GROUP 7 – NORTHERN PORTION OF AREA IV
RCRA FACILITY INVESTIGATION REPORT
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

VOLUME II – RFI SITE REPORTS

APPENDIX C

RADIOACTIVE MATERIALS HANDLING FACILITY RFI SITE (SWMU 7.6 AND AREA IV AOC)

Prepared For:

THE UNITED STATES DEPARTMENT OF ENERGY

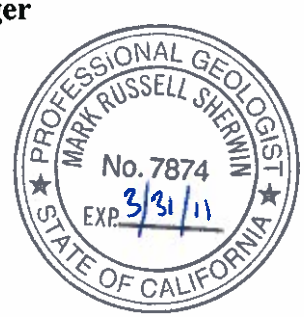
Prepared By:

MWH
618 Michillinda Avenue, Suite 200
Arcadia, CA 91007

June 2009

Meghann Chell
RFI Site Manager

Jose Toledo
RFI Group 7 Report Manager



Mark Sherwin, P.G. 7874
RFI Senior Technical Lead

MWH

APPENDIX C
TABLE OF CONTENTS

Section No. **Page No.**

C.1 INTRODUCTION..... C.1-1
C.1.1 Report Organization.....C.1-3
C.1.2 Historical Reference Documents.....C.1-4

C.2 SITE HISTORY, CHEMICAL USE AND EXISTING CONDITIONS... C.2-1
C.2.1 SWMUs and AOCs at the RMHF RFI Site.....C.2-2
C.2.2 RMHF RFI Site History.....C.2-7
C.2.3 RMHF RFI Site Chemical Use Areas.....C.2-16
C.2.4 Site Conditions.....C.2-17

C.3 NATURE AND EXTENT OF CHEMICAL IMPACTS..... C.3-1
C.3.1 Sampling Objectives.....C.3-1
C.3.2 Sampling Scope.....C.3-2
C.3.3 Key Decision Points.....C.3-3
C.3.4 Soil Matrix and Soil Vapor Findings.....C.3-5
C.3.4.1 Soil Data Presentation.....C.3-6
C.3.4.2 Soil Data Summary.....C.3-7
C.3.5 Groundwater Findings.....C.3-12
C.3.5.1 Groundwater Data Presentation.....C.3-12
C.3.5.2 Groundwater Data Summary.....C.3-13
C.3.6 Surface Water Findings.....C.3-14

C.4 RISK ASSESSMENT FINDINGS SUMMARY..... C.4-1
C.4.1 Key Decision Points.....C.4-1
C.4.2 Human Health Risk Assessment Findings.....C.4-2
C.4.3 Ecological Risk Assessment Findings.....C.4-3

C.5 RMHF RFI SITE ACTION RECOMMENDATIONS..... C.5-1
C.5.1 RFI Reporting Requirements.....C.5-1
C.5.2 Basis for Site Action Recommendations.....C.5-2
C.5.3 RMHF RFI Site Recommendations.....C.5-5

C.6 REFERENCES..... C.6-1

LIST OF TABLES

Table No. (All Electronic Copies)

C.2-1 RMHF RFI Site Building Inventory
C.2-2 RMHF RFI Site Tank Inventory
C.2-3 RMHF RFI Site Transformer Inventory
C.2-4 RMHF RFI Site Other Features Inventory
C.2-5 RMHF RFI Site Chemicals Used
C.2-6 RMHF RFI Site Spills Inventory

C.3-1A RMHF RFI Site Sampling Summary
C.3-1B RMHF RFI Site Soil Vapor Sampling and Analytical Summary
C.3-1C RMHF RFI Site Soil Matrix Sampling and Analytical Summary
C.3-1D RMHF RFI Site Surface Water Sampling and Analytical Summary
C.3-2A RMHF RFI Site Description of Chemical Use Areas and Soil Sampling Results Summary
C.3-2B RMHF RFI Site Summary and Evaluation of Groundwater Sampling Results
C.3-3A RMHF RFI Site Analytical Data Screening Summary and Data Quality (Soil)
C.3-3B RMHF RFI Site Analytical Data Screening Summary and Data Quality (Soil Vapor)
C.3-3C RMHF RFI Site Analytical Data Screening Summary and Data Quality (Surface Water)

C.4-1 Chemicals of Potential Concern for Human Health
C.4-2 Human Health Risk Estimates Summary
C.4-3 Human Health Risk Assessment Uncertainty Analysis
C.4-4 Summary of Chemicals of Potential Ecological Concern
C.4-5 Ecological Hazard Estimate Summary
C.4-6 Ecological Risk Assessment Uncertainty Analysis

C.5-1 RMHF RFI Site Surficial Media Site Action Recommendations
C.5-2 Summary of RMHF RFI Site Surficial Media CMS Recommendations

LIST OF FIGURES

Figure No. (All Electronic Copies)

C.1-1 Site Location Map
C.2-1A Chemical Use Areas
C.2-1B Plot Plan
C.2-2 Sample and Trench Locations
C.2-3 Surficial Cross Sections A-A' and B-B'
C.2-4 Soil Disturbance Areas
C.3-1A VOCs Chemical Data Results – East Area
C.3-1B VOCs Chemical Data Results – West Area
C.3-1C VOCs Chemical Data Results – North Area
C.3-1D VOCs Chemical Data Results – South Area
C.3-2A SVOCs Chemical Data Results – East Area
C.3-2B SVOCs Chemical Data Results – West Area
C.3-2C SVOCs Chemical Data Results – North Area
C.3-2D SVOCs Chemical Data Results – South Area
C.3-3A TPH Chemical Data Results – East Area
C.3-3B TPH Chemical Data Results – West Area
C.3-3C TPH Chemical Data Results – South Area
C.3-4A Other Organics Chemical Data Results – East Area
C.3-4B Other Organics Chemical Data Results – West Area
C.3-5 Dioxins Chemical Data Results
C.3-6A Metals / pH / Inorganics Chemical Data Results – East Area
C.3-6B Metals / pH / Inorganics Chemical Data Results – West Area
C.3-6C Metals / pH / Inorganics Chemical Data Results – Mixed Waste Storage Yard and Building 4621 Area
C.3-6D Metals / pH / Inorganics Chemical Data Results – North Area
C.3-6E Metals / pH / Inorganics Chemical Data Results – RMHF Catch Basin Area
C.3-6F Metals / pH / Inorganics Chemical Data Results – South Area
C.4-1 Human Health Risk Assessment Conceptual Site Model
C.4-2 Ecological Risk Assessment Conceptual Site Model
C.5-1 Surficial Media Site Action Recommendations

LIST OF ATTACHMENTS

Attachment No. (All Electronic Copies)

C-1 Regulatory Agency Correspondence

C-2 Subsurface Information

C-3 Data Quality, Validation and Laboratory Reports

C-4 Building Evaluation Documentation Logs

LIST OF ACRONYMS AND ABBREVIATIONS

AI	Atomics International
AOC	Area of Concern
AST	aboveground storage tank
BBC	Brandeis-Bardin Campus
bgs	below ground surface
BMP	best management practice
Boeing	The Boeing Company
BRS	biennial reporting system
CCR	Current Conditions Report
CFOU	Chatsworth Formation Operable Unit
CMS	Corrective Measures Study
COPC	contaminant of potential concern
CPEC	chemicals of potential ecological concern
CUA	chemical use area
D&D	decontamination and decommissioning
DCGL	derived concentration guideline level
DOSH	Department of Occupational Safety and Health
DHS	Department of Health Services
Dioxins/Furans	(a) - *see table below*
DOE	Department of Energy
DPH	Department of Public Health
DTSC	Department of Toxic Substances Control
E&E	Ecology and Environment, Inc.
EBR	experimental breeder reactor
ECL	Environmental Chemistry Laboratory
EcoRBSL	ecological risk-based screening level
EPC	exposure point concentration
ERA	ecological risk assessment
ETEC	Energy Technology Engineering Center
H&A	Haley and Aldrich
HEPA	high-efficiency particulate air

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

HI	hazard index
HQ	hazard quotient
HRA	human health risk assessment
HSA	Historical Site Assessment
HWMF	Hazardous Waste Management Facility
ICF	ICF Kaiser Engineers
ILCR	incremental lifetime cancer risk
ISF	Interim Storage Facility
LMFBR	Liquid Metal Fast Breeder Reactor
LMEC	Liquid Metal Engineering Center
LSA	low specific activity
mg/kg	milligrams per kilogram
MRCA	Mountains Recreation and Conservation Authority
mrem/yr	millirems per year
msl	mean sea level
MWH	Montgomery Watson Harza
NFA	no further action
NPDES	National Pollutant Discharge Elimination System
NSGW	near-surface groundwater
Ogden	Ogden Environmental and Energy Services Company, Inc.
OMRE	Organic Moderated Reactor Experiment
ORISE	Oak Ridge Institute for Science and Education
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
pCi/g	picocuries per gram
pg/g	picograms per gram
ppm	part per million
QA	quality assurance
RBSL	risk-based screening level

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

RCRA	Resource Conservation and Recovery Act
ResRBSL	residential risk-based screening level
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RME	Reasonable Maximum Exposure
RMDF	Radioactive Materials Disposal Facility
RMHF	Radioactive Materials Handling Facility
Rocketdyne	Rocketdyne Propulsion and Power
Rockwell	Rockwell International
SAIC	Science Applications International Corporation
Sapere	Sapere Consulting, Inc.
SEFOR	Southwest Experimental Fast Oxide Reactor
SNAP	Systems for Nuclear Auxiliary Power
SGR	Sodium Graphite Reactor
SRAM	Standardized Risk Assessment Methodology Work Plan
SRE	Sodium Reactor Experiment
SSFL	Santa Susana Field Laboratory
STIR	Shield Test Irradiation Reactor
STR	Shield Test Reactor
Surficial OU	Surficial Media Operable Unit
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TEDE	total effective dose equivalent
TEQ	Toxic Equivalent
TIC	tentatively identified compound
TPH	total petroleum hydrocarbons
TRU	transuranic
USEPA	United States Environmental Protection Agency
UST	underground storage tank
µg/dL	micrograms per deciliter
µg/kg	micrograms per kilogram

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

µg/L_v	micrograms per liter vapor
VCEHD	Ventura County Environmental Health Division
VOC	volatile organic compound
VSI	visual site inspection
WP	work plan
WPA	RFI Work Plan Addendum
WPAA	RFI Work Plan Addendum Amendment

(a) Definition of dioxin/furan congeners

PCDD/PCDFs	polychlorinated dibenzo-p-dioxins/dibenzofurans
2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
1,2,3,7,8-PeCDD	1,2,3,7,8-pentachlorodibenzo-p-dioxin
1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-hexachlorodibenzo-p-dioxin
1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-hexachlorodibenzo-p-dioxin
1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin
OCDD	1,2,3,4,6,7,8,9-octachlorodibenzo-p-dioxin
2,3,7,8-TCDF	2,3,7,8-tetrachlorodibenzofuran
1,2,3,7,8-PeCDF	1,2,3,7,8-pentachlorodibenzofuran
2,3,4,7,8-PeCDF	2,3,4,7,8-pentachlorodibenzofuran
1,2,3,4,7,8-HxCDF	1,2,3,4,7,8-hexachlorodibenzofuran
1,2,3,6,7,8-HxCDF	1,2,3,6,7,8-hexachlorodibenzofuran
2,3,4,6,7,8-HxCDF	2,3,4,6,7,8-hexachlorodibenzofuran
1,2,3,7,8,9-HxCDF	1,2,3,7,8,9-hexachlorodibenzofuran
1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-heptachlorodibenzofuran
1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8,9-heptachlorodibenzofuran
OCDF	1,2,3,4,6,7,8,9-octachlorodibenzofuran
TEQ	Toxic Equivalent (normalized to 2,3,7,8-TCDD)

C.1 INTRODUCTION

This appendix to the Group 7 Resource Conservation Recovery Act (RCRA) Facility Investigation (RFI) Report presents a site report detailing the findings and recommendations based on the results of the investigation of Radioactive Materials Handling Facility (RMHF) RFI Site at the Santa Susana Field Laboratory (SSFL). The RMHF RFI Site is comprised of the RMHF Area (Solid Waste Management Unit [SWMU] 7.6) and the Building 4021 Leach Field (Area IV Area of Concern [AOC]). The RCRA Corrective Action Program at the SSFL is being conducted under the oversight of the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC).

The RMHF RFI Site is one of three RFI sites included in the Group 7 RFI Report. The location of the RMHF RFI Site within the SSFL and Group 7 Reporting Area is shown on Figure C.1-1. An RFI site is defined to comprise SWMUs and AOCs, and includes all associated operational areas where site activities were conducted. In addition, surrounding areas are investigated as needed to evaluate potential chemical impacts from peripheral activities or migration. The other two Group 7 RFI sites are the Building 4029 Reactive Metals Storage Yard (SWMU 7.11) and the Building 4133 Sodium Burn Facility (SWMU 7.2).

The RMHF RFI Site is located in the northern central portion of Area IV, adjacent to the SSFL Area IV property boundary, west of the Building 4133 RFI Site (Figure C.1-1).

The RMHF RFI Site was operated by the Energy Technology and Engineering Center (ETEC) business unit of the Atomics International (AI) division of Rockwell International (predecessor companies of The Boeing Company [Boeing]), on behalf of the Department of Energy (DOE). Prior to 1978, ETEC was known as the Liquid Metal Engineering Center (LMEC).

The SSFL RFI is being conducted to characterize the presence of SSFL operation-related chemicals in environmental media. Results of this investigation will be used to estimate risks to human health and the environment (i.e., the ecosystem), gather data for the next phase of RCRA Corrective Action, the Corrective Measures Study (CMS), and identify areas for further work.

The SSFL has been divided into two operable units (OUs): the Surficial Media Operable Unit (Surficial OU) and the Chatsworth Formation Operable Unit (CFOU). The RMHF RFI Site characterization presented in this site report comprises data for both the Surficial OU and CFOU. The Surficial OU includes soil, sediment, surface water, air, biota, and near-surface groundwater (NSGW) at the SSFL. NSGW is defined as groundwater occurring within alluvium or weathered bedrock of the Chatsworth formation. Vadose zone bedrock and deeper groundwater that occurs within unweathered Chatsworth formation bedrock is defined as the CFOU.

DOE SWMUs and AOCs at the SSFL identified as having potential radioactive contamination are addressed by DOE site closure programs under RCRA permits. Any potential chemical contamination within the permitted units is also addressed under the closure programs. Potential chemical contamination outside these permitted facilities is addressed by the RFI under DTSC oversight.

Typically, RFI fieldwork and reporting at radiological facilities is conducted after DOE has investigated and released the facilities for unrestricted use. However, since May 24, 2007, Decontamination and Decommissioning (D&D) activities in Area IV have been on hold. Due to the delay in radiological closure programs, the RFI fieldwork at the RMHF was conducted prior to the D&D of radiological facilities and DOE release for unrestricted use to allow for timely reporting of potential impacts for the RFI. On February 12, 2008, DOE submitted a letter to DTSC describing DOE's intention to perform RFI chemical sampling at RMHF prior to closure plan investigation, RMHF D&D activities, and the site's release for unrestricted use (Boeing, 2008a). In a letter dated February 15, 2008, DTSC responded that DOE should continue with the RMHF RFI sampling and report preparation to avoid unnecessary delay in RFI completion (DTSC, 2008). Closure plan samples collected as part of the RFI for the RMHF RFI site are noted on tables presented in this report, and results from these samples included for description of nature and extent and risk assessment evaluations.

C.1.1 Report Organization

This RMHF RFI Site report provides detailed sampling data and evaluation pertaining to the RMHF RFI Site, which includes the relevant information needed to evaluate the completeness of characterization, risk assessment results, and site recommendations based on the receptors evaluated based on the receptors evaluated. This information is presented in sections organized as follows:

- **Section C.2 – Site History, Chemical Use, and Current Conditions.** Presents the site history and chemical use, and the current conditions including geology and groundwater conditions.
- **Section C.3 – Nature and Extent of Chemical Impacts.** Presents a summary of Surficial OU, NSGW, and CFOU characterization information for the RMHF RFI Site.
- **Section C.4 – Risk Assessment Findings Summary**. Presents a summary of the human health risk assessment (HRA) and ecological risk assessment (ERA) results; the complete RMHF RFI Risk Assessment is included in Appendix E, Attachment E-3.
- **Section C.5 – Site Actions Recommendations**. Presents a summary of chemical use areas recommended for no further action (NFA), further characterization in the CMS, and areas identified for stabilization to prevent chemical contaminant migration.
- **Section C.6 – References.** Presents the references cited in this site report.

Site-specific additional information is provided in the following attachments:

- **Attachment C-1**: Site-specific regulatory agency documents and correspondence.
- **Attachment C-2**: Subsurface information (soil borings, trench, piezometer, and well logs).
- **Attachment C-3**: Data quality, validation, and laboratory reports.
- **Attachment C-4:** Building Evaluation Documentation Logs. Includes documentation (maps, logs, and photos) for building features as outlined in the Standard Operating Procedure: Building Features Evaluation and Sampling (MWH/CH2M Hill, 2008b).

Information regarding characterization for the RMHF RFI Site is provided in the following figures and tables:

- **Figure C.1-1**: Presents the location of the RMHF RFI Site within the SSFL and the Group 7 Reporting area.
- **Figure C.2-1A through C.2-1B**: Present views of the RMHF RFI Site, showing known and potential chemical use areas. Tables C.2-1 through C.2-6 present

summaries of buildings, tanks, transformers, other features, chemicals used, and spills at the RMHF RFI Site.

- **Figure C.2-2**: Present views of the RMHF RFI Site, showing soil and vapor sampling locations, and nearby monitoring wells.
- **Figure C.2-3A through C.2-3B**: Presents geologic cross-sections locations and geologic cross sections across the RMHF RFI Site.
- **Figure C.2-4:** Presents a plan view of the soil disturbance areas at the RMHF RFI Site.
- **Figures C.3-1A through C.3-6E**: Present characterization details for all soil and vapor sampling at the RMHF RFI Site. Soil and vapor sampling results are shown on the maps and correlate with appropriate sections of Table C.3-2A.
- **Table C.3-2A:** Presents a description of chemical use areas and a summary of soil and vapor sampling results.
- **Table C.3-2B**: Presents a summary of groundwater characterization.

Information regarding Group 7 area-wide conditions, transport and fate of chemicals between RFI sites, and other evaluations of area-wide issues are contained in the Group 7 RFI Report, and appendices. Pertinent appendices to this Group 7 RFI Report are:

- **Appendix D:** Presents information regarding groundwater conditions in the Group 7 reporting area, including the RMHF RFI Site. Information includes groundwater occurrence and quality, chemical transport, data set representativeness, and supporting data (monitoring results, time-series plots, and hydrographs), as well as an evaluation of naturally occurring constituents.
- **Appendix E:** Presents risk assessment information including a description of any methodology variances from the Standardized Risk Assessment Methodology (SRAM) Work Plan, risk calculations, result tables, and all transport and fate modeling (except groundwater).
- **Appendix F:** Presents the results of the waste debris survey activities performed in 2008 at the SSFL, which consisted of systematic visual inspections of the SSFL for surficial evidence of solid waste (MWH/CH2M Hill, 2008a).
- **Appendix G:** Presents the documentation (maps, logs, and photos) for sewer inspection, in which 2 out of the 2 manholes located in Group 7 were inspected to assess potential releases from the sewer lines.

C.1.2 Historical Reference Documents

Historical documents for the Group 7 Reporting Area are being submitted to DTSC along with this report (Boeing, 2009e). These documents represent a compilation of information from multiple sources that were searched to find SSFL documents relevant to the Group 7 RFI. Included in the document submittal are the available photographs, maps and drawings,

manifests, memoranda, tabulations, facility records, correspondence, and reports relevant to site operations and types and sources of chemicals that may have been used, handled, or released in the Group 7 Reporting Area. Documents pertaining to the entire SSFL are also included if they have relevant information also specific to Group 7. These documents were reviewed to: (1) assess history of site operations, (2) identify areas of known or potential chemical use for evaluation in the RFI, (3) compile site characterization data, and (4) identify areas where additional data were required to adequately characterize environmental site conditions. The results of the historical document review and sampling data collected relevant to the RMHF RFI Site are presented in this site report. This document review, coupled with the site characterization data, provides a solid basis for the recommendations provided in Section C.5 of this report, including areas that are recommended for further evaluation in the CMS and areas that are recommended for NFA.

It is worth noting that information presented in this RMHF RFI Site report is also supplemented by other environmental reports that contain information about site and facility background, Surficial OU Program background, and methodologies/procedures. Key historical documents are listed below with brief descriptions:

- RCRA Facility Assessment (RFA) (Science Applications International Corporation [SAIC], 1991; 1994):
  - A brief description of the SSFL facility, including an operational history, physical setting information, and regulatory programs and oversight during the late 1980s and early 1990s.
  - Visual inspection records performed at facility operations.
  - Definition and description of SWMUs and AOCs identified during the assessment.
- Current Conditions Report (CCR) (ICF Kaiser Engineers [ICF], 1993):
  - A general description of the SSFL facility, including an operational history, physical setting information, and regulatory programs and oversight during the late 1980s and early 1990s.
  - Descriptions of SWMUs and AOCs, including a presentation of results from environmental sampling performed to assess current conditions.
  - A draft work plan for further investigation during the RFI for selected SWMUs and AOCs.
- RFI Work Plan Addendum (WPA) (Ogden Environmental and Energy Services Company, Inc. [Ogden], 1996), and RFI Work Plan Addendum Amendments (WPAA) (Ogden 2000a; 2000b):

  - Sampling procedures and rationale.
  - RFI site descriptions and operational history.
  - Shallow groundwater characterization sampling and analysis plan for the SSFL.

- RFI Program Report (MWH, 2004a):
  - A general description of the SSFL facility, including an operational history, physical setting information, and regulatory programs and oversight.
  - A summary of the RCRA Corrective Action Program being conducted at the SSFL and a description of the OUs.
  - A comprehensive description of the Surficial OU field sampling program, including work plans followed, overall sampling scope, sampling methods and subcontractors used, and protocol followed.
  - Details of the analytical program for the Surficial OU RFI, including laboratories used, data validation findings, and Data Quality Assessment findings.
  - Programmatic key decision points or significant issues that influenced sampling, laboratory procedures, methodologies, or step-out requirements.
- Standardized Risk Assessment Methodology (SRAM) Work Plan, Revision 2 (MWH, 2005):
  - Procedures for completing HRAs and ERAs.
  - Background soil concentrations and groundwater comparison concentrations.
  - A biological conditions report for the SSFL.
- Building Feature Evaluation and Sampling Standard Operating Procedure (MWH/CH2M Hill, 2008b):
  - Procedure for evaluation of environmental conditions associated with existing building and other miscellaneous building support infrastructure.
  - Describes approach for building feature inspection and sampling activities.
- Historical Site Assessment of Area IV (HSA) (Sapere Consulting, Inc. [Sapere], 2005):
  - Facility descriptions and historical operational information for all buildings in Area IV.
  - Information regarding demolition activities, radiological surveys, releases, and removal actions conducted for radiological areas within Area IV.
- Near-Surface Groundwater Characterization Report (MWH, 2003):
  - Nature and extent of NSGW at the SSFL.
  - Distribution, transport, and fate of trichloroethene (TCE) and other chemicals of concern, and the relationship of NSGW to CFOU groundwater.

- CFOU Characterization Reports (Montgomery Watson, 2000; MWH, 2002; 2003):
  - Geologic framework at the SSFL and hydrogeologic conditions of both NSGW and CFOU groundwater.
  - Transport and fate of TCE, and the occurrence and transport of other chemicals of concern in the CFOU.
- Annual and quarterly groundwater monitoring reports, including:
  - Annual Groundwater Monitoring Report (Haley & Aldrich, Inc. [H&A], 2009).
  - First Quarter 2008 Groundwater Monitoring Report (H&A, 2008a).
  - Second Quarter 2008 Groundwater Monitoring Report (H&A, 2008b).
  - Third Quarter 2008 Groundwater Monitoring Report (H&A, 2008c).

This page intentionally left blank

C.2 SITE HISTORY, CHEMICAL USE AND CURRENT CONDITIONS

The RMHF RFI Site consists of approximately 4.1 acres located in the northern central portion of Area IV at the SSFL. The site location within the SSFL, the Group 7 Reporting Area, and Area IV Administrative Area is shown on Figure C.1-1. The site layout, site boundary, and the locations of identified and potential chemical use areas are shown on Figure C.2-1A. The sampling locations are shown on Figure C.2-2A through C.2-2C and the locations of surficial cross-sections across the site are shown on Figure C.2-3A through C.2-3B.

During the RFA, the operational area of the RMHF was identified as SWMU 7.6, and the Building 4021 Leach Field (also referred to as the RMHF Leach Field) was identified as an Area IV AOC (SAIC, 1994). The RMHF RFI Site has been defined to include the RMHF (the developed area within the fence line) and the features that surround the RMHF, including the former RMHF Catch Basin, the northern perimeter north of the RMHF fence line, and the Building 4021 Leach Field. In addition, the RMHF RFI Site boundary has been modified to include operational areas to the south at former Buildings 4028 and 4811.

A comprehensive review of historical documents generated during facility operations or in subsequent environmental investigations was performed to identify known or potential chemical use areas at or near the RMHF RFI Site. As provided in documents submitted in conjunction with this report (Boeing, 2009e), thousands of records (some dating back to 1958) were reviewed to identify areas of potential environmental concern at the Group 7 RFI sites or elsewhere within the Group 7 Reporting Area. As described in Section C.1, documents reviewed included facility operational reports, maps and drawings, internal and external correspondence, regulatory compliance information, historical photographs, facility personnel interview records, and previous environmental reports.

Based on a comprehensive review of this compiled information, the RMHF RFI Site includes the operational area associated with the SWMU identified above and nearby facilities or features that warranted assessment in the RFI. These features are evaluated along with the main operational areas at the RMHF RFI Site and include:

- The Building 4028 – Shield Test Reactor (STR) / Shield Test Irradiation Reactor (STIR) / Liquid Metal Fast Breeder Reactor (LMFBR) Test Facility
- Building 4811 – STR / STIR / LMFBR Mechanical Support Pad

- Debris and disturbed areas observed in the undeveloped land adjacent to the RMHF RFI Site

Known and potential chemical use areas at the RMHF RFI Site are shown on Figure C.2-1A.

The following sections describe the site history, operations, chemical use areas, and current conditions at the RMHF RFI Site SWMU, AOC, and nearby facilities and features.

C.2.1 SWMUs and AOCs at the RMHF RFI Site

A brief summary of the SWMU (7.6) and Area IV AOC that is included in this RFI site report is presented below.

RMHF (SWMU 7.6)

The RMHF RFI Site was constructed in 1959 to store fuel and process liquid and solid wastes generated at the Sodium Reactor Experiment (SRE), the various System for Nuclear Auxiliary Power (SNAP) facilities, and other Area IV radiological facilities. The RMHF has subsequently been used to support all SSFL nuclear operations and radioactive waste processing at ETEC, including the Organic Moderated Reactor Experiment (OMRE), the Sodium Graphite Reactor (SGR), Rockwell International Hot Laboratory (RIHL), D&D, and fuel fabrication and decladding programs (Rockwell, 1983; 1985b; 1989d; 1994a; Rocketdyne, 2000). Site operations at the RMHF RFI Site included of fuel element storage, waste processing, decontamination, packaging, and storage (Rockwell, 1983c; 1988c). Until the mid-1990s the RMHF was referred to as the Radioactive Materials Disposal Facility (RMDF). The facility is used for checking, processing, and packaging radioactive waste and mixed waste materials for shipment and disposal (Rockwell, 1983c). Currently the RMHF is only used for waste storage and shipments. Wastes handled at RMHF were generally generated from metallurgical and chemical laboratory operations, reactor fuel fabrication, reactor fuel decladding, maintenance work on contaminated equipment, and D&D of discontinued experimental reactors (Rockwell, 1988c; DOE, 2003). Waste has been packaged and shipped in accordance with applicable regulations for low-specific activity (LSA), high level, or transuranic wastes (TRU) materials (Rockwell, 1985b). Final closure, decontamination, and demolition for the RMHF will be implemented under the 2006 RMHF Closure Plan following DTSC approval (H&A, 2006).

The RMHF contains three RCRA Part A (Interim Status) permitted facilities:

- Building 4021, the RMHF Decontamination and Packaging Facility
- Building 4022, the RMHF Radioactive Storage Building
- Building 4621, Radioactive Accountable Waste Storage Building (including the Mixed Waste Storage Yard)

Building 4021, the RMHF Decontamination and Packaging Facility, is a 3,000-square foot, on-grade metal building. The building was constructed in 1959 and contains a decontamination room, a packaging room, hot and cold change rooms, a laundry room, and an office (1959l; 1959p; DMJM, 1959d). Building 4021 was originally constructed to process materials contaminated with mixed fission products and fuels, and was used as a processing area for wastes developed during D&D activities (Sapere, 2005). Operations conducted at Building 4021 included radioactive component cleaning, component size reduction, radioactive liquid waste processing (evaporation/solidification), decontamination services, and waste packaging (Rockwell, 1983c).

Building 4022, RMHF Radioactive Storage Building, is a metal building with a high-bay roof and seven below-grade storage vaults. Building 4022 was constructed in 1959 and designed to store materials that contained mixed fission products and fuels, including SRE, SNAP, SEFOR, and EBR fuel sources in support of fuel decladding operations at the RIHL (Sapere, 2005; Rockwell, 1983c). Support generally involved receipt and storage of incoming fuels and pre-shipment storage and shipment of outgoing fuels (Rockwell, 1978f). All vaults with the exception of Vault 2 were also used to store mixed waste (DTSC, 2001).

The area between Buildings 4021 and 4022, referred to as the Filter/Blower Area (CUA 1d), contained filtration equipment used to filter all air from Buildings 4021 and 4022 (Rockwell, 1988c; AI 1959g; 1959h; 1959l). The air circulation system provided temperature control and filtration for the Building 4022 subsurface vaults and supported two fume hoods and an evaporator located in the Building 4021 Decontamination Room. Air collected from Buildings 4021 and 4022 passed through a series of high-efficiency particulate air (HEPA) filters before it was exhausted from the 130-foot tall stack on the western side of Building 4022, where it is sampled for radioactive content (Rockwell, 1988c; AI, 1959j; 1960). The Filter/Blower Area contained three utility trenches used to support the ventilation ducts (DMJM, 1958h). Each of these trenches contained a floor drain used to convey surface water away from the Filter/Blower Area (DMJM, 1958d). The floor drains connected to a pipeline

that conveyed the surface water to the RMHF northern slope, bypassing the RMHF Catch Basin (DMJM, 1958f).

