) - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total[a]**
Conduct Groundwater Monitoring - semi-annually for 2 years					
Sample wells (5 wells, 2 seeps, and 1 duplicate; semi-annually)	ea	16	$ 800	$ 12,800	
Dispose of groundwater sampling residuals	ls	1	$ 200	$ 200	
Analyze groundwater samples from wells					
General Water Chemistry	ea	16	$ 259	$ 4,144	
Total Dissolved Solids	ea	16	$ 27	$ 432	
4 Metals, dissolved (EPA Method 6010/6020) [see Note 13]	ea	16	$ 105	$ 1,680	
4 Metals, total (EPA Method 6010/6020)	ea	6	$ 85	$ 510	
Total Sulfide (EPA Method 376.2)	ea	16	$ 46	$ 736	
Perform independent data validation	ea	16	$ 20	$ 320	
Input analytical results into Presidio database	ea	16	$ 15	$ 240	
Prepare annual monitoring reports	ea	1	$ 2,500	$ 2,500	
					$ 23,562

Table 9G
Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Subtotal Estimated Costs (w/ contractor overhead and profit):	$	24,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):	$	1,000
Subtotal Estimated Costs (w/ legal and administrative costs):	$	25,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):	$	5,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:	**$**	**30,000**

Annual Costs (30 years) - Phase 1								
	Estimated Costs							
Task Description	Unit	Quantity	Unit Cost		Subtotal		Total	
Land Use Controls (Area B)								
Annual administrative cost of Land Use Controls	ls	1	$	1,000	$	1,000		
Annualized cost of Five-Year Review (6 occurrences)	ls	1	$	5,000	$	5,000		
							$	6,000
Subtotal Estimated Costs (w/ contractor overhead and profit):							$	6,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):							$	-
Subtotal Estimated Costs (w/ legal and administrative costs):							$	6,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):							$	1,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:							**$**	**7,000**

Notes and Assumptions

1. Totals may not sum exactly because of rounding.
2. Sidewall confirmation samples will be collected at an approximate frequency of 1 sample per every 25 linear feet. Samples will be analyzed for TPHd, TPHfo, TPHg, (EPA 8015M) and PAHs (EPA 8270). All samples for TPH analysis will be prepared with a silica gel cleanup (SGCU). Only samples from FDS Pipeline Residuals Areas will be analyzed for BTEX (EPA 8260B).
3. Bottom confirmation samples will be collected at a frequency of 1 sample per 625 sf. Samples will be analyzed for the same parameters as sidewall samples.
4. Waste characterization samples will be collected approximately 1 per 500 cy. Samples will be analyzed for 6 Metals (Cd, Cr, Cu, Pb, Ni and Zn) (EPA 6010B), and total extractable petroleum hydrocarbons (EPA 8015M).
5. Areas and volumes are presented in Tables 9K and 9L.
6. Conversion factor from cy of soil to tons was 1.6.
7. Conversion factor from cy of asphalt to tons was 1.7.
8. Conversion factor from cy of concrete to tons was 1.9.
9. Total volume of concrete and asphalt was increased by 10 percent to account for additional demolition during field effort.
10. Estimated water volume for dewatering included 10 foot excavations only. Assuming saturated zone will be from 5 to 10 feet. Estimated water volume is 911,026 gallons.
11. Water disposal samples will be collected at a rate of one per every two 18,100-gallon weir tanks. Water disposal samples will be analyzed for Ag, As, Cd, Cr, Cu, Pb, Ni, Zn (EPA Method 6010B) and Hg (EPA 7196), pH, Cyanide (EPA 9010B, 9012A), Phenols (EPA 625), and Sulfides (EPA 376). Analyses are based on the Trust's Sanitary Sewer Discharge Permit.
12. 4 Metals include: Al, As, Fe, and Mn.
13. Groundwater and surface water monitoring will include 5 monitoring wells and 2 seeps quarterly for 1 year and semi-annually for 2 additional years.
14. Derivation of the unit rates is presented in Table 9J.

Table 9H
Less Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Building 610
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Pre-excavation, post-excavation and confirmation sample survey	1s	1	$ 4,500	$ 4,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
Remove 11" thick concrete flooring	ft^3	3,652	$ 28	$ 101,957	
					$129,957
Excavate Waste and Soil					
Interior excavation with Bobcat	cy	1,209	$ 91.00	$ 110,051	
Segregate debris from soil and stockpile on site	cy	1,209	$ 5.00	$ 6,047	
Collect soil profile samples for disposal	ea	3	$ 26	$ 65	
Six metals (EPA Method 6010B)	ea	3	$ 100	$ 250	
Total Extractable Petroleum Hydrocarbons	ea	3	$ 85	$ 213	
Dispose of non-hazardous soil at a Class II facility	ton	1,935	$ 35	$ 67,724	
Waste characterization and Recycling, Concrete	ton	257	$ 20	$ 5,140	
					$ 189,489
Dewater Excavation					
Trash Pump Rental	mo	0.5	$ 900	$ 450	
Tank Rental (Assuming 18,100 gallon tank weir tank)	day	14	$ 26	$ 364	
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	0.5	$ 250	$ 125	
Collect water disposal samples					
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	4	$ 150	$ 556	
pH	ea	4	$ 10	$ 37	
Cyanide	ea	4	$ 35	$ 130	
Phenols	ea	4	$ 150	$ 556	
Sulfides	ea	4	$ 25	$ 93	
					$ 2,310
Replace Concrete Floor					
Import and place drain rock	cy	553	$ 32.50	$ 17,978	
Import and place clean fill	cy	656	$ 20.00	$ 13,123	
Pump 11" elevated slab with finish and medium service hardener	cy	135	$ 50.00	$ 6,800	
					$ 37,902
Design and Construction Management					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (workplan and figures)	ls	1	$ 25,000	$ 25,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	3	$ 5,000	$ 15,000	
Provide office support	wk	3	$ 2,000	$ 6,000	
Provide vehicles and equipment	wk	3	$ 1,300	$ 3,900	
Collect soil confirmation samples	ea	26	$ 26	$ 676	
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	26	$ 200	$ 5,200	
Total Petroleum Hydrocarbons as Gasoline, Diesel Fuel and Fuel Oil (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	26	$ 135	$ 3,510	
Perform independent data validation (Level III plus 10% Level IV)	ls	26	$ 20	$ 520	
Input analytical results into Presidio database	ls	26	$ 15	$ 390	
Prepare Remediation Completion Report	ls	1	$ 50,000	$ 50,000	
					$ 141,696
Engineering Project Management					
9% of Excavation Management and Observation Services	ls	9%			$ 12,753

Table 9H
Less Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Building 610
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Subtotal Estimated Costs (w/ contractor overhead and profit):					$514,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 26,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 540,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 108,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 648,000**

Notes and Assumptions

1. Totals may not sum exactly because of rounding.
2. Field effort for interior excavations is assumed to be two weeks in duration. Field effort includes mobilizing, concrete floor removal, excavation, and concrete floor replacement. Field effort includes three days for monitoring well abandonment.
3. Sidewall confirmation samples will be collected at a frequency of 1 sample per every 25 linear feet for a total of 20 samples. Samples will be analyzed for TPHd, TPHfo, TPHg, (EPA 8015M) and PAHs (EPA 8270). All samples for TPH analysis will be prepared with a silica gel cleanup (SGCU).
4. Bottom confirmation samples will be collected at a frequency of 1 sample per 625 sf, with a minimum of one sample per excavation, for a total of 7 samples. Samples will be analyzed for TPHd, TPHfo, TPHg (EPA Method 8015M) and PAHs (EPA 8270 SIM).
5. Waste characterization samples will be collected approximately 1 per 500 cy for a total of 3 samples. Samples will be analyzed for 6 Metals (Cd, Cr, Cu, Pb, Ni and Zn) (EPA 6010B), and total extractable petroleum hydrocarbons (EPA 8015M).
6. Areas and volumes are presented in Tables 9K and L.
7. Assumed concrete slab is 11-inches thick.
8. Estimated water volume for one time dewatering included 10 feet excavations only. Assuming saturated zone will be from 5 to 10 feet. Estimated water volume is 134,128 gallons.
9. Water disposal samples will be collected at a rate of one per every two 18,100-gallon weir tanks. Water disposal samples will be analyzed for Ag, As, Cd, Cr, Cu, Pb, Ni, Zn (EPA Method 6010B) and Hg (EPA 7196), pH, Cyanide (EPA 9010B, 9012A), Phenols (EPA 625), and Sulfides (EPA 376). Analyses are based on the Trust’s Sanitary Sewer Discharge Permit.
10. Costs for dewatering equipment and tanks from vendor (Rain for Rent).
11. Conversion factor from cy of soil to tons was 1.6.
12. Conversion factor from cy of concrete to tons was 1.9.
13. Derivation of the unit rates is presented in Table 9J.

Table 9I
Less Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal Following Demolition of Building 610
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
(Included under Alternative 4 for Accessible Locations)					$ -
Excavate Waste and Soil					
Excavate soil no segregation (Assume 100% of Vol.)	cy	1,209	$ 3.50	$ 4,233	
Collect soil profile samples for disposal	ea	3	$ 26	$ 65	
Disposal characterization					
Six metals (EPA Method 6010B)	ea	3	$ 100	$ 250	
(EPA 8015M)	ea	3	$ 105	$ 263	
Dispose of non-hazardous soil at Class II facility	ton	1,935	$ 35	$ 67,724	
					$ 72,534
Dewatering Activities					
Trash Pump Rental	mo	0.50	$ 900	$ 450	
Tank Rental (Assuming 18,100 gallon tank weir tank)	day	14	$ 26	$ 364	
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	0.50	$ 250	$ 125	
Collect water disposal samples	ea	4	$ 26	$ 96	
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	4	$ 150	$ 556	
pH	ea	4	$ 10	$ 37	
Cyanide	ea	4	$ 35	$ 130	
Phenols	ea	4	$ 150	$ 556	
Sulfides	ea	4	$ 25	$ 93	
					$ 2,406
Restoration Activities					
Import and place drain rock	cy	553	$ 32.50	$ 17,978	
Import and place clean fill	cy	525	$ 20	$ 10,499	
Import and place topsoil (12 inches)	cy	131	$ 30	$ 3,937	
Restore Landscaping	acre	0.09	$ 30,000	$ 2,738	
					$ 35,152
Design and Construction Management Services					
Engineering					
(Included under Alternative 4 for Accessible Locations)					$ -
Construction observation					
Provide resident engineer	wk	1	$ 5,000	$ 5,000	
Provide office support	wk	1	$ 2,000	$ 2,000	
Provide vehicles and equipment	wk	1	$ 1,300	$ 1,300	
Perform air monitoring	wk	1	$ 1,000	$ 1,000	
Collect soil confirmation samples	ea	26	$ 26	$ 676	
PAHs by EPA Method 8081/8082	ea	26	$ 200	$ 5,200	
Total Petroleum Hydrocarbons as Diesel Fuel, Fuel Oil, Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	26	$ 135	$ 3,510	
Perform independent data validation	ea	26	$ 20	$ 520	
Input analytical results into Presidio database	ea	26	$ 15	$ 390	
Prepare Remediation Completion Report					
(Included under Alternative 4 for Accessible Locations)	ls	0	$ 50,000	$ -	
					$ 19,596
Engineering Project Management					
9% of Design and Excavation Management Services	ls	9%			$ 1,764

Table 9I
Less Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal Following Demolition of Building 610
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs						
	Estimated Costs					
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**	
Subtotal Estimated Costs (w/ contractor overhead and profit):					$	131,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$	7,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$	140,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$	28,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$**	**168,000**

Notes and Assumptions
1. Totals may not sum exactly because of rounding.
2. Field effort for former interior excavations is assumed to be one week in duration. Concrete floor removal is assumed to have occurred during Building 610 demolition.
3. Sidewall confirmation samples will be collected at a frequency of 1 sample per every 25 linear feet for a total of 20 samples. Samples will be analyzed for TPHd, TPHfo, TPHg, (EPA 8015M) and PAHs (EPA 8270). All samples for TPH analysis will be prepared with a silica gel cleanup (SGCU).
4. Bottom confirmation samples will be collected at a frequency of 1 sample per 625 sf, with a minimum of one sample per excavation, for a total of 7 samples. Samples will be analyzed for TPHd, TPHfo, TPHg (EPA Method 8015M) and PAHs (EPA 8270 SIM).
5. Waste characterization samples will be collected approximately 1 per 500 cy for a total of 3 samples. Samples will be analyzed for 6 Metals (Cd, Cr, Cu, Pb, Ni and Zn) (EPA 6010B), and total extractable petroleum hydrocarbons (EPA 8015M).
6. Areas and volumes are presented in Tables 9K and L.
7. Estimated water volume for one time dewatering included 10 feet excavations only. Assuming saturated zone will be from 5 to 10 feet. Estimated water volume is 134,128 gallons.
8. Water disposal samples will be collected at a rate of one per every two 18,100-gallon weir tanks. Water disposal samples
9. Costs for dewatering equipment and tanks from vendor (Rain for Rent).
10. Conversion factor from cy of soil to tons was 1.6.
11. Derivation of the unit rates is presented in Table 9J.

Table 9J
Derivation of Unit Rates
Commissary/PX Study Area
Presidio of San Francisco, CA

Task Description	Unit	Unit Cost	Source
CAPITAL COSTS			
General Site Preparation - Alternatives 2 (All RUs) and 4 (All RUs)			
Mobilize contractor equipment and supplies to site	ls	$ 20,000	Table E-3, Main Installation Sites FS, EKI, March 2003 (MIFS).
Erect and maintain perimeter temporary fence	ft	$ 1.09	National Rent-a-Fence
Remove 5' to 6' trees and save for replanting	ea	$ 48	Means Cost Guide (Means)
Remove 11" thick concrete flooring	ft^3	$ 28	Means
Pre-excavation, post-excavation and confirmation sample survey	acre	$ 1,500	MIFS
Pre-excavation, post-excavation, and confirmation sample survey	ls	$ 4,500	MIFS/Towill Surveys (lump sum minimum for smaller jobs)
Provide Personnel Protective Equipment (PPE)	ls	$ 2,000	Treadwell & Rollo, Inc. (T&R)
Decontamination area for personnel and equipment	1s	$ 1,500	T&R
General Site Preparation - Alternative 3 (Less Accessible RUs)			
Mobilize contractor equipment and supplies to site	ls	$ 20,000	MIFS
Pre-excavation, post-excavation, and confirmation sample survey	ls	$ 4,500	MIFS/Towill Surveys
Provide Personnel Protective Equipment (PPE)	ls	$ 2,000	T&R
Decontamination area for personnel and equipment	1s	$ 1,500	T&R
Excavate Waste and Soil			
Remove 11" thick concrete flooring	ft^3	$ 28	Means
Break and remove asphalt, stockpile	sf	$ 1.00	Means
Break and remove concrete, stockpile (6-in. pavement)	sf	$ 10.68	Means
Interior excavation with Bobcat	cy	$ 91.00	Means; adjusted for small equipment
Excavate, segregate soil from asphalt and concrete, stockpile	cy	$ 8.50	MIFS
Segregate debris from soil and stockpile on site	cy	$ 5.00	MIFS
Excavate soil no segregation	cy	$ 3.50	MIFS
Collect soil profile samples for disposal	ea	$ 26	MIFS
Disposal characterization			
Six metals (EPA Method 6010B)	ea	$ 100	Curtis & Tompkins Laboratories (C&T)
(EPA 8015M)	ea	$ 105	C&T
Dispose of non-hazardous soil at Class II facility	ton	$ 35	Presidio Trust (Trust)
Waste Characterization and Recycling, Concrete	ton	$ 20	Contractor bid sheet
Waste Characterization and Recycling, Asphalt	ton	$ 20	Contractor bid sheet
Dewatering Activities			
Trash Pump Rental	mo	$ 900	Rain-for-Rent
Tank Rental (Assuming 18,100 gallon tank weir tank)	day	$ 26	Rain-for-Rent
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	$ 250	Rain-for-Rent

Table 9J
Derivation of Unit Rates
Commissary/PX Study Area
Presidio of San Francisco, CA

Task Description	Unit		Unit Cost	Source
Collect water disposal samples	ea	$	26	MIFS (used same rate as for soil samples)
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	$	150	C&T
pH	ea	$	10	C&T
Cyanide	ea	$	35	C&T
Phenols	ea	$	150	C&T
Sulfides	ea	$	25	C&T
Restoration Activities				
Replace Concrete Floor - Pump 11" elevated slab with finish and medium service hardener	cy	$	50	Means
Replant selected trees	ea	$	80	Means
Restore Asphalt	sf	$	2.25	Means
Restore paint to parking spaces	stall	$	9.96	Means
Restore paint to bike path	ft	$	0.80	Means
Restore Concrete	cy	$	675	Means
Restore Parking Curbs	ft	$	26	Means
Restore Landscaping	acre	$	30,000	T&R (extrapolated from Trust spreadsheet for native veg.)
Abandon Existing Groundwater Monitoring Wells				
Abandon 2-inch PVC monitoring wells	ea	$	500	T&R subcontractor
Dispose of well abandonment residuals	ea	$	200	T&R subcontractor
Install replacement well, 2-inch [600GW101]	ea	$	1,000	T&R subcontractor
Construct Cap				
Repair/Upgrade Permeable Cover (Asphalt Area)				
Asphalt Sealing	sy	$	1.25	Means
Import and Place Clean Topsoil (12 inches)	cy	$	30	MIFS
Vegetate Imported Cover (grass)	acre	$	30,000	Preliminary Restoration Costs for Remediation Sites (Trust, 2004)
ORC® application in 2-inch diameter DPT borings				
Concrete cutting (12" core up to 11" thick)	ea	$	113	Means
Mobilize Direct-push Rig	ls	$	400	Contractor estimate
ORC Injection with Direct-push Rig	day	$	1,500	Contractor estimate
ORC® material (quantity based on using ORC-Advanced)	lb	$	8.25	Contractor estimate

Table 9J
Derivation of Unit Rates
Commissary/PX Study Area
Presidio of San Francisco, CA

Task Description	Unit		Unit Cost	Source
Bioventing System Installation				
Install Injection (4)/Venting Wells (3) in 626/628 Areas				
Concrete cutting (12" core up to 11" thick)	ea	$	113	Means
Contractor (7 31-ft-long 2-in inclined wells, to 9-ft (4) and 4-ft (3) depths)	ft	$	75	T&R
Install Injection (1)/Venting Wells (1) in 619 Area				
Concrete cutting (12" core up to 11" thick)	ea	$	113	Means
Contractor (2 550-ft long 2-in horizontal wells, to 9-ft (1) and 3-ft (1) depths)	ft	$	120	T&R
Surface Installation (piping in trenches, manifold, blowers, controls)				
Contractor - Trenching (1-in piping,1-ft deep)	ea	$	50	T&R
Contractor (skid-mounted blowers, controls, noise shed)	ls	$	30,000	T&R
Ozone Sparging System Installation				
Ozone sparge system enclosure (behind Bldg. 610); installed				
Concrete pad, 5'x8'x6" (field mix; incl. forms; 2,250 psi)	ls	$	500	Means
Wood posts, 4"x4"x5' (to mount sparge panels), incl. connectors	ea	$	83	Home Depot website
Enclosure fencing, incl. 1 gate (6-foot, chain link, vinyl clad)	ls	$	-	Means
Ozone sparge system				
System installation and start-up (subcontractor, includes site review & training)	ls	$	13,500	Vendor estimate
Concrete cutting (for 12"x12" Christy boxes)	day	$	129	Means
Concrete cutting, shallow (for 1/2-in. dia. piping)	day	$	129	Means
Wall penetrations (cut small opening for piping)	ea	$	100	T&R
Contractor (drill with HSA six 15-foot borings for sparge points)	ea	$	465	Contractor estimate
Christy box, 12"x12", furnish & install	ea	$	428	Means
C-Sparge panel, 10-well	ea	$	38,600	Vendor estimate
C-Sparge panel and well materials, crating and shipping	ls	$	950	Vendor estimate
Mixing tank, pump, level, starter peroxide	ea	$	1,250	Vendor estimate
Laminar sparge points (incl. couplings, Teflon tubing, check valves)	ea	$	700	Vendor estimate
3/8-in. dia. HDPE tubing	lf	$	0.95	Vendor estimate
1/2-in. dia. HDPE tubing	lf	$	1.95	Vendor estimate

Table 9J
Derivation of Unit Rates
Commissary/PX Study Area
Presidio of San Francisco, CA

Task Description	Unit	Unit Cost	Source
Temporary floor covering (over piping)	ls	$ 1,000	T&R
System O&M (9 months)			
Labor (4 hrs/week)	hr	$ 90	Vendor estimate
Hydrogen peroxide (35%, 55-gallon drum, incl. sales tax)	ea	$ 346	Vendor estimate
Site/building restoration			
Dismantle sparging equipment and enclosure	ls	$ 3,000	T&R
Remove temporary floor covering and piping	ls	$ 500	T&R
Patch floor with neat cement grout, finish	ls	$ 500	T&R
Abandon Christy boxes in place	ea	$ 50	T&R
Patch wall penetrations	loc	$ 100	T&R
Abandon sparge points	ea	$ 500	T&R
Dispose of sparge point abandonment residuals	ea	$ 200	T&R
Activated Sodium Persulfate application in 2-inch diameter DPT borings			
		$ 113	
Concrete cutting (12" core up to 11" thick)	ea		Means
Contractor (10-foot DPT borings for Sodium Persulfate application)	ea	$ 1,425	Contractor estimate
Activated Sodium Persulfate (713 gallons applied at each location)	gal	$ 1.03	Contractor estimate
Implement Land Use Controls			
Prepare Presidio LUC Master Reference Report (allocated share)	ls	$ 5,000	Consistent Costs for LUCs and 5-year Reviews (Trust, 2005)
Prepare Site-Specific Addendum to LUCMRR (Area B)	ls	$ 10,000	Consistent Costs for LUCs and 5-year Reviews (Trust, 2005)
Implement Land Use Controls for Area A RUs	ls	$ 5,000	Consistent Costs for LUCs and 5-year Reviews (Trust, 2005)
Add Site-Specific Land Use Controls to Trust GIS System	yrs	$ 1,000	Consistent Costs for LUCs and 5-year Reviews (Trust, 2005)
Design and Construction Management Services			
Engineering			
Perform general planning activities	ls	$ 20,000	MIFS
Prepare Remedial Design (workplan and figures) - Alts 3, 4 (Less Acc.)	ls	$ 25,000	MIFS Note: Contract/design documents for in-situ remediation and limited excavation (Alts. 3 and 4 for Less Accessible RUs) may consist of a work plan with figures, as the in-situ work would be performed by specialty contractor and the scope of work is very limited for indoor excavation.
Prepare Remedial Design (plans and specifications) - Alts. 2, 4 (Acc.)	ls	$ 75,000	T&R. Note: Contract/design documents for selected demolition, shallow excavation, placement of GCL, revegetation, and repaving (Alt. 2) or mass excavation (Alt. 4, Accessible RUs) should consist of engineering drawings and specifications. Cost is based on recent Trust experience on comparable projects.

Table 9J
Derivation of Unit Rates
Commissary/PX Study Area
Presidio of San Francisco, CA

Task Description	Unit		Unit Cost	Source
Bid, award, and negotiate construction contract - Alts. 3, 4 (Less Acc.)	ls	$	11,500	MIFS
Construction Observation				
Provide resident engineer	wk	$	5,000	MIFS
Provide office support	wk	$	2,000	MIFS
Provide vehicles and equipment	wk	$	1,300	MIFS
Perform air monitoring	wk	$	1,000	MIFS
Bioventing Monitoring				
\	dy	$	100	T&R
Field monitoring for O2, CO2	dy	$	500	T&R
Confirmation Soil Sampling				
Collect soil confirmation samples with DPT	ea	$	865	T&R subcontractor
Collect soil confirmation samples, surface	ea	$	26	MIFS
Total Petroleum Hydrocarbons as Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	$	80	C&T
Total Petroleum Hydrocarbons as Diesel Fuel (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	$	85	C&T
Total Petroleum Hydrocarbons as Fuel Oil (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	$	85	C&T
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	$	200	C&T
Benzene, toluene, ethylbenzene, and xylenes (EPA Method 8260B)	ea	$	200	C&T
Prepare Remediation Completion Report	1s	$	50,000	MIFS
Prepare Start Up Report	1s	$	50,000	MIFS (assume same level of effort as above)
Prepare Well Abandonment Report - Alt. 1	ls	$	5,000	T&R
ANNUAL COSTS				
Conduct Groundwater Monitoring				
Sample wells (obtain 12 well and 2 seep samples per quarter)	ea	$	800	T&R subcontractor
Dispose of groundwater sampling residuals	ls	$	800	T&R
Analyze groundwater samples from wells				
General Water Chemistry	ea	$	259	C&T
Total Dissolved Solids	ea	$	27	C&T
4 Metals, dissolved (EPA Method 6010/6020)	ea	$	105	C&T
4 Metals, total (EPA Method 6010/6020)	ea	$	85	C&T
Total Sulfide (EPA Method 376.2)	ea	$	46	C&T
BTEX and MTBE (EPA Method 8021B or 8020)	ea	$	56	C&T
Total Petroleum Hydrocarbons as Gasoline, as Diesel Fuel, and as Motor Oil (EPA 8015 + EPA 3630A, silica gel cleanup)	ea	$	206	C&T

Table 9J
Derivation of Unit Rates
Commissary/PX Study Area
Presidio of San Francisco, CA

Task Description	Unit	Unit Cost	Source
Perform independent data validation	ea	$ 20	MIFS
Input analytical results into Presidio database	ea	$ 15	MIFS
Prepare quarterly monitoring reports	ea	$ 5,000	MIFS (assume letter-report)
Inspect and Repair Cap			
Repair damage to low-permeability cover caused by erosion	ls	$ 3,600	MIFS
Repair periodic breaches/damage to cover	ls	$ 4,000	MIFS
Inspect and clear vegetation from drainage ditches	ls	$ 2,000	MIFS
Project Management/Administration			
Annual administrative cost of Land Use Controls	ls	$ 1,000	MIFS
Coordinate with NPS for Area A site (TPHg Source Area Only)	ls	$ 1,000	MIFS
Annualized cost of Five-Year Review (6 occurrences)	ls	$ 5,000	MIFS

Table 9K
Soil Area and Volume Estimates (Scenario I - Lesser Impact Scenario)
Commissary/PX Study Area
Presidio of San Francisco, California

NAME	DEPTH	PHASE	AREA (feet^2)	% GRASS	% ASPHALT	% CONCRETE	AREA GRASS (feet^2)	AREA ASPHALT (feet^2)	AREA CONCRETE (feet^2)	THICKNESS ASPHALT & CONCRETE (feet)	VOLUME ASPHALT (feet^3)	VOLUME CONCRETE (feet^3)	VOLUME ASPHALT (yard^3)	VOLUME CONCRETE (yard^3)	BOTTOM EXCAVATION AREA (feet^2)	BOTTOM CONFIRMATION SAMPLES[1]	EXCAVATION PERIMETER LENGTH (feet)	PERIMETER CONFIRMATION SAMPLES[2]
Building 613	Shallow M	2	5,316	0	80	20	0	4,253	1,063	0.5	2,126	532	79	20	5,316	9	370	15
Building 613	Deep M	2	4,378															
Building 619	Deep L	2	1,573												1,573	3	200	8
Building 626	Shallow M	2	1,536	0	60	40	0	922	614	0.5	461	307	17	11	904	2	130	6
Building 626	Shallow L	2	1,666												1,666	3	180	8
Building 626	Deep M	1	632												632	2	95	4
Building 626	Deep L	2	1,268															
Building 628 Area #1	Shallow M	2	1,906	100	0	0	1,906	0	0	0.5	0	0	0	0	1,906	4	225	9
Building 628 Area #1	Deep M	2	320															
Building 628 Area #1	Deep L	2	304												304	1	70	3
Building 628 Area #2	Shallow M	2	857	0	0	100	0	0	857	0.5	0	428	0	16	857	2	125	5
Building 628 Area #2	Deep M	2	307															
FDS Pipeline Area	Shallow M	2	7,012	0	95	5	0	6,661	351	0.5	3,331	175	123	6	7,012	12	720	29
FDS Pipeline Area	Deep M	2	2,584															
FDS Pipeline Residuals Area #1	Shallow M	1	787	100	0	0	787	0	0	0.5	0	0	0	0	787	2	110	5
FDS Pipeline Residuals Area #2	Shallow M	1	449	0	100	0	0	449	0	0.5	225	0	8	0	449	1	80	4
FDS Pipeline Residuals Area #3 /AST 634 Area	Shallow M	1	1,545	80	20	0	1,236	309	0	0.5	154	0	6	0	1,545	3	145	6
Pipeline A Area #1	Shallow M	2	1,666	100	0	0	1,666	0	0	0.5	0	0	0	0	1,666	3	210	9
Pipeline A Area #1	Deep M	2	843															
Pipeline A Area #2	Shallow M	2	1,702	90	10	0	1,532	170	0	0.5	85	0	3	0	1,702	3	210	9
Pipeline A Area #2	Deep M	2	459															
Site 15 Area	Shallow M	2	11,053	0	75	25	0	8,289	2,763	0.5	4,145	1,382	154	51	11,053	18	525	21
Site 15 Area	Deep M	2	2,274															
TPHg Source Area	Shallow M	1	11,143	0	80	20	0	8,914	2,229	0.5	4,457	1,114	165	41	11,143	18	880	36
TPHg Source Area	Deep M	1	9,044															
															More Accessible	**More Accessible**	**More Accessible**	**More Accessible**
Subtotal, Phase 1			**23,600**				**2,023**	**9,672**	**2,229**		**4,836**	**1,114**	**179**	**41**	**14,556**	**26**	**1,310**	**55**
Subtotal, Phase 2			**42,213**				**5,104**	**20,295**	**5,648**		**10,148**	**2,824**	**376**	**105**	**30,416**	**53**	**2,515**	**103**
TOTALS, More Accessible			**65,813**				**7,127**	**29,968**	**7,877**		**14,984**	**3,938**	**555**	**146**	**44,972**	**79**	**3,825**	**158**
															Less Accessible	**Less Accessible**	**Less Accessible**	**Less Accessible**
TOTALS, Less Accessible			**4,812**				**0**	**0**	**0**		**0**	**0**	**0**	**0**	**3,543**	**7**	**450**	**19**
TOTALS, All Areas			**70,624**				**7,127**	**29,968**	**7,877**		**14,984**	**3,938**	**555**	**146**	**48,515**	**86**	**4,275**	**177**

Notes:
L - Less Accessible
M - More Accessible
[1] Bottom confirmation samples will be collected at a frequency of 1 sample per 625 square feet.
[2] Sidewall confirmation samples will be collected at a frequency of 1 sample per every 25 linear feet.

Table 9L
Soil Volume Estimates by Depth (Scenario I - Lesser Impact Scenario)
Commissary/PX Study Area
Presidio of San Francisco, California

NAME	DEPTH	PHASE	THICKNESS (feet)	AREA (ft²)	VOLUME (cy)	SUBTOTAL VOLUME BY PHASE	TOTAL VOLUME BY DEPTH (cy)
Building 628 Area #2	Shallow M	2	3	857	95	**Phase 1** **1,547**	**4,997**
Building 628 Area #1	Shallow M	2	3	1,906	212		
Pipeline A Area #1	Shallow M	2	3	1,666	185		
Site 15 Area	Shallow M	2	3	11,053	1,228		
FDS Pipeline Area	Shallow M	2	3	7,012	779		
TPHg Source Area	Shallow M	1	3	11,143	1,238		
Pipeline A Area #2	Shallow M	2	3	1,702	189	**Phase 2** **3,450**	
Building 626	Shallow M	2	3	1,536	171		
Building 613	Shallow M	2	3	5,316	591		
FDS Pipeline Residuals Area #1	Shallow M	1	3	787	87		
FDS Pipeline Residuals Area #2	Shallow M	1	3	449	50		
FDS Pipeline Residuals Area #3 /AST 634 Area	Shallow M	1	3	1,545	172		
Building 626	Shallow L	2	3	1,666	185	**Phase 2** **185**	**185**
Site 15 Area	Deep M	2	7	2,274	590	**Phase 1** **2,509**	**5,403**
TPHg Source Area	Deep M	1	7	9,044	2,345		
FDS Pipeline Area	Deep M	2	7	2,584	670		
Building 628 Area #2	Deep M	2	7	307	80		
Pipeline A Area #1	Deep M	2	7	843	218	**Phase 2** **2,894**	
Pipeline A Area #2	Deep M	2	7	459	119		
Building 628 Area #1	Deep M	2	7	320	83		
Building 626	Deep M	1	7	632	164		
Building 613	Deep M	2	7	4,378	1,135		
Building 619	Deep L	2	10	1,573	583	**Phase 2** **1,024**	**1,024**
Building 628 Area #1	Deep L	2	10	304	113		
Building 626	Deep L	2	7	1,268	329		
TOTAL				**70,624**	**11,609**		**11,609**
					Total Volume (M) Phase 1	**4,056**	**10,400**
					Total Volume (M) Phase 2	**6,344**	
					Total Volume Shallow (L)	**185**	**1,209**
					Total Volume Deep (L)	**1,024**	
					Total Shallow (M) Phase 1	**1,547**	**4,997**
					Total Shallow (M) Phase 2	**3,450**	
					Total Deep (M) Phase 1	**2,509**	**5,403**
					Total Deep (M) Phase 2	**2,894**	

Notes:

L - Less Accessible
M - More Accessible

Table 10
Groundwater and Surface Water Monitoring Program
Commissary/PX Study Area
Presidio of San Francisco, California

Location ID	New or Existing Sampling Location[1]	Water Level/ Seep Evaluation	Sampling Method	Monitoring Location Rationale	Analytical Requirements							
					General Chemistry[2]	Dissolved Metals[3]	Total Metals (Not Filtered)[3]	Total Dissolved Solids	Total Organic Carbon	Total Sulfide[4]	BTEX and MTBE	Total Petroleum Hydrocarbons[5]
					Various	EPA 6010/6020	EPA 6010/6020	EPA 160.1	EPA 9060	EPA 376.2	EPA 8021B or 8020	EPA 8015/ EPA 3630A
600GW101	Existing/ Replaced[6]	During Each Sampling Event	Low Flow	Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents.	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3		Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q1, Q3	Q1, Q3
600GW102	Existing	During Each Sampling Event	N/A	N/A								
600GW103	Existing	During Each Sampling Event	N/A	N/A								
600GW104	Existing	During Each Sampling Event	N/A	N/A								
600GW105	Existing	During Each Sampling Event	N/A	N/A								
600GW106	Existing	During Each Sampling Event	Low Flow	Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents.	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3		Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q1, Q3	Q1, Q3
600GW107	Existing	During Each Sampling Event	N/A	N/A								
600GW108	Existing	During Each Sampling Event	N/A	N/A								
600GW109	Existing	During Each Sampling Event	N/A	N/A								
610GW101	Existing	During Each Sampling Event	Low Flow	Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents.	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3		Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q1, Q3	Q1, Q3
610GW102	Existing	During Each Sampling Event	Low Flow	Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents.	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3		Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q1, Q3	Q1, Q3
610GW103	Existing	During Each Sampling Event	Low Flow	Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents.	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3		Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q1, Q3	Q1, Q3
610SP01	Existing	During Each Sampling Event	Surface[7]	Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents.	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q1, Q3	Q1, Q3
610SP02	Existing	During Each Sampling Event	Surface[7]	Monitor Commissary Seeps area for petroleum following Phase 1 remedy and arsenic and related analytical constituents.	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q for year 1; followed by Q1, Q3	Q1, Q3	Q1, Q3

Notes

Q1, Q3 = Semi-annual sampling (Quarters 1 and 3)

Q = Quarterly sampling

This monitoring program will be implemented following Phase 1 construction activities and will continue until Phase 2 implementation. The need for additional monitoring will be evaluated in the Phase 2 CAP Implementation Work Plan.

Section 5.5 of the text provides additional details regarding the monitoring program.

1 All Study Area wells will remain in place until Phase 2 implementation. The Trust will then request approval for abandonment from the RWQCB for wells no longer included in the monitoring program.

2 General Chemistry Parameters include: alkalinity (total), bicarbonate, carbonate, chloride, fluoride, nitrate as N, nitrite as N, and sulfate. Dissolved Oxygen (DO) concentrations will be recorded immediately before sample collection and recorded in field sampling logs.

3 Metals List includes: Al, As, Fe, and Mn.

4 Total sulfides are analyzed by the laboratory for all samples collected at the Presidio.

5 Samples will be analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg), diesel (TPHd), and fuel oil (TPHfo), with respective carbon ranges of C7 - C12, C12 - C24, and C24 - C36, by EPA Method 8015M with silica gel cleanup by EPA Method 3630A.

6 Well 600GW101 will be abandoned as part of the preferred remedial alternative; it will be replaced after completion of remedial construction activities.

7 Surface water seeps will be sampled per Standard Operating Procedure. For metals analysis, two samples will be collected; one will be filtered and analyzed for dissolved metals and one will not be filtered and analyzed for total metals.

FIGURES

COMMISSARY/PX SITE LOCATION MAP

Treadwell&Rollo

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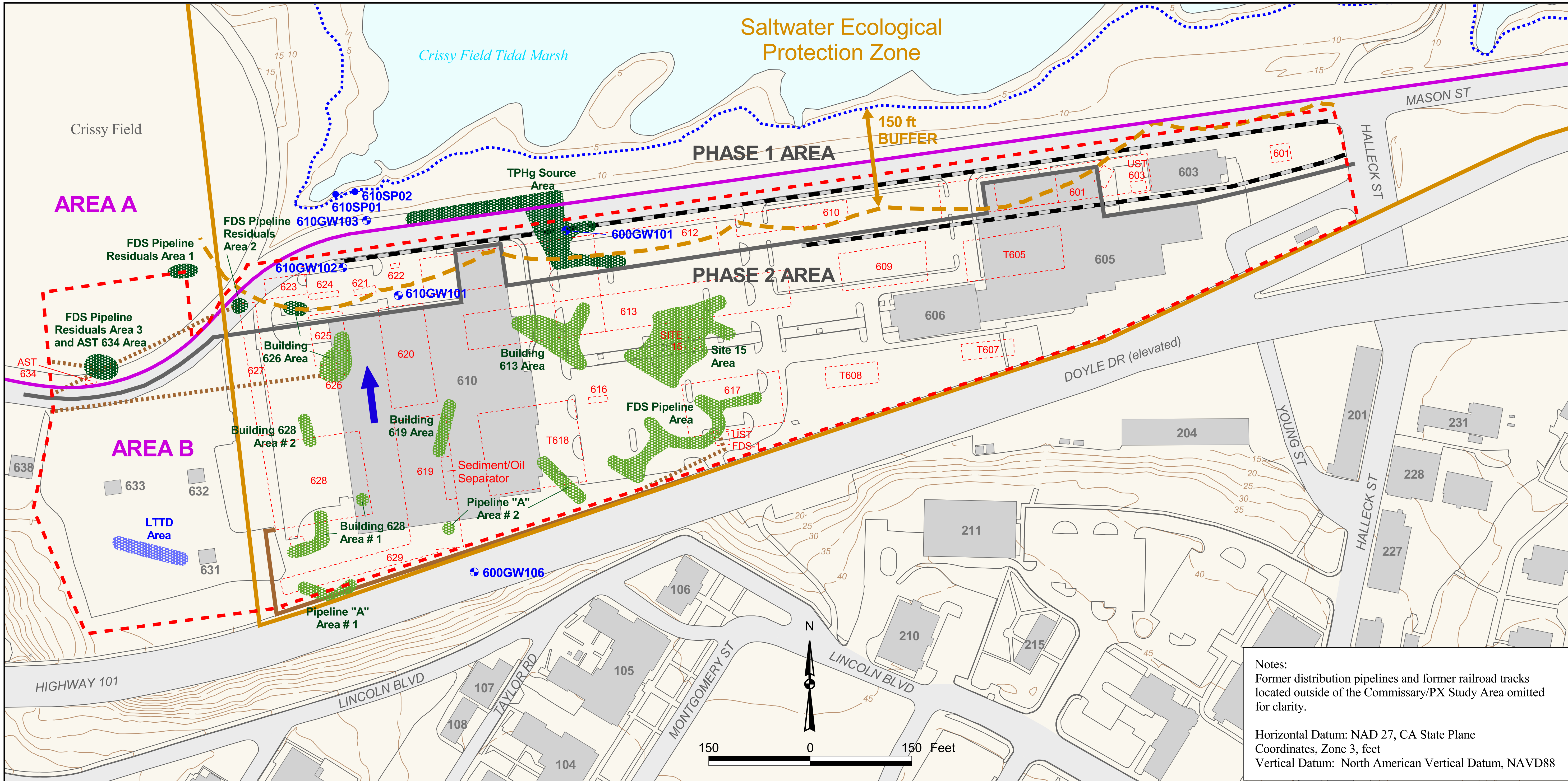
December 2005

FIGURE 1

Treadwell & Rollo 2893_11\COMMISSARY\FINAL_CAP.APR 12/2005



LEGEND

- 610SP01 — Proposed Commissary/PX Seep Monitoring Location
- 600GW106 — Proposed Commissary/PX Groundwater Monitoring Well Location
- Approximate Direction of Groundwater Flow
- Approximate Extent of Phase 1 Impacted Soil
- Approximate Extent of Phase 2 Impacted Soil
- LTTD Area is being addressed under the Building 633 Firing Range CERCLA program
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003). (Areas north and east of boundary lie within zone).
- Approximate 150 ft Buffer Zone
- Area A / Area B Boundary
- Effective Phase 1 Area/ Phase 2 Area Boundary
- Mean Higher High Water Level (MHHW) 5.69 feet NAVD88 from National Oceanic and Atmospheric Administration Station ID 9414290
- Study Area Boundary
- Former Railroad Tracks
- Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- 5 — Topographic Contour (Contour Interval : 5 Feet)
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

COMMISSARY/PX PHASE 1 AND 2 CORRECTIVE ACTION AREAS

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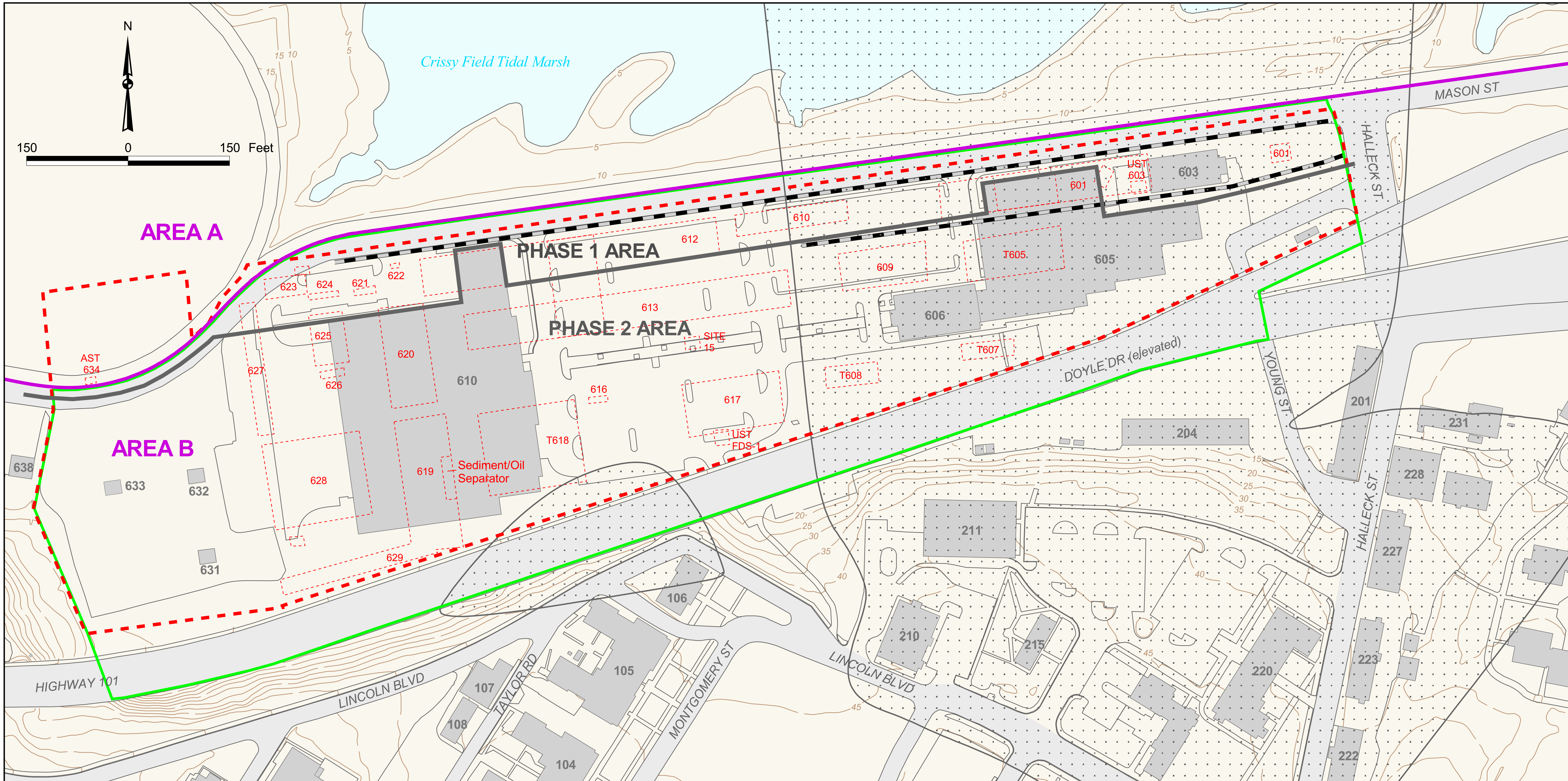
FIGURE 2A

Treadwell & Rollo 2893_11\COMMISSARY\FINAL_CAP.APR 12/2005



LEGEND

- Area A / Area B Boundary
- Effective Phase 1 Area/ Phase 2 Area Boundary
- Land Use Control Area
- Study Area Boundary
- Former Railroad Tracks
- 5 Topographic Contour (Contour Interval : 5 Feet)
- 19th Century Quartermaster Depot & Landfill
- 629 Former Motor Pool Structure and Identification Number
- 610 Existing Structure and Identification Number

Notes:
Former railroad tracks located outside of the Commissary/PX Study Area omitted for clarity.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: North American Vertical Datum, NAVD88

AREA B LAND USE CONTROL ZONE

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FIGURE 2B

Treadwell & Rollo 2893_11\COMMISSARY\FINAL_CAP.APR 12/2005

LEGEND

- Groundwater Monitoring Well Location
- Surface Water Seep Location
- Former A2 Zone Bioassay Study Micro Well
  Source: IT, 1997. Report of Petroleum Hydrocarbon Bioassay and Point of Compliance Concentration Determinations, Salt Water Ecological Protection Zone, Presidio of San Francisco, California. December.
- Former A1 Zone Bioassay Study Micro Well
  Source: IT, 1997. Report of Petroleum Hydrocarbon Bioassay and Point of Compliance Concentration Determinations, Salt Water Ecological Protection Zone, Presidio of San Francisco, California. December.
- Historical Sample Location
- Commissary/PX Study Area Boundary
- Building 637 Corrective Action Plan Area
- Buildings 207/231 Corrective Action Plan Area
- FDS Removal
- Building 633 Pistol Range Site Investigation *
- UST FDS-1 Removal
- Commissary Seeps Interim Source Removal Action
- Contigency Site 171199-1100 (Approximate Location)
  Source: Trust, 1999a, Letter regarding Crissy Field Area Contingency Plan Site 171199-1100: Seeps in Southwest Corner of the Tidal Marsh, Commissary Area, Area A, Presidio of San Francisco. 19 November.
- Commissary Construction Waste Oil Tank Removal (approximate)
  Source: Dames & Moore, 1997. Final Remedial Investigation Report, Presidio Main Installation, Presidio of San Francisco. January.
- UST 603 Removal
- Removed FDS Line and/or Conveyance Line
- Former Railroad *
- Former Storm Drain
- Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- Topographic Contour (Contour Interval : 5 Feet)
- FDS Test Pit
  Source: Montgomery Watson, 1999a. Additional Investigation of Fuel Distribution Systems, Presidio of San Francisco, California. July.
- LTTD Pretreatment Soil Sampling Investigation
  Source: Montgomery Watson, 1996a. LTTD Pretreatment Baseline Soil Sampling at Motor Pool Area. May.
- Contigency Site 111098-1100 (Approximate Location)
  Source: Golden Gate National Park Association, 1998, Form 1, Soil Observation Field Report Form 10 November.
- Former Fuel Dispensing ans Storage Features
- Former Grease Racks, Wash Racks, Waste Oil Tanks, Oil/Water Separators
- Refer to Inset Map for enlarged area
- Former Coal Bin Storage *
- Former Motor Pool Shops
- 609 Former Motor Pool Structures
- 605 Existing Building and Number

Notes:
* Selected Remedial Action for these Sites to be Presented in "Remedial Action Plan, Baker Beach Disturbed Areas 1, 1A, 2, and 2A and Twenty-Seven Other Sites, Presidio of San Francisco, California" MACTEC, 2004.

For additional previous investigation specific information refer to Table 2.

Elevations based on feet above mean sea level.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

Vertical Datum (topography): North American Vertical Datum, NAVD88, feet

PREVIOUS INVESTIGATION AND REMOVAL ACTION AREAS

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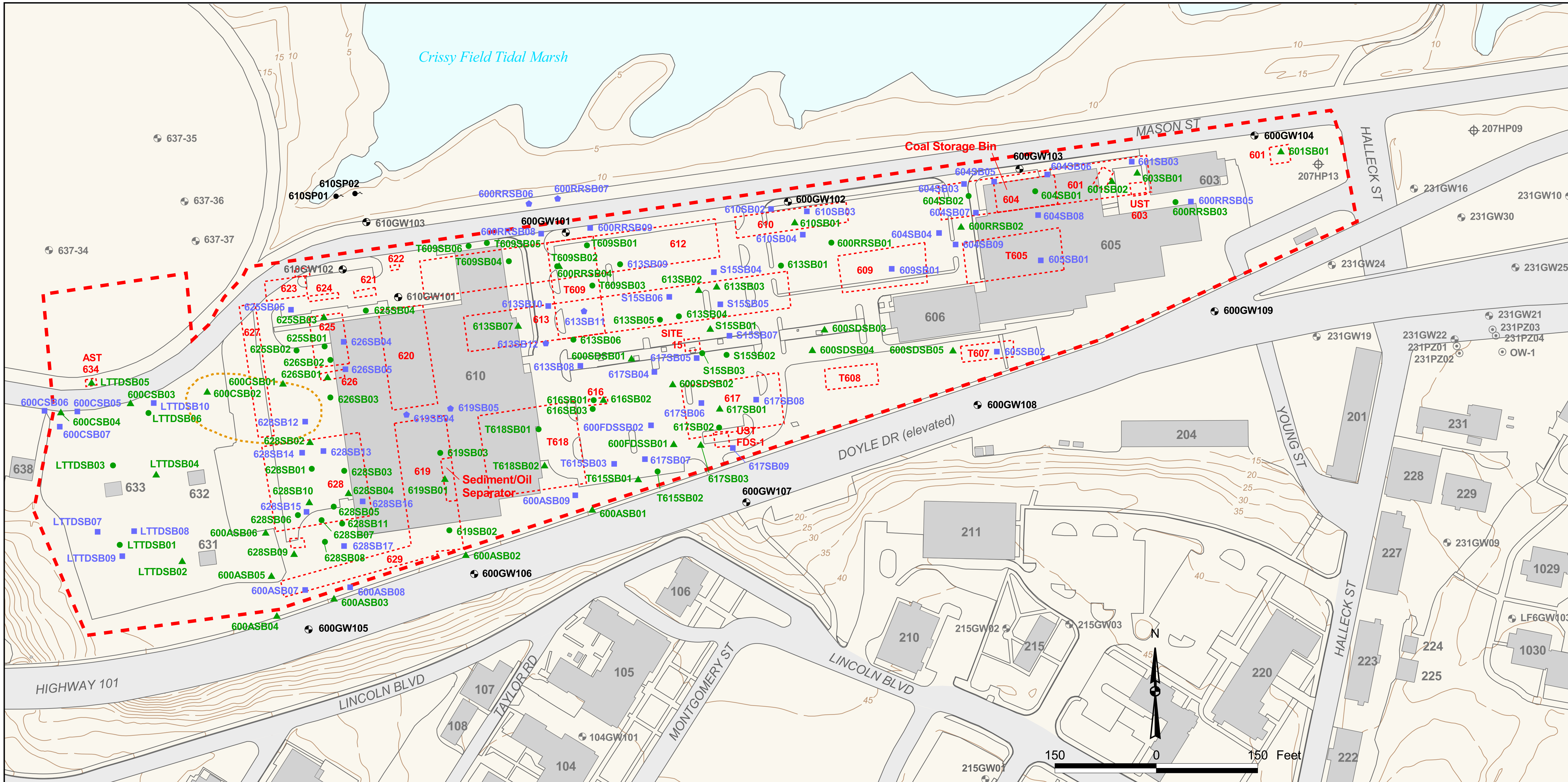
FIGURE 3

Treadwell & Rollo 2893_11\COMMISSARY\CommPX_CAP_FIG3.APR 12/2005



LEGEND

- LTTDSB01 — Phase 1 - Soil Sample Location
- 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- LTTDSB07 — Phase 2 - Soil Sample Location
- 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 610SP01 — Seep Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- 637-35 — Adjacent Study Area Shallow Groundwater Monitoring Well
- 231PZ01 — Adjacent Study Area Shallow Piezometer
- 207HP09 — CPT Boring (Approximate Location) Source: Draft Final Building 207/231 Correction Action Plan, Montgomery Watson, August 1999b
- Study Area Boundary
- 5 — Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- Proposed SFr-6 Boundary (Archaeologically Sensitive Area)
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

Notes:
Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

Vertical Datum: North American Vertical Datum, NAVD88, feet

SITE INVESTIGATION SAMPLING LOCATIONS

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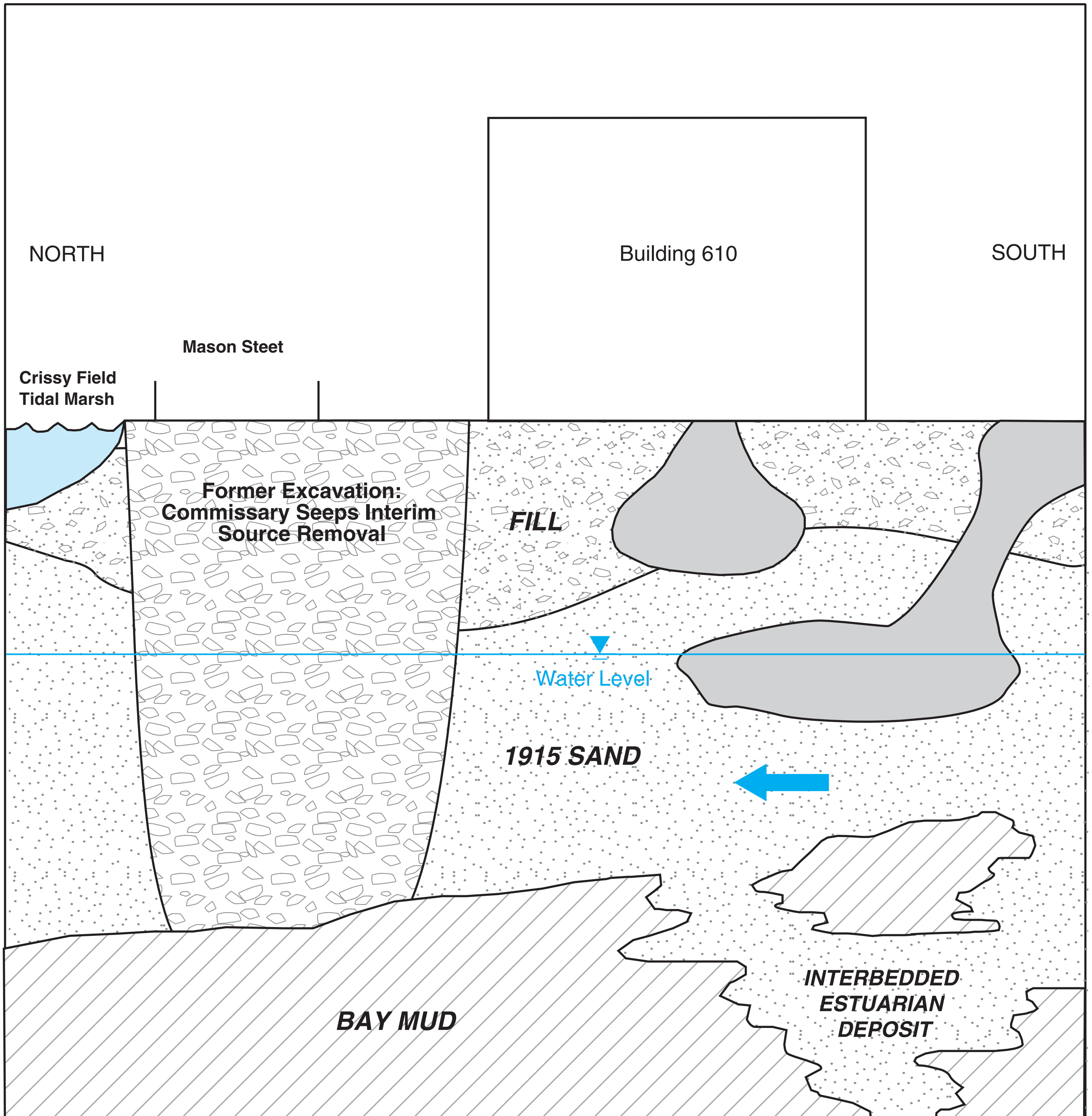
FIGURE 4



LEGEND

- Bay Mud
- TPH/PAH Impacted Soil
- Fill
- 1915 Sand/Interbedded Estuarian Deposit
- Water level
- Groundwater flow direction
- Geologic contact

Note:
Drawing is schematic, represents typical site subsurface conditions and is not drawn to scale.

GENERALIZED SUBSURFACE CONDITIONS

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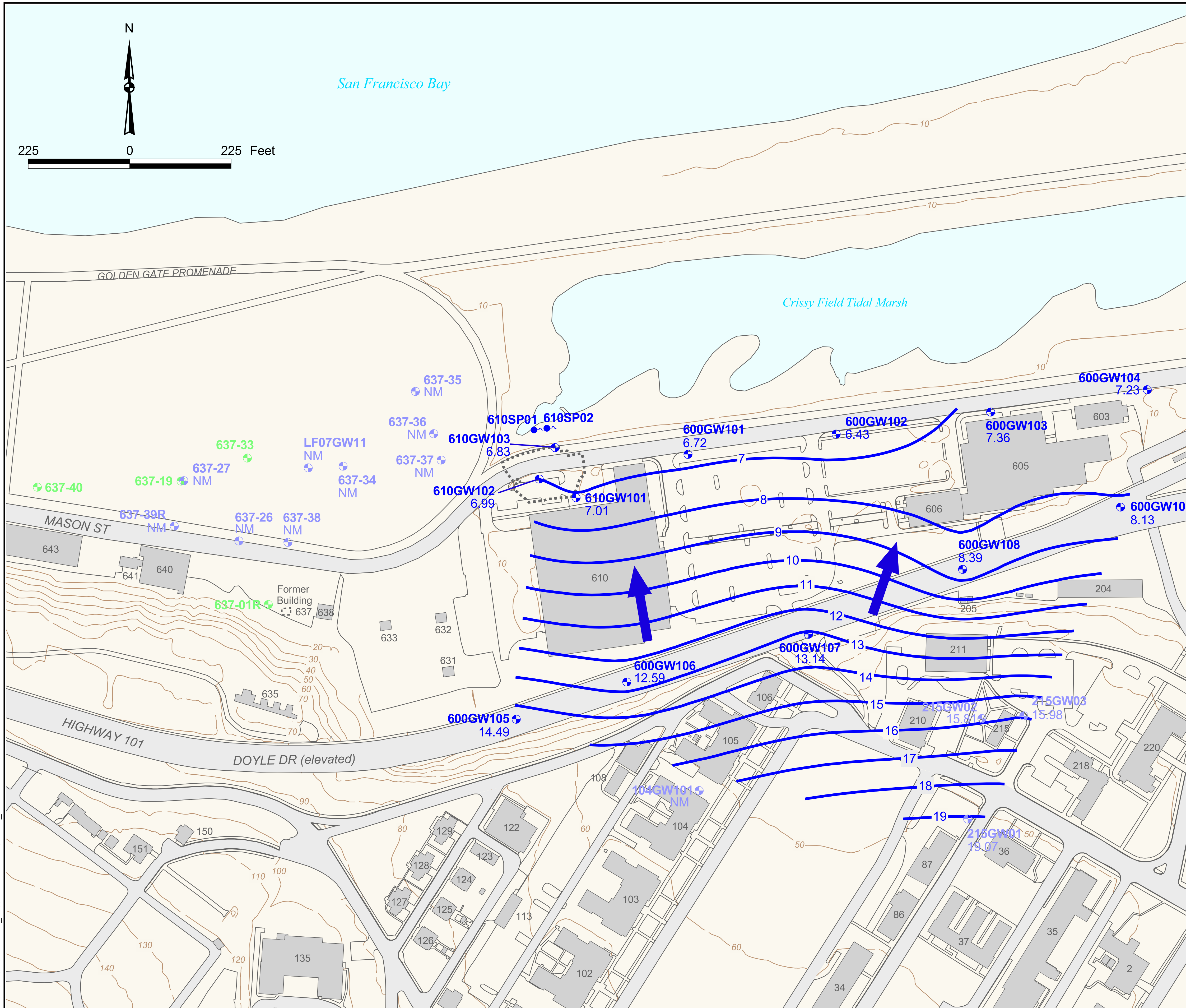
FIGURE 5

Treadwell & Rollo 2893_11\commissary\Final_CAP_fig_05.ai 10/2005



LEGEND

- 610GW101 7.01 — A1 Groundwater Monitoring Well, March 2005 Groundwater Elevation
- 637-35 — Adjacent Study Area A1 Zone Groundwater Monitoring Well
- NM — Not Measured. Well approved for removal from the groundwater monitoring program prior to the Second Quarter 2004.
- 637-19 — Adjacent Study Area A2 Zone Groundwater Monitoring Well
- 610SP01 — Surface Water Seep Location
- Approximate Direction of Groundwater Flow
- Groundwater Contour (Contour Interval : 1 ft)
- Commissary Seeps Interim Source Removal Excavation
- Topographic Contour (Contour Interval : 10 ft)
- 610 — Building and Number

Notes:
Groundwater elevation data collected on 14 March 2005.

The excavation boundary is defined in the Commissary Seeps Interim Removal Action Report (Treadwell & Rollo, 2002a).

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

Vertical Datums: (groundwater) Presidio Lower Low Water (ft. PLLW) (topography) North American Vertical Datum, NAVD88

COMMISSARY/PX AREA
14 MARCH 2005
GROUNDWATER ELEVATION MAP
A1 ZONE WELLS

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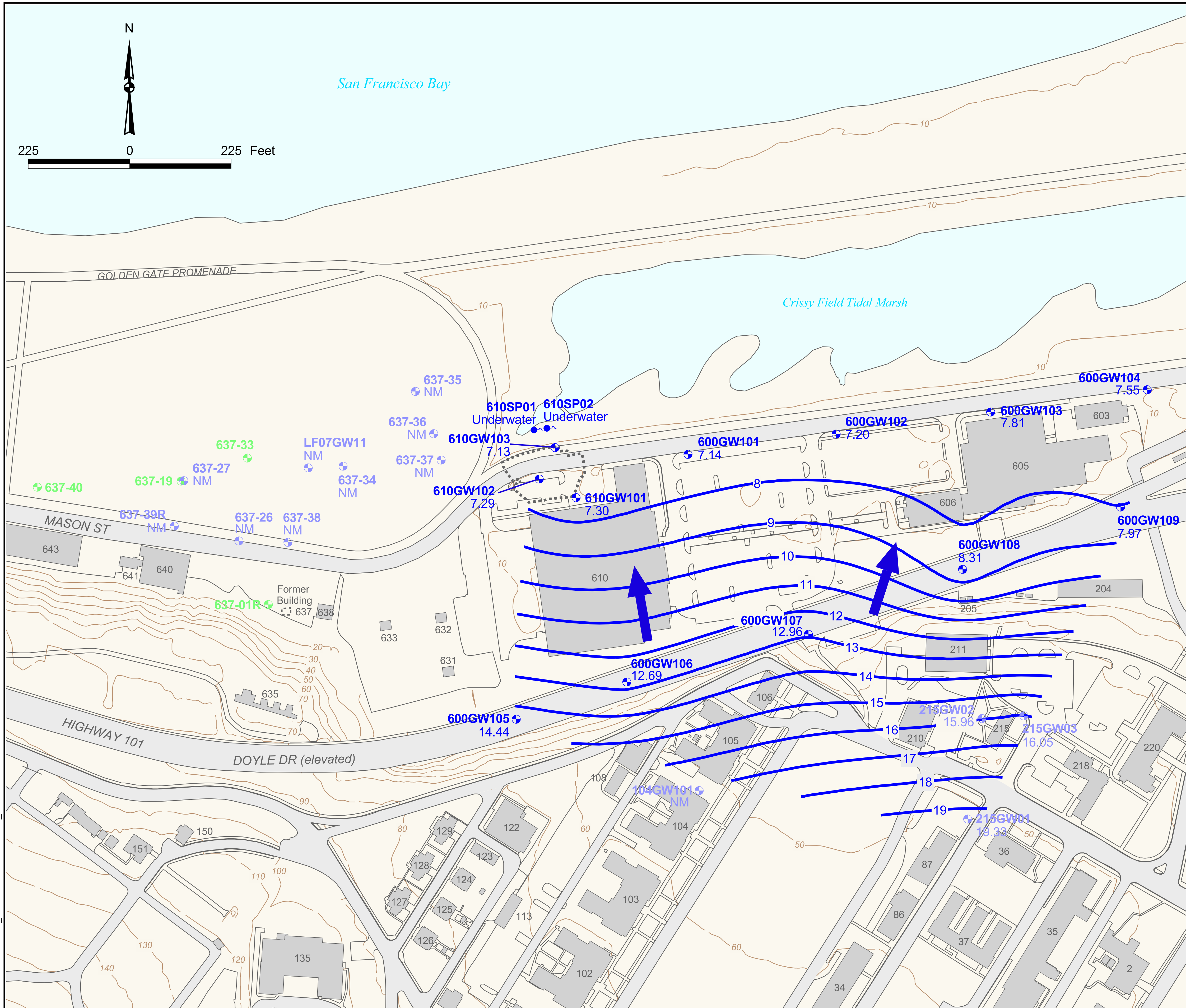
FIGURE 6

Treadwell & Rollo 2893_11\COMMISSARY\FINAL_CAP.APR 12/2005



LEGEND

610GW101 7.30	A1 Groundwater Monitoring Well May 2005 Groundwater Elevation
637-35	Adjacent Study Area A1 Zone Groundwater Monitoring Well
NM	Not Measured. Well approved for removal from the groundwater monitoring program prior to the Second Quarter 2004.
637-19	Adjacent Study Area A2 Zone Groundwater Monitoring Well
610SP01	Surface Water Seep Location
	Approximate Direction of Groundwater Flow
	Groundwater Contour (Contour Interval : 1 ft)
	Commissary Seeps Interim Source Removal Excavation
	Topographic Contour (Contour Interval : 10 ft)
610	Building and Number

Notes:
Groundwater elevation data collected on 23 May 2005.

The excavation boundary is defined in the Commissary Seeps Interim Removal Action Report (Treadwell & Rollo, 2002a).

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

Vertical Datums: (groundwater) Presidio Lower Low Water (ft. PLLW) (topography) North American Vertical Datum, NAVD88

COMMISSARY/PX AREA
23 MAY 2005
GROUNDWATER ELEVATION MAP
A1 ZONE WELLS

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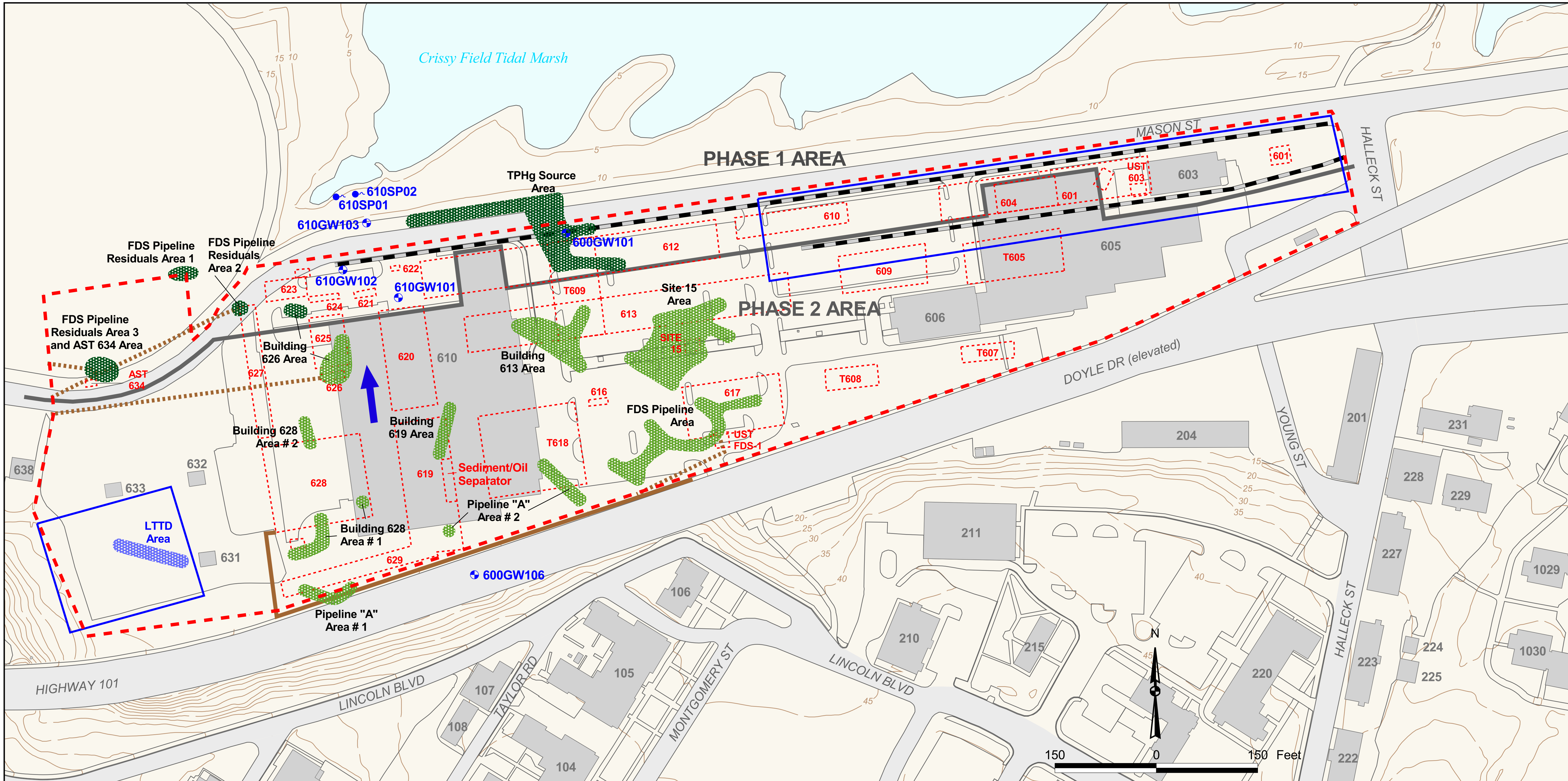
FIGURE 7

Treadwell & Rollo 2893_11\COMMISSARY\FINAL_CAP.APR 12/2005



LEGEND

- 610SP01 Proposed Commissary/PX Seep Monitoring Location
- 600GW106 Proposed Commissary/PX Groundwater Monitoring Well Location
- Approximate Direction of Groundwater Flow
- Former Railroad Tracks
- Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- Study Area Boundary
- Effective Phase 1 Area/ Phase 2 Area Boundary
- 5 Topographic Contour (Contour Interval : 5 Feet)
- Approximate Extent of Phase 1 Impacted Soil
- Approximate Extent of Phase 2 Impacted Soil
- LTTD Area is being addressed under the Building 633 Firing Range CERCLA program
- Areas addressed under the CERCLA program
- 629 Former Motor Pool Structure and Identification Number
- 610 Existing Structure and Identification Number

Notes:
Remedial Action for CERCLA Sites addressed in "Remedial Action Plan, Baker Beach Disturbed Areas 1, 1A, 2, and 2A and Twenty-Seven Other Sites, Presidio of San Francisco, California" MACTEC, 2004.

Former distribution pipelines and former railroad tracks located outside of the Commissary/PX Study Area omitted for clarity.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: North American Vertical Datum, NAVD88

SOIL REMEDIAL UNITS AND GROUNDWATER AND SURFACE WATER MONITORING NETWORK

Treadwell&Rollo

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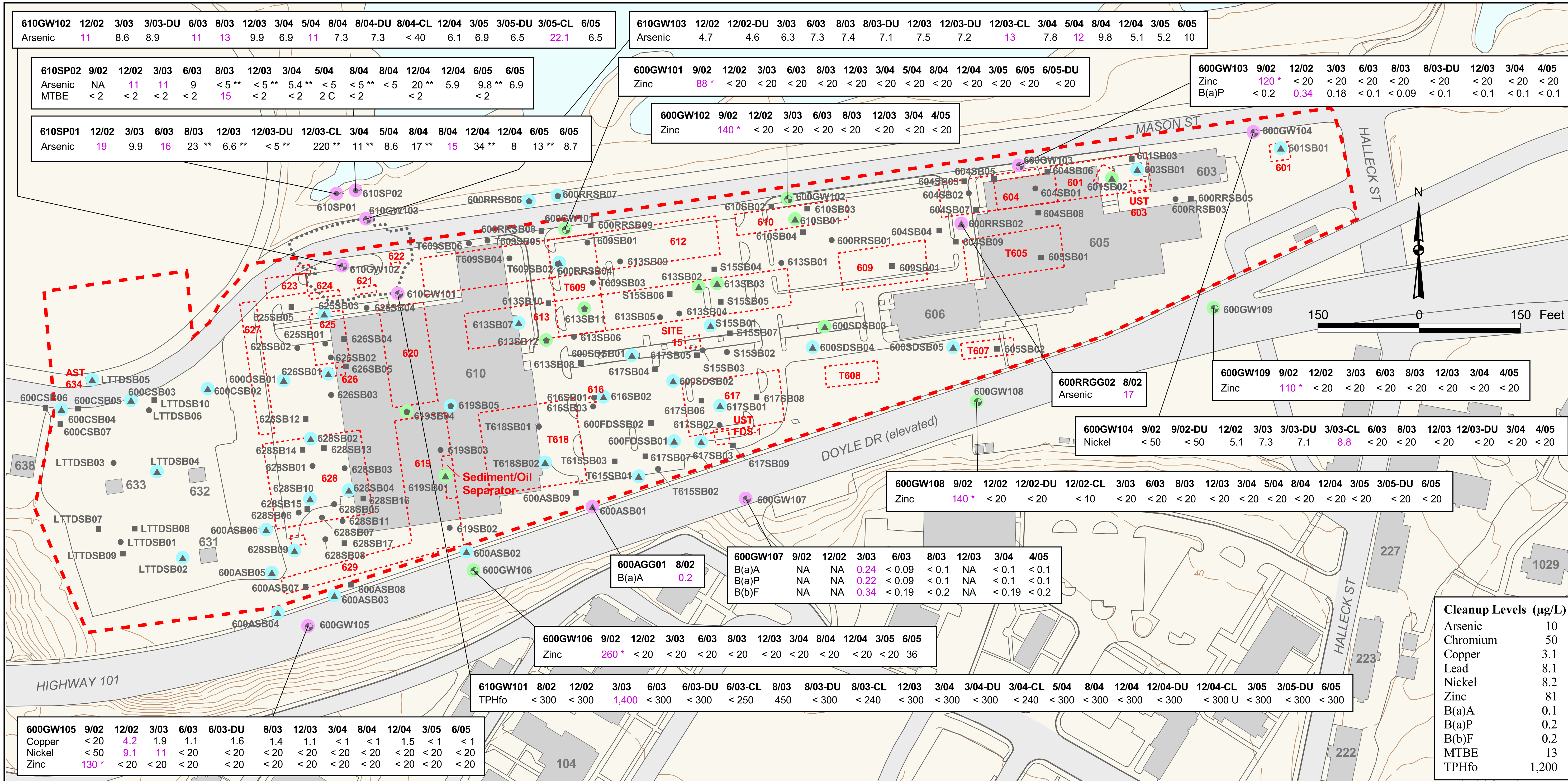
FIGURE 8

Treadwell & Rollo 2893_11\COMMISSARY\FINAL_CAP.APR 12/2005



610GW102	12/02	3/03	3/03-DU	6/03	8/03	12/03	3/04	5/04	8/04	8/04-DU	8/04-CL	12/04	3/05	3/05-DU	3/05-CL	6/05
Arsenic	11	8.6	8.9	11	13	9.9	6.9	11	7.3	7.3	< 40	6.1	6.9	6.5	22.1	6.5

610GW103	12/02	12/02-DU	3/03	6/03	8/03	8/03-DU	12/03	12/03-DU	12/03-CL	3/04	5/04	8/04	12/04	3/05	6/05
Arsenic	4.7	4.6	6.3	7.3	7.4	7.1	7.5	7.2	13	7.8	12	9.8	5.1	5.2	10

610SP02	9/02	12/02	3/03	6/03	8/03	12/03	3/04	5/04	8/04	8/04	12/04	12/04	6/05	6/05
Arsenic	NA	11	11	9	< 5 **	< 5 **	5.4 **	< 5	< 5 **	< 5	20 **	5.9	9.8 **	6.9
MTBE	< 2	< 2	< 2	< 2	15	< 2	< 2	2 C	< 2		< 2		< 2	

600GW101	9/02	12/02	3/03	6/03	8/03	12/03	3/04	5/04	8/04	12/04	3/05	6/05	6/05-DU
Zinc	88 *	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20

600GW103	9/02	12/02	3/03	6/03	8/03	8/03-DU	12/03	3/04	4/05
Zinc	120 *	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
B(a)P	< 0.2	0.34	0.18	< 0.1	< 0.09	< 0.1	< 0.1	< 0.1	< 0.1

610SP01	12/02	3/03	6/03	8/03	12/03	12/03-DU	12/03-CL	3/04	5/04	8/04	8/04	12/04	12/04	6/05	6/05
Arsenic	19	9.9	16	23 **	6.6 **	< 5 **	220 **	11 **	8.6	17 **	15	34 **	8	13 **	8.7

600GW102	9/02	12/02	3/03	6/03	8/03	12/03	3/04	4/05
Zinc	140 *	< 20	< 20	< 20	< 20	< 20	< 20	< 20

600GW109	9/02	12/02	3/03	6/03	8/03	12/03	3/04	4/05
Zinc	110 *	< 20	< 20	< 20	< 20	< 20	< 20	< 20

600RRGG02	8/02
Arsenic	17

600GW104	9/02	9/02-DU	12/02	3/03	3/03-DU	3/03-CL	6/03	8/03	12/03	12/03-DU	3/04	4/05
Nickel	< 50	< 50	5.1	7.3	7.1	8.8	< 20	< 20	< 20	< 20	< 20	< 20

600GW108	9/02	12/02	12/02-DU	12/02-CL	3/03	6/03	8/03	12/03	3/04	5/04	8/04	12/04	3/05	3/05-DU	6/05
Zinc	140 *	< 20	< 20	< 10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20

600AGG01	8/02
B(a)A	0.2

600GW107	9/02	12/02	3/03	6/03	8/03	12/03	3/04	4/05
B(a)A	NA	NA	0.24	< 0.09	< 0.1	NA	< 0.1	< 0.1
B(a)P	NA	NA	0.22	< 0.09	< 0.1	NA	< 0.1	< 0.1
B(b)F	NA	NA	0.34	< 0.19	< 0.2	NA	< 0.19	< 0.2

600GW106	9/02	12/02	3/03	6/03	8/03	12/03	3/04	8/04	12/04	3/05	6/05
Zinc	260 *	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	36

610GW101	8/02	12/02	3/03	6/03	6/03-DU	6/03-CL	8/03	8/03-DU	8/03-CL	12/03	3/04	3/04-DU	3/04-CL	5/04	8/04	12/04	12/04-DU	12/04-CL	3/05	3/05-DU	6/05
TPHfo	< 300	< 300	1,400	< 300	< 300	< 250	450	< 300	< 240	< 300	< 300	< 300	< 240	< 300	< 300	< 300	< 300	< 300 U	< 300	< 300	< 300

600GW105	9/02	12/02	3/03	6/03	6/03-DU	8/03	12/03	3/04	8/04	12/04	3/05	6/05
Copper	< 20	4.2	1.9	1.1	1.6	1.4	1.1	< 1	< 1	1.5	< 1	< 1
Nickel	< 50	9.1	11	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Zinc	130 *	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20

Cleanup Levels	(µg/L)
Arsenic	10
Chromium	50
Copper	3.1
Lead	8.1
Nickel	8.2
Zinc	81
B(a)A	0.1
B(a)P	0.2
B(b)F	0.2
MTBE	13
TPHfo	1,200

LEGEND

- ● LTTDSB01 — Phase 1 - Soil Sample Location
- ▲ 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 — Phase 2 - Soil Sample Location
- ⬟ 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- 610SP01 — Seep Sample Location
- Study Area Boundary
- Commissary Seeps Interim Source Removal Excavation
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

Sample Date — Duplicate Sample — Quality Control Duplicate Sample

600GW108	9/02	12/02	12/02-DU	12/02-CL	3/03	6/03	8/03	12/03
Zinc	140 *	< 20	< 20	< 10	< 20	< 20	< 20	< 20

Refer to Notes

Values in pink are above cleanup levels

Abbreviated Analytes
B(a)A - Benzo(a)Anthracene
B(a)P - Benzo(a)Pyrene
B(b)F - Benzo(b)Fluoranthene
MTBE - Methyl Tertiary-Butyl Ether
TPHfo - Total Petroleum Hydrocarbons as Fuel Oil

- Value above cleanup level - refer to chembox for specific analytes
- Value below cleanup level for all analytes
- No analytes detected

Notes:
Results reported in micrograms/liter (µg/L).

Only groundwater data collected since August 2002 are presented.

Additional Results for 610 wells and Data Qualifers are presented in Appendix C.

CL - Suffix denotes a Quality Control Duplicate Sample sent to a Control Lab.
NA - Not analyzed

* - Zinc exceedances due to filter type used by Blaine Tech in September 2002 (refer to Section 2 of the main text)

** - Total metals results; samples were not filtered.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: North American Vertical Datum, NAVD88

POTENTIAL CONTAMINANTS OF CONCERN IN GROUNDWATER

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FIGURE 9

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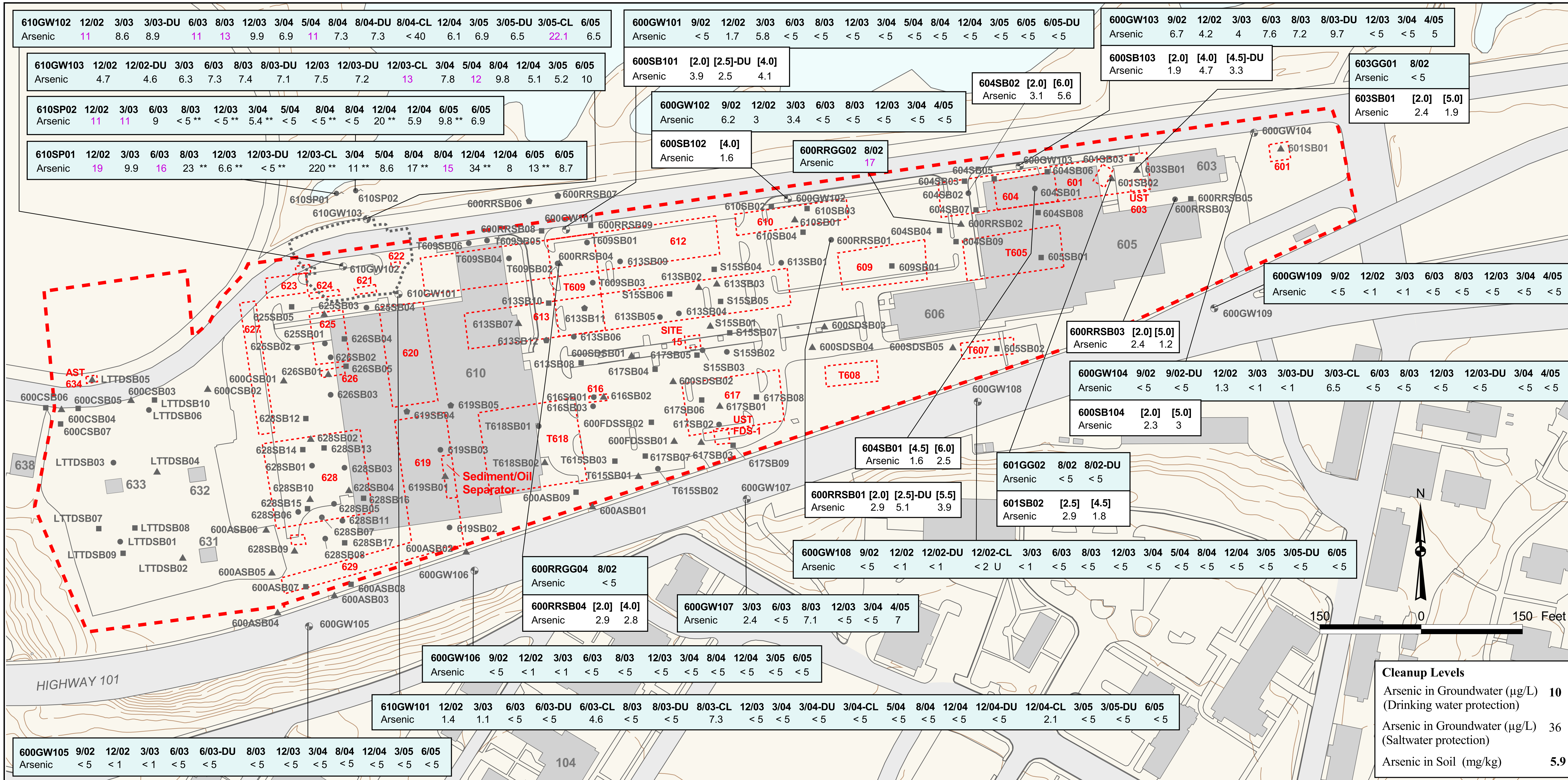

Cleanup Levels

Arsenic in Groundwater (µg/L) (Drinking water protection)	10
Arsenic in Groundwater (µg/L) (Saltwater protection)	36
Arsenic in Soil (mg/kg)	5.9

LEGEND

- ● LTTDSB01 Phase 1 - Soil Sample Location
- ▲ 600ASB01 Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 Phase 2 - Soil Sample Location
- ⬟ 619SB04 Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 Groundwater Monitoring Well Location
- 610SP01 Seep Sample Location
- Study Area Boundary
- Commissary Seeps Interim Source Removal Excavation
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 Former Motor Pool Structure and Identification Number
- 610 Existing Structure and Identification Number

GROUNDWATER RESULTS

Sample Date — Duplicate Sample — Quality Control Duplicate Sample

610SP01	12/02	3/03	6/03	8/03	12/03	12/03-DU	12/03-CL
Arsenic	19	9.9	16	23 **	6.6	< 5	220 **

Values in pink are above cleanup levels — Refer to Notes

SOIL RESULTS

Depth in Feet — Duplicate Sample

600RRSB01	[2.0]	[2.5]-DU	[5.5]
Arsenic	2.9	5.1	3.9

Notes:
Results reported in micrograms/liter (µg/L) for groundwater and milligrams/kilogram (mg/kg) for soil.

Only groundwater data collected since August 2002 are presented.

Additional Results and Data Qualifers are presented in Appendix C.

GG - Groundwater Grab Sample
GW - Groundwater Well Sample
SB - Soil Boring Sample
SP - Seep Sample

** - Total metals results; samples were not filtered.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: (topography) North American Vertical Datum, NAVD88

ARSENIC IN SOIL AND GROUNDWATER

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FIGURE 10

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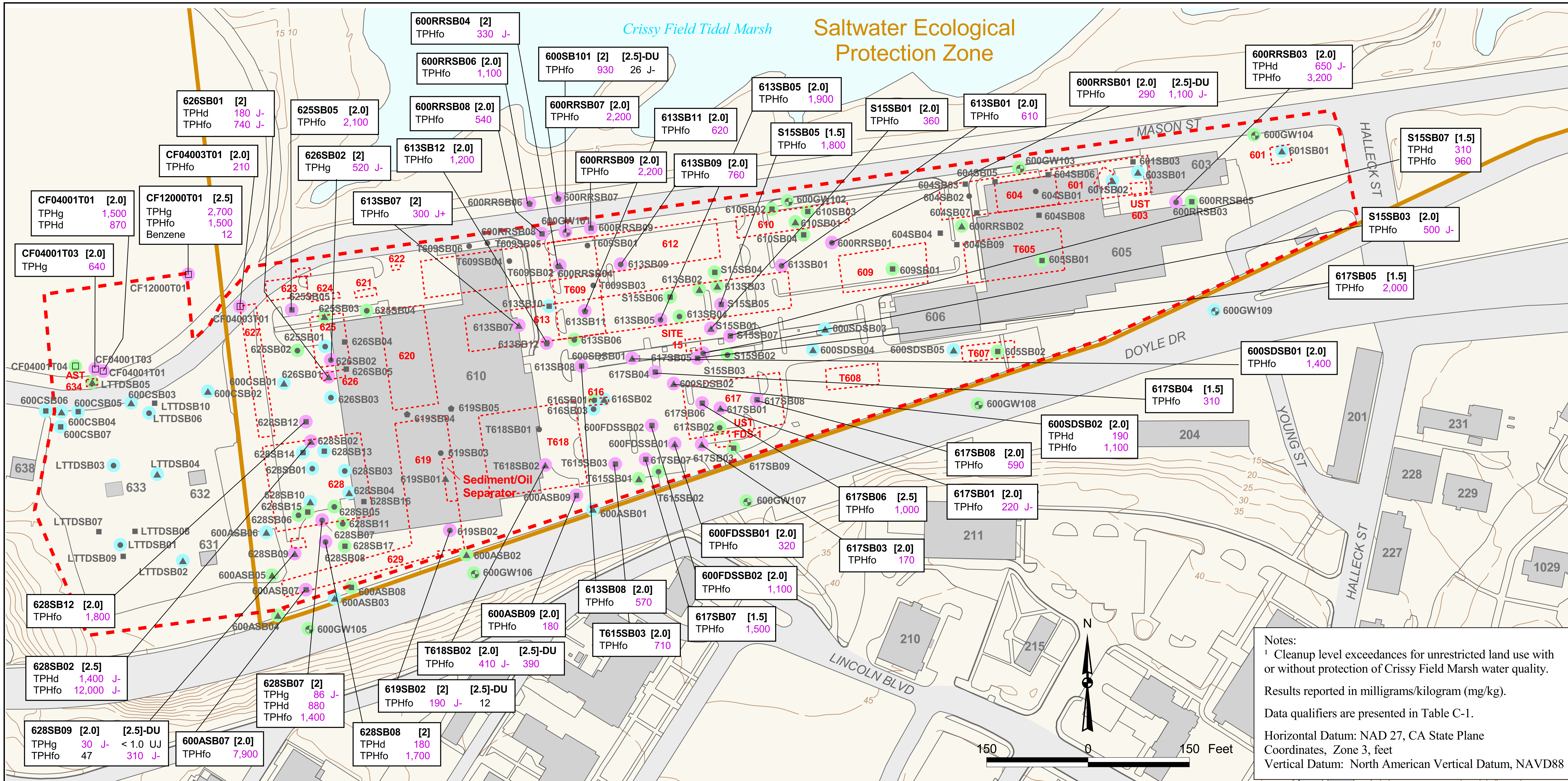

Notes:
[1] Cleanup level exceedances for unrestricted land use with or without protection of Crissy Field Marsh water quality.

Results reported in milligrams/kilogram (mg/kg).

Data qualifiers are presented in Table C-1.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: North American Vertical Datum, NAVD88

LEGEND

- ● LTTDSB01 Phase 1 - Soil Sample Location
- ▲ 600ASB01 Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 Phase 2 - Soil Sample Location
- ⬟ 619SB04 Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 Groundwater Monitoring Well Location
- □ CF04003T01 Army FDS Closure Excavation Soil Sample (IT, 1999)
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003) (Areas north and east of boundary lie within zone)
- Study Area Boundary
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 Former Motor Pool Structure and Identification Number
- 610 Existing Structure and Identification Number

[depth in feet]

T618SB02 [2.0] [2.5]-DU — Duplicate Sample
TPHfo 410 J- 390 — Values in pink are above cleanup levels
Data Qualifiers

Abbreviated Analytes
TPHg - Total Petroleum Hydrocarbons as Gasoline
TPHd - Total Petroleum Hydrocarbons as Diesel
TPHfo - Total Petroleum Hydrocarbons as Fuel Oil

Cleanup Levels for Unrestricted Land Use

	With Protection of Crissy Field Marsh Water Quality *	Without Protection of Crissy Field Marsh Water Quality **
TPHg	11.6 mg/kg	610 mg/kg
TPHd	144 mg/kg	700 mg/kg
TPHfo	144 mg/kg	980 mg/kg
Benzene	0.6 mg/kg	0.6 mg/kg

* within Saltwater Ecological Protection Zone
** outside Saltwater Ecological Protection Zone

TPH Only
- Value above cleanup level
- Value below cleanup level
- Not detected

TPH AND BENZENE CONTAMINANTS OF CONCERN IN SHALLOW SOIL (0 - 3 FEET) [1]

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FIGURE 11

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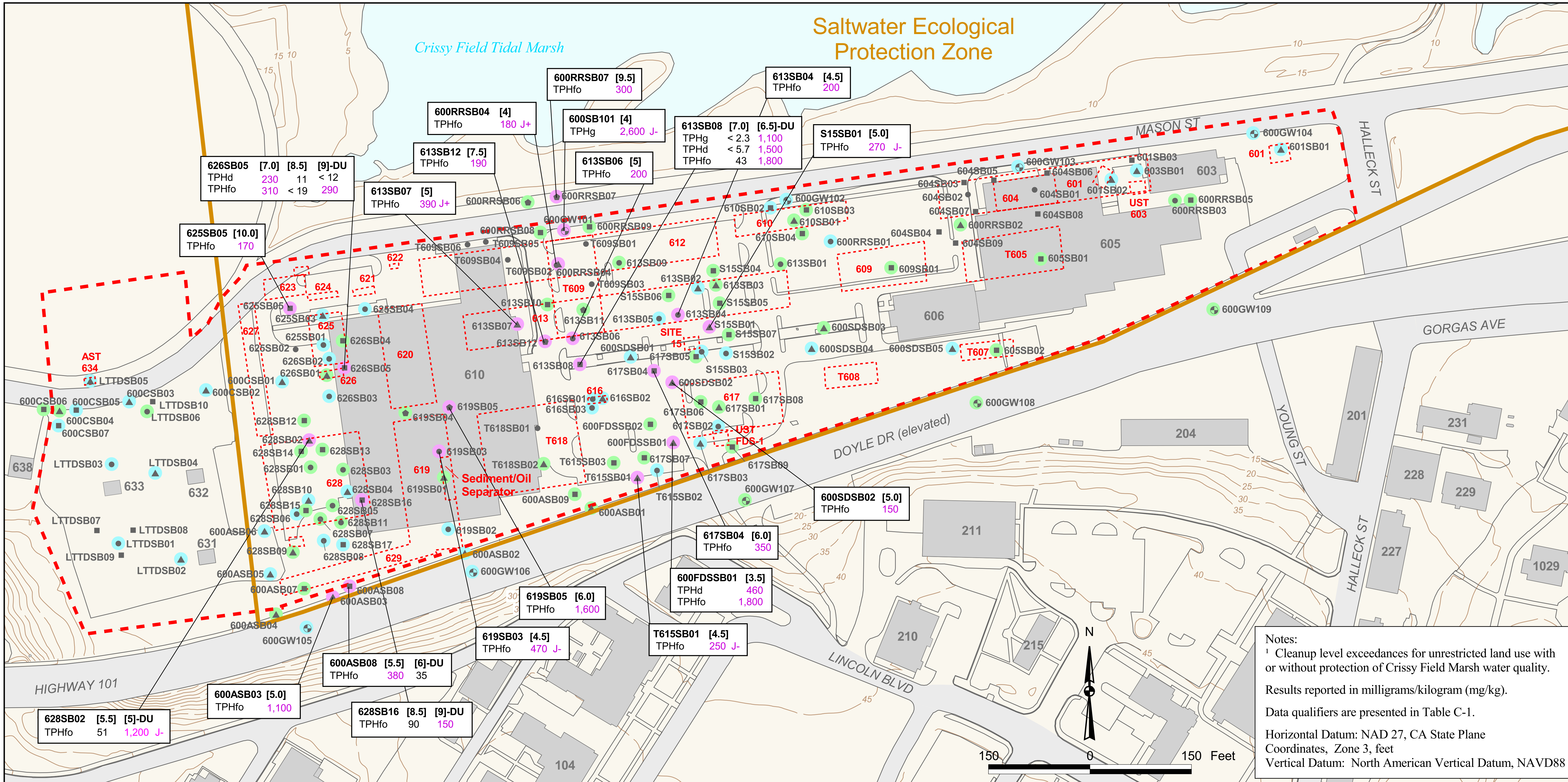

Notes:
[1] Cleanup level exceedances for unrestricted land use with or without protection of Crissy Field Marsh water quality.

Results reported in milligrams/kilogram (mg/kg).

Data qualifiers are presented in Table C-1.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: North American Vertical Datum, NAVD88

LEGEND

- ● LTTDSB01 Phase 1 - Soil Sample Location
- ▲ 600ASB01 Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 Phase 2 - Soil Sample Location
- ⬟ 619SB04 Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 Groundwater Monitoring Well Location
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003) (Areas north and east of boundary lie within zone)
- Study Area Boundary
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 Former Motor Pool Structure and Identification Number
- 610 Existing Structure and Identification Number

[depth in feet]

628SB02 [5.5] [5]-DU — Duplicate Sample
TPHfo 51 1,200 J- — Data Qualifiers

Values in pink are above cleanup levels

Abbreviated Analytes
TPHg - Total Petroleum Hydrocarbons as Gasoline
TPHd - Total Petroleum Hydrocarbons as Diesel
TPHfo - Total Petroleum Hydrocarbons as Fuel Oil

Cleanup Levels for Unrestricted Land Use

	With Protection of Crissy Field Marsh Water Quality *	Without Protection of Crissy Field Marsh Water Quality **
TPHg	11.6 mg/kg	610 mg/kg
TPHd	144 mg/kg	700 mg/kg
TPHfo	144 mg/kg	980 mg/kg
Benzene	0.6 mg/kg	0.6 mg/kg

* within Saltwater Ecological Protection Zone
** outside Saltwater Ecological Protection Zone

- Value above cleanup level
- Value below cleanup level
- Not detected

TPH CONTAMINANTS OF CONCERN IN DEEP SOIL (> 3 FEET) [1]

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FIGURE 12

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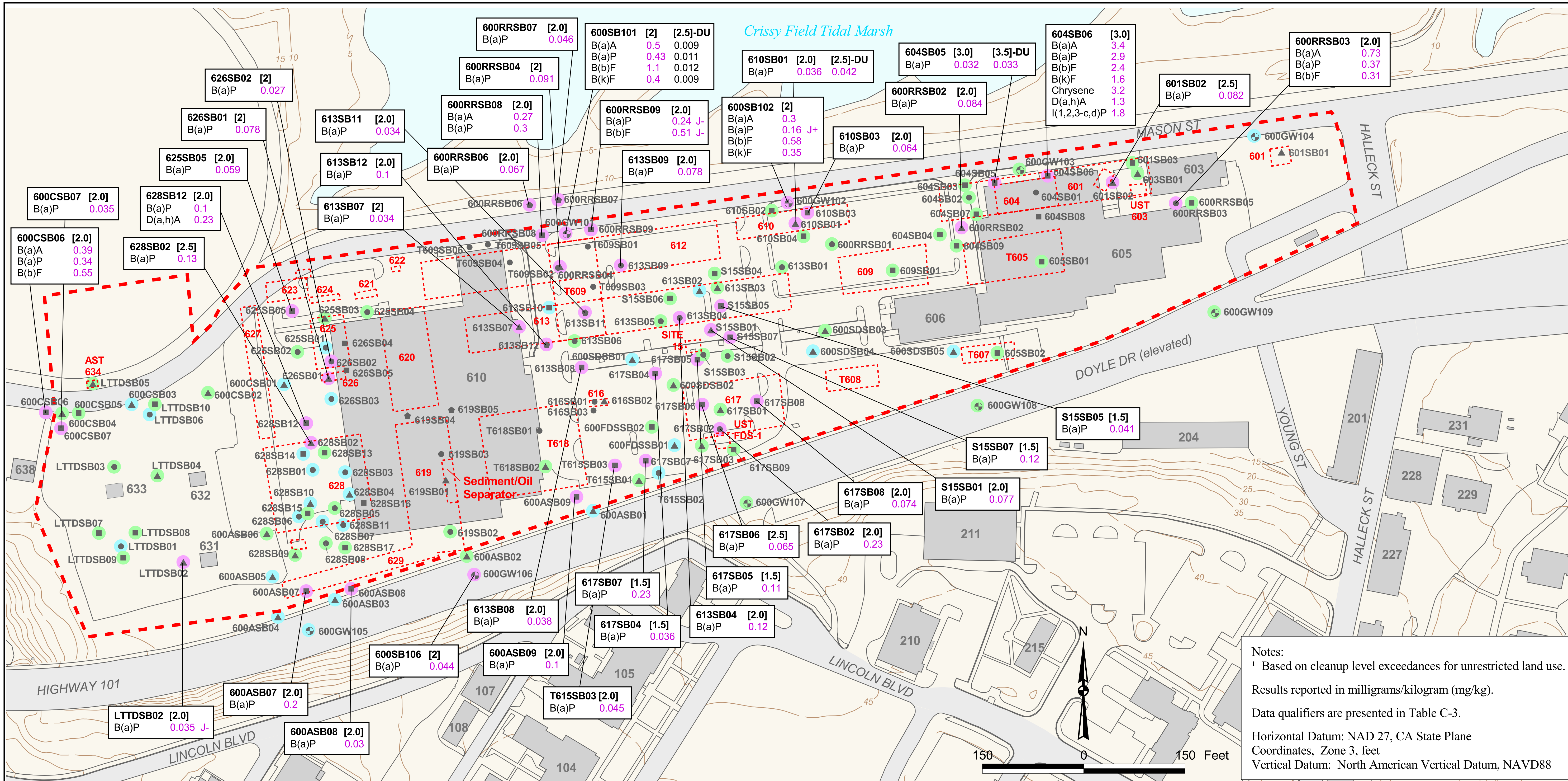

Notes:
[1] Based on cleanup level exceedances for unrestricted land use.

Results reported in milligrams/kilogram (mg/kg).

Data qualifiers are presented in Table C-3.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: North American Vertical Datum, NAVD88

LEGEND

- ● LTTDSB01 — Phase 1 - Soil Sample Location
- ▲ 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 — Phase 2 - Soil Sample Location
- ⬟ 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- Study Area Boundary
- 5 — Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

[depth in feet]

600SB101	[2]	[2]-DU
B(a)A	0.5	0.009
B(a)P	0.43	0.011
B(b)F	1.1	0.012
B(k)F	0.4	0.009

Duplicate Sample

Values in pink are above screening levels

Abbreviated Analytes
B(a)A - Benzo(a)Anthracene
B(a)P - Benzo(a)Pyrene
B(b)F - Benzo(b)Fluoranthene
B(k)F - Benzo(k)Fluoranthene
D(a,h)A - Dibenz(a,h)Anthracene
I(1,2,3-c,d)P - Indeno(1,2,3-c,d)Pyrene

Cleanup Levels
B(a)A - 0.27 mg/kg
B(a)P - 0.027 mg/kg
B(b)F - 0.27 mg/kg
B(k)F - 0.27 mg/kg
Chrysene - 2.7 mg/kg
D(a,h)A - 0.19 mg/kg
I(1,2,3-c,d)P - 0.27 mg/kg

- Value above cleanup level
- Value below cleanup level
- Not detected

PAH CONTAMINANTS OF CONCERN IN SHALLOW SOIL (0 - 3 FEET) [1]

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FIGURE 13

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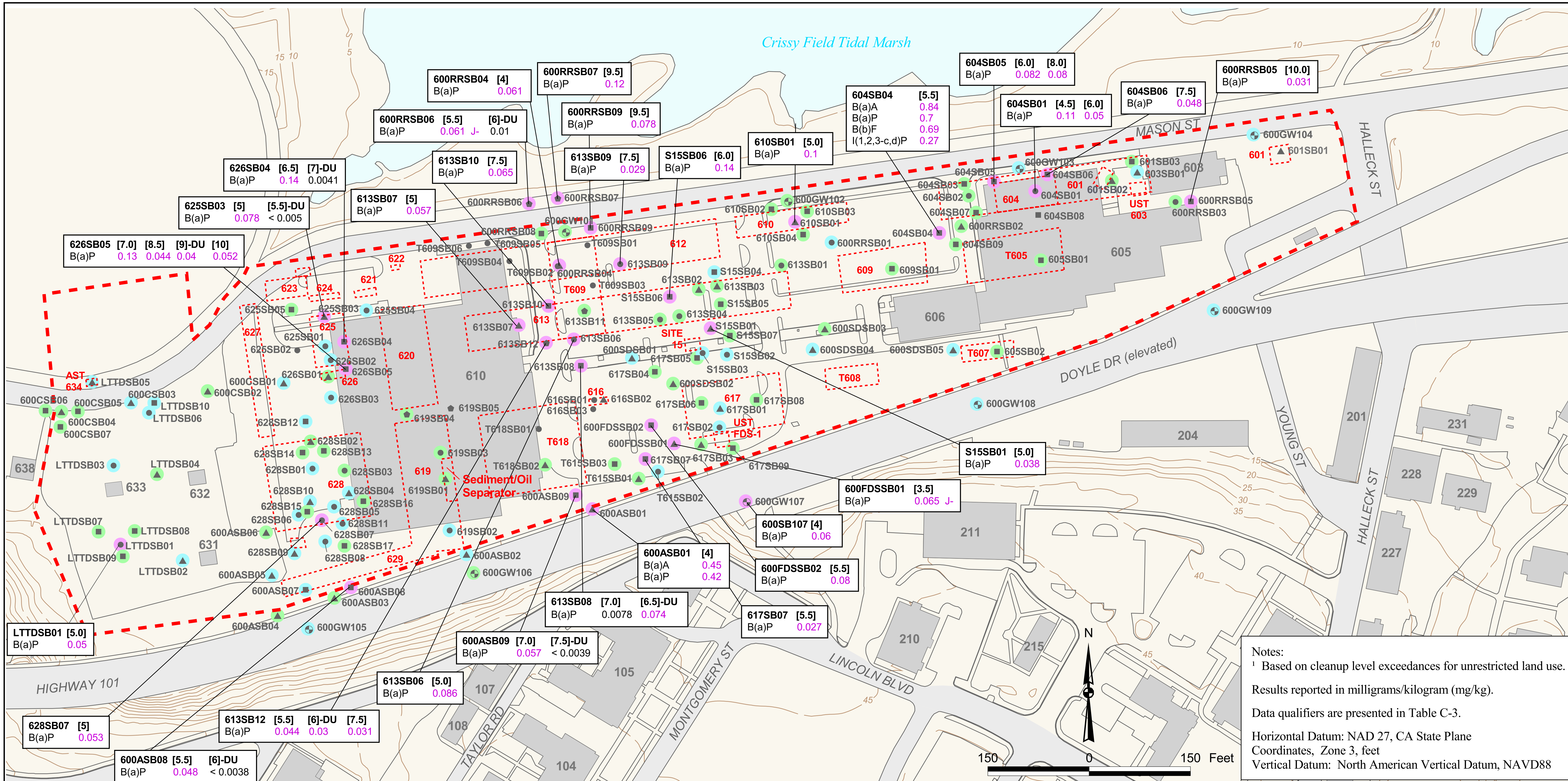

Notes:
¹ Based on cleanup level exceedances for unrestricted land use.

Results reported in milligrams/kilogram (mg/kg).

Data qualifiers are presented in Table C-3.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: North American Vertical Datum, NAVD88

LEGEND

- ● LTTDSB01 — Phase 1 - Soil Sample Location
- ▲ 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 — Phase 2 - Soil Sample Location
- ⬟ 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- Study Area Boundary
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

[depth in feet]

625SB03 [5] [5.5]-DU — Duplicate Sample
B(a)P 0.078 < 0.005

Values in pink are above screening levels

Abbreviated Analytes

B(a)A - Benzo(a)Anthracene
B(a)P - Benzo(a)Pyrene
B(b)F - Benzo(b)Fluoranthene
I(1,2,3-c,d)P - Indeno(1,2,3-c,d)Pyrene

Cleanup Levels

B(a)A - 0.27 mg/kg
B(a)P - 0.027 mg/kg
B(b)F - 0.27 mg/kg
I(1,2,3-c,d)P - 0.27 mg/kg

- Value above cleanup level
- Value below cleanup level
- Not detected

PAH CONTAMINANTS OF CONCERN IN DEEP SOIL (> 3 FEET) ¹

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FIGURE 14

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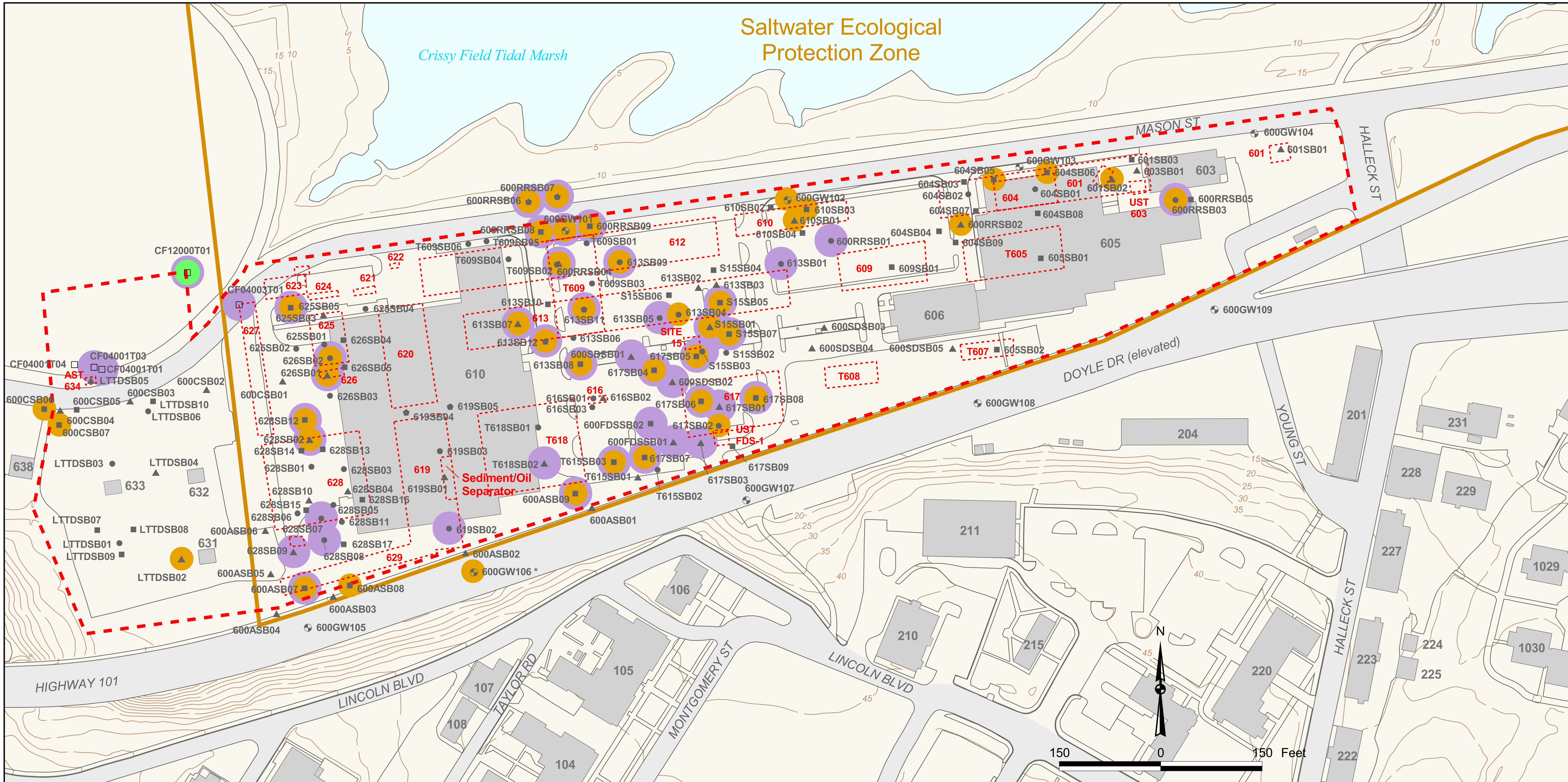

LEGEND

- ● LTTDSB01 — Phase 1 - Soil Sample Location
- ▲ 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 — Phase 2 - Soil Sample Location
- ⬟ 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- □ CF04003T01 — Army FDS Closure Excavation Soil Sample (IT, 1999)
- ⊕ 600GW105 — Groundwater Monitoring Well Location
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Study Area Boundary
- 5 — Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number
- PAH Exceedance in Shallow Soil Samples
- BTEX Exceedance in Shallow Soil Samples
- TPH Exceedance in Shallow Soil Samples

Notes:
[1] Based on cleanup level exceedances for unrestricted land use with or without protection of Crissy Field Marsh water quality.

* Upgradient Location Outside of Study Area

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: North American Vertical Datum, NAVD88

CLEANUP LEVEL EXCEEDANCES IN SHALLOW SOIL (0 - 3 FEET) [1]

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FIGURE 15

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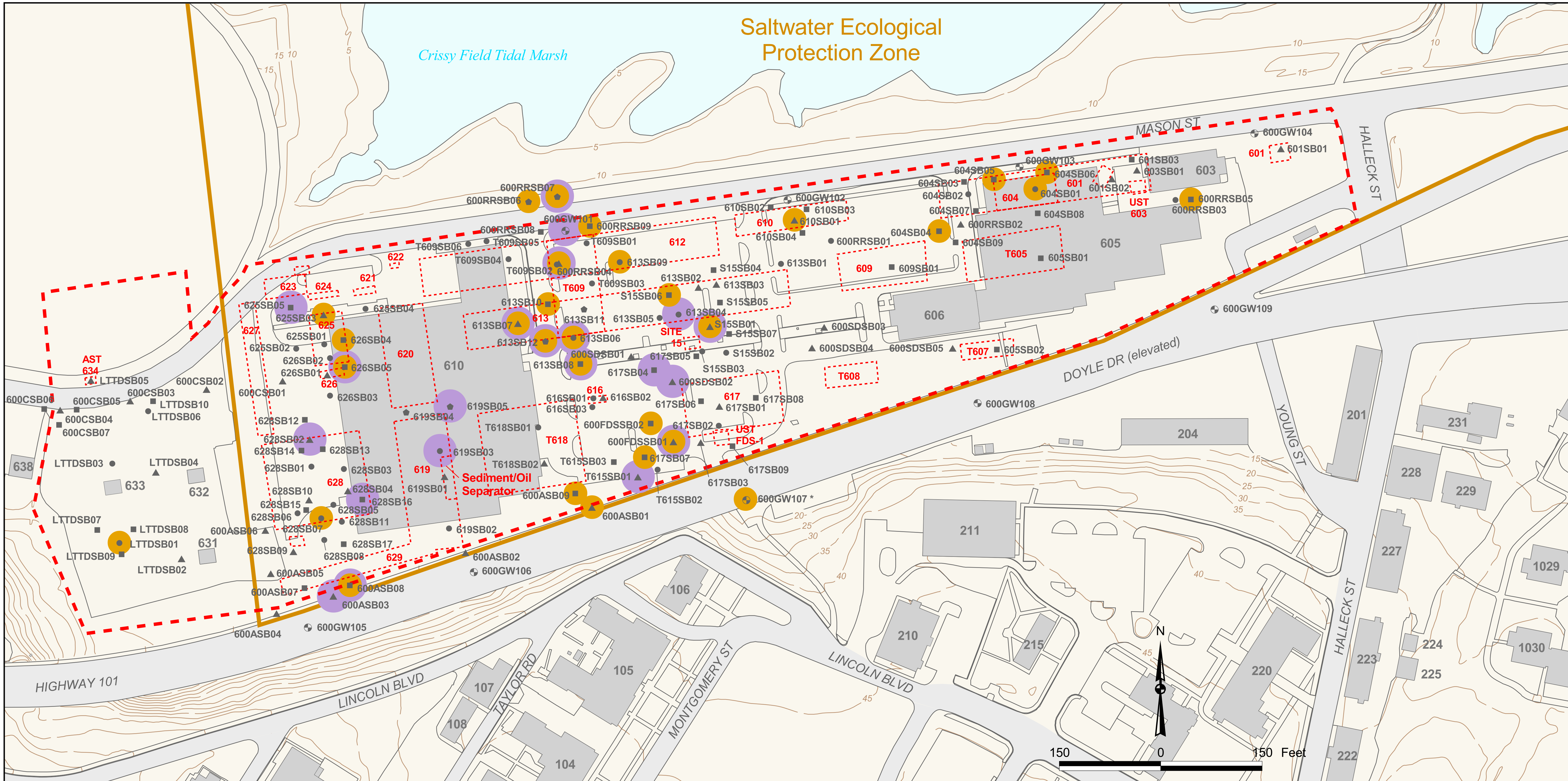

LEGEND

- ● LTTDSB01 Phase 1 - Soil Sample Location
- ▲ 600ASB01 Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 Phase 2 - Soil Sample Location
- ⬟ 619SB04 Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 Groundwater Monitoring Well Location
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Study Area Boundary
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 Former Motor Pool Structure and Identification Number
- 610 Existing Structure and Identification Number
- PAH Exceedance in Deep Soil Samples
- TPH Exceedance in Deep Soil Samples

Notes:
[1] Based on cleanup level exceedances for unrestricted land use with or without protection of Crissy Field Marsh water quality.

* Upgradient Location Outside of Study Area

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet
Vertical Datum: North American Vertical Datum, NAVD88

CLEANUP LEVEL EXCEEDANCES IN DEEP SOIL (> 3 FEET) [1]

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FIGURE 16

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LEGEND

- ● LTTDSB01 Phase 1 - Soil Sample Location
- ▲ 600ASB01 Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 Phase 2 - Soil Sample Location
- ⬟ 619SB04 Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 Groundwater Monitoring Well Location
- Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- Study Area Boundary
- Effective Phase 1 Area/ Phase 2 Area Boundary
- PAH Exceedance in Soil Samples
- TPH Exceedance in Soil Samples
- Approximate Extent of Accessible Shallow Impacted Soil (0-3 feet)
- Approximate Extent of Accessible Deep Impacted Soil (0-10 feet)
- Approximate Extent of Less Accessible Shallow Impacted Soil (0-3 feet)
- Approximate Extent of Less Accessible Deep Impacted Soil (0-10 feet)
- Areas addressed under the CERCLA program
- 610 Existing Structure and Identification Number

Notes:
yd³ - cubic yards

Former distribution pipelines and former railroad tracks located outside of the Commissary/PX Study Area omitted for clarity.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

CENTRAL SOIL REMEDIAL UNITS FOR SCENARIO I (LESSER IMPACT SCENARIO)

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FIGURE 17A

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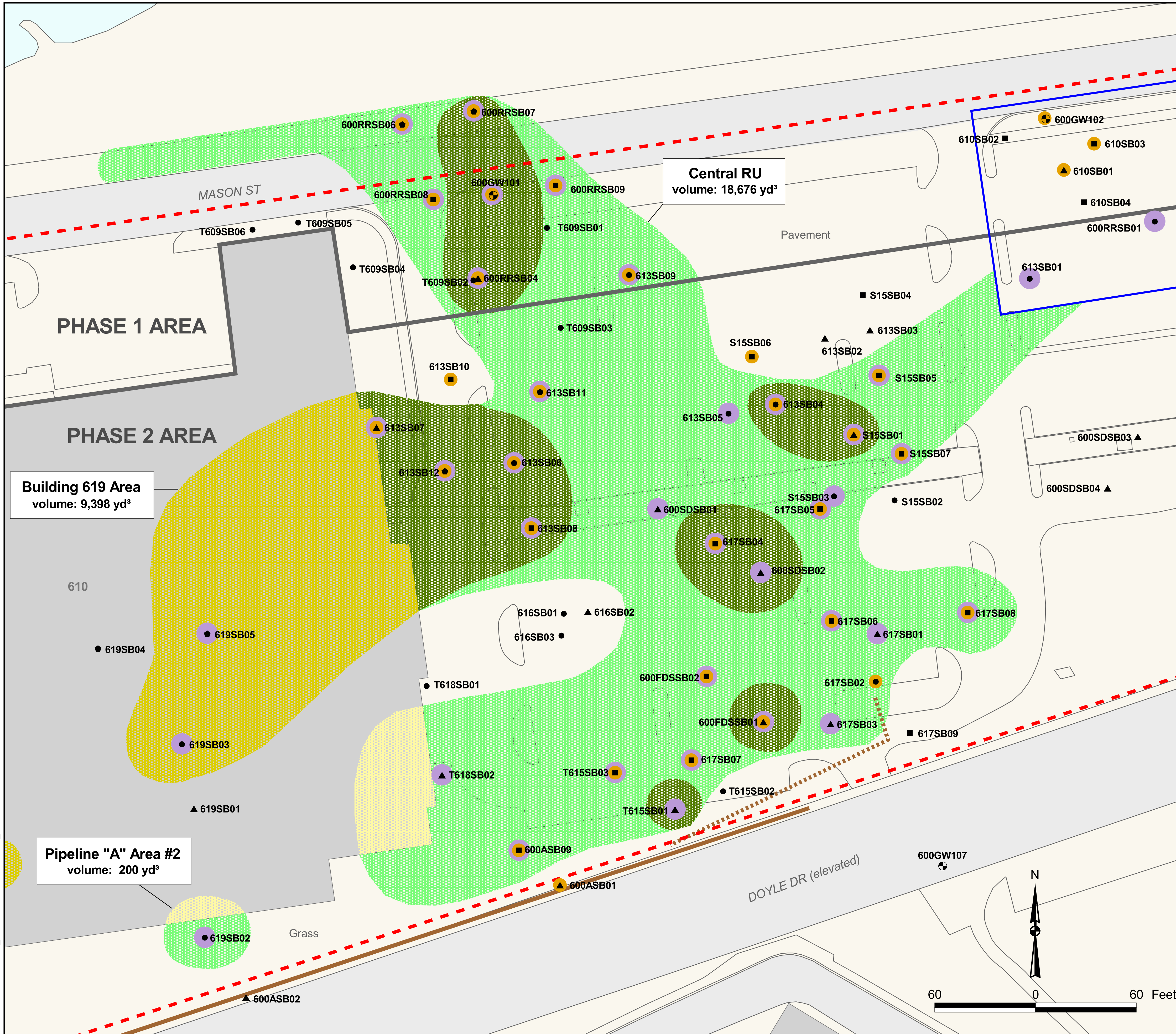

LEGEND

- ● LTTDSB01 Phase 1 - Soil Sample Location
- ▲ 600ASB01 Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 Phase 2 - Soil Sample Location
- ⬟ 619SB04 Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 Groundwater Monitoring Well Location
- Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- Study Area Boundary
- Effective Phase 1 Area/ Phase 2 Area Boundary
- PAH Exceedance in Soil Samples
- TPH Exceedance in Soil Samples
- Approximate Extent of Accessible Shallow Impacted Soil (0-3 feet)
- Approximate Extent of Accessible Deep Impacted Soil (0-10 feet)
- Approximate Extent of Less Accessible Shallow Impacted Soil (0-3 feet)
- Approximate Extent of Less Accessible Deep Impacted Soil (0-10 feet)
- Areas within and East of boundary are addressed under the CERCLA program
- 610 Existing Structure and Identification Number

Notes:
yd³ - cubic yards

Former distribution pipelines and former railroad tracks located outside of the Commissary/PX Study Area omitted for clarity.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

CENTRAL SOIL REMEDIAL UNITS FOR SCENARIO II (GREATER IMPACT SCENARIO)

Treadwell&Rollo

THE PRESIDIO TRUST

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San Francisco, CA
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415/561-5300
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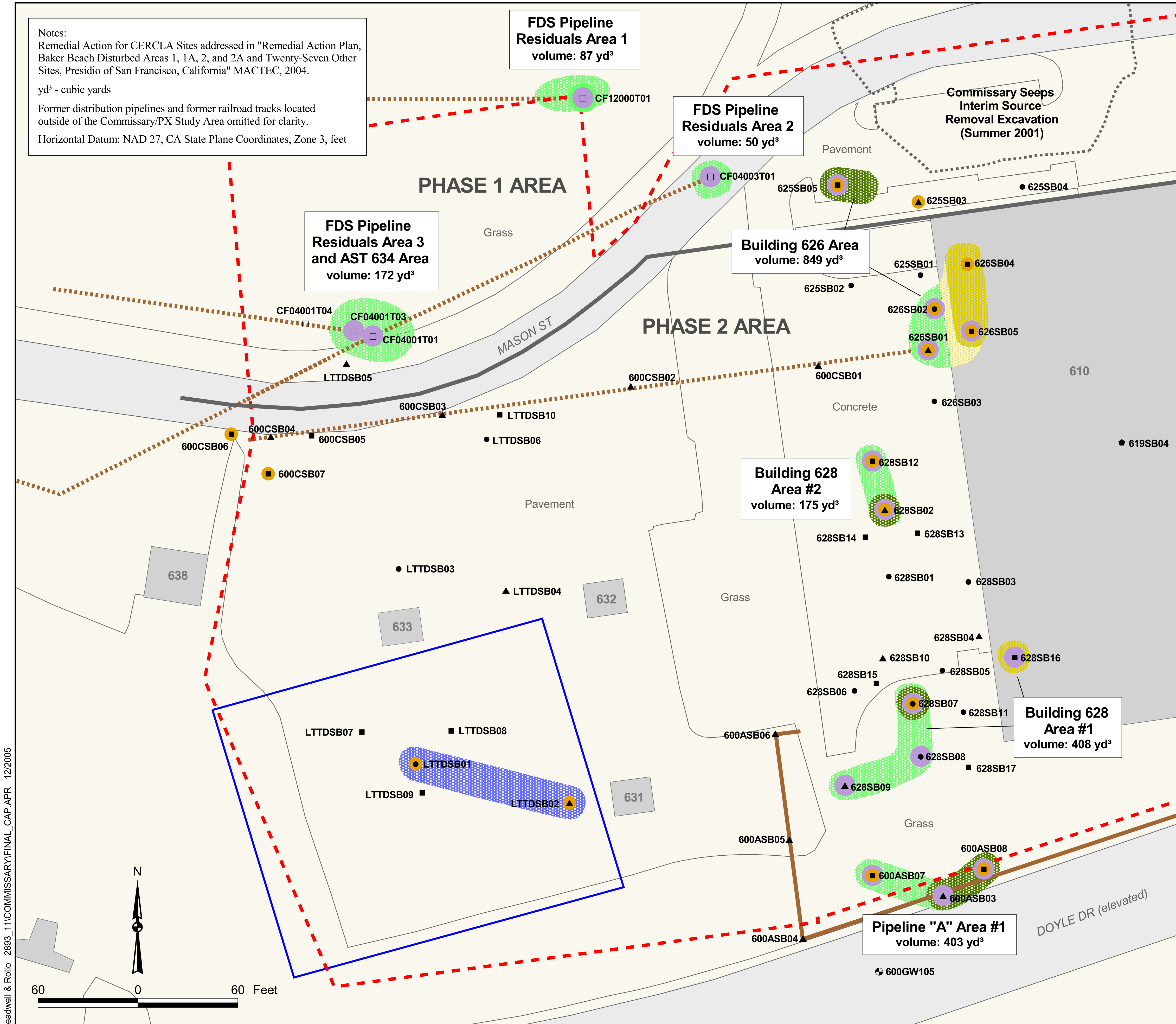
December 2005

FIGURE 17B

Treadwell & Rollo 2893_11\COMMISSARY\FINAL_CAP.APR 12/2005



LEGEND

- LTTDSB01 — Phase 1 - Soil Sample Location
- 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- LTTDSB07 — Phase 2 - Soil Sample Location
- 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- CF04003T01 — Army FDS Closure Excavation Soil Sample (IT, 1999)
- Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- Study Area Boundary
- Effective Phase 1 Area/ Phase 2 Area Boundary
- PAH Exceedance in Soil Samples
- TPH Exceedance in Soil Samples
- BTEX Exceedance in Soil Samples
- Approximate Extent of Accessible Shallow Impacted Soil (0-3 feet)
- Approximate Extent of Accessible Deep Impacted Soil (0-10 feet)
- Approximate Extent of Less Accessible Shallow Impacted Soil (0-3 feet)
- Approximate Extent of Less Accessible Deep Impacted Soil (0-10 feet)
- LTTD Area is being addressed under the Building 633 Firing Range CERCLA program
- Area addressed under the Building 633 Firing Range CERCLA program
- 610 — Existing Structure and Identification Number

WESTERN SOIL REMEDIAL UNITS FOR SCENARIO I (LESSER IMPACT SCENARIO)

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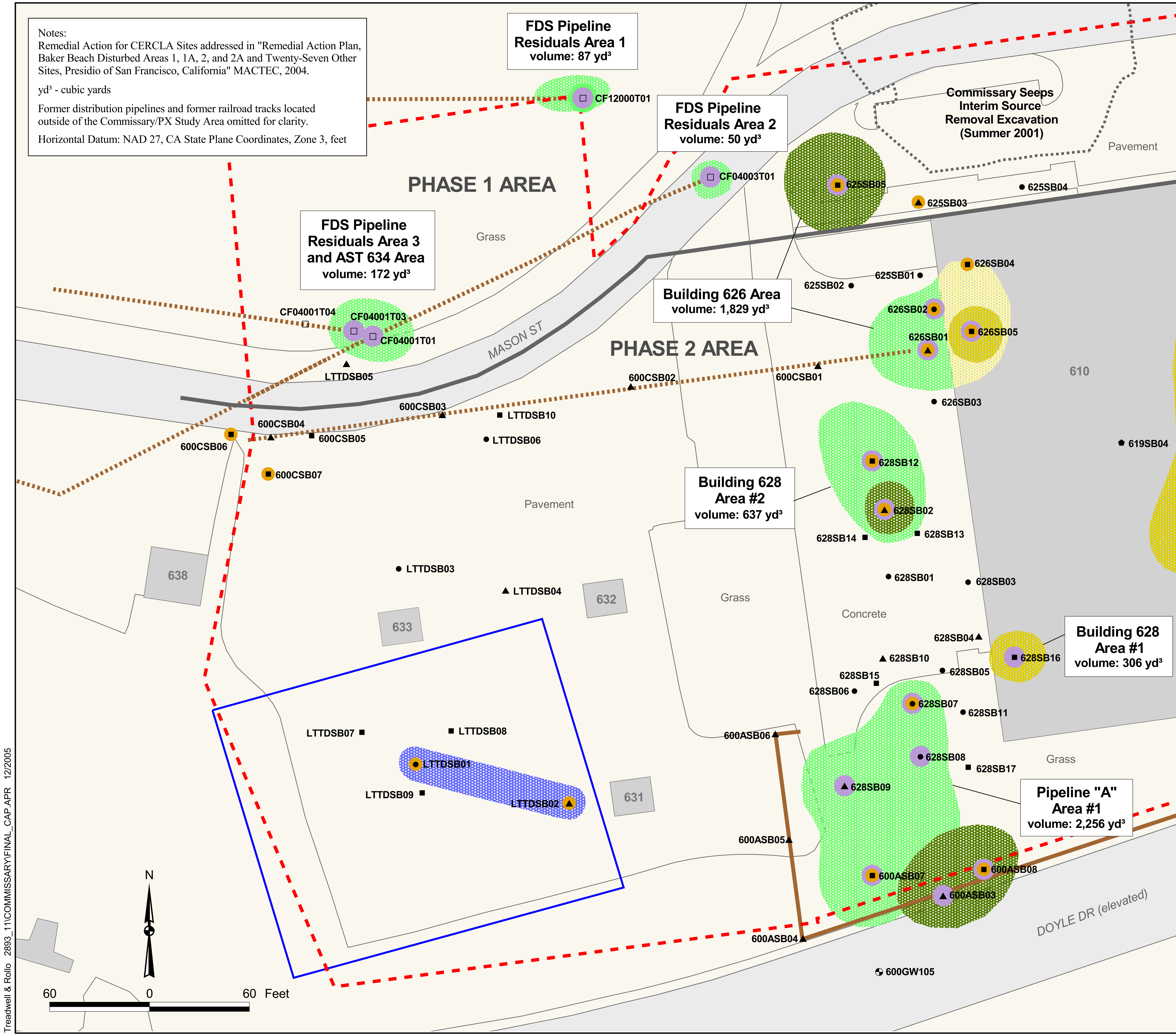
December 2005

FIGURE 18A



LEGEND

- LTTDSB01 — Phase 1 - Soil Sample Location
- 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- LTTDSB07 — Phase 2 - Soil Sample Location
- 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- CF04003T01 — Army FDS Closure Excavation Soil Sample (IT, 1999)
- Suspected Fuel Distribution Pipeline
- Removed Fuel Distribution Pipeline
- Study Area Boundary
- Effective Phase 1 Area/ Phase 2 Area Boundary
- PAH Exceedance in Soil Samples
- TPH Exceedance in Soil Samples
- BTEX Exceedance in Soil Samples
- Approximate Extent of Accessible Shallow Impacted Soil (0-3 feet)
- Approximate Extent of Accessible Deep Impacted Soil (0-10 feet)
- Approximate Extent of Less Accessible Shallow Impacted Soil (0-3 feet)
- Approximate Extent of Less Accessible Deep Impacted Soil (0-10 feet)
- LTTD Area is being addressed under the Building 633 Firing Range CERCLA program
- Area addressed under the Building 633 Firing Range CERCLA program
- 610 — Existing Structure and Identification Number

WESTERN SOIL REMEDIAL UNITS FOR SCENARIO II (GREATER IMPACT SCENARIO)

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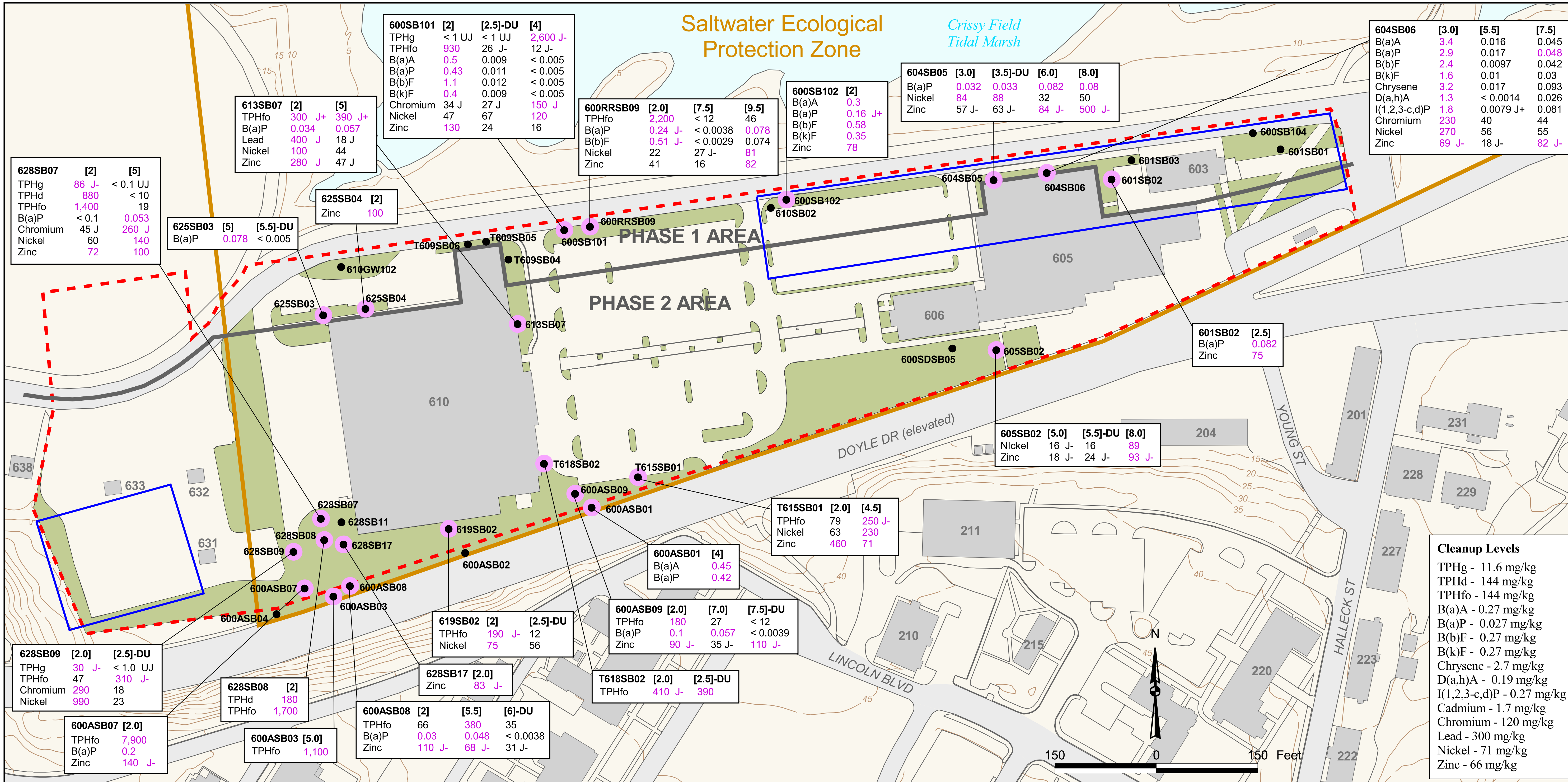
December 2005

FIGURE 18B



Treadwell & Rollo 2893_11\COMMISSARY\FINAL_CAP.APR 12/2005

LEGEND

- ● 628SB11 — Site Investigation Soil Sample Locations within Landscaped Areas
- ● 628SB08 — Location Exceeding for TPH, PAH and/or Metals (Refer to chembox for specific analytes)
- Study Area Boundary
- Effective Phase 1 Area/ Phase 2 Area Boundary
- Saltwater Ecological Protection Zone Boundary (RWQCB, 2003). (Areas north and east of boundary lie within zone)
- Areas addressed under the CERCLA program.
- Landscaped Areas
- 610 — Existing Structure and Identification Number
- 5 — Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map

[depth in feet]

T618SB02	[2.0]	[2.5]-DU
TPHfo	410 J-	390

Duplicate Sample
Values in pink are above cleanup levels
Data Qualifiers

Abbreviated Analytes
TPHg - Total Petroleum Hydrocarbons as Gasoline
TPHd - Total Petroleum Hydrocarbons as Diesel
TPHfo - Total Petroleum Hydrocarbons as Fuel Oil
B(a)A - Benzo(a)Anthracene
B(a)P - Benzo(a)Pyrene
B(b)F - Benzo(b)Fluoranthene
B(k)F - Benzo(k)Fluoranthene
D(a,h)A - Dibenz(a,h)Anthracene
I(1,2,3-c,d)P - Indeno(1,2,3-c,d)Pyrene

Notes:
[1] Cleanup level exceedances for unrestricted land use with protection of Crissy Field Marsh water quality.