Buildings 4021 and 4022 included a radioactive liquid waste treatment system (CUA 1c) used to collect and treat water produced at the SRE, RIHL, RMHF, and other ETEC facilities (Rockwell, 1983c). Radioactive liquid wastes were transferred to RMHF using a 500-gallon mobile transfer tank and were stored in a 5,000-gallon holding tank (also identified as tank T-1) located west of Building 4021 (Rockwell, 1978c; 1981a; AI, 1959n). The low-level liquid waste was treated by a combination of filtration, evaporation, and solidification (Rockwell, 1988c). Liquids were evaporated using a gas-powered evaporator in Building 4021, filtered through the HEPA filtration system, then exhausted from the 130-ft stack; sludge remaining after evaporation was solidified using concrete, resulting in 55-gallon drums of concentrated solidified sludge (Rockwell, 1988c).

The liquid treatment system also received water that collected in the Building 4022 subsurface vaults and condensed in the HEPA filtration system. Water that collected in the vaults flowed to a floor drain located in Vault 6 to a 200-gallon tank in the Building 4022 Sump, located outside of the southwest corner of the building (Boeing, 2009b; DMJM, 1958h; AI, 1959f). A subsurface pipeline conveyed water from the Building 4022 Sump and condensate from the HEPA filters in the Filter/Blower Area to the 3-foot below ground Building 4021 Decontamination Room Sump, located in of Building 4021(DMJM, 1958c; 1958g; Boeing, 2009b). An exit pipeline then transferred the water and condensate to the 1-foot deep Building 4021 Packaging Room Sump (Boeing, 2009b; DMJM, 1958c). The collected water then flowed to the 150-gallon Building 4021 Intermediate Holdup Sump Tank and was then pumped to holding tank T-1 for storage or to the evaporator for treatment (Rockwell, 1989c). Following an overflow of holding tank T-1 in 1978, the system was modified to replace the AST with UT-15, an 8,000-gallon UST located in Building 4022 Vault 2 (Rockwell, 1978e; 1978h; 1978i; 1990a).

Building 4621 was constructed in the mid-1960s. The building is used for the interim storage of source materials used in research activities when they were not in use and for low-specific activity (LSA) containerized waste (SAIC, 1994; Boeing, 2007); Building 4621 and the adjacent Mixed Waste Storage Yard (CUA 5b) are also used for the storage of mixed waste and contaminated equipment (SAIC, 1994; Rockwell, 1981c). Only non-liquid waste stored in closed containers that was pending offsite shipment is stored in the Mixed Waste Storage Yard (Boeing, 2007b).

Buildings 4022, 4621, and the Mixed Waste Storage Yard are currently active. Building 4021 became inactive in 2007 and all equipment was removed from the building (Boeing, 2009c). Building 4075 has been inactive since 2001 (Boeing, 2007b; Sapere, 2007).

In addition to the permitted facilities, the RMHF RFI Site includes several support buildings: Buildings 4034, 4044, 4075, 4658, 4663, 4665, and 4688. According to historical documentation, these buildings were not used for radioactive waste storage (Boeing, 2007b). Most of the remaining buildings present at the RMHF RFI Site are currently inactive (Buildings 4075, 4563, 4658, and 4665). The remaining active buildings are used for: office space and controlled site entry point (Building 4034); a break room and health physics counting laboratory (Building 4044); a covered canopy area, is used for equipment and hazardous waste storage (Building 4688), and; a former building foundation (Building 4663) that is currently a storage pad.

The RMHF RFI Site included a Catch Basin (referred to as Building 4614 in facility drawings) located adjacent to the western boundary of the site. Surface water from the RMHF operational area was conveyed to the Catch Basin by an asphalt-paved swale along the northern site boundary and an asphalt paved drainage channel from the site to the basin. The RMHF Catch Basin also received surface water from the Building 4028 and Building 4024 (included in the Group 5 RFI Report) via asphalt-paved drainages (AI, 1961b). During storm events, water in the Catch Basin was pumped to a subsurface pipeline that ran south to G Street. The catch basin contained a real-time radiation detection system connected to a monitored alarm. Storm-water runoff was also sampled for radioactivity following storm events. The pipeline discharged to surface drainages that ultimately lead to the R-2 Pond (SWMU 5.26). The Catch Basin and discharge channel were removed in 2006 and replaced with a 1,500-gallon polyurethane aboveground storage tank (AST) (Cabrera, 2007a).

The RMHF RFI Site included several ASTs and underground storage tanks (USTs), most of which were used in support of the containment, conveyance, and treatment of radioactive process water received from other ETEC facilities, such as the SRE and RIHL, D&D activities, and decontamination activities at Building 4021 (Rockwell, 1983c). Tanks associated with the treatment of radioactive water were present at Buildings 4021, 4022, and 4664. A 500-gallon transfer AST used to transfer LLRW water to the RMHF was stored in the Mixed Waste Storage Yard (SAIC, 1994; Rockwell, 1989a). A former diesel AST was present in the filter/blower area adjacent to Building 4022 (Rockwell, 1990a; DOE, 1970).

All ASTs and USTs have been removed with the exception of the 1,500-gallon polyethylene tank used to collect surface water at the RMHF RFI Site.

Building 4021 Leach Field (Area IV AOC)

The Building 4021 Leach Field was identified during the RFA (SAIC, 1994) as an inactive sanitary leach field. The leach field was constructed as a roughly-rectangular shaped excavation that was backfilled with about 4 feet of gravel. It was located at the bottom of the sloped perimeter approximately 70-feet north of the RMHF fence line (Figure B.2-1A) and consisted of a 3,400-square foot transpiration bed with two parallel perforated pipes that extended 100 feet to the northeast from a concrete distribution box (SAIC, 1994). The distribution box was gravity fed from the 1,500 gallon septic tank located underneath the top of an embankment forming the north side of the RMHF site (Rockwell, 1982a; Rockwell, 1982c). The distribution box was connected to the outlet of the septic tank by a 4-inch diameter cast iron sanitary sewer pipe (SAIC, 1994).

The leach field, septic tank, and associated piping were installed in 1959 for the disposal of sanitary waste in support from RMHF, which then consisted of Buildings 4021 and 4022 (ICF, 1993; Rockwell, 1982a; 1982c). A second connection to the leach field, bypassing the septic tank, was made from the radioactive water processing system holding tank via the Building 4021 Sump located on the western side of Building 4021 (Rockwell, 1982a; 1982c; DMJM, 1958f). Water from the holding tank was reportedly discharged to the leach field only after the water was analyzed and determined to be within acceptable limits of radiation (Rockwell, 1982a). The septic tank and Building 4021 Leach Field were abandoned in place in late 1961, when a central sewer system was installed at the SSFL (Rockwell, 1982c).

The Building 4021 Leach Field was excavated in 1978 to mitigate elevated levels of radioactivity detected during a site survey (Rockwell, 1982a). The septic piping tank and piping were abandoned in place. Removal of the septic tank has not been documented and is assumed to be in place. Building 4664 was constructed atop the septic tank area (Rockwell, 1982b).

Adjacent Areas

Building 4028 STIR Test Facility and Building 4811 Mechanical Support Pad

The Building 4028 Shield Test Facility (STF) housed the Shield Test Irradiation Reactor (STIR), used for SNAP shield testing experiments as well as uranium oxide melting experiments between 1961 and 1981 (DOE, 1997). The reactor was operated with a 50-kilowatt (kW) capacity between 1961 and 1964 and a 1-megawatt (MW) capacity between 1964 and 1972 (DOE, 1997). The adjacent Mechanical Support Pad included a cooling tower, heat exchanger, ventilation equipment, and an air-cooled condenser (Sapere, 2005).

C.2.2 RMHF RFI Site History

A summary of the site chronology, description of operations, and investigation activities for the RMHF RFI Site is presented below. Facility correspondence, investigation reports, waste disposal records, facility maps, drawings, photographs, and personnel interviews were reviewed and evaluated to compile the site history information presented below. Primary sources of information include:

- RFA (SAIC, 1991; 1994)
- CCR (ICF, 1993)
- RFI WPA (Ogden, 1996)
- RFI WPAA (MWH, 2003)
- The RMHF WPAA (MWH, 2008a)
- HSA (Sapere, 2005)
- Historical Photographs (various sources and dates)

Site Chronology: RMHF

1959	Buildings 4021 (Chemical Use Area [CUA] 1a) and 4022 (CUA 1b) were constructed at the RMHF RFI Site The RMHF Decontamination and Packaging Facility (Building 4021) (Chemical Use Area [CUA] 1a), Radioactive Storage Building (Building 4022) (CUA 1b), Filter/Blower Area (CUA 1d), and radioactive liquid waste treatment system (CUA 1c) were constructed at the RMHF RFI Site (AI, 1959a). Building 4021 Leach Field (CUA 4b) was constructed to support RMHF activities (AI, 1959e). In addition to receiving sanitary waste from Building 4021 lavatories, showers, and toilets, the leach field received process water from the Building 4021 Sump (CUA 1c) once it was determined that the

1959 (Continued)	measureable radioactivity of the water was below actionable levels (DMJM, 1958d; 1958f; Rockwell, 1981b; Boeing, 2009b; AI, 1959b). Water conveyed from the Building 4021 Sump bypassed the subsurface septic tank (CUA 4a), which was located below the embankment forming the northern boundary of the RMHF RFI Site (Rockwell, 1982c). A Drum Storage Area (CUA 9c) and an oil dump sump (CUA 12) were constructed in the northeast corner of the RMHF RFI Site (AI, 1959c; 1959d). The oil dump sump was located in the approximate center of the concrete slab (AI, 1959d; 1959k). "Building 4568", the asphalt-paved, uncovered storage area comprising the western portion of the RMHF RFI Site, was constructed. Building 4563 consisted of what would be the future locations of Buildings 4075, 4664, 4665, and the Mixed Waste Storage Yard (Rockwell, 1967). Building 4658 (CUA 9a), the Guard Shack was constructed to act as a controlled entry point to the RMHF (DMJM, 1959j). The Guard Shack had a two-step, fenced entry way (Boeing, 2009b). Storage of SRE Fuel Core I began at Building 4022 (Rockwell, 1974b).
Early 1960s	Building 4663 (CUA 5c), the RMHF Storage Area, was constructed (Sapere, 2005). Building 4663 was used for material storage and may have been used to store radioactive wastes (Sapere, 2005).
1961	Building 4021 was connected to the central SSFL Sewer System. The Building 4021 Leach Field, septic tank, and associated piping (CUAs 4a – 4b) were abandoned in place (Rockwell, 1982c). The RMHF Catch Basin (CUA 10c), drainage channel (CUA 10b), and discharge pipeline (CUA 10d) were constructed.
1962	Building 4034 (CUA 9a), the Radioactive Waste Facility Office, was constructed (Sapere, 2005; AI, 1961b; 1962a). Building 4034 was used as the RMHF main office and controlled employee entry point (Sapere, 2005). Open storage was observed in the Building 4563 area in a historical photo (AI, 1962b).
1962 - 1963	A valve connecting the tank T-1 (CUA 1c) to the Building 4021 Leach Field either leaked or was inadvertently left open, allowing an undetermined amount of radioactive water to enter the leach field (Sapere, 2005; SAIC, 1994; Rockwell, 1982a).

1964	Building 4664 (CUA 8a), the Low Level Waste Processing Building, was constructed (AI, 1963e; Rockwell, 1974a). The Low Level Waste Processing Building was an uncovered equipment pad consisting of a 1,350-gallon radioactive water storage tank (T-2), a clarification tower, an evaporator, an incinerator, two flocculation chemical feeding drums, two condensate tanks (T-5 and T-6), a spray chamber, and a bag filter (AI, 1963e; 1963f, 1963i). Evaporated liquids were exhausted from an approximately 15-foot tall stack that was continuously monitored for radioactivity (AI, 1965d). Radioactive liquids, as well as domestic water, gas, and electricity, were conveyed to Building 4664 via an overhead pipeline that ran from the north face of Building 4021 to Building 4664 (AI, 1963f; 1963i; 1976a; 1976b; Rockwell, 1978j; Photos SS-464, SS-466CN). Exhaust from the evaporator could be conveyed either to the bag filter located on Building 4664 or to Building 4022 by an overhead pipeline, where it would be treated by the Filter/Blower exhaust system (AI, 1963f). The incinerator was a test installation to determine if some of the waste could be disposed by burning (Rockwell, 1989d). It was tested with non-radioactive waste and never functioned well, so it was dismantled (Rockwell, 1989d). The flocculation tower was built to pre-treat radioactively contaminated water to make it easier to filter, but was made unnecessary by more efficient filters and became inactive (Rockwell, 1989d). Building 4665, the Radioactive Scrap Oxidation Facility (CUA 8b), was constructed and connected to the Building 4664 bag filter (AI, 1963c; 1963j). The addition of Buildings 4664 and 4665 required relocation of the northern RMHF perimeter fence and addition of approximately 20 feet of additional asphalt (AI, 1963d). Building 4664 was built atop the abandoned Building 4021 septic tank (Rockwell, 1982c). Storage of SRE Fuel Core II began at Building 4022 following removal from SRE Reactor (Rockwell, 1974b).
Mid-1960s	Building 4621 (CUA 5a), Radioactive Accountable Wastes Storage, was constructed (Sapere, 2005; Boeing, 2007b; AI, 1963a; 1963b). Building 4688 was relocated to the RMHF Drum Storage Area from another Area IV facility, potentially the SRE, sometime between 1962 and 1967 (Sapere, 2005; Rockwell, 1967; Boeing, 2009b), providing a canopy-covered storage space.

1965	Aerial photos indicate the presence of a disturbed soil area southwest of the Building 4614 Catch Basin (AI, 1965e; 1969; Rockwell, 1985a).
1966	Building 4044, the Break Room and Counting Laboratory, was constructed (Sapere, 2005; AI, 1964d; 1964f). Building 4044 functioned as a clean shop, health physics and counting laboratory, and a break room (Sapere, 2005; Boeing, 2007b). An evaporator fire occurred in the Packaging Room of Building 4021, apparently due to ignition of a waxy substance by evaporator radiant heaters (AI, 1966a; 1966b).
1969	Aerial photos indicate the presence of a devegetated area in the Building 4021 Leach Field area (AI, 1969).
Early 1970s	The Building 4663 structure was demolished; the remaining concrete building foundation served as a storage area for non-radioactive material (Sapere, 2005).
1971	Building 4075, the Contaminated Equipment Storage Building (CUA 6a), was constructed in 1971 and served as a storage area for radioactive wastes that were pending shipment for offsite disposal (Boeing, 2007b; AI, 1971). Building 4075 was constructed on the northwestern portion of the RMHF fenced area and served as a support and storage area for radioactive wastes (low-level, mixed, and transuranic wastes) prior to staging in the Mixed Waste Storage Yard for shipment to offsite disposal sites (Rockwell, 1983c; SAIC, 1994; Boeing, 2007b).
1975	During a site survey, vegetation growing on the abandoned Building 4021 Leach Field site was discovered to be contaminated with radioactivity (Rockwell, 1982a). Additional observations, including radioactive contamination of the leach field distribution box, identified the source of contamination as root uptake from the underlying leach field (Rockwell, 1982a). The site was surveyed by drilling approximately 30 6-foot deep test holes to assess the extent of contamination and define the limits of radioactive material migration in the leach field (Rockwell, 1982c). Following the discovery, all plant material was removed and the site was fenced, posted, and protected from further activity (Rockwell, 1982c). Other areas of contamination noted during this survey included the RMHF north slope, Building 4621, Building 4664, and areas of asphalt within the RMHF complex (Rockwell, 1975).

1975 (Continued)	Building 4665 was used for long-term storage of sodium that had previously been temporarily stored in Building 4022 and at the SRE (Rockwell, 1975).
1976	Aerial photos indicate the presence of two debris areas on the hill slope north of Buildings 4075 and 4664 (AI, 1976a; 1976b).
1977	The Building 4664 evaporator, incinerator, and flocculation system were partially removed, leaving only the flocculation tower and the treated water tank (AI, 1976b; Rockwell, 1977a; 1977b; 1978i).
1978	Contaminated runoff water was detected in a drainage downslope from the Building 4021 Leach Field (CUA 4b) as a result of unusually heavy spring rain (Rockwell, 1978a). A mudslide blocked drainage paths around the leach field, resulting in flooding of the leach field, including and the exploratory borings drilled in 1975 that perforated the gravel bed (Rockwell, 1978a; 1982c). The drainage point was dammed with sandbags and a sump was created to retain additional drainage. Soil was removed from the surface of the drainage channels downstream of the Building 4021 Leach Field to remove potential contamination. A temporary roof was erected to reduce generation of contaminated water (Rockwell, 1978d). Surface water was subsequently collected in two 5,000-gallon USTs stored in Building 4022 Vault 2 (Boeing, 2009c). The disposal method used for the collected surface water was not specified, but it is reasonable to assume it was tested for radioactivity and subsequently released or treated. The leach field excavation began in mid-1978. Non-contaminated overburden was removed and stockpiled for use as backfill material (Rockwell, 1982c). Radionuclide-contaminated soil and gravel were packaged in plastic-lined boxes and transported directly to the RMHF Mixed Waste Storage Yard by an overhead crane (Rockwell, 1982c; 1978g). Contaminated bedrock was removed with a hydraulic jackhammer; three remaining contaminated cracks in the bedrock were sealed with bituminous mastic to prevent intrusion of percolating water (Rockwell, 1982c). Approximately 28,000 cubic feet (1,037 cubic yards) of excavated material was disposed at the licensed Nuclear Energy Company disposal site (U.S. Ecology) located in Beatty, Nevada. Approximately 8,000 cubic feet (296 cubic yards) of waste was sent to the DOE Hanford disposal site in Washington state (Rockwell, 1982c). The field was then backfilled and finished to a grade several feet below the original surface, contoured to drain surface water to the west, and seeded with rye grass cover to prevent erosion (Rockwell, 1982c; 1978l). A final decontamination report of leach field excavation activities was published in 1982 (Rockwell, 1982c). Following an overflow of the tank T-1, the radioactive water treatment system (CUA 1c) was modified to replace the T-1 with an 8,000-gallon UST (tank UT-15) that was located in Building 4022 Vault 2 (Rockwell, 1978e; 1978h; 1978i; 1990a). The UST was connected into the existing

1978 (Continued)	radioactive liquid treatment system via an overhead, double-walled pipeline between Buildings 4021 and 4022 that was then plumbed through Vault 1 into Vault 2 (Boeing, 2009b). The UST was located in a secondary open tank that provides secondary containment for tank overflow or failure (Rockwell, 1988c). Building 4664 flocculation system taken offline; the building became inactive (Boeing, 2009c). Building 4665 used as a non-radioactive storage area (Sapere, 2005).
1982	Building 4664 incinerator and support equipment was removed; the underlying concrete was air-chipped to reduce contamination. Approximately 800 square feet of contaminated asphalt and soil were removed and disposed as radioactive waste (Rockwell, 1982d; 1982e; 1984a).
1987	The Building 4021 Sump (CUA 1c) was upgraded and the Intermediate Holdup Sump Tank was replaced with a 200-gallon tank (UT-16) with primary and backup pumps, independent level controls, high water alarms, new sump liner for secondary containment, new water detection sensor, and new electrical control and monitoring systems (Rockwell, 1987b). In May, DOE directed Rocketdyne to stop development of all pending RIHL declad programs and begin preparing the building for D&D (DOE, 2003). All remaining Special Nuclear Material at the RIHL was sent to RMHF for packaging and disposal (DOE, 2003).
1989	The last packages of disassembled Fermi fuel were sent to another DOE site in May. No nuclear fuel has been stored at the RMHF since this time (Rockwell, 1990a). RCRA Part A (Interim Status) permit was submitted in March for storage of mixed waste (Rockwell, 1990a; DTSC, 2001).
1990	Historical photographs taken inside Building 4044 (CUA 9b) indicate that radioactive waste samples were occasionally present inside the counting room (Rockwell, 1990c). In the photo, two small containers labeled “Radioactive Material” and “Radioactive Material – Contaminated Waste” are located under a desk.
1992 and 1994	Multi-media sampling at RMHF and offsite drainage channels and analysis for chemicals and radionuclides was performed (McLaren/Hart, 1993; 1995).

2003	Due to elevated levels of cesium-137, three small excavations were performed at the area south of the Mixed Waste Storage Yard in 2003, measuring 125 by 13 feet, 5 by 7 feet, and 7 by 12 feet, respectively (Boeing, 2004). Excavation depths were approximately 0.5 feet deep, removing approximately 130 cubic yards of soil. Excavated soil was disposed of at the DOE LLRW disposal site at the Nevada Test Site (NTS).
2004	Building 4021 evaporator was taken offline and Building 4021 and 4022 sumps were deactivated, terminating the radioactive water conveyance and evaporation/volume reduction process (Boeing, 2009c).
2006	Cabrera Services (Cabrera) conducted a radiological survey of surface soil (less than 0.5 feet below ground surface [bgs]) at the RMHF north slope, which indicated the presence of elevated cesium-137. Following the survey, an approximately 200-square foot area (CUA 14a) was excavated to a depth of about 0.5 feet bgs, reportedly removing approximately 200 cubic feet (7 cubic yards) of soil (Boeing, 2006b; 2006c; Cabrera, 2006). No staining, discoloration, or odors were noted during the excavation (Boeing, 2006c). After the excavation, radiological constituents were below derived concentration guideline levels (DCGLs) in all surveyed locations (Boeing, 2006a; 2006b). Straw waddles were placed around the excavation area to prevent erosion and straw cover was placed over the excavated area to promote new plant growth (Boeing, 2006a; 2006b). Excavated soil was disposed of at the DOE LLRW disposal site at the NTS. The RMHF Catch Basin (CUA 10b) and associated drainage channel and pipeline (CUAs 10c and 10d) were removed as part of ongoing D&D activities (Cabrera, 2007a). The area was not backfilled or graded following the excavation. The Catch Basin was replaced with a 1,500-gallon polyurethane AST and enclosed drainage pipe that receive surface water from the RMHF fenced area (Cabrera, 2007a). Approximately 20 cubic yards of soil were excavated during the Catch Basin removal due to detected radionuclides (Boeing, 2008b). Excavated soil was disposed of at the DOE LLRW disposal site at the NTS.
2007	Cabrera conducted a status survey in the area of the former RMHF Catch Basin. During the survey, two areas of radioactivity above background levels were identified and approximately 340 cubic feet (13 cubic yards) of soil was excavated – one approximately 10 feet north of the former Catch Basin and one in the footprint of the former drainage channel (CUA 10d) (Cabrera, 2007a). Excavated soil was disposed of at the DOE LLRW disposal site at the NTS. Based on the results of the survey, the former RMHF Catch Basin was recommended for release for unrestricted use (Cabrera, 2007a).

2007 (Continued)	A building survey indicated Buildings 4075, 4563, 4621, and 4665 were suitable for release with the exception of their roofs and foundations, which would require additional survey data to determine suitability for release (Cabrera, 2007b). Surveys indicate that residual radioactivity, surficially or volumetrically, will result in a dose level less than or equal to 1.0 millirems per year (mrem/yr) total effective dose equivalent (TEDE). Surveys of Buildings 4022 and 4668 had insufficient data collected to determine suitability of release (Cabrera, 2007b). As a result of the survey it was determined that all RMHF structures and foundations would be managed as LLRW. Building 4021 became inactive (Boeing, 2009c). All equipment was removed from within the building; floors, walls, and ceilings of the Decontamination and Packaging Rooms were painted to contain radioactivity (Boeing, 2009c).
2008	Several debris areas were observed in the Group 7 Reporting area adjacent to the RMHF RFI Site during the February Debris Area Survey (MWH/CH2M Hill, 2008a) (CUAs 13a – 13j).
2008 - present	Buildings 4022, 4621, and the mixed waste storage yard remain active under the RCRA Part A (Interim Status) Permit.

Site Chronology: Building 4028

1961-1964	Building 4028 was constructed to perform tests of space reactor shields using a fission plate driven by neutrons from a swimming-pool type reactor in support of ETEC SNAP program (DOE, 1997; Rockwell, 1987a). The building is comprised of two areas. The below grade portion of the building, the shield test room, was constructed of reinforced concrete and designed to expose materials to defined sources of neutrons and gamma radiation (AI, 1961c). The above-grade portion of the building, the reactor support building, was a standard prefabricated steel structure containing a 50 kW pool-type reactor, control room, laboratory, and change room (AI, 1961c). Personnel access to the shield test room is provided by a concrete passageway intended to control potential releases of radiation (AI, 1961c). The original building configuration, called the Shield Test Reactor (STR), was operated during this period using a 50-kW reactor (DOE, 1997). Building 4811, which included a 15-ton capacity water refrigeration system, airblast heat exchanger, air-cooled condenser, ventilation system, and water storage tank, was constructed adjacent to Building 4028 to support STR testing activities (DOE, 1997).
1964-1972	Building 4028 was modified to operate with a 1-MW reactor and renamed the Shield Test Irradiation Reactor (STIR) (DOE, 1997). The Building 4811 heat exchanger was upgraded and the water refrigeration system was

1964-1972 (Continued)	replaced with a one-cell, induced draft counter-flow cooling tower (DOE, 1997).
1973	Fuel for STIR removed and disposed; water from reactor pool drained.
1976	Building 4028 was decommissioned and made available for alternate use (DOE, 1997).
1977 – 1981	Building 4028 was operated as the Liquid Metal Fast Breeder Reactor (LMFBR), or Arc Melt Facility, to investigate the behavior of molten uranium dioxide relative to simulated reactor accidents, particularly related to flooring and structural materials (DOE, 1997). The tests were conducted at the minimum scale necessary to simulate post-accident heat removal conditions (Rockwell, 1987a).
1977 – 1988	Building 4028 contained a fuel storage vault used to store approximately 300 pounds of normal and depleted uranium oxide (DOE, 1997).
1984	Molten uranium dioxide operations were terminated and the building became inactive under periodic surveillance (DOE, 1997).
1986	The Building 4028 substation was removed as part of an environmental program to eliminate PCB-containing transformers (Rockwell, 1987a).
1988	Initiated cleanout, decontamination, and decommission of Buildings 4028 and 4811 (DOE, 1997). Activities included: the removal of surplus normal and depleted uranium oxide; decontamination and removal of equipment and electrical components; removal of radioactive ducting system; building surface decontamination; final radiological survey of facility (DOE, 1997).
1989	Above-ground portion of Building 4028 and 4811 demolished, leaving concrete floor below-grade test vault (DOE, 1997).
1992	California Department of Health Services (DHS) performed verification sampling (Sapere, 2005).
1993	Oak Ridge Institute for Science and Education (ORISE) conducted the final verification study of Building 4028. Survey results indicated that Building 4028 met the requirements for release to unrestricted use (DOE, 1997).
1995	DHS concurred with the release of Building 4028 for unrestricted use (Sapere, 2005).
1997	Building 4028 released for unrestricted use (DOE, 1997). The building foundation and below-grade vault were demolished (Rockwell, 1997).

Spill Record

Approximately 22 spills were reported in the RMHF area between 1962 and 1997 (ICF, 1993; SAIC, 1994; Rockwell, 1994b; Sapere, 2005). Historical releases at the RMHF RFI Site include: radioactive waste, radioactive water, radioactive liquid, mixed fission products, sodium, uranium metal, and radioactively-contaminated sand, alcohol, and rainwater. The largest documented releases at the RMHF RFI Site include an undetermined amount of radioactive water from the Building 4021 Sump and adjacent holding tank to the Building 4021 Leach Field due to a valve inadvertently left open, and 100 gallons of water from the Building 4021 Sump to the RMHF Catch Basin due to a broken hose. A summary of documented spills at RMHF is provided in Table C.2-6.

Site Inventories

Inventories of buildings, tanks, transformers, and chemicals used at the RMHF RFI Site were compiled during preparation of this RFI site report. Historical reports and facility drawings were reviewed and visual site inspections were conducted. The locations of identified buildings, tanks, and transformers are shown on Figure C.2-1A or C.2-1B. The inventories are included as the following tables:

- Building inventory – Table C.2-1
- Tank inventory – Table C.2-2
- Transformer inventory – Table C.2-3
- Other features inventory – Table C.2-4
- Documented chemical use – Table C.2-5
- Spills / release inventory – Table C.2-6

C.2.3 RMHF RFI Site Chemical Use Areas

Chemical use areas include areas where chemicals were documented to have been (or potentially may have been) used, stored, spilled, discharged, and/or disposed. Chemical use areas at the RMHF RFI Site are shown on Figure C.2-1A and described in detail in Section C.3. The 15 RMHF RFI Site chemical use area types (48 individual chemical use areas) evaluated at or near the site are listed below in order of chemical use area number:

- 1a – Building 4021 Radioactive Waste Decontamination and Packaging
- 1b – Building 4022 Radioactive Waste Vault Storage
- 1c – Radioactive water treatment system
- 1d – Filter/blower area

- 2 (a-c) – Transformers and Substations
- 3 – Diesel AST
- 4 (a-b) – Building 4021 septic tank, pipeline, and leach field
- 5a – Building 4621 Radioactive Accountable Waste Storage
- 5b – Mixed Waste Storage Yard
- 5c – Former Building 4663, Equipment Storage Area
- 6a – Building 4075 Contaminated Storage
- 6b – Building 4563 Storage Area
- 7 – Waste Receiving Yard
- 8a – Building 4664 Flocculating Tower, Incinerator, and Cooling Tower
- 8b – Building 4665 Radioactive Scrap Oxidation Facility
- 9a – Buildings 4034 (Office) and 4622 (Former Counting Laboratory)
- 9b – Building 4044 Break Room and Counting Laboratory
- 9c – Building 4688 Equipment and Hazardous Waste Storage Area
- 10 (a-d) – Former RMHF Catch Basin and associated drainages, channels, and pipelines
- 11 (a-b) –STIR/LMFBR Facility and Mechanical Support Pad
- 12 – Former Oil Sump
- 13(a-k) – Debris Areas
- 14 (a-d) – Excavation Areas
- 15 – RMHF Soil Disturbance Area

The site characterization information is described relative to these chemical use areas in Section C.3. Potential chemicals used or stored at the RMHF RFI Site are listed on Table C.2-5.

C.2.4 Site Conditions

This section provides summaries of site conditions at and near the RMHF RFI Site including topography, geology, soils, groundwater, surface water, seeps and springs, and biology.

General Conditions and Topography

The RMHF RFI Site is located in the northern portion of Area IV at the northern terminus of 12th Street. The RMHF operational area is situated on a hill top bounded by steep slopes to

the west and north with exposed outcrops to the east and south. Buildings 4028 and 4881 are located west and slightly downslope of the RMHF RFI Site, and are bounded steep slopes to the north and developed areas to the east, south, and west.

Surface elevation at the site ranges, with the highest portion within the RMHF fenced area and the lowest portions in the canyons that former the RMHF operational area to the north and west. The RMHF operational area is relatively flat, sloping from approximately 1,850 feet above mean sea level (msl) along the eastern border to 1830 feet msl at the western border. The canyons located to the north and west of the RMHF RFI Site vary between gradual and steep slopes, reaching approximately to approximately 1,760 feet msl to the north and 1,680 feet msl to the west. Topography for the site is shown on two geologic cross sections, presented in Figure C.2-3: one oriented east-west (Cross Section A-A'), and one oriented north-south (Cross Section B-B'). Locations of the geologic cross-sections are shown on Figure C.2-3.

The RMHF fenced area, measuring approximately 1.7 acres, has been paved with asphalt since 1959. Buildings 4021, 4022, 4034, 4044, 4075, 4563, 4621, 4658, 4665, and 4688 are still present at the RMHF RFI Site, though Buildings 4021, 4075, 4658, and 4665 are currently inactive. Buildings 4622, 4663, and 4664 have been removed; the Building 4663 pad remains as a storage area and Buildings 4622 and 4664 footprints are paved with asphalt. The adjacent Building 4028 area is unpaved and graded following the demolition of Buildings 4028 and 4881 in 1997. The area outside of the RMHF operational area is unpaved.

Geology

SSFL underlies the Late Cretaceous Chatsworth formation, and is a deep sea turbidite sequence that consists mainly of sandstone with interbeds of siltstone, shale, and conglomerate (MWH, 2007). The RMHF RFI Site is located on the Upper Burro Flats Member of the Chatsworth formation, just north of the "Lot Bed" outcrop (MWH, 2002). The Upper Chatsworth formation is a series of interbedded fine to medium grained, brown to tan sandstone with minor amounts of fine-grained conglomerate, siltstone, and shale that generally strike North 70 degrees East and dip 25 degrees Northwest. The Upper Burro Flats Member is comprised of fine to medium-grained sandstone. The "Lot Bed" is a finer grained unit within the Upper Burro Flats Member that consists of interbedded sandstone siltstone, and shale, and it ranges from approximately 3 to 10 feet thick (MWH, 2007). Figure 2-5 of the Group 7 RFI Report shows the geologic units represented within the site. The ELV

Member occurs between the Upper and Lower Burro Flats Members, and is comprised of thinly interbedded, fine-grained sandstone, siltstone, and shale. The western portion of the North fault zone extends through the RMHF drainage in the northern portion of the RMHF RFI Site.

Soils

Surface soils at the RMHF RFI Site are covered by asphalt and concrete surfaces within the fenced RMHF area. The remaining areas contain exposed sandstone outcrops and shallow soils. Based on soil borings and exploratory trench logs, soil thickness at the RMHF operational area ranges from less than 1 foot to approximately 6 feet (Attachment C-2) with isolated areas of deeper soils (up to 20 ft bgs) in the center of the RMHF fenced area. Soils on the RMHF northern slope range from 0.5 to 2 feet bgs. Soils in the area of the former Building 4021 Leach Field range from 1.5 to 4.5 feet bgs. Soils in the former Building 4028 area range from 6 to 10 feet bgs. Soils in the area west of the RMHF RFI Site range from 0.5 feet bgs to 2.5 feet bgs. A figure depicting the general distribution of alluvial soils within the Group 7 Reporting Area is provided as Figure 2-4 in the Group 7 RFI Report main text. Soils are generally comprised of silty sands and clayey sands with occasionally occurring clayey silt, silt with sand, and lean clay; concluded to be weathered products of the Chatsworth formation Upper Burrow Flats member interbedded sandstone, siltstone, and shale bedrock. Soil boring logs are included as Attachment C-2 to this site report.

Several soil disturbance areas were noted in the RMHF RFI Site and adjacent areas. Soil disturbance areas are shown on Figure C.2-4. Observed soil disturbance areas include:

- A disturbed soil disturbance measuring approximately 1 acre in area is located southwest of the RMHF Catch Basin, first noted in a 1965 aerial photo (AI, 1965e; 1969; Rockwell, 1985a).
- A disturbed area resulted from the demolition of Building 4028 in 1998, which required the removal of the subsurface structures and test vault, approximately 40 feet by 50 feet by 18 feet deep constructed of reinforced concrete (Rockwell, 1987c). The area was backfilled and graded subsequent to removal.
- A soil disturbance resulted from the removal of the RMHF Catch Basin and subsequent excavations at the basin footprint, the former drainage channel, and the area 10 feet north of the former Catch Basin to remove elevated radionuclides.
- Soil disturbance areas within the RMHF fenced area as a result of the removal of the septic tank (formerly located underneath Building 4664), removal of the Building 4664 foundation, and the excavation of the oil sump (adjacent to Building 4688).

- Two soil disturbance areas are present north of the RMHF fenced area due excavations at the RMHF perimeter and former Building 4021 Leach Field to remove radioactivity.

Groundwater

Groundwater conditions the groundwater monitoring network for Group 7 Reporting Area are described in Appendix D. Figures D-3 and C.2-2 show wells and piezometers used to monitor groundwater at and near the RMHF RFI site.

NSGW at the RMHF Site is monitored by shallow well RS-28 and piezometer PZ-116, which are completed to depths of 19 and 34 feet below ground surface (bgs), respectively. Although near-surface groundwater has been present at RS-28 and PZ-116 in recent years, dry conditions are often observed at these locations during periods of low precipitation. When present, NSGW has been measured at depths ranging from ground surface to 24 feet bgs (1730 to 1770 feet msl).

Based on a comparison of water levels at PZ-116 and RS-28 with those measured at nearby wells RD-34A and RD-30, it appears that NSGW is at certain times perched above Chatsworth formation groundwater and at other times vertically continuous with Chatsworth formation groundwater. This variable condition is related to the rise and fall of the Chatsworth formation water table and the intermittent presence of near-surface groundwater at PZ-116 and RS-28. When Chatsworth formation groundwater rises into weathered bedrock near RMHF, water levels measured in PZ-116 and RS-28 are within several feet of those measured at RD-34A and RD-30 and exhibit nearly identical temporal trends. Perched conditions appear to exist for only a short time and often precede the rise of Chatsworth formation groundwater into weathered bedrock.

Chatsworth formation groundwater at RMHF is monitored by 14 wells (RD-27, RD-30, RD-34A, RD-34B, RD-34C, RD-63, RD-87, RD-88, RD-89, RD-90, RD-94, RD-96, RD-97, and RD-98). The depth to Chatsworth formation groundwater near the RMHF RFI Site generally ranges between 40 and 55 feet bgs (1765 and 1790 feet msl), but often rises into weathered bedrock at monitoring locations within the drainage to the north (RD-30 and RD-34A). At these locations, water has been observed within 10 feet of the ground surface. Chatsworth formation water table gradients in this area generally decrease towards the northwest (H&A, 2009).

Several offsite wells (OS-02, OS-03, OS-04, OS-5, OS-5A, OS-06, RD-59A, RD-59B, and RD-59C) are used to monitor groundwater conditions down-gradient of the RMHF RFI Site. Groundwater elevations measured in these wells are hundreds of feet lower than those measured at wells within the RMHF RFI Site, which is likely due to the significant topographic decline. Artesian conditions are observed in several of these wells and are responsible for the presence of a number of springs that have been identified nearby.

Surface Water

Surface water flow at the RMHF RFI Site is shown on Figure 2-7B of the Group 7 RFI Report main text. Surface water within the RMHF fenced area generally flows from east to west across the site by sheet flow to a storm drain culvert located along the western perimeter of the site (Figure 2-7B). Surface water flow to the northern perimeter drains into an asphalt-lined swale that leads to the storm drain culvert. Prior to 2006, the culvert drained to an asphalt-lined channel that conveyed surface water to the RMHF Catch Basin. Following the removal of the Catch Basin and asphalt-lined drainage channel in 2006, the culvert drains into an aboveground pipeline that conveys water to a 1,500-gallon polyurethane storm water AST. Stored storm water runoff is collected and then pumped from the AST to a pipeline that discharges to a lined drainage along 17th Street (located in the Group 5 Reporting Area). From this discharge point, surface water flows down 17th Street to G Street (Boeing, 2009a). Surface water discharge then continues through both lined and unlined drainages to the unlined 17th Street Pond, which in turn discharges via natural drainages to the R-2 Pond (SWMU 5.26). Surface water discharge from the R-2 Pond is monitored at NPDES Outfall 018.

The area north of the RMHF fenced area is unpaved and surface water is conveyed via sheet flow to a natural drainage north of the site that discharges through Outfall 003. The former Catch Basin area, located west of the RMHF fenced area, drains via sheet flow to a natural drainage that flows into the inlet of Outfall 003. Further to the southwest of RMHF, north of the Group 5 boundary, surface water discharge is conveyed by sheet flow to two natural drainages that lead to the north, and converge with a natural drainage from the Former Sodium Disposal Facility (FSDF) (SWMU 7.3), located in Group 8, just north of the SSFL property boundary. This drainage in turn leads to the Meier Canyon drainage, which discharges into the Arroyo Simi in Simi Valley.

The only portion of the RMHF RFI site that naturally drains to the south is a small portion south of the RMHF fence yard. The area south of the RMHF Mixed Waste Storage Yard is unpaved and surface water is conveyed via sheet flow to a south-facing slope which drains into concrete-lined drainage channel which discharges into a storm drain culvert.

There are two storm drains (upper and lower) at the former location of Building 4028. Storm water runoff that enters these drains comes from a drainage north the Building 4024 which receives surface water runoff from the areas east of Building 4024, the asphalt area around Building 4024, and from the slope between RMHF and nearby rock outcrops (Boeing, 2009d). The former locations of Building 4032 and 4023 also have storm drain systems that are now unused and covered with welded steel plates (Boeing, 2009d).

Prior to the 2006 Catch Basin removal, the Building 4028 culvert drained to a pipeline and surface water was conveyed to the RMHF Catch Basin (Boeing, 2009d). Since the Catch Basin removal in 2006, surface water flow has been redirected away from the storm drains and currently drains around the former Catch Basin and converges with the drainage that runs north of the RMHF and enters drainage monitored by NPDES Outfall 003. The storm water AST that replaced the RMHF Catch Basin currently only contains storm water runoff from the paved surface area of the RMHF. However, the Catch Basin was originally built only to contain discharges from Building 4028, not RMHF. It was modified in approximately 1961 to also receive surface water from RMHF.

The southern portion of the Building 4024 area also drains to the storm drain that runs from east to west along “B” Street, along the road immediately to the south of Building 4024. Discharge from this storm drain flows into Silvernale Reservoir, which is monitored at NPDES Outfalls 018 and 002 (Boeing, 2009d).

Historically, surface water from the Filter/Blower Area between Buildings 4021 and 4022 collected in three concrete-lined trenches. Drains in these trenches discharged to the RMHF northern slope via a 4-inch below-grade pipeline, which, as described above, discharged to the natural drainage north of the site. At some time during the RMHF operational period, the drains were plugged, although the reason or timing of this action is not specified in the reviewed historical documents. The drains are currently in place, but not in use. Currently, surface water from the Filter/Blower Area is conveyed to the west via sheet flow to the area of the former RMHF Catch Basin or the storm water AST.

Seeps and Springs

There are four seeps (S19, S20, S21, and FDP-424) located to the northwest of the SSFL property boundary on property owned by the Jewish American University, Brandeis-Bardin Campus (BBC). These springs have been assigned to the Group 7 Reporting Area due to their proximity and potential down-gradient location. S-19, S-21, and FDP-424 have been sampled on at least one occasion for VOCs. VOCs have been detected at low concentrations in S-19, and an investigation is on-going to assess detected concentrations. Additional information regarding seeps near the Group 7 Reporting Area may be found in Appendix D.

Biology

Biological conditions at the RMHF RFI Site, including vegetation types and sensitive species, are shown on Figure 2-13 of the Group 7 RFI Report. An area of coast live oak woodland habitat exists north of the RMHF RFI site within the RMHF drainage. Chaparral vegetation is predominant along the hillside and the drainage areas north of the RMHF RFI site and ruderal vegetation is predominant in the former Building 4028 operational area. Other habitats in the area surrounding the RMHF RFI site consist of rock outcrops, Venturan sage scrub/chaparral, southern willow scrub, non-native grassland, and Venturan coastal sage scrub. The area on the RMHF northern slope, which was burned during the 2005 Topanga Fire, has been revegetated with primarily coastal scrub and ruderal species. Other than oak trees, which are recognized by counties or municipalities for historical significance, sensitive species have not been observed near the RMHF RFI site or within the northern RMHF drainage. Findings from this survey are presented in Appendix E, Attachment E-9.

This page intentionally left blank

C.3 NATURE AND EXTENT OF CHEMICAL IMPACTS

This section describes the data used to define the nature and extent of chemical impacts to environmental media at the RMHF RFI Site. The presentation includes sampling objectives, scope, key decision points related to characterization activities, and findings.

Transport and fate evaluations are discussed in the following sections of the report:

- Group 7 RFI Report, Section 5, Contaminant Transport and Fate: potential migration via surface water flow, soil to groundwater, and groundwater migration.
- Group 7 RFI Report, Appendix D, Groundwater Characterization: potential migration from soil to groundwater, and groundwater migration.
- Group 7 RFI Report, Appendix E, Risk Assessment: potential volatile organic compound (VOC) migration from groundwater to soil, soil to indoor air.

C.3.1 Sampling Objectives

Soil and groundwater samples were collected to characterize the extent of potential chemical impacts at the RMHF RFI Site. As described in Section C.1, extensive historical documents (Boeing, 2009e) were reviewed to identify potential chemical use areas for RFI sampling. The process of selecting sampling locations, depths, and analytical methods considered the following objectives:

- Defining the lateral and vertical extent of impacts.
- Defining potential chemical gradients.
- Obtaining sufficient data for risk assessment.
- Obtaining data sufficient to estimate CMS soil volumes to within a factor of 10.

To achieve these objectives, soil sampling was conducted as described in the RFI Work Plans (Ogden, 1996; 2000a), or as directed by DTSC during the RFI field program. Additional sampling was also performed to achieve objectives outlined above, considering the following:

- Additional information regarding site use and observed site conditions.
- Site sampling results and data trends.
- Knowledge of chemical properties (e.g., mobility, volatility, association with other chemicals, etc.).
- SSFL metals and dioxin background concentrations.

- SSFL SRAM-based screening concentrations for human health and ecological receptors.
- Risk assessment results and knowledge of areas recommended for requiring further evaluation during the CMS.

Groundwater has been sampled to meet site-wide routine monitoring requirements and additional characterization objectives according to regulatory agency-approved work plans (see Section C.3.2). Based on detected RFI Site chemicals, chemical distribution, and site conditions, additional groundwater sampling and analysis was also conducted to complete characterization of individual RFI Sites and provide data sufficient for risk assessment. Groundwater sampling was conducted as described in the Sampling Analysis Plans (GRC, 1995a; b) and the Shallow Zone Groundwater Investigation Work Plan (Ogden, 2000b).

C.3.2 Sampling Scope

A total of 237 soil matrix samples and 25 soil vapor samples were collected between August 25, 1988, and May 8, 2008, to assess potential impacts associated with chemical use areas at the RMHF RFI Site. Sampling locations and analytical suites were based on DTSC requests, sampling results from previous investigations, additional facility information from historical records, site inspections and/or personnel interviews, waste disposal characterization data, and historical and/or aerial photographs. Sampling schedules are presented in Tables C.3-1B through C.3-1D.

Both Chatsworth formation groundwater and NSGW have been sampled and analyzed according to agency-approved work plans (GRC, 1995a; 1995b; Ogden, 2000b). A total of 16 monitoring wells and/or piezometers were used to characterize groundwater specifically at and near the RMHF RFI Site (PZ-116, RS-28, RD-27, RD-30, RD-34A, RD-34B, RD-34C, RD-63, RD-87, RD-88, RD-89, RD-90, RD-94, RD-96, RD-97, and RD-98). As described in the risk assessment (Appendix E), groundwater monitoring data from the most impacted well within the Group 7 Reporting Area were used to characterize the potential direct exposure (drinking water) route for human receptors. RFI site groundwater monitoring data were used for potential indirect groundwater exposures (indoor air) at that site. Groundwater characterization data for the RMHF RFI site are presented with the entire Group 7 groundwater data set in Appendix D.

Based on quality assurance (QA) review conducted on soil, soil vapor, sediment, and piezometer sampling results, data have been deemed usable and meet RFI program requirements as defined by DTSC-approved Quality Assurance Project Plans (Ogden, 2000a). The RFI QA program included individual sample data validation; assessment of each laboratory's performance; and a qualitative review of the precision, accuracy, representativeness, reliability, and completeness parameters for the datasets. Historical samples (collected prior to the beginning of the RFI in 1996) were typically not validated for the subsequent RFI, but are deemed useable for the RFI since they were collected and reviewed according to the QA protocols for those programs and used by agencies to make decisions for the RMHF cleanup actions. Overall data quality is described in the RFI Program Report (MWH, 2004a). Site-specific data quality summaries for the RMHF RFI Site are described by media in the sections below.

As an ongoing, additional QA measure, DTSC's Environmental Chemistry Laboratory (ECL, formerly the Hazardous Materials Laboratory) is performing independent data quality audits of approximately 5 to 10 percent of the surficial media analyses performed for the RFI. The ECL data quality audits include data validation, electronic data file audits, and split sample comparisons. The ECL findings are compiled in a report for each audit and those available by 2004 are published in the RFI Program Report (MWH, 2004a).

This site report presents characterization results for all media sampled at the RMHF RFI Site, including the following:

- Soil vapor
- Soil matrix (including soil and pond/drainage sediment)
- Groundwater

C.3.3 Key Decision Points

The DTSC has been an integral part of the decision-making process during the SSFL RFI program. All RMHF RFI Site chemical use areas and potential chemical use areas were evaluated for sampling by the DTSC in site visits throughout the RFI process. The DTSC also provided ongoing review during the SSFL RFI field sampling, selected additional step-out sample locations, reviewed field sampling protocols, and collected split samples.

Programmatic decision points (those common to all RFI Sites) are described and included in the RFI Program Report (MWH, 2004a). Site-specific characterization decision points are listed below. These decision points represent either assumptions upon which sampling was based, or decisions made during step-out sampling or data evaluation.

1) Nature and extent evaluations, risk assessments, and site action recommendations presented in this report are based on data that were collected and requested for analysis before December 31, 2008. Ten additional data gap soil samples were collected and analyzed at the RMHF RFI Site on May 8, 2009 (Attachment C-3). Results for these data gap samples are included in this site report since they could be reviewed and validated before report completion, and are also considered for site action recommendations presented herein. However, they could not be included in the quantitative site risk assessments, although uncertainty associated with these findings are discussed. These results will be quantitatively included in a revised report following DTSC review of this document.
2) Areas where further assessment in the CMS is recommended were not characterized beyond data needs.
3) Soil vapor sampling was conducted at locations of historical elevated sample results and various locations to provide representative site coverage both laterally and vertically, and to define plumes.
4) Samples collected during the Multi-Media Sampling Report for the BBC and MRCA used USEPA Method 8270 for analysis of pesticides, while USEPA Method 8081 currently is used for the RFI. Samples analyzed for pesticides using Method 8270 had reporting limits above current EcoRBSLs for some analytes. Collected samples in drainage north of RMHF in order to confirm previous detection.
5) A semivolatile organic compound (SVOC) tentatively identified compounds (TICs) screen was added to adequately address wastes listed for RMHF RFI Site in the USEPA Biennial Reporting System (BRS) database, which included pyridine, nicotine, mopheline, and hydroquinone.
6) Glycols and terphenyls analysis was added at RMHF RFI Site locations to evaluate potential impacts related to documented storage of waste antifreeze and dowanol.
7) Inorganic constituents added to evaluate potential acid releases.
8) Radiological constituents were analyzed during the 2008 data gap sampling event as specified in the RMHF WPAA (MWH, 2008a), but is not presented in the summary of results.
9) Asbestos content was analyzed in samples collected along the RMHF Drainage Pipeline (CUA 10d) to address potential impacts from the transite pipeline.
10) Active soil vapor samples were not collected in several areas with potential solvent use due to shallow bedrock (less than 3 feet bgs). If soil vapor samples could not be collected, soil matrix samples were collected for VOC analysis unless bedrock was encountered at less than 2 feet bgs.

11) The potential release from the SSFL sewer lines in Group 7 were assessed through sewer manhole inspections. All of the sewer manholes in Group 7 (manholes B-11 and B-12 at/near the RMHF RFI Site) were inspected. Documentation for these inspections can be found in Appendix G of the Group 7 RFI Report. Sediment samples from within the sewer lines were not collected because sediment was not observed within the sewer lines. A soil sample was collected adjacent to the manhole within the RMHF fenced yard as requested by DTSC and specified in the RMHF work plan. A sample was not collected at the exit point of the sewer line from Building 4034 since an interior soil sample was collected near this point inside the building at a floor drain.

12) Previously unidentified debris areas located in unaffiliated areas surrounding the RMHF Site were sampled at representative and targeted locations for SVOCs, total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), metals, fluoride, and pH for debris areas containing soil, containers, scrap metal, and construction debris. Debris areas containing drums were also analyzed for VOCs.

13) For characterization purposes, a screening level of 6 micrograms per liter (µg/L) was used to evaluate perchlorate in soil based on DTSC-approved interim measure (IM) levels used at other SSFL sites (e.g., Happy Valley IM). For the RFI, perchlorate samples are typically collected as water leachates to allow lower laboratory reporting limits. The method uses a 1:1 extraction method, so 1 µg/L is considered equal to 1 microgram per kilogram (µg/kg) (MWH, 2003c).

14) Dioxins, metals, and other chemicals potentially resulting from burning of power poles during the 2005 Topanga Fire are being addressed as part of ongoing post-fire maintenance activities. Immediately following the fire, burnt power poles and associated debris were removed to address safety hazards. Assessment of adequate cleanup is underway, and some additional actions are likely.

C.3.4 Soil Matrix and Soil Vapor Findings

All soil and soil vapor sampling results and characterization findings are presented in Table C.3-2A. The goals of the table are to:

1. Present summaries of sampling results, including nature and extent of impacts.
2. Demonstrate that soil characterization is adequate for risk assessment, and that no further sampling is warranted.
3. For areas recommended for CMS evaluation, indicate that soil volumes are estimable within a factor of 10 for comparison of remedial alternatives.

Goals 2 and 3 are achieved through an iterative evaluation process that takes into account risk assessment results and CMS recommendations, as well as soil analytical data. For example, if detected chemical concentrations are sufficiently high to indicate that further evaluation in the CMS will be necessary, the data for that chemical are considered to be adequate for the purpose of risk assessment. Similarly, the risk assessment results can be

used, along with the soil analytical results, to delineate CMS areas and estimate soil volumes within an order of magnitude (Goal 3). Other criteria used to evaluate characterization completeness include the sampling results compared to screening levels, the presence and magnitude of concentration gradients, types of historical site operations and chemical uses, analytical detection limits, and physical constraints (e.g., soil depth and bedrock occurrence).

Data quality summaries for the RMHF RFI Site are provided in Tables C.3-3A (soil), C.3-3B (soil vapor), and C.3-3C (surface water).

C.3.4.1 Soil Data Presentation

Relevant site information, sampling rationale, analytical results, and evaluation of results are presented in Table C.3-2A. Table C.3-2A refers to chemical results that are shown by chemical group category on Figures C.3-1A through C.3-6E. Figures 4-1 through 4-7 of the Group 7 RFI Report also present chemical results for all of Group 7. Table C.3-2A presents the following site characterization information by each chemical use area (Figure C.2-1A) for each relevant chemical group within each chemical use area:

- Relevant site history, site characteristics, and activities related to chemical use for each chemical use area by chemical use number.
- Sampling scope and rationale for each chemical use area by chemical use number.
- Summary of sampling results for soil and soil vapor for each chemical use area by chemical use number. As appropriate, sample results are compared to established SSFL background concentrations (metals and dioxins only) and/or SSFL risk-based screening levels RBSLs[1]. The screening levels are also displayed on Figures C.3-1A through C.3-6E.
- Summary of sampling results and assessment of whether chemical gradient characterization of each chemical group is sufficient for risk assessment.
- Determination if nature and extent of chemicals is defined sufficiently to estimate soil volumes (within a factor of 10) identified for further consideration in the CMS (if needed).

[1] The use of the SRAM-based screening levels for comparison purpose does not serve as a risk assessment. These screening levels are not used to determine the significance of detected chemical concentrations or if a chemical use area will be recommended for further consideration in the CMS, but only to provide the reader another tool to evaluate the characterization data. The SRAM-based screening levels represent conservative concentrations that pose a low level of risk. See Appendix E.

C.3.4.2 Soil Data Summary

Described in detail on Table C.3-2A, the following summary presents detected VOCs, SVOCs, TPH, PCBs, dioxins, perchlorate, herbicides, pesticides, inorganic compounds, and metals, in particular, those that exceeded Residential Risk-Based Screening Levels (ResRBSLs) and Ecological Risk-Based Screening Levels (EcoRBSLs) at the 48 confirmed and potential chemical use areas identified at the RMHF RFI Site (values compared against most conservative screening criteria). For CMS recommendations (see Section C.5), various land uses, or ecological receptors may be used based on physical site conditions and/or future land use.

VOCs

- Methylene chloride was detected at two locations east of the Waste Receiving Yard (CUA 7) up to 8.57 µg/kg, above the ResRBSL and below the EcoRBSL. Other detected VOCs, including styrene and methyl ethyl ketone, were below RBSLs.
- Tetrachloroethene (PCE) was detected at 0.47 µg/kg in one sample, slightly above the ResRBSL and below the EcoRBSL, at a debris area identified northwest of the RMHF RFI Site (CUA 13e). Methylene chloride, m-xylene, and p-xylene were also detected below RBSLs at this location. A second sample within this debris area was non-detect for VOCs.
- Methylene chloride was detected at 4.67 µg/kg in one sample collected at the former Building 4021 Leach Field (CUA 4b), above the ResRBSLs and below the EcoRBSL. Ethylbenzene was detected in four historical samples collected at the former Building 4021 Leach Field at concentrations up to 8 µg/kg, above the ResRBSL and below the EcoRBSL, but was not detected in more recent samples.
- PCE detected up to 0.57 µg/L, above ResRBSL, north of Building 4021.
- Acetone and methylene chloride, common laboratory contaminants, were detected in samples collected at the north drainage (west of Outfall 003), at the southwest drainage, and at the confluence of the Outfall 003 drainage and FSDF for the McLaren Hart Multi-Media Survey (McLaren/Hart, 1993). Methylene chloride was detected above ResRBSLs at all three drainage locations. The highest concentrations were observed at the drainage confluence, where methylene chloride was detected up to 73 µg/kg. Methylene chloride was detected at 7 µg/kg at the north and southwest drainages. Samples collected at the north and southwest drainages during the recent sampling event did not contain VOCs.

SVOCs

- Benzo(a)pyrene was detected up to 154 µg/kg at the Southern Slope Excavation Area (CUA 14d), on unpaved ground just outside the RMHF fenced area, above the ResRBSL. Concentrations decreased to non-detect or below RBSLs downslope.

Other SVOCs detected at the Southern Slope Excavation Area, primarily polynuclear aromatic hydrocarbons (PAHs), ranged up to 388 µg/kg (max = pyrene).

- At remaining locations, SVOCs were detected below RBSLs across the RMHF RFI Site. Benzo(a)pyrene was detected up to 47.3 µg/kg.
- Glycols and terphenyls were screened at Building 4621 (CUA 5a), the Mixed Waste Storage Yard (CUA 5b), the Building 4663 Equipment Storage Area (CUA 5c), the Waste Receiving Yard (CUA 7), the former Building 4021 Leach Field (CUA 4b), the RMHF Drainage Channel (CUA 10b), and the RMHF North Slope Excavation Area (CUA 14a). Glycols and terphenyls were not detected at the screened locations.
- SVOCs were analyzed in samples collected at the north drainage (west of Outfall 003), at the southwest drainage, and at the confluence of the Outfall 003 drainage and FSDF for the McLaren Hart Multi-Media Survey (McLaren/Hart, 1993). Three phthalates were detected in samples collected at the north and southwest drainages at concentrations up to 150 µg/kg (max = bis(2-ethylhexyl) phthalate), below RBSLs. Phthalates were detected at one location in the north drainage during the 2008 data gap sampling at concentrations up to 83.5 µg/kg (max = bis(2-ethylhexyl)phthalate), below RBSLs. SVOCs were not detected at the southwest drainage during the 2008 data gap sampling event.

TPH

- Petroleum hydrocarbons, primarily lubricant oil range organics (C20 to C30), were detected across the RMHF RFI Site and adjacent areas at concentrations below RBSLs. The majority of samples contained lubricant oil range organics at concentrations less than 100 mg/kg, while four samples had concentrations in excess of 500 mg/kg up to 1,030 mg/kg.
- Gasoline range organics (C08 – C11) were detected at one location west of the Waste Receiving Yard (CUA 7) at 1.5 mg/kg, slightly above the ResRBSL (1.2 mg/kg). Benzene was not detected in this sample, or any depths at this location.
- Diesel range (C15 – C20) and/or lubricant oil range organics were detected in the six sampled locations in the north and southwest drainages up to 10.2 mg/kg (max = lubricant oil range organics), below ResRBSLs.

PCBs

- PCBs were detected below RBSLs in approximately one-third of samples collected at the RMHF RFI Site and adjacent areas at concentrations below RBSLs. Areas where PCBs were detected include Building 4621 (CUA 5), the Building 4021 septic tank and former leach field (CUA 4a and 4b), the Building 4021 Sump (CUA 1c), the RMHF Catch Basin Drainage Channel (CUA 10b). The majority of detections were at concentrations below 15 µg/kg, with detections below RBSLs up to 40.5 µg/kg.
- Aroclor 1260 was detected at the Southern Slope Excavation Area (CUA 14d) up to 6,710 µg/kg, exceeding the Res and EcoRBSLs. The highest observed concentration was at a location south of the RMHF fence line. Aroclor 1242, Aroclor 1254, and

Aroclor 1260 were detected in down-slope and adjacent samples up to 392 µg/kg, exceeding Res and/or EcoRBSLs. Concentrations decreased to non-detect or below RBSLs at down-slope sample locations.

- PCBs were also detected at two locations in the north drainage (east of Outfall 003) and at one location at the southeast drainage at concentrations up to 20.7 µg/kg. Concentrations in the north drainage are highest in upslope samples and decrease to non-detect down drainage.