Results reported in milligrams/kilogram (mg/kg).

Data qualifiers are presented in tables in Appendix C.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

Vertical Datum: North American Vertical Datum, NAVD88, feet

CLEANUP LEVEL EXCEEDANCES [1] IN LANDSCAPED AREAS

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December 2005

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FIGURE 19

APPENDIX A
Response to Comments for the Draft Corrective Action Plan

APPENDIX A
Response to Comments for the Draft Corrective Action Plan
Commissary/PX Study Area
Presidio of San Francisco, California

This Response to Comments presents a written response to all comments received during the regulatory agency and public comment period on the *Draft Corrective Action Plan (Draft CAP) for the Commissary/PX Study Area, Presidio of San Francisco, California*. The Presidio Trust (Trust) submitted the Draft CAP to the California Regional Water Quality Control Board (RWQCB) and project stakeholders on 30 July 2004. Comment was invited through 30 September 2004.

The comments received during the comment period are compiled and included in this Response to Comments. Copies of the Final CAP are available for review at the Presidio Library, 34 Graham Street, Presidio of San Francisco, weekdays between the hours of 8 a.m. and 5 p.m.

After review of all comments received from stakeholders on the Draft CAP, several changes were incorporated into this document to address four broader considerations:

- Schedule for implementation of the corrective action,
- Cleanup of polycyclic aromatic hydrocarbons (PAHs) in soil,
- Cleanup of metals in soil, and
- Dissolved arsenic detected in groundwater.

In addition, although no stakeholder comments were received on the cleanup levels used in the Draft CAP, specific cleanup levels have been updated in the Final CAP. The updates to the Final CAP in response to the four broader considerations above and cleanup level changes are discussed below, followed by responses to individual comments on the Draft CAP.

IMPLEMENTATION PLAN AND SCHEDULE

After careful consideration of all comments, the Trust has re-evaluated and modified the approach for implementing the corrective action and has revised the implementation schedule to address several important issues. A number of present uncertainties (discussed below) make it difficult to accurately define, at this time, the full extent of necessary cleanup. To address the uncertainties, the Trust plans to implement the corrective action in two phases. The phased approach will allow uncertainties regarding future land use (including the planned expansion of the Crissy Field Marsh), the volume and extent of contamination, and the potential presence of culturally significant artifacts in the subsurface to be addressed. As part of the phased approach, the Trust has divided the Study Area into two areas, which will be managed separately during implementation of the corrective action. The Phase 1 and 2 Areas are shown on Figure 2A of the Final CAP.

The Phase 1 Area encompasses all portions of the site within Area A and portions of Area B within an approximate 150-foot buffer zone along the current Crissy Field Marsh shoreline (Figure 2A). The Order used a 150-foot buffer along the Crissy Field shoreline to establish the Saltwater Ecological Protection Zone. The primary objective of correction actions within the Phase 1 Area is to address the soil RUs that potentially pose a current threat to the Crissy Field Marsh and land uses within Area A.

The Phase 2 Area encompasses the remaining portions of the site which fall outside of the approximate 150-foot buffer zone and are within Area B (Figure 2A). The primary objective of correction actions within the Phase 2 Area is to address the RUs that potentially pose a threat to anticipated land use (i.e., recreational use) within Area B and could pose a threat to the Crissy Field Marsh if it were expanded into the area in the future.

During Phase 1, soil which poses a threat to the Crissy Field Marsh will be removed at all Remedial Units (RUs) located within the Phase 1 Area. Implementation of Phase 1 is currently planned to commence no later than 21 February 2006 (date pending RWQCB approval).

Phase 2 will commence following decisions regarding the potential expansion of the Crissy Field Marsh into the Phase 2 Area. During Phase 2, soil will be removed from RUs located within the Phase 2 Area consistent with land use decisions, subject to RWQCB approval. If the Crissy Field Marsh is expanded into the area, cleanup will be conducted to protect the marsh and human land use, as applicable. If the Crissy Field Marsh is not expanded into the area, cleanup may be conducted to protect the anticipated land use (i.e., recreational use). These cleanup decisions will be made in consultation with the RWQCB prior to implementation of Phase 2. The Trust will proceed with Phase 2 work no later than the end of 2008.

The present uncertainties that warrant conducting the corrective action work in two phases include:

- <u>Uncertainties about Crissy Field Marsh Expansion</u>. Along Crissy Field, the RWQCB Order specifies separate zones with different cleanup levels. The majority of the Commissary/PX Study Area is in the Order's Saltwater Ecological Protection Zone (Figure 2A). The Zone was drawn to allow for the potential expansion of the Crissy Field Marsh into the Commissary/PX Area. However, the extent and location of potential expansion is currently unknown but is being considered by the Trust and the National Park Service (NPS). The proposed expansion project will be evaluated in an upcoming National Environmental Policy Act (NEPA) process. Although it is possible that the Crissy Field Marsh could be expanded to include the Commissary/PX Area, it is likely that alternate locations for expansion will be selected. Therefore, cleanup of the Phase 2 Area to the most stringent levels required to support an ecologically sensitive marsh is unwarranted until the proposed marsh expansion project is studied under NEPA and a decision is made regarding expansion in to the Phase 2 Area. If instead, the future use of the Phase 2 Area involves a land use other than marsh expansion, then alternative cleanup levels, consistent with actual land use, may be more appropriate.

The Saltwater Ecological Protection Zone cleanup levels are considerably more stringent than other potentially applicable cleanup levels (i.e., protection of human health, Table 1 of the Order; protection of terrestrial receptors, Table 2 of the Order; and protection of groundwater in Crissy Field Groundwater Area, Table 5 of the Order).[1] Therefore, remediation costs to remove all soil exceeding the Saltwater Ecological Protection Zone cleanup levels within the Phase 2 Area would be considerably higher than costs of cleanup assuming an alternate land use. Because of these considerable costs, it is prudent to defer cleanup of affected soil within the Phase 2 Area until a decision is made regarding expansion of the Crissy Field Marsh.

If the Crissy Field Marsh later expands into the corrective action site, petroleum-affected soil in the Phase 2 Area could be removed at the time of marsh expansion. This phased approach to remediation avoids "double excavation" of soil, once now and again later, thus unnecessarily duplicating mobilization and administrative costs.

The Trust recognizes that there may be administrative issues to be addressed before petroleum can be left in place at concentrations above the Saltwater Ecological Protection Zone cleanup levels within the Phase 2 Area; however, the effort to address the administrative issues may be warranted in light of the high cost to remediate all soil with concentrations above the Saltwater Ecological Protection Zone cleanup levels.

- Uncertainties about Total Volume of Affected Soil and Associated Remediation Costs. As pointed out by commenters, the actual extent of affected soil is uncertain and could be much larger than what was depicted in the July 2004 Draft CAP. Accordingly, remediation costs could be considerably higher than originally estimated in the Draft CAP. To further assess this uncertainty, a second, more conservative interpretation of soil RUs (Scenario II – Greater Impact Scenario) has been added to this Final CAP which shows larger potential cleanup areas of soil containing petroleum hydrocarbons at concentrations above Saltwater Ecological Protection Zone cleanup levels (see Section 3.3 of the Final CAP). Because remediation costs could significantly increase under this alternate scenario, it is prudent to defer the final cleanup decision for the Phase 2 Area until future land use determinations about the Crissy Field Marsh expansion have been made.
- Uncertainties about Archaeological Issues. Portions of the Commissary/PX Study Area are known to be archaeologically sensitive. Subsurface excavations and activities within the Study Area could disturb or damage sensitive artifacts. The Trust is currently working with Presidio archaeologists to develop an approach for monitoring and processing archaeological

[1] The Commissary/PX Study Area also falls within the area designated as an "Ecological Buffer Zone" in the Cleanup Levels Document (EKI, 2002; Figure 7-2). However, these cleanup levels are not applicable to the petroleum-related chemicals of concern (COCs) at this site (TPH, BTEX, and PAHs) because no TPH or BTEX cleanup levels were developed for the "Ecological Buffer Zone" (Table 7-2) and the applicable PAH cleanup levels developed under the Order are considerably lower than those developed for the "Ecological Buffer Zone." For metals, Ecological Buffer Zone cleanup levels are considered (along with all other applicable cleanup levels) because there are no cleanup levels for these contaminants under the RWQCB Order.

artifacts to avoid adverse impacts on the artifacts (see Section 5.4 of the Final CAP). Implementation of Phase 1 will provide an opportunity to evaluate this approach before commencing subsurface excavations within the Phase 2 Area. Because such archaeological monitoring and processing may be time consuming and costly, phasing the work and controlling the total amount of soil to be excavated in a given year should minimize the potential construction delays such monitoring and processing may cause.

Relevant sections of the CAP that have been revised to address the phased approach include the following:

- ***Section 1.5 Response to Stakeholder Comments*** has been added to the CAP and the information above is presented in that section.
- ***Section 3.1 Remedial Action Objectives (RAOs)*** has been framed within context of future land use.
- ***Section 3.2.1 Soil Cleanup Levels*** has been revised to provide for the contingent applicability of the Saltwater Ecological Protection Zone cleanup levels.
- ***Section 3.3 Identification of Remedial Units (RUs)*** has been revised to provide two interpretations (Scenario I [Lesser Impact Scenario] and Scenario II [Greater Impact Scenario]) of potential volumes of affected soil requiring corrective action.
- ***Section 3.4 Phased Approach for Corrective Action (Phase 1 and 2 Areas) and Effective Soil Cleanup Levels*** has been added to provide a basis for the phased approach for corrective action in terms of the project's RAOs and presents the "effective" cleanup levels that will be used for corrective action, based on future site land use.
- ***Section 4.0 Evaluation of Alternatives (and subsections)*** has been revised to incorporate the phased approach and corresponding Phase 1 and 2 Areas in the development, evaluation, and selection of corrective action alternatives.
- ***Section 5.1 Remedy Implementation (and subsections)*** has been revised to add a detailed summary of the Phase 1 and 2 corrective action alternatives selected in the Final CAP.
- ***Section 5.7 Implementation Schedule*** has been revised to present the phased approach for implementation.
- ***Tables 5 and 7 through 9 and Appendix D Cost Estimates and Assumptions for Corrective Action Alternatives*** have been revised to reflect Phase 1 and 2 Area RU groupings and costs for the phased approach.

CLEANUP OF PAHs

The primary objective of this CAP is to evaluate potential remedial alternatives to address adverse effects from petroleum-related contamination and select a corrective action for implementation at the Commissary/PX Study Area. Contaminants considered to be related to petroleum releases in this CAP are total petroleum hydrocarbons (TPH) as gasoline, diesel, and fuel oil; PAHs; and benzene, toluene, ethylbenzene and xylenes (BTEX). However, although PAHs are a component of petroleum hydrocarbon mixtures, they can also be derived from other anthropogenic sources, such as asphalt pavement, contaminated fill, particulates from burning, and vehicle exhaust (Agency for Toxic Substances and Disease Registry, 1995; see website at http://www.atsdr.cdc.gov/toxprofiles/tp69.html). PAHs may be present in soil at the Study Area from these sources, particularly from past disposal activities or placement of contaminated fill. Therefore, PAHs may potentially be present in any fill material or material potentially moved and reburied during past site demolition, construction, and grading activities. If present throughout the fill, the extent of PAH contamination would be difficut to define and potentially costly to remediate. Thus, the following approach has been developed in this CAP to address PAHs in soil, consistent with the Phase 1 and 2 Areas identified above:

- Phase 1 Area: Within Area A portions of the Phase 1 Area, the Trust will remediate TPH and BTEX contamination to achieve cleanup levels for unrestricted land use. The Trust will also remediate PAHs to achieve unrestricted land use within Area A, to the extent practicable, but will consult with the NPS and RWQCB regarding further excavation decisions related to these compounds during implementation of the remedy. To the extent practicable, remediation will be conducted so that no land use control (LUC) is necessary within Area A. It is noted that if contamination is left in-place above cleanup levels for unrestricted use in Area A, an LUC for the area may need to be adopted and would be subject to management of the LUC by the NPS. Within Area B portions of the Phase 1 Area, an LUC will be implemented to prohibit unrestricted human land use of the property and PAHs above human health cleanup levels will be maintained under current caps or landscaping.

- Phase 2 Area: Within the Phase 2 Area (which is entirely within Area B), an LUC will be implemented to prohibit unrestricted human land use of the property and PAHs above human health cleanup levels will be maintained under current caps or landscaping (Figure 2B). Once a decision is made regarding expansion of the Crissy Field Marsh into the area, cleanup decisions for PAHs will be made in consultation with the RWQCB, prior to implementation of Phase 2.

Relevant sections of the CAP that have been revised to address PAHs are as follows:

- ***Section 1.5 Response to Stakeholder Comments*** has been added to the CAP and the information above is presented in that section.

- ***Section 4.4.3 Alternative 3 and Section 4.4.4 Alternative 4*** have been revised to include capping and LUCs to address PAHs as a component of the alternatives.

- ***Section 4.5 Selected Alternatives (and subsections)*** has been revised to include capping and LUCs to address PAHs as a component of the selected alternatives.

- ***Section 5.1 Remedy Implementation (and subsections)*** has been revised to describe how PAHs will be addressed as part of the corrective action for the Phase 1 and 2 Areas.

- ***Section 5.2 Soil Confirmation Sampling Program*** has been revised to indicate how corrective action decisions regarding PAH results will be made for the Phase 1 and 2 Areas.

- ***Section 5.6 Land Use Control*** has been added to describe the LUC that will be implemented to address residual PAHs left in-place within Area B.

CLEANUP OF METALS IN SOIL

As discussed above, this CAP addresses contamination associated with petroleum releases, including TPH, PAHs, and BTEX. Certain metals are present in soil at levels above background concentrations and cleanup levels. These metals include cadmium, chromium, lead, nickel, and zinc which are associated with shallow fill material present beneath the Study Area. The alternatives developed in this CAP for Area B include LUCs to address metals that may be left in place at concentrations above cleanup levels (Figure 2B of the Final CAP shows the LUC Zone). To the extent practicable, remediation of metals will be conducted so that no LUC is necessary within Area A. It is noted that if contamination is left in-place above cleanup levels for unrestricted use in Area A, an LUC for the area may need to be adopted and would be subject to approval and management of the LUC by the NPS.

Relevant sections of the CAP that have been revised to address metals are as follows:

- ***Section 1.5 Response to Stakeholder Comments*** has been added to the CAP and the information above is presented in that section.
- ***Section 4.4.3 Alternative 3 and Section 4.4.4 Alternative 4*** have been revised to include capping and LUCs to address metals as a component of the alternatives.
- ***Section 4.5 Selected Alternatives (and subsections)*** has been revised to include LUCs to address metals as a component of the selected alternatives.
- ***Section 5.1 Remedy Implementation (and subsections)*** has been revised to describe how metals will be addressed as part of the corrective action for the Phase 1 and 2 Areas.
- ***Section 5.2 Soil Confirmation Sampling Program*** has been revised to indicate how corrective action decisions regarding metal results will be made for the Phase 1 and 2 Areas.
- ***Section 5.6 Land Use Control*** has been added to describe the LUC that will be implemented to address metals in fill material within Area B.

DISSOLVED ARSENIC IN GROUNDWATER

The Trust received several comments regarding detections of arsenic in groundwater above the identified cleanup level of 10 micrograms per liter (µg/L), which is based on the cleanup level for drinking water. Arsenic concentrations in groundwater intermittently exceed this cleanup level in samples from two seep locations (610SP01 and 610SP02) and two monitoring wells upgradient of the seeps (610GW102 and 610GW103).[2]

To address the comments on arsenic in groundwater, the Trust performed a detailed analysis of arsenic data in groundwater at the Study Area and at other Presidio sites, based on data collected through the Second Quarter 2005. This analysis is provided in Attachment A-1 to this Response to Comments. The following conclusions were drawn from the analysis:

- The dissolved arsenic and redox groundwater data collected at the Commissary/PX Study Area indicate that reducing conditions are present in areas with former petroleum releases. The elevated dissolved arsenic concentrations above the cleanup level of 10 µg/L in the vicinity of the Commissary Seeps Interim Source Removal Area are likely the result of reducing conditions in the area.
- Reducing conditions are also apparent at other petroleum-release sites at the Presidio, including the Building 1065 Area, Building 1349 Area, and Building 207/231 Area.
- There does not appear to be a relationship between chloride levels and dissolved arsenic in groundwater at the Commissary/PX Study Area nor other neighboring sites near the Bay. Thus, alternative laboratory techniques aimed at minimizing potential interference of chloride in arsenic analyses are not warranted.
- Dissolved arsenic concentrations are expected to decrease (when reducing conditions are caused by petroleum) after the petroleum in soil is remediated and groundwater returns to ambient conditions.

In light of the above considerations, the Trust continues to believe that it is appropriate to monitor the effects of source removal at the Commissary/PX Study Area. Therefore, the Final CAP does not contain an evaluation of active groundwater remediation alternatives to address arsenic, but includes Groundwater and Surface Water Monitoring as part of the soil corrective action remedy.

The Trust notes that dissolved arsenic concentrations in groundwater samples from the Commissary Seeps Interim Source Removal Area are below the Saltwater Ecological Protection Zone cleanup level of 36 µg/L and, therefore, dissolved arsenic in groundwater does not pose a significant risk to ecological receptors in the Crissy Field Marsh. We also note that it is extremely unlikely that shallow groundwater adjacent to Crissy Field Marsh will be used for drinking water purposes. This point was acknowledged by RWQCB when soil cleanup levels were developed for Crissy Field. The Order states:

---

[2] Arsenic also was detected at 17 µg/L in one grab groundwater sample near the Former Railroad Tracks/Coal Bin area (600RRGG02).

> "Crissy Field is treated differently because there is a low probability of groundwater being used for municipal supply purposes in the near future. Although groundwater in certain areas within Crissy Field meets the criteria of this Board's drinking water policy (Board Resolution 89-39), the probability of use for such purposes is minimal. Pumping groundwater in those portions of Crissy filed [sic] where artificial fill lie [sic] on top of bay mud is likely to cause seawater intrusion and land subsidence, thus limiting the probability of developing these waters for such use."

The instances where dissolved arsenic in groundwater exceeds the drinking water cleanup level conform to the conditions described above in the RWQCB Order. Although the drinking water cleanup levels apply to all groundwater in a strict sense, it is reasonable to treat the achievement of cleanup levels at Crissy Field differently due to the low probability of using the groundwater at this location as a drinking water supply. Thus, in the Final CAP, arsenic concentrations above the drinking water level of 10 µg/L are also evaluated against the Saltwater Ecological Protection Zone cleanup level of 36 µg/L to determine if arsenic poses a potential threat to the Crissy Field Marsh and assess the need for further action related to arsenic in groundwater.

To provide better context for the arsenic detections in groundwater, the following sections of the CAP have been revised:

- ***Section 1.5 Response to Stakeholder Comments*** has been added to the CAP and the information above is presented in that section.
- ***Section 2.4.4 Groundwater Impact Summary—Arsenic*** has been revised to discuss dissolved arsenic concentrations relative to the Saltwater Ecological Protection Zone cleanup level and includes a summary of the arsenic groundwater data evaluation in Attachment A-1.
- ***Section 3.2.4 Groundwater COCs*** has been revised to discuss arsenic concentrations relative to the Saltwater Ecological Protection Zone cleanup level.
- ***Section 3.3.2 Identification of Remedial Units (RUs) – Groundwater*** has been revised to provide further justification for why no formal groundwater RU has been established.

RESPONSE TO INDIVIDUAL COMMENTS

Comments James Ponton
Associate Engineering Geologist
California Regional Water Quality Control Board (RWQCB)
Oakland, California
12 August 2004

Comment 1: Staff is pleased with the recommended corrective measure for soil of excavation and offsite disposal for the accessible areas of soil contamination.

Response to Comment 1: The RWQCB's comment and endorsement of the proposed corrective measure for the Accessible Locations is noted (please note that the term "Accessible RUs" has been changed to "Accessible Locations" in the Final CAP to avoid confusion with RU terminology). As described in this Response to Comments, our strategy to implement our cleanup of the Accessible Locations will be phased in order to address several issues raised in various comments and to better meet the goals of this cleanup (see above discussion).

Comment 2: The logic employed for treating in-place or excavating if made available the less accessible soil makes sense. Please remember however, that Staff is eager to see the CAP implemented and completed so that Staff can close the site (issue an NFA for petroleum).

Response to Comment 2: The RWQCB's comment and endorsement of treating Less Accessible Locations in-place or excavating, if made available, is noted. The Trust shares the RWQCB's desire to implement the CAP and move to site closure. Building 610 is planned for retail or recreational use for the foreseeable future. As described above, an LUC will be required to restrict soil disturbance due to non-petroleum PAHs and metals in fill material. Because Building 610 provides cover over the RUs and the LUC would further protect potential receptors from exposure to COCs, the recommended alternative for the Less Accessible Locations in the Final CAP is Alternative 2, Capping and LUCs. If the Crissy Field Marsh or associated buffer zone is expanded into the area of the building, the Trust will then either treat the Less Accessible Locations in-place or excavate, if made available.

Comment 3: Staff is intrigued by the detections of arsenic in groundwater and surface water in the vicinity of 610SP01 and SP02. As I mentioned in an earlier email, Staff understands that elevated levels of chloride may interfere with the ICP analysis of arsenic. Please review the literature and pursue with your lab contact. Along those lines, please include measurement of chloride in groundwater and surface water samples collected from this point forward.

Response to Comment 3: The Trust has performed a detailed review of chloride and arsenic data in groundwater at the Commissary/PX Study Area and other neighboring Presidio sites. Please refer to Attachment A-1 for this analysis. The data indicate that there is no specific pattern related to reported dissolved arsenic and chloride concentrations in wells at the site or other Presidio sites near the Bay. Instead, the Trust believes that the elevated arsenic concentrations in the vicinity of the Commissary seeps is a result of reducing conditions created by petroleum releases, which has been observed at other Presidio sites. Thus, alternative laboratory techniques aimed at minimizing potential interference of chloride in arsenic analyses are not warranted.

Chloride analysis has been included in the Groundwater and Surface Water Monitoring Program (see Section 5.5 of the Final CAP).

Comment 4: Please review the groundwater data that exists for the neighboring CAP sites (207/231 and 637/638) to see if those sites manifest similar increases in arsenic as we sample and analyze points located proximal to the Bay. It is staff's understanding that the interim dig for the Com/PX was backfilled with gravel (not soil). Staff is not sure how the leaching hypothesis proposed in the Draft CAP would work given the absence of leachable soil upgradient of the seeps.

Response to Comment 4: The Commissary Seeps Interim Source Removal Excavation was backfilled with gravel (aggregate drain rock) in the lower 2.5 feet of the excavation. A synthetic geo-fabric was placed over the gravel and covered with backfill consisting of clean on-site sand and gravel and clean imported silty sand. The clean native soil used as backfill and the native soil with remnant petroleum surrounding the excavation and in the vicinity of the marsh may still provide an arsenic source.

The Trust has performed a detailed review of arsenic groundwater data collected at the Commissary/PX Study Area and other neighboring Presidio sites. Please refer to Attachment A-1 for this analysis. The data indicate that arsenic concentrations do not increase with proximity to the Bay. Also, there does not appear to be an interference of chloride in arsenic analyses. Instead, the Trust believes that the elevated arsenic concentrations in the vicinity of the Commissary seeps is a result of reducing conditions created by petroleum releases, which has been observed at other Presidio sites.

Comment 5: Please review the cost estimates provided in Appendix D, Table D-7 for Alternative 4 to insure that backfilling and compaction costs are included in the list of restoration activities provided on Table D-7.

Response to Comment 5: Cost estimates in the Final CAP have been revised to include backfilling and compaction costs. As discussed above, the CAP also has been revised to show a potential range of costs reflecting the uncertainty associated with the volumes of affected soil requiring corrective action (from Scenario I – Lesser Impact Scenario to Scenario II – Greater Impact Scenario).

Comments **Jan Blum**
San Francisco, California
30 August 2004

Comment 1: Thank you for accepting public comment on the Alternative for a Corrective Action Plan for the Commissary PX Area.

As you know, the sites in question contain hazardous substances including gasoline, diesel, fuel, oil, PAHs, and BTEX as well as arsenic in groundwater. These contaminants are in both accessible and less accessible areas.

Because so much is undecided about the future development of the Commissary PX area, including the proposed future expansion of Crissy Marsh, an expansion that possibly will be in the area under consideration for the CAP for the Commissary PX, the construction of Doyle Drive which will take place over/near/on this area, and the planned future connection to the Marin Post, I support a combination of Remedies which best protect this area for future use and especially for the possibility of future use for natural habitat.

The recommended Remedy (Alternative 4) for Accessible Areas excavates and disposes, off-site, off all contaminated soil, beneficially cleaning out 12,652 cubic yards of contaminated soil; by far the highest percentage of all the contaminated soil in the area under inspection. This remedy also includes groundwater monitoring and in situ soil treatment in only those areas where removal is beyond reach of conventional excavation equipment. This permanent protection remedy is the only way to ensure that contaminants cannot affect current or future use of this site which is next to some of the most valued natural habitat on the Presidio, Crissy Marsh, and therefore, represents the most cost effective remedy over time.

Additionally, I support a flexible Correction Action Plan for the Less Accessible Areas. That is, I support Alternative 4 (off site disposal with groundwater monitoring) or Alternative 3 (in situ treatment), if Building 610 (the Commissary) is not to be demolished within 5 years.

Response to Comment 1: Ms. Blum’s comment and endorsement of the proposed corrective measure for the Accessible and Less Accessible Locations is noted. Please note that as described in this Response to Comments, our strategy to implement cleanup of the Accessible Locations will be phased in order to address several potential issues raised in various comments and to better meet the goals of this cleanup (see above discussion).

Comments **Brian Ullensvang**
National Park Service (NPS)
San Francisco, California
September 2004

General Comment from Cover Letter: Our most significant concern relates to the levels of dissolved arsenic in the groundwater and whether the groundwater conditions and consideration of possible alternatives to correct this problem have been adequately discussed in this CAP. Existing Presidio data indicate that the elevated arsenic is a result of a past petroleum release. In addition to this significant concern, we have identified other important concerns in the attached comments.

The CAP needs more discussion of the existing groundwater contamination and the proposed groundwater remedy needs to be supported by data. Existing data indicate that arsenic contamination in the groundwater likely resulted from impacts of a past petroleum spill. The potential impacts of this contamination on NPS resources, including Crissy Marsh, can be clearly seen on Figure 15 of the CAP. The Trust has been collecting groundwater data from this area for two years and yet this CAP does not provide any substantive discussion of the results, nor any evaluation of whether the data support the proposed approach to address the arsenic contamination. Arsenic is currently found above the cleanup levels in groundwater at the Commissary/PX study area and yet monitoring is proposed as the appropriate action to address this problem. The CAP does indicate that the arsenic is due to changed groundwater conditions resulting from a petroleum release. However, the CAP is missing any discussion of whether removal of the petroleum source alone will reverse these changed conditions and lower the arsenic levels. The CAP should include a proposed remedy that is demonstrated to result in a lowering of the arsenic levels to below the cleanup levels in an appropriate timeframe. It is not clear that source removal and monitoring, alone, is likely to achieve that goal.

Response to General Comment: The Trust has performed a detailed review of arsenic data in groundwater at the Commissary/PX Study Area and other Presidio sites. Please refer to Attachment A-1 for this analysis. The following are conclusions from the analysis:

- The dissolved arsenic and redox groundwater data collected at the Commissary/PX Study Area indicate that reducing conditions are present in areas with former petroleum releases. The elevated dissolved arsenic concentrations above the cleanup level of 10 µg/L in the vicinity of the Commissary Seeps Interim Source Removal Area are likely the result of reducing conditions in the area.

- Reducing conditions are also apparent at other petroleum-release sites at the Presidio, including the Building 1065 Area, Building 1349 Area, and Building 207/231 Area.
- Dissolved arsenic concentrations are expected to decrease (when reducing conditions are caused by petroleum) after the petroleum in soil is remediated and groundwater returns to ambient conditions.

In light of the above considerations, the Trust continues to believe that it is appropriate to monitor the effects of source removal at the Commissary/PX Study Area. Therefore, the Final CAP does not contain an evaluation of active groundwater remediation alternatives to address arsenic but includes Groundwater and Surface Water Monitoring as part of the soil corrective action remedy.

Comment 1: *Not all soil contamination is addressed by the proposed remedies.* Section 2.4.1.5 (Six Metals and Arsenic) identifies two areas where lead in soil was detected above the cleanup levels, the LTTD Area and an area north of Building 610. The discussion indicates that the lead in the LTTD Area is likely related to the contamination at the Building 633 Pistol Firing Range. Because lead does not appear to be associated with petroleum it is not retained as a PCOC. While this approach may be adequate to address the lead in the LTTD Area (since it will be included in the CERCLA cleanup plans for the Pistol Range), the lead above cleanup levels observed north of Building 610 remains unaddressed. In addition to lead in soil at location 600GW106, the shallow soils in this area north of Building 610 also have PAH contamination above the cleanup levels (see CAP Figure 12). The proposed remedies should be revised to address all contaminants that are found at levels above the cleanup levels. In addition, the data should be reviewed to insure that the physical scope of the proposed remedies will adequately address all areas with contamination above the cleanup levels.

Response to Comment 1: A total of seven out of approximately 310 soil samples (approximately 2%) collected throughout the Commissary/PX Study Area had lead concentrations exceeding the soil cleanup level of 300 mg/kg, which is based on the Ecological Buffer Zone Cleanup Level (October 30, 2002 *Development of Presidio-Wide Cleanup Levels for Soil Sediment, Groundwater and Surface Water*, prepared by Erler & Kalinowski, Inc.). We note that only three soil samples (approximately 1% of the total) had concentrations exceeding the residential cleanup level of 400 mg/kg: one sample from the Former Building 633 Firing Range CERCLA site (LTTDSB01[5.0] at 560 mg/kg), one sample from the Coal Storage Area and Former Railroad Tracks CERCLA site (604SB03[3.5] at 1300 mg/kg), and one sample from the area underneath Doyle Drive, outside the formal Commissary/PX Study Area boundary (600SB106[2] at 510 mg/kg).

All lead concentrations exceeding the CAP cleanup level within the Study Area ultimately will be addressed through a corrective action under the CAP program or remedial action under the CERCLA program. As implied in the comment, the lead exceedances at the Former Building 633 Firing Range CERCLA site (LTTDSB01) and the Coal Storage Area and Former Railroad Tracks CERCLA site (604SB03) will be addressed during the CERCLA process. The selected remedial action for these sites are documented in the *Draft Remedial Action Plan (RAP), Baker*

Beach Disturbed Areas 1, 1A, 2, and 2A and Twenty-Seven Other Main Installation Sites (MACTEC, 2004). The remaining lead exceedances within the Study Area will be addressed under this CAP. Two lead exceedances (613SB07 and 617SB06) occur within RUs identified in the CAP and will be addressed during CAP implementation. Two remaining lead exceedances (600GW105 and 600GW106) are beneath the Doyle Drive elevated roadway and are outside the formal Study Area boundary. However, the Final CAP has been revised to include the area underneath the Doyle Drive roadway in the LUC which will be implemented to address metals in fill material throughout the Study Area (see Figure 2B). Section 2.4.1.5 has been revised to include the above information.

Comment 2: *Dissolved lead in groundwater.*
The CAP should clearly and fully present the extent and nature of any dissolved lead that was observed in the groundwater. Section 2.4.3.4 (Six Metals and Arsenic) identifies that lead has been detected in groundwater samples at the site and further identifies that lead exceeded CAP groundwater cleanup levels. Other than these two identifications, the lead findings are not discussed in this section. The discussion does, however, refer the reader to Figure B-7 and Table C-10. Figure B-7 does not include a presentation of lead data, and the data showing the lead detection or exceedance are not included in Table C-10. Further discussion and analysis in the CAP is required.

Response to Comment 2: Section 2.4.3.4 has been revised to refer the reader to Figure 9 (previous Draft CAP Figure 16) instead of Figure B-7 and discuss both total and dissolved lead concentrations in groundwater and seep samples. Table C-10 includes all the lead data for groundwater and surface water through the Second Quarter 2005 and Figure 9 (previous Draft CAP Figure 16) shows results for parameters that exceeded cleanup levels, including lead. Dissolved lead has not been detected in groundwater or seep water samples. Total lead concentrations in seep samples have ranged between 6.4 and 16 µg/L at 610SP02 and 2.4 and 18 µg/L at 610SP01; though the duplicate and control laboratory duplicate samples results were 9.7 and 300 µg/L, respectively (Table C-10). At the request of DTSC, unfiltered seep samples were collected for use in ecological risk comparisons. However, because the saltwater ecological criteria used in the CAP from the Basin Plan are expressed in terms of dissolved concentrations, rather than total concentrations, it is more appropriate to compare the dissolved concentrations to the Saltwater Ecological Protection Zone cleanup levels in the CAP to assess the potential for water quality impacts for ecological receptors.

Comment 3: *Organic Compounds in Groundwater.*
Section 2.4.4 (Groundwater Impact Summary, Organic Compounds) describes that TPHg, ethylbenzene, toluene, and xylenes have been reported, primarily in the northwestern corner of the study area where they were present prior to the Commissary Seeps Interim Source Removal. There are no data for these chemicals, prior to the Commissary Seeps Interim Source Removal, presented in Appendix C of the CAP. The groundwater data collected by the Army in this area of the Presidio, which would include data from before the Commissary Seeps Interim Source Removal should be included in the data presentation in this CAP. These data would include data from wells EBPP01, EBPP01A, EBPP02, EBPP03,

EBPP03A, EBPP04, EBPP05, EBPP05A, EBPP06, and EBPP06A. In addition, Section 2.4.4 indicates that the detections and concentrations of these compounds have decreased over time. The basis for this assertion should be described, since this trend is not apparent from data presented in Appendix C.

Response to Comment 3:

The following text has been added to Section 2.4.4:

"To comply with the RWQCB Order Number 96-070, the Army conducted a Petroleum Hydrocarbon Bioassay and Point of Compliance Concentration Determination Study in this area in 1997 which included the installation and sampling of a series of small-diameter microwells using direct-push drilling methodologies (microwells EBPP01 through EBPP6A, Figure 3). Groundwater samples collected from the microwells in March 1997 did not contain detectable levels of TPHg and BTEX (IT, 1997b).

In mid-November 1999, the Trust became aware that groundwater seeps in the southwest corner of the new Crissy Field tidal marsh (610SP01 and 610SP02), contained detectable concentrations of TPHg (Figure 3). Throughout 2000, the Trust conducted a series of investigations to identify and delineate the source of TPHg in the seeps including monthly sampling of the seeps (Table C-7). The Trust also collected shallow groundwater grab samples within Mason Street and near the seep locations using direct-push drilling and HydroPunch™ sampling methods. As documented in the Trust's *Commissary Seeps Interim Source Removal Action Plan* (Trust, 2000), TPHg in the seep samples ranged up to 810 µg/L and shallow groundwater TPHg concentrations up to 3,400 µg/L before removal was conducted. Soil in the majority of this area was excavated as part of the Commissary Seeps Interim Source Removal Action (Figure 3) conducted in 2001. Since removal was conducted, the highest TPHg concentration detected in seep samples has been 240 µg/L and the highest concentration detected in monitoring wells upgradient of the seeps (610GW101 through 610GW103) has been 430 µg/L."

Trust, 2000. *Commissary Seeps Interim Source Removal Action Plan*. October.

Comment 4: *Arsenic in groundwater.*
The discussion of the arsenic in groundwater observations indicates that it is believed that the elevated dissolved arsenic in groundwater is due to the subsurface geochemical conditions related to the historical and current tidal marsh and the degradation of historical petroleum releases. These two different hypotheses for the explanation of the dissolved arsenic should be explored by comparison with existing data from other Presidio locations. For example, arsenic data from other Presidio petroleum sites should be reviewed to see if elevated dissolved arsenic has an association with 1) petroleum release sites, 2) petroleum release locations near Crissy Marsh, or 3) the site's proximity to Crissy Marsh regardless of past petroleum releases. A preliminary review of groundwater data from the Building 1349 petroleum site (not located near Crissy Marsh), indicates that dissolved arsenic is elevated in the wells located in the area of past petroleum releases and not at the non-petroleum impacted well locations and as is discussed

in the *Revised Feasibility Study, Main Installation Sites*, this association has already been shown and described at the Building 1065 site. The CAP should more thoroughly explore the existing Presidio data on this subject and avoid suggesting hypotheses which are not supported by the data.

Response to Comment 4: The Trust has performed a detailed review of arsenic data in groundwater at the Commissary/PX Study Area and other Presidio sites. Please refer to Attachment A-1 for this analysis. The following are conclusions from the analysis:

- The dissolved arsenic and redox groundwater data collected at the Commissary/PX Study Area indicate that reducing conditions are present in areas with former petroleum releases. The elevated dissolved arsenic concentrations above the cleanup level of 10 µg/L in the vicinity of the Commissary Seeps Interim Source Removal Area are likely the result of reducing conditions in the area.
- Reducing conditions are also apparent at other petroleum-release sites at the Presidio, including the Building 1065 Area, Building 1349 Area, and Building 207/231 Area.
- There does not appear to be a relationship between chloride levels and dissolved arsenic in groundwater at the Commissary/PX Study Area nor other neighboring sites near the Bay.
- Dissolved arsenic concentrations are expected to decrease (when reducing conditions are caused by petroleum) after the petroleum in soil is remediated and groundwater returns to ambient conditions.

In light of the above considerations, the Trust continues to believe that it is appropriate to monitor the effects of source removal at the Commissary/PX Study Area. Therefore, the Final CAP does not contain an evaluation of active groundwater remediation alternatives to address arsenic, but includes Groundwater and Surface Water Monitoring as part of the soil corrective action remedy.

Comment 5: *In situ treatment.*
All of the *in situ* treatment technologies considered in the CAP utilize oxidizers or the introduction of oxygen into the subsurface environment. The effect that this treatment might have on the elevated levels of dissolve arsenic in the groundwater should be discussed. If it is determined that the use of one or more of these treatment technologies would have a positive effect on the levels of dissolved arsenic in the groundwater, then this should be included in the evaluation and selection of soil remedies at the site.

Response to Comment 5: Section 4.4.3 of the CAP text has been revised to discuss how *in situ* oxidizing treatments would create conditions that would be more oxidizing than the current conditions, which would be favorable for decreasing the concentrations of dissolved arsenic in groundwater. The following text has been added to Section 4.4.3:

"As discussed above in Section 2.4.4, reducing conditions in groundwater at Presidio petroleum sites are associated with elevated dissolved arsenic concentrations. Thus, the addition of oxidizing *in situ* treatments should result in less reducing conditions, which would be favorable for decreasing the concentrations of soluble arsenic in groundwater and surface water seeps."

Comment 6: *Confirmation Sampling – Soil.*
The frequency of confirmation sampling proposed for the Accessible Soil Units is significantly less than the frequency of sampling that was proposed and used for the adjacent, similar petroleum excavations at the Commissary Seep Interim Source Removal and the Building 637 CAP. This CAP proposes that confirmation samples be collected every 50 feet along the excavation sidewalls and once per every 2,500 square feet of excavation bottom. The previous petroleum sites in this area of Crissy Field collected confirmation sampling every 25 feet of excavation sidewall and once per every 625 square feet of excavation bottom. The CAP does not provide any basis for the reduction of the confirmation sampling frequency from what has been used in the past, and the frequency of confirmation sampling should not be reduced.

Response to Comment 6: Confirmation sampling for removals at the Presidio have used confirmation sampling frequencies based on the general size of the excavations. For example, for Landfill 4, a 50- by 50-foot sampling grid was used with one bottom sample collected per every 2,500 square feet of excavation area and sidewall samples collected every 50 feet. Landfill 4 had an estimated surface area of 58,500 square feet. Given the anticipated area of the excavations at the Commissary/PX Area, confirmation samples will be collected every 25 feet of excavation sidewall and once per every 625 square feet of excavation bottom. For areas outside of the 150-foot Crissy Field Marsh buffer zone, if an individual excavation becomes considerably larger than anticipated (greater than 50,000 square feet), the sampling frequency will be changed to 50 feet of excavation sidewall and once per every 2,500 square feet of excavation bottom. For each excavation, a minimum of one bottom and four sidewall confirmation samples will be collected. Section 5.2 of the CAP has been modified to reflect these changes.

Comment 7: *Groundwater and Surface Water Monitoring.*
The proposed groundwater monitoring remedy selected to address the dissolved arsenic exceedances should be expanded to collect data which will provide greater understanding of the problem and provide a basis for determining that the groundwater conditions are improving. For example, collection of Oxidation Reduction Potential (ORP) data is proposed for part of the monitoring program, but as described in the Trust's *Revised Feasibility Study, Main Installation Sites* ORP is difficult to accurately measure in the field and does not provide a reliable indicator of redox state. The monitoring should include all of the specific redox couples that are relevant to the understanding of the arsenic III/V redox couple and the overall groundwater redox conditions. In addition, the monitoring should be based on a thorough review of the nearly two years of data that have already been collected by the Trust from wells in this area. Do these data indicate that the

arsenic levels have begun to decline in the two years since the petroleum contaminated soil was removed? If they do not, what evidence suggests that such a trend would begin now or be shown by additional monitoring alone.

Response to Comment 7: The Trust has performed a detailed review of arsenic data in groundwater at the Commissary/PX Study Area and other Presidio sites. Please refer to Attachment A-1 for this analysis. The analysis shows that arsenic concentrations have begun to decline at the majority of locations near the Commissary seeps. Dissolved arsenic concentrations are expected to decrease (when reducing conditions are caused by petroleum) after the petroleum in soil is remediated and groundwater returns to ambient conditions.

Section 5.5 of the Final CAP presents the revised Phase 1 groundwater monitoring program that will be implemented under this CAP. Groundwater and surface water samples from monitoring wells and seep locations in the vicinity of the Commissary Seeps and Building 610 will be analyzed for arsenic and related constituents on a quarterly basis to assess whether arsenic concentrations in wells and seep samples at the site show trends over time and further evaluate the relationship between arsenic concentrations, TPH concentrations, Bay Mud, or other factors that affect redox conditions and therefore, the solubility of arsenic in groundwater. Samples collected will be analyzed for the following parameters:

- Dissolved arsenic, iron, manganese, and aluminum (EPA 6010-6020)
- Total arsenic, iron, manganese, and aluminum (EPA 6010-6020), at seep locations only
- General chemistry parameters: alkalinity (total), bicarbonate, carbonate, chloride, fluoride, nitrate as N, and nitrite as N, and sulfate (by various analytical methods)
- Sulfide (EPA 376.2/SW9030)
- Total dissolved solids (EPA 160.1)
- Total Organic Carbon (TOC) (SW 9060)
- Field parameters including dissolved oxygen (DO), specific conductance, and pH.

Comment 8: *Implementation Schedule.*
This discussion of the proposed implementation schedule should be expanded to include a timeframe for the preparation and submittal of the Accessible Area and the Less Accessible Work Plans.

Response to Comment 8: Section 5.7 provides the updated CAP implementation schedule milestones pursuant to Task 1 of the RWQCB Order. In addition, the text has been revised to state "The Phase 1 CAP Implementation Work Plan for the selected alternative will be submitted within two months following regulatory approval of the Final CAP. The Phase 2 CAP Implementation Work Plan will be prepared within 6 months of a determination concerning the Crissy Field Marsh expansion or submitted no later than 1 September 2008."

Comment 9: Section 2.4.4 Groundwater Impact Summary, page 19
This section refers the reader to a web page found at URL http://www.ecousa.net/toxics/chcl3.shmtl. Attempts made to access this web site on August 3, and August 24, 2004 were unsuccessful. The web site address or reference should be updated to provide a usable resource.

Response to Comment 9: The URL has been revised in the text to http://www.eco usa.net/toxics/chcl3.shtml.

Comment 10: Section 2.4.4 Groundwater Impact Summary, page 20
The discussion regarding the groundwater detections of chloroform indicates that chloroform is frequently detected in low concentrations in the Trust's groundwater monitoring program Source Water Blanks. It appears that this is intended to suggest that the groundwater detections may be related to source water contamination. Data from both the Commissary SI and Groundwater Monitoring Program have gone through data validation and review. Those data which were suspect due to blank contamination or for other reasons were qualified. Any additional suggestion of data problems should be supported by additional data analysis, otherwise the data should be considered valid as presented.

Response to Comment 10: Section 2.4.4 has been revised. The statement "Chloroform is also frequently detected at low concentrations in the source water blank quality control samples of the Presidio-wide Quarterly Groundwater Monitoring Program (Treadwell & Rollo, Inc. 2004a)" was not intended to suggest that chloroform detections were associated with source blank contamination and has been deleted. The following sentence has been added: "Chloroform detections at this and other sites at the Presidio (Building 1065, Building 207/231, Battery Howe Wagner, Directorate of Engineering and Housing) have generally ranged from 0.08 to 19 μg/L, well below the chloroform cleanup level of 80 μg/L."

Comment 11: Section 3.2.3 Soil COCs, page 23
This section indicates that there were metals detected above the cleanup levels, but they were not associated with Motor Pool releases and therefore were not retained as site COCs. As noted in Comment #1, lead was detected in the soil at location 600GW106, as were PAHs. PAHs were retained as site COCs. There are no data presented which might suggest that lead and PAHs were not related at this location. Lead should be retained as a COC.

Response to Comment 11: Section 3.2.3 has been revised to include metals detected in soil above cleanup levels as COCs. The text has been modified as follows:

"As discussed in Section 2.4.1.5, the SI concluded that elevated metal concentrations were not associated with Motor Pool releases, but are associated with the shallow fill material present beneath the Study Area. However, potential risk associated with these metals must be managed; therefore, cadmium, chromium, copper, lead, nickel, and zinc are also retained as soil COCs for the Commissary/PX Study Area."

Comment 12: Section 4.1 Identification and Screening of Potential Soil Remediation Technologies, 3. Cost Effectiveness, page 28
This section indicates that groundwater remedial technologies or groundwater remedial alternatives were not deemed warranted for this CAP, and that this decision is further explained in Section 3.5. There is no Section 3.5 included in this version of the CAP, and we were unable to locate this further explanation elsewhere in the document. If a review of the 2 years of existing data (see Comment #7) suggests that the current groundwater conditions and dissolved arsenic levels are not returning to normal, and there has been no groundwater remedial technologies or alternatives consideration in the CAP, then a groundwater remedial alternative evaluation would be needed (in a separate document). Creating a separate, extra document would not be time or funding efficient. This evaluation should be included in the CAP.

Response to Comment 12: The text of Section 4.1 has been revised to reference the reader to Section 3.3.

The Trust has performed a detailed review of arsenic data in groundwater at the Commissary/PX Study Area. Please refer to Attachment A-1 for this analysis. Based on the analysis, the Trust continues to believe that it is appropriate to monitor the effects of source removal at the Commissary/PX Study Area. Therefore, the Final CAP does not contain an evaluation of active groundwater remediation alternatives to address arsenic.

Arsenic concentrations are well below the Saltwater Ecological Protection Zone cleanup level of 36 µg/L and, therefore, dissolved arsenic in groundwater does not pose a significant risk to ecological receptors in the Crissy Field Marsh. Although concentrations are intermittently above the drinking water cleanup levels, it is highly unlikely that water from the seeps and nearby groundwater will ever be used for drinking water. The Trust believes that it is inappropriate to consider groundwater remediation alternatives to address arsenic because (1) the limited area of affected groundwater poses no unacceptable risk to current receptors that would require an action, (2) it is extremely unlikely that this area of affected water adjacent to Crissy Field Marsh will ever be used for drinking water, and (3) remediation of petroleum likely will result in dissolved arsenic concentrations to decrease below the drinking water cleanup level.

Under the selected corrective action for the soil RUs, Phase 1 groundwater monitoring will be conducted until implementation of the Phase 2 corrective action. In the Phase 2 CAP Implementation Work Plan, the arsenic and other groundwater data will be reviewed to assess the need for further monitoring. Under Phase 1 CAP implementation, an LUC to restrict use of groundwater in the area for drinking water purposes will be implemented. The LUC will be retained for long-term management of groundwater, if necessary, until chemical concentrations in groundwater are below drinking water cleanup levels.

Comment 13: Section 4.1 Identification and Screening of Potential Soil Remediation Technologies, Ex Situ Soil Treatment, page 30

The CAP states that *ex situ* treatment was not retained for further evaluation because it would not be desirable in this highly used area. This assumes that the *ex situ* treatment is performed on site. Options for excavation with off site treatment prior to disposal should be considered and compared to the current preferred alternative of excavation and landfill disposal without treatment.

Response to Comment 13: To address this comment, the following text has been added to the subsection on *Ex Situ* Soil Treatment, Section 4.1.5:

"Under current disposal market conditions in California, treating Class II soil to meet Class III acceptance criteria, whether performed onsite or offsite, is not cost effective. The difference between the unit rate disposal costs for Class II soil ($35/ton) and Class III soil ($24/ton) is approximately $9 /ton. The cost for treating soil to meet Class III acceptance criteria (either onsite or offsite) is likely much greater than $9/ton. *Ex situ* treatment would only address TPH and PAHs. Low-level metals in the soil would remain, resulting in a need to perform sampling and analysis, including leaching testing, for disposal purposes. Even after treatment for TPH and PAHs, the soil may not qualify for Class III disposal because of metals present in the soil. This additional sampling and analysis would also add to the cost of the *ex situ* treatment option. Other disadvantages for on-site and off-site treatment are discussed below.

Ex-situ On-Site Soil Treatment Prior to Disposal Off-Site. There are numerous logistical reasons why on-site treatment is not desirable. Construction and operation of high-profile *ex situ* soil treatment units is undesirable in this public, highly used and visited area. Stockpiling and treating affected soil would cause nuisance issues (visual impact, odors) and utilize needed parking areas.

Ex-situ Off-Site Soil Treatment Prior to Disposal. There are a limited number of facilities that will treat petroleum-affected soil prior to disposal as Class III waste. Transportation to such facilities would increase costs by an additional $25 or more per ton. Treatment costs at off-site facilities also are very high. For example, Envirogreen Recycling located in Vancouver, Canada would treat and recycle the treated soil for other industrial uses at a cost of $65 to $85 per ton, not including transportation costs. Transportation and treatment costs would be much greater than the additional $9/ton to simply dispose the soil at a Class II facility.

For these reasons, *ex situ* treatment prior to off-site disposal is not retained for further consideration."

Comment 14: Section 4.1 Identification and Screening of Potential Soil Remediation Technologies, Excavation and Off-Site Disposal (supplemented by oxygen releasing product, if necessary), page 30
The description of this technology (excavation) indicates that if the deeper contamination can not be reached with the excavation technologies then ORC® could be placed in the excavation. In order to fully evaluate this technology at this

site, a comparison of the excavation depths that may be reached with the considered equipment should be made to the depths where contamination has been observed. If contamination is expected below the reach of the excavation technology, based on this comparison, then the specific details regarding the placement of ORC® should be provided. As discussed in Comment #5, the potential of ORC®, or other oxidizing agents, to impact the elevated dissolved arsenic levels should be considered and discussed.

Response to Comment 14: The text in Section 4.1.6 has been revised as follows to address this comment: "Excavation is a practical source control measure that would be applicable to the conditions at the Commissary/PX Study Area sites. Conventional excavation technologies (e.g. excavators, backhoes, etc) can remove soil contamination to a depth of approximately 15 feet bgs without shoring. Fifteen feet bgs is beyond the maximum anticipated depth of contamination at each soil RU including any smear zone contamination. The majority of the contamination is located in the upper 5 feet of the subsurface. In addition, the presence of Bay Mud at approximately 7 to 8 feet bgs in the northern portion of the Study Area limits the depths to which contaminants might have migrated. Wood, asphalt, concrete and vegetative waste are not thought to be present in sufficient volumes at each soil RU to make recycling practicable. Off-site disposal moves petroleum-affected soil from its current location to an approved off-site disposal facility. As stated above, it is anticipated that conventional excavation technologies would be able to remove smear zone contamination. However, in the unlikely event that excavation technologies could not completely remove the deeper petroleum contamination, oxygen releasing product (e.g. ORC®) could be placed in the excavation area to complete the remediation of any remaining contamination. This product is selected over the other *in situ* technologies described above in Section 4.1.4 because it can be easily spread or applied in an open excavation without the use of specialized equipment, injection wells, or piping required by other *in situ* technologies. A detailed outline of the potential application of an oxygen releasing product in combination with excavation would be presented in the CAP Implementation Work Plans (Section 5.0)."

Please also see the Response to Comment #5.

Comment 15: Section 4.4.3 Alternative 3 – In Situ Soil Remediation (Less Accessible Units), page 33

This discussion indicates that *in situ* soil remediation is not considered for the Accessible Units because of the "large number of cost-prohibitive borings" that would be required. The reason why this would be cost prohibitive is not clear. At the adjacent Building 637 Site, the Trust injected ORC® into the subsurface using direct push technology and it appeared that due to the shallow nature of contamination in this area that this method of application was cost effective. It would be helpful to provide some support for the statement that the cost of the borings for treatment application would be cost prohibitive.

Response to Comment 15: The following information has been added to Section 4.1.4 of the CAP:

"The volume of soil requiring treatment in both the shallow and deep zones of the Accessible Locations is approximately 12,000 yd^3, assuming the interpretation of affected soil shown on Figures 17A and 18A (Scenario I - Lesser Impact Scenario). The range of TPHg concentrations exceeding cleanup levels in shallow soil (0 - 3 feet bgs) is 30 to 520 mg/kg; for TPHd is 180 to 1,400 mg/kg; and for TPHfo is 170 to 7,900 mg/kg (Figure 11). The range of TPHg concentrations exceeding cleanup levels in deep soil (3 to 10 feet bgs) is 1,100 to 2,600 mg/kg; for TPHd is 230 to 1,500 mg/kg; and for TPHfo is 150 to 1,800 mg/kg (Figure 12).

For the purposes of calculating the amount of ORC-Advanced™ needed for soil treatment, an average concentration of TPHg, TPHd, and TPHfo for the entire treatment area needs to be estimated. Based on the available data, an average concentration of 70 mg/kg TPHg, 100 mg/kg TPHd, and 1,100 mg/kg TPHfo, for an overall average of 1,270 mg/kg of total TPH was assumed. Using the proprietary software provided by a manufacturer of oxygen release compound (ORC-Advanced™ by Regenesis, Inc. [Regenesis, 2004]), the calculated quantity of ORC required to treat 12,030 yd^3 of soil with an average concentration of 1,270 mg/kg TPH is 863,628 pounds at a cost of $8 per pound or a total materials cost of $6,909,026 (plus California sales tax and shipping). The cost of applying the ORC, whether by means of excavation, mixing with a pugmill, and backfilling or direct injection via soil borings; construction management; reporting, and so forth, would be in addition to this cost. If the area of impact is greater than that shown on Figures 17A and 18A (i.e., similar to that shown on Figures 17B and 18B), the costs would be considerably higher. Clearly, this approach is infeasible for a variety of reasons, most importantly excessive cost. The vendor contacted concurs with this assessment and does not recommend using this product to treat gross soil contamination. Therefore, *in situ* treatment technologies are not retained for the Accessible Locations as a single remediation option."

Comment 16: Section 4.4.3 Alternative 3 – In Situ Soil Remediation (Less Accessible Units), page 33
This discussion indicates that through the use of the bioventing/biosparging, *in situ* treatment could be implemented practically during the occupancy of Building 610. In spite of this difference from the other in situ technologies (which are described as not practicable to implement during building occupancy), the implementation of this technology is not considered for immediate application, but, as indicated in Table D-4 is implemented following five years of Land Use Controls and monitoring. Immediate implementation of this alternative should be evaluated and considered as a way to quickly and fully resolve the site issues and reduce overall project costs.

Response to Comment 16: Regardless of implementation time, bioventing/biosparging was not the most cost effective *in situ* alternative evaluated in the CAP. Additionally, due to uncertainties regarding the expansion of the Crissy Field Marsh into the area of Building 610 and the future status of the building, the remedy selected in the CAP for Building 610 has been revised to a combination of three alternatives, as follows:

- No Marsh Expansion (Selected Alternative: Alternative 2, *Capping and LUCs*): Building 610, which overlies and covers the Less Accessible Locations, is planned for retail or recreational use for the foreseeable future. Under this alternative, Building 610 will provide an effective cap to prevent exposure to PAHs in soil underneath the building and the LUC will limit use of the property to recreational uses. In addition, as outlined in Appendix E, an evaluation of potential vapor intrusion from residual volatile organic compounds (VOCs) in the subsurface under and around Building 610 was conducted using available soil and groundwater data. This evaluation indicates that there is no significant potential for vapor intrusion into Building 610 under an unrestricted land use scenario (i.e., including residential, commercial/industrial, and recreational uses of the building). Thus, *Capping and LUCs* is considered protective of the Less Accessible Locations underneath Building 610 if the marsh or associated buffer zone is not expanded into the area of the building.

- Marsh Expansion with Demolition of Building 610 (Selected Alternative: Alternative 4, *Excavation and Off-Site Disposal and Capping and LUCs*): Although not anticipated, if the Crissy Field Marsh were expanded into the area of Building 610 in the future and the building demolished, excavation activities could be conducted to achieve the more stringent cleanup levels for saltwater protection under this alternative.

- Marsh Expansion with Building 610 In-Place (Selected Alternative: Alternative 3, *In Situ Soil Remediation and LUCs*): If the marsh buffer zone were expanded into the area but the building remains in-place, *in situ* soil treatment could be conducted for contamination underneath the building. This alternative provides the only cost-effective technology to remediate contamination underneath the building, while the building remains in-place.

If the *in situ* remedy is implemented for the contamiantion underneath Building 610, the technologies that will be considered for future implementation include: 1) oxygen release product injection, 2) bioventing/biosparging, 3) ozone sparging, and 4) sodium persulfate injection. Implementation time and building occupancy will be considered when selecting the most appropriate *in situ* technology at that time.

Comment 17: Section 4.5.1 Accessible Soil RUs, page 35
This section indicates that the recommended alternative for Accessible Soil units is Alternative 4 with Alternative 3 recommended as a contingency under specified circumstances. It appears that the “specified circumstances” that are contemplated are when excavation technologies are unable to excavate to the full depth of contamination. Alternative 3 was rejected for consideration for Accessible Soil units because it was considered “cost prohibitive”. As noted in Comment #14, comparison of known depths of contamination with the technical limitations of the excavation equipment is needed to determine the likelihood of contingent

implementation of Alternative 3. Furthermore, the selection of an Alternative that is described as “cost prohibitive” should be better described and justified.

Response to Comment 17: See Response to Comment #14 regarding the use of oxygen releasing product within excavations.

It is also noted that the selected alternative for the Accessible Locations, described in Section 4.5.1, has been revised in the Final CAP. The following text is now included in Section 4.5.1:

“The selected alternative for the Accessible Locations is Alternative 4, *Excavation and Off-Site Disposal, Capping and LUCs, and Groundwater Monitoring*. This alternative represents the best balance between costs, uncertainty concerning future land uses, and uncertainty related to the extent and volume of contamination (including PAHs) in soil at this site. Although Alternative 4 does not contain treatment as a principal element, the alternative is protective of human health, safety, and the environment; the phased excavation will minimize disturbance of culturally sensitive artifacts potentially present in the subsurface and will be implemented using methods that comply with regulations; and it is the most cost effective approach to meet the RAOs. This alternative provides for the cleanup and long-term management of TPH-, BTEX-, PAH-, and metal-contaminated soil. In addition, Alternative 4 offers flexibility with respect to the future expansion of the Crissy Field Marsh and minimizes costs associated with excavation of soil by implementing an LUC until a determination is made by the Trust and NPS regarding whether the Crissy Field Marsh will be expanded into the area. Once the determination is made, additional corrective action in the area will be implemented to remove soil containing COCs, as appropriate, to be consistent with actual land use.”

Comment 18: Table 1, Groundwater Elevation Summary
The groundwater elevations for the December 1, 2003 monitoring of locations 610SP01 and 610SP02 is given as “Y”. The definition of “Y” should be provided.

Response to Comment 18: The “Y” is a typo and has been deleted.

Comment 19: Figure 8 Soil Remedial Units and Groundwater and Surface Water Monitoring Network
This figure shows that excavation is only proposed for soil at the ends or at selected locations along Pipelines A and C and that the pipelines themselves will not be removed. This is not consistent with, and is less stringent than, past fuel line removals conducted by the Army where pipelines were removed unless significant obstacles were encountered. Pipeline removals performed under this CAP should not be less stringent than was required of the Army during their FDS removal work.

Response to Comment 19: To address this comment, the following text has been added to Section 5.1.2:

"The Fuel Distribution System Closure Report (IT, 1999), index map indicates that Pipeline A has been removed and Sheet CF-4 of that report documents that Pipeline C has also been removed. However, if portions of the pipelines are found during soil excavation activities, the pipelines will be removed and confirmation samples will be collected as outlined in the Phase 2 CAP Implementation Work Plan."

Comment 20: Appendix D, Table D-3 Less Accessible Soil Remediation Units, Alternative 3: Estimated Costs for In Situ Soil Remediation – Oxygen Release Product Injection although the overall cost for ORC® injection is similar to the injection costs estimated in the Building 637 CAP, several of the details appear to be in error and should be reviewed. For example, it does not appear to be necessary to core a 12 inch diameter hole in order to insert a 2 inch diameter injection probe and it does not appear correct that the deeper boring are less expensive than the shallow borings. Furthermore, the time period assumed necessary to perform 40 ORC® injections appears to be excessive and results in an overestimation of construction observation costs. For the ORC® injection performed by the Trust at the Building 637 site, the Trust averaged 24 injection borings per day (with a range of 23 to 25 borings per day). Based on this rate, it appears excessive to estimate that 40 injection borings will take 2.5 weeks to complete at the commissary.

Response to Comment 20: The 12-inch diameter concrete core was used to allow for additional room that would be needed for later confirmation sampling or injection boring access to avoid more than one round of coring. The cost estimate has been restructured based on a day rate for application (300 feet of drilling per day) and pounds per foot cost of oxygen releasing product.

Comments **Mark Youngkin Community Co-Chair**
Presidio of San Francisco
Restoration Advisory Board (RAB)
San Francisco, California
October 2004

Thank you for the opportunity to review the subject document. This area is an important site at the Presidio and we are pleased that the site has received close attention. We want to take this moment to also express our appreciation for the diligent efforts of the Presidio Trust and the Regional Water Quality Control Board to investigate the site thoroughly and determine several reasonable remedies.

In general, the Presidio Restoration Advisory Board is in agreement with the analysis and proposed remedy for the site. We do have comments for the record that we hope will not impede progress for the Commissary cleanup.

Comment 1: The site has been sampled extensively. We appreciate this effort and would welcome a breakdown of the cost of individual rounds of sampling. Despite the extensive sampling the depiction of subsurface contamination in various figures, does not appear geologically realistic. We expect that the actual shapes of excavation will be much different and possibly much larger. Isn't it worth having the remediation contractors develop realistic estimates of the soil volumes so that these volumes are not largely underestimated?

Response to Comment 1: As noted in the comment, extensive sampling has been performed at the Commissary/PX Study Area to delineate impacted soil volumes. The Site Investigation (SI) sampling costs were approximately $1 million, exclusive of Trust, NPS, and regulatory oversight. The depiction of subsurface contamination represents an interpretation between existing data using our understanding of potential sources of releases and our expectations regarding the movement of these releases in the subsurface. We recognize that the Draft CAP presented an estimate of contaminated soil volumes and associated soil excavation costs based on sample data with cleanup level exceedances, which could be biased low. The remediation cost estimates in the Draft CAP included a 20% contingency; however, this contingency may not fully address all soil above the cleanup levels.

In response to this comment, the Final CAP has been updated to depict two interpretations of soil RUs: Scenario I (Lesser Impact Scenario) and Scenario II (Greater Impact Scenario). Section 3.3 describes the two interpretations of soil RUs. Cost estimates have also been developed for both scenarios. In addition, as discussed in the introductory section to this Response to Comments, to account for the uncertainty related to the actual volume of contaminated soil at the site, the Trust has revised the remedy selected in the CAP and plans to implement remediation in two phases.

Comment 2: We have raised the question of whether the timing for cleanup at the site is appropriate given the opportunity to expand the Crissy marsh in the direction of the Commissary. We understand that the remediation program feels the need to move ahead without waiting for results of the marsh expansion study. If the Trust proceeds with cleanup and then decides to expand the marsh in this direction, the site will be "double excavated." We wish that the Trust would consider the cost of double excavating the site. We estimate this cost to be approximately $750,000. To arrive at this cost, we used the disposal volume of 20,242 cubic yards. We used $15 per cubic yard for clean back fill. This is an estimate achieved by halving the cost of $30 for clean top soil from alternative #1 in the subject document. We also estimated an increase in 50% volume of excavation given the odd shapes that have been depicted in the document, (comment #1). In addition, if the site were to become part of the marsh expansion project, an additional $250,000 would be required to excavate the back-filled area. Is it worth $750,000 to get this site cleaned up quickly, knowing that it might be re-excavated at a future date?

Response to Comment 2: The Trust acknowledges the RAB's concerns and agrees that the uncertainties related to the Crissy Field Marsh expansion and total volume of affected soil at the site warrant conducting the corrective action at the Commissary/PX Study Area in two phases. Under the phased implementation schedule discussed above, remediation of the Phase 2 Area will commence following decisions regarding the potential expansion of the Crissy Field Marsh into the Phase 2 Area. The Trust will proceed with Phase 2 work no later than the end of 2008.

Comment 3: The RAB has been strongly supportive of clean closure remedies in the past and we remain so. We also believe that it is prudent to discuss the opportunities and priorities gained and lost by spending dollars on this particular site for clean closure. If the site is to become a marsh expansion site, then the contamination is a clear threat and should be removed. If the site is going to remain a parking lot, what are the dangers associated with this contamination to the marsh? Could a phased approach to removal be considered, that remains cost effective? That is, could contamination that represents a clear threat to the marsh be removed next summer as planned and then the remainder removed/contained when future land use has been clarified?

Response to Comment 3: The Trust concurs with the approach presented in this comment and currently plans to perform the corrective action in two phases. The introduction section to this Response to Comments describes the phased approach in more detail. The Final CAP has been updated accordingly.

ATTACHMENT A-1

Arsenic in Groundwater Discussion

This Attachment provides a discussion of dissolved arsenic concentrations and associated trends in groundwater for the Commissary/PX Study Area. The information included in this discussion addresses the following comments received on the Draft Corrective Action Plan (CAP):

- James Ponton, Regional Water Quality Control Board (RWQCB): Comments 3 and 4: and
- Brian Ullensvang, National Park Service (NPS): General Comment and Comments 4, 7, and 12.

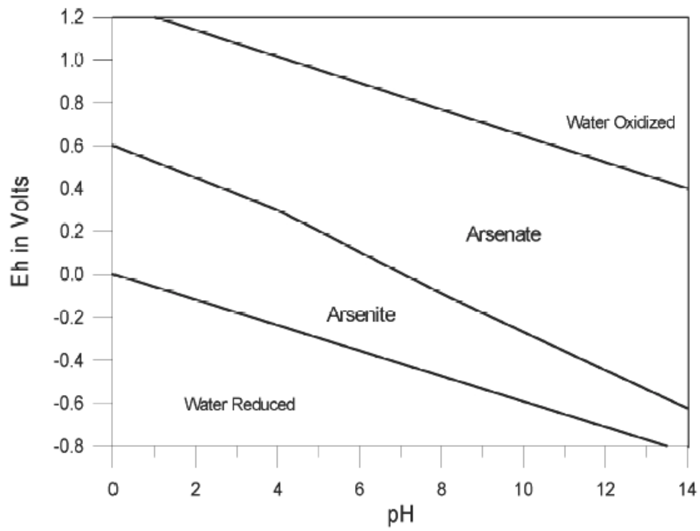
In this Attachment, the Commissary/PX Study Area groundwater data are evaluated to assess if elevated dissolved arsenic concentrations at the site are a result of reducing conditions caused by petroleum releases. Data from other sites at the Presidio are discussed, as appropriate, to support the analysis. Potential chloride interferences in the analysis of arsenic are also evaluated. Lastly, trends of arsenic over time at the Study Area are presented. The data and conclusions presented in this Attachment support the petroleum source removal remedy selected in the Final CAP to address arsenic detections in groundwater.

This discussion incorporates data collected through the Second Quarter 2005 groundwater monitoring event (Treadwell & Rollo, 2005). The groundwater data are presented in Tables A-1 total petroleum hydrocarbon (TPH), arsenic, and chloride) and A-2 (additional oxidation-reduction parameters).

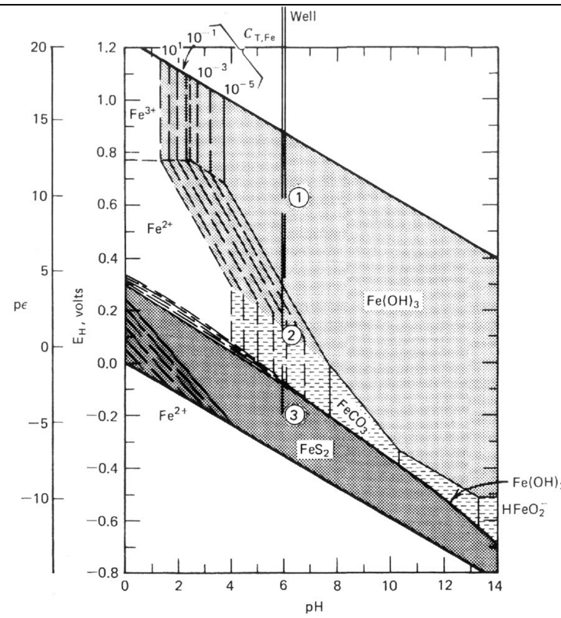
General Discussion of Reducing Conditions and Dissolved Arsenic

The relationship between reducing conditions in groundwater and elevated dissolved arsenic concentrations is widely recognized (Dragun, 1988, Fetter, 1993, Saxena, et al., 2004, and Kirk, et al., 2004). Reducing conditions can mobilize naturally-occurring arsenic that is present in soil. Arsenic is mobilized by reductive dissolution of iron and manganese oxides/hydroxides on which it adsorbs (i.e., reduction of iron III to iron II and reduction of manganese IV to manganese II) and the reduction of arsenic from arsenate (arsenic V) to arsenite (arsenic III). Arsenate is more adsorptive on iron and manganese oxides/hydroxides than is arsenite.

When reducing conditions mobilize arsenic, elevated dissolved arsenic would be expected to be accompanied by elevated dissolved (reduced) iron (i.e., ferrous iron or iron II). At a neutral pH, ferric iron (iron III) reduces to ferrous iron (iron II) at an Eh (oxidation-reduction potential relative to the standard hydrogen reference electrode) similar to that where arsenate (arsenic V) reduces to arsenite (arsenic III; i.e., approximately +0.1 volts for iron compared to 0.0 volts for arsenic). Therefore, dissolved iron measurements in groundwater provide a useful tool for assessing whether groundwater conditions would favor mobilization of naturally-occurring arsenic. Eh-pH diagrams for arsenic and iron are shown below.



Arsenic Eh-pH Diagram From: Johnson, Jeffrey A. and Madeline Schreiber, 2004, Arsenic: Perspectives regarding a new environmental concern: The Professional Geologist, v. 41, no. 4, p. 41- 44.



Iron Eh-pH diagram from: Snoeyink, Vernon L. and David Jenkins, 1980, Water chemistry, John Wiley & Sons, New York, 463 p.

Parameters that can be used as indicators of changing redox potential within groundwater include the following:

- **Dissolved Oxygen**: Low dissolved oxygen concentrations are typically associated with low redox potential and reducing environments.
- **Oxidation Reduction Potential (ORP)**: ORP is a direct measurement of redox potential. In general, the lower the ORP values the more reducing the water is, whereas, the greater the ORP value the more oxidizing the water.
- **Nitrate/Nitrite**: A decreasing nitrate concentration trend in groundwater can be indicative of low redox potential, microbial metabolism, and a reducing environment. Increasing concentrations of nitrate are typically associated with a rising redox potential.
- **Sulfate/Sulfide**: Decreasing concentrations of sulfate indicate sulfate reduction is taking place due to a reducing environment. Decreasing concentrations of sulfate are usually associated with sulfide production (i.e., sulfide is a product of sulfate reduction) and the repeated presence of sulfide in groundwater further confirms that sulfate is being reduced.

- **Total Organic Carbon (TOC)**: Decreasing trends in TOC over time indicate that microbial metabolism is taking place and TOC is being consumed.
- **Dissolved Gases (methane)**: An increasing trend in methane concentrations can be associated with a declining redox potential, and vice versa.
- **Arsenic Speciation (As III and As V)**: The relative ratios of the two most common forms of arsenic in groundwater (As III and AsV) is indicative of the current redox status of arsenic in groundwater. As III is typically found at higher concentrations, when compared to As V, in reducing environments.
- **Dissolved Arsenic, Iron, and Manganese**: Increasing concentrations of arsenic, iron, and/or manganese can be typically associated with a decreasing redox potential. Decreasing concentrations of these metals in association with increasing sulfate concentrations can be associated with an increasing redox potential.

Evaluation of Reducing Conditions and Arsenic Concentrations at the Commissary/PX Study Area

Dissolved arsenic, sulfate, nitrate/nitrite, and dissolved oxygen have been regularly analyzed in groundwater samples collected from well and seep locations throughout the Study Area. Analyses of dissolved iron, dissolved manganese, arsenic speciation, dissolved gases, TOC, ORP, and sulfide were conducted during the Fourth Quarter 2004, First Quarter 2005, and/or Second Quarter 2005 groundwater sampling events at the Study Area. These data are presented in Tables A-1 and A-2.

Dissolved arsenic has been detected above the cleanup level of 10 micrograms per liter (µg/L) in monitoring well and seep samples collected in the vicinity and downgradient of the Commissary Seeps Interim Source Removal Excavation. Monitoring well 610GW101 is located on the southern excavation boundary where concentrations have ranged from < 5 to 7.3 µg/L. Monitoring well 610GW102 is located in the former Commissary Seeps Excavation where concentrations have ranged from 6.1 to 22.1 µg/L. Dissolved arsenic concentrations at 610GW103 have ranged between 4.6 to 13 µg/L. Dissolved arsenic has also consistently been detected at both seeps (610SP01 and 610SP02) at concentrations ranging from 5.9 to 23 µg/L.

The elevated dissolved arsenic concentrations in the Commissary Seeps Interim Source Removal Area are likely the result of reducing conditions created by the former petroleum release, based on the following measurements:

- Elevated dissolved iron concentrations ranging up to 59,000 µg/L have been detected at these locations.
- Elevated dissolved manganese concentrations of 1,100 µg/L or greater have been detected at locations 610GW102, 610GW103, 610SP01, and 610SP02.
- Arsenic speciation analyses (As III and As V) conducted on samples beginning in the Fourth Quarter 2004 have showed As III at concentrations greater than 50% of the

inorganic arsenic concentration at these five locations. In general, these wells and seeps had higher concentrations of dissolved iron and/or manganese than wells with less As III than As V (e.g., 600GW102, 600GW104).

- Nitrate has consistently been non-detect or detected at very low concentrations at these locations.
- The lowest ORP readings have been measured at wells 610GW101, 610GW102, and 610GW103, in addition to well 600GW101 (discussed below).
- The highest methane readings have been measured at wells 610GW101 and 610GW102, in addition to well 600GW101 (discussed below).

Elsewhere in the Commissary/PX Study Area, groundwater that is not affected by petroleum appears to maintain iron in the ferric (iron III) oxidation state, which is oxidizing enough to oxidize arsenite to arsenate. The dissolved arsenic and redox data for Commissary/PX Study Area wells outside of the Commissary Seeps Interim Source Removal area are summarized as follows (based on data collected through the Second Quarter 2005):

- Well 600GW101 is located within an area where TPHg has been consistently detected in groundwater (TPHg Source Area Remedial Unit) and the dissolved iron concentrations have been elevated (up to 10,000 µg/L). Low concentrations of sulfate and non-detect nitrate further indicate reducing groundwater conditions at this location. Arsenic has not been detected in this well since the First Quarter 2003.
- Moderate to elevated iron concentrations (ranging between 1,100 and 9,500 µg/L) were detected in wells 600GW102, 600GW104, 600GW107, and 600GW109 during the First Quarter 2005 (which is the only time iron has been reported within these wells). These wells are all in areas not affected by petroleum releases. Sulfate and nitrate concentrations in these wells do not suggest that reducing conditions are present in groundwater. Arsenic has not been detected above the cleanup level in these wells. Furthermore, the As III concentration was less than As V in wells 600GW102 and 600GW104 during the Second Quarter 2005, further supporting the conclusion that reducing conditions are not present in these wells.
- In the First Quarter 2005, an elevated iron concentration (11,000 µg/L) was measured at well 600GW103. The low sulfate and non-detect nitrate concentrations in this well suggest reducing groundwater conditions at this location. Although TPH compounds have not been detected in this well, the well is downgradient of the former UST 603 (which is being addressed under the Former Coal Storage Bin Area CERCLA site). Grab samples collected from the UST excavation showed TPHd at 6,800 µg/L and TPHmo at 220 µg/L (MACTEC, 2004). Dissolved arsenic concentrations in this well have been reported up to 9.7 µg/L (Third Quarter 2003), which is below the cleanup level. These slightly elevated arsenic concentrations are likely the result of reducing

conditions in the well. Low ORP and high methane readings in this well also suggest reducing conditions.

- Samples from well 600GW105 have contained elevated iron (up to 2,600 µg/L). This well is not in an area affected by petroleum releases. Sulfate and nitrate concentrations do not suggest that reducing conditions are present in groundwater at this location and arsenic has not been detected.
- Dissolved iron was not detected in the samples from well 600GW106 and was detected at low concentrations (140 µg/L or less) from well 600GW108 (both located in areas not affected by petroleum releases). Dissolved arsenic has never been detected in samples from these wells, indicating that ambient groundwater conditions in the vicinity of these wells favors maintaining iron and arsenic in the oxidized state. Additionally, sulfate and nitrate concentrations do not suggest that reducing conditions are present in groundwater at these locations. The As III concentration was less than As V during the Fourth Quarter 2004, further supporting the conclusion that reducing conditions are not present in these wells.

The redox environment at the Commissary/PX Area is illustrated on the redox diagram from the First and Second Quarter Groundwater Monitoring Report (Figure A-16-4). This figure shows a more reducing environment in the area of former or current petroleum impacts and elevated arsenic concentrations in groundwater (at the 610-wells and seeps).

In conclusion, the dissolved arsenic and redox groundwater data collected at the Commissary/PX Study Area indicate that reducing conditions are present in areas with former petroleum releases. The elevated dissolved arsenic concentrations above the cleanup level of 10 µg/L in the vicinity of the Commissary Seeps Interim Source Removal Area are likely the result of reducing conditions in the area.

Evaluation of Reducing Conditions and Arsenic Concentrations at other Presidio Sites

The presence of reducing conditions and elevated dissolved arsenic concentrations in the area of petroleum impacts is, perhaps, more pronounced at other areas of the Presidio. Elsewhere on the Presidio, dissolved arsenic data have been collected from approximately 100 monitoring wells and at four seeps or springs (First and Second Quarter 2005 Groundwater Monitoring Report and Table A-1, attached). Of these locations, recurring dissolved arsenic concentrations have been reported greater than 10 µg/L at the Building 1065 Area and Building 1349 Area. Recent detections of dissolved arsenic above 10 µg/L have also occurred at the Building 207/231 Area. Other sites with dissolved arsenic concentrations exceeding 10 µg/L have been single samples and are inconsistent with the results for other samples from these locations and therefore, are not evaluated.

At the Building 1065 Area, dissolved arsenic concentrations in samples from six monitoring wells (1065PZ1A, 1065PZ2A, 1065PZ4A, 1065PZ5A/1065PZ5AR, 1065MW101, and

1065MW102) have been detected at concentrations above 10 µg/L (ranging from 11 to 31 µg/L). These wells are all screened within the shallow water-bearing zone within an area of petroleum impacts. Dissolved iron concentrations in these wells have been on the order of 5,000 to 25,000 µg/L (compared to less than 500 µg/L in other site wells) and methane concentrations have been on the order of 3,000 to 15,000 µg/L (compared to less than 100 µg/L for other site wells). The reason(s) for the reducing conditions are unclear, but may be due to the fact that these wells are partially completed in Bay Mud or fill with other organics. At well 1065MW101, high dissolved iron concentrations (between 4,000 and 19,000 µg/L) and methane concentrations (10,000 to 15,000 µg/L) have also been detected, indicating reducing conditions. At well 1065MW102, moderate iron concentrations (150 to 550 µg/L) and lower methane concentrations (1,500 to 2,900 µg/L) have been observed. Petroleum was not detected in the samples from either well.

Well 1065MW9A has historically had low concentrations of TPHg detected in groundwater samples. Dissolved iron concentrations in this well have ranged from 3,500 to 6,100 µg/L and methane concentrations have been moderately high (4,700 to 9,200 µg/L), indicating that reducing groundwater conditions also exist at this well location. Arsenic has been detected at 6.9 to 7.9 µg/L, potentially due to reducing groundwater conditions.

Arsenic speciation analyses conducted on samples from wells 1065PZ1A, 1065PZ2A, 1065PZ4A, 1065PZ5A/1065PZ5AR, 1065MW9A, and 1065MW101 further indicate reducing conditions. As III has been found at concentrations greater than 50% of the inorganic arsenic concentration at these locations. In addition, nitrate concentrations have been low or non-detect in these wells and sulfate concentrations are generally lower than other onsite wells.

Redox diagrams (Figure A-11-6 for shallow groundwater and Figure A-11-7 for intermediate groundwater) representing an approximation of the redox state of groundwater within the Building 1065 Area appear in the First and Second Quarter Groundwater Monitoring Report. These figures show that the shallow water-bearing zone at the Building 1065 Area is generally reducing, with a more reducing environment in the area of petroleum impacts and elevated arsenic concentrations in groundwater. In comparison, the intermediate water-bearing zone bears a more oxidizing environment. As discussed earlier, the reason(s) for the reducing conditions are unclear, and may be due to the fact that the shallow wells are partially completed in Bay Mud or fill with other organics. However, these data support the conclusion that elevated arsenic in the shallow groundwater at the site is likely the result of reducing conditions and the petroleum impacts have likely enriched the reducing environment.

At the Building 1349 Area, dissolved arsenic concentrations exceeding 10 µg/L (ranging from 11 to 23 µg/L) are accompanied by dissolved iron concentrations exceeding 20,000 µg/L and non-detect nitrate concentrations at well 1349MW100, which has consistently had high concentrations of petroleum.

One other well, 1349MW105, has had several samples with dissolved arsenic concentrations slightly exceeding 10 µg/L. Only slightly elevated iron concentrations have been observed in this well. The elevated arsenic concentrations in well 1349MW105 are likely associated with higher pH values observed in the area (BBL, 2005).

At the Building 207/231 Area, dissolved arsenic was analyzed for the first time in several wells beginning in the First Quarter 2005. Arsenic was detected above the cleanup level (at concentrations ranging from 14 to 32 µg/L) in wells 231GW21, 231GW22, 231GW25, and 231PZ01, screened in the shallow water-bearing zone. These wells are in the area of highest petroleum impacts in the shallow water-bearing zone and also exhibit the characteristics of a reducing environment, with high dissolved iron (on the order of 10,000 to 45,000 µg/L), low or non-detect nitrate and sulfate concentrations, low dissolved oxygen, and high methane concentrations. Manganese concentrations are also higher in these wells than other shallow zone wells. Arsenic speciation analyses have also shown As III at 62% or greater of the inorganic arsenic concentration at these locations. The reducing conditions in these wells are more pronounced than other shallow zone wells at the site, which show, in particular, lower iron and methane concentrations and higher manganese concentrations. This condition can be observed in the redox diagrams for the Building 207/231 Area from the First and Second Quarter Groundwater Monitoring Report (Figure A-10-9 for shallow groundwater and Figure A-10-10 for intermediate groundwater).

In summary, data from other sites at the Presidio, including the Building 1065 Area, Building 1349 Area, and Building 207/231 Area, support the relationship between reducing conditions, petroleum impacts, and elevated dissolved arsenic. Although a reducing environment has been observed in some areas of these sites without petroleum impacts, which could be related to Bay Mud or fill with other organics, it is clear that in the areas of petroleum impacts and elevated arsenic concentrations, reducing environments with high iron and low sulfate and nitrate concentrations are present. There also does not appear to be a pattern of increasing arsenic concentrations at these sites as proximity to the Bay increases. As such, dissolved arsenic concentrations are expected to decrease (when reducing conditions are caused by petroleum) after the petroleum is remediated and groundwater returns to ambient conditions.

Potential Effect of Chloride on Dissolved Arsenic Analysis

Chloride analysis is currently included in the Quarterly groundwater and surface water sampling program for the Commissary/PX Study Area and will continue to be monitored under the selected corrective action in this CAP (see Section 5.5). Table A-1 presents chloride, TPH, and dissolved arsenic data for Presidio well and seep locations where these data are collected, through the Second Quarter 2005. Chloride levels in the vicinity of the Commissary seeps have generally been higher than other areas of the site, and have ranged up to 5,800 mg/L at 610SP01 and up to 12,000 mg/L at 610SP02.

Heitkemper (2001) indicates that chloride interference with arsenic can result in reported arsenic concentrations biased high by as much as 1 μg/L for each 100 mg/L of chloride present. However, the Trust does not believe that chloride interference is the cause of elevated arsenic concentrations at the Commissary seeps. As shown on Table A-1, chloride concentrations at 610SP01 and 610SP02 have fluctuated over time, but do not correlate well with fluctuations of reported dissolved arsenic concentrations. In addition, dissolved arsenic concentrations above the cleanup level of 10 μg/L have also been detected in nearby wells 610GW102 and 610GW103, which have low concentrations of chloride, ranging up to only 74 and 270 μg/L, respectively. Higher concentrations of chloride ranging up to 870 μg/L have been reported in well 600GW102, but dissolved arsenic concentrations have been low (6.2 μg/L or less) in this well. These data indicate that there is no specific pattern related to reported dissolved arsenic and chloride concentrations in wells at the site.

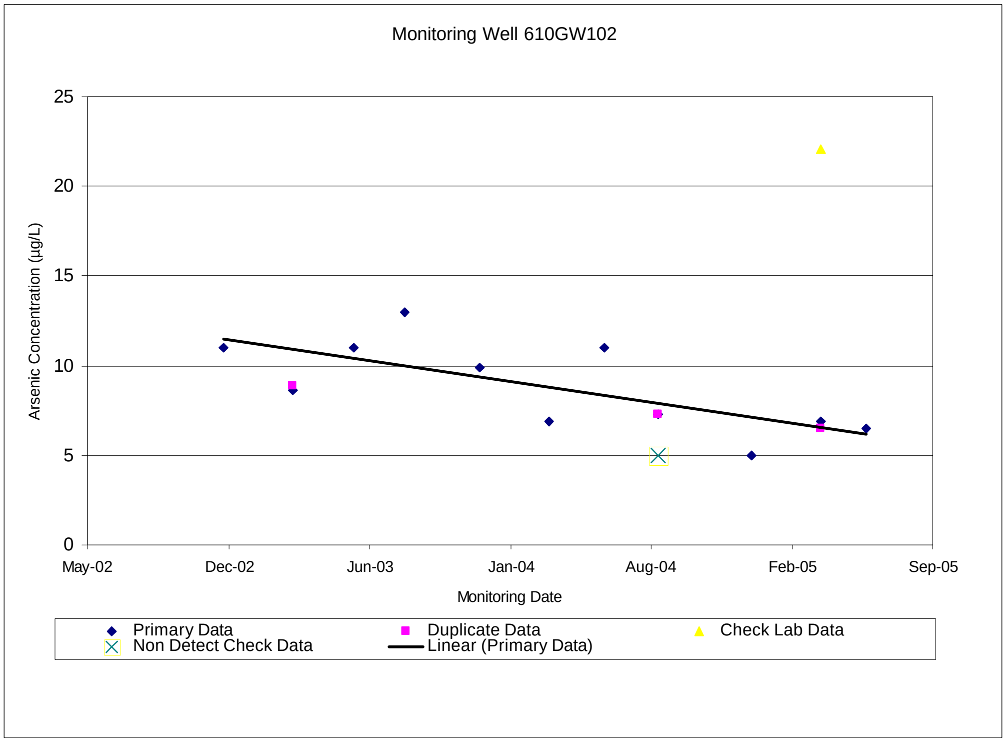
Chloride concentrations also do not appear to have an affect on dissolved arsenic concentrations at other nearby sites. At the Building 207/231 and Building 1065 Areas, chloride levels measured in the wells with elevated arsenic have not been higher than other wells at the site and the levels of elevated arsenic do not show an increasing pattern with proximity to the Bay. There are no available data for arsenic in groundwater around Buildings 637 and 638 to assess this relationship at that site, located west and adjacent to the Commissary/PX Study Area.

Presentation of Arsenic Trends at the Commissary Seeps

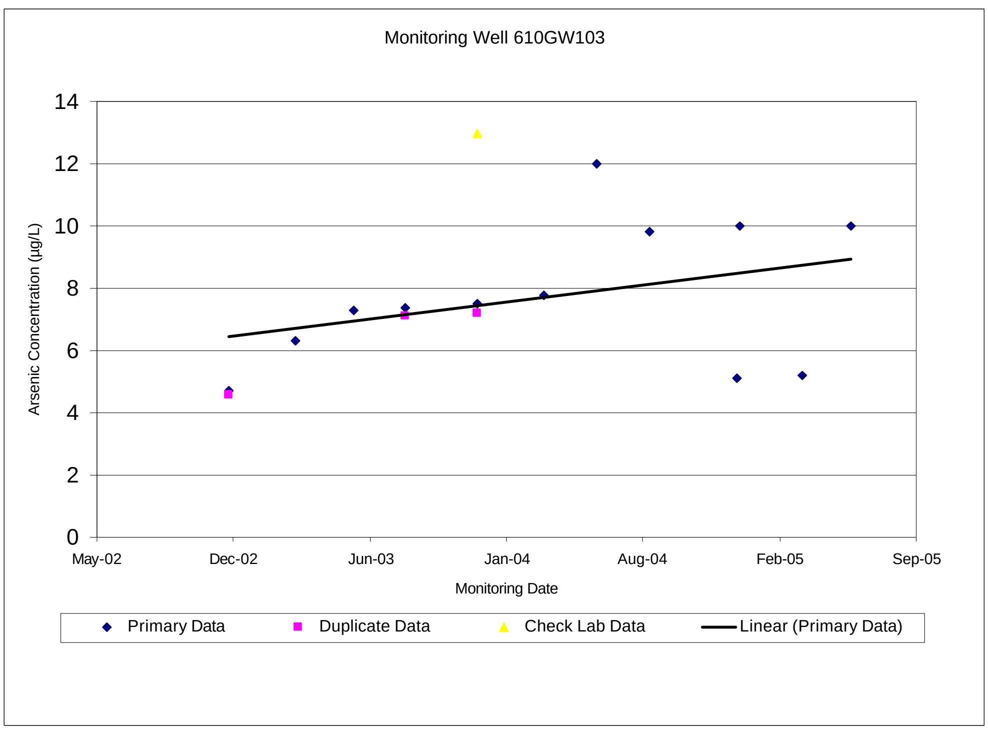
In order to assess if dissolved arsenic concentrations in the vicinity of the Commissary Seeps Interim Source Removal Excavation have declined since the petroleum contaminated soil was removed from the area, dissolved arsenic concentration vs. time were plotted for the two seep locations (610SP01 and 610SP02) and wells 610GW102 and 610GW103. Data from well 610GW101 were not plotted because most samples were non-detect (<5 μg/L). We caution against drawing any conclusions about trends because:

- sample detections are very low (i.e., not much greater than the analytical reporting limit) and reported concentrations are very sensitive to the variability inherent in sampling and analysis; and

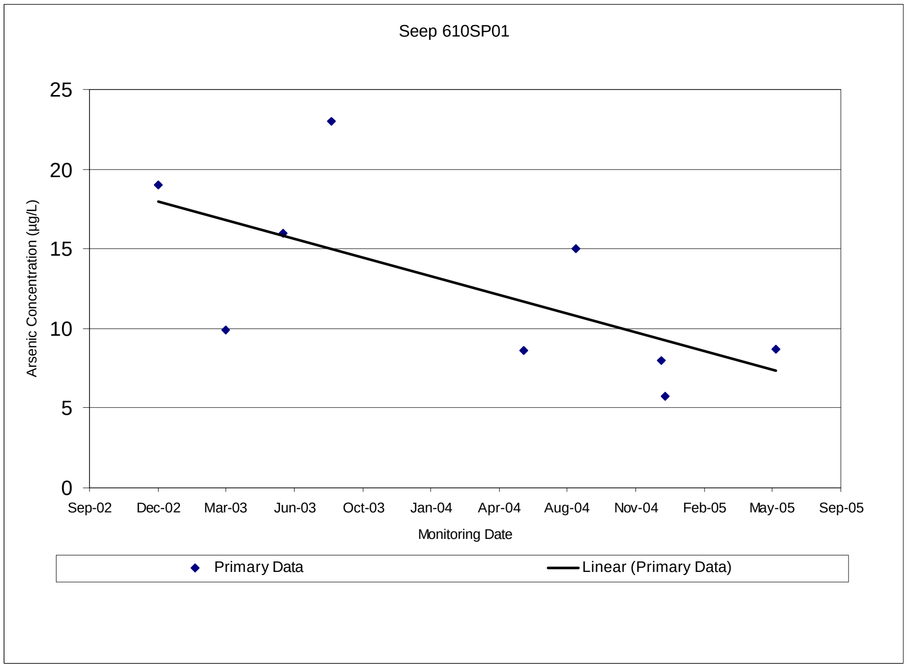
- there are a limited number of unfiltered samples collected to date. Based on a linear regression of the data, a decreasing trend is observed at 610SP01, 610SP02 and 610GW102. A slightly increasing trend is observed at 610GW103. The reason for this increasing trend at 610GW103 is unclear; however, over the last year of monitoring at this well, the dissolved arsenic concentrations have not exceeded the cleanup level of 10 μg/L. These data are not conclusive, but are sufficiently favorable to support continuation of monitoring.



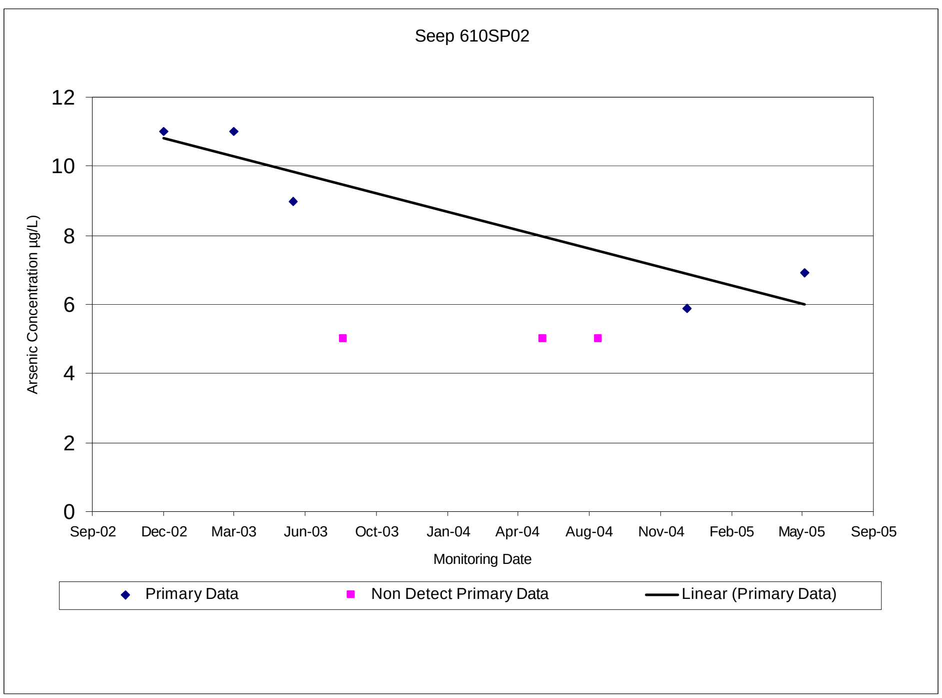
Monitoring Well 610GW102



Monitoring Well 610GW103



Seep 610SP01



Seep 610SP02

When ambient conditions return following the removal of petroleum, dissolved (ferrous [iron II]) iron should oxidize to form ferric oxides/hydroxides, which strongly adsorb arsenic, and arsenite should oxidize to arsenate. We note that when groundwater conditions favor the oxidation of arsenite, the reaction should occur very quickly. Manning and Suarez (2000) measured reaction rates for the oxidation of arsenite in a soil-in-water suspension. The first-order reaction rate constants for the soils tested ranged from 0.008 to 0.041 per hour (0.8% to 4.1% per hour). On a time scale of months, this oxidation is a rapid reaction. Manning and Suarez (2000) also demonstrated that arsenite adsorbs to soils containing ferric oxides/hydroxides.

Conclusions

Based on this evaluation of arsenic and other parameters in groundwater at the Commissary/PX Study Area and other sites throughout the Presidio, the following conclusions can be drawn:

- The dissolved arsenic and redox groundwater data collected at the Commissary/PX Study Area indicate that reducing conditions are present in areas with former petroleum releases. The elevated dissolved arsenic concentrations above the cleanup level of 10 µg/L in the vicinity of the Commissary Seeps Interim Source Removal Area are likely the result of reducing conditions in the area.
- Reducing conditions are also apparent at other petroleum-release sites at the Presidio, including the Building 1065, Building 1349, and Building 207/231 Areas.
- There does not appear to be a relationship between chloride levels and dissolved arsenic in groundwater at the Commissary/PX Study Area nor other neighboring sites near the Bay. Thus, alternative laboratory techniques aimed at minimizing potential interference of chloride in arsenic analyses are not warranted.
- Dissolved arsenic concentrations are expected to decrease (when reducing conditions are caused by petroleum) after the petroleum in soil is remediated and groundwater returns to ambient conditions.

In light of the above considerations, the Trust continues to believe that it is appropriate to monitor the effects of source removal at the Commissary/PX Study Area. Therefore, the Final CAP does not contain an evaluation of active groundwater remediation alternatives to address arsenic.

It is important to note that the dissolved arsenic concentrations at the Commissary/PX Study Area are below the saltwater cleanup level of 36 µg/L and, therefore, dissolved arsenic in groundwater does not pose a significant risk to ecological receptors in Crissy Field Marsh. Although concentrations are intermittently above the drinking water cleanup levels, water from the seeps and nearby groundwater is unlikely to be used as a source of drinking water. A component of the selected corrective action for the Commissary/PX Study Area is implementation and maintenance of a land use control (LUC) that will restrict the use of groundwater as a drinking supply until constituent concentrations are below drinking water cleanup levels.

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Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
Non-Petroleum Release Sites									
El Polin Springs, Fill Site 1 and Landfill 2									
EPSP01	03/15/05	NA	NA	NA	< 5	NA	NA	NA	89
(Total)	03/15/05	NA	NA	NA	< 5	NA	NA	NA	NA
	03/15/04	NA	NA	NA	< 5	NA	NA	NA	90
	03/13/03	NA	NA	NA	< 1	NA	NA	NA	82
	12/03/02	NA	NA	NA	< 1	NA	NA	NA	82
	08/27/02	NA	NA	NA	< 1	NA	NA	NA	78
	06/05/02	NA	NA	NA	< 1	NA	NA	NA	82
	03/11/02	NA	NA	NA	< 1	NA	NA	NA	78
	11/28/01	NA	NA	NA	< 1	NA	NA	NA	190
	08/29/01	NA	NA	NA	< 1	NA	NA	NA	81
	05/18/01	NA	NA	NA	< 1	NA	NA	NA	82
	05/13/99	< 50	81 (J25)	< 300	< 5	NA	NA	NA	97
	02/10/99	< 50	< 50	< 300	< 5	NA	NA	NA	103
	12/04/98	< 50	75 (J25)	< 300	< 5	NA	NA	NA	96
	04/17/98	NA	< 50	< 300	< 5	NA	NA	NA	78
	03/09/98	< 50	< 50	< 300	< 5	NA	NA	NA	72
	01/08/98	< 50	2,300 (J25)	1,800 (J25)	< 5	NA	NA	NA	77
	11/09/94	NA	NA	NA	NA	NA	NA	NA	85.3
	09/04/92	NA	< 50	NA	NA	NA	NA	NA	NA
LF01GW01	03/17/05	NA	NA	NA	< 5	NA	NA	NA	53
DUP0317051A	03/17/05	NA	NA	NA	< 5	NA	NA	NA	53
LF01GW01CL	03/17/05	NA	NA	NA	< 2 U	NA	NA	NA	51.6
	03/16/04	NA	NA	NA	< 5	NA	NA	NA	48
	03/13/03	NA	NA	NA	< 1	NA	NA	NA	25
	12/09/02	NA	NA	NA	< 1	NA	NA	NA	47
DUP1209022D	12/09/02	NA	NA	NA	< 1	NA	NA	NA	48
LF01GW01CL	12/09/02	NA	NA	NA	< 2 U	NA	NA	NA	45
	08/27/02	NA	NA	NA	< 1	NA	NA	NA	49
	05/29/02	NA	NA	NA	< 1	NA	NA	NA	44
DUP0311022A	03/11/02	NA	NA	NA	< 1	NA	NA	NA	35
LF01GW01CL	03/11/02	NA	NA	NA	< 1	NA	NA	NA	35
	03/11/02	NA	NA	NA	< 2	NA	NA	NA	39
	11/27/01	NA	NA	NA	< 1	NA	NA	NA	30
	08/28/01	NA	NA	NA	< 1	NA	NA	NA	29
	05/16/01	NA	NA	NA	< 1	NA	NA	NA	57
	05/10/99	NA	NA	NA	< 5	NA	NA	NA	34
	02/08/99	NA	< 50	< 300	< 5	NA	NA	NA	42
	11/09/98	NA	NA	NA	< 5	NA	NA	NA	45
	08/11/98	NA	NA	NA	< 5	NA	NA	NA	299
	04/09/98	NA	NA	NA	< 5	NA	NA	NA	30
	01/05/98	NA	NA	NA	< 5	NA	NA	NA	56
	11/05/97	NA	NA	NA	< 5	NA	NA	NA	57
	08/06/97	NA	NA	NA	< 5	NA	NA	NA	47
	05/07/97	NA	NA	NA	< 5	NA	NA	NA	35
	02/05/97	NA	NA	NA	< 5	NA	NA	NA	52
	10/29/96	< 50	< 50	< 300	5.8	NA	NA	NA	41
	08/01/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	36
	05/23/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	28
	03/08/96	< 50	< 50	470 (J32)	< 5 U	NA	NA	NA	57
	12/15/95	< 50	< 50	< 300	< 5	NA	NA	NA	54
	09/13/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	38
	11/08/94	NA	NA	NA	NA	NA	NA	NA	466
	08/26/92	NA	< 50	NA	NA	NA	NA	NA	46

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(mg/L)
LF01GW02	03/15/05	NA	NA	NA	< 5	NA	NA	NA	100
	03/16/94	NA	NA	NA	< 5	NA	NA	NA	130
	03/13/03	NA	NA	NA	< 1	NA	NA	NA	91
	12/03/02	NA	NA	NA	< 1	NA	NA	NA	70
	08/27/02	NA	NA	NA	< 1	NA	NA	NA	44
	05/29/02	NA	NA	NA	< 1	NA	NA	NA	81
	03/11/02	NA	NA	NA	< 1	NA	NA	NA	88
	11/27/01	NA	NA	NA	< 1	NA	NA	NA	90
	08/28/01	NA	NA	NA	< 1	NA	NA	NA	93
DUP0828012A	08/28/01	NA	NA	NA	< 1	NA	NA	NA	93
	05/17/01	NA	NA	NA	< 1 UJ	NA	NA	NA	84
DUP0517011A	05/17/01	NA	NA	NA	< 1 UJ	NA	NA	NA	82
	05/11/99	NA	NA	NA	< 5	NA	NA	NA	78
	02/09/99	NA	< 50	< 300	< 5	NA	NA	NA	110
	11/10/98	NA	NA	NA	< 5	NA	NA	NA	57
	08/12/98	NA	NA	NA	< 5	NA	NA	NA	46
	04/10/98	NA	NA	NA	< 5	NA	NA	NA	77
	01/06/98	NA	NA	NA	< 5	NA	NA	NA	63
	11/04/97	NA	NA	NA	< 5	NA	NA	NA	56
	08/05/97	NA	NA	NA	< 5	NA	NA	NA	56
	05/06/97	NA	NA	NA	< 5	NA	NA	NA	79
	02/04/97	NA	NA	NA	< 5	NA	NA	NA	66
	10/29/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	58
	08/01/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	66
	05/23/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	71
	03/08/96	< 50	< 50	2,200 (J32)	< 5 U	NA	NA	NA	62
	12/15/95	< 50	< 50	< 300	< 5	NA	NA	NA	53
	09/13/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	73
	08/26/92	NA	< 50	NA	NA	NA	NA	NA	65
LF01GW03	03/15/05	NA	NA	NA	< 5	NA	NA	NA	110
	03/17/04	NA	NA	NA	< 5	NA	NA	NA	120
	03/13/03	NA	NA	NA	2.2	NA	NA	NA	110
	12/03/02	NA	NA	NA	2.6	NA	NA	NA	84
	08/27/02	NA	NA	NA	1.9	NA	NA	NA	82
	05/29/02	NA	NA	NA	2.6	NA	NA	NA	99
	03/12/02	NA	NA	NA	2.5	NA	NA	NA	120
	11/27/01	NA	NA	NA	3.6	NA	NA	NA	88
	08/29/01	NA	NA	NA	2.9	NA	NA	NA	88
	05/17/01	NA	NA	NA	3.3 J	NA	NA	NA	99
	05/10/99	NA	NA	NA	< 5	NA	NA	NA	108
	02/08/99	NA	< 50	< 300	< 5	NA	NA	NA	130
	11/09/98	NA	NA	NA	< 5	NA	NA	NA	130
	08/11/98	NA	NA	NA	< 5	NA	NA	NA	96
	04/09/98	NA	NA	NA	< 5	NA	NA	NA	120
	01/05/98	NA	NA	NA	< 5	NA	NA	NA	83
	11/05/97	NA	NA	NA	< 5	NA	NA	NA	84
	08/06/97	NA	NA	NA	< 5	NA	NA	NA	83
	05/07/97	NA	NA	NA	< 5	NA	NA	NA	97
	02/05/97	NA	NA	NA	< 5	NA	NA	NA	100
	10/30/96	< 50	< 50	< 300	9.3	NA	NA	NA	100
	08/05/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	86
	05/22/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	91
	03/08/96	< 50	< 50	3,030 (J32)	< 5 U	NA	NA	NA	92
	12/15/95	< 50	< 50	< 300	< 5	NA	NA	NA	85
	09/13/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	100
	11/08/94	NA	NA	NA	NA	NA	NA	NA	1,730
	09/10/92	< 50	NA	NA	NA	NA	NA	NA	81

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
LF01GW04	03/15/05	NA	NA	NA	< 5	NA	NA	NA	94
	03/17/04	NA	NA	NA	< 5	NA	NA	NA	61
DUP0317043A	03/17/04	NA	NA	NA	< 5	NA	NA	NA	60
LF01GW04CL	03/17/04	NA	NA	NA	< 5	NA	NA	NA	57
	03/13/03	NA	NA	NA	< 1	NA	NA	NA	57
DUP0313032A	03/13/03	NA	NA	NA	< 1	NA	NA	NA	55
	12/03/02	NA	NA	NA	< 1	NA	NA	NA	57
	08/27/02	NA	NA	NA	< 1	NA	NA	NA	58
	05/30/02	NA	NA	NA	< 1	NA	NA	NA	61
DUP0530021B	05/30/02	NA	NA	NA	< 1	NA	NA	NA	63
LF01GW04CL	05/30/02	NA	NA	NA	< 0.5	NA	NA	NA	58
	03/12/02	NA	NA	NA	< 1	NA	NA	NA	83
	11/27/01	NA	NA	NA	< 1	NA	NA	NA	57
DUP1127012A	11/27/01	NA	NA	NA	< 1	NA	NA	NA	58
LF01GW04CL	11/27/01	NA	NA	NA	< 2.0	NA	NA	NA	66
	08/29/01	NA	NA	NA	< 1	NA	NA	NA	57
	05/17/01	NA	NA	NA	< 1 UJ	NA	NA	NA	55
	05/11/99	NA	NA	NA	< 5	NA	NA	NA	36
	02/10/99	NA	59 (J25)	303 (J25)	< 5	NA	NA	NA	35
	11/10/98	NA	NA	NA	< 5	NA	NA	NA	27
	08/12/98	NA	NA	NA	< 5	NA	NA	NA	205
	04/10/98	NA	NA	NA	< 5	NA	NA	NA	27
	01/06/98	NA	NA	NA	< 5	NA	NA	NA	20
	11/06/97	NA	NA	NA	< 5	NA	NA	NA	28
	08/07/97	NA	NA	NA	< 5	NA	NA	NA	20
	05/08/97	NA	NA	NA	< 5	NA	NA	NA	21
	02/05/97	NA	NA	NA	< 5	NA	NA	NA	33
	10/30/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	21
	08/05/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	21
	05/21/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	28
	03/11/96	< 50	< 50	586 (J32)	< 5 U	NA	NA	NA	35
	12/18/95	< 50	< 50	< 300	< 5	NA	NA	NA	35
	09/14/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	39
	11/08/94	NA	NA	NA	NA	NA	NA	NA	575
	09/10/92	< 50	NA	NA	NA	NA	NA	NA	55
LF01GW05	03/15/05	NA	NA	NA	< 5	NA	NA	NA	72
	03/16/04	NA	NA	NA	< 5	NA	NA	NA	58
	03/12/03	NA	NA	NA	< 1	NA	NA	NA	71
	12/03/02	NA	NA	NA	< 1	NA	NA	NA	61
	08/27/02	NA	NA	NA	< 1	NA	NA	NA	66
	05/29/02	NA	NA	NA	< 1	NA	NA	NA	67
	03/11/02	NA	NA	NA	< 1	NA	NA	NA	19
	11/27/01	NA	NA	NA	< 1	NA	NA	NA	54
	08/28/01	NA	NA	NA	< 1	NA	NA	NA	61
	05/16/01	NA	NA	NA	< 1	NA	NA	NA	58
	05/13/99	NA	NA	NA	< 5	NA	NA	NA	78
	02/11/99	NA	< 50	< 300	< 5	NA	NA	NA	87
	11/12/98	NA	NA	NA	< 5	NA	NA	NA	94
	08/11/98	NA	NA	NA	< 5	NA	NA	NA	66
	04/09/98	NA	NA	NA	< 5	NA	NA	NA	85
	01/05/98	NA	NA	NA	< 5	NA	NA	NA	66
	11/06/97	NA	NA	NA	< 5	NA	NA	NA	86
	08/07/97	NA	NA	NA	< 5	NA	NA	NA	69
	05/08/97	NA	NA	NA	< 5	NA	NA	NA	72
	02/06/97	NA	NA	NA	< 5	NA	NA	NA	65
	10/31/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	61
	08/06/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	59
	05/22/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	58
	03/12/96	< 50	< 50	327 (J32)	< 5 U	NA	NA	NA	57

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
LF01GW05	12/19/95	< 50	< 50	< 300	< 5	NA	NA	NA	54
	09/15/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	55
	11/08/94	NA	NA	NA	NA	NA	NA	NA	527
	09/10/92	< 50	NA	NA	NA	NA	NA	NA	46
LF01GW06	03/15/05	NA	NA	NA	< 5	NA	NA	NA	2.2
	03/17/04	NA	NA	NA	< 5	NA	NA	NA	13
	03/13/03	NA	NA	NA	< 1	NA	NA	NA	11
	12/03/02	NA	NA	NA	< 1	NA	NA	NA	31
	08/27/02	NA	NA	NA	< 1	NA	NA	NA	31
DUP0827022A	08/27/02	NA	NA	NA	< 1	NA	NA	NA	31
	05/30/02	NA	NA	NA	< 1	NA	NA	NA	32
DUP0530021C	05/30/02	NA	NA	NA	< 1	NA	NA	NA	32
	03/12/02	< 50	< 50	< 300	< 1	NA	NA	NA	15
	11/27/01	NA	NA	NA	< 1	NA	NA	NA	33
	08/28/01	NA	NA	NA	< 1	NA	NA	NA	34
	05/17/01	< 50	< 50	< 300	< 1 UJ	NA	NA	NA	32
	05/12/99	NA	NA	NA	< 5	NA	NA	NA	32
	02/10/99	< 50	< 50	< 300	< 5	NA	NA	NA	15
	11/11/98	NA	NA	NA	< 5	NA	NA	NA	32
	08/13/98	NA	NA	NA	< 5	NA	NA	NA	27
	04/13/98	NA	NA	NA	< 5	NA	NA	NA	35
	01/06/98	< 50	< 50	< 300	< 5	NA	NA	NA	19
	11/05/97	NA	NA	NA	< 5	NA	NA	NA	25
	08/06/97	NA	NA	NA	< 5	NA	NA	NA	26
	05/07/97	NA	NA	NA	< 5	NA	NA	NA	28
	02/05/97	NA	NA	NA	< 5	NA	NA	NA	32
	10/30/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	26
	08/05/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	26
	05/23/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	22
	03/11/96	< 50	< 50 (U6)	1,990 (J32, J6)	< 5 U	NA	NA	NA	15
	12/18/95	< 50	< 50	< 300	< 5	NA	NA	NA	21
	09/14/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	23
	11/08/94	NA	NA	NA	NA	NA	NA	NA	335
	08/28/92	< 50	NA	NA	NA	NA	NA	NA	25
LF01GW07	03/15/05	NA	NA	NA	< 5	NA	NA	NA	25
	03/17/04	NA	NA	NA	< 5	NA	NA	NA	48
	03/13/03	NA	NA	NA	< 1	NA	NA	NA	48
	12/03/02	NA	NA	NA	< 1	NA	NA	NA	55
	08/27/02	NA	NA	NA	< 1	NA	NA	NA	55
	05/29/02	NA	NA	NA	< 1	NA	NA	NA	54
	03/12/02	NA	NA	NA	< 1	NA	NA	NA	53
	11/27/01	NA	NA	NA	< 1	NA	NA	NA	52
	08/29/01	NA	NA	NA	< 1	NA	NA	NA	54
	05/15/01	NA	NA	NA	< 1	NA	NA	NA	50
DUP0515013A	05/15/01	NA	NA	NA	< 1	NA	NA	NA	51
LF01GW07CL	05/15/01	NA	NA	NA	< 2	NA	NA	NA	50
	05/10/99	NA	NA	NA	< 5	NA	NA	NA	58.4
	02/08/99	NA	< 50	< 300	< 5	NA	NA	NA	63.3
	11/09/98	NA	NA	NA	< 5	NA	NA	NA	68.2
	08/11/98	NA	NA	NA	< 5	NA	NA	NA	46
	04/09/98	NA	NA	NA	< 5	NA	NA	NA	56
	01/05/98	NA	NA	NA	< 5	NA	NA	NA	45
	11/06/97	NA	NA	NA	< 5	NA	NA	NA	53
	08/07/97	NA	NA	NA	< 5	NA	NA	NA	50
	05/08/97	NA	NA	NA	< 5	NA	NA	NA	53
	02/06/97	NA	NA	NA	< 5	NA	NA	NA	39
	10/31/96	< 50	< 50	< 300	5	NA	NA	NA	48
	08/06/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	48
	05/22/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	47

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
LF01GW07	03/12/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	48
	12/19/95	< 50	< 50	< 300	< 5	NA	NA	NA	52
	09/15/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	55
LF02GW01	03/15/05	NA	NA	NA	< 5	NA	NA	NA	74
	03/16/04	NA	NA	NA	< 5	NA	NA	NA	NA
	03/13/03	NA	NA	NA	< 1	NA	NA	NA	NA
	12/03/02	NA	NA	NA	< 1	NA	NA	NA	67
	08/27/02	NA	NA	NA	< 1	NA	NA	NA	69
	05/29/02	NA	NA	NA	< 1	NA	NA	NA	70
	03/11/02	NA	NA	NA	< 1	NA	NA	NA	68
	11/28/01	NA	NA	NA	< 1	NA	NA	NA	73
	08/28/01	NA	NA	NA	< 1	NA	NA	NA	69
	05/17/01	NA	NA	NA	1.2 J	NA	NA	NA	68
	05/11/99	NA	NA	NA	< 5	NA	NA	NA	78
	02/09/99	NA	< 50	< 300	< 5	NA	NA	NA	87
	11/10/98	NA	NA	NA	< 5	NA	NA	NA	85
	08/12/98	NA	NA	NA	< 5	NA	NA	NA	63
	04/10/98	NA	NA	NA	< 5	NA	NA	NA	81
	01/06/98	NA	NA	NA	< 5	NA	NA	NA	60
	11/03/97	NA	NA	NA	< 5	NA	NA	NA	71
	08/04/97	NA	NA	NA	< 5	NA	NA	NA	66
	05/05/97	NA	NA	NA	< 5	NA	NA	NA	67
	02/03/97	NA	NA	NA	< 5	NA	NA	NA	57
	10/28/96	< 50	< 50	< 300	5.9	NA	NA	NA	64
	07/31/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	64
	05/21/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	64
	03/04/96	< 50	80 (J32)	1,600 (J32)	< 5 U	NA	NA	NA	69
	12/11/95	< 50	< 50	< 300	< 5	NA	NA	NA	52
	09/08/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	65
	11/09/94	NA	NA	NA	NA	NA	NA	NA	69.4
	08/28/92	NA	70	NA	NA	NA	NA	NA	60
LF02GW02	03/15/05	NA	NA	NA	< 5	NA	NA	NA	170
	03/16/04	NA	NA	NA	< 5	NA	NA	NA	190
	03/13/03	NA	NA	NA	1	NA	NA	NA	170
DUP0313032B	03/13/03	NA	NA	NA	< 1	NA	NA	NA	170
	12/03/02	NA	NA	NA	1.3	NA	NA	NA	180
DUP1203023A	12/03/02	NA	NA	NA	1	NA	NA	NA	180
	08/27/02	NA	NA	NA	1.1	NA	NA	NA	180
DUP0827023A	08/27/02	NA	NA	NA	1.1	NA	NA	NA	180
	05/29/02	NA	NA	NA	< 1	NA	NA	NA	180
	03/11/02	< 50	< 50	< 300	1.3	NA	NA	NA	200
DUP0311022B	03/11/02	< 50	< 50	< 300	1.3	NA	NA	NA	200
LF02GW02CL	03/11/02	< 50	< 50	< 300	0.67 J	NA	NA	NA	200
	11/28/01	NA	NA	NA	2.5	NA	NA	NA	210
	08/28/01	NA	NA	NA	2.3	NA	NA	NA	190
	05/17/01	< 50	< 50	< 300	1.5 J	NA	NA	NA	190
	05/12/99	NA	NA	NA	< 5	NA	NA	NA	248
	02/10/99	< 50	< 50	< 300	< 5	NA	NA	NA	279
	11/11/98	NA	NA	NA	< 5	NA	NA	NA	311
	08/13/98	NA	NA	NA	< 5	NA	NA	NA	220
	04/13/98	NA	NA	NA	< 5	NA	NA	NA	290
	01/07/98	< 50	< 50	< 300	< 5	NA	NA	NA	248
	11/03/97	NA	NA	NA	< 5	NA	NA	NA	260
	08/04/97	NA	NA	NA	< 5	NA	NA	NA	270
	05/05/97	NA	NA	NA	< 5	NA	NA	NA	230
	02/03/97	NA	NA	NA	< 5	NA	NA	NA	250
	10/28/96	< 50	< 50	< 300	11	NA	NA	NA	210
	07/31/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	220
	05/22/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	200

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
LF02GW02	03/04/96	< 50	55 (J32)	1,200 (J32)	< 5 U	NA	NA	NA	209
	12/11/95	< 50	< 50	< 300	< 5	NA	NA	NA	56
	09/06/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	160
	11/09/94	NA	NA	NA	NA	NA	NA	NA	152
	09/04/92	NA	< 50	NA	NA	NA	NA	NA	130
LF02GW04	03/15/05	NA	NA	NA	< 5	NA	NA	NA	68
	03/16/04	NA	NA	NA	< 5	NA	NA	NA	92
	03/13/03	NA	NA	NA	2.9	NA	NA	NA	98
	12/03/02	NA	NA	NA	4.4	NA	NA	NA	99
	08/27/02	NA	NA	NA	4.3	NA	NA	NA	100
	05/29/02	NA	NA	NA	3.4	NA	NA	NA	100
	03/11/02	NA	NA	NA	2.4	NA	NA	NA	61
	11/28/01	NA	NA	NA	4.7	NA	NA	NA	110
	08/28/01	NA	NA	NA	4.3	NA	NA	NA	100
	05/15/01	NA	NA	NA	4.4	NA	NA	NA	100
	05/12/99	NA	NA	NA	< 5	NA	NA	NA	126
	02/11/99	NA	< 50	< 300	< 5	NA	NA	NA	140
	11/11/98	NA	NA	NA	< 5	NA	NA	NA	148
	08/13/98	NA	NA	NA	5.6	NA	NA	NA	110
	04/13/98	NA	NA	NA	< 5	NA	NA	NA	170
	01/07/98	NA	NA	NA	< 5	NA	NA	NA	96
	11/04/97	NA	NA	NA	< 5	NA	NA	NA	110
	08/05/97	NA	NA	NA	< 5	NA	NA	NA	130
	05/06/97	NA	NA	NA	< 5	NA	NA	NA	130
	02/04/97	NA	NA	NA	< 5	NA	NA	NA	120
	11/01/96	< 50	< 50	< 300	10	NA	NA	NA	120
	08/01/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	110
	05/21/96	< 50	< 50	< 300	< 5 U	NA	NA	NA	110
	03/06/96	< 50	< 50	310 (J32)	< 5 U	NA	NA	NA	100
	12/11/95	< 50	< 50	< 300	< 5	NA	NA	NA	130
	09/11/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	100
Landfill 10									
LF10GW01	03/17/05	NA	NA	NA	< 5	NA	NA	NA	82
	03/10/04	NA	NA	NA	< 5	NA	NA	NA	69
	08/19/03	NA	NA	NA	< 5	NA	NA	NA	94
	06/10/03	NA	NA	NA	< 5	NA	NA	NA	97
	03/19/03	NA	NA	NA	1	NA	NA	NA	79
	12/05/02	< 50	< 50	< 300	< 1	NA	NA	NA	94
	09/04/02	< 50	< 50	< 300	1	NA	NA	NA	96
	06/04/02	< 50	< 50	< 300	1.1	NA	NA	NA	96
	03/11/02	< 50	< 63	< 380	1.4	NA	NA	NA	86
	11/30/01	< 50	< 50	< 300	1.2	NA	NA	NA	98
	08/31/01	< 50 R	< 50 [2]	< 300 [2]	1.4	NA	NA	NA	95
	05/18/01	< 50	< 50	< 300	1.2 J	NA	NA	NA	91
	02/19/97	< 50 (U15)	< 50	< 300	< 5	NA	NA	NA	77
	12/13/96	< 50	< 50	< 300	< 5	NA	NA	NA	88
	09/05/96	< 50	< 50	< 300	< 5	NA	NA	NA	88
	03/22/96	< 50	< 50	< 300	< 5	NA	NA	NA	81
	12/04/95	< 50	< 50	< 300	< 5	NA	NA	NA	89
	09/26/95	< 50	< 50	< 300	< 5	NA	NA	NA	87
	06/09/95	< 50	< 50	NA	< 5	NA	NA	NA	87
	03/21/95	< 50	< 50	NA	< 5	NA	NA	NA	77
	12/13/94	< 50	< 50	NA	< 5	NA	NA	NA	84
	09/09/94	< 50	65 (J25)	NA	7.4	NA	NA	NA	143

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
LF10GW02	03/17/05	NA	NA	NA	< 5	NA	NA	NA	77
	03/10/04	NA	NA	NA	< 5	NA	NA	NA	76
	08/19/03	NA	NA	NA	< 5	NA	NA	NA	40
	06/10/03	NA	NA	NA	< 5	NA	NA	NA	66
	03/19/03	NA	NA	NA	< 1	NA	NA	NA	79
	12/05/02	< 50	< 50	< 300	< 1	NA	NA	NA	42
	09/04/02	< 50	< 50	< 300	< 1	NA	NA	NA	37
	06/04/02	< 50	< 50	< 300	< 1	NA	NA	NA	45
	03/11/02	< 50	< 50	< 300	1.1	NA	NA	NA	71
	11/30/01	< 50	< 50	< 300	1	NA	NA	NA	44
	08/31/01	< 50 R	< 50 [2]	< 300 [2]	1.3	NA	NA	NA	40
	02/19/97	< 50	< 50	NA	< 5	NA	NA	NA	61
	12/13/96	< 50	< 50	NA	< 5	NA	NA	NA	37
	09/05/96	< 50	< 50	NA	< 5	NA	NA	NA	36
	03/22/96	< 50	< 50	NA	< 5	NA	NA	NA	57
	12/04/95	< 50	< 50	NA	< 5	NA	NA	NA	47
	09/25/95	< 50	< 50	NA	< 5	NA	NA	NA	55
	06/08/95	< 50	< 50	NA	< 5	NA	NA	NA	56
	03/16/95	< 50	79 (J25)	NA	< 5	NA	NA	NA	51
	12/12/94	< 50	< 50	NA	< 5	NA	NA	NA	46
	09/12/94	1,500 (J25)	< 50	NA	< 5	NA	NA	NA	47
LF10GW03	03/17/05	NA	NA	NA	< 5	NA	NA	NA	63
	03/18/04	NA	NA	NA	< 5	NA	NA	NA	67
	08/20/03	NA	NA	NA	< 5	NA	NA	NA	63
	06/10/03	NA	NA	NA	< 5	NA	NA	NA	66
	03/19/03	NA	NA	NA	< 1	NA	NA	NA	62
	12/06/02	< 50	< 50	< 300	< 1	NA	NA	NA	65
	09/04/02	< 50	< 50	< 300	< 1	NA	NA	NA	68
	06/05/02	< 50	< 50	< 300	< 1	NA	NA	NA	66
	03/12/02	< 50	< 50	< 300	< 1	NA	NA	NA	68
	11/30/01	< 50	< 50	< 300	< 1	NA	NA	NA	67
	08/31/01	< 50 R	< 50 [2]	< 300 [2]	< 1	NA	NA	NA	68
	05/17/01	< 50	< 50	< 300	< 1	NA	NA	NA	68
	02/18/97	< 50 (U15)	< 50	< 300	< 5	NA	NA	NA	60
	12/12/96	< 50	< 50	< 300	< 5	NA	NA	NA	61
	09/04/96	< 50	< 50	< 300	< 5	NA	NA	NA	64
	06/06/96	< 50	< 50	< 300	< 5	NA	NA	NA	58
	03/21/96	< 50	< 50	< 300	< 5	NA	NA	NA	52
	12/01/95	< 50	< 50	< 300	< 5	NA	NA	NA	46
	09/26/95	< 50	< 50	440 (J25)	< 5	NA	NA	NA	48
	06/09/95	< 50	< 50	NA	< 5	NA	NA	NA	37
	03/16/95	< 50	< 50	NA	< 5	NA	NA	NA	37
	12/13/94	< 50	< 50	NA	< 5	NA	NA	NA	37
	09/09/94	98 (J25)	76 (J25)	NA	9.9	NA	NA	NA	219
LF10GW100	05/26/05	< 50	< 50	710 Y	< 5	NA	NA	NA	31
	03/17/05	NA	< 50	< 300	< 5	NA	NA	NA	19
	03/17/05	< 50	< 50	< 300	< 5	NA	NA	NA	19
	03/17/05	< 50 U	54	< 300 U	< 2 U	NA	NA	NA	17.8
	12/14/04	< 50	< 50	< 300	< 5	NA	NA	NA	64
	08/12/04	< 50	< 50	< 300	< 5	NA	NA	NA	50
	05/28/04	< 50	< 50	< 300	< 5	NA	NA	NA	20
DUP0528042A	05/28/04	< 50	< 50	< 300	< 5	NA	NA	NA	20
	03/18/04	< 50	< 50	< 300	< 5	NA	NA	NA	19
DUP0318043A	03/18/04	< 50	< 50	< 300	< 5	NA	NA	NA	19
	12/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	52
	08/20/03	< 50	< 50	< 300	< 5	NA	NA	NA	39
	06/10/03	< 50	< 50	< 300	< 5	NA	NA	NA	25

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
LF10GW100	03/19/03	< 50	< 50	< 300	2.2	NA	NA	NA	68
(Total)	02/10/03	NA	NA	NA	8.7	NA	NA	NA	NA
DUP021003 (Total)	02/10/03	NA	NA	NA	10	NA	NA	NA	NA
(Total)	12/23/02	< 50	120 A-02	< 250	13 J-	NA	NA	NA	110
LF10122302-DUP1 (Total)	12/23/02	< 50	< 50	< 250	< 5 UJ	NA	NA	NA	110
LF10SP01	03/17/05	< 50	< 50	< 300	< 5	NA	NA	NA	70
(Total)	03/17/05	NA	NA	NA	< 5	NA	NA	NA	NA
	12/14/04	< 50	< 50	< 300	6	NA	NA	NA	95
(Total)	12/14/04	NA	NA	NA	< 5	NA	NA	NA	NA
	05/26/04	< 50	< 50	< 300	9.4	NA	NA	NA	85
(Total)	05/26/04	NA	NA	NA	< 5	NA	NA	NA	NA
(Total)	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	77
(Total)	12/03/03	< 50	< 50	< 300	7.7	NA	NA	NA	90
DUP1203031B (Total)	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	90
LF10SP01CL (Total)	12/03/03	< 50	< 48	< 240	12	NA	NA	NA	89.8
	08/19/03	< 50	< 50	< 300	< 5	NA	NA	NA	87
	06/10/03	< 50	140 YZ	< 300	< 5	NA	NA	NA	88
(Total)	12/05/02	< 50	< 50	< 250	< 5	NA	NA	NA	94
Fill Site 5									
LF5GW100	05/26/05	< 50	< 50	< 300	< 5	NA	NA	NA	300
DUP0526051A	05/26/05	< 50	< 50	< 300	< 5	NA	NA	NA	300
LF5GW100CL	05/26/05	< 50 U	56	< 300 U	< 2 U	NA	NA	NA	355
	05/26/04	< 50	< 50	< 300	< 5	NA	NA	NA	320
	03/28/05	< 50	< 50	< 300	< 5	NA	NA	NA	320
	12/16/04	< 50	< 50	< 300	< 5	NA	NA	NA	330
DUP1216041A	12/16/04	< 50	< 50	< 300	< 5	NA	NA	NA	330
	08/12/04	< 50	< 50	< 300	< 5	NA	NA	NA	320
	05/26/04	< 50	< 50	< 300	< 5	NA	NA	NA	320
	03/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	330
	12/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	330
	08/14/03	< 50	< 50	< 300	< 5	NA	NA	NA	310
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	270
	12/04/02	< 50	< 50	< 300	1.3	NA	NA	NA	260
	08/29/02	< 50	< 50	< 300	1.1	NA	NA	NA	270
	05/30/02	< 50	< 50	< 300	1.1	NA	NA	NA	290
	03/06/02	< 50	< 50	< 300	1.7	NA	NA	NA	280
	11/28/01	< 50	< 50	< 300	1.8	NA	NA	NA	270
	08/30/01	< 50	< 50 [2]	< 300 [2]	1.3	NA	NA	NA	270
	05/10/01	< 50	< 50	< 300	1.2	NA	NA	NA	340
	07/21/00	< 50	< 50	NA	5.2	NA	NA	NA	400
LF5GW101	05/26/05	< 50	< 50	< 300	< 5	NA	NA	NA	240
	05/26/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/28/05	< 50	< 50	< 300	< 5	NA	NA	NA	270
	12/16/04	< 50	< 50	< 300	< 5	NA	NA	NA	270
	08/12/04	< 50	< 50	< 300	< 5	NA	NA	NA	250
	05/26/04	< 50	< 50	< 300	< 5	NA	NA	NA	260
	03/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	270
	12/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	260
	08/14/03	< 50	< 50	450	< 5	NA	NA	NA	250
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	330
	12/04/02	< 50	< 50	< 300	< 1	NA	NA	NA	330
	08/29/02	< 50	< 50	< 300	1.1	NA	NA	NA	330
	05/30/02	< 50	< 50	< 300	1.1	NA	NA	NA	340

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
LF5GW101	03/06/02	< 50	< 50	< 300	1.3	NA	NA	NA	340
	11/28/01	< 50	< 50	< 300	1.5	NA	NA	NA	320
	08/30/01	< 50	< 50 [2]	< 300 [2]	1	NA	NA	NA	340
	05/10/01	< 50	< 50	< 300	1.4	NA	NA	NA	260
LF5GW101CL	05/10/01	< 50	87 ndp	< 50	< 2	NA	NA	NA	280
	07/21/00	< 50	< 50	NA	5.4	NA	NA	NA	300
LF5GW102	05/26/05	< 50	51 Y	< 300	< 5	NA	NA	NA	210
	03/21/05	< 50	< 50	< 300	< 5	NA	NA	NA	230
	12/14/04	< 50	< 50	< 300	5.8	NA	NA	NA	240
	08/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	220
	05/27/04	< 50	< 50	< 300	< 5	NA	NA	NA	230
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	240
	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	230
DUP1203031A	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	240
LF5GW102CL	12/03/03	< 50	< 48	< 240	9.1	NA	NA	NA	263
	08/13/03	< 50	< 50	< 300	5.9	NA	NA	NA	320
	06/06/03	< 50	< 50	< 300	6.1	NA	NA	NA	380
LF5GW103	05/24/05	< 50	< 50	< 300	< 5	NA	NA	NA	180
	03/15/05	< 50	< 50	< 300	< 5	NA	NA	NA	190
	12/14/04	< 50	< 50	< 300	< 5	NA	NA	NA	200
	08/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	200
	05/27/04	< 50	< 50	< 300	< 5	NA	NA	NA	190
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	210
	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	200
	08/19/03	< 50	< 50	< 300	< 5	NA	NA	NA	200
DUP0819032A	08/19/03	< 50	< 50	< 300	< 5	NA	NA	NA	200
LF5GW103CL	08/19/03	< 50	< 50	< 250	< 5	NA	NA	NA	200
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	210
LF5GW104	05/24/05	< 50	< 50	< 300	< 5	NA	NA	NA	310
	03/15/05	< 50	< 50	< 300	< 5	NA	NA	NA	280
	12/14/04	< 50	< 50	< 300	< 5	NA	NA	NA	230
	08/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	220
	05/26/04	< 50	< 50	< 300	< 5	NA	NA	NA	230
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	290
	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	200
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	200
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	260
Fill Site 6									
LF6GW100	04/04/05	< 50	< 50	NA	< 5	0.792	< 0.025 U	0.792	30
	03/15/04	< 50	NA	NA	< 5	NA	NA	NA	NA
	12/05/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
DUP1205033A	12/05/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
LF6GW100CL	12/05/03	< 50	< 48 UJ	NA	5.9	NA	NA	NA	NA
	08/20/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
	06/09/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
	03/19/03	< 50	< 50	NA	< 1	NA	NA	NA	NA
	12/06/02	< 50	< 50	NA	< 1	NA	NA	NA	NA
	09/05/02	< 50	< 50	NA	1	NA	NA	NA	NA
DUP0905023A	09/05/02	< 50	< 50	NA	< 1	NA	NA	NA	NA
	06/05/02	< 50	< 50	NA	1.2	NA	NA	NA	NA
	03/12/02	< 50	< 50	NA	1.2	NA	NA	NA	NA
DUP0312022A	03/12/02	< 50	< 50	NA	1.2	NA	NA	NA	NA
LF6GW100CL	03/12/02	< 50	< 50 UJ	NA	< 2	NA	NA	NA	NA
	12/04/01	< 50	< 50	NA	1.2	NA	NA	NA	NA
DUP1204011A	12/04/01	< 50	< 50	NA	1.4	NA	NA	NA	NA
LF6GW100CL	12/04/01	< 50	< 50	NA	1.9 BJ	NA	NA	NA	NA
	08/29/01	< 50	60 [3] Y,NJ	NA	1.7	NA	NA	NA	NA
	05/17/01	< 50	< 50	NA	1.4	NA	NA	NA	NA
	07/19/00	< 50	< 50	NA	< 5	NA	NA	NA	NA
LF6GW101	04/04/05	< 50	< 50	NA	< 5	1.22	< 0.025 U	1.22	43

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
	03/15/04	< 50	NA	NA	< 5	NA	NA	NA	NA
	12/05/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
	08/20/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
	06/10/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
	03/19/03	< 50	< 50	NA	1.3	NA	NA	NA	NA
	12/06/02	< 50	< 50	NA	1.5	NA	NA	NA	NA
	09/04/02	< 50	< 50	NA	1.6	NA	NA	NA	NA
	06/05/02	< 50	< 50	NA	1.8	NA	NA	NA	NA
DUP0605021A	06/05/02	< 50	< 50	NA	2	NA	NA	NA	NA
	03/13/02	< 50	< 50	NA	2.2	NA	NA	NA	NA
	12/04/01	< 50	< 50	NA	2.1	NA	NA	NA	NA
	08/29/01	< 50	< 50 [3]	NA	3	NA	NA	NA	NA
	05/17/01	< 50	< 50	NA	2.6	NA	NA	NA	NA
	07/19/00	< 50	< 50	NA	< 5	NA	NA	NA	NA
LF6GW102	04/04/05	< 50	< 50	NA	< 5	0.851 J	0.483 J	0.368 J	57
	12/16/04	< 50	< 50	NA	< 5	NA	NA	NA	33
	08/12/04	< 50	< 50	NA	< 5	NA	NA	NA	30
	05/26/04	< 50	< 50	NA	< 5	NA	NA	NA	31
	03/17/04	< 50	< 50	NA	< 5	NA	NA	NA	45
	12/08/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
	08/18/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
	06/04/03	< 50	< 50	NA	< 5	NA	NA	NA	NA
	03/18/03	< 50	< 50	NA	3.4	NA	NA	NA	NA
DUP0318031A	03/18/03	< 50	< 50	NA	2.7	NA	NA	NA	NA
LF6GW102CL	03/18/03	< 50	< 50	NA	< 2	NA	NA	NA	NA
	12/11/02	< 50	< 50	NA	2.9	NA	NA	NA	NA
	09/05/02	< 50	< 50	NA	3.3	NA	NA	NA	NA
	06/06/02	< 50	< 50	NA	3.1	NA	NA	NA	NA
	03/13/02	< 50	< 50	NA	2.7	NA	NA	NA	NA
DUP0313021A	03/13/02	< 50	< 50	NA	2.6	NA	NA	NA	NA
	12/03/01	< 50	< 50	NA	2.8	NA	NA	NA	NA
DUP1203013A	12/03/01	< 50	< 50	NA	2.8	NA	NA	NA	NA
	09/07/01	< 50	57 [3] Y,NJ	NA	2.5	NA	NA	NA	NA
	05/18/01	< 50	< 50	NA	2.9	NA	NA	NA	NA
	07/19/00	< 50	< 50	NA	< 5	NA	NA	NA	NA
LF6GW103	05/25/05	< 50	< 50	NA	< 5	NA	NA	NA	52
	04/05/05	< 50	< 50	NA	< 5	0.397 J	< 0.025 U	0.397 J	52
DUP0405053A	04/05/05	< 50	< 50	NA	< 5	0.386 J	< 0.025 U	0.386 J	52
	04/05/05	< 50 U	< 50 U	NA	< 2 U	NA	NA	NA	51
	12/16/04	< 50	< 50	NA	< 5	NA	NA	NA	71
	08/12/04	< 50	< 50	NA	< 5	NA	NA	NA	77
DUP0812042A	08/12/04	< 50	< 50	NA	< 5	NA	NA	NA	78
	05/26/04	< 50	< 50	NA	< 5	NA	NA	NA	84
	03/15/04	< 50	NA	NA	< 5	NA	NA	NA	88
	12/09/03	< 50	< 50	NA	< 5	NA	NA	NA	95
	08/14/03	< 50	< 50	NA	< 5	NA	NA	NA	71
	06/10/03	< 50	< 50	NA	< 5	NA	NA	NA	64
	03/19/03	< 50	< 50	NA	< 1	NA	NA	NA	NA
	12/06/02	< 50	< 50	NA	< 1	NA	NA	NA	NA
	09/05/02	< 50	< 50	NA	< 1	NA	NA	NA	NA
	06/05/02	< 50	< 50	NA	< 1	NA	NA	NA	NA
	03/13/02	< 50	< 50	NA	< 1	NA	NA	NA	NA
	12/04/01	< 50	< 50	NA	< 1	NA	NA	NA	NA
	08/29/01	< 50	< 50 [3]	NA	< 1	NA	NA	NA	NA
	05/17/01	< 50	< 50	NA	< 1	NA	NA	NA	NA
	07/19/00	< 50	< 50	NA	< 5	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW09	06/01/05	< 50	< 50	< 300	< 5	0.371	< 0.025 U	0.371	48
	04/04/05	< 50	< 50	< 300	NA	0.344	< 0.025 U	0.344	51
	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	52
DUP1217042A	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	51
	08/12/04	< 50	< 50	< 300	< 5	NA	NA	NA	50
	05/27/04	< 50	170 HY	NA	< 5	NA	NA	NA	51
DUP0527042C	05/27/04	< 50	< 50	NA	< 5	NA	NA	NA	51
231GW09CL	05/27/04	< 50	< 66	NA	< 5	NA	NA	NA	52 D
	03/18/04	< 50	< 50	NA	< 5	NA	NA	NA	56
	12/04/03	NA	NA	NA	< 5	NA	NA	NA	53
	08/15/03	< 50	< 50	NA	< 5	NA	NA	NA	51
	06/10/03	NA	NA	NA	< 5	NA	NA	NA	57
Nike Missile Facility									
NKGW01	03/16/05	< 50	< 50	< 300	9.3	NA	NA	NA	NA
	03/16/05	< 50	< 50	< 300	7.6	NA	NA	NA	NA
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
DUP0317042A	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
NKGW01CL	03/17/04	< 50	< 48	< 240	6.2	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	< 1	NA	NA	NA	NA
	03/12/02	< 50	< 50	< 300	2.2	NA	NA	NA	NA
	05/17/01	< 50	< 50	< 300	< 1 UJ	NA	NA	NA	NA
	08/18/98	NA	NA	NA	NA	NA	NA	NA	NA
	02/24/99	< 50	65 (J25)	< 300	NA	NA	NA	NA	NA
	01/20/98	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/13/97	NA	NA	NA	NA	NA	NA	NA	NA
	11/14/97	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/19/97	< 50	240 (J25)	< 300	< 5	NA	NA	NA	NA
	02/17/97	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/11/96	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	09/03/96	< 50	51 (J25)	< 300	< 5	NA	NA	NA	NA
	06/05/96	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/20/96	< 50	< 50	< 300 (U6)	< 5	NA	NA	NA	NA
	11/30/95	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	09/21/95	< 50	68 (J25)	< 300	< 5	NA	NA	NA	NA
	11/10/94	< 50	NA	NA	NA	NA	NA	NA	NA
NKGW02	03/16/05	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	< 1	NA	NA	NA	NA
	03/12/02	< 50	< 50	< 300	< 1	NA	NA	NA	NA
	05/16/01	<50	<50	<300	< 1 UJ	NA	NA	NA	NA
	02/23/99	< 50	< 50 (U13)	< 300	NA	NA	NA	NA	NA
	01/21/98	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/20/97	NA	NA	NA	< 5	NA	NA	NA	NA
	11/14/97	< 50	< 50	< 300	NA	NA	NA	NA	NA
	02/18/97	< 50 (U15)	< 50	< 300	< 5	NA	NA	NA	NA
	06/05/96	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/19/96	< 50	< 50	< 300 (U6)	< 5	NA	NA	NA	NA
	09/22/95	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	04/05/95	< 10	NA	NA	NA	NA	NA	NA	NA
NKGW03	03/18/05	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/12/02	< 50	< 50	< 300	< 1	NA	NA	NA	NA
	02/23/99	< 50	< 50 (U13)	< 300	< 5	NA	NA	NA	NA
	01/20/98	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	02/18/97	< 50 (U15)	< 50	< 300	< 5	NA	NA	NA	NA
	04/06/95	11	NA	NA	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
NKGW04	03/16/05	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/17/04	< 50	< 52	< 310	< 5	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	< 1	NA	NA	NA	NA
	03/12/02	< 50	< 50	< 300	< 1	NA	NA	NA	NA
	05/17/01	< 50	< 50	< 300	< 1 UJ	NA	NA	NA	NA
	02/22/99	< 50	< 50 (U13)	< 300	NA	NA	NA	NA	NA
	01/20/98	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	11/13/97	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	08/13/97	360 (J32)	< 50	< 300	< 5	NA	NA	NA	NA
	05/19/97	< 50	130 (J32)	< 300	< 5	NA	NA	NA	NA
	02/17/97	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/11/96	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	11/30/95	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	04/05/95	< 10	NA	NA	NA	NA	NA	NA	NA
NKGW05	03/16/05	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	08/13/04	NA	NA	NA	NA	NA	NA	NA	NA
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	< 1	NA	NA	NA	NA
	03/12/02	< 50	< 50	< 300	< 1	NA	NA	NA	NA
	05/17/01	<50	< 50	< 300	< 1 UJ	NA	NA	NA	NA
	02/22/99	< 50	< 50 (U10, U13)	< 300	NA	NA	NA	NA	NA
	01/21/98	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/14/97	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/19/97	< 50	110 (J32)	< 300	< 5	NA	NA	NA	NA
	02/17/97	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/11/96	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	09/03/96	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	06/05/96	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/20/96	< 50	< 50	< 300 (U6)	< 5	NA	NA	NA	NA
	11/30/95	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	09/22/95	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	04/05/95	< 10	NA	NA	NA	NA	NA	NA	NA
Landfill 4									
LF04GW03	05/24/05	NA	NA	NA	< 5	NA	NA	NA	65
	03/18/05	< 50	< 50	< 300	< 5	NA	NA	NA	64
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	73
	05/13/99	NA	180 (J25)	< 300	< 5	NA	NA	NA	71.4
	02/11/99	< 50	NA	NA	NA	NA	NA	NA	NA
	08/12/98	< 50	51 (J25)	< 50	< 5	NA	NA	NA	61
	04/13/98	< 50	< 50	1,000 (J25)	< 5	NA	NA	NA	55
	01/12/98	< 50	< 50	< 300	< 5	NA	NA	NA	172
	05/06/97	< 50	< 50	< 300	< 5	NA	NA	NA	79
	02/04/97	< 50	< 50	< 300	< 5	NA	NA	NA	57
	05/29/96	< 50	< 50	< 300	< 5	NA	NA	NA	88
	03/12/96	< 50	< 50	< 300 (U16)	< 5	NA	NA	NA	41
	04/04/95	NA	NA	NA	NA	NA	NA	NA	63.6
LF4GW102	03/17/05	< 50	< 50	< 300	< 5	NA	NA	NA	130
DUP0317053B	03/17/05	< 50	< 50	< 300	< 5	NA	NA	NA	120
LF4GW102CL	03/17/05	< 50 U	< 50 U	< 300 U	< 2 U	NA	NA	NA	123
	12/15/04	NA	NA	NA	< 5	NA	NA	NA	170
DUP1215042C	12/15/04	NA	NA	NA	< 5	NA	NA	NA	170
LF4GW102CL	12/15/04	NA	NA	NA	< 2 U	NA	NA	NA	160
LF4GW102	08/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	130
DUP0811042A	08/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	130
LF4GW102CL	08/11/04	< 100	< 100 J-	< 400 UJ	< 5	NA	NA	NA	130
	05/25/04	< 50	< 50	< 300	< 5	NA	NA	NA	130
DUP0525042A	05/25/04	< 50	< 50	< 300	< 5	NA	NA	NA	130
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	160
DUP0309042A	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	160

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
LF4GW102	12/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	160
DUP1204031A	12/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	160
LF4GW102CL	12/04/03	< 50	< 48 UJ	< 240 UJ	6.5	NA	NA	NA	173
	08/21/03	< 50	< 50	< 300	< 5	NA	NA	NA	120
	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	120
DUP0609033A	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	130
LF4GW102CL	06/09/03	< 50	< 50	< 250	2	NA	NA	NA	120
	03/20/03	< 50	< 50	< 300	< 1	NA	NA	NA	130
DUP0320031A	03/20/03	< 50	< 50	< 300	< 1	NA	NA	NA	130
LF4GW103	03/15/05	< 50	< 50	< 300	< 5	NA	NA	NA	140
	12/14/04	NA	NA	NA	5.3	NA	NA	NA	170
	08/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	140
	05/25/04	< 50	< 50	< 300	6	NA	NA	NA	140
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	160
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	180
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	140
	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	170
	03/20/03	< 50	< 50	< 300	3.8	NA	NA	NA	240
LF4GW104	03/15/05	< 50	< 50	< 300	< 5	NA	NA	NA	290
	12/14/04	NA	NA	NA	< 5	NA	NA	NA	290
	08/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	260
	05/25/04	< 50	< 50	< 300	< 5	NA	NA	NA	260
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	250
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	250
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	240
	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	250
DUP0609031A	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	250
	03/20/03	< 50	< 50	< 300	3.1	NA	NA	NA	230
LF4GW105	03/15/05	< 50	< 50	< 300	< 5	NA	NA	NA	180
	12/14/04	NA	NA	NA	< 5	NA	NA	NA	170
	08/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	280
	05/25/04	< 50	< 50	< 300	< 5	NA	NA	NA	140
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	130
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	130
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	120
	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	140
	03/20/03	< 50	< 50	< 300	< 1	NA	NA	NA	130
LF4GW106	03/15/05	< 50	< 50	< 300	< 5	NA	NA	NA	150
	12/14/04	NA	NA	NA	< 5	NA	NA	NA	150
	08/10/04	< 50	< 50	490	< 5	NA	NA	NA	140
	05/25/04	< 50	< 50	< 300	< 5	NA	NA	NA	150
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	150
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	140
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	140
	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	150
	03/20/03	< 50	< 50	< 300	3.8	NA	NA	NA	160
Baker Beach Disturbed Areas 3									
BB3GW100	05/24/05	< 50	< 50	< 300	< 5	NA	NA	NA	210
	03/22/05	< 50	< 50	< 300	< 5	NA	NA	NA	190
DUP0322053A	03/22/05	< 50	< 50	< 300	< 5	NA	NA	NA	190
	12/14/04	< 50	< 50	< 300	< 5	NA	NA	NA	260
BB3GW101	05/24/05	< 100	< 50	< 300	NA	NA	NA	NA	NA
	03/22/05	< 50	< 50	< 300	5.1	NA	NA	NA	350
BB3PZ101	03/22/05	< 50	< 50	< 300	< 5	NA	NA	NA	140
	12/16/04	< 50	< 50	< 300	< 5	NA	NA	NA	120
(Total)	12/16/04	NA	NA	NA	7.5	NA	NA	NA	NA
BB3SP100	05/01/00	< 50 U	77	< 500 U	NA	NA	NA	NA	NA
	05/01/00	NA	NA	NA	NA	NA	NA	NA	NA
	03/22/05	< 50	< 50	< 300	< 5	NA	NA	NA	75

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
BB3SW101	05/24/05	< 50	< 50	< 300	< 5	NA	NA	NA	67
(Total)	05/24/05	NA	NA	NA	5.3	NA	NA	NA	NA
	04/14/05	NA	NA	NA	< 5	NA	NA	NA	75
(Total)	04/14/05	NA	NA	NA	< 5	NA	NA	NA	NA
	03/22/05	< 50	< 50	< 300	< 5	NA	NA	NA	83
	12/17/04	< 50	NA	NA	NA	NA	NA	NA	NA
BB3SW102	05/24/05	< 50	< 50	< 300	< 5	NA	NA	NA	150
(Total)	05/24/05	NA	NA	NA	< 5	NA	NA	NA	NA
(Total)	04/14/05	NA	NA	NA	5.5	NA	NA	NA	140
	04/14/05	NA	NA	NA	< 5	NA	NA	NA	NA
	03/22/05	< 50	< 50	< 300	< 5	NA	NA	NA	100
	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	130
(Total)	12/17/04	NA	NA	NA	6.3	NA	NA	NA	NA
Landfill E									
DAEGW03	03/16/05	< 50	< 50	< 300	< 5	NA	NA	NA	110
	03/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	110
DUP0311043A	03/11/04	< 50	140 HY	< 300	< 5	NA	NA	NA	110
DAEGW03CL	03/11/04	< 50	< 50	< 250	< 5	NA	NA	NA	110
	08/20/03	< 50	< 50	< 300	< 5	NA	NA	NA	130
	03/13/03	< 50	< 50	< 300	< 1	NA	NA	NA	150
	12/04/02	NA	NA	NA	< 1	NA	NA	NA	NA
	09/03/02	NA	NA	NA	< 1	NA	NA	NA	180
	06/04/02	NA	NA	NA	1.2	NA	NA	NA	140
	03/12/02	< 50	< 50	< 300	< 1	NA	NA	NA	170
	12/03/01	NA	NA	NA	1	NA	NA	NA	160
	08/28/01	NA	NA	NA	1.4	NA	NA	NA	200
	05/17/01	< 50	< 50	< 300	< 1 UJ	NA	NA	NA	150
	05/17/99	NA	NA	NA	< 5	NA	NA	NA	190
	02/15/99	< 50	< 50	< 300	< 5	NA	NA	NA	180
	11/16/98	NA	NA	NA	< 5	NA	NA	NA	180
	08/14/98	NA	NA	NA	< 5	NA	NA	NA	84
	04/14/98	NA	NA	NA	< 5	NA	NA	NA	140
	01/13/98	< 50	< 50	< 300	< 5	NA	NA	NA	160
	11/10/97	NA	NA	NA	NA	NA	NA	NA	170
	08/11/97	NA	NA	NA	6	NA	NA	NA	120
	05/13/97	NA	NA	NA	6	NA	NA	NA	110
	02/12/97	NA	NA	NA	< 5	NA	NA	NA	120
	12/05/96	< 50	< 50	< 300	8	NA	NA	NA	130
	08/28/96	< 50	< 50	< 300	< 5	NA	NA	NA	160
	05/30/96	< 50	< 50	< 300 (U16)	< 5	NA	NA	NA	120
	03/05/96	< 50	110 (J32)	3,000 (J32)	< 5 U	NA	NA	NA	113
	12/11/95	< 50	< 50	< 300	< 5	NA	NA	NA	121
	09/11/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	NA
	11/08/94	< 50	NA	NA	NA	NA	NA	NA	95
	08/27/92	NA	70	NA	NA	NA	NA	NA	140
DAEGW04	03/16/05	NA	< 50	< 300	< 5	NA	NA	NA	140
	03/17/04	NA	< 50	< 300	< 5	NA	NA	NA	180
	08/20/03	NA	< 50	< 300	< 5	NA	NA	NA	190
	03/13/03	NA	< 50	< 300	< 1	NA	NA	NA	170
	12/04/02	NA	NA	NA	< 1	NA	NA	NA	160
	09/03/02	NA	NA	NA	< 1	NA	NA	NA	150
	06/04/02	NA	NA	NA	< 1	NA	NA	NA	150
	03/12/02	NA	< 50	< 300	< 1	NA	NA	NA	180
	12/03/01	NA	NA	NA	< 1	NA	NA	NA	170
DUP1203011B	12/03/01	NA	NA	NA	< 1	NA	NA	NA	170
	08/29/01	NA	NA	NA	< 1	NA	NA	NA	150
	05/17/01	NA	< 50	< 300	< 1 UJ	NA	NA	NA	140
	05/17/99	NA	NA	NA	< 5	NA	NA	NA	152

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
DAEGW04	02/15/99	< 50	77 (J25)	< 300	< 5	NA	NA	NA	117
	11/16/98	NA	NA	NA	< 5	NA	NA	NA	78.6
	08/14/98	NA	NA	NA	< 5	NA	NA	NA	66
	04/14/98	NA	NA	NA	NA	NA	NA	NA	110
	01/13/98	< 50	< 50	< 300	NA	NA	NA	NA	100
	11/10/97	NA	NA	NA	NA	NA	NA	NA	80
	08/11/97	NA	NA	NA	NA	NA	NA	NA	50
	05/13/97	NA	NA	NA	NA	NA	NA	NA	60
	02/12/97	NA	NA	NA	NA	NA	NA	NA	90
	12/05/96	< 50	< 50	< 300	NA	NA	NA	NA	66
	08/29/96	< 50	< 50	< 300	NA	NA	NA	NA	80
	06/10/96	< 50	< 50 (U6)	< 300	NA	NA	NA	NA	80
	03/07/96	< 50	110 (J32)	2,700 (J32)	< 5 U	NA	NA	NA	70
	12/11/95	< 50	< 50	< 300	< 5	NA	NA	NA	44
	09/11/95	< 50	< 50	< 1,300	< 60 U	NA	NA	NA	NA
	11/09/94	< 50	NA	NA	NA	NA	NA	NA	71
	11/02/92	NA	< 50	NA	NA	NA	NA	NA	96
DAEGW05	03/16/05	< 50	< 50	< 300	< 5	NA	NA	NA	130
DUP0316053A	03/16/05	< 50	< 50	< 300	< 5	NA	NA	NA	130
	03/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	110
	08/19/03	< 50	< 50	< 300	< 5	NA	NA	NA	78
	03/13/03	< 50	< 50	< 300	< 1	NA	NA	NA	120
	12/04/02	NA	NA	NA	< 1	NA	NA	NA	100
	09/03/02	NA	NA	NA	< 1	NA	NA	NA	100
	06/04/02	NA	NA	NA	< 1	NA	NA	NA	140
	03/12/02	< 50	< 50	< 300	< 1	NA	NA	NA	120
DUP0312023A	03/12/02	< 50	< 50	< 300	< 1	NA	NA	NA	120
	12/03/01	NA	NA	NA	< 1	NA	NA	NA	40
	08/28/01	NA	NA	NA	1.1	NA	NA	NA	130
	05/17/01	< 50	< 50	< 300	< 1 UJ	NA	NA	NA	110
	05/18/99	NA	NA	NA	< 5	NA	NA	NA	161
	03/15/99	< 50	< 50	< 300	< 5	NA	NA	NA	140
	11/17/98	NA	NA	NA	< 5	NA	NA	NA	172
	08/17/98	NA	NA	NA	< 5	NA	NA	NA	107
	04/15/98	NA	NA	NA	< 5	NA	NA	NA	110
	01/14/98	< 50	< 50	< 300	< 5	NA	NA	NA	130
	11/11/97	NA	NA	NA	< 5	NA	NA	NA	120
	08/12/97	NA	NA	NA	< 5	NA	NA	NA	110
	05/14/97	NA	NA	NA	< 5	NA	NA	NA	90
	02/13/97	NA	NA	NA	< 5	NA	NA	NA	90
	12/06/96	< 50	< 50	< 300	< 5	NA	NA	NA	100
	08/29/96	< 50	< 50	< 300	< 5	NA	NA	NA	90
	05/30/96	< 50	< 50 (U6)	< 300	< 5	NA	NA	NA	100
	03/06/96	< 50	120 (J32)	2,800 (J32)	< 5 U	NA	NA	NA	125
	12/11/95	< 50	< 50 (U6)	< 300 (U6)	< 5	NA	NA	NA	90
	09/12/95	< 50	< 50	< 1,300	< 5 U	NA	NA	NA	NA
	11/08/94	< 50	NA	NA	NA	NA	NA	NA	138
	11/02/92	NA	< 50	NA	NA	NA	NA	NA	200
DAEGW06	03/16/05	NA	< 50	< 300	< 5	NA	NA	NA	150
	03/11/04	NA	< 50	< 300	< 5	NA	NA	NA	150
	08/20/03	NA	< 50	< 300	< 5	NA	NA	NA	140
	03/12/03	NA	< 50	< 300	< 1	NA	NA	NA	140
	12/04/02	NA	NA	NA	1.2	NA	NA	NA	140
	09/03/02	NA	NA	NA	1.3	NA	NA	NA	140
	06/04/02	NA	NA	NA	1.3	NA	NA	NA	140
	03/12/02	NA	< 50	< 300	1	NA	NA	NA	150
	12/03/01	NA	NA	NA	1	NA	NA	NA	150
	08/28/01	NA	NA	NA	1.6	NA	NA	NA	140

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
DAEGW06	05/17/01	NA	< 50	< 300	1.5 J	NA	NA	NA	140
DUP0517012A	05/17/01	NA	< 50	< 300	1.4 J	NA	NA	NA	140
	05/17/99	NA	NA	NA	< 5	NA	NA	NA	160
	02/15/99	< 50	< 50	< 300	< 5	NA	NA	NA	160
	11/16/98	NA	NA	NA	< 5	NA	NA	NA	180
	08/14/98	NA	NA	NA	< 5	NA	NA	NA	120
	08/14/98	NA	NA	NA	< 5	NA	NA	NA	120
	04/14/98	NA	NA	NA	< 5	NA	NA	NA	160
	01/13/98	< 50	< 50	< 300	< 5	NA	NA	NA	140
	11/10/97	NA	NA	NA	< 5	NA	NA	NA	160
	08/11/97	NA	NA	NA	< 5	NA	NA	NA	140
	05/13/97	NA	NA	NA	< 5	NA	NA	NA	130
	02/12/97	NA	NA	NA	< 5	NA	NA	NA	130
	12/06/96	< 50	< 50	< 300	< 5	NA	NA	NA	110
	08/28/96	< 50	< 50	< 300	< 5	NA	NA	NA	120
	05/30/96	< 50	< 50	< 300 (U16)	< 5	NA	NA	NA	120
	03/06/96	< 50	< 50	680 (J32)	< 5 U	NA	NA	NA	130
	12/11/95	< 50	< 50	< 300	< 5	NA	NA	NA	152
	09/12/95	< 50	< 50	< 1300	< 5 U	NA	NA	NA	NA
	04/05/95	< 10	NA	NA	NA	NA	NA	NA	139
DAEGW07	03/18/05	< 50	< 50	< 300	< 5	NA	NA	NA	22
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	21
DUP0317041A	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	21
	03/19/03	< 50	< 50	< 300	< 1	NA	NA	NA	22
	03/11/02	< 50	< 50	< 300	< 1	NA	NA	NA	21
	05/18/99	< 50	< 50	< 300	< 5	NA	NA	NA	247
	03/15/99	< 50	< 50	< 300	< 5	NA	NA	NA	24
	04/15/98	< 50	< 50	< 300	< 5	NA	NA	NA	32
	01/14/98	< 50	< 50	< 300	< 5	NA	NA	NA	40
	12/12/97	< 50	< 50	1,500 (R32)	< 5	NA	NA	NA	40
	02/13/97	< 50	< 50	< 300	< 5	NA	NA	NA	30
	03/07/96	< 50	< 50	660 (J32)	< 5 U	NA	NA	NA	29
	12/14/95	< 50	< 50	< 300	< 5	NA	NA	NA	59
	04/04/95	< 10	NA	NA	NA	NA	NA	NA	34
DAEGW08	03/28/05	< 50	< 50	< 300	< 5	NA	NA	NA	140
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	140
	08/18/03	< 50	< 50	< 300	< 5	NA	NA	NA	110
	03/19/03	< 50	< 50	< 300	< 1	NA	NA	NA	120
	12/05/02	NA	NA	NA	< 1	NA	NA	NA	49
	09/04/02	NA	NA	NA	< 1	NA	NA	NA	98
	06/04/02	NA	NA	NA	< 1	NA	NA	NA	130
	03/11/02	< 50	< 50	< 300	< 1	NA	NA	NA	130
	11/30/01	NA	NA	NA	< 1	NA	NA	NA	91
	08/29/01	NA	NA	NA	< 1	NA	NA	NA	100
	05/16/01	< 50	< 50	< 300	< 1	NA	NA	NA	97
	05/18/99	NA	NA	NA	< 5	NA	NA	NA	102
	02/16/99	< 50	< 50	< 300	< 5	NA	NA	NA	76
	11/17/98	NA	NA	NA	< 5	NA	NA	NA	95
	08/17/98	NA	NA	NA	< 5	NA	NA	NA	69
	04/15/98	NA	NA	NA	< 5	NA	NA	NA	64 (U4)
	01/14/98	< 50	< 50	< 300	< 5	NA	NA	NA	< 60
	11/11/97	NA	NA	NA	< 5	NA	NA	NA	50
	08/12/97	NA	NA	NA	< 5	NA	NA	NA	60
	05/14/97	NA	NA	NA	< 5	NA	NA	NA	90
	02/13/97	NA	NA	NA	< 5	NA	NA	NA	100
	12/06/96	< 50	< 50	< 300	< 5	NA	NA	NA	60
	08/29/96	< 50	< 50	< 300	< 5	NA	NA	NA	70
	06/10/96	< 50	< 50 (U6, U9)	< 300 (U6, U16)	< 5	NA	NA	NA	100
	03/07/96	< 50	260 (J32)	5,000 (J32)	< 5U	NA	NA	NA	203

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
DAEGW08	12/14/95	< 50	< 50	< 300	< 5	NA	NA	NA	60
	09/12/95	< 50	< 50	< 1,300	< 5U	NA	NA	NA	NA
	04/03/95	11	NA	NA	NA	NA	NA	NA	68
DAEGW101	05/26/05	< 50	< 50	< 300	< 5	NA	NA	NA	18
	03/16/05	< 50	< 50	< 300	< 5	NA	NA	NA	17
	08/12/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	05/27/04	< 50	< 50	< 300	< 5	NA	NA	NA	21
	03/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	25
	08/20/03	NA	NA	NA	NA	NA	NA	NA	63
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	53
	03/13/03	< 50	< 50	< 300	3.4	NA	NA	NA	73
DAEGW102	05/26/05	< 50	< 50	< 300	< 5	NA	NA	NA	380
	03/16/05	< 50	< 50	< 300	< 5	NA	NA	NA	450
	12/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	520
	08/12/04	< 50	< 50	< 300	< 5	NA	NA	NA	510
	05/27/04	< 50	< 50	< 300	< 5	NA	NA	NA	520
	03/15/04	< 50	NA	NA	5.2	NA	NA	NA	580
	12/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	610
	08/19/03	< 50	190 HY	< 300	< 5	NA	NA	NA	630
	06/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	770
	03/12/03	< 50	< 50	< 300	3.1	NA	NA	NA	840
	11/26/02	< 50	NA	NA	NA	NA	NA	NA	NA
DAEGW103	05/26/05	< 50	< 50	< 300	< 5	NA	NA	NA	130
	03/17/05	< 50	< 50	< 300	< 5	NA	NA	NA	140
	03/17/05	NA	NA	NA	< 2 U	NA	NA	NA	140
DUP0317053A	03/17/05	< 50	< 50	< 300	< 5	NA	NA	NA	130
	12/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	150
DUP1215042A	12/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	140
DAEGW103CL	12/15/04	NA	NA	NA	< 2 U	NA	NA	NA	132
	08/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	140
DUP0811042B	08/11/04	< 50	< 50	< 300	< 5	NA	NA	NA	140
DAEGW103CL	08/11/04	< 100	< 100 J-	< 400 UJ	< 40	NA	NA	NA	130
	05/28/04	< 50	< 50	< 300	< 5	NA	NA	NA	140
DUP0528041A	05/28/04	< 50	< 50	< 300	< 5	NA	NA	NA	140
DAEGW103CL	05/28/04	< 50	< 48	< 240	6	NA	NA	NA	150
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	150
DUP0310043B	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	150
DAEGW103CL	03/10/04	< 50	< 49	< 240	< 5	NA	NA	NA	140
	12/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	140
DUP1204033A	12/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	140
DAEGW103CL	12/04/03	< 50	< 48 UJ	< 240 UJ	6.3	NA	NA	NA	153
	08/19/03	< 50	54 HY	< 300	< 5	NA	NA	NA	130
DUP0819033B	08/19/03	< 50	< 50	< 300	< 5	NA	NA	NA	140
DAEGW103CL	08/19/03	< 50	< 50	< 250	< 5	NA	NA	NA	140
	06/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	150
DUP0604033A	06/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	150
DAEGW103CL	06/04/03	< 50	< 50	< 250	2.4	NA	NA	NA	140
	03/13/03	< 50	< 50	< 300	< 1	NA	NA	NA	140
DUP0313033A	03/13/03	< 50	< 50	< 300	< 1	NA	NA	NA	140
DAEGW103CL	03/13/03	< 50	< 50	< 250	4.4	NA	NA	NA	140
	11/25/02	< 50	< 59	< 590	< 5	NA	NA	NA	140
DAEGW104	05/26/05	< 50	< 50	< 300	< 5	NA	NA	NA	77
DUP0526052A	05/26/05	< 50	< 50	< 300	< 5	NA	NA	NA	76
DAEGW104CL	05/26/05	< 50 U	64	< 300 U	< 2 U	NA	NA	NA	78
	03/16/05	< 50	< 50	< 300	< 5	NA	NA	NA	73
	12/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	72
	08/12/04	< 50	< 50	< 300	< 5	NA	NA	NA	69
	05/27/04	< 50	< 50	< 300	< 5	NA	NA	NA	69
	03/15/04	< 50	NA	NA	< 5	NA	NA	NA	73

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
DAEGW104	12/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	70
	08/19/03	< 50	< 50	< 300	< 5	NA	NA	NA	66
DUP0819033A	08/19/03	< 50	< 50	< 300	< 5	NA	NA	NA	67
	06/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	78
	03/12/03	< 50	< 50	< 300	1.9	NA	NA	NA	79
	11/25/02	< 50	< 50	< 500	11	NA	NA	NA	260
DAESP03	03/22/05	< 50	< 50	< 300	< 5	NA	NA	NA	20
(Total)	03/22/05	NA	NA	NA	< 5	NA	NA	NA	NA
	12/28/01	NA	NA	NA	< 1	NA	NA	NA	NA
	12/28/01	NA	NA	NA	< 1	NA	NA	NA	22
DUP112801	12/28/01	NA	NA	NA	< 1	NA	NA	NA	22
Petroleum Release Sites									
Building 1349									
1349MW01	03/21/05	< 50	< 50	< 300	< 5	NA	NA	NA	690
	03/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	740
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	690
	08/21/03	< 50	< 50	< 300	< 5	NA	NA	NA	700
	06/10/03	< 50	< 50	< 300	< 5	NA	NA	NA	740
	03/12/03	NA	< 50	< 300	NA	NA	NA	NA	NA
	12/09/02	< 50	< 50	< 300	< 1	NA	NA	NA	750
DUP1209021A	12/09/02	< 50	< 50	< 300	< 1	NA	NA	NA	750
1349MW01CL	12/09/02	< 50	< 50	< 250	14	NA	NA	NA	360
	08/28/02	< 50	< 50	< 300	< 1	NA	NA	NA	740
	05/30/02	< 50	< 50	< 300	< 1	NA	NA	NA	810
	03/06/02	< 50	< 50	< 300	1.1	NA	NA	NA	830
	11/28/01	< 50	< 50	< 300	1.9	NA	NA	NA	820
	08/30/01	< 50	< 50 [3]	< 300 [3]	< 1	NA	NA	NA	740
DUP0830013A	08/30/01	< 50	57 [3] Y,NJ	< 300 [3]	< 1	NA	NA	NA	740
1349MW01CL	08/30/01	< 50	< 50	< 300	< 2	NA	NA	NA	760
	05/10/01	< 50	< 50	< 300	1.3	NA	NA	NA	760
	05/19/99	NA	< 50	< 300	NA	NA	NA	NA	820
	02/19/99	NA	< 50	< 300	NA	NA	NA	NA	731
	11/18/98	NA	< 50	< 300	NA	NA	NA	NA	666
	08/18/98	NA	< 50 (U15)	< 300	NA	NA	NA	NA	701
	04/16/98	NA	< 50	< 300	NA	NA	NA	NA	679
	01/22/98	NA	< 50	< 300	NA	NA	NA	NA	673
	10/30/97	NA	< 50	< 300	NA	NA	NA	NA	726
	07/31/97	NA	< 50	< 300	NA	NA	NA	NA	777
	05/01/97	NA	< 50	< 300	NA	NA	NA	NA	768
	02/10/97	NA	< 50	< 300	NA	NA	NA	NA	888
	11/25/96	NA	< 50	< 300	NA	NA	NA	NA	NA
	09/12/96	NA	< 50	< 300	NA	NA	NA	NA	NA
	08/08/95	NA	< 50	NA	NA	NA	NA	NA	NA
1349MW02	05/25/05	< 50	< 50	< 300	< 5	NA	NA	NA	710
	03/21/05	< 50	< 50	< 300	< 5	NA	NA	NA	860
	12/16/04	< 50	< 50	< 300	< 5	NA	NA	NA	620
	08/12/04	< 50	< 50	< 300	NA	NA	NA	NA	600
	05/26/04	< 50	< 50	< 300	NA	NA	NA	NA	650
	03/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	670
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	600
	08/13/03	< 50	290 HY	< 300	< 5	NA	NA	NA	550
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	610
DUP0605032A	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	610
	03/12/03	NA	< 50	< 300	NA	NA	NA	NA	NA
	12/04/02	< 50	< 50	< 300	< 1	NA	NA	NA	580
DUP1204023A	12/04/02	< 50	< 50	< 300	< 1	NA	NA	NA	560
	08/28/02	< 50	< 50	< 300	< 1	NA	NA	NA	570

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
1349MW02	05/30/02	< 50	< 50	< 300	< 1	NA	NA	NA	630
	03/06/02	< 50	< 50	< 300	< 1	NA	NA	NA	680
DUP0306022A	03/06/02	< 50	< 50	< 300	< 1	NA	NA	NA	670
	11/28/01	< 50	< 50	< 300	1.2	NA	NA	NA	580
DUP1128011A	11/28/01	< 50	< 50	< 300	1	NA	NA	NA	570
	08/30/01	< 50	57 [3] Y,NJ	< 300 [3]	< 1	NA	NA	NA	570
DUP0830012A	08/30/01	< 50	67 [3] Y,NJ	< 300 [3]	< 1	NA	NA	NA	550
1349MW02CL	08/30/01	< 50	< 50	< 300	< 2	NA	NA	NA	550
	05/10/01	< 50	< 50	< 300	1.1	NA	NA	NA	570
	05/19/99	NA	< 50	< 300	NA	NA	NA	NA	724
	02/19/99	NA	< 50	< 300	NA	NA	NA	NA	766
	11/18/98	NA	< 50	< 300	NA	NA	NA	NA	690
	08/18/98	NA	< 50 (U15)	< 300	NA	NA	NA	NA	637
	04/16/98	NA	< 50	< 300	NA	NA	NA	NA	555
	01/22/98	NA	< 50	< 300	NA	NA	NA	NA	586
	10/30/97	NA	< 50	< 300	NA	NA	NA	NA	653
	07/31/97	NA	58 (R32)	< 300	NA	NA	NA	NA	662
	05/01/97	NA	< 50	< 300	NA	NA	NA	NA	661
	02/10/97	NA	< 50	< 300	NA	NA	NA	NA	501
	11/25/96	NA	< 50	< 300	NA	NA	NA	NA	NA
	09/12/96	NA	< 50	< 300	NA	NA	NA	NA	NA
	08/08/95	NA	< 50	NA	NA	NA	NA	NA	NA
1349MW03	08/28/02	< 50	< 50	< 300	< 1	NA	NA	NA	110
DUP0828022A	08/28/02	< 50	< 50	< 300	< 1	NA	NA	NA	100
1349MW03CL	08/28/02	< 50	< 50 UJ	< 300 UJ	< 2	NA	NA	NA	110
1349MW03R	05/25/05	< 50	< 50	< 300	< 5	NA	NA	NA	560
	03/21/05	< 50	< 50	< 300	< 5	NA	NA	NA	960
	12/16/04	< 50	< 50	< 300	< 5	NA	NA	NA	78
	08/10/04	< 50	< 50	< 300	NA	NA	NA	NA	68
	05/26/04	< 50	< 50	< 300	NA	NA	NA	NA	79
	03/09/04	< 50	81 HY	770 Z	< 5	NA	NA	NA	78
	12/02/03	< 50	< 50	< 300	5.4	NA	NA	NA	72
	08/13/03	< 50	< 50	< 300	7.4	NA	NA	NA	78
	06/09/03	< 50	< 50	< 300	6.2	NA	NA	NA	130
1349MW100	05/25/05	690 H	5,100	< 300	11	NA	NA	NA	810
	03/23/05	960 HY	24,000	< 600	8	NA	NA	NA	820
	12/16/04	1,400 HY J+	6,300	< 300	20	NA	NA	NA	1,200
	08/10/04	3,000 HY	5,000	< 300	NA	NA	NA	NA	1,000
	05/27/04	920 HY	3,600	< 300	NA	NA	NA	NA	1,100
	03/16/04	930 H	31,000	< 600	11	NA	NA	NA	830
	12/02/03	1,000 HY,J+	1,100 LY	< 300	23	NA	NA	NA	1,200
	08/12/03	700 YH	9,000	< 300	15 J+	NA	NA	NA	1,100
	06/09/03	1,200 YH	5,100	< 300	14	NA	NA	NA	890
	03/12/03	610 YH	1,800	< 300	7.9	NA	NA	NA	840
	12/10/02	230 Y	1,500	< 300	5.9	NA	NA	NA	1,300
1349MW101	05/25/05	< 50	< 50	< 300	5.5	NA	NA	NA	200
DUP0525052A	05/25/05	< 50	< 50	< 300	5.5	NA	NA	NA	200
	03/21/05	< 50	< 50	< 300	5.7	NA	NA	NA	210
	12/15/04	< 50	< 50	< 300	5.1	NA	NA	NA	230
	03/09/04	< 50	< 50	< 300	5.2	NA	NA	NA	210
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	230
	08/19/03	< 50	< 50	< 300	5.9	NA	NA	NA	260
	06/09/03	< 50	< 50	< 300	6.1	NA	NA	NA	300
1349MW102	05/25/05	< 50	< 50	< 300	< 5	NA	NA	NA	150
	03/21/05	< 50	< 50	< 300	< 5	NA	NA	NA	340
DUP0321053A	03/21/05	< 50	< 50	< 300	< 5	NA	NA	NA	330
	12/16/04	< 50	< 50	< 300	< 5	NA	NA	NA	450

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
1349MW102	08/10/04	< 50	< 50	< 300	NA	NA	NA	NA	400
DUP0810042A	08/10/04	< 50	< 50	< 300	NA	NA	NA	NA	420
	05/27/04	< 50	51 Y	< 300	NA	NA	NA	NA	410
DUP0527041A	05/27/04	< 50	< 50	< 300	NA	NA	NA	NA	400
1349MW102CL	05/27/04	< 50	54	< 240	NA	NA	NA	NA	88
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	470
DUP0310041A	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	470
1349MW102CL	03/10/04	< 50	NA	NA	5.6	NA	NA	NA	450
	12/10/03	< 50	< 50	< 300	< 5	NA	NA	NA	480
DUP1210031A	12/10/03	< 50	< 50	< 300	< 5	NA	NA	NA	480
	08/12/03	< 50	< 50	< 300	< 5 UJ	NA	NA	NA	430
	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	560
DUP0609032A	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	570
1349MW102CL	06/09/03	< 50	< 50	< 250	7.3	NA	NA	NA	490
1349MW103	03/23/05	< 50	< 50	< 300	< 5	NA	NA	NA	830
	03/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	830
	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	800
DUP1203032A	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	800
	08/12/03	< 50	< 50	< 300	< 5 UJ	NA	NA	NA	790
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	830
1349MW104	03/23/05	< 50	< 50	< 300	< 5	NA	NA	NA	850
	03/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	820
	12/02/03	< 50	< 50	< 300	5.8	NA	NA	NA	790
	08/12/03	< 50	< 50	< 300	6 J+	NA	NA	NA	770
	06/06/03	< 50	< 50	< 300	< 5	NA	NA	NA	870
1349MW105	03/23/05	< 50	< 50	< 300	11	NA	NA	NA	540
	03/15/04	< 50	< 50	< 300	12	NA	NA	NA	590
	12/02/03	< 50	< 50	< 300	10	NA	NA	NA	600
	08/12/03	< 50	< 50	< 300	12 J+	NA	NA	NA	600
	06/09/03	< 50	< 50	< 300	10	NA	NA	NA	760
Building 1065/1027									
1065MW101 (shallow)	05/26/05	< 50	< 50	< 300	26	22.9	18.1	4.8	54
DUP0526051B	05/26/05	< 50	< 50	< 300	26	21.3	17.8	3.5	55
1065MW101CL	05/26/05	< 50 U	130	< 300 U	24	NA	NA	NA	52
	03/29/05	< 50	< 50	< 300	23	17	20.1	< 0.14 U	54
1065MW102	05/24/05	< 50	< 50	< 300	8.2	4.32	1.48	2.84	46
	03/29/05	< 50	< 50	< 300	6.5	5.8	4.47	1.34	25
1065PZ1A	06/02/05	170	< 50	< 300	30	35.7	30	5.7	63
(shallow)	03/29/05	56	< 50	< 300	31	3.23	2.55	0.678 B	42
	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	08/11/04	200	< 50	< 300	23	NA	NA	NA	NA
	05/26/04	220	< 50	< 300	20	NA	NA	NA	NA
	03/19/04	230	< 50	< 300	16	NA	NA	NA	NA
	12/05/03	170	< 50	< 300	NA	NA	NA	NA	NA
	08/19/03	310 H	< 50	< 300	NA	NA	NA	NA	NA
	06/11/03	170 Y	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	140	< 50	< 300	NA	NA	NA	NA	NA
	12/06/02	200 Y	< 50	< 300	NA	NA	NA	NA	NA
	09/05/02	180 Y	< 50	< 300	NA	NA	NA	NA	NA
DUP0905021A	09/05/02	160 Y	< 50	< 300	NA	NA	NA	NA	NA
	05/30/02	120	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	97	< 50	< 300	NA	NA	NA	NA	NA
	11/29/01	190	< 50	< 300	NA	NA	NA	NA	NA
	09/06/01	150	450 [2] Y,NJ	< 300 [2]	NA	NA	NA	NA	NA
DUP0906013A	09/06/01	140	440 [2] Y,NJ	< 300 [2]	NA	NA	NA	NA	NA
1065PZ1ACL	09/06/01	100 g	< 50	< 300	NA	NA	NA	NA	NA
	05/11/01	190 Y	< 50	< 300	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
1065PZ1A	07/18/00	120	< 50	< 300	18	NA	NA	NA	NA
(shallow)	05/27/99	110 (J25)	94 (J25)	< 300	NA	NA	NA	NA	NA
	03/08/99	120 (J25)	< 50	< 300	NA	NA	NA	NA	64.4
	11/30/98	180 (J25, J29)	< 76 (U12)	< 310	NA	NA	NA	NA	89
	08/26/98	130 (J18, J25)	< 50	< 300	NA	NA	NA	NA	63
	06/10/98	76 (J25)	65	< 300	NA	NA	NA	NA	56.4
	03/16/98	77 (J25)	< 50	< 300	NA	NA	NA	NA	48.6
	12/18/97	150 (J25)	< 50	< 300	NA	NA	NA	NA	79.3
	09/17/97	190 (J25)	< 50	< 300	NA	NA	NA	NA	18.4 D
1065PZ1B (intermediate)	05/24/05	< 50	< 50	< 300	< 5	NA	NA	NA	170
DUP0524052A	05/24/05	< 50	< 50	< 300	< 5	NA	NA	NA	170
	04/05/05	< 50	< 50	< 300	< 5	NA	NA	NA	170
	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	08/13/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	05/27/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/13/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/09/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP1209023A	12/09/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
1065PZ1BCL	12/09/02	< 50	< 50	< 250	NA	NA	NA	NA	NA
	09/17/97	< 50	< 50	< 300	NA	NA	NA	NA	61.7 D
1065PZ2A	05/24/05	< 50	< 50	< 300	21	19.2	15	4.2	39
(shallow)	04/01/05	< 50	< 50	< 300	10	8.88	6.15	2.73	30
DUP0401052A	04/01/05	< 50	< 50	< 300	9	9.02	5.78	3.25	30
	12/15/04	< 50	< 50	< 300	6.8	NA	NA	NA	NA
	08/11/04	< 50	< 50	< 300	19	NA	NA	NA	NA
	05/25/04	< 50	< 50	< 300	18	NA	NA	NA	NA
	03/15/04	< 50	< 50	< 300	16	NA	NA	NA	NA
	07/18/00	NA	NA	NA	25	NA	NA	NA	NA
	12/05/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/19/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/29/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50 UJ	< 300 UJ	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50 [2]	< 300 [2]	NA	NA	NA	NA	NA
	05/11/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0511013A	05/11/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/25/99	< 50	68 (U12)	< 300	NA	NA	NA	NA	NA
	03/03/99	< 50	< 50	< 300	NA	NA	NA	NA	63.7
	11/24/98	< 50	< 51	< 310	NA	NA	NA	NA	99.7
	08/25/98	< 50	< 50 (U18)	< 300	NA	NA	NA	NA	57
	06/09/98	< 50	< 50	< 300	NA	NA	NA	NA	62.9
	03/12/98	< 50	< 50	< 300	NA	NA	NA	NA	67.3 D
	12/17/97	< 50	< 50	< 300	NA	NA	NA	NA	81.8 D
	09/16/97	< 50	66 (R32)	< 300	NA	NA	NA	NA	77.2 D

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
1065PZ2B	04/05/05	< 50	< 50	< 300	< 5	NA	NA	NA	35
(intermediate)	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/13/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0813032A	08/13/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/06/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/09/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/13/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50 [2]	< 300 [2]	NA	NA	NA	NA	NA
	05/16/01	< 50	<50	< 300	NA	NA	NA	NA	NA
	05/25/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/03/99	< 50	< 50	< 300	NA	NA	NA	NA	51.5
	11/24/98	< 50	< 52	< 310	NA	NA	NA	NA	60.6
	08/25/98	< 50 (U18)	< 50	< 300	NA	NA	NA	NA	38
	06/09/98	< 50	< 50	< 300	NA	NA	NA	NA	43.5
	03/12/98	< 50	< 50	< 300	NA	NA	NA	NA	58.4 D
	12/17/97	< 50	< 50	< 300	NA	NA	NA	NA	57.5 D
	09/16/97	< 50	< 50	< 300	NA	NA	NA	NA	160
1065PZ3A (shallow)	04/05/05	< 50	< 50	< 300	< 5	NA	NA	NA	71
DUP0405052A	04/05/05	< 50	< 50	< 300	< 5	NA	NA	NA	71
1065PZ3ACL	04/05/05	< 50 U	< 50 U	< 300 U	< 2 U	NA	NA	NA	73
	03/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/29/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/11/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	07/18/00	NA	NA	NA	< 5	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/29/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50 [2]	< 300 [2]	NA	NA	NA	NA	NA
	05/11/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/24/99	< 50	59 (J25)	< 300	NA	NA	NA	NA	NA
	03/01/99	< 50	< 50	< 300	NA	NA	NA	NA	35
	11/23/98	< 50	< 61	< 370	NA	NA	NA	NA	36
	08/24/98	< 50 (U18)	< 50	< 300	NA	NA	NA	NA	15
	06/08/98	< 50	< 50	< 300	NA	NA	NA	NA	9.19 D
	03/11/98	< 50	< 50	< 300	NA	NA	NA	NA	34.2 D
	12/16/97	< 50	< 50	< 300	NA	NA	NA	NA	41.9 D
1065PZ3B	04/06/05	< 50	< 50	< 300	< 5	NA	NA	NA	69
(intermediate)	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0814032A	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
1065PZ3BCL	08/14/03	< 50	< 48	< 240	NA	NA	NA	NA	NA
	06/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/10/02	< 50	< 50	< 300	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
1065PZ3B (intermediate)	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/13/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	110 [2] Y,NJ	< 300 [2]	NA	NA	NA	NA	NA
DUP0905012A	09/05/01	< 50	110 [2] Y,NJ	< 300 [2]	NA	NA	NA	NA	NA
1065PZ3BCL	09/05/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/17/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0517014A	05/17/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
1065PZ3BCL	05/17/01	< 50	< 50	<500	NA	NA	NA	NA	NA
	05/24/99	< 50	67 (J25)	< 300	NA	NA	NA	NA	NA
	03/01/99	< 50	< 50	< 300	NA	NA	NA	NA	111
	11/23/98	< 50	< 54	< 320	NA	NA	NA	NA	41
	08/24/98	< 50 (U18)	< 50	< 300	NA	NA	NA	NA	82
	06/08/98	< 50	< 50	< 300	NA	NA	NA	NA	93.6 D
	03/11/98	< 50	< 50	< 300	NA	NA	NA	NA	91.8 D
	12/16/97	< 50	< 50	< 300	NA	NA	NA	NA	95.3 D
	09/15/97	< 50	< 50	< 300	NA	NA	NA	NA	70 D
1065PZ4A (shallow)	06/02/05	< 50	< 50	< 300	9.6	9.33	8.44	0.89	57
	04/01/05	< 50	< 50	< 300	7.6	6.7	6.4	0.306 B	62
	03/15/04	< 50	< 50	< 300	14	NA	NA	NA	NA
	12/05/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/19/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/11/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50 UJ	< 300 UJ	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	140 [2] YH,NJ	< 300 [2]	NA	NA	NA	NA	NA
	05/11/01	< 300	< 50	< 300	NA	NA	NA	NA	NA
	07/17/00	NA	NA	NA	14	NA	NA	NA	NA
	05/27/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/08/99	< 50	< 50	< 300	NA	NA	NA	NA	58.7
	12/01/98	< 50	< 54 (U12)	< 310	NA	NA	NA	NA	76.9
	08/27/98	< 50 (U18)	< 50	< 300	NA	NA	NA	NA	52
	06/11/98	< 50	56 (J25)	< 300	NA	NA	NA	NA	52.3
	03/17/98	< 50	< 50	< 300	NA	NA	NA	NA	54.9 D
	12/22/97	< 50	< 50	< 300	NA	NA	NA	NA	66.7 D
	09/18/97	< 50	< 50	< 300	NA	NA	NA	NA	72.7 D
1065PZ4B (intermediate)	04/05/05	< 50	< 50	< 300	< 5	NA	NA	NA	50
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/05/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/06/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/09/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/13/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50 [2]	< 300 [2]	NA	NA	NA	NA	NA
	05/09/01	< 300	< 50	< 300	NA	NA	NA	NA	NA
DUP0509012A	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/27/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/08/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/01/98	< 50	< 53 (U12)	< 310	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
1065PZ4B (intermediate)	08/27/98	< 50	< 50	< 300	NA	NA	NA	NA	55.7
	06/11/98	< 50	< 50	< 300	NA	NA	NA	NA	68.2
	03/17/98	< 50	< 50	< 300	NA	NA	NA	NA	49.5 D
	12/22/97	< 50	< 50	< 300	NA	NA	NA	NA	55 D
	09/18/97	< 50	< 50 (U29)	< 300	NA	NA	NA	NA	53.4 D
1065PZ5AR (shallow)	05/24/05	< 50	< 50	< 300	NA	24.5	20	4.5	63
	04/11/05	< 50	< 50	< 300	33	26.4	19	7.39	76
	03/10/04	< 50	< 50	< 300	22	NA	NA	NA	NA
	12/08/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/09/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
1065PZ5B (intermediate)	04/11/05	< 50	< 50	< 300	< 5	NA	NA	NA	41
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/08/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0604032B	06/04/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
1065PZ5BCL	06/04/03	< 50	< 50	< 250	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/10/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/13/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/03/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50 [2]	< 300 [2]	NA	NA	NA	NA	NA
	05/16/01	< 300	< 50	< 300	NA	NA	NA	NA	NA
	05/25/99	< 50	66 (J25)	< 300	NA	NA	NA	NA	NA
	03/03/99	< 50	< 50	< 300	NA	NA	NA	NA	40.5
	11/24/98	< 50	< 50	< 300	NA	NA	NA	NA	44.2
	08/25/98	< 50	< 50	< 300	NA	NA	NA	NA	26
	06/09/98	< 50	< 50	< 300	NA	NA	NA	NA	28.1
	03/12/98	< 50	< 50	< 300	NA	NA	NA	NA	29.7 D
	12/17/97	< 50	< 50	< 300	NA	NA	NA	NA	32.7 D
	09/16/97	< 50	< 50	< 300	NA	NA	NA	NA	33.9 D
1065PZ6A (shallow)	04/11/05	< 50	< 50	< 300	< 5	NA	NA	NA	85
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/08/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/10/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/10/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/13/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	07/17/00	NA	NA	NA	< 5	NA	NA	NA	NA
	12/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50 [2]	< 300 [2]	NA	NA	NA	NA	NA
	05/17/01	< 300	< 50	< 300	NA	NA	NA	NA	NA
	05/24/99	< 50	51 (J25)	< 300	NA	NA	NA	NA	NA
	03/01/99	< 50	480 (J25)	430 (J25)	NA	NA	NA	NA	72.4
	11/23/98	< 50	< 50	< 320	NA	NA	NA	NA	85.8
	08/24/98	< 50	< 50	< 300	NA	NA	NA	NA	56
	06/08/98	< 50	< 50	< 300	NA	NA	NA	NA	65.6 D
	03/11/98	< 50	< 50	< 300	NA	NA	NA	NA	65.8 D
	12/16/97	< 50	< 50	< 300	NA	NA	NA	NA	70.1 D
	09/15/97	< 50	< 50	< 300	NA	NA	NA	NA	71.2 D

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
1065PZ6B (intermediate)	04/05/05	< 50	< 50	< 300	< 5	NA	NA	NA	98
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/13/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/09/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/13/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50 [2]	< 300 [2]	NA	NA	NA	NA	NA
	05/11/01	< 300	< 50	< 300	NA	NA	NA	NA	NA
DUP0511012A	05/11/01	< 300	< 50	< 300	NA	NA	NA	NA	NA
	05/24/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/01/99	< 50	< 50	< 300	NA	NA	NA	NA	56.8
	11/23/98	< 50	< 52	< 310	NA	NA	NA	NA	64
	08/24/98	< 50	< 50	< 300	NA	NA	NA	NA	46
	06/08/98	< 50	< 50	< 300	NA	NA	NA	NA	54.4 D
	03/11/98	< 50	< 50	< 300	NA	NA	NA	NA	58.6 D
	12/16/97	< 50	< 50	< 300	NA	NA	NA	NA	62 D
	09/15/97	< 50	< 50	< 300	NA	NA	NA	NA	58.4 D
1065PZ7A (shallow)	04/06/05	< 50	< 50	< 300	< 5	NA	NA	NA	37
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/08/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/13/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/10/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/09/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/13/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/03/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50 [2]	< 300 [2]	NA	NA	NA	NA	NA
	05/09/01	< 300	< 50	< 300	NA	NA	NA	NA	NA
	07/17/00	NA	NA	NA	< 5	NA	NA	NA	NA
	05/27/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/08/99	< 50	< 50	< 300	NA	NA	NA	NA	16
	12/01/98	< 50 (U18)	< 50	< 300	NA	NA	NA	NA	19.6
	09/17/97	< 50	< 50 (U29)	< 300	NA	NA	NA	NA	82.1 D
1065PZ7B (intermediate)	04/06/05	< 50	< 50	< 300	< 5	NA	NA	NA	120
	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/08/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/13/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/10/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/09/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/13/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/03/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/05/01	< 50	< 50 [2]	< 300 [2]	NA	NA	NA	NA	NA
	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/27/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/08/99	< 50	< 50	< 300	NA	NA	NA	NA	46.6
	12/01/98	< 50	< 55 (U12)	< 330	NA	NA	NA	NA	56

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
1065PZ7B	08/26/98	< 50 (U18)	< 50	< 300	NA	NA	NA	NA	48
(intermediate)	06/10/98	< 50	< 50	< 300	NA	NA	NA	NA	53.4
	03/16/98	< 50	< 50	< 300	NA	NA	NA	NA	54.8 D
	12/18/97	< 50	< 50	< 300	NA	NA	NA	NA	63.9 D
	09/17/97	< 50	< 50 (U18)	< 300	NA	NA	NA	NA	57.3 D
1065MW9A	05/24/05	< 50	< 50	< 300	8.5	2.23	1.14	1.09	180
(shallow)	04/06/05	< 50	< 50	< 300	NA	8.23	5.67	2.56	190
DUP0406052A	04/06/05	< 50	< 50	< 300	NA	4.36	4.1	0.259	180
	12/17/04	< 50	< 50	< 300	8.6	NA	NA	NA	NA
	08/13/04	< 50	< 50	< 300	7.7	NA	NA	NA	NA
	05/27/04	< 50	< 50	< 300	7.1	NA	NA	NA	NA
	03/10/04	53	< 50	< 300	7.9	NA	NA	NA	NA
DUP0310042A	03/10/04	< 50	< 50	< 300	6.9	NA	NA	NA	NA
	12/08/03	120	< 50	< 300	NA	NA	NA	NA	NA
DUP1208031A	12/08/03	130	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/09/03	350	< 50	< 300	NA	NA	NA	NA	NA
DUP0609032C	06/09/03	310	< 50	< 300	NA	NA	NA	NA	NA
	03/18/03	160	< 50	< 300	NA	NA	NA	NA	NA
	11/05/02	150 YL	< 50	< 300	NA	NA	NA	NA	NA
	10/07/02	370	480	< 250	NA	NA	NA	NA	NA
1065MW9B	05/24/05	< 50	< 50	< 300	< 5	NA	NA	NA	48
(intermediate)	04/06/05	< 50	< 50	< 300	< 5	NA	NA	NA	53
	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	08/13/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
DUP0813041A	08/13/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	05/27/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
DUP0527042A	05/27/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/08/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/13/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/09/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0609032B	06/09/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
1065MW9BCL	06/09/03	< 50	< 50	< 250	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/05/02	120 YL	< 50	< 300	NA	NA	NA	NA	NA
	10/07/02	340	< 50	< 250	NA	NA	NA	NA	NA
1065MW10A	04/11/05	< 50	< 50	< 300	< 5	NA	NA	NA	58
(shallow)	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/08/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/06/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	10/07/02	< 50	< 50	< 250	NA	NA	NA	NA	NA
1065MW10B	04/11/05	< 50	< 50	< 300	< 5	NA	NA	NA	55
(intermediate)	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/13/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0318032A	03/18/03	NA	NA	NA	NA	NA	NA	NA	NA
1065MW10BCL	03/18/03	< 50	< 50	< 250	NA	NA	NA	NA	NA
	11/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	10/07/02	< 50	< 50	< 250	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
1065MW11A	04/11/05	< 50	< 50	< 300	< 5	NA	NA	NA	58
(shallow)	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
DUP0317042B	03/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/08/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/06/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0318032B	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	10/07/02	< 50	< 50	< 250	NA	NA	NA	NA	NA
1065MW11B	04/11/05	< 50	< 50	< 300	< 5	NA	NA	NA	72
(intermediate)	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	12/04/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/13/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/03/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/05/02	< 50	96 Y	< 300	NA	NA	NA	NA	NA
	10/07/02	< 50	< 50	< 250	NA	NA	NA	NA	NA
1027MW01	07/17/00	NA	NA	NA	< 5	NA	NA	NA	NA
	05/06/96	NA	< 47	< 280	NA	NA	NA	NA	NA
	02/13/96	< 50	< 51	< 310	NA	NA	NA	NA	NA
	11/10/95	NA	< 50	< 1,300	NA	NA	NA	NA	NA
	08/16/95	NA	< 50	< 1,300	NA	NA	NA	NA	NA
1027MW03	07/17/00	NA	NA	NA	< 5	NA	NA	NA	NA
	05/06/96	NA	< 49	< 290	NA	NA	NA	NA	NA
	02/14/96	NA	< 52	< 310	NA	NA	NA	NA	NA
	11/10/95	NA	< 50	< 1,300	NA	NA	NA	NA	NA
	08/18/95	NA	< 50	< 1,300	NA	NA	NA	NA	NA
1047MW101	05/26/05	< 50	NA	NA	NA	NA	NA	NA	NA
DUP0526052C	05/26/05	< 50	NA	NA	NA	NA	NA	NA	NA
1047MW101CL	05/26/05	67	NA	NA	NA	NA	NA	NA	NA
	04/06/05	< 50	NA	NA	< 5	NA	NA	NA	8.9
	12/16/04	< 50	NA	NA	NA	NA	NA	NA	NA
1047MW101CL	12/16/04	< 50 U	NA	NA	NA	NA	NA	NA	NA
DUP1216042A	12/16/04	< 50	NA	NA	NA	NA	NA	NA	NA
	08/13/04	< 50	NA	NA	NA	NA	NA	NA	NA
	05/27/04	< 50	NA	NA	NA	NA	NA	NA	NA
DUP0527042B	05/27/04	< 50	NA	NA	NA	NA	NA	NA	NA
1047MW101CL	05/27/04	< 50	NA	NA	NA	NA	NA	NA	NA
	03/11/04	< 50	NA	NA	< 5	NA	NA	NA	NA
DUP0311042A	03/11/04	< 50	NA	NA	< 5	NA	NA	NA	NA
1047MW101CL	03/11/04	< 50	NA	NA	< 5	NA	NA	NA	NA
	12/10/03	< 50	NA	NA	NA	NA	NA	NA	NA
Commissary/PX Study Area									
600GW101	06/01/05	270 Y	< 50	< 300	< 5	2.12	1.72	0.4 B	96
DUP0601053A	06/01/05	280 Y	< 50	< 300	< 5	2.34	1.74	0.6	95
	03/21/05	390 HY J+	< 50	< 300	< 5	3.16	3.66	< 0.025 U	110
	12/22/04	NA	NA	NA	NA	2.6	1.86	0.739	NA
DUP1221043A	12/22/04	NA	NA	NA	NA	2.46	2.03	0.43	NA
	12/16/04	460 HY	< 50	< 300	< 5	NA	NA	NA	NA
	08/10/04	390 Y	< 50	< 300	< 5	NA	NA	NA	130
	05/26/04	570 Y	< 50	< 300	< 5	NA	NA	NA	110
	03/09/04	600 HY	< 50	< 300	< 5	NA	NA	NA	110
	12/02/03	340 Y	< 50	< 300	< 5	NA	NA	NA	98
	08/13/03	370 Y	< 50	< 300	< 5	NA	NA	NA	100
	06/09/03	470 Y	< 50	< 300	< 5	NA	NA	NA	97
	03/11/03	630 Y	< 50	< 300	5.8	NA	NA	NA	120
	12/04/02	310 Y	< 50	< 300	1.7	NA	NA	NA	100
	09/10/02	230 J-	< 100 UJ	< 300 UJ	< 5.0	NA	NA	NA	100

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
600GW102	04/06/05	< 50	< 50	< 300	< 5	1.14	0.162	0.978	150
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	230
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	200
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	870
	06/09/03	< 50	< 50	< 300	< 5	NA	NA	NA	440
	03/11/03	< 50	< 50	< 300	3.4	NA	NA	NA	170
	12/04/02	< 50	< 50	< 300	3	NA	NA	NA	460
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ	6.2	NA	NA	NA	220
600GW103	04/11/05	< 50	< 50	< 300	5	3.21	2.19	1.02	93
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	110
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	100
	08/13/03	< 50	< 50	< 300	7.2	NA	NA	NA	97
DUP0813033A	08/13/03	< 50	< 50	< 300	9.7	NA	NA	NA	98
	06/09/03	< 50	< 50	< 300	7.6	NA	NA	NA	130
	03/11/03	< 50	< 50	< 300	4	NA	NA	NA	120
	12/04/02	< 50	< 50	< 300	4.2	NA	NA	NA	97
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ	6.7	NA	NA	NA	110
600GW104	04/11/05	< 50	< 50	< 300	< 5	2.18	0.791	1.39	24
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	43
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	42
DUP1202033A	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	43
	08/18/03	< 50	< 50	< 300	< 5	NA	NA	NA	38
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	48
	03/11/03	< 50	< 50	< 300	< 1	NA	NA	NA	59
DUP0311032A	03/11/03	< 50	< 50	< 300	< 1	NA	NA	NA	59
600GW104CL	03/11/03	< 50	< 50 UJ	< 250	6.5	NA	NA	NA	54
	12/04/02	< 50	< 50	< 300	1.3	NA	NA	NA	55
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ	< 5.0	NA	NA	NA	59
DUP0910021A	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ	< 5.0	NA	NA	NA	58
600GW105	06/01/05	< 50	< 50	< 300	< 5	NA	NA	NA	89
	03/22/05	< 50	< 50	< 300	< 5	NA	NA	NA	86
	12/22/04	NA	NA	NA	NA	0.931	0.591	0.34	NA
	12/16/04	< 50	< 50	< 300	< 5	NA	NA	NA	88
	08/12/04	< 50	< 50	< 300	< 5	NA	NA	NA	93
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	90
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	86
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	86
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	90
DUP0605033A	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	90
	03/12/03	< 50	< 50	< 300	< 1	NA	NA	NA	83
	12/04/02	< 50	< 50	< 300	< 1	NA	NA	NA	88
	09/11/02	< 50 UJ	< 100 UJ	< 300 UJ	< 5	NA	NA	NA	99
600GW106	06/01/05	< 50	< 50	< 300	< 5	NA	NA	NA	28
	03/29/05	< 50	< 50	< 300	< 5	NA	NA	NA	33
	12/22/04	NA	NA	NA	NA	0.441	< 0.03 U	0.41	NA
	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	35
	08/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	30
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	34
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	36
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	33
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	37
	03/12/03	< 50	< 50	< 300	< 1	NA	NA	NA	39
	12/04/02	< 50	< 50	< 300	< 1	NA	NA	NA	42
	09/11/02	< 50 UJ	< 100 UJ	< 300 UJ	< 5	NA	NA	NA	44

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
600GW107	04/11/05	< 50	< 50	< 300	7	NA	NA	NA	40
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	43
	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	NA
	08/13/03	< 50	170 HY	< 300	7.1	NA	NA	NA	45
	06/06/03	< 50	< 50	< 300	< 5	NA	NA	NA	53
	03/11/03	< 50	85 YH	< 300	2.4	NA	NA	NA	54
	12/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/11/02	< 50 UJ	NA	NA	NA	NA	NA	NA	NA
600GW108	06/01/05	< 50	< 50	< 300	< 5	NA	NA	NA	49
	03/21/05	< 50	< 50	< 300	< 5	NA	NA	NA	47
DUP0321052B	03/21/05	< 50	< 50	< 300	< 5	NA	NA	NA	46
	12/22/04	NA	NA	NA	NA	0.446	< 0.03 BU	0.446	NA
	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	51
	08/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	25
	05/26/04	< 50	< 50	< 300	< 5	NA	NA	NA	35
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	48
	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	46
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	29
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	45
	03/12/03	< 50	< 50	< 300	< 1	NA	NA	NA	46
	12/09/02	< 50	< 50	< 300	< 1	NA	NA	NA	48
DUP1209022C	12/09/02	< 50	< 50	< 300	< 1	NA	NA	NA	47
600GW108CL	12/09/02	< 50	< 50	< 250	< 2 U	NA	NA	NA	46
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ	< 5	NA	NA	NA	42
600GW109	04/01/05	< 50	< 50	< 300	< 5	NA	NA	NA	39
	03/09/04	< 50	< 50	< 300	< 5	NA	NA	NA	42
	12/03/03	< 50	< 50	< 300	< 5	NA	NA	NA	38
	08/13/03	< 50	< 50	< 300	< 5	NA	NA	NA	55
	06/05/03	< 50	< 50	< 300	< 5	NA	NA	NA	46
	03/11/03	< 50	< 50	< 300	< 1	NA	NA	NA	51
	12/04/02	< 50	< 50	< 300	< 1	NA	NA	NA	44
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ	NA	NA	NA	NA	45
610GW101	06/02/05	< 50	< 50	< 300	< 5	3.34	2.76	0.58	44
	03/21/05	< 50	< 50	< 300	< 5	1.51	1.21	0.302	42
DUP0321052A	03/21/05	< 50	< 50	< 300	< 5	1.68	1.67	< 0.025 U	43
	12/21/04	NA	NA	NA	NA	2.6	1.86	0.739	NA
	12/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	NA
DUP1215041A	12/15/04	< 50	< 50	< 300	< 5	NA	NA	NA	37
610GW101CL	12/15/04	< 50 U	< 50 U	< 300 U	2.1	NA	NA	NA	39
	08/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	35.4
	05/26/04	< 50	< 50	< 300	< 5	NA	NA	NA	52
	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	45
DUP0310043A	03/10/04	< 50	< 50	< 300	< 5	NA	NA	NA	43
610GW101CL	03/10/04	< 50	< 48	< 240	< 5	NA	NA	NA	45
	12/02/03	< 50	< 50	< 300	< 5	NA	NA	NA	28
	08/14/03	< 50	< 50	450	< 5	NA	NA	NA	46
DUP0814033A	08/14/03	< 50	< 50	< 300	< 5	NA	NA	NA	48
610GW101CL	08/14/03	< 50	< 48	< 240	7.3	NA	NA	NA	55
	06/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	51
DUP0604033B	06/04/03	< 50	< 50	< 300	< 5	NA	NA	NA	51
610GW101CL	06/04/03	< 50	< 50	< 250	4.6	NA	NA	NA	58
	03/11/03	< 50	380 YH	1,400	1.1	NA	NA	NA	48
	12/03/02	< 50	< 50	< 300	1.4	NA	NA	NA	57
	08/29/02	< 50	< 50	< 300	NA	NA	NA	NA	56
	05/29/02	< 50	< 50	< 300	NA	NA	NA	NA	52
	03/05/02	< 50	< 50	< 300	NA	NA	NA	NA	53
	12/03/01	< 50	< 50	< 300	NA	NA	NA	NA	48
	08/29/01	< 50	NA	NA	NA	NA	NA	NA	52

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
610GW102	06/02/05	52	< 50	< 300	6.5	6.39	5.95	0.44 B	47
	03/31/05	51	< 50	< 300	6.9	6.52	4.14	2.38	50
DUP0331052C	03/31/05	< 50	< 50	< 300	6.5	6.01	5.04	0.973	49
610GW102CL	03/31/05	< 50 U	< 50 U	< 300 U	22.1	NA	NA	NA	46.4
	12/21/04	NA	NA	NA	NA	4.96	3.82	1.14	NA
	12/15/04	64	< 50	< 300	6.1	NA	NA	NA	63
	08/11/04	< 50	< 50	< 300	7.3	NA	NA	NA	51
DUP0811041A	08/11/04	50	< 50	< 300	7.3	NA	NA	NA	51
610GW102CL	08/11/04	< 100	< 100 J-	< 400 UJ	< 40	NA	NA	NA	48
	05/26/04	58 Y	< 50	< 300	11	NA	NA	NA	45
	03/09/04	67	< 50	< 300	6.9	NA	NA	NA	57
	12/02/03	83	< 50	< 300	9.9	NA	NA	NA	62
	08/18/03	73 Y	< 50	< 300	13	NA	NA	NA	66
	06/05/03	67	< 50	< 300	11	NA	NA	NA	74
	03/11/03	< 50	< 50	< 300	8.6	NA	NA	NA	61
DUP0311033A	03/11/03	< 50	< 50	< 300	8.9	NA	NA	NA	64
	12/03/02	55 Y	< 50	< 300	11	NA	NA	NA	55
	08/29/02	67	< 50	< 300	NA	NA	NA	NA	49
	05/29/02	< 50	< 50	< 300	NA	NA	NA	NA	43
	03/05/02	72	< 50	< 300	NA	NA	NA	NA	54
	12/03/01	< 50	< 50	< 300	NA	NA	NA	NA	74
	08/29/01	230	NA	NA	NA	NA	NA	NA	57
610GW103	06/02/05	< 50	< 50	< 300	10	9.43	8.57	0.86	120
	03/22/05	< 50	< 50	< 300	5.2	4.6	2.12	2.48	93
	12/21/04	NA	NA	NA	NA	10.00	8.26	1.75	NA
	12/16/04	52 HY	< 50	< 300	5.1	NA	NA	NA	270
	08/10/04	61 Y	< 50	< 300	9.8	NA	NA	NA	72
	05/26/04	< 50	< 50	< 300	12	NA	NA	NA	60
	03/09/04	69	< 50	< 300	7.8	NA	NA	NA	60
	12/03/03	64	< 50	< 300	7.5	NA	NA	NA	78
DUP1203033A	12/03/03	60	< 50	< 300	7.2	NA	NA	NA	77
610GW103CL	12/03/03	< 50	< 48 A-01,U	< 240	13	NA	NA	NA	86
	08/18/03	110 Y	< 50	< 300	7.4	NA	NA	NA	64
DUP0818033A	08/18/03	110 Y	62 Y	< 300	7.1	NA	NA	NA	67
	06/05/03	96	< 50	< 300	7.3	NA	NA	NA	62
	03/11/03	< 50	< 50	< 300	6.3	NA	NA	NA	76
	12/03/02	< 50	< 50	< 300	4.7	NA	NA	NA	67
DUP1203022A	12/03/02	54 Y	< 50	< 300	4.6	NA	NA	NA	69
	08/29/02	59	< 50	< 300	NA	NA	NA	NA	61
	05/30/02	88	< 50	< 300	NA	NA	NA	NA	62
DUP0530022A	05/30/02	88	< 50	< 300	NA	NA	NA	NA	65
610GW103CL	05/30/02	110 g	< 50	< 300	NA	NA	NA	NA	57
	03/05/02	100	< 50	< 300	NA	NA	NA	NA	71
DUP0305023A	03/05/02	110	< 50	< 300	NA	NA	NA	NA	69
610GW103CL	03/05/02	95 g	< 50 UJ	< 300	NA	NA	NA	NA	65
	12/03/01	< 50	< 50	< 300	NA	NA	NA	NA	46
DUP1203011A	12/03/01	< 50	< 50	< 300	NA	NA	NA	NA	47
610GW103CL	12/03/01	< 50	< 50	< 500	NA	NA	NA	NA	49
	08/29/01	430	NA	NA	NA	NA	NA	NA	110
610SP01	06/01/05	99 Y	< 50	< 300	8.7	7.6	6.28	1.32	350
(Total)	06/01/05	NA	NA	NA	13	NA	NA	NA	NA
	12/21/04	NA	NA	NA	NA	5.72	5.38	0.338	NA
(Total)	12/21/04	NA	NA	NA	NA	11.1	10.5	0.559	NA
	12/17/04	85 HY	< 50	< 300	8	NA	NA	NA	2,300
(Total)	12/17/04	NA	NA	NA	34	NA	NA	NA	NA
	08/13/04	51	< 50	< 300	15	NA	NA	NA	4,400
(Total)	08/13/04	NA	NA	NA	17	NA	NA	NA	NA
	05/28/04	54	< 50	< 300	8.6	NA	NA	NA	62
(Total)	03/16/04	< 50	< 50	< 300	11	NA	NA	NA	79

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(mg/L)
610SP01 (Total)	12/09/03	100 Y	< 50	< 300	6.6	NA	NA	NA	1,800
DUP1209031A (Total)	12/09/03	100 Y	< 50	< 300	< 5	NA	NA	NA	1,700
610SP01CL (Total)	12/09/03	58	< 48	< 240	220	NA	NA	NA	1,280
	08/21/03	< 50	< 50	< 300	23	NA	NA	NA	1,400
	06/11/03	56 Y	< 50	< 300	16	NA	NA	NA	5,800
	03/20/03	81	< 50	< 300	9.9	NA	NA	NA	2,200
	12/11/02	< 50	< 50	< 300	19	NA	NA	NA	5,500
	09/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	02/14/02	88	< 50	< 300	NA	NA	NA	NA	NA
	08/30/01	80	< 50	< 300	NA	NA	NA	NA	NA
	07/19/01	130 Y	130 Y	< 300	NA	NA	NA	NA	NA
	05/25/01	87	< 50	< 300	NA	NA	NA	NA	NA
	04/05/01	150 Y	80 Y	< 300	NA	NA	NA	NA	NA
	12/27/00	NA	< 50	NA	NA	NA	NA	NA	NA
	08/02/00	450	NA	NA	NA	NA	NA	NA	NA
	06/27/00	170	NA	NA	NA	NA	NA	NA	NA
	05/09/00	480 Y	NA	NA	NA	NA	NA	NA	NA
	04/06/00	460 Y	NA	NA	NA	NA	NA	NA	NA
	02/09/00	440 Y	NA	NA	NA	NA	NA	NA	NA
	01/04/00	810	NA	NA	NA	NA	NA	NA	NA
	12/03/99	660 Y	NA	NA	NA	NA	NA	NA	NA
	11/18/99	570	< 50	< 300	NA	NA	NA	NA	NA
610SP02	06/01/05	120 Y	< 50	< 300	6.9	6.82	5.37	1.45	170
(Total)	06/01/05	NA	NA	NA	9.8	NA	NA	NA	NA
	12/21/04	NA	NA	NA	NA	7.47	7.63	< 0.007	NA
(Total)	12/21/04	NA	NA	NA	NA	10.2	8.02	2.16	NA
	12/17/04	150 HY	< 50	< 300	5.9	NA	NA	NA	580
(Total)	12/17/04	NA	NA	NA	20	NA	NA	NA	NA
	08/13/04	< 50	< 50	< 300	< 5	NA	NA	NA	12,000
(Total)	08/13/04	NA	NA	NA	< 5	NA	NA	NA	NA
	05/28/04	56	< 50	< 300	< 5	NA	NA	NA	220
(Total)	03/16/04	81	< 50	< 300	5.4	NA	NA	NA	480
(Total)	12/09/03	240 Y	< 50	< 300	< 5	NA	NA	NA	3,300
	08/21/03	85	< 50	< 300	< 5	NA	NA	NA	7,700
	06/11/03	71 Y	< 50	< 300	9	NA	NA	NA	2,700
	03/20/03	97	< 50	< 300	11	NA	NA	NA	3,700
	12/11/02	130 Y	< 50	< 300	11	NA	NA	NA	5,300
	09/05/02	120 Y	< 50	< 300	NA	NA	NA	NA	NA
	02/14/02	140	< 50	< 300	NA	NA	NA	NA	NA
	08/30/01	190	< 50	< 300	NA	NA	NA	NA	NA
	07/19/01	57 Y	250 Y	< 300	NA	NA	NA	NA	NA
	05/25/01	110	170 Y	< 300	NA	NA	NA	NA	NA
	04/05/01	150 Y	63 Y	< 300	NA	NA	NA	NA	NA
	12/27/00	NA	< 50	NA	NA	NA	NA	NA	NA
	08/02/00	67	NA	NA	NA	NA	NA	NA	NA
	06/27/00	73	NA	NA	NA	NA	NA	NA	NA
	05/09/00	280 Y	NA	NA	NA	NA	NA	NA	NA
	04/06/00	110 Y	NA	NA	NA	NA	NA	NA	NA
	02/09/00	210 Y	NA	NA	NA	NA	NA	NA	NA
	12/03/99	95 Y	NA	NA	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
Building 207/231 Grab Groundwater Samples									
207HP101(12)	04/08/04	34 J	1200	< 660	NA	NA	NA	NA	NA
207HP102(12)	04/07/04	23 J	190	< 420	NA	NA	NA	NA	NA
207HP103(10)	04/07/04	64	370	< 330	NA	NA	NA	NA	NA
207SB104(12)	04/08/04	41 J	300	< 330	NA	NA	NA	NA	NA
207SB105(16)	04/08/04	2100	600	< 320	NA	NA	NA	NA	NA
208SB100(12)	04/08/04	NA	160	< 400	7.5	NA	NA	NA	NA
228SB101(16)	04/06/04	970	920	< 400	5.5	NA	NA	NA	NA
228SB102(16)	04/06/04	< 5000	5900	2400	3.8 J	NA	NA	NA	NA
231SB100(10)	04/05/04	320	900	400	NA	NA	NA	NA	NA
231SB101(10.5)	04/05/04	26 J	2600	330	NA	NA	NA	NA	NA
231SB102(11)	04/05/04	NA	430	< 270	NA	NA	NA	NA	NA
231SB102(12)	04/08/04	30 J	NA	NA	10	NA	NA	NA	NA
231SB103(10.5)	04/05/04	28 J	940	< 280	12	NA	NA	NA	NA
231SB104(12)	04/07/04	840	2900	290	NA	NA	NA	NA	NA
231SB105(12)	04/07/04	1200	1700	1100	NA	NA	NA	NA	NA
231SB106(10.5)	04/08/04	23 J	140	< 260	NA	NA	NA	NA	NA
231SB108(14.5)	04/05/04	2400	1800	590	NA	NA	NA	NA	NA
231SB109(14.5)	04/06/04	50	260	< 260	NA	NA	NA	NA	NA
231SB110(12)	04/08/04	< 50	130	< 300	NA	NA	NA	NA	NA
231SB111(16)	04/06/04	130	140	< 290	NA	NA	NA	NA	NA
231SB112(10.5)	04/06/04	40 J	150	< 300	NA	NA	NA	NA	NA
231SB113(15)	04/06/04	18 J	240	< 420	NA	NA	NA	NA	NA
231SB114(16)	04/07/04	< 50	150	< 300	NA	NA	NA	NA	NA
231SB115(16)	04/08/04	49 J	61	< 270	NA	NA	NA	NA	NA
231SB116(10.5)	04/05/04	22 J	350	< 380	8.3	NA	NA	NA	NA
271SB100(10.5)	04/08/04	50	110	< 290	9.7	NA	NA	NA	NA
38SB100(10.5)	04/07/04	19 J	180	< 270	8.7	NA	NA	NA	NA
38SB101(10.5)	04/07/04	24 J	160	< 270	14	NA	NA	NA	NA
38SB102(12)	04/07/04	35 J	420	450	24	NA	NA	NA	NA
38SB103(12)	04/06/04	36 J	370	< 370	7.2	NA	NA	NA	NA
Building 207/231									
207GW01	07/09/98	< 50	< 50	< 300	NA	NA	NA	NA	214 D
	05/04/98	< 50	< 50	< 300	NA	NA	NA	NA	246 D
	03/05/98	< 50	< 50	< 300	NA	NA	NA	NA	244 D
207GW02	07/09/98	< 50	55	570	NA	NA	NA	NA	374 D
	05/04/98	< 50	< 50	< 300	NA	NA	NA	NA	372 D
	03/05/98	< 50	< 50	< 300	NA	NA	NA	NA	342 D
207GW03	04/12/05	< 50	< 50	< 300	< 5	0.249	0.09	0.159	120
	03/19/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/21/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/19/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/10/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/11/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/30/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/01	< 50	73 Y NJ	< 300	NA	NA	NA	NA	NA
	05/14/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/13/99	< 50	63 (J25, J9)	< 300	NA	NA	NA	NA	NA
	01/11/99	< 50	< 50	< 300	NA	NA	NA	NA	150
	10/12/98	< 50	< 50	< 300	NA	NA	NA	NA	160
	07/09/98	< 50	59 (J25)	< 300	NA	NA	NA	NA	184 D
	05/04/98	< 50	130 (J25)	< 300	NA	NA	NA	NA	159 D
	03/05/98	< 50	< 50	< 300	NA	NA	NA	NA	204 D
	01/29/97	NA	NA	NA	NA	NA	NA	NA	56.1 D

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW06	04/04/05	< 50	< 50	< 300	6.1	5.52	0.168	5.36	57
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	66 Y	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/05/02	< 50	55 Y	< 300	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	370	NA	NA	NA	NA	NA
	08/30/01	< 50	64 Y NJ	< 300	NA	NA	NA	NA	NA
	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/20/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/20/99	< 50	< 50 (J25)	< 300	NA	NA	NA	NA	95
	10/20/98	< 50	< 50	< 300	NA	NA	NA	NA	81.1
	07/21/98	< 50	< 50	< 300	NA	NA	NA	NA	64.1 D
	04/23/98	< 50	< 50	< 300	NA	NA	NA	NA	62.6 D
	01/27/98	< 50	< 50	< 300	NA	NA	NA	NA	67.2 D
	10/22/97	< 50	< 50	< 300	NA	NA	NA	NA	66.9 D
	07/23/97	< 50	< 50	< 300	NA	NA	NA	NA	62.3 D
	04/23/97	< 50	< 50	< 300	NA	NA	NA	NA	63.6 D
	01/29/97	< 50	< 50	< 300	NA	NA	NA	NA	56.1 D
	10/10/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	07/15/96	150 (J25)	< 50	< 300	NA	NA	NA	NA	NA
	05/02/96	< 50	< 50	< 300 (U12)	NA	NA	NA	NA	NA
	02/07/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/09/95	< 50	56 (J25)	< 300	NA	NA	NA	NA	NA
	08/10/95	< 50	120 (J25)	< 300	NA	NA	NA	NA	NA
	04/17/95	< 50	200 (J25)	NA	NA	NA	NA	NA	NA
	01/25/95	< 50	< 50	NA	NA	NA	NA	NA	NA
	11/09/94	< 50	660 (J25)	NA	NA	NA	NA	NA	NA
	08/16/94	< 50	66 (J25)	NA	NA	NA	NA	NA	NA
	04/25/94	< 50	190 (J25)	NA	NA	NA	NA	NA	NA
	01/28/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	10/25/93	< 50	< 50	NA	NA	NA	NA	NA	NA
	07/27/93	< 50	< 50	NA	NA	NA	NA	NA	NA
231GW09	06/01/05	< 50	< 50	< 300	< 5	0.371	< 0.025 U	0.371	48
	04/04/05	< 50	< 50	< 300	< 5	0.344	< 0.025 U	0.344	51
	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	52
DUP1217042A	12/17/04	< 50	< 50	< 300	< 5	NA	NA	NA	51
	08/12/04	< 50	< 50	< 300	< 5	NA	NA	NA	50
	05/27/04	< 50	170 HY	< 300	< 5	NA	NA	NA	51
DUP0527042C	05/27/04	< 50	< 50	< 300	< 5	NA	NA	NA	51
231GW09CL	05/27/04	< 50	< 66	< 330	< 5	NA	NA	NA	52 D
	03/18/04	< 50	< 50	< 300	< 5	NA	NA	NA	56
	12/04/03	NA	NA	NA	< 5	NA	NA	NA	53
	08/15/03	< 50	< 50	< 300	< 5	NA	NA	NA	51
	06/10/03	NA	NA	NA	< 5	NA	NA	NA	57
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/30/02	< 50	170 Y	610	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50 UJ	< 300 UJ	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/14/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/13/99	< 50	< 50	< 300	NA	NA	NA	NA	55.8
	10/14/98	< 50	< 50	< 300	NA	NA	NA	NA	49
	07/15/98	< 50	< 50	< 300	NA	NA	NA	NA	49.9 D

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW09	04/20/98	< 50	< 50	< 300	NA	NA	NA	NA	75.1 D
	01/28/98	< 50	< 50	< 300	NA	NA	NA	NA	62.4 D
	10/23/97	< 50	< 50	< 300	NA	NA	NA	NA	47.5 D
	07/24/97	< 50	< 50	< 300	NA	NA	NA	NA	42.4 D
	04/22/97	< 50	< 50	< 300	NA	NA	NA	NA	49.8 D
	01/28/97	< 50	< 50	< 300	NA	NA	NA	NA	53.9 D
	10/09/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	07/12/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/01/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	02/08/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/07/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/10/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/18/95	< 50	< 50	NA	NA	NA	NA	NA	NA
	01/23/95	< 50	< 50	NA	NA	NA	NA	NA	NA
	11/10/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	08/18/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	04/27/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	02/04/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	10/27/93	< 50	< 50	NA	NA	NA	NA	NA	NA
	07/27/93	< 50	< 50	NA	NA	NA	NA	NA	NA
231GW10	03/22/05	< 50	< 50	< 300	10	10.6	9.57	1.04	48
	03/16/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/29/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50 UJ	< 300 UJ	NA	NA	NA	NA	NA
	12/03/01	< 50	< 50 UJ	< 300 UJ	NA	NA	NA	NA	NA
	08/30/01	< 50	190 Y NJ	< 300	NA	NA	NA	NA	NA
	05/11/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/19/99	< 50	56	< 300	NA	NA	NA	NA	NA
	01/25/99	< 50	< 50	< 300	NA	NA	NA	NA	31.3
	10/19/98	< 50	< 50	< 300	NA	NA	NA	NA	67
	07/22/98	< 50	< 50	< 300	NA	NA	NA	NA	55.6 D
	04/23/98	< 50	< 50	< 300	NA	NA	NA	NA	52.6 D
	01/28/98	< 50	< 50	< 300	NA	NA	NA	NA	53 D
	10/22/97	< 50	< 50	< 300	NA	NA	NA	NA	62.1 D
	07/23/97	< 50	< 50	< 300	NA	NA	NA	NA	60.8 D
	04/23/97	< 50	< 50	< 300	NA	NA	NA	NA	63.5 D
	01/29/97	< 50	< 50	< 300	NA	NA	NA	NA	57 D
	10/10/96	< 50	110 (J25)	< 300	NA	NA	NA	NA	NA
	07/16/96	< 50	< 50	300 (U6)	NA	NA	NA	NA	NA
	05/03/96	< 50	< 50	< 300 (U12)	NA	NA	NA	NA	NA
	02/06/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/06/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/11/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/19/95	< 50	< 50	NA	NA	NA	NA	NA	NA
	01/24/95	< 50	54 (J25)	NA	NA	NA	NA	NA	NA
	11/11/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	08/18/94	< 50	56 (J25)	NA	NA	NA	NA	NA	NA
	04/27/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	01/31/94	< 50	57 (J25)	NA	NA	NA	NA	NA	NA
	10/27/93	< 50	< 50	NA	NA	NA	NA	NA	NA
	07/26/93	< 50	< 50	NA	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW11	04/05/05	< 50	< 50	< 300	< 5	0.894 J	0.647 J	0.247 J	50
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	77 Y	< 300	NA	NA	NA	NA	NA
	03/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/13/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/11/99	< 50	< 50	< 300	NA	NA	NA	NA	70
	10/12/98	< 50	< 50	< 300	NA	NA	NA	NA	56.5
	07/13/98	< 50	< 50	< 300	NA	NA	NA	NA	48.8 D
	04/21/98	< 50	< 50	< 300	NA	NA	NA	NA	50.6 D
	01/26/98	< 50	< 50	< 300	NA	NA	NA	NA	53.8 D
	10/21/97	< 50	< 50	< 300	NA	NA	NA	NA	59.6 D
	07/21/97	< 50	< 50	< 300	NA	NA	NA	NA	55 D
	04/21/97	< 50	< 50	< 300	NA	NA	NA	NA	60.3 D
	01/28/97	< 50	< 50	< 300	NA	NA	NA	NA	61.5 D
	10/08/96	< 50	< 50	< 300 (U6)	NA	NA	NA	NA	NA
	07/16/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/03/96	< 50	< 50	< 300 (U12)	NA	NA	NA	NA	NA
	02/13/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/08/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/19/95	< 50	< 50	NA	NA	NA	NA	NA	NA
	01/24/95	< 50	< 50	NA	NA	NA	NA	NA	NA
	11/11/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	08/17/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	04/26/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	02/07/94	< 50	< 50	NA	NA	NA	NA	NA	NA
	10/28/93	< 50	< 50	NA	NA	NA	NA	NA	NA
	07/26/93	< 50	< 50	NA	NA	NA	NA	NA	NA
231GW13	04/05/05	< 50	< 50	< 300	32	30.2 J	1.02 J	29.2 J	150
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/06/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/28/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/16/99	< 50	< 50	< 300 (U6)	NA	NA	NA	NA	NA
	01/14/99	< 50	< 50	< 300	NA	NA	NA	NA	180
	10/15/98	< 50	< 50	< 300	NA	NA	NA	NA	184
	07/16/98	< 50	< 50	< 300	NA	NA	NA	NA	157 D
	04/21/98	< 50	< 50	< 300	NA	NA	NA	NA	145 D
	01/26/98	< 50	< 50	< 300	NA	NA	NA	NA	133 D
	10/20/97	< 50	< 50	< 300	NA	NA	NA	NA	157 D
	07/21/97	< 50	< 50	< 300	NA	NA	NA	NA	150 D
	04/21/97	< 50	< 50	< 300	NA	NA	NA	NA	162 D
	01/27/97	< 50	< 50	< 300	NA	NA	NA	NA	160 D
	10/07/96	< 50	< 50	< 300 (U6)	NA	NA	NA	NA	NA
	07/10/96	< 50	< 50	< 300	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW13	04/29/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	02/06/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/03/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/15/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/10/95	< 10	< 50	NA	NA	NA	NA	NA	72.1
231GW15	04/05/05	< 50	< 50	< 300	< 5	0.322 J	0.159 J	0.164 J	59
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/28/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/16/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/14/99	< 50	< 50	< 300	NA	NA	NA	NA	83.8
	10/15/98	< 50	< 50	< 300	NA	NA	NA	NA	79
	07/16/98	< 50	< 50	< 300	NA	NA	NA	NA	68.8 D
	04/21/98	< 50	< 50	< 300	NA	NA	NA	NA	59.9 D
	01/26/98	< 50	< 50	< 300	NA	NA	NA	NA	64.8 D
	10/20/97	< 50	< 50	< 300	NA	NA	NA	NA	74.3 D
	07/21/97	< 50	< 50	< 300	NA	NA	NA	NA	66.7 D
	04/21/97	< 50	< 50	< 300	NA	NA	NA	NA	70.4 D
	01/27/97	< 50	< 50	< 300	NA	NA	NA	NA	65.7 D
	10/07/96	< 50	< 50	< 300 (U6)	NA	NA	NA	NA	NA
	07/10/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/29/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	02/06/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/03/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/16/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/07/95	NA	< 50	NA	NA	NA	NA	NA	58.8
231GW16	03/22/05	< 50	< 50	< 300	< 5	0.112	0.104	0.008 B	150
	03/16/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/08/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0308023A	03/08/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/01	< 50	99 Y NJ	< 300	NA	NA	NA	NA	NA
	05/14/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/16/99	< 50	120 (J25)	< 300	NA	NA	NA	NA	NA
	01/14/99	< 50	< 50	< 300	NA	NA	NA	NA	400
	10/15/98	< 50	< 50	< 300	NA	NA	NA	NA	272
	07/16/98	< 50	60 (J25)	< 300	NA	NA	NA	NA	407 D
	04/21/98	< 50	< 50	< 300	NA	NA	NA	NA	188 D
	01/26/98	< 50	< 50	< 300	NA	NA	NA	NA	214 D
	10/20/97	< 50	< 50	< 300	NA	NA	NA	NA	566 D
	07/21/97	< 50	< 50	< 300	NA	NA	NA	NA	580 D
	04/24/97	< 50	< 50	< 300	NA	NA	NA	NA	297 D
	01/30/97	< 50	< 50	< 300	NA	NA	NA	NA	153 D
	10/10/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	07/15/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/02/96	< 50	< 50	< 300 (U6)	NA	NA	NA	NA	NA
	02/13/96	< 50	< 50	< 300 (U12)	NA	NA	NA	NA	NA
	11/03/95	< 50	< 50	< 300	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW17	04/05/05	< 50	< 50	< 300	< 5	0.818 J	< 0.025 U	0.818 J	31
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/18/03	< 50	74 HY	< 300	NA	NA	NA	NA	NA
	03/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/06/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/31/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50 UJ	< 300 UJ	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/01	< 50	85 Y NJ	< 300	NA	NA	NA	NA	NA
	05/11/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/15/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/13/99	< 50	< 50	< 300	NA	NA	NA	NA	45.8
	10/14/98	< 50	< 50	< 300	NA	NA	NA	NA	37
	07/15/98	< 50	< 50	< 300	NA	NA	NA	NA	38.7 D
	04/20/98	< 50	< 50	< 300	NA	NA	NA	NA	33.6 D
	01/27/98	< 50	< 50	< 300	NA	NA	NA	NA	35.5 D
	10/21/97	< 50	< 50	< 300	NA	NA	NA	NA	42.7 D
	07/22/97	< 50	< 50	< 300	NA	NA	NA	NA	32.4 D
	04/22/97	< 50	< 50	< 300	NA	NA	NA	NA	38 D
	01/28/97	< 50	< 50	< 300	NA	NA	NA	NA	37.9 D
	10/08/96	< 50	< 50	< 300 (U6)	NA	NA	NA	NA	NA
	07/11/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/30/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	02/07/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/06/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/16/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/10/95	< 50	< 50	NA	NA	NA	NA	NA	30.5
231GW18	04/05/05	< 50	< 50	< 300	< 5	1.25 J	0.011 JB	1.24 J	49
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/31/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/01	< 50	54 Y NJ	< 300	NA	NA	NA	NA	NA
	05/11/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/15/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/13/99	< 50	< 50	< 300	NA	NA	NA	NA	69
	10/14/98	< 50	< 50	< 300	NA	NA	NA	NA	76
	07/15/98	< 50	< 50	< 300	NA	NA	NA	NA	60.2 D
	04/20/98	< 50	< 50	< 300	NA	NA	NA	NA	60.8 D
	01/27/98	< 50	< 50	< 300	NA	NA	NA	NA	57 D
	10/21/97	< 50	< 50	< 300	NA	NA	NA	NA	62.4 D
	07/22/97	< 50	< 50	< 300	NA	NA	NA	NA	56.7 D
	04/22/97	< 50	< 50	< 300	NA	NA	NA	NA	61.8 D
	01/28/97	< 50	< 50	< 300	NA	NA	NA	NA	61 D
	10/08/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	07/11/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/30/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	02/07/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/06/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/17/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/10/95	NA	< 50	NA	NA	NA	NA	NA	50.2

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW19	04/05/05	< 50	< 50	< 300	8.2	9.14 J	6.08 J	3.06 J	28
	03/18/04	< 50	72 HY	370	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/28/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/29/01	< 50	59 Y NJ	< 300	NA	NA	NA	NA	NA
	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/15/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/13/99	< 50	< 50	< 300	NA	NA	NA	NA	73
	10/14/98	< 50	< 50	< 300	NA	NA	NA	NA	59.8
	07/15/98	< 50	< 50	< 300	NA	NA	NA	NA	47.1 D
	04/20/98	< 50	< 50	< 300	NA	NA	NA	NA	52.5 D
	01/27/98	< 50	< 50	< 300	NA	NA	NA	NA	52.5 D
	10/20/97	< 50	< 50	< 300	NA	NA	NA	NA	54.6 D
	07/22/97	< 50	< 50	< 300	NA	NA	NA	NA	41.1 D
	04/21/97	< 50	< 50	< 300	NA	NA	NA	NA	45.7 D
	01/27/97	< 50	< 50	< 300	NA	NA	NA	NA	36.3 D
	10/07/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	07/10/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/29/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	02/06/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/06/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/17/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/10/95	NA	< 50	NA	NA	NA	NA	NA	32.4
231GW20	04/06/05	< 50	< 50	< 300	< 5	0.809	< 0.025 U	0.809	39
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/18/03	< 50	91 HY	< 300	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/06/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/31/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/11/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/20/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/20/99	< 50	< 50 (U12)	< 300	NA	NA	NA	NA	67
	10/20/98	< 50	< 50	< 300	NA	NA	NA	NA	66.5
	07/21/98	< 50	< 50	< 300	NA	NA	NA	NA	57.4 D
	04/23/98	< 50	< 50	< 300	NA	NA	NA	NA	53.9 D
	01/29/98	< 50	< 50	< 300	NA	NA	NA	NA	57.6 D
	10/22/97	< 50	68 (J25)	340 (J25)	NA	NA	NA	NA	56.8 D
	07/23/97	< 50	< 50	< 300	NA	NA	NA	NA	57.2 D
	04/23/97	< 50	< 50	< 300	NA	NA	NA	NA	57.4 D
	01/29/97	< 50	< 50	< 300	NA	NA	NA	NA	NA
	10/09/96	< 50	< 50	< 300 (U6)	NA	NA	NA	NA	NA
	07/16/96	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/02/96	< 50	< 50	< 300 (U12)	NA	NA	NA	NA	NA
	02/13/96	< 50	< 50	340 (J25, J32)	NA	NA	NA	NA	NA
	11/08/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/17/95	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/11/95	NA	100	NA	NA	NA	NA	NA	53.4

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW21	03/31/05	2,900 Y	590 LY	< 300	21	18.2	16.6	1.68	41
DUP0331052D	03/31/05	1,700 Y	420 LY	< 300	23	19.1	15.9	3.15	33
231GW21CL	03/31/05	1,500	1,800	430	6.45	NA	NA	NA	39.7
	03/19/04	4,100	120 LY	< 300	NA	NA	NA	NA	NA
	08/19/03	4,700 H	150 LY	< 300	NA	NA	NA	NA	NA
DUP0819031B	08/19/03	6,400 Z	180 LY	< 300	NA	NA	NA	NA	NA
	03/14/03	3,400	130 YL	< 300	NA	NA	NA	NA	NA
	12/06/02	6,100 Y	260 YL	< 300	NA	NA	NA	NA	NA
DUP1206021A	12/06/02	5,900 Y	210 YL	< 300	NA	NA	NA	NA	NA
	09/04/02	5,500	170 YL	< 300	NA	NA	NA	NA	NA
	06/04/02	3,700	200 YL	< 300	NA	NA	NA	NA	NA
DUP0604023A	06/04/02	3,800	160 YL	< 300	NA	NA	NA	NA	NA
	03/08/02	2,100	91 YL	< 300	NA	NA	NA	NA	NA
	11/29/01	2,700	130 YL	< 300	NA	NA	NA	NA	NA
	09/06/01	6,100 Z	3,100 YL NJ	< 300	NA	NA	NA	NA	NA
	05/14/01	8,600	250 YL	< 300	NA	NA	NA	NA	NA
	06/17/99	8,000 (J25)	NA	NA	NA	NA	NA	NA	NA
	04/20/99	< 50	470 (J25)	< 3,000	NA	NA	NA	NA	NA
	01/20/99	4,400 (J25)	380 (J25, J12)	< 300	NA	NA	NA	NA	65
	10/20/98	9,800 (J25)	750 (J25)	< 300	NA	NA	NA	NA	53.7
	07/23/98	10,000 (J25)	560 (J25)	< 300	NA	NA	NA	NA	49.9 D
	05/01/98	6,600 (J25)	240 (J25)	< 300	NA	NA	NA	NA	48.6 D
	01/28/98	6,500 (J25)	620 (J25)	< 300	NA	NA	NA	NA	52.6 D
	10/27/97	4,800 (J25)	280 (J25)	< 300	NA	NA	NA	NA	58.4 D
	07/24/97	19,000 (J25)	630 (J25)	< 300	NA	NA	NA	NA	51 D
	04/24/97	16,000 (J25)	1,100 (J25)	< 300	NA	NA	NA	NA	53.2 D
	01/30/97	5,800 (J25)	840 (J25)	< 300	NA	NA	NA	NA	53.9 D
	10/11/96	11,000 (J25)	810 (J25)	< 300	NA	NA	NA	NA	NA
	07/17/96	18,000 (J25)	570 (J25)	< 300	NA	NA	NA	NA	NA
	05/06/96	22,000	830 (J25)	< 300	NA	NA	NA	NA	NA
	02/12/96	13,000 (J25)	540 (J25)	< 300 (U12)	NA	NA	NA	NA	NA
	11/10/95	24,000 (J25)	970 (J25)	< 300	NA	NA	NA	NA	NA
	08/16/95	26,000 (J25)	1,100 (J25)	< 300	NA	NA	NA	NA	NA
	04/24/95	16,000 (J25)	1,100 (J25)	NA	NA	NA	NA	NA	NA
	04/12/95	NA	4,700	NA	NA	NA	NA	NA	49.5
231GW22	03/23/05	18,000 Z	130 LY	< 300	30	23.6	22.8	0.722 B	58
DUP0323052A	03/23/05	16,000 Z	120 LY	300 Y	30	26.2	27.2	< 0.28 U	58
	03/19/04	25,000	89 LY	< 300	NA	NA	NA	NA	NA
DUP0319041A	03/19/04	24,000 Z	100 LY	< 300	NA	NA	NA	NA	NA
231GW22CL	03/19/04	4,700	< 48	< 240	NA	NA	NA	NA	NA
	08/19/03	7,900 Z	110 LY	< 300	NA	NA	NA	NA	NA
DUP0819031A	08/19/03	17,000 Z	150 LY	< 300	NA	NA	NA	NA	NA
231GW22CL	08/19/03	7,600	< 50	< 250	NA	NA	NA	NA	NA
	03/17/03	5,900	540 YL	< 300	NA	NA	NA	NA	NA
DUP0317031A	03/17/03	5,600 Z	350 YL	< 300	NA	NA	NA	NA	NA
231GW22CL	03/17/03	8,000	< 50	270	NA	NA	NA	NA	NA
	12/06/02	3,400 YZ	170 YL	< 300	NA	NA	NA	NA	NA
	09/04/02	6,700	70 YL	< 300	NA	NA	NA	NA	NA
DUP0904021A	09/04/02	7,000	81 YL	< 300	NA	NA	NA	NA	NA
231GW22CL	09/04/02	7,200 g	120 ndp	< 300	NA	NA	NA	NA	NA
	06/05/02	2,400 Z	< 50	< 300	NA	NA	NA	NA	NA
DUP0605023B	06/05/02	2,400 Z	51 YL	< 300	NA	NA	NA	NA	NA
	03/08/02	6,400 Z	110 YL	< 300	NA	NA	NA	NA	NA
DUP0308023B	03/08/02	6,600 Z	73 YL	< 300	NA	NA	NA	NA	NA
231GW22CL	03/08/02	260	< 50 UJ	< 500 UJ	NA	NA	NA	NA	NA
	12/04/01	9,000	110 YL	< 300	NA	NA	NA	NA	NA
DUP1204013A	12/04/01	9,100	120 YL	< 300	NA	NA	NA	NA	NA
	09/04/01	15,000 Z	5,800 YL NJ	740 YL NJ	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW22	05/14/01	20,000	110 YL	< 300	NA	NA	NA	NA	NA
DUP0514011A	05/14/01	19,000	110 YL	< 300	NA	NA	NA	NA	NA
	04/21/99	15,000 (J25)	840 (J25)	< 1,500	NA	NA	NA	NA	NA
	01/21/99	26,000 (J25)	550 (J25, J12)	< 1,500	NA	NA	NA	NA	88
	10/21/98	14,000 (J25)	530 (J25, J13)	< 320	NA	NA	NA	NA	101
	07/22/98	21,000 (J25)	490 (J25)	< 300	NA	NA	NA	NA	73 D
	04/27/98	24,000 (J25)	760 (J25)	< 300	NA	NA	NA	NA	79 D
	01/29/98	29,000 (J25)	1,000 (J25)	340 (J25)	NA	NA	NA	NA	84.8 D
	10/28/97	19,000 (J25)	820 (J25)	< 300	NA	NA	NA	NA	98.1 D
	07/28/97	31,000 (J25)	700 (J25)	< 300	NA	NA	NA	NA	141 D
	04/28/97	36,000 (J25)	770 (J25)	< 300	NA	NA	NA	NA	281 D
231GW23	04/05/05	< 50	< 50	< 300	6.1	5.66 J	4.01 J	1.65 J	55
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/31/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50 (UJ)	< 300 UJ	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/14/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/20/99	< 50	63	< 300	NA	NA	NA	NA	NA
	01/20/99	< 50	< 50 (U12)	< 300	NA	NA	NA	NA	68
	10/22/98	< 50	< 57 (U13)	< 340	NA	NA	NA	NA	59.1
	07/23/98	680 (R32)	< 50	< 300	NA	NA	NA	NA	55.8 D
	04/28/98	< 50	< 50	< 300	NA	NA	NA	NA	52.8 D
	02/02/98	< 50	< 50	< 300	NA	NA	NA	NA	60.3 D
	10/23/97	< 50	< 50	< 300	NA	NA	NA	NA	56.5 D
	07/29/97	< 50	54 (R32)	< 300	NA	NA	NA	NA	56.9 D
	04/29/97	< 50	< 50	< 300	NA	NA	NA	NA	60.6 D
231GW24	04/05/05	< 50	< 50	< 300	< 5	4.19 J	2.5 J	1.69 J	26
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/30/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/06/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/19/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/20/99	< 50	< 50 (U12)	< 300	NA	NA	NA	NA	55.9
	10/19/98	< 50	< 50	< 300	NA	NA	NA	NA	43.7
	07/20/98	< 50	< 50	< 300	NA	NA	NA	NA	39.2 D
	04/22/98	< 50	< 50	< 300	NA	NA	NA	NA	51.8 D
	02/03/98	< 50	< 50	< 300	NA	NA	NA	NA	44 D
	10/29/97	< 50	< 50	< 300	NA	NA	NA	NA	39.6 D
	07/30/97	< 50	< 50	< 300	NA	NA	NA	NA	36.2 D
	04/30/97	< 50	< 50	< 300	NA	NA	NA	NA	33.9 D
231GW25	04/06/05	< 50	< 50	< 300	14	14.2	10	4.11	50
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/18/03	< 50	64 Y	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/05/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/31/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(mg/L)
231GW25	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/01	< 50	200 Y NJ	< 300	NA	NA	NA	NA	NA
	05/14/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/19/99	< 50	88 (J25)	< 300	NA	NA	NA	NA	NA
	01/21/99	< 50	< 50 (U12)	< 300	NA	NA	NA	NA	73
	10/19/98	< 50	< 50	< 300	NA	NA	NA	NA	71
	07/20/98	< 50	< 50	< 300	NA	NA	NA	NA	64.8 D
	04/22/98	< 50	< 50	< 300	NA	NA	NA	NA	63.2 D
	02/03/98	< 50	< 50	< 300	NA	NA	NA	NA	69.2 D
	10/29/97	< 50	< 50	< 300	NA	NA	NA	NA	64.5 D
	07/30/97	< 50	< 50	< 300	NA	NA	NA	NA	64.8 D
	04/30/97	< 50	< 50	< 300	NA	NA	NA	NA	91.1 D
231GW26	04/06/05	< 50	< 50	< 300	< 5	2.94	0.098	2.84	63
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/15/03	< 50	130 HY	< 300	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/06/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/10/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/21/99	< 50	< 50 (U9)	< 300	NA	NA	NA	NA	NA
	01/21/99	< 50	< 50 (U12)	< 300	NA	NA	NA	NA	94
	10/21/98	< 50	< 54 (U13)	< 310	NA	NA	NA	NA	101
	07/22/98	440 (R32)	< 50	< 300	NA	NA	NA	NA	70.2 D
	04/27/98	< 50	< 50	< 300	NA	NA	NA	NA	73 D
	01/29/98	< 50	< 50	< 300	NA	NA	NA	NA	64.6 D
	10/28/97	< 50	< 50	< 300	NA	NA	NA	NA	66.5 D
	07/28/97	< 50	< 50	< 300	NA	NA	NA	NA	75.6 D
	04/28/97	57 (J25)	< 50	< 300	NA	NA	NA	NA	73.7 D
231GW27	04/06/05	< 50	< 50	< 300	< 5	1.03	0.02 B	1.01	60
	03/19/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/15/03	< 50	84 HY	< 300	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/10/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50 YH J-	< 300 J-	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/01	< 50	3100 YH NJ	1400 YL NJ	NA	NA	NA	NA	NA
DUP0904012A	09/04/01	< 50	3500 YH NJ	1500 YL NJ	NA	NA	NA	NA	NA
231GW27CL	09/04/01	< 50	85 ndp	< 300	NA	NA	NA	NA	NA
	05/10/01	< 50	79 YH	460	NA	NA	NA	NA	NA
DUP0510011A	05/10/01	< 50	130 YH	740	NA	NA	NA	NA	NA
231GW27CL	05/10/01	< 50	89 ndp	NA	NA	NA	NA	NA	NA
	04/21/99	< 50	58 (J25)	< 300	NA	NA	NA	NA	NA
	01/21/99	< 50	< 50 (U12)	< 300	NA	NA	NA	NA	< 9.62
	10/21/98	< 50	< 52 (U13)	< 310	NA	NA	NA	NA	67.8
	07/22/98	< 1000	< 50	< 300	NA	NA	NA	NA	52.1 D
	04/27/98	< 50	< 50	< 300	NA	NA	NA	NA	57.3 D
	01/29/98	< 50	< 50	< 300	NA	NA	NA	NA	41.4 D
	10/28/97	< 50	< 50	< 300	NA	NA	NA	NA	50.5 D
	07/28/97	< 50	< 50	< 300	NA	NA	NA	NA	55.8 D
	04/28/97	< 50	< 50	< 300	NA	NA	NA	NA	67.7 D

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW28	04/06/05	51 HY	< 50	< 300	5.8	5.01	3.51	1.5	18
	03/18/04	< 50	55 Y	< 300	NA	NA	NA	NA	NA
	08/15/03	< 50	100 HY	< 300	NA	NA	NA	NA	NA
	03/17/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/06/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/31/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/09/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/13/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/11/99	< 50	< 50	< 300	NA	NA	NA	NA	31
	10/22/98	< 50	< 53 (U13)	< 310	NA	NA	NA	NA	32
	07/23/98	< 50	< 50	< 300	NA	NA	NA	NA	36.4 D
	04/28/98	< 50	< 50	< 300	NA	NA	NA	NA	32.4 D
	02/02/98	< 50	< 50	< 300	NA	NA	NA	NA	26.1 D
	10/27/97	< 50	< 50	< 300	NA	NA	NA	NA	30.7 D
	07/29/97	< 50	< 50	< 300	NA	NA	NA	NA	33.2 D
	04/29/97	< 50	< 50	< 300	NA	NA	NA	NA	27.8 D
231GW29	04/06/05	< 50	< 50	< 300	< 5	3.62	0.118	3.5	54
	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
DUP0318043B	03/18/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
231GW29CL	03/18/04	< 50	< 51	< 250	NA	NA	NA	NA	NA
	08/15/03	< 50	99 HY	< 300	NA	NA	NA	NA	NA
	03/18/03	< 50	< 50 UJ	< 300	NA	NA	NA	NA	NA
	12/06/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/03/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/07/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	11/29/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	05/11/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/21/99	< 50	< 50	< 300	NA	NA	NA	NA	NA
	01/21/99	< 50	71 (J25, J12)	< 300	NA	NA	NA	NA	68
	10/22/98	< 50	< 54 (U13)	< 320	NA	NA	NA	NA	59.8
	07/23/98	76 (J25)	< 50	< 300	NA	NA	NA	NA	53.8 D
	04/28/98	< 50	< 50	< 300	NA	NA	NA	NA	54.2 D
	02/02/98	< 50	< 50	< 300	NA	NA	NA	NA	54.8 D
	10/27/97	< 50	< 50	< 300	NA	NA	NA	NA	53.4 D
	07/29/97	< 50	75 (R32)	< 300	NA	NA	NA	NA	52.6 D
	04/29/97	< 50	< 50	< 300	NA	NA	NA	NA	51.8 D
231GW30	03/22/05	< 50	< 50	< 300	6.8	6.97	7.58	< 0.28 U	33
	03/19/04	< 50	< 50	< 300	NA	NA	NA	NA	NA
	08/14/03	< 50	340 HY	3500	NA	NA	NA	NA	NA
	03/14/03	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/06/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	06/04/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	03/08/02	< 50	< 50	< 300	NA	NA	NA	NA	NA
	12/04/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	09/04/01	< 50	300 Y NJ	< 300	NA	NA	NA	NA	NA
	05/14/01	< 50	< 50	< 300	NA	NA	NA	NA	NA
	04/19/99	< 50	220 (J25)	< 300	NA	NA	NA	NA	NA
	01/19/99	< 50	160 (J25, J12)	< 300	NA	NA	NA	NA	64
	10/19/98	< 50	450 (J25)	< 300	NA	NA	NA	NA	66.1
	07/20/98	< 50	240 (J25)	< 300	NA	NA	NA	NA	55.9 D
	04/22/98	< 50	210 (J25)	< 300	NA	NA	NA	NA	60.3 D

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil (Carbon Range C_{24}-C_{36})**	**Dissolved Arsenic**	**Dissolved Arsenic**	**Arsenic (III) Oxide**	**Arsenic (V)**	**Chloride**
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231GW30	02/03/98	< 50	120 (J25)	< 300	NA	NA	NA	NA	54.4 D
	10/29/97	64 (J25)	340 (J25)	< 300	NA	NA	NA	NA	66.2 D
	07/30/97	< 50	380 (R32)	< 300	NA	NA	NA	NA	67.4 D
	04/30/97	< 50	250 (J25)	< 420	NA	NA	NA	NA	86.2 D
231PZ01	04/04/05	15,000	430 LY	< 300	17	7.43	4.63	2.8	81
	03/19/04	24,000 Z	340 LY	< 300	NA	NA	NA	NA	NA
	08/19/03	6,900 Z	370 LY	< 300	NA	NA	NA	NA	NA
	03/17/03	8,300 Z	430 YL	< 300	NA	NA	NA	NA	NA
	12/09/02	22,000	120 YL	< 300	NA	NA	NA	NA	NA
	09/05/02	18,000 Z	180 YL	< 300	NA	NA	NA	NA	NA
	06/05/02	6,900 Z	170 YL	< 300	NA	NA	NA	NA	NA
	03/08/02	8,600 Z	340 YL	< 600	NA	NA	NA	NA	NA
	11/30/01	20,000	220 YL	< 300	NA	NA	NA	NA	NA
	09/06/01	23,000 Z	12,000 YL NJ	1,700 YL NJ	NA	NA	NA	NA	NA
	05/15/01	7,000	230 YL	< 300	NA	NA	NA	NA	NA
	04/14/99	62,000 (J25)	9,600 (J25)	< 12,000	NA	NA	NA	NA	NA
	01/12/99	37,000 (J25)	800 (J25)	< 3,000	NA	NA	NA	NA	NA
	10/13/98	25,000 (J25)	3,700 (J25)	< 7,500	NA	NA	NA	NA	NA
	07/14/98	44,000 (J25)	930 (J25)	850 (J25)	NA	NA	NA	NA	81.5 D
	04/30/98	45,000 (J25)	810 (J25)	< 300	NA	NA	NA	NA	87.1 D
	02/03/98	93,000 (J25, J29)	2,600 (J25)	650 (J25)	NA	NA	NA	NA	80.6 D
231PZ02	04/04/05	1,100	100 Y	< 300	< 5	0.387	0.342	0.045	72
	03/19/04	1100	< 50	< 300	NA	NA	NA	NA	NA
	08/19/03	800 LZ	< 50	< 300	NA	NA	NA	NA	NA
	03/17/03	690	300 Y	< 300	NA	NA	NA	NA	NA
	12/09/02	1700	< 50	< 300	NA	NA	NA	NA	NA
	09/05/02	1,400 YZ	< 50	< 300	NA	NA	NA	NA	NA
	06/05/02	740 YL	< 50	< 300	NA	NA	NA	NA	NA
	03/08/02	610	< 50	< 300	NA	NA	NA	NA	NA
	11/30/01	460	< 50	< 300	NA	NA	NA	NA	NA
	09/06/01	1,900 Z	22,000 YH NJ	8,300 YL NJ	NA	NA	NA	NA	NA
	05/15/01	470	< 50	< 300	NA	NA	NA	NA	NA
	04/14/99	1,500 (J25)	3,200 (J25)	760 (J25, J5)	NA	NA	NA	NA	NA
	01/12/99	1,400 (J25)	NA	NA	NA	NA	NA	NA	NA
	10/13/98	1,800 (J25)	120 (J25)	660 (J25)	NA	NA	NA	NA	NA
	07/14/98	1,400 (J25)	310 (J25)	370 (J25)	NA	NA	NA	NA	232 D
	04/30/98	620 (J25)	750 (J25, J7)	< 300	NA	NA	NA	NA	153 D
	02/03/98	1,300 (J25)	< 50	< 300	NA	NA	NA	NA	118 D
231PZ03	04/04/05	3,700	180 Y	< 300	< 5	2.31	1.13	1.19	38
	03/19/04	4,700	98 LY	< 300	NA	NA	NA	NA	NA
	08/21/03	2,700	120 YL	< 300	NA	NA	NA	NA	NA
	03/17/03	2,300	380 YL	< 300	NA	NA	NA	NA	NA
	12/06/02	2,200 Y	87 YL	< 300	NA	NA	NA	NA	NA
	09/04/02	2,500	98 YL	< 300	NA	NA	NA	NA	NA
	06/06/02	2,300	68 YL	< 300	NA	NA	NA	NA	NA
	03/11/02	3,200 Z	83 YL	< 300	NA	NA	NA	NA	NA
	11/30/01	1,900	140 YLH	670	NA	NA	NA	NA	NA
	09/06/01	1,900	2,100 YL NJ	< 300	NA	NA	NA	NA	NA
	05/15/01	4,000	99 YL	< 300	NA	NA	NA	NA	NA
	04/14/99	4,000 (J25)	390 (J25)	< 600	NA	NA	NA	NA	NA
	01/12/99	2,900 (J25)	1,100 (J25)	< 300	NA	NA	NA	NA	74
	10/13/98	3,000 (J25)	470 (J25, J5)	< 1,200	NA	NA	NA	NA	66
	07/14/98	6,600 (J25)	260 (J25)	< 300	NA	NA	NA	NA	38.7 D
	04/30/98	5,000 (J25)	610 (J25)	< 300	NA	NA	NA	NA	34.3 D
	02/03/98	12,000 (J25, J29)	1,400 (J25)	< 1,500	NA	NA	NA	NA	31.2 D

Table A-1
TPH, Arsenic, and Chloride
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil (Carbon Range C_{24}-C_{36})	Dissolved Arsenic	Dissolved Arsenic	Arsenic (III) Oxide	Arsenic (V)	Chloride
	Analytical Method[1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M	SW6020	1632M	1632M	1632M	E300.0/ SW9056
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
231PZ04	04/04/05	6,100	290 LY	< 300	10	6.64	5.44	1.19	32
	03/19/04	7,000	140 LY	< 300	NA	NA	NA	NA	NA
	08/21/03	3,000	160 YL	< 300	NA	NA	NA	NA	NA
	03/17/03	4,700	240 YL	< 300	NA	NA	NA	NA	NA
	12/06/02	4,500 Y	160 YL	< 300	NA	NA	NA	NA	NA
	09/04/02	4,000	170 YL	< 300	NA	NA	NA	NA	NA
	06/06/02	3,200	140 YL	< 300	NA	NA	NA	NA	NA
	03/08/02	4,700	120 YL	< 300	NA	NA	NA	NA	NA
	11/30/01	2,200	130 YL	< 300	NA	NA	NA	NA	NA
	09/06/01	4,200 Z	2,200 YL NJ	< 300	NA	NA	NA	NA	NA
	05/15/01	7,600	190 YL	< 300	NA	NA	NA	NA	NA
	04/14/99	11,000 (J25)	710 (J25)	< 680	NA	NA	NA	NA	NA
	01/11/99	8,500 (J25)	370 (J25)	< 300	NA	NA	NA	NA	80.2
	10/12/98	7,600 (J25)	< 50 (J25)	< 300	NA	NA	NA	NA	59
	07/13/98	9,700 (J25)	460 (J25)	< 300	NA	NA	NA	NA	36.7 D
	04/30/98	14,000 (J25)	770 (J25)	< 300	NA	NA	NA	NA	34.1 D
	02/04/98	28,000 (J25)	1,400 (J25)	< 300	NA	NA	NA	NA	15.3 D

Notes

1 - The identified analytical method(s) are for analyses performed beginning in the Second Quarter 2001. The analytical methods used during previous quarters are identified in the respective quarterly reports.