Metals

Metals were detected above background at numerous locations across the RMHF fenced yard, most prominently sodium and zinc. Remaining metals were detected above background at one or two locations and, with the exception of zinc and sodium, metals were not elevated outside the immediate vicinity of the paved RMHF yard. With the exception of cobalt, no metals were detected above ResRBSLs; EcoRBSLs are below background for most metals (see below). Details include:

- Several metals were detected above background concentrations in the Building 4621, Mixed Waste Storage Yard and Building, and Building 4663 Equipment Storage Area (CUAs 5a through 5c). Cobalt was detected above the ResRBSL (22.7 mg/kg). Hexavalent chromium was detected above the EcoRBSL. EcoRBSLs for boron, cobalt, copper, and vanadium are below background concentrations.
  - Boron up to 17.6 mg/kg (background = 9.7 mg/kg)
  - Cobalt at 29 mg/kg (background 21 mg/kg)
  - Copper at 62.7 mg/kg (background = 29 mg/kg)
  - Sodium up to 537 mg/kg (background = 110 mg/kg)
  - Thallium up to 0.6 mg/kg (background = 0.46 mg/kg)
  - Vanadium at 75.3 mg/kg (background 62 mg/kg)

- Four metals were detected above background concentrations in the Filter/Blower Area and at the Filter/Blower Area discharge pipeline (CUA 1d). EcoRBSLs for cadmium, lead, zinc, and zirconium are below background concentrations. No metals were detected above ResRBSLs.
  - Cadmium at 4.8 mg/kg (background = 1 mg/kg) at the pipeline discharge
  - Lead at 44.1 mg/kg (background = 34 mg/kg) at the pipeline discharge
  - Sodium up to 202 mg/kg (background = 110 mg/kg)
  - Zinc up to 1,240 mg/kg (background = 110 mg/kg) with the maximum detected concentration at the pipeline discharge
  - Zirconium at 14.2 mg/kg (background = 8.6 mg/kg)

- Four metals were detected above background concentrations at the Southern Culvert Area. Cobalt was detected above ResRBSL. EcoRBSLs for cobalt, copper, silver, and zinc are below background.

  - Cobalt at 152 mg/kg (background = 21 mg/kg)
  - Copper at 39.3 mg/kg (background = 29 mg/kg)
  - Silver at 9.95 mg/kg (background = 0.79 mg/kg)
  - Zinc at 329 mg/kg (background = 110 mg/kg)

- Several metals were detected above background concentrations along the RMHF Asphalt Drainage Swale (CUA 10a). Hexavalent chromium was detected slightly above the EcoRBSL. EcoRBSLs for chromium, cobalt, lead, selenium, and zinc are below background concentrations. No metals were detected above ResRBSLs. Metals were not detected above background at the RMHF Drainage Channel or RMHF Catch Basin (CUAs 10b and 10c, respectively), which receive surface water from the swale.
  - Chromium at 37.7 mg/kg (background = 36.8 mg/kg)
  - Cobalt at 48 mg/kg (background = 21 mg/kg)
  - Hexavalent chromium at 0.225 mg/kg (no background concentration)
  - Lead at 35.4 mg/kg (background = 34 mg/kg)
  - Selenium at 0.76 mg/kg (background = 0.655 mg/kg)
  - Sodium at 559 mg/kg (background = 110 mg/kg)
  - Zinc up to 520 mg/kg (background = 110 mg/kg)

- Selenium was detected at the RMHF Catch Basin Discharge Pipeline (CUA 10d) at 2.7 mg/kg, above background concentrations (background = 0.655 mg/kg) and below the ResRBSL. Eco RBSL for selenium is less than the background concentration. No metals were detected above background at the downslope locations or the pipeline discharge location.
- Hexavalent chromium was detected at 0.69 mg/kg at the Southern Slope Excavation Area (CUA 14d), exceeding the EcoRBSL.
- Zinc was detected up to 173 mg/kg at the excavation area north of the RMHF Catch Basin (CUA 14c), exceeding background concentrations (background = 110 mg/kg) and below ResRBSL. The EcoRBSL for zinc is less than the background concentration. Zinc was not detected above background concentrations at downslope drainage locations.
- Sodium was detected above background concentrations (background 110 mg/kg) across the RMHF RFI Site and in the adjacent areas at concentrations up to 655 mg/kg. Concentrations above background levels were generally observed in the RMHF fenced area, and were also observed in the disturbed soil area west of the RMHF Catch Basin (CUA 15) and at the former Building 4028 operational area (CUA 11a). There are no established RBSLs for sodium.
- Metals concentrations were below background ranges in samples collected at the north drainage (west of Outfall 003), at the southwest drainage, and at the confluence of the Outfall 003 drainage and FSDF for the McLaren Hart Multi-Media Survey (McLaren/Hart, 1993). During the 2008 data gap sampling, zinc was detected at 120 mg/kg, slightly above background concentration (110 mg/kg), at one location in

the north drainage, below the ResRBSL. EcoRBSL for zinc is less than background concentration. All other detected metals concentrations were below background.

Inorganics

Fluoride was detected above background concentrations at one location within the former Building 4021 Leach Field footprint (CUA 4b) at 7.51 mg/kg (background = 6.7 mg/kg), below the ResRBSL.

Perchlorate

Perchlorate was screened at the Building 4021 Septic Tank (CUA 4a), the former Building 4021 Leach Field (CUA 4b), the former RMHF Drainage Channel (CUA 10b), the former RMHF Catch Basin (CUA 10c), and the RMHF Drainage Pipeline (CUA 10d). Perchlorate was not detected.

Pesticides/Herbicides

One pesticide, 4,4'-dichlorodiphenyldichloroethane (4,4'-DDD), was detected above the EcoRBSL at 200 µg/kg, in an historical sample collected adjacent to the natural drainage north RMHF RFI Site, west of NPDES Outfall 003. Pesticides were detected at low concentrations in a recent collocated sample (4,4'-DDT) at 1.58 µg/kg and 4,4'-DDE at 0.81 µg/kg), below eco- and ResRBSLs. Pesticides were not detected in samples collected upstream and downstream within the drainage. Herbicides were not detected in any screened locations.

Dioxins

Calculated 2,3,7,8-tetrachlorodibenzo-p-dioxin(2,3,7,8-TCDD) toxic equivalents (TEQs) were slightly above background (background 0.87 nanograms per kilogram [ng/kg]) at one drainage location down-slope of the former Building 4021 Leach Field (CUA 4b) at 1.0 ng/kg, below Res and EcoRBSLs. Six individual dioxin congeners were detected above background and below RBSLs at this location. TEQs were below background concentration at all other locations analyzed for dioxins.

Topanga Fire Evaluation

The potential contribution of the 2005 Topanga Fire to the concentrations of metals and dioxins in soil has been considered in the RMHF RFI Site characterization. This evaluation was conducted to assess whether any elevated concentrations of six metals (barium, boron, copper, lead, thallium and zinc) or dioxins concentrations in soil samples collected after the fire could be related to the presence of ash and burned materials deposited in surface soil.

Only those surficial soil samples (from depths down to 1 foot bgs) collected after the fire were considered in this evaluation. For the RMHF RFI Site, there were approximately 150 post-fire soil samples analyzed for metals. Of the approximately 150 samples analyzed for metals:

- Five samples had zinc concentrations above background levels (RMBS0068 at 113 mg/kg, RMBS0099 at 113 mg/kg, RMBS0133 at 153 mg/kg, RMBS0144 up to 172 mg/kg, and RMBS0155 at 127 mg/kg [background = 110 mg/kg]).

For the RMHF RFI Site, there were approximately eight post-fire samples analyzed for dioxins. Of the approximately 8 samples analyzed for dioxins:

- One sample had dioxins concentrations slightly above background levels (RMBS0036 at 1.0 ng/kg [background 0.87 ng/kg]).

Based on detected concentrations and sample locations, all of which are within areas burned during the 2005 Topanga Fire, metals and dioxins detected potentially constitute fire-related impacts.

C.3.5 Groundwater Findings

Groundwater occurrence and impacts at the RMHF RFI Site are described below.

C.3.5.1 Groundwater Data Presentation

Groundwater sampling results and characterization findings are summarized in Table C.3-2B. The purposes of the table are to:

- Summarize soil impacts as they potentially relate to groundwater impacts.
- Present groundwater sampling results.
- Demonstrate that groundwater characterization is sufficient for the purposes of risk assessment including:
  - That groundwater characterization is adequate for detected site-related chemical constituents.
  - That site soil characterization is adequate for detected groundwater chemical constituents.

Similar to Table C.3-2A, Table C.3-2B describes groundwater data by chemical group (metals, VOCs, SVOCs, etc.). Table C.3-2B is organized as follows:

- Column 1 – Analytical group

- Column 2 – Summary of site soil impacts
- Column 3 – Confirmation that chemicals detected in site soil are monitored in groundwater
- Column 4 – Summary of groundwater impacts
- Column 5 – Discussion of whether chemicals are site-related
- Column 6 – Conclusion regarding adequacy of groundwater characterization

A detailed compilation of groundwater data is provided in Appendix D of this Group 7 RFI Report. The groundwater appendix contains a description of hydrogeologic conditions (occurrence, water levels, recharge, yield, etc.), groundwater quality, and transport and fate. These data include:

- Laboratory analytical results
- Hydrographs
- Time-series plots

A site-wide report on SSFL groundwater will be prepared as part of the RFI Program. This report will contain a site-wide assessment of the characterization and transport and fate issues addressed in Appendix D.

C.3.5.2 Groundwater Data Summary

Chatsworth formation groundwater at the RMHF RFI Site is monitored at 14 wells with screened intervals primarily within unweathered bedrock (RD-27, RD-30, RD-34A, RD-34B, RD-34C, RD-63, RD-87, RD-88, RD-89, RD-90, RD-94, RD-96, RD-97, and RD-98). Near-surface groundwater is monitored at one shallow well (RS-28), and one piezometer (PZ-116) screened within weathered bedrock. Analytical results from these locations are summarized and evaluated in conjunction with soil findings on Table C.3-2B.

As described in Appendix D, the primary chemicals detected in groundwater above regulatory criteria are VOCs such as PCE, TCE, and associated degradation products. Site groundwater data indicates VOCs entered the subsurface within the Group 7 Reporting Area, although soil VOC data do not identify an input location. Based on the distribution of groundwater VOC impacts, the most likely source is the Building 4021 Leach Field. While TCE is not detected in recent soil vapor samples, PCE was detected in a soil vapor sample collected adjacent to Building 4021 and the Building 4021 Sump. Based on historical use, these solvents were likely released into the leach field prior to the 1978 excavation.

Several metals were detected above groundwater comparison concentrations (GWCC) including cadmium, molybdenum, manganese, and selenium. As described in Table 3-2B, these metals are not considered to be site-related.

C.3.6 Surface Water Findings

Two surface water samples were collected at one location in the drainage north of the RMHF RFI Site (BB-16-001) during the McLaren-Hart Multi-Media Survey Report and analyzed for VOCs, SVOCs, and metals (McLaren-Hart, 1993). VOCs and metals were not detected at the sampled location. One SVOC, fluoranthene, was detected at 0.3 µg/L.

C.4 RISK ASSESSMENT FINDINGS SUMMARY

The following sections summarize the findings of the HRA and ERA performed for the RMHF RFI Site within the Group 7 RFI Report area. Details regarding how the HRA and ERA were conducted are presented in the SRAM (MWH, 2005) and in Appendix E of this Group 7 RFI Report.

C.4.1 Key Decision Points

Site-specific key decision points for the HRA and ERA are listed below and described in more fully in Appendix E. These decisions were made for the risk assessments based on site-specific conditions, chemical characteristics, and assessment findings. Programmatic decision points are described and included in the RFI Program Report (MWH, 2004a). Site-specific key decision points include:

1. Direct exposure risks were calculated using the maximum concentrations of compounds detected in well (RD-30), which had the highest concentrations of all the wells assigned to the Group 7 Reporting Area. For metals detected in groundwater from well (RD-30), unfiltered data were used to evaluate risks.
2. Exposure Point Concentration (EPC) calculations were based on collected characterization data, as follows:
    - All groundwater EPCs were based on maximum levels detected in a single highest concentration well at the RMHF RFI Site (RS-28) for indirect exposure, or detected within a single highest-concentration well within the Group 7 area (RD-30) for direct exposure.
    - A review of time series plots for chemical constituents, groundwater gradients, and source areas indicates maximum concentrations detected during the last consecutive three years conservatively represent potential future conditions for the purpose of estimating future risks.
    - Soil reasonable maximum exposure (RME) EPCs were based on maximum detected concentrations, or one-half the detection limit for non-detects if there was sufficient evidence that the chemical is present, unless there were sufficient data to calculate a statistical upper bound estimate of the concentration and that estimate was lower than the maximum.
3. Large home range receptors were assumed to live only in source areas within the RMHF RFI Site. Risks for these receptors using home range adjusted exposures were calculated for the purpose of comparing to the RFI site only risks. Large home range receptor cumulative risk across SSFL will be presented later in a Site-Wide Summary Large Home Range Receptor Risk Assessment Report.

4. Additional data gap samples were collected after the RMHF risk assessment was completed. Data for these samples could not be assessed quantitatively, which results in some uncertainty. The samples were analyzed for VOCs, SVOCs, pesticides, PCBs, TPH, and metals. VOC, TPH, and pesticide compounds were detected at concentrations similar or lower than the concentrations detected previously, and PCBs were detected at substantially lower concentrations. Therefore, including the additional data for these compounds would not affect the overall conclusions of the risk assessment. Several PAHs and a few metals were detected in the additional samples at concentrations greater than those detected previously. As a result, risk estimates for these compounds were likely underestimated for this site. However, the additional samples with higher concentrations of PAHs and metals are located in areas proposed for further evaluation during the CMS.

C.4.2 Human Health Risk Assessment Findings

The receptors included in the HRA are the potential trespasser and the future resident and recreator. Since the current potential trespasser and future recreator have the same exposure parameters, they have been presented together as the recreator.

Supporting information for the HRA is presented in the following tables and figure:

- Chemicals of Potential Concern (COPC) for Human Health – Table C.4-1
- Human Health Risk Estimates – Table C.4-2
- Human Health Risk Assessment Uncertainty Analysis – Table C.4-3
- Generalized Conceptual Site Model of HRA Exposures – Figure C.4-1

A summary of the HRA findings is presented below. For comparison purposes, excess upper bound theoretical incremental lifetime cancer risks (ILCRs) of 1×10^{-6}, or less, associated with multimedia exposures are considered acceptable. Potential risks between 1×10^{-6} and 1×10^{-4} require risk-management decisions and above 1×10^{-4} usually require remediation. Likewise, Hazard Indices (HIs) below 1.0 are considered acceptable and above 1.0 usually require remediation. Blood lead concentrations less than 10 microgram per deciliter (µg/dL) are generally considered to be acceptable for making remedial decisions (DTSC, 1992). These criteria were used to make evaluation recommendations for the CMS.

Exposure to Surficial Media Plus Indirect Groundwater Exposure

The RME risks presented in this section were based on exposures to all relevant surficial media, plus indirect exposure to VOCs in groundwater due to vapor migration, and included:

- Estimated ILCRs for all receptors ranged up to 5×10^{-6} (adult and child resident) and HIs ranged up to 0.3 (child resident). The chemical contributing to these potential risks was Aroclor 1260 in soil.
- Blood lead levels were not estimated since lead was not determined to be a COPC.

The major issues related to uncertainty and conservatism in these risk estimates are presented in Table C.4-3.

C.4.3 Ecological Risk Assessment Findings

The ecological receptors representing the site are deer mouse, hermit thrush, red-tailed hawk, bobcat, mule deer, soil invertebrates, and plants. Supporting information for the ERA is presented in the following tables and figure:

- Chemicals of Potential Ecological Concern (CPEC) – Table C.4-4
- Risk Estimates for Ecological Receptors – Table C.4-5
- Ecological Risk Assessment Uncertainty Analysis – Table C.4-6
- Graphical ERA Conceptual Site Model – Figure C.4-2

A summary of the ERA findings is presented below. For comparison purposes, estimated potential ecological risks were generally considered acceptable for Hazard Quotient (HQ) value less than 1 (HQs are hazard estimates for single CPECs). The ERA findings included:

- The deer mouse, hermit thrush, red-tailed hawk, and mule deer had estimated HQs associated with soil exposure from the RMHF RFI Site that were greater than 1. The most sensitive receptor, the deer mouse, had RME HQs greater than 1 for cadmium (10), copper (4), selenium (2), zinc (6) and total Aroclors (8). The thrush, hawk, and mule deer had at least one estimated HQ below 10, but above 1. The HQs for the bobcat were all less than 1,
- HQs were primarily associated with:
  - Cadmium, copper, selenium, zinc, and total Aroclors for the terrestrial ecological receptors.
- The deer mouse burrow air inhalation pathway does contribute significantly to their risks, compared to the risks from other non-volatile constituents.
- Estimated HQs for soil invertebrates are less than 1 for CPECs.
- No adverse effects on health or productivity of native plant species were observed within areas potentially impacted by CPECs.

The major items related to uncertainty and conservatism in these risk estimates are presented in Table C.4-6.

These HRA and ERA results are appropriate to use in making CMS recommendations for the receptors evaluated.

C.5 RMHF RFI SITE ACTION RECOMMENDATIONS

This section presents a summary of RFI reporting requirements as they apply to the RMHF RFI Site. Section C.5.1 describes current RFI reporting requirements, particularly identification of areas for further work, or 'site action' recommendations. The process and criteria used for making site action recommendations is described in Section C.5.2, and site action recommendations for the RMHF RFI Site are summarized in Section C.5.3.

C.5.1 RFI Reporting Requirements

As described in regulatory guidance documents for the SSFL RCRA Corrective Action Program (see Group 7 RFI Report Section 1.2.3), the purpose of the RFI is to: (1) characterize the nature and extent of contamination, and identify potential source areas; (2) assess potential migration pathways; (3) estimate risks to actual or potential receptors; and, (4) gather necessary data to support the CMS (DTSC, 1995). The RFI Report is required to: (1) present findings regarding the above information; (2) describe the completeness of the investigation; and, (3) indicate if additional work is needed.

This RMHF RFI Site Report accomplishes these requirements for the receptors evaluated using currently approved risk assessment methodologies:

1) Presenting detailed chemical characterization findings, source area identification, and investigation completeness determinations by media and by chemical class for all chemical use areas (and associated down-drainage locations) (Tables C.3-2A and C.3.2B). Section C.3 summarizes the overall characterization of chemical contamination nature and extent, potential source areas, and an assessment of investigation completeness. . Assessments of investigation completeness have been made for the known or potential chemical use areas identified in this report based on sampling results, using professional judgment, and considering historical site operations, chemical data concentration gradients or trends, and risk-based screening levels and risk assessment findings for residential, recreational, and ecological receptors.
2) Evaluating groundwater migration pathways in Appendix D of the Group 7 RFI Site report, and other potential transport pathways in Appendix E of the Group 7 RFI Site report.
3) Identifying potential receptors (residential, recreational, and ecological) and estimating potential risks at the RMHF RFI Site (Section C.4 and Appendix E).
4) Identifying RMHF RFI Site areas for chemicals in surficial media requiring further work (this Section)

C.5.2 Basis for Site Action Recommendations

In summary, site action recommendations for chemicals in surficial media included in the RMHF RFI Site Report identify areas for:

- Further evaluation in the CMS (CMS Areas).
- No further action (NFA) areas.
- Interim corrective measures to stabilize source areas and control chemical contaminant migration (Stabilization Areas).

Site action recommendations are based on information in historical documents, site characterization data, and risk assessment findings. Historical document review findings are used to determine areas of potential chemical use and identify areas for additional RFI sampling and characterization. Characterization findings provide definition of the nature and extent of site chemical contaminants, based on chemical data and transport and fate evaluation. Risk assessments evaluate chemical characterization data, estimate human health and ecological risks based on specified land use scenarios, and identify chemicals that drive or contribute to those risks.

Based on the review and evaluation of extensive historical records and environmental sampling data collected prior to and during the RFI, additional sampling was performed in areas where chemicals were potentially used, handled, stored, or released within the Group 7 Reporting Area. Samples were also collected in areas where the existing chemical analytical data were considered to be inadequate for site characterization and/or risk assessment (including down-gradient locations). Similarly, for areas where no historical chemical use, storage, or handling was indicated in the historical documents (i.e., for areas determined to have very limited or no potential for environmental concern), no samples were collected. Based on the documents reviewed and nearby sampling results, if any, these non-chemical use areas are recommended for NFA.

NFA and CMS recommendations for the areas sampled within the Group 7 Reporting Area are based on an integrated evaluation of characterization and risk assessment results for the receptors evaluated. Information in the historical documents indicating past chemical use practices and areas, coupled with site characterization data indicating environmental impacts or lack thereof, provide a solid basis for the NFA and CMS recommendations for chemicals in surficial media made in this site report. Stabilization Area recommendations rely on

characterization evaluations, including transport and fate analysis, and comparison to risk-based levels. Each process is described further below.

The determination of characterization and risk assessment requirements associated with SB990 is ongoing. Once these determinations are made, RFI Group documents (including the site action recommendations provided herein), will be reviewed and revised if required. The evaluation and site action recommendations presented below are based on an evaluation of chemical impacts and risk assessment findings for residential, recreational, and ecological receptors performed using currently approved RFI work plans for characterization and risk assessment.

CMS and NFA Area Site Action Evaluation Process

CMS or NFA site action recommendations for chemicals in surficial media are based on a four-step process that evaluates risk assessment results for residential, recreational, and ecological receptors in the context of characterization results and considers potential migration from identified source areas. This process is presented in detail in Section 7.1 of the Group 7 RFI Report and is summarized as follows:

- **Site Action Evaluation Step 1.** Risk assessment results for human and ecological receptors are compared to "acceptable" levels published by the USEPA or DTSC as guidance for site managers (DTSC, 1992; USEPA, 1992). The low end of the risk range (i.e., 1×10^{-6}, or 1 in 1,000,000, or HI = 1.0) is used to conservatively estimate the areal extent that is recommended for site action.
- **Site Action Evaluation Step 2.** When estimated RFI site risks are greater than 1×10^{-6} (cancer risks) or HI values greater than 1 (non-cancer and ecological risks), each RFI site's risks are reviewed on a chemical-by-chemical basis to identify risk-drivers and significant risk contributors to cumulative, total risk for each evaluated receptor.
- **Site Action Evaluation Step 3.** Characterization findings from the entire RFI site are evaluated to spatially identify areas where higher concentrations of risk drivers and contributors are detected. The identified areas are termed in this report 'CMS Areas' and represent locations recommended for further evaluation during the CMS. Areas recommended for further evaluation during the CMS are comprehensive of all appropriate potential receptors or land use scenarios evaluated following currently approved RFI work plans.
- **Site Action Evaluation Step 4.** The fourth step identifies any uncertainties in RMHF RFI Site characterization and risk assessments that affect findings. For example, some chemicals are assumed to be present in soil based on TPH extrapolation factors (e.g., benzene and PAHs) and contribute to total risk for the RFI site above acceptable

levels. Since this assumption is often highly conservative, its use as a basis for CMS recommendations may be further evaluated in the CMS.

As described in Step 3 above, the areas of the RFI sites proposed for further evaluation in the CMS (i.e., CMS Areas) are based on identifying chemical concentrations that are above their respective RBSL. This process results in CMS Areas that are larger than would need to be addressed during cleanup to achieve acceptable risks. This is due to comparing individual soil sample results to RBSLs as 'bright-line' criteria, instead of using an area-average concentration. Area-averaged concentrations will be used in the CMS to refine the cleanup extent at these recommended CMS Areas.

Site action recommendations are tabulated by chemical use area and chemical risk drivers/contributors are identified for each appropriate receptor in Table C.5-1. CMS Areas are also depicted graphically in Figure C.5-1 to illustrate location and approximate aerial extents, and summarized in Table C.5-2.

Two additional aspects of RFI reporting will serve to confirm and/or finalize the areas recommended in Group RFI Site Reports for evaluation in the CMS. The first is an ecological evaluation for large-home range receptors (e.g., mule deer and hawk). The second is a groundwater evaluation that will be reported in the Site-Wide Groundwater Report.

Stabilization Area Site Action Evaluation Process

Chemical data collected during the RFI is evaluated for chemical contaminant migration. Resulting site action recommendations focus on stabilization measures related to sediment transport via the surface water pathway.

Criteria used to evaluate if source area stabilization measures are needed to control surface water migration include:

- Presence of concentrations above background or RBSLs in surficial (not deeper) soils.
- Proximity of surficial source area to an active surface water drainage pathway.
- Moderate to steep topography.
- Absence of containment features (e.g., surface coatings, dams).
- Chemical concentration gradients that indicate prior transport away from the surficial source area.

Each criterion is considered important, and a weight-of-evidence evaluation is used to make a recommendation for chemical source area stabilization measures. Source area stabilization measures, which include the use of best management practices (BMPs), are used to prevent migration to surface water. BMPs include the installation of straw bales, fiber rolls, silt fencing, and covering areas with plastic tarp. Erosion control measures have been applied to many surficial soil source areas at the SSFL to prevent chemical contaminant migration. These are described in the SSFL Storm Water Pollution and Prevention Plan (MWH, 2006).

C.5.3 RMHF RFI Site Recommendations

The RMHF RFI Site action recommendations are listed in Table C.5-1 and are presented on Figure C.5-1. Table C.5-1 lists CMS and NFA recommendations and includes identification of chemical risk drivers and contributors for each appropriate receptor. Source area stabilization recommendations are also identified for one CMS Area, as noted. CMS Areas shown on Figure C.5-1 are approximate and represent evaluations inclusive of the receptors and land use evaluated. As noted above, recommendations reported in this document will be reviewed upon completion of the site-wide groundwater report and large-home range receptor evaluations, and updates to this report prepared as needed.

RMHF RFI Site areas recommended for evaluation in the CMS, and for surficial soil source stabilization measures are summarized below. Four CMS areas were identified at the RMHF RFI Site (Table C.5-2), including:

- RMHF-1: South Fence Excavation Area (Aroclor 1260, Aroclor1242, Aroclor 1254, benzo(a)pyrene)
- RMHF-2: Waste Receiving Yard Area (benzene, methylene chloride)
- RMHF-3: Northeast Slope Area (cadmium, cobalt, zinc)
- RMHF-4: Southern Culvert Area (cobalt, copper, silver, zinc)

One stabilization area was identified at this site, RMHF-4, since the impacted soil is immediately adjacent to a storm drain.

This page intentionally left blank

C.6 REFERENCES

Atomics International (AI), 1961c. SNAP Shield Test Experiment Preliminary Operations Manual. May 8. HDMSP002053011

AI, 1964e. Internal letter from L. M. Young to R. M. Hill regarding Incident Report. June 17. HDMSP00050988

AI, 1965a. Internal letter from L. M. Young to R. M. Hill regarding Incident Report. January 18. HDMSP00051001

AI, 1965b. Internal letter from L. M. Young to R. M. Hill regarding Incident Report. February 12. HDMSP00050965

AI, 1965c. Internal letter from L. M. Young to R. M. Hill regarding Incident Report. May 18. HDMSP00051011

AI, 1966a. Monthly Progress Report, September, 1966. October 10. HDMSE00637010

AI, 1966b. Fire Alarm, Bldg 021. November 15. HDMSP00050332.

AI, 1966c. Review of Fire in Bldg 021, Santa Susana. November 15. HDMSP00050334

AI, 1967. Internal letter to M. E. Remley regarding Radiation Safety Unit Weekly Newsletter. June. HDMSP00051142

The Boeing Company (Boeing), 1997. Internal letter from R. Deschamps to Radiation Safety Team regarding Incident Report. October 20. HDMSP00051208

Boeing, 2003a. Internal letter from Phil Rutherford to Roger Marshall regarding Radioactive Materials Handling Facility (RMHF) Catch Basin Alarms, Santa Susana Field Laboratory. February 13. HDMSP00108920

Boeing, 2003b. SSFL Hazardous Materials Release Response Business Plan and Inventory (Business Plan) – Revision 18. November 18. HDMSP00119989

Boeing, 2006a. Radiation Survey Report – RMHF North Slope. April 20. HDMSP00038283

Boeing, 2006b. Email from Philip D. Rutherford to Daniel M. Trippeda regarding RMHF Slope. April 24. HDMSP00038287

Boeing, 2006c. Internal Letter from Phil Rutherford and Dan Trippeda to Brian Sujata regarding Contract DE-AC03-99SF21530 – RMHF Slope Remediation. June 9. HDMSP00038299

Boeing, 2007a. Letter from P.J. Costa, Boeing, to S. Du Vall Knorr, VCEHD, regarding Santa Susana Field Laboratory ID#: FA0004865 Business Plan and Hazardous Materials Inventory Update. February 14. HDMSP00077371

Boeing, 2007b. Radioactive Materials Handling Facility Decontamination and Decommissioning Engineering Evaluation / Cost Analysis. June 18. HDMSE00726955

Boeing, 2008a. Letter from Ravnesh Amar, DOE, to Norm Riley, DTSC, regarding RCRA Facility Investigation of Radioactive Materials Handling Facility, Santa Susana Field Laboratory. February 12.

Boeing, 2008b. Email conversation between Shelby Valenzuela, MWH, and Dan Trippeda, Boeing, regarding RMHF Catch Basin Removal. January 18. HDMSE00715853

Boeing, 2009a. Conversation with Dan Trippeda regarding RMHF Catch Basin. February 23. HDMSE00726954

Boeing, 2009b. Conversation with Paul Waite regarding RMHF Site History. February 23.HDMSE00731637

Boeing, 2009c. Conversation with Paul Waite regarding RMHF Questions. March 16. HDMSE00731639

Boeing, 2009d. Conversation with Dan Trippeda regarding Building 4028 Storm Drains. May 13, 2009. HDMSE00731636

Boeing, 2009e. Group 7 Historical Documents, Santa Susana Field Laboratory, Ventura County, California. June.