2 - TPH analysis was not run using the silica gel cleanup method 3630A, although it was marked on the chain of custody.

NA - not analyzed
µg/L - micrograms per liter
mg/L - milligrams per liter
TPH - Total Petroleum Hydrocarbons

Data from the following Presidio sites or locations were not included due to lack of arsenic and/or TPH results: Building 900s Area, Landfill 8, Building 215, Battery Howe/Wagner, Tennessee Hollow and Upgradient wells, LF5SP100, BB3PZ100A, BB3PZ100B, and 1065TMW03.

Table 11 in the Semi-annual Groundwater Monitoring Report identifies current and historical data qualifiers.

Metals results are dissolved unless indicated as "Total" in the left-hand column for unfiltered samples.

The arsenic speciation analyses were performed by analytical method 1632M. The dissolved arsenic concentrations discussed in the text and used to assess arsenic impacts are those analyzed by method SW6020.

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
Non-Petroleum Release Sites												
El Polin Springs, Fill Site 1 and Landfill 2												
EPSP01	05/26/05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.9
	03/15/05	510	91	NA	1.2	< 0.05	NA	NA	17	NA	NA	NM
(Total)	03/15/05	450	83	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/15/04	230	68	NA	1.4	< 0.05	NA	NA	18	NA	NA	6.83
	03/13/03	< 100	23	NA	1.6	< 0.05	NA	NA	16	NA	NA	5.1
	12/03/02	< 100	23	NA	1.4	< 0.05	NA	NA	NA	NA	NA	9.3
	08/27/02	< 100	22	NA	1.5	< 0.05	NA	NA	16	NA	NA	1.6
	06/05/02	< 100	20	NA	1.5	< 0.05	NA	NA	17	NA	NA	7
	03/11/02	< 100	28	NA	1.3	< 0.05	NA	NA	17	NA	NA	4
	11/28/01	< 100	25	NA	1.6 J	< 0.05 UJ	NA	NA	18	NA	NA	2.1
	08/29/01	120	28	NA	1.6	< 0.05	NA	NA	17	NA	NA	3.5
	05/18/01	170	25	NA	1.7	< 0.05	NA	NA	17	NA	NA	3.9
	05/13/99	< 100	35.1	NA	NA	NA	1.38	257.4	18.4	NA	NA	7.96
	02/10/99	129	36.4	NA	NA	NA	1.52	NA	31	NA	NA	NA
	12/04/98	< 100	67.4	NA	NA	NA	1.62	NA	18.6	NA	NA	NA
	04/17/98	< 100	38.7	NA	1.43	NA	1.33	364	14.3	< 0.05	NA	4.4
	03/09/98	< 100	20	NA	NA	NA	1.28	255	14.4	< 0.05	NA	5.66
	01/08/98	< 100	47.9	NA	1.59	NA	1.45	NA	14.6	< 0.05	NA	NA
	11/09/94	NA	NA	NA	0.187	NA	NA	NA	21	NA	NA	NA
	09/04/92	NA	NA	NA	NA	NA	1.9	NA	13.4	NA	NA	NA
	02/06/91	NA	NA	NA	NA	NA	1.6	NA	NA	NA	NA	NA
	11/13/90	NA	NA	NA	NA	NA	NA	NA	18	NA	NA	NA
LF01GW01	03/17/05	150	< 10	NA	4.1	< 0.05	NA	NA	37	NA	NA	0.1
DUP0317051A	03/17/05	140	< 10	NA	4.2	< 0.05	NA	NA	38	NA	NA	NA
LF01GW01CL	03/17/05	< 100 U	< 10 U	NA	4.34	< 0.1 U	NA	NA	37	NA	NA	NA
	03/16/04	110	< 10	NA	5.8	< 0.05	NA	NA	43	NA	NA	0.2
	03/13/03	< 100	< 10	NA	1.2	< 0.05	NA	NA	31	NA	NA	0.2
	12/09/02	140	92 J	NA	NA	< 0.05	NA	NA	32	NA	NA	2.2
DUP1209022D	12/09/02	120	67 J	NA	NA	< 0.05	NA	NA	33	NA	NA	NA
LF01GW01CL	12/09/02	< 150	58	NA	7.3 J-	< 0.05 UJ	7.3 J-	NA	37	NA	NA	NA
	08/27/02	< 100	22	NA	2.1	< 0.05	NA	NA	39	NA	NA	0.9
	05/29/02	< 100	45	NA	0.09	< 0.05	NA	NA	40	NA	NA	1.3
	03/11/02	110	< 10	NA	1.4	< 0.05	NA	NA	49	NA	NA	1.2
DUP0311022A	03/11/02	110	< 10	NA	1.4	< 0.05	NA	NA	49	NA	NA	NA
LF01GW01CL	03/11/02	18 J	9.7	NA	1.4	< 1	NA	NA	51	NA	NA	NA
	11/27/01	< 100	140	NA	NA	< 0.05 UJ	NA	NA	31	NA	NA	2.5
	08/28/01	180	150	NA	2	< 0.05	NA	NA	33	NA	NA	3
	05/16/01	350	< 10	NA	1.6	< 0.05	NA	NA	46	NA	NA	6.2
	05/10/99	< 100	< 10	NA	NA	NA	3.28	378.3	53	NA	NA	2.63
	02/08/99	< 100	16.6	NA	NA	NA	7.28	193.6	42	NA	NA	1.58
	11/09/98	< 100	14.5	NA	NA	NA	4.27	117.9	46	NA	NA	5.36
	08/11/98	< 50	8.7	NA	NA	NA	6.24	189.5	33	NA	NA	5.14
	04/09/98	< 100	17	NA	NA	NA	2.1	426	39	NA	NA	2.43
	01/05/98	< 100	< 10	NA	10.4	NA	9.04	262	38.8	< 0.05	NA	4.61
	11/05/97	< 100	< 10	NA	NA	NA	8.7	481	38	NA	NA	5.26
	08/06/97	< 100	< 10	NA	NA	NA	NA	463	40	NA	NA	3.75
	05/07/97	< 100	< 10	NA	NA	NA	2.2	464	42	NA	NA	4.21
	02/06/97	< 100	< 10	NA	NA	NA	9.3	178	41	NA	NA	4.6
	10/29/96	< 100 U	33	NA	NA	NA	5.2	NA	43	NA	NA	NA
	08/01/96	< 100 U	33	NA	NA	NA	3	NA	49	NA	NA	NA
	05/23/96	< 100 U	13	NA	NA	NA	3	NA	56	NA	NA	NA
	03/08/96	< 100 U	13	NA	10	NA	NA	NA	45	NA	NA	NA
	12/15/95	< 100	17	NA	5.8	NA	NA	NA	46	NA	NA	NA
	09/13/95	< 100 U	29	NA	NA	NA	1.5	NA	63	NA	NA	NA
	11/08/94	NA	NA	NA	5.84	NA	NA	NA	55.1	NA	NA	NA
	08/26/92	NA	NA	NA	NA	NA	2	NA	109	NA	NA	NA
	11/30/90	NA	NA	NA	NA	NA	10.9	NA	42	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
LF01GW02	03/15/05	< 100	< 10	NA	5.6	< 0.05	NA	NA	42	NA	NA	0.9
	03/16/04	< 100	< 10	NA	6.4	< 0.05	NA	NA	49	NA	NA	0.3
	03/13/03	< 100	< 10	NA	6.9	< 0.05	NA	NA	42	NA	NA	0.1
	12/03/02	< 100	< 10	NA	6.7	< 0.05	NA	NA	42	NA	NA	4
	08/27/02	< 100	< 10	NA	5.3	< 0.05	NA	NA	39	NA	NA	2.9
	05/29/02	< 100	< 10	NA	5.8	< 0.05	NA	NA	44	NA	NA	1
	03/11/02	< 100	< 10	NA	6.1	< 0.05	NA	NA	43	NA	NA	3.2
	11/27/01	< 100	< 10	NA	7 J	< 0.05 UJ	NA	NA	42	NA	NA	4
	08/28/01	140	< 10	NA	7.3	< 0.05	NA	NA	43	NA	NA	3
DUP0828012A	08/28/01	160	< 10	NA	7.3	< 0.05	NA	NA	43	NA	NA	3
	05/17/01	< 100 UJ	< 10 UJ	NA	6.6	< 0.05	NA	NA	38	NA	NA	NA
DUP0517011A	05/17/01	< 100 UJ	< 10 UJ	NA	6.2	< 0.05	NA	NA	38	NA	NA	5.3
	05/11/99	< 100	< 10	NA	NA	NA	7.99	356	41	NA	NA	5.12
	02/09/99	< 100	< 10	NA	NA	NA	6.82	225	28	NA	NA	5.04
	11/10/98	215	28.3	NA	NA	NA	17.4	193.7	59	NA	NA	5.33
	08/12/98	< 100	< 10	NA	NA	NA	8.81	190	339	NA	NA	7.55
	04/10/98	< 100	< 10	NA	NA	NA	16	398	49	NA	NA	5.35
	01/06/98	< 100	< 10	NA	9.89	NA	8.93	279	37.6	< 0.05	NA	5.34
	11/04/97	< 100	< 10	NA	NA	NA	13	421	49	NA	NA	5.22
	08/05/97	< 100	< 10	NA	NA	NA	NA	451	49	NA	NA	5.32
	05/06/97	< 100	< 10	NA	NA	NA	12	433	49	NA	NA	5.67
	02/04/97	< 100	< 10	NA	NA	NA	9.8	128	56	NA	NA	5.32
	10/29/96	< 100 U	< 10 U	NA	NA	NA	17	NA	58	NA	NA	NA
	08/01/96	< 100 U	< 10 U	NA	NA	NA	21 (J10)	NA	61	NA	NA	NA
	05/23/96	< 100 U	< 10 U	NA	NA	NA	28	NA	58	NA	NA	NA
	03/08/96	< 100 U	< 10 U	NA	32	NA	NA	NA	62	NA	NA	NA
	12/15/95	< 100	< 10	NA	22	NA	NA	NA	55	NA	NA	NA
	09/13/95	< 100 U	< 10 U	NA	NA	NA	13	NA	59	NA	NA	NA
	08/26/92	NA	NA	NA	NA	NA	7.7	NA	40	NA	NA	NA
	11/30/90	NA	NA	NA	NA	NA	8.3	NA	49	NA	NA	NA
LF01GW03	03/15/05	< 100	< 10	NA	4.8	< 0.05	NA	NA	38	NA	NA	0.9
	03/17/04	< 100	< 10	NA	4.9	< 0.05	NA	NA	47	NA	NA	1
	03/13/03	< 100	< 10	NA	5.2	< 0.05	NA	NA	42	NA	NA	0.8
	12/03/02	< 100	< 10	NA	6	< 0.05	NA	NA	34	NA	NA	3.7
	08/27/02	< 100	< 10	NA	6	< 0.05	NA	NA	33	NA	NA	2.1
	05/29/02	< 100	< 10	NA	5.7	< 0.05	NA	NA	36	NA	NA	1.2
	03/12/02	< 100	< 10	NA	5.4	< 0.05	NA	NA	45	NA	NA	2.2
	11/27/01	760	< 10	NA	6.1 J	< 0.05 UJ	NA	NA	35	NA	NA	3.1
	08/29/01	< 100	< 10	NA	6.2	< 0.05	NA	NA	34	NA	NA	2.6
	05/17/01	< 100 UJ	< 10 UJ	NA	5.7	< 0.05	NA	NA	43	NA	NA	5.4
	05/10/99	< 100	< 10	NA	NA	NA	5.58	259.5	34	NA	NA	1.79
	02/08/99	< 100	< 10	NA	NA	NA	6.97	191.4	94	NA	NA	1.23
	11/09/98	122	< 10	NA	NA	NA	4.75	35.7	40	NA	NA	1.79
	08/11/98	< 100	< 10	NA	NA	NA	5	111.2	25	NA	NA	3.48
	04/09/98	< 100	< 10	NA	NA	NA	5.9	322	35	NA	NA	2.19
	01/05/98	< 100	< 10	NA	5.11	NA	4.6	216	34.1	< 0.05	NA	3.01
	11/05/97	< 100	< 10	NA	NA	NA	5.2	436	31	NA	NA	1.46
	08/06/97	< 100	< 10	NA	NA	NA	NA	421	30	NA	NA	2.45
	05/07/97	< 100	< 10	NA	NA	NA	4.2	392	29	NA	NA	1.7
	02/05/97	< 100	< 10	NA	NA	NA	6.8	61	31	NA	NA	3.8
	10/30/96	< 100 U	< 10 U	NA	NA	NA	6.4	NA	33	NA	NA	NA
	08/05/96	< 100 U	< 10 U	NA	NA	NA	7.6	NA	31	NA	NA	NA
	05/22/96	< 100 U	< 10 U	NA	NA	NA	7.7	NA	28	NA	NA	NA
	03/08/96	< 100 U	< 10 U	NA	5.5	NA	NA	NA	28	NA	NA	NA
	12/15/95	< 100	18	NA	5.9	NA	NA	NA	30	NA	NA	NA
	09/13/95	< 100 U	< 10 U	NA	NA	NA	5.5	NA	34	NA	NA	NA
	11/08/94	5610 B	176	NA	5.6	NA	NA	NA	34.5	NA	NA	NA
	09/10/92	10300	306	NA	NA	NA	4.2	NA	32.6	NA	NA	NA
	12/07/90	NA	NA	NA	NA	NA	17.6	NA	39.7	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
LF01GW04	03/15/05	< 100	< 10	NA	4.1	< 0.05	NA	NA	45	NA	NA	0.8
	03/17/04	< 100	< 10	NA	13	< 0.05	NA	NA	52	NA	NA	0.8
DUP0317043A	03/17/04	< 100	< 10	NA	13	< 0.05	NA	NA	52	NA	NA	NA
LF01GW04CL	03/17/04	< 500	< 5	NA	13 J	< 0.05 UJ	13 J	NA	49	NA	NA	NA
DUP0313032A	03/13/03	< 100	< 10	NA	13	< 0.05	NA	NA	47	NA	NA	NA
	03/13/03	110	< 10	NA	13	< 0.05	NA	NA	47	NA	NA	0.4
	12/03/02	< 100	< 10	NA	12	< 0.05	NA	NA	49	NA	NA	4.7
	08/27/02	< 100	< 10	NA	13	< 0.05	NA	NA	49	NA	NA	1
	05/30/02	< 100	< 10	NA	12	0.03 J	NA	NA	47	NA	NA	1.4
DUP0530021B	05/30/02	< 100	< 10	NA	11	0.03 J	NA	NA	47	NA	NA	NA
LF01GW04CL	05/30/02	< 100	< 5	NA	12	< 1	NA	NA	49	NA	NA	NA
	03/12/02	< 100	< 10	NA	10	0.04 J	NA	NA	42	NA	NA	1.7
	11/27/01	< 100	< 10	NA	13	< 0.05 UJ	NA	NA	49	NA	NA	3.2
DUP1127012A	11/27/01	< 100	< 10	NA	14 J	< 0.05 UJ	NA	NA	49	NA	NA	NA
LF01GW04CL	11/27/01	< 200	< 5	NA	13	< 1	NA	NA	53	NA	NA	NA
	08/29/01	100	< 10	NA	13	< 0.05	NA	NA	50	NA	NA	3.2
	05/17/01	110 J	< 10 UJ	NA	13	< 0.05	NA	NA	49	NA	NA	7.2
	05/11/99	< 100	< 10	NA	NA	NA	12.4	383.7	53	NA	NA	5.27
	02/10/99	< 100	< 10	NA	NA	NA	13	154.6	53	NA	NA	5.36
	11/10/98	< 100	17.8	NA	NA	NA	13.1	205.8	54	NA	NA	5.97
	08/12/98	< 100	< 10	NA	NA	NA	10	199.8	40	NA	NA	6.08
	04/10/98	< 100	< 10	NA	NA	NA	11	459	61	NA	NA	5.16
	01/06/98	< 100	< 10	NA	9.58	NA	8.06	306	46.5	< 0.05	NA	5.42
	11/06/97	< 100	< 10	NA	NA	NA	10	452	51	NA	NA	5.8
	08/07/97	< 100	< 10	NA	NA	NA	NA	464	52	NA	NA	5.13
	05/08/97	< 100	< 10	NA	NA	NA	6.2	484	51	NA	NA	5.07
	02/05/97	< 100	< 10	NA	NA	NA	12	125	49	NA	NA	5.06
	10/30/96	< 100 U	< 10 U	NA	NA	NA	10	NA	50	NA	NA	NA
	08/05/96	< 100 U	< 10 U	NA	NA	NA	14	NA	50	NA	NA	NA
	05/21/96	< 100 U	< 10 U	NA	NA	NA	12	NA	45	NA	NA	NA
	03/11/96	1300	25	NA	13	NA	NA	NA	46	NA	NA	NA
	12/18/95	< 100	< 10	NA	13	NA	NA	NA	54	NA	NA	NA
	09/14/95	110	27	NA	NA	NA	12	NA	62	NA	NA	NA
	11/08/94	NA	NA	NA	10.9	NA	NA	NA	51.8	NA	NA	NA
	09/10/92	NA	NA	NA	NA	NA	10	NA	53.5	NA	NA	NA
	12/07/90	NA	NA	NA	NA	NA	34.6	NA	55.6	NA	NA	NA
LF01GW05	03/15/05	< 100	< 10	NA	1.4	< 0.05	NA	NA	40	NA	NA	0.6
	03/16/04	< 100	< 10	NA	0.84	< 0.05	NA	NA	30	NA	NA	0.9
	03/12/03	< 100 UJ	11	NA	0.63	< 0.05	NA	NA	38	NA	NA	0.2
	12/03/02	< 100	< 10	NA	1	< 0.05	NA	NA	NA	NA	NA	0.9
	08/27/02	< 100	13	NA	0.82	< 0.05	NA	NA	44	NA	NA	0.8
	05/29/02	< 100	15	NA	0.42	< 0.05	NA	NA	43	NA	NA	1.6
	03/11/02	210	< 10	NA	2.7	< 0.05	NA	NA	13	NA	NA	3.8
	11/27/01	< 100	16	NA	0.79 J	0.04 J J	NA	NA	45	NA	NA	4.1
	08/28/01	180	19	NA	0.25	< 0.05	NA	NA	42	NA	NA	0.4
	05/16/01	1500	63	NA	0.03 J	< 0.05	NA	NA	44	NA	NA	3.6
	05/13/99	< 100	15.8	NA	NA	NA	< 0.081	222.6	50.7	NA	NA	0.89
	02/11/99	< 100	13.5	NA	NA	NA	< 0.29	194.4	54	NA	NA	1.97
	11/12/98	< 100	15.9	NA	NA	NA	0.39	141.2	57	NA	NA	1.92
	08/11/98	< 50	15.8	NA	NA	NA	0.45	142.8	33	NA	NA	2.6
	04/09/98	< 100	13	NA	NA	NA	0.038	406	45	NA	NA	4.57
	01/05/98	< 100	< 10	NA	0.115	NA	0.076	280	37.7	< 0.05	NA	2.47
	11/06/97	< 100	< 10	NA	NA	NA	3.8	452	46	NA	NA	1.19
	08/07/97	< 100	< 10	NA	NA	NA	NA	430	41	NA	NA	0.84
	05/08/97	< 120	< 10	NA	NA	NA	< 0.05	462	31	NA	NA	1.66
	02/06/97	< 100	< 10	NA	NA	NA	< 0.05	176	37	NA	NA	5.1
	10/31/96	< 100 U	< 10 U	NA	NA	NA	< 0.05	NA	29	NA	NA	NA
	08/06/96	< 100 U	< 10 U	NA	NA	NA	0.14	NA	32	NA	NA	NA
	05/22/96	< 100 U	< 10 U	NA	NA	NA	0.13	NA	35	NA	NA	NA
	03/12/96	< 100 U	< 10 U	NA	0.24	NA	NA	NA	29	NA	NA	NA
	12/19/95	< 100	< 10	NA	0.9	NA	NA	NA	32	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
LF01GW05	09/15/95	< 100 U	< 10 U	NA	NA	NA	0.43	NA	26	NA	NA	NA
	11/08/94	NA	NA	NA	1.41	NA	NA	NA	37.6	NA	NA	NA
	09/10/92	NA	NA	NA	NA	NA	1.1	NA	49.5	NA	NA	NA
	11/29/90	NA	NA	NA	NA	NA	1.3	NA	66.6	NA	NA	NA
LF01GW06	03/15/05	< 100	< 10	NA	0.34	< 0.05	NA	NA	1.3	NA	NA	0.2
	03/17/04	< 100	< 10	NA	4.3	< 0.05	NA	NA	18	NA	NA	4.8
	03/13/03	110	< 10	NA	2.4	< 0.05	NA	NA	7.3	NA	NA	1.3
	12/03/02	< 100	< 10	NA	11	< 0.05	NA	NA	45	NA	NA	4.1
	08/27/02	< 100	< 10	NA	11	< 0.05	NA	NA	47	NA	NA	1.2
DUP0827022A	08/27/02	< 100	< 10	NA	11	< 0.05	NA	NA	46	NA	NA	NA
	05/30/02	< 100	< 10	NA	11	< 0.05	NA	NA	48	NA	NA	1.6
DUP0530021C	05/30/02	< 100	< 10	NA	11	< 0.05	NA	NA	49	NA	NA	NA
	03/12/02	220	< 10	NA	5.6	< 0.05	NA	NA	22	NA	NA	1.1
	11/27/01	< 100	< 10	NA	12 J	< 0.05 UJ	NA	NA	47	NA	NA	3.76
	08/28/01	160	< 10	NA	12	< 0.05	NA	NA	48	NA	NA	3
	05/17/01	< 100 UJ	< 10 UJ	NA	12	< 0.05	NA	NA	48	NA	NA	5.5
	05/12/99	< 100	< 10	NA	NA	NA	10.7 (J12)	313.6	48	NA	NA	5.98
	02/10/99	113	< 10	NA	NA	NA	8.24	118.1	24	NA	NA	5.57
	11/11/98	115	< 10	NA	NA	NA	11.2	183.4	47	NA	NA	6.11
	08/13/98	< 100	< 10	NA	NA	NA	9.8	164.8	36	NA	NA	5.25
	04/13/98	< 100	< 10	NA	NA	NA	11	381	52	NA	NA	5.57
	01/06/98	< 100	< 10	NA	6.58	NA	5.93	286	30.2	< 0.05	NA	6.01
	11/05/97	< 100	< 10	NA	NA	NA	8.1	471	42	NA	NA	4.21
	08/06/97	< 100	< 10	NA	NA	NA	NA	472	42	NA	NA	5.66
	05/07/97	< 100	< 10	NA	NA	NA	8.6	491	39	NA	NA	4.79
	02/05/97	< 100	15	NA	NA	NA	12	185	45	NA	NA	5.42
	10/30/96	< 100 U	< 10 U	NA	NA	NA	11	NA	44	NA	NA	NA
	08/05/96	< 100 U	< 10 U	NA	NA	NA	13	NA	43	NA	NA	NA
	05/23/96	< 100 U	< 10 U	NA	NA	NA	11	NA	35	NA	NA	NA
	03/11/96	< 100 U	18	NA	1.2	NA	NA	NA	< 7.6 (U4)	NA	NA	NA
	12/18/95	< 100	< 10	NA	5.4	NA	NA	NA	26	NA	NA	NA
	09/14/95	< 100 U	< 10 U	NA	NA	NA	9.2	NA	31	NA	NA	NA
	11/08/94	NA	NA	NA	10.9	NA	NA	NA	45.3	NA	NA	NA
	08/28/92	NA	NA	NA	NA	NA	9.8	NA	47.1	NA	NA	NA
LF01GW07	03/15/05	< 100	< 10	NA	4.5	< 0.05	NA	NA	21	NA	NA	0.9
	03/17/04	< 100	< 10	NA	7.9	< 0.05	NA	NA	36	NA	NA	3.5
	03/13/03	< 100	< 10	NA	6.9	< 0.05	NA	NA	35	NA	NA	3.8
	12/03/02	< 100	< 10	NA	8	< 0.05	NA	NA	48	NA	NA	4.1
	08/27/02	< 100	< 10	NA	8.3	< 0.05	NA	NA	50	NA	NA	NM
	05/29/02	< 100	< 10	NA	7.5	< 0.05	NA	NA	45	NA	NA	1.4
	03/12/02	< 100	< 10	NA	7.7	< 0.05	NA	NA	40	NA	NA	1.9
	11/27/01	1000	< 10	NA	8.75	< 0.05 UJ	NA	NA	49	NA	NA	3.4
	08/29/01	< 100	< 10	NA	8.8	< 0.05	NA	NA	49	NA	NA	3
	05/15/01	250	< 10	NA	8.6 J	NA	NA	NA	53	NA	NA	NA
DUP0515013A	05/15/01	250	< 10	NA	8.6 J	< 0.05 UJ	NA	NA	53	NA	NA	NA
LF01GW07CL	05/15/01	< 200	< 5	NA	39	< 1	NA	NA	52	NA	NA	NA
	05/10/99	< 100	< 10	NA	NA	NA	7.77	307.5	58	NA	NA	7.78
	02/08/99	< 100	< 10	NA	NA	NA	8.9	232.7	60	NA	NA	7.46
	11/09/98	< 100	< 10	NA	NA	NA	6.92	85.5	58	NA	NA	8.03
	08/11/98	< 50	< 5	NA	NA	NA	7.16	173.1	39	NA	NA	9.68
	04/09/98	< 100	< 10	NA	NA	NA	8.6	423	59	NA	NA	4.9
	01/05/98	< 100	< 10	NA	7.21	NA	6.68	229	46.4	< 0.05	NA	7.81
	11/06/97	< 100	< 10	NA	NA	NA	9.7	446	54	NA	NA	5.27
	08/07/97	< 100	< 10	NA	NA	NA	NA	454	53	NA	NA	4.41
	05/08/97	< 100	< 10	NA	NA	NA	7	458	53	NA	NA	4.18
	02/06/97	< 100	< 10	NA	NA	NA	9.6	190	38	NA	NA	4.46
	10/31/96	< 100 U	< 10 U	NA	NA	NA	10	NA	54	NA	NA	NA
	08/06/96	< 100 U	< 10 U	NA	NA	NA	11	NA	63	NA	NA	NA
	05/22/96	< 100 U	< 10 U	NA	NA	NA	11	NA	56	NA	NA	NA
	03/12/96	< 100 U	< 10 U	NA	11	NA	NA	NA	64	NA	NA	NA
	12/19/95	< 100	< 10	NA	21	NA	NA	NA	68	NA	NA	NA
	09/15/95	180	51	NA	NA	NA	12	NA	83	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
LF02GW01	03/15/05	< 100	< 10	NA	0.92	< 0.05	NA	NA	16	NA	NA	0.4
	03/16/04	< 100	< 10	NA	0.98	< 0.05	NA	NA	16	NA	NA	0.8
	03/13/03	< 100	< 10	NA	0.97	< 0.05	NA	NA	15	NA	NA	0.7
	12/03/02	< 100	< 10	NA	0.95	< 0.05	NA	NA	NA	NA	NA	1.5
	08/27/02	< 100	< 10	NA	0.94	< 0.05	NA	NA	15	NA	NA	1.2
	05/29/02	< 100	< 10	NA	0.87	< 0.05	NA	NA	15	NA	NA	1.4
	03/11/02	< 100	< 10	NA	0.97	< 0.05	NA	NA	15	NA	NA	0.8
	11/28/01	< 100	< 10	NA	1 J	< 0.05 UJ	NA	NA	15	NA	NA	1.5
	08/28/01	< 100	< 10	NA	0.97	< 0.05	NA	NA	15	NA	NA	0.9
	05/17/01	< 100 UJ	< 10 UJ	NA	0.94	< 0.05	NA	NA	15	NA	NA	2.3
	05/11/99	< 100	< 10	NA	NA	NA	0.552	305	15.1	NA	NA	0.73
	02/09/99	< 100	< 10	NA	NA	NA	0.986	151.7	17	NA	NA	0.8
	11/10/98	298	31.8	NA	NA	NA	1	163.2	15.9	NA	NA	3.15 (J35)
	08/12/98	< 100	< 10	NA	NA	NA	1.03	154.5	11	NA	NA	1.09
	04/10/98	< 100	< 10	NA	NA	NA	1	399	16	NA	NA	0.68
	01/06/98	< 100	< 10	NA	0.908	NA	0.862	262	13.2	< 0.05	NA	1.63
	11/03/97	< 100	< 10	NA	NA	NA	0.81	392	14	NA	NA	0.68
	08/04/97	< 100	< 10	NA	NA	NA	NA	385	14	NA	NA	1.45
	05/05/97	< 100	< 10	NA	NA	NA	0.71	384	12	NA	NA	1.63
	02/03/97	< 100	< 10	NA	NA	NA	< 0.05 (R9)	30	15	NA	NA	0.79
	10/28/96	< 100 U	< 10 U	NA	NA	NA	1.1	NA	44	NA	NA	NA
	07/31/96	< 100 U	< 10 U	NA	NA	NA	1.3	NA	15	NA	NA	NA
	05/21/96	110	< 10 U	NA	NA	NA	1.8	NA	13	NA	NA	NA
	03/04/96	< 100 U	< 10 U	NA	1.34	NA	NA	NA	15	NA	NA	NA
	12/11/95	< 100	39	NA	7	NA	NA	NA	47	NA	NA	NA
	09/08/95	< 100 U	< 10 U	NA	NA	NA	1.2	NA	19	NA	NA	NA
	11/09/94	212	8	NA	1.6	NA	NA	NA	16.3	NA	NA	NA
	08/28/92	NA	NA	NA	NA	NA	1.2	NA	15.1	NA	NA	NA
	11/28/90	NA	NA	NA	NA	NA	1.3	NA	18.9	NA	NA	NA
LF02GW02	03/15/05	< 100	220	NA	< 0.05	< 0.05	NA	NA	72	NA	NA	0.9
	03/16/04	< 100	34	NA	< 0.05	< 0.05	NA	NA	79	NA	NA	0.1
	03/13/03	160	310	NA	0.06	< 0.05	NA	NA	71	NA	NA	0.1
DUP0313032B	03/13/03	140	330	NA	0.08	< 0.05	NA	NA	82	NA	NA	NA
	12/03/02	120	970	NA	< 0.05	< 0.05	NA	NA	84	NA	NA	0.6
DUP1203023A	12/03/02	120	930	NA	< 0.05	< 0.05	NA	NA	83	NA	NA	NA
	08/27/02	240	390	NA	< 0.05	< 0.05	NA	NA	84	NA	NA	1.3
DUP0827023A	08/27/02	230	410	NA	< 0.05	< 0.05	NA	NA	84	NA	NA	NA
	05/29/02	< 100	170	NA	< 0.05	< 0.05	NA	NA	86	NA	NA	1
	03/11/02	120	220	NA	< 0.05	< 0.05	NA	NA	97	NA	NA	0.8
DUP0311022B	03/11/02	110	200	NA	< 0.05	< 0.05	NA	NA	96	NA	NA	NA
LF02GW02CL	03/11/02	38 J	210	NA	< 1	< 1	NA	NA	93	NA	NA	NA
	11/28/01	260	630	NA	< 0.05	< 0.05	NA	NA	96	NA	NA	0.6
	08/28/01	320	540	NA	0.14	< 0.05	NA	NA	94	NA	NA	1.5
	05/17/01	130 J	890 J	NA	< 0.05	< 0.05	NA	NA	99	NA	NA	1.7
	05/12/99	< 100	492	NA	NA	NA	0.095	207	120	NA	NA	0.44
	02/10/99	< 100	329	NA	NA	NA	< 0.02	138.1	130	NA	NA	0.25
	11/11/98	262	407	NA	NA	NA	0.059	136.5	130	NA	NA	1.59
	08/13/98	< 100	400	NA	NA	NA	< 0.05	9.5	90	NA	NA	1.22
	04/13/98	< 100	470	NA	NA	NA	< 0.05	364	130	NA	NA	0.6
	01/07/98	110	406	NA	< 0.05	NA	< 0.05	220	117	< 0.05	NA	1.6
	11/03/97	110	420	NA	NA	NA	< 0.02	381	110	NA	NA	0.36
	08/04/97	390	490	NA	NA	NA	NA	361	130	NA	NA	1.06
	05/05/97	< 100	370	NA	NA	NA	< 0.05	195	85	NA	NA	0.78
	02/03/97	< 100	330	NA	NA	NA	< 0.05	177	110	NA	NA	1.71
	10/28/96	< 100 U	310	NA	NA	NA	0.18	NA	82	NA	NA	NA
	07/31/96	< 100 U	340	NA	NA	NA	< 0.5	NA	81	NA	NA	NA
	05/22/96	< 100 U	230	NA	NA	NA	< 0.05	NA	58	NA	NA	NA
	03/04/96	< 100 U	348	NA	< 0.05	NA	NA	NA	64	NA	NA	NA
	12/11/95	< 100	< 10	NA	21	NA	NA	NA	54	NA	NA	NA
	09/06/95	< 100 U	180	NA	NA	NA	< 0.04	NA	46	NA	NA	NA
	11/09/94	NA	NA	NA	1.6	NA	NA	NA	52.7	NA	NA	NA
	09/04/92	NA	NA	NA	NA	NA	0.025	NA	54	NA	NA	NA
	11/29/90	NA	NA	NA	NA	NA	0.3	NA	54.7	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
LF02GW04	03/15/05	440	14	NA	8.8	< 0.05	NA	NA	29	NA	NA	0.8
	03/16/04	210	88	NA	9.5	< 0.05	NA	NA	35	NA	NA	0.3
	03/13/03	160	150	NA	2.9	< 0.05	NA	NA	30	NA	NA	0.2
	12/03/02	< 100	78	NA	5.3	< 0.05	NA	NA	NA	NA	NA	0.3
	08/27/02	< 100	130	NA	4.9	0.04 J	NA	NA	28	NA	NA	1.1
	05/29/02	130	170	NA	2.4	< 0.05	NA	NA	28	NA	NA	1.1
	03/11/02	200	78	NA	1.4	< 0.05	NA	NA	35	NA	NA	0.8
	11/28/01	< 100	110	NA	5.4	0.07	NA	NA	27	NA	NA	0.3
	08/28/01	< 100	51	NA	5.9	< 0.05	NA	NA	28	NA	NA	1.8
	05/15/01	180	90	NA	4.5 J	0.08 J	NA	NA	32	NA	NA	2.5
	05/12/99	< 100	131	NA	NA	NA	4.99	277.2	31	NA	NA	0.38
	02/11/99	< 100	66.8	NA	NA	NA	5.95	35	41.2	NA	NA	1.47
	11/11/98	258	58.1	NA	NA	NA	5.54	198.9	34	NA	NA	0.32
	08/13/98	< 100	52	NA	NA	NA	4.5	111	27	NA	NA	0.59
	04/13/98	< 100	65	NA	NA	NA	4.8	349	47	NA	NA	2.21
	01/07/98	< 100	50.4	NA	5.07	NA	4.76	273	25.8	< 0.05	NA	2.02
	11/04/97	< 100	50	NA	NA	NA	5.2	397	25	NA	NA	0.34
	08/05/97	< 100	58	NA	NA	NA	NA	434	45	NA	NA	0.18
	05/06/97	< 100	56	NA	NA	NA	3.8	358	28	NA	NA	0.83
	02/04/97	< 100	47	NA	NA	NA	4.3	113	30	NA	NA	0.7
	11/01/96	< 100 U	59	NA	NA	NA	6.5	NA	27	NA	NA	NA
	08/01/96	< 100 U	53	NA	NA	NA	4.7	NA	31	NA	NA	NA
	05/21/96	< 100 U	56	NA	NA	NA	4.5	NA	23	NA	NA	NA
	03/06/96	< 100 U	54	NA	5.5	NA	NA	NA	26	NA	NA	NA
	12/11/95	< 100	90	NA	6.4	NA	NA	NA	25	NA	NA	NA
	09/11/95	120	230	NA	NA	NA	5.6	NA	30	NA	NA	NA
Landfill 4												
LF04GW03	05/24/05	< 100	23	NA	0.33	< 0.05	NA	NA	39	NA	NA	0.9
	03/18/05	100	< 10	NA	4	< 0.05	NA	NA	37	NA	NA	0.9
	03/17/04	< 100	< 10	NA	17	< 0.05	NA	NA	74	NA	NA	3.2
	05/13/99	< 100	31.3	NA	NA	NA	2.83 (J12)	306.2	39.5	NA	NA	9.11
	08/12/98	442	394	NA	NA	NA	< 0.05	128.7	18.8	NA	NA	7.4
	04/13/98	< 100	27	NA	NA	NA	< 0.05	412	22	NA	NA	4.89
	01/12/98	< 100	12.2	NA	NA	NA	2.26	NA	46.9	NA	NA	NA
	05/06/97	< 100	70	NA	NA	NA	< 0.05	496	22	NA	NA	6.25
	02/04/97	< 100	< 10	NA	NA	NA	1.5	163	31	NA	NA	6.41
	05/29/96	100	40	NA	NA	NA	0.08	NA	38	NA	NA	NA
	03/12/96	167	< 10	NA	4.8	NA	NA	NA	29	NA	NA	NA
	04/04/05	NA	NA	NA	17.9	NA	NA	NA	56.6	NA	NA	NA
LF4GW101	03/17/05	880	140	NA	0.11	< 0.05	NA	NA	12	NA	NA	1.5
LF4GW102	03/17/05	< 100	10	NA	1.2	< 0.05	NA	NA	75	NA	NA	0.1
DUP0317053B	03/17/05	< 100	< 10	NA	1.2	< 0.05	NA	NA	72	NA	NA	NA
LF4GW102CL	03/17/05	< 100 U	11.4	NA	1.22	< 1 U	NA	NA	71.9	NA	NA	NA
	12/15/04	< 100	22	NA	1.3	< 0.05	NA	NA	85	NA	NA	0.1
DUP1215042C	12/15/04	100	22	NA	1.2	< 0.05	NA	NA	86	NA	NA	NA
LF4GW102CL	12/15/04	< 100 U	22.1	NA	NA	NA	1.22	NA	96.7	NA	NA	NA
	08/11/04	< 100	79	NA	0.97	< 0.05	NA	NA	75	NA	NA	0.12
DUP0811042A	08/11/04	< 100	96	NA	0.96	< 0.05	NA	NA	75	NA	NA	NA
LF4GW102CL	08/11/04	< 10	68	NA	NA	NA	0.81 J-	NA	77	NA	NA	NA
	05/25/04	< 100	36	NA	0.92	< 0.05	NA	NA	77	NA	NA	0.69
DUP0525042A	05/25/04	< 100	39	NA	0.94	< 0.05	NA	NA	75	NA	NA	NA
	03/09/04	< 100	43	NA	1.1	< 0.05	NA	NA	79	NA	NA	0.21
DUP0309042A	03/09/04	< 100	36	NA	1.1	< 0.05	NA	NA	83	NA	NA	NA
	12/04/03	110	43	NA	1.3	< 0.05	NA	NA	80	NA	NA	0.6
DUP1204031A	12/04/03	100	49	NA	1.2	< 0.05	NA	NA	80	NA	NA	NA
LF4GW102CL	12/04/03	< 500	41	NA	1.4 J-	< 0.05	1.4 J-	NA	83.6	NA	NA	NA
	08/21/03	180	61	NA	1	< 0.05	NA	NA	72	NA	NA	1.2
	06/09/03	< 100	45	NA	1.1	< 0.05	NA	NA	74	NA	NA	0.4
DUP0609033A	06/09/03	< 100	46	NA	1.1	< 0.05	NA	NA	79	NA	NA	NA
LF4GW102CL	06/09/03	1300	77	NA	1	< 0.05	1	NA	66	NA	NA	NA
	03/20/03	< 100	76	NA	1.2	< 0.05	NA	NA	72	NA	NA	0.5
DUP0320031A	03/20/03	< 100	73	NA	1.2	< 0.05	NA	NA	73	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
LF4GW103	03/15/05	< 100	48	NA	< 0.05	< 0.05	NA	NA	44	NA	NA	0.1
	12/14/04	160	140	NA	< 0.05	< 0.05	NA	NA	200	NA	NA	0.2
	08/10/04	< 100	49	NA	< 0.05	< 0.05	NA	NA	41	NA	NA	0.27
	05/25/04	< 100	52	NA	< 0.05	< 0.05	NA	NA	36	NA	NA	0.92
	03/09/04	< 100	78	NA	< 0.05	< 0.05	NA	NA	97	NA	NA	0.29
	12/02/03	230	110	NA	< 0.05	< 0.05	NA	NA	160	NA	NA	0.7
	08/13/03	150	52	NA	< 0.25 UJ	< 0.25 UJ	NA	NA	37	NA	NA	0.1
	06/09/03	< 100	46	NA	< 0.05	< 0.05	NA	NA	43	NA	NA	0.5
	03/20/03	< 100	50	NA	< 0.05	< 0.05	NA	NA	70	NA	NA	0.4
LF4GW104	03/15/05	130	56	NA	0.6	< 0.05	NA	NA	140	NA	NA	0.1
	12/14/04	190	63	NA	0.41	< 0.05	NA	NA	140	NA	NA	0.1
	08/10/04	170	64	NA	0.32	< 0.05	NA	NA	130	NA	NA	0.15
	05/25/04	210	57	NA	0.31	< 0.05	NA	NA	140	NA	NA	0.33
	03/09/04	120	47	NA	0.34	< 0.05	NA	NA	140	NA	NA	0.07
	12/02/03	290	40	NA	0.3	< 0.05	NA	NA	140	NA	NA	0.2
	08/13/03	340	34	NA	< 0.25 UJ	< 0.25 UJ	NA	NA	140	NA	NA	0.3
	06/09/03	130	22	NA	0.37	< 0.05	NA	NA	140	NA	NA	0.5
	06/09/03	120	22	NA	0.53	< 0.05	NA	NA	140	NA	NA	NA
	03/20/03	140	< 10	NA	0.35	1.3	NA	NA	140	NA	NA	0.2
LF4GW105	03/15/05	< 100	14	NA	1.6	< 0.05	NA	NA	73	NA	NA	0.1
	12/14/04	< 100	< 10	NA	2.1	< 0.05	NA	NA	73	NA	NA	0.1
	08/10/04	110	< 10	NA	1.8	< 0.05	NA	NA	84	NA	NA	0.12
	05/25/04	120	< 10	NA	1.3	< 0.05	NA	NA	60	NA	NA	0.59
	03/09/04	< 100	< 10	NA	1.5	< 0.05	NA	NA	55	NA	NA	0.18
	12/02/03	130	< 10	NA	1.6	< 0.05	NA	NA	51	NA	NA	0.3
	08/13/03	180	< 10	NA	1.4 b J-	< 0.25 UJ	NA	NA	59	NA	NA	0.3
	06/09/03	< 100	< 10	NA	1.7	< 0.05	NA	NA	56	NA	NA	0.5
	03/20/03	< 100	11	NA	1.5	< 0.05	NA	NA	51	NA	NA	2.2
LF4GW106	03/15/05	< 100	15	NA	0.88	< 0.05	NA	NA	92	NA	NA	0.1
	12/14/04	110	65	NA	0.85	< 0.05	NA	NA	96	NA	NA	0.2
	08/10/04	100	< 10	NA	0.8	< 0.05	NA	NA	95	NA	NA	0.06
	05/25/04	150	< 10	NA	0.74 J	< 0.05 UJ	NA	NA	98	NA	NA	0.33
	03/09/04	< 100	17	NA	0.7	< 0.05	NA	NA	99	NA	NA	0.31
	12/02/03	200	13	NA	0.56	< 0.05	NA	NA	96	NA	NA	0.4
	08/13/03	280	13	NA	0.42 b J-	< 0.25 UJ	NA	NA	100	NA	NA	0.3
	06/09/03	< 100	16	NA	0.57	< 0.05	NA	NA	100	NA	NA	0.3
	03/20/03	< 100	< 10	NA	0.68	< 0.05	NA	NA	99	NA	NA	3.8
Landfill 10												
LF10GW01	03/17/05	< 100	< 10	NA	11	< 0.05	NA	NA	49	NA	NA	3.3
	03/10/04	< 100	< 10	NA	11	< 0.05	NA	NA	46	NA	NA	3.4
	08/19/03	< 100	< 10	NA	7.6 J-	< 0.05 UJ	NA	NA	59	NA	NA	2.6
	06/10/03	< 100	< 10	NA	9.9	< 0.05	NA	NA	58	NA	NA	3.9
	03/19/03	< 100	< 10 UJ	NA	8	< 0.05	NA	NA	67	NA	NA	3.2
	12/05/02	< 100	< 10	NA	7.3	< 0.05	NA	NA	46	NA	NA	2.3
	09/04/02	< 100	< 10	NA	8	< 0.05	NA	NA	56	NA	NA	1.4
	06/04/02	< 100	< 10	NA	7.5	< 0.05	NA	NA	49	NA	NA	3.3
	03/11/02	< 100	< 10	NA	6.9	< 0.05	NA	NA	55	NA	NA	4.1
	11/30/01	530	< 10	NA	6.8	< 0.05	NA	NA	46	NA	NA	4.5
	08/31/01	250	< 10	NA	7.1	< 0.05	NA	NA	46	NA	NA	4.4
	05/18/01	< 100 UJ	< 10 UJ	NA	7	< 0.05	NA	NA	48	NA	NA	4.7
	02/19/97	< 100	< 10	NA	NA	NA	8.74	52	53.2 R	< 0.05	NA	4.48
	12/13/96	< 100	< 10	NA	NA	NA	7.27	NA	56.7 R	< 0.05	NA	NA
	09/05/96	< 100	< 10	NA	NA	NA	8.5	NA	54.8 R	< 0.05	NA	NA
	03/22/96	< 100	< 10	NA	NA	NA	9.8	NA	54 R	< 0.05	NA	NA
	12/04/95	< 100	< 10	NA	NA	NA	8.3	NA	53 R	< 0.05	NA	NA
	09/26/95	< 100	< 10	NA	NA	NA	10	NA	62 R	< 0.05	NA	NA
	06/09/95	< 100	< 10	NA	NA	NA	10	NA	62 R	< 0.05	NA	NA
	03/21/95	< 100	< 10	NA	NA	NA	9.7	NA	57 R	< 0.05	NA	NA
	12/13/94	< 100	< 10	NA	NA	NA	8.6	NA	55 R	< 0.05	NA	NA
	09/09/94	< 100	< 10	NA	NA	NA	8.1	NA	66.4	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
LF10GW02	03/17/05	2700	760	NA	< 0.05	< 0.05	NA	NA	17	NA	NA	0.1
	03/10/04	3100	780	NA	< 0.05	< 0.05	NA	NA	12	NA	NA	0.07
	08/19/03	2400	820	NA	0.45 J-	< 0.05 UJ	NA	NA	94	NA	NA	0.4
	06/10/03	1600	710	NA	< 0.05	< 0.05	NA	NA	44	NA	NA	0.3
	03/19/03	2100	920 J	NA	< 0.05	< 0.05	NA	NA	12	NA	NA	0.3
	12/05/02	3400	950	NA	< 0.05	< 0.05	NA	NA	71	NA	NA	0.5
	09/04/02	2900	1,100	NA	0.4	< 0.05	NA	NA	100	NA	NA	0.2
	06/04/02	3200	1,200	NA	0.28	0.03 J	NA	NA	130	NA	NA	1.3
	03/11/02	2500	830	NA	< 0.05	< 0.05	NA	NA	16	NA	NA	0.7
	11/30/01	6900	1,600	NA	< 0.05 UJ	< 0.05 UJ	NA	NA	160	NA	NA	4
	08/31/01	3900	1,000	NA	0.04 J	< 0.05	NA	NA	120	NA	NA	2.4
	02/19/97	5030	1770	NA	NA	NA	< 0.05	-61	74	< 0.05	NA	0.22
	12/13/96	3890	1330	NA	NA	NA	0.063	NA	64	< 0.05	NA	NA
	09/05/96	4050	1800	NA	NA	NA	< 0.05	NA	127	< 0.05	NA	NA
	03/22/96	4650	1830	NA	NA	NA	< 0.05	NA	72	< 0.05	NA	NA
	12/04/95	4000	1800	NA	NA	NA	< 0.05	NA	99	< 0.05	NA	NA
	09/25/95	2900	2200	NA	NA	NA	0.058	NA	167	< 0.05	NA	NA
	06/08/95	5700	2900	NA	NA	NA	< 0.05	NA	169	< 0.05	NA	NA
	03/16/95	4400	2200	NA	NA	NA	< 0.05	NA	39	< 0.05	NA	NA
	12/12/94	5000	2500	NA	NA	NA	< 0.05	NA	48	< 0.05	NA	NA
	09/27/94	NA	NA	NA	NA	NA	NA	NA	55.8	< 0.05	NA	NA
	09/12/94	4400	2600	NA	NA	NA	< 0.05	NA	44.7	NA	NA	NA
LF10GW03	03/16/05	< 100	< 10	NA	7.1	< 0.05	NA	NA	75	NA	NA	0.6
	03/18/04	< 100	< 10	NA	7.4	< 0.05	NA	NA	80	NA	NA	1.4
	08/20/03	230	< 10	NA	7	< 0.05	NA	NA	75	NA	NA	2.1
	06/10/03	< 100	11	NA	8.2	< 0.05	NA	NA	81	NA	NA	1.7
	03/19/03	< 100	< 10 UJ	NA	7.8	< 0.05	NA	NA	74	NA	NA	3.5
	12/06/02	< 100	< 10 UJ	NA	8.2	< 0.05	NA	NA	79	NA	NA	2.2
	09/04/02	< 100	11	NA	7.9	< 0.05	NA	NA	80	NA	NA	0.4
	06/05/02	110	20	NA	7.8	< 0.05	NA	NA	80	NA	NA	1.3
	03/12/02	< 100	< 10	NA	8.6	< 0.05	NA	NA	82	NA	NA	4.8
	11/30/01	540	< 10	NA	8.5 J	< 0.05 UJ	NA	NA	78	NA	NA	2.8
	08/31/01	< 100	< 10	NA	8	< 0.05	NA	NA	79	NA	NA	NM
	05/17/01	290	13	NA	8.2	< 0.05	NA	NA	78	NA	NA	3.3
	02/18/97	< 100	< 10	NA	NA	NA	10	197	76	< 0.05	NA	0.74
	12/12/96	< 100	< 10	NA	NA	NA	7.91	NA	74	< 0.05	NA	NA
	09/04/96	< 100	< 10	NA	NA	NA	9.4	NA	73	< 0.05	NA	NA
	06/06/96	< 100	< 10	NA	NA	NA	8.3	NA	75	< 0.05	NA	NA
	03/21/96	< 100	< 10	NA	NA	NA	8	NA	73	< 0.05	NA	NA
	12/01/95	100	< 10	NA	NA	NA	4.6	NA	66	< 0.05	NA	NA
	09/26/95	< 100	< 10	NA	NA	NA	7.6	NA	77	< 0.05	NA	NA
	06/09/95	< 100	14	NA	NA	NA	6.8	NA	72	< 0.05	NA	NA
	03/16/95	< 100	54	NA	NA	NA	4.9	NA	74	< 0.05	NA	NA
	12/13/94	< 100	39	NA	NA	NA	4.1	NA	78	< 0.05	NA	NA
	09/27/94	NA	NA	NA	NA	NA	NA	NA	86	< 0.05	NA	NA
	09/09/94	< 100	< 10	NA	NA	NA	7.8	NA	111	NA	NA	NA
LF10GW100	05/26/05	120	< 10	NA	29	< 0.05	NA	NA	220	NA	NA	0.9
	03/17/05	120	< 10	NA	29	< 0.05	NA	NA	200	NA	NA	0.4
DUP0317051B	03/17/05	130	< 10	NA	27	< 0.05	NA	NA	200	NA	NA	NA
LF10GW100CL	03/17/05	< 100 U	< 10 U	NA	31	< 0.1 U	NA	NA	206	NA	NA	NA
	12/14/04	130	< 10	NA	41	< 0.05	NA	NA	290	NA	NA	1.8
	08/12/04	< 100	33	NA	41	< 0.05	NA	NA	280	NA	NA	2.4
	05/28/04	< 100	18	NA	25	0.86	NA	NA	210	NA	NA	0.59
DUP0528042A	05/28/04	< 100	16	NA	25	0.86	NA	NA	210	NA	NA	NA
	03/18/04	100	< 10	NA	27	< 0.05	NA	NA	220	NA	NA	1.3
DUP0318043A	03/18/04	< 100	< 10	NA	27	< 0.05	NA	NA	220	NA	NA	NA
	12/09/03	280	< 10	NA	28	< 0.05	NA	NA	260	NA	NA	1.1
	08/20/03	450	< 10	NA	26	< 0.05	NA	NA	250	NA	NA	1.9
	06/10/03	< 100	11	NA	27	< 0.05	NA	NA	220	NA	NA	1.6
LF10GW100	03/19/03	< 100	16 J	NA	42	< 0.05	NA	NA	280	NA	NA	NM
(Total)	02/10/03	< 300	29	NA	NA	NA	NA	NA	NA	NA	NA	NA
(Total)	12/23/02	480	96	NA	NA	0.000069	0.04	NA	300	< 0.1	3.6 J-	NA
LF10122302 -DUP1 (Total)	12/23/02	< 300	60	NA	NA	0.000057	0.03	NA	310	< 0.1	3.6 J-	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
LF10SP01	03/17/05	450	170	NA	0.61	< 0.05	NA	NA	24	NA	NA	4.9
(Total)	03/17/05	1,000	180	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/14/04	290	170	NA	0.2	< 0.05	NA	NA	28	NA	NA	4.8
(Total)	12/14/04	3,400	260	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/26/04	210	200	NA	0.28	< 0.05	NA	NA	22	NA	NA	7.2
(Total)	05/26/04	13000	540	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/10/04	9700	470	NA	0.49	< 0.05	NA	NA	24	NA	NA	4.8
(Total)	12/03/03	12000	1400	NA	0.16	< 0.05	NA	NA	18	NA	NA	6.9
(Total)	12/03/03	2500	240	NA	0.15	0.1	NA	NA	18	NA	NA	NA
LF10SP01CL (Total)	12/03/03	7900	560	NA	0.24	< 0.05	0.24	NA	19	NA	NA	NA
	08/19/03	1200	200	NA	0.2 J-	< 0.05 UJ	NA	NA	21	NA	NA	4.5
	06/10/03	< 100	75	NA	0.28	< 0.05	NA	NA	22	NA	NA	6.9
(Total)	12/05/02	2700	450	NA	NA	< 0.05	< 0.05	NA	54	< 0.2	NA	NA
LF1020502-DUP1 (Total)	12/05/02	NA	NA	NA	NA	NA	< 0.05	NA	NA	NA	NA	NA
Landfill 5												
LF5GW100	05/26/05	< 100	< 10	NA	2.7	< 0.05	NA	NA	33	NA	NA	1.3
DUP0526051A	05/26/05	< 100	< 10	NA	2.7	< 0.05	NA	NA	33	NA	NA	NA
LF5GW100CL	05/26/05	< 100 U	< 10 U	NA	2.7	< 1 U	NA	NA	31.2	NA	NA	NA
	03/28/05	< 100	< 10	NA	2.7	< 0.05	NA	NA	33	NA	NA	1.1
	12/16/04	< 100	< 10	NA	2.7	< 0.05	NA	NA	33	NA	NA	0.9
	12/16/04	< 100	< 10	NA	2.7	< 0.05	NA	NA	33	NA	NA	NA
	08/12/04	< 100	< 10	NA	2.6	< 0.05	NA	NA	32	NA	NA	0.5
	05/26/04	< 100	< 10	NA	2.6	< 0.05	NA	NA	33	NA	NA	0.7
	03/15/04	< 100	< 10	NA	2.7	< 0.05	NA	NA	35	NA	NA	0.8
	12/04/03	< 100	< 10	NA	2.7	< 0.05	NA	NA	34	NA	NA	0.9
	08/14/03	< 100	< 10	NA	2.6 b J-	< 0.05 UJ	NA	NA	35	NA	NA	0.35
	06/05/03	< 100	< 10	NA	4.3	< 0.05	NA	NA	29	NA	NA	0.9
	12/04/02	< 100	< 10	NA	4.1	< 0.05	NA	NA	NA	NA	NA	0.66
	08/29/02	< 100	< 10	NA	NA	NA	NA	NA	30	NA	NA	0.69
	05/30/02	< 100	< 10	NA	4.3	0.02 J	NA	NA	31	NA	NA	0.83
	03/06/02	< 100	< 10	NA	4.3	< 0.05	NA	NA	27	NA	NA	1.15
	11/28/01	< 100	< 10	NA	4.3	< 0.05	NA	NA	28	NA	NA	1.01
	08/30/01	< 100	< 10	NA	4.3	< 0.05	NA	NA	27	NA	NA	1.06
	05/10/01	170	< 10	NA	2.7	< 0.05	NA	NA	33	NA	NA	4.5
	07/21/00	NA	NA	NA	NA	NA	NA	NA	42	NA	NA	NA
LF5GW101	05/26/05	< 100	< 10	NA	4	< 0.05	NA	NA	30	NA	NA	0.7
	03/28/05	< 100	< 10	NA	4.1	< 0.05	NA	NA	27	NA	NA	0.91
	12/16/04	< 100	< 10	NA	4.2	< 0.05	NA	NA	30	NA	NA	0.7
	08/12/04	< 100	< 10	NA	4.1	< 0.05	NA	NA	29	NA	NA	0.7
	05/26/04	< 100	< 10	NA	3.9	< 0.05	NA	NA	29	NA	NA	0.4
	03/15/04	< 100	< 10	NA	4.2	< 0.05	NA	NA	30	NA	NA	0.8
	12/04/03	< 100	< 10	NA	4.2	< 0.05	NA	NA	29	NA	NA	0.9
	08/14/03	< 100	< 10	NA	3.9 b J-	< 0.05 UJ	NA	NA	30	NA	NA	0.71
	06/05/03	< 100	< 10	NA	2.8	< 0.05	NA	NA	33	NA	NA	0.7
	12/04/02	< 100	< 10	NA	2.7	< 0.05	NA	NA	NA	NA	NA	0.72
	08/29/02	< 100	< 10	NA	NA	NA	NA	NA	35	NA	NA	0.45
	05/30/02	< 100	< 10	NA	2.8	< 0.05	NA	NA	35	NA	NA	0.53
	03/06/02	< 100	< 10	NA	2.8	< 0.05	NA	NA	34	NA	NA	0.88
	11/28/01	< 100	< 10	NA	2.8	< 0.05	NA	NA	34	NA	NA	0.61
	08/30/01	< 100	< 10	NA	2.8	< 0.05	NA	NA	35	NA	NA	0.83
	05/10/01	150	< 10	NA	4.3	< 0.05	NA	NA	28	NA	NA	4.7
LF5GW101CL	05/10/01	< 200	5.9	NA	4.3	< 1	NA	NA	28	NA	NA	NA
	07/21/00	NA	NA	NA	NA	NA	NA	NA	30	NA	NA	NA
LF5GW102	05/26/05	< 100	< 10	NA	0.78	0.08	NA	NA	24	NA	NA	0.7
	03/21/05	< 100	< 10	NA	0.48	0.15	NA	NA	23	NA	NA	0.1
	12/14/04	< 100	< 10	NA	0.23	0.15	NA	NA	22	NA	NA	0.2
	08/11/04	< 100	< 10	NA	0.41	0.11	NA	NA	24	NA	NA	0.45
	05/27/04	< 100	< 10	NA	0.55	0.06	NA	NA	27	NA	NA	1.3
	03/10/04	< 100	< 10	NA	0.25	0.09	NA	NA	28	NA	NA	0.37
	12/03/03	< 100	< 10	NA	1.1	< 0.05	NA	NA	26	NA	NA	0.7
	12/03/03	< 100	< 10	NA	0.62	< 0.05	NA	NA	25	NA	NA	NA
LF5GW102CL	12/03/03	< 500	12	NA	0.42	0.057	0.48	NA	25.8	NA	NA	NA
	08/13/03	< 100	21	NA	< 0.25 UJ	< 0.25 UJ	NA	NA	37	NA	NA	0.6

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
	06/06/03	< 100	20	NA	0.1	0.1	NA	NA	37	NA	NA	0.7
LF5GW103	05/24/05	< 100	< 10	NA	4.5	< 0.05	NA	NA	27	NA	NA	0.9
	03/15/05	200	< 10	NA	5	< 0.05	NA	NA	27	NA	NA	0.8
	12/14/04	< 100	< 10	NA	5.1	< 0.05	NA	NA	28	NA	NA	0.7
	08/11/04	< 100	< 10	NA	4.9	< 0.05	NA	NA	28	NA	NA	0.49
	05/27/04	< 100	< 10	NA	4.8	< 0.05	NA	NA	27	NA	NA	1.3
	03/10/04	< 100	< 10	NA	4.8	< 0.05	NA	NA	29	NA	NA	0.7
	12/03/03	130	< 10	NA	4.8	< 0.05	NA	NA	29	NA	NA	0.8
	08/19/03	140	< 10	NA	4.8	< 0.05	NA	NA	31	NA	NA	1
	08/19/03	110	< 10	NA	4.8	< 0.05	NA	NA	30	NA	NA	NA
LF5GW103CL	08/19/03	< 500 UJ	18	NA	5 J-	< 0.05	5 J-	NA	27	NA	NA	NA
	06/05/03	< 100	< 10	NA	4.6	< 0.05	NA	NA	29	NA	NA	0.8
LF5GW104	05/24/05	< 100	< 10	NA	6.8	< 0.05	NA	NA	81	NA	NA	0.7
	03/15/05	< 100	< 10	NA	7.1	< 0.05	NA	NA	80	NA	NA	0.9
	12/14/04	< 100	< 10	NA	5.4	< 0.05	NA	NA	46	NA	NA	0.7
	08/11/04	< 100	< 10	NA	5.2	< 0.05	NA	NA	50	NA	NA	0.47
	05/26/04	< 100	< 10	NA	5.5	< 0.05	NA	NA	56	NA	NA	1.3
	03/10/04	120	< 10	NA	7	< 0.05	NA	NA	83	NA	NA	0.7
	12/03/03	130	< 10	NA	5.1	< 0.05	NA	NA	49	NA	NA	0.6
	08/13/03	130	< 10	NA	5.7 b J-	< 0.25 UJ	NA	NA	66	NA	NA	0.7
	06/05/03	< 100	< 10	NA	7.5	< 0.05	NA	NA	82	NA	NA	0.6
LF5SP100	06/01/05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NM
	03/22/05	400	< 10	NA	0.34	< 0.05	NA	NA	14	NA	NA	9.4
	03/22/05	12,000	62	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/05/03	2,200	42	NA	1.4	< 0.05	NA	NA	54	NA	NA	8.9
DUP1205031A	12/05/03	1,700	40	NA	1.4	< 0.05	NA	NA	54	NA	NA	NA
LF5SP100CL	12/05/03	15,000	73	NA	1.5 J-	0.067	1.6 J-	NA	54.4	NA	NA	NA
Fill Site 6A												
LF6GW100	04/04/05	130	< 10	< 0.005	0.37	< 0.05	NA	NA	33	< 0.04 UJ	3	5.5
	03/15/04	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	2.6
	12/05/03	100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	2
DUP1205033A	12/05/03	110	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
LF6GW100CL	12/05/03	< 500	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/20/03	390	< 10	NA	NA	NA	NA	NA	NA	NA	NA	1.1
	06/09/03	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	4.7
	03/19/03	< 100	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	5.2
	12/06/02	110	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	3.9
	09/05/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.8
DUP0905023A	09/05/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
	06/05/02	120	< 10	NA	NA	NA	NA	NA	NA	NA	NA	1.7
	03/12/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.9
DUP0312022A	03/12/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
LF6GW100CL	03/12/02	< 200	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/04/01	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	1.2
DUP1204011A	12/04/01	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
LF6GW100CL	12/04/01	< 200	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/29/01	310	< 10	NA	NA	NA	NA	NA	NA	NA	NA	2.8
	05/17/01	360	13	NA	NA	NA	NA	NA	NA	NA	NA	6.1
LF6GW101	04/04/05	< 100	< 10	< 0.005	0.59	< 0.05	NA	NA	48	< 0.04 UJ	1.5	5.1
	03/15/04	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	2.2
	12/05/03	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	2.4
	08/20/03	250	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.7
	06/10/03	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	4.9
	03/19/03	< 100	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	5
	12/06/02	< 100	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	5.3
	09/04/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	1.4
	06/05/02	110	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.9
DUP0605021A	06/05/02	100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/13/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	4.2
	12/04/01	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.9
	08/29/01	130	< 10	NA	NA	NA	NA	NA	NA	NA	NA	4.1
	05/17/01	240	< 10	NA	NA	NA	NA	NA	NA	NA	NA	5.7

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
LF6GW102	04/04/05	12,000	8,300	0.52	< 0.05	< 0.05	NA	NA	120	< 0.04 UJ	14	0.1
	12/16/04	18,000	7,200	NA	< 0.05	< 0.05	NA	NA	3	NA	NA	0.6
	08/12/04	21,000	8,200	NA	0.05	< 0.05	NA	NA	6.3	NA	NA	0.29
	05/26/04	15,000	6,500	NA	< 0.05	< 0.05	NA	NA	11	NA	NA	0.52
	03/17/04	13,000	8,000	NA	< 0.05	< 0.05	NA	NA	68	NA	NA	0.18
	12/08/03	13,000	4,600	NA	NA	NA	NA	NA	NA	NA	NA	1.2
	08/18/03	11,000	4,500	NA	NA	NA	NA	NA	NA	NA	NA	0.3
	06/04/03	9,800	3,900	NA	NA	NA	NA	NA	NA	NA	NA	0.3
	03/18/03	12,000	5800 J	NA	NA	NA	NA	NA	NA	NA	NA	0.2
DUP0318031A	03/18/03	12,000	5600 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
LF6GW102CL	03/18/03	14,000	5,900	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/11/02	14,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
	09/05/02	16,000	6,300	NA	NA	NA	NA	NA	NA	NA	NA	1
	06/06/02	14,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6
	03/13/02	NA	6,200	NA	NA	NA	NA	NA	NA	NA	NA	NA
DUP0313021A	03/13/02	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/13/02	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.8
	12/03/01	14,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4
DUP1203013A	12/03/01	14,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/07/01	14,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8
	05/18/01	14,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2
LF6GW103	05/25/05	< 100	< 10	NA	2.8	< 0.05	NA	NA	150	NA	NA	0.9
	04/05/05	120	< 10 UJ	< 0.005	3	< 0.05	NA	NA	140	< 0.04	1.4	2.7
DUP0405053A	04/05/05	150	< 10 UJ	< 0.005	3.1	< 0.05	NA	NA	140	< 0.04	1.4	NA
LF6GW103CL	04/05/05	< 100 U	< 10 U	< 0.0005 U	3.17	< 0.02 U	NA	NA	147	0.053	1.4	NA
	12/16/04	130	< 10	NA	3.8	< 0.05	NA	NA	150	NA	NA	0.7
	08/12/04	< 100	19	NA	3.8	< 0.05	NA	NA	130	NA	NA	0.33
DUP0812042A	08/12/04	140	< 10	NA	3.8	< 0.05	NA	NA	130	NA	NA	NA
	05/26/04	110	< 10	NA	3.6	< 0.05	NA	NA	150	NA	NA	0.69
	03/15/04	< 100	< 10	NA	3.9	< 0.05	NA	NA	160	NA	NA	2.1
	12/09/03	330	< 10	NA	4.3	< 0.05	NA	NA	160	NA	NA	2.7
	08/14/03	210	< 10	NA	3.8 b J-	< 0.05 UJ	NA	NA	170	NA	NA	3.3
	06/10/03	< 100	< 10	NA	4.3	< 0.05	NA	NA	170	NA	NA	2.8
	03/19/03	< 100	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	3.7
	12/06/02	130	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	5.5
	09/05/02	100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	2.4
	06/05/02	180	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.8
	03/13/02	140	< 10	NA	NA	NA	NA	NA	NA	NA	NA	3.2
	12/04/01	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	1
	08/29/01	200	< 10	NA	NA	NA	NA	NA	NA	NA	NA	3
	05/17/01	330	< 10	NA	NA	NA	NA	NA	NA	NA	NA	5.2
Nike Missile Facility												
NKGW01	03/16/05	< 100	13	NA	NA	NA	NA	NA	NA	NA	NA	0.5
DUP0031605A	03/16/05	< 100	11	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/13/04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.50
	03/17/04	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.52
DUP0317042A	03/17/04	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
NKGW01CL	03/17/04	< 500	7.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/18/03	< 100	13 J	NA	NA	NA	NA	NA	NA	NA	NA	0.7
NKGW01	03/12/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	1
	05/17/01	< 100 UJ	18 J	NA	NA	NA	NA	NA	NA	NA	NA	3.4
	02/24/99	NA	NA	NA	NA	NA	NA	242.7	NA	NA	NA	0.55
	08/18/98	NA	NA	NA	NA	NA	NA	237	NA	NA	NA	0.79
	01/20/98	NA	NA	NA	NA	NA	NA	326	NA	NA	NA	0.61
	11/14/97	NA	NA	NA	NA	NA	NA	444	NA	NA	NA	0.69
	08/13/97	NA	NA	NA	NA	NA	NA	497	NA	NA	NA	0.16
	05/19/97	700	90	NA	NA	NA	NA	470	NA	NA	NA	1.5
	02/17/97	< 100	14.7	NA	NA	NA	NA	177	NA	NA	NA	1.62
	12/11/96	113	279	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/03/96	< 100	32.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
	06/05/96	< 100	28.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/20/96	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/30/95	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/21/95	100	10	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
NKGW02	03/16/05	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.6
	08/13/04	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.6
	03/17/04	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	4.72
	03/18/03	< 100	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	5.7
	03/12/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	5
	05/16/01	< 100 UJ	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	5.7
	02/23/99	NA	NA	NA	NA	NA	NA	218.2	NA	NA	NA	7.9
	01/21/98	NA	NA	NA	NA	NA	NA	298	NA	NA	NA	9.32
	05/20/97	< 100	70	NA	NA	NA	NA	467	NA	NA	NA	1.28
	02/18/97	< 100	< 10	NA	NA	NA	NA	211	NA	NA	NA	6.32
	06/05/96	< 100	14.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/19/96	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/22/95	< 100	96	NA	NA	NA	NA	NA	NA	NA	NA	NA
NKGW03	03/18/05	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	2.8
	03/17/04	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	3.1
	03/12/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	2.1
	02/23/99	< 100	< 10	NA	NA	NA	NA	214.3	NA	NA	NA	9.14
	04/16/98	NA	NA	NA	NA	NA	NA	250	NA	NA	NA	10.88 (J25)
	01/20/98	1640	38	NA	NA	NA	NA	267	NA	NA	NA	8.02 (J25)
	02/18/97	362	< 10	NA	NA	NA	NA	183	NA	NA	NA	9.14
NKGW04	03/16/05	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.6
	08/13/04	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.6
	03/17/04	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	0.87
	03/18/03	< 100	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	5.8
	03/12/02	< 100	< 10	NA	NA	NA	NA	NA	NA	NA	NA	3.2
	05/17/01	100 J	26 J	NA	NA	NA	NA	NA	NA	NA	NA	1.6
	02/22/99	NA	NA	NA	NA	NA	NA	200.8	NA	NA	NA	2.95
	01/20/98	< 100	93.2	NA	NA	NA	NA	279	NA	NA	NA	0.76
	11/13/97	< 100	208	NA	NA	NA	NA	452	NA	NA	NA	0.7
	08/13/97	< 100	346	NA	NA	NA	NA	469	NA	NA	NA	0.7
	05/19/97	< 100	110	NA	NA	NA	NA	403	NA	NA	NA	0.49
	02/17/97	< 100	33.4	NA	NA	NA	NA	125	NA	NA	NA	1.12
	12/11/96	< 100	203	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/30/95	< 100	130	NA	NA	NA	NA	NA	NA	NA	NA	NA
NKGW05	03/16/05	150	1400	NA	NA	NA	NA	NA	NA	NA	NA	0.8
	08/13/04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.13
	03/17/04	< 100	35	NA	NA	NA	NA	NA	NA	NA	NA	0.1
	03/18/03	< 100	45 J	NA	NA	NA	NA	NA	NA	NA	NA	5.1
	03/12/02	< 100	24	NA	NA	NA	NA	NA	NA	NA	NA	1
	05/17/01	< 100 UJ	33 J	NA	NA	NA	NA	NA	NA	NA	NA	1.4
	02/22/99	NA	NA	NA	NA	NA	NA	162.6	NA	NA	NA	0.86
	01/21/98	NA	NA	NA	NA	NA	NA	311	NA	NA	NA	0.28
	11/14/97	NA	NA	NA	NA	NA	NA	436	NA	NA	NA	0.4
	05/19/97	< 100	10	NA	NA	NA	NA	413	NA	NA	NA	0.56
	02/17/97	< 100	34.7	NA	NA	NA	NA	182	NA	NA	NA	1.85
	12/11/96	< 100	57.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/03/96	3750 (J8)	150	NA	NA	NA	NA	NA	NA	NA	NA	NA
	06/05/96	< 100	35.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
	03/20/96	< 100	39.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/30/95	< 100	32	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/22/95	120	39	NA	NA	NA	NA	NA	NA	NA	NA	NA
Baker Beach Disturbed Area 3												
BB3GW100	05/24/05	< 100	< 10	NA	7.4	< 0.05	NA	NA	50	NA	NA	0.2
DUP0322053A	03/22/05	100	< 10	NA	12	< 0.05	NA	NA	48	NA	NA	NA
	03/22/05	100	< 10	NA	12	< 0.05	NA	NA	47	NA	NA	0.9
	12/14/04	< 100	< 10	NA	7.3	< 0.05	NA	NA	56	NA	NA	2.2
BB3GW101	03/22/05	310	< 10	NA	17	< 0.05	NA	NA	93	NA	NA	6.9
BB3PZ101	03/22/05	240	< 10	NA	25	< 0.05	NA	NA	71	NA	NA	1.3
	12/16/04	260	440	NA	17	< 0.05	NA	NA	89	NA	NA	5.8
BB3SW100	03/22/05	890	210	NA	1.7	< 0.05	NA	NA	30	NA	NA	2.3
BB3SW101	05/24/05	170	20	NA	8.9	< 0.05	NA	NA	31	NA	NA	2.9
(Total)	05/24/05	16,000	940	NA	8.9	< 0.05	NA	NA	31	NA	NA	2.9
	04/14/05	< 100	40	NA	8.7	< 0.05	NA	NA	33	NA	NA	5.12
	03/22/05	110	63	NA	9.1	< 0.05	NA	NA	36	NA	NA	4.9

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
BB3SW102	05/24/05	< 1,000	40	NA	4.7	< 0.005	NA	NA	38	NA	NA	5.9
(Total)	05/24/05	5,900	< 10	NA	4.7	< 0.05	NA	NA	38	NA	NA	5.9
	04/14/05	15,000	2000	NA	5.3	< 0.05	NA	NA	36	NA	NA	5.84
	03/22/05	160	< 10	NA	5.8	< 0.05	NA	NA	26	NA	NA	8.6
	12/17/04	< 100	780	NA	25	< 0.05	NA	NA	77	NA	NA	6.7
Landfill E												
DAEGW03	03/16/05	140	91	NA	0.69	< 0.05	NA	NA	110	NA	NA	0.2
	03/11/04	200	49	NA	0.68	< 0.05	NA	NA	110	NA	NA	0.9
DUP0311043A	03/11/04	220	61	NA	0.73	< 0.05	NA	NA	110	NA	NA	NA
DAEGW03CL	03/11/04	< 500	46	NA	0.86	< 0.05	0.86	NA	110	NA	NA	NA
	08/20/03	580	37	NA	0.75	< 0.05	NA	NA	130	NA	NA	0.53
	03/13/03	170 J	24	NA	0.8	< 0.05	NA	NA	130	NA	NA	0.4
	12/04/02	210	24	NA	0.6	< 0.05	NA	NA	150	NA	NA	1.8
	09/03/02	100	< 10	NA	0.6	< 0.05	NA	NA	160	NA	NA	1.1
	06/04/02	310	76	NA	0.25	< 0.05	NA	NA	160	NA	NA	2.1
	03/12/02	190	< 10	NA	0.64	< 0.05	NA	NA	160	NA	NA	2.3
	12/03/01	< 100	< 10	NA	0.41 J	< 0.05 UJ	NA	NA	140	NA	NA	1.4
	08/28/01	420	< 10	NA	0.44	< 0.05	NA	NA	180	NA	NA	2.3
	05/17/01	200 J	< 10 UJ	NA	0.36	< 0.05	NA	NA	150	NA	NA	1.5
	05/17/99	< 100	92.3	NA	NA	NA	1.07	214	200	NA	NA	0.13
	02/15/99	< 100	45.5	NA	NA	NA	0.604	258.1	210	NA	NA	0.28
	11/16/98	< 100	32.1	NA	NA	NA	0.795	50.6	230	NA	NA	0.46
	08/14/98	< 100	31.2	NA	NA	NA	1.26	135.1	274	NA	NA	0.16
	04/14/98	< 100	77	NA	NA	NA	1	301	350	NA	NA	0.42
	01/13/98	< 100	140	NA	NA	NA	1.2	187	200	NA	NA	0.43
	11/10/97	< 100	60	NA	NA	NA	1.2	381	230	NA	NA	0.5
	08/11/97	< 100	50	NA	NA	NA	1.5	412	300	NA	NA	0.01
	05/13/97	< 100	20	NA	NA	NA	1.2	358	280	NA	NA	0.1
	02/12/97	< 100	140	NA	NA	NA	1	85	230	NA	NA	0.08
	12/05/96	< 100	20	NA	NA	NA	1.3	NA	210	NA	NA	NA
	08/28/96	< 100	40	NA	NA	NA	1.4	NA	340	NA	NA	NA
	05/30/96	< 100	40	NA	NA	NA	1.1	NA	260	NA	NA	NA
	03/05/96	< 100 U	62	NA	0.75	0.75	NA	NA	172	NA	NA	NA
	12/11/95	< 100	42	NA	0.73	0.73	NA	NA	191	NA	NA	NA
	09/11/95	< 100 U	36	NA	NA	NA	0.6	NA	200	NA	NA	NA
DAEGW04	03/16/05	110	1600	NA	1	< 0.05	NA	NA	63	NA	NA	0.1
	03/17/04	130	< 10	NA	1.3	< 0.05	NA	NA	79	NA	NA	0.7
	08/20/03	480	35	NA	1.9	< 0.05	NA	NA	82	NA	NA	2
	03/13/03	140 J	54	NA	3	< 0.05	NA	NA	75	NA	NA	0.9
	12/04/02	150	19	NA	2.4	< 0.05	NA	NA	67	NA	NA	2.8
	09/03/02	< 100	18	NA	2.4	< 0.05	NA	NA	59	NA	NA	0.8
	06/04/02	190	19	NA	2.2	< 0.05	NA	NA	64	NA	NA	2.4
	03/12/02	150	23	NA	4.7	< 0.05	NA	NA	70	NA	NA	3.2
DAEGW04	12/03/01	< 100	16	NA	3.5 J	< 0.05 UJ	NA	NA	63	NA	NA	NM
DUP1203011B	12/03/01	< 100	17	NA	3.6 J	< 0.05 UJ	NA	NA	62	NA	NA	NA
	08/29/01	130	12	NA	3 J-	< 0.05 R	NA	NA	60	NA	NA	2.8
	05/17/01	190 J	21 J	NA	2.9	< 0.05	NA	NA	57	NA	NA	6.1
	05/17/99	184	22.4	NA	NA	NA	1.75	242	56	NA	NA	7.09
	02/15/99	103	26.8	NA	NA	NA	2.18	177.8	48	NA	NA	7.2
	11/16/98	149	25.8	NA	NA	NA	2.49	111.2	40	NA	NA	6.83
	08/14/98	< 100	606	NA	NA	NA	1.91	55.2	45	NA	NA	10.26
	04/14/98	< 100	17	NA	NA	NA	1.6	271	51	NA	NA	6.43
	01/13/98	< 100	10	NA	NA	NA	1.8 (J16)	209	43 (J8)	NA	NA	6.63
	11/10/97	< 100	10	NA	NA	NA	2.3	391	46	NA	NA	7.87
	08/11/97	< 100	10	NA	NA	NA	1.5	404	32	NA	NA	6.01
	05/13/97	< 100	10	NA	NA	NA	1.8	380	37	NA	NA	6.32
	02/12/97	< 100	10	NA	NA	NA	2	37	63	NA	NA	6.82
	12/05/96	< 100	20	NA	NA	NA	3	NA	45	NA	NA	NA
	08/29/96	< 100	30	NA	NA	NA	1.4	NA	48	NA	NA	NA
	06/10/96	< 100	40	NA	NA	NA	1.9	NA	46	NA	NA	NA
	03/07/96	< 100 U	25	NA	2.06	NA	NA	NA	45	NA	NA	NA
	12/11/95	< 100	22	NA	2	NA	NA	NA	31	NA	NA	NA
	09/11/95	2600	76	NA	NA	NA	2.1	NA	44	NA	NA	NA
	11/09/94	NA	NA	NA	2.66	NA	NA	NA	50.2	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
DAEGW05	03/16/05	210	14	NA	1.8	< 0.05	NA	NA	110	NA	NA	0.2
DUP0316053A	03/16/05	230	13	NA	1.8	< 0.05	NA	NA	120	NA	NA	NA
	03/11/04	240	10	NA	1.3	< 0.05	NA	NA	130	NA	NA	0.8
	08/19/03	430	11	NA	0.8	< 0.05	NA	NA	140	NA	NA	0.6
	03/13/03	190 J	11	NA	1.3	< 0.05	NA	NA	120	NA	NA	1.2
	12/04/02	220	< 10	NA	1.1	< 0.05	NA	NA	120	NA	NA	1.9
	09/03/02	110	10	NA	1.1	< 0.05	NA	NA	130	NA	NA	1.1
	06/04/02	330	12	NA	1.4	< 0.05	NA	NA	140	NA	NA	2.2
	03/12/02	210	11	NA	1	< 0.05	NA	NA	150	NA	NA	NA
DUP0312023A	03/12/02	220	11	NA	1	< 0.05	NA	NA	150	NA	NA	1.5
	12/03/01	< 100	13	NA	0.13 J	< 0.05 UJ	NA	NA	150	NA	NA	1.2
	08/28/01	440	< 10	NA	0.91	< 0.05	NA	NA	160	NA	NA	0.5
	05/17/01	250 J	< 10 UJ	NA	0.84	< 0.05	NA	NA	150	NA	NA	3.2
	05/18/99	< 100	< 10	NA	NA	NA	< 2.53 (U4)	289.7	110	NA	NA	0.12
	03/15/99	< 100	< 10	NA	NA	NA	1.14	311.8	140	NA	NA	1.74
	11/17/98	< 100	11.9	NA	NA	NA	1.56	341.1	130	NA	NA	0.51
	08/17/98	< 100	< 10	NA	NA	NA	1.77 (J33)	144.5	95	NA	NA	0.87
	04/15/98	< 100 J	11	NA	NA	NA	1	321	110	NA	NA	0.27
	01/14/98	< 100	10	NA	NA	NA	2.1 (J16)	274	130	NA	NA	0.37
	11/11/97	< 100	< 10	NA	NA	NA	1.8	460	120	NA	NA	0.65
	08/12/97	< 100	< 10	NA	NA	NA	1.7	463	120	NA	NA	0.64
	05/14/97	< 100	10	NA	NA	NA	1.7	421	92	NA	NA	0.52
	02/13/97	200	< 10	NA	NA	NA	2	55	110	NA	NA	0.54
	12/06/96	< 100	< 10	NA	NA	NA	1.3 (J33)	NA	120	NA	NA	NA
	08/29/96	< 100	< 10	NA	NA	NA	1.8	NA	120	NA	NA	NA
	05/30/96	< 100	< 10	NA	NA	NA	2.6	NA	100	NA	NA	NA
	03/06/96	< 100 U	12	NA	2.67	NA	NA	NA	103	NA	NA	NA
	12/11/95	< 100	39	NA	1.4	NA	NA	NA	149	NA	NA	NA
	09/12/95	< 100 U	19	NA	NA	NA	1.4	NA	130	NA	NA	NA
	11/08/94	NA	NA	NA	3.55	NA	NA	NA	123	NA	NA	NA
	11/02/92	NA	NA	NA	NA	NA	3.6	NA	130	NA	NA	NA
DAEGW06	03/16/05	< 100	140	NA	< 0.05	< 0.05	NA	NA	7.8	NA	NA	0.7
	03/11/04	120	1900	NA	< 0.05	< 0.05	NA	NA	7.8	NA	NA	0.4
	08/20/03	280	< 10	NA	< 0.05	< 0.05	NA	NA	7.7	NA	NA	1.5
	03/12/03	< 100 UJ	800	NA	< 0.05	< 0.05	NA	NA	7.2	NA	NA	1.1
	12/04/02	130	330	NA	< 0.05	< 0.05	NA	NA	8.2	NA	NA	0.8
	09/03/02	< 100	< 10	NA	0.22	< 0.05	NA	NA	8.2	NA	NA	0.9
	06/04/02	120	< 10	NA	0.12	< 0.05	NA	NA	8.5	NA	NA	2.2
	03/12/02	100	220	NA	0.04 J	< 0.05	NA	NA	8.7	NA	NA	1
	12/03/01	< 100	140	NA	0.02 J J	< 0.05 UJ	NA	NA	9.5	NA	NA	2.4
	08/28/01	190	< 10	NA	0.06	< 0.05	NA	NA	8.6	NA	NA	1.4
DUP0517012A	05/17/01	120 J	< 10 UJ	NA	0.03 J	< 0.05	NA	NA	8.4	NA	NA	NA
	05/17/01	120 J	< 10 UJ	NA	0.03 J	< 0.05	NA	NA	8.3	NA	NA	1.9
	05/17/99	606	967	NA	NA	NA	0.057	234.9	< 20	NA	NA	3.12
	02/15/99	260	941	NA	NA	NA	0.485	216.3	< 25	NA	NA	0.64
	11/16/98	715	1190	NA	NA	NA	1.27	32.1	12	NA	NA	3.75 (J35)
	08/14/98	< 100	360	NA	NA	NA	0.082	72.3	13.5	NA	NA	0.9
	04/14/98	< 100	42	NA	NA	NA	0.057	365	< 20	NA	NA	3.25
	01/13/98	< 100	160	NA	NA	NA	0.3 (J 16)	227	10	NA	NA	1.11
	11/10/97	300	910	NA	NA	NA	< 0.1	441	9	NA	NA	0.65
	08/11/97	< 100	< 10	NA	NA	NA	0.2	419	18	NA	NA	2.37
	05/13/97	< 100	110	NA	NA	NA	0.25	355	9.6	NA	NA	2.02
	02/12/97	< 100	270	NA	NA	NA	0.13	145	9.7	NA	NA	0.63
	12/06/96	< 100	260	NA	NA	NA	0.2	NA	11	NA	NA	NA
	08/28/96	< 100	70	NA	NA	NA	0.22	NA	13	NA	NA	NA
	05/30/96	< 100	210	NA	NA	NA	< 0.05	NA	13	NA	NA	NA
	03/06/96	< 100 U	43	NA	0.16	NA	NA	NA	30	NA	NA	NA
	12/11/95	< 100	614	NA	0.24	NA	NA	NA	19	NA	NA	NA
	09/12/95	< 100 U	110	NA	NA	NA	0.24	NA	< 25	NA	NA	NA
	04/05/95	NA	NA	NA	0.201	NA	NA	NA	28	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
DAEGW07	03/18/05	260	30	NA	< 0.05	< 0.05	NA	NA	18	NA	NA	0.2
	03/17/04	< 100	18	NA	0.25	< 0.05	NA	NA	15	NA	NA	NA
DUP0317041A	03/17/04	130	40	NA	0.29	< 0.05	NA	NA	15	NA	NA	0.22
	03/19/03	< 100	< 10 UJ	NA	< 0.05	< 0.05	NA	NA	13	NA	NA	1.73
	03/11/02	100	< 10	NA	0.45	< 0.05	NA	NA	18	NA	NA	2
	05/18/99	< 100	10.1	NA	NA	NA	0.449	345.4	19	NA	NA	6.76
	03/15/99	< 100	30.4	NA	NA	NA	0.21	237.9	24	NA	NA	1.57
	04/15/98	< 100	120	NA	NA	NA	< 0.05	325	24	NA	NA	0.71
	01/14/98	< 100	< 10	NA	NA	NA	3.7 (J16)	NA	27	NA	NA	NA
	12/12/97	< 100	< 10	NA	NA	NA	0.73	416	31	NA	NA	4.81
	02/13/97	100	140	NA	NA	NA	0.13	74	29	NA	NA	0.95
	03/07/96	610	245	NA	< 0.05	NA	NA	NA	23	NA	NA	NA
	12/14/95	< 100	< 10	NA	1.8	NA	NA	NA	54	NA	NA	NA
	04/04/95	NA	NA	NA	< 0.2	NA	NA	NA	40.5	NA	NA	NA
DAEGW08	03/28/05	220	540	NA	< 0.05	< 0.05	NA	NA	180	NA	NA	3.1
	03/17/04	220	550	NA	< 0.05	< 0.05	NA	NA	180	NA	NA	0.7
	08/18/03	410	510	NA	0.47	< 0.05	NA	NA	150	NA	NA	0.3
	03/19/03	250	490 J	NA	< 0.05	< 0.05	NA	NA	150	NA	NA	0.2
	12/05/02	120	120	NA	0.99	< 0.05	NA	NA	69	NA	NA	0.3
	09/04/02	< 100	430	NA	0.33	< 0.05	NA	NA	130	NA	NA	0.2
	06/04/02	300	550	NA	< 0.05	< 0.05	NA	NA	160	NA	NA	1.4
	03/11/02	200	410	NA	< 0.05	< 0.05	NA	NA	170	NA	NA	0.6
	11/30/01	1100	32	NA	2.4	< 0.05	NA	NA	88	NA	NA	1.8
	08/29/01	360	180	NA	1.4	< 0.05	NA	NA	120	NA	NA	2
	05/16/01	470	210	NA	0.86	< 0.05	NA	NA	140	NA	NA	2.9
	05/18/99	< 100	285	NA	NA	NA	0.23	351.5	75	NA	NA	0.5
	02/16/99	< 100	< 10	NA	NA	NA	1.28	305.3	110	NA	NA	0.83
	11/17/98	< 100	10	NA	NA	NA	0.33	298.7	98	NA	NA	1.26
	08/17/98	< 100	70	NA	NA	NA	< 0.05	233.7	53	NA	NA	0.67
	04/15/98	< 100	71	NA	NA	NA	< 0.05	414	82	NA	NA	0.77
	01/14/98	< 100	< 10	NA	NA	NA	< 0.6	292	91	NA	NA	0.88
	11/11/97	< 100	10	NA	NA	NA	0.4	449	86	NA	NA	1.51
	08/12/97	< 100	< 10	NA	NA	NA	< 0.05	472	77	NA	NA	1.5
	05/14/97	< 100	80	NA	NA	NA	0.54	441	94	NA	NA	0.39
	02/13/97	< 100	50	NA	NA	NA	0.05	104	100	NA	NA	0.29
	12/06/96	< 100	< 10	NA	NA	NA	0.18	NA	120	NA	NA	NA
	08/29/96	< 100	60	NA	NA	NA	0.08	NA	90	NA	NA	NA
	06/10/96	< 100	50	NA	NA	NA	0.08	NA	170	NA	NA	NA
	03/07/96	< 100 U	30	NA	< 0.05	NA	NA	NA	234	NA	NA	NA
	12/14/95	< 100	36	NA	0.07	NA	NA	NA	96	NA	NA	NA
	09/12/95	< 100 U	24	NA	NA	NA	0.2	NA	170	NA	NA	NA
	04/03/95	NA	NA	NA	< 0.2	NA	NA	NA	128	NA	NA	NA
DAEGW101	05/26/05	320	270	NA	< 0.05	< 0.05	NA	NA	100	NA	NA	0.3
	03/16/05	370	56	NA	0.69	< 0.05	NA	NA	100	NA	NA	0.1
	12/15/04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NM
	08/12/04	350	170	NA	NA	NA	NA	NA	NA	NA	NA	0.25
	05/27/04	470	90	NA	0.95	< 0.05	NA	NA	100	NA	NA	1.7
	03/11/04	570	64	NA	1.7	0.28	NA	NA	110	NA	NA	0.3
	08/20/03	NA	NA	NA	2.2	0.2	NA	NA	130	NA	NA	0.6
	06/05/03	360	420	NA	1.3	< 0.05	NA	NA	120	NA	NA	0.8
	03/13/03	470 J	460	NA	< 0.05	< 0.05	NA	NA	120	NA	NA	1
DAEGW102	05/26/05	370	< 10	NA	0.21	< 0.05	NA	NA	290	NA	NA	1.1
	03/16/05	450	< 10	NA	0.22	< 0.05	NA	NA	320	NA	NA	3
	12/15/04	420	< 10	NA	0.28	< 0.05	NA	NA	260	NA	NA	0.8
	08/12/04	470	< 10	NA	0.37	< 0.05	NA	NA	290	NA	NA	2.7
	05/27/04	560	< 10	NA	0.39	< 0.05	NA	NA	320	NA	NA	2.3
	03/15/04	380	< 10	NA	0.47	< 0.1	NA	NA	300	NA	NA	1.2
	12/04/03	720	48	NA	0.64	< 0.1	NA	NA	260	NA	NA	0.8
	08/19/03	1300	130	NA	0.91 J-	< 0.1 UJ	NA	NA	410	NA	NA	1.6
	06/04/03	390	320	NA	1	< 0.25	NA	NA	340	NA	NA	2
	03/12/03	540 J	510	NA	0.96	< 0.1	NA	NA	270	NA	NA	2.4

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
DAEGW103	05/26/05	< 100	< 10	NA	4.1	< 0.05	NA	NA	70	NA	NA	5.5
	03/17/05	120	< 10	NA	3.9	< 0.05	NA	NA	71	NA	NA	6.8
DUP0317053A	03/17/05	120	< 10	NA	3.9	< 0.05	NA	NA	69	NA	NA	NA
DAEGW103CL	03/17/05	< 100 U	< 10 U	NA	4.09	< 0.1 U	NA	NA	68	NA	NA	NA
	12/15/04	< 100	< 10	NA	4.2	< 0.05	NA	NA	72	NA	NA	6
DUP1215042A	12/15/04	110	< 10	NA	4.2	< 0.05	NA	NA	71	NA	NA	NA
DAEGW103CL	12/15/04	< 100 U	< 10 U	NA	NA	NA	4.14	NA	71.8	NA	NA	NA
	08/11/04	< 100	< 10	NA	3.9	< 0.05	NA	NA	70	NA	NA	6.92
DUP0811042B	08/11/04	< 100	< 10	NA	3.9	< 0.05	NA	NA	69	NA	NA	NA
DAEGW103CL	08/11/04	< 10	0.12 J	NA	NA	NA	3.3 J-	NA	66	NA	NA	NA
	05/28/04	< 100	< 10	NA	3.8	< 0.05	NA	NA	72	NA	NA	4.8
DUP0528041A	05/28/04	< 100	< 10	NA	3.8	< 0.05	NA	NA	73	NA	NA	NA
DAEGW103CL	05/28/04	850	< 5	NA	3.9	< 0.05	3.9	NA	74 D	NA	NA	NA
	03/10/04	110	< 10	NA	4	< 0.05	NA	NA	77	NA	NA	1.8
DUP0310043B	03/10/04	110	< 10	NA	4	< 0.05	NA	NA	77	NA	NA	NA
DAEGW103CL	03/10/04	< 500	< 5	NA	4	0.068	4.1 HT-04	NA	71	NA	NA	NA
	12/04/03	140	< 10	NA	4	< 0.05	NA	NA	72	NA	NA	3.8
DUP1204033A	12/04/03	140	< 10	NA	4.1	< 0.05	NA	NA	72	NA	NA	NA
DAEGW103CL	12/04/03	< 500	< 5	NA	4.5 J-	< 0.05	4.5 J-	NA	75.2	NA	NA	NA
	08/19/03	210	< 10	NA	3.9 J-	< 0.05 UJ	NA	NA	89	NA	NA	2.2
DUP0819033B	08/19/03	210	< 10	NA	3.9 J-	< 0.05 UJ	NA	NA	91	NA	NA	NA
DAEGW103CL	08/19/03	< 500 UJ	< 5	NA	4.2 J-	< 0.05	4.2 J-	NA	70	NA	NA	NA
	06/04/03	< 100	< 10	NA	4.2	< 0.05	NA	NA	78	NA	NA	4.8
DUP0604033A	06/04/03	< 100	< 10	NA	4.2	< 0.05	NA	NA	78	NA	NA	NA
DAEGW103CL	06/04/03	< 500	< 5	NA	4.1 J-	< 0.05	4.1 HT-04 J-	NA	65	NA	NA	NA
	03/13/03	110 J	< 10	NA	4.2	< 0.05	NA	NA	76	NA	NA	6.1
DUP0313033A	03/13/03	< 100 UJ	< 10	NA	4.3	< 0.05	NA	NA	72	NA	NA	NA
DAEGW103CL	03/13/03	< 500	< 5	NA	3.8	0.082 J-	3.9	NA	67	NA	NA	NA
	11/25/02	42000	920 J-	NA	NA	NA	NA	NA	74	NA	NA	NA
DAEGW104	05/26/05	< 100	< 10	NA	< 0.05	< 0.05	NA	NA	26	NA	NA	0.5
DUP0526052A	05/26/05	< 100	< 10	NA	< 0.05	< 0.05	NA	NA	26	NA	NA	NA
DAEGW104CL	05/26/05	< 100 U	< 10 U	NA	1	< 1 U	NA	NA	25	NA	NA	NA
	03/16/05	120	< 10	NA	0.06	< 0.05	NA	NA	14	NA	NA	0.3
	12/15/04	< 100	260	NA	0.07	< 0.05	NA	NA	11	NA	NA	0.9
	08/12/04	< 100	190	NA	0.05	< 0.05	NA	NA	10	NA	NA	0.32
	05/27/04	120	120	NA	0.07	< 0.05	NA	NA	11	NA	NA	1.4
	03/15/04	< 100	41	NA	< 0.05	< 0.05	NA	NA	11	NA	NA	0.8
	12/04/03	140	75	NA	0.13	< 0.05	NA	NA	11	NA	NA	0.9
	08/19/03	250	48	NA	0.07 J-	< 0.05 UJ	NA	NA	12	NA	NA	0.6
DUP0819033A	08/19/03	280	330	NA	< 0.05 UJ	< 0.05 UJ	NA	NA	11	NA	NA	NA
	06/04/03	< 100	290	NA	0.19	< 0.05	NA	NA	12	NA	NA	1.1
	03/12/03	120 J	190	NA	< 0.05	< 0.05	NA	NA	12	NA	NA	1.8
	11/25/02	130,000	1900 J-	NA	NA	NA	NA	NA	48	NA	NA	NA
DAESP03	03/22/05	13,000	19	NA	1.6	< 0.05	NA	NA	9.5	NA	NA	9.8
	03/22/05	350	150	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/28/01	1,100	18	NA	1	< 0.05	NA	NA	7.8	NA	NA	NA
DUP112801	12/28/01	900	17	NA	1	< 0.05	NA	NA	7.8	NA	NA	NA
Petroleum Release Sites												
Building 1065/1027												
1047MW101	04/06/05	< 100	< 10	NA	0.13	< 0.05	NA	NA	5.1	< 0.04 UJ	NA	1.1
	03/11/04	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.39
1065MW101	05/26/05	19,000	100	14	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	51	0.3
DUP0526051B	05/26/05	19,000	100	13	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	51	NA
1065MW101CL	05/26/05	17,700	86.8	10	< 0.1 U	< 1 U	NA	NA	< 1 U	0.14 J-	34.7	NA
	03/29/05	19,000	130	15	< 0.05	< 0.05	NA	NA	0.98	0.06	34	0.2
	12/17/04	13,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3
	08/11/04	4,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
1065MW102	05/24/05	550	220	2.9	0.07	< 0.05	NA	NA	31	2.4	12	1.3
	03/29/05	370	220	1.5	0.2	< 0.05	NA	NA	33	0.11	8.3	1
	12/15/04	570	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
	08/11/04	150	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
1065MW10A	04/11/05	16,000	560	NA	< 0.05	< 0.05	NA	NA	46	< 0.04	NA	0.8
1065MW10B	04/11/05	< 100	< 10	NA	4.9	< 0.05	NA	NA	67	< 0.04	NA	2.6
1065MW11A	04/11/05	< 100	< 10	NA	2.9	< 0.05	NA	NA	84	< 0.04	NA	1.2
1065MW11B	04/11/05	< 100	< 10	NA	3.6	< 0.05	NA	NA	82	< 0.04	NA	2.2
	03/09/04	< 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.91

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
1065MW9A	05/24/05	3,500	540	4.7	< 0.05	< 0.05	NA	NA	21	< 0.04	3	0.7
	04/06/05	6,100	500	9.2	< 0.05	< 0.05	NA	NA	17	< 0.04 UJ	2.9	1.1
DUP0406052A	04/06/05	3,600	450	9.2	< 0.05	< 0.05	NA	NA	15	< 0.04 UJ	2.7	NA
	12/17/04	5,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.85
	08/13/04	5,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3
1065MW9B	05/24/05	< 100	< 10	NA	5	< 0.05	NA	NA	65	< 0.04	NA	0.7
	04/06/05	< 100	< 10	NA	5.3	< 0.05	NA	NA	67	< 0.04 UJ	NA	2.1
	12/17/04	< 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6
	08/13/04	< 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.6
	05/27/04	< 100	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.76
1065PZ1A	06/02/05	25000	160	10	< 0.05	< 0.05	NA	NA	4.7	< 0.04	20	0.29
	03/29/05	10000	54	4	0.37	< 0.05	NA	NA	32	< 0.04	11	0.4
	12/17/04	280	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.9
	03/08/99	7,990	95	7	1.7	NA	NA	-62.3	15	NA	NA	0.56
	11/30/98	14,200	127	10	0.46	NA	NA	197	< 0.5	NA	NA	2.98
	08/26/98	6,360	135	8.6	< 0.4	NA	NA	-167	< 5	NA	NA	1.75
	06/10/98	10,700	134	4.4	0.995	NA	NA	382	9.18	NA	NA	1.31
	03/16/98	1,340	125	3.3	2.84	NA	NA	-159	27.9	NA	NA	2.99
	12/18/97	9,740	226	13.4	0.013	NA	NA	118	1.08	NA	NA	0.61
	09/17/97	9,480	284	15.5 D	0.678	NA	NA	133	38.6	NA	NA	0.87
1065PZ1B	05/24/05	270	86	NA	< 0.05	< 0.05	NA	NA	55	0.05	NA	0.7
DUP0524052A	05/24/05	240	87	NA	0.05	< 0.05	NA	NA	57	< 0.04	NA	NA
	04/05/05	430	80	NA	0.09	< 0.05	NA	NA	57	< 0.04	NA	0.9
	12/17/04	< 100 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7
	08/13/04	310	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8
	05/27/04	330	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.56
	05/27/99	NA	NA	NA	NA	NA	NA	-223.9	NA	NA	NA	0.59
	03/08/99	< 100	63.4	NA	< 0.08	NA	NA	-155.2	67	NA	NA	0.19
	11/30/98	141	71.6	0.079	0.12	NA	NA	-188.9	82	NA	NA	0.21
	08/26/98	119	66.1	0.0097	< 0.5	NA	NA	NA	66	NA	NA	NA
	08/26/98	119	66.1	0.0097	< 0.5	NA	NA	-238.4	66	NA	NA	0.16
	06/10/98	118	65	0.0017	0.051	NA	NA	295	62.7	NA	NA	0.14
	03/16/98	< 100	66	0.0284 D	0.02	NA	NA	-114	63.8 D	NA	NA	0.51
	12/18/97	105	76.4	0.196 D	< 0.01	NA	NA	23	71.4 D	NA	NA	0.29
	09/17/97	< 100	62.6	0.0559 D	0.09	NA	NA	218	72 D	NA	NA	0.6
1065PZ2A	05/24/05	17,000	1,000	12	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	12	0.2
	04/01/05	9,600	560 J	4.8	0.13	< 0.05	NA	NA	33	< 0.04	7.8	0.2
DUP0401052A	04/01/05	8,600	590 J	4.3	0.16	< 0.05	NA	NA	35	< 0.04	7.8	NA
	12/15/04	3,300	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
	03/03/99	8,800	855	7	< 0.04	NA	NA	230	12	NA	NA	0.79
	11/24/98	13,700	843	6.6	1.1	NA	NA	283.3	26	NA	NA	1.02
	08/25/98	8,580	891	12	< 1	NA	NA	-191.2	< 13	NA	NA	0.34
	06/09/98	14,400	845	9 D	0.074	NA	NA	355	2.22	NA	NA	0.39
	03/12/98	13,900	1,450	4.29 D	0.012	NA	NA	248	1.67	NA	NA	1.02
	12/17/97	15,100	949	18.1 D	0.01	NA	NA	308	1.84	NA	NA	0.47
	09/16/97	11,400	1040	8.4 D	< 0.01	NA	NA	344	4.34	NA	NA	1
1065PZ2B	04/05/05	150	< 10	NA	2.6	0.06	NA	NA	50	< 0.04	NA	0.9
	05/25/99	NA	NA	NA	NA	NA	NA	193.5	NA	NA	NA	1.87
	03/03/99	< 100	12	< 0.003	5.2	NA	NA	39.6	52	NA	NA	0.77
	11/24/98	< 100	20.2	< 0.003	5.1	NA	NA	33.4	58	NA	NA	0.61
	08/25/98	< 100	11.6	0.0041	3.9	NA	NA	-65.1	43	NA	NA	0.53
	06/09/98	< 100	15.8	0.0008	4.56	NA	NA	310	48.5	NA	NA	0.53
	03/12/98	< 100	25.9	< 0.0005	4.57 D	NA	NA	250	51.2 D	NA	NA	0.59
	12/17/97	< 100	38.9	0.0007	4.82	NA	NA	386	61.8 D	NA	NA	0.71
	09/16/97	< 100	56.2	0.0214 D	4.46 D	NA	NA	286	61.1 D	NA	NA	0.31
1065PZ3A	04/05/05	430	< 10	NA	1	< 0.05	NA	NA	78	< 0.04	NA	3.4
DUP0405052A	04/05/05	410	< 10	NA	1	< 0.05	NA	NA	78	< 0.04	NA	NA
1065PZ3ACL	04/05/05	< 100 U	< 10 U	NA	1.03	< 0.02 U	NA	NA	79	< 0.04 U	NA	NA
	05/24/99	NA	NA	NA	NA	NA	NA	262.4	NA	NA	NA	8.59
	03/01/99	< 100	< 10	< 0.003	1	NA	NA	233.8	32	NA	NA	7.59
	11/23/98	< 100	< 10	< 0.003	3.2	NA	NA	NA	38	NA	NA	NA
	08/24/98	< 100	< 10	< 0.003	1	NA	NA	188.4	19	NA	NA	7.52
	06/08/98	< 100	< 10	< 0.0006	1.42	NA	NA	339	14.3	NA	NA	5.6
	03/11/98	< 100	< 10	< 0.0005	1.1 D	NA	NA	341	26.4 D	NA	NA	4.69
	12/16/97	< 100	< 10	< 0.0005	2.06	NA	NA	401	43.2 D	NA	NA	5.03

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
1065PZ3B	04/06/05	< 100	< 10	NA	2.1	< 0.05	NA	NA	83	< 0.04 UJ	NA	2.2
	05/24/99	NA	NA	NA	NA	NA	NA	268.6	NA	NA	NA	2.4
	03/01/99	< 100	< 10	< 0.003	3.7	NA	NA	181.4	100	NA	NA	2.09
	11/23/98	< 100	< 10	< 0.003	1.3	NA	NA	231	36	NA	NA	1.96
	08/24/98	< 100	< 10	< 0.003	3.1	NA	NA	199.7	78	NA	NA	2.51
	06/08/98	< 100	< 10	< 0.0005	3.82 D	NA	NA	352	89.5 D	NA	NA	2.31
	03/11/98	< 100	< 10	< 0.0005	3.54 D	NA	NA	338	76.2 D	NA	NA	2.7
	12/16/97	< 100	< 10	< 0.0005	4.02	NA	NA	394	85.2 D	NA	NA	3.02
	09/15/97	< 100	< 10	0.0063	3.68 D	NA	NA	368	64.4 D	NA	NA	3.09
1065PZ4A	06/02/05	23000	1600	12	< 1.3	< 1.3	NA	NA	< 13	< 0.04	9.3 J+	0.28
	04/01/05	20000	1400 J	11	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	6.2	0.1
	05/27/99	NA	NA	NA	NA	NA	NA	-183	NA	NA	NA	0.62
	03/08/99	12800	1140	3.4	< 0.04	NA	NA	-159.5	34	NA	NA	0.17
	12/01/98	23700	2050	6.9	< 0.04	NA	NA	-165.5	18	NA	NA	0.21
	08/27/98	16500	1670	9.6	< 0.5	NA	NA	-249.1	33	NA	NA	0.17
	06/11/98	14300	1600	3.3 D	< 0.05	NA	NA	421	38.9	NA	NA	1.99 (J35)
	03/17/98	14700	1790	2.47 D	0.01	NA	NA	337	39.3 D	NA	NA	0.63
	12/22/97	25600	2800	14 D	0.015	NA	NA	351	25.8 D	NA	NA	0.31
	09/18/97	22800	2490	13.5 D	0.034	NA	NA	268	31.7 D	NA	NA	0.39
1065PZ4B	04/05/05	150	< 10	NA	4.7	< 0.05	NA	NA	59	< 0.04	NA	3.2
	05/27/99	NA	NA	NA	NA	NA	NA	101.9	NA	NA	NA	1.47
	03/08/99	< 100	12.8	0.057	4.2	NA	NA	-25.9	64	NA	NA	1.22
	12/01/98	< 100	25.3	0.14	5.1	NA	NA	-155.9	71	NA	NA	1.17
	08/27/98	< 100	29.8	0.036	4.3	NA	NA	-58.7	58	NA	NA	1.9
	06/11/98	< 100	30.7	0.001	4.51	NA	NA	446	59.9	NA	NA	2.13
	03/17/98	< 100	35	< 0.0005	4.56 D	NA	NA	335	60.2 D	NA	NA	1.2
	12/22/97	< 100	27	0.0721 D	5.04 D	NA	NA	374	71.7 D	NA	NA	1.22
	09/18/97	< 100	64.7	0.133 D	4.6 D	NA	NA	299	64.2 D	NA	NA	1.5
1065PZ5AR	05/24/05	NA	NA	6.9	< 0.05	< 0.05	NA	NA	5.3	< 0.04	57	0.5
	04/11/05	32,000	2,600	12	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	47	0.1
1065PZ5B	04/11/05	< 100	< 10	NA	3.5	< 0.05	NA	NA	75	< 0.04	NA	3
	05/25/99	NA	NA	NA	NA	NA	NA	-17.9	NA	NA	NA	2.51
	03/03/99	< 100	14.7	< 0.003	4.3	NA	NA	12.2	54	NA	NA	2.46
	11/24/98	< 100	32.4	< 0.003	4.4	NA	NA	5.4	48	NA	NA	2.62
	08/25/98	< 100	25.6	< 0.003	3.2	NA	NA	7	33	NA	NA	3.46
	06/09/98	< 100	23.8	0.0008	3.49	NA	NA	369	35.3	NA	NA	2.65
	03/12/98	< 100	25.1	< 0.0005	3.49 D	NA	NA	329	39.7 D	NA	NA	2.22
	12/17/97	< 100	63.4	< 0.0005	4.3	NA	NA	355	46.9 D	NA	NA	2.59
	09/16/97	< 100	53.4	0.0148	4.48 D	NA	NA	277	49.4 D	NA	NA	2.1
1065PZ6A	04/11/05	< 100	< 10	NA	4	< 0.05	NA	NA	100	< 0.04	NA	2.3
	05/24/99	NA	NA	NA	NA	NA	NA	296.8	NA	NA	NA	5.36
	05/24/99	NA	NA	NA	NA	NA	NA	296.8	NA	NA	NA	5.36
	03/01/99	< 100	< 10	< 0.003	5.4	NA	NA	159.4	95	NA	NA	5.35
	11/23/98	< 100	< 10	< 0.003	5.9	NA	NA	251.7	110	NA	NA	4.63
	08/24/98	< 100	< 10	< 0.003	4.2	NA	NA	174.8	75	NA	NA	5.09
	06/08/98	< 100	< 10	< 0.0005	18.2 D	NA	NA	353	92.7 D	NA	NA	4.28
	03/11/98	< 100	< 10	< 0.0005	4.63 D	NA	NA	347	87 D	NA	NA	5.17
	12/16/97	< 100	10.2	< 0.0005	6 D	NA	NA	412	93.9 D	NA	NA	4.44
	09/15/97	< 100	< 10	0.0006	5.58 D	NA	NA	386	97.5 D	NA	NA	3.51
1065PZ6B	04/05/05	260	< 10	NA	3.6	< 0.05	NA	NA	94	< 0.04	NA	1.1
	05/24/99	NA	NA	NA	NA	NA	NA	281.3	NA	NA	NA	3.09
	03/01/99	< 100	< 10	< 0.003	5	NA	NA	155.8	66	NA	NA	2.67
	11/23/98	< 100	< 10	< 0.003	4.9	NA	NA	232.2	70	NA	NA	2.8
	08/24/98	< 100	< 10	< 0.003	4.1	NA	NA	190.7	57	NA	NA	2.9
	06/08/98	< 100	< 10	0.0009	5.01 D	NA	NA	394	72.5 D	NA	NA	2.77
	03/11/98	< 100	< 10	< 0.0005	4.9 D	NA	NA	354	72 D	NA	NA	2.87
	12/16/97	< 100	< 10	0.0008	5.58 D	NA	NA	427	81 D	NA	NA	2.57
	09/15/97	< 100	12.2	0.0109	5.11 D	NA	NA	380	80.7 D	NA	NA	2.21

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
1065PZ7A	04/06/05	< 100	< 10	NA	2.9	< 0.05	NA	NA	62	< 0.04 UJ	NA	1.1
	05/27/99	NA	NA	NA	NA	NA	NA	-101.8	NA	NA	NA	5.58 (J35)
	03/08/99	< 100	< 10	< 0.003	0.24	NA	NA	245.1	35	NA	NA	2.27
	03/08/99	NA	NA	NA	0.24	NA	NA	245.1	35	NA	NA	2.27
	12/01/98	< 100	< 10	< 0.003	0.42	NA	NA	-109.1	31	NA	NA	2.21
	12/01/98	NA	NA	NA	0.42	NA	NA	-109.1	31	NA	NA	2.21
	08/26/98	< 100	< 10	< 0.003	0.33	NA	NA	-64.6	32	NA	NA	1.61
	08/26/98	NA	NA	NA	0.33	NA	NA	-64.6	32	NA	NA	1.61
	06/10/98	< 100	< 10	< 0.0005	0.717	NA	NA	300	38.8	NA	NA	0.99
	06/10/98	NA	NA	NA	0.717	NA	NA	300	38.8	NA	NA	0.99
	03/16/98	NA	12.6	< 0.0005	0.744 D	NA	NA	104	38.2 D	NA	NA	2.89
	03/16/98	NA	NA	NA	0.744 D	NA	NA	104	38.2 D	NA	NA	2.89
	12/18/97	< 100	< 10	< 0.0005	0.633	NA	NA	281	41.1 D	NA	NA	1.5
	09/17/97	< 100	< 10	< 0.0005	0.011	NA	NA	271	1.69	NA	NA	1.22
	09/17/97	NA	NA	NA	0.011	NA	NA	271	1.69	NA	NA	1.22
1065PZ7B	04/06/05	< 100	< 10	NA	3.2	< 0.05	NA	NA	110	0.06 J-	NA	1.3
	05/27/99	NA	NA	NA	NA	NA	NA	-5	NA	NA	NA	3.66
	03/08/99	< 100	< 10	< 0.003	2.6	NA	NA	241.7	57	NA	NA	3
	12/01/98	< 100	< 10	< 0.003	2.5	NA	NA	-86.2	61	NA	NA	3.65
	08/26/98	< 100	< 10	< 0.003	2.9	NA	NA	7.4	58	NA	NA	3.11
	06/10/98	< 100	< 10	0.0007	2.79	NA	NA	351	66.3	NA	NA	2.45
	03/16/98	< 100	< 10	< 0.0005	3.28 D	NA	NA	176	71.2 D	NA	NA	3.91
	12/18/97	< 100	< 10	0.0033	3.27	NA	NA	335	81.8 D	NA	NA	2.31
	09/17/97	< 100	< 10	0.0166	3.42 D	NA	NA	323	72.3 D	NA	NA	2.14
Building 1349												
1349MW01	03/21/05	220	< 10	NA	2.1	< 0.1	NA	NA	230	NA	NA	0.3
	03/15/04	270	< 10	NA	2.2	< 0.1	NA	NA	250	NA	NA	0.39
	12/02/03	370	< 10	NA	2.2	< 0.05	NA	NA	220	NA	NA	1.1
	08/21/03	610	< 10	NA	1.8	< 0.1	NA	NA	220	NA	NA	1.42
	06/10/03	150	12	NA	2.1	< 0.1	NA	NA	230	NA	NA	1.29
	03/12/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.59
	12/09/02	330	10 J	NA	1.7	< 0.1	NA	NA	210	NA	NA	0.76
DUP1209021A	12/09/02	320	12 J	NA	1.8	< 0.1	NA	NA	220	NA	NA	NA
1349MW01CL	12/09/02	< 150	11	NA	1.4 J-	< 0.05 UJ	1.4 J-	NA	220	NA	NA	NA
	08/28/02	180	< 10	NA	1.7	< 0.05	NA	NA	240	NA	NA	1.34
	05/30/02	200	< 10	NA	1.7	< 0.05	NA	NA	230	NA	NA	1.37
	03/06/02	480	< 10	NA	1.8	< 0.05	NA	NA	250	NA	NA	2.13
	11/28/01	< 100	15	NA	1.8	< 0.05	NA	NA	240	NA	NA	1.36
	08/30/01	300	15	NA	1.3	NA	NA	NA	180	NA	NA	0.61
DUP0830013A	08/30/01	300	15	NA	1.2	< 2.5	NA	NA	180	NA	NA	0.61
1349MW01CL	08/30/01	< 200	16	NA	1.4	< 1	NA	NA	210	NA	NA	0.61
	05/10/01	840	11	NA	1.4	< 0.05	NA	NA	220	NA	NA	1.45
	05/19/99	< 100 B	< 10 B	NA	NA	NA	0.537	314.1	188 Q	NA	NA	0.83
	02/19/99	< 100	< 10	NA	NA	NA	0.641	122.6	192	NA	NA	1.83
	11/18/98	< 100	< 10	NA	NA	NA	0.62	NA	205	NA	NA	NA
	08/18/98	< 100	< 10	NA	NA	NA	0.404	126.9	161	NA	NA	2.24
	04/16/98	< 100	< 10	NA	NA	NA	0.715	371	221	NA	NA	2.89
	01/22/98	< 100	13.4	NA	NA	NA	0.416	NA	159	NA	NA	NA
	10/30/97	< 100	24.2	NA	0.478	NA	0.368	NA	158	NA	NA	NA
	07/31/97	< 100	14.2	0.006	0.532 D	NA	0.617	398	192 D	NA	NA	0.5
	05/01/97	< 100 J	29	0.0012	0.451 D	NA	NA	440	190 D	NA	NA	1.17
	02/10/97	< 100	34	0.0009	0.635 D	NA	< 0.05 J	255	262 D	NA	NA	1.26
1349MW02	05/25/05	< 100	< 10	NA	1.2	< 0.1	NA	NA	68	NA	NA	0.5
	03/21/05	350	< 10	NA	1.3	< 0.1	NA	NA	67	NA	NA	0.1
	12/16/04	190	< 10	NA	1.6	< 0.1	NA	NA	66	NA	NA	0.8
	08/12/04	NA	NA	NA	1.5	< 0.1	NA	NA	64	NA	NA	0.4
	05/26/04	NA	NA	NA	1.3	< 0.1	NA	NA	64	NA	NA	0.59
	03/15/04	190	< 10	NA	1.4	< 0.1	NA	NA	66	NA	NA	0.44
	12/02/03	220	< 10	NA	1.6	< 0.05	NA	NA	64	NA	NA	0.6
	08/13/03	300	< 10	NA	1.3 b J-	< 0.5 UJ	NA	NA	73	NA	NA	1.6
	06/05/03	150	< 10	NA	1.6	< 0.1	NA	NA	62	NA	NA	1.3
DUP0605032A	06/05/03	100	< 10	NA	1.6	< 0.1	NA	NA	62	NA	NA	NA
	03/12/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
1349MW02	12/04/02	160	< 10	NA	1.7	< 0.1	NA	NA	62	NA	NA	1.8
DUP1204023A	12/04/02	160	< 10	NA	1.7	< 0.1	NA	NA	63	NA	NA	NA
	08/28/02	< 100	< 10	NA	1.6	< 0.05	NA	NA	68	NA	NA	1
	05/30/02	< 100	< 10	NA	1.6	< 0.05	NA	NA	60	NA	NA	0.7
	03/06/02	310	< 10	NA	1.6	< 0.05	NA	NA	58	NA	NA	1.2
DUP0306022A	03/06/02	310	< 10	NA	1.6	< 0.05	NA	NA	59	NA	NA	NA
	11/28/01	< 100	< 10	NA	1.7	< 0.05	NA	NA	60	NA	NA	2.25
DUP1128011A	11/28/01	< 100	< 10	NA	1.8	< 0.05	NA	NA	56	NA	NA	NA
	08/30/01	150	< 10	NA	1.7	< 0.05	NA	NA	64	NA	NA	NM
	08/30/01	150	< 10	NA	1.7	< 0.05	NA	NA	64	NA	NA	NM
DUP0830012A	08/30/01	150	< 10	NA	1.7	< 0.05	NA	NA	63	NA	NA	NA
	05/10/01	390	< 10	NA	1.7	< 0.05	NA	NA	62	NA	NA	1.3
	05/19/99	< 100	< 10 B	NA	NA	NA	1.58	343.7	76.3 Q	NA	NA	0.51
	02/19/99	< 100	< 10	NA	NA	NA	1.29	134.3	80.1	NA	NA	0.6
	11/18/98	< 100	< 10	NA	NA	NA	1.22	240.7	69.4	NA	NA	0.71
	08/18/98	< 100	< 10	NA	NA	NA	1.24	215	68.5	NA	NA	0.39
	04/16/98	< 100	< 10	NA	NA	NA	1.23	286	64.3	NA	NA	0.9
	01/22/98	< 100	< 10	NA	NA	NA	1.12	220	59.7	NA	NA	1.34
	10/30/97	< 100	< 10	0.0007	1.3	NA	1.21	371	72.3 D	NA	NA	0.33
	07/31/97	< 100	< 10	< 0.0005	1.29 D	NA	1.2	378	72.6 D	NA	NA	0.62
	05/01/97	< 100 J	< 10 J	0.0008	1.18 D	NA	NA	314	61 D	NA	NA	0.31
	05/01/97	< 50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/10/97	< 100	19.7	0.04 D	0.924 D	NA	1.3	82	52 D	NA	NA	0.5
1349MW02CL	08/30/01	< 200	< 5	NA	1.5	< 1	NA	NA	56	NA	NA	NA
1349MW03R	05/25/05	< 100	< 10	NA	6.3	< 0.1	NA	NA	84	NA	NA	0.6
	03/21/05	180	< 10	NA	5.4	< 0.1	NA	NA	130	NA	NA	7.7
	12/16/04	< 100	< 10	NA	5.2	< 0.05	NA	NA	29	NA	NA	4.8
	08/10/04	NA	NA	NA	4.6	< 0.05	NA	NA	30	NA	NA	3.94
	05/26/04	NA	NA	NA	4.5	< 0.05	NA	NA	31	NA	NA	5.7
	03/09/04	< 100	< 10	NA	4.5	< 0.05	NA	NA	33	NA	NA	7.08
	12/02/03	< 100	< 10	NA	4.8	< 0.05	NA	NA	22	NA	NA	5.2
	08/13/03	120	< 10	NA	4.5 b J-	< 0.25 UJ	NA	NA	32	NA	NA	4.8
	06/09/03	< 100	< 10	NA	4.7	0.1	NA	NA	33	NA	NA	2.6
1349MW100	05/25/05	33,000	16,000	NA	< 0.05	< 0.1	NA	NA	35	NA	NA	0.3
	03/23/05	31,000	13,000	NA	< 0.05	< 0.1	NA	NA	37	NA	NA	0.1
	12/16/04	39,000	18,000	NA	< 0.05	< 0.25	NA	NA	< 0.5	NA	NA	0.2
	08/10/04	NA	NA	NA	< 0.05	< 0.1	NA	NA	0.51	NA	NA	0.7
	05/27/04	NA	NA	NA	< 0.05	< 0.1	NA	NA	2	NA	NA	0.55
	03/16/04	30,000	16,000	NA	< 0.05	< 0.1	NA	NA	10	NA	NA	0.37
	12/02/03	36,000	15,000	NA	< 0.1	< 0.1	NA	NA	< 1	NA	NA	1
	08/12/03	21,000	160	NA	< 0.25	< 0.25	NA	NA	< 2.5	NA	NA	0.5
	06/09/03	25,000	14,000	NA	< 0.25	< 0.25	NA	NA	3.5	NA	NA	1.8
	03/12/03	13,000	14,000	NA	< 0.1	< 0.1	NA	NA	7.7	NA	NA	0.6
	12/10/02	4,600	6,600 J	NA	< 0.1	< 0.1	NA	NA	9.2	NA	NA	0.9
1349MW101	05/25/05	< 100	< 10	NA	2.3	< 0.05	NA	NA	15	NA	NA	0.4
DUP0525052A	05/25/05	< 100	< 10	NA	2.3	< 0.05	NA	NA	15	NA	NA	NA
	03/21/05	< 100	< 10	NA	3	< 0.05	NA	NA	18	NA	NA	0.2
	12/15/04	< 100	< 10	NA	2.8	< 0.05	NA	NA	17	NA	NA	0.3
	03/09/04	< 100	< 10	NA	3.5	< 0.05	NA	NA	19	NA	NA	3.52
	12/02/03	< 100	24	NA	2.4	< 0.05	NA	NA	19	NA	NA	1.4
	08/19/03	120	19	NA	2.5	< 0.05	NA	NA	25	NA	NA	1.7
	06/09/03	< 100	< 10	NA	4.3	0.13	NA	NA	38	NA	NA	1.1
1349MW102	05/25/05	< 100	< 10	NA	2.8	< 0.05	NA	NA	95	NA	NA	0.5
	03/21/05	170	62	NA	1.8	< 0.05	NA	NA	79	NA	NA	0.4
DUP0321053A	03/21/05	170	48	NA	2	< 0.05	NA	NA	79	NA	NA	NA
	12/16/04	210	410	NA	0.71	< 0.05	NA	NA	47	NA	NA	1.08
	08/10/04	NA	NA	NA	0.8	< 0.05	NA	NA	42	NA	NA	1.54
DUP0810042A	08/10/04	NA	NA	NA	0.54	< 0.05	NA	NA	41	NA	NA	NA
	05/27/04	NA	NA	NA	0.52	< 0.05	NA	NA	44	NA	NA	1.1
DUP0527041A	05/27/04	NA	NA	NA	0.74	< 0.05	NA	NA	47	NA	NA	NA
1349MW102CL	05/27/04	NA	NA	NA	0.6	< 0.05	0.6	NA	18 D	NA	NA	NA
	03/10/04	290	430	NA	0.4	< 0.05	NA	NA	48	NA	NA	0.5
DUP0310041A	03/10/04	260	400	NA	0.4	< 0.05	NA	NA	47	NA	NA	NA
1349MW102CL	03/10/04	640	420	NA	0.45 J	< 0.05 UJ	0.45 HT-04 J	NA	44	NA	NA	NA
	12/10/03	420	550	NA	0.09	< 0.05	NA	NA	43	NA	NA	2
DUP1210031A	12/10/03	460	600	NA	0.1	< 0.05	NA	NA	43	NA	NA	NA

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Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
1349MW102	08/12/03	390	550	NA	0.17 b J	< 0.1 UJ	NA	NA	47	NA	NA	1.1
	06/09/03	210	440	NA	0.14	< 0.1	NA	NA	68	NA	NA	1.9
DUP0609032A	06/09/03	260	450	NA	0.11	< 0.1	NA	NA	70	NA	NA	NA
1349MW102CL	06/09/03	530	340	NA	0.13	< 0.05	0.13	NA	59	NA	NA	NA
1349MW103	03/23/05	390	380	NA	< 0.05	< 0.1	NA	NA	95	NA	NA	0.1
	03/15/04	210	280	NA	< 0.05	< 0.1	NA	NA	100	NA	NA	0.52
	12/03/03	360	260	NA	< 0.1	< 0.1	NA	NA	97	NA	NA	1.2
DUP1203032A	12/03/03	370	250	NA	< 0.1	< 0.1	NA	NA	110	NA	NA	NA
	08/12/03	270	190	NA	< 0.1	< 0.1	NA	NA	110	NA	NA	2.4
	06/05/03	170	160	NA	< 0.1	< 0.1	NA	NA	110	NA	NA	1.8
1349MW104	03/23/05	410	300	NA	0.07	< 0.1	NA	NA	60	NA	NA	0.6
	03/15/04	190	56	NA	0.35	< 0.1	NA	NA	62	NA	NA	0.32
	12/02/03	280	80	NA	0.12	< 0.1	NA	NA	58	NA	NA	1
	08/12/03	360	530	NA	< 0.1	< 0.1	NA	NA	55	NA	NA	1.3
	06/06/03	190	970	NA	0.17	< 0.1	NA	NA	67	NA	NA	3
1349MW105	03/23/05	420	210	NA	< 0.05	< 0.05	NA	NA	130	NA	NA	0.1
	03/15/04	360	310	NA	< 0.05	< 0.1	NA	NA	150	NA	NA	0.31
	12/02/03	600	340	NA	< 0.05	< 0.05	NA	NA	150	NA	NA	1.2
	08/12/03	590	380	NA	< 0.1	< 0.1	NA	NA	130	NA	NA	3.1
	06/09/03	440	350	NA	< 0.1	< 0.1	NA	NA	130	NA	NA	1.2
Building 207/231 Area												
207GW03	04/12/05	< 100	14	9	< 0.05	< 0.05	NA	NA	2.7	2.5	3.6	0.2
	03/19/04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4
	08/21/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4
	03/19/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7
	12/10/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.5
	09/03/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4
	06/03/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.9
	03/11/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.64
	11/30/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8
	08/30/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4
	05/14/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.7
	04/13/99	NA	NA	NA	NA	NA	NA	-260.9	NA	NA	NA	0.34
	01/11/99	< 100	44.5	1.32 E	< 2	NA	NA	-302.9	< 25	NA	NA	0.09
	10/12/98	< 100	51.3	7.5	< 0.2	NA	NA	-232	2.66	NA	NA	0.62
	07/09/98	< 100	26.8	2.33 D	0.017	NA	NA	182	4.03	NA	NA	0.54
	05/04/98	< 100	42.9	0.82 D	0.063	NA	NA	182	9.38	NA	NA	0.46
231GW06	04/04/05	< 100	24	0.026	0.1	< 0.05	NA	NA	76	< 0.04 UJ	1.4	0.1
	03/18/04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.12
	08/14/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
	03/17/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4
	12/04/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2
	09/03/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3
	05/30/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1
	03/05/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8
	11/29/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.5
	08/30/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.8
	05/09/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.1
	04/20/99	NA	NA	NA	NA	NA	NA	-68	NA	NA	NA	0.28
	01/20/99	< 100	< 10	0.003	3.39	NA	NA	96.7	74	NA	NA	0.18
	10/20/98	113	27.2	0.006	3.1	NA	NA	91.8	72	NA	NA	0.79
	07/21/98	< 100	28.7	0.0019	3.17 D	NA	NA	208	67.5 D	NA	NA	0.82
	04/23/98	< 100	25.4	0.005	2.72 D	NA	NA	363	62.2 D	NA	NA	0.73
	01/27/98	< 100	16	0.0047	3.67 D	NA	NA	-62	69.9 D	NA	NA	0.23
	10/22/97	< 100	25.2	0.0108	3.62	NA	NA	175	70.4 D	NA	NA	0.49
	07/23/97	< 100	12.2	0.0031	3.69 D	NA	NA	266	67.3 D	NA	NA	0.29
	04/23/97	< 100	23	0.0068	3.09 D	NA	NA	185	67.1 D	NA	NA	0.29
231GW09	06/01/05	< 100	< 10	< 0.005	5.5	< 0.05	NA	NA	77	0.04	1.2 J+	1.9
	04/04/05	< 100	< 10	< 0.005	5.5	< 0.05	NA	NA	79	0.11 J-	1.3	2.1
	12/17/04	< 100	< 10	NA	5.8	< 0.05	NA	NA	81	NA	NA	0.9
DUP1217042A	12/17/04	< 100	< 10	NA	5.6	< 0.05	NA	NA	79	NA	NA	NA
	08/12/04	110	< 10	NA	5.8	< 0.05	NA	NA	77	NA	NA	0.82

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
231GW09	05/27/04	< 100	12	NA	6	< 0.05	NA	NA	81	NA	NA	0.49
DUP0527042C	05/27/04	< 100	12	NA	5.7	< 0.05	NA	NA	80	NA	NA	NA
231GW09CL	05/27/04	570	14	NA	7.1 D	< 0.05	7.1 A-01a D	NA	83 D	NA	NA	NA
	03/18/04	< 100	< 10	NA	6.5	< 0.05	NA	NA	85	NA	NA	0.7
	12/04/03	< 100	< 10	NA	6.9	< 0.05	NA	NA	81	NA	NA	1.6
	08/15/03	120	< 10	NA	7.7 b J-	< 0.05 UJ	NA	NA	91	NA	NA	1.7
	06/10/03	< 100	< 10	NA	9.1	< 0.05	NA	NA	88	NA	NA	2.1
	03/17/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
	12/04/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.9
	08/30/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4
	05/30/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.8
	03/07/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2
	11/29/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5
	08/30/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.9
	05/09/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4
	04/14/99	NA	NA	NA	NA	NA	NA	64.8	NA	NA	NA	4.5
	01/13/99	< 100	19.4	0.0075	33.6	NA	NA	43.7	69	NA	NA	4.23
	10/14/98	< 100	18.3	0.0085	28.2	NA	NA	61.9	65	NA	NA	4.73
	07/15/98	< 100	< 10	0.0046	32.2 D	NA	NA	314	68.6 D	NA	NA	6.62
	04/20/98	< 100	19.2	0.002	45.6 D	NA	NA	341	92.8 D	NA	NA	4.05
	01/28/98	8640	1510	0.0305 D	22.3 D	NA	NA	261	73.8 D	NA	NA	3.47
	10/23/97	< 100	< 10	0.0025	24.5 D	NA	NA	164	67.4 D	NA	NA	2.08
	07/24/97	< 100	< 10	0.0068	29.1 D	NA	NA	412	75.9 D	NA	NA	3.72
	04/22/97	< 100 J	19	0.0093	29.8 D	NA	NA	358	69.2 D	NA	NA	3.96
231GW10	03/22/05	15000	780	13	< 0.05	< 0.05	NA	NA	12	< 0.04	8.9	0.1
	03/16/04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.15
	08/14/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.11
	03/14/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1
	12/05/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1
	08/29/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.12
	06/04/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.25
	03/07/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.15
	12/03/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
	08/30/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2
	05/11/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.4
	04/19/99	NA	NA	NA	NA	NA	NA	-92.7	NA	NA	NA	1.35
	01/25/99	12400	1550	NA	< 0.2	NA	NA	-129.3	60.6	NA	NA	0.72
	10/19/98	6720	437	4.4	0.15	NA	NA	-129.5	0.751	NA	NA	3.05
	07/22/98	6910	443	5.5 D	0.018	NA	NA	103	0.327	NA	NA	0.64
	04/23/98	7640	912	4.63 D	0.012	NA	NA	314	14.1 D	NA	NA	0.26
	01/28/98	< 100	< 10	12.1 D	0.011	NA	NA	82	8.9	NA	NA	0.36
	10/22/97	5790	550	9.7 D	< 0.01	NA	NA	365	< 0.387	NA	NA	0.31
	07/23/97	5860	420	4.7 D	0.041	NA	NA	320	0.291	NA	NA	0.18
	04/23/97	7580	474	14.4 D	0.019	NA	NA	-102	0.158	NA	NA	0.4
231GW11	04/05/05	4500	180	5.7	< 0.05	< 0.05	NA	NA	7.3	0.3	2.7	0.2
	03/18/04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1
	08/14/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
	03/14/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1
	12/04/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4
	08/30/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.8
	05/30/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7
	03/07/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7
	11/29/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
	08/30/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.8
	05/09/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.9
	04/13/99	NA	NA	NA	NA	NA	NA	-178.2	NA	NA	NA	1.01
	01/11/99	3,980	200	0.779 E	< 0.8	NA	NA	-136.5	10.3	NA	NA	1.43
	10/12/98	1,570	119	1.5	< 0.04	NA	NA	-130	10.9	NA	NA	4.32
	07/13/98	1,060	102	1.16 D	0.022	NA	NA	297	5.01	NA	NA	1.38
	04/21/98	3,540	167	1.25 D	0.037	NA	NA	180	6.01	NA	NA	1.19
	01/26/98	5,210	246	3.97 D	0.019	NA	NA	76	4	NA	NA	1.03
	10/21/97	4,340	192	4.78 D	0.017	NA	NA	202	2.14	NA	NA	0.41
	07/21/97	1,550	101	3.12 D	0.013	NA	NA	249	4.44	NA	NA	0.46
	04/21/97	3,610	164	2.3 D	< 0.01	NA	NA	-97	2.08	NA	NA	0.43

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
231GW13	04/05/05	220	82	0.012	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	3.4	0.1
	03/18/04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.81
	08/14/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
	03/17/03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6
	12/05/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7
	08/30/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
	05/30/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8
	03/06/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
	11/28/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.5
	08/29/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.8
	05/09/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
	04/16/99	NA	NA	NA	NA	NA	NA	-141	NA	NA	NA	0.24
	01/14/99	733	92	< 0.003	< 2	NA	NA	148.3	< 25	NA	NA	0.13
	10/15/98	480	86.5	0.0071	< 0.08	NA	NA	79.7	< 1	NA	NA	0.93
	07/16/98	852	18.6	< 0.0005	0.791	NA	NA	237	0.361	NA	NA	1.13
	04/21/98	755	91.2	0.0094	0.043	NA	NA	164	0.485	NA	NA	0.74
	01/26/98	1,020	85.2	0.0085	0.029	NA	NA	-41	0.242	NA	NA	0.49
	10/20/97	1,030	74.9	0.0053	0.163	NA	NA	-55	0.358	NA	NA	0.09
	07/21/97	892	16.6	0.0017	0.912	NA	NA	71	0.505	NA	NA	0.45
	04/21/97	999	85	0.0193 D	0.067	NA	NA	-28	0.304	NA	NA	0.51
	01/27/97	568	96	0.0064	0.04	NA	NA	-37	0.44	NA	NA	0
	04/10/95	2,000	NA	NA	< 0.2	NA	NA	NA	< 5	NA	NA	NA
231GW15	04/05/05	600	180	0.079	< 0.05	< 0.05	NA	NA	37	< 0.04	1.2	0.3
	04/16/99	NA	NA	NA	NA	NA	NA	-217.5	NA	NA	NA	0.25
	01/14/99	< 284	158	0.068	< 0.5	NA	NA	-117.9	20	NA	NA	0.19
	10/15/98	< 100	15.5	< 0.003	0.23	NA	NA	-232	12.7	NA	NA	0.6
	07/16/98	< 100	13.7	< 0.0005	0.25	NA	NA	182	11.2	NA	NA	0.34
	04/21/98	134	162	0.091 D	< 0.028	NA	NA	187	4.79	NA	NA	0.19
	01/26/98	< 100	71.3	0.055 D	0.057	NA	NA	140	11.6	NA	NA	0.71
	10/20/97	< 100	< 10	0.0025	0.33	NA	NA	-106	15.2 D	NA	NA	0.2
	07/21/97	341	155	0.057 D	0.014	NA	NA	-114	20.5 D	NA	NA	0.35
	04/21/97	279	151	0.049 D	0.021	NA	NA	-122	16.6 D	NA	NA	0.25
231GW16	03/22/05	1,300	380	5.2	< 0.05	< 0.05	NA	NA	16	0.19	5	0.1
	04/16/99	NA	NA	NA	NA	NA	NA	-4.1	NA	NA	NA	0.37
	01/14/99	1,110	402	1.61	< 4	NA	NA	-118.1	< 50	NA	NA	0.34
	10/15/98	561	414	3.6	< 0.16	NA	NA	129.1	< 2	NA	NA	0.82
	07/16/98	1,000	525	0.94 D	< 0.01	NA	NA	245	42.4 D	NA	NA	0.8
	04/21/98	1,260	355	0.549 D	< 0.01	NA	NA	245	29 D	NA	NA	0.74
	01/26/98	432	408	3.53 D	0.016	NA	NA	-58	13.5	NA	NA	3.27
	10/20/97	1,290	295	3.33 D	0.069	NA	NA	6	30.2 D	NA	NA	0.08
	07/21/97	2,190	516	3.45 D	< 0.01	NA	NA	253	70.6 D	NA	NA	0.28
	04/24/97	407	347	9.7 D	< 0.01	NA	NA	-95	39.9 D	NA	NA	0.44
231GW17	04/05/05	< 100	< 10	0.008	9.2	< 0.05	NA	NA	42	< 0.04	< 0.5	2.4
	04/15/99	NA	NA	NA	NA	NA	NA	197.8	NA	NA	NA	4.06
	01/13/99	429	15	0.0063	8.79	NA	NA	235.8	44	NA	NA	4.27
	10/14/98	< 100	< 10	0.004	7.2	NA	NA	NA	37	NA	NA	NA
	07/15/98	< 100	< 10	0.0034	7.92 D	NA	NA	320	38.7 D	NA	NA	6.66
	04/20/98	< 100	< 10	< 0.0005	6.88 D	NA	NA	364	34.2 D	NA	NA	3.86
	01/27/98	< 100	< 10	0.0254 D	7.97 D	NA	NA	210	39.2 D	NA	NA	4.22
	10/21/97	< 100	< 10	0.0058	7.48 D	NA	NA	185	39.8 D	NA	NA	3.18
	07/22/97	< 100	< 10	0.0013	7.45 D	NA	NA	408	35.4 D	NA	NA	3.92
	04/22/97	451	< 10 J	0.022 D	7.36 D	NA	NA	341	34.6 D	NA	NA	3.12
231GW18	04/05/05	150	< 10	0.04	6.4	< 0.05	NA	NA	58	< 0.04	0.65	0.9
	04/15/99	NA	NA	NA	NA	NA	NA	159.6	NA	NA	NA	3.27
	01/13/99	< 100	< 10	0.003	7.4	NA	NA	232	66	NA	NA	3.46
	10/14/98	< 100	< 10	0.003	8.3	NA	NA	154.1	75	NA	NA	4.99
	07/15/98	< 100	< 10	0.002	7.01 D	NA	NA	304	65.2 D	NA	NA	5.19
	04/20/98	< 100	< 10	< 0.0005	7.13 D	NA	NA	412	59.5 D	NA	NA	3.25
	01/27/98	< 100	< 10	0.0114	7.66 D	NA	NA	236	68.8 D	NA	NA	3.74
	10/21/97	< 100	< 10	0.0011	7.31 D	NA	NA	291	61.4 D	NA	NA	2.92
	07/22/97	< 100	< 10	2.380 D	7.71 D	NA	NA	416	62.1 D	NA	NA	3.28
	04/22/97	117	< 10 J	0.0081	7.56 D	NA	NA	354	60.7 D	NA	NA	3.58

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
231GW19	04/05/05	8,400	460	2.4	< 0.05	< 0.05	NA	NA	10	< 0.04	3.9	0.2
	04/15/99	NA	NA	NA	NA	NA	NA	-162.5	NA	NA	NA	0.16
	01/13/99	15,100	792	1.6	0.12	NA	NA	12	21	NA	NA	0.39
	10/14/98	7,740	506	4.1	< 0.4	NA	NA	-117.5	27	NA	NA	0.7
	07/15/98	9,790	636	1.05 D	0.071	NA	NA	211	39.9 D	NA	NA	0.26
	04/20/98	6,250	657	0.53 D	0.051	NA	NA	315	65.8 D	NA	NA	0.39
	01/27/98	4,170	443	3.96 D	0.011	NA	NA	-238	3.22	NA	NA	0.29
	10/20/97	7,000	499	6.35 D	0.011	NA	NA	-29	41.2 D	NA	NA	0.38
	07/22/97	7,330	501	4.7 D	< 0.01	NA	NA	-30	43.8 D	NA	NA	0.15
	04/21/97	11,600	778	9.1 D	0.046	NA	NA	-82	30.6 D	NA	NA	0.53
231GW20	04/06/05	< 100	< 10	< 0.005	0.91	< 0.05	NA	NA	12	< 0.04 UJ	1	0.1
	04/20/99	NA	NA	NA	NA	NA	NA	-140.1	NA	NA	NA	0.18
	01/20/99	< 100	< 10	NA	2.1	NA	NA	306.4	23.6	NA	NA	1.4
	10/20/98	< 100	< 10	NA	1.9	NA	NA	44.9	22	NA	NA	0.51
	07/21/98	< 100	< 10	0.0014	2.13 D	NA	NA	177	25.4 D	NA	NA	0.19
	04/23/98	< 100	< 10	< 0.0005	2.25 D	NA	NA	340	23.6 D	NA	NA	0.33
	01/29/98	< 100	< 10	0.0285 D	2.29 D	NA	NA	59	25.5 D	NA	NA	0.12
	10/22/97	< 100	< 10	0.0037	2.25	NA	NA	38	26.7 D	NA	NA	0.4
	07/23/97	< 100	< 10	0.0007	2.34 D	NA	NA	132	25.5 D	NA	NA	0.25
	04/23/97	< 100 J	< 10 J	0.0024	2.08 D	NA	NA	52	24.1 D	NA	NA	0.2
231GW21	03/31/05	28,000	1,600 J	8.3	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	29	0.2
DUP0331052D	03/31/05	25,000	1,400 J	5.3	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	28	NA
231GW21CL	03/31/05	1,720	3,710	5.3	< 0.1 U	< 0.02 U	NA	NA	< 1 U	< 0.04 U	32.7	NA
	04/20/99	NA	NA	NA	NA	NA	NA	-113.3	NA	NA	NA	0.42
	01/20/99	19,700	2,620	1.28	0.38	NA	NA	-73.7	< 1	NA	NA	0.91
	10/20/98	29,600	3,020	5.1	0.42	NA	NA	-115.9	< 0.5	NA	NA	0.68
	07/23/98	32,200	3,430	3.73 D	0.011	NA	NA	223	0.17	NA	NA	0.31
	05/01/98	32,900	3,960	2.46 D	0.014	NA	NA	445	0.261	NA	NA	0.43
	01/28/98	30,100	3,230	6.03 D	0.02	NA	NA	265	0.12	NA	NA	0.39
	10/27/97	7,730	2,080	2.56 D	0.012	NA	NA	495	0.512	NA	NA	1.26
	07/24/97	27,300	3,610	3.88 D	< 0.05 DU	NA	NA	447	< 0.5 DU	NA	NA	0.19
	04/24/97	26,100	3,910	13.9 D	< 0.01	NA	NA	-76	< 0.1	NA	NA	0.44
231GW22	03/23/05	30,000	1,300	12	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	25	0.2
DUP0323052A	03/23/05	33,000	1,300	11	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	25	NA
	04/21/99	NA	NA	NA	NA	NA	NA	-16.7	NA	NA	NA	0.52
	01/21/99	17,200	1,470	1.33 E	0.54	NA	NA	-95.8	3	NA	NA	0.37
	10/21/98	15,800	1,610	4.5	0.053	NA	NA	-120.6	1.5	NA	NA	5.57
	07/22/98	8,380	1,330	0.84 D	0.021	NA	NA	268	0.242	NA	NA	0.36
	04/27/98	7,180	1,380	0.28 D	0.07	NA	NA	237	0.252	NA	NA	0.16
	01/29/98	4,350	1,300	5.13 D	0.051	NA	NA	142	0.269	NA	NA	0.25
	10/28/97	4,470	1,420	5.83 D	0.037	NA	NA	428	0.536	NA	NA	0.44
	07/28/97	6,220	1,660	6.42 D	0.075	NA	NA	411	0.356	NA	NA	0.38
	04/28/97	1,260	951	2.3 D	0.153	NA	NA	169	34.2 D	NA	NA	0.33
231GW23	04/05/05	25,000	2,200	15	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	6.9	0.4
	04/20/99	NA	NA	NA	NA	NA	NA	-191.7	NA	NA	NA	0.17
	01/20/99	21,900	1550	NA	0.11	NA	NA	-125.4	1	NA	NA	0.19
	10/22/98	21,500	1710	NA	0.68	NA	NA	-141.1	9.5	NA	NA	0.74
	07/23/98	23,000	1,700	6.02 D	< 0.013	NA	NA	197	< 1.27	NA	NA	0.32
	04/28/98	22,700	1,610	7.05 D	< 0.02	NA	NA	342	< 0.536	NA	NA	0.13
	02/02/98	22,600	1,640	8.3 D	< 0.01	NA	NA	206	6.1	NA	NA	0.55
	10/23/97	21,000	1,620	8.3 D	< 0.011	NA	NA	337	< 0.561	NA	NA	0.13
	07/29/97	15,800	1,680	7.75 D	< 0.01	NA	NA	309	0.231	NA	NA	0.34
	04/29/97	4,100	1,980	10.2 D	0.019	NA	NA	-95	0.681	NA	NA	0.31
231GW24	04/05/05	1,700	130	0.88	0.21	< 0.05	NA	NA	30	< 0.04	1.9	0.6
	04/19/99	NA	NA	NA	NA	NA	NA	-54.2	NA	NA	NA	0.39
	01/20/99	1,890	58.3	NA	< 0.04	NA	NA	-67	22	NA	NA	0.34
	10/19/98	1,270	59.8	NA	< 0.04	NA	NA	-59.4	25	NA	NA	1.78
	07/20/98	1,090	65.5	1.05 D	0.016	NA	NA	258	33.2 D	NA	NA	0.89
	04/22/98	953	72.7	0.76 D	0.174 D	NA	NA	276	30.2 D	NA	NA	0.13
	02/03/98	682	65.1	1.99 D	2.11 D	NA	NA	175	37.3 D	NA	NA	0.82
	10/29/97	1,430	60.4	2.2 D	0.014	NA	NA	303	16.8 D	NA	NA	0.47
	07/30/97	1,350	73.8	4.07 D	0.026	NA	NA	36	25.6 D	NA	NA	0.46
	04/30/97	2,080	148	5.5 D	0.295	NA	NA	-33	19.6 D	NA	NA	0.41

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	**Sample Date**	**Iron**	**Manganese**	**Methane**	**N as Nitrate**	**N as Nitrite**	**Nitrogen, Nitrate + Nitrite**	**ORP**	**Sulfate**	**Sulfide**	**TOC**	**Dissolved Oxygen**
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
231GW25	04/06/05	18,000	3,000	12	< 0.05	< 0.05	NA	NA	2.4	< 0.04 UJ	12	0.5
	04/06/05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	04/19/99	NA	NA	NA	NA	NA	NA	-70.6	NA	NA	NA	0.23
	01/21/99	13,700	3,120	NA	0.26	NA	NA	-118.4	5.4	NA	NA	0.18
	10/19/98	11,600	2,420	5.6	0.22	NA	NA	-129.1	1.7	NA	NA	2.05
	07/20/98	9,900	3,270	3.38 D	< 0.01	NA	NA	208	< 1.12	NA	NA	1.28
	04/22/98	10,400	3,340	2.45 D	< 0.031	NA	NA	348	4.49	NA	NA	0.49
	02/03/98	8,140	5,040	3.67 D	< 0.01	NA	NA	39	30 D	NA	NA	0.25
	10/29/97	5,060	2,580	8.5 D	< 0.01	NA	NA	289	10.5	NA	NA	0.48
	07/30/97	1,770	2,330	8.3 D	0.034	NA	NA	262	15.8 D	NA	NA	0.46
	04/30/97	1,660	1,780	2.8 D	0.017	NA	NA	169	27.2 D	NA	NA	0.59
231GW26	04/06/05	< 100	13	0.04	2.2	< 0.05	NA	NA	73	< 0.04 UJ	1.5	0.3
	04/21/99	NA	NA	NA	NA	NA	NA	-106.5	NA	NA	NA	1.2
	01/21/99	< 100	16.2	< 0.003	4.1	NA	NA	94.6	85	NA	NA	0.83
	10/21/98	< 100	30.2	< 0.003	3.4	NA	NA	60.6	89	NA	NA	3.28
	07/22/98	< 100	19.3	0.0008	4.36 D	NA	NA	268	71.5 D	NA	NA	1.02
	04/27/98	< 100	18.5	0.0097 D	4.07 D	NA	NA	361	72.6 D	NA	NA	0.96
	01/29/98	< 100	17.8	0.0402 D	4.39 D	NA	NA	172	62.5 D	NA	NA	1.27
	10/28/97	< 100	19.5	0.044 D	4.09 D	NA	NA	413	68.5 D	NA	NA	2.13
	07/28/97	< 100	29.9	0.0006	4.53 D	NA	NA	387	75.2 D	NA	NA	0.65
	04/28/97	< 50	48	0.031 D	3.63 D	NA	NA	388	73.1 D	NA	NA	0.81
231GW27	04/06/05	< 100	< 10	0.032	5.5	< 0.05	NA	NA	68	< 0.04 UJ	0.81	2.3
	04/21/99	NA	NA	NA	NA	NA	NA	195.9	NA	NA	NA	4.03
	01/21/99	< 100	10.3	< 0.003	0.64	NA	NA	194.1	< 7.6	NA	NA	4.11
	10/21/98	< 100	< 10	0.0095	6	NA	NA	215.6	57	NA	NA	4.56
	07/22/98	< 100	< 10	0.0063	5.54 D	NA	NA	291	54.4 D	NA	NA	8.25
	04/27/98	182	< 10	0.0233 D	6.54 D	NA	NA	412	54.2 D	NA	NA	4.66
	01/29/98	< 100	< 10	0.058	6.38 D	NA	NA	162	49.7 D	NA	NA	4.51
	10/28/97	< 100	< 10	0.031 D	6.47 D	NA	NA	454	54.3 D	NA	NA	4.77
	07/28/97	< 100	< 10	0.0011	7.69 D	NA	NA	426	57 D	NA	NA	4.26
	04/28/97	< 50	15	0.0205 D	6.39 D	NA	NA	416	53.9 D	NA	NA	5.77
231GW28	04/06/05	15,000	760	4.7	0.46	< 0.05	NA	NA	13	0.05 J-	7.8	0.1
	01/11/99	3020	192	0.224 E	4.2	NA	NA	-130.7	57	NA	NA	0.17
	10/22/98	< 100	19.2	< 0.003	6.1	NA	NA	110.7	76	NA	NA	0.87
	07/23/98	< 100	83.9	0.0081	6.32 D	NA	NA	222	69.7 D	NA	NA	1.47
	04/28/98	934	92	0.703 D	4.36 D	NA	NA	294	48.5 D	NA	NA	1.52
	02/02/98	1610	128	6.13 D	5.5 D	NA	NA	-154	64.8 D	NA	NA	1.09
	10/27/97	< 100	40.8	0.077 D	7.89 D	NA	NA	446	67.4 D	NA	NA	1.5
	07/29/97	< 100	71.2	0.067 D	6.8 D	NA	NA	426	65.1 D	NA	NA	0.4
	04/29/97	315	370	2.1 D	4.4 D	NA	NA	-1	42.6 D	NA	NA	0.51
231GW29	04/06/05	< 100	170	0.009	2.5	< 0.05	NA	NA	66	< 0.04 UJ	0.74	0.2
	04/21/99	NA	NA	NA	NA	NA	NA	-109.6	NA	NA	NA	0.23
	01/21/99	< 100	150	0.0065	2.7	NA	NA	59.1	80	NA	NA	0.33
	10/22/98	< 100	233	< 0.003	2.6	NA	NA	14.6	72	NA	NA	0.45
	07/23/98	< 100	21.6	0.0011	3.95 D	NA	NA	143	64 D	NA	NA	0.44
	04/28/98	< 100	61.8	0.001	3.72 D	NA	NA	320	58.8 D	NA	NA	0.22
	02/02/98	< 100	177	0.0286 D	3.38 D	NA	NA	30	66.1 D	NA	NA	0.45
	10/27/97	< 100	24.8	0.0005	4.89 D	NA	NA	437	62.3 D	NA	NA	0.87
	07/29/97	< 100	56.2	0.0009	4.17 D	NA	NA	430	58 D	NA	NA	0.14
	04/29/97	< 50	206	0.013 D	2.62 D	NA	NA	226	60.3 D	NA	NA	0.87
231GW30	03/22/05	3400	920	4.6	0.16	< 0.05	NA	NA	27	< 0.04	4.8	0.2
	04/19/99	NA	NA	NA	NA	NA	NA	-44.4	NA	NA	NA	0.34
	01/19/99	5.750	1,980	1.44 E	0.25	NA	NA	299.6	13	NA	NA	0.66
	10/19/98	6,150	2,000	5.7	0.09	NA	NA	-116.3	3.8	NA	NA	7.88
	07/20/98	1,740	1,800	3.74 D	0.013	NA	NA	344	3.62	NA	NA	1.3
	04/22/98	3,130	1,830	2.99 D	0.054	NA	NA	155	16.7 D	NA	NA	0.51
	02/03/98	1,680	1,550	3.1 D	1.04 D	NA	NA	249	131 D	NA	NA	1.05
	10/29/97	1,750	1,880	7.04 D	0.03	NA	NA	347	2.16	NA	NA	0.42
	07/30/97	1,850	1,800	7.8 D	0.015	NA	NA	304	3.97	NA	NA	0.15
	04/30/97	692	1560	3.2 D	0.018	NA	NA	8	20.4 D	NA	NA	0.81
231PZ01	04/04/05	41,000	2,400	12	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04 UJ	58	NM
	01/12/99	43,600	2,180	NA	NA	NA	NA	131.2	NA	NA	NA	9.18
	10/13/98	NA	NA	NA	NA	NA	NA	77.8	NA	NA	NA	5.98
	07/14/98	25,000	1,080	5.96 D	0.216	NA	NA	NA	0.495	NA	NA	NA
	04/30/98	14,600	1,340	1.45 D	0.134	NA	NA	NA	0.201	NA	NA	NA
	02/03/98	21,900	1,230	6.81 D	0.034	NA	NA	196	0.464	NA	NA	0.8

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
231PZ02	04/04/05	3,300	2,700	4.8	< 0.05	< 0.05	NA	NA	4.6	0.11 J-	36	0.2
	04/14/99	NA	NA	NA	NA	NA	NA	-38.9	NA	NA	NA	0.49
	01/12/99	NA	NA	1.61	NA	NA	NA	29.7	NA	NA	NA	8.41
	10/13/98	NA	NA	4.9	NA	NA	NA	-122	NA	NA	NA	7.81
	07/14/98	796	1,320	1.25 D	0.029	NA	NA	321	17.7 D	NA	NA	11.6
	04/30/98	1,310	1,670	1.91 D	0.027	NA	NA	53	27.9 D	NA	NA	1.93
	02/03/98	2,820	3,580	7.92 D	< 0.01	NA	NA	192	52.7 D	NA	NA	0.59
231PZ03	04/04/05	15,000	2,100	8.3	< 0.05	< 0.05	NA	NA	< 0.5	0.08 J-	14	0.2
	04/14/99	NA	NA	NA	NA	NA	NA	-117.2	NA	NA	NA	0.44
	01/12/99	265	737	1.42	< 1	NA	NA	-14.4	17.7	NA	NA	0.38
	10/13/98	363	882	5.6	< 0.04	NA	NA	-175.1	6.84	NA	NA	0.94
	07/14/98	3,580	1,980	3.8 D	< 0.01	NA	NA	-25	3.16	NA	NA	0.23
	04/30/98	13,200	2,930	5.51 D	< 0.01	NA	NA	301	3.71	NA	NA	0.13
	02/03/98	2,020	902	10.4 D	< 0.01	NA	NA	79	20.6 D	NA	NA	2.21
231PZ04	04/04/05	21,000	2,400	9.1	< 0.05	< 0.05	NA	NA	< 0.5	0.06 J-	18	0.2
	04/14/99	NA	NA	NA	NA	NA	NA	-132.6	NA	NA	NA	2.27
	01/11/99	2,370	1,230	1.31 E	< 0.5	NA	NA	119.9	7.32	NA	NA	8.71
	10/12/98	4,440	1,490	4.6	< 0.2	NA	NA	-99	8	NA	NA	8.03
	07/13/98	9,050	2,710	2.14 D	0.019	NA	NA	330	4.74	NA	NA	14.57
	04/30/98	13,000	3,590	4.35 D	0.017	NA	NA	246	4.06	NA	NA	4.57
	02/04/98	13,000	5,630	2.82 D	< 0.01	NA	NA	-49	3.21	NA	NA	6.68
Commissary/PX Study Area												
600GW101	06/01/05	10,000	1,200	10	< 0.05	< 0.05	NA	NA	0.65	0.07	5.6 J+	0.3
DUP0601053A	06/01/05	10,000	1,300	10	< 0.05	< 0.05	NA	NA	0.63	< 0.04	9.6 J+	NA
	03/21/05	9,200	1,300	10	< 0.05	< 0.05	NA	NA	6.3	0.12	11	0.1
	12/16/04	350	NA	15	< 0.05	< 0.05	NA	NA	0.51	0.07	NA	0.2
	08/10/04	10,000	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	NA	0.1
	05/26/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	0.91	NA	NA	NM
600GW101	03/09/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	0.9	NA	NA	0.3
	12/02/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	NA	NA	0.7
	08/13/03	NA	NA	NA	< 0.25 UJ	< 0.25 UJ	NA	NA	< 2.5	NA	NA	0.1
	06/09/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	NA	NA	0.4
	03/11/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	32	NA	NA	0.2
	12/04/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	0.83	NA	NA	0.8
	09/10/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	< 1	NA	NA	0.8
600GW102	04/06/05	3,000	270	4.6	0.46	< 0.05	NA	NA	35	< 0.04 UJ	8.8	1.2
	03/09/04	NA	NA	NA	0.55	< 0.05	NA	NA	24	NA	NA	0.7
	12/02/03	NA	NA	NA	2	< 0.05	NA	NA	51	NA	NA	1
	08/13/03	NA	NA	NA	< 0.5 UJ	< 0.5 UJ	NA	NA	59	NA	NA	1.1
	06/09/03	NA	NA	NA	< 0.1	< 0.1	NA	NA	16	NA	NA	0.6
	03/11/03	NA	NA	NA	0.11	< 0.05	NA	NA	26	NA	NA	0.5
	12/04/02	NA	NA	NA	0.15	< 0.05	NA	NA	58	NA	NA	1
	09/10/02	NA	NA	NA	1.1	< 0.05	NA	NA	38	NA	NA	0.7
600GW103	04/11/05	11,000	3,200	14	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	6.5	0.6
	03/09/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	NA	NA	0.6
	12/02/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	NA	NA	1.8
	08/13/03	NA	NA	NA	< 0.25 UJ	< 0.25 UJ	NA	NA	< 2.5	NA	NA	0.3
DUP0813033A	08/13/03	NA	NA	NA	< 0.25 UJ	< 0.25 UJ	NA	NA	< 2.5	NA	NA	NA
	06/09/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	NA	NA	0.7
	03/11/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	NA	NA	0.2
	12/04/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	2.9	NA	NA	0.9
	09/10/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	1.5	NA	NA	0.7
600GW104	04/11/05	1100	330	0.052	0.08	< 0.05	NA	NA	160	< 0.04	3.9	0.9
	03/09/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	110	NA	NA	2.1
	12/02/03	NA	NA	NA	0.13 J-	< 0.05 UJ	NA	NA	71	NA	NA	1.8
DUP1202033A	12/02/03	NA	NA	NA	0.2	< 0.05	NA	NA	72	NA	NA	NA
	08/18/03	NA	NA	NA	0.35	< 0.05	NA	NA	99	NA	NA	0.4
	06/05/03	NA	NA	NA	0.69	< 0.05	NA	NA	130	NA	NA	0.6
	03/11/03	NA	NA	NA	0.64	< 0.05	NA	NA	280	NA	NA	0.3
DUP0311032A	03/11/03	NA	NA	NA	0.63	< 0.05	NA	NA	300	NA	NA	NA
600GW104CL	03/11/03	NA	NA	NA	0.55	< 0.05 UJ	NA	NA	280	NA	NA	NA
	12/04/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA	NA	NA	2.2
	09/10/02	NA	NA	NA	0.17	< 0.05	NA	NA	180	NA	NA	1
DUP0910021A	09/10/02	NA	NA	NA	0.17	< 0.05	NA	NA	180	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
600GW105	06/01/05	2600	3700	0.85	< 2.5	< 2.5	NA	NA	60	< 0.04	5.9	0.7
	03/22/05	1600	3300	0.75	1.9	< 0.05	NA	NA	67	< 0.04	4.6	0.2
	12/16/04	290	NA	0.49	1.6	< 0.05	NA	NA	69	< 0.04	NA	0.2
	08/12/04	1800	NA	NA	1	< 0.05	NA	NA	61	< 0.04	NA	0.6
	03/10/04	NA	NA	NA	0.58	< 0.05	NA	NA	62	NA	NA	0.2
	12/02/03	NA	NA	NA	1.4	< 0.05	NA	NA	63	NA	NA	0.7
	08/13/03	NA	NA	NA	1.1 b J-	< 0.25 UJ	NA	NA	64	NA	NA	0.2
	06/05/03	NA	NA	NA	2.7	0.07	NA	NA	74	NA	NA	0.4
DUP0605033A	06/05/03	NA	NA	NA	2.6	0.07	NA	NA	77	NA	NA	NA
	03/12/03	NA	NA	NA	2.5	< 0.05	NA	NA	76	NA	NA	0.3
	12/04/02	NA	NA	NA	2.3	< 0.05	NA	NA	NA	NA	NA	0.6
	09/11/02	NA	NA	NA	3.8	< 0.05	NA	NA	79	NA	NA	1
600GW106	06/01/05	< 100	700	0.008	3.3	0.17	NA	NA	42	< 0.04	2.1	0.44
	03/29/05	< 100	600	0.29	3.1	< 0.05	NA	NA	40	< 0.04	2.4	0.2
	12/17/04	< 100	NA	0.073	3.5	0.08	NA	NA	46	< 0.04	NA	0.2
	08/10/04	< 100	NA	NA	2.8	0.19	NA	NA	39	< 0.04	NA	0.1
	03/10/04	NA	NA	NA	2.8	0.09	NA	NA	40	NA	NA	0.6
	12/02/03	NA	NA	NA	3.1	0.15	NA	NA	50	NA	NA	0.7
	08/13/03	NA	NA	NA	2.7 b J-	< 0.25 UJ	NA	NA	48	NA	NA	0.2
	06/05/03	NA	NA	NA	2.5	0.07	NA	NA	46	NA	NA	0.4
	03/12/03	NA	NA	NA	3.3	0.09	NA	NA	44	NA	NA	0.2
	12/04/02	NA	NA	NA	3.9	0.1	NA	NA	NA	NA	NA	1
	09/11/02	NA	NA	NA	2.7	0.089	NA	NA	44	NA	NA	0.9
600GW107	04/11/05	9500	2700	2.2	0.24	< 0.05	NA	NA	46	< 0.04	3.3	0.3
	03/10/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	14	NA	NA	0.3
	08/13/03	NA	NA	NA	< 0.25 UJ	0.76 b J-	NA	NA	3.2	NA	NA	0.1
	06/06/03	NA	NA	NA	0.1	0.5	NA	NA	4.8	NA	NA	0.6
	03/11/03	NA	NA	NA	0.05	< 0.05	NA	NA	12	NA	NA	1.6
600GW108	06/01/05	< 100	12	< 0.005	6.7	0.24	NA	NA	55	< 0.04	< 0.5	0.37
	03/21/05	140	16	< 0.005	8.3	0.15	NA	NA	90	< 0.04	2.2	0.3
DUP0321052B	03/21/05	140	17	< 0.005	8.3	0.15	NA	NA	88	< 0.04	2.3	NA
	12/17/04	< 100	NA	< 0.005	7.8	0.08	NA	NA	52	NA	NA	0.2
	08/10/04	< 100	NA	NA	3.4	0.12	NA	NA	26	NA	NA	0.2
	05/26/04	NA	NA	NA	4.8	< 0.05	NA	NA	38	NA	NA	0.78
	03/10/04	NA	NA	NA	7.3	< 0.05	NA	NA	55	NA	NA	0.8
	12/03/03	NA	NA	NA	7.4	< 0.05	NA	NA	52	NA	NA	0.7
	08/13/03	NA	NA	NA	3.8 b J-	< 0.25 UJ	NA	NA	35	NA	NA	0.3
	06/05/03	NA	NA	NA	6.9	< 0.05	NA	NA	50	NA	NA	0.6
	03/12/03	NA	NA	NA	7.5	< 0.05	NA	NA	52	NA	NA	1
	12/09/02	NA	NA	NA	NA	< 0.05	NA	NA	NA	NA	NA	1
DUP1209022CRE	12/09/02	NA	NA	NA	7.6	< 0.05	NA	NA	52	NA	NA	NA
600GW108CL	12/09/02	NA	NA	NA	7.2 J-	0.18 J-	NA	NA	55	NA	NA	NA
	09/10/02	NA	NA	NA	5.7	< 0.05	NA	NA	46	NA	NA	1
600GW109	04/01/05	2800	190 J	0.47	0.74	< 0.05	NA	NA	47	< 0.04	2.1	0.7
	03/09/04	NA	NA	NA	0.26	< 0.05	NA	NA	51	NA	NA	0.4
	12/03/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	16	NA	NA	0.8
	08/13/03	NA	NA	NA	< 0.25 UJ	< 0.25 UJ	NA	NA	20	NA	NA	0.2
	06/05/03	NA	NA	NA	0.39	< 0.05	NA	NA	30	NA	NA	0.7
	03/11/03	NA	NA	NA	1	< 0.05	NA	NA	44	NA	NA	0.4
	12/04/02	NA	NA	NA	0.33	< 0.05	NA	NA	NA	NA	NA	1.6
	09/10/02	NA	NA	NA	0.54	< 0.05	NA	NA	50	NA	NA	1
610GW101	06/02/05	4300	280	9.5	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	3.4 J+	0.28
	03/21/05	4200	280	7.3	0.06	< 0.05	NA	NA	11	< 0.04	3.8	0.2
DUP0321052A	03/21/05	4000	280	7.6	< 0.05	< 0.05	NA	NA	10	< 0.04	3.6	NA
	12/15/04	3100	240	8.4	< 0.05	< 0.05	NA	NA	10	< 0.04	3.5	0.2
DUP1215041A	12/15/04	3200	260	9	< 0.05	< 0.05	NA	NA	10	< 0.04	3.4	NA
610GW101CL	12/15/04	3540	256	5.9	NA	NA	0.027	NA	9.88	< 0.04 U	3.8	NA
	08/10/04	4400	NA	NA	< 0.05	< 0.05	NA	NA	4.9	< 0.04	NA	0.1
	05/26/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	1.2	NA	NA	0.62
	03/10/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	4.6	NA	NA	0.2
610GW101CL	03/10/04	NA	NA	NA	< 0.1 UJ	< 0.05 UJ	< 0.05 UJ	NA	5.3	NA	NA	NA
DUP0310043A	03/10/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	5.1	NA	NA	NA
	12/02/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	7.7	NA	NA	1
	08/14/03	NA	NA	NA	< 0.05 UJ	< 0.05 UJ	NA	NA	3.1	NA	NA	0.3
DUP0814033A	08/14/03	NA	NA	NA	< 0.05 UJ	< 0.05 UJ	NA	NA	2.5	NA	NA	NA
610GW101CL	08/14/03	NA	NA	NA	< 0.1 UJ	< 0.05	< 0.05 UJ	NA	2.1	NA	NA	NA

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
610GW101	06/04/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	1.8	NA	NA	0.6
DUP0604033B	06/04/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	1.9	NA	NA	NA
610GW101CL	06/04/03	NA	NA	NA	< 0.1 R	< 0.05	< 0.05 R	NA	1.6	NA	NA	NA
	03/11/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	6.7	NA	NA	0.9
	12/03/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	NA	NA	1
	08/29/02	NA	NA	NA	NA	NA	NA	NA	0.72	NA	NA	1.1
	05/29/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	9.3	NA	NA	0.8
	03/05/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	6.3	NA	NA	0.6
	08/29/01	NA	NA	NA	< 0.05	< 0.05	NA	NA	6.7	NA	NA	0.6
610GW102	06/02/05	1700	3300	7.9	< 0.05	< 0.05	NA	NA	20	0.09	4.9 J+	0.16
	03/31/05	2000	3700 J	3.8	< 0.05	< 0.05	NA	NA	160	0.06	5.3	0.1
DUP0331052C	03/31/05	1800	3500 J	4.4	< 0.05	< 0.05	NA	NA	160	0.08	6.1	NA
610GW102CL	03/31/05	27600	1350	2.5	< 0.1 U	< 0.02 U	NA	NA	134	< 0.04 U	1.3	NA
	12/15/04	2700	4100	14	< 0.05	< 0.05	NA	NA	39	0.14	6.2	0.2
	08/11/04	2000	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	NA	0.1
DUP0811041A	08/11/04	2100	NA	NA	< 0.05	< 0.05	NA	NA	< 0.5	< 0.04	NA	NA
610GW102CL	08/11/04	1100	NA	NA	NA	NA	< 0.5 R	NA	< 0.5 J	NA	NA	NA
	05/26/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	2.4	NA	NA	0.6
	03/09/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	51	NA	NA	0.2
	12/02/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	2	NA	NA	0.9
	08/18/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	2.2	NA	NA	0.2
	06/05/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	13	NA	NA	0.6
	03/11/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	66	NA	NA	1.8
DUP0311033A	03/11/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	67	NA	NA	NA
	12/03/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA	NA	NA	0.6
	08/29/02	NA	NA	NA	NA	NA	NA	NA	19	NA	NA	0.9
	05/29/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	34	NA	NA	0.7
	03/05/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	37	NA	NA	0.5
	12/03/01	NA	NA	NA	< 0.05 UJ	< 0.05 UJ	NA	NA	NA	NA	NA	0.7
	08/29/01	NA	NA	NA	< 0.05	< 0.05	NA	NA	39	NA	NA	0.4
610GW103	06/02/05	3,900	2,900	3.3	< 0.05	< 0.05	NA	NA	55	0.06	5 J+	0.2
	03/22/05	650	790	0.097	0.08	< 0.05	NA	NA	140	< 0.04	5.6	0.7
	12/16/04	240	3,000	2.2	< 0.05	< 0.05	NA	NA	47	NA	4.9	0.2
	08/10/04	3,000	NA	NA	< 0.05	< 0.05	NA	NA	5.5	< 0.04	NA	0.2
	05/26/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	26	NA	NA	0.5
	03/09/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	83	NA	NA	0.5
	12/03/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	13	NA	NA	1.1
DUP1203033A	12/03/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	14	NA	NA	NA
	08/18/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	9.6	NA	NA	0.2
DUP0818033A	08/18/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	10	NA	NA	NA
	06/05/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	30	NA	NA	1
	03/11/03	NA	NA	NA	< 0.05	< 0.05	NA	NA	93	NA	NA	0.6
	12/03/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA	NA	NA	2.1
DUP1203022A	12/03/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA	NA	NA	NA
610GW103CL	12/03/03	NA	NA	NA	< 0.1	< 0.05	< 0.05	NA	14.9	NA	NA	NA
	08/29/02	NA	NA	NA	NA	NA	NA	NA	18	NA	NA	1.8
	05/30/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	27	NA	NA	0.8
DUP0530022A	05/30/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	26	NA	NA	NA
610GW103CL	05/30/02	NA	NA	NA	< 1	< 1	NA	NA	26	NA	NA	NA
	03/05/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA	NA	NA	0.8
DUP0305023A	03/05/02	NA	NA	NA	< 0.05	< 0.05	NA	NA	NA	NA	NA	NA
610GW103CL	03/05/02	NA	NA	NA	< 1	< 1	NA	NA	110	NA	NA	NA
	12/03/01	NA	NA	NA	0.04 J J	< 0.05 UJ	NA	NA	NA	NA	NA	0.2
DUP1203011A	12/03/01	NA	NA	NA	0.05 J J	< 0.05 UJ	NA	NA	NA	NA	NA	NA
610GW103CL	12/03/01	NA	NA	NA	< 1	< 1	NA	NA	300	NA	NA	NA
	08/29/01	NA	NA	NA	< 0.05	< 0.05	NA	NA	40	NA	NA	0.5
610SP01	06/01/05	280	350	0.23	< 0.05	< 0.05	NA	NA	130	< 0.04	5.7 J+	1.6
(Total)	06/01/05	17,000	550	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/17/04	210	540	0.29	< 0.25	< 0.25	NA	NA	350	< 0.04	4	1.1
(Total)	12/17/04	59,000	1,100	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/13/04	1,000	NA	NA	0.5	< 0.5	NA	NA	560	0.44	NA	0.74
(Total)	08/13/04	41,000	NA	NA	0.5	< 0.5	NA	NA	560	0.44	NA	0.74
	05/28/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	33	NA	NA	1.6

Table A-2
Oxidation-Reduction Parameters
Groundwater Sample Results
Presidio of San Francisco, California

Sampling Location Name	Sample Date	Iron	Manganese	Methane	N as Nitrate	N as Nitrite	Nitrogen, Nitrate + Nitrite	ORP	Sulfate	Sulfide	TOC	Dissolved Oxygen
	Analytical Method	SW6010/ SW6020	SW6010/ SW6020	RSK 175	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0	Field	E300.0/ SW9056	E300.0/ SW9056	SW9060	E160.1
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mV	mg/L	mg/L	mg/L	mg/L
610SP01	03/16/04	NA	NA	NA	0.16	< 0.05	NA	NA	160	NA	NA	1.45
	12/09/03	NA	NA	NA	< 0.15	< 0.15	NA	NA	250	NA	NA	6.2
DUP1209031A	12/09/03	NA	NA	NA	< 0.15	< 0.15	NA	NA	220	NA	NA	NA
610SP01CL	12/09/03	NA	NA	NA	< 0.1	< 0.05	< 0.05	NA	225	NA	NA	NA
	08/21/03	NA	NA	NA	< 0.25	< 0.25	NA	NA	180	NA	NA	0.2
	06/11/03	NA	NA	NA	< 1	< 1	NA	NA	780	NA	NA	0.8
	03/20/03	NA	NA	NA	< 0.25	< 0.25	NA	NA	360	NA	NA	0.8
610SP02	06/01/05	230	1,100	0.57	< 0.05	< 0.05	NA	NA	37	< 0.04	5.2 J+	1.7
(Total)	06/01/05	15,000	1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/17/04	210	2,100	0.67	< 0.05	< 0.05	NA	NA	89	< 0.04	4	NM
(Total)	12/17/04	26,000	2,500	NA	NA	NA	NA	NA	NA	NA	NA	NA
	08/13/04	15,000	NA	NA	< 1.3	< 1.3	NA	NA	1,700	0.08	NA	0.84
(Total)	08/13/04	50,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/28/04	NA	NA	NA	0.12	< 0.05	NA	NA	49	NA	NA	NM
	03/16/04	NA	NA	NA	< 0.05	< 0.05	NA	NA	130	NA	NA	0.99
	12/09/03	NA	NA	NA	< 0.25	< 0.25	NA	NA	440	NA	NA	4.5
	08/21/03	NA	NA	NA	< 1.3	< 1.3	NA	NA	1,100	NA	NA	0.4
	06/11/03	NA	NA	NA	< 1	< 1	NA	NA	360	NA	NA	0.7
	03/20/03	NA	NA	NA	< 0.5	< 0.5	NA	NA	500	NA	NA	0.9

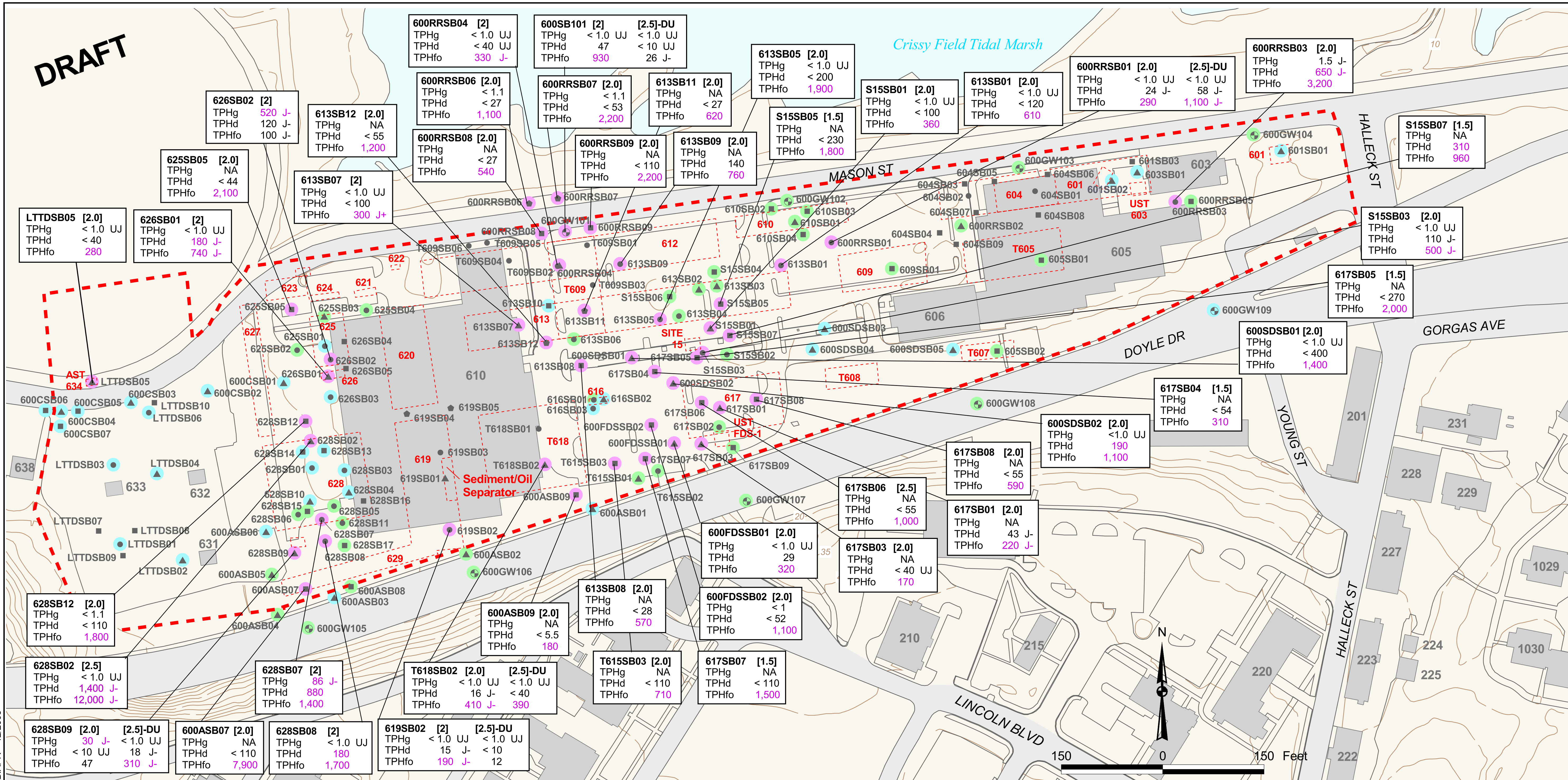
Notes

Data from the following Presidio sites or locations were not included due to lack of arsenic and/or TPH results: Building 900s Area, Landfill 8, Building 215, Battery Howe/Wagner, Tennessee Hollow and Upgradient wells, LF5SP100, BB3PZ100A, BB3PZ100B, and 1065TMW03.

Table 11 in the Semi-annual Groundwater Monitoring Report identifies current and historical data qualifiers.

Metals results are dissolved unless indicated as "Total" in the left-hand column for unfiltered samples.

APPENDIX B
Site Investigation Report Screening Level Exceedance Figures



LEGEND

- ● LTTDSB01 — Phase 1 - Soil Sample Location
- ▲ 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 — Phase 2 - Soil Sample Location
- ⬟ 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- Study Area Boundary
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

[depth in feet]

T618SB02	[2.0]	[2.5]-DU
TPHg	<1.0 UJ	< 1.0 UJ
THPd	16 J-	< 40
TPHfo	410 J-	390

Duplicate Sample

Values in pink are above screening levels

Data Qualifiers

TPHg - Total Petroleum Hydrocarbons as Gasoline
TPHd - Total Petroleum Hydrocarbons as Diesel
TPHfo - Total Petroleum Hydrocarbons as Fuel Oil

Screening Levels:
TPHg - 11.6 mg/kg
TPHd - 144 mg/kg
TPHfo - 144 mg/kg

- Value above screening level
- Value below screening level
- Not detected

Notes:
Results reported in milligrams/kilogram (mg/kg).

Data qualifiers are presented in Table C-1.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

TPH SCREENING LEVEL EXCEEDANCES IN SHALLOW SOIL (0 - 3 FEET)

Treadwell&Rollo

Presidio Trust
34 Graham Street
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San Francisco, CA
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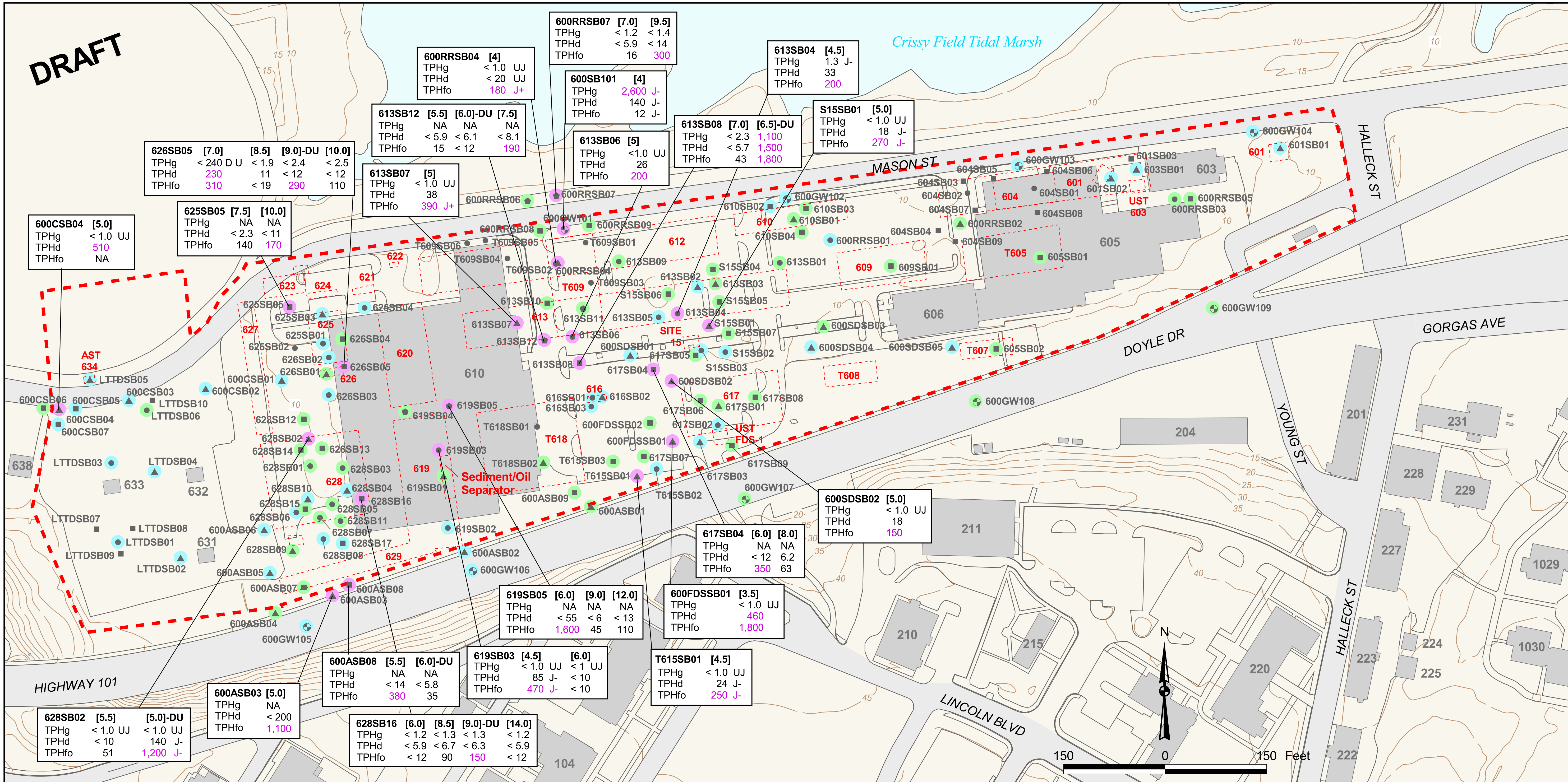
415/561-5300
fax 415/561-5315

December 2005

FIGURE B-1

Treadwell & Rollo 2893_11\COMMISSARY\Final_CAP_AppendixB.APR 12/2005



LEGEND

- ● LTTDSB01 — Phase 1 - Soil Sample Location
- ▲ 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 — Phase 2 - Soil Sample Location
- ⬟ 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- Study Area Boundary
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

[depth in feet]

628SB02	[5.5]	[5.0]-DU
TPHg	<1.0 UJ	< 1.0 UJ
THPd	< 10	140 J-
TPHfo	51	1,200 J-

Duplicate Sample
Data Qualifiers
Values in pink are above screening levels

TPHg - Total Petroleum Hydrocarbons as Gasoline
TPHd - Total Petroleum Hydrocarbons as Diesel
TPHfo - Total Petroleum Hydrocarbons as Fuel Oil

Screening Levels:
TPHg - 11.6 mg/kg
TPHd - 144 mg/kg
TPHfo - 144 mg/kg

- Value above screening level
- Value below screening level
- Not detected

Notes:
Results reported in milligrams/kilogram (mg/kg).

Data qualifiers are presented in Table C-1.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

TPH SCREENING LEVEL EXCEEDANCES IN DEEP SOIL (> 3 FEET)

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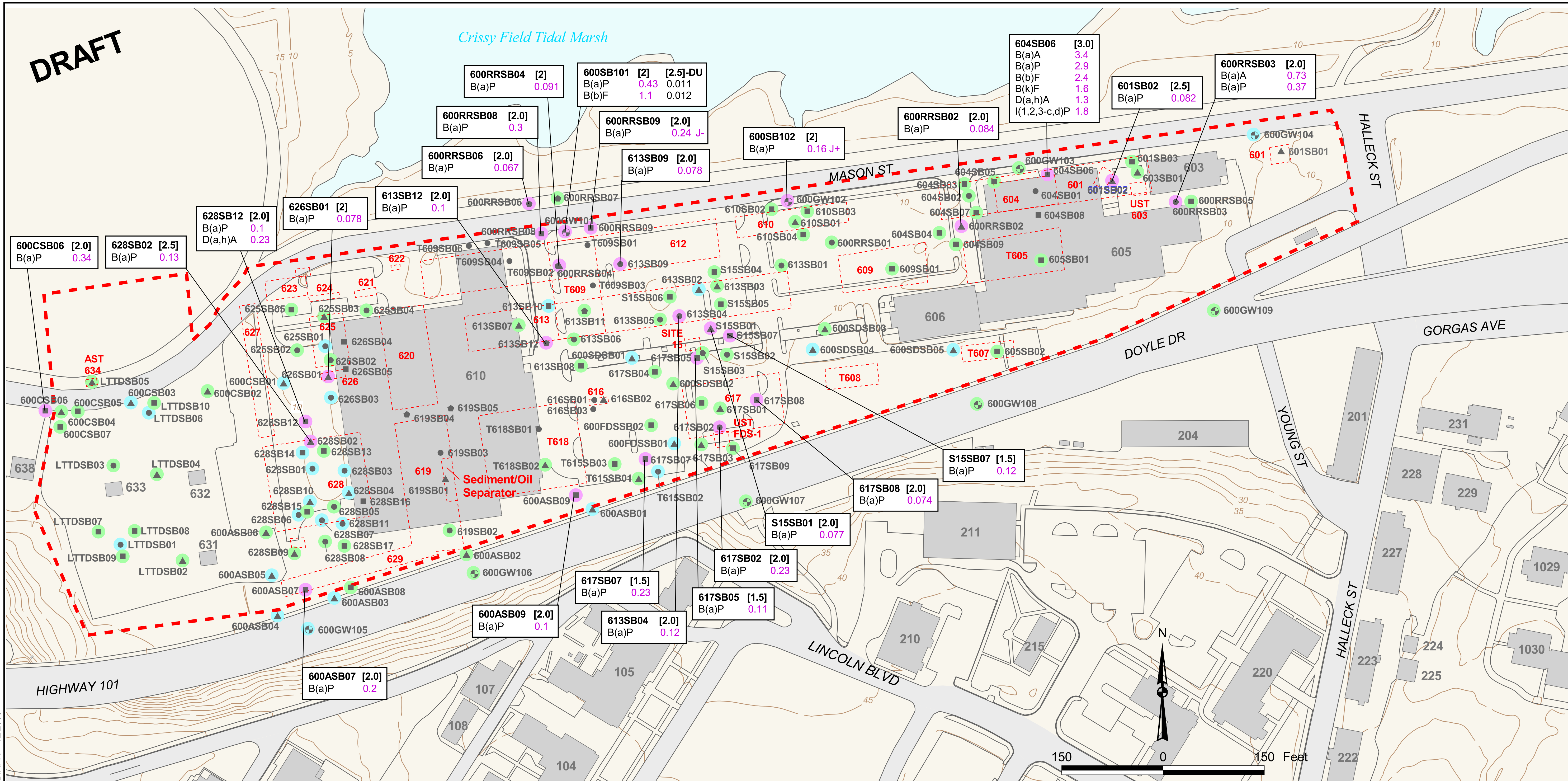
December 2005

FIGURE B-2

Treadwell & Rollo 2893_11\COMMISSARY\Final_CAP_AppendixB.APR 12/2005



LEGEND

● LTTDSB01	Phase 1 - Soil Sample Location	
▲ 600ASB01	Phase 1 - Soil and Groundwater Grab Sample Location	
■ LTTDSB07	Phase 2 - Soil Sample Location	
⬟ 619SB04	Phase 2 - Soil and Groundwater Grab Sample Location	
600GW105	Groundwater Monitoring Well Location	

- Study Area Boundary
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

[depth in feet]

600SB101	[2]	[2]-DU
B(a)P	0.43	0.011
B(b)F	1.1	0.012

Duplicate Sample

Values in pink are above screening levels

B(a)A - Benzo(a)Anthracene
B(a)P - Benzo(a)Pyrene
B(b)F - Benzo(b)Fluoranthene
B(k)F - Benzo(k)Fluoranthene
D(a,h)A - Dibenz(a,h)Anthracene
I(1,2,3-c,d)P - Indeno(1,2,3-c,d)Pyrene

Screening Levels:
B(a)A - 0.65 mg/kg
B(a)P - 0.065 mg/kg
B(b)F - 0.65 mg/kg
B(k)F - 0.65 mg/kg
D(a,h)A - 0.19 mg/kg
I(1,2,3-c,d)P - 0.65 mg/kg

- Value above screening level
- Value below screening level
- Not detected

Notes:
Results reported in milligrams/kilogram (mg/kg).

Data qualifiers are presented in Table C-3.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

PAH SCREENING LEVEL EXCEEDANCES IN SHALLOW SOIL (0 - 3 FEET)

Treadwell&Rollo

THE PRESIDIO TRUST

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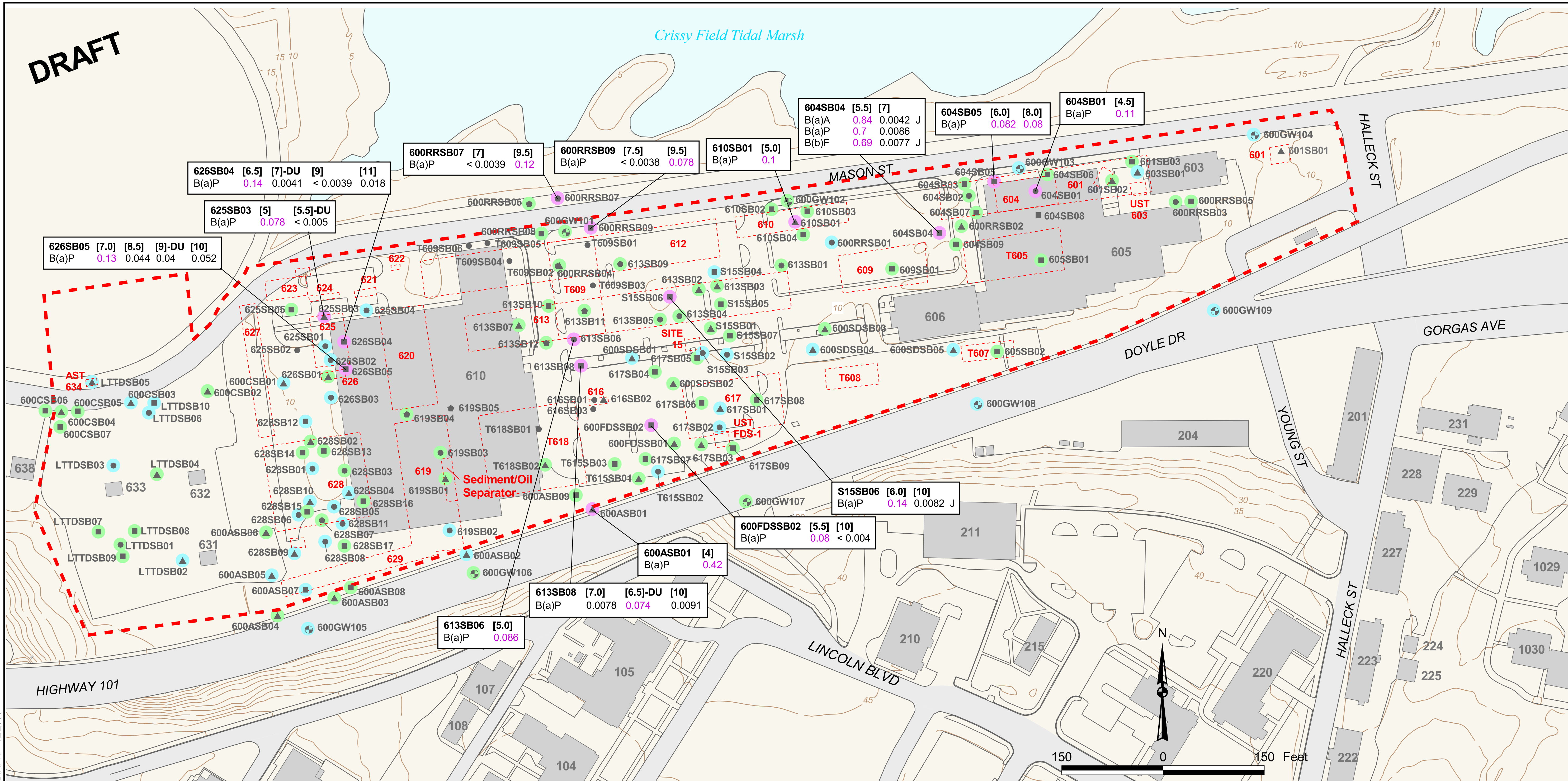
December 2005

FIGURE B-3

Treadwell & Rollo 2893_11\COMMISSARY\Final_CAP_AppendixB.APR 12/2005



Treadwell & Rollo 2893_11\COMMISSARY\Final_CAP_AppendixB.APR 12/2005

LEGEND

● LTTDSB01	Phase 1 - Soil Sample Location
▲ 600ASB01	Phase 1 - Soil and Groundwater Grab Sample Location
■ LTTDSB07	Phase 2 - Soil Sample Location
⬟ 619SB04	Phase 2 - Soil and Groundwater Grab Sample Location
600GW105	Groundwater Monitoring Well Location
(red dashed line)	Study Area Boundary
— 5 —	Topographic Contour (Contour Interval : 5 Feet)
(gray line)	Presidio Base Map
629	Former Motor Pool Structure and Identification Number
610	Existing Structure and Identification Number

[depth in feet]

625SB03	[5]	[5.5]-DU
B(a)P	0.078	< 0.005

Duplicate Sample

Values in pink are above screening levels

B(a)A - Benzo(a)Anthracene
B(a)P - Benzo(a)Pyrene
B(b)F - Benzo(b)Fluoranthene

Screening Levels:
B(a)A - 0.65 mg/kg
B(a)P - 0.065 mg/kg
B(b)F - 0.65 mg/kg

● Value above screening level
● Value below screening level
● Not detected

Notes:
Results reported in milligrams/kilogram (mg/kg).

Data qualifiers are presented in Table C-3.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

PAH SCREENING LEVEL EXCEEDANCES IN DEEP SOIL (> 3 FEET)

Treadwell&Rollo

THE PRESIDIO TRUST

Presidio Trust
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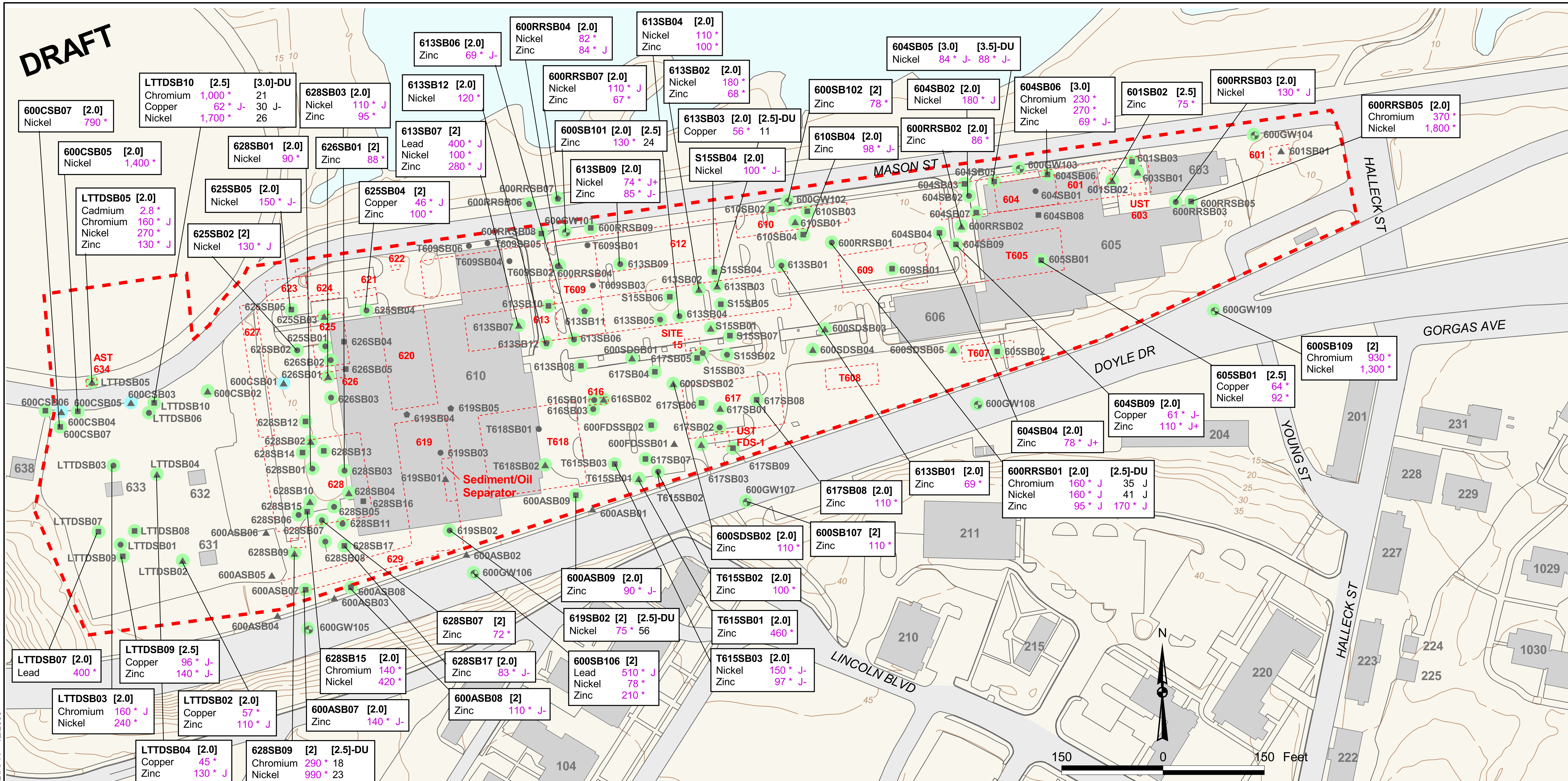
December 2005

FIGURE B-4



LEGEND

- ● LTTDSB01 — Phase 1 - Soil Sample Location
- ▲ 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 — Phase 2 - Soil Sample Location
- ⬟ 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- Study Area Boundary
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

[depth in feet]

613SB03	[2.0]	[2.5]-DU
Copper	56 *	11

Duplicate Sample

Values in pink are above screening levels — Refer to Notes

Screening Levels:

Cadmium	1.7
Chromium	120
Copper	43
Lead	300
Nickel	71
Zinc	66

- Value detected
- Not detected

Notes:
Results reported in milligrams/kilogram (mg/kg).

* Correlation coefficient and 95% Upper Confidence Limit (UCL) analysis for cadmium, chromium, copper, lead, nickel, and zinc indicate exceedances are not likely due to releases from Motor Pool activities (Treadwell & Rollo, 2003c) .

Data qualifiers are presented in Table C-5.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

METAL SCREENING LEVEL EXCEEDANCES IN SHALLOW SOIL (0 - 3 FEET)

Treadwell&Rollo

THE PRESIDIO TRUST

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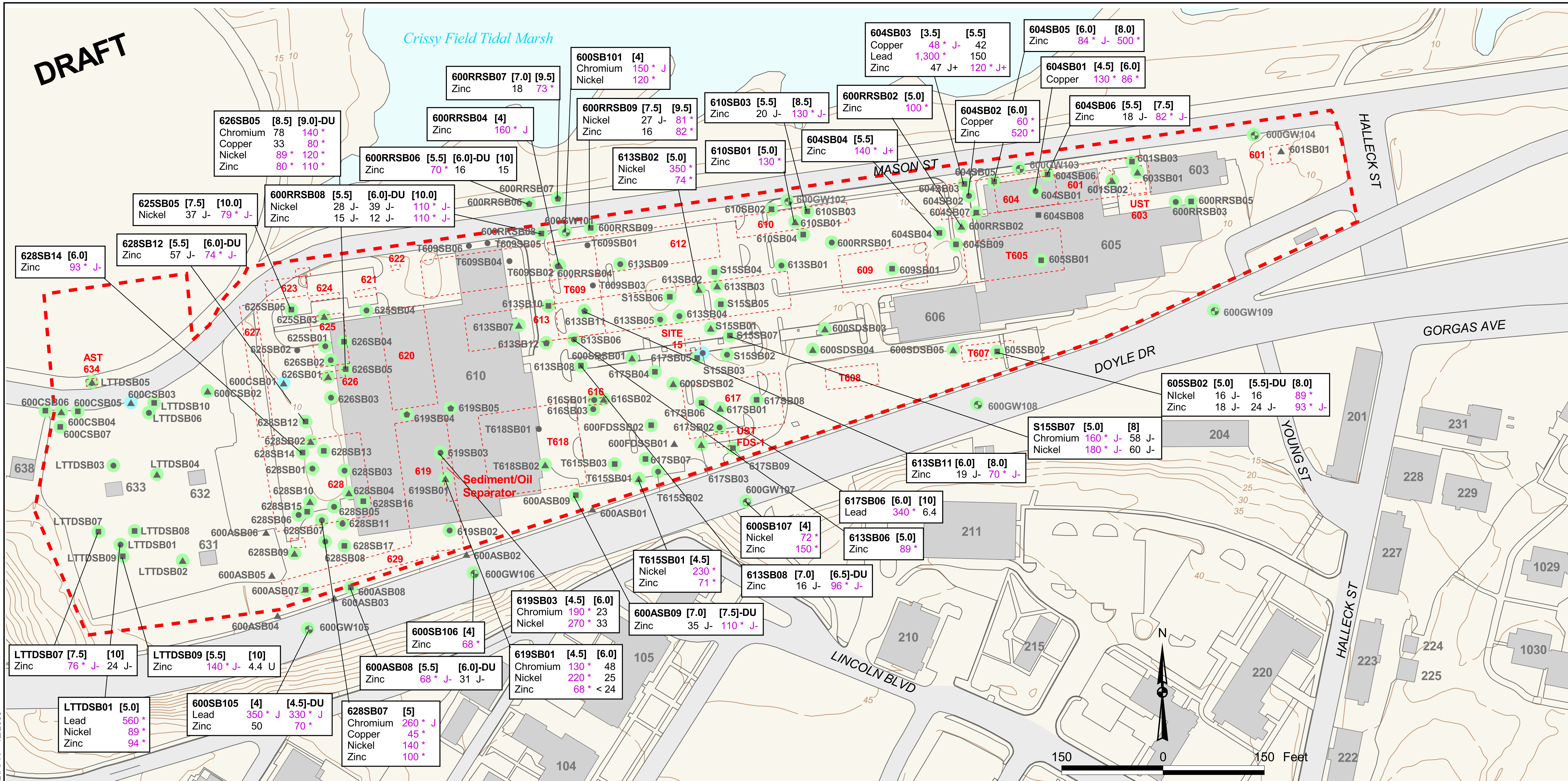
December 2005

FIGURE B-5



LEGEND

- ● LTTDSB01 — Phase 1 - Soil Sample Location
- ▲ 600ASB01 — Phase 1 - Soil and Groundwater Grab Sample Location
- ■ LTTDSB07 — Phase 2 - Soil Sample Location
- ⬟ 619SB04 — Phase 2 - Soil and Groundwater Grab Sample Location
- 600GW105 — Groundwater Monitoring Well Location
- Study Area Boundary
- Topographic Contour (Contour Interval : 5 Feet)
- Presidio Base Map
- 629 — Former Motor Pool Structure and Identification Number
- 610 — Existing Structure and Identification Number

[depth in feet]

600ASB09	[7.0]	[7.5]-DU
Zinc	35 J-	110 * J-

— Duplicate Sample; — Data Qualifier; Values in pink are above screening levels; Refer to Notes

Screening Levels:

Chromium	120
Copper	43
Lead	300
Nickel	71
Zinc	66

- ▲ Value detected
- ▲ Not detected

Notes:
Results reported in milligrams/kilogram (mg/kg).

* Correlation coefficient and 95% Upper Confidence Limit (UCL) analysis for cadmium, chromium, copper, lead, nickel, and zinc indicate exceedances are not likely due to releases from Motor Pool activities (Treadwell & Rollo, 2003c).

Data qualifiers are presented in Table C-5.

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

METAL SCREENING LEVEL EXCEEDANCES IN DEEP SOIL (> 3 FEET)

Treadwell&Rollo

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FIGURE B-6

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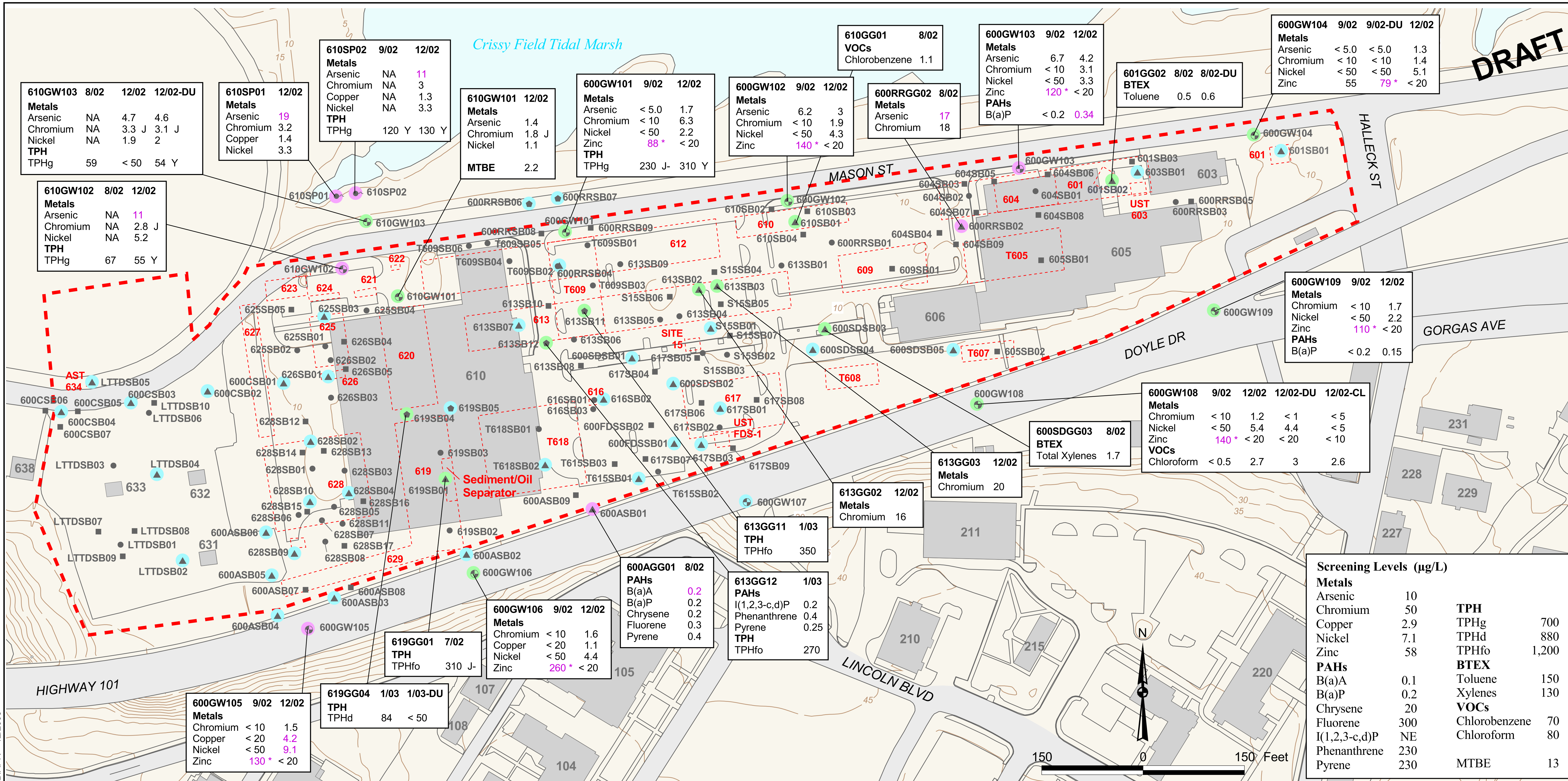

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LEGEND

● LTTDSB01	Phase 1 - Soil Sample Location
▲ 600ASB01	Phase 1 - Soil and Groundwater Grab Sample Location
■ LTTDSB07	Phase 2 - Soil Sample Location
⬟ 619SB04	Phase 2 - Soil and Groundwater Grab Sample Location
600GW105	Groundwater Monitoring Well Location
610SP01	Seep Sample Location
	Study Area Boundary
5	Topographic Contour (Contour Interval : 5 Feet)
	Presidio Base Map
629	Former Motor Pool Structure and Identification Number
610	Existing Structure and Identification Number

Sample Date

600GW104	9/02	9/02-DU	12/02
Metals			
Arsenic	< 5.0	< 5.0	1.3
Chromium	< 10	< 10	1.4
Nickel	< 50	< 50	5.1
Zinc	55	79 *	< 20

Duplicate Sample

Refer to Notes

Values in pink are above screening levels

Abbreviated Analytes

B(a)A - Benzo(a)Anthracene
B(a)P - Benzo(a)Pyrene
I(1,2,3-c,d)P - Indeno (1,2,3-cd) Pyrene
TPHg - Total Petroleum Hydrocarbons as Gasoline
TPHd - Total Petroleum Hydrocarbons as Diesel
TPHfo - Total Petroleum Hydrocarbons as Fuel Oil

- Value above screening level - refer to chembox for specific analytes
- Value below screening level for all analytes
- No analytes detected

Notes:
Results reported in micrograms/liter (µg/L).

Additional Results for 610 wells and Data Qualifers are presented in Tables C-7 - C-11.

CL - Suffix denotes a Quality Control Duplicate Sample sent to a Control Lab.
NA - Not analyzed
NE - Not Established
* - Zinc exceedances due to filter type used by Blaine Tech in September 2002 (refer to Section 4.3.6 of the main text)

Horizontal Datum: NAD 27, CA State Plane Coordinates, Zone 3, feet

GROUNDWATER ANALYTICAL RESULTS AND EXCEEDANCES

Treadwell&Rollo

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FIGURE B-7

APPENDIX C
Previous Soil and Groundwater Analytical Results

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
601SB01[2]	08/06/02	2	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
601SB01[4]	08/06/02	4	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
601SB02[2.5]	08/05/02	2.5	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.005
601SB02[4.5]	08/05/02	4.5	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.005
603SB01[2.0]	08/05/02	2	< 1 UJ	< 10 UJ	NA	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.005
603SB01[5.0]	08/05/02	5	< 1 UJ	< 10 UJ	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
605SB01[2.5]	01/22/03	2.5	< 1.1	< 5.5	72	NA	NA	NA	NA	NA
605SB01[5.0]	01/22/03	5	< 1.2	< 6	< 12	NA	NA	NA	NA	NA
605SB01[10.0]	01/22/03	10	< 1.2	< 5.8	< 12	< 0.0058	< 0.0058	< 0.0058	< 0.0058	< 0.0058
605SB02[2.0]	01/16/03	2	< 1.1	< 5.5	76	NA	NA	NA	NA	NA
605SB02[5.0]	01/16/03	5	< 1.1	< 5.6	< 11	NA	NA	NA	NA	NA
DUP011603B[MSD]	01/16/03	5.5	< 1.2	< 5.9	< 12	NA	NA	NA	NA	NA
605SB02[8.0]	01/16/03	8	< 2.1	< 11	87	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
609SB01[2.0]	01/14/03	2	< 1.1	< 1.1	26	NA	NA	NA	NA	NA
609SB01[4.0]	01/14/03	4	< 1.2	< 1.2	< 12	NA	NA	NA	NA	NA
609SB01[8.0]	01/14/03	8	< 1.7	< 1.7	< 17	< 0.0087	< 0.0087	< 0.0087	< 0.0087	< 0.0087
610SB01[2.0]	08/05/02	2	< 1 UJ	12 J-	71 J-	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
DUP080502E[MSD]	08/05/02	2.5	< 1 UJ	< 10 UJ	17 J-	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
610SB01[5.0]	08/05/02	5	< 1 UJ	< 10 UJ	46 J-	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
610SB02[2.0]	01/16/03	2	NA	< 5.8	14	NA	NA	NA	NA	NA
610SB02[5.0]	01/16/03	5	NA	< 5.5	< 11	NA	NA	NA	NA	NA
610SB02[7.5]	01/16/03	7.5	NA	< 6	< 12	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006
610SB03[2.0]	01/14/03	2	NA	< 2.2	140	NA	NA	NA	NA	NA

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
610SB03[5.5]	01/14/03	5.5	NA	< 2.2	82	NA	NA	NA	NA	NA
610SB03[8.5]	01/14/03	8.5	NA	< 1.4	80	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007
610SB04[2.0]	01/14/03	2	NA	< 5.8	30	NA	NA	NA	NA	NA
610SB04[6.0]	01/14/03	6	NA	6.9	30	NA	NA	NA	NA	NA
610SB04[7.5]	01/14/03	7.5	NA	< 6.2	130	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
613SB01[2.0]	08/02/02	2	< 1 UJ	< 120	**610**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
613SB01[5.0]	08/02/02	5	< 1 UJ	< 10	11	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
613SB02[2.0]	08/02/02	2	< 1 UJ	< 10	12	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
613SB02[5.0]	08/02/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
613SB03[2.0]	08/02/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
DUP080202C	08/02/02	2.5	< 1 UJ	11	39	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
613SB03[5.0]	08/02/02	5	< 1 UJ	< 10	31	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
613SB04[2.0]	08/02/02	2	< 1 UJ	< 10	37	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
613SB04[4.5]	08/02/02	4.5	1.3 J-	33	**200**	< 0.005 UJ	< 0.01 UJ	< 0.005 UJ	< 0.01 UJ	< 0.02 UJ
613SB05[2.0]	08/02/02	2	< 1 UJ	< 200	**1,900**	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02 UJ
613SB05[4.0]	08/02/02	4	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
613SB06[2.0]	08/02/02	2	< 1 UJ	< 10	30	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
613SB06[5.0]	08/02/02	5	< 1 UJ	26	**200**	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
613SB07[2]	07/30/02	2	< 1 UJ	< 100	**300 J+**	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
613SB07[5]	07/30/02	5	< 1 UJ	38	**390 J+**	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
613SB08[2.0]	01/21/03	2	NA	< 28	**570**	NA	NA	NA	NA	NA
613SB08[7.0]	01/21/03	7	< 2.3	< 5.7	43	< 0.028	< 0.028	< 0.028	< 0.028	< 0.028
DUP012103A[MSD]	01/21/03	6.5	**1,100**	**1,500**	**1,800**	**< 5.7**	< 5.7	< 5.7	< 5.7	< 5.7

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
613SB08[10.0]	01/21/03	10	< 1.2	< 6	19	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006
613SB09[2.0][MSD]	01/17/03	2	NA	140	**760**	NA	NA	NA	NA	NA
613SB09[5.5]	01/17/03	5.5	NA	< 5.8	< 12	NA	NA	NA	NA	NA
613SB09[7.5]	01/17/03	7.5	NA	< 7.5	38	NA	NA	NA	NA	NA
613SB10[2.5]	01/22/03	2.5	NA	< 5.7	< 11	NA	NA	NA	NA	NA
613SB10[5.5]	01/22/03	5.5	NA	< 6	13	NA	NA	NA	NA	NA
DUP012203A	01/22/03	6	NA	< 5.9	67	NA	NA	NA	NA	NA
613SB10[7.5]	01/22/03	7.5	NA	< 6.4	60	NA	NA	NA	NA	NA
613SB11[2.0]	01/21/03	2	NA	< 27	**620**	NA	NA	NA	NA	NA
613SB11[6.0]	01/21/03	6	NA	< 5.7	< 11	NA	NA	NA	NA	NA
613SB11[8.0]	01/21/03	8	NA	< 7.2	27	NA	NA	NA	NA	NA
613SB12[2.0]	01/21/03	2	NA	< 55	**1,200**	NA	NA	NA	NA	NA
613SB12[5.5]	01/21/03	5.5	NA	< 5.9	15	NA	NA	NA	NA	NA
DUP012103C[MSD]	01/21/03	6	NA	< 6.1	< 12	NA	NA	NA	NA	NA
613SB12[7.5][MSD]	01/21/03	7.5	NA	< 8.1	**190**	NA	NA	NA	NA	NA
616SB01[2.0]	07/30/02	2	1.1 J-	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01	NA
DUP073002D(MSD)	07/30/02	1.5	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01	NA
616SB01[4.0]	07/30/02	4	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01	NA
616SB02[2.0]	07/30/02	2	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01	NA
616SB02[5.0]	07/30/02	5	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01	NA
616SB03[2.0]	07/30/02	2	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01	NA
616SB03[5.0]	07/30/02	5	< 1 UJ	NA	NA	< 0.005	< 0.01	< 0.005	< 0.01	NA
617SB01[2.0]	08/01/02	2	NA	43 J-	**220 J-**	< 0.005	< 0.01	< 0.005	< 0.01	NA

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
617SB01[5.0]	08/01/02	5	NA	< 10 UJ	11 J-	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	NA
617SB02[2.0]	07/31/02	2	NA	< 40 UJ	140 J-	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	NA
617SB02[5.0]	07/31/02	5	NA	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	NA
617SB03[2.0]	08/01/02	2	NA	< 40 UJ	**170**	< 0.005	< 0.01	< 0.005	< 0.01	NA
617SB03[5.0]	08/01/02	5	NA	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	NA
617SB04[1.5]	01/15/03	1.5	NA	< 54	**310**	NA	NA	NA	NA	NA
617SB04[6.0]	01/15/03	6	NA	< 12	**350**	NA	NA	NA	NA	NA
617SB04[8.0]	01/15/03	8	NA	6.2	63	NA	NA	NA	NA	NA
617SB05[1.5]	01/15/03	1.5	NA	< 270	**2,000**	NA	NA	NA	NA	NA
617SB05[4.0]	01/15/03	4	NA	49	130	NA	NA	NA	NA	NA
617SB05[7.5]	01/15/03	7.5	NA	< 11	140	NA	NA	NA	NA	NA
617SB06[2.5]	01/15/03	2.5	NA	< 55	**1,000**	NA	NA	NA	NA	NA
617SB06[6.0]	01/15/03	6	NA	< 6.9	14	NA	NA	NA	NA	NA
617SB06[10.0]	01/15/03	10	NA	< 5.9	< 12	NA	NA	NA	NA	NA
617SB07[1.5]	01/15/03	1.5	NA	< 110	**1,500**	NA	NA	NA	NA	NA
617SB07[5.5]	01/15/03	5.5	NA	< 7.1	71	NA	NA	NA	NA	NA
617SB07[9.0]	01/15/03	9	NA	< 6.2	40	NA	NA	NA	NA	NA
617SB08[2.0]	01/15/03	2	NA	< 55	**590**	NA	NA	NA	NA	NA
617SB08[5.5]	01/15/03	5.5	NA	< 5.7	< 11	NA	NA	NA	NA	NA
617SB08[10.0]	01/15/03	10	NA	< 5.7	30	NA	NA	NA	NA	NA
617SB09[2.0]	01/16/03	2	NA	< 5.4	23	NA	NA	NA	NA	NA
617SB09[5.5]	01/16/03	5.5	NA	16	43	NA	NA	NA	NA	NA
617SB09[10.0]	01/16/03	10	NA	< 6.1	22	NA	NA	NA	NA	NA

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
619SB01[4.5]	07/31/02	4.5	< 1 UJ	< 10	36	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
619SB01[6.0]	07/31/02	6	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
619SB02[2]	08/06/02	2	< 1 UJ	15 J-	**190 J-**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
DUP080602D[MSD]	08/06/02	2.5	< 1 UJ	< 10	12	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
619SB02[5]	08/06/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
619SB03[4.5]	07/31/02	4.5	< 1 UJ	85 J-	**470 J-**	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
619SB03[6.0]	07/31/02	6	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
619SB04[7.0]	01/23/03	7	< 1.2	< 5.8	< 12	NA	NA	NA	NA	NA
619SB04[11.5]	01/23/03	11.5	< 1.7	< 8.4	46	NA	NA	NA	NA	NA
DUP012303A	01/23/03	12	< 1.2	< 6.2	< 12	NA	NA	NA	NA	NA
619SB04[13.0][MSD]	01/23/03	13	< 1.3	< 6.4	32	< 0.0064	< 0.0064	< 0.0064	< 0.0064	< 0.0064
619SB05[6.0]	01/23/03	6	NA	< 55	**1,600**	NA	NA	NA	NA	NA
619SB05[9.0]	01/23/03	9	NA	< 6	45	NA	NA	NA	NA	NA
619SB05[12.0]	01/23/03	12	NA	< 13	110	NA	NA	NA	NA	NA
625SB01[2]	07/29/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
625SB01[4]	07/29/02	4	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
625SB02[2]	07/29/02	2	< 1 UJ	< 10	120	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
625SB03[2]	07/29/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
DUP072902A	07/29/02	2.5	< 1 UJ	< 10	17	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
625SB03[5]	07/29/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
DUP072902B	07/29/02	5.5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
625SB04[2]	07/29/02	2	< 1 UJ	< 10	45	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
625SB04[5]	07/29/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
625SB05[2.0]	01/13/03	2	NA	< 44	**2,100**	NA	NA	NA	NA	NA
625SB05[7.5]	01/13/03	7.5	NA	< 2.3	140	NA	NA	NA	NA	NA
625SB05[10.0]	01/13/03	10	NA	< 11	**170**	NA	NA	NA	NA	NA
626SB01[2]	07/29/02	2	< 1 UJ	**180 J-**	**740 J-**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
626SB01[4]	07/29/02	4	< 1 UJ	13	92	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
626SB02[2]	07/29/02	2	**520 J-**	120 J-	100 J-	< 0.2	< 0.4	< 0.2	< 0.4	< 0.2
626SB02[4]	07/29/02	4	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
626SB03[2]	07/29/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
626SB03[5]	07/29/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
626SB04[6.5]	01/23/03	6.5	< 1.2	< 5.8	69	NA	NA	NA	NA	NA
DUP012303C[MSD]	01/23/03	7	< 1.2	< 6.2	< 12	NA	NA	NA	NA	NA
626SB04[9.0]	01/23/03	9	< 1.2	< 5.9	< 12	NA	NA	NA	NA	NA
626SB04[11.0]	01/23/03	11	< 1.7	< 8.4	28	< 0.0084	< 0.0084	< 0.0084	< 0.0084	< 0.0084
626SB05[7.0]	01/23/03	7	< 240 D U	**230**	**310**	NA	NA	NA	NA	NA
626SB05[8.5]	01/23/03	8.5	< 1.9	11	< 19	< 0.0095	< 0.0095	< 0.0095	< 0.0095	< 0.0095
DUP012303E	01/23/03	9	< 2.4	< 12	**290**	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
626SB05[10.0]	01/23/03	10	< 2.5	< 12	110	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
628SB01[2.0]	07/30/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB01[5.0]	07/30/02	5	< 1 UJ	< 10	19	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB02[2.5]	07/30/02	2.5	< 1 UJ	**1,400 J-**	**12,000 J-**	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB02[5.5]	07/30/02	5.5	< 1 UJ	< 10	51	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
DUP073002A	07/30/02	5	< 1 UJ	140 J-	**1,200 J-**	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB03[2.0]	07/30/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	TPH As Gasoline (C_7-C_{12})	TPH As Diesel (C_{12}-C_{24})	TPH As Fuel Oil (C_{24}-C_{36})	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
628SB03[4.5]	07/30/02	4.5	< 1 UJ	< 10	34	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB04[2]	07/30/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB04[5]	07/30/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB05[2]	07/31/02	2	< 1 UJ	< 10	11	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB05[5]	07/31/02	5	< 1 UJ	< 10	34	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB06[2]	07/31/02	2	< 1 UJ	< 10	18	< 0.005 UJ	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
628SB06[4]	07/31/02	4	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
628SB07[2]	07/31/02	2	**86 J-**	**880**	**1,400**	< 0.2	< 0.4	< 0.2	< 0.4	< 0.8
628SB07[5]	07/31/02	5	< 1 UJ	< 10	19	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
628SB08[2]	07/31/02	2	< 1 UJ	**180**	**1,700**	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
628SB08[5]	07/31/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
628SB09[2]	08/02/02	2	**30 J-**	< 10 UJ	47	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
DUP080202A	08/02/02	2.5	< 1 UJ	18 J-	**310 J-**	< 0.005 UJ	< 0.01 UJ	< 0.005 UJ	< 0.01 UJ	< 0.005 UJ
628SB09[5]	08/02/02	5	< 1 UJ	< 10 UJ	16	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	0.008
628SB10[2.0]	07/30/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB10[5.0]	07/30/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB11[2]	07/31/02	2	< 1 UJ	40	110	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
DUP073102A(MSD)	07/31/02	2.5	< 1 UJ	< 10	34	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB11[5]	07/31/02	5	< 1 UJ	< 10	32	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
628SB12[2.0]	01/17/03	2	< 1.1	< 110	**1,800**	NA	NA	NA	NA	NA
628SB12[5.5]	01/17/03	5.5	< 1.3	< 6.5	16	NA	NA	NA	NA	NA
DUP011703B[MSD]	01/17/03	6	< 1.3	< 6.5	< 13	NA	NA	NA	NA	NA
628SB12[10.0]	01/17/03	10	< 1.1	< 5.6	< 11	NA	NA	NA	NA	NA

Table C-1
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Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
628SB13[2.0]	01/17/03	2	< 1.1	< 5.5	< 11	NA	NA	NA	NA	NA
628SB13[6.0]	01/17/03	6	< 1.2	< 6.1	< 12	NA	NA	NA	NA	NA
628SB13[10.0]	01/17/03	10	< 1.2	< 6.1	51	NA	NA	NA	NA	NA
628SB14[3.0]	01/17/03	3	< 1.2	< 5.8	< 12	NA	NA	NA	NA	NA
628SB14[6.0]	01/17/03	6	< 1.5	< 7.6	94	NA	NA	NA	NA	NA
628SB14[10.0]	01/17/03	10	< 1.2	< 5.8	< 12	NA	NA	NA	NA	NA
628SB15[2.0]	01/17/03	2	< 1.1	< 5.5	38	NA	NA	NA	NA	NA
628SB15[6.0]	01/17/03	6	< 1.3	< 6.3	34	NA	NA	NA	NA	NA
628SB15[9.5]	01/17/03	9.5	< 1.2	< 5.8	< 12	< 0.0058	< 0.0058	< 0.0058	< 0.0058	< 0.0058
DUP011703A	01/17/03	10	< 1.1	< 5.7	< 11	< 0.0057	< 0.0057	< 0.0057	< 0.0057	< 0.0057
628SB16[6.0]	01/23/03	6	< 1.2	< 5.9	< 12	NA	NA	NA	NA	NA
628SB16[8.5]	01/23/03	8.5	< 1.3	< 6.7	90	NA	NA	NA	NA	NA
DUP012303D	01/23/03	9	< 1.3	< 6.3	**150**	NA	NA	NA	NA	NA
628SB16[14.0]	01/23/03	4	< 1.2	< 5.9	< 12	< 0.0059	< 0.0059	< 0.0059	< 0.0059	< 0.0059
628SB17[2.0]	01/17/03	2	< 1.1	< 5.4	32	NA	NA	NA	NA	NA
628SB17[7.0]	01/17/03	7	< 1.2	< 5.8	< 12	NA	NA	NA	NA	NA
628SB17[10.0]	01/17/03	10	< 1.1	< 5.6	< 11	NA	NA	NA	NA	NA
T615SB01[2.0]	08/01/02	2	< 1 UJ	17 J-	79	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
T615SB01[4.5]	08/01/02	4.5	< 1 UJ	24 J-	**250 J-**	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
T615SB02[2.0]	07/31/02	2	< 1 UJ	< 10	10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
T615SB02[5.0]	07/31/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
T615SB03[2.0]	01/15/03	2	NA	< 110	**710**	NA	NA	NA	NA	NA
T615SB03[6.0]	01/15/03	6	NA	< 7.5	29	NA	NA	NA	NA	NA

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
T615SB03[10.0]	01/15/03	10	NA	< 5.9	< 12	NA	NA	NA	NA	NA
T618SB02[2.0]	08/06/02	2	< 1 UJ	16 J-	**410 J-**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
DUP080602C	08/06/02	2.5	< 1 UJ	< 40	**390**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
T618SB02[5.0]	08/06/02	5	< 1 UJ	< 10 UJ	28 J-	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
S15SB01[2.0]	08/06/02	2	< 1 UJ	< 100	**360**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
S15SB01[5.0]	08/06/02	5	< 1 UJ	18 J-	**270 J-**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
S15SB02[2.0]	08/01/02	2	< 1 UJ	17	44	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.005
S15SB02[4.0]	08/01/02	4	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
S15SB03[2.0]	08/06/02	2	< 1 UJ	110 J-	**500 J-**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
S15SB03[5.0]	08/06/02	5	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
S15SB04[2.0]	01/14/03	2	NA	< 5.7	60	NA	NA	NA	NA	NA
S15SB04[5.5]	01/14/03	5.5	NA	< 5.8	18	NA	NA	NA	NA	NA
S15SB04[10.0]	01/14/03	10	NA	< 6	< 12	NA	NA	NA	NA	NA
S15SB05[1.5]	01/15/03	1.5	NA	< 230	**1,800**	NA	NA	NA	NA	NA
S15SB05[5.5]	01/15/03	5.5	NA	< 6	27	NA	NA	NA	NA	NA
DUP011503A	01/15/03	6	NA	< 6.5	< 13	NA	NA	NA	NA	NA
S15SB05[7.0]	01/15/03	7	NA	< 9.3	59	NA	NA	NA	NA	NA
DUP011503B	01/15/03	7.5	NA	< 9.8	94	NA	NA	NA	NA	NA
S15SB06[3.0]	01/16/03	3	NA	< 5.8	59	NA	NA	NA	NA	NA
S15SB06[6.0]	01/16/03	6	NA	< 7.4	42	NA	NA	NA	NA	NA
S15SB06[10.0]	01/16/03	10	NA	< 9.1	27	NA	NA	NA	NA	NA
S15SB07[1.5]	01/15/03	1.5	NA	**310**	**960**	NA	NA	NA	NA	NA
S15SB07[5.0]	01/15/03	5	NA	< 5.8	< 12	NA	NA	NA	NA	NA
S15SB07[8.0]	01/15/03	8	NA	< 7.8	100	NA	NA	NA	NA	NA

Table C-1
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Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
600ASB01[2]MSD	08/07/02	2	NA	< 10	< 10	NA	NA	NA	NA	NA
DUP080702A[MSD]	08/07/02	2.5	NA	< 10	< 10	NA	NA	NA	NA	NA
600ASB01[4]MSD	08/07/02	4	NA	< 10	32	NA	NA	NA	NA	NA
600ASB02[2]	08/01/02	2	NA	< 10 UJ	22 J-	NA	NA	NA	NA	NA
600ASB02[4]	08/01/02	4	NA	< 10 UJ	< 10	NA	NA	NA	NA	NA
600ASB03[2.0]	08/01/02	2	NA	< 10 UJ	< 10	NA	NA	NA	NA	NA
600ASB03[5.0]	08/01/02	5	NA	< 200 UJ	**1,100**	NA	NA	NA	NA	NA
600ASB04[2]	08/01/02	2	NA	12	36	NA	NA	NA	NA	NA
600ASB04[5]	08/01/02	5	NA	< 10 UJ	19 J-	NA	NA	NA	NA	NA
600ASB05[2]	08/01/02	2	NA	< 10	24	NA	NA	NA	NA	NA
600ASB05[5]	08/01/02	5	NA	< 10	< 10	NA	NA	NA	NA	NA
600ASB06[2]	08/01/02	2	NA	< 10	< 10	NA	NA	NA	NA	NA
600ASB06[5]	08/01/02	5	NA	< 10 UJ	< 10 UJ	NA	NA	NA	NA	NA
600ASB07[2.0]	01/17/03	2	NA	< 110	**7,900**	NA	NA	NA	NA	NA
600ASB07[5.5]	01/17/03	5.5	NA	< 5.7	17	NA	NA	NA	NA	NA
600ASB07[10.0]	01/17/03	10	NA	< 5.9	18	NA	NA	NA	NA	NA
600ASB08[2.0]	01/17/03	2	NA	< 5.4	66	NA	NA	NA	NA	NA
600ASB08[5.5]	01/17/03	5.5	NA	< 14	**380**	NA	NA	NA	NA	NA
DUP011703C	01/17/03	6	NA	< 5.8	35	NA	NA	NA	NA	NA
600ASB08[7.0]	01/17/03	7	NA	< 6.3	17	NA	NA	NA	NA	NA
600ASB09[2.0]	01/16/03	2	NA	< 5.5	**180**	NA	NA	NA	NA	NA
600ASB09[7.0]	01/16/03	7	NA	< 6	27	NA	NA	NA	NA	NA
DUP011603C	01/16/03	7.5	NA	< 5.8	< 12	NA	NA	NA	NA	NA

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
600ASB09[10.0][MSD]	01/16/03	10	NA	< 7.4	24	NA	NA	NA	NA	NA
600CSB01[2]	07/31/02	2	< 1 UJ	< 10	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600CSB01[5]	07/31/02	5	< 1 UJ	< 10 UJ	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600CSB02[2]	07/31/02	2	< 1 UJ	< 10	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600CSB02[4.0]	07/31/02	4	< 1 UJ	< 10	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600CSB03[2.0]	07/29/02	2	< 1 UJ	< 10	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600CSB03[5.0]	07/29/02	5	< 1 UJ	< 10	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600CSB04[2.0]	07/29/02	2	< 1 UJ	< 10	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600CSB04[5.0]	07/29/02	5	< 1 UJ	**510**	NA	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600CSB05[2.0]	01/13/03	2	NA	< 1.1	NA	NA	NA	NA	NA	NA
600CSB05[8.0]	01/13/03	8	NA	< 1.2	NA	NA	NA	NA	NA	NA
600CSB05[10.0]	01/13/03	10	NA	< 1.2	NA	NA	NA	NA	NA	NA
600CSB06[2.0]	01/13/03	2	NA	< 43	NA	NA	NA	NA	NA	NA
600CSB06[5.0]	01/13/03	5	NA	1.9	NA	NA	NA	NA	NA	NA
600CSB06[10.0]	01/13/03	10	NA	< 1.7	NA	NA	NA	NA	NA	NA
600CSB07[2.0]	01/13/03	2	NA	< 53	NA	NA	NA	NA	NA	NA
600CSB07[5.5]	01/13/03	5.5	NA	< 1.2	NA	NA	NA	NA	NA	NA
600CSB07[10.0]	01/13/03	10	NA	< 1.3	NA	NA	NA	NA	NA	NA
600FDSSB01[2.0]	08/01/02	2	< 1 UJ	< 100	**320**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600FDSSB01[3.5]	08/01/02	3.5	< 1 UJ	**460**	**1,800**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600FDSSB02[2.0]	01/15/03	2	< 1	< 52	**1,100**	NA	NA	NA	NA	NA
600FDSSB02[5.5]	01/15/03	5.5	< 1.2 UJ	< 6	63	NA	NA	NA	NA	NA
600FDSSB02[10.0]	01/15/03	10	< 1.2	< 6.1	14	NA	NA	NA	NA	NA

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
600RRSB01[2.0]	08/05/02	2	< 1 UJ	24 J-	**290**	< 0.005	< 0.01	< 0.005	< 0.01 UJ	NA
DUP080502B	08/05/02	2.5	< 1 UJ	58 J-	**1,100 J-**	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	NA
600RRSB01[5.5]	08/05/02	5.5	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01 UJ	NA
600RRSB02[2.0]	08/05/02	2	< 1 UJ	14	89	< 0.005	< 0.01	< 0.005	< 0.01 UJ	NA
600RRSB02[5.0]	08/05/02	5	< 1 UJ	22 J-	53 J-	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	NA
600RRSB03[2.0]	08/05/02	2	1.5 J-	**650 J-**	**3,200**	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	NA
600RRSB03[5.0]	08/05/02	5	1 J-	23 J-	130	< 0.005 UJ	< 0.01 UJ	< 0.005 UJ	< 0.01 UJ	NA
600RRSB04[2]MSD	08/07/02	2	< 1 UJ	< 40 UJ	**330 J-**	< 0.005	< 0.01	< 0.005	< 0.01	NA
600RRSB04[4]MSD	08/07/02	4	< 1 UJ	< 20 UJ	**180 J+**	< 0.005	< 0.01	< 0.005	< 0.01	NA
600RRSB05[2.0]	01/16/03	2	NA	< 6.2	21	NA	NA	NA	NA	NA
600RRSB05[6.0]	01/16/03	6	NA	< 6	< 12	NA	NA	NA	NA	NA
600RRSB05[10.0]	01/16/03	10	NA	< 5.8	130	NA	NA	NA	NA	NA
600RRSB06[2.0]	01/21/03	2	< 1.1	< 27	**1,100**	NA	NA	NA	NA	NA
600RRSB06[5.5]	01/21/03	5.5	< 1.2	26	99	NA	NA	NA	NA	NA
DUP012103D	01/21/03	6	< 1.2	< 6	14	NA	NA	NA	NA	NA
600RRSB06[10.0]	01/21/03	10	< 1.2	< 5.8	< 12	NA	NA	NA	NA	NA
600RRSB07[2.0]	01/22/03	2	< 1.1	< 53	**2,200**	NA	NA	NA	NA	NA
600RRSB07[7.0]	01/22/03	7	< 1.2	< 5.9	16	NA	NA	NA	NA	NA
600RRSB07[9.5]	01/22/03	9.5	< 1.4	< 14	**300**	NA	NA	NA	NA	NA
600RRSB08[2.0]	01/21/03	2	NA	< 27	**540**	NA	NA	NA	NA	NA
600RRSB08[5.5]	01/21/03	5.5	NA	< 5.7	< 11	NA	NA	NA	NA	NA
DUP012103B	01/21/03	6	NA	< 5.8	< 12	NA	NA	NA	NA	NA
600RRSB08[10.0]	01/21/03	10	NA	< 9.5	32	NA	NA	NA	NA	NA

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	TPH As Gasoline (C_7-C_{12})	TPH As Diesel (C_{12}-C_{24})	TPH As Fuel Oil (C_{24}-C_{36})	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
600RRSB09[2.0]	01/22/03	2	NA	< 110	**2,200**	NA	NA	NA	NA	NA
600RRSB09[7.5][MSD]	01/22/03	7.5	NA	< 5.8	< 12	NA	NA	NA	NA	NA
600RRSB09[9.5]	01/22/03	9.5	NA	< 9.5	46	NA	NA	NA	NA	NA
600SDSB01[2.0]	08/06/02	2	< 1 UJ	< 400	**1,400**	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SDSB01[5.0]	08/06/02	5	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005 UJ	< 0.01 UJ	< 0.005 UJ	< 0.01 UJ	< 0.02 UJ
600SDSB02[2.0]	08/01/02	2	< 1 UJ	**190**	**1,100**	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
600SDSB02[5.0]	08/01/02	5	< 1 UJ	18	**150**	< 0.005	< 0.01	< 0.005	< 0.01 UJ	< 0.02
600SDSB03[2.0]	08/06/02	2	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SDSB03[5.5]	08/06/02	5.5	< 1 UJ	< 10 UJ	86 J-	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SDSB04[2.0]	08/06/02	2	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
DUP080602B	08/06/02	2.5	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SDSB04[5.0]	08/06/02	5	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SDSB05[2]	08/07/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SDSB05[5]	08/07/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
LTTDSB01[2.5]	07/29/02	2.5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	NA
LTTDSB01[5.0]	07/29/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	NA
LTTDSB02[2.0]	07/29/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	NA
LTTDSB02[5.0]	07/29/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	NA
LTTDSB03[2.0]	07/29/02	2	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	NA
LTTDSB03[5.0]	07/29/02	5	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	NA
LTTDSB04[2.0]	07/29/02	2	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	NA
LTTDSB04[5.0]	07/29/02	5	< 1 UJ	< 10	< 10	< 0.005	< 0.01	< 0.005	< 0.01	NA
LTTDSB05[2.0]	07/29/02	2	< 1 UJ	< 40	**280**	< 0.005	< 0.01	< 0.005	< 0.01	NA

Table C-1
Summary of TPH, BTEX, and MTBE Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
LTTDSB05[5.0]	07/29/02	5	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	NA
LTTDSB06[2.0]	07/29/02	2	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	NA
LTTDSB06[4.5]	07/29/02	4.5	< 1 UJ	14	< 10	< 0.005	< 0.01	< 0.005	< 0.01	NA
600SB101[2]	08/06/02	2	< 1 UJ	47	**930**	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
DUP080602A	08/06/02	2.5	< 1 UJ	< 10 UJ	26 J-	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB101[4]	08/06/02	4	**2,600 J-**	140 J-	12 J-	< 0.5 UJ	< 1 UJ	< 0.5 UJ	< 1 UJ	< 2 UJ
600SB102[2]	08/06/02	2	< 1 UJ	< 10 UJ	65 J-	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB102[4]	08/06/02	4	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB103[2]	08/05/02	2	< 1 UJ	< 10 UJ	22	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB103[4]	08/05/02	4	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
DUP080502D	08/05/02	4.5	< 1 UJ	< 10 UJ	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB104[2]	08/06/02	2	< 1 UJ	< 10	38	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB104[4]	08/06/02	4	< 1 UJ	< 10 UJ	< 10 UJ	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB105[2]	08/05/02	2	< 1 UJ	< 10 UJ	11 J-	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB105[4]	08/05/02	4	< 1 UJ	< 10 UJ	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
DUP080502A	08/05/02	4.5	< 1 UJ	< 10 UJ	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB106[2]	08/05/02	2	< 1 UJ	< 10 UJ	44 J-	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB106[4]	08/05/02	4	< 1 UJ	< 10 UJ	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB107[2]	08/02/02	2	< 1 UJ	< 10 UJ	39	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
600SB107[4]	08/02/02	4	< 1 UJ	< 10 UJ	48	< 0.005	< 0.01	< 0.005 UJ	< 0.01 UJ	< 0.02
600SB108[2]	08/02/02	2	< 1 UJ	< 10 UJ	47	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02

Table C-1
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Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**TPH As Gasoline (C_7-C_{12})**	**TPH As Diesel (C_{12}-C_{24})**	**TPH As Fuel Oil (C_{24}-C_{36})**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
		Analytical Method	GC/MS Comb SW8015M	GC/MS Comb SW8015M	GC/MS Comb SW8015M	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**11.6**	**144**	**144**	**0.6**	**14**	**5**	**22**	**190**
600SB108[4]	08/02/02	4	< 1 UJ	< 10 UJ	11	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB109[2]	08/05/02	2	< 1 UJ	< 10 UJ	< 10	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02
600SB109[4]	08/05/02	4	< 1 UJ	< 10 UJ	17	< 0.005	< 0.01	< 0.005	< 0.01	< 0.02

Notes
[1] Cleanup Levels are found in Table 3.
BOLD values indicate concentration exceeding cleanup levels.
DUP prefix indicates blind duplicate sample; parent sample precedes duplicate sample.
feet - feet below ground surface
mg/kg - milligrams per kilogram
MSD - Matrix spike duplicate
MSD indicates to the laboratory which samples were to be used for the MSD quality control sample analyses. These are not matrix spike results.
MTBE - Methyl tert-butyl ether
NA - not analyzed
TPH - Total petroleum hydrocarbons
TPH as Fuel Oil using a motor oil standard with carbon range C_{24}-C_{36}
J+ - Data validation qualifier, "The analyte was positively identified; the associated numerical value is biased high due to a high surrogate recovery and should be considered an approximate concentration of the analyte in the sample."
J- - Data validation qualifier, "The analyte was positively identified; the associated numerical values is biased low due to a low surrogate recovery and should be considered an approximate concentration of the analyte in the sample."
UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."