Cabrera Services (Cabrera), 2006. Final Status and Survey Report: Characterization and Final Status Survey Radioactive Materials Handling Facility Perimeter, Santa Susana Field Laboratory, Ventura County. March. HDMSE00714226

Cabrera, 2007a. Characterization and Final Status Survey Radioactive Materials Handling Facility Holdup Pond (Site 4614). March. HDMSE00714288

Cabrera, 2007b. Final Combined Summary Report: Radioactive Materials Handling Facility Building Surveys, Santa Susana Field Laboratory, Ventura County. October. HDMSE00714021

Daniel, Mann, Johnson, & Mendenhall Architects and Engineers (DMJM), 1958a. Calculations for R/A Waste & Fuel Storage Facility Santa Susana California AEC Contract at (11-1)-632 for United States Atomic Energy Commission. August. HDMSe00459394

Department of Energy (DOE), 1989. Finding of No Significant Impact – TRUMP-S Program. October 20. HDMSP001816664

DOE, 1990. Radioactive Waste Packaging Lot Follower and Procedure Verification, Building T020, Container No. L408, Packaged February 1, 1990. HDMSP001892204

DOE, 1991. Radioactive Waste Packaging Lot Follower and Procedure Verification, Building T022, Container No. L-418, Received August 26, 1991. HDMSP001877865

DOE, 1992. Radioactive Waste Packaging Lot Follower, Building 020, Container No. L426. May 19. HDMSP001864057

DOE, 1993a. Radioactive Waste Packaging Lot Follower and Procedure Verification, Building 022, Container No.: L558. August 31. HDMSP001843598

DOE, 1993b. Known and Suspected Mixed Wastes from RIHL. November 15. HDMSp001892233

DOE, 1993c. Tasks to Complete B/020 D&D. December 22. HDMSp001877724

DOE, 1994a. Radioactive Waste Packaging Lot Follower and Procedure Verification, Container No.: L556. January 13. HDMSP001843596DOE, 1994b. Radioactive Waste Packaging Lot Follower and Procedure Verification, Building T621, Container No. L598, Received April 28, 1994. HDMSp001881259

DOE. 1995a. Radioactive Waste Packaging Lot Follower and Procedure Verification, Building T021, Container No. L668, Received January 16, 1995. HDMSp001881403

DOE. 1995b. Radioactive Waste Packaging Lot Follower and Procedure Verification, Building T020/RMDF, Container No. B-176, Received July 19, 1995. HDMSP001875475

DOE, 1997a. Certification Docket for the Release of Building 028 at the Energy Technology Engineering Center. April. HDMSP00014804

DOE, 1997ba. Letter from C. Irvine, DOE to C. Kawashige, DTSC, regarding Identification of New Potential Mixed Waste at ETEC, “Mercury / Sediment Containing Mercury”. May 9. HDMSP001875259

DOE, 1997cb. Radioactive Waste Packaging Lot Follower and Procedure Verification, Building 100, Container No: L-598, Received July 16, 1997. HDMSP001905961

DOE, 1997d. Radioactive Waste Packaging Lot Follower and Procedure Verification, Building 021, Container No: B509, Received November 9, 1995. HDMSP001905961

DOE, 2003. Draft Docket for Release of the Former Building 4020 Site (Hot Laboratory) as Part of the Energy Technology Engineering Center Closure. June. HDMSP00012411

Department of Toxic Substances Control (DTSC). 1992. Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities. October. HDMSe00719828.

DTSC, 1995. Hazardous Waste Facility Post-Closure Permit PC-94/95-3-02 (Area I & III). May. HDMSe00166796.

DTSC, 2001. Inspection Report: Energy Technology Engineering Center Radioactive Materials Handling Facility, Top of Woolsey Canyon Road, Simi Valley, California, EPA ID No. CA3-890-090-001. March. HDMSE00586385

DTSC, 2007. Docket No. P3-07/08-003, Consent Order for Corrective Action. August 16. HDMSE00552174

DTSC, 2008. Letter from Norm Riley, DTSC, to Ravnesh Amar, DOE, regarding RCRA Facility Investigation of Radioactive Materials Handling Facility, Santa Susana Field Laboratory. February 12.

Ecology & Environment, Inc., 1989. Summary Review of Preliminary Assessments/Site Inspections of Rockwell International Santa Susana Field Laboratory. July 19. HDMSP001800321

Energy Technology Engineering Center (ETEC), 1993. Area IV Chemical Usage Summary Report. August. HDMSP00041455

Groundwater Resource Consultants (GRC), 1995a. Sampling and Analysis Plan, Hazardous Waste Facility Post-Closure Permit PC-94/95-3-03, Area II. Santa Susana Field Laboratory, Rockwell International Corporation, Rocketdyne Division. June 5. HDMSe00167212.

GRC, 1995b. Sampling and Analysis Plan, Hazardous Waste Facility Post-Closure Permit PC-94/95-3-02, Areas I and III. Santa Susana Field Laboratory, Rockwell International Corporation, Rocketdyne Division. June 5. HDMSe00000125.

H&A, 2006. Closure Plan for the Radioactive Materials Handling Facility. October. HDMSP00033215

H&A, 2007. Report on Annual Groundwater Monitoring, 2006. Santa Susana Field Laboratory, Ventura County, California. February. HDMSe00102096

Haley & Aldrich, Inc. (H&A), 2008a. Report on Annual Groundwater Monitoring, 2007. Santa Susana Field Laboratory, Ventura County, California. February. HDMSe00716956 (VI of II), HDMSe00717315 (VII of II).

H&A, 2008b First Quarter 2008 Groundwater Monitoring Report, Santa Susana Field Laboratory, Ventura County, California. May. HDMSe00718400.

H&A, 2008c Second Quarter 2008 Groundwater Monitoring Report, Santa Susana Field Laboratory, Ventura County, California. August. HDMSe00724498.

H&A, 2008d Third Quarter 2008 Groundwater Monitoring Report, Santa Susana Field Laboratory, Ventura County, California. November. HDMSe00724753.

Hill Wynne Troop & Meisinger (HWTM), 1993. Memorandum from HWTM to all Rockwell International employees, Rocketdyne Division. January 5. HDMSe00106345

ICF Kaiser Engineers (ICF), 1993. Current Conditions Report and Draft RFI Work Plan, Areas I and III, Santa Susana Field Laboratory, Ventura County, California. September. HDMSe00126914, HDMSe00125366, HDMSe00127177, HDMSe00126446.

McLaren/Hart Environmental Engineering Corporation (McLaren/Hart), 1993. Multi-Media Sampling Report for the Brandeis-Bardin Institute and the Santa Monica Mountains Conservancy. March 10. HDMSE00082594, HDMSE00083333, HDMSE00083993, HDMSE00083070, HDMSE00084821

McLaren/Hart, 1995. Additional Soil and Water Sampling, The Brandeis-Bardin Institute and The Santa Monica Mountains Conservancy. January 19. HDMSE00078244

Montgomery Watson, 2000. Technical Memorandum, Conceptual Site Model, Movement of TCE in the Chatsworth formation. Santa Susana Field Laboratory, Volumes I, II, and III. April. HDMSe00012888 (Volume I), HDMSe00012932 (Volume II), HDMSe00013132 (Volume III).

Montgomery Watson Harza (MWH), 2002. Technical Memorandum, Geological Characterization of the Northeast Portion of the SSFL, Ventura County, California. February. HDMSe00720657.

MWH, 2003. Near-surface Groundwater Characterization Report. Santa Susana Field Laboratory, Ventura County. November. HDMSe00015203.

MWH, 2004a. RCRA Facility Investigation Program Report. Santa Susana Field Laboratory, Ventura County. July. HDMSe00017872.

MWH, 2004b. Report of Results, Phase I of Northeast Investigation Area Groundwater Characterization. Santa Susana Field Laboratory, Ventura County. September. HDMSE00014766, HDMSe00122614.

MWH, 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan, Revision 2. Santa Susana Field Laboratory, Ventura County. September. HDMSe00198211.

MWH, 2006. Storm Water Pollution Prevention Plan for Santa Susana Field Laboratory. June. HDMSe00006204.

MWH, 2008a. RCRA Facility Investigation Work Plan Addendum Amendment, Radioactive Materials Handling Facility RFI Site (SWMU 7.6 and Area IV AOC), Santa Susana Field Laboratory, Ventura County. March. HDMSE00726997

MWH, 2008b. RCRA Facility Investigation Work Plan Addendum Second Amendment, Radioactive Materials Handling Facility RFI Site (SWMU 7.6 and Area IV AOC), Santa Susana Field Laboratory, Ventura County. October. HDMSE00727184

MWH/CH2M Hill, 2008a. Waste Debris Survey, Santa Susana Field Laboratory, Ventura County, California. March. DRAFT. HDMSe00720088.

MWH/CH2M Hill, 2008b. Standard Operating Procedures: Building Feature Evaluation and Sampling, Santa Susana Field Laboratory, Ventura County, California. July. HDMSe00720063.

Ogden Environmental and Energy Services Co., Inc. (Ogden), 1996. RFI Work Plan Addendum, Volumes I, II, and III, Santa Susana Field Laboratory, Ventura County, California, September. HDMSe00018939, HDMSe00019266, and HDMSe00019681.

Ogden, 2000a. RCRA Facility Investigation Work Plan Addendum Amendment. Santa Susana Field Laboratory, Ventura County, California. June. HDMSe00170168.

Ogden, 2000b. Standardized Risk Assessment Methodology (SRAM) Work Plan, Santa Susana Field Laboratory, Ventura County, California. June. HDMSe00177198.

Rocketdyne, 1989. Internal letter from Norma Fujikawa to Dinah regarding Code for Laboratory Tests for Radioactivity in Well Waters Near these Attached Areas. September 22. HDMSP001796955

Rocketdyne, 2000. Analysis of Hazardous Chemical Constituents from Normal Operations and Accident Scenarios for Mixed Waste Handling at the Radioactive Materials Handling Facility. May. HDMSP00061962

Rockwell, 1974b. Letter from M. E. Remley, Manager of Health, Safety and Radiation Services, Rockwell International, to R. G. Page, Directorate of Licensing, Materials and Plant Processing Branch, U. S. Atomic Energy Commission, regarding Physical Protection of Special Nuclear Materials Docket 70-25. August 16. HDMSP001811326

Rockwell, 1975. Internal Letter from J. M. Harris to W. R. McCurnin regarding Plan of Action for RMDF. November 18. HDMSP00046486

Rockwell, 1978a. Internal Letter from R. J. Tuttle to Radiation and Nuclear Safety regarding Contaminated Runoff from RMDF Leach Field. March 2. HDMSP00009559

Rockwell, 1978c. Internal letter from W. R. McCurnin to numerous recipients regarding the Proposed Plan for Handling Radioactive Liquid Waste at RMDF and SRE. March 15. HDMSE00373136

Rockwell, 1978d. Internal letter from M. R. McCurnin to W. D. Kittinger regarding Removal of RMDF Leach Field Temporary Roofing. May 16. HDMSE00373135

Rockwell, 1978e. Internal letter from S. M. Bradbury to R. J. Tuttle regarding Sump Overflow in the 5,000-Gal Holdup Tank Enclosure at the RMDF. June 7. HDMSP00049681

Rockwell, 1978f. Fermi Fuel Decladding Checkout Nuclear Safety Analysis. July. HDMSP00186589

Rockwell, 1978h. Internal letter from R. J. Tuttle to L. S. Breese and J. H. Walker regarding RMDF Liquid R/A Waste Holdup Tank. July 27. HDMSP00049765

Rockwell, 1979a. Internal letter from F. W. Gardner to M. E. Remley regarding Release of Radioactivity from RMDF – January 1979. February 23. HDMSP00050251

Rockwell, 1979b. Internal letter from F. W. Gardner to Radiation & Nuclear Safety regarding Radiological Safety Incident Report. February 26. HDMSP00049694

Rockwell, 1979c. Letter from M. E. Remley, Rockwell International, to C. D. Jackson, Department of Energy, regarding Radioactive Release at RMDF. March 6. HDMSP00049700

Rockwell, 1979d. Internal letter from D. E. Owens to Radiation & Nuclear Safety Group regarding Radiological Safety Incident Report. August 20. HDMSP00050404, HDMSP00050405

Rockwell, 1979e. Internal letter from F. H. Badger to W. R. McCurnin, Jr., regarding Radioactive Spills at RMDF. October 17. HDMSP00049483

Rockwell, 1979f. Internal letter from D. E. Owens to Radiation & Nuclear Safety regarding Radiological Safety Incident Report. October 29. HDMSP001812088

Rockwell, 1980a. Internal letter from S. M. Bradbury to Radiation & Nuclear Safety regarding Radiological Safety Incident Report. January 9. HDMSP00049712, HDMSP00049713, HDMSP00049714

Rockwell, 1980b. Internal letter from R. J. Tuttle to N. E. Remley regarding Summary of Release of Contaminated Water at RMDF, January 1980. January 31. HDMSP00049715

Rockwell, 1981a. Internal letter from R. J. Tuttle, Energy Systems Group, to M. A. Francis, Rocketdyne-Canoga, regarding Sources of Radioactively Contaminated Water at Santa Susana. February 17. HDMSE00605886

Rockwell, 1981b. SNAP Facilities Decommissioning Alternatives. July 9. HDMSP01886661

Rockwell, 1981c. Relevant Information to Support RMDF and Interim Storage Facility Decommissioning. November 5. HDMSP00054164

Rockwell, 1982a. Radioactive Materials Disposal Facility Leach Field Environmental Evaluation Report. February 23. HDMSP00009475

Rockwell, 1982b. SEFOR Shipping Canister Closure Weld Test Program. April 20. HDMSP001921190

Rockwell, 1982c. RMDF Leach Field Decontamination Final Report. September 15. HDMSP00009415

Rockwell, 1982d. Internal letter from W. R. McCurnin to J. H. Walter regarding Highlights – Week Ending 09-24-82. September 24. HDMSP001824027

Rockwell, 1982e. Internal letter from J. P. Page to W. J. Roberts regarding Engineering Development and Test Highlites [sic] – Week Ending 9-24-82. HDMSP001824081

Rockwell, 1983a. Internal letter from D. A. Sheptenko, Energy Services Group, to W. F. Dennison, Energy Services Group, regarding Relocate Emergency 100 KW Generator from SRE to RMHF. March 14. HDMSE00024514

Rockwell, 1983b. Abandon Sewer Lines, Drain Lines, and Septic Tank Removal Detailed Work Procedure. May 12. HDMSP001629666

Rockwell, 1983c. Radioactive Materials Disposal Facility Interim Decommissioning Approach. July. HDMSP001929524

Rockwell, 1984a. Action Description Memorandum for Decontamination and Decommissioning of the Surplus Facilities at the ESG Santa Susana Field Laboratory. June 30. HDMSP001881193

Rockwell, 1984b. Repackaging of Advanced Fuel Program UPuO2 Scrap. December 14. HDMSP001822170

Rockwell, 1985b. Internal letter from W. R. McCurnin to T. T. Higgins regarding Nuclear Operations – Charter. June 17. HDMSP001816981

Rockwell, 1986b. Processing and Handling of Fermi Fuel Assemblies at the RIHL. April 24. HDMSP001806182

Rockwell, 1987a. Letter from J. T. Evans, Rockwell, to M. E. Long, DOE, regarding Strategic Facilities Initiative. March 23. HDMSP001825271

Rockwell, 1987ba. Modification of RMDF, B021 Sump. July 16. Rockwell. HDMSP001929442

Rockwell, 1987c. Other Advanced Fuels Nuclear Material Waste. November 17. HDMSP0001840421

Rockwell, 1987d. Internal letter from F. C. Schrag to W. R. McCurnin regarding Highlights, Week Ending December 11, 1987. December 14. HDMSP001816774

Rockwell, 1987e. Internal letter from J. Wallace to Radiation & Nuclear Safety Group regarding Radiological Safety Incident Report. December 21. HDMSP00050134

Rockwell, 1988a. Internal Letter from J.D. Moore to M.E. Remley regarding Quarterly Review of the RMDF for Radiation Safety, Fourth Calendar, 1987. March 25. HDMSP001813881Rockwell, 1988b. Internal letter from AWC, Inc., to Radiation & Nuclear Safety Group regarding Radiological Safety Incident Report. August 23. HDMSP00050141

Rockwell, 1988c. Internal letter from F. A. Seward to W. E. Nagel regarding Request for Radioactive Material and Radiation Producing Device User Authorization for RMDF Operation. December 9. HDMSP001800214

Rockwell, 1989b. letter from R. J. Tuttle, Rockwell, to R. Vaille, USEPA, regarding Identification and Description of Areas Involved with Radioactive materials at SSFL Area IV. October 2. HDMSP001858656

Rockwell, 1989c. Nuclear Operations at Rockwell's Santa Susana Field laboratory – A Factual Perspective. December. HDMSE00001205

Rockwell, 1989d. Radioactive Materials Disposal Facility (RMDF) Interim Decommissioning Approach. December 4. HDMSP001929524

Rockwell, 1990a. Rocketdyne Division Environmental Monitoring and Facility Effluent Annual Report, De Soto and Santa Susana Field Laboratories Sites, 1989. May. HDMSE00503119

Rockwell, 1990b. Procedure Evaluation for Electropolishing Three-Inch Diameter Building T020 Cell Wall Penetrations. July 11. HDMSP001922350

Rockwell, 1993a. Internal letter from P. D. Rutherford to S. R. Lafflam regarding Activity Report for the Radiation Protection and Health Physics Services, Week Ending 5/28/93. June 1. HDMSE00605863

Rockwell, 1993b. Rockwell International Hot Laboratory. August 1. HDMSP001799542

Rockwell, 1993ca. Internal letter from R. J Tuttle to P. D. Rutherford regarding NESHAPS Evaluation of T023 Sodium Passivation at Radioactive Materials Disposal Facility. August 6. HDMSE00671273

Rockwell, 1993db. Internal Letter from P. D. Rutherford to S. R. Lafflam regarding Activity Report for Radiation Protection and Health Physics Services, Week Ending November 5, 1993. November 8. HDMSP001814828Rockwell, 1993ec. RIHL Building 020 Waste Characterization Plan. November 9. HDMSP001824608

Rockwell, 1994a. NTS Waste Stream – DD200001 Characterization Document. March 2. HDMSP00020044

Rockwell, 1994b. Internal letter from F. H. Badger to P. D. Rutherford regarding Master Incident File (MIF) Status. May 9. HDMSE00581438

Rockwell, 1994c. Summary Historical Review of Underground Tanks, Santa Susana. August 10. HDMSE00104523

Rockwell, 1994d. RIHL Backlog Waste Review. August 20. HDMSp001881292

Rockwell, 1994e. A Document Review to Characterize Atomic International SNAP Fuels Shipped to INEL 1966 – 1973. September 30. HDMSP001918144

Rockwell, 1994f. Area IV Chemical Usage Summary Report. November. HDMSP00041455

Rockwell, 1994g. RIHL Contaminated Lead Removal from Facility. November 16. HDMSP001892255

Rockwell, 1995a. Letter from S. R. Lafflam, Rockwell International, to the Regional Water Quality Control Board, Los Angeles Division, 1994 Annual NPDES Report. March 15. HDMSE00090886

Rockwell, 1995b. Internal letter from A. D. Nelson to S. R. Lafflam regarding Activity Report – April. April 24. HDMSE00629266

Rockwell, 1996. Area IV Radiological Characterization Survey Final Report. August 15, 1996. HDMSe00030423 (Vol. I), HDMSe00030951 (Vol. II), HDMSe00031374 (Vol. III), HDMSe00031876 (Vol. IV)

Sapere Consulting, Inc. and the Boeing Company (Sapere), 2005. Historical Site Assessment of Area IV, Santa Susana Field Laboratory, Ventura County, California. May. HDMSe00032525, HDMSe00032615

Science Applications International Corporation (SAIC), 1991. Interim Final RCRA Facility Assessment Report for Rockwell International Corporation, Rocketdyne Division, Santa Susana Field Laboratory, Ventura County, California. July. HDMSe00121141.

SAIC, 1994. Final RCRA Facility Assessment Report for Rockwell International Corporation, Rocketdyne Division, Santa Susana Field Laboratory, Ventura County, California. May. HDMSe00008191.

United States Environmental Protection Agency (USEPA), 1992. Guidance for Data Usability in Risk Assessment (Part A), Final. Office of Emergency and Remedial Response. HDMSe00720342.

USEPA, 1997. Aerial Photographic Analysis of Rockwell Rocketdyne Santa Susana Field Laboratory, Ventura County, California. USEPA Research and Development, Characterization Research Division, EPA Region 9, TS-PIC-9709912R. May. HDMSe00021334 (document), HDMSE00021321 through HDMSE00021333 and HDMSE000221375 through HDMSE00021381 (photographs)

Facility Drawings

Atomics International (AI), 1959o. Drawing Number 303-021-E8 regarding Radioactive Waste and Fuel Storage Bldg 021 Santa Susana Weather Proof Elect. Equip. September 26. HDMSe00459057

AI, 1960. Drawing Number 303-021-M2 regarding R/A Waste and Fuel Storage, Bldg 021 & 022 Exhaust Modifications – Plan. August. HDMSE00731195

AI, 1961a. Drawing Number 303-034-A2 regarding Radioactive Waste Facility Office Building Floor Plan and Elevations. August. HDMSE00731204

AI, 1961b. Drawing Number 303-614-C1 regarding Sump – Drainage Control SNAP Area – Santa Susana. March. HDMSE00731206

AI, 1961d. Drawing Number 303-614-C2 regarding Surface Drainage and Sump Modification Plot Plan – SNAP Area – Santa Susana. October. HDMSE00731207

AI, 1962a. Drawing Number 303-034-E1 regarding Radioactive Waste Facility Office Bldg. Electrical Power & Lighting. January 8. HDMSE00731212

AI, 1963a. Drawing Number 303-621-A1 regarding Accountable Waste Storage Building 621 Plan, Elevations, and Details. November 18. HDMSE00731208

AI, 1963b. Drawing Number 303-621-C1 regarding Accountable Waste Storage Building 621 Site and Grading Plans and Details. November 18. HDMSE00731209

AI, 1963c. Drawing Number 303-664-C1 regarding Low Level Radioactive Waste Facility Santa Susana Site Plans and Details. December 17. HDMSe00459075

AI, 1963d. Drawing Number 303-664-M1 regarding Low Level Radioactive Waste Facility Flow Diagram and Details. December 17. HDMSe00459083

AI, 1963e. Drawing Number 303-664-M2 regarding Low Level Radioactive Waste Facility Mechanical Plan and Section. December 17. HDMSe00459084

AI, 1963f. Drawing Number 303-664-M3 regarding Low Level Radioactive Waste Facility Mechanical Details. December 17. HDMSe00459085

AI, 1963g. Drawing Number 303-664-M4 regarding Low Level Radioactive Waste Facility Evaporator and Condenser Details. December 17. HDMSe00459086

AI, 1963h. Drawing Number 303-664-M5 regarding Low Level Radioactive Waste Facility Equipment and Piping Plan. December 17. HDMSe00459087

AI, 1963i. Drawing Number 303-665-A1 regarding Radioactive Scrap Oxidation Facility Building 665 Santa Susana Floor Plan, Elevations, and Details. December 17. HDMSe00459099

AI, 1963j. Drawing Number 303-665-E1 regarding Building 665 Santa Susana Radioactive Scrap Oxidation Facility Lighting, Power Plans, and Details. December 18. HDMSe00459100

AI, 1964a. Drawing Number 303-664-P1 regarding Low Level Radioactive Waste Santa Susana Facility Flow Diagram. April 15. HDMSe00459092

AI, 1964b. Drawing Number 303-664-E3 regarding Low Level Radioactive Waste Facility Santa Susana Facility Electrical Plan and Details. April 15. HDMSe00459078

AI, 1964c. Drawing Number 303-664-M6 regarding Low Level Radioactive Waste Facility 664 Santa Susana Facility Equipment Sections and Elevation. April 15. HDMSe00459088

AI, 1964d. Drawing Number 303-044-A1 regarding Santa Susana Facility – Building 044 RMDF Clean Shop Plan and Sections. June 12. HDMSE00731203

AI, 1964f. Drawing Number 303-044-E1 regarding Santa Susana Facility – Building 044 RMDF Clean Shop Electrical Plans & Details. June 19. HDMSE00731213

AI, 1965d. Drawing Number 303-664-M10 regarding Low Level Radioactive Waste Facility Modifications Plan and Elevation. December 8. HDMSe00459091

AI, 1971. Drawing Number 303-075-S1 regarding Contaminated Equip. Storage Bldg. 075. May. HDMSE00731205

DMJM, 1958b. Drawing Number 303-021-P1 regarding R/A Waste and Fuel Storage Plumbing Floor Plans and Details. September 25. HDMSE00731232

DMJM, 1958c. Drawing Number 303-021-P2 regarding R/A Waste and Fuel Storage Plumbing Floor Plans and Details. September 25. HDMSe00459056

DMJM, 1958d. Drawing Number 303-022-M1 regarding R/A Waste and Fuel Storage Plumbing Site Plan, General Notes and Legend. September 25. HDMSe00459074

DMJM, 1958e. Drawing Number 303-022-M2 regarding R/A Waste and Fuel Storage Plumbing Floor Plans and Details. September 25. HDMSE00731200

DMJM, 1958f. Drawing Number 303-022-A1 regarding R/A Waste and Fuel Storage Plumbing Site Plan, General Notes and Legend. September 25. HDMSE00731196

DMJM, 1958g. Drawing Number 303-022-E2 regarding R/A Waste and Fuel Storage Plumbing Site Plan, General Notes and Legend. September 25. HDMSE00731198

DMJM, 1958h. Drawing Number 303-022-S2 regarding R/A Waste and Fuel Storage Foundation Plans and Details. September 25. HDMSE00731202

DMJM, 1958i. Drawing Number 303-022-S4 regarding R/A Waste and Fuel Storage Foundation Plans and Details. September 25. HDMSE00731234

DMJM, 1959j. Drawing Number 303-022-A7 regarding R/A Waste and Fuel Storage Guard Shack. September 25. HDMSE00731197

Rockwell, 1967. Drawing Number 303-GEN-C40 regarding Santa Susana Field Laboratory Plot Plan. HDMSE00726993

Rockwell, 1976a. Drawing Number 303-GEN-E180 regarding Santa Susana Field Laboratory S./C./E.-Burro Flats Sub Station #704 Electrical Load Schedule – 4160 V. 1975 – 1981. HDMSE00726996

Rockwell, 1976b. Drawing Number 303-021-E10 regarding Santa Susana Field Laboratory R/A Waste and Fuel Storage - Bldg 21 RMDF Evaporator Tank Control. June 8. HDMSE00731201

Rockwell, 1977c. Drawing Number 303-021-S14 regarding Santa Susana Buildings 021 and 022 Seismic Tiedowns Plan and Details. August 5. HDMSE00731210

Rockwell, 1977d. Drawing Number 303-022-E8 regarding Santa Susana Facility B/022 NA Melt Electrical Heaters Power and Control. August 18. HDMSE00731233

Rockwell, 1977e Drawing Number 303-GEN-C93 regarding Santa Susana Facility Area Plan Storm Water Master East. September. HDMSE00726994

Rockwell, 1978b. Drawing Number 303-022-S19 regarding Santa Susana Field Laboratory B/022 Tank Containers. March 6. HDMSE00731231

Rockwell, 1978i. Drawing Number 303-022-P1 regarding Santa Susana Field Lab B/021 & B/022 Liquid Waste Storage. August 23. HDMSE00731237

Rockwell, 1978j. Drawing Number 303-022-P2 regarding Santa Susana Field Lab B/021 & B/022 Liquid Waste Storage Elevations. August 23. HDMSE00731230

Rockwell, 1978k. Drawing Number 303-022-E10 regarding Santa Susana Field Lab Bldg 022 Liquid Waste Storage Tank Pump Diagram and Section. August 25. HDMSE00731211

Rockwell, 1978m. Drawing Number 303-GEN-E295 regarding Santa Susana Facility – RMDF Communication System – RMDF Area Plans – Bldgs. 021, 022, 034, 044, 075. December 1. HDMSe00459069

Rockwell, 1986a. Drawing Number M000-68105-E1, 303-GEN-E333, regarding SSFL Area IV ETEC Transformers and Capacitors Plot Plan. February 12. HDMSE00726995

Photographs

AI, 1959a. Photograph Number 00-53760 A. March 20. HDMSE00731255

AI, 1959b. Photograph Number 00-57361 A. March 30. HDMSE00731256

AI, 1959c. Photograph Number 00-57361 F. March 30. HDMSE00731257

AI, 1959d. Photograph Number 00-57361 H. March 30. HDMSE00731258

AI, 1959e. Photograph Number 00-57339 D. May 7. HDMSE00731272

AI, 1959f. Photograph Number 00-57403 A. May 20. HDMSE00731271

AI, 1959g. Photograph Number 7528-5701 D. July 24. HDMSE00731261

AI, 1959h. Photograph Number 7528-5701 E. July 24. HDMSE00731262

AI, 1959i. Photograph Number 7528-5701 H. July 24. HDMSE00731263

AI, 1959j. Photograph Number 7528-5701 J. July 24. HDMSE00731264

AI, 1959k. Photograph Number 7508-5722. September 14. HDMSE00731265

AI, 1959l. Photograph Number 7508-5724. September 14. HDMSE00731266

AI, 1959m. Photograph Number 7508-5726. September 14. HDMSE00731267

AI, 1959n. Photograph Number 7508-5731. September 14. HDMSE00731268

AI, 1959o. Photograph Number 7508-5733. September 14. HDMSE00731269

AI, 1959p. Photograph Number 7508-5736. September 14. HDMSE00731270

AI, 1959q (estimated). Photograph of R/A Waste Hold-up Tank and Sub-station Transformer. HDMSE00731260

AI, 1962b. Photograph Number SS-57. March 14. HDMSM000000285

AI, 1965e. Photograph Number SS-182. HDMSM000000273

AI, 1969. Photograph Number S-294. April 24. HDMSM000000264

AI, 1974. Photograph Number 9070-6228-RMDF. July 22. HDMSP00015880

AI, 1976a (estimated). Photograph Number SS-464. HDMSP00038395

AI, 1976b. Photograph Number SS-466CN. August 6. HDMSP00015875

DOE, 1970 (estimated). Bldg T021 South Site. HDMSP00040649

Rockwell, 1974a. Photograph Number 9070-6227-RMDF. July 22. HDMSP00015879

Rockwell, 1977a. Photograph Number 7704-62920. June 15. HDMSP00015902

Rockwell, 1977b. Photograph Number 7704-62948CN. July 18. HDMSP00015904

Rockwell, 1978g. Photograph Number 7704-621343CN. July 6. HDMSP00015911

Rockwell, 1978l. Photograph Number 7704-621529CN. October 2. HDMSP00015931

Rockwell, 1982e (estimated). Photograph Title "RMDF". HDMSP00043678

Rockwell, 1985a. Photograph Number 6AZ11-2/14/85-1-C4U. February 14. HDMSP00033132

Rockwell, 1989a. Photograph Number 6CZ11-4/5/89-S2F. April 5. HDMSP00033184

Rockwell, 1990c (estimated). Photograph of SSFL Building 44 RMDF Clean Shop. HDMSP00048945, HDMSP00048946

Rockwell, 1997. Lee Construction Building 4028 Site Photos, Photograph Number ETEC-9/22/97-395366. September 27. HDMSP00037808

This page intentionally left blank

TABLES

TABLE C.2-1
RMHF RFI SITE BUILDING INVENTORY
(Page 1 of 2)

Building	Chemical Use Area Location	Use Period	Current/Former Use	Operationl Status Existing/Removed	DTSC Site Visit Date	Notes	Reference
Building 4021	1a	1959 - 200X7	Decontamination and Packaging Building	Existing/Inactive	Not Visited	Building became inactive and all equipment removed in 2007.	HDMSe00032615 HDMSe00459056 HDMSE00731196 HDMSE00731255 HDMSE00731256 HDMSE00731639
Building 4022	1b	1959 - Current	Radioactive Vault Storage	Existing	Not Visited		HDMSe00032615 HDMSE00731196 HDMSe00459074 HDMSE00731202 HDMSE00731271 HDMSE00731255
Building 4028	11a	1961 - 1984	STR Facility STIR Test Reactor LMFBR Fuel Safety Building	Removed	Not Visited	Abovegrade portion removed 1989. Foundation demolished 1997.	HDMSe00032615 HDMSP001825271 HDMSP001858656 HDMSP00037808
Building 4034	9a	1962 - Current	RMHF Office Building	Existing	Not Visited		HDMSe00032615 HDMSE00731204 HDMSE00731212 Visual Site Inspection
Building 4044	9b	1966 - Current	RMHF Clean Shop Health Physics Counting Laboratory and Break Room	Existing	Not Visited		HDMSe00032615 HDMSE00731203 HDMSE00731213
Building 4075	6a	1971 - 2001	Contaminated Equipment Storage Building	Existing	Not Visited	Inactive	HDMSe00032615 HDMSE00731205 HDMSE00726993
Building 4563	6b	1959 - Early 1980s	A.C. Paved Storage Area	Existing	Not Visited	Paved storage area comprised most of the eastern RMHF before the addition of Buildings 4075, 4621, and the Mixed Waste Storage Yard. It was converted from an open storage area to an awning-covered storage area in late 1990s.	HDMSe00032615 HDMSP00043678 HDMSE00726993
		Early 1980s - Current	Covered Storage Area				
Building 4614	10b	early 1960s - 1976	Drainage Sump Building 4028 Catch Basin Building 4028 Holdup Pond	Removed	Not Visited	Catch basin replaced with Baker tank in 2006, which is currently active.	HDMSE00714288 HDMSe00032615 HDMSP00108920 HDMSE00726993 HDMSE00726994
		1976 - 2006	RMHF Catch Basin RMHF Holdup Pond RMHF Drainage Sump				

TABLE C.2-1
RMHF RFI SITE BUILDING INVENTORY
(Page 2 of 2)

Building	Chemical Use Area Location	Use Period	Current/Former Use	Operationl Status Existing/Removed	DTSC Site Visit Date	Notes	Reference
Building 4621	5a	Mid 1960s - Current	RMHF Radioactive Accountable Waste Storage	Existing	Not Visited	Active	HDMSe00032615 HDMSe00726955 HDMSE00731208 HDMSE00731209 Visual Site Inspection
Building 4622	9a	1959 - 1976	RMDF Counting Building	Removed	Not Visited		HDMSe00032615
Building 4658	9a	1959 - Late 1980s	RMHF Guard Shack	Existing	Not Visited	Inactive	HDMSe00032615 HDMSE00731197
Building 4663	5c	Early 1960s - Early 1970s	RMHF Storage Area	Removed	Not Visited	Concrete pad still in place and used for storage.	HDMSe00032615
Building 4664	8a	mid-1960s - 1982	Flocculation Tower, Incinerator, and Cooling Tower	Removed	Not Visited	Removed in early 1980s	HDMSP001824027 HDMSP001824081
Building 4665	8b	mid-1960s - 1978	RMHF Radioactive Scrap Oxidation Facility	Existing	Not Visited	Operational use of building changed when flocculation/evaporator system removed from Building 4664.	HDMSe00459099 HDMSe00459100
		1978 - Current	Equipment Storage				
Building 4688	9c	1959 - Current	Drum Storage Area	Existing	Not Visited	Building 4688 was located at SRE prior to 1962. Previous to that, the area was not covered.	HDMSe00032615 HDMSE00731257 HDMSE00731258 HDMSE00731639 HDMSE00726993 Visual Site Inspection
		1967 - Current	Equipment Storage Area				
Building 4811	11b	1961 - 1988	Building 4028 STIR/LFMBR Mechanical Support Pad	Removed	Not Visited	Became part of Building 4028 between 1962 and 1967. Removed in 1988.	HDMSe00032615

Notes:
(a) Buildings are sometimes identified with the Administrative Area number followed by the building number (e.g., Building 021 vs. Building 4021).