Table C-2
Summary of VOC Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	1,2-DCE	2-Butanone	Acetone	Carbon Disulfide	Chloroform	Trans-1,3-DCP	All Other VOCs
		Analytical Method	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**NE**	**3.8**	**0.24**	**200**	**NE**	**NE**	**--**
601SB01[2]	08/06/02	2	NA	NA	NA	NA	NA	NA	ND
601SB01[4]	08/06/02	4	NA	NA	NA	NA	NA	NA	ND
601SB02[2.5]	08/05/02	2.5	NA	NA	NA	NA	NA	NA	ND
601SB02[4.5]	08/05/02	4.5	NA	NA	NA	NA	NA	NA	ND
603SB01[2.0]	08/05/02	2	NA	NA	NA	NA	NA	NA	ND
603SB01[5.0]	08/05/02	5	NA	NA	NA	NA	NA	NA	ND
605SB01[10.0]	01/22/03	10	< 0.00058	< 0.012	< 0.058	< 0.012	< 0.0058	< 0.0058	ND
605SB02[8.0]	01/16/03	8	< 0.011	< 0.021	< 0.11	0.024	< 0.011	< 0.011	ND
609SB01[8.0]	01/14/03	8	< 0.0087	< 0.017	< 0.087	< 0.017	< 0.0087	< 0.0087	ND
610SB01[2.0]	08/05/02	2	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP080502E[MSD]	08/05/02	2.5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
610SB01[5.0]	08/05/02	5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	0.005 J+	< 0.005	< 0.01	ND
610SB02[7.5]	01/16/03	7.5	< 0.006	0.017	< 0.06	< 0.012	< 0.006	< 0.006	ND
610SB03[8.5]	01/14/03	8.5	< 0.007	< 0.014	< 0.07	< 0.014	< 0.007	< 0.007	ND
610SB04[7.5]	01/14/03	7.5	0.13	< 0.025	< 0.12	< 0.025	< 0.012	< 0.012	ND
613SB01[2.0]	08/02/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB01[5.0]	08/02/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB02[2.0]	08/02/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB02[5.0]	08/02/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB03[2.0]	08/02/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP080202C	08/02/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB03[5.0]	08/02/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB04[2.0]	08/02/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB04[4.5]	08/02/02	4.5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005 UJ	< 0.005 UJ	< 0.01 UJ	ND
613SB05[2.0]	08/02/02	2	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005 UJ	< 0.005 UJ	< 0.01	ND
613SB05[4.0]	08/02/02	4	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB06[2.0]	08/02/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND

Table C-2
Summary of VOC Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	1,2-DCE	2-Butanone	Acetone	Carbon Disulfide	Chloroform	Trans-1,3-DCP	All Other VOCs
		Analytical Method	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**NE**	**3.8**	**0.24**	**200**	**NE**	**NE**	**--**
613SB06[5.0]	08/02/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB07[2]	07/30/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB07[5]	07/30/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
613SB08[7.0]	01/21/03	7	< 0.0028	< 0.057	< 0.28	< 0.057 UJ	< 0.028	< 0.028	ND
DUP012103A[MSD]	01/21/03	6.5	< 0.57	< 11	< 57 UJ	< 11	< 5.7	< 5.7	ND
613SB08[10.0]	01/21/03	10	< 0.0006	< 0.012	< 0.06	< 0.012	< 0.006	< 0.006	ND
616SB01[2.0]	07/30/02	2	NA	NA	NA	NA	NA	NA	ND
DUP073002D(MSD)	07/30/02	1.5	NA	NA	NA	NA	NA	NA	ND
616SB01[4.0]	07/30/02	4	NA	NA	NA	NA	NA	NA	ND
616SB02[2.0]	07/30/02	2	NA	NA	NA	NA	NA	NA	ND
616SB02[5.0]	07/30/02	5	NA	NA	NA	NA	NA	NA	ND
616SB03[2.0]	07/30/02	2	NA	NA	NA	NA	NA	NA	ND
616SB03[5.0]	07/30/02	5	NA	NA	NA	NA	NA	NA	ND
617SB01[2.0]	08/01/02	2	NA	NA	NA	NA	NA	NA	ND
617SB01[5.0]	08/01/02	5	NA	NA	NA	NA	NA	NA	ND
617SB02[2.0]	07/31/02	2	NA	NA	NA	NA	NA	NA	ND
617SB02[5.0]	07/31/02	5	NA	NA	NA	NA	NA	NA	ND
617SB03[2.0]	08/01/02	2	NA	NA	NA	NA	NA	NA	ND
617SB03[5.0]	08/01/02	5	NA	NA	NA	NA	NA	NA	ND
619SB01[4.5]	07/31/02	4.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
619SB01[6.0]	07/31/02	6	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
619SB02[2]	08/06/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP080602D[MSD]	08/06/02	2.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
619SB02[5]	08/06/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
619SB03[4.5]	07/31/02	4.5	< 0.005 UJ	< 0.05	0.28 J- *	< 0.005	< 0.005	< 0.01	ND
619SB03[6.0]	07/31/02	6	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND

Table C-2
Summary of VOC Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	1,2-DCE	2-Butanone	Acetone	Carbon Disulfide	Chloroform	Trans-1,3-DCP	All Other VOCs
		Analytical Method	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**NE**	**3.8**	**0.24**	**200**	**NE**	**NE**	**--**
619SB04[13.0][MSD]	01/23/03	13	< 0.00064	< 0.013	< 0.064	< 0.013	< 0.0064	< 0.0064	ND
625SB01[2]	07/29/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
625SB01[4]	07/29/02	4	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
625SB02[2]	07/29/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
625SB03[2]	07/29/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP072902A	07/29/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
625SB03[5]	07/29/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP072902B	07/29/02	5.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
625SB04[2]	07/29/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
625SB04[5]	07/29/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
626SB01[2]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
626SB01[4]	07/29/02	4	NA	NA	NA	NA	NA	NA	ND
626SB02[2]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
626SB02[4]	07/29/02	4	NA	NA	NA	NA	NA	NA	ND
626SB03[2]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
626SB03[5]	07/29/02	5	NA	NA	NA	NA	NA	NA	ND
626SB04[11.0]	01/23/03	11	< 0.00084	0.021	< 0.084	< 0.017	< 0.0084	< 0.0084	ND
626SB05[8.5]	01/23/03	8.5	< 0.00095	< 0.019	< 0.095	< 0.019 UJ	< 0.0095	< 0.0095	ND
DUP012303E	01/23/03	9	< 0.003	< 0.061	< 0.3	< 0.061 UJ	< 0.03	< 0.03	ND
626SB05[10.0]	01/23/03	10	< 0.0012	< 0.025	< 0.12	< 0.025 UJ	< 0.012	< 0.012	ND
628SB01[2.0]	07/30/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB01[5.0]	07/30/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB02[2.5]	07/30/02	2.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB02[5.5]	07/30/02	5.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP073002A	07/30/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB03[2.0]	07/30/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND

Table C-2
Summary of VOC Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	1,2-DCE	2-Butanone	Acetone	Carbon Disulfide	Chloroform	Trans-1,3-DCP	All Other VOCs
		Analytical Method	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**NE**	**3.8**	**0.24**	**200**	**NE**	**NE**	**--**
628SB03[4.5]	07/30/02	4.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB04[2]	07/30/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB04[5]	07/30/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB05[2]	07/31/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB05[5]	07/31/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB06[2]	07/31/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	0.015 J-	ND
628SB06[4]	07/31/02	4	< 0.005 UJ	< 0.05	0.14 J-	< 0.005	< 0.005	< 0.01	ND
628SB07[2]	07/31/02	2	< 0.2 UJ	< 2	< 2 UJ	< 0.2	< 0.2	< 0.4	ND
628SB07[5]	07/31/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB08[2]	07/31/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB08[5]	07/31/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB09[2]	08/02/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP080202A	08/02/02	2.5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005 UJ	< 0.005 UJ	< 0.01 UJ	ND
628SB09[5]	08/02/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB10[2.0]	07/30/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB10[5.0]	07/30/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB11[2]	07/31/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP073102A(MSD)	07/31/02	2.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB11[5]	07/31/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
628SB15[9.5]	01/17/03	9.5	< 0.0058	< 0.012	< 0.058	< 0.012	< 0.0058	< 0.0058	ND
DUP011703A	01/17/03	10	< 0.0057	< 0.011	< 0.057	< 0.011	< 0.0057	< 0.0057	ND
628SB16[14.0]	01/23/03	4	< 0.00059	< 0.012	< 0.059	< 0.012 UJ	< 0.0059	< 0.0059	ND
T615SB01[2.0]	08/01/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
T615SB01[4.5]	08/01/02	4.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
T615SB02[2.0]	07/31/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
T615SB02[5.0]	07/31/02	5	< 0.005 UJ	< 0.05	0.055 J-	< 0.005	< 0.005	< 0.01	ND

Table C-2
Summary of VOC Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	1,2-DCE	2-Butanone	Acetone	Carbon Disulfide	Chloroform	Trans-1,3-DCP	All Other VOCs
		Analytical Method	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**NE**	**3.8**	**0.24**	**200**	**NE**	**NE**	**--**
T618SB02[2.0]	08/06/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP080602C	08/06/02	2.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
T618SB02[5.0]	08/06/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
S15SB01[2.0]	08/06/02	2	NA	NA	NA	NA	NA	NA	ND
S15SB01[5.0]	08/06/02	5	NA	NA	NA	NA	NA	NA	ND
S15SB02[2.0]	08/01/02	2	NA	NA	NA	NA	NA	NA	ND
S15SB02[4.0]	08/01/02	4	NA	NA	NA	NA	NA	NA	ND
S15SB03[2.0]	08/06/02	2	NA	NA	NA	NA	NA	NA	ND
S15SB03[5.0]	08/06/02	5	NA	NA	NA	NA	NA	NA	ND
600FDSSB01[2.0]	08/01/02	2	NA	NA	NA	NA	NA	NA	ND
600FDSSB01[3.5]	08/01/02	3.5	NA	NA	NA	NA	NA	NA	ND
600CSB01[2]	07/31/02	2	NA	NA	NA	NA	NA	NA	ND
600CSB01[5]	07/31/02	5	NA	NA	NA	NA	NA	NA	ND
600CSB02[2]	07/31/02	2	NA	NA	NA	NA	NA	NA	ND
600CSB02[4.0]	07/31/02	4	NA	NA	NA	NA	NA	NA	ND
600CSB03[2.0]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
600CSB03[5.0]	07/29/02	5	NA	NA	NA	NA	NA	NA	ND
600CSB04[2.0]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
600CSB04[5.0]	07/29/02	5	NA	NA	NA	NA	NA	NA	ND
600RRSB01[2.0]	08/05/02	2	NA	NA	NA	NA	NA	NA	ND
DUP080502B	08/05/02	2.5	NA	NA	NA	NA	NA	NA	ND
600RRSB01[5.5]	08/05/02	5.5	NA	NA	NA	NA	NA	NA	ND
600RRSB02[2.0]	08/05/02	2	NA	NA	NA	NA	NA	NA	ND
600RRSB02[5.0]	08/05/02	5	NA	NA	NA	NA	NA	NA	ND
600RRSB03[2.0]	08/05/02	2	NA	NA	NA	NA	NA	NA	ND
600RRSB03[5.0]	08/05/02	5	NA	NA	NA	NA	NA	NA	ND

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Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	1,2-DCE	2-Butanone	Acetone	Carbon Disulfide	Chloroform	Trans-1,3-DCP	All Other VOCs
		Analytical Method	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**NE**	**3.8**	**0.24**	**200**	**NE**	**NE**	**--**
600RRSB04[2]MSD	08/07/02	2	NA	NA	NA	NA	NA	NA	ND
600RRSB04[4]MSD	08/07/02	4	NA	NA	NA	NA	NA	NA	ND
600SDSB01[2.0]	08/06/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SDSB01[5.0]	08/06/02	5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005 UJ	< 0.005 UJ	< 0.01 UJ	ND
600SDSB02[2.0]	08/01/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SDSB02[5.0]	08/01/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SDSB03[2.0]	08/06/02	2	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SDSB03[5.5]	08/06/02	5.5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SDSB04[2.0]	08/06/02	2	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP080602B	08/06/02	2.5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SDSB04[5.0]	08/06/02	5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SDSB05[2]	08/07/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SDSB05[5]	08/07/02	5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
LTTDSB01[2.5]	07/29/02	2.5	NA	NA	NA	NA	NA	NA	ND
LTTDSB01[5.0]	07/29/02	5	NA	NA	NA	NA	NA	NA	ND
LTTDSB02[2.0]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
LTTDSB02[5.0]	07/29/02	5	NA	NA	NA	NA	NA	NA	ND
LTTDSB03[2.0]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
LTTDSB03[5.0]	07/29/02	5	NA	NA	NA	NA	NA	NA	ND
LTTDSB04[2.0]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
LTTDSB04[5.0]	07/29/02	5	NA	NA	NA	NA	NA	NA	ND
LTTDSB05[2.0]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
LTTDSB05[5.0]	07/29/02	5	NA	NA	NA	NA	NA	NA	ND
LTTDSB06[2.0]	07/29/02	2	NA	NA	NA	NA	NA	NA	ND
LTTDSB06[4.5]	07/29/02	4.5	NA	NA	NA	NA	NA	NA	ND

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Sample Name	Sample Date	Sample Depth (feet)	1,2-DCE	2-Butanone	Acetone	Carbon Disulfide	Chloroform	Trans-1,3-DCP	All Other VOCs
		Analytical Method	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**NE**	**3.8**	**0.24**	**200**	**NE**	**NE**	**--**
600SB101[2]	08/06/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP080602A	08/06/02	2.5	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	ND
600SB101[4]	08/06/02	4	< 0.5 UJ	< 5 UJ	< 5 UJ	< 0.5 UJ	< 0.5 UJ	< 1 UJ	ND
600SB102[2]	08/06/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB102[4]	08/06/02	4	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB103[2]	08/05/02	2	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB103[4]	08/05/02	4	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP080502D	08/05/02	4.5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	0.007 J+	< 0.005	< 0.01	ND
600SB104[2]	08/06/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB104[4]	08/06/02	4	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB105[2]	08/05/02	2	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB105[4]	08/05/02	4	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
DUP080502A	08/05/02	4.5	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB106[2]	08/05/02	2	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB106[4]	08/05/02	4	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB107[2]	08/02/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB107[4]	08/02/02	4	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB108[2]	08/02/02	2	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB108[4]	08/02/02	4	< 0.005 UJ	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND

Table C-2
Summary of VOC Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**1,2-DCE**	**2-Butanone**	**Acetone**	**Carbon Disulfide**	**Chloroform**	**Trans-1,3-DCP**	**All Other VOCs**
		Analytical Method	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B	SW8260B
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**NE**	**3.8**	**0.24**	**200**	**NE**	**NE**	**--**
600SB109[2]	08/05/02	2	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND
600SB109[4]	08/05/02	4	< 0.005 UJ	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.01	ND

Notes

[1] Screening Levels were obtained from Table 1a of the *Draft Site Investigation Report Commissary/Post Exchange Study Area Presidio of San Francisco, California* (Treadwell& Rollo, 2003c).

DCE - dichloroethylene

DCP - Dichloropropene

DUP prefix indicates blind duplicate sample; parent sample precedes duplicate sample.

mg/kg - milligrams per kilogram

MSD - Matrix spike duplicate

MSD indicates to the laboratory which samples were to be used for the MSD quality control sample analyses. These are not matrix spike results.

ND - not detected above laboratory reporting limits.

NE - not established

VOCs - Volatile organic compounds

J+ - Data validation qualifier, "The analyte was positively identified; the associated numerical value is biased high due to a high surrogate recovery and should be considered an approximate concentration of the analyte in the sample."

J - - Data validation qualifier, "The analyte was positively identified; the associated numerical values is biased low due to a low surrogate recovery and should be considered an approximate concentration of the analyte in the sample."

UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."

* Exceedance due to laboratory contamination

Table C-3
Summary of PAH Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Anthracene	Benzo(a) Anthracene	Benzo(a) Pyrene	Benzo(b) Fluoranthene	Benzo(g,h,i) Perylene	Benzo(k) Fluoranthene	Chrysene	Dibenz(a,h) Anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-c,d) Pyrene	Naphthalene	Phenanthrene	Pyrene
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
601SB02[2.5]	08/05/02	2.5	0.063	0.093	**0.082**	0.06	0.046	0.055	0.12	< 0.02	0.15	0.025	0.041	< 0.2	0.31	0.15
601SB02[4.5]	08/05/02	4.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	0.007	< 0.005
601SB03[3.0]	01/16/03	3	< 0.0016	0.0049 J	0.0046 J	< 0.0029	< 0.0015 J U	< 0.0029	0.0056 J	< 0.0014	0.0054 J	< 0.0025	< 0.0014	< 0.0029	0.0042 J	0.0068 J
601SB03[8.0]	01/16/03	8	0.0058 J	0.015	0.018	0.014	< 0.0015 U	0.013	0.016	< 0.0014	0.025	0.0053 J	0.011 J+	0.008	0.019	0.027
601SB03[11.0]	01/16/03	11	< 0.0017	< 0.0014	< 0.0041	< 0.0031	< 0.0016	< 0.0031	< 0.0016	< 0.0014	< 0.0013	< 0.0027	< 0.0015	< 0.003	< 0.0022	< 0.0022
603SB01[2.0]	08/05/02	2	< 0.005	0.008	0.007	< 0.005	< 0.005	0.006	0.01	< 0.005	0.014	< 0.005	< 0.005	< 0.05	0.011	0.018
603SB01[5.0]	08/05/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
604SB01[4.5]	07/31/02	4.5	< 0.015	0.053	**0.11**	0.063	0.035	< 0.015	0.23	< 0.015	0.041	0.029	< 0.015	< 0.15	0.055	0.1
604SB01[6.0]	07/31/02	6	0.017	0.062	**0.05**	0.028	0.026	0.027	0.06	0.006	0.11	0.013	0.021	< 0.05	0.073	0.14
604SB02[2.0]	08/05/02	2	< 0.005	0.01	0.009	0.006	0.008	0.006	0.014	< 0.005	0.018	< 0.005	0.006	< 0.05	0.012	0.021
604SB02[6.0]	08/05/02	6	< 0.005	0.011	0.009	0.008	0.007	0.008	0.012	< 0.005	0.014	< 0.005	0.006	< 0.05	0.018	0.014
604SB03[2.0]	01/14/03	2	< 0.0015	0.016	0.0068 J	0.01	0.0063 J	< 0.0028	0.012	0.0056 J	0.0038 J	0.0039 J	0.0051 J	0.01	0.016	0.0091
604SB03[3.5]	01/14/03	3.5	< 0.002	0.0079 J	0.0094 J	0.0064 J	< 0.0019	< 0.0037	0.0088 J	0.0052 J	0.0069 J	< 0.0032	0.0067 J	0.019	0.028	0.0078 J
604SB03[5.5]	01/14/03	5.5	< 0.0025	0.0065 J	0.011 J	< 0.0047	< 0.0024	< 0.0047	0.0065 J	< 0.0022	< 0.002	< 0.0041	0.0087 J	0.0085 J	0.014	0.0068 J
604SB04[2.0]	01/14/03	2	0.0052 J	0.017	0.024	0.032	0.015	0.01	0.022	0.0069 J	0.034	0.0099	0.015	0.11	0.055	0.035
604SB04[5.5]	01/14/03	5.5	0.036 J	**0.84**	**0.7**	**0.69**	0.3	0.25	0.86	0.087	0.86	< 0.014	**0.27**	< 0.016	0.11	1.4
604SB04[7.0]	01/14/03	7	< 0.0017	0.0042 J	0.0086	0.0077 J	0.0045 J	< 0.0031	0.0047 J	0.0064 J	0.0046 J	< 0.0027	0.0082	< 0.003	< 0.0022	0.0048 J
604SB05[3.0]	01/16/03	3	0.018	0.032	**0.032**	0.027	0.022	0.023	0.033	0.005 J J+	0.048	0.01	0.02 J+	0.063	0.071	0.051
DUP011603A	01/16/03	3.5	0.016	0.027	**0.033**	0.024	0.023	0.02	0.03	0.0041 J J+	0.05	0.018	0.021 J+	0.037	0.084	0.049
604SB05[6.0]	01/16/03	6	0.022	0.07	**0.082**	0.053	0.052	0.051	0.074	0.012	0.13	0.008 J	0.044	0.017	0.072	0.17
604SB05[8.0]	01/16/03	8	0.031	0.055	**0.08**	0.062	0.12	0.082	0.064	0.017	0.12	0.051	0.04	0.011 J	0.073	0.13
604SB06[3.0]	01/16/03	3	4.6	**3.4**	**2.9**	**2.4**	3.6	**1.6**	**3.2**	**1.3**	23	4.7	**1.8**	0.044	29	19
604SB06[5.5]	01/16/03	5.5	0.011	0.016	0.017	0.0097	< 0.0015 U	0.01	0.017	< 0.0014	0.027	< 0.0026	0.0079 J+	0.0047 J	0.013	0.032
604SB06[7.5]	01/16/03	7.5	0.097	0.045	**0.048**	0.042	0.17	0.03	0.093	0.026	0.21	0.075	0.081	0.044	0.61	0.18
604SB07[2.0]	01/14/03	2	< 0.0016	< 0.0014	0.0053 J	< 0.003	< 0.0015	< 0.003	< 0.0015	< 0.0014	< 0.0013	< 0.0026	0.005 J	< 0.0029	< 0.0021	< 0.0021
604SB07[3.5]	01/14/03	3.5	< 0.0015	0.011	0.016	0.015	0.0084	0.0057 J	0.013	0.0052 J	0.015	< 0.0024	0.01	0.0056 J	0.011	0.017
604SB07[5.5]	01/14/03	5.5	0.0053 J	0.017	0.024	0.018	0.012	0.0069 J	0.016	0.0064 J	0.019 J+	< 0.003	0.013	< 0.0034	0.011	0.031
604SB09[2.0]	01/14/03	2	< 0.0018	0.0063 J	0.0083 J	0.0084 J	0.0054 J	< 0.0033	0.0062 J	0.007 J	< 0.0014	< 0.0028	0.0084 J	< 0.0032	< 0.0023	< 0.0023
604SB09[4.0]	01/14/03	4	< 0.0015	< 0.0013	0.0054 J	< 0.0027	< 0.0014	< 0.0027	< 0.0014	0.0054 J	< 0.0012	< 0.0024	0.0063 J	< 0.0026	< 0.0019	< 0.0019
604SB09[10.0]	01/14/03	10	< 0.0015	< 0.0013	< 0.0037	< 0.0028	< 0.0015	< 0.0028	< 0.0015	< 0.0013	< 0.0012	< 0.0025	< 0.0014	< 0.0027	< 0.002	< 0.002
605SB01[2.5]	01/22/03	2.5	< 0.0015	0.0061 J	0.01	0.01	0.0074	0.0045 J	0.0055 J	0.007 J	0.0098	< 0.0024	0.0088	< 0.0027	0.0091	0.021
605SB01[5.0]	01/22/03	5	< 0.0016	< 0.0014	< 0.004	< 0.003	< 0.0016	< 0.003	< 0.0016	< 0.0014	< 0.0013	< 0.0026	< 0.0015	< 0.0029	< 0.0021	< 0.0021
605SB01[10.0]	01/22/03	10	< 0.0016	< 0.0013	< 0.0038	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
605SB02[2.0]	01/16/03	2	< 0.0015	0.008	0.012	0.01	< 0.0014 U	0.0081	0.0093	< 0.0013	0.0093	< 0.0024	0.0087 J+	0.0048 J	0.0069 J	0.011
605SB02[5.0]	01/16/03	5	< 0.0015	< 0.0013	< 0.0037	< 0.0028	< 0.0014	< 0.0028	< 0.0014	< 0.0013	< 0.0012	< 0.0024	< 0.0014	< 0.0027	< 0.002	< 0.002
DUP011603B[MSD]	01/16/03	5.5	< 0.0016	< 0.0013	< 0.0039	< 0.0029	< 0.0015 J U	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
605SB02[8.0]	01/16/03	8	< 0.0029	0.017	0.018	0.019	0.023	0.016	0.016	0.0085 J	0.034	0.012 J	0.017	< 0.0051	0.021	0.032
609SB01[2.0]	01/14/03	2	< 0.0015	0.0089	0.013	0.012	0.0057 J	0.0054 J	0.0083	0.0051 J	0.0081	< 0.0024	0.0079	0.014	0.0081	0.0092

Table C-3
Summary of PAH Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Anthracene**	**Benzo(a) Anthracene**	**Benzo(a) Pyrene**	**Benzo(b) Fluoranthene**	**Benzo(g,h,i) Perylene**	**Benzo(k) Fluoranthene**	**Chrysene**	**Dibenz(a,h) Anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-c,d) Pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
609SB01[4.0]	01/14/03	4	< 0.0016	< 0.0013	0.0053 J	< 0.0029	< 0.0015	< 0.0029	< 0.0015	0.0045 J	< 0.0012	< 0.0025	0.0052 J	< 0.0028	< 0.002	< 0.002
609SB01[8.0]	01/14/03	8	< 0.0024	< 0.002	0.0073 J	< 0.0044	< 0.0023	< 0.0044	< 0.0023	0.0065 J	< 0.0018	< 0.0038	0.0078 J	< 0.0042	< 0.0031	< 0.0031
610SB01[2.0]	08/05/02	2	< 0.005	0.021	**0.036**	0.024	0.054	0.019	0.028	0.012	0.058	< 0.005	0.031	< 0.05	0.037	0.067
DUP080502E[MSD]	08/05/02	2.5	< 0.005	0.041	**0.042**	0.027	0.029	0.023	0.047	0.008	0.051	< 0.005	0.023	< 0.05	0.019	0.067
610SB01[5.0]	08/05/02	5	0.034 J-	0.097 J-	**0.1**	0.074	0.059	0.065	0.11 J-	0.018	0.15 J-	0.007	0.053	< 0.05	0.057 J-	0.16 J-
610SB02[2.0]	01/16/03	2	< 0.0016	0.013	0.013	0.012	0.011	0.011	0.015	< 0.0014	0.022	< 0.0025	0.0086	< 0.0028	0.015	0.026
610SB02[5.0]	01/16/03	5	< 0.0015	0.0056 J	0.004 J	< 0.0028	< 0.0014	< 0.0028	0.0059 J	< 0.0013	0.0077	< 0.0024	< 0.0014	< 0.0027	0.0094	0.01
610SB02[7.5]	01/16/03	7.5	< 0.0016	< 0.0014	< 0.004	< 0.003	< 0.0016	< 0.003	< 0.0016	< 0.0014	< 0.0013	< 0.0026	< 0.0015	< 0.0029	< 0.0021	< 0.0021
610SB03[2.0]	01/14/03	2	< 0.006	0.062	**0.064**	0.066	0.032	0.022 J	0.055	0.019 J	0.098	< 0.0096	0.033	< 0.011	0.075	0.15
610SB03[5.5]	01/14/03	5.5	< 0.0015	0.0081	0.011	0.0072 J	0.0052 J	< 0.0028	0.008	0.0044 J	0.011	< 0.0024	0.0074	< 0.0027	0.0071 J	0.013
610SB03[8.5]	01/14/03	8.5	< 0.0019	0.015	0.016	0.016	0.0067 J	0.0057 J	0.017	0.006 J	0.026	< 0.003	0.011	< 0.0034	0.016	0.025
610SB04[2.0]	01/14/03	2	0.0047 J	0.017	0.017	0.016	< 0.0015 U	0.013	0.021	0.004 J	0.028	< 0.0025	0.014	0.0057 J	0.019	0.032
610SB04[6.0]	01/14/03	6	0.0041 J	0.019	0.024	0.017	0.021	0.016	0.02	< 0.0013	0.035	< 0.0024	0.017	< 0.0026	0.011	0.041
610SB04[7.5]	01/14/03	7.5	< 0.0017	0.0067 J	0.0089	0.0082	< 0.0016 U	0.0045 J	0.0057 J	< 0.0014	0.012	< 0.0027	0.0052 J	< 0.003	< 0.0022	0.022
613SB01[2.0]	08/02/02	2	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.12	< 0.06	< 0.06	< 0.6	0.09	0.75
613SB01[5.0]	08/02/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	0.007	< 0.005	< 0.005	< 0.05	< 0.005	0.015
613SB02[2.0]	08/02/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
613SB02[5.0]	08/02/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	0.012
613SB03[2.0]	08/02/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
DUP080202C	08/02/02	2.5	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.007	< 0.005	0.022	< 0.005	< 0.005	< 0.05	0.014	0.1
613SB03[5.0]	08/02/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	0.006
613SB04[2.0]	08/02/02	2	0.045	0.15	**0.12**	0.068	0.05	0.076	0.17	0.017	0.31	0.012	0.048	< 0.05	0.27	0.39
613SB04[4.5]	08/02/02	4.5	< 0.005	0.008	0.008	0.006	0.007	0.005	0.012	< 0.005	0.017	< 0.005	< 0.005	< 0.05	0.02	0.02
613SB05[2.0]	08/02/02	2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 1	< 0.1	< 0.1
613SB05[4.0]	08/02/02	4	< 0.005	0.011	0.009	0.005	< 0.005	0.006	0.014	< 0.005	0.016	< 0.005	< 0.005	< 0.05	0.012	0.022
613SB06[2.0]	08/02/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	0.013
613SB06[5.0]	08/02/02	5	0.03	0.096	**0.086**	0.048	0.033	0.068	0.12	0.01	0.15	0.007	0.028	< 0.05	0.13	0.21
613SB07[2]	07/30/02	2	< 0.005	0.017	**0.034**	0.019	0.02	0.008	0.035	< 0.005	0.02	< 0.005	0.006	< 0.05	0.012	0.026
613SB07[5]	07/30/02	5	0.014	0.061	**0.057**	0.048	0.049	0.032	0.082	< 0.01	0.089	< 0.01	0.036	< 0.1	0.062	0.1
613SB08[2.0]	01/21/03	2	0.0044 J	0.029	**0.038**	0.053	0.03	0.016	0.025	0.013	0.026	< 0.0024	0.018	0.0063 J	0.025	0.079 J+
613SB08[7.0]	01/21/03	7	< 0.0015	< 0.0013	0.0078	0.0073 J	0.0048 J	< 0.0028	< 0.0015	< 0.0013	0.0067 J	< 0.0025	0.0074 J	< 0.0028	0.0076	0.018 J+
DUP012103A[MSD]	01/21/03	6.5	0.042	0.059	**0.074**	0.094	0.035	0.033	0.056	< 0.0013	0.0083	0.23	0.026	0.19	0.45	0.37 J+
613SB08[10.0]	01/21/03	10	< 0.0016	0.0046 J	0.0091	0.0085	0.0057 J	0.0047 J	0.004 J	< 0.0014	0.0056 J	< 0.0026	0.0084	< 0.0029	0.0052 J	0.01 J+
613SB09[2.0][MSD]	01/17/03	2	0.013	0.046	**0.078**	0.069	0.046	0.035	0.088	0.014	0.067	< 0.0024	0.024	0.012	0.052	0.13
613SB09[5.5]	01/17/03	5.5	< 0.0016	< 0.0013	< 0.0038	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
613SB09[7.5]	01/17/03	7.5	0.0061 J	0.033	**0.029**	0.024	0.02	0.023	0.028	< 0.0018	0.06	< 0.0033	0.012	< 0.0037	0.018	0.055
613SB10[2.5]	01/22/03	2.5	< 0.0015	< 0.0013	< 0.0037	< 0.0028	< 0.0015	< 0.0028	< 0.0015	< 0.0013	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.002	< 0.002
613SB10[5.5]	01/22/03	5.5	< 0.0016	< 0.0014	0.0076 J	0.0075 J	0.0051 J	< 0.003	< 0.0016	< 0.0014	< 0.0013	< 0.0026	0.0082	< 0.0029	< 0.0021	0.0055 J

Table C-3
Summary of PAH Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Anthracene	Benzo(a) Anthracene	Benzo(a) Pyrene	Benzo(b) Fluoranthene	Benzo(g,h,i) Perylene	Benzo(k) Fluoranthene	Chrysene	Dibenz(a,h) Anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-c,d) Pyrene	Naphthalene	Phenanthrene	Pyrene
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
DUP012203A	01/22/03	5.5	< 0.0016	0.0042 J	0.0086	0.0089	0.0056 J	0.0041 J	0.0044 J	< 0.0014	0.0044 J	< 0.0026	0.0081	< 0.0029	< 0.0021	0.0086
613SB10[7.5]	01/22/03	7.5	0.02	0.075	**0.065**	0.07	0.034	0.028	0.072	0.014	0.13	0.0043 J	0.032	< 0.0031	0.091	0.18
613SB11[2.0]	01/21/03	2	< 0.0015	0.018	**0.034**	0.056	0.029	0.012	0.023	< 0.0013	0.019	< 0.0024	0.016	0.0065 J	0.015	0.058 J+
613SB11[6.0]	01/21/03	6	< 0.0015	< 0.0013	0.0075	0.0066 J	0.0044 J	< 0.0028	< 0.0015	< 0.0013	0.0039 J	< 0.0025	0.0075	< 0.0027	0.0043 J	0.0068 J J+
613SB11[8.0]	01/21/03	8	< 0.0019	< 0.0016	0.0087 J	0.0096	0.005 J	< 0.0036	< 0.0018	< 0.0017	< 0.0015	< 0.0031	< 0.0018	< 0.0035	0.0087 J	0.0059 J J+
613SB12[2.0]	01/21/03	2	0.11	0.12	**0.1**	0.12	0.088	0.08	0.19	0.028	0.4	< 0.0047	0.054	0.011 J	0.64	0.34
613SB12[5.5]	01/21/03	5.5	0.0089	0.038	**0.044**	0.048	0.027	0.019	0.046	0.012	0.064	0.0048 J	0.024	0.0054 J	0.06	0.098 J+
DUP012103C[MSD]	01/21/03	6	0.0099	0.027	**0.03**	0.028	0.018	0.013	0.028	0.0096	0.042	< 0.0026	0.018	< 0.0029	0.034	0.072 J+
613SB12[7.5][MSD]	01/21/03	7.5	< 0.0022	0.02	**0.031**	0.026	0.018	0.021	0.023	< 0.0019	0.03	0.0084 J	0.015	< 0.0039	0.032	0.03
617SB01[2.0]	08/01/02	2	< 0.005	0.024	0.019	0.016	0.012	0.013	0.035	< 0.005	0.028	< 0.005	0.008	< 0.05	0.021	0.046
617SB01[5.0]	08/01/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
617SB02[2.0]	07/31/02	2	0.03	0.18	**0.23**	0.18	0.14	0.16	0.21	0.03	0.3	0.012	0.11	< 0.05	0.19	0.34
617SB02[5.0]	07/31/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
617SB03[2.0]	08/01/02	2	0.006	0.029	0.022	0.021	0.012	0.014	0.043	< 0.005	0.046	< 0.005	0.008	< 0.05	0.037	0.06
617SB03[5.0]	08/01/02	5	< 0.005	0.018	0.014	0.009	0.007	0.01	0.017	< 0.005	0.03	< 0.005	0.005	< 0.05	0.02	0.034
617SB04[1.5]	01/15/03	1.5	0.0074	0.025	**0.036**	0.043	0.042	0.021	0.04	0.012	0.043	< 0.0024	0.019	0.0052 J	0.026	0.051
617SB04[6.0]	01/15/03	6	< 0.0017	< 0.0014	0.0044 J	0.0072 J	0.013	< 0.0031	0.0079 J	< 0.0014	< 0.0013	0.0047 J	< 0.0015	< 0.003	< 0.0022	0.0057 J
617SB04[8.0]	01/15/03	8	< 0.0016	< 0.0013	< 0.0039	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
617SB05[1.5]	01/15/03	1.5	0.084	0.14	**0.11**	0.13	0.087	0.079	0.28	0.023 J	0.37	< 0.014	0.039 J	< 0.016	0.7	0.35
617SB05[4.0]	01/15/03	4	< 0.0016	0.0087	0.008	0.0061 J	0.0055 J	0.0056 J	0.0099	< 0.0014	0.015	< 0.0025	0.0049 J	0.012	0.015	0.02
617SB05[7.5]	01/15/03	7.5	< 0.0028	< 0.0024	< 0.007	< 0.0053	< 0.0027	< 0.0053	< 0.0027	< 0.0025	< 0.0022	< 0.0046	< 0.0026	< 0.0051	< 0.0038	< 0.0038
617SB06[2.5]	01/15/03	2.5	0.041	0.061	**0.065**	0.079	0.065	0.036	0.12	0.016	0.13	0.0058 J	0.024	0.0098 J	0.14	0.17
617SB06[6.0]	01/15/03	6	0.017	0.011	0.0062 J	0.0071 J	< 0.0018 U	< 0.0034	0.011	< 0.0016	0.015	0.0066 J	< 0.0017	0.045	0.037	0.016
617SB06[10.0]	01/15/03	10	< 0.0016	< 0.0014	< 0.0039	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0029	< 0.0021	< 0.0021
617SB07[1.5]	01/15/03	1.5	0.17	0.24	**0.23**	0.24	0.2	0.16	0.47	0.055 J	0.63	0.064 J	0.13	0.21	0.85	0.56
617SB07[5.5]	01/15/03	5.5	0.054	0.034	**0.027**	0.034	0.028	0.018	0.038	0.0076 J	0.066	0.026	0.018	0.089	0.13	0.061
617SB07[9.0]	01/15/03	9	< 0.0017	< 0.0014	< 0.0041	< 0.0031	< 0.0016	< 0.0031	< 0.0016	< 0.0014	< 0.0013	< 0.0027	< 0.0015	< 0.003	< 0.0022	< 0.0022
617SB08[2.0]	01/15/03	2	0.011	0.049	**0.074**	0.072	0.06	0.046	0.077	0.011	0.075	< 0.0024	0.038	0.01	0.041	0.079
617SB08[5.5]	01/15/03	5.5	0.0057 J	0.015	0.016	0.011	0.012	0.011	0.014	< 0.0013	0.035	< 0.0025	0.0086	< 0.0028	0.028	0.043
617SB08[10.0]	01/15/03	10	< 0.0016	0.0052 J	0.0046 J	< 0.0029	< 0.0015	< 0.0029	0.0054 J	< 0.0013	0.0082	< 0.0025	< 0.0014	< 0.0028	0.0064 J	0.01
617SB09[2.0]	01/16/03	2	0.0048 J	0.016	0.022	0.017	0.021	0.014	0.02	< 0.0013	0.028	< 0.0023	0.017 J+	0.0044 J	0.022	0.036
617SB09[5.5]	01/16/03	5.5	0.0048 J	0.011	0.01	0.01	< 0.0015 U	0.008	0.01	< 0.0014	0.016	< 0.0025	0.0054 J J+	0.0048 J	0.014	0.018
617SB09[10.0]	01/16/03	10	< 0.0016	< 0.0014	< 0.004	< 0.003	< 0.0016	< 0.003	< 0.0016	< 0.0014	< 0.0013	< 0.0026	< 0.0015	< 0.003	< 0.0022	< 0.0022
619SB01[4.5]	07/31/02	4.5	< 0.005	0.012	0.013	0.009	0.008	0.007	0.015	< 0.005	0.021	< 0.005	0.007	0.058	0.021	0.024
619SB01[6.0]	07/31/02	6	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	0.006
619SB02[2]	08/06/02	2	< 0.005	0.014	0.017	0.013	0.014	0.009	0.022	< 0.005	0.018	< 0.005	0.007	< 0.05 UJ	0.013	0.025
DUP080602D[MSD]	08/06/02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05 UJ	< 0.005	< 0.005
619SB02[5]	08/06/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05 UJ	< 0.005	< 0.005

Table C-3
Summary of PAH Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Anthracene	Benzo(a) Anthracene	Benzo(a) Pyrene	Benzo(b) Fluoranthene	Benzo(g,h,i) Perylene	Benzo(k) Fluoranthene	Chrysene	Dibenz(a,h) Anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-c,d) Pyrene	Naphthalene	Phenanthrene	Pyrene
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
619SB03[4.5]	07/31/02	4.5	< 0.005	0.023	0.019	0.021	0.02	0.007	0.065	< 0.005	0.02	< 0.005 UJ	0.006	< 0.05 UJ	0.028	0.048
619SB03[6.0]	07/31/02	6	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
619SB04[7.0]	01/23/03	7	< 0.0016	< 0.0013	< 0.0039	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	0.004 J
619SB04[11.5]	01/23/03	11.5	< 0.0023	< 0.0019	< 0.0055	< 0.0042	0.044	< 0.0042	< 0.0022	< 0.002	< 0.0018	< 0.0036	< 0.0021	< 0.0041	< 0.003	< 0.003
DUP012303A	01/23/03	12	< 0.0017	< 0.0014	< 0.0041	< 0.0031	< 0.0016	< 0.0031	< 0.0016	< 0.0015	< 0.0013	< 0.0027	< 0.0015	< 0.003	< 0.0022	< 0.0022
619SB04[13.0][MSD]	01/23/03	13	< 0.0017	< 0.0015	< 0.0042	< 0.0032	0.043	< 0.0032	< 0.0016	< 0.0015	0.0053 J	< 0.0028	< 0.0016	< 0.0031	< 0.0023	0.0048 J
625SB01[2]	07/29/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
625SB01[4]	07/29/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
625SB02[2]	07/29/02	2	< 0.005	0.012	0.017	0.012	0.018	0.01	0.016	< 0.005	0.016	< 0.005	0.012	< 0.05	0.012	0.021
625SB03[2]	07/29/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
DUP072902A	07/29/02	2.5	< 0.005	0.008	0.007	< 0.005	0.006	0.005	0.009	< 0.005	0.014	< 0.005	< 0.005	< 0.05	0.01	0.018
625SB03[5]	07/29/02	5	0.025	0.082	**0.078**	0.052	0.054	0.049	0.097	0.007	0.21	< 0.02	0.045	< 0.2	0.16	0.26
DUP072902B	07/29/02	5.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
625SB04[2]	07/29/02	2	< 0.005	0.006	0.008	0.006	0.007	0.005	0.008	< 0.005	0.009	< 0.005	0.005	< 0.05	0.006	0.01
625SB04[5]	07/29/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
625SB05[2.0]	01/13/03	2	< 0.0059	0.061	**0.059**	0.085	0.026 J	0.022 J	0.084	0.021 J	0.12	< 0.0096	0.031	< 0.011	0.025 J	0.16
625SB05[7.5]	01/13/03	7.5	< 0.0062	< 0.0053	0.026 J	0.016 J	< 0.0059	< 0.011	0.02 J	0.018 J	0.021 J	< 0.0099	0.02 J	< 0.011	0.016 J	0.026 J
625SB05[10.0]	01/13/03	10	< 0.0029	< 0.0025	0.011 J	< 0.0055	< 0.0028	< 0.0055	< 0.0028	0.0092 J	< 0.0023	< 0.0047	0.011 J	< 0.0053	< 0.0039	< 0.0039
626SB01[2]	07/29/02	2	0.012	0.036	**0.078**	0.041	0.041	0.014	0.11	0.008	0.076	0.026	0.013	< 0.1	0.17	0.12
626SB01[4]	07/29/02	4	< 0.005 UJ	0.01 J-	0.014	0.011	0.016	0.006	0.016 J-	< 0.005	0.005 J-	< 0.005	0.009	< 0.05	< 0.005 UJ	0.013 J-
626SB02[2]	07/29/02	2	0.014	0.067	**0.027**	0.021	0.012	0.019	0.07	0.006	0.12	0.008	0.011	0.064	0.024	0.18
626SB02[4]	07/29/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
626SB03[2]	07/29/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
626SB03[5]	07/29/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
626SB04[6.5]	01/23/03	6.5	0.068	0.2	**0.14**	0.15	0.069	0.13	0.2	0.029	0.41	0.0061 J	0.068	0.011	0.38	0.3
DUP012303C[MSD]	01/23/03	7	< 0.0017	< 0.0014	< 0.0041	< 0.0031	< 0.0016	< 0.0031	< 0.0016	< 0.0014	< 0.0013	< 0.0027	< 0.0015	< 0.003	< 0.0022	< 0.0022
626SB04[9.0]	01/23/03	9	< 0.0016	< 0.0014	< 0.0039	< 0.003	< 0.0015	< 0.003	< 0.0015	< 0.0014	< 0.0013	< 0.0026	< 0.0015	< 0.0029	< 0.0021	< 0.0021
626SB04[11.0]	01/23/03	11	0.006 J	0.018	0.026	0.016	0.015	0.014	0.018	< 0.002	0.027	< 0.0036	0.013	< 0.0041	0.013	0.032
626SB05[7.0]	01/23/03	7	0.064	0.15	**0.13**	0.086	0.039	0.083	0.17	0.013	0.23	0.044	0.032	2.1	0.21	0.25
626SB05[8.5]	01/23/03	8.5	0.011 J	0.032	**0.044**	0.026	0.024	0.025	0.034	< 0.0022	0.047	< 0.0041	0.021	0.011 J	0.025	0.063
DUP012303E	01/23/03	9	0.011 J	0.034	**0.04**	0.043	0.022	0.026	0.073	< 0.0028	0.074	0.026	0.016	0.016	0.11	0.084
626SB05[10.0]	01/23/03	10	0.013 J	0.036	**0.052**	0.035	0.027	0.031	0.046	< 0.0029	0.058	< 0.0054	0.024	0.011 J	0.04	0.074
628SB01[2.0]	07/30/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB01[5.0]	07/30/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB02[2.5]	07/30/02	2.5	< 0.1	< 0.1	**0.13**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 1	< 0.1	0.29
628SB02[5.5]	07/30/02	5.5	< 0.005	0.007	0.006	< 0.005	< 0.005	< 0.005	0.009	< 0.005	0.006	< 0.005	< 0.005	< 0.05	< 0.005	0.009
DUP073002A	07/30/02	5	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.2	< 0.02	0.042
628SB03[2.0]	07/30/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005

Table C-3
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Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Anthracene**	**Benzo(a) Anthracene**	**Benzo(a) Pyrene**	**Benzo(b) Fluoranthene**	**Benzo(g,h,i) Perylene**	**Benzo(k) Fluoranthene**	**Chrysene**	**Dibenz(a,h) Anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-c,d) Pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
628SB03[4.5]	07/30/02	4.5	< 0.005	0.013	0.011	0.007	0.008	0.007	0.012	< 0.005	0.031	< 0.005	0.005	< 0.05	0.035	0.039
628SB04[2]	07/30/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB04[5]	07/30/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB05[2]	07/31/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.007	< 0.005	< 0.005	< 0.05	0.005	0.007
628SB05[5]	07/31/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB06[2]	07/31/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB06[4]	07/31/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB07[2]	07/31/02	2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 1	< 0.1	< 0.1
628SB07[5]	07/31/02	5	0.019	0.082	**0.053**	0.055	0.018	0.046	0.087	0.008	0.14	0.006	0.017	< 0.05	0.072	0.11
628SB08[2]	07/31/02	2	< 0.02 UJ	< 0.02 UJ	< 0.02 UJ	0.043 J-	0.034 J-	< 0.02 UJ	0.077 J-	< 0.02 UJ	0.024 J-	< 0.02	< 0.02 UJ	< 0.2	< 0.02 UJ	0.03 J-
628SB08[5]	07/31/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB09[2]	08/02/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
DUP080202A	08/02/02	2.5	< 0.005	0.008	0.014	0.011	0.015	< 0.005	0.024	< 0.005	0.007	< 0.005	0.005	< 0.05	< 0.005	0.018
628SB09[5]	08/02/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB10[2.0]	07/30/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB10[5.0]	07/30/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB11[2]	07/31/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
DUP073102A(MSD)	07/31/02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB11[5]	07/31/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
628SB12[2.0]	01/17/03	2	0.026	0.038	**0.1**	0.065	0.31	0.042	0.099	**0.23**	0.18	0.0048 J	0.25	0.012	0.05	0.16
628SB12[5.5]	01/17/03	5.5	< 0.0018	< 0.0015	< 0.0043	< 0.0033	< 0.0017	< 0.0033	< 0.0017	< 0.0015	< 0.0014	< 0.0028	< 0.0016	< 0.0032	< 0.0023	< 0.0023
DUP011703B[MSD]	01/17/03	6	< 0.0018	< 0.0015	< 0.0043	< 0.0033	< 0.0017	< 0.0033	< 0.0017	< 0.0015	< 0.0014	< 0.0028	< 0.0016	< 0.0032	< 0.0023	< 0.0023
628SB12[10.0]	01/17/03	10	< 0.0015	< 0.0013	< 0.0037	< 0.0028	< 0.0014	< 0.0028	< 0.0014	< 0.0013	< 0.0012	< 0.0024	< 0.0014	< 0.0027	< 0.002	< 0.002
628SB13[2.0]	01/17/03	2	0.0041 J	0.015	0.014	0.0077	0.016	0.0092	0.016	< 0.0013	0.023	< 0.0024	0.0082	< 0.0027	0.014	0.036
628SB13[6.0]	01/17/03	6	< 0.0016	< 0.0014	< 0.004	< 0.003	< 0.0016	< 0.003	< 0.0016	< 0.0014	0.0043 J	< 0.0026	< 0.0015	< 0.0029	< 0.0022	< 0.0022
628SB13[10.0]	01/17/03	10	0.0044 J	0.0096	0.0067 J	0.0078 J	0.026	0.0055 J	0.01	0.0045 J	0.017	< 0.0027	0.01	< 0.003	0.0099	0.027
628SB14[3.0]	01/17/03	3	< 0.0016	< 0.0013	< 0.0039	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
628SB14[6.0]	01/17/03	6	< 0.0021	< 0.0017	< 0.005	< 0.0038	0.012	< 0.0038	< 0.002	< 0.0018	0.0094 J	< 0.0033	0.0062 J	< 0.0037	0.006 J	0.016
628SB14[10.0]	01/17/03	10	< 0.0016	< 0.0013	< 0.0038	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
628SB15[2.0]	01/17/03	2	< 0.0015 UJ	< 0.0013 UJ	< 0.0036 UJ	< 0.0027 UJ	0.0045 J J-	< 0.0027 UJ	0.0054 J J-	< 0.0013 UJ	0.0062 J J-	0.012 J-	< 0.0013 UJ	< 0.0027 UJ	< 0.0019 UJ	0.0069 J J-
628SB15[6.0]	01/17/03	6	< 0.0017	< 0.0014	< 0.0042	< 0.0031	< 0.0016	< 0.0031	< 0.0016	< 0.0015	< 0.0013	< 0.0027	< 0.0015	< 0.0031	< 0.0022	0.0049 J
628SB15[9.5]	01/17/03	9.5	< 0.0016	< 0.0013	< 0.0038	< 0.0029	0.0039 J	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
DUP011703A	01/17/03	10	< 0.0015	< 0.0013	< 0.0037	< 0.0028	< 0.0015	< 0.0028	< 0.0015	< 0.0013	< 0.0012	< 0.0025	< 0.0014	< 0.0027	< 0.002	< 0.002
628SB16[6.0]	01/23/03	6	< 0.0016	< 0.0014	< 0.0039	< 0.003	< 0.0015	< 0.003	< 0.0015	< 0.0014	< 0.0013	< 0.0026	< 0.0015	< 0.0029	< 0.0021	< 0.0021
628SB16[8.5]	01/23/03	8.5	0.0045 J	0.012	0.013	0.0093	0.15	0.0087 J	0.015	< 0.0016	0.017	< 0.0029	0.0074 J	< 0.0032	0.016	0.022
DUP012303D	01/23/03	9	0.0069 J	0.016	0.015	0.011	0.16	0.0076 J	0.025	< 0.0015	0.019	0.008 J	0.0071 J	< 0.0031	0.038	0.031
628SB16[14.0]	01/23/03	4	< 0.0016	< 0.0014	< 0.0039	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0026	< 0.0014	< 0.0029	< 0.0021	< 0.0021
628SB17[2.0]	01/17/03	2	< 0.0015	< 0.0012	0.011	0.0077	0.04	0.005 J	< 0.0014	0.0085	< 0.0011	< 0.0024	0.016	< 0.0026	< 0.0019	0.0081

Table C-3
Summary of PAH Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Anthracene**	**Benzo(a) Anthracene**	**Benzo(a) Pyrene**	**Benzo(b) Fluoranthene**	**Benzo(g,h,i) Perylene**	**Benzo(k) Fluoranthene**	**Chrysene**	**Dibenz(a,h) Anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-c,d) Pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
628SB17[7.0]	01/17/03	7	< 0.0016	0.061	0.0044 J	< 0.0029	0.012	< 0.0029	< 0.0015	< 0.0013	< 0.0012	< 0.0025	0.0067 J	< 0.0028	< 0.0021	0.0054 J
628SB17[10.0]	01/17/03	10	< 0.0015	< 0.0013	< 0.0037	< 0.0028	0.006 J	< 0.0028	< 0.0014	< 0.0013	< 0.0012	< 0.0024	< 0.0014	< 0.0027	< 0.002	0.0065 J
T615SB01[2.0]	08/01/02	2	0.007	0.043	0.024	0.025	0.015	0.019	0.058	0.005	0.067	< 0.005	0.013	< 0.05	0.061	0.068
T615SB01[4.5]	08/01/02	4.5	0.006 J-	0.021 J-	0.018 J-	0.019 J-	0.012 J-	0.012 J-	0.037 J-	< 0.005 UJ	0.041 J-	< 0.005 UJ	0.007 J-	< 0.05 UJ	0.043 J-	0.048 J-
T615SB02[2.0]	07/31/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
T615SB02[5.0]	07/31/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
T615SB03[2.0]	01/15/03	2	0.0094	0.034	**0.045**	0.049	0.046	0.028	0.058	0.0067 J	0.073	< 0.0024	0.022	0.021	0.063	0.076
T615SB03[6.0]	01/15/03	6	< 0.002	< 0.0017	< 0.0049	< 0.0037	< 0.0019	< 0.0037	< 0.0019	< 0.0018	< 0.0016	0.0084 J	< 0.0018	< 0.0036	< 0.0027	< 0.0027
T615SB03[10.0]	01/15/03	10	< 0.0016	< 0.0014	< 0.0039	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0026	< 0.0014	< 0.0029	< 0.0021	< 0.0021
T618SB02[2.0]	08/06/02	2	< 0.005	0.007	0.009	0.011	0.011	< 0.005	0.022	< 0.005	< 0.005 U	< 0.005	< 0.005	< 0.05 UJ	< 0.005 U	< 0.005 U
DUP080602C	08/06/02	2.5	< 0.02 UJ	< 0.02 UJ	< 0.02 UJ	< 0.02 UJ	0.024 J-	< 0.02 UJ	0.024 J-	< 0.02 UJ	< 0.02 UJ	< 0.02 UJ	< 0.02 UJ	< 0.2 UJ	< 0.02 UJ	< 0.02 UJ
T618SB02[5.0]	08/06/02	5	< 0.005	0.008	0.008	0.007	0.006	0.005	0.011	< 0.005	< 0.005 U	< 0.005	0.005	< 0.05 UJ	< 0.005 U	< 0.005 U
S15SB01[2.0]	08/06/02	2	< 0.05	0.11	**0.077**	0.059	0.051	< 0.05	0.15	< 0.05	0.19	< 0.05	< 0.05	< 0.5 UJ	0.19	< 0.05 U
S15SB01[5.0]	08/06/02	5	0.013	0.06	**0.038**	0.035	0.02	0.028	0.083	0.005	0.11	< 0.005	0.017	< 0.05 UJ	< 0.005 U	< 0.005 U
S15SB02[2.0]	08/01/02	2	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.008	< 0.005	0.009	< 0.005	< 0.005	< 0.05	0.006	0.01
S15SB02[4.0]	08/01/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
S15SB03[2.0]	08/06/02	2	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.038	< 0.02	< 0.02 U	< 0.02	< 0.02	< 0.2 UJ	< 0.02	< 0.02 U
S15SB03[5.0]	08/06/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005 U	< 0.005	< 0.005	< 0.05 UJ	< 0.005	< 0.005 U
S15SB04[2.0]	01/14/03	2	0.0066 J	0.017	0.019	0.015	NA	0.013	0.02	< 0.0013	0.032	< 0.0025	0.011	0.052	0.044	0.037
S15SB04[5.5]	01/14/03	5.5	< 0.0016	< 0.0013	< 0.0038	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
S15SB04[10.0]	01/14/03	10	< 0.0016	< 0.0014	< 0.0039	< 0.003	< 0.0015	< 0.003	< 0.0015	< 0.0014	< 0.0013	< 0.0026	< 0.0015	< 0.0029	< 0.0021	< 0.0021
S15SB05[1.5]	01/15/03	1.5	0.011	0.029	**0.041**	0.038	0.05	0.026	0.053	0.0083	0.049	< 0.0025	0.02	0.0078	0.037	0.071
S15SB05[5.5]	01/15/03	5.5	< 0.0016	0.0058 J	0.0062 J	0.0063 J	0.0055 J	0.0051 J	0.0069 J	< 0.0014	0.0096	< 0.0026	0.0053 J	< 0.0029	0.007 J	0.0095
DUP011503A	01/15/03	6	< 0.0018	0.0052 J	< 0.0043	0.0051 J	< 0.0017	0.0044 J	0.0058 J	< 0.0015	0.0086	< 0.0028	< 0.0016	< 0.0032	0.0074 J	0.008 J
S15SB05[7.0]	01/15/03	7	< 0.0025	< 0.0021	< 0.0061	< 0.0046	< 0.0024	< 0.0046	< 0.0024	< 0.0022	< 0.002	< 0.004	< 0.0023	< 0.0045	< 0.0033	< 0.0033
DUP011503B	01/15/03	7.5	< 0.0026	< 0.0022	< 0.0064	< 0.0049	< 0.0025	< 0.0049	< 0.0025	< 0.0023	< 0.0021	< 0.0042	< 0.0024	< 0.0047	< 0.0035	< 0.0035
S15SB06[3.0]	01/16/03	3	0.0064 J	0.021	0.021	0.013	< 0.0015 U	0.013	0.024	< 0.0014	0.031	< 0.0025	0.012 J+	< 0.0028	0.027	0.043
S15SB06[6.0]	01/16/03	6	0.048	0.14	**0.14**	0.096	0.078	0.093	0.13	0.017 J+	0.25	0.024	0.07 J+	0.0066 J	0.19	0.26
S15SB06[10.0]	01/16/03	10	0.0093 J	0.0089 J	0.0082 J	0.0082 J	< 0.0023 J U	0.0061 J	0.0076 J	< 0.0021	0.026	< 0.0039	< 0.0022	< 0.0044	0.025	0.022
S15SB07[1.5]	01/15/03	1.5	0.15	0.12	**0.12**	0.11	0.078	0.065	0.18	0.022	0.4	0.1	0.048	0.23	0.65	0.33
S15SB07[5.0]	01/15/03	5	< 0.0016	< 0.0013	< 0.0038	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	0.0041 J
S15SB07[8.0]	01/15/03	8	< 0.0021	< 0.0018	< 0.0051	< 0.0039	< 0.002	< 0.0039	< 0.002	< 0.0018	< 0.0017	< 0.0034	< 0.0019	< 0.0038	< 0.0028	< 0.0028
600ASB01[2]MSD	08/07/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05 UJ	< 0.005	< 0.005
DUP080702A[MSD]	08/07/02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05 UJ	< 0.005	< 0.005
600ASB01[4]MSD	08/07/02	4	0.13	**0.45**	**0.42**	0.19	0.2	0.19	0.46	0.055	0.63	0.01	0.18	0.067	0.27	0.76
600ASB02[2]	08/01/02	2	< 0.005	0.01	0.005	0.006	< 0.005	0.006	0.013	< 0.005	0.009	< 0.005	< 0.005	< 0.05	0.006	0.01
600ASB02[4]	08/01/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600ASB03[2.0]	08/01/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005

Table C-3
Summary of PAH Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Anthracene**	**Benzo(a) Anthracene**	**Benzo(a) Pyrene**	**Benzo(b) Fluoranthene**	**Benzo(g,h,i) Perylene**	**Benzo(k) Fluoranthene**	**Chrysene**	**Dibenz(a,h) Anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-c,d) Pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
600ASB03[5.0]	08/01/02	5	< 0.01	0.02	0.024	0.034	0.034	0.012	0.057	0.012	0.034	< 0.01	0.016	< 0.1	0.033	0.041
600ASB04[2]	08/01/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600ASB04[5]	08/01/02	5	0.008	0.02	0.023	0.019	0.016	0.018	0.028	< 0.005	0.045	< 0.005	0.012	< 0.05	0.032	0.042
600ASB05[2]	08/01/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600ASB05[5]	08/01/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600ASB06[2]	08/01/02	2	< 0.005	0.014	0.014	0.009	< 0.005	0.01	0.018	< 0.005	0.015	< 0.005	< 0.005	< 0.05	< 0.005	0.023
600ASB06[5]	08/01/02	5	< 0.005	0.008	0.007	< 0.005	< 0.005	< 0.005	0.009	< 0.005	0.011	< 0.005	< 0.005	< 0.05	< 0.005	0.015
600ASB07[2.0]	01/17/03	2	0.08	0.092	**0.2**	0.18	0.096	0.052	0.19	0.042	0.22	0.024	0.051	0.015	0.31	0.29
600ASB07[5.5]	01/17/03	5.5	< 0.0015	< 0.0013	< 0.0038	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0013	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.002	< 0.002
600ASB07[10.0]	01/17/03	10	< 0.0016	< 0.0013	< 0.0039	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0029	< 0.0021	< 0.0021
600ASB08[2.0]	01/17/03	2	0.0047 J	0.024	**0.03**	0.044	0.034	0.017	0.045	0.01	0.031	< 0.0023	0.018	< 0.0026	0.014	0.037
600ASB08[5.5]	01/17/03	5.5	0.0066 J	0.033	**0.048**	0.041	0.035	0.03	0.048	0.0084 J	0.039	< 0.003	0.025	0.0056 J	0.024	0.05
DUP011703C	01/17/03	6	< 0.0016	< 0.0013	< 0.0038	< 0.0029	0.004 J	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	0.0054 J
600ASB08[7.0]	01/17/03	7	< 0.0017	< 0.0014	0.0054 J	< 0.0031	< 0.0016	< 0.0031	< 0.0016	< 0.0015	< 0.0013	< 0.0027	< 0.0015	< 0.003	< 0.0022	< 0.0022
600ASB09[2.0]	01/16/03	2	0.044	0.09	**0.1**	0.074	0.056	0.055	0.12	0.014	0.16	0.008	0.036	0.025	0.16	0.21
600ASB09[7.0]	01/16/03	7	0.014	0.054	**0.057**	0.047	0.032	0.037	0.048	0.0066 J	0.088	0.0049 J	0.03	0.011	0.032	0.08
DUP011603C	01/16/03	7.5	< 0.0016	0.0045 J	< 0.0039	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	0.0053 J	0.0043 J	< 0.0014	< 0.0028	< 0.0021	0.005 J
600ASB09[10.0][MSD]	01/16/03	10	< 0.002	< 0.0017	< 0.0049	< 0.0037	< 0.0019	< 0.0037	< 0.0019	< 0.0017	< 0.0016	< 0.0032	< 0.0018	< 0.0036	< 0.0026	< 0.0026
600CSB01[2]	07/31/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600CSB01[5]	07/31/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600CSB02[2]	07/31/02	2	< 0.005	0.01	0.009	0.006	< 0.005	0.006	0.012	< 0.005	0.013	< 0.005	< 0.005	< 0.05	0.008	0.018
600CSB02[4.0]	07/31/02	4	< 0.005	0.013	0.011	0.007	0.005	0.007	0.016	< 0.005	0.017	< 0.005	< 0.005	< 0.05	0.01	0.023
600CSB03[2.0]	07/29/02	2	< 0.005 UJ	< 0.005 UJ	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.005 UJ	< 0.005 UJ
600CSB03[5.0]	07/29/02	5	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.05 UJ	< 0.005 UJ	< 0.005 UJ
600CSB04[2.0]	07/29/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.05	< 0.005	0.006
600CSB04[5.0]	07/29/02	5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	0.061	0.085
600CSB05[2.0]	01/13/03	2	< 0.0015	< 0.0013	0.0041 J	< 0.0028	< 0.0015	< 0.0028	< 0.0015	< 0.0013	< 0.0012	< 0.0025	0.0041 J	< 0.0028	< 0.002	< 0.002
600CSB05[8.0]	01/13/03	8	< 0.0016	< 0.0014	0.0041 J	< 0.003	< 0.0015	< 0.003	< 0.0015	< 0.0014	< 0.0013	< 0.0026	< 0.0015	< 0.0029	< 0.0021	< 0.0021
600CSB05[10.0]	01/13/03	10	< 0.0017	< 0.0014	0.0042 J	< 0.0031	< 0.0016	< 0.0031	< 0.0016	< 0.0014	< 0.0013	< 0.0027	< 0.0015	< 0.003	< 0.0022	< 0.0022
600CSB06[2.0]	01/13/03	2	0.11	**0.39**	**0.34**	**0.55**	0.12	0.19	0.45	0.038	0.77	0.041	0.11	0.018	0.61	0.74
600CSB06[5.0]	01/13/03	5	< 0.0016	< 0.0013	0.0041 J	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	0.0041 J	< 0.0028	< 0.0021	< 0.0021
600CSB06[10.0]	01/13/03	10	< 0.0023	< 0.002	0.0066 J	< 0.0042	< 0.0022	< 0.0042	< 0.0022	< 0.002	< 0.0018	< 0.0037	0.0064 J	< 0.0041	< 0.003	< 0.003
600CSB07[2.0]	01/13/03	2	< 0.0054	< 0.0046	**0.035**	0.098	0.028 J+	0.027	0.017 J	0.017 J	0.021 J	< 0.0086	0.02 J	< 0.0096	< 0.0071	0.067
600CSB07[5.5]	01/13/03	5.5	< 0.0016	< 0.0013	0.0041 J	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	0.004 J	< 0.0028	< 0.0021	< 0.0021
600CSB07[10.0]	01/13/03	10	< 0.0017	< 0.0015	0.0047 J	< 0.0032	< 0.0017	< 0.0032	< 0.0017	< 0.0015	< 0.0014	< 0.0028	0.0046 J	< 0.0031	< 0.0023	< 0.0023
600FDSSB01[2.0]	08/01/02	2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.05	< 0.05
600FDSSB01[3.5]	08/01/02	3.5	< 0.04 UJ	0.1 J-	**0.065 J-**	0.072 J-	0.047 J-	< 0.04 UJ	0.17 J-	< 0.04 UJ	0.18 J-	< 0.04 UJ	< 0.04 UJ	< 0.4 UJ	0.2 J-	0.2 J-
600FDSSB02[2.0]	01/15/03	2	< 0.0014 UJ	< 0.0012 UJ	< 0.0035 UJ	< 0.0026 UJ	< 0.0013 UJ	< 0.0026 UJ	0.0067 J J-	< 0.0012 UJ	< 0.0011 UJ	< 0.0023 UJ	< 0.0013 UJ	< 0.0025 UJ	0.0055 J J-	0.0063 J J-

Table C-3
Summary of PAH Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Anthracene**	**Benzo(a) Anthracene**	**Benzo(a) Pyrene**	**Benzo(b) Fluoranthene**	**Benzo(g,h,i) Perylene**	**Benzo(k) Fluoranthene**	**Chrysene**	**Dibenz(a,h) Anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-c,d) Pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
600FDSSB02[5.5]	01/15/03	5.5	0.027	0.051	**0.08**	0.12	0.34	0.092	0.051	0.046	0.054	< 0.0026	0.26	0.092	0.093	0.043
600FDSSB02[10.0]	01/15/03	10	< 0.0016	< 0.0014	< 0.004	< 0.003	< 0.0016 U	< 0.003	< 0.0016	< 0.0014	0.005 J	< 0.0026	< 0.0015	< 0.0029	< 0.0022	0.0044 J
600RRSB01[2.0]	08/05/02	2	< 0.005	0.014	0.016	0.018	0.02	0.008	0.026	< 0.005	0.036	< 0.005	0.011	0.005	0.033	0.041
DUP080502B	08/05/02	2.5	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.2	< 0.02	0.02
600RRSB01[5.5]	08/05/02	5.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600RRSB02[2.0]	08/05/02	2	0.015	0.056	**0.084**	0.074	0.078	0.071	0.069	0.012	0.15	0.011	0.063	< 0.05	0.013	0.18
600RRSB02[5.0]	08/05/02	5	0.006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.017	0.019	< 0.005	< 0.05	0.043	0.013
600RRSB03[2.0]	08/05/02	2	0.71	**0.73**	**0.37**	**0.31**	< 0.3	**< 0.3**	1.1	< 0.3	0.93	0.61	**< 0.3**	< 3	4	1.8
600RRSB03[5.0]	08/05/02	5	0.026	0.031	0.017	0.014	0.013	< 0.005	0.045	< 0.005	0.043	0.026	0.006	< 0.05	0.17	0.079
600RRSB04[2]MSD	08/07/02	2	< 0.02	0.068	**0.091**	0.067	0.096	0.054	0.097	< 0.02	0.17	< 0.02	0.069	< 0.2	0.095	0.2
600RRSB04[4]MSD	08/07/02	4	< 0.01	0.041	**0.061**	0.045	0.054	0.034	0.053	< 0.01	0.094	< 0.01	0.039	< 0.1	0.064	0.11
600RRSB05[2.0]	01/16/03	2	< 0.0017	< 0.0014	< 0.0041	< 0.0031	< 0.0016	< 0.0031	< 0.0016	< 0.0015	< 0.0013	< 0.0027	< 0.0015	< 0.003	< 0.0022	< 0.0022
600RRSB05[6.0]	01/16/03	6	< 0.0016	0.0041 J	< 0.0039	< 0.003	< 0.0015	< 0.003	< 0.0015	< 0.0014	0.0054 J	< 0.0026	< 0.0015	< 0.0029	< 0.0021	0.0067 J
600RRSB05[10.0]	01/16/03	10	0.007 J	0.022	**0.031**	0.021	0.029	0.016	0.028	0.0069 J	0.036	< 0.0025	0.014	< 0.0028	0.019	0.045
600RRSB06[2.0]	01/21/03	2	0.022	0.055	**0.067**	0.065	0.055	0.041	0.1	0.016	0.14	< 0.0047	0.029	< 0.0053	0.13	0.15
600RRSB06[5.5]	01/21/03	5.5	0.0073 J	0.043	**0.061 J-**	0.083 J-	0.03 J-	0.026 J-	0.047	0.014 J-	0.053	< 0.0025	0.023 J-	< 0.0028	0.031	0.099 J+
DUP012103D	01/21/03	6	< 0.0016	0.0053 J	0.01	0.0096	0.0063 J	0.0045 J	0.0046 J	< 0.0014	0.0062 J	< 0.0026	0.0089	< 0.0029	0.0057 J	0.01 J+
600RRSB06[10.0]	01/21/03	10	< 0.0016	< 0.0013	0.0062 J	0.0052 J	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
600RRSB07[2.0]	01/22/03	2	0.016	0.057	**0.046**	0.085	0.078	0.036	0.16	0.023	0.096	< 0.0046	0.026	0.016	0.11	0.17
600RRSB07[7.0]	01/22/03	7	< 0.0016	< 0.0014	< 0.0039	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0026	< 0.0014	< 0.0029	< 0.0021	< 0.0021
600RRSB07[9.5]	01/22/03	9.5	0.032	0.095	**0.12**	0.12	0.08	0.041	0.1	0.019	0.16	0.017	0.059	0.01	0.079	0.31
600RRSB08[2.0]	01/21/03	2	0.025	**0.27**	**0.3**	0.22	0.16	0.17	0.36	0.055	0.2	< 0.0048	0.1	0.012 J	0.12	0.36
600RRSB08[5.5]	01/21/03	5.5	< 0.0015	< 0.0013	0.0084	0.0074 J	0.0058 J	< 0.0029	< 0.0015	< 0.0013	0.0039 J	< 0.0025	0.0082	< 0.0028	< 0.002	0.014 J+
DUP012103B	01/21/03	6	< 0.0016	< 0.0013	0.0082	0.0073 J	0.006 J	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	0.0083	< 0.0028	< 0.0021	0.0076 J+
600RRSB08[10.0]	01/21/03	10	< 0.0026	< 0.0022	0.012	0.013	< 0.0024	< 0.0047	< 0.0024	< 0.0022	0.012	0.008 J	< 0.0023	< 0.0046	0.015	0.015 J+
600RRSB09[2.0]	01/22/03	2	0.035 J	0.072 J-	**0.24 J-**	**0.51 J-**	0.17 J-	0.1 J-	0.35 J-	< 0.01 R	0.091	< 0.019	< 0.011 R	< 0.021	0.049 J	0.36 J-
600RRSB09[7.5][MSD]	01/22/03	7.5	< 0.0016	< 0.0013	< 0.0038	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.0021	< 0.0021
600RRSB09[9.5]	01/22/03	9.5	0.017	0.051	**0.078**	0.074	0.052	0.027	0.057	0.017	0.079	0.0088 J	0.043	0.01 J	0.04	0.18
600SDSB01[2.0]	08/06/02	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	**< 0.2**	< 0.2	< 0.2	< 0.2	< 2 UJ	< 0.2	< 0.2
600SDSB01[5.0]	08/06/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05 UJ	< 0.005	< 0.005
600SDSB02[2.0]	08/01/02	2	< 0.06	< 0.06	< 0.06	< 0.06	0.085	< 0.06	0.075	< 0.06	< 0.06	< 0.06	< 0.06	< 0.6	< 0.06	< 0.06
600SDSB02[5.0]	08/01/02	5	< 0.005	0.008	0.007	0.01	0.006	< 0.005	0.018	< 0.005	0.015	< 0.005	< 0.005	< 0.05	0.009	0.018
600SDSB03[2.0]	08/06/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.007	< 0.005	< 0.005	< 0.05	0.005	0.008
600SDSB03[5.5]	08/06/02	5.5	< 0.005	< 0.005	< 0.005	< 0.005	0.007	< 0.005	0.009	< 0.005	0.006	< 0.005	< 0.005	< 0.05	< 0.005	0.007
600SDSB04[2.0]	08/06/02	2	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.05	< 0.005 UJ	< 0.005 UJ
DUP080602B	08/06/02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005

Table C-3
Summary of PAH Results in Soil
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Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Anthracene**	**Benzo(a) Anthracene**	**Benzo(a) Pyrene**	**Benzo(b) Fluoranthene**	**Benzo(g,h,i) Perylene**	**Benzo(k) Fluoranthene**	**Chrysene**	**Dibenz(a,h) Anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-c,d) Pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
600SDSB04[5.0]	08/06/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600SDSB05[2]	08/07/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600SDSB05[5]	08/07/02	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
LTTDSB01[2.5]	07/29/02	2.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
LTTDSB01[5.0]	07/29/02	5	0.013	0.068	**0.05**	0.024	0.024	0.034	0.08	0.005	0.091	< 0.005	0.021	< 0.05	0.062	0.12
LTTDSB02[2.0]	07/29/02	2	0.011 J-	0.042 J-	**0.035 J-**	0.027 J-	0.027 J-	0.027 J-	0.044 J-	< 0.005 UJ	0.082 J-	< 0.005	0.021 J-	< 0.05	0.048 J-	0.095 J-
LTTDSB02[5.0]	07/29/02	5	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.05	< 0.005 UJ	< 0.005 UJ
LTTDSB03[2.0]	07/29/02	2	< 0.005 UJ	0.007 J-	0.006 J-	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	0.009 J-	< 0.005 UJ	0.011 J-	< 0.005 UJ	< 0.005 UJ	< 0.05 UJ	0.007 J-	0.015 J-
LTTDSB03[5.0]	07/29/02	5	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.05	< 0.005 UJ	< 0.005 UJ
LTTDSB04[2.0]	07/29/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.05	< 0.005	0.007
LTTDSB04[5.0]	07/29/02	5	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.05 UJ	< 0.005 UJ	0.005 J-
LTTDSB05[2.0]	07/29/02	2	< 0.02 UJ	< 0.02 UJ	< 0.02	< 0.02	< 0.02	< 0.02	0.027 J-	< 0.02	< 0.02 UJ	< 0.02	< 0.02	< 0.2	< 0.02 UJ	0.023 J-
LTTDSB05[5.0]	07/29/02	5	< 0.005 UJ	< 0.005 UJ	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.005 UJ	< 0.005 UJ
LTTDSB06[2.0]	07/29/02	2	< 0.005 UJ	< 0.005 UJ	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.005 UJ	< 0.005 UJ
LTTDSB06[4.5]	07/29/02	4.5	< 0.005 UJ	< 0.005 UJ	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.005 UJ	< 0.005 UJ
LTTDSB07[2.0]	01/13/03	2	< 0.0015	< 0.0013	0.006 J	< 0.0028	< 0.0014	< 0.0028	< 0.0014	< 0.0013	< 0.0012	< 0.0024	0.0049 J	< 0.0027	< 0.002	0.0037 J
LTTDSB07[7.5]	01/13/03	7.5	< 0.0016	0.01	0.013	0.01	0.0044 J J+	0.0034 J	0.011	0.0044 J	0.02	< 0.0026	0.0081	< 0.0029	0.02	0.022
LTTDSB07[10.0]	01/13/03	10	< 0.0016	< 0.0013	0.0071 J	0.0043 J	< 0.0015	< 0.0029	0.0042 J	< 0.0013	0.0047 J	< 0.0025	0.0059 J	< 0.0028	< 0.0021	0.0056 J
LTTDSB08[3.0]	01/13/03	3	< 0.0015	< 0.0013	0.0048 J	0.0037 J	< 0.0014	< 0.0027	< 0.0014	0.0039 J	< 0.0012	< 0.0024	0.0042 J	< 0.0027	< 0.0019	< 0.0019
LTTDSB08[5.5]	01/13/03	5.5	< 0.0015	< 0.0013	0.0045 J	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0013	< 0.0012	< 0.0025	0.0042 J	< 0.0028	< 0.002	< 0.002
DUP011303B	01/13/03	6	< 0.0016	< 0.0013	0.004 J	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0014	< 0.0012	< 0.0025	0.0041 J	< 0.0028	< 0.0021	< 0.0021
LTTDSB08[10.0]	01/13/03	10	< 0.0015	< 0.0013	0.0047 J	< 0.0028	< 0.0015	< 0.0028	< 0.0015	< 0.0013	< 0.0012	< 0.0025	0.0042 J	< 0.0027	< 0.002	< 0.002
LTTDSB09[2.5]	01/13/03	2.5	0.0042 J	0.017	0.021	0.027	0.012	0.0093	0.022	0.0071 J	0.024	< 0.0024	0.012	< 0.0027	0.022	0.03
LTTDSB09[5.5]	01/13/03	5.5	< 0.0016	0.0046 J	0.0083	0.006 J	< 0.0015	< 0.0029	0.0039 J	0.0056 J	< 0.0012	< 0.0025	0.007 J	< 0.0028	< 0.0021	< 0.0021
LTTDSB09[10.0]	01/13/03	10	< 0.0016	< 0.0014	0.0066 J	0.0041 J	< 0.0015	< 0.0029	< 0.0015	0.0052 J	< 0.0012	< 0.0026	0.0064 J	< 0.0029	< 0.0021	< 0.0021
LTTDSB10[2.5]	01/13/03	2.5	< 0.0016	< 0.0013	0.0041 J	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0013	< 0.0012	< 0.0025	0.0043 J	< 0.0028	< 0.0021	< 0.0021
DUP011303A	01/13/03	3	< 0.0014	< 0.0012	0.004 J	< 0.0026	< 0.0013	< 0.0026	< 0.0013	< 0.0012	< 0.0011	< 0.0022	0.004 J	< 0.0025	< 0.0018	< 0.0018
LTTDSB10[5.5]	01/13/03	5.5	< 0.0015	< 0.0013	< 0.0038	< 0.0029	< 0.0015	< 0.0029	< 0.0015	< 0.0013	< 0.0012	< 0.0025	< 0.0014	< 0.0028	< 0.002	< 0.002
LTTDSB10[10.0]	01/13/03	10	< 0.0017	< 0.0014	< 0.0041	< 0.0031	< 0.0016	< 0.0031	< 0.0016	< 0.0014	< 0.0013	< 0.0027	< 0.0015	< 0.003	< 0.0022	< 0.0022
600SB101[2]	08/06/02	2	0.099	**0.5**	**0.43**	**1.1**	0.22	**0.4**	1.4	0.059	0.21	< 0.02	0.19	< 0.2 UJ	0.012	0.42
DUP080602A	08/06/02	2.5	< 0.005	0.009	0.011	0.012	0.009	0.009	0.016	< 0.005	0.012	< 0.005	0.006	< 0.05 UJ	0.007	0.014
600SB101[4]	08/06/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.074 J-	< 0.005	< 0.005
600SB102[2]	08/06/02	2	0.048	**0.3**	**0.16 J+**	**0.58**	0.11 J+	**0.35**	0.55	0.039 J+	0.79	0.014	0.098 J+	< 0.05 UJ	0.19	0.79
600SB102[4]	08/06/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.007	< 0.005	< 0.005	< 0.05 UJ	< 0.005	0.008
600SB103[2]	08/05/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.008	< 0.005	< 0.005	< 0.05	0.007	0.009
600SB103[4]	08/05/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
DUP080502D	08/05/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600SB104[2]	08/06/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05 UJ	< 0.005	< 0.005

Table C-3
Summary of PAH Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Anthracene**	**Benzo(a) Anthracene**	**Benzo(a) Pyrene**	**Benzo(b) Fluoranthene**	**Benzo(g,h,i) Perylene**	**Benzo(k) Fluoranthene**	**Chrysene**	**Dibenz(a,h) Anthracene**	**Fluoranthene**	**Fluorene**	**Indeno (1,2,3-c,d) Pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
		Analytical Method	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270	SW8270
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**40**	**0.27**	**0.027**	**0.27**	**40**	**0.27**	**2.7**	**0.19**	**40**	**40**	**0.27**	**40**	**40**	**40**
600SB104[4]	08/06/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05 UJ	< 0.005	< 0.005
600SB105[2]	08/05/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600SB105[4]	08/05/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
DUP080502A	08/05/02	4.5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600SB106[2]	08/05/02	2	< 0.005	0.066	**0.044**	0.069	0.032	0.046	0.067	0.01	0.097	< 0.005	0.031	< 0.05	0.015	0.093
600SB106[4]	08/05/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.05	< 0.005	0.007
600SB107[2]	08/02/02	2	< 0.005	0.011	0.014	0.01	0.01	0.01	0.013	< 0.005	0.018	< 0.005	0.007	< 0.05	0.007	0.021
600SB107[4]	08/02/02	4	< 0.005	0.035	**0.06**	0.043	0.037	0.032	0.042	0.009	0.043	< 0.005	0.03	< 0.05	0.026	0.061
600SB108[2]	08/02/02	2	< 0.005	0.006	0.007	0.005	0.006	0.005	0.007	< 0.005	0.011	< 0.005	< 0.005	< 0.05	0.007	0.013
600SB108[4]	08/02/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005
600SB109[2]	08/05/02	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.05	0.008	0.006
600SB109[4]	08/05/02	4	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.05	< 0.005	< 0.005

Notes

[1] Cleanup Levels are found in Table 3.
Bold - values indicate concentration exceeding cleanup levels.
DUP prefix indicates blind duplicate sample; parent sample precedes duplicate sample.
mg/kg - milligrams per kilogram
MSD - Matrix spike duplicate
MSD indicates to the laboratory which samples were to be used for the MSD quality control sample analyses. These are not matrix spike results.
NA -Not Analyzed
PAHs - polycyclic aromatic hydrocarbons
U - Data validation qualifier, "The analyte was analyzed for, but was not detected above the reported sample quantitation limit."
J - Data validation qualifier, "The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample."
J+ - Data validation qualifier, "The analyte was positively identified; the associated numerical value is biased high due to a high surrogate recovery and should be considered an approximate concentration of the analyte in the sample."
J- - Data validation qualifier, "The analyte was positively identified; the associated numerical values is biased low due to a low surrogate recovery and should be considered an approximate concentration of the analyte in the sample."
UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."

Table C-4
Summary of PCB Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**PCB-1016**	**PCB-1221**	**PCB-1232**	**PCB-1242**	**PCB-1248**	**PCB-1254**
		Analytical Method	SW8082	SW8082	SW8082	SW8082	SW8082	SW8082
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**
605SB01[2.5]	01/22/03	2.5	< 0.037 UJ	< 0.037 UJ	< 0.037 UJ	< 0.037 UJ	< 0.037 UJ	< 0.037 UJ
626SB01[2]	07/29/02	2	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
626SB01[4]	07/29/02	4	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
626SB02[2]	07/29/02	2	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
626SB02[4]	07/29/02	4	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
626SB03[2]	07/29/02	2	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
626SB03[5]	07/29/02	5	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
628SB09[2]	08/02/02	2	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
DUP080202A	08/02/02	2.5	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
628SB09[5]	08/02/02	5	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

Notes
[1] Screening Levels were obtained from Table 1a of the *Draft Site Investigation Report Commissary/Post Exchange Study Area Presidio of San Francisco, California* (Treadwell& Rollo, 2003c).
DUP prefix indicates blind duplicate sample; parent sample precedes duplicate sample.
mg/kg - milligrams per kilogram
NE - Not established
PCB - Polychlorinated biphenyl
UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."

Table C-5
Summary of Metals Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
601SB02[2.5]	08/05/02	2.5	2.9	< 0.5	37 J	17	56	53 J	**75**
601SB02[4.5]	08/05/02	4.5	1.8	< 0.5	22 J	5.2	< 4	31 J	14
601SB03[3.0]	01/16/03	3	NA	NA	NA	NA	2	NA	NA
601SB03[8.0]	01/16/03	8	NA	NA	NA	NA	130	NA	NA
601SB03[11.0]	01/16/03	11	NA	NA	NA	NA	2.4	NA	NA
603SB01[2.0]	08/05/02	2	2.4	< 0.5	37 J	6.6	9.5	38 J	27
603SB01[5.0]	08/05/02	5	1.9	< 0.5	37 J	4.5	< 4	53 J	21
604SB01[4.5]	07/31/02	4.5	1.6	< 0.5	15	**130**	30	31	52
604SB01[6.0]	07/31/02	6	2.5	< 0.5	73	86	31	66	64
604SB02[2.0]	08/05/02	2	3.1	< 0.5	51 J	26	27 J	**180 J**	50
604SB02[6.0]	08/05/02	6	5.6	0.6	24 J	60	200 J	65 J	**520**
604SB03[2.0]	01/14/03	2	NA	NA	30 J-	9.6 J-	3.3	28 J-	34 J+
604SB03[3.5]	01/14/03	3.5	NA	NA	15 J-	48 J-	**1,300**	43 J-	47 J+
604SB03[5.5]	01/14/03	5.5	NA	NA	18 J-	42 J-	150	57 J-	**120 J+**
604SB04[2.0]	01/14/03	2	NA	NA	34 J-	27 J-	27	62 J-	**78 J+**
604SB04[5.5]	01/14/03	5.5	NA	NA	65 J-	23 J-	34	70 J-	**140 J+**
604SB04[7.0]	01/14/03	7	NA	NA	45 J-	9.7 J-	6.3	30 J-	31 J+
604SB05[3.0]	01/16/03	3	NA	NA	69	21 J	31	**84**	57 J-
DUP011603A	01/16/03	3.5	NA	NA	60	23 J	34	**88**	63 J-
604SB05[6.0]	01/16/03	6	NA	NA	23	20 J	30	32	**84 J-**
604SB05[8.0]	01/16/03	8	NA	NA	54	32 J	69	50	**500 J-**
604SB06[3.0]	01/16/03	3	NA	NA	**230**	23 J	45	**270**	**69 J-**
604SB06[5.5]	01/16/03	5.5	NA	NA	40	4.4 J	2.3	56	18 J-
604SB06[7.5]	01/16/03	7.5	NA	NA	44	24 J	23	55	**82 J-**
604SB07[2.0]	01/14/03	2	NA	NA	54 J-	17 J-	24	38 J-	54 J+
604SB07[3.5]	01/14/03	3.5	NA	NA	44 J-	17 J-	33	33 J-	58 J+

Table C-5
Summary of Metals Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
604SB07[5.5]	01/14/03	5.5	NA	NA	39 J-	12 J-	6.1	46 J-	41 J+
604SB09[2.0]	01/14/03	2	NA	NA	20 J-	61 J-	2.2	36 J-	**110 J+**
604SB09[4.0]	01/14/03	4	NA	NA	34 J-	3.6 J-	1.6	20 J-	21 J+
604SB09[10.0]	01/14/03	10	NA	NA	20 J-	3.1 J-	1.5	21 J-	14 J+
605SB01[2.5]	01/22/03	2.5	NA	NA	100	64	13	**92**	55
605SB01[5.0]	01/22/03	5	NA	NA	47	4.5	1.5	24	17
605SB01[10.0]	01/22/03	10	NA	NA	57	17	2.8	44	28
605SB02[2.0]	01/16/03	2	NA	NA	52 J-	14 J-	15 J-	45 J-	36 J-
605SB02[5.0]	01/16/03	5	NA	NA	26 J-	3.5 J-	1.5 J-	16 J-	18 J-
DUP011603B[MSD]	01/16/03	5.5	NA	NA	35	3.5 J	1.6	16	24 J-
605SB02[8.0]	01/16/03	8	NA	NA	110	31 J	56	**89**	**93 J-**
609SB01[2.0]	01/14/03	2	NA	NA	42 J-	24 J-	12	38 J-	36 J+
609SB01[4.0]	01/14/03	4	NA	NA	47 J-	3.9 J-	1.9	35 J-	15 J+
609SB01[8.0]	01/14/03	8	NA	NA	71 J-	5.4 J-	4.2	54 J-	22 J+
610SB01[2.0]	08/05/02	2	NA	0.6	26 J	16	47 J	27 J	61
DUP080502E[MSD]	08/05/02	2.5	NA	< 0.5	33 J	13	51 J	42 J	54
610SB01[5.0]	08/05/02	5	NA	< 0.5	30 J	25	68 J	40 J	**130**
610SB02[2.0]	01/16/03	2	NA	NA	60 J-	NA	13 J-	NA	35 J-
610SB02[5.0]	01/16/03	5	NA	NA	17 J-	NA	7.6 J-	NA	19 J-
610SB02[7.5]	01/16/03	7.5	NA	NA	24 J-	NA	1.6 J-	NA	17 J-
610SB03[2.0]	01/14/03	2	NA	NA	50	NA	24	NA	56 J-
610SB03[5.5]	01/14/03	5.5	NA	NA	32	NA	3.1	NA	20 J-
610SB03[8.5]	01/14/03	8.5	NA	NA	80	NA	76	NA	**130 J-**
610SB04[2.0]	01/14/03	2	NA	NA	17	NA	4.1	NA	**98 J-**
610SB04[6.0]	01/14/03	6	NA	NA	26	NA	17	NA	32 J-
610SB04[7.5]	01/14/03	7.5	NA	NA	76	NA	14	NA	62 J-

Table C-5
Summary of Metals Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
613SB01[2.0]	08/02/02	2	NA	< 0.5	45	40	17	68	**69**
613SB01[5.0]	08/02/02	5	NA	< 0.5	40	10	7.4	24	29
613SB02[2.0]	08/02/02	2	NA	< 0.5	100	27	58	**180**	**68**
613SB02[5.0]	08/02/02	5	NA	< 0.5	97	25	44	**350**	**74**
613SB03[2.0]	08/02/02	2	NA	< 0.5	43	56	8.1	61	55
DUP080202C	08/02/02	2.5	NA	< 0.5	20	11	< 4	27	27
613SB03[5.0]	08/02/02	5	NA	< 0.5	11	15	9.1	19	34
613SB04[2.0]	08/02/02	2	NA	< 0.5	67	23	82	**110**	**100**
613SB04[4.5]	08/02/02	4.5	NA	< 0.5	27	5.6	14	36	18
613SB05[2.0]	08/02/02	2	NA	< 0.5	39	11	31	36	48
613SB05[4.0]	08/02/02	4	NA	< 0.5	26	5.9	6.7	36	26
613SB06[2.0]	08/02/02	2	NA	< 0.5	19	6.8	< 4	17	**69**
613SB06[5.0]	08/02/02	5	NA	< 0.5	50	28	43	59	**89**
613SB07[2]	07/30/02	2	NA	1.1	84	33 J	**400 J**	**100**	**280 J**
613SB07[5]	07/30/02	5	NA	< 0.5	37	17 J	18 J	44	47 J
613SB08[2.0]	01/21/03	2	NA	NA	43 J+	NA	30 J-	60	59 J-
613SB08[7.0]	01/21/03	7	NA	NA	33 J+	NA	2 J-	46	16 J-
DUP012103A[MSD]	01/21/03	6.5	NA	NA	25 J+	NA	49 J-	32	**96 J-**
613SB08[10.0]	01/21/03	10	NA	NA	28 J+	NA	3.9 J-	44	23 J-
613SB09[2.0][MSD]	01/17/03	2	NA	NA	50 J+	NA	61 J-	**74 J+**	**85 J-**
613SB09[5.5]	01/17/03	5.5	NA	NA	67 J+	NA	1.7 J-	62 J+	18 J-
613SB09[7.5]	01/17/03	7.5	NA	NA	68 J+	NA	14 J-	52 J+	64 J-
613SB10[2.5]	01/22/03	2.5	NA	NA	65	NA	5.5	39	38
613SB10[5.5]	01/22/03	5.5	NA	NA	38	NA	1.7	53	16
DUP012203A	01/22/03	6	NA	NA	22	NA	1.8	31	15
613SB10[7.5]	01/22/03	7.5	NA	NA	33	NA	8.3	42	25

Table C-5
Summary of Metals Results in Soil
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Sample Name	Sample Date	Sample Depth (feet)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
613SB11[2.0]	01/21/03	2	NA	NA	34 J+	NA	12 J-	37 J-	41 J-
613SB11[6.0]	01/21/03	6	NA	NA	44 J+	NA	3.4 J-	34 J-	19 J-
613SB11[8.0]	01/21/03	8	NA	NA	81 J+	NA	74 J-	61 J-	**70 J-**
613SB12[2.0]	01/21/03	2	NA	NA	73 J+	NA	41 J-	**120 J-**	57 J-
613SB12[5.5]	01/21/03	5.5	NA	NA	24 J+	NA	7.7 J-	27 J-	25 J-
DUP012103C[MSD]	01/21/03	6	NA	NA	36 J+	NA	4.8 J-	32	21 J-
613SB12[7.5][MSD]	01/21/03	7.5	NA	NA	71	NA	7.6	49	66
616SB01[2.0]	07/30/02	2	NA	NA	NA	NA	28	NA	NA
DUP073002D(MSD)	07/30/02	1.5	NA	NA	NA	NA	13	NA	NA
616SB01[4.0]	07/30/02	4	NA	NA	NA	NA	28	NA	NA
616SB02[2.0]	07/30/02	2	NA	NA	NA	NA	10	NA	NA
616SB02[5.0]	07/30/02	5	NA	NA	NA	NA	36	NA	NA
616SB03[2.0]	07/30/02	2	NA	NA	NA	NA	21 J	NA	NA
616SB03[5.0]	07/30/02	5	NA	NA	NA	NA	29 J	NA	NA
617SB01[2.0]	08/01/02	2	NA	NA	NA	NA	90	NA	NA
617SB01[5.0]	08/01/02	5	NA	NA	NA	NA	74	NA	NA
617SB02[2.0]	07/31/02	2	NA	NA	NA	NA	140	NA	NA
617SB02[5.0]	07/31/02	5	NA	NA	NA	NA	28	NA	NA
617SB03[2.0]	08/01/02	2	NA	NA	NA	NA	110	NA	NA
617SB03[5.0]	08/01/02	5	NA	NA	NA	NA	140	NA	NA
617SB04[1.5]	01/15/03	1.5	NA	NA	NA	NA	8.8	NA	NA
617SB04[6.0]	01/15/03	6	NA	NA	NA	NA	34	NA	NA
617SB04[8.0]	01/15/03	8	NA	NA	NA	NA	11	NA	NA
617SB05[1.5]	01/15/03	1.5	NA	NA	NA	NA	47	NA	NA
617SB05[4.0]	01/15/03	4	NA	NA	NA	NA	3.1	NA	NA
617SB05[7.5]	01/15/03	7.5	NA	NA	NA	NA	10	NA	NA

Table C-5
Summary of Metals Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
617SB06[2.5]	01/15/03	2.5	NA	NA	NA	NA	27	NA	NA
617SB06[6.0]	01/15/03	6	NA	NA	NA	NA	**340**	NA	NA
617SB06[10.0]	01/15/03	10	NA	NA	NA	NA	6.4	NA	NA
617SB07[1.5]	01/15/03	1.5	NA	NA	NA	NA	42	NA	NA
617SB07[5.5]	01/15/03	5.5	NA	NA	NA	NA	75	NA	NA
617SB07[9.0]	01/15/03	9	NA	NA	NA	NA	5.1	NA	NA
617SB08[2.0]	01/15/03	2	NA	NA	NA	NA	71	38	**110**
617SB08[5.5]	01/15/03	5.5	NA	NA	NA	NA	< 1.1	< 2.2	16
617SB08[10.0]	01/15/03	10	NA	NA	NA	NA	5.8	42	22
617SB09[2.0]	01/16/03	2	NA	NA	NA	NA	37 J-	NA	NA
617SB09[5.5]	01/16/03	5.5	NA	NA	NA	NA	18 J-	NA	NA
617SB09[10.0]	01/16/03	10	NA	NA	NA	NA	1.5 J-	NA	NA
619SB01[4.5]	07/31/02	4.5	NA	< 0.5	**130**	17	42	**220**	**68**
619SB01[6.0]	07/31/02	6	NA	< 0.5	48	4.7	6.6	25	< 2 U
619SB02[2]	08/06/02	2	NA	< 0.5	56 J	12 J	31 J	**75**	54
DUP080602D[MSD]	08/06/02	2.5	NA	< 0.5	33 J	13 J	25 J	56	37
619SB02[5]	08/06/02	5	NA	< 0.5	23 J	3 J	< 4	43	14
619SB03[4.5]	07/31/02	4.5	NA	< 0.5	**190**	17	28	**270**	62
619SB03[6.0]	07/31/02	6	NA	< 0.5	23	2.7	< 4	25	< 2 U
619SB04[7.0]	01/23/03	7	NA	NA	32	3.9	4.9	33	17
619SB04[11.5]	01/23/03	11.5	NA	NA	26	7.1	3.5	29	17
DUP012303A	01/23/03	12	NA	NA	26	5.8	2.9	29	16
619SB04[13.0][MSD]	01/23/03	13	NA	NA	41	10	12	37	28
619SB05[6.0]	01/23/03	6	NA	NA	20	NA	NA	22	NA
619SB05[9.0]	01/23/03	9	NA	NA	26	NA	NA	39	NA
619SB05[12.0]	01/23/03	12	NA	NA	51	NA	NA	56	NA

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Summary of Metals Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
625SB01[2]	07/29/02	2	NA	< 0.5	35 J	6.7 J	8.9 J	26 J	36
625SB01[4]	07/29/02	4	NA	< 0.5	27 J	3.4 J	< 4	29 J	13
625SB02[2]	07/29/02	2	NA	< 0.5	83 J	22 J	58 J	**130 J**	64
625SB03[2]	07/29/02	2	NA	< 0.5	24 J	29 J	4.9 J	25 J	62
DUP072902A	07/29/02	2.5	NA	< 0.5	41 J	8.1 J	13 J	34 J	34
625SB03[5]	07/29/02	5	NA	< 0.5	29 J	3.4 J	< 4	24 J	15
DUP072902B	07/29/02	5.5	NA	< 0.5	22 J	2.9 J	< 4	23 J	15
625SB04[2]	07/29/02	2	NA	0.8	16 J	46 J	62 J	29 J	**100**
625SB04[5]	07/29/02	5	NA	< 0.5	25 J	3.2 J	< 4	22 J	14
625SB05[2.0]	01/13/03	2	NA	NA	51 J-	NA	25	**150 J-**	NA
625SB05[7.5]	01/13/03	7.5	NA	NA	22 J-	NA	2.1	37 J-	NA
625SB05[10.0]	01/13/03	10	NA	NA	67 J-	NA	9.2	**79 J-**	NA
626SB01[2]	07/29/02	2	NA	< 0.5	34 J	22 J	55 J	62 J	**88**
626SB01[4]	07/29/02	4	NA	< 0.5	22 J	6 J	8.8 J	28 J	30
626SB02[2]	07/29/02	2	NA	< 0.5	53 J	16 J	14 J	42 J	35
626SB02[4]	07/29/02	4	NA	< 0.5	25 J	4.5 J	< 4	35 J	22
626SB03[2]	07/29/02	2	NA	< 0.5	36	3.3 J	< 4	29	14 J
626SB03[5]	07/29/02	5	NA	< 0.5	22	2.9 J	< 4	27	13 J
626SB04[6.5]	01/23/03	6.5	NA	NA	58	4.6	4	38 J-	16 J-
DUP012303C[MSD]	01/23/03	7	NA	NA	21	3.4	1.5	30 J-	18 J-
626SB04[9.0]	01/23/03	9	NA	NA	< 2.2	4.4	< 1.1	< 4.3 UJ	< 11 UJ
626SB04[11.0]	01/23/03	11	NA	NA	71	22	16	69 J-	61 J-
626SB05[7.0]	01/23/03	7	NA	NA	30	8.2	14	28	33
626SB05[8.5]	01/23/03	8.5	NA	NA	78	33	12	**89**	**80**
DUP012303E	01/23/03	9	NA	NA	**140**	80	93	**120**	**110**
626SB05[10.0]	01/23/03	10	NA	NA	54	11	4.9	64	32

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Summary of Metals Results in Soil
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Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
628SB01[2.0]	07/30/02	2	NA	< 0.5	41 J	31 J	9.7 J	**90 J+**	55 J
628SB01[5.0]	07/30/02	5	NA	< 0.5	31 J	3.3 J	< 4	33 J+	13 J
628SB02[2.5]	07/30/02	2.5	NA	< 0.5	20 J	3 J	< 4	29 J	13 J
628SB02[5.5]	07/30/02	5.5	NA	< 0.5	29 J	5.8 J	< 4	45 J+	19 J
DUP073002A	07/30/02	5	NA	< 0.5	30 J	6 J	4.3 J	39 J+	19 J
628SB03[2.0]	07/30/02	2	NA	< 0.5	50 J	41	71	**110 J**	**95**
628SB03[4.5]	07/30/02	4.5	NA	< 0.5	19 J	4.5 J	< 4	24 J	14 J
628SB04[2]	07/30/02	2	NA	< 0.5	27 J	3.7	< 4	30	15
628SB04[5]	07/30/02	5	NA	< 0.5	27 J	4.2	< 4	32	17
628SB05[2]	07/31/02	2	NA	< 0.5	39 J	6.9	37	37	36
628SB05[5]	07/31/02	5	NA	< 0.5	45 J	7.2	59	35	31
628SB06[2]	07/31/02	2	NA	< 0.5	33 J	8.9	< 4	30	33
628SB06[4]	07/31/02	4	NA	< 0.5	39 J	8	19	29	30
628SB07[2]	07/31/02	2	NA	< 0.5	45 J	11	47	60	**72**
628SB07[5]	07/31/02	5	NA	0.8	**260 J**	45	99	**140**	**100**
628SB08[2]	07/31/02	2	NA	< 0.5	74 J	21	51	46	55
628SB08[5]	07/31/02	5	NA	< 0.5	21 J	4.6	< 4	30	14
628SB09[2]	08/02/02	2	NA	< 0.5	**290**	24	5.4	**990**	55
DUP080202A	08/02/02	2.5	NA	< 0.5	18	2.9	< 4	23	13
628SB09[5]	08/02/02	5	NA	< 0.5	28	4	< 4	28	15
628SB10[2.0]	07/30/02	2	NA	< 0.5	24 J	5.1 J	< 4	29 J+	14 J
628SB10[5.0]	07/30/02	5	NA	< 0.5	23 J	3.7 J	< 4	27 J+	12 J
628SB11[2]	07/31/02	2	NA	< 0.5	61 J	18	46	53	60
DUP073102A(MSD)	07/31/02	2.5	NA	< 0.5	64 J	9.9	57	34	34
628SB11[5]	07/31/02	5	NA	< 0.5	34 J	8.5	59	29	29
628SB12[2.0]	01/17/03	2	NA	NA	42 J+	24	29 J-	69 J+	59 J-

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Summary of Metals Results in Soil
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Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
628SB12[5.5]	01/17/03	5.5	NA	NA	20 J+	24	< 1.3 UJ	23 J+	57 J-
DUP011703B[MSD]	01/17/03	6	NA	NA	22 J+	28	1.7 J-	28 J+	**74 J-**
628SB12[10.0]	01/17/03	10	NA	NA	30 J+	12	2 J-	19 J+	34 J-
628SB13[2.0]	01/17/03	2	NA	NA	31 J+	9.9	3.3 J-	29 J+	24 J-
628SB13[6.0]	01/17/03	6	NA	NA	36 J+	19	2.2 J-	41 J+	22 J-
628SB13[10.0]	01/17/03	10	NA	NA	32 J+	9.6	4.5 J-	37 J+	33 J-
628SB14[3.0]	01/17/03	3	NA	NA	33	3.7	1.3	29	15 J-
628SB14[6.0]	01/17/03	6	NA	NA	41	17	8.4	39	**93 J-**
628SB14[10.0]	01/17/03	10	NA	NA	29	3.9	1.5	25	16 J-
628SB15[2.0]	01/17/03	2	NA	NA	**140**	24	2.6	**420**	37 J-
628SB15[6.0]	01/17/03	6	NA	NA	27	3.3	1.5	16	15 J-
628SB15[9.5]	01/17/03	9.5	NA	NA	33	3	1.5	17	18 J-
DUP011703A	01/17/03	10	NA	NA	28	3.8	1.2	31	15 J-
628SB16[14.0]	01/23/03	4	NA	NA	37	3.9	1.7	22	14
628SB16[6.0]	01/23/03	6	NA	NA	26	4.7	2.8	29	17
628SB16[8.5]	01/23/03	8.5	NA	NA	39	9.8	11	40	29
DUP012303D	01/23/03	9	NA	NA	29	7.8	7.1	35	22
628SB17[2.0]	01/17/03	2	NA	NA	29	37	20	46	**83 J-**
628SB17[7.0]	01/17/03	7	NA	NA	25	4.3	2.7	28	17 J-
628SB17[10.0]	01/17/03	10	NA	NA	26	4.2	1.8	28	14 J-
T615SB01[2.0]	08/01/02	2	NA	0.9	55	30	170	63	**460**
T615SB01[4.5]	08/01/02	4.5	NA	< 0.5	92	30	99	**230**	**71**
T615SB02[2.0]	07/31/02	2	NA	< 0.5	26	7	150	22	**100**
T615SB02[5.0]	07/31/02	5	NA	< 0.5	60	4.9	5.3	21	< 2 U
T615SB03[2.0]	01/15/03	2	NA	NA	NA	NA	82	**150 J-**	**97 J-**
T615SB03[6.0]	01/15/03	6	NA	NA	NA	NA	17	41 J-	41 J-

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Sample Name	Sample Date	Sample Depth (feet)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
T615SB03[10.0]	01/15/03	10	NA	NA	NA	NA	1.8	21 J-	26 J-
T618SB02[2.0]	08/06/02	2	NA	< 0.5	40 J	< 2 U	14	40	< 2 U
DUP080602C	08/06/02	2.5	NA	< 0.5	36 J	11	15	42	< 2 U
T618SB02[5.0]	08/06/02	5	NA	< 0.5	38 J	16	19	40	< 2 U
S15SB01[2.0]	08/06/02	2	NA	NA	NA	NA	34	NA	NA
S15SB01[5.0]	08/06/02	5	NA	NA	NA	NA	27	NA	NA
S15SB02[2.0]	08/01/02	2	NA	NA	NA	NA	11	NA	NA
S15SB02[4.0]	08/01/02	4	NA	NA	NA	NA	8.9	NA	NA
S15SB03[2.0]	08/06/02	2	NA	NA	NA	NA	25	NA	NA
S15SB03[5.0]	08/06/02	5	NA	NA	NA	NA	< 4	NA	NA
S15SB04[2.0]	01/14/03	2	NA	NA	86	NA	36	**100 J-**	NA
S15SB04[5.5]	01/14/03	5.5	NA	NA	19	NA	14	33 J-	NA
S15SB04[10.0]	01/14/03	10	NA	NA	26	NA	1.4	25 J-	NA
S15SB05[1.5]	01/15/03	1.5	NA	NA	40 J-	NA	27 J-	36 J-	NA
S15SB05[5.5]	01/15/03	5.5	NA	NA	22 J-	NA	11 J-	21 J-	NA
DUP011503A	01/15/03	6	NA	NA	25 J-	NA	1.8 J-	20 J-	NA
S15SB05[7.0]	01/15/03	7	NA	NA	72 J-	NA	10 J-	66 J-	NA
DUP011503B	01/15/03	7.5	NA	NA	77 J-	NA	11 J-	64 J-	NA
S15SB06[3.0]	01/16/03	3	NA	NA	14 J-	NA	10 J-	16 J-	NA
S15SB06[6.0]	01/16/03	6	NA	NA	34 J-	NA	140 J-	47 J-	NA
S15SB06[10.0]	01/16/03	10	NA	NA	36 J-	NA	3.8 J-	42 J-	NA
S15SB07[1.5]	01/15/03	1.5	NA	NA	42 J-	NA	28 J-	62 J-	NA
S15SB07[5.0]	01/15/03	5	NA	NA	**160 J-**	NA	66 J-	**180 J-**	NA
S15SB07[8.0]	01/15/03	8	NA	NA	58 J-	NA	6.9 J-	60 J-	NA
600ASB07[2.0]	01/17/03	2	NA	NA	NA	NA	270 J-	NA	**140 J-**
600ASB07[5.5]	01/17/03	5.5	NA	NA	NA	NA	1.8 J-	NA	23 J-

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Sample Name	Sample Date	Sample Depth (feet)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
600ASB07[10.0]	01/17/03	10	NA	NA	NA	NA	1.6 J-	NA	15 J-
600ASB08[2.0]	01/17/03	2	NA	NA	NA	NA	180	NA	**110 J-**
600ASB08[5.5]	01/17/03	5.5	NA	NA	NA	NA	26	NA	**68 J-**
DUP011703C	01/17/03	6	NA	NA	NA	NA	10	NA	31 J-
600ASB08[7.0]	01/17/03	7	NA	NA	NA	NA	6.5	NA	60 J-
600ASB09[2.0]	01/16/03	2	NA	NA	NA	NA	71	NA	**90 J-**
600ASB09[7.0]	01/16/03	7	NA	NA	NA	NA	23	NA	35 J-
DUP011603C	01/16/03	7.5	NA	NA	NA	NA	10	NA	**110 J-**
600ASB09[10.0][MSD]	01/16/03	10	NA	NA	NA	NA	12	NA	30 J-
600FDSSB02[2.0]	01/15/03	2	NA	NA	NA	NA	8.1	NA	NA
600FDSSB02[5.5]	01/15/03	5.5	NA	NA	NA	NA	40	NA	NA
600FDSSB02[10.0]	01/15/03	10	NA	NA	NA	NA	23	NA	NA
600CSB01[2]	07/31/02	2	NA	NA	NA	NA	< 4	NA	NA
600CSB01[5]	07/31/02	5	NA	NA	NA	NA	< 4	NA	NA
600CSB02[2]	07/31/02	2	NA	NA	NA	NA	9.9	NA	NA
600CSB02[4.0]	07/31/02	4	NA	NA	NA	NA	6.2	NA	NA
600CSB03[2.0]	07/29/02	2	NA	NA	NA	NA	< 4	NA	NA
600CSB03[5.0]	07/29/02	5	NA	NA	NA	NA	< 4	NA	NA
600CSB04[2.0]	07/29/02	2	NA	NA	NA	NA	< 4	NA	NA
600CSB04[5.0]	07/29/02	5	NA	NA	NA	NA	97 J	NA	NA
600CSB05[2.0]	01/13/03	2	NA	NA	NA	NA	< 1.6	**1,400**	NA
600CSB05[8.0]	01/13/03	8	NA	NA	NA	NA	1.9	30	NA
600CSB05[10.0]	01/13/03	10	NA	NA	NA	NA	2.5	25	NA
600CSB06[2.0]	01/13/03	2	NA	NA	NA	NA	73	59	NA
600CSB06[5.0]	01/13/03	5	NA	NA	NA	NA	3.5	24	NA
600CSB06[10.0]	01/13/03	10	NA	NA	NA	NA	16	47	NA

Table C-5
Summary of Metals Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
600CSB07[2.0]	01/13/03	2	NA	NA	NA	NA	6.5	**790**	NA
600CSB07[5.5]	01/13/03	5.5	NA	NA	NA	NA	2	29	NA
600CSB07[10.0]	01/13/03	10	NA	NA	NA	NA	2.4	26	NA
600RRSB01[2.0]	08/05/02	2	2.9	< 0.5	**160 J**	38	52	**160 J**	**95**
DUP080502B	08/05/02	2.5	5.1	< 0.5	35 J	24	110	41 J	**170**
600RRSB01[5.5]	08/05/02	5.5	3.9	< 0.5	91 J	13	5.8	42 J	34
600RRSB02[2.0]	08/05/02	2	NA	0.7	13 J	26	36	24 J	**86**
600RRSB02[5.0]	08/05/02	5	NA	< 0.5	41 J	37	48	57 J	**100**
600RRSB03[2.0]	08/05/02	2	2.4	< 0.5	76 J	34	9.8	**130 J**	29
600RRSB03[5.0]	08/05/02	5	1.2	< 0.5	24 J	23	16	39 J	47
600RRSB04[2]MSD	08/07/02	2	2.9	< 0.5	38 J	24 J	37	**82**	**84 J**
600RRSB04[4]MSD	08/07/02	4	2.8	0.7	38 J	20 J	97	60	**160 J**
600RRSB05[2.0]	01/16/03	2	NA	NA	**370**	NA	< 1.2	**1,800**	NA
600RRSB05[6.0]	01/16/03	6	NA	NA	30	NA	2.8	29	NA
600RRSB05[10.0]	01/16/03	10	NA	NA	32	NA	8.5	33	NA
600RRSB06[2.0]	01/21/03	2	NA	NA	51	NA	57	52	54
600RRSB06[5.5]	01/21/03	5.5	NA	NA	50	NA	13	52 J-	**70**
DUP012103D	01/21/03	6	NA	NA	20	NA	2.2	26 J-	16
600RRSB06[10.0]	01/21/03	10	NA	NA	22	NA	1.1	31 J-	15
600RRSB07[2.0]	01/22/03	2	NA	NA	65	NA	59	**110 J-**	**67**
600RRSB07[7.0]	01/22/03	7	NA	NA	24	NA	1.4	28	18
600RRSB07[9.5]	01/22/03	9.5	NA	NA	59	NA	40	69	**73**
600RRSB08[2.0]	01/21/03	2	NA	NA	47 J+	NA	20 J-	61 J-	56 J-
600RRSB08[5.5]	01/21/03	5.5	NA	NA	18 J+	NA	1.6 J-	28 J-	15 J-
DUP012103B	01/21/03	6	NA	NA	27 J+	NA	1.3 J-	39 J-	12 J-
600RRSB08[10.0]	01/21/03	10	NA	NA	100 J+	NA	27 J-	**110 J-**	**110 J-**
600RRSB09[2.0]	01/22/03	2	NA	NA	12	NA	49	22	41

Table C-5
Summary of Metals Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
600RRSB09[7.5][MSD]	01/22/03	7.5	NA	NA	20	NA	1.3	27 J-	16
600RRSB09[9.5]	01/22/03	9.5	NA	NA	78	NA	18	**81**	**82**
600SDSB01[2.0]	08/06/02	2	NA	< 0.5	26 J	21	7.9	55	53
600SDSB01[5.0]	08/06/02	5	NA	< 0.5	18 J	< 2 U	< 4	21	< 2 U
600SDSB02[2.0]	08/01/02	2	NA	< 0.5	25 J	23	68	45	**110**
600SDSB02[5.0]	08/01/02	5	NA	< 0.5	38 J	13	17	51	36
600SDSB03[2.0]	08/06/02	2	NA	< 0.5	27 J	4.7	17 J	23 J	29
600SDSB03[5.5]	08/06/02	5.5	NA	< 0.5	38 J	7.5	12 J	27 J	43
600SDSB04[2.0]	08/06/02	2	NA	< 0.5	42 J	8.7	5.5 J	34 J	23
DUP080602B	08/06/02	2.5	NA	< 0.5	42 J	9.2	6 J	32 J	23
600SDSB04[5.0]	08/06/02	5	NA	< 0.5	34 J	3.2	< 4	21 J	17
600SDSB05[2]	08/07/02	2	NA	< 0.5	41 J	4.7 J	< 4	20	17 J
600SDSB05[5]	08/07/02	5	NA	< 0.5	36 J	4.2 J	< 4	18	17 J
LTTDSB01[2.5]	07/29/02	2.5	NA	< 0.5	49 J	23	140	69	47 J
LTTDSB01[5.0]	07/29/02	5	NA	< 0.5	58 J	37	**560**	**89**	**94 J**
LTTDSB02[2.0]	07/29/02	2	NA	< 0.5	39 J	57	69	62	**110 J**
LTTDSB02[5.0]	07/29/02	5	NA	< 0.5	26 J	3.4	< 4	30	< 2 U
LTTDSB03[2.0]	07/29/02	2	NA	< 0.5	**160 J**	14	26	**240**	49 J
LTTDSB03[5.0]	07/29/02	5	NA	< 0.5	38 J	6.7	7.5	37	18 J
LTTDSB04[2.0]	07/29/02	2	NA	< 0.5	31 J	45	110	54	**130 J**
LTTDSB04[5.0]	07/29/02	5	NA	< 0.5	35 J	2.7	< 4	32	< 2 U
LTTDSB05[2.0]	07/29/02	2	NA	**2.8**	**160 J**	24	40	**270**	**130 J**
LTTDSB05[5.0]	07/29/02	5	NA	< 0.5	23 J	3.2	< 4	31	< 2 U
LTTDSB06[2.0]	07/29/02	2	NA	< 0.5	33 J	5.1	< 4	60	17 J

Table C-5
Summary of Metals Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
LTTDSB06[4.5]	07/29/02	4.5	NA	< 0.5	48 J	3.4	< 4	71	15 J
LTTDSB07[2.0]	01/13/03	2	NA	NA	61	34 J-	**400**	60	45
LTTDSB07[7.5]	01/13/03	7.5	NA	NA	48 J-	15 J-	8.1 J-	35 J-	**76 J-**
LTTDSB07[10.0]	01/13/03	10	NA	NA	31 J-	7.1 J-	9.2 J-	34 J-	24 J-
LTTDSB08[3.0]	01/13/03	3	NA	NA	7.3	43 J-	32	10	< 3.3 U
LTTDSB08[5.5]	01/13/03	5.5	NA	NA	45	4.4 J-	2.8	23	< 4.3 U
DUP011303B	01/13/03	6	NA	NA	44	4.9 J-	4.4	30	< 3.9 U
LTTDSB08[10.0]	01/13/03	10	NA	NA	27	7.4 J-	7.6	24	27
LTTDSB09[2.5]	01/13/03	2.5	NA	NA	42 J-	96 J-	78 J-	21 J-	**140 J-**
LTTDSB09[5.5]	01/13/03	5.5	NA	NA	13 J-	3.5 J-	7.7 J-	14 J-	**140 J-**
LTTDSB09[10.0]	01/13/03	10	NA	NA	16 J-	1.9 J-	0.98 J-	17 J-	64 J-
LTTDSB10[2.5]	01/13/03	2.5	NA	NA	**1,000**	62 J-	< 1.6	**1,700**	< 4.3 U
DUP011303A	01/13/03	3	NA	NA	21	30 J-	2.5	26	< 3.9 U
LTTDSB10[5.5]	01/13/03	5.5	NA	NA	42	5 J-	2.2	35	< 4.5 U
LTTDSB10[10.0]	01/13/03	10	NA	NA	25	4.3 J-	2.3	22	< 4.4 U
600SB101[2]	08/06/02	2	3.9	< 0.5	34 J	22 J	84 J	47	**130**
DUP080602A	08/06/02	2.5	2.5	< 0.5	27 J	7.6 J	7.2 J	67	24
600SB101[4]	08/06/02	4	4.1	< 0.5	**150 J**	5.5 J	< 4	**120**	16
600SB102[2]	08/06/02	2	NA	0.6	14 J	19 J	96 J	18	**78**
600SB102[4]	08/06/02	4	1.6	< 0.5	27 J	3.6 J	< 4	22	14
600SB103[2]	08/05/02	2	1.9	< 0.5	29	8.2 J	7.6 J	34	25
600SB103[4]	08/05/02	4	4.7	< 0.5	33	5.6 J	4.2 J	39	21
DUP080502D	08/05/02	4.5	3.3	< 0.5	26	4 J	< 4	30	16
600SB104[2]	08/06/02	2	2.3	< 0.5	27 J	5.4 J	< 4	34	20
600SB104[4]	08/06/02	4	3	< 0.5	36 J	4.8 J	4.3 J	43	17
600SB105[2]	08/05/02	2	NA	< 0.5	61	8.8 J	5.9 J	53	30

Table C-5
Summary of Metals Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Nickel**	**Zinc**
		Analytical Method	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Cleanup Level[1]			**5.9**	**1.7**	**120**	**120**	**300**	**71**	**66**
600SB105[4]	08/05/02	4	NA	< 0.5	61	15 J	**350 J**	41	50
DUP080502A	08/05/02	4.5	NA	< 0.5	61	22 J	**330 J**	42	**70**
600SB106[2]	08/05/02	2	NA	0.8	95	39 J	**510 J**	**78**	**210**
600SB106[4]	08/05/02	4	NA	< 0.5	46	13 J	66 J	36	**68**
600SB107[2]	08/02/02	2	NA	< 0.5	69	22	170	63	**110**
600SB107[4]	08/02/02	4	NA	0.6	74	25	270	**72**	**150**
600SB108[2]	08/02/02	2	NA	< 0.5	46	8.8	15	36	34
600SB108[4]	08/02/02	4	NA	< 0.5	50	5.7	4.9	25	20
600SB109[2]	08/05/02	2	NA	< 0.5	**930**	19 J	6.2 J	**1,300**	35
600SB109[4]	08/05/02	4	NA	< 0.5	44	5.1 J	4.7 J	26	18

Notes

[1] Cleanup Levels are found in Table 3.
BOLD values indicate concentration exceeding cleanup levels.
DUP prefix indicates blind duplicate sample; parent sample precedes duplicate sample.
LD - laboratory duplicate
mg/kg - milligrams per kilogram
MSD - Matrix spike duplicate
MSD indicates to the laboratory which samples were to be used for the MSD quality control sample analyses. These are not matrix spike results.
NA - Not analyzed
J+ - Data validation qualifier, "The analyte was positively identified; the associated numerical value is biased high due to a high surrogate recovery and should be considered an approximate concentration of the analyte in the sample."
J- - Data validation qualifier, "The analyte was positively identified; the associated numerical values is biased low due to a low surrogate recovery and should be considered an approximate concentration of the analyte in the sample."
UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."

Table C-6
Summary of Pesticide Results in Soil
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Sample Depth (feet)**	**4,4'-DDD**	**4,4'-DDE**	**4,4'-DDT**	**Aldrin**	**alpha-BHC**	**beta-BHC**	**delta-BHC**	**alpha-Chlordane**	**Dieldrin**	**Endosulfan I**	**Endosulfan II**	**Endosulfan Sulfate**	**Endrin**	**Endrin Aldehyde**	**Endrin Ketone**	**gamma-BHC**	**gamma-Chlordane**	**Heptachlor**	**Heptachlor Epoxide**
		Analytical Method	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081	SW8081
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Screening Level[1]			**0.53**	**0.61**	**0.53**	**0.07**	**0.44**	**0.79**	**0.44**	**0.04**	**0.074**	**3.3**	**3.3**	**3.3**	**0.11**	**0.11**	**0.11**	**0.37**	**0.04**	**0.29**	**0.21**
T609SB01[2]	07/30/02	2	< 0.008	< 0.008	< 0.008 UJ	< 0.004	< 0.004 UJ	< 0.004	< 0.004	0.006	< 0.008	< 0.004	< 0.004	< 0.008	< 0.008	< 0.008	< 0.008	< 0.004	0.006	< 0.004 UJ	< 0.004
T609SB02[2]	07/30/02	2	< 0.008	< 0.008	< 0.008 UJ	< 0.004	< 0.004 UJ	< 0.004	< 0.004	< 0.004	< 0.008	< 0.004	< 0.004	< 0.008	< 0.008	< 0.008	< 0.008	< 0.004	< 0.004	< 0.004 UJ	< 0.004
DUP073002B	07/30/02	1.5	< 0.008	< 0.008	< 0.008 UJ	< 0.004	< 0.004 UJ	< 0.004	< 0.004	< 0.004	< 0.008	< 0.004	< 0.004	< 0.008	< 0.008	< 0.008	< 0.008	< 0.004	< 0.004	< 0.004 UJ	< 0.004
T609SB03[2]	07/30/02	2	< 0.008	< 0.008	< 0.008 UJ	< 0.004	< 0.004 UJ	< 0.004	< 0.004	< 0.004	< 0.008	< 0.004	< 0.004	< 0.008	< 0.008	< 0.008	< 0.008	< 0.004	< 0.004	< 0.004 UJ	< 0.004
T609SB04[2]	07/30/02	2	< 0.16	< 0.16	< 0.16 UJ	**< 0.08**	< 0.08 UJ	< 0.08	< 0.08	**< 0.08**	**< 0.16**	< 0.08	< 0.08	< 0.16	**< 0.16**	**< 0.16**	**< 0.16**	< 0.08	**< 0.08**	< 0.08 UJ	< 0.08
T609SB05[2]	07/30/02	2	< 0.008	< 0.008	< 0.008 UJ	< 0.004	< 0.004 UJ	< 0.004	< 0.004	< 0.004	< 0.008	< 0.004	< 0.004	< 0.008	< 0.008	< 0.008	< 0.008	< 0.004	< 0.004	< 0.004 UJ	< 0.004
T609SB06[2]	07/30/02	2	< 0.008	< 0.008	< 0.008 UJ	< 0.004	< 0.004 UJ	< 0.004	< 0.004	< 0.004	< 0.008	< 0.004	< 0.004	< 0.008	< 0.008	< 0.008	< 0.008	< 0.004	< 0.004	< 0.004 UJ	< 0.004

Notes
[1] Screening Levels were obtained from Table 1a of the *Draft Site Investigation Report Commissary/Post Exchange Study Area Presidio of San Francisco, California* (Treadwell& Rollo, 2003c).
Bold indicates a reporting limit which exceeds the screening level.
DUP prefix indicates blind duplicate sample; parent sample precedes duplicate sample.
feet - feet below ground surface
mg/kg - milligrams per kilograms
UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."

Table C-7
TPH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil [2] (Carbon Range C_{24}-C_{36})**
	Analytical Method [1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M
		(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [3]		**770**	**880**	**1,200**
601GG01	08/06/02	< 50 UJ	NA	NA
601GG02	08/05/02	< 50 UJ	NA	NA
DUP080502C	08/05/02	< 50 UJ	NA	NA
603GG01	08/05/02	< 50 UJ	< 100 UJ	NA
610GG01	08/05/02	< 50 UJ	< 100 UJ	< 300 UJ
613GG02	08/02/02	< 50 UJ	< 100 UJ	< 300 UJ
613GG03	08/02/02	< 50 UJ	< 100 UJ	< 300 UJ
613GG07	07/30/02	< 50 UJ	< 100 UJ	< 300
613GG11	01/21/03	NA	< 50	350
613GG12	01/21/03	NA	< 50	270
616GG02	07/30/02	< 50 UJ	NA	NA
617GG01	08/01/02	NA	< 100 UJ	< 300 UJ
617GG03	08/01/02	NA	< 100 UJ	< 300 UJ
619GG01	07/31/02	< 50 UJ	< 100 UJ	310 J-
619GG04[MSD]	01/23/03	< 50	84	< 250
DUP012303B	01/23/03	< 50	< 50	< 250
619GG05	01/23/03	NA	< 50	< 250
625GG03	07/29/02	< 50 UJ	< 100 UJ	< 300
DUP072902C	07/29/02	< 50 UJ	< 100 UJ	< 300
626GG01	07/29/02	< 50 UJ	< 100 UJ	< 300 UJ
628GG02	07/30/02	< 50 UJ	< 100 UJ	< 300
628GG04	07/30/02	< 50 UJ	< 100 UJ	< 300 UJ
628GG09	08/02/02	< 50 UJ	< 100 UJ	< 300
DUP080202B	08/02/02	< 50 UJ	< 100 UJ	< 300
628GG10	07/30/02	< 50 UJ	< 100 UJ	< 300
DUP073002C	07/30/02	< 50 UJ	< 100 UJ	< 300
T615GG01	08/01/02	< 50 UJ	< 100 UJ	< 300 UJ
T618GG02	08/06/02	< 50 UJ	< 100 UJ	< 300 UJ
S15GG01	08/06/02	< 50 UJ	< 100 UJ	< 300 UJ
600AGG01	08/07/02	NA	< 100 UJ	< 300 UJ
600AGG02	08/01/02	NA	< 100 UJ	< 300
600AGG03	08/01/02	NA	< 100 UJ	< 300
600AGG04	08/01/02	NA	< 100 UJ	< 300 UJ
600AGG05	08/01/02	NA	< 100 UJ	< 300 UJ
600AGG06	08/01/02	NA	< 100 UJ	< 300 UJ
600FDSGG01	08/01/02	< 50 UJ	< 100 UJ	< 300 UJ
DUP080102A	08/01/02	< 50 UJ	< 100 UJ	< 300 UJ
600CGG01	07/31/02	< 50 UJ	< 100 UJ	NA
600CGG02	07/31/02	< 50 UJ	< 100 UJ	NA
600CGG03	07/29/02	< 50 UJ	< 100 UJ	NA
600CGG04	07/29/02	< 50 UJ	< 100 UJ	NA
600SDGG01	08/06/02	< 50 UJ	< 100 UJ	< 300 UJ
600SDGG02	08/01/02	< 50 UJ	< 100 UJ	< 300 UJ
600SDGG03	08/06/02	< 50 UJ	< 100 UJ	< 300 UJ
600SDGG04	08/06/02	< 50 UJ	< 100 UJ	< 300 UJ
600SDGG05	08/07/02	< 50 UJ	< 100 UJ	< 300 UJ
600RRGG02	08/05/02	< 50 UJ	< 100 UJ	< 300 UJ
600RRGG04	08/07/02	< 50 UJ	< 100 UJ	< 300 UJ
600RRGG06	01/21/03	< 50	< 50	< 250
600RRGG07	01/22/03	< 50	< 50	< 250
LTTDGG02	07/29/02	< 50 UJ	< 100 UJ	< 300
DUP072902D	07/29/02	< 50 UJ	< 100 UJ	< 300
LTTDGG04	07/29/02	< 50 UJ	< 100 UJ	< 300
LTTDGG05	07/29/02	< 50 UJ	< 100 UJ	< 300 UJ

Table C-7
TPH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil [2] (Carbon Range C_{24}-C_{36})**
	Analytical Method [1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M
		(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [3]		**770**	**880**	**1,200**
600GW101	06/01/05	270 Y	< 50	< 300
DUP0601053A	06/01/05	280 Y	< 50	< 300
	03/21/05	390 HY J+	< 50	< 300
	12/16/04	460 HY	< 50	< 300
	08/10/04	390 Y	< 50	< 300
	05/26/04	570 Y	< 50	< 300
	03/09/04	600 HY	< 50	< 300
	12/02/03	340 Y	< 50	< 300
	08/13/03	370 Y	< 50	< 300
	06/09/03	470 Y	< 50	< 300
	03/11/03	630 Y	< 50	< 300
	12/04/02	310 Y	< 50	< 300
	09/10/02	230 J-	< 100 UJ	< 300 UJ
600GW102	04/06/05	< 50	< 50	< 300
	03/09/04	< 50	< 50	< 300
	12/02/03	< 50	< 50	< 300
	08/13/03	< 50	< 50	< 300
	06/09/03	< 50	< 50	< 300
	03/11/03	< 50	< 50	< 300
	12/04/02	< 50	< 50	< 300
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ
600GW103	04/11/05	< 50	< 50	< 300
	03/09/04	< 50	< 50	< 300
	12/02/03	< 50	< 50	< 300
	08/13/03	< 50	< 50	< 300
DUP0813033A	08/13/03	< 50	< 50	< 300
	06/09/03	< 50	< 50	< 300
	03/11/03	< 50	< 50	< 300
	12/04/02	< 50	< 50	< 300
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ
600GW104	04/11/05	< 50	< 50	< 300
	03/09/04	< 50	< 50	< 300
	12/02/03	< 50	< 50	< 300
DUP1202033A	12/02/03	< 50	< 50	< 300
	08/18/03	< 50	< 50	< 300
	06/05/03	< 50	< 50	< 300
	03/11/03	< 50	< 50	< 300
DUP0311032A	03/11/03	< 50	< 50	< 300
600GW104CL	03/11/03	< 50 UJ	< 50	< 250
	12/04/02	< 50	< 50	< 300
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ
DUP0910021A	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ
600GW105	06/01/05	< 50	< 50	< 300
	03/22/05	< 50	< 50	< 300
	12/16/04	< 50	< 50	< 300
	08/12/04	< 50	< 50	< 300
	03/10/04	< 50	< 50	< 300
	12/02/03	< 50	< 50	< 300
	08/13/03	< 50	< 50	< 300
	06/05/03	< 50	< 50	< 300
DUP0605033A	06/05/03	< 50	< 50	< 300
	03/12/03	< 50	< 50	< 300
	12/04/02	< 50	< 50	< 300
	09/11/02	< 50 UJ	< 100 UJ	< 300 UJ

Table C-7
TPH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	TPH as Gasoline (Carbon Range C_7-C_{12})	TPH as Diesel (Carbon Range C_{12}-C_{24})	TPH as Fuel Oil [2] (Carbon Range C_{24}-C_{36})
	Analytical Method [1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M
		(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [3]		**770**	**880**	**1,200**
600GW106	06/01/05	< 50	< 50	< 300
	03/29/05	< 50	< 50	< 300
	12/17/04	< 50	< 50	< 300
	08/10/04	< 50	< 50	< 300
	03/10/04	< 50	< 50	< 300
	12/02/03	< 50	< 50	< 300
	08/13/03	< 50	< 50	< 300
	06/05/03	< 50	< 50	< 300
	03/12/03	< 50	< 50	< 300
	12/04/02	< 50	< 50	< 300
	09/11/02	< 50 UJ	< 100 UJ	< 300 UJ
600GW107	04/11/05	< 50	< 50	< 300
	03/10/04	< 50	< 50	< 300
	12/03/03	< 50	< 50	< 300
	08/13/03	< 50	170 HY	< 300
	06/06/03	< 50	< 50	< 300
	03/11/03	< 50	85 YH	< 300
	12/04/02	< 50	< 50	< 300
	09/11/02	< 50 UJ	NA	NA
600GW108	06/01/05	< 50	< 50	< 300
	03/21/05	< 50	< 50	< 300
DUP0321052B	03/21/05	< 50	< 50	< 300
	12/17/04	< 50	< 50	< 300
	08/10/04	< 50	< 50	< 300
	05/26/04	< 50	< 50	< 300
	03/10/04	< 50	< 50	< 300
	12/03/03	< 50	< 50	< 300
	08/13/03	< 50	< 50	< 300
	06/05/03	< 50	< 50	< 300
	03/12/03	< 50	< 50	< 300
	12/09/02	< 50	< 50	< 300
DUP1209022C	12/09/02	< 50	< 50	< 300
600GW108CL	12/09/02	< 50	< 50	< 250
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ
600GW109	04/01/05	< 50	< 50	< 300
	03/09/04	< 50	< 50	< 300
	12/03/03	< 50	< 50	< 300
	08/13/03	< 50	< 50	< 300
	06/05/03	< 50	< 50	< 300
	03/11/03	< 50	< 50	< 300
	12/04/02	< 50	< 50	< 300
	09/10/02	< 50 UJ	< 100 UJ	< 300 UJ
610GW101	06/02/05	< 50	< 50	< 300
	03/21/05	< 50	< 50	< 300
DUP0321052A	03/21/05	< 50	< 50	< 300
	12/15/04	< 50	< 50	< 300
DUP1215041A	12/15/04	< 50	< 50	< 300
610GW101CL	12/15/04	< 50 U	< 50 U	< 300 U
	08/10/04	< 50	< 50	< 300
	05/26/04	< 50	< 50	< 300
	03/10/04	< 50	< 50	< 300
DUP0310043A	03/10/04	< 50	< 50	< 300
610GW101CL	03/10/04	< 50	< 48	< 240
	12/02/03	< 50	< 50	< 300

Table C-7
TPH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil [2] (Carbon Range C_{24}-C_{36})**
	Analytical Method [1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M
		(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [3]		**770**	**880**	**1,200**
610GW101	08/14/03	< 50	< 50	450
DUP0814033A	08/14/03	< 50	< 50	< 300
610GW101CL	08/14/03	< 48	< 50	< 240
	06/04/03	< 50	< 50	< 300
DUP0604033B	06/04/03	< 50	< 50	< 300
610GW101CL	06/04/03	< 50	< 50	< 250
	03/11/03	< 50	380 YH	**1,400**
	12/03/02	< 50	< 50	< 300
	08/29/02	< 50	< 50	< 300
	05/29/02	< 50	< 50	< 300
	03/05/02	< 50	< 50	< 300
	12/03/01	< 50	< 50	< 300
	08/29/01	< 50	NA	NA
610GW102	06/02/05	52	< 50	< 300
	03/31/05	51	< 50	< 300
DUP0331052C	03/31/05	< 50	< 50	< 300
610GW102CL	03/31/05	< 50 U	< 50 U	< 300 U
	12/15/04	64	< 50	< 300
	08/11/04	< 50	< 50	< 300
DUP0811041A	08/11/04	50	< 50	< 300
610GW102CL	08/11/04	< 100	< 100 J-	< 400 UJ
	05/26/04	58 Y	< 50	< 300
	03/09/04	67	< 50	< 300
	12/02/03	83	< 50	< 300
	08/18/03	73 Y	< 50	< 300
	06/05/03	67	< 50	< 300
	03/11/03	< 50	< 50	< 300
DUP0311033A	03/11/03	< 50	< 50	< 300
610GW102	12/03/02	55 Y	< 50	< 300
	08/29/02	67	< 50	< 300
	05/29/02	< 50	< 50	< 300
	03/05/02	72	< 50	< 300
	12/03/01	< 50	< 50	< 300
	08/29/01	230	NA	NA
610GW103	06/02/05	< 50	< 50	< 300
	03/22/05	< 50	< 50	< 300
	12/16/04	52 HY	< 50	< 300
	08/10/04	61 Y	< 50	< 300
	05/26/04	< 50	< 50	< 300
	03/09/04	69	< 50	< 300
	12/03/03	64	< 50	< 300
DUP1203033A	12/03/03	60	< 50	< 300
610GW103CL	12/03/03	< 50	< 48 A-01,U	< 240
	08/18/03	110 Y	< 50	< 300
DUP0818033A	08/18/03	110 Y	62 Y	< 300
	06/05/03	96	< 50	< 300
	03/11/03	< 50	< 50	< 300
	12/03/02	< 50	< 50	< 300
DUP1203022A	12/03/02	54 Y	< 50	< 300
	08/29/02	59	< 50	< 300
	05/30/02	88	< 50	< 300
DUP0530022A	05/30/02	88	< 50	< 300
610GW103CL	05/30/02	110 g	< 50	< 300

Table C-7
TPH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil [2] (Carbon Range C_{24}-C_{36})**
	Analytical Method [1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M
		(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [3]		**770**	**880**	**1,200**
610GW103	03/05/02	100	< 50	< 300
DUP0305023A	03/05/02	110	< 50	< 300
610GW103CL	03/05/02	95 g	< 50 UJ	< 300
	12/03/01	< 50	< 50	< 300
DUP1203011A	12/03/01	< 50	< 50	< 300
610GW103CL	12/03/01	< 50	< 50	< 500
	08/29/01	430	NA	NA
610SP01	06/01/05	99 Y	< 50	< 300
	12/17/04	85 HY	< 50	< 300
	08/13/04	51	< 50	< 300
	05/28/04	54	< 50	< 300
	03/16/04	< 50	< 50	< 300
	12/09/03	100 Y	< 50	< 300
DUP1209031A	12/09/03	100 Y	< 50	< 300
610SP01CL	12/09/03	58	< 48	< 240
	08/21/03	< 50	< 50	< 300
	06/11/03	56 Y	< 50	< 300
	03/20/03	81	< 50	< 300
	12/11/02	< 50	< 50	< 300
	09/05/02	< 50	< 50	< 300
	02/14/02	88	< 50	< 300
	08/30/01	80	< 50	< 300
	07/19/01	130 Y	130 Y	< 300
	05/25/01	87	< 50	< 300
	04/05/01	150 Y	80 Y	< 300
	12/27/00	NA	< 50	NA
	08/02/00	450	NA	NA
	06/27/00	170	NA	NA
	05/09/00	480 Y	NA	NA
	04/06/00	460 Y	NA	NA
	02/09/00	440 Y	NA	NA
	01/04/00	**810**	NA	NA
	12/03/99	660 Y	NA	NA
	11/18/99	570	< 50	< 300
610SP02	06/01/05	120 Y	< 50	< 300
	12/17/04	150 HY	< 50	< 300
	08/13/04	< 50	< 50	< 300
	05/28/04	56	< 50	< 300
	03/16/04	81	< 50	< 300
	12/09/03	240 Y	< 50	< 300
	08/21/03	85	< 50	< 300
	06/11/03	71 Y	< 50	< 300
	03/20/03	97	< 50	< 300
	12/11/02	130 Y	< 50	< 300
	09/05/02	120 Y	< 50	< 300
	02/14/02	140	< 50	< 300
	08/30/01	190	< 50	< 300
	07/19/01	57 Y	250 Y	< 300
	05/25/01	110	170 Y	< 300
	04/05/01	150 Y	63 Y	< 300
	12/27/00	NA	< 50	NA
	08/02/00	67	NA	NA
	06/27/00	73	NA	NA

Table C-7
TPH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**TPH as Gasoline (Carbon Range C_7-C_{12})**	**TPH as Diesel (Carbon Range C_{12}-C_{24})**	**TPH as Fuel Oil [2] (Carbon Range C_{24}-C_{36})**
	Analytical Method [1]	SW8015B/ SW8015M	SW8015B/ SW8015M	SW8015B/ SW8015M
		(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [3]		**770**	**880**	**1,200**
610SP02	05/09/00	280 Y	NA	NA
	04/06/00	110 Y	NA	NA
	02/09/00	210 Y	NA	NA
	12/03/99	95 Y	NA	NA

Notes

[1] The identified analytical method(s) are for analyses performed beginning in the Second Quarter 2001. The analytical methods used during previous quarters are identified in the respective quarterly reports.

[2] TPH as fuel oil uses a motor oil standard for carbon range (C_{24}-C_{36}).

[3] Cleanup Levels found in Table 4.

Concentrations in **BOLD** indicate an exceedance of applicable cleanup levels.
"CL" suffix denotes a quality control duplicate sample was sent to the control laboratory.
DUP prefix indicates blind duplicate sample.
MSD - Matrix spike duplicate.
MSD indicates to the laboratory which samples were to be used for the MSD quality control sample analyses.
These are not matrix spike results.
NA - not analyzed
TPH - total petroleum hydrocarbon
µg/L - micrograms per liter
g - Laboratory qualifier, "Hydrocarbon reported in the gasoline range does not match our gasoline standard."
J - - Data validation qualifier, "The analyte was positively identified; the associated numerical values is biased low due to a low surrogate recovery and should be considered an approximate concentration of the analyte in the sample."
UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."
Y - Laboratory qualifier, "Sample exhibits a fuel pattern which does not resemble standard."

Table C-8
VOC Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Benzene	Chloro-benzene	Chloro-form	Ethyl-benzene	MTBE	Toluene	Total Xylenes	All Other VOCs
	Analytical Method [1]	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Screening Levels [2]		**1**	**70**	**80**	**43**	**13**	**150**	**130**	**--**
601GG01	08/06/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1	ND
601GG02	08/05/02	< 0.5	NA	NA	< 0.5	< 0.5	0.5	< 1	ND
DUP080502C	08/05/02	< 0.5	NA	NA	< 0.5	< 0.5	0.6	< 1	ND
603GG01	08/05/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1	ND
610GG01	08/05/02	< 0.5	1.1	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
613GG02	08/02/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
613GG03	08/02/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
613GG07	07/30/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1 UJ	ND
616GG02	07/30/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 1	ND
617GG01	08/01/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 1	ND
617GG03	08/01/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 1	ND
619GG01	07/31/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
619GG04[MSD]	01/23/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
DUP012303B	01/23/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
625GG03	07/29/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1 UJ	ND
DUP072902C	07/29/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1 UJ	ND
626GG01	07/29/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1 UJ	ND
628GG02	07/30/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
628GG04	07/30/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
628GG09	08/02/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5 UJ	< 0.5	< 1	ND
DUP080202B	08/02/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
628GG10	07/30/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
DUP073002C	07/30/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
T615GG01	08/01/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1 UJ	ND
T618GG02	08/06/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
S15GG01	08/06/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1	ND
600FDSGG01	08/01/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1	ND
DUP080102A	08/01/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1	ND
600CGG01	07/31/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1	ND
600CGG02	07/31/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1	ND
600CGG03	07/29/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1	ND
600CGG04	07/29/02	< 0.5	NA	NA	< 0.5	< 0.5	< 0.5	< 1	ND
600SDGG01	08/06/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
600SDGG02	08/01/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1 UJ	ND
600SDGG03	08/06/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	1.7	ND
600SDGG04	08/06/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
600SDGG05	08/07/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
600RRGG02	08/05/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 1	ND
600RRGG04	08/07/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 1	ND
LTTDGG02	07/29/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 1	ND
DUP072902D	07/29/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 1	ND
LTTDGG04	07/29/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 1	ND
LTTDGG05	07/29/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 1	ND
600GW101	06/01/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
DUP0601053A	06/01/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	03/21/05	< 0.5	NA	NA	< 0.5	2.3	< 0.5	0.54 C	NA
	12/16/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	2 C	NA
	08/10/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA

Table C-8
VOC Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Benzene	Chloro-benzene	Chloro-form	Ethyl-benzene	MTBE	Toluene	Total Xylenes	All Other VOCs
	Analytical Method [1]	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Screening Levels [2]		**1**	**70**	**80**	**43**	**13**	**150**	**130**	**--**
600GW101	05/26/04	< 0.5	NA	NA	2.2	3.5 C	< 0.5	3.1	NA
	03/09/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	12/02/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	08/13/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	06/09/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/11/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/04/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	09/10/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	< 0.5	< 1.0	ND
600GW102	04/06/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
	03/09/04	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/02/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	08/13/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	06/09/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/11/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/04/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
600GW102	09/10/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	< 0.5	< 1.0	ND
600GW103	04/11/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
	03/09/04	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/02/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	08/13/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
DUP0813033A	08/13/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	06/09/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/11/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/04/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	09/10/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	< 0.5	< 1.0	ND
600GW104	04/11/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
	03/09/04	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/02/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
DUP1202033A	12/02/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	08/18/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	06/05/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/11/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
DUP0311032A	03/11/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
600GW104CL	03/11/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/04/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	09/10/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	< 0.5	< 1.0	ND
DUP0910021A	09/10/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	< 0.5	< 1.0	ND
600GW105	03/22/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
	03/10/04	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/02/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	08/13/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	06/05/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
DUP0605033A	06/05/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/12/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/04/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	09/11/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND

Table C-8
VOC Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Benzene	Chloro-benzene	Chloro-form	Ethyl-benzene	MTBE	Toluene	Total Xylenes	All Other VOCs
	Analytical Method [1]	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Screening Levels [2]		**1**	**70**	**80**	**43**	**13**	**150**	**130**	**--**
600GW106	03/29/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
	03/10/04	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/02/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	08/13/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	06/05/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/12/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/04/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	09/11/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
600GW107	04/11/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
	03/10/04	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/03/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	08/13/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	06/06/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/11/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/04/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	09/11/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 0.5	< 1	ND
600GW108	06/01/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
	03/21/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
DUP0321052B	03/21/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
	12/17/04	< 0.5	< 0.5	0.7	< 0.5	< 0.5	< 0.5	< 1	ND
	08/10/04	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	05/26/04	< 0.5	< 0.5	11	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/10/04	< 0.5	< 0.5	4.6	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/03/03	< 0.5	< 0.5	7.9	< 0.5	< 0.5	< 0.5	< 0.5	ND
	08/13/03	< 0.5	< 0.5	1.3	< 0.5	< 0.5	< 0.5	< 0.5	ND
	06/05/03	< 0.5	< 0.5	4.7	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/12/03	< 0.5	< 0.5	3.7	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/09/02	< 0.5	< 0.5	2.7	< 0.5	< 0.5 UJ	< 0.5	< 0.5	ND
DUP1209022C	12/09/02	< 0.5	< 0.5	3	< 0.5	< 0.5 UJ	< 0.5	< 0.5	ND
600GW108CL	12/09/02	< 0.5	< 0.5	2.6	< 0.5	< 0.5	< 0.5	< 0.5	ND
	09/10/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	< 0.5	< 1.0	ND
600GW109	04/01/05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	ND
	03/09/04	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/03/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	08/13/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	06/05/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	03/11/03	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	12/04/02	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	ND
	09/10/02	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	< 0.5	< 1.0	ND
610GW101	06/02/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	03/21/05	< 0.5	NA	NA	< 0.5	2.2	< 0.5	< 1	NA
DUP0321052A	03/21/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	12/15/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
DUP1215041A	12/15/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
610GW101CL	12/15/04	< 0.5 U	NA	NA	< 0.5 U	< 2.5 U	< 0.5 U	< 1 U	NA
	08/10/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	05/26/04	< 0.5	NA	NA	< 0.5	4.3 C	< 0.5	< 0.5	NA

Table C-8
VOC Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Benzene	Chloro-benzene	Chloro-form	Ethyl-benzene	MTBE	Toluene	Total Xylenes	All Other VOCs
	Analytical Method [1]	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Screening Levels [2]		**1**	**70**	**80**	**43**	**13**	**150**	**130**	**--**
610GW101	03/10/04	< 0.5	NA	NA	< 0.5	< 2 C,U	< 0.5	< 0.5	NA
DUP0310043A	03/10/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
610GW101CL	03/10/04	< 0.5	NA	NA	< 0.5	< 2.5	< 0.5	< 0.5	NA
	12/02/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	08/14/03	< 0.5	NA	NA	< 0.5	3	< 0.5	< 0.5	ND
DUP0814033A	08/14/03	< 0.5	NA	NA	< 0.5	2.9	< 0.5	< 0.5	ND
610GW101CL	08/14/03	< 0.5	NA	NA	< 0.5	< 2.5	0.81	0.71	ND
	06/04/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
DUP0604033B	06/04/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
610GW101CL	06/04/03	< 0.5	NA	NA	< 0.5	< 2.5	< 0.5	< 0.5	ND
	03/11/03	< 0.5	NA	NA	< 0.5	2.7	< 0.5	< 0.5	ND
	12/03/02	< 0.5	NA	NA	< 0.5	2.2	< 0.5	< 0.5	ND
	08/29/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	05/29/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	03/05/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	12/03/01	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	08/29/01	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
610GW102	06/02/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	03/31/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	03/31/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	03/31/05	< 1 U	NA	NA	< 1 U	< 5 U	< 1 U	< 2 U	NA
	12/15/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	08/11/04	< 0.5	NA	NA	< 0.5	2.1	< 0.5	< 0.5	NA
DUP0811041A	08/11/04	< 0.5	NA	NA	< 0.5	4.4	< 0.5	< 0.5	NA
610GW102CL	08/11/04	< 1	NA	NA	< 1	< 1 UJ	< 1	< 1	NA
	05/26/04	< 0.5	NA	NA	< 0.5	4.8	< 0.5	< 0.5	NA
	03/09/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	12/02/03	0.53	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	08/18/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	06/05/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	03/11/03	< 0.5	NA	NA	< 0.5	2.4	< 0.5	< 0.5	ND
DUP0311033A	03/11/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	12/03/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	08/29/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	05/29/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	03/05/02	< 0.5	NA	NA	0.78	< 2	< 0.5	< 0.5	ND
	12/03/01	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	08/29/01	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
610GW103	06/02/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	03/22/05	< 0.5	NA	NA	< 0.5	2.1	< 0.5	< 1	NA
	12/16/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	08/10/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	05/26/04	< 0.5	NA	NA	< 0.5	3.9 C	< 0.5	< 0.5	NA
	03/09/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	12/03/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
DUP1203033A	12/03/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
610GW103CL	12/03/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	0.64	NA

Table C-8
VOC Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Benzene	Chloro-benzene	Chloro-form	Ethyl-benzene	MTBE	Toluene	Total Xylenes	All Other VOCs
	Analytical Method [1]	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Screening Levels [2]		**1**	**70**	**80**	**43**	**13**	**150**	**130**	**--**
610GW103	08/18/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
DUP0818033A	08/18/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	06/05/03	< 0.5	NA	NA	0.69 C	< 2	< 0.5	< 0.5	ND
	03/11/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	12/03/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
DUP1203022A	12/03/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	08/29/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	05/30/02	< 0.5	NA	NA	1	< 2	< 0.5	< 0.5	ND
DUP0530022A	05/30/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
610GW103CL	05/30/02	< 0.5	NA	NA	< 0.5	< 5	< 0.5	< 0.5	ND
	03/05/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
DUP0305023A	03/05/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
610GW103CL	03/05/02	< 0.5	NA	NA	< 0.5	NA	< 0.5	< 0.5	ND
	12/03/01	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
DUP1203011A	12/03/01	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
610GW103CL	12/03/01	< 0.5	NA	NA	< 0.5	< 5	< 0.5	< 0.5	ND
	08/29/01	< 0.5	NA	NA	4.9	< 2	< 0.5	0.93	ND
610SP01	06/01/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	12/17/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	08/13/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	05/28/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	03/16/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	12/09/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
DUP1209031A	12/09/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
610SP01CL	12/09/03	< 0.5	NA	NA	< 0.5	< 2.5	< 0.5	< 0.5	NA
	08/21/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	06/11/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	03/20/03	< 0.5	NA	NA	0.54 C	< 2	< 0.5	< 0.5	ND
	12/11/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	09/05/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	08/30/01	< 0.5	NA	NA	< 0.5	2.5	< 0.5	< 0.5	ND
	07/19/01	< 0.5	NA	NA	2.3 C	2.7	< 0.5	< 0.5	ND
	05/25/01	< 0.5	NA	NA	< 0.5	< 2.0	< 0.5	< 0.5	ND
	04/05/01	< 0.5	NA	NA	< 0.5	2.2	< 0.5	0.85	ND
	08/02/00	< 0.5	NA	NA	2.1	< 2	1.3	1.4	ND
	06/27/00	< 0.5	NA	NA	< 0.5	< 2	< 0.5	0.8	ND
	05/09/00	< 0.5	NA	NA	3	3.3 C	0.93	< 0.5	ND
	04/06/00	< 0.5	NA	NA	6.8 C	< 2	4.8 C	< 0.5	ND
	02/09/00	< 0.5	NA	NA	4.9 C	2	4.9	< 0.5	ND
	01/04/00	< 0.5	NA	NA	4.7	NA	< 0.5	1.2 C	ND
	12/03/99	< 0.5	NA	NA	11 C	NA	6.4	1.7	ND
	11/18/99	< 0.5	NA	NA	3.7	NA	3.8	3.8	ND
610SP02	06/01/05	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 1	NA
	12/17/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	1.3 C	NA
	08/13/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	05/28/04	< 0.5	NA	NA	< 0.5	2 C	< 0.5	< 0.5	NA
	03/16/04	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	NA
	12/09/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	0.58	NA

Table C-8
VOC Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Benzene**	**Chloro-benzene**	**Chloro-form**	**Ethyl-benzene**	**MTBE**	**Toluene**	**Total Xylenes**	**All Other VOCs**
	Analytical Method [1]	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260	SW8020/ SW8021/ SW8260
		(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)
Screening Levels [2]		**1**	**70**	**80**	**43**	**13**	**150**	**130**	**--**
610SP02	08/21/03	< 0.5	NA	NA	< 0.5	**15**	< 0.5	< 0.5	ND
	06/11/03	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	03/20/03	< 0.5	NA	NA	1.7 C	< 2	< 0.5	0.52	ND
	12/11/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	09/05/02	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	08/30/01	< 0.5	NA	NA	1.4 C	< 2.0	< 0.5	0.6	ND
	07/19/01	< 0.5	NA	NA	< 0.5	3	< 0.5	< 0.5	ND
	05/25/01	< 0.5	NA	NA	< 0.5	4	< 0.5	< 0.5	ND
	04/05/01	< 0.5	NA	NA	< 0.5	< 2.0	< 0.5	< 0.5	ND
	08/02/00	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	06/27/00	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	05/09/00	< 0.5	NA	NA	1.3	< 2	0.69 C	< 0.5	ND
	04/06/00	< 0.5	NA	NA	< 0.5	< 2	< 0.5	< 0.5	ND
	02/09/00	< 0.5	NA	NA	2.1	< 2.0	< 0.5	< 0.5	ND
	12/03/99	< 0.5	NA	NA	0.82 C	NA	< 0.5	< 0.5	ND

Notes
[1] The identified analytical method(s) are for analyses performed beginning in the Second Quarter 2001.
The analytical methods used during previous quarters are identified in the respective quarterly reports.
[2] Screening Levels were obtained from Table 1a of the *Draft Site Investigation Report Commissary/Post Exchange Study Area Presidio of San Francisco, California* (Treadwell& Rollo, 2003c).
Concentrations in **BOLD** indicate an exceedance of applicable screening levels.
"CL" suffix denotes a quality control duplicate sample was sent to the control laboratory.
DUP prefix indicates a blind duplicate sample
MTBE - methyl tertiary butyl ether
NA - not analyzed
ND - not detected
MSD - Matrix spike duplicate.
MSD indicates to the laboratory which samples were to be used for the MSD quality control sample analyses.
These are not matrix spike results.
VOC - volatile organic compound
μg/L - micrograms per liter
UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."

Table C-9
PAH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Acenaph-thene**	**Anthracene**	**Benzo(a)-Anthracene**	**Benzo(a)-Pyrene**	**Benzo(b)-Fluoranthene**	**Benzo(g,h,i)-Perylene**	**Benzo(k)-Fluoranthene**	**Chrysene**	**Dibenz(a,h)-Anthracene**	**Fluor-anthene**	**Indeno (1,2,3-c,d) Pyrene**	**Phen-anthrene**	**Pyrene**	**All Other PAHs**
	Analytical Method[1]	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [2]		**--**	**770**	**0.1**	**0.2**	**0.2**	**150**	**2**	**20**	**--**	**300**	**--**	**230**	**230**	**--**
601GG02	08/05/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
DUP080502C	08/05/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
603GG01	08/05/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
610GG01	08/05/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
613GG02	08/02/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
613GG03	08/02/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
613GG07	07/30/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
613GG11	01/21/03	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	ND
613GG12	01/21/03	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	0.4	0.25	ND
617GG01	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
617GG03	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
619GG01	07/31/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
619GG04[MSD]	01/23/03	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	ND
DUP012303B	01/23/03	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	ND
625GG03	07/29/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
DUP072902C	07/29/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
626GG01	07/29/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
628GG02	07/30/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
628GG04	07/30/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
628GG09	08/02/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
DUP080202B	08/02/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
628GG10	07/30/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
DUP073002C	07/30/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
T615GG01	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
T618GG02	08/06/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
S15GG01	08/06/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600AGG01	08/07/02	< 5	< 0.2	**0.2**	0.2	< 0.2	< 0.2	< 0.2	0.2	< 0.5	0.3	< 0.2	< 1	0.4	ND
600AGG02	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600AGG03	08/01/02	< 5 UJ	< 0.2 UJ	< 0.1 UJ	< 0.2 UJ	< 0.2 UJ	< 0.2 UJ	< 0.2 UJ	< 0.2 UJ	< 0.5 UJ	< 0.2 UJ	< 0.2 UJ	< 1 UJ	< 0.2 UJ	ND
600AGG04	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600AGG05	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600AGG06	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600FDSGG01	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
DUP080102A	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600CGG01	07/31/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600CGG02	07/31/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600CGG03	07/29/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600CGG04	07/29/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600SDGG01	08/06/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600SDGG02	08/01/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600SDGG03	08/06/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600SDGG04	08/06/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600SDGG05	08/07/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND

Table C-9
PAH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Acenaph-thene**	**Anthracene**	**Benzo(a)-Anthracene**	**Benzo(a)-Pyrene**	**Benzo(b)-Fluoranthene**	**Benzo(g,h,i)-Perylene**	**Benzo(k)-Fluoranthene**	**Chrysene**	**Dibenz(a,h)-Anthracene**	**Fluor-anthene**	**Indeno (1,2,3-c,d) Pyrene**	**Phen-anthrene**	**Pyrene**	**All Other PAHs**
	Analytical Method[1]	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [2]		**--**	**770**	**0.1**	**0.2**	**0.2**	**150**	**2**	**20**	**--**	**300**	**--**	**230**	**230**	**--**
600RRGG02	08/05/02	< 5 UJ	< 0.2 UJ	< 0.1 UJ	< 0.2 UJ	< 0.2 UJ	< 0.2 UJ	< 0.2 UJ	< 0.2 UJ	< 0.5 UJ	< 0.2 UJ	< 0.2 UJ	< 1 UJ	< 0.2 UJ	ND
600RRGG04	08/07/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600RRGG06	01/21/03	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	ND
600RRGG07	01/22/03	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	ND
LTTDGG02	07/29/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
DUP072902D	07/29/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
LTTDGG04	07/29/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
LTTDGG05	07/29/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600GW101	12/02/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	08/13/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	06/09/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	03/11/03	< 0.96	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	12/04/02	< 1	< 0.5	< 0.1	< 0.1	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	< 0.4	< 0.14	< 0.5	< 0.2	ND
	09/10/02	< 5.0	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1.0	< 0.2	ND
600GW102	04/06/05	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
	03/09/04	< 0.98	< 0.49	< 0.1	< 0.1	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	< 0.39	< 0.14	< 0.49	< 0.2	ND
	12/02/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	08/13/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	06/09/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	03/11/03	< 0.96	< 0.48	< 0.1	0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	12/04/02	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
	09/10/02	< 5.0	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1.0	< 0.2	ND
600GW103	04/11/05	7.7	< 0.49	< 0.1	< 0.1	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	< 0.39	< 0.14	< 0.49	< 0.2	ND
	03/09/04	7.3	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	12/02/03	7.3	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	08/13/03	9	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
DUP0813033A	08/13/03	7.4	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
600GW103	06/09/03	8.9	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	03/11/03	5.6	< 0.48	< 0.1	0.18	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	12/04/02	6.4	< 0.47	< 0.09	**0.34**	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	09/10/02	< 5.0	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1.0	< 0.2	ND
600GW104	04/11/05	< 0.98	< 0.49	< 0.1	< 0.1	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	< 0.39	< 0.14	< 0.49	< 0.2	ND
	03/09/04	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	12/02/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
DUP1202033A	12/02/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	08/18/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	06/05/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	03/11/03	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	0.14	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
DUP0311032A	03/11/03	< 0.96	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
600GW104CL	03/11/03	< 0.5	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.05	< 0.05	< 0.2	< 0.1	< 0.05	< 0.05	< 0.05	ND
	12/04/02	< 0.94 UJ	< 0.47 UJ	< 0.09 UJ	< 0.09 UJ	< 0.19 UJ	< 0.19 UJ	< 0.09 UJ	< 0.09 UJ	< 0.19 UJ	< 0.38 UJ	< 0.13 UJ	< 0.47 UJ	< 0.19 UJ	ND
	09/10/02	< 5.0	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1.0	< 0.2	ND
DUP0910021A	09/10/02	< 5.0	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1.0	< 0.2	ND

Table C-9
PAH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Acenaph-thene**	**Anthracene**	**Benzo(a)-Anthracene**	**Benzo(a)-Pyrene**	**Benzo(b)-Fluoranthene**	**Benzo(g,h,i)-Perylene**	**Benzo(k)-Fluoranthene**	**Chrysene**	**Dibenz(a,h)-Anthracene**	**Fluor-anthene**	**Indeno (1,2,3-c,d) Pyrene**	**Phen-anthrene**	**Pyrene**	**All Other PAHs**
	Analytical Method[1]	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [2]		**--**	**770**	**0.1**	**0.2**	**0.2**	**150**	**2**	**20**	**--**	**300**	**--**	**230**	**230**	**--**
600GW105	03/22/05	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
	03/10/04	< 1.1	< 0.56	< 0.11	< 0.11	< 0.22	< 0.22	< 0.11	< 0.11	< 0.22	< 0.44	< 0.16	< 0.56	< 0.22	ND
	12/02/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	08/13/03	< 0.96	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	06/05/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
DUP0605033A	06/05/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	03/12/03	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
	12/04/02	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	09/11/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600GW106	03/29/05	< 0.98	< 0.49	< 0.1	< 0.1	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	< 0.39	< 0.14	< 0.49	< 0.2	ND
	03/10/04	< 0.96	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	12/02/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	08/13/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	06/05/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	03/12/03	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
	12/04/02	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	09/11/02	< 5	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1	< 0.2	ND
600GW107	04/11/05	< 0.98	< 0.49	< 0.1	< 0.1	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	< 0.39	< 0.14	< 0.49	< 0.2	ND
	03/10/04	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
	08/13/03	< 1	< 0.5	< 0.1	< 0.1	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	0.05 J	< 0.14	< 0.5	< 0.2	ND
	06/06/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	0.1	< 0.19	0.07 J	< 0.13	< 0.47	< 0.19	ND
	03/11/03	< 0.95	0.19 J	**0.24**	**0.22**	**0.34**	0.4	0.15	0.62	0.4	0.49	0.21	0.51	0.53	ND
	12/04/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/11/02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
600GW108	06/01/05	< 0.96	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.13	< 0.48	< 0.19	ND
	03/21/05	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
DUP0321052B	03/21/05	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
	12/17/04	< 0.97	< 0.49	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.39	< 0.14	< 0.49	< 0.19	ND
	08/10/04	< 0.98	< 0.49	< 0.1	< 0.1	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	< 0.39	< 0.14	< 0.49	< 0.2	ND
	05/26/04	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	03/10/04	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	12/03/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	08/13/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	06/05/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	03/12/03	< 0.96	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	12/09/02	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
DUP1209022C	12/09/02	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
600GW108CL	12/09/02	< 0.5	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.05	< 0.05	< 0.2	< 0.1	< 0.05	< 0.05	< 0.05	ND
	09/10/02	< 5.0	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1.0	< 0.2	ND
600GW109	04/01/05	< 0.96	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	03/09/04	< 1	< 0.5	< 0.1	< 0.1	< 0.2	< 0.2	< 0.1	< 0.1	< 0.2	< 0.4	< 0.14	< 0.5	< 0.2	ND
	12/03/03	< 0.94	< 0.47	< 0.09	< 0.09	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND

Table C-9
PAH Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Acenaph-thene**	**Anthracene**	**Benzo(a)-Anthracene**	**Benzo(a)-Pyrene**	**Benzo(b)-Fluoranthene**	**Benzo(g,h,i)-Perylene**	**Benzo(k)-Fluoranthene**	**Chrysene**	**Dibenz(a,h)-Anthracene**	**Fluor-anthene**	**Indeno (1,2,3-c,d) Pyrene**	**Phen-anthrene**	**Pyrene**	**All Other PAHs**
	Analytical Method[1]	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310	SW8270/ SW8310
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Cleanup Levels [2]		**--**	**770**	**0.1**	**0.2**	**0.2**	**150**	**2**	**20**	**--**	**300**	**--**	**230**	**230**	**--**
600GW109	08/13/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	06/05/03	< 0.95	< 0.48	< 0.1	< 0.1	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	03/11/03	< 0.96	< 0.48	< 0.1	0.11	< 0.19	< 0.19	< 0.1	< 0.1	< 0.19	< 0.38	< 0.13	< 0.48	< 0.19	ND
	12/04/02	< 0.94	< 0.47	< 0.09	0.15	< 0.19	< 0.19	< 0.09	< 0.09	< 0.19	< 0.38	< 0.13	< 0.47	< 0.19	ND
	09/10/02	< 5.0	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 1.0	< 0.2	ND

Notes
[1] The identified analytical method(s) are for analyses performed beginning in the Second Quarter 2001. The analytical methods used during previous quarters are identified in the respective quarterly reports.
[2] Cleanup Levels found in Table 4.
BOLD values indicate concentration exceeding cleanup levels
"CL" suffix denotes a quality control duplicate sample was sent to the control laboratory.
DUP prefix indicates a blind duplicate sample.
NA - not analyzed
ND - not detected
PAHs - Polycyclic aromatic hydrocarbons
µg/L - micrograms per liter
UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."

Table C-10
Metals Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Aluminum	Arsenic	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Sodium	Zinc	Total Dissolved Solids
	Analytical Method [1]	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	E160.1
			(µg/L)	(µg/L)		(µg/L)	(µg/L)		(µg/L)			(µg/L)			(µg/L)	(mg/L)
Cleanup Levels [2]		**--**	**10**	**5**	**--**	**50**	**3.1**	**--**	**8.1**	**--**	**--**	**8.2**	**--**	**--**	**81**	**--**
601GG02	08/05/02	NA	< 5	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
DUP080502C	08/05/02	NA	< 5	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
603GG01	08/05/02	NA	< 5	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
610GG01	08/05/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
613GG02	08/02/02	NA	NA	< 5	NA	16	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
613GG03	08/02/02	NA	NA	< 5	NA	20	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
613GG07	07/30/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
613GG11	01/21/03	NA	NA	NA	NA	< 10	NA	NA	< 3	NA	NA	< 10	NA	NA	< 20	NA
613GG12	01/21/03	NA	NA	NA	NA	< 10	NA	NA	< 3	NA	NA	< 10	NA	NA	< 20	NA
616GG02	07/30/02	NA	NA	NA	NA	NA	NA	NA	< 15	NA	NA	NA	NA	NA	NA	NA
617GG01	08/01/02	NA	NA	NA	NA	NA	NA	NA	< 15	NA	NA	NA	NA	NA	NA	NA
617GG03	08/01/02	NA	NA	NA	NA	NA	NA	NA	< 15	NA	NA	NA	NA	NA	NA	NA
619GG01	07/31/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
619GG04[MSD]	01/23/03	NA	NA	NA	NA	< 10	< 10 UJ	NA	< 3	NA	NA	< 10	NA	NA	< 20 UJ	NA
DUP012303B	01/23/03	NA	NA	NA	NA	< 10	< 10 UJ	NA	< 3	NA	NA	< 10	NA	NA	< 20 UJ	NA
619GG05	01/23/03	NA	NA	NA	NA	< 10	NA	NA	NA	NA	NA	< 10	NA	NA	NA	NA
625GG03	07/29/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
626GG01	07/29/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
628GG02	07/30/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
628GG04	07/30/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
628GG09	08/02/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
DUP080202B	08/02/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
628GG10	07/30/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
DUP073002C	07/30/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
T615GG01	08/01/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
T618GG02	08/06/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
S15GG01	08/06/02	NA	NA	NA	NA	NA	NA	NA	< 15	NA	NA	NA	NA	NA	NA	NA
600CGG01	07/31/02	NA	NA	NA	NA	NA	NA	NA	< 15	NA	NA	NA	NA	NA	NA	NA
600CGG02	07/31/02	NA	NA	NA	NA	NA	NA	NA	< 15	NA	NA	NA	NA	NA	NA	NA
600CGG03	07/29/02	NA	NA	NA	NA	NA	NA	NA	< 15	NA	NA	NA	NA	NA	NA	NA
600CGG04	07/29/02	NA	NA	NA	NA	NA	NA	NA	< 15	NA	NA	NA	NA	NA	NA	NA
600SDGG01	08/06/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
600SDGG02	08/01/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
600SDGG03	08/06/02	NA	NA	< 5	NA	< 10	< 20	NA	< 75	NA	NA	< 50	NA	NA	< 20	NA
600SDGG04	08/06/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA

Table C-10
Metals Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Aluminum**	**Arsenic**	**Cadmium**	**Calcium**	**Chromium**	**Copper**	**Iron**	**Lead**	**Magnesium**	**Manganese**	**Nickel**	**Potassium**	**Sodium**	**Zinc**	**Total Dissolved Solids**
	Analytical Method [1]	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	E160.1
			(µg/L)	(µg/L)		(µg/L)	(µg/L)		(µg/L)			(µg/L)			(µg/L)	(mg/L)
Cleanup Levels [2]		**--**	**10**	**5**	**--**	**50**	**3.1**	**--**	**8.1**	**--**	**--**	**8.2**	**--**	**--**	**81**	**--**
600SDGG05	08/07/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
600RRGG02	08/05/02	NA	**17**	< 5	NA	18	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
600RRGG04	08/07/02	NA	< 5	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
600RRGG06	01/21/03	NA	NA	NA	NA	< 10	NA	NA	< 3	NA	NA	< 10	NA	NA	< 20	NA
600RRGG07	01/22/03	NA	NA	NA	NA	< 10	NA	NA	< 3	NA	NA	< 10	NA	NA	< 20	NA
LTTDGG02	07/29/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
LTTDGG04	07/29/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
DUP072902D	07/29/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
LTTDGG05	07/29/02	NA	NA	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	< 20	NA
600GW101	06/01/05	< 100	< 5	< 1	90,000	< 10	< 1	10,000	< 3	49,000	1,200	< 20	15,000 J	150,000	< 20	860
DUP0601053A	06/01/05	< 100	< 5	< 1	100,000	< 10	< 1	10,000	< 3	55,000	1,300	< 20	15,000 J	170,000	< 20	930
	03/21/05	< 100	< 5	< 1	100,000	< 10	< 1	9,200	< 3	48,000	1,300	< 20	13,000	120,000	< 20	870
	12/16/04	NA	< 5	< 1	NA	< 10	< 1	350	< 3	NA	NA	< 20	NA	NA	< 20	930
	08/10/04	NA	< 5	< 1	NA	< 10	< 1	10,000	< 3	NA	NA	< 20	NA	NA	< 20	900
	05/26/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	890
	03/09/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	890
	12/02/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	730
	08/13/03	NA	< 5	< 1	NA	< 10	2.3	NA	< 3	NA	NA	< 20	NA	NA	< 20	790
	06/09/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	980
	03/11/03	NA	5.8	< 1	NA	4.7	< 1	NA	< 3	NA	NA	3.4	NA	NA	< 20	950
	12/04/02	NA	1.7	< 1	NA	6.3	< 1	NA	< 3	NA	NA	2.2	NA	NA	< 20	890
	09/10/02	NA	< 5.0	< 5.0	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	**88 [3]**	NA
600GW102	04/06/05	< 100	< 5	< 1	150,000	< 10	< 1	3,000	< 3	46,000	270	< 20	9,900	140,000	< 20	810
	03/09/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	910
	12/02/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	590
	08/13/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	1990
	06/09/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	1400
	03/11/03	NA	3.4	< 1	NA	2	< 1	NA	< 3	NA	NA	4.3	NA	NA	< 20	720
	12/04/02	NA	3	< 1	NA	1.9	< 1	NA	< 3	NA	NA	4.3	NA	NA	< 20	1450
	09/10/02	NA	6.2	< 5.0	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	**140 [3]**	NA

Table C-10
Metals Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Aluminum	Arsenic	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Sodium	Zinc	Total Dissolved Solids
	Analytical Method [1]	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	E160.1
			(µg/L)	(µg/L)		(µg/L)	(µg/L)		(µg/L)			(µg/L)			(µg/L)	(mg/L)
Cleanup Levels [2]		**--**	**10**	**5**	**--**	**50**	**3.1**	**--**	**8.1**	**--**	**--**	**8.2**	**--**	**--**	**81**	**--**
600GW103	04/11/05	< 100	5	< 1	110,000	< 10	< 1	11,000	< 3	31,000	3,200	< 20	13,000	84,000	< 20	780
	03/09/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	680
	12/02/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	580
	08/13/03	NA	7.2	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	620
DUP0813033A	08/13/03	NA	9.7	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	670
	06/09/03	NA	7.6	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	770
	03/11/03	NA	4	< 1	NA	1.2	< 1	NA	< 3	NA	NA	2.9	NA	NA	< 20	670
	12/04/02	NA	4.2	< 1	NA	3.1	< 1	NA	< 3	NA	NA	3.3	NA	NA	< 20	660
	09/10/02	NA	6.7	< 5.0	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	**120** [3]	NA
600GW104	04/11/05	< 100	< 5	< 1	120,000	< 10	< 1	1,100	< 3	52,000	330	< 20	6,500	48,000	< 20	440
	03/09/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	500
	12/02/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	370
DUP1202033A	12/02/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	330
	08/18/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20 UJ	530
600GW104	06/05/03	NA	< 5	< 1	NA	< 10	1.2	NA	< 3	NA	NA	< 20	NA	NA	< 20	620
	03/11/03	NA	< 1	< 1	NA	< 1	1	NA	< 3	NA	NA	7.3	NA	NA	< 20	800
DUP0311032A	03/11/03	NA	< 1	< 1	NA	1.8	1.1	NA	< 3	NA	NA	7.1	NA	NA	< 20	870
600GW104CL	03/11/03	NA	6.5	< 1	NA	< 5	< 5	NA	< 3	NA	NA	**8.8**	NA	NA	14	960
	12/04/02	NA	1.3	< 1	NA	1.4	< 1	NA	< 3	NA	NA	5.1	NA	NA	< 20	540
	09/10/02	NA	< 5.0	< 5.0	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	55	NA
DUP0910021A	09/10/02	NA	< 5.0	< 5.0	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	79 [3]	NA
600GW105	06/01/05	< 100	< 5	< 1	39,000	< 10	< 1	2,600	< 3	47,000	3,700	< 20	740 J	110,000	< 20	590
	03/22/05	< 100	< 5	< 1	32,000	< 10	< 1	1,600	< 3	43,000	3,300	< 20	700	100,000	< 20	550
	12/16/04	NA	< 5	< 1	NA	< 10	1.5	290	< 3	NA	NA	< 20	NA	NA	< 20	540
	08/12/04	NA	< 5	< 1	NA	< 10	< 1	1,800	< 3	NA	NA	< 20	NA	NA	< 20	660
	03/10/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	600
	12/02/03	NA	< 5	< 1	NA	< 10	1.1	NA	< 3	NA	NA	< 20	NA	NA	< 20	420
	08/13/03	NA	< 5	< 1	NA	< 10	1.4	NA	< 3	NA	NA	< 20	NA	NA	< 20	470
	06/05/03	NA	< 5	< 1	NA	< 10	1.1	NA	< 3	NA	NA	< 20	NA	NA	< 20	550
DUP0605033A	06/05/03	NA	< 5	< 1	NA	< 10	1.6	NA	< 3	NA	NA	< 20	NA	NA	< 20	510
	03/12/03	NA	< 1	< 1	NA	< 1	1.9	NA	< 3	NA	NA	**11**	NA	NA	< 20	560
	12/04/02	NA	< 1	< 1	NA	1.5	**4.2**	NA	< 3	NA	NA	**9.1**	NA	NA	< 20	560
	09/11/02	NA	< 5	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	**130** [3]	NA

Table C-10
Metals Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Aluminum**	**Arsenic**	**Cadmium**	**Calcium**	**Chromium**	**Copper**	**Iron**	**Lead**	**Magnesium**	**Manganese**	**Nickel**	**Potassium**	**Sodium**	**Zinc**	**Total Dissolved Solids**
	Analytical Method [1]	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	E160.1
			(µg/L)	(µg/L)		(µg/L)	(µg/L)		(µg/L)			(µg/L)			(µg/L)	(mg/L)
Cleanup Levels [2]		**--**	**10**	**5**	**--**	**50**	**3.1**	**--**	**8.1**	**--**	**--**	**8.2**	**--**	**--**	**81**	**--**
600GW106	06/01/05	< 100	< 5	< 1	15,000	< 10	< 1	< 100	< 3	22,000	700	< 20	< 500 UJ	80,000	36	340
	03/29/05	< 100	< 5	< 1	17,000	< 10	2.2	< 100	< 3	26,000	600	< 20	< 500	83,000	< 20	410
	12/17/04	NA	< 5	< 1	NA	< 10	< 1	< 100	< 3	NA	NA	< 20	NA	NA	< 20	380
	08/10/04	NA	< 5	< 1	NA	< 10	< 1	< 100	< 3	NA	NA	< 20	NA	NA	< 20	370
	03/10/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	410
	12/02/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	310
	08/13/03	NA	< 5	< 1	NA	< 10	1.1	NA	< 3	NA	NA	< 20	NA	NA	< 20	280
	06/05/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	380
	03/12/03	NA	< 1	< 1	NA	1.1	< 1	NA	< 3	NA	NA	4.6	NA	NA	< 20	350
	12/04/02	NA	< 1	< 1	NA	1.6	1.1	NA	< 3	NA	NA	4.4	NA	NA	< 20	560
	09/11/02	NA	< 5	< 5	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	**260 [3]**	NA
600GW107	04/11/05	< 100	7	< 1	120,000	< 10	< 1	9,500	< 3	56,000	2,700	< 20	6,700	62,000	21	670
	03/10/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	630
	12/03/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	NA
	08/13/03	NA	7.1	< 1	NA	< 10	1.2	NA	< 3	NA	NA	< 20	NA	NA	< 20	570
	06/06/03	NA	< 5	< 1	NA	< 10	2.3	NA	< 3	NA	NA	< 20	NA	NA	< 20	630
	03/11/03	NA	2.4	< 1	NA	1	< 1	NA	< 3	NA	NA	3.8	NA	NA	< 20	640
600GW108	06/01/05	< 100	< 5	< 1	35,000	< 10	< 1	< 100	< 3	35,000	12	< 20	2,500 J	35,000	< 20	380
	03/21/05	< 100	< 5	< 1	50,000	< 10	< 1	140	< 3	43,000	16	< 20	3,200	31,000	< 20	450
DUP0321052B	03/21/05	< 100	< 5	< 1	52,000	< 10	< 1	140	< 3	42,000	17	< 20	3,300	30,000	< 20	460
600GW108	12/17/04	NA	< 5	< 1	NA	< 10	< 1	< 100	< 3	NA	NA	< 20	NA	NA	< 20	300
	08/10/04	NA	< 5	< 1	NA	< 10	< 1	< 100	< 3	NA	NA	< 20	NA	NA	< 20	230
	05/26/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	290
	03/10/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	360
	12/03/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	330
	08/13/03	NA	< 5	< 1	NA	< 10	1.3	NA	< 3	NA	NA	< 20	NA	NA	< 20	250
	06/05/03	NA	< 5	< 1	NA	< 10	1.1	NA	< 3	NA	NA	< 20	NA	NA	< 20	280
	03/12/03	NA	< 1	< 1	NA	< 1	< 1	NA	< 3	NA	NA	4.2	NA	NA	< 20	310
	12/09/02	NA	< 1	< 1	NA	1.2	< 1	NA	< 3	NA	NA	5.4	NA	NA	< 20	360
DUP1209022C	12/09/02	NA	< 1	< 1	NA	< 1	< 1	NA	< 3	NA	NA	4.4	NA	NA	< 20	350
600GW108CL	12/09/02	NA	< 2 U	< 1	NA	< 5	< 5	NA	< 3	NA	NA	< 5	NA	NA	< 10	330
	09/10/02	NA	< 5.0	< 5.0	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	**140 [3]**	NA

Table C-10
Metals Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Aluminum**	**Arsenic**	**Cadmium**	**Calcium**	**Chromium**	**Copper**	**Iron**	**Lead**	**Magnesium**	**Manganese**	**Nickel**	**Potassium**	**Sodium**	**Zinc**	**Total Dissolved Solids**
	Analytical Method [1]	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	E160.1
			(µg/L)	(µg/L)		(µg/L)	(µg/L)		(µg/L)			(µg/L)			(µg/L)	(mg/L)
Cleanup Levels [2]		--	**10**	**5**	--	**50**	**3.1**	--	**8.1**	--	--	**8.2**	--	--	**81**	--
600GW109	04/01/05	< 100	< 5	< 1	28,000 J	< 10	2.4	2,800	< 3	49,000	190 J	< 20	2,700	39,000	< 20	450
	03/09/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	430
	12/03/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	350
	08/13/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	480
	06/05/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	440
	03/11/03	NA	< 1	< 1	NA	2.9	< 1	NA	< 3	NA	NA	3.5	NA	NA	< 20	490
	12/04/02	NA	< 1	< 1	NA	1.7	< 1	NA	< 3	NA	NA	2.2	NA	NA	< 20	450
	09/10/02	NA	< 5.0	< 5.0	NA	< 10	< 20	NA	< 15	NA	NA	< 50	NA	NA	**110 [3]**	NA
610GW101	06/02/05	< 100	< 5	< 1	62,000	< 10	1.9	4,300	< 3	43,000	280	< 20	6,400 J	80,000	< 20	580
	03/21/05	< 100	< 5	< 1	63,000	< 10	< 1	4,200	< 3	37,000	280	< 20	5,200	70,000	< 20	530
DUP0321052A	03/21/05	< 100	< 5	< 1	62,000	< 10	< 1	4,000	< 3	37,000	280	< 20	5,100	70,000	< 20	480
	12/15/04	NA	< 5	< 1	NA	< 10	< 1	3,100	< 3	NA	240	< 20	NA	NA	< 20	440
DUP1215041A	12/15/04	NA	< 5	< 1	NA	< 10	< 1	3,200	< 3	NA	260	< 20	NA	NA	< 20	2190
610GW101CL	12/15/04	NA	2.1	< 1 U	NA	< 10 U	< 2 U	3,540	< 1 U	NA	256	< 2 U	NA	NA	< 20 U	488
	08/10/04	NA	< 5	< 1	NA	< 10	< 1	4,400	< 3	NA	NA	< 20	NA	NA	< 20	600
	05/26/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	600
	03/10/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	560
DUP0310043A	03/10/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	550
610GW101CL	03/10/04	NA	< 5	< 1	NA	< 10	< 10	NA	< 3	NA	NA	< 10	NA	NA	< 20	540 QB01
	12/02/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	540
	08/14/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20 UJ	540
DUP0814033A	08/14/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20 UJ	500
610GW101CL	08/14/03	NA	7.3	< 1	NA	< 10	< 10	NA	< 3	NA	NA	< 10	NA	NA	< 20	580
	06/04/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	640
DUP0604033B	06/04/03	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	550
610GW101CL	06/04/03	NA	4.6	< 1	NA	< 5	< 5	NA	< 3	NA	NA	< 5	NA	NA	< 20	520
	03/11/03	NA	1.1	< 1	NA	2.9	< 1	NA	< 3	NA	NA	1.5	NA	NA	< 20	520
	12/03/02	NA	1.4	< 1	NA	1.8 J	< 1	NA	< 3	NA	NA	1.1	NA	NA	< 20	600
610GW102	06/02/05	< 100	6.5	< 1	71,000	< 10	< 1	1,700	< 3	34,000	3,300	< 20	5,100 J	79,000	< 20	520
	03/31/05	< 100	6.9	< 1	86,000 J	< 10	< 1	2,000	< 3	37,000	3,700 J	< 20	5,100	83,000	< 20	590 J-
DUP0331052C	03/31/05	< 100 U	6.5	< 1	78,200	< 10	< 1	1,800	< 3	67,300	3,500 J	< 20	6,810	70,100	< 20	540 J-
610GW102CL	03/31/05	< 100	**22.1**	< 1 U	79,000 J	< 10 U	< 2 U	27,600	5.89	33,000	1,350	< 2 U	4,600	73,000	< 20 U	667

Table C-10
Metals Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Aluminum	Arsenic	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Sodium	Zinc	Total Dissolved Solids
	Analytical Method [1]	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	E160.1
			(µg/L)	(µg/L)		(µg/L)	(µg/L)		(µg/L)			(µg/L)			(µg/L)	(mg/L)
Cleanup Levels [2]		**--**	**10**	**5**	**--**	**50**	**3.1**	**--**	**8.1**	**--**	**--**	**8.2**	**--**	**--**	**81**	**--**
	12/15/04	NA	6.1	< 1	NA	< 10	< 1	2,700	< 3	NA	4,100	< 20	NA	NA	29	630
	08/11/04	NA	7.3	< 1	NA	< 10	< 1	2,000	< 3	NA	NA	< 20	NA	NA	< 20	500
DUP0811041A	08/11/04	NA	7.3	< 1	NA	< 10	< 1	2,100	< 3	NA	NA	< 20	NA	NA	< 20	470
610GW102CL	08/11/04	NA	< 40	< 10	NA	< 10	< 10	1,100	< 50	NA	NA	< 30	NA	NA	< 30	571
	05/26/04	NA	**11**	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	500
	03/09/04	NA	6.9	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	570
	12/02/03	NA	9.9	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	430
	08/18/03	NA	**13**	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20 UJ	340
	06/05/03	NA	**11**	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	500
	03/11/03	NA	8.6	< 1	NA	2.7	1	NA	< 3	NA	NA	6.1	NA	NA	< 20	580
DUP0311033A	03/11/03	NA	8.9	< 1	NA	1.1	< 1	NA	< 3	NA	NA	5.8	NA	NA	< 20	530
	12/03/02	NA	**11**	< 1	NA	2.8 J	< 1	NA	< 3	NA	NA	5.2	NA	NA	< 20	390
610GW103	06/02/05	< 100	10	< 1	84,000	< 10	< 1	3,900	< 3	51,000	2,900	< 20	8,000 J	120,000	< 20	670
	03/22/05	< 100	5.2	< 1	64,000	< 10	1.9	650	< 3	46,000	790	< 20	9,400	130,000	< 20	770
	12/16/04	NA	5.1	< 1	NA	< 10	< 1	240	< 3	NA	3,000	< 20	NA	NA	< 20	880
	08/10/04	NA	9.8	< 1	NA	< 10	< 1	3,000	< 3	NA	NA	< 20	NA	NA	< 20	620
	05/26/04	NA	**12**	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	640
	03/09/04	NA	7.8	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	21	640
	12/03/03	NA	7.5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	580
DUP1203033A	12/03/03	NA	7.2	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	600
610GW103CL	12/03/03	NA	**13**	< 1	NA	< 10	< 10	NA	< 3	NA	NA	< 10	NA	NA	< 20	560
	08/18/03	NA	7.4	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20 UJ	570
DUP0818033A	08/18/03	NA	7.1	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20 UJ	530
	06/05/03	NA	7.3	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	560
	03/11/03	NA	6.3	< 1	NA	2.2	< 1	NA	< 3	NA	NA	7.7	NA	NA	< 20	690
	12/03/02	NA	4.7	< 1	NA	3.3 J	< 1	NA	< 3	NA	NA	1.9	NA	NA	< 20	2880
DUP1203022A	12/03/02	NA	4.6	< 1	NA	3.1 J	< 1	NA	< 3	NA	NA	2	NA	NA	< 20	3080
610SP01	06/01/05	< 100	8.7	< 1	64,000	< 10	< 1	280	< 3	74,000	350	< 20	37,000 J	250,000	< 20	1,220
(Total)	06/01/05	7,800	13	< 1	67,000	38	12	17,000	41	77,000	550	63	36,000	230,000	58	NA
	12/17/04	NA	8	< 1	NA	< 10	< 1	210	< 3	NA	540	< 20	NA	NA	< 20	4,240
(Total)	12/17/04	NA	34	< 1	NA	180	44	59,000	70	NA	1,100	270	NA	NA	130 J+	NA
	08/13/04	NA	**15**	< 1	NA	< 10	< 1 U	1,000	< 3	NA	NA	< 20	NA	NA	< 20	9,260
(Total)	08/13/04	NA	17	< 1	NA	110	36	41,000	45	NA	NA	130	NA	NA	74	NA

Table C-10
Metals Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**Aluminum**	**Arsenic**	**Cadmium**	**Calcium**	**Chromium**	**Copper**	**Iron**	**Lead**	**Magnesium**	**Manganese**	**Nickel**	**Potassium**	**Sodium**	**Zinc**	**Total Dissolved Solids**
	Analytical Method [1]	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	SW6010/ SW6020	E160.1
			(µg/L)	(µg/L)		(µg/L)	(µg/L)		(µg/L)			(µg/L)			(µg/L)	(mg/L)
Cleanup Levels [2]		**--**	**10**	**5**	**--**	**50**	**3.1**	**--**	**8.1**	**--**	**--**	**8.2**	**--**	**--**	**81**	**--**
610SP01	05/28/04	NA	8.6	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	890
(Total)	03/16/04	NA	11	< 1	NA	11	1.3	NA	24	NA	NA	37	NA	NA	76	800
(Total)	12/09/03	NA	6.6	< 1	NA	21	2.4	NA	15	NA	NA	65	NA	NA	110 J+	6,850
DUP1209031A (Total)	12/09/03	NA	< 5	< 1	NA	23	< 1	NA	9.7	NA	NA	81	NA	NA	110 J+	2,660
610SP01CL (Total)	12/09/03	NA	220	5.5	NA	1,000	320	NA	300	NA	NA	1,400	NA	NA	920	2,800 QB-01
(Total)	08/21/03	NA	23	1.2	NA	87	18	NA	190	NA	NA	330	NA	NA	300	2580
	06/11/03	NA	**16**	< 1	NA	< 10	1.1	NA	< 3	NA	NA	< 20	NA	NA	< 20	8860
	03/20/03	NA	9.9	< 1	NA	1.2	< 1	NA	< 3	NA	NA	3.6	NA	NA	< 10	4480
	12/11/02	NA	**19**	< 1	NA	3.2	1.4	NA	< 3	NA	NA	3.3	NA	NA	< 20	12200
610SP02	06/01/05	< 100	6.9	< 1	83,000	< 10	< 1	230	< 3	55,000	1,100	< 20	11,000 J	170,000	< 20	810
(Total)	06/01/05	6,500	9.8	< 1	93,000	29	9.1	15,000	20	58,000	1,400	34	11,000	160,000	49	NA
	12/17/04	NA	5.9	< 1	NA	< 10	< 1	210	< 3	NA	2,100	< 20	NA	NA	< 20	1,550
(Total)	12/17/04	NA	20	< 1	NA	48	14	26,000	25	NA	2,500	56	NA	NA	72 J+	NA
	08/13/04	NA	< 5	< 1	NA	< 10	< 1 U	15,000	< 3	NA	NA	< 20	NA	NA	< 20	23,700
(Total)	08/13/04	NA	< 5	< 1	NA	74	29	50,000	19	NA	NA	77	NA	NA	26	NA
	05/28/04	NA	< 5	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	970
(Total)	03/16/04	NA	5.4	< 1	NA	23	1.4	NA	8.8	NA	NA	48	NA	NA	85	1,400
(Total)	12/09/03	NA	< 5	< 1	NA	12	2.3	NA	16	NA	NA	25	NA	NA	74 J+	5,720
(Total)	08/21/03	NA	< 5	< 1	NA	< 10	< 1	NA	6.4	NA	NA	< 20	NA	NA	< 20	11900
	06/11/03	NA	9	< 1	NA	< 10	< 1	NA	< 3	NA	NA	< 20	NA	NA	< 20	4070
	03/20/03	NA	**11**	< 1	NA	1.2	1.1	NA	< 3	NA	NA	3.9	NA	NA	< 10	5730
	12/11/02	NA	**11**	< 1	NA	3	1.3	NA	< 3	NA	NA	3.3	NA	NA	< 20	8240

Notes

[1] The identified analytical method(s) are for analyses performed beginning in the Second Quarter 2001. The analytical methods used during previous quarters are identified in their respective quarterly report.

[2] Cleanup Levels are found in Table 4.

[3] Zinc exceedances due to filter type used by Blaine Tech in September 2002. Refer to Section 2.4.3.4.

All metal results represent dissolved metals, unless indicated as "(Total)" in the left-hand column, for unfiltered samples.

BOLD indicates a concentration which exceeds the cleanup level.

"CL" suffix denotes a quality control duplicate sample sent to the quality control laboratory.

DUP prefix indicates a blind duplicate sample

NA - not analyzed

µg/L - micrograms per liter

J - Data validation qualifier, "The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample."

UJ - Data validation qualifier, "The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample."

Table C-11
PCB Results in Groundwater
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	**Sample Date**	**PCB-1016**	**PCB-1221**	**PCB-1232**	**PCB-1242**	**PCB-1248**	**PCB-1254**
	Analytical Method	SW8082	SW8082	SW8082	SW8082	SW8082	SW8082
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Screening Levels [1]		**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**
626GG01	07/29/02	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
628GG09	08/02/02	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
DUP080202B	08/02/02	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Notes
[1] Screening Levels were obtained from Table 1a of the *Draft Site Investigation Report Commissary/Post Exchange Study Area Presidio of San Francisco, California* (Treadwell& Rollo, 2003c).
DUP prefix indicates a blind duplicate sample
PCB - Polychlorinated biphenyl
µg/L - micrograms per liter

Table C-12
Results of General Chemistry Analyses
Commissary/PX Area
Presidio of San Francisco, California

Well Name	Sample Date	Alkalinity Total	Bicarbonate	Chloride	Dissolved Oxygen	Fluoride	N as Nitrate	N as Nitrite	Sulfate	Sulfide
	Analytical Method [1]	E310.1	E310.1	E300.0/ SW9056	Field	E300.0/ E340.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0/ SW9056	E300.0/SW9056
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
600GW101	06/01/05	800	800	96	0.3	0.49	< 0.05	< 0.05	0.65	0.07
DUP0601053A	06/01/05	740	740	95	--	0.51	< 0.05	< 0.05	0.63	< 0.04
	03/21/05	720	720	110	0.10	0.33	< 0.05	< 0.05	6.3	0.12
	12/22/04	NA	NA	NA	0.17	NA	NA	NA	NA	NA
	12/16/04	830	830	130	0.2	0.39	< 0.05	< 0.05	0.51	0.07
	08/10/04	690	690	120	0.1	0.37	< 0.05	< 0.05	< 0.5	< 0.04
	05/26/04	660	660	110	NM	0.42	< 0.05	< 0.05	0.91	NA
	03/09/04	710	710	110	0.3	0.4	< 0.05	< 0.05	0.9	NA
	12/02/03	660	660	98	0.7	0.44	< 0.05	< 0.05	< 0.5	NA
	08/13/03	720	720	100	0.1	0.63	< 0.25 UJ	< 0.25 UJ	< 2.5	NA
	06/09/03	680	680	97	0.4	0.57	< 0.05	< 0.05	< 0.5	NA
	03/11/03	650	650	120	0.2	0.37	< 0.05	< 0.05	32	NA
	12/04/02	670	670	100	0.8	0.46	< 0.05	< 0.05	0.83	NA
	09/10/02	670	670	100	0.8	0.52	< 0.05	< 0.05	< 1	NA
600GW102	04/06/05	550	550	150	1.2	0.18	0.46	< 0.05	35	< 0.04 UJ
	03/09/04	630	630	230	0.7	0.16	0.55	< 0.05	24	NA
	12/02/03	310	310	200	1	0.18	2	< 0.05	51	NA
	08/13/03	570	570	870	1.1	< 1	< 0.5 UJ	< 0.5 UJ	59	NA
	06/09/03	650	650	440	0.6	< 0.2	< 0.1	< 0.1	16	NA
	03/11/03	480	480	170	0.5	0.2	0.11	< 0.05	26	NA
	12/04/02	350	350	460	1	0.23	0.15	< 0.05	58	NA
	09/10/02	400	400	220	0.7	0.37	1.1	< 0.05	38	NA
600GW103	04/11/05	470	470	93	0.6	0.33	< 0.05	< 0.05	< 0.5	< 0.04
	03/09/04	520	520	110	0.6	0.28	< 0.05	< 0.05	< 0.5	NA
	12/02/03	540	540	100	1.8	0.27	< 0.05	< 0.05	< 0.5	NA
	08/13/03	550	550	97	0.3	< 0.5	< 0.25 UJ	< 0.25 UJ	< 2.5	NA
DUP0813033A	08/13/03	540	540	98	--	0.5	< 0.25 UJ	< 0.25 UJ	< 2.5	NA
	06/09/03	550	550	130	0.7	0.36	< 0.05	< 0.05	< 0.5	NA
	03/11/03	530	530	120	0.2	0.22	< 0.05	< 0.05	< 0.5	NA
	12/04/02	500	500	97	0.9	0.22	< 0.05	< 0.05	2.9	NA
	09/10/02	550	550	110	0.7	0.35	< 0.05	< 0.05	1.5	NA
600GW104	04/11/05	480	480	24	0.9	0.39	0.08	< 0.05	160	< 0.04
	03/09/04	290	290	43	2.1	0.39	< 0.05	< 0.05	110	NA
	12/02/03	330	330	42	1.8	0.29	0.13 J-	< 0.05 UJ	71	NA
DUP1202033A	12/02/03	310	310	43	--	0.3	0.2	< 0.05	72	NA
	08/18/03	410	410	38	0.4	0.35	0.35	< 0.05	99	NA
	06/05/03	350	350	48	0.6	0.29	0.69	< 0.05	130	NA
	03/11/03	390	390	59	0.3	0.2	0.64	< 0.05	280	NA
DUP0311032A	03/11/03	440	440	59	NA	0.22	0.63	< 0.05	300	NA
600GW104CL	03/11/03	400	400	54	NA	0.24 J-	0.55	< 0.05 UJ	280	NA
	12/04/02	420	420	55	2.2	0.18	< 0.05	< 0.05	170	NA
	09/10/02	450	450	59	1.0	0.24	0.17	< 0.05	180	NA
DUP0910021A	09/10/02	450	450	58	--	0.22	0.17	< 0.05	180	NA
600GW105	06/01/05	710	710	89	0.7	< 5	< 2.5	< 2.5	60	< 0.04
	03/22/05	310	310	86	0.2	0.25	1.9	< 0.05	67	< 0.04
	12/22/04	NA	NA	NA	0.14	NA	NA	NA	NA	NA
	12/16/04	350	350	88	0.2	0.27	1.6	< 0.05	69	< 0.04
	08/12/04	340	340	93	0.6	0.28	1	< 0.05	61	< 0.04
	03/10/04	340	340	90	0.2	0.3	0.58	< 0.05	62	NA
	12/02/03	320	320	86	0.7	0.28	1.4	< 0.05	63	NA
	08/13/03	370	370	86	0.2	< 0.5	1.1 b,J-	< 0.25 UJ	64	NA
	06/05/03	370	370	90	0.4	0.28	2.7	0.07	74	NA
DUP0605033A	06/05/03	320	320	90	NA	0.28	2.6	0.07	77	NA
	03/12/03	290	290	83	0.3	0.25	2.5	< 0.05	76	NA

Table C-12
Results of General Chemistry Analyses
Commissary/PX Area
Presidio of San Francisco, California

Well Name	Sample Date	Alkalinity Total	Bicarbonate	Chloride	Dissolved Oxygen	Fluoride	N as Nitrate	N as Nitrite	Sulfate	Sulfide
	Analytical Method [1]	E310.1	E310.1	E300.0/ SW9056	Field	E300.0/ E340.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0/ SW9056	E300.0/SW9056
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
600GW105	12/04/02	370	370	88	0.6	0.24	2.3	< 0.05	78	NA
	09/11/02	260	260	99	1	< 0.1 U	3.8	< 0.05	79	NA
600GW106	06/01/05	650	650	28	0.44	0.24	3.3	0.17	42	< 0.04
	03/29/05	250	250	33	0.2	0.2	3.1	< 0.05	40	< 0.04
	12/22/04	NA	NA	NA	0.19	NA	NA	NA	NA	NA
	12/17/04	240	240	35	0.2	0.2	3.5	0.08	46	< 0.04
	08/10/04	210	210	30	0.1	0.19	2.8	0.19	39	< 0.04
	03/10/04	190	190	34	0.6	0.2	2.8	0.09	40	NA
	12/02/03	210	210	36	0.7	0.21	3.1	0.15	50	NA
	08/13/03	240	240	33	0.2	< 0.5	2.7 b,J-	< 0.25 UJ	48	NA
	06/05/03	220	220	37	0.4	0.22	2.5	0.07	46	NA
	03/12/03	240	240	39	0.2	0.19	3.3	0.09	44	NA
	12/04/02	200	200	42	1.0	0.19	3.9	0.1	56	NA
	09/11/02	250	250	44	0.9	< 0.1 U	2.7	0.089	44	NA
600GW107	04/11/05	550	550	40	0.3	0.11	0.24	< 0.05	46	< 0.04
	03/10/04	590	590	43	0.3	0.13	< 0.05	< 0.05	14	NA
	12/03/03	NA	NA	NA	0.7	NA	NA	NA	NA	NA
	08/13/03	600	600	45	0.1	< 0.5	< 0.25 UJ	0.76 b,J-	3.2	NA
	06/06/03	540	540	53	0.6	0.17	0.1	0.5	4.8	NA
	03/11/03	520	520	54	1.6	0.13	0.05	< 0.05	12	NA
	12/04/02	NA	NA	NA	0.9	NA	NA	NA	NA	NA
600GW108	06/01/05	200	200	49	0.37	0.67	6.7	0.24	55	< 0.04
	03/21/05	310	310	47	0.3	0.61	8.3	0.15	90	< 0.04
DUP0321052B	03/21/05	260	260	46	--	0.64	8.3	0.15	88	< 0.04
	12/22/04	NA	NA	NA	0.12	NA	NA	NA	NA	NA
	12/17/04	170	170	51	0.2	0.8	7.8	0.08	52	NA
	08/10/04	190	190	25	0.2	1.1	3.4	0.12	26	NA
	05/26/04	110	110	35	0.78	1.1	4.8	< 0.05	38	NA
	03/10/04	150	150	48	0.8	0.75	7.3	< 0.05	55	NA
	12/03/03	150	150	46	0.7	0.82	7.4	< 0.05	52	NA
	08/13/03	160	160	29	0.3	1.4	3.8 b,J-	< 0.25 UJ	35	NA
	06/05/03	230	230	45	0.6	1	6.9	< 0.05	50	NA
	03/12/03	260	260	46	1.0	0.75	7.5	< 0.05	52	NA
	12/09/02	160	160	48	1.0	0.89	7.6	< 0.05	56	NA
DUP1209022C	12/09/02	160	160	47	--	0.94	7.6	< 0.05	52	NA
600GW108CL	12/09/02	160	160	46	--	1	7.2 J-	0.18 J-	55	NA
	09/10/02	140	140	42	1.0	1.1	5.7	< 0.05	46	NA
600GW109	04/01/05	290	290	39	0.7	< 0.1	0.74	< 0.05	47	< 0.04
	03/09/04	300	300	42	0.4	< 0.1	0.26	< 0.05	51	NA
	12/03/03	310	310	38	0.8	< 0.1	< 0.05	< 0.05	16	NA
	08/13/03	440	440	55	0.2	< 0.5	< 0.25 UJ	< 0.25 UJ	20	NA
	06/05/03	310	310	46	0.7	< 0.1	0.39	< 0.05	30	NA
	03/11/03	430	430	51	0.4	< 0.1	1	< 0.05	44	NA
	12/04/02	280	280	44	1.6	< 0.1	0.33	< 0.05	51	NA
	09/10/02	290	290	45	1.0	0.12	0.54	< 0.05	50	NA
610GW101	06/02/05	440	440	44	0.28	0.29	< 0.05	< 0.05	< 0.5	< 0.04
	03/21/05	480	480	42	0.2	0.12	0.06	< 0.05	11	< 0.04
DUP0321052A	03/21/05	420	420	43	--	0.12	< 0.05	< 0.05	10	< 0.04
	12/21/04	NA	NA	NA	1.29	NA	NA	NA	NA	NA
	12/15/04	390	390	37	0.2	0.17	< 0.05	< 0.05	10	< 0.04
DUP1215041A	12/15/04	390	390	39	--	0.17	< 0.05	< 0.05	10	< 0.04
610GW101CL	12/15/04	352	352	35.4	--	< 0.3 U	0.027 [2]		9.88	NA
	08/10/04	490	490	47	0.1	0.19	< 0.05	< 0.05	4.9	< 0.04

Table C-12
Results of General Chemistry Analyses
Commissary/PX Area
Presidio of San Francisco, California

Well Name	Sample Date	Alkalinity Total	Bicarbonate	Chloride	Dissolved Oxygen	Fluoride	N as Nitrate	N as Nitrite	Sulfate	Sulfide
	Analytical Method [1]	E310.1	E310.1	E300.0/ SW9056	Field	E300.0/ E340.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0/ SW9056	E300.0/SW9056
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
610GW101	05/26/04	450	450	52	0.62	0.22	< 0.05	< 0.05	1.2	NA
	03/10/04	450	450	45	0.2	0.17	< 0.05	< 0.05	4.6	NA
DUP0310043A	03/10/04	440	440	43	--	0.16	< 0.05	< 0.05	5.1	NA
610GW101CL	03/10/04	430	430	45	--	0.18	< 0.1 UJ	< 0.05 UJ	5.3	NA
	12/02/03	390	390	28	1.0	0.19	< 0.05	< 0.05	7.7	NA
	08/14/03	560	560	46	0.3	0.25	< 0.05 UJ	< 0.05 UJ	3.1	NA
	08/14/03	510	510	48	--	0.28	< 0.05 UJ	< 0.05 UJ	2.5	NA
610GW101CL	08/14/03	470	470	55	--	0.27 J+	< 0.1 UJ	< 0.05	2.1	NA
	06/04/03	460	460	51	0.6	0.26	< 0.05	< 0.05	1.8	NA
DUP0604033B	06/04/03	450	450	51	NA	0.29	< 0.05	< 0.05	1.9	NA
610GW101CL	06/04/03	450	450	58	NA	0.27	< 0.1 R	< 0.05	1.6	NA
	03/11/03	450	450	48	0.9	0.2	< 0.05	< 0.05	6.7	NA
	12/03/02	490	490	57	1	0.2	< 0.05	< 0.05	< 0.5	NA
	08/29/02	490	490	56	1.1	0.3	< 0.25	< 0.25	0.72	NA
	05/29/02	460	460	52	0.8	0.3	< 0.05	< 0.05	9.3	NA
	03/05/02	450	450	53	0.6	0.35	< 0.05	< 0.05	6.3	NA
	12/03/01	450	450	48	0.6	0.29	< 0.5 UJ	< 0.5 UJ	50	NA
	08/29/01	460	460	52	0.6	0.38	< 0.05	< 0.05	6.7	NA
610GW102	06/02/05	400	400	47	0.16	0.24	< 0.05	< 0.05	20	0.09
	03/31/05	330	330	50	0.1	0.25	< 0.05	< 0.05	160	0.06
DUP0331052C	03/31/05	320	320	49	--	0.26	< 0.05	< 0.05	160	0.08
610GW102CL	03/31/05	354	354	46.4	--	0.35	< 0.1 U	< 0.02 U	134	< 0.04 U
	12/21/04	NA	NA	NA	0.32	NA	NA	NA	NA	NA
	12/15/04	450	450	63	0.2	0.2	< 0.05	< 0.05	39	0.14
	08/11/04	360	360	51	0.1	0.23	< 0.05	< 0.05	< 0.5	< 0.04
DUP0811041A	08/11/04	370	370	51	--	0.22	< 0.05	< 0.05	< 0.5	< 0.04
610GW102CL	08/11/04	374	374	48	--	0.23	< 0.5 R [3]	< 0.5 R [3]	< 0.5 J	< 0.1
	05/26/04	630	630	45	0.6	0.24	< 0.05	< 0.05	2.4	NA
	03/09/04	420	420	57	0.2	0.23	< 0.05	< 0.05	51	NA
	12/02/03	450	450	62	0.9	0.2	< 0.05	< 0.05	2	NA
	08/18/03	400	400	66	0.2	0.27	< 0.05	< 0.05	2.2	NA
	06/05/03	390	390	74	0.6	0.24	< 0.05	< 0.05	13	NA
	03/11/03	350 J-	350 J-	61	1.8	0.21	< 0.05	< 0.05	66	NA
DUP0311033A	03/11/03	370	370	64	--	0.18	< 0.05	< 0.05	67	NA
	12/03/02	420	420	55	0.6	0.19	< 0.05	< 0.05	7.4	NA
	08/29/02	360	360	49	0.9	0.23	< 0.25	< 0.25	19	NA
	05/29/02	360	360	43	0.7	0.3	< 0.05	< 0.05	34	NA
	03/05/02	420	420	54	0.5	0.31	< 0.05	< 0.05	37	NA
	12/03/01	460	460	74	0.7	0.35	< 0.05 UJ	< 0.05 UJ	70	NA
	08/29/01	420	420	57	0.4	0.34	< 0.05	< 0.05	39	NA
610GW103	06/02/05	470	470	120	0.2	0.26	< 0.05	< 0.05	55	0.06
	03/22/05	400	400	93	0.7	0.22	0.08	< 0.05	140	< 0.04
	12/21/04	NA	NA	NA	0.33	NA	NA	NA	NA	NA
	12/16/04	530	530	270	0.2	0.2	< 0.05	< 0.05	47	< 0.04
	08/10/04	480	480	72	0.2	0.2	< 0.05	< 0.05	5.5	< 0.04
	05/26/04	430	430	60	0.5	0.23	< 0.05	< 0.05	26	NA
	03/09/04	440	440	60	0.5	0.21	< 0.05	< 0.05	83	NA
	12/03/03	510	510	78	1.1	0.16	< 0.05	< 0.05	13	NA
DUP1203033A	12/03/03	510	510	77	--	0.19	< 0.05	< 0.05	14	NA
610GW103CL	12/03/03	490	490	86	--	0.11	< 0.1	< 0.05	14.9	NA
	08/18/03	470	470	64	0.2	0.28	< 0.05	< 0.05	9.6	NA
DUP0818033A	08/18/03	470	470	67	--	0.28	< 0.05	< 0.05	10	NA
	06/05/03	460	460	62	1	0.23	< 0.05	< 0.05	30	NA
	03/11/03	490	490	76	0.6	0.26	< 0.05	< 0.05	93	NA

Table C-12
Results of General Chemistry Analyses
Commissary/PX Area
Presidio of San Francisco, California

Well Name	**Sample Date**	**Alkalinity Total**	**Bicarbonate**	**Chloride**	**Dissolved Oxygen**	**Fluoride**	**N as Nitrate**	**N as Nitrite**	**Sulfate**	**Sulfide**
	Analytical Method [1]	E310.1	E310.1	E300.0/ SW9056	Field	E300.0/ E340.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0/ E353.2/ SW9056	E300.0/ SW9056	E300.0/SW9056
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
610GW103	12/03/02	460	460	67	2.1	0.23	< 0.05	< 0.05	25	NA
DUP1203022A	12/03/02	460	460	69	--	0.23	< 0.05	< 0.05	24	NA
	08/29/02	450	450	61	1.8	0.32	< 0.25	< 0.25	18	NA
	05/30/02	460	460	62	0.8	0.24	< 0.05	< 0.05	27	NA
DUP0530022A	05/30/02	470	470	65	--	0.3	< 0.05	< 0.05	26	NA
610GW103CL	05/30/02	450	450	57	--	< 1	< 1	< 1	26	NA
	03/05/02	430	430	71	0.8	0.33	< 0.05	< 0.05	110	NA
DUP0305023A	03/05/02	420	420	69	--	0.29	< 0.05	< 0.05	110	NA
610GW103CL	03/05/02	410	410	65	--	< 1	< 1	< 1	110	NA
	12/03/01	320	320	46	0.2	0.33	0.04 J,J	< 0.05 UJ	260	NA
DUP1203011A	12/03/01	330	330	47	--	0.35	0.05 J,J	< 0.05 UJ	240	NA
610GW103CL	12/03/01	310	310	49	--	< 1.0	< 1.0	< 1.0	300	NA
	08/29/01	460	460	110	0.5	0.32	< 0.05	< 0.05	40	NA
610SP01	06/01/05	430	430	350	1.6	0.21	< 0.05	< 0.05	130	< 0.04
	12/21/04	NA	NA	NA	NM	NA	NA	NA	NA	NA
	12/17/04	580	580	2,300	1.1	< 0.5	< 0.25	< 0.25	350	< 0.04
	08/13/04	610	610	4,400	0.74	< 1	0.5	< 0.5	560	0.44
	05/28/04	530	530	62	1.6	0.49	< 0.05	< 0.05	33	NA
	03/16/04	460	460	79	1.45	0.26	0.16	< 0.05	160	NA
	12/09/03	800	800	1,800	6.2	0.38	< 0.15	< 0.15	250	NA
DUP1209031A	12/09/03	570	570	1,700	--	0.34	< 0.15	< 0.15	220	NA
610SP01CL	12/09/03	620	620	1,280	--	0.23	< 0.1	< 0.05	225	NA
	08/21/03	570	570	1400	0.2	1.3	< 0.25	< 0.25	180	NA
	06/11/03	380	380	5800	0.8	< 2	< 1	< 1	780	NA
	03/20/03	580	580	2,200	0.8	< 0.5	< 0.25	< 0.25	360	NA
	12/11/02	370	370	5,500	0.8	< 1	< 0.5	< 0.5	820	NA
	09/05/02	NA	NA	NA	0.4	NA	NA	NA	NA	NA
610SP02	06/01/05	510	510	170	1.7	0.33	< 0.05	< 0.05	37	< 0.04
	12/21/04	NA	NA	NA	NM	NA	NA	NA	NA	NA
	12/17/04	560	560	580	NM	0.29	< 0.05	< 0.05	89	< 0.04
	08/13/04	420	420	12,000	0.84	< 2.5	< 1.3	< 1.3	1,700	0.08
	05/28/04	620	620	220	NM	0.47	0.12	< 0.05	49	NA
	03/16/04	490	490	480	0.99	0.44	< 0.05	< 0.05	130	NA
	12/09/03	550	550	3,300	4.5	< 0.5	< 0.25	< 0.25	440	NA
	08/21/03	450	450	7700	0.4	< 2.5	< 1.3	< 1.3	1100	NA
	06/11/03	570	570	2700	0.7	< 2	< 1	< 1	360	NA
	03/20/03	460	460	3,700	0.9	< 1	< 0.5	< 0.5	500	NA
	12/11/02	390	390	5,300	1	< 1	< 0.5	< 0.5	740	NA
	09/05/02	NA	NA	NA	1	NA	NA	NA	NA	NA

Notes
1 - The identified analytical method(s) are for analyses performed beginning in the Second Quarter 2001. The analytical methods used during previous quarters are identified in the respective quarterly reports.
mg/L - milligrams per liter
NA - Not analyzed
"--" dissolved oxygen measurements were not taken for duplicate and quality control samples.
"CL" suffix denotes a quality control duplicate sample was sent to the control laboratory.

Table C-13
Results of Dissolved Gas and TOC Analyses
Commissary/PX Area
Presidio of San Francisco, California

Location ID	**Sample Date**	**Ethane**	**Ethene**	**Methane**	**TOC**
	Analytical Method[1]	RSK 175	RSK 175	RSK 175	SW9060
		mg/L	mg/L	mg/L	mg/L
600GW101	06/01/05	< 0.005	< 0.005	10	5.6 J+
DUP0601053A	06/01/05	< 0.005	< 0.005	10	9.6 J+
	03/21/05	< 0.005	< 0.005	10	11
	12/16/04	< 0.005	< 0.005	15	NA
600GW102	04/06/05	< 0.005	< 0.005	4.6	8.8
600GW104	04/11/05	< 0.005	< 0.005	0.052	3.9
600GW105	06/01/05	< 0.005	< 0.005	0.85	5.9
	03/22/05	< 0.005	< 0.005	0.75	4.6
	12/16/04	< 0.005	< 0.005	0.49	NA
600GW106	06/01/05	< 0.005	< 0.005	0.008	2.1
	03/29/05	< 0.005	< 0.005	0.29	2.4
600GW108	06/01/05	< 0.005	< 0.005	< 0.005	< 0.5
	03/21/05	< 0.005	< 0.005	< 0.005	2.2
DUP0321052B	03/21/05	< 0.005	< 0.005	< 0.005	2.3
	12/17/04	< 0.005	< 0.005	< 0.005	NA
600GW109	04/01/05	< 0.005	< 0.005	0.47	2.1
610GW101	06/02/05	< 0.005	< 0.005	9.5	3.4 J+
	03/21/05	< 0.005	< 0.005	7.3	3.8
	12/15/04	< 0.005	< 0.005	8.4	3.5
DUP1215041A	12/15/04	< 0.005	< 0.005	9	3.4
610GW101CL	12/15/04	0.00071	< 0.0015 U	5.9	3.8
610GW102	06/02/05	< 0.005	< 0.005	7.9	4.9 J+
	03/31/05	< 0.005	< 0.005	3.8	5.3
DUP0331052C	03/31/05	< 0.005	< 0.0015 U	2.5	1.3
	12/15/04	< 0.005	< 0.005	14	6.2
610GW103	06/02/05	< 0.005	< 0.005	3.3	5 J+
	03/22/05	< 0.005	< 0.005	0.097	5.6
	12/16/04	< 0.005	< 0.005	2.2	4.9
610SP01	06/01/05	< 0.005	< 0.005	0.23	5.7 J+
	12/17/04	< 0.005	< 0.005	0.29	4
610SP02	06/01/05	< 0.005	< 0.005	0.57	5.2 J+
	12/17/04	< 0.005	< 0.005	0.67	4

Notes
1 - The identified analytical method(s) are for analyses performed beginning in the Fourth Quarter 2004.
mg/L - milligrams per liter
NA - Not analyzed
TOC - Total Organic Carbon
"CL" suffix denotes a quality control duplicate sample was sent to the control laboratory.
Table 11 in the main report identifies current and historical data qualifiers.
Table 7 in the main report identifies all duplicate and split samples and the well from which they were collected.

Table C-14
Results of Arsenic Speciation Analyses and pH and ORP Measurements
Commissary/PX Area
Presidio of San Francisco, California

Location ID	Sample Date	Inorganic Arsenic (As)	Arsenite (As III)	Arsenate (As V) [2]	Percentage of As III	Percentage of As V	ORP	pH
	Analytical Method[1]	1632M	1632M	1632M	--	--	Field	Field
		(µg/L)	(µg/L)	(µg/L)	%	%	mV	
Cleanup Levels [3]		10	--	--	--	--	--	--
600GW101	06/01/05	2.12	1.72	0.4 B	81	19	-115.9	7.07
DUP0601053A	06/01/05	2.34	1.74	0.6	74	26	-115.9	7.07
	03/21/05	3.16	3.66	< 0.025 U	>99	<1	-115.2	6.61
	12/22/04	2.6	1.86	0.739	72	28	-55.6	6.54
DUP1221043A	12/22/04	2.46	2.03	0.43	83	17	-55.6	6.54
600GW102	04/06/05	1.14	0.162	0.978	14	86	NM	6.8
600GW103	04/11/05	3.21	2.19	1.02	68	32	NM	6.6
600GW104	04/11/05	2.18	0.791	1.39	36	64	NM	6.9
600GW105	03/22/05	NA	NA	NA	NA	NA	-87.8	6.53
	12/22/04	0.931	0.591	0.34	63	37	52.5	5.51
600GW106	03/29/05	NA	NA	NA	NA	NA	-34.7	6.58
	12/22/04	0.441	< 0.03 U	0.41	7	93	45.8	5.78
600GW107	04/11/05	NA	NA	NA	NA	NA	NM	6.40
600GW108	03/21/05	NA	NA	NA	NA	NA	-58.9	6.70
	12/22/04	0.446	< 0.03 B U	0.446	6	94	46.4	6.00
600GW109	04/01/05	NA	NA	NA	NA	NA	NM	6.65
610GW101	06/02/05	3.34	2.76	0.58	83	17	-149	7.05
	03/21/05	1.51	1.21	0.302	80	20	-89.3	7.01
DUP0321052A	03/21/05	1.68	1.67	< 0.025 U	99	1	-89.3	7.01
	12/21/04	2.60	1.86	0.739	72	28	-115.3	7.49
610GW102	06/02/05	6.39	5.95	0.44 B	93	7	-97	6.92
	03/31/05	6.52	4.14	2.38	63	37	-96.2	6.99
DUP0331052C	03/31/05	6.01	5.04	0.973	99	1	-96.2	6.99
	12/21/04	4.96	3.82	1.14	77	23	-96.3	7.46

Table C-14
Results of Arsenic Speciation Analyses and pH and ORP Measurements
Commissary/PX Area
Presidio of San Francisco, California

Location ID	**Sample Date**	**Inorganic Arsenic (As)**	**Arsenite (As III)**	**Arsenate (As V) [2]**	**Percentage of As III**	**Percentage of As V**	**ORP**	**pH**
	Analytical Method[1]	**1632M**	**1632M**	**1632M**	**--**	**--**	**Field**	**Field**
		(µg/L)	(µg/L)	(µg/L)	%	%	mV	
610GW103	06/02/05	9.43	8.57	0.86	91	9	-96	6.88
	03/22/05	4.60	2.12	2.48	46	54	-70.6	6.74
	12/21/04	10.00	8.26	1.75	83	17	-118.1	7.45
610SP01	06/01/05	7.6	6.28	1.32	83	17	37.2	7.6
	12/21/04	5.72	5.38	0.338	94	6	NM	7.32
(Total)	12/21/04	11.10	10.5	0.559	95	5	NM	--
610SP02	06/01/05	6.82	5.37	1.45	79	21	-29.2	7.52
	12/21/04	7.47	7.63	< 0.007	>99	<1	NM	7.51
(Total)	12/21/04	10.20	8.02	2.16	79	21	NM	--

Notes

1 - The identified analytical method(s) are for analyses performed beginning in the Second Quarter 2001.

2 - The concentration of As V was determined by the laboratory by subtracting the As III concentration from the inorganic As concentration. As III has been detected at greater concentrations than inorganic As, due to analytical variability. As V is reported as non-detect when As III is detected at a greater concentration than inorganic As.

3 - Groundwater cleanup levels are from Table 4 of the main text.

µg/L - micrograms per liter

mV - millivolts

NA - Not analyzed

Concentrations in **BOLD** indicate an exceedance of applicable cleanup levels.

"CL" suffix denotes a quality control duplicate sample was sent to the control laboratory.

Analytical results represent dissolved arsenic, unless indicated as "total" in the left-hand column, for total arsenic results.

APPENDIX D
Cost Estimates and Assumptions for Corrective Action Alternatives

APPENDIX D

Cost Estimates and Assumptions for Corrective Action Alternatives Commissary/PX Corrective Action Plan

Presidio of San Francisco, California

Corrective action cost estimates have been prepared for the alternatives retained for further evaluation. Corrective action costs for the alternatives and the Scenario I (Lesser impact Scenario) are presented in the main text in Tables 9A through 9J. Tables D-1 through D-9 provide corrective action cost estimates for the Scenario II (Greater Impact Scenario) or revised volume interpretation shown in Figures 17B and 18B. All of these estimates have an accuracy level of +50 percent to –30 percent in accordance with U.S. Environmental Protection Agency (EPA) guidance (EPA, 1988). For all alternatives, the costs are presented in present value. The level of accuracy for these estimates is appropriate for comparing corrective action alternatives and not necessarily accurate prediction of incurred cost. The cost estimate basis is a conceptual design rather than a detailed design. Notes and assumptions used for estimating the costs are on each table. These cost estimates include direct costs, indirect costs, and contingency. Direct costs include the labor, equipment, and materials required to complete the project or task. Indirect costs include general conditions (i.e., mobilization, site supervision, etc.), overhead and profit, and project management. Estimated legal costs, administrative costs, contingencies, and mobilization costs are following the *Presidio Trust Revised Feasibility Study Main Installations Sites* (EKI, 2003).

Table 9J presents unit rates used in the cost estimates. Material surface area and volume estimates for the Lesser Impact and Greater Impact Scenarios, respectively, are presented in Tables 9K and 9L and D-11 and D-12. Where applicable, the cost estimates are divided into Phase 1 versus Phase 2 costs. Phase 2 costs are dependent upon future land use decisions. For cost estimating purposes only, the Phase 2 cleanup of TPH to protect human health recreational land use (i.e. Restricted Land Use without Protection of Crissy Field Marsh Water Quality) is documented in Tables D-13 through D-17.

Table D-1A
Summary of Estimated Costs for Corrective Action Alternatives (Scenario II - Greater Impact Scenario) - Phases 1 and 2
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative		**Capital Cost[1]**		**Annual O&M Cost[1]**		**O&M Period (years)**		**Total Cost[2] (NPV[3])**	
Accessible RUs	**Less Accessible RUs**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**
1) No Action[4]		$65,000		$ --		--		**$65,000**	
2) Capping with Land Use Controls[5]		$862,000		$89,000 $23,000		5 * 30 ** ***		**$1,687,000**	
	3) In Situ Soil Remediation[6]								
	• Oxygen Release Product Injection		$724,000		--		--		**$724,000**
	• Bioventing and Biosparging		$1,441,000		--		--		**$1,441,000**
	• Ozone Sparging		$694,000		--		--		**$694,000**
	• Sodium Persulfate Injection		$1,310,000		--		--		**$1,310,000**
4) Excavation and Off-Site Disposal with Groundwater Monitoring[5]		$4,344,000		$77,000 $29,000 $8,000		1 * 2 * 30 **		**$4,566,000**	
	4) Excavation and Off-Site Disposal[6]								
	• With Building 610 in place		$4,068,000		--		--		**$4,068,000**
	• Without Building 610		$1,020,000		--		--		**$1,020,000**
Phase 1 Cost of Preferred Alternative for Accessible RUs (Alternative 4):								**$1,290,000**	
Phase 2 Cost Range for Accessible RUs (Alternative 4) and Less Accessible RUs (Alternative 2 [low] or 3 [high])[7]:								**$2,990,000 - $4,717,000**	
Combined Cost Range of Preferred Alternative for Accessible RUs - Phases 1 and 2 (Alternative 4) and Less Accessible RUs (Alternative 2 or 3)[8]:								**$4.3 - 6.0 million**	

Notes
1 Detailed estimates for capital and annual O&M costs are presented in Tables D-2 through D-10 with Unit Costs detailed in Table 9J and Areas and Volumes detailed in Tables D-11 and D-12, respectively.
2 Total Cost is calculated using a 3.5 percent interest rate per OSWER guidance (EPA, 2000b) and Federal guidelines (EPA, 2000a).
3 NPV = Net Present Value
4 Alternative includes groundwater monitoring well abandonment.
5 Alternative includes seeps and groundwater monitoring and land use controls for 30 years.
6 Alternative includes land use controls for 30 years (costs included under Alternatives 2 and 4, Phase 1). Alternative does not include groundwater monitoring (monitoring is included under Alternatives 2 and 4, Phase 1).
7 Phase 2 costs are dependent upon future land use decisions. For cost estimating purposes only, the Phase 2 costs range from cleanup of petroleum to protect human health recreational land use (i.e., Restricted land use without protection of Crissy Field Marsh water quality, Alternative 4 - Accessible RUs and Alternative 2 - Less Accessible RUs) to cleanup for Saltwater ecological protection (i.e., Unrestricted land use with protection of Crissy Field Marsh water quality, Alternative 4 - Accessible RUs and Alternative 3 - Less Accessible RUs).
8 Alternative includes seeps and groundwater monitoring for 3 years until Phase 2 corrective action; includes Area B land use controls for 30 years to restrict soil disturbance due to PAHs and metals associated with Fill Material, restrict marsh or similar habitat restoration, and restrict potable use of groundwater.
* Groundwater monitoring costs
** Land use control costs
*** Includes cost for maintenance of caps.

Table D-1B
Summary of Estimated Costs for Corrective Action Alternatives (Scenario II - Greater Impact Scenario) - Phase 1
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative		Capital Cost[1]		Annual O&M Cost[1]		O&M Period (years)		Total Cost[2] (NPV[3])	
Accessible RUs	**Less Accessible RUs**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**
1) No Action[4]		$65,000		$ --		--		**$65,000**	
2) Capping with Land Use Controls[5]		$358,000		$89,000 $13,000		5 * 30 **	***	**$999,000**	
	3) In Situ Soil Remediation[6] • Oxygen Release Product Injection • Bioventing and Biosparging • Ozone Sparging • Sodium Persulfate Injection								 **NA** **NA** **NA** **NA**
4) Excavation and Off-Site Disposal with Groundwater Monitoring[5]		$1,068,000		$77,000 $29,000 $8,000		1 * 2 * 30 **		**$1,290,000**	
	4) Excavation and Off-Site Disposal[6] • With Building 610 in place • Without Building 610								 **NA** **NA**
Cost of Preferred Alternative for Accessible RUs - Phase 1 (Alternative 4)[5]:								**$1.3 million**	

Notes

[1] Detailed estimates for capital and annual O&M costs are presented in Tables D-2 through D-10 with Unit Costs detailed in Table 9J and Areas and Volumes detailed in Tables D-11 and D-12, respectively.

[2] Total Cost is calculated using a 3.5 percent interest rate per OSWER guidance (EPA, 2000b) and Federal guidelines (EPA, 2000a).

[3] NPV = Net Present Value

[4] Alternative includes groundwater monitoring well abandonment.

[5] Alternative includes seeps and groundwater monitoring and land use controls for 30 years.

[6] Alternative does not apply to Phase 1 Area.

* Groundwater monitoring costs

** Land use control costs

*** Includes cost for maintenance of caps for Phase 1 area.

NA - Not applicable

Table D-1C
Summary of Estimated Costs for Corrective Action Alternatives (Scenario II - Greater Impact Scenario) - Phase 2
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative		Capital Cost[1]		Annual O&M Cost[1]		O&M Period (years)		Total Cost[2] (NPV[3])	
Accessible RUs	**Less Accessible RUs**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**
1) No Action[4]		$ --		$ --		--		$ --	
2) Capping with Land Use Controls[5]		$504,000		$0 $10,000		30 **	***	**$688,000**	
	3) In Situ Soil Remediation[6] • Oxygen Release Product Injection • Bioventing and Biosparging • Ozone Sparging • Sodium Persulfate Injection		 $724,000 $1,441,000 $694,000 $1,310,000		 -- -- -- --		 -- -- -- --		 **$724,000** **$1,441,000** **$694,000** **$1,310,000**
4) Excavation and Off-Site Disposal with Groundwater Monitoring[5]		$3,276,000		$0 $0 $0				**$3,276,000**	
	4) Excavation and Off-Site Disposal[6] • With Building 610 in place • Without Building 610		 $4,068,000 $1,020,000		 -- --		 -- --		 **$4,068,000** **$1,020,000**
Cost Range of Preferred Alternative for Accessible RUs - Phase 2 (Alternative 4) and Less Accessible RUs (Alternative 2 [low] or 3 [high])[6,7]:								**$2,990,000 - $4,717,000**	

Notes
[1] Detailed estimates for capital and annual O&M costs are presented in Tables D-2 through D-10 with Unit Costs detailed in Table 9J and Areas and Volumes detailed in Tables D-11 and D-12, respectively.
[2] Total Cost is calculated using a 3.5 percent interest rate per OSWER guidance (EPA, 2000b) and Federal guidelines (EPA, 2000a).
[3] NPV = Net Present Value
[4] Alternative includes groundwater monitoring well abandonment (costs included under the No Action alternative for Phase 1).
[5] Alternative includes land use controls for 30 years (Phase 2) to restrict soil disturbance due to PAHs and metals associated with Fill Material and to restrict marsh or similar habitat restoration.
[6] Alternative includes land use controls for 30 years (costs included under Alternatives 2 and 4, Phase 1). Alternative does not include groundwater monitoring (monitoring is included under Alternatives 2 and 4, Phase 1).
[7] Phase 2 costs are dependent upon future land use decisions. For cost estimating purposes only, the Phase 2 costs range from cleanup of petroleum to protect human health recreational land use (i.e., Restricted land use without protection of Crissy Field Marsh water quality, Alternative 4 - Accessible RUs and Alternative 2 - Less Accessible RUs) to cleanup for Saltwater ecological protection (i.e., Unrestricted land use with protection of Crissy Field Marsh water quality, Alternative 4 - Accessible RUs and Alternative 3 - Less Accessible RUs).
** Land use control costs
*** Includes cost for maintenance of caps for Phase 2 area.

Table D-2
All Locations - Greater Impact Scenario - Alternative 1:
Estimated Costs Associated with No Further Action
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Abandon Existing Groundwater Monitoring Wells					
Abandon 2-inch PVC monitoring wells	ea	12	$ 3,300	$ 39,600	
Dispose of well abandonment residuals	ea	12	$ 200	$ 2,400	
					$ 42,000
Design and Construction Management Services					
Engineering/Project Management/Office Support	ls	1	$ 1,000	$ 1,000	
Construction Observation and Coordination	day	3	$ 1,000	$ 3,000	
Prepare well abandonment letter report	ls	1	$ 5,000	$ 5,000	
					$ 9,000
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 51,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 3,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 54,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 11,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 65,000**

Notes
1. Totals may not sum exactly because of rounding.
2. Derivation of unit rates is presented in Table 9J.

Table D-3
Accessible Locations - Greater Impact Scenario - Alternative 2:
Estimated Costs for Capping Soil with Land Use Controls and Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Erect and maintain perimeter temporary fence	ft	1,000	$ 1.09	$ 1,090	
Remove 5' to 6' trees and save for replanting	ea	10	$ 48	$ 480	
Pre-excavation, post-excavation and confirmation sample survey	acre	4.0	$ 1,500	$ 6,000	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
					$ 31,070
Construct Cap					
Mobilize contractor equipment and supplies to site	ls	1	$ 5,000	$ 5,000	
Repair/Upgrade Permeable Cover (Asphalt Area)					
Asphalt Sealing	sy	1,745	$ 1.25	$ 2,181	
Excavate Impacted Soil (12 inches); small equipment	cy	201	$ 8.75	$ 1,760	
Collect soil profile samples for disposal	ea	2	$ 26	$ 52	
Disposal Characterization					
Six metals (EPA Method 6010B)	ea	2	$ 100	$ 200	
(EPA 8015M)	ea	2	$ 105	$ 210	
Dispose of non-hazardous soil at Class II facility	ton	322	$ 35	$ 11,261	
Compact soil subgrade; small equipment	sf	5,429	$ 0.25	$ 1,357	
Furnish and install geosynthetic clay liner (GCL) [see Note 4]	sf	5,429	$ 0.75	$ 4,072	
Import and Place Clean Topsoil (12 inches)	cy	201	$ 30	$ 6,033	
Restore Parking Curbs	ft	222	$ 26	$ 5,772	
Restore landscaping compatible with GCL liner [see Note 4]	ls	0.20	$ 20,000	$ 4,000	
Vegetate Imported Cover (grass)	acre	0.12	$ 30,000	$ 3,732	
					$ 45,629
Land Use Controls					
Prepare Presidio LUC Master Reference Report	ls	1	$ 5,000	$ 5,000	
Prepare Site-Specific Addendum to LUCMRR (Area B)	ls	1	$ 10,000	$ 10,000	
Implement Land Use Controls for Area A RUs	ls	1	$ 5,000	$ 5,000	
Add Site-Specific Land Use Controls to Trust GIS System	ls	1	$ 500	$ 500	
					$ 20,500
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	1.0	$ 5,000	$ 5,000	
Provide office support	wk	1.0	$ 2,000	$ 2,000	
Provide vehicles and equipment	wk	1.0	$ 1,300	$ 1,300	
Perform air monitoring	wk	1.0	$ 1,000	$ 1,000	
Prepare Remediation Completion Report	ls	1	$ 50,000	$ 50,000	
					$ 165,800
Abandon Existing Groundwater Monitoring Wells (deferred)					
Abandon 2-inch PVC monitoring wells	ea	12	$ 500	$ 6,000	
Dispose of well abandonment residuals	ea	12	$ 200	$ 2,400	
Subtotal				$ 8,400	
Discount subtotal at 3.5% annually for 10 years				$ (2,518)	
					$ 5,882
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 14,922

Table D-3
Accessible Locations - Greater Impact Scenario - Alternative 2:
Estimated Costs for Capping Soil with Land Use Controls and Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Subtotal Estimated Costs (w/ contractor overhead and profit):	$	284,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):	$	14,000
Subtotal Estimated Costs (w/ legal and administrative costs):	$	298,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):	$	60,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:	**$**	**358,000**

Capital Costs - Phase 2						
	Estimated Costs					
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**		**Total**
General Site Preparation						
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000		
Erect and maintain perimeter temporary fence	ft	1,000	$ 1.09	$ 1,090		
Remove 5' to 6' trees and save for replanting	ea	10	$ 48	$ 480		
Pre-excavation, post-excavation and confirmation sample survey	acre	6.3	$ 1,500	$ 9,450		
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500		
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000		
					$	34,520
Construct Cap						
Mobilize contractor equipment and supplies to site	ls	1	$ 5,000	$ 5,000		
Repair/Upgrade Permeable Cover (Asphalt Area)						
Asphalt Sealing	sy	6,643	$ 1.25	$ 8,304		
Excavate Impacted Soil (12 inches); small equipment	cy	826	$ 8.75	$ 7,227		
Collect soil profile samples for disposal	ea	3	$ 26	$ 78		
Disposal Characterization						
Six metals (EPA Method 6010B)	ea	3	$ 100	$ 300		
(EPA 8015M)	ea	3	$ 105	$ 315		
Dispose of non-hazardous soil at Class II facility	ton	1,322	$ 35	$ 46,253		
Compact soil subgrade; small equipment	sf	22,300	$ 0.25	$ 5,575		
Furnish and install geosynthetic clay liner (GCL) [see Note 4]	sf	22,300	$ 0.75	$ 16,725		
Import and Place Clean Topsoil (12 inches)	cy	826	$ 30	$ 24,778		
Restore Parking Curbs	ft	333	$ 26	$ 8,658		
Restore landscaping compatible with GCL liner [see Note 4]	ls	0.8	$ 20,000	$ 16,000		
Vegetate Imported Cover (grass)	acre	0.51	$ 30,000	$ 15,327		
					$	154,540
Design and Construction Management Services						
Engineering						
Perform general planning activities	ls	1	$ 20,000	$ 20,000		
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000		
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500		
Construction observation						
Provide resident engineer	wk	4.0	$ 5,000	$ 20,000		
Provide office support	wk	4.0	$ 2,000	$ 8,000		
Provide vehicles and equipment	wk	4.0	$ 1,300	$ 5,200		
Perform air monitoring	wk	4.0	$ 1,000	$ 4,000		
Prepare Remediation Completion Report	ls	1	$ 50,000	$ 50,000		
					$	193,700
Engineering Project Management						
9% of Design and Construction Management Services	1s	9%			$	17,433
Subtotal Estimated Costs (w/ contractor overhead and profit):					$	400,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$	20,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$	420,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$	84,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$**	**504,000**

Table D-3
Accessible Locations - Greater Impact Scenario - Alternative 2:
Estimated Costs for Capping Soil with Land Use Controls and Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Annual Costs (5 years) - Phase 1

Task Description	Unit	Quantity	Unit Cost	Subtotal	Total
Conduct Groundwater Monitoring					
Sample wells (12 well, 2 seep, and 2 dup. samples; semi-annually)	ea	32	$ 800	$ 25,600	
Dispose of groundwater sampling residuals	ls	1	$ 800	$ 800	
Analyze groundwater samples from wells					
General Water Chemistry	ea	32	$ 259	$ 8,288	
Total Dissolved Solids	ea	32	$ 27	$ 864	
4 Metals, dissolved (EPA Method 6010/6020) [see Note 5]	ea	32	$ 105	$ 3,360	
4 Metals, total (EPA Method 6010/6020) [2 seeps and 1 duplicate]	ea	6	$ 85	$ 510	
Total Sulfide (EPA Method 376.2)	ea	32	$ 46	$ 1,472	
BTEX and MTBE (EPA Method 8021B or 8020)	ea	32	$ 56	$ 1,792	
Total Petroleum Hydrocarbons as Gasoline, as Diesel Fuel, and as Motor Oil (EPA 8015 + EPA 3630A, silica gel cleanup)	ea	32	$ 206	$ 6,592	
Perform independent data validation	ea	32	$ 20	$ 640	
Input analytical results into Presidio database	ea	32	$ 15	$ 480	
Prepare quarterly monitoring reports	ea	4	$ 5,000	$ 20,000	
					$ 70,398
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 70,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 4,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 74,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 15,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 89,000**

Annual Costs (30 years) - Phase 1

Task Description	Unit	Quantity	Unit Cost	Subtotal	Total
Inspect and Repair Cap [Apportioned with Phase 2 by Volume @ 20%]					
Repair damage to low-permeability cover caused by erosion	ls	0.20	$ 3,600	$ 720	
Repair periodic breaches/damage to cover	ls	0.20	$ 4,000	$ 800	
Inspect and clear vegetation from drainage ditches	ls	0.20	$ 2,000	$ 400	
					$ 1,920
Land Use Controls					
Annual administrative cost of Land Use Controls (Area B)	ls	1	$ 1,000	$ 1,000	
Coordinate with NPS for Area A site (TPHg Source Area Only)	ls	1	$ 1,000	$ 1,000	
Annual administrative cost of Land Use Controls (Area A)	ls	1	$ 1,000	$ 1,000	
Annualized cost of Five-Year Review (6 occurrences)	ls	1	$ 5,000	$ 5,000	
					$ 8,000
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 10,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 1,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 11,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 2,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 13,000**

Annual Costs (30 years) - Phase 2

Task Description	Unit	Quantity	Unit Cost	Subtotal	Total
Inspect and Repair Cap [Apportioned with Phase 1 by Volume @ 80%]					
Repair damage to low-permeability cover caused by erosion	ls	0.80	$ 3,600	$ 2,880	
Repair periodic breaches/damage to cover	ls	0.80	$ 4,000	$ 3,200	
Inspect and clear vegetation from drainage ditches	ls	0.80	$ 2,000	$ 1,600	
					$ 7,680
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 8,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ -
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 8,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 2,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 10,000**

Table D-3
Accessible Locations - Greater Impact Scenario - Alternative 2:
Estimated Costs for Capping Soil with Land Use Controls and Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, California

Notes and Assumptions

1. Totals may not sum exactly because of rounding.
2. Groundwater and surface water monitoring will include 12 monitoring wells and 2 seeps sampled semi-annually for 5 years.
3. Areas and volumes are presented in Tables D-11 and D-12.
4. Landscaping options for 12-inch vegetative layer overlying geosynthetic clay liner (GCL) are limited. Salvaged or new tress or shrubs may be placed in sub-surface "planters" consisting of a hole sized to accommodate the root ball, lined with GCL, and backfilled with clean topsoil and any necessary soil amendments. The locations and depths of such "planters" would require coordination with the Revegetation Plan, which is not currently available.
5. 4 Metals include: Al, As, Fe, and Mn.
6. Derivation of unit rates is presented in Table 9J.

Table D-4
Less Accessible Locations - Greater Impact Scenario - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Oxygen Release Product Injection
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$24,000	$ 24,000	
Pre-excavation, post-excavation, and confirmation sample survey	ls	1	$11,250	$ 11,250	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 5,000	$ 5,000	
Decontamination area for personnel and equipment	1s	1	$ 3,750	$ 3,750	
					$ 44,000
ORC® application in 2-inch diameter DPT borings					
Concrete cutting (12" core up to 11" thick)	ea	325	$ 113	$ 36,725	
Mobilize Direct-push Rig	ls	1	$ 400	$ 400	
ORC Injection with Direct-push Rig	day	11	$ 1,500	$ 16,500	
ORC® material (quantity based on using ORC-Advanced)	lb	26,815	$ 10.00	$ 268,154	
					$ 321,779
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$25,000	$ 25,000	
Prepare Remedial Design (workplan and figures)	ls	1	$30,000	$ 30,000	
Construction Observation					
Provide resident engineer	wk	2.50	$ 5,000	$ 12,500	
Provide office support	wk	2.50	$ 2,000	$ 5,000	
Perform air monitoring	wk	2.50	$ 1,000	$ 2,500	
Collect soil confirmation samples with DPT	ea	36	$ 865	$ 31,140	
Total Petroleum Hydrocarbons as Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	72	$ 80	$ 5,760	
Total Petroleum Hydrocarbons as Diesel Fuel (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	72	$ 85	$ 6,120	
Total Petroleum Hydrocarbons as Fuel Oil (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	72	$ 85	$ 6,120	
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	72	$ 200	$ 14,400	
Perform independent data validation (Level III plus 10% Level IV)	ea	72	$ 20	$ 1,440	
Input analytical results into Presidio database	ea	72	$ 15	$ 1,080	
Prepare Remediation Completion Report	1s	1	$50,000	$ 50,000	
					$ 191,060
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 17,195
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 574,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 29,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 603,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 121,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 724,000**

Notes and Assumptions
1.Totals may not sum exactly because of rounding.
2. Field effort for ORC application is assumed to be 11 days in duration.
3. Total number or ORC injection points based on a 9 foot by 9 foot grid and 7 rows in each direction.
4. Estimated cost of ORC is $10/pound. Assumed using 2.5 pounds of ORC per cubic yard of soil, per manufacturer's recommendations. By comparison, at Building 637, 2,700 pounds of ORC were injected in 96 borings located on a 10-foot by 20-foot grid, between 3 and 7 feet bgs (EKI, 2004), for an average application rate of 1.1 pounds per cubic yard, per manufacturer's recommendations. The relatively lower application rate for Building 637 may be attributable to ORC application over a large, contiguous area from which hot spots had previously been excavated.
5. In situ remediation is assumed to be complete in six months after ORC application.
6. Drilling costs quoted from Gregg Drilling and Testing, Inc. ORC costs quoted from Regenesis.
7. Post-remediation confirmation samples will be collected at SI exceedance locations. Samples will be analyzed for contaminants of concern exceeding cleanup levels.
8. Areas and volumes are presented in Tables D-11 and D-12.
9. Derivation of unit rates is presented in Table 9J.

Table D-5
Less Accessible Locations - Greater Impact Scenario - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Bioventing and Biosparging
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 24,000	$ 24,000	
Pre-excavation, post-excavation, and confirmation sample survey	ls	1	$ 11,250	$ 11,250	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 5,000	$ 5,000	
Decontamination area for personnel and equipment	1s	1	$ 3,750	$ 3,750	
					$ 44,000
Install Injection (6)/Venting Wells (4) in 626/628 Areas					
Concrete cutting (12" core up to 11" thick)	ea	10	$ 113	$ 1,130	
Contractor (Ten 31-ft-long 2-in inclined wells, to 9-ft (4) and 4-ft (3) depths)	ft	310	$ 75	$ 23,250	
					$ 24,380
Install Injection (6)/Venting Wells (5) in 619 Area					
Concrete cutting (12" core up to 11" thick)	ea	11	$ 113	$ 1,243	
Contractor (11 550-ft long 2-in horizontal wells, to 9-ft (6) and 3-ft (5) depths)	ft	5,720	$ 120	$ 686,400	
					$ 687,643
Surface Installation (piping in trenches, manifold, blowers, controls)					
Contractor - Trenching (4-in piping,1-ft deep)	ea	700	$ 50	$ 35,000	
Contractor (skid-mounted blowers, controls, noise shed)	ls	1	$ 70,000	$ 70,000	
					$ 105,000
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare Remedial Design (workplan and figures)	ls	1	$ 25,000	$ 25,000	
Construction Observation					
Provide resident engineer	wk	8	$ 5,000	$ 40,000	
Provide office support	wk	8	$ 2,000	$ 16,000	
Installation Monitoring					
Field monitoring for O2, CO2	dy	40	$ 100	$ 4,000	
Field Monitoring for VOCs	dy	20	$ 100	$ 2,000	
Performance Monitoring (Year 1)					
Field monitoring for O2, CO2	dy	26	$ 500	$ 13,000	
Performance Monitoring (Years 2 thru 5)					
Field monitoring for O2, CO2	dy	48	$ 500	$ 24,000	
Collect soil confirmation samples with DPT	ea	36	$ 865	$ 31,140	
Total Petroleum Hydrocarbons as Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	72	$ 80	$ 5,760	
Total Petroleum Hydrocarbons as Diesel Fuel (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	72	$ 85	$ 6,120	
Total Petroleum Hydrocarbons as Fuel Oil (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	72	$ 85	$ 6,120	
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	72	$ 200	$ 14,400	
Perform independent data validation (Level III plus 10% Level IV)	ea	72	$ 20	$ 1,440	
Input analytical results into Presidio database	ea	72	$ 15	$ 1,080	
Prepare Start Up Report	1s	1	$ 50,000	$ 50,000	
					$ 260,060
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 23,405
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 1,144,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 57,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 1,201,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 240,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 1,441,000**

Table D-5

Less Accessible Locations - Greater Impact Scenario - Alternative 3:

Estimated Costs for In Situ Soil Remediation - Bioventing and Biosparging

Commissary/PX Study Area

Presidio of San Francisco, California

Notes and Assumptions

1.Totals may not sum exactly because of rounding.

2. Field effort for bio-sparging application is assumed to be 8 weeks in duration.

3. Cost estimate is based upon the following conceptual design:

Building 626 Area - Four 2-inch inclined injection wells, 31 feet long, end-cap depth of 9 feet bgs; screen at 29 to 31 feet; angle about 6 degrees from horizontal (84 degrees from vertical). Two 2-inch inclined venting wells, 31 feet long, end-cap depth of 3 feet bgs; screen at 16 to 31 feet; angle about 5 degrees from horizontal.

Building 628 Area - Two 2-inch inclined injection well, 31 feet long, end-cap depth of 9 feet bgs; screen at 29 to 31 feet; angle about 6 degrees from horizontal (84 degrees from vertical). Two 2-inch inclined venting well, 31 feet long, end-cap depth of 3 feet bgs; screen at 16 to 31 feet; angle about 5 degrees from horizontal.

Building 619 Area - Eleven 2-inch horizontal wells, five injection at 9 ft bgs and six extraction at 3 ft bgs, installed by drilling completely under building from one site (Doyle Drive side) to the other (Mason Street side); total length approx. 520 feet; screened interval from approx. (200 ft screen length) along horizontal boring. On 25' centers

All three Areas - Manifolded together for air injection and air extraction; approx. 550 feet of piping in subsurface trench, 2 low volume blowers (1 to 5 standard cubic feet per minute [scfm] each well), controls, power. Operated by injecting air at 1 to 2 scfm into injection wells, extracting at 4 to 5 scfm from venting wells; Inlet and exhaust air stream monitored for O_2, CO_2, and VOCs (initially); Monitoring daily first week, every other day second and third week.

4. Derivation of unit rates is presented in Table 9J.

Table D-6
Less Accessible Locations - Greater Impact Scenario - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Ozone Sparging
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Pre-excavation, post-excavation, and confirmation sample survey	ls	1	$ 4,500	$ 4,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
Decontamination area for personnel and equipment	1s	1	$ 1,500	$ 1,500	
					$ 28,000
Ozone Injection					
Ozone sparge system enclosure (behind Bldg. 610); installed					
Concrete pad, 10'x8'x6" (field mix; incl. forms; 2,250 psi)	ls	1	$ 1,000	$ 1,000	
Wood posts, 4"x4"x5' (to mount sparge panels), incl. connectors	ea	8	$ 83	$ 664	
Enclosure fencing, incl. 1 gate (6-foot, chain link, vinyl clad)	ls	1	$ 1,486	$ 1,486	
Ozone sparge system					
System installation and start-up (subcontractor, includes site review & training)	ls	1	$ 19,500	$ 19,500	
Concrete cutting (for 12"x12" Christy boxes)	day	4	$ 129	$ 515	
Concrete cutting, shallow (for 1/2-in. dia. piping)	day	4	$ 129	$ 515	
Wall penetrations (cut small opening for piping)	ea	3	$ 200	$ 600	
Contractor (drill with HSA six 15-foot borings for sparge points)	ea	33	$ 417	$ 13,759	
Christy box, 12"x12", furnish & install	ea	33	$ 428	$ 14,137	
C-Sparge panel, 10-well	ea	4	$ 38,600	$ 154,400	
C-Sparge panel and well materials, crating and shipping	ls	1	$ 3,800	$ 3,800	
Mixing tank, pump, level, starter peroxide	ea	1	$ 2,500	$ 2,500	
Laminar sparge points (incl. couplings, Teflon tubing, check valves)	ea	33	$ 700	$ 23,100	
3/8-in. dia. HDPE tubing	lf	5,640	$ 0.95	$ 5,358	
1/2-in. dia. HDPE tubing	lf	5,640	$ 1.95	$ 10,998	
Temporary floor covering (over piping)	ls	1	$ 3,000	$ 3,000	
System O&M (9 months)					
Labor (8 hrs/week)	hr	312	$ 80	$ 24,960	
Hydrogen peroxide (35%, 55-gallon drum, incl. sales tax)	ea	5	$ 346	$ 1,728	
Site/building restoration					
Dismantle sparging equipment and enclosure	ls	1	$ 6,000	$ 6,000	
Remove temporary floor covering and piping	ls	1	$ 1,500	$ 1,500	
Patch floor with neat cement grout, finish	ls	1	$ 1,500	$ 1,500	
Abandon Christy boxes in place	ea	33	$ 50	$ 1,650	
Patch wall penetrations	loc	3	$ 200	$ 600	
Abandon sparge points	ea	33	$ 500	$ 16,500	
Dispose of sparge point abandonment residuals	ea	33	$ 200	$ 6,600	
					$ 316,371
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare Remedial Design (workplan and figures)	ls	1	$ 25,000	$ 25,000	
Construction Observation					
Provide resident engineer	wk	4	$ 5,000	$ 20,000	
Provide office support	wk	4	$ 1,000	$ 4,000	
Perform air monitoring	wk	4	$ 1,000	$ 4,000	
Collect soil confirmation samples with 2 inch diameter DPT	ea	36	$ 865	$ 31,140	
Total Petroleum Hydrocarbons as Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	72	$ 80	$ 5,760	
Total Petroleum Hydrocarbons as Diesel Fuel	ea	72	$ 85	$ 6,120	
Total Petroleum Hydrocarbons as Fuel Oil	ea	72	$ 85	$ 6,120	
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	72	$ 200	$ 14,400	

Table D-6
Less Accessible Locations - Greater Impact Scenario - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Ozone Sparging
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Perform independent data validation (Level III plus 10% Level IV)	ea	72	$ 20	$ 1,440	
Input analytical results into Presidio database	ea	72	$ 15	$ 1,080	
Prepare Remediation Completion Report	1s	1	$ 50,000	$ 50,000	
					$ 189,060
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 17,015
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 550,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 28,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 578,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 116,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 694,000**

Notes and Assumptions
1. Totals may not sum exactly because of rounding.
2. Field effort for installing ozone sparge points and remedial system assumed to be four weeks in duration. This estimate includes having a remedial system supplier on-site to set-up and start system, drilling 33 borings with a hollow-stem auger and engineering oversight. The borings will be converted to ozone sparge points.
3. Estimated cost includes all equipment required to build the ozone sparge system. Assumed a total of 33 points. Four sparging panels will be required.
4. Assumed each ozone sparge point has an estimated 40-foot diameter zone of influence. Targeted sparge point placement to overlap 20% to 30%.
5. In situ remediation is assumed to be complete in nine months after ozone sparge system is operational. Vendor (KVA) estimates that 300 gallons of 6.5% hydrogen peroxide solution will be required to treat impacted soil (original area) to achieve cleanup levels. Extrapolation to revised area interpretation indicates 1,240 gallons of solution will be required.
6. Drilling costs quoted from Gregg Drilling and Testing, Inc. Cost of ozone injection system is quoted from MEES and KVA.
7. Post-remediation confirmation samples will be collected at SI exceedance locations. Samples will be collected 9 months after system start-up and will be analyzed for contaminants of concern exceeding cleanup levels.
8. Estimated cost to collect soil confirmation samples with DPT includes driller mobilization, concrete coring, DPT rig, and field engineer. Field effort for soil confirmation sample collection is assumed to be 4 days.
9. Areas and volumes are presented in Tables D-11 and D-12.
10. Derivation of unit rates is presented in Table 9J.