Acronyms:
DTSC - Department of Toxic Substances Control
LMFBR - Liquid Metal Fast Breeder Reactor
NA - Not Applicable
RFI - RCRA Facility Investigation
RMDF - Radioactive Materials Disposal Facility (AKA RMHF)
RMHF - Radioactive Materials Handling Facility
SRE - Sodium Reactor Experiment
STR - Shield Test Reactor
STIR - Shield Test Irradiation Reactor
USEPA = United States Environmental Protection Agency

TABLE C.2-2
RMHF RFI SITE TANK INVENTORY
(Page 1 of 2)

Tank Designator (a)	Chemical Use Area Location	Use Period	Location	Contents	Tank Size (gallons)	Operational Status Existing/ Removed	Notes	Reference
Aboveground Tanks - Fuel								
V-XXX-01	3	--	South of Building 4021	Diesel Fuel	--	Removed		HDMSE00503119
Aboveground Tanks - Other								
T-1	1c	1959 - 1978	West of Building 4021	Radioactive Waste	5,000	Removed		HDMSe00459092 HDMSe00459083 HDMSe00459084 HDMSe00459085 HDMSe00459087 HDMSe00459088 HDMSe00459078 HDMSE00731208 HDMSE00731209 HDMSe00459075 HDMSe00459078 HDMSe00459088 HDMSP00015880
T-2	8a	1964 - 1982	Building 4664	Radioactive Waste	1,350	Removed		HDMSe00459083 HDMSe00459084
T-3	8a	1964 - 1982	Building 4664	Radioactive Waste	400	Removed		HDMSe00459083 HDMSe00459084
T-4	8a	1964 - 1982	Building 4664	Clarified Water	200	Removed		HDMSe00459083 HDMSe00459084
T-5	8a	1964 - 1982	Building 4664	Condensate	--	Removed		HDMSe00459083 HDMSe00459084
T-6	8a	1964 - 1982	Building 4664	Condensate	--	Removed		HDMSe00459083 HDMSe00459084
V-XXX-02	10b	2006 - present	Near Former Catch Basin	Stormwater	5,000	Existing	Installed after RMHF Catch Basin removed	HDMSE00714288 HDMSP00084212
V-XXX-03	1a	1959 - 2007	Building 4021 Packaging Room	Radioactive Waste	300	Removed	RMHF Evaporator Tank	HDMSe00459057 HDMSE00731639
V-XXX-04	1a	1959 - 2007	Building 4021 Decontamination Room	Soap, Acid, and Water	--	Removed	RMHF Evaporator Tank MX-12	HDMSE00731210 HDMSE00731639
V-XXX-05	1d	1959 - Unknown	Filter/Blower Area, Adjacent to Northeast Corner of Building 4021	Air	--	Removed		HDMSe00459056 Visual Site Inspection
V-XXX-06	11b	1961 - 1978	Building 4811	Cooling Water	--	Removed		HDMSP00014804
V-XXX-07	5b	--	Mixed Waste Storage Yard	Waste Antifreeze	700	Removed		HDMSP00033184 HDMSE00008191
V-XXX-08	1d	Unknown - Current	Filter/Blower Area, Adjacent to Northeast Corner of Building 4021	Blowdown Water with Trace Oil	55	Existing	Blowdown tank for air compressor	Visual Site Inspection
Underground Tanks - Other								
Septic Tank	4a	1959 - 1961	North of Building 4021	Sanitary Waste	--	Existing	Septic tank and related piping removed in 1983	HDMSe00459056 HDMSP00009415
V-XXX-09	1c	1959 - 1987	Building 4021 Western Sump	Radioactive Waste	150	Removed	Replaced by UT-16	HDMSe00459056 HDMSP001929442 HDMSP001816774
V-XXX-10	1c	1959 - 2004	Building 4022 Southern Sump	Radioactive Waste	200	Removed		HDMSe00459056 HDMSE00731255 HDMSE00731271 HDMSE00731639
UT-14	1b	Unknown - 1986	Building 4022	Radioactive Waste	9,400	Removed	Tank location not known, but is included in Area IV tank inventory.	HDMSe00106345 HDMSE00104523

TABLE C.2-2
RMHF RFI SITE TANK INVENTORY
(Page 2 of 2)

Tank Designator (a)	Chemical Use Area Location	Use Period	Location	Contents	Tank Size (gallons)	Operational Status Existing/ Removed	Notes	Reference
UT-15	1b	1978 - 2005	Building 4022	Radioactive Waste	8,000	Removed		HDMSe00106345 HDMSp001881292 HDMSP00049681 HDMSP00049765 HDMSE00731237 HDMSE00731211 HDMSE00503119 HDMSE00731639
V-XXX-11	1b	1978 - --	Building 4022	Water	5,000	Removed	Used to collect rain water during Building 4021 Leach Field excavation	HDMSE00731231 HDMSE00731639
V-XXX-12	1b	1978 - --	Building 4022	Water	5,000	Removed	Used to collect rain water during Building 4021 Leach Field excavation	HDMSE00731231 HDMSE00731639
V-XXX-13	1b	1977 - Late 1970s	Building 4022	Sodium	--	Removed	Tank used to melt sodium out of piping units from SRE.	HDMSE00731233 HDMSE00731639
UT-16	1c	1987 - 2004	Building 4021 Western Sump	Radioactive Waste	200	Removed		HDMSE00731639 HDMSe00106345 HDMSE00104523 HDMSe00126914 HDMSP001816774

Acronyms
RFI - RCRA Facility Investigation
RMHF - Radioactive Materials Handling Facility
SRE - Sodium Reactor Experiment

Notes
(a) Tanks listed by category (fuel, solvent, other). If category not indicated on table, then that type of tank was not present on site.
-- = Tank size was not documented (Boeing, 2007a)
V-XXX - This designator used to label tanks that did not have identification numbers in facility records

Tanks across SSFL were often moved between sites, and contents of these tanks often changed when being moved. Documentation used for this inventory may not be complete or accurately reflect the contents of tank during operation at this site.

TABLE C.2-3
RMHF RFI SITE TRANSFORMER INVENTORY
(Page 1 of 1)

SSFL Indentification Number	Chemical Use Area Location	Use Period	Description	Location	Status	Oil Sampled for PCBs? (Date/ Results)	Visual Site Inspection (Date/ Findings	Reference
Pole # X27A Tag # 139, 140, 141	2b	1961 - 1986	3 pole-mounted transformers	South of Mixed Waste Storage Yard	Removed	Yes 1983 1, 1.3, 1 ppm (Aroclor 1260)	No Staining Observed (April 2008)	HDMSE00726995 HDMSP001825271 HDMSP001825271
Substation #721	2a	1959 - Current	1 substation	West Side of Building 4021	Existing	Not Sampled	No Staining Observed (April 2008)	HDMSE00726995
Substation #728	2c	1961 - 1989	1 substation	South Side of Building 4028	Removed	Not Sampled	Removed prior to inspection	HDMSE00726996 HDMSE00726995 HDMSP00033184

Acronyms:
RFI - RCRA Facility Investigation
RMHF - Radioactive Materials Handling Facility
SSFL - Santa Susana Field Laboratory
ppm - parts per million

TABLE C.2-4
RMHF RFI SITE OTHER FEATURES INVENTORY
(Page 1 of 2)

Feature [a]	Chem Use Area Number	Current / Former Use	Use Period	Operational Status Existing/Removed [b]	Notes	References
Cooling Tower	8a	Cooling tower was part of the Building 4664 radioactive water treatment system	1964 - 1978	Removed	Building 4664 system was not considered effective and quickly became inactive.	HDMSe00459083 HDMSe00459084 HDMSe00459085 HDMSe00459086 HDMSe00459087 HDMSe00459091 HDMSP00033184 HDMSE00731639
1-MW Cooling Tower	11b	Cooling tower supported the STIR experiments conducted at Building 4028	1964 - 1978	Removed		HDMSP00014804
Heat Exchanger	11b	Supported the STIR experiments conducted at Building 4028	1964 - 1978	Removed		HDMSP00014804
15-ton Refrigeration Water Cooling Unit and Airblast Heat Exchanger	11b	Supported STIR experiments conducted at Building 4028	1961 - 1964	Removed		HDMSP00014804
Radioactive Scrap Oxidation Facility	8b	Oxidation of radioactive wastes	1964 - 1978	Removed		HDMSe00459099 HDMSe00459100 HDMSE00731639
Building 4664 Evaporator	8a	Evaporation of radioactive liquids	1964 - 1977	Removed	Building 4664 system was not considered effective and quickly became inactive.	HDMSe00459083 HDMSe00459084 HDMSe00459085 HDMSe00459086 HDMSe00459087 HDMSe00459091 HDMSP00033184 HDMSE00731639
Incinerator	8a	Incineration of radioactive materials	1964 - 1977	Removed	Incinerator was tested on non-radioactive materials and was not considered effective. Incinerator was never used on radioactive materials.	HDMSe00459083 HDMSe00459084 HDMSe00459085 HDMSe00459086 HDMSe00459087 HDMSe00459091 HDMSP00033184 HDMSE00731639
Hazardous Waste Storage Cabinets	9c	Storage of hazardous wastes pending shipment for offsite disposal	Current	Existing	The two hazardous waste storage cabinets are inspected weekly for contents, spills, and condition	Visual Site Inspection; HDMSE00731637
Flammable Chemical Storage Cabinet	9c	Storage of flammable chemicals	Current	Existing	Storage cabinets are inspected weekly for contents, spills, and condition	Visual Site Inspection; HDMSE00731637
Dry Fume Hood	1a	Support of Building 4021 Decontamination Room activities	1959 - 2007	Removed		HDMSe00459056 HDMSe00459057 HDMSE00731639
Wet Fume Hood	1a	Support of Building 4021 Decontamination Room activities	1959 - 2007	Removed		HDMSe00459056 HDMSe00459057 HDMSE00731639
Building 4021 Decontamination Room Evaporator	1a	Evaporation of radioactive liquids	1959 - 2007	Removed		HDMSe00459056 HDMSe00459057 HDMSE00731639
Slurry Drums	8a	Storaging chemicals used by flocculation unit	1964 - 1978	Removed	Building 4664 system was not considered effective and quickly became inactive.	HDMSe00459083 HDMSe00459084 HDMSe00459085 HDMSe00459086 HDMSe00459087 HDMSe00459091 HDMSP00033184 HDMSE00731639

TABLE C.2-4
RMHF RFI SITE OTHER FEATURES INVENTORY
(Page 2 of 2)

Feature [(a)]	Chem Use Area Number	Current / Former Use	Use Period	Operational Status Existing/Removed [(b)]	Notes	References
Flocculator	8a	Removal of solids from radioactive water pending treatment	1964 - 1978	Removed	Building 4664 system was not considered effective and quickly became inactive.	HDMSe00459083 HDMSe00459084 HDMSe00459085 HDMSe00459086 HDMSe00459087 HDMSe00459091 HDMSP00033184 HDMSE00731639
Sonic Clean	1a	Cleaning contaminated parts or equipment	1959 - 2007	Removed		HDMSe00459057 HDMSE00731639
Generator	1d	Provided emergency electrical power to Buildings 4021, 4022, and blower area. Was upgraded from 40 kW to 100 kW generator in 1983; 100 kW generator previously at the SRE.	1959 - 2007	Removed		HDMSE00731198 HDMSe00459057 HDMSE00024514 HDMSE00731639
Air Compressor	1d			Existing		HDMSe00459056 Visual Site Inspection
Air Compressor	1d			Existing	Compressor includes a 55-gallon blowdown barrel containing oily water	Visual Site Inspection
Sodium Melt Electrical Heater	1b	Used to melt residual sodium from SRE piping. Supported sodium melt tank, located inside Vault 3	1977 - Late 1970s	Removed		HDMSE00731233 HDMSE00731639
Drum Press	1a	Used to close barrels in support of Building 4021 Packaging Room	1959 - 2007	Removed		HDMSe00459057 HDMSE00731639
Oil Sump	12	Located in the middle of the Drum Storage Area, which became Building 4688.	1960 - 2007	Removed		HDMSe00459056 HDMSE00731258
Building 4021 Sump	1c	Radioactive water conveyance to storage and treatment systems	1961 - 2007	Removed		HDMSE00731237 HDMSP001929442 HDMSP001816774 HDMSE00731639 HDMSe00106345 HDMSE00104523 HDMSe00126914
Building 4022 Sump	1c	Conveying water from Building 4022 vaults to Building 4021 Sump for testing/treatment	1962 - 2007	Removed		HDMSe00459056 HDMSE00731639
Building 4021 Decontamination Room Grease Trap Sump	1a	Collection of liquids in Building 4021 Decontamination Room, which were conveyed to Building 4021 Sump	1963 - 2007	Existing/Inactive		HDMSe00459056 HDMSE00731639
Building 4021 Packaging Room Grease Trap Sump	1a	Collection of liquids in Building 4021 Packaging Room, which were conveyed to Building 4021 Sump	1964 - 2007	Existing/Inactive		HDMSe00459056 HDMSE00731639

Notes:
(a) Features listed within this inventory table are features (not included in buildings, tanks, and transformers which are included in other tables) that are of known or suspected chemical use.
(b) Operations Status as of March 2009

Acronyms:
kW - kilowatt
MW - megawatt
RMHF - Radioactive Materials Handling Facility
SRE - Sodium Reactor Experiment
STIR- Shield Test Irradiation Reactor
RFI - RCRA Facility Investigation

TABLE C.2-5
RMHF RFI SITE CHEMICAL USE
(Page 1 of 4)

Chemicals Used	Reference
1,1,1-Trichlorethane	HDMSP001921190
Absorbed Industrial Waste	HDMSP00061962
Acetone	EPA BRS Data 1993
Acetylene	HDMSP00119989
Acid Electrolyte	HDMSP001922350
Acid Rags	HDMSP001892233
Acidic Fluids (pH<2)	HDMSP001881259 HDMSP001800214 EPA BRS Data 1999
Air, Compressed	HDMSP00119989
Alcohol	HDMSP001921190
Alkaline Rust Remover	HDMSE00731639
Amberlite Resin	HDMSP001877865
Ammonium Salts (Photochemical Waste)	EPA BRS Data 1991
Antifreeze	HDMSE00008191
Arsenic	EPA BRS Data 2001
Asbestos	HDMSP00033215 HDMSE00379867
Barium	EPA BRS Data 2001
Benzene	EPA BRS Data 1997
Cadmium	HDMSP001816664 EPA BRS Data 2001
Cadmium-containing Cleaning Solution, Wastewater	EPA BRS Data 1993
Cadmium-containing Concrete	HDMSE00102096
Calcium Carbonate	EPA BRS Data 1999
Carbon Steel	HDMSP001873957
Carbon tetrachloride	HDMSE00707592
Caustic chemicals	HDMSP001800214
Caustic aqueous waste without cyanide	EPA BRS Data 2001
Chloroform-containing Organic Solvents	EPA BRS Data 1999
Chlorotrifluoromethane gas	HDMSE00379867
Chromium-containing Salt Cores	HDMSE00102096 EPA BRS Data 1999
Chromium (detected in Outfall 003)	HDMSE00090886
Complexing chemicals	HDMSP001800214
Concrete Debris	HDMSP00061962
Contaminated Sand (Building 4059)	HDMSP001813881
Contaminated Soil	HDMSE00102096
Coolant Solution (Sodium and Potassium Nitrate)	EPA BRS Data 1989
Copper	HDMSP001875475
Corrosive Wastes	HDMSE00102096
Desiccants	EPA BRS Data 1991
Dichlorodifluoromethane gas	HDMSE00379867 EPA BRS Data 1997
Diesel Fuel #2	HDMSP00119989
Diesel-Fuel contained soil	EPA BRS Data 1993
Dilute aqueous waste (99% water)	EPA BRS Data 2001
Dowanol	HDMSE00707592 EPA BRS Data 1991
Drain Line Debris	HDMSE00102096
Drain Line Pipes	HDMSP00061962
Drain Sump Sludge	HDMSP00061962
Dried RMHF Catch Basin Sediment	HDMSP00061962
Ducting and Ventilation Material	HDMSP00061962
Electropolish Solution, Solidified	HDMSP001881403
Emulsifying chemicals	HDMSP001800214
Ethanol	EPA BRS Data 1997

TABLE C.2-5
RMHF RFI SITE CHEMICAL USE
(Page 2 of 4)

Chemicals Used	Reference
Ethanol with Dissolved Salts	HDMSP001905961
Ethylene Glycol	HDMSP00041455 EPA BRS Data 1991
Evaporator Sludge	HDMSE00102096 HDMSP00061962
Foaming Agents	EPA BRS Data 1991
Freon	HDMSP001864057
Glycol	HDMSP001823491
Grease	EPA BRS Data 1991
Groundwater, VOC Contaminated	HDMSP001810575
HEPA Filters (including lead-contaminated)	HDMSP00061962 HDMSP001810872 HDMSE00102096
Hydraulic Oil	HDMSP001892204
Hydrochloric Acid	HDMSP001906704
Hydrofluoric Acid	HDMSP001921190
Hydrogen	HDMSP001918144
Hydroquinone (Photochemical Waste)	EPA BRS Data 1991
Ignitable Solvents	HDMSE00102096
Isopropyl Alcohol, Spent	EPA BRS Data 1993
Kerosene	HDMSE00707592
Latex	EPA BRS Data 1991
Lead	HDMSP00119989 HDMSP00084745
Lead Acid Batteries	EPA BRS Data 1993
Lead Glass/Lead	HDMSE00102096
Lead Paint Chips	HDMSP00061962
Lead shot, bricks, shields, plugs, tracer snouts	HDMSP001892255
Lead-containing Debris	EPA BRS Data 1995
Liquid Mercury	HDMSP001824608
Lithium Hydride	EPA BRS Data 1991
Lithium Metal	EPA BRS Data 1991
Lubricant Cans	EPA BRS Data 1995
Lubriplate Grease	HDMSP001892177
Machine Coolant	EPA BRS Data 1989
Machine Oil	EPA BRS Data 1989
Mecury-containing Sediments	HDMSe00102096
Mercuric Nitrate	EPA BRS Data 1997
Mercury	HDMSP001875259
Mercury contaminated with Sodium Hydroxide	EPA BRS Data 1991
Mercury Solid -- radioactive, sulfur amalgamated	EPA BRS Data 1993
Mercury, Amalgamated	HDMSP001892233
Mercury-containing sludge	HDMSE00586385
Mercury, Metallic	EPA BRS Data 1993
Mercury-containing Lightbulbs	EPA BRS Data 1997
Mercury-containing liquids/drain line fluids	EPA BRS Data 2001
Metallic Sodium	EPA BRS Data 1989
Metals	HDMSe00102096
Methane gas	HDMSE00379867 EPA BRS Data 1997
Methanol	EPA BRS Data 1997
Methyl Ethyl Ketone	EPA BRS Data 1997
Methyl Orange (pH indicator)	HDMSE00707592
Mineral Oil	HDMSP00119989
Mixed Acids	EPA BRS Data 1989
Mixed Hazardous Waste	HDMSP001810575
Mixed Lab Packs from Remedial Activities	EPA BRS Data 1993

TABLE C.2-5
RMHF RFI SITE CHEMICAL USE
(Page 3 of 4)

Chemicals Used	Reference
Mixed Metal Oxide Powder	EPA BRS Data 1989
Morphaline, Aqueous	EPA BRS Data 1989
MSO Salt Cores	HDMSP001843598
Neutralized, Solidified Reaction Product Test Waste	HDMSP00061962
Nickel-cadmium Batteries	EPA BRS Data 1993
Nicotine, Nicotine Salts	EPA BRS Data 1997
Nitric Acid	HDMSP001921190
Off-specified, Aged, Used Lab Chemicals	EPA BRS Data 1997
Oil	HDMSE00102096 EPA BRS Data 1991
Oil debris	HDMSE00726955
Oil-Contaminated Solids	EPA BRS Data 1993
Oxygen	HDMSP00119989
P-10 Gas [(a)]	HDMSP00119989
Paint and Solvents	HDMSE00102096
Paint Chips	HDMSE00102096
PCB Ballasts	HDMSP001875435
Phenolthalene	HDMSE00707592
Phosphorus anhydride	EPA BRS Data 1991
Potassium Bromides (Photochemical Waste)	EPA BRS Data 1991
Potassium Cyanide	EPA BRS Data 1991
Potassium Metal	EPA BRS Data 2001
Propane	HDMSP00119989
Pyridine	EPA BRS Data 1991
Reactive Inorganic Salts	EPA BRS Data 1999
Silicon oil	HDMSE00008191
Silver	HDMSP001816664 EPA BRS Data 1991
Silver Cyanide	EPA BRS Data 1991
Silver Halides (Photochemical Waste)	EPA BRS Data 1991
Silver-containing Photographic Chemicals	EPA BRS Data 1993
Soda Lime	EPA BRS Data 1989
Sodium	HDMSE00008191
Sodium and Potassium Metal Alloys	EPA BRS Data 1997
Sodium Bisulfide	EPA BRS Data 1991
Sodium Carbonate	HDMSP001843598
Sodium Carbonate and Sodium Hydroxide Mixture	EPA BRS Data 1989
Sodium chromate	HDMSE00707592
Sodium Cyanide	EPA BRS Data 1991
Sodium Hydroxide	HDMSP00119989 HDMSE00629266 EPA BRS Data 1989
Sodium Oxide Solid	EPA BRS Data 1989
Sodium Solid Waste	HDMSE00671273
Solidified Oil with Solvents	HDMSE00102096
Solidified Transformer Oil	HDMSP001892233
Solvent Cans	EPA BRS Data 1995
Solvent-Contaminated Solids	EPA BRS Data 1997
Solvents	HDMSP00033215 EPA BRS Data 2001
Spray Paint Cans	HDMSP001892233
Stay-Lube Grease	HDMSP001892177
Storage Tubes	HDMSP00061962
Tank Sludge, Sediment, Slag	EPA BRS Data 2001
Tetraolin	EPA BRS Data 2002
Toluene	EPA BRS Data 1993
Torit Air Filter Drums	HDMSP00061962

TABLE C.2-5
RMHF RFI SITE CHEMICAL USE
(Page 4 of 4)

Chemicals Used	Reference
Transformer Oils	HDMSP001825271 HDMSP00033184
Treated ETN 4029 and 4033 waste	HDMSP00061962
Treated Mercury Waste	HDMSP00061962
Turco Degreaser	HDMSE00731639
Uniflex DOS [(c)]	HDMSP00119989
Universal Wastes (Batteries, Lamps, Thermostats)	HDMSE00726955 EPA BRS Data 2001
Vac Drums	HDMSP001881292
Vacuum Waste	HDMSP00061962
Vault Cleanup Material	HDMSP00061962
Waste aerosols	HDMSE00726955
Waste Alkali Metal Alloys	EPA BRS Data 2003
Waste Ethanol	EPA BRS Data 1993
Waste Oil	HDMSE00707592
Waste Paint	EPA BRS Data 1993
Waste Paint Thinner	EPA BRS Data 1993
Waste Water Sludge	HDMSP001861967
Waste water with oil	HDMSE00726955
Waste flammable, corrosive liquids	HDMSE00379867
Water with Trace Solvents	EPA BRS Data 1993
Weir Box/Sludge	HDMSP001892233
Xylene cyanol	HDMSE00707592
Zirconium	HDMSP001918144

Notes

[(a)] The RMHF was used for the storage and treatment of radioactive materials and radioactive wastes generated during D&D activities, including,

- new and irradiated nuclear fuel including enriched uranium, thorium and plutonium;
- low level radioactive wastes (LLRW) containing by-product material such as fission products (e.g. cesium-137 and strontium-90) and neutron activation products (e.g. cobalt-60, europium isotopes and tritium);
- transuranic (TRU) wastes containing plutonium isotopes and their decay products (e.g. americium-241);

Screening sampling for gamma emitting radionuclides, strontium-90 and plutonium will be conducted following D&D of the RMHF.

[(b)] P-10 gas is a gas mixture comrised of 90% argon and 10% methane.

[(c)] Uniflex DOS is a plasticizer comprised of dioctyl sebacate.

[(d)] A complete list of acronyms is presented in the Appendix C text

[(e)] A complete list of references is presented in Section C.6

TABLE C.2-6
RMHF RFI SITE SPILLS AND RELEASES INVENTORY TABLE
(Page 1 of 2)

Building Number or Area (a)	Date of Spill or Release	Description	Material Released	Amount Released	Concentration	Reference Document Number
Building 4021	1962-1963	In the fall of 1962 or spring of 1963, a valve to the RMHF radioactive water processing system was inadvertently left partially open and allowed an unknown amount of contaminated water to enter the leach field system.	Radioactive Waste	--	--	HDMSe00032525 (c) HDMSe00032615 (c) HDMSE00008191 (c)
Building 4021	6/10/1964	The attempt to disassemble a moderator can for disposal resulted in a reaction of sodium. The resulting explosion and fire caused airborne radiological contamination. The average contamination level caused by the smoke was 4 x 106 dpm/100 cm2 beta. The fire was extinguished with calcium carbonate with no difficulty.	Sodium, Mixed Fission Products	--	--	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00050988 (d)
Building 4022	7/21/1964	While attempting to wash out an empty moderator storage can, a sodium reaction occurred, resulting in an explosion and fire. The explosion and fire were confined inside the storage can and smothered with calcium carbonate.	Sodium, Mixed Fission Products	--	--	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00050989 (d)
Building 4023	12/22/1964	While transferring a bell portion of an SRE heat exchanger from a storage area to the decontamination room at B4021, rain water from under the plastic covering spilled on the pad and asphalt in the back of the decontamination room, resulting in contamination of up to 2000 dpm/cm2 with a radiation level of 6 mr/hr on the asphalt.	Rain Water with Radioactive Contamination	--	--	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00051001 (d)
Building 4024	12/29/1965	Drums of contaminated sodium exploded in a rain storm and burned the outside of the building.	Sodium			HDMSe00032525 (c) HDMSe00032615 (c)
Building 4025	11/9/1987	Airborne Cs-137 was released into RMHF decontamination room when a worker dropped a contaminated, cut-up piece of the old B4021 sump tank into a shipping box. A smear survey of the shipping box found radioactivity contamination levels of up to 400 dpm beta. All bioassay results of workers were below the minimum detectable activity (MDA) level.	Airborne Cs-137	--	--	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00050134 (d)
Building 4021 Hold-up Tank	5/22/1978	The sump pump stopped working, and contaminated liquid flowed out of the 5,000-gallon B4021 hold-up tank, contaminating asphalt, and later contaminating the tires on a contractor's trailer. Both the tires and the asphalt were decontaminated.	Water Contaminated with Mixed Fission Products	40 - 50 gallons	--	HDMSP00049681 (d)
Building 4021 Hold-up Tank, Building 4614	1/9/1980	A water hose broke, causing the B4021 tank to overflow. This incident resulted in the release of about 100 gallons of liquid containing 1 x10-2 mCi of mixed fission products. All significantly contaminated water was collected at the B4028 pond and returned to storage at RMDF. Contaminated paving was cleaned to prevent further contamination of surface runoff resulting from rainfall. (b)	Radioactive Liquid containing Mixed Fission Products	100 gallons	1 X 10-2 µCi	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00049715 (d) HDMSP00049713 (d) HDMSP00049712 (d)
Building 4075	8/15/1988	A forklift driver punctured a drum of radioactive sand stored in waste drums from B4059 during preparation for shipment. The sand spilled out onto the floor of B4075; however, surveys indicated that no detectable contamination occurred as a result.	Radioactive Sand	40 grams		HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00050141 (d)
Building 4621	9/4/1975	A 132 mCi Ra-266 source was discovered lying on the ground outside B4621. The source was not labeled, nor was in it a shielded container. Following its discovery, the source was properly marked and stored in a secure condition.	Ra-266	132 mCi	--	HDMSe00032525 (c) HDMSe00032615 (c)
Building 4664	2/10/1965	The evaporator system at B4664 backed up, and a flexible hose was blown from its connection, releasing approximately 5 gallons of radioactive contaminated liquid with approximately 5 x 10-3 µCi/cc beta-gamma onto the asphalt. Decontamination of this area was performed immediately.	Radioactive Liquid	5 gallons	5 x 10-3	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00050965 (d)
Building 4665	5/13/1965	The flocculation tower was overfilled with treated liquid used for separation of sludge from liquid, spilling approximately 10 gallons of radioactive water onto equipment, the pad, and the surrounding soil.	Radioactive Liquid	10 gallons	--	HDMSe00032525 (c, HDMSe00032615 (c) HDMSP00051011 (d)
Building 4666	5/21/1967	A drum of uranium carbide sludge exploded on a truck parked outside the incinerator, contaminating asphalt and the evaporator equipment. Contamination levels ranged from 300 to 5,000 dpm/100 cm2 beta. The area was decontaminated.	Uranium Carbide	--	--	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00051142 (d)

TABLE C.2-6
RMHF RFI SITE SPILLS AND RELEASES INVENTORY TABLE
(Page 2 of 2)

Building Number or Area (a)	Date of Spill or Release	Description	Material Released	Amount Released	Concentration	Reference Document Number
Building 4664, Building 4614	1/17/1979	Contaminated water from the flocculation tower, estimated to be about 2 gallons containing about 5 x 10-2 µCi/mL old mixed fission products was accidentally rinsed into the B4028 pond (b).	Water with Mixed Fission Products	2 gallons	5 x 10-3 µCi/mL	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00050251 (d) HDMSP00049694 (d) HDMSP00049700 (d)
Building 4664	10/23/1979	Radioactive waste water from SRE and RIHL was released to the metal-lined catch basin under the RMHF flocculation tower. The catch basin was decontaminated to standard operating levels (i.e., <1,000 dpm/100 cm2 beta).	Radioactive Waste Water	1 gallon	--	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP001812088 (c)
Mixed Waste Storage Yard, West of the Mixed Waste Storage Yard, Western Slope Area	6/22/1975 (e)	Nine significant radioactive spill areas were identified at the RMHF facility. Most of the spills appear to have occurred prior to 1975. Six of these areas were located in the Mixed Waste Storage Yard. One was located inside the RMHF fenced area, west of the storage yard, and two were located in the western slope area. The activity associated with these spills ranged from 0.5 mrad/hr (beta/gamma) to 3,500 mrad/hr (beta/gamma).	Mixed Fission Products	--		HDMSP00049483 (d)
Mixed Waste Storage Yard, Building 4021	5/21/1967	A 55-gallon drum containing uranium metal under calcium carbonate was found burning in the RMHF storage yard. Workers believed the drum was likely to explode, so three rifle shots were fired into the drum to relieve the pressure building inside. The fire extinguished itself and the drum was left outside to cool overnight. It was then moved to Building 4021 where again it began burning. The fire was again extinguished, and contamination surveys indicated no significant release of radioactive material.	Uranium metal	--	--	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00051142 (d)
Outside the RMHF Gate	8/14/1979	A shipping box loaded on a waste truck for offsite disposal leaked radioactive alcohol containing Cs-137 and Sr-90 on the asphalt outside RMHF. The leak occurred shortly after the vehicle moved outside the immediate facility. Immediate readings indicated contamination of 85 mrad/hr on the asphalt. The area was successfully decontaminated shortly after the incident.	Alcohol containing Cs-137 and Sr-90	1 pint	--	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00050404 (d) HDMSP00050405 (d)
RMHF Leach Field	11/3/1976	The leach field connected to B4021 was found to be contaminated at levels up to 200 mrad/hr.	Radioactive Waste	--	200 mrad/hr	HDMSe00032525 (c) HDMSe00032615 (c)
RMHF Leach Field	2/14/1978	Excessive rainfall in January and February caused an estimated release of 200 µCi. Catch basins were installed, 42,000 gallons of water were pumped to storage, and the leach field was removed from service.	Radioactive Waste	2 µCi	--	HDMSe00032525 (c) HDMSe00032615 (c)
RMHF Leach Field	2/15/1978	The contaminated leach field flooded with rainwater, resulting in the release of water contaminated with Sr-90 at a level of 40 mCi/ml gross beta activity.	Sr-90	--	4 x 105 µCi/ml	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00049493 (d)
RMHF Lower Parking Lot	10/3/1997	Four concrete blocks in the parking lot were found to have beta contamination ranging from 100 to 800 counts per minute. The concrete blocks were decontaminated, resurveyed and released without radiological restrictions.	Radioactive Waste	--	100 - 800 counts/min	HDMSe00032525 (c) HDMSe00032615 (c) HDMSP00051208 (d)

Notes:

(a) Buildings are sometimes identified with the Administrative Area number followed by the building number (e.g., Building 021 vs. Building 4021).
(b) B4028 Pond was renamed the RMHF Catch Basin during 1980. The B4028 Pond began receiving surface water from the RMHF fenced area in 1961.
(c) Reference documents submitted to DTSC in April 2008 in support of the March 2008 RMHF Work Plan Addendum Amendment review.
(d) Reference documents submitted to DTSC in July 2008 in support of the RMHF WPAA review.
(e) The spill areas were identified in 1975. The spills appear to have occurred prior to 1975.
-- = Spill amount was not reported.

Acronyms (a complete list of acronyms is presented in the work plan text):

cc - cubic centimeter
cm^2 - square centimeter
Cs-137 - Cesium-137
dpm - disintegration per minute
µCi - microcurie
mCi - millicurie
mL - milliliter
mr/hr - millirem per hour
mrad/hr - millirad per hour
MDA - Minimum Detectable Activity
Ra-226 - Radium-266
RMDF - Radioactive Materials Disposal Facility
RMHF - Radioactive Mateirals Handling Facility
RIHL - Rockwell International Hot Laboratory
SAIC - Science Applications International Corporation
Sr-90 - Strontium-90
SRE - Sodium Reactor Experiment

TABLE C.3-1A
RMHF RFI SITE SAMPLING SUMMARY
(Page 1 of 1)

Sample Type (1,5)	Total Number of Samples (2)	Total QC Samples (3)	Total Agency Samples (4)	Total Validated Samples
Soil Vapor Samples (Table C.3-1B)	25	1	0	24
Soil Matrix Samples (Table C.3-1C)	227	27	3	222
Surface Water Samples (Table C.3-1D)	3	1	0	0

Notes:

1. Detailed sample and analytical program information is contained in Tables C.3-1B , C.3-1C and C.3-1D as indicated above.
2. Total samples = total primary site investigation samples, including historical samples and composite samples.
3. QC samples = Site-specific QC Samples, co-located duplicates and laboratory split samples.
   The total QC sample count in this table DOES NOT include Trip Blanks, Equipment Rinsates or Field Blanks.
   According to RFI sampling protocols, these types of QC samples are not site-specific and findings will be summarized in the RFI Program report.
4. Agency Samples = DTSC or USEPA split samples.
5. All groundwater data presented in Appendix D of the Group 7 RFI Report.
6. Soil sampling and analytical summary includes only samples collected prior to May 8, 2009. For information regarding additional samples collected on May 8, 2009, see the 'Additional Data' folder of Attachment C-3 of this report. These Group 7 data gap sample results are considered for site action recommendations presented in the Group 7 RFI Report, but could not be included in the quantitative site risk assessments.

Acronyms:

DTSC - Department of Toxic Substances Control
QC - Quality control
RFI - Resource Conservation and Recovery Act Facility Investigation
USEPA - United States Environmental Protection Agency

TABLE C.3-1B
RMHF RFI SITE SOIL VAPOR SAMPLING AND ANALYTICAL SUMMARY
(Page 1 of 2)

Sample Location Identification	Unique Sample ID	Sample Identification	Date Collected	Removed or In Place	Sample Method	Depth (feet bgs)	Sample Type	Validated Yes/No		Rationale [b]	Consultant [c]	Reference Document [d]
								VOC	Validated [a]			
RMSV0006	RMSV0006S01	RMSV0006S01	05/08/08	In Place	Active	3.5	Primary Sample	Y	Y	DGA	MWH	This Report
RMSV0019	RMSV0019S01	RMSV0019S01	05/08/08	In Place	Active	4	Primary Sample	Y	Y	DGA	MWH	This Report
RMSV0021	RMSV0021S01	RMSV0021S01	05/08/08	In Place	Active	3.5	Primary Sample	Y	Y	DGA	MWH	This Report
RMSV0030	RMSV0030S01	RMSV0030S01	05/08/08	In Place	Active	3.5	Primary Sample	Y	Y	DGA	MWH	This Report
RMSV0032	RMSV0032S01	RMSV0032S01	05/07/08	In Place	Active	4	Primary Sample	Y	Y	DGA	MWH	This Report
RMSV0033	RMSV0033S01	RMSV0033S01	05/07/08	In Place	Active	4	Primary Sample	Y	Y	DGA	MWH	This Report
RMSV0039	RMSV0039S01	RMSV0039S01	05/08/08	In Place	Active	4.5	Primary Sample	Y	Y	DGA	MWH	This Report
RMSV0040	RMSV0040S01	RMSV0040S01	05/08/08	In Place	Active	4	Primary Sample	Y	Y	DGA	MWH	This Report
RMSV0100	RMSV0100S01	RMSV0100S01	05/08/08	In Place	Active	5	Primary Sample	Y	Y	DGA	MWH	This Report
RMSV0106	RMSV0106S01	RMSV0106S01	05/08/08	In Place	Active	4	Primary Sample	Y	Y	DGA*	MWH	This Report
RMSV0107	RMSV0107D01	RMSV0107D01	05/08/08	In Place	Active	3	Field Duplicate	Y	Y	DGA*	MWH	This Report
RMSV0107	RMSV0107S01	RMSV0107S01	05/08/08	In Place	Active	3	Primary Sample	Y	Y	DGA*	MWH	This Report
RMSV0112	RMSV0112S001	RMSV0112S001	11/20/08	In Place	Active	5	Primary Sample	Y	Y	DGA*	MWH	This Report
RMSV0112	RMSV0112S002	RMSV0112S002	11/20/08	In Place	Active	10	Primary Sample	Y	Y	DGA*	MWH	This Report
SV-LF021-1	SVLF0211	SVLF0211	08/23/93	In Place	Active	2	Primary Sample	N	N	WP	ICF Kaiser Engineers	ICF, 1993
SV-LF021-2	SVLF0212	SVLF0212	08/23/93	In Place	Active	1	Primary Sample	N	N	WP	ICF Kaiser Engineers	ICF, 1993
U7SV0011	U7SV0011D001	U7SV0011D001	11/20/08	In Place	Active	5.25	Primary Sample	Y	Y	DGA	MWH	This Report
U7SV0011	U7SV0011S001	U7SV0011S001	11/20/08	In Place	Active	5.25	Primary Sample	Y	Y	DGA	MWH	This Report
U7SV0011	U7SV0011S002	U7SV0011S002	11/20/08	In Place	Active	8.75	Primary Sample	Y	Y	DGA	MWH	This Report
U7SV0018	U7SV0018S01	U7SV0018S01	05/07/08	In Place	Active	5	Primary Sample	Y	Y	DGA	MWH	This Report
U7SV0018	U7SV0018S02	U7SV0018S02	05/07/08	In Place	Active	10	Primary Sample	Y	Y	DGA	MWH	This Report
U7SV0018	U7SV0018S03	U7SV0018S03	05/07/08	In Place	Active	15	Primary Sample	Y	Y	DGA	MWH	This Report
U7SV0018	U7SV0018S04	U7SV0018S04	05/07/08	In Place	Active	19.5	Primary Sample	Y	Y	DGA	MWH	This Report
U7SV0021	U7SV0021S001	U7SV0021S001	11/20/08	In Place	Active	5.25	Primary Sample	Y	Y	DGA	MWH	This Report
U7SV0021	U7SV0021S002	U7SV0021S002	11/20/08	In Place	Active	10.25	Primary Sample	Y	Y	DGA	MWH	This Report
U7SV0021	U7SV0021S003	U7SV0021S003	11/20/08	In Place	Active	15.5	Primary Sample	Y	Y	DGA	MWH	This Report

Total Primary Samples:	25
Total QC (Duplicate) Samples:	1
Number of RMHF RFI Site Soil Vapor Samples:	**26**

Validated:	24
Not Validated:	2

Notes:

Sample Location Identification - Vapor probe number

Unique Sample ID - Laboratory reporting code

Sample Identification - RFI site and sample identifier code

(a) **Validated** indicates at least one analysis has been validated following RFI protocols; agency split samples were not validated but were reviewed for comparability.

Data collected prior to the RFI were not typically subsequently validated using RFI protocols but were collected and reviewed following QA procedures established for earlier investigation programs.

TABLE C.3-1B
RMHF RFI SITE SOIL VAPOR SAMPLING AND ANALYTICAL SUMMARY
(Page 2 of 2)

(b) **Rationale (see below):**

DGA - Indicates samples collected in 2008 as a part of the Data Gaps Analysis to address delineation with stepout samples, elevated detection limit issues, and specific DTSC resquests.

DGA* - Indicates samples collected in 2008 as a part of the Data Gaps Analysis that were specific DTSC resquests.

WP - Indicates samples collected based on DTSC-approved Work Plan scope.

(c) **Consultant** - indicates contractor responsible for sampling and reporting for each location.

(d) **Reference Document** indicates where data are published; "This report" includes the RMHF RFI site appendix and the Group 7 RFI Report (See References, Section C.6).

Acronyms:

bgs - below ground surface

DTSC - Department of Toxic Substances Control

QA - Quality assurance

QC - Quality control

RFI - Resource Conservation and Recovery Act Facility Investigation

Laboratory Analytical Methods Represented (EPA Method No.)

VOC - 8260B

VOC - Volatile Organic Compound

TABLE C.3-1C
RMHF RFI SITE SOIL MATRIX SAMPLING AND ANALYTICAL SUMMARY
(Page 1 of 4)

Sample Location Identification	Unique Sample ID	Sample Identification *	Date Collected	Removed or In Place (f)	Sample Method (a)	Depth (feet bgs)	Sample Type	Sample Analyses (Validated Yes/No)												Validated (b)	Rationale (c)	Consultant (d)	Reference Document (e)
								Asbestos	Dioxin	Herbicide	Inorganics	Metals	Other Organic Data	PCBs	Perchlorate	Pesticide	SVOCs	TPH	VOCs				
416380	12124012	416380P	06/28/95	In Place	G	0	Primary Sample							N						N	WP	McLaren/Hart	McLaren/Hart, 1995 [g]
424760	12124014	424760P	06/28/95	In Place	G	0	Primary Sample							N						N	WP	McLaren/Hart	McLaren/Hart, 1995 [g]
428480	12124015	428480P	06/28/95	In Place	G	0	Primary Sample							N						N	WP	McLaren/Hart	McLaren/Hart, 1995 [g]
416380	15000003	416380	06/28/95	In Place	G	0	Primary Sample		N											N	WP	McLaren/Hart	McLaren/Hart, 1995 [g]
424760	15000004	424760	06/28/95	In Place	G	0	Primary Sample		N											N	WP	McLaren/Hart	McLaren/Hart, 1995 [g]
428480	15000006	428480	06/28/95	In Place	G	0	Primary Sample		N											N	WP	McLaren/Hart	McLaren/Hart, 1995 [g]
BB-03-005	BB03005	BB03005	03/17/92	In Place	HA	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993 [g]
BB-03-005	BB03005-USEPA	BB03005-USEPA	03/17/92	In Place	HA	0.5	Split Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993 [g]
BB-03-017	BB03017	BB03017	03/17/92	In Place	HA	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993 [g]
BB-03-025	BB03025	BB03025	03/17/92	In Place	HA	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993 [g]
BB-03-079	BB03079	BB03079	03/17/92	In Place	HA	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993 [g]
BB-03-092	BB03092	BB03092	03/17/92	In Place	HA	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993 [g]
BB-16-001A	BB16001A	BB16001A	04/22/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-16-001B	BB16001B	BB16001B	04/22/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-16-001B	BB16001B-USEPA	BB16001B-USEPA	04/22/92	In Place	T	0.5	Split Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-16-002	BB16002	BB16002	04/22/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-16-003	BB16003	BB16003	04/22/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-16-003	BB16003-DUP	BB16003-DUP	04/22/92	In Place	T	0.5	Field Duplicate												N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-16-004	BB16004	BB16004	04/22/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-16-005	BB16005	BB16005	04/22/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-17-001	BB17001	BB17001	04/21/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-17-001	BB17001-USEPA	BB17001-USEPA	04/21/92	In Place	T	0.5	Split Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-17-002	BB17002	BB17002	04/21/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-17-003	BB17003	BB17003	04/21/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-17-004	BB17004	BB17004	04/21/92	In Place	T	0.5	Primary Sample					N					N		N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BBBS0003	BBBS0003S01	BBBS0003S01	04/05/07	In Place	HA	0.25	Primary Sample				Y	Y								Y	WP	MWH	MWH, 2007 [g]
BBBS0004	BBBS0004S01	BBBS0004S01	04/05/07	In Place	HA	0.5	Primary Sample				Y	Y								Y	WP	MWH	MWH, 2007 [g]
BBBS0005	BBBS0005S01	BBBS0005S01	04/05/07	In Place	HA	0.25	Primary Sample				Y	Y								Y	WP	MWH	MWH, 2007 [g]
Brandeis-1	Brandeis-1	Brandeis-1	11/09/00	In Place	BR	0	Primary Sample							Y						Y	WP	IT Corp	IT, 2002 [g]
Brandeis-1	Brandeis-1D	Brandeis-1D	11/09/00	In Place	BR	0	Field Duplicate							Y						Y	WP	IT Corp	IT, 2002 [g]
Brandeis-2	Brandeis-2	Brandeis-2	11/09/00	In Place	BR	0	Primary Sample							Y						Y	WP	IT Corp	IT, 2002 [g]
RMBS0001	RMBS0001S01	RMBS0001S01	04/29/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0002	RMBS0002S01	RMBS0002S01	04/29/08	In Place	HA	1	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0003	RMBS0003AS01	RMBS0003AS01	04/16/08	In Place	HA	1	Primary Sample												Y	Y	DGA	MWH	This Report
RMBS0003	RMBS0003S01	RMBS0003S01	04/16/08	In Place	HA	0.5	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0004	RMBS0004AS001	RMBS0004AS001	11/13/08	In Place	GP	1	Primary Sample				N		Y							Y	DGA	MWH	This Report
RMBS0004	RMBS0004S01	RMBS0004S01	04/18/08	In Place	GP	1.5	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0004	RMBS0004S02	RMBS0004S02	04/18/08	In Place	GP	2.5	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0005	RMBS0005S01	RMBS0005S01	04/29/08	In Place	HA	1.5	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0006	RMBS0006D02	RMBS0006D02	04/23/08	In Place	GP	3	Field Duplicate				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0006	RMBS0006S01	RMBS0006S01	04/23/08	In Place	GP	1	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0006	RMBS0006S02	RMBS0006S02	04/23/08	In Place	GP	3	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0007	RMBS0007AS001	RMBS0007AS001	11/13/08	In Place	GP	0.75	Primary Sample				N		Y							Y	DGA	MWH	This Report
RMBS0007	RMBS0007S01	RMBS0007S01	04/23/08	In Place	GP	1	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0008	RMBS0008D01	RMBS0008D01	04/23/08	In Place	GP	1.3	Field Duplicate				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0008	RMBS0008S01	RMBS0008S01	04/23/08	In Place	GP	1.3	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0009	RMBS0009AS001	RMBS0009AS001	11/13/08	In Place	GP	1.5	Primary Sample				N		Y							Y	DGA	MWH	This Report
RMBS0009	RMBS0009S01	RMBS0009S01	04/18/08	In Place	GP	2	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0009	RMBS0009S02	RMBS0009S02	04/18/08	In Place	GP	3	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0010	RMBS0010AS01	RMBS0010AS01	04/30/08	In Place	GP	1	Primary Sample			Y	N		Y			Y	Y			Y	DGA	MWH	This Report
RMBS0010	RMBS0010S01	RMBS0010S01	04/23/08	In Place	GP	1	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0011	RMBS0011S01	RMBS0011S01	04/29/08	In Place	HA	1.25	Primary Sample				Y	Y	Y				Y	Y	Y	Y	DGA	MWH	This Report
RMBS0012	RMBS0012S01	RMBS0012S01	04/18/08	In Place	GP	2	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0013	RMBS0013S01	RMBS0013S01	04/16/08	In Place	GP	0.9	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0013	RMBS0013S02	RMBS0013S02	04/16/08	In Place	GP	2	Primary Sample				Y	Y	Y				Y	Y	Y	Y	DGA	MWH	This Report
RMBS0014	RMBS0014S01	RMBS0014S01	04/18/08	In Place	GP	2	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0014	RMBS0014S01SP	RMBS0014S01SP	04/18/08	In Place	GP	2	Split Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0014	RMBS0014S02	RMBS0014S02	04/18/08	In Place	GP	3	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0014	RMBS0014S03	RMBS0014S03	04/18/08	In Place	GP	6	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0015	RMBS0015S01	RMBS0015S01	04/18/08	In Place	GP	2	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0016	RMBS0016S01	RMBS0016S01	04/18/08	In Place	GP	2	Primary Sample				Y	Y	Y				Y	Y	Y	Y	DGA	MWH	This Report
RMBS0016	RMBS0016S01SP	RMBS0016S01SP	04/18/08	In Place	GP	2	Split Sample				Y	Y	Y				Y	Y		Y	DGA	MWH	This Report
RMBS0016	RMBS0016S02	RMBS0016S02	04/18/08	In Place	GP	3	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0016	RMBS0016S03	RMBS0016S03	04/18/08	In Place	GP	6	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0017	RMBS0017S01	RMBS0017S01	04/18/08	In Place	GP	2	Primary Sample				Y	Y	Y				Y	Y	Y	Y	DGA	MWH	This Report
RMBS0018	RMBS0018S01	RMBS0018S01	04/25/08	In Place	GP	1.5	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
RMBS0019	RMBS0019D01	RMBS0019D01	04/25/08	In Place	GP	1.75	Field Duplicate				Y	Y					Y	Y		Y	DGA	MWH	This Report
RMBS0019	RMBS0019S01	RMBS0019S01	04/25/08	In Place	GP	1.75	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
RMBS0019	RMBS0019S02	RMBS0019S02	04/25/08	In Place	GP	4	Primary Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0020	RMBS0020S01	RMBS0020S01	04/22/08	In Place	GP	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0021	RMBS0021S01	RMBS0021S01	04/22/08	In Place	GP	1.5	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
RMBS0022S70	RMBS0022S70	RMBS0022S70	04/19/08	In Place	HA	1	Composite Sample				N			Y						Y	DGA	MWH	This Report
RMBS0023S70	RMBS0023S70	RMBS0023S70	04/19/08	In Place	HA	1	Composite Sample				N			Y						Y	DGA	MWH	This Report
RMBS0030	RMBS0030S01	RMBS0030S01	04/22/08	In Place	GP	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0030	RMBS0030S02	RMBS0030S02	04/22/08	In Place	GP	3.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report

TABLE C.3-1C
RMHF RFI SITE SOIL MATRIX SAMPLING AND ANALYTICAL SUMMARY
(Page 2 of 4)