Table D-7
Less Accessible Locations - Greater Impact Scenario - Alternative 3:
Estimated Costs for In Situ Soil Remediation - Sodium Persulfate Injection
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$24,000	$ 24,000	
Pre-excavation, post-excavation, and confirmation sample survey	ls	1	$11,250	$ 11,250	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 5,000	$ 5,000	
Decontamination area for personnel and equipment	1s	1	$ 3,750	$ 3,750	
					$ 44,000
Activated Sodium Persulfate application in 2-inch diameter DPT borings					
Concrete cutting (12" core up to 11" thick)	ea	325	$ 113	$ 36,725	
Contractor (10-foot DPT borings for Sodium Persulfate application)	ea	325	$ 1,425	$ 463,255	
Activated Sodium Persulfate (713 gallons applied at each location)	gal	231,725	$ 1.03	$ 239,372	
					$ 739,352
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$25,000	$ 25,000	
Prepare Remedial Design (workplan and figures)	ls	1	$30,000	$ 30,000	
Construction Observation					
Provide resident engineer	wk	8	$ 5,000	$ 40,000	
Provide office support	wk	8	$ 2,000	$ 16,000	
Perform air monitoring	wk	8	$ 1,000	$ 8,000	
Collect soil confirmation samples with 2 inch diameter DPT	ea	36	$ 865	$ 31,140	
Total Petroleum Hydrocarbons as Gasoline	ea	72	$ 80	$ 5,760	
Total Petroleum Hydrocarbons as Diesel Fuel	ea	72	$ 85	$ 6,120	
Total Petroleum Hydrocarbons as Fuel Oil	ea		$ 85	$ 6,120	
(EPA 8015M + EPA 3630A, silica gel cleanup)		72			
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	72	$ 200	$ 14,400	
Perform independent data validation (Level III plus 10% Level IV)	ea	72	$ 20	$ 1,440	
Input analytical results into Presidio database	ea	72	$ 15	$ 1,080	
Prepare Remediation Completion Report	1s	1	$50,000	$ 50,000	
					$ 235,060
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 21,155
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 1,040,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 52,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 1,092,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 218,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 1,310,000**

Notes and Assumptions
1.Totals may not sum exactly because of rounding.
2. Field effort for bioremediation enhancement application is assumed to be 8 weeks in duration.
3. Total number of activated sodium persulfate application points was calculated using 10-foot linear spacing (5 feet radius of influence). Assumed drilling all borings to 10 feet.
4. Assumed using 5% sodium persulfate solution activated with chelated iron.
5. In situ remediation is assumed to be complete in six months after sodium persulfate application.
6. Drilling costs and sodium persulfate application costs quoted from Vironex.
7. Post-remediation confirmation samples will be collected at SI exceedance locations. Samples will be analyzed for contaminants of concern exceeding cleanup levels.
8. Areas and volumes are presented in Tables D-11 and D-12.
9. Derivation of unit rates is presented in Table 9J.

Table D-8
Accessible Locations - Greater Impact Scenario - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, CA

Capital Costs - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Erect and maintain perimeter temporary fence	ft	2,090	$ 1.09	$ 2,278	
Remove 5' to 6' trees and save for replanting	ea	30	$ 48	$ 1,440	
Pre-excavation, post-excavation and confirmation sample survey	acre	4.0	$ 1,500	$ 6,000	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
					$ 33,218
Excavate Waste and Soil					
Break and remove asphalt, stockpile	sf	17,272	$ 1.00	$ 17,272	
Break and remove concrete, stockpile (6-in. pavement)	sf	4,229	$ 10.68	$ 45,162	
Excavate, segregate soil from asphalt and concrete, stockpile (Assume 20% of Vol.)	cy	830	$ 8.50	$ 7,053	
Excavate soil no segregation (Assume 80% of Vol.)	cy	3,319	$ 3.50	$ 11,617	
Collect soil profile samples for disposal	ea	14	$ 26	$ 351	
Disposal characterization					
Six metals (EPA Method 6010B)	ea	14	$ 100	$ 1,350	
Total Extractable Petroleum Hydrocarbons (EPA 8015M)	ea	14	$ 105	$ 1,418	
Dispose of non-hazardous soil at Class II facility	ton	6,638	$ 35	$ 232,343	
Waste Characterization and Recycling, Concrete	ton	149	$ 20	$ 2,976	
Waste Characterization and Recycling, Asphalt	ton	494	$ 20	$ 9,886	
					$ 329,428
Dewatering Activities					
Trash Pump Rental	mo	1 pump	$ 900	$ 900	
Tank Rental (Assuming 18,100 gallon tank weir tank)	day	45	$ 26	$ 1,170	
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	70 feet	$ 250	$ 250	
Collect water disposal samples	ea	5	$ 26	$ 130	
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	5	$ 150	$ 750	
pH	ea	5	$ 10	$ 50	
Cyanide	ea	5	$ 35	$ 175	
Phenols	ea	5	$ 150	$ 750	
Sulfides	ea	5	$ 25	$ 125	
					$ 4,300
Restoration Activities					
Import and place drain rock	cy	1,179	$ 32.50	$ 38,308	
Import and place clean fill	cy	2,137	$ 20.00	$ 42,747	
Import and place topsoil (12 inches)	cy	833	$ 30.00	$ 24,988	
Replant selected trees	ea	10	$ 80	$ 802	
Restore Asphalt	sf	17,272	$ 2.25	$ 38,862	
Restore paint to parking spaces	stall	10	$ 9.96	$ 100	
Restore paint to bike path	ft	470	$ 0.80	$ 376	
Restore Concrete	cy	78	$ 25	$ 1,958	
Restore Parking Curbs	ft	222	$ 26	$ 5,772	
Restore Landscaping (grass)	acre	0.12	$ 43,500	$ 5,220	
					$ 159,132
Abandon & Replace Existing Groundwater Monitoring Wells					
Abandon 2-inch PVC monitoring wells [600GW101, -105, -107]	ea	3	$ 500	$ 1,500	
Dispose of well abandonment residuals	ea	3	$ 200	$ 600	
Install replacement well, 2-inch [600GW101]	ea	1	$ 1,000	$ 1,000	
					$ 3,100

Table D-8
Accessible Locations - Greater Impact Scenario - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, CA

Capital Costs - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Abandon Existing Groundwater Monitoring Wells (deferred)					
Abandon 2-inch PVC monitoring wells	ea	10	$ 500	$ 5,000	
Dispose of well abandonment residuals	ea	10	$ 200	$ 2,000	
Subtotal				$ 7,000	
Discount subtotal at 3.5% annually for 6 years				$ (1,347)	
					$ 5,653
Land Use Controls (Area B)					
Prepare Presidio LUC Master Reference Report	ls	1	$ 5,000	$ 5,000	
Prepare Site-Specific Addendum to LUCMRR (Area B)	ls	1	$ 10,000	$ 10,000	
Add Site-Specific Land Use Controls to Trust GIS System	ls	1	$ 500	$ 500	
					$ 15,500
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	3.6	$ 5,000	$ 18,000	
Provide office support	wk	4	$ 2,000	$ 7,200	
Provide vehicles and equipment	wk	4	$ 1,300	$ 4,680	
Perform air monitoring	wk	4	$ 1,000	$ 3,600	
Collect soil confirmation samples	ea	120	$ 26	$ 3,120	
BTEX by EPA Method 8260B	ea	25	$ 100	$ 2,500	
PAHs by EPA Method 8081/8082	ea	120	$ 200	$ 24,000	
Total Petroleum Hydrocarbons as Diesel Fuel, Fuel Oil, Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	120	$ 135	$ 16,200	
Metals by EPA Method 6000/7000	ea	120	$ 280	$ 33,600	
Perform independent data validation	ea	120	$ 20	$ 2,400	
Input analytical results into Presidio database	ea	120	$ 15	$ 1,800	
Prepare Remediation Completion Report	ls	1	$ 50,000	$ 50,000	
					$ 273,600
Engineering Project Management					
9% of Design and Excavation Management Services	ls	9%			$ 24,624
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 849,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 42,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 890,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 178,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 1,068,000**

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Erect and maintain perimeter temporary fence	ft	0	$ 1.09	$ -	
Remove 5' to 6' trees and save for replanting	ea	30	$ 48	$ 1,440	
Pre-excavation, post-excavation and confirmation sample survey	acre	6.3	$ 1,500	$ 9,450	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
					$ 34,390

Table D-8
Accessible Locations - Greater Impact Scenario - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, CA

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	Unit	Quantity	Unit Cost	Subtotal	Total
Excavate Waste and Soil					
Break and remove asphalt, stockpile	sf	65,764	$ 1.00	$ 65,764	
Break and remove concrete, stockpile (6-in. pavement)	sf	23,453	$ 10.68	$ 250,477	
Excavate, segregate soil from asphalt and concrete, stockpile (Assume 20% of Vol.)	cy	3,767	$ 8.50	$ 32,016	
Excavate soil no segregation (Assume 80% of Vol.)	cy	15,066	$ 3.50	$ 52,732	
Collect soil profile samples for disposal	ea	62	$ 26	$ 1,599	
Disposal characterization					
Six metals (EPA Method 6010B)	ea	62	$ 100	$ 6,150	
Total Extractable Petroleum Hydrocarbons (EPA 8015M)	ea	62	$ 105	$ 6,458	
Dispose of non-hazardous soil at Class II facility	ton	30,133	$ 35	$ 1,054,646	
Waste Characterization and Recycling, Concrete	ton	825	$ 20	$ 16,504	
Waste Characterization and Recycling, Asphalt	ton	1,882	$ 20	$ 37,643	
					$ 1,523,989
Dewatering Activities					
Trash Pump Rental	mo	1 pump	$ 900	$ 900	
Tank Rental (Assuming 18,100 gallon tank weir tank)	day	45	$ 26	$ 1,170	
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	70 feet	$ 250	$ 250	
Collect water disposal samples	ea	21	$ 26	$ 546	
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	21	$ 150	$ 3,150	
pH	ea	21	$ 10	$ 210	
Cyanide	ea	21	$ 35	$ 735	
Phenols	ea	21	$ 150	$ 3,150	
Sulfides	ea	21	$ 25	$ 525	
					$ 10,636
Restoration Activities					
Import and place drain rock	cy	5,344	$ 32.50	$ 173,665	
Import and place clean fill	cy	9,705	$ 20.00	$ 194,109	
Import and place topsoil (12 inches)	cy	3,784	$ 30.00	$ 113,520	
Replant selected trees	ea	10	$ 80	$ 802	
Restore Asphalt	sf	65,764	$ 2.25	$ 147,969	
Restore paint to parking spaces	stall	20	$ 9.96	$ 199	
Restore paint to bike path	ft	0	$ 0.80	$ -	
Restore Concrete	cy	434	$ 25	$ 10,858	
Restore Parking Curbs	ft	333	$ 26	$ 8,658	
Restore Landscaping (grass)	acre	0.51	$ 43,500	$ 22,185	
					$ 671,965
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	4	$ 5,000	$ 20,000	
Provide office support	wk	4	$ 2,000	$ 8,000	
Provide vehicles and equipment	wk	4	$ 1,300	$ 5,200	
Perform air monitoring	wk	4	$ 1,000	$ 4,000	

Table D-8
Accessible Locations - Greater Impact Scenario - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, CA

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Collect soil confirmation samples	ea	330	$ 26	$ 8,580	
PAHs by EPA Method 8081/8082	ea	330	$ 200	$ 66,000	
Total Petroleum Hydrocarbons as Diesel Fuel, Fuel Oil, Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	330	$ 135	$ 44,550	
Perform independent data validation	ea	330	$ 20	$ 6,600	
Input analytical results into Presidio database	ea	330	$ 15	$ 4,950	
Prepare Remediation Completion Report	ls	1	$ 50,000	$ 50,000	
					$ 324,380
Engineering Project Management					
9% of Design and Excavation Management Services	ls	9%			$ 29,194
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 2,595,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 130,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 2,730,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 546,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 3,276,000**

Annual Costs (Year 1) - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total[a]**
Conduct Groundwater Monitoring - quarterly for 1 year					
Sample wells (5 wells, 2 seeps, and 1 duplicate)	ea	32	$ 800	$ 25,600	
Dispose of groundwater sampling residuals	ls	1	$ 800	$ 800	
Analyze groundwater samples from wells					
General Water Chemistry	ea	32	$ 259	$ 8,288	
Total Dissolved Solids	ea	32	$ 27	$ 864	
4 Metals, dissolved (EPA Method 6010/6020) [see Note 13]	ea	32	$ 105	$ 3,360	
4 Metals, total (EPA Method 6010/6020)	ea	12	$ 85	$ 1,020	
Total Sulfide (EPA Method 376.2)	ea	32	$ 46	$ 1,472	
BTEX and MTBE (EPA Method 8021B or 8020)	ea	32	$ 56	$ 1,792	
Total Petroleum Hydrocarbons as Gasoline, as Diesel Fuel, and as Motor Oil (EPA 8015 + EPA 3630A, silica gel cleanup)	ea	32	$ 206	$ 6,592	
Perform independent data validation	ea	32	$ 20	$ 640	
Input analytical results into Presidio database	ea	32	$ 15	$ 480	
Prepare semi-annual monitoring reports	ea	2	$ 5,000	$ 10,000	
					$ 60,908
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 61,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 3,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 64,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 13,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 77,000**

Table D-8
Accessible Locations - Greater Impact Scenario - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, CA

Annual Costs (Years 2 - 3) - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total[a]**
Conduct Groundwater Monitoring - semi-annually for 2 years					
Sample wells (5 wells, 2 seeps, and 1 duplicate)	ea	16	$ 800	$ 12,800	
Dispose of groundwater sampling residuals	ls	1	$ 200	$ 200	
Analyze groundwater samples from wells (3 wells, 2 seeps, 1 dup.)					
General Water Chemistry	ea	16	$ 259	$ 4,144	
4 Metals, dissolved (EPA Method 6010/6020) [see Note 13]	ea	16	$ 105	$ 1,680	
4 Metals, total (EPA Method 6010/6020)	ea	12	$ 85	$ 1,020	
Perform independent data validation	ea	16	$ 20	$ 320	
Input analytical results into Presidio database	ea	16	$ 15	$ 240	
Prepare annual monitoring reports	ea	1	$ 2,500	$ 2,500	
					$ 22,904
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 23,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 1,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 24,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 5,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 29,000**

Annual Costs (30 years) - Phase 1					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Land Use Controls (Area B)					
Annual administrative cost of Land Use Controls (Area B)	ls	1	$ 1,000	$ 1,000	
Coordinate with NPS for Area A site (TPHg Source Area Only)	ls	1	$ 1,000	$ 1,000	
Annualized cost of Five-Year Review (6 occurrences)	ls	1	$ 5,000	$ 5,000	
					$ 7,000
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 7,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ -
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 7,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 1,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 8,000**

Notes and Assumptions

1. Totals may not sum exactly because of rounding.
2. Field effort of excavation and well abandonment is estimated to be 18 weeks in duration.
3. Sidewall confirmation samples will be collected at an approximate frequency of 1 sample per every 25 linear feet. Samples will be analyzed for TPHd, TPHfo, TPHg, (EPA 8015M) and PAHs (EPA 8270). All samples for TPH analysis will be prepared with a silica gel cleanup (SGCU). Samples at FDS Pipeline Residual Area 1 will also be analyzed for BTEX (EPA 8260B).
4. Bottom confirmation samples will be collected at a frequency of 1 sample per 625 sf. Samples will be analyzed for the same parameters as sidewall samples.
5. Waste characterization samples will be collected approximately 1 per 500 cy (includes bulking factor of 1.5). Samples will be analyzed for 6 Metals (Cd, Cr, Cu, Pb, Ni and Zn) (EPA 6010B), and total extractable petroleum hydrocarbons (EPA 8015M).
6. Areas and volumes are presented in Tables D-11 and D-12.
7. Conversion factor from cy of soil to tons was 1.6
8. Conversion factor from cy of asphalt to tons was 1.7
9. Conversion factor from cy of concrete to tons was 1.9.
10. Total volume of concrete and asphalt was increased by 10 percent to account for additional demolition during field effort.
11. Estimated water volume for dewatering included 10 foot excavations only. Assuming saturated zone will be from 5 to 10 feet. Estimated water volume is 2,150,000 gallons.
12. Water disposal samples will be collected at one per 18,100-gallon weir tank. Approximately 120 water disposal samples will be analyzed for Ag, As, Cd, Cr, Cu, Pb, Ni, Zn (EPA Method 6010B) and Hg (EPA 7196), pH, Cyanide (EPA 9010B, 9012A), Phenols (EPA 625), and Sulfides (EPA 376). Analyses are based on the Trust's Sanitary Sewer Discharge Permit.
13. 4 Metals include: Al, As, Fe, and Mn.
14. Groundwater and surface water monitoring will include 5 monitoring wells and 2 seeps quarterly for 1 year and semi-annually for 2 additional years.
15. Derivation of the unit rates is presented in Table 9J.

Table D-9
Less Accessible Locations - Greater Impact Scenario - Alternative 4:
Estimated Costs for Excavation and Off-Site Disposal With Building 610
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Pre-excavation, post-excavation and confirmation sample survey	1s	1	$ 4,500	$ 4,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
Remove 11" thick concrete flooring	ft^3	32,748	$ 28	$ 914,266	
					$942,266
Excavate Waste and Soil					
Interior excavation with Bobcat	cy	10,629	$ 91.00	$ 967,220	
Segregate debris from soil and stockpile on site	cy	10,629	$ 5.00	$ 53,144	
Collect soil profile samples for disposal	ea	23	$ 26	$ 598	
Six metals (EPA Method 6010B)	ea	23	$ 100	$ 2,300	
Total Extractable Petroleum Hydrocarbons	ea	23	$ 85	$ 1,955	
Dispose of non-hazardous soil at a Class II facility	ton	17,006	$ 35	$ 595,212	
Waste characterization and Recycling, Concrete	ton	2,305	$ 20	$ 46,090	
					$ 1,666,519
Dewater Excavation					
"Rain for Rent" tank rental (18,000-gal.)	day	15	$ 26	$ 390	
Trash pump, self-primed	mo	0.5	$ 900	$ 450	
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	0.5	$ 250	$ 125	
Collect water disposal samples					
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	28	$ 150	$ 4,200	
pH	ea	28	$ 10	$ 280	
Cyanide	ea	28	$ 35	$ 980	
Phenols	ea	28	$ 150	$ 4,200	
Sulfides	ea	28	$ 25	$ 700	
					$ 11,325
Replace Concrete Floor					
Import and place drain rock	cy	4,966	$ 32.50	$ 161,386	
Import and place clean fill	cy	5,663	$ 20.00	$ 113,261	
Pump 11" elevated slab with finish and medium service hardener	cy	1,213	$ 50.00	$ 60,600	
					$ 335,247
Design and Construction Management					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (workplan and figures)	ls	1	$ 25,000	$ 25,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	12	$ 5,000	$ 60,000	
Provide office support	wk	12	$ 2,000	$ 24,000	
Provide vehicles and equipment	wk	12	$ 1,300	$ 15,600	
Collect soil confirmation samples	ea	113	$ 26	$ 2,938	
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	113	$ 200	$ 22,600	
Total Petroleum Hydrocarbons as Gasoline, Diesel Fuel and	ea		$ 135	$ 15,255	
Fuel Oil (EPA 8015M + EPA 3630A, silica gel cleanup)		113			
Perform independent data validation (Level III plus 10% Level IV)	ls	113	$ 20	$ 2,260	
Input analytical results into Presidio database	ls	113	$ 15	$ 1,695	
Prepare Remediation Completion Report	ls	1	$ 50,000	$ 50,000	
					$ 250,848
Engineering Project Management					
9% of Excavation Management and Observation Services	ls	9%			$ 22,576

Table D-9
Less Accessible Locations - Greater Impact Scenario - Alternative 4:
Estimated Costs for Excavation and Off-Site Disposal With Building 610
Commissary/PX Study Area
Presidio of San Francisco, California

Subtotal Estimated Costs (w/ contractor overhead and profit):		$3,229,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):	$	161,000
Subtotal Estimated Costs (w/ legal and administrative costs):	$	3,390,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):	$	678,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:	**$**	**4,068,000**

Notes and Assumptions

1. Totals may not sum exactly because of rounding

2. Field effort for interior excavations is assumed to be two weeks in duration. Field effort includes mobilizing, concrete floor removal, excavation, and concrete floor replacement. Field effort includes three days for monitoring well abandonment.

3. Sidewall confirmation samples will be collected at a frequency of 1 sample per every 25 linear feet. Samples will be analyzed for TPHd, TPHfo, TPHg, (EPA 8015M) and PAHs (EPA 8270). All samples for TPH analysis will be prepared with a silica gel cleanup (SGCU).

4. Bottom confirmation samples will be collected at a frequency of 1 sample per 625 sf, with a minimum of one sample per excavation. Samples will be analyzed for TPHd, TPHfo, TPHg (EPA Method 8015M) and PAHs (EPA 8270 SIM).

5. Waste characterization samples will be collected approximately 1 per 500 cy (includes bulking factor of 1.5). Samples will be analyzed for 6 Metals (Cd, Cr, Cu, Pb, Ni and Zn) (EPA 6010B), and total extractable petroleum hydrocarbons (EPA 8015M).

6. Areas and volumes are presented in Tables D-11 and D-12.

7. Assumed concrete slab is 11-inches thick for removal and replacement estimate.

8. Estimated water volume for one time dewatering included 10 feet excavations only. Assuming saturated zone will be from 5 to 10 feet. Estimated water volume is 138,673 gallons.

9. Water disposal samples will be collected at one per 18,100-gallon weir tank. Water disposal samples will be analyzed for Ag, As, Cd, Cr, Cu, Pb, Ni, Zn (EPA Method 6010B) and Hg (EPA 7196), pH, Cyanide (EPA 9010B, 9012A), Phenols (EPA 625), and Sulfides (EPA 376). Analyses are based on the Trust's Sanitary Sewer Discharge Permit.

10. Costs for dewatering equipment and tanks from vendor (Rain for Rent).

11. Conversion factor from cy of soil to tons was 1.6.

12. Conversion factor from cy of concrete to tons was 1.9.

13. Derivation of unit rates is presented in Table 9J.

Table D-10
Less Accessible Locations - Greater Impact Scenario - Alternative 4:
Estimated Costs for Excavation and Off-Site Disposal Following Demolition of Building 610
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
(Included under Alternative 4 for Accessible Locations)					
					$0
Excavate Waste and Soil					
Excavate soil, no segregation (Assume 100% of volume)	cy	10,629	$ 3.50	$ 37,201	
Collect soil profile samples for disposal	ea	23	$ 26	$ 598	
Six metals (EPA Method 6010B)	ea	23	$ 100	$ 2,300	
Total Extractable Petroleum Hydrocarbons	ea	23	$ 85	$ 1,955	
Dispose of non-hazardous soil at a Class II facility	ton	17,006	$ 35	$ 595,212	
					$ 637,266
Dewater Excavation					
"Rain for Rent" tank rental (18,000-gal.)	day	15	$ 26	$ 390	
Trash pump, self-primed	mo	0.5	$ 900	$ 450	
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	0.5	$ 250	$ 125	
Collect water disposal samples					
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	28	$ 150	$ 4,200	
pH	ea	28	$ 10	$ 280	
Cyanide	ea	28	$ 35	$ 980	
Phenols	ea	28	$ 150	$ 4,200	
Sulfides	ea	28	$ 25	$ 700	
					$ 11,325
Design and Construction Management					
Engineering					
(Included under Alternative 4 for Accessible Locations)				$ -	
Construction observation					
Provide resident engineer	wk	12	$ 5,000	$ 60,000	
Provide office support	wk	12	$ 2,000	$ 24,000	
Provide vehicles and equipment	wk	12	$ 1,300	$ 15,600	
Collect soil confirmation samples	ea	113	$ 26	$ 2,938	
Polycyclic aromatic hydrocarbons (EPA Method 8270)	ea	113	$ 200	$ 22,600	
Total Petroleum Hydrocarbons as Gasoline, Diesel Fuel and Fuel Oil (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	113	$ 135	$ 15,255	
Perform independent data validation (Level III plus 10% Level IV)	ls	113	$ 20	$ 2,260	
Input analytical results into Presidio database	ls	113	$ 15	$ 1,695	
Prepare Remediation Completion Report					
(Included under Alternative 4 for Accessible Locations)				$ -	
					$ 144,348
Engineering Project Management					
9% of Excavation Management and Observation Services	ls	9%			$ 12,991
Subtotal Estimated Costs (w/ contractor overhead and profit):					$806,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 40,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 850,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 170,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 1,020,000**

Notes and Assumptions
1. Totals may not sum exactly because of rounding
2. Field effort for interior excavations is assumed to be two weeks in duration. Field effort includes mobilizing, concrete floor
3. Sidewall confirmation samples will be collected at a frequency of 1 sample per every 25 linear feet. Samples will be analyzed for TPHd, TPHfo, TPHg, (EPA 8015M) and PAHs (EPA 8270). All samples for TPH analysis will be prepared with a silica gel cleanup (SGCU).
4. Bottom confirmation samples will be collected at a frequency of 1 sample per 625 sf, with a minimum of one sample per excavation. Samples will be analyzed for TPHd, TPHfo, TPHg (EPA Method 8015M) and PAHs (EPA 8270 SIM).
5. Waste characterization samples will be collected approximately 1 per 500 cy (includes bulking factor of 1.5). Samples will be analyzed for 6 Metals (Cd, Cr, Cu, Pb, Ni and Zn) (EPA 6010B), and total extractable petroleum hydrocarbons (EPA 8015M).
6. Areas and volumes are presented in Tables D-11 and D-12.

Table D-10

Less Accessible Locations - Greater Impact Scenario - Alternative 4:
Estimated Costs for Excavation and Off-Site Disposal Following Demolition of Building 610
Commissary/PX Study Area

Presidio of San Francisco, California

7. Assumed concrete slab is 11-inches thick for removal and replacement estimate.
8. Estimated water volume for one time dewatering included 10 feet excavations only. Assuming saturated zone will be from 5 to 10 feet. Estimated water volume is 138,673 gallons.
9. Water disposal samples will be collected at one per 18,100-gallon weir tank. Water disposal samples will be analyzed for Ag, As, Cd, Cr, Cu, Pb, Ni, Zn (EPA Method 6010B) and Hg (EPA 7196), pH, Cyanide (EPA 9010B, 9012A), Phenols (EPA 625), and Sulfides (EPA 376). Analyses are based on the Trust’s Sanitary Sewer Discharge Permit.
10. Costs for dewatering equipment and tanks from vendor (Rain for Rent).
11. Conversion factor from cy of soil to tons was 1.6.
12. Conversion factor from cy of concrete to tons was 1.9.
13. Derivation of unit rates is presented in Table 9J.

Table D-11
Soil Area and Volume Estimates (Scenario II - Greater Impact Scenario)
Commissary/PX Study Area
Presidio of San Francisco, California

NAME	DEPTH	AREA ($feet^2$)	PHASE	AREA ($feet^2$)	% GRASS	% ASPHALT	% CONCRETE	AREA GRASS ($feet^2$)	AREA ASPHALT ($feet^2$)	AREA CONCRETE ($feet^2$)	THICKNESS ASPHALT & CONCRETE (feet)	VOLUME ASPHALT ($feet^3$)	VOLUME CONCRETE ($feet^3$)	VOLUME ASPHALT ($yard^3$)	VOLUME CONCRETE ($yard^3$)	EXCAVATION BOTTOM AREA ($feet^2$)	BOTTOM CONFIRMATION SAMPLES[1]	EXCAVATION PERIMETER LENGTH (feet)	PERIMETER CONFIRMATION SAMPLES[2]
Central RU	Shallow M	105,116	1	19,708	10%	70%	20%	1,971	13,796	3,942	0.5	6,898	1,971	255	73	19,708	32	800	32
			2	85,408	10%	70%	20%	8,541	59,786	17,082	0.5	29,893	8,541	1,107	316	85,408	137	1,673	67
Central RU	Shallow L	3,367	2	3,367			100%	-	-	3,367	1.0	-	3,367	-	125	3,367	6	242	10
Central RU	Deep M	25,542	1	6,365				-	-	-	-	-	-	-	-		-	340	14
			2	19,177														1,068	43
Building 619	Deep L	25,374	2	25,374			100%	-	-	25,374	1.0	-	25,374	-	940	25,374	41	653	27
Building 626	Shallow M	2,412	2	2,412			100%	-	-	2,412	0.5	-	1,206	-	45	2,412	4	197	8
Building 626	Shallow L	2,436	2	2,436			100%	-	-	2,436	1.0	-	2,436	-	90	2,436	4	197	8
Building 626	Deep M	2,871	1	2,871	50%	40%	10%	1,435	1,148	287	0.5	574	144	21	5	2,871	5	192	8
Building 626	Deep L	876	2	876				-	-	-	-	-	-	-	-	-	-	106	5
Building 628 Area #1	Deep L	827	2	827			100%	-	-	827	1.0	-	827	-	31	827	2	104	5
Building 628 Area #2	Shallow M	3,959	2	3,959			100%	-	-	3,959	0.5	-	1,979	-	73	3,959	7	236	10
Building 628 Area #2	Deep M	761	2	761				-	-	-	-	-	-	-	-	761	2	100	4
FDS Pipeline Residuals Area #1	Shallow M	787	1	787	100%			787	-	-	-	-	-	-	-	787	2	125	5
FDS Pipeline Residuals Area #2	Shallow M	449	1	449		100%		-	449	-	0.5	225	-	8	-	449	1	125	5
FDS Pipeline Residuals Area #3/ AST 634 Area	Shallow M	1,545	1	1,545	80%	20%		1,236	309	-	0.5	154	-	6	-	1,545	3	314	13
Pipeline A Area #1	Shallow M	9,070	2	9,070	100%			9,070	-	-	-	-	-	-	-	9,070	15	340	14
Pipeline A Area #1	Deep M	3,371	2	3,371	100%			3,371	-	-	-	-	-	-	-	3,371	6	153	7
Pipeline A Area #2	Shallow M	1,319	2	1,319	100%			1,319	-	-	-	-	-	-	-	1,319	3	52	3
Pipeline A Area #2	Shallow L	474	2	474			100%	-	-	474	1.0	-	474	-	18	474	1	87	4
TOTALS	**-**	**190,556**		**190,556**	**-**	**-**	**-**	**27,730**	**75,488**	**60,159**		**37,744**	**46,318**	**1,398**	**1,715**	**164,138**	**271**	**7,104**	**292**
																More Accessible	**More Accessible**	**More Accessible**	**More Accessible**
Subtotal, Phase 1				**31,725**				**5,429**	**15,702**	**4,229**		**7,851**	**2,114**	**291**	**78**	**25,360**	**43**	**1,896**	**77**
Subtotal, Phase 2				**125,477**				**22,300**	**59,786**	**23,453**		**29,893**	**11,726**	**1,107**	**434**	**106,300**	**174**	**3,818**	**156**
TOTALS, More Accessible				**157,202**				**27,730**	**75,488**	**27,682**		**37,744**	**13,841**	**1,398**	**513**	**131,660**	**217**	**5,714**	**233**
																Less Accessible	**Less Accessible**	**Less Accessible**	**Less Accessible**
TOTALS, Less Accessible				**33,354**				**0**	**0**	**32,478**		**0**	**32,478**	**0**	**1,203**	**32,478**	**54**	**1,390**	**59**

Notes:
L - Less Accessible
M - More Accessible
Central RU = Central Remedial Unit. Area includes portions of Site 15, Bldg 613, TPHg Source, Pipeline A Area 2, and FDS Pipeline Area.

Table D-12
Soil Volume Estimates by Depth (Scenario II - Greater Impact Scenario)
Commissary/PX Study Area
Presidio of San Francisco, California

NAME	DEPTH	Phase 1 vs. 2	THICKNESS (feet)	AREA (ft^2)	VOLUME (cy)	SUBTOTAL VOLUME BY PHASE	VOLUME by DEPTH (cy)
Building 628 Area #2	Shallow M	2	3	3,959	440	**Phase 1**	
Pipeline A Area #1	Shallow M	2	3	9,070	1,008		
Central RU	Shallow M	1	3	19,708	2,190	**2,499**	
		2	3	85,408	9,490		
Pipeline A Area #2	Shallow M	2	3	1,319	147	**Phase 2**	**13,851**
Building 626	Shallow M	2	3	2,412	268		
FDS Pipeline Residuals Area #1	Shallow M	1	3	787	87	**11,352**	
FDS Pipeline Residuals Area #2	Shallow M	1	3	449	50		
634 Area	Shallow M	1	3	1,545	172		
Pipeline A Area #2	Shallow L	2	3	474	53	**Phase 2**	
Central RU	Shallow L	2	3	3,367	374	**697**	**697**
Building 626	Shallow L	2	3	2,436	271		
Building 628 Area #2	Deep M	2	7	761	197	**Phase 1**	
Pipeline A Area #1	Deep M	2	10	3,371	1,248	**1,650**	
Building 626	Deep M	2	10	2,871	1,063	**Phase 2**	**9,131**
Central RU	Deep M	1	7	6,365	1,650	**7,481**	
		2	7	19,177	4,972		
Building 619	Deep L	2	10	25,374	9,398	**Phase 2**	
Building 628 Area #1	Deep L	2	10	827	306	**9,931**	**9,931**
Building 626	Deep L	2	7	876	227		
TOTAL				**190,556**	**33,611**		**33,611**
					Total Volume (M) Phase 1	**4,149**	**22,982**
					Total Volume (M) Phase 2	**18,833**	
					Total Volume Shallow (L)	**697**	**10,629**
					Total Volume Deep (L)	**9,931**	
					Total Shallow (M) Phase 1	**2,499**	**13,851**
					Total Shallow (M) Phase 2	**11,352**	
					Total Deep (M) Phase 1	**1,650**	**9,131**
					Total Deep (M) Phase 2	**7,481**	

Notes
L - Less Accessible
M - More Accessible
Central RU = Central Remedial Unit. Area includes portions of Site 15, Bldg 613, TPHg Source, Pipeline A Area 2, and FDS Pipeline Area.

Table D-13
Phase 2 Summary of Estimated Costs for Corrective Action Alternatives to Cleanup TPH for Human Health Recreational Land Use
Commissary/PX Study Area
Presidio of San Francisco, California

Alternative		Capital Cost[1]		Annual O&M Cost[1]		O&M Period (years)		Total Cost[2] (NPV[3])	
Accessible RUs	**Less Accessible RUs**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**	**Accessible**	**Less Accessible**
1) No Action[4]				$ --		--		**$0**	
2) Capping with Land Use Controls[5]		$313,000		$0 $7,000		30 **		**$442,000**	
	3) In Situ Soil Remediation • Oxygen Release Product Injection • Bioventing and Biosparging • Ozone Sparging • Sodium Persulfate Injection								 **NA** **NA** **NA** **NA**
4) Excavation and Off-Site Disposal		$432,000		$0 $0 $0				**$432,000**	
	4) Excavation and Off-Site Disposal • With Building 610 in place • Without Building 610								 **NA** **NA**
Phase 2 Cost of Preferred Alternative for Accessible RUs - Phase 2 (Alternative 4)[6]:								**$432,000**	

Notes

[1] Detailed estimates for capital and annual O&M costs are presented in Tables D-14 and D-15 and Areas and Volumes are detailed in Tables D-16 and D-17, respectively.
[2] Total Cost is calculated using a 3.5 percent interest rate per OSWER guidance (EPA, 2000b) and Federal guidelines (EPA, 2000a).
[3] NPV = Net Present Value
[4] Alternative includes groundwater monitoring well abandonment (costs included under the No Action alternative for Phase 1).
[5] Alternative includes land use controls for 30 years (Phase 2) to restrict soil disturbance due to PAHs and metals associated with Fill Material, restrict marsh or similar habitat restoration, and restrict potable use of groundwater.
[6] Cleanup of TPH to Restricted Land Use without protection of Crissy Field Marsh water quality.
** Land use control costs

Table D-14
Phase 2 TPH - Accessible Locations - Alternative 2:
Estimated Costs for Capping Soil with LUCs
Commissary/PX Study Area
Presidio of San Francisco, California

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Erect and maintain perimeter temporary fence	ft	1,000	$ 1.09	$ 1,090	
Remove 5' to 6' trees and save for replanting	ea	10	$ 48	$ 480	
Pre-excavation, post-excavation and confirmation sample survey	acre	6.3	$ 1,500	$ 9,450	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
					$ 34,520
Construct Cap					
Mobilize contractor equipment and supplies to site	ls	1	$ 5,000	$ 5,000	
Repair/Upgrade Permeable Cover (Asphalt Area)					
Asphalt Sealing	sy	0	$ 1.25	$ -	
Excavate Impacted Soil (12 inches); small equipment	cy	62	$ 8.75	$ 540	
Collect soil profile samples for disposal	ea	2	$ 26	$ 52	
Disposal Characterization					
Six metals (EPA Method 6010B)	ea	2	$ 100	$ 200	
Total Extractable Petroleum Hydrocarbons (EPA 8015M)	ea	2	$ 105	$ 210	
Dispose of non-hazardous soil at Class II facility	ton	99	$ 35	$ 3,456	
Compact soil subgrade; small equipment	sf	1,666	$ 0.25	$ 417	
Furnish and install geosynthetic clay liner (GCL) [see Note 4]	sf	1,666	$ 0.75	$ 1,250	
Import and Place Clean Topsoil (12 inches)	cy	62	$ 30	$ 1,851	
Restore Parking Curbs	ft	333	$ 26	$ 8,658	
Restore landscaping compatible with GCL liner [see Note 4]	ls	0.60	$ 10,000	$ 6,000	
Vegetate Imported Cover (grass)	acre	0.04	$ 30,000	$ 1,200	
					$ 28,833
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	
Construction observation					
Provide resident engineer	wk	1.5	$ 5,000	$ 7,500	
Provide office support	wk	1.5	$ 2,000	$ 3,000	
Provide vehicles and equipment	wk	1.5	$ 1,300	$ 1,950	
Perform air monitoring	wk	1.5	$ 1,000	$ 1,500	
Prepare Remediation Completion Report	ls	1.0	$ 50,000	$ 50,000	
					$ 170,450
Engineering Project Management					
9% of Design and Construction Management Services	1s	9%			$ 15,341
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 249,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 12,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 261,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 52,000
Total Preliminary Estimated Capital Costs of Remedial Alternative - Phase 2:					**$ 313,000**

Table D-14
Phase 2 TPH - Accessible Locations - Alternative 2:
Estimated Costs for Capping Soil with LUCs
Commissary/PX Study Area
Presidio of San Francisco, California

Annual Costs (30 years) - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Inspect and Repair Cap [Apportioned with Phase 1 by Volume @ 60%]					
Repair damage to low-permeability cover caused by erosion	ls	0.60	$ 3,600	$ 2,160	
Repair periodic breaches/damage to cover	ls	0.60	$ 4,000	$ 2,400	
Inspect and clear vegetation from drainage ditches	ls	0.60	$ 2,000	$ 1,200	
					$ 5,760
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 6,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ -
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 6,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 1,000
Total Preliminary Estimated Annual Costs of Remedial Alternative:					**$ 7,000**

Notes and Assumptions
1. Totals may not sum exactly because of rounding.
2. Derivation of unit rates is presented in Table 9J.
3. Areas and volumes are presented in Tables D-16 and D-17.
4. Landscaping options for 12-inch vegetative layer overlying geosynthetic clay liner (GCL) are limited. Salvaged or new tress or shrubs may be placed in sub-surface "planters" consisting of a hole sized to accommodate the root ball, lined with GCL, and backfilled with clean topsoil and any necessary soil amendments. The locations and depths of such "planters" would require coordination with the Revegetation Plan, which is not currently available.

Table D-15
Phase 2 TPH Cleanup of Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, CA

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
General Site Preparation					
Mobilize contractor equipment and supplies to site	ls	1	$ 20,000	$ 20,000	
Erect and maintain perimeter temporary fence	ft	1,000	$ 1.09	$ 1,090	
Remove 5' to 6' trees and save for replanting	ea	10	$ 48	$ 480	
Pre-excavation, post-excavation and confirmation sample survey	acre	6.3	$ 1,500	$ 9,450	
Decontamination area for personnel and equipment	ls	1	$ 1,500	$ 1,500	
Provide Personnel Protective Equipment (PPE)	ls	1	$ 2,000	$ 2,000	
					$ 34,520
Excavate Waste and Soil					
Break and remove asphalt, stockpile	sf	0	$ 1.00	$ -	
Break and remove concrete, stockpile (6-in. pavement)	sf	857	$ 10.68	$ 9,150	
Excavate, segregate soil from asphalt and concrete, stockpile (Assume 20% of Vol.)	cy	116	$ 8.50	$ 983	
Excavate soil no segregation (Assume 80% of Vol.)	cy	463	$ 3.50	$ 1,620	
Collect soil profile samples for disposal	ea	1	$ 26	$ 26	
Disposal characterization					
Six metals (EPA Method 6010B)	ea	1	$ 100	$ 100	
(EPA 8015M)	ea	1	$ 105	$ 105	
Dispose of non-hazardous soil at Class II facility	ton	740	$ 35	$ 25,917	
Waste Characterization and Recycling, Concrete	ton	110	$ 20	$ 2,198	
Waste Characterization and Recycling, Asphalt (waste + pvmt.)	ton	98	$ 20	$ 1,967	
					$ 42,067
Dewatering Activities					
Trash Pump Rental	mo	0.7	$ 900	$ 900	
Tank Rental (Assuming 18,100 gallon tank weir tank)	day	25	$ 26	$ 650	
Hose Rental (Assuming 20' section excavation to tank and 50' section tank to sewer)	mo	0.7	$ 250	$ 250	
Collect water disposal samples	ea	14	$ 26	$ 364	
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn)	ea	14	$ 150	$ 2,100	
pH	ea	14	$ 10	$ 140	
Cyanide	ea	14	$ 35	$ 490	
Phenols	ea	14	$ 150	$ 2,100	
Sulfides	ea	14	$ 25	$ 350	
					$ 7,344
Restoration Activities					
Import and place drain rock	cy	213	$ 32.50	$ 6,922	
Import and place clean fill	cy	272	$ 20.00	$ 5,442	
Import and place topsoil (12 inches)	cy	93	$ 30.00	$ 2,803	
Replant selected trees	ea	10	$ 80	$ 802	
Restore Asphalt	sf	0	$ 2.25	$ -	
Restore paint to parking spaces	stall	20	$ 9.96	$ 199	
Restore paint to bike path	ft	0	$ 0.80	$ -	
Restore Concrete (6-inch thick slab)	cy	16	$ 675	$ 10,710	
Restore Parking Curbs	ft	333	$ 26	$ 8,658	
Restore Landscaping (grass)	acre	0.04	$ 30,000	$ 1,200	
					$ 36,736
Design and Construction Management Services					
Engineering					
Perform general planning activities	ls	1	$ 20,000	$ 20,000	
Prepare remedial design (plans and specifications)	ls	1	$ 75,000	$ 75,000	
Bid, award, and negotiate construction contract	ls	1	$ 11,500	$ 11,500	

Table D-15
Phase 2 TPH Cleanup of Accessible Locations - Alternative 4:
Estimated Costs for Soil Excavation and Off-Site Disposal with Groundwater Monitoring
Commissary/PX Study Area
Presidio of San Francisco, CA

Capital Costs - Phase 2					
	Estimated Costs				
Task Description	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**	**Total**
Construction observation					
Provide resident engineer	wk	4	$ 5,000	$ 20,000	
Provide office support	wk	4	$ 2,000	$ 8,000	
Provide vehicles and equipment	wk	4	$ 1,300	$ 5,200	
Perform air monitoring	wk	4	$ 1,000	$ 4,000	
Collect soil confirmation samples	ea	19	$ 26	$ 494	
PAHs by EPA Method 8081/8082	ea	19	$ 200	$ 3,800	
Total Petroleum Hydrocarbons as Diesel Fuel, Fuel Oil, Gasoline (EPA 8015M + EPA 3630A, silica gel cleanup)	ea	19	$ 135	$ 2,565	
Perform independent data validation	ea	19	$ 20	$ 380	
Input analytical results into Presidio database	ea	19	$ 15	$ 285	
Prepare Remediation Completion Report	ls	1	$ 50,000	$ 50,000	
					$ 201,224
Engineering Project Management					
9% of Design and Excavation Management Services	ls	9%			$ 18,110
Subtotal Estimated Costs (w/ contractor overhead and profit):					$ 340,000
Legal and Administrative Costs (assumed to be 5 percent of subtotal estimated costs w/ contractor overhead and profit):					$ 17,000
Subtotal Estimated Costs (w/ legal and administrative costs):					$ 360,000
Contingencies (assumed to be 20 percent of subtotal estimated costs w/ legal and administrative costs):					$ 72,000
Total Preliminary Estimated Capital Costs of Remedial Alternative:					**$ 432,000**

Notes and Assumptions

1. Totals may not sum exactly because of rounding.
2. Sidewall confirmation samples will be collected at an approximate frequency of 1 sample per every 25 linear feet. Samples will be analyzed for TPHd, TPHfo, TPHg, (EPA 8015M) and PAHs (EPA 8270). All samples for TPH analysis will be prepared with a silica gel cleanup (SGCU). Only samples from Pipeline Residuals Areas 1, 2 and 3 will be analyzed for BTEX (EPA 8260B).
3. Bottom confirmation samples will be collected at a frequency of 1 sample per 625 sf. Samples will be analyzed for the same parameters as sidewall samples.
4. Waste characterization samples will be collected approximately 1 per 500 cy. Samples will be analyzed for 6 Metals (Cd, Cr, Cu, Pb, Ni and Zn) (EPA 6010B), and total extractable petroleum hydrocarbons (EPA 8015M).
5. Areas and volumes are presented in Tables D-16 and D-17.
6. Conversion factor from cy of soil to tons was 1.6
7. Conversion factor from cy of asphalt to tons was 1.7
8. Conversion factor from cy of concrete to tons was 1.9.
9. Total volume of concrete and asphalt was increased by 10 percent to account for additional demolition during field effort.
10. Estimated water volume for dewatering included 10 foot excavations only. Assuming saturated zone will be from 5 to 10 feet. Estimated water volume is 911,026 gallons.
11. Water disposal samples will be collected at a rate of one per every two 18,100-gallon weir tanks. Water disposal samples will be analyzed for Ag, As, Cd, Cr, Cu, Pb, Ni, Zn (EPA Method 6010B) and Hg (EPA 7196), pH, Cyanide (EPA 9010B, 9012A), Phenols (EPA 625), and Sulfides (EPA 376). Analyses are based on the Trust's Sanitary Sewer Discharge Permit.
12. 4 Metals include: Al, As, Fe, and Mn.
13. Derivation of the unit rates is presented in Table 9J.

Table D-16
Phase 2 Soil Area and Volume Estimates for TPH Cleanup for HH Recreational Land Use (Scenario I - Lesser Impact Scenario)
Commissary/PX Study Area
Presidio of San Francisco, California

NAME	DEPTH	PHASE 1 vs. 2	AREA (feet^2)	% GRASS	% ASPHALT	% CONCRETE	AREA GRASS (feet^2)	AREA ASPHALT (feet^2)	AREA CONCRETE (feet^2)	THICKNESS ASPHALT & CONCRETE (feet)	VOLUME ASPHALT (feet^3)	VOLUME CONCRETE (feet^3)	VOLUME ASPHALT (yard^3)	VOLUME CONCRETE (yard^3)	BOTTOM EXCAVATION AREA (feet^2)	BOTTOM CONFIRMATION SAMPLES[1]	EXCAVATION PERIMETER LENGTH (feet)	PERIMETER CONFIRMATION SAMPLES[2]
Building 613	Shallow M	2	0	0	80	20	0	0	0	0.5	0	0	0	0	0	0	0	0
Building 613	Deep M	2	0															
Building 619	Deep L	2	0												0	0	0	0
Building 626	Shallow M	2	0	0	60	40	0	0	0	0.5	0	0	0	0	0	0	0	0
Building 626	Shallow L	2	0												0	0	0	0
Building 626	Deep L	2	0															
Building 628 Area #1	Shallow M	2	0	100	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0
Building 628 Area #1	Deep M	2	0															
Building 628 Area #1	Deep L	2	0												0	0	0	0
Building 628 Area #2	Shallow M	2	857	0	0	100	0	0	857	0.5	0	428	0	16	857	2	125	5
Building 628 Area #2	Deep M	2	307															
FDS Pipeline Area	Shallow M	2	0	0	95	5	0	0	0	0.5	0	0	0	0	0	0	0	0
FDS Pipeline Area	Deep M	2	0															
Pipeline A Area #1	Shallow M	2	1,666	100	0	0	1,666	0	0	0.5	0	0	0	0	1,666	3	210	9
Pipeline A Area #1	Deep M	2	843															
Pipeline A Area #2	Shallow M	2	0	90	10	0	0	0	0	0.5	0	0	0	0	0	0	0	0
Pipeline A Area #2	Deep M	2	0															
Site 15 Area	Shallow M	2	0	0	75	25	0	0	0	0.5	0	0	0	0	0	0	0	0
Site 15 Area	Deep M	2	0															
															More Accessible	**More Accessible**	**More Accessible**	**More Accessible**
Subtotal, Phase 2			**3,673**				**1,666**	**0**	**857**		**0**	**428**	**0**	**16**	**2,523**	**5**	**335**	**14**

Notes

Gray shading indicates locations that will require remediation in Phase 2 for human health recreational land use.

L - Less Accessible

M - More Accessible

[1] Bottom confirmation samples will be collected at a frequency of 1 sample per 625 square feet

[2] Sidewall confirmation samples will be collected at a frequency of 1 sample per every 25 linear feet.

Table D-17
Phase 2 Soil Volume Estimates by Depth for TPH Cleanup for HH Recreational Land Use (Scenario I - Lesser Impact Scenario)
Commissary/PX Study Area
Presidio of San Francisco, California

NAME	DEPTH	PHASE	THICKNESS (feet)	AREA (ft^2)	VOLUME (cy)	SUBTOTAL VOLUME BY PHASE	TOTAL VOLUME BY DEPTH (cy)
Building 628 Area #2	Shallow M	2	3	857	95	**Phase 1**	**NA**
Building 628 Area #1	Shallow M	2	3	0	0	**NA**	
Pipeline A Area #1	Shallow M	2	3	1,666	185		
Site 15 Area	Shallow M	2	3	0	0		
FDS Pipeline Area	Shallow M	2	3	0	0		
Pipeline A Area #2	Shallow M	2	3	0	0	**Phase 2**	
Building 626 Area	Shallow M	2	3	0	0	**280**	
Building 613 Area	Shallow M	2	3	0	0		
Building 626 Area	Shallow L	2	3	0	0	**Phase 2** **0**	**0**
Site 15 Area	Deep M	2	7	0	0	**Phase 1**	**NA**
FDS Pipeline Area	Deep M	2	7	0	0	**NA**	
Building 628 Area #2	Deep M	2	7	307	80		
Pipeline A Area #1	Deep M	2	7	843	218	**Phase 2**	
Pipeline A Area #2	Deep M	2	7	0	0		
Building 628 Area #1	Deep M	2	7	0	0	**298**	
Building 613 Area	Deep M	2	7	0	0		
Building 619 Area	Deep L	2	10	0	0	**Phase 2**	**0**
Building 628 Area #1	Deep L	2	10	0	0	**0**	
Building 626 Area	Deep L	2	7	0	0		
TOTAL				**3,673**	**579**		**0**
				Total Volume (M) Phase 1		**NA**	**NA**
				Total Volume (M) Phase 2		**579**	
				Total Volume Shallow (L)		**0**	**NA**
				Total Volume Deep (L)		**0**	
				Total Shallow (M) Phase 1		**NA**	**NA**
				Total Shallow (M) Phase 2		**280**	
				Total Deep (M) Phase 1		**NA**	**NA**
				Total Deep (M) Phase 2		**298**	

Notes

L - Less Accessible
M - More Accessible

APPENDIX E
Evaluation of the Potential for Vapor Intrusion of Volatile Organic Compounds in the Subsurface to Indoor Air at Building 610

APPENDIX E

Evaluation of the Potential for Vapor Intrusion of Volatile Organic Compounds in the Subsurface to Indoor Air at Building 610 Commissary/PX Study Area

Presidio of San Francisco, California

Building 610 was evaluated for potential vapor intrusion of volatile organic compounds (VOCs) from the subsurface to indoor air based on available soil and groundwater data for the Building 610 area. The evaluation was performed in accordance with *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Interim Final,* Department of Toxic Substances Control (DTSC), California Environmental Protection Agency dated 7 February 2005. Building 610 is located in an area which housed a number of Army motor pool structures, was previously used as a commissary, and is currently used for retail operations.

The vapor intrusion evaluation included review of available soil and groundwater data for concentrations of VOCs. Residual chemical data were evaluated from soil and groundwater samples collected within the footprint of the building and within a 100-foot radius around Building 610. The 2005 DTSC Guidance requires consideration of subsurface contamination within a 100-foot radius of the building being evaluated. Both the soil and groundwater data were used as lines of evidence in the evaluation of potential vapor intrusion for Building 610. No soil gas data were available for Building 610 or the surrounding area. Because Building 610 is currently used for retail operations, the vapor intrusion evaluation was performed based on a commercial/industrial land use scenario. A residential land use scenario has also been included in the evaluation to assess unrestricted land use which would also be protective of a recreational use scenario.

E.1 SOIL DATA

Figure E-1 presents the soil sample locations included in the evaluation. Table E-1 summarizes the soil data for VOCs. Many of the VOCs were reported as not detected. Because both soil and groundwater data were included in the evaluation, soil samples included in the evaluation were limited to those samples collected above the depth of groundwater encountered in the borings. Residual chemicals in deeper soil samples were evaluated by assessing the groundwater data.

The DTSC Guidance indicates that a preliminary screening of soil data should only be used when soil samples are collected using EPA Method 5035A, *Closed System Purge and Trap Extraction for Volatile Organic Compounds.* Although the soil VOC data was not developed from samples collected by EPA Method 5035A, the available soil data was used as one of the lines of evidence for the vapor intrusion evaluation.

The 2005 DTSC Guidance indicates that use of soil data without the availability of soil gas data requires the estimation of soil gas concentrations from soil to assess potential vapor intrusion.

The partitioning calculation procedure presented in Appendix E of the 2005 DTSC Guidance was used to estimate soil gas concentrations from the Building 610 and surrounding area soil data. Of the VOCs included in the sample analyses, only acetone, naphthalene and trichloroethene were reported as detected in soil above the laboratory detection limits. The maximum detected concentrations of acetone, naphthalene and trichloroethene in soil were used in the soil gas partitioning calculations.

The predicted soil gas concentrations were less than the soil gas California Human Health Screening Levels (CHHSLs) found in *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties* (Cal EPA, 2005) based on commercial/industrial and residential land uses with a building over engineered fill. The predicted soil gas concentrations were also less than the 2005 San Francisco Bay Regional Water Quality Control Board (RWQCB) soil gas Environmental Screening Levels (ESLs) for protection of indoor air under commercial/industrial and residential land use scenarios presented in *Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final)* (RWQCB, 2005). Table E-2 presents the soil-based soil gas estimate calculation parameters and the corresponding CHHSL and ESL criteria.

E.2 GROUNDWATER DATA

Figure E-1 presents the groundwater sample locations included in the evaluation. Table E-3 summarizes the groundwater data for VOCs. Many of the VOCs were reported as not detected. The 2005 DTSC Guidance indicates that use of groundwater data without the availability of soil gas data requires the estimation of soil gas concentrations from groundwater to assess potential vapor intrusion. The partitioning calculation procedure presented in Step 5 of the Vapor Assessment section of the 2005 DTSC Guidance was used to estimate soil gas concentrations from the Building 610 and surrounding area groundwater data. Of the VOCs included in the sample analyses, only benzene, ethylbenzene, methyl-tert butyl ether, toluene, and total xylenes were reported as detected above the laboratory detection limits. The maximum detected concentrations of these compounds were used in the soil gas partitioning calculations.

The predicted soil gas concentrations were less than the soil gas CHHSLs (Cal EPA, 2005) based on commercial/industrial land use with a building over engineered fill. The predicted soil gas concentrations were also less than the 2005 RWQCB soil gas ESLs for protection of indoor air under a commercial/industrial land use scenario. Under the residential land use scenario, all predicted soil gas concentrations were less than the CHHSLs and ESLs, except for benzene. Using the maximum groundwater concentration for benzene of 0.53 micrograms per liter (µg/L), a soil gas concentration of 122 micrograms per cubic meter ($\mu g/m^3$) was predicted, which exceeded the CHHSL and ESL of 85 $\mu g/m^3$. However, benzene was only detected in one of 67 groundwater samples collected in the area. The only detected result was measured in December 2003 from well 610GW102 which is 80 feet downgradient of the building. Benzene was not detected in this well during the six subsequent sampling events in 2004, nor any samples collected prior to December 2003. Based on these results, there is no significant potential for vapor intrusion from benzene in groundwater in the vicinity of Building 610 under a residential or commercial/industrial land use scenario. Table E-4 presents the groundwater-based soil gas estimate calculation parameters and the corresponding CHHSL and ESL criteria.

E.3 CONCLUSIONS

An evaluation of potential vapor intrusion from residual chemicals in the subsurface under and around Building 610 using available soil and groundwater data as lines of evidence, indicates that there is not a significant potential for vapor intrusion at Building 610 under commercial/industrial, recreational, or residential land uses. The evaluation was performed based upon procedures presented in *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Interim Final* (DTSC, 2005).

Table E-1
Soil Sample Data Used in the Vapor Intrusion Evaluation
Building 610
Presidio of San Francisco, California

	Compound			**1,1,1-Trichloroethane**	**1,1,2,2-Tetrachloroethane**	**1,1,2-Trichloroethane**	**1,1-Dichloroethane**	**1,1-Dichloroethene**	**1,2-Dichloroethane**	**1,2-Dichloroethene (Total)**	**1,2-Dichloropropane**	**1,4-Dichlorobenzene**	**2-Butanone**	**2-Chloroethyl Vinyl Ether**
	Units			**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Location ID	**Sample ID**	**Soil End Depth**	**Water Level**											
600ASB01	600ASB01[2]MSD	2	4.0											
600ASB01	DUP080702A[MSD]	2.5	4.0											
600ASB02	600ASB02[2]	2	4.0											
600ASB08	600ASB08[2.0]	2	5.5											
600ASB09	600ASB09[2.0]	2	8.0											
600ASB09	600ASB09[7.0]	7	8.0											
600ASB09	DUP011603C	7.5	8.0											
600CSB01	600CSB01[2]	2	2.5											
600RRSB04	600RRSB04[2]MSD	2	4.0											
600RRSB06	600RRSB06[2.0]	2	6.5											
600RRSB06	600RRSB06[5.5]	5.5	6.5											
600RRSB06	DUP012103D	6	6.5											
600RRSB08	600RRSB08[2.0]	2	6.8											
600RRSB08	600RRSB08[5.5]	5.5	6.8											
600RRSB08	DUP012103B	6	6.8											
600SB101	600SB101[2]	2	4	< 0.01	< 0.01 UJ	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.05	< 0.01
600SB101	DUP080602A	2.5	4	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
600SB106	600SB106[2]	2	4	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05 UJ	< 0.01
613SB06	613SB06[2.0]	2	4.5	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
613SB07	613SB07[2]	2	6.0	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
613SB07	613SB07[5]	5	6.0	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
613SB08	613SB08[10.0]	10	7.0	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.0006	< 0.006	< 0.006	< 0.012	< 0.006
613SB08	613SB08[2.0]	2	7.0											
613SB10	613SB10[2.5]	2.5	5.0											
613SB10	613SB10[5.5]	5.5	5.0											
613SB10	DUP012203A	6	5.0											
613SB12	613SB12[2.0]	2	6.0											
613SB12	613SB12[5.5]	5.5	6.0											
613SB12	DUP012103C[MSD]	6	6.0											
616SB01	616SB01[2.0]	2	4.0											
616SB01	DUP073002D(MSD)	1.5	4.0											
616SB02	616SB02[2.0]	2	4.3											
616SB03	616SB03[2.0]	2	4.0											
619SB01	619SB01[4.5]	4.5	5.5	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
619SB02	619SB02[2]	2	4.0	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
619SB02	DUP080602D[MSD]	2.5	4.0	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
619SB03	619SB03[4.5]	4.5	5.0	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
625SB01	625SB01[2]	2	4.0	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
625SB02	625SB02[2]	2	4.0	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
625SB03	625SB03[2]	2	4.5	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
625SB03	DUP072902A	2.5	4.5	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
625SB04	625SB04[2]	2	4.0	< 0.01	< 0.01 UJ	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.05	< 0.01
625SB05	625SB05[2.0]	2	9.0											
625SB05	625SB05[7.5]	7.5	9.0											
626SB01	626SB01[2]	2	4.0											
626SB02	626SB02[2]	2	4.0											
626SB03	626SB03[2]	2	4.0											
628SB01	628SB01[2.0]	2	2.5	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
628SB03	628SB03[2.0]	2	2.5	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
628SB05	628SB05[2]	2	2.5	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
628SB06	628SB06[2]	2	NA	< 0.01 UJ	< 0.01 UJ	< 0.01 UJ	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.05	< 0.01
628SB06	628SB06[4]	4	NA	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
628SB07	628SB07[2]	2	3.0	< 0.4	< 0.4	< 0.4	< 0.2	< 0.2	< 0.2	< 0.2 UJ	< 0.2	< 0.2	< 2	< 0.4
628SB08	628SB08[2]	2	3.5	< 0.01	< 0.01 UJ	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005 UJ	< 0.05	< 0.01
628SB10	628SB10[2.0]	2	2.5	< 0.01	< 0.01	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
628SB12	628SB12[2.0]	2	5.0											
628SB13	628SB13[2.0]	2	4.5											
628SB14	628SB14[3.0]	3	4.5											
628SB15	628SB15[2.0]	2	6.0											
628SB17	628SB17[2.0]	2	7.0											
T618SB02	DUP080602C	2.5	5.0	< 0.01	< 0.01 UJ	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
T618SB02	T618SB02[2.0]	2	5.0	< 0.01	< 0.01 UJ	< 0.01	< 0.005	< 0.005	< 0.005	< 0.005 UJ	< 0.005	< 0.005	< 0.05	< 0.01
	Number of samples			26	26	26	26	26	26	26	26	26	26	26

Notes
Blank cells indicate no results available for the specific chemical.
< - Not detected, at a concentration less than the limit noted.
mg/kg - milligrams per kilogram
MTBE - Methyl tert-butyl ether

Table E-1
Soil Sample Data Used in the Vapor Intrusion Evaluation
Building 610
Presidio of San Francisco, California

	Compound			**4-Methyl-2-Pentanone**	**Acetone**	**Benzene**	**Bromodichloromethane**	**Bromoform**	**Bromomethane**	**Carbon Disulfide**	**Carbon Tetrachloride**	**CFC-11**	**Chlorobenzene**	**Chloroethane**	**Chloroform**	**Chloromethane**	**Cis-1,3-Dichloropropene**
	Units			**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Location ID	**Sample ID**	**Soil End Depth**	**Water Level**														
600ASB01	600ASB01[2]MSD	2	4.0														
600ASB01	DUP080702A[MSD]	2.5	4.0														
600ASB02	600ASB02[2]	2	4.0														
600ASB08	600ASB08[2.0]	2	5.5														
600ASB09	600ASB09[2.0]	2	8.0														
600ASB09	600ASB09[7.0]	7	8.0														
600ASB09	DUP011603C	7.5	8.0														
600CSB01	600CSB01[2]	2	2.5			< 0.005											
600RRSB04	600RRSB04[2]MSD	2	4.0			< 0.005											
600RRSB06	600RRSB06[2.0]	2	6.5														
600RRSB06	600RRSB06[5.5]	5.5	6.5														
600RRSB06	DUP012103D	6	6.5														
600RRSB08	600RRSB08[2.0]	2	6.8														
600RRSB08	600RRSB08[5.5]	5.5	6.8														
600RRSB08	DUP012103B	6	6.8														
600SB101	600SB101[2]	2	4	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005 UJ	< 0.01	< 0.005	< 0.005		< 0.005 UJ	< 0.01	< 0.005	< 0.01	< 0.005
600SB101	DUP080602A	2.5	4	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
600SB106	600SB106[2]	2	4	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
613SB06	613SB06[2.0]	2	4.5	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
613SB07	613SB07[2]	2	6.0	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
613SB07	613SB07[5]	5	6.0	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
613SB08	613SB08[10.0]	10	7.0	< 0.012	< 0.06	< 0.006	< 0.006	< 0.006	< 0.006	< 0.012	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006
613SB08	613SB08[2.0]	2	7.0														
613SB10	613SB10[2.5]	2.5	5.0														
613SB10	613SB10[5.5]	5.5	5.0														
613SB10	DUP012203A	6	5.0														
613SB12	613SB12[2.0]	2	6.0														
613SB12	613SB12[5.5]	5.5	6.0														
613SB12	DUP012103C[MSD]	6	6.0														
616SB01	616SB01[2.0]	2	4.0			< 0.005											
616SB01	DUP073002D(MSD)	1.5	4.0			< 0.005											
616SB02	616SB02[2.0]	2	4.3			< 0.005											
616SB03	616SB03[2.0]	2	4.0			< 0.005											
619SB01	619SB01[4.5]	4.5	5.5	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
619SB02	619SB02[2]	2	4.0	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
619SB02	DUP080602D[MSD]	2.5	4.0	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
619SB03	619SB03[4.5]	4.5	5.0	< 0.05	0.28 J-	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
625SB01	625SB01[2]	2	4.0	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
625SB02	625SB02[2]	2	4.0	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
625SB03	625SB03[2]	2	4.5	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
625SB03	DUP072902A	2.5	4.5	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
625SB04	625SB04[2]	2	4.0	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005 UJ	< 0.01	< 0.005	< 0.005		< 0.005 UJ	< 0.01	< 0.005	< 0.01	< 0.005
625SB05	625SB05[2.0]	2	9.0														
625SB05	625SB05[7.5]	7.5	9.0														
626SB01	626SB01[2]	2	4.0			< 0.005											
626SB02	626SB02[2]	2	4.0			< 0.2											
626SB03	626SB03[2]	2	4.0			< 0.005											
628SB01	628SB01[2.0]	2	2.5	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
628SB03	628SB03[2.0]	2	2.5	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
628SB05	628SB05[2]	2	2.5	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
628SB06	628SB06[2]	2	NA	< 0.05	< 0.05 UJ	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.01	< 0.005	< 0.005 UJ		< 0.005 UJ	< 0.01	< 0.005	< 0.01	< 0.005 UJ
628SB06	628SB06[4]	4	NA	< 0.05 UJ	0.14 J-	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
628SB07	628SB07[2]	2	3.0	< 2 UJ	< 2 UJ	< 0.2	< 0.2	< 0.2	< 0.4	< 0.2	< 0.2		< 0.2	< 0.4	< 0.2	< 0.4	< 0.2
628SB08	628SB08[2]	2	3.5	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005 UJ	< 0.01	< 0.005	< 0.005		< 0.005 UJ	< 0.01	< 0.005	< 0.01	< 0.005
628SB10	628SB10[2.0]	2	2.5	< 0.05	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
628SB12	628SB12[2.0]	2	5.0														
628SB13	628SB13[2.0]	2	4.5														
628SB14	628SB14[3.0]	3	4.5														
628SB15	628SB15[2.0]	2	6.0														
628SB17	628SB17[2.0]	2	7.0														
T618SB02	DUP080602C	2.5	5.0	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
T618SB02	T618SB02[2.0]	2	5.0	< 0.05 UJ	< 0.05 UJ	< 0.005	< 0.005	< 0.005	< 0.01	< 0.005	< 0.005		< 0.005	< 0.01	< 0.005	< 0.01	< 0.005
	Number of samples			26	26	35	26	26	26	26	26	1	26	26	26	26	26

Notes
Blank cells indicate no results available for the specific chemical.
< - Not detected, at a concentration less than the limit noted.
mg/kg - milligrams per kilogram
MTBE - Methyl tert-butyl ether

Table E-1
Soil Sample Data Used in the Vapor Intrusion Evaluation
Building 610
Presidio of San Francisco, California

	Compound			Dibromochloromethane	Dichloromethane	Ethylbenzene	Methyl N-Butyl Ketone	MTBE	Naphthalene	Styrene (Monomer)	Tetrachloroethene	Toluene	Trans-1,3-Dichloropropene	Trichloroethene	Vinyl Acetate	Vinyl Chloride	Xylenes (Total)
	Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location ID	**Sample ID**	**Soil End Depth**	**Water Level**														
600ASB01	600ASB01[2]MSD	2	4.0						< 0.05 UJ								
600ASB01	DUP080702A[MSD]	2.5	4.0						< 0.05 UJ								
600ASB02	600ASB02[2]	2	4.0						< 0.05								
600ASB08	600ASB08[2.0]	2	5.5						< 0.0026								
600ASB09	600ASB09[2.0]	2	8.0						0.025								
600ASB09	600ASB09[7.0]	7	8.0						0.011								
600ASB09	DUP011603C	7.5	8.0						< 0.0028								
600CSB01	600CSB01[2]	2	2.5			< 0.005		< 0.005	< 0.05			< 0.01					< 0.01
600RRSB04	600RRSB04[2]MSD	2	4.0			< 0.005			< 0.2			< 0.01					< 0.01
600RRSB06	600RRSB06[2.0]	2	6.5						< 0.0053								
600RRSB06	600RRSB06[5.5]	5.5	6.5						< 0.0028								
600RRSB06	DUP012103D	6	6.5						< 0.0029								
600RRSB08	600RRSB08[2.0]	2	6.8						0.012 J								
600RRSB08	600RRSB08[5.5]	5.5	6.8						< 0.0028								
600RRSB08	DUP012103B	6	6.8						< 0.0028								
600SB101	600SB101[2]	2	4	< 0.005	< 0.005 UJ	< 0.005 UJ	< 0.05 UJ	< 0.02	< 0.2 UJ	< 0.01 UJ	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
600SB101	DUP080602A	2.5	4	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05 UJ	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
600SB106	600SB106[2]	2	4	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
613SB06	613SB06[2.0]	2	4.5	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
613SB07	613SB07[2]	2	6.0	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
613SB07	613SB07[5]	5	6.0	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.1	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
613SB08	613SB08[10.0]	10	7.0	< 0.006	< 0.006	< 0.006	< 0.012	< 0.006	< 0.0029	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.012	< 0.006	< 0.006
613SB08	613SB08[2.0]	2	7.0						0.0063 J								
613SB10	613SB10[2.5]	2.5	5.0						< 0.0028								
613SB10	613SB10[5.5]	5.5	5.0						< 0.0029								
613SB10	DUP012203A	6	5.0						< 0.0029								
613SB12	613SB12[2.0]	2	6.0						0.011 J								
613SB12	613SB12[5.5]	5.5	6.0						0.0054 J								
613SB12	DUP012103C[MSD]	6	6.0						< 0.0029								
616SB01	616SB01[2.0]	2	4.0			< 0.005						< 0.01					< 0.01
616SB01	DUP073002D(MSD)	1.5	4.0			< 0.005						< 0.01					< 0.01
616SB02	616SB02[2.0]	2	4.3			< 0.005						< 0.01					< 0.01
616SB03	616SB03[2.0]	2	4.0			< 0.005						< 0.01					< 0.01
619SB01	619SB01[4.5]	4.5	5.5	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	0.058	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
619SB02	619SB02[2]	2	4.0	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05 UJ	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
619SB02	DUP080602D[MSD]	2.5	4.0	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05 UJ	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
619SB03	619SB03[4.5]	4.5	5.0	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05 UJ	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
625SB01	625SB01[2]	2	4.0	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
625SB02	625SB02[2]	2	4.0	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
625SB03	625SB03[2]	2	4.5	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
625SB03	DUP072902A	2.5	4.5	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
625SB04	625SB04[2]	2	4.0	< 0.005	< 0.005 UJ	< 0.005 UJ	< 0.05 UJ	< 0.02	< 0.05	< 0.01 UJ	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
625SB05	625SB05[2.0]	2	9.0						< 0.011								
625SB05	625SB05[7.5]	7.5	9.0						< 0.011								
626SB01	626SB01[2]	2	4.0			< 0.005		< 0.005	< 0.1			< 0.01					< 0.01
626SB02	626SB02[2]	2	4.0			< 0.2		< 0.2	0.064			< 0.4					< 0.4
626SB03	626SB03[2]	2	4.0			< 0.005		< 0.005	< 0.05			< 0.01					< 0.01
628SB01	628SB01[2.0]	2	2.5	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
628SB03	628SB03[2.0]	2	2.5	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
628SB05	628SB05[2]	2	2.5	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
628SB06	628SB06[2]	2	NA	< 0.005 UJ	< 0.005 UJ	< 0.005 UJ	< 0.05 UJ	< 0.02	< 0.05	< 0.01 UJ	< 0.01	< 0.01	< 0.005 UJ	0.015 J-	< 0.01	< 0.01	< 0.01 UJ
628SB06	628SB06[4]	4	NA	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
628SB07	628SB07[2]	2	3.0	< 0.2	< 0.2 UJ	< 0.2	< 2 UJ	< 0.8	< 1	< 0.4	< 0.4	< 0.4	< 0.2	< 0.4	< 0.4	< 0.4	< 0.4
628SB08	628SB08[2]	2	3.5	< 0.005	< 0.005 UJ	< 0.005 UJ	< 0.05 UJ	< 0.02	< 0.2	< 0.01 UJ	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
628SB10	628SB10[2.0]	2	2.5	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01 UJ
628SB12	628SB12[2.0]	2	5.0						0.012								
628SB13	628SB13[2.0]	2	4.5						< 0.0027								
628SB14	628SB14[3.0]	3	4.5						< 0.0028								
628SB15	628SB15[2.0]	2	6.0						< 0.0027 UJ								
628SB17	628SB17[2.0]	2	7.0						< 0.0026								
T618SB02	DUP080602C	2.5	5.0	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.2 UJ	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
T618SB02	T618SB02[2.0]	2	5.0	< 0.005	< 0.005 UJ	< 0.005	< 0.05 UJ	< 0.02	< 0.05 UJ	< 0.01	< 0.01	< 0.01	< 0.005	< 0.01	< 0.01	< 0.01	< 0.01
	Number of samples			26	26	35	26	30	58	26	26	35	26	26	26	26	35

Notes
Blank cells indicate no results available for the specific chemical.
< - Not detected, at a concentration less than the limit noted.
mg/kg - milligrams per kilogram
MTBE - Methyl tert-butyl ether

Table E-2
Soil-Based Soil Gas Partitioning Calculations
Building 610
Presidio of San Francisco, California

Compound	Maximum Soil Concentration (mg/kg)	Maximum Soil Concentration (g/g)	Henry's Law Constant (unitless)	Koc (cm^3/g)	Soil Volumetric Water Content (cm^3/cm^3)	Soil Volumetric Air Content (cm^3/cm^3)	Soil Bulk Density (g/cm^3)	Soil Fraction Organic Carbon (g/g)	Soil Gas Concentration (g/cm^3)	Predicted Soil Gas Concentration ($\mu g/m^3$)	Commercial CHHSL Soil Gas ($\mu g/m^3$)	Commercial ESL Soil Gas ($\mu g/m^3$)	Residential CHHSL Soil Gas ($\mu g/m^3$)	Residential ESL Soil Gas ($\mu g/m^3$)
Acetone	0.28	2.80E-07	1.60E-03	0.58	0.15	0.28	1.5	0.006	4.3E-09	4317	NE	1,800,000	NE	650,000
Naphthalene	0.011	1.10E-08	2.00E-02	1.20E+03	0.15	0.28	1.5	0.006	3.0E-11	30	310	240	93	71
Trichloroethene	0.015	1.50E-08	4.20E-01	1.20E+03	0.15	0.28	1.5	0.006	8.5E-10	854	4,400	4,100	1,300	1,200

Notes

CHHSL - California Human Health Screening Level, Soil Gas Levels, Buildings with Engineered Fill, Table 6 (Cal EPA, 2005).
ESL - Soil Gas Environmental Screening Level for Evaluation of Potential Vapor Intrusion Concerns, Table E-2 (RWQCB, 2005).
Estimated soil gas concentration from equations presented in Appendix A of Cal EPA, 2005.

g/g - grams per gram
mg/kg - milligrams per kilogram
cm^3/cm^3 - cubic centimeters per cubic centimeters `
$\mu g/m^3$ - micrograms per cubic meter
g/cm^3 - grams per cubic centimeter
cm^3/g - cubic centimeters per gram

NE - Not established

Table E-3
Groundwater Sample Data Used in the Vapor Intrusion Evaluation
Building 610
Presido, San Francisco

	Compound	**1,1,1-Trichloroethane**	**1,1,2,2-Tetrachloroethane**	**1,1,2-Trichloroethane**	**1,1-Dichloroethane**	**1,1-Dichloroethene**	**1,2-Dichloroethane**	**1,2-Dichloroethene (Total)**	**1,2-Dichloropropane**	**1,4-Dichlorobenzene**	**2-Butanone**	**2-Chloroethyl Vinyl Ether**	**4-Methyl-2-Pentanone**	**Acetone**	**Benzene**
	Units	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Sample ID	**Sample Date**														
600GW10103/11/03	3/11/2003	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW101030904	3/9/2004														< 0.5
600GW101032105	3/21/2005														< 0.5
600GW101052604	5/26/2004														< 0.5
600GW10106/09/03	6/9/2003	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW101060105	6/1/2005														< 0.5
600GW10108/13/03	8/13/2003	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW101081004	8/10/2004														< 0.5
600GW10112/02/03	12/2/2003	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW10112/04/02	12/4/2002	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW101121604	12/16/2004														< 0.5
600GW1019/10/2002	9/10/2002	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 10	< 10	< 10 UJ	< 0.5
DUP0601053A	6/1/2005														< 0.5
600GW10603/12/03	3/12/2003	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW106031004	3/10/2004	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10 UJ	< 0.5
600GW106032905	3/29/2005	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW10606/05/03	6/5/2003	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW10608/13/03	8/13/2003	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW10612/02/03	12/2/2003	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW10612/04/02	12/4/2002	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		< 10		< 10	< 10	< 0.5
600GW1069/11/2002	9/11/2002	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10 UJ	< 10	< 10	< 10 UJ	< 0.5
610GW10103/05/02	3/5/2002														< 0.5
610GW10103/11/03	3/11/2003														< 0.5
610GW101031004	3/10/2004														< 0.5
610GW101032105	3/21/2005														< 0.5
610GW10105/29/02	5/29/2002														< 0.5
610GW101052604	5/26/2004														< 0.5
610GW10106/04/03	6/4/2003														< 0.5
610GW101060205	6/2/2005														< 0.5
610GW10108/14/03	8/14/2003														< 0.5
610GW10108/29/01	8/29/2001														< 0.5
610GW10108/29/02	8/29/2002														< 0.5
610GW101081004	8/10/2004														< 0.5
610GW10112/02/03	12/2/2003														< 0.5
610GW10112/03/01	12/3/2001														< 0.5
610GW10112/03/02	12/3/2002														< 0.5
610GW101121504	12/15/2004														< 0.5
610GW101CL12/15/04	12/15/2004														< 0.5 U
DUP0310043A	3/10/2004														< 0.5
DUP0321052A032105	3/21/2005														< 0.5
DUP0604033B	6/4/2003														< 0.5
DUP0814033A	8/14/2003														< 0.5
DUP1215041A	12/15/2004														< 0.5
610GW101CL03/10/04	3/10/2004														< 0.5
610GW101CL06/04/03	6/4/2003														< 0.5
610GW101CL08/14/03	8/14/2003														< 0.5
610GW10203/05/02	3/5/2002														< 0.5
610GW10203/11/03	3/11/2003														< 0.5
610GW102030904	3/9/2004														< 0.5
610GW102033105	3/31/2005														< 0.5
610GW10205/29/02	5/29/2002														< 0.5
610GW102052604	5/26/2004														< 0.5
610GW10206/05/03	6/5/2003														< 0.5
610GW102060205	6/2/2005														< 0.5
610GW10208/18/03	8/18/2003														< 0.5
610GW10208/29/01	8/29/2001														< 0.5
610GW10208/29/02	8/29/2002														< 0.5
610GW102081104	8/11/2004														< 0.5
610GW10212/02/03	12/2/2003														0.53
610GW10212/03/01	12/3/2001														< 0.5
610GW10212/03/02	12/3/2002														< 0.5
610GW102121504	12/15/2004														< 0.5
610GW102CL03/31/05	3/31/2005														< 1 U
DUP0311033A	3/11/2003														< 0.5
DUP0331052C033105	3/31/2005														< 0.5
DUP0811041A	8/11/2004														< 0.5
610GW102CL8/13/04	8/11/2004														< 1
Number of samples		14	14	14	14	14	14	2	14	2	14	2	14	14	67

Notes
µg/L - micrograms per liter

Table E-3
Groundwater Sample Data Used in the Vapor Intrusion Evaluation
Building 610
Presido, San Francisco

	Compound	**Bromodichloromethane**	**Bromoform**	**Bromomethane**	**Carbon Disulfide**	**Carbon Tetrachloride**	**Chlorobenzene**	**Chloroethane**	**Chloroform**	**Chloromethane**	**Cis-1,2-Dichloroethene**	**Cis-1,3-Dichloropropene**	**Dibromochloromethane**	**Dichloromethane**	**Ethylbenzene**	**m,p-Xylenes**
	Units	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Sample ID	**Sample Date**															
600GW10103/11/03	3/11/2003	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW101030904	3/9/2004														< 0.5	
600GW101032105	3/21/2005														< 0.5	
600GW101052604	5/26/2004														2.2	
600GW10106/09/03	6/9/2003	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW101060105	6/1/2005														< 0.5	
600GW10108/13/03	8/13/2003	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW101081004	8/10/2004														< 0.5	
600GW10112/02/03	12/2/2003	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW10112/04/02	12/4/2002	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW101121604	12/16/2004														< 0.5	
600GW1019/10/2002	9/10/2002	< 0.5	< 0.5	< 0.5	< 5.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 4.5	< 0.5	
DUP0601053A	6/1/2005														< 0.5	
600GW10603/12/03	3/12/2003	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW106031004	3/10/2004	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW106032905	3/29/2005	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW10606/05/03	6/5/2003	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW10608/13/03	8/13/2003	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW10612/02/03	12/2/2003	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW10612/04/02	12/4/2002	< 0.5	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 4	< 0.5	
600GW1069/11/2002	9/11/2002	< 0.5	< 0.5	< 0.5	< 5 UJ	< 0.5	< 0.5	< 0.5 UJ	< 0.5	< 0.5		< 0.5	< 0.5	< 4.5	< 0.5	
610GW10103/05/02	3/5/2002														< 0.5	
610GW10103/11/03	3/11/2003														< 0.5	
610GW101031004	3/10/2004														< 0.5	
610GW101032105	3/21/2005														< 0.5	
610GW10105/29/02	5/29/2002														< 0.5	
610GW101052604	5/26/2004														< 0.5	
610GW10106/04/03	6/4/2003														< 0.5	
610GW101060205	6/2/2005														< 0.5	
610GW10108/14/03	8/14/2003														< 0.5	
610GW10108/29/01	8/29/2001														< 0.5	< 0.5
610GW10108/29/02	8/29/2002														< 0.5	
610GW101081004	8/10/2004														< 0.5	
610GW10112/02/03	12/2/2003														< 0.5	
610GW10112/03/01	12/3/2001														< 0.5	< 0.5
610GW10112/03/02	12/3/2002														< 0.5	
610GW101121504	12/15/2004														< 0.5	
610GW101CL12/15/04	12/15/2004														< 0.5 U	
DUP0310043A	3/10/2004														< 0.5	
DUP0321052A032105	3/21/2005														< 0.5	
DUP0604033B	6/4/2003														< 0.5	
DUP0814033A	8/14/2003														< 0.5	
DUP1215041A	12/15/2004														< 0.5	
610GW101CL03/10/04	3/10/2004														< 0.5	
610GW101CL06/04/03	6/4/2003														< 0.5	
610GW101CL08/14/03	8/14/2003														< 0.5	
610GW10203/05/02	3/5/2002														0.78	
610GW10203/11/03	3/11/2003														< 0.5	
610GW102030904	3/9/2004														< 0.5	
610GW102033105	3/31/2005														< 0.5	
610GW10205/29/02	5/29/2002														< 0.5	
610GW102052604	5/26/2004														< 0.5	
610GW10206/05/03	6/5/2003														< 0.5	
610GW102060205	6/2/2005														< 0.5	
610GW10208/18/03	8/18/2003														< 0.5	
610GW10208/29/01	8/29/2001														< 0.5	< 0.5
610GW10208/29/02	8/29/2002														< 0.5	
610GW102081104	8/11/2004														< 0.5	
610GW10212/02/03	12/2/2003														< 0.5	
610GW10212/03/01	12/3/2001														< 0.5	< 0.5
610GW10212/03/02	12/3/2002														< 0.5	
610GW102121504	12/15/2004														< 0.5	
610GW102CL03/31/05	3/31/2005														< 1 U	
DUP0311033A	3/11/2003														< 0.5	
DUP0331052C033105	3/31/2005														< 0.5	
DUP0811041A	8/11/2004														< 0.5	
610GW102CL8/13/04	8/11/2004														< 1	
Number of samples		14	14	14	14	14	14	14	14	14	12	14	14	14	67	4

Notes
µg/L - micrograms per liter

Table E-3
Groundwater Sample Data Used in the Vapor Intrusion Evaluation
Building 610
Presido, San Francisco

	Compound	**Methyl N-Butyl Ketone**	**MTBE**	**Naphthalene**	**o-Xylene**	**Styrene (Monomer)**	**Tetrachloroethene**	**Toluene**	**Trans-1,2-Dichloroethene**	**Trans-1,3-Dichloropropene**	**Trichloroethene**	**Vinyl Acetate**	**Vinyl Chloride**	**Xylenes (Total)**
	Units	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Sample ID	**Sample Date**													
600GW10103/11/03	3/11/2003	< 10	< 0.5	< 0.96		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW101030904	3/9/2004		< 2					< 0.5						< 0.5
600GW101032105	3/21/2005		2.3					< 0.5						0.54 C
600GW101052604	5/26/2004		3.5 C					< 0.5						3.1
600GW10106/09/03	6/9/2003	< 10	< 0.5	< 0.94		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW101060105	6/1/2005		< 2					< 0.5						< 1
600GW10108/13/03	8/13/2003	< 10	< 0.5	< 0.95		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW101081004	8/10/2004		< 2					< 0.5						< 0.5
600GW10112/02/03	12/2/2003	< 10	< 0.5	< 0.95		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW10112/04/02	12/4/2002	< 10	< 0.5	< 1		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW101121604	12/16/2004		< 2					< 0.5						2 C
600GW1019/10/2002	9/10/2002	< 10	< 2.0	< 5.0		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 10	< 0.5	< 1.0
DUP0601053A	6/1/2005		< 2					< 0.5						< 1
600GW10603/12/03	3/12/2003	< 10	< 0.5	< 0.97		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW106031004	3/10/2004	< 10 UJ	< 0.5	< 0.96		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW106032905	3/29/2005	< 10	< 0.5	< 0.98		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 1
600GW10606/05/03	6/5/2003	< 10	< 0.5	< 0.94		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW10608/13/03	8/13/2003	< 10	< 0.5	< 0.95		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW10612/02/03	12/2/2003	< 10	< 0.5	< 0.95		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW10612/04/02	12/4/2002	< 10	< 0.5	< 0.94		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 0.5	< 0.5
600GW1069/11/2002	9/11/2002	< 10 UJ	< 2	< 5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 10	< 0.5	< 1
610GW10103/05/02	3/5/2002		< 2					< 0.5						< 0.5
610GW10103/11/03	3/11/2003		2.7					< 0.5						< 0.5
610GW101031004	3/10/2004		< 2 C U					< 0.5						< 0.5
610GW101032105	3/21/2005		2.2					< 0.5						< 1
610GW10105/29/02	5/29/2002		< 2					< 0.5						< 0.5
610GW101052604	5/26/2004		4.3 C					< 0.5						< 0.5
610GW10106/04/03	6/4/2003		< 2					< 0.5						< 0.5
610GW101060205	6/2/2005		< 2					< 0.5						< 1
610GW10108/14/03	8/14/2003		3					< 0.5						< 0.5
610GW10108/29/01	8/29/2001		< 2		< 0.5			< 0.5						
610GW10108/29/02	8/29/2002		< 2					< 0.5						< 0.5
610GW101081004	8/10/2004		< 2					< 0.5						< 0.5
610GW10112/02/03	12/2/2003		< 2					< 0.5						< 0.5
610GW10112/03/01	12/3/2001		< 2		< 0.5			< 0.5						
610GW10112/03/02	12/3/2002		2.2					< 0.5						< 0.5
610GW101121504	12/15/2004		< 2					< 0.5						< 1
610GW101CL12/15/04	12/15/2004		< 2.5 U					< 0.5 U						< 1 U
DUP0310043A	3/10/2004		< 2					< 0.5						< 0.5
DUP0321052A032105	3/21/2005		< 2					< 0.5						< 1
DUP0604033B	6/4/2003		< 2					< 0.5						< 0.5
DUP0814033A	8/14/2003		2.9					< 0.5						< 0.5
DUP1215041A	12/15/2004		< 2					< 0.5						< 1
610GW101CL03/10/04	3/10/2004		< 2.5					< 0.5						< 0.5
610GW101CL06/04/03	6/4/2003		< 2.5					< 0.5						< 0.5
610GW101CL08/14/03	8/14/2003		< 2.5					0.81						0.71
610GW10203/05/02	3/5/2002		< 2					< 0.5						< 0.5
610GW10203/11/03	3/11/2003		2.4					< 0.5						< 0.5
610GW102030904	3/9/2004		< 2					< 0.5						< 0.5
610GW102033105	3/31/2005		< 2					< 0.5						< 1
610GW10205/29/02	5/29/2002		< 2					< 0.5						< 0.5
610GW102052604	5/26/2004		4.8					< 0.5						< 0.5
610GW10206/05/03	6/5/2003		< 2					< 0.5						< 0.5
610GW102060205	6/2/2005		< 2					< 0.5						< 1
610GW10208/18/03	8/18/2003		< 2					< 0.5						< 0.5
610GW10208/29/01	8/29/2001		< 2		< 0.5			< 0.5						
610GW10208/29/02	8/29/2002		< 2					< 0.5						< 0.5
610GW102081104	8/11/2004		2.1					< 0.5						< 0.5
610GW10212/02/03	12/2/2003		< 2					< 0.5						< 0.5
610GW10212/03/01	12/3/2001		< 2		< 0.5			< 0.5						
610GW10212/03/02	12/3/2002		< 2					< 0.5						< 0.5
610GW102121504	12/15/2004		< 2					< 0.5						< 1
610GW102CL03/31/05	3/31/2005		< 5 U					< 1 U						< 2 U
DUP0311033A	3/11/2003		< 2					< 0.5						< 0.5
DUP0331052C033105	3/31/2005		< 2					< 0.5						< 1
DUP0811041A	8/11/2004		4.4					< 0.5						< 0.5
610GW102CL8/13/04	8/11/2004		< 1 UJ					< 1						< 1
Number of samples		14	67	14	4	14	14	67	12	14	14	14	14	63

Notes

µg/L - micrograms per liter

Table E-4
Groundwater-Based Soil Gas Partitioning Calculations
Building 610
Presido of San Francisco, California

Chemical	Maximum Groundwater Concentration (μg/L)	Henry's Law Constant (unitless)	Conversion Factor (L/m^3)	Estimated Soil Gas Concentration ($\mu g/m^3$)	Commercial Soil Gas CHHSL ($\mu g/m^3$)	Commercial Soil Gas ESL ($\mu g/m^3$)	Residential Soil Gas CHHSL ($\mu g/m^3$)	Residential Soil Gas ESL ($\mu g/m^3$)
Benzene	0.53	2.30E-01	1,000	122	280	290	85	85
Ethylbenzene	2.2	3.20E-01	1,000	704	NE	1,200,000	NE	420,000
MTBE	4.8	2.40E-02	1,000	115	29,000	31,000	8,600	9,400
Toluene	0.81	2.70E-01	1,000	219	890,000	180,000	320,000	63,000
Total Xylenes	3.1	3.00E-01	1,000	930	2,100,000	410,000	740,000	150,000

Notes

CHHSL - California Human Health Screening Level, Soil Gas Levels, Buildings with Engineered Fill, Table 6 (Cal EPA, 2005).
ESL - Soil Gas Environmental Screening Level for Evaluation of Potential Vapor Intrusion Concerns, Table E-2 (RWQCB, 2005).
Estimated soil gas concentration from equations presented in Step 5 ov Vapor Intrusion Assessment of Cal EPA, 2005.

L/m^3 - liters per cubic meter
μg/L - micrograms per liter
$\mu g/m^3$ - micrograms per cubic meter

NE - Not established

APPENDIX F
Procedures to Calculate the 95% UCL for Benzo(a)pyrene

APPENDIX F
Procedures to Calculate the 95% UCL for Benzo(a)pyrene
Commissary/PX Study Area
Presidio of San Francisco, California

At the Commissary/PX Study Area, five soil sample locations with exceedances of the applicable site cleanup level for benzo(a)pyrene (0.027 mg/kg) are anticipated to remain in place after the implementation of Alternative 4 for Accessible Areas. Specifically, exceedances of the applicable soil cleanup level for benzo(a)pyrene would remain at sampling locations 600CSB06, 600ASB01, 613SB10, S15SB06, and 625SB03 (Table F-1). If the area is not cleaned up to saltwater protection levels for the Crissy Field Marsh, then an exceedance of the human health recreational cleanup level (0.065 mg/kg) would also remain at sampling location 600ASB09, which lies outside the saltwater ecological protection zone.

For the shallow (0 to 3 feet bgs) uncapped soils within landscaped areas that would remain onsite under this alternative, the 95% Upper Confidence Limit (UCL) of the mean value of the data set was calculated and then compared to the applicable site cleanup level to determine whether the remaining exceedance(s) would present an unacceptable health or environmental risk. The calculations were performed in conformance with EPA guidance (EPA, 2002). The calculations are shown in Table F-1 and are described below.

The first step in performing the UCL calculation is to analyze the data set to evaluate whether the data distribution approximates either a normal or lognormal data distribution. A visual inspection of the data for these constituents indicated that the data for this constituent are approximately lognormally distributed. Therefore, a lognormal distribution was assumed for the data set, and the 95% UCL was calculated by the Land Method (Table F-1), which uses the following equation (EPA, 2002):

$$UCL = \exp\left(\bar{x} + \frac{s^2}{2} + \frac{Hs}{\sqrt{n-1}}\right)$$

where

UCL = Upper Confidence Limit on the mean concentration
$\bar{x}$ = arithmetic mean of the log-transformed concentration values
H = H-statistic
s = standard deviation of the log-transformed concentration values
n = number of samples in the data set

Values of the H-statistic can be obtained from tables in the published literature (Land, 1975). Samples without detectable concentrations were assumed to contain the analyte at concentrations equal to one-half the detection limit given for the sample. However, given that the calculation used log-transformed concentration values, the detection limits also required transformation. For example, a detection limit of 0.005 mg/kg was log-transformed according to the following equation.

$$< 0.005 \cong \ln\left(\frac{0.005}{\sqrt{2}}\right) = -5.645$$

In cases where field duplicates were collected, the concentration values of the two samples were averaged before performing the calculations.

The results of these calculations for the Commissary/PX Study Area are discussed in greater detail in Section 5.1.2 of the Corrective Action Plan.

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
601SB02[2.5]	08/05/02	2.5	**0.082**	CERCLA				
601SB02[4.5]	08/05/02	4.5	< 0.005	"				
601SB03[3.0]	01/16/03	3	0.0046 J	CERCLA				
601SB03[8.0]	01/16/03	8	0.018	"				
601SB03[11.0]	01/16/03	11	< 0.0041	"				
603SB01[2.0]	08/05/02	2	0.007	CERCLA				
603SB01[5.0]	08/05/02	5	< 0.005	"				
604SB01[4.5]	07/31/02	4.5	**0.11**	CERCLA				
604SB01[6.0]	07/31/02	6	0.05	"				
604SB02[2.0]	08/05/02	2	0.009	CERCLA				
604SB02[6.0]	08/05/02	6	0.009	"				
604SB03[2.0]	01/14/03	2	0.0068 J	CERCLA				
604SB03[3.5]	01/14/03	3.5	0.0094 J	"				
604SB03[5.5]	01/14/03	5.5	0.011 J	"				
604SB04[2.0]	01/14/03	2	0.024	CERCLA				
604SB04[5.5]	01/14/03	5.5	**0.7**	"				
604SB04[7.0]	01/14/03	7	0.0086	"				
604SB05[3.0]	01/16/03	3	0.032	CERCLA				
DUP011603A	01/16/03	3.5	0.033	"				
604SB05[6.0]	01/16/03	6	**0.082**	"				
604SB05[8.0]	01/16/03	8	**0.08**	"				
604SB06[3.0]	01/16/03	3	**2.9**	CERCLA				
604SB06[5.5]	01/16/03	5.5	0.017	"				
604SB06[7.5]	01/16/03	7.5	0.048	"				
604SB07[2.0]	01/14/03	2	0.0053 J	CERCLA				
604SB07[3.5]	01/14/03	3.5	0.016	"				
604SB07[5.5]	01/14/03	5.5	0.024	"				
604SB09[2.0]	01/14/03	2	0.0083 J	CERCLA				
604SB09[4.0]	01/14/03	4	0.0054 J	"				
604SB09[10.0]	01/14/03	10	< 0.0037	"				
605SB01[2.5]	01/22/03	2.5	0.01	Capped				
605SB01[5.0]	01/22/03	5	< 0.004	"				
605SB01[10.0]	01/22/03	10	< 0.0038	"				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
605SB02[2.0]	01/16/03	2	0.012	Landscaped	0.012	0.012	0.012	-4.423
605SB02[5.0]	01/16/03	5	< 0.0037	"				
DUP011603B[MSD]	01/16/03	5.5	< 0.0039	"				
605SB02[8.0]	01/16/03	8	0.018	"				
609SB01[2.0]	01/14/03	2	0.013	Capped				
609SB01[4.0]	01/14/03	4	0.0053 J	"				
609SB01[8.0]	01/14/03	8	0.0073 J	"				
610SB01[2.0]	08/05/02	2	0.036	CERCLA				
DUP080502E[MSD]	08/05/02	2.5	0.042	"				
610SB01[5.0]	08/05/02	5	**0.1**	"				
610SB02[2.0]	01/16/03	2	0.013	CERCLA				
610SB02[5.0]	01/16/03	5	0.004 J	"				
610SB02[7.5]	01/16/03	7.5	< 0.004	"				
610SB03[2.0]	01/14/03	2	0.064	CERCLA				
610SB03[5.5]	01/14/03	5.5	0.011	"				
610SB03[8.5]	01/14/03	8.5	0.016	"				
610SB04[2.0]	01/14/03	2	0.017	CERCLA				
610SB04[6.0]	01/14/03	6	0.024	"				
610SB04[7.5]	01/14/03	7.5	0.0089	"				
613SB01[2.0]	08/02/02	2	< 0.06	CERCLA				
613SB01[5.0]	08/02/02	5	< 0.005	"				
613SB02[2.0]	08/02/02	2	< 0.005	Capped				
613SB02[5.0]	08/02/02	5	< 0.005	"				
613SB03[2.0]	08/02/02	2	< 0.005	Capped				
DUP080202C	08/02/02	2.5	< 0.005	"				
613SB03[5.0]	08/02/02	5	< 0.005	"				
613SB04[2.0]	08/02/02	2	**0.12**	Excavated				
613SB04[4.5]	08/02/02	4.5	0.008	Excavated				
613SB05[2.0]	08/02/02	2	< 0.1	Excavated				
613SB05[4.0]	08/02/02	4	0.009	Unexcavated				
613SB06[2.0]	08/02/02	2	< 0.005	Excavated				
613SB06[5.0]	08/02/02	5	**0.086**	Excavated				
613SB07[2]	07/30/02	2	0.034	Excavated				
613SB07[5]	07/30/02	5	0.057	Excavated				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
613SB08[2.0]	01/21/03	2	0.038	Excavated				
613SB08[7.0]	01/21/03	7	0.0078	Excavated				
DUP012103A[MSD]	01/21/03	6.5	**0.074**	"				
613SB08[10.0]	01/21/03	10	0.0091	Excavated				
613SB09[2.0][MSD]	01/17/03	2	**0.078**	Excavated				
613SB09[5.5]	01/17/03	5.5	< 0.0038	Excavated				
613SB09[7.5]	01/17/03	7.5	0.029	Excavated				
613SB10[2.5]	01/22/03	2.5	< 0.0037	Capped				
613SB10[5.5]	01/22/03	5.5	0.0076 J	"				
DUP012203A	01/22/03	5.5	0.0086	"				
613SB10[7.5]	01/22/03	7.5	**0.065**	"				
613SB11[2.0]	01/21/03	2	0.034	Excavated				
613SB11[6.0]	01/21/03	6	0.0075	Unexcavated				
613SB11[8.0]	01/21/03	8	0.0087 J	Unexcavated				
613SB12[2.0]	01/21/03	2	**0.1**	Excavated				
613SB12[5.5]	01/21/03	5.5	0.044	Excavated				
DUP012103C[MSD]	01/21/03	6	0.03	"				
613SB12[7.5][MSD]	01/21/03	7.5	0.031	Excavated				
617SB01[2.0]	08/01/02	2	0.019	Excavated				
617SB01[5.0]	08/01/02	5	< 0.005	Unexcavated				
617SB02[2.0]	07/31/02	2	**0.23**	Excavated				
617SB02[5.0]	07/31/02	5	< 0.005	Unexcavated				
617SB03[2.0]	08/01/02	2	0.022	Excavated				
617SB03[5.0]	08/01/02	5	0.014	Unexcavated				
617SB04[1.5]	01/15/03	1.5	0.036	Excavated				
617SB04[6.0]	01/15/03	6	0.0044 J	Excavated				
617SB04[8.0]	01/15/03	8	< 0.0039	Excavated				
617SB05[1.5]	01/15/03	1.5	**0.11**	Excavated				
617SB05[4.0]	01/15/03	4	0.008	Unexcavated				
617SB05[7.5]	01/15/03	7.5	< 0.007	Unexcavated				
617SB06[2.5]	01/15/03	2.5	**0.065**	Excavated				
617SB06[6.0]	01/15/03	6	0.0062 J	Unexcavated				
617SB06[10.0]	01/15/03	10	< 0.0039	Unexcavated				
617SB07[1.5]	01/15/03	1.5	**0.23**	Excavated				
617SB07[5.5]	01/15/03	5.5	0.027	Excavated				
617SB07[9.0]	01/15/03	9	< 0.0041	Excavated				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
617SB08[2.0]	01/15/03	2	**0.074**	Excavated				
617SB08[5.5]	01/15/03	5.5	0.016	Unexcavated				
617SB08[10.0]	01/15/03	10	0.0046 J	Unexcavated				
617SB09[2.0]	01/16/03	2	0.022	Capped				
617SB09[5.5]	01/16/03	5.5	0.01	"				
617SB09[10.0]	01/16/03	10	< 0.004	"				
619SB01[4.5]	07/31/02	4.5	0.013	Capped				
619SB01[6.0]	07/31/02	6	< 0.005	"				
619SB02[2]	08/06/02	2	0.017	Excavated				
DUP080602D[MSD]	08/06/02	2.5	< 0.005	"				
619SB02[5]	08/06/02	5	< 0.005	Unexcavated				
619SB03[4.5]	07/31/02	4.5	0.019	Excavated				
619SB03[6.0]	07/31/02	6	< 0.005	Excavated				
619SB04[7.0]	01/23/03	7	< 0.0039	Capped				
619SB04[11.5]	01/23/03	11.5	< 0.0055	"				
DUP012303A	01/23/03	12	< 0.0041	"				
619SB04[13.0][MSD]	01/23/03	13	< 0.0042	"				
625SB01[2]	07/29/02	2	< 0.005	Capped				
625SB01[4]	07/29/02	4	< 0.005	"				
625SB02[2]	07/29/02	2	0.017	Capped				
625SB03[2]	07/29/02	2	< 0.005	Landscaped	< 0.005	0.004	0.005	-5.246
DUP072902A	07/29/02	2.5	0.007	"	0.007	0.007		
625SB03[5]	07/29/02	5	**0.078**	"				
DUP072902B	07/29/02	5.5	< 0.005	"				
625SB04[2]	07/29/02	2	0.008	Landscaped	0.008	0.008	0.008	-4.828
625SB04[5]	07/29/02	5	< 0.005	"				
625SB05[2.0]	01/13/03	2	0.059	Excavated				
625SB05[7.5]	01/13/03	7.5	0.026 J	Excavated				
625SB05[10.0]	01/13/03	10	0.011 J	Excavated				
626SB01[2]	07/29/02	2	**0.078**	Excavated				
626SB01[4]	07/29/02	4	0.014	Unexcavated				
626SB02[2]	07/29/02	2	0.027	Excavated				
626SB02[4]	07/29/02	4	< 0.005	Unexcavated				
626SB03[2]	07/29/02	2	< 0.005	Capped				
626SB03[5]	07/29/02	5	< 0.005	"				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
626SB04[6.5]	01/23/03	6.5	**0.14**	Excavated				
DUP012303C[MSD]	01/23/03	7	< 0.0041	"				
626SB04[9.0]	01/23/03	9	< 0.0039	Excavated				
626SB04[11.0]	01/23/03	11	0.026	Unexcavated				
626SB05[7.0]	01/23/03	7	**0.13**	Excavated				
626SB05[8.5]	01/23/03	8.5	0.044	Excavated				
DUP012303E	01/23/03	9	0.04	"				
626SB05[10.0]	01/23/03	10	0.052	Excavated				
628SB01[2.0]	07/30/02	2	< 0.005	Capped				
628SB01[5.0]	07/30/02	5	< 0.005	"				
628SB02[2.5]	07/30/02	2.5	**0.13**	Excavated				
628SB02[5.5]	07/30/02	5.5	0.006	Excavated				
DUP073002A	07/30/02	5	< 0.02	"				
628SB03[2.0]	07/30/02	2	< 0.005	Capped				
628SB03[4.5]	07/30/02	4.5	0.011	"				
628SB04[2]	07/30/02	2	< 0.005	Capped				
628SB04[5]	07/30/02	5	< 0.005	"				
628SB05[2]	07/31/02	2	< 0.005	Capped				
628SB05[5]	07/31/02	5	< 0.005	"				
628SB06[2]	07/31/02	2	< 0.005	Capped				
628SB06[4]	07/31/02	4	< 0.005	"				
628SB07[2]	07/31/02	2	< 0.1	Excavated				
628SB07[5]	07/31/02	5	0.053	Excavated				
628SB08[2]	07/31/02	2	< 0.02 UJ	Excavated				
628SB08[5]	07/31/02	5	< 0.005	Unexcavated				
628SB09[2]	08/02/02	2	< 0.005	Excavated				
DUP080202A	08/02/02	2.5	0.014	"				
628SB09[5]	08/02/02	5	< 0.005	Unexcavated				
628SB10[2.0]	07/30/02	2	< 0.005	Capped				
628SB10[5.0]	07/30/02	5	< 0.005	"				
628SB11[2]	07/31/02	2	< 0.005	Landscaped	< 0.005	0.004	0.004	-5.645
DUP073102A(MSD)	07/31/02	2.5	< 0.005	"	< 0.005	0.004		
628SB11[5]	07/31/02	5	< 0.005	"				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
628SB12[2.0]	01/17/03	2	**0.1**	Excavated				
628SB12[5.5]	01/17/03	5.5	< 0.0043	Unexcavated				
DUP011703B[MSD]	01/17/03	6	< 0.0043	"				
628SB12[10.0]	01/17/03	10	< 0.0037	Unexcavated				
628SB13[2.0]	01/17/03	2	0.014	Capped				
628SB13[6.0]	01/17/03	6	< 0.004	"				
628SB13[10.0]	01/17/03	10	0.0067 J	"				
628SB14[3.0]	01/17/03	3	< 0.0039	Capped				
628SB14[6.0]	01/17/03	6	< 0.005	"				
628SB14[10.0]	01/17/03	10	< 0.0038	"				
628SB15[2.0]	01/17/03	2	< 0.0036 UJ	Capped				
628SB15[6.0]	01/17/03	6	< 0.0042	"				
628SB15[9.5]	01/17/03	9.5	< 0.0038	"				
DUP011703A	01/17/03	10	< 0.0037	"				
628SB16[6.0]	01/23/03	6	< 0.0039	Excavated				
628SB16[8.5]	01/23/03	8.5	0.013	Excavated				
DUP012303D	01/23/03	9	0.015	"				
628SB16[14.0]	01/23/03	14	< 0.0039	Unexcavated				
628SB17[2.0]	01/17/03	2	0.011	Landscaped	0.011	0.011	0.011	-4.510
628SB17[7.0]	01/17/03	7	0.0044 J	"				
628SB17[10.0]	01/17/03	10	< 0.0037	"				
T615SB01[2.0]	08/01/02	2	0.024	Excavated				
T615SB01[4.5]	08/01/02	4.5	0.018 J-	Excavated				
T615SB02[2.0]	07/31/02	2	< 0.005	Capped				
T615SB02[5.0]	07/31/02	5	< 0.005	"				
T615SB03[2.0]	01/15/03	2	0.045	Excavated				
T615SB03[6.0]	01/15/03	6	< 0.0049	Unexcavated				
T615SB03[10.0]	01/15/03	10	< 0.0039	Unexcavated				
T618SB02[2.0]	08/06/02	2	0.009	Excavated				
DUP080602C	08/06/02	2.5	< 0.02 UJ	"				
T618SB02[5.0]	08/06/02	5	0.008	Unexcavated				
S15SB01[2.0]	08/06/02	2	**0.077**	Excavated				
S15SB01[5.0]	08/06/02	5	0.038	Excavated				
S15SB02[2.0]	08/01/02	2	< 0.005	Capped				
S15SB02[4.0]	08/01/02	4	< 0.005	"				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
S15SB03[2.0]	08/06/02	2	< 0.02	Excavated				
S15SB03[5.0]	08/06/02	5	< 0.005	Unexcavated				
S15SB04[2.0]	01/14/03	2	0.019	Capped				
S15SB04[5.5]	01/14/03	5.5	< 0.0038	"				
S15SB04[10.0]	01/14/03	10	< 0.0039	"				
S15SB05[1.5]	01/15/03	1.5	0.041	Excavated				
S15SB05[5.5]	01/15/03	5.5	0.0062 J	Unexcavated				
DUP011503A	01/15/03	6	< 0.0043	"				
S15SB05[7.0]	01/15/03	7	< 0.0061	Unexcavated				
DUP011503B	01/15/03	7.5	< 0.0064	"				
S15SB06[3.0]	01/16/03	3	0.021	Capped				
S15SB06[6.0]	01/16/03	6	**0.14**	"				
S15SB06[10.0]	01/16/03	10	0.0082 J	"				
S15SB07[1.5]	01/15/03	1.5	**0.12**	Excavated				
S15SB07[5.0]	01/15/03	5	< 0.0038	Unexcavated				
S15SB07[8.0]	01/15/03	8	< 0.0051	Unexcavated				
600ASB01[2]MSD	08/07/02	2	< 0.005	Landscaped	< 0.005	0.004	0.004	-5.645
DUP080702A[MSD]	08/07/02	2.5	< 0.005	"	< 0.005	0.004		
600ASB01[4]MSD	08/07/02	4	**0.42**	"				
600ASB02[2]	08/01/02	2	0.005	Landscaped	0.005	0.005	0.005	-5.298
600ASB02[4]	08/01/02	4	< 0.005	"				
600ASB03[2.0]	08/01/02	2	< 0.005	Excavated				
600ASB03[5.0]	08/01/02	5	0.024	Excavated				
600ASB04[2]	08/01/02	2	< 0.005	Landscaped	< 0.005	0.004	0.004	-5.645
600ASB04[5]	08/01/02	5	0.023	"				
600ASB05[2]	08/01/02	2	< 0.005	Capped				
600ASB05[5]	08/01/02	5	< 0.005	"				
600ASB06[2]	08/01/02	2	0.014	Capped				
600ASB06[5]	08/01/02	5	0.007	"				
600ASB07[2.0]	01/17/03	2	**0.2**	Excavated				
600ASB07[5.5]	01/17/03	5.5	< 0.0038	Unexcavated				
600ASB07[10.0]	01/17/03	10	< 0.0039	Unexcavated				
600ASB08[2.0]	01/17/03	2	0.03	Excavated				
600ASB08[5.5]	01/17/03	5.5	0.048	Excavated				
DUP011703C	01/17/03	6	< 0.0038	"				
600ASB08[7.0]	01/17/03	7	0.0054 J	Excavated				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
600ASB09[2.0]	01/16/03	2	**0.1**	Excavated[2]	0.1	0.1	0.1	-2.303
600ASB09[7.0]	01/16/03	7	0.057	Excavated[2]				
DUP011603C	01/16/03	7.5	< 0.0039	"				
600ASB09[10.0][MSD]	01/16/03	10	< 0.0049	Excavated[2]				
600CSB01[2]	07/31/02	2	< 0.005	Capped				
600CSB01[5]	07/31/02	5	< 0.005	"				
600CSB02[2]	07/31/02	2	0.009	Capped				
600CSB02[4.0]	07/31/02	4	0.011	"				
600CSB03[2.0]	07/29/02	2	< 0.005	Capped				
600CSB03[5.0]	07/29/02	5	< 0.005 UJ	"				
600CSB04[2.0]	07/29/02	2	< 0.005	Capped				
600CSB04[5.0]	07/29/02	5	< 0.05	"				
600CSB05[2.0]	01/13/03	2	0.0041 J	Capped				
600CSB05[8.0]	01/13/03	8	0.0041 J	"				
600CSB05[10.0]	01/13/03	10	0.0042 J	"				
600CSB06[2.0]	01/13/03	2	**0.34**	Capped				
600CSB06[5.0]	01/13/03	5	0.0041 J	Unexcavated				
600CSB06[10.0]	01/13/03	10	0.0066 J	Unexcavated				
600CSB07[2.0]	01/13/03	2	0.035	Capped				
600CSB07[5.5]	01/13/03	5.5	0.0041 J	Unexcavated				
600CSB07[10.0]	01/13/03	10	0.0047 J	Unexcavated				
600FDSSB01[2.0]	08/01/02	2	< 0.05	Excavated				
600FDSSB01[3.5]	08/01/02	3.5	**0.065 J-**	Excavated				
600FDSSB02[2.0]	01/15/03	2	< 0.0035 UJ	Excavated				
600FDSSB02[5.5]	01/15/03	5.5	**0.08**	Excavated				
600FDSSB02[10.0]	01/15/03	10	< 0.004	Excavated				
600RRSB01[2.0]	08/05/02	2	0.016	CERCLA				
DUP080502B	08/05/02	2.5	< 0.02	"				
600RRSB01[5.5]	08/05/02	5.5	< 0.005	"				
600RRSB02[2.0]	08/05/02	2	**0.084**	CERCLA				
600RRSB02[5.0]	08/05/02	5	< 0.005	"				
600RRSB03[2.0]	08/05/02	2	**0.37**	CERCLA				
600RRSB03[5.0]	08/05/02	5	0.017	"				
600RRSB04[2]MSD	08/07/02	2	**0.091**	Excavated				
600RRSB04[4]MSD	08/07/02	4	0.061	Excavated				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
600RRSB05[2.0]	01/16/03	2	< 0.0041	CERCLA				
600RRSB05[6.0]	01/16/03	6	< 0.0039	"				
600RRSB05[10.0]	01/16/03	10	0.031	"				
600RRSB06[2.0]	01/21/03	2	**0.067**	Excavated				
600RRSB06[5.5]	01/21/03	5.5	0.061 J-	Excavated				
DUP012103D	01/21/03	6	0.01	"				
600RRSB06[10.0]	01/21/03	10	0.0062 J	Excavated				
600RRSB07[2.0]	01/22/03	2	0.046	Excavated				
600RRSB07[7.0]	01/22/03	7	< 0.0039	Excavated				
600RRSB07[9.5]	01/22/03	9.5	**0.12**	Excavated				
600RRSB08[2.0]	01/21/03	2	**0.3**	Excavated				
600RRSB08[5.5]	01/21/03	5.5	0.0084	Unexcavated				
DUP012103B	01/21/03	6	0.0082	"				
600RRSB08[10.0]	01/21/03	10	0.012	Unexcavated				
600RRSB09[2.0]	01/22/03	2	**0.24 J-**	Excavated				
600RRSB09[7.5][MSD]	01/22/03	7.5	< 0.0038	Excavated				
600RRSB09[9.5]	01/22/03	9.5	**0.078**	Excavated				
600SDSB01[2.0]	08/06/02	2	< 0.2	Excavated				
600SDSB01[5.0]	08/06/02	5	< 0.005	Unexcavated				
600SDSB02[2.0]	08/01/02	2	< 0.06	Excavated				
600SDSB02[5.0]	08/01/02	5	0.007	Excavated				
600SDSB03[2.0]	08/06/02	2	< 0.005	Capped				
600SDSB03[5.5]	08/06/02	5.5	< 0.005	"				
600SDSB04[2.0]	08/06/02	2	< 0.005 UJ	Capped				
DUP080602B	08/06/02	2.5	< 0.005	"				
600SDSB04[5.0]	08/06/02	5	< 0.005	"				
600SDSB05[2]	08/07/02	2	< 0.005	Landscaped	< 0.005	0.004	0.004	-5.645
600SDSB05[5]	08/07/02	5	< 0.005	"				
LTTDSB01[2.5]	07/29/02	2.5	< 0.005	CERCLA				
LTTDSB01[5.0]	07/29/02	5	0.05	"				
LTTDSB02[2.0]	07/29/02	2	0.035 J-	CERCLA				
LTTDSB02[5.0]	07/29/02	5	< 0.005 UJ	"				
LTTDSB03[2.0]	07/29/02	2	0.006 J-	Capped				
LTTDSB03[5.0]	07/29/02	5	< 0.005 UJ	"				
LTTDSB04[2.0]	07/29/02	2	< 0.005	Capped				
LTTDSB04[5.0]	07/29/02	5	< 0.005 UJ	"				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
LTTDSB05[2.0]	07/29/02	2	< 0.02	Capped				
LTTDSB05[5.0]	07/29/02	5	< 0.005	"				
LTTDSB06[2.0]	07/29/02	2	< 0.005	Capped				
LTTDSB06[4.5]	07/29/02	4.5	< 0.005	"				
LTTDSB07[2.0]	01/13/03	2	0.006 J	CERCLA				
LTTDSB07[7.5]	01/13/03	7.5	0.013	"				
LTTDSB07[10.0]	01/13/03	10	0.0071 J	"				
LTTDSB08[3.0]	01/13/03	3	0.0048 J	CERCLA				
LTTDSB08[5.5]	01/13/03	5.5	0.0045 J	"				
DUP011303B	01/13/03	6	0.004 J	"				
LTTDSB08[10.0]	01/13/03	10	0.0047 J	"				
LTTDSB09[2.5]	01/13/03	2.5	0.021	CERCLA				
LTTDSB09[5.5]	01/13/03	5.5	0.0083	"				
LTTDSB09[10.0]	01/13/03	10	0.0066 J	"				
LTTDSB10[2.5]	01/13/03	2.5	0.0041 J	Capped				
DUP011303A	01/13/03	3	0.004 J	"				
LTTDSB10[5.5]	01/13/03	5.5	< 0.0038	"				
LTTDSB10[10.0]	01/13/03	10	< 0.0041	"				
600SB101[2]	08/06/02	2	**0.43**	Excavated				
DUP080602A	08/06/02	2.5	0.011	"				
600SB101[4]	08/06/02	4	< 0.005	Excavated				
600SB102[2]	08/06/02	2	**0.16 J+**	CERCLA				
600SB102[4]	08/06/02	4	< 0.005	"				
600SB103[2]	08/05/02	2	< 0.005	CERCLA				
600SB103[4]	08/05/02	4	< 0.005	"				
DUP080502D	08/05/02	4	< 0.005	"				
600SB104[2]	08/06/02	2	< 0.005	CERCLA				
600SB104[4]	08/06/02	4	< 0.005	"				
600SB105[2]	08/05/02	2	< 0.005	Outside				
600SB105[4]	08/05/02	4	< 0.005	"				
DUP080502A	08/05/02	4.5	< 0.005	"				
600SB106[2]	08/05/02	2	0.044	Outside				
600SB106[4]	08/05/02	4	< 0.005	"				
600SB107[2]	08/02/02	2	0.014	Outside				
600SB107[4]	08/02/02	4	0.06	"				

Table F-1
Calculation of 95% Upper Confidence Limit for Benzo(a)Pyrene Soil Sampling Data
Commissary/PX Study Area
Presidio of San Francisco, California

Sample Name	Sample Date	Sample Depth (feet)	Benzo(a) Pyrene (mg/kg)	Post-remediation Status (Alternative 4)	Retained Data Points (x)[1]	Converted Detection Limits	Averaged Duplicates	Ln(x)
Cleanup Level (Human Health Recreational)			**0.065**					
600SB108[2]	08/02/02	2	0.007	Outside				
600SB108[4]	08/02/02	4	< 0.005	"				
600SB109[2]	08/05/02	2	< 0.005	Outside				
600SB109[4]	08/05/02	4	< 0.005	"				

<u>Calculation of 95% UCL, per SW-846 (EPA, 1986)</u>

Assumed Data Distribution - from histogram	Lognormal
Sum, E(x)	-49.19
Number, n	10
Mean, x = E(x) / n	-4.92
Standard Deviation, s	1.034
Degrees of freedom, df = n - 1	9
H statistic (95%) - from table of H values (Land, 1975)	4.233
95% Upper Confidence Limit, 95% UCL = $\exp\{mean(x)+(s^2/2)+[H*s/(n-1)^{1/2}]\}$	**0.054**
Cleanup Level, CL	**0.065**

References
U.S. Environmental Protection Agency, 1986. *Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, SW-846, Revision 0.* September.
Land, C.E., 1975. *Tables of Confidence Limits for Linear Functions of the Normal Mean and Variance, Selected Tables in Mathematics and Statistics,* Vol. III, American Mathematical Society.

Notes
mg/kg - milligrams per kilogram
DUP prefix indicates blind duplicate sample; parent sample precedes duplicate sample.
MSD indicates to the laboratory which samples were to be used for the MSD quality control sample analyses. These are not matrix spike results.
Values in **bold** typeface indicate cleanup level exceedances.
CERCLA - Sampling location is in an area to be addressed under the CERCLA program.
Excavated - Sampling locations is in an impacted area and will be excavated as part of Alternative 4.
Unexcavated - Sampling locations is in an impacted area but is at a depth that will not be excavated.
Capped - Sampling location is in an area that will not be excavated, but will remain capped as part of Alternative 4.
Landscaped - Sampling location is in an area that will not be excavated and will not be capped as part of Alternative 4.
Outside - Sampling location is outside of the Commissary/PX Study Area.
Green shading indicates boring is located in a landscaped area. Gray shading indicates boring is in a capped area (building or pavement). Yellow highlighting indicates locations where the benzo(a)pyrene concentration exceeds the cleanup level but will not be excavated under Alternative 4.
[1] Shallow (0-3 ft bgs) unexcavated samples in uncapped areas are retained for the 95% UCL analysis.
[2] Soil around boring 600ASB09 will not be excavated, assuming the area is not cleaned up to saltwater protection levels for the Crissy Field Marsh.

APPENDIX G
Evaluation of TPH Dilution Attenuation and Retardation Factors

APPENDIX G
Evaluation of TPH Dilution Attenuation and Retardation Factors
Commissary/PX Study Area
Presidio of San Francisco, California

Soil and groundwater analytical data were collected in the vicinity of the Commissary Seeps prior to the Interim Source Removal Action to evaluate Dilution Attenuation Factors (DAFs) and retardation factors (Rs) (Treadwell & Rollo, 2002a). DAFs indicate the reduction in groundwater concentration that occurs through attenuation as a contaminant migrates downgradient. The retardation factors indicate the general reduction in velocity that a sorbing compound undergoes versus the prevailing groundwater flow velocity. The empirical estimation of these parameters can be affected by a number of factors including stratigraphic heterogeneity, anisotropic groundwater flow paths, and sampling and laboratory analyses. Treadwell & Rollo, Inc. (Treadwell & Rollo) reviewed the DAF evaluation performed as part of the Commissary Seeps Interim Removal Action and documented in Appendix J of the *Draft Commissary Seeps Interim Source Removal Action Report* (Treadwell & Rollo, 2002a) to assess whether the DAFs and Rs estimated support the Trust's current proposed Phase 1 and Phase 2 Corrective Action Plan (CAP) implementation approach.

As outlined below, the DAF and retardation factors estimated support the Phase 1 and 2 CAP approach as total petroleum hydrocarbons (TPH) in the Phase 2 Area soil and in groundwater would not migrate to the Crissy Field Marsh at detectable levels, prior to Phase 2 implementation in 2008. Because detectable levels would not be attained within a 150-foot or more distance from the source area by 2008, impacts to water quality within the Crissy Field Marsh from TPH in soil and groundwater within the Phase 2 Area are not expected to occur prior to Phase 2 implementation. Additionally, these estimates do not account for TPH degradation that is likely occurring.

The DAF for a given contaminant is calculated by taking the ratio of the contaminant concentration near the presumed source and the contaminant concentration at a sampling point located near the downgradient edge of the impacted area. If the value of the DAF is less than 1.0, it indicates that the upgradient sampling point is not located near the source area. DAFs were calculated along two lines of points oriented north south and trending through the Commissary Seeps Interim Removal Action impacted soil (Treadwell & Rollo, 2002a). Some DAFs for TPH as gasoline (TPHg) and TPH as diesel (TPHd) were less than or equal to 1.0 indicating that the upgradient sampling point was not located in the source area. The DAF values > 1.0 estimated for TPHg range from 6.7 to 9.6 and for TPHd range from 1.1 to 18.2. The DAFs estimated for TPH as fuel oil (TPHfo) were less than or equal to 1.0 because TPHfo was not detected in groundwater at three sampling locations. The DAFs were estimated based on a 30-foot transport pathway; thus, the TPH concentration would be reduced by the DAF every 30 feet. Given a 150 foot transport pathway from the Phase 2 Area to the marsh and the above TPHg and TPHd DAFs, a TPH concentration of up to 2,000 µg/L would be attenuated to less than 1 µg/L before reaching the marsh (Section G.1). The TPH concentrations in groundwater at the Commissary/PX have generally been less than 500 µg/L.

The Rs for TPHg, TPHd, and TPHfo were estimated using compound partitioning coefficients and pairs of soil and groundwater concentration data. The average calculated R values for TPHg, TPHd, and TPHfo are 10.6, 62.2, and 354, respectively. To assess whether the Rs indicate migration to the marsh from the Phase 2 Area is possible, a groundwater seepage velocity was estimated as were the times for a given TPH concentration to travel the 150-foot buffer zone between the proposed Phase 2 CAP area and the marsh (Section G.2). The TPH velocity would be equal to the groundwater velocity divided by the R value. If the average groundwater velocity is 450 feet/year as estimated using site-specific data, then TPHg, TPHd, and TPHfo from the Phase 2 Area would travel 150 feet to the marsh in approximately 3.5, 20, and 118 years.

The DAF and R calculations are presented in the following sections.

G.1 TPH Dilution Attenuation Estimate

DAFs estimated for TPHg and TPHd at the Commissary Seeps (Treadwell & Rollo, 2002) had the following ranges.

DAF_{TPHg}	6.7	-	9.6
DAF_{TPHd}	5.7	-	18.2

Because the DAFs were estimated based on a 30-foot transport pathway, the DAFs have been applied in 30-foot increments or the assumed concentration is reduced by the DAF every 30 feet. The range of estimated DAFs greater than 1.0 and an arbitrary TPH contaminant concentration of 2,000 µg/L were used. TPH concentrations detected in groundwater the Commissary/PX Study Area generally have not approached this level.

Transport Distance (feet)		0	30	60	90	120	150
DAFs		**Estimated TPH Concentrations (µg/L)**					
TPHg	6.7	2,000	298.5	44.6	6.7	0.99	0.15
	9.6	2,000	208.3	21.7	2.3	0.24	0.02
TPHd	5.7	2,000	350.9	61.6	10.8	1.9	0.33
	18.2	2,000	109.9	6.04	0.33	0.02	0.00

The highest TPHg concentration in groundwater at Commissary/PX in the Fourth Quarter 2004 was 460 µg/L. This assessment indicates that even if concentrations in groundwater were on the order of 2,000 µg/L at the Phase 2 boundary, detectable levels of TPH would not reach the marsh.

G.2 TPH Retardation Estimate

The average estimated Rs for TPHg, TPHd, and TPHfo at the Commissary Seeps are indicated below (Treadwell & Rollo, 2002a).

R_{TPHg}	10.6
R_{TPHd}	62.2
R_{TPHfo}	354

Seepage Velocity Calculation

$v = Ki/n$

v = seepage velocity
(Freeze and Cherry, 1979)

K= effective hydraulic conductivity
(Source: Treadwell & Rollo, 2003c)

i = hydraulic gradient
(Treadwell & Rollo, 2005)

n = effective porosity
(Treadwell & Rollo, 2003c)

$$v = \frac{(0.0173 \text{ cm/s} * 1 \text{ in}/2.54 \text{ cm} * 1 \text{ ft}/12 \text{ in} * 31{,}536{,}000 \text{ s/yr})\ (0.011 \text{ ft/ft})}{0.437}$$

$$v = \frac{(17{,}894 \text{ ft/yr})\ (0.011 \text{ ft/ft})}{0.437}$$

$v = 450$ ft/yr

Time required for groundwater to travel 150 feet

T_g = distance/v
= 150 ft/450 ft/yr
= 0.33 yr

Time required for TPH in groundwater to travel 150 feet

$v_c = v/R$
(Drever, 1982)

v_c = velocity of contaminant at plume mid-point
v = groundwater seepage velocity
R = retardation factor
T = time of transport
D = distance of 150 feet

T_{TPHg} = distance/v_c
= 150 ft/ (v/R_{TPHg})
= 150 ft/ (450/10.6)
= 150 ft/42.45 ft/yr
= 3.5 yr

T_{TPHd} = distance/v_c
= 150 ft/ (v/R_{TPHd})
= 150 ft/ (450/62.2)
= 150 ft/7.23 ft/yr
= 21 yr

T_{TPHfo} = distance/v_c
= 150 ft/ (v/R_{TPHfo})
= 150 ft/ (450/354)
= 150 ft/1.27 ft/yr
= 118 yr

These calculations indicate that it would take 3.5 to over 100 years for TPH to reach the marsh.

Assumptions

- Seepage velocity is assumed for linear flow only.
- Hydraulic conductivity and effective porosity used in the calculation of the groundwater velocity was taken from the *Draft Site Investigation Report, Commissary/PX Study Area* (Treadwell & Rollo, 2003c) Table B-1 Geotechnical Parameters. Results for sample 600SBS102[5.0] were used because it is a sand and has bulk density and porosity values similar to the ones measured for the Commissary Seeps DAF and retardation calculations (*Draft Commissary Seeps Interim Source Removal Action Report* Table 4).
- The hydraulic gradients were reported in the *Draft Semi-Annual Groundwater Monitoring Report, First and Second Quarters 2004 and Third and Fourth Quarters 2004*. (Treadwell & Rollo, 2005) The values reported for 2004 ranged between 0.011 ft/ft and 0.017 ft/ft. The hydraulic gradient (i) value used in groundwater seepage velocity calculations (0.011 ft/ft) is the steepest gradient which will give the most conservative number (fastest flow).

G.3 References

Drever, James I., 1982. *The Geochemistry of Natural Waters*, Prentice-Hall, Inc.

Freeze, R. Allan; Cherry, John A., 1979. *Groundwater*, Prentice-Hall, Inc.

Treadwell & Rollo, Inc. (Treadwell & Rollo), 2002a. *Draft Commissary Seeps Interim Source Removal Action Report*. January.

Treadwell & Rollo, 2003c. *Draft Site Investigation Report, Commissary/PX Study Area* . August.

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