Sample Location Identification	Unique Sample ID	Sample Identification *	Date Collected	Removed or In Place (f)	Sample Method (a)	Depth (feet bgs)	Sample Type	Sample Analyses (Validated Yes/No)												Validated (b)	Rationale (c)	Consultant (d)	Reference Document (e)
								Asbestos	Dioxin	Herbicide	Inorganics	Metals	Other Organic Data	PCBs	Perchlorate	Pesticide	SVOCs	TPH	VOCs				
RMBS0031	RMBS0031S01	RMBS0031S01	05/01/08	In Place	HA	1	Primary Sample				Y	Y		Y	Y			Y	Y	Y	DGA	MWH	This Report
RMBS0032	RMBS0032S01	RMBS0032S01	05/02/08	In Place	HA	1	Primary Sample				Y	Y		Y	Y			Y		Y	DGA	MWH	This Report
RMBS0032	RMBS0032S01SP	RMBS0032S01SP	05/02/08	In Place	HA	1	Split Sample				Y	Y			Y			Y		Y	DGA	MWH	This Report
RMBS0032	RMBS0032S02	RMBS0032S02	05/02/08	In Place	HA	3.5	Primary Sample				Y	Y		Y	Y		Y	Y		Y	DGA	MWH	This Report
RMBS0033	RMBS0033S01	RMBS0033S01	05/01/08	In Place	HA	1.5	Primary Sample				Y	Y		Y	Y		Y	Y		Y	DGA	MWH	This Report
RMBS0033	RMBS0033S02	RMBS0033S02	05/01/08	In Place	HA	4	Primary Sample				Y	Y		Y	Y			Y		Y	DGA	MWH	This Report
RMBS0034	RMBS0034S01	RMBS0034S01	05/05/08	In Place	HA	1	Primary Sample				Y	Y						Y	Y	Y	DGA	MWH	This Report
RMBS0035	RMBS0035S01	RMBS0035S01	05/02/08	In Place	HA	1	Primary Sample				Y	Y		Y	Y		Y	Y		Y	DGA	MWH	This Report
RMBS0035	RMBS0035S02	RMBS0035S02	05/02/08	In Place	HA	2.25	Primary Sample				N								Y	Y	DGA	MWH	This Report
RMBS0036	RMBS0036D01	RMBS0036D01	05/05/08	In Place	HA	1	Field Duplicate		Y		Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0036	RMBS0036S01	RMBS0036S01	05/05/08	In Place	HA	1	Primary Sample		Y		Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0037	RMBS0037S01	RMBS0037S01	05/02/08	In Place	HA	1	Primary Sample				Y	Y		Y	Y		Y	Y	Y	Y	DGA	MWH	This Report
RMBS0038	RMBS0038S01	RMBS0038S01	04/17/08	In Place	GP	1.5	Primary Sample				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0039	RMBS0039S01	RMBS0039S01	04/17/08	In Place	GP	1.5	Primary Sample				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0039	RMBS0039S02	RMBS0039S02	04/17/08	In Place	GP	4	Primary Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0040	RMBS0040S01	RMBS0040S01	04/23/08	In Place	GP	1.5	Primary Sample				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0040	RMBS0040S02	RMBS0040S02	04/23/08	In Place	GP	4	Primary Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0041	RMBS0041S01	RMBS0041S01	04/21/08	In Place	GP	1	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0042	RMBS0042AS001	RMBS0042AS001	11/14/08	In Place	GP	1	Primary Sample				N								Y	Y	DGA	MWH	This Report
RMBS0042	RMBS0042AS002	RMBS0042AS002	11/14/08	In Place	GP	5	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0042	RMBS0042AS003	RMBS0042AS003	11/14/08	In Place	GP	10	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0042	RMBS0042AS004	RMBS0042AS004	11/14/08	In Place	GP	15	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0042	RMBS0042S01	RMBS0042S01	04/21/08	In Place	GP	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0042	RMBS0042S01SP	RMBS0042S01SP	04/21/08	In Place	GP	1.5	Split Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0042	RMBS0042S02	RMBS0042S02	04/21/08	In Place	GP	4	Primary Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0043	RMBS0043S01	RMBS0043S01	04/22/08	In Place	GP	1	Primary Sample		Y		Y	Y						Y	Y	Y	DGA	MWH	This Report
RMBS0044	RMBS0044S01	RMBS0044S01	04/24/08	In Place	GP	1	Primary Sample		Y		Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0045	RMBS0045S01	RMBS0045S01	04/28/08	In Place	HA	1	Primary Sample		Y		Y	Y			Y			Y	Y	Y	DGA	MWH	This Report
RMBS0046	RMBS0046S01	RMBS0046S01	04/24/08	In Place	GP	1	Primary Sample				Y	Y						Y	Y	Y	DGA*	MWH	This Report
RMBS0047	RMBS0047S01	RMBS0047S01	04/24/08	In Place	GP	1	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0048	RMBS0048S01	RMBS0048S01	04/28/08	In Place	HA	1	Primary Sample				Y	Y						Y	Y	Y	DGA	MWH	This Report
RMBS0049	RMBS0049D01	RMBS0049D01	04/25/08	In Place	GP	1.5	Field Duplicate				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0049	RMBS0049S01	RMBS0049S01	04/25/08	In Place	GP	1.5	Primary Sample				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0050	RMBS0050S01	RMBS0050S01	04/24/08	In Place	GP	1.5	Primary Sample				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0051	RMBS0051S01	RMBS0051S01	04/29/08	In Place	HA	1	Primary Sample				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0051	RMBS0051S01SP	RMBS0051S01SP	04/29/08	In Place	HA	1	Split Sample				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0052	RMBS0052S01	RMBS0052S01	04/30/08	In Place	HA	0.75	Primary Sample				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0053	RMBS0053S01	RMBS0053S01	04/28/08	In Place	HA	0.75	Primary Sample				Y	Y						Y		Y	DGA	MWH	This Report
RMBS0054	RMBS0054S01	RMBS0054S01	05/07/08	In Place	HA	1	Primary Sample				Y	Y		Y	Y		Y	Y	Y	Y	DGA	MWH	This Report
RMBS0055	RMBS0055S01	RMBS0055S01	05/01/08	In Place	HA	1	Primary Sample				Y	Y			Y			Y	Y	Y	DGA	MWH	This Report
RMBS0056	RMBS0056D01	RMBS0056D01	05/02/08	In Place	HA	0.75	Field Duplicate				Y	Y		Y	Y		Y	Y		Y	DGA	MWH	This Report
RMBS0056	RMBS0056S01	RMBS0056S01	05/02/08	In Place	HA	0.75	Primary Sample				Y	Y		Y	Y		Y	Y		Y	DGA	MWH	This Report
RMBS0057	RMBS0057AS001	RMBS0057AS001	11/19/08	In Place	HA	1	Primary Sample				N	Y								Y	DGA	MWH	This Report
RMBS0057	RMBS0057S01	RMBS0057S01	05/02/08	In Place	HA	1	Primary Sample	Y			Y	Y			Y			Y		Y	DGA	MWH	This Report
RMBS0058	RMBS0058S01	RMBS0058S01	05/01/08	In Place	GP	1.5	Primary Sample	Y			Y	Y			Y			Y		Y	DGA	MWH	This Report
RMBS0059	RMBS0059S01	RMBS0059S01	05/01/08	In Place	GP	1.5	Primary Sample	Y			Y	Y			Y			Y		Y	DGA	MWH	This Report
RMBS0059	RMBS0059S02	RMBS0059S02	05/01/08	In Place	GP	4	Primary Sample	Y			Y	Y								Y	DGA	MWH	This Report
RMBS0060	RMBS0060AS001	RMBS0060AS001	11/19/08	In Place	HA	0.75	Primary Sample				N								Y	Y	DGA	MWH	This Report
RMBS0060	RMBS0060S01	RMBS0060S01	05/01/08	In Place	GP	1.5	Primary Sample	Y			Y	Y			Y			Y		Y	DGA	MWH	This Report
RMBS0061	RMBS0061S01	RMBS0061S01	05/01/08	In Place	GP	1.5	Primary Sample				Y	Y			Y			Y		Y	DGA	MWH	This Report
RMBS0062	RMBS0062AS01	RMBS0062AS01	05/07/08	In Place	HA	1	Primary Sample												Y	Y	DGA	MWH	This Report
RMBS0062	RMBS0062S01	RMBS0062S01	05/05/08	In Place	HA	1	Primary Sample		Y		Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0063	RMBS0063D01	RMBS0063D01	05/06/08	In Place	GP	1.5	Field Duplicate		Y		Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0063	RMBS0063S01	RMBS0063S01	05/06/08	In Place	GP	1.5	Primary Sample		Y		Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0064	RMBS0064S01	RMBS0064S01	05/06/08	In Place	HA	1.5	Primary Sample		Y		Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0065	RMBS0065S01	RMBS0065S01	04/25/08	In Place	GP	1	Primary Sample				Y							Y		Y	DGA	MWH	This Report
RMBS0066	RMBS0066AS001	RMBS0066AS001	11/24/08	In Place	HA	1	Primary Sample				N								Y	Y	DGA	MWH	This Report
RMBS0066	RMBS0066S01	RMBS0066S01	05/01/08	In Place	HA	0.75	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0067	RMBS0067AS001	RMBS0067AS001	11/24/08	In Place	HA	1	Primary Sample				N								Y	Y	DGA	MWH	This Report
RMBS0067	RMBS0067S01	RMBS0067S01	05/05/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0067	RMBS0067S01SP	RMBS0067S01SP	05/05/08	In Place	HA	1	Split Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0068	RMBS0068AS001	RMBS0068AS001	11/24/08	In Place	HA	1	Primary Sample				N								Y	Y	DGA	MWH	This Report
RMBS0068	RMBS0068S01	RMBS0068S01	05/01/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0069	RMBS0069S01	RMBS0069S01	05/02/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0069	RMBS0069S02	RMBS0069S02	05/02/08	In Place	HA	2.25	Primary Sample				N								Y	Y	DGA	MWH	This Report
RMBS0070	RMBS0070S01	RMBS0070S01	05/05/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0091	RMBS0091S01	RMBS0091S01	04/28/08	In Place	HA	1	Primary Sample				Y	Y						Y	Y	Y	DGA	MWH	This Report
RMBS0092	RMBS0092S01	RMBS0092S01	04/24/08	In Place	GP	1	Primary Sample				Y	Y						Y	Y	Y	DGA*	MWH	This Report
RMBS0093	RMBS0093D01	RMBS0093D01	05/01/08	In Place	HA	1	Field Duplicate				N	Y		Y			Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0093	RMBS0093S01	RMBS0093S01	05/01/08	In Place	HA	1	Primary Sample				N	Y		Y			Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0094	RMBS0094AS001	RMBS0094AS001	11/13/08	In Place	GP	1.75	Primary Sample				N								Y	Y	DGA*	MWH	This Report
RMBS0094	RMBS0094AS002	RMBS0094AS002	11/13/08	In Place	GP	5	Primary Sample				N						Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0094	RMBS0094BS001	RMBS0094BS001	11/17/08	In Place	GP	1.75	Primary Sample				Y	Y		Y			Y			Y	DGA*	MWH	This Report
RMBS0094	RMBS0094BS002	RMBS0094BS002	11/17/08	In Place	GP	5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA*	MWH	This Report
RMBS0094	RMBS0094BS003	RMBS0094BS003	11/17/08	In Place	GP	10	Primary Sample				Y	Y								Y	DGA*	MWH	This Report
RMBS0094	RMBS0094S01	RMBS0094S01	04/21/08	In Place	GP	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA*	MWH	This Report
RMBS0095	RMBS0095S01	RMBS0095S01	04/24/08	In Place	GP	1	Primary Sample				N									N	DGA*	MWH	This Report
RMBS0097	RMBS0097S01	RMBS0097S01	04/29/08	In Place	HA	1	Primary Sample				N	Y		Y			Y	Y	Y	Y	DGA*	MWH	This Report

TABLE C.3-1C
RMHF RFI SITE SOIL MATRIX SAMPLING AND ANALYTICAL SUMMARY
(Page 3 of 4)

Sample Location Identification	Unique Sample ID	Sample Identification *	Date Collected	Removed or In Place (f)	Sample Method (a)	Depth (feet bgs)	Sample Type	Sample Analyses (Validated Yes/No)												Validated (b)	Rationale (c)	Consultant (d)	Reference Document (e)
								Asbestos	Dioxin	Herbicide	Inorganics	Metals	Other Organic Data	PCBs	Perchlorate	Pesticide	SVOCs	TPH	VOCs				
RMBS0098	RMBS0098S01	RMBS0098S01	05/02/08	In Place	HA	0.75	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0099	RMBS0099S01	RMBS0099S01	05/01/08	In Place	HA	1	Primary Sample				Y	Y		Y	Y		Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0100	RMBS0100S01	RMBS0100S01	04/17/08	In Place	GP	2	Primary Sample				N	Y		Y			Y	Y		Y	DGA*	MWH	This Report
RMBS0101	RMBS0101S01	RMBS0101S01	04/22/08	In Place	GP	1.5	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0102	RMBS0102S01	RMBS0102S01	04/21/08	In Place	GP	1.5	Primary Sample				Y	Y						Y		Y	DGA*	MWH	This Report
RMBS0103	RMBS0103S01	RMBS0103S01	04/21/08	In Place	GP	1.5	Primary Sample				Y	Y						Y		Y	DGA*	MWH	This Report
RMBS0104	RMBS0104S01	RMBS0104S01	04/21/08	In Place	GP	1	Primary Sample				Y	Y						Y		Y	DGA*	MWH	This Report
RMBS0105	RMBS0105S01	RMBS0105S01	04/21/08	In Place	GP	1	Primary Sample				Y	Y						Y		Y	DGA*	MWH	This Report
RMBS0106	RMBS0106S01	RMBS0106S01	04/17/08	In Place	GP	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA*	MWH	This Report
RMBS0106	RMBS0106S02	RMBS0106S02	04/17/08	In Place	GP	4	Primary Sample				Y	Y								Y	DGA*	MWH	This Report
RMBS0107	RMBS0107S01	RMBS0107S01	04/22/08	In Place	GP	1	Primary Sample				Y	Y						Y		Y	DGA*	MWH	This Report
RMBS0108	RMBS0108S01	RMBS0108S01	04/22/08	In Place	GP	1.5	Primary Sample			Y	Y	Y		Y		Y	Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0109	RMBS0109S01	RMBS0109S01	04/24/08	In Place	GP	0.75	Primary Sample				Y	Y		Y			Y		Y	Y	DGA*	MWH	This Report
RMBS0110	RMBS0110S01	RMBS0110S01	04/17/08	In Place	GP	2	Primary Sample				Y	Y		Y			Y	Y		Y	DGA*	MWH	This Report
RMBS0111	RMBS0111S01	RMBS0111S01	04/21/08	In Place	GP	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA*	MWH	This Report
RMBS0112	RMBS0112AS003	RMBS0112AS003	11/14/08	In Place	GP	10	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0112	RMBS0112S01	RMBS0112S01	04/23/08	In Place	GP	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA*	MWH	This Report
RMBS0112	RMBS0112S02	RMBS0112S02	04/23/08	In Place	GP	4	Primary Sample				Y	Y								Y	DGA*	MWH	This Report
RMBS0113	RMBS0113S01	RMBS0113S01	04/24/08	In Place	GP	1	Primary Sample			Y	Y	Y		Y		Y	Y	Y		Y	DGA*	MWH	This Report
RMBS0114	RMBS0114S01	RMBS0114S01	05/02/08	In Place	HA	1	Primary Sample				Y	Y			Y			Y	Y	Y	DGA*	MWH	This Report
RMBS0115	RMBS0115S01	RMBS0115S01	05/02/08	In Place	HA	1	Primary Sample				Y	Y			Y			Y	Y	Y	DGA*	MWH	This Report
RMBS0116	RMBS0116S01	RMBS0116S01	05/02/08	In Place	HA	1	Primary Sample				Y	Y			Y			Y	Y	Y	DGA*	MWH	This Report
RMBS0117	RMBS0117501	RMBS0117501	04/30/08	In Place	GP	1.5	DTSC Split		N		N	N		N			N	N		N	DGA*	DTSC Split	This Report
RMBS0117	RMBS0117AS001	RMBS0117AS001	11/17/08	In Place	GP	1.5	Primary Sample				N								Y	Y	DGA*	MWH	This Report
RMBS0117	RMBS0117S01	RMBS0117S01	04/30/08	In Place	GP	1.5	Primary Sample		Y		Y	Y						Y		Y	DGA*	MWH	This Report
RMBS0117	RMBS0117S01SP	RMBS0117S01SP	04/30/08	In Place	GP	1.5	Split Sample		Y		Y	Y		Y				Y		Y	DGA*	MWH	This Report
RMBS0118	RMBS0118501	RMBS0118501	04/30/08	In Place	GP	0.8	DTSC Split			N	N	N				N	N	N		N	DGA*	DTSC Split	This Report
RMBS0118	RMBS0118S01	RMBS0118S01	04/30/08	In Place	GP	0.8	Primary Sample			Y	Y	Y				Y	Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0119	RMBS0119501	RMBS0119501	04/30/08	In Place	GP	1.5	DTSC Split				N	N					N	N		N	DGA*	DTSC Split	This Report
RMBS0119	RMBS0119S01	RMBS0119S01	04/30/08	In Place	GP	1.5	Primary Sample				Y	Y					Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0120	RMBS0120S01	RMBS0120S01	04/28/08	In Place	HA	0.75	Primary Sample			Y	Y	Y		Y		Y	Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0121	RMBS0121S01	RMBS0121S01	04/28/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0122	RMBS0122S01	RMBS0122S01	04/30/08	In Place	GP	1	Primary Sample				Y	Y						Y	Y	Y	DGA*	MWH	This Report
RMBS0123	RMBS0123S01	RMBS0123S01	04/25/08	In Place	GP	1	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA*	MWH	This Report
RMBS0124	RMBS0124S01	RMBS0124S01	04/25/08	In Place	GP	1	Primary Sample				Y	Y						Y	Y	Y	DGA*	MWH	This Report
RMBS0125	RMBS0125S01	RMBS0125S01	05/01/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y		Y	DGA*	MWH	This Report
RMBS0126	RMBS0126S01	RMBS0126S01	04/29/08	In Place	HA	1	Primary Sample				Y	Y						Y	Y	Y	DGA*	MWH	This Report
RMBS0127	RMBS0127S01	RMBS0127S01	04/28/08	In Place	HA	1	Primary Sample				Y	Y						Y	Y	Y	DGA	MWH	This Report
RMBS0133	RMBS0133S001	RMBS0133S001	11/24/08	In Place	HA	1	Primary Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0134	RMBS0134S001	RMBS0134S001	11/24/08	In Place	HA	1	Primary Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0135	RMBS0135S001	RMBS0135S001	11/24/08	In Place	HA	1	Primary Sample				N						Y			Y	DGA	MWH	This Report
RMBS0136	RMBS0136S001	RMBS0136S001	11/24/08	In Place	HA	1	Primary Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0137	RMBS0137S001	RMBS0137S001	11/17/08	In Place	GP	1	Primary Sample				Y	Y							Y	Y	DGA	MWH	This Report
RMBS0138	RMBS0138S001	RMBS0138S001	11/17/08	In Place	GP	1	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0139	RMBS0139S001	RMBS0139S001	11/20/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
RMBS0139	RMBS0139S001SP	RMBS0139S001SP	11/20/08	In Place	HA	1	Split Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0140	RMBS0140S001	RMBS0140S001	11/20/08	In Place	HA	1	Primary Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0141	RMBS0141S001	RMBS0141S001	11/20/08	In Place	HA	1	Primary Sample				Y	Y								Y	DGA	MWH	This Report
RMBS0142	RMBS0142S001	RMBS0142S001	11/19/08	In Place	GP	3.5	Primary Sample				N	Y		Y	Y		Y	Y	Y	Y	DGA	MWH	This Report
RMBS0143	RMBS0143S001	RMBS0143S001	11/19/08	In Place	GP	3	Primary Sample				N	Y		Y	Y		Y	Y	Y	Y	DGA	MWH	This Report
RMBS0144	RMBS0144S001	RMBS0144S001	11/24/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0144	RMBS0144S001SP	RMBS0144S001SP	11/24/08	In Place	HA	1	Split Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0145	RMBS0145S001	RMBS0145S001	11/24/08	In Place	HA	0.75	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
RMBS0148	RMBS0148S001	RMBS0148S001	11/17/08	In Place	GP	0.75	Primary Sample				N								Y	Y	DGA	MWH	This Report
RMDF1	RMDF1 (h)	RMDF1	08/25/88	In Place	HA	0.5	Primary Sample				N	N								N	WP	Groundwater Resources Consultants, Inc.	This Report
RMDF2	RMDF2 (h)	RMDF2	08/25/88	In Place	HA	0.5	Primary Sample				N	N								N	WP	Groundwater Resources Consultants, Inc.	This Report
RMDF3	RMDF3 (h)	RMDF3	08/25/88	In Place	HA	0.5	Primary Sample				N	N								N	WP	Groundwater Resources Consultants, Inc.	This Report
RMDF4	RMDF4 (h)	RMDF4	08/25/88	In Place	HA	0.5	Primary Sample				N	N								N	WP	Groundwater Resources Consultants, Inc.	This Report
RMDF5	RMDF5 (h)	RMDF5	08/25/88	In Place	HA	0.5	Primary Sample				N	N								N	WP	Groundwater Resources Consultants, Inc.	This Report
RMDF6	RMDF6 (h)	RMDF6	08/25/88	In Place	HA	0.5	Primary Sample				N	N								N	WP	Groundwater Resources Consultants, Inc.	This Report
U7BS0001	U7BS0001S01	U7BS0001S01	05/02/08	In Place	HA	1.25	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0002	U7BS0002S01	U7BS0002S01	05/02/08	In Place	HA	0.75	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0003	U7BS0003S01	U7BS0003S01	05/02/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0003	U7BS0003S02	U7BS0003S02	05/02/08	In Place	HA	2.5	Primary Sample				Y	Y								Y	DGA	MWH	This Report
U7BS0004	U7BS0004S01	U7BS0004S01	05/07/08	In Place	HA	0.7	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0005	U7BS0005S01	U7BS0005S01	05/07/08	In Place	HA	0.7	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0006	U7BS0006S01	U7BS0006S01	05/07/08	In Place	HA	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0007	U7BS0007S01	U7BS0007S01	04/30/08	In Place	GP	1	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0008	U7BS0008S01	U7BS0008S01	04/30/08	In Place	GP	1	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0008	U7BS0008S01SP	U7BS0008S01SP	04/30/08	In Place	GP	1	Split Sample				Y	Y						Y		Y	DGA	MWH	This Report
U7BS0010	U7BS0010S01	U7BS0010S01	04/30/08	In Place	GP	1	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0010	U7BS0010S02	U7BS0010S02	04/30/08	In Place	GP	4.5	Primary Sample				Y	Y								Y	DGA	MWH	This Report
U7BS0010	U7BS0010S03	U7BS0010S03	04/30/08	In Place	GP	11.5	Primary Sample				Y	Y								Y	DGA	MWH	This Report
U7BS0011	U7BS0011D01	U7BS0011D01	04/30/08	In Place	GP	1	Field Duplicate				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0011	U7BS0011S01	U7BS0011S01	04/30/08	In Place	GP	1	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0012S01	U7BS0012S01	U7BS0012S01	05/01/08	In Place	GP	1	Primary Sample				N			Y						Y	DGA	MWH	This Report
U7BS0012S70	U7BS0012S70	U7BS0012S70	05/01/08	In Place	GP	1	Composite Sample				N			Y						Y	DGA	MWH	This Report
U7BS0013	U7BS0013AS001	U7BS0013AS001	11/24/08	In Place	HA	1	Primary Sample				N								Y	Y	DGA	MWH	This Report

TABLE C.3-1C
RMHF RFI SITE SOIL MATRIX SAMPLING AND ANALYTICAL SUMMARY
(Page 4 of 4)

Sample Location Identification	Unique Sample ID	Sample Identification *	Date Collected	Removed or In Place (f)	Sample Method (a)	Depth (feet bgs)	Sample Type	Sample Analyses (Validated Yes/No)												Validated (b)	Rationale (c)	Consultant (d)	Reference Document (e)
								Asbestos	Dioxin	Herbicide	Inorganics	Metals	Other Organic Data	PCBs	Perchlorate	Pesticide	SVOCs	TPH	VOCs				
U7BS0013	U7BS0013S01	U7BS0013S01	05/06/08	In Place	HA	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0014	U7BS0014AS001	U7BS0014AS001	11/21/08	In Place	HA	1	Primary Sample				N								Y	Y	DGA	MWH	This Report
U7BS0014	U7BS0014S01	U7BS0014S01	05/07/08	In Place	HA	0.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0015	U7BS0015AS001	U7BS0015AS001	11/21/08	In Place	HA	1	Primary Sample				N								Y	Y	DGA	MWH	This Report
U7BS0015	U7BS0015S01	U7BS0015S01	05/06/08	In Place	HA	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0016	U7BS0016AS001	U7BS0016AS001	11/21/08	In Place	HA	0.75	Primary Sample				N								Y	Y	DGA	MWH	This Report
U7BS0016	U7BS0016S01	U7BS0016S01	05/06/08	In Place	HA	1	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0016	U7BS0016S01SP	U7BS0016S01SP	05/06/08	In Place	HA	1	Split Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0017	U7BS0017AS001	U7BS0017AS001	11/20/08	In Place	HA	1	Primary Sample				N								Y	Y	DGA	MWH	This Report
U7BS0017	U7BS0017S01	U7BS0017S01	05/06/08	In Place	HA	1.5	Primary Sample				Y	Y		Y			Y	Y		Y	DGA	MWH	This Report
U7BS0018	U7BS0018S01	U7BS0018S01	05/01/08	In Place	GP	1	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0018	U7BS0018S02	U7BS0018S02	05/01/08	In Place	GP	5	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0018	U7BS0018S03	U7BS0018S03	05/01/08	In Place	GP	10	Primary Sample				Y	Y								Y	DGA	MWH	This Report
U7BS0018	U7BS0018S04	U7BS0018S04	05/01/08	In Place	GP	13.5	Primary Sample				Y	Y								Y	DGA	MWH	This Report
U7BS0018	U7BS0018S05	U7BS0018S05	05/01/08	In Place	GP	19.75	Primary Sample				Y	Y								Y	DGA	MWH	This Report
U7BS0020	U7BS0020S001	U7BS0020S001	11/18/08	In Place	GP	1	Primary Sample				Y	Y								Y	DGA	MWH	This Report
U7BS0021	U7BS0021D001	U7BS0021D001	11/12/08	In Place	GP	0.5	Field Duplicate				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0021	U7BS0021S001	U7BS0021S001	11/12/08	In Place	GP	0.5	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0022	U7BS0022D001	U7BS0022D001	11/18/08	In Place	GP	1	Field Duplicate				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0022	U7BS0022S001	U7BS0022S001	11/18/08	In Place	GP	1	Primary Sample				Y	Y					Y	Y		Y	DGA	MWH	This Report
U7BS0023	U7BS0023S001	U7BS0023S001	11/17/08	In Place	HA	1	Primary Sample				Y	Y					Y	Y	Y	Y	DGA	MWH	This Report
U7BS0024S070	U7BS0024S070	U7BS0024S070	11/18/08	In Place	GP	1	Composite Sample				N			Y						Y	DGA	MWH	This Report
U7BS0025	U7BS0025S001	U7BS0025S001	11/20/08	In Place	HA	1.25	Primary Sample				Y	Y		Y			Y	Y	Y	Y	DGA	MWH	This Report
U7BS0026	U7BS0026S001	U7BS0026S001	11/21/08	In Place	HA	1	Primary Sample				Y	Y								Y	DGA	MWH	This Report
U7BS0027	U7BS0027S001	U7BS0027S001	11/19/08	In Place	HA	1	Primary Sample					Y								Y	DGA	MWH	This Report
U7BS0027	U7BS0027S002	U7BS0027S002	11/19/08	In Place	HA	5	Primary Sample				Y	Y								Y	DGA	MWH	This Report
			Total Primary Samples:	227			**Validated:**	5	11	5	183	190	9	97	24	5	122	161	100	**222**			
			Total QC (Duplicate, Split) Samples:	27			**Not Validated**	0	4	1	43	27	0	4	0	1	21	3	19	**35**			
			Total Number of RMHF RFI Site Soil Samples:	**257**																			

* Soil sampling and analytical summary includes only samples collected prior to May 8, 2009. For information regarding additional samples collected on May 8, 2009, see the 'Additional Data' folder of Attachment C-3 of this report. These Group 7 data gap sample results are considered for site action recommendations presented in the Group 7 RFI Report, but could not be included in the quantitative site risk assessments.

Notes:

Sample Location Identification - Boring or trench number

Unique Sample ID - Laboratory reporting code

Sample Identification - RFI site and sample identifier code

(a) **Sample Method:**

GP = Geoprobe - using direct push core barrel. **G** = Grab sample

HA = Hand Auger sample **T =** Trench sample

(b) **Validated:** "Y" indicates that a minimum of one analysis has been validated following RFI protocols; agency split samples were not validated but were reviewed for comparability.
Data collected prior to the RFI were not typically subsequently validated using RFI protocols but were collected and reviewed following QA procedures established for earlier investigation programs.

(c) **Rationale (see below):**

DGA - Indicates samples collected in 2008 as a part of the Data Gaps Analysis to address delineation with stepout samples, and elevated detection limit issues..
DGA* - Indicates samples collected in 2008 as a part of the Data Gaps Analysis that were specific DTSC resquests.
WP - Indicates samples collected based on DTSC-approved Work Plan scope.

(d) **Consultant:** Contractor responsible for sampling and reporting for each location.

(e) **Reference Document:** Document containing published data; "This report" includes the RMHF RFI site appendix and the Group 7 RFI Report. Refer to Section C.6 (References) for complete citation.

(f) **Removed or in-place sample status:** Status as of date of this report.

(g) Sample was collected outside of the Group 7 Reporting Area near offsite drainages.

(h) Samples collected at locations RMDF1 through RMDF6 shown on figures are identified as SB_RMDF-1_0.0-0.5 through SB_RMDF-6_0.0-0.5. Sample IDs changed to RMDF1 through RMDF6 for database management purposes.

Acronyms:

bgs - below ground surface
DTSC - Department of Toxic Substances Control
RFI - Resource Conservation and Recovery Act Facility Investigation
QA - Quality assurance
QC - Quality control

Laboratory Analytical Methods Represented (EPA Method No.)

Asbestos - CARB 435
Dioxin - 1613B, 8290
Herbicide - 8151A
Inorganics - 300.0, 9045, 9056, % Moist, 160.3 MOD, 2540G, 9045C, D2216M
Metals - 6010, 6020, 7060, 7199, 7471, 7610, 7740, 7770, 7841, 6010B, 6010B/7471A, 7196A, 7471A, 9012A
Other Organic Data - 8015B, 8315A
PCB - 8080, 8082
Perchlorate - 314.0-DI WET
Pesticide - 8081A
SVOCs - 8270, 8270C, 8270C SIM
TPH - 8015B
VOCs - 8240, 8260B

Inorganics - % Moisture, pH and Fluoride
Other Organic Data - Glycols and Terphenyls
PCB - Polychlorinated biphenyls
SVOCs - Semivolatile Organic Compound
TPH - Total Petroleum Hydrocarbons
VOCs - Volatile Organic Compound

TABLE C.3-1D
RMHF RFI SITE SURFACE WATER SAMPLING AND ANALYTICAL SUMMARY
(Page 1 of 1)

Sample Location Identifiation	Unique Sample ID	Sample Identification	Date Collected	Removed or In Place (f)	Sample Method (a)	Depth (feet bgs)	Sample Type	SVOCs	VOCs	Validated (b)	Rationale (c)	Consultant (d)	Reference Document (e)
BB-03-001	BB03001W	BB03001W	03/17/92	In Place	G	0	Primary Sample	N	N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-03-001	BB03001W-USEPA	BB03001W-USEPA	03/17/92	In Place	G	0	Primary Sample	N	N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-16-001B	BB16001BW	BB16001BW	04/22/92	In Place	G	0.5	Primary Sample	N	N	N	WP	McLaren/Hart	McLaren/Hart, 1993
BB-16-001B	BB16001BW-USEPA	BB16001BW-USEPA	04/22/92	In Place	G	0.5	Split Sample	N	N	N	WP	McLaren/Hart	McLaren/Hart, 1993
		Total Primary Samples:	3				**Validated:**	0	0	0			
		Total QC (Duplicate, Split) Samples:	1				**Not Validated:**	4	4	4			
		Total Number of RMHF RFI Site Surface Water Samples	**4**										

Notes:

Sample Location Identification - Boring or trench number

Unique Sample ID - Laboratory reporting code

Sample Identification - RFI site and sample identifier code

(a) **Sample Method:**

G = Grab sample

(b) **Validated:** "Y" indicates that a minimum of one analysis has been validated following RFI protocols; agency split samples were not validated but were reviewed for comparability.

Data collected prior to the RFI were not typically subsequently validated using RFI protocols but were collected and reviewed following QA procedures established for earlier investigation programs.

(c) **Rationale (see below):**

WP - Indicates samples collected based on DTSC-approved Work Plan scope.

(d) **Consultant:** Contractor responsible for sampling and reporting for each location.

(e) **Reference Document:** Document containing published data; "This report" includes the RMHF RFI site appendix and the Group 7 RFI Report. Refer to Section C.6 (References) for complete citation.

Acronyms:

bgs - below ground surface

DTSC - Department of Toxic Substances Control

RFI - Resource Conservation and Recovery Act Facility Investigation

QA - Quality assurance

QC - Quality control

Laboratory Analytical Methods Represented (EPA Method No.)

SVOC- 3510/610, 8270

VOC - 8240

SVOCs - Semivolatile Organic Compound

VOCs - Volatile Organic Compound

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 1 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
1a – 1d	**Building 4021 Radioactive Waste Decontamination and Packaging (1a); Building 4022 Radioactive Vault Storage (1b); Radioactive Water Treatment System (1c); and Filter/Blower Area (1d)** Building 4021 Radioactive Waste Decontamination and Packaging (Chemical Use Area [CUA] 1a) is a 3,000-square foot, on-grade metal building. The building was constructed in 1959 and contains a decontamination room, a packaging room, hot and cold change rooms, a laundry room, and an office. Building 4021 was originally constructed to process materials contaminated with mixed fission products and fuels, and was used as a processing area for wastes developed during decontamination and decommissioning (D&D) activities. Operations conducted at Building 4021 included radioactive component cleaning, component size reduction, radioactive liquid waste processing (evaporation and solidification), decontamination services, and waste packaging. Building 4022, Radioactive Vault Storage (CUA 1b) is a metal building with a high-bay roof and seven below-grade storage vaults. Building 4022 was constructed in 1959 and designed to store materials that contained mixed fission products and nuclear fuels in support of Energy Technology Engineering Center (ETEC) nuclear facilities and Rockwell International Hot Laboratory (RIHL) fuel decladding operations. Support generally involved receipt and storage of incoming fuels and pre-shipment storage and shipment of outgoing fuels. All vaults with the exception of Vault 2 were also used to store mixed waste. The storage vaults are approximately 25 feet long, vary in width from 7.5 feet to 17.5 feet and in depth from 11.5 feet to 20 feet. The vaults were constructed from reinforced concrete and have individually-controlled air-cooling systems used for temperature and fire control. All seven vaults have a common drainage system that drains to the Radioactive Liquid Treatment System (CUA 1c)	**VOCs** Storage of solvents, including chlorinated solvents documented.	<u>Soil Vapor</u> Collected soil vapor samples at three targeted locations: • North of Building 4021 targeted beneath an overhead pipeline connecting to the Building 4664 (CUA 8a) evaporator and flocculator (RMSV0107 3.0 feet bgs) • South of Building 4021, downslope and west of Building 4022 and the Building 4022 Sump (RMSV0019 at 4.0 feet bgs) • Adjacent to the Building 4021 Sump (RMSV0030 at 3.0 feet bgs) [Note: Soil vapor samples were not collected in other locations within CUAs 1a – 1d due to shallow (< 3 feet)]. <u>Soil Matrix</u> Collected soil matrix samples at 12 locations around Building 4021 and Building 4022, and in the Filter/Blower area. Several sample locations targeted known potential sources or likely pathways: • Adjacent to the Building 4022 Sump (RMBS0018 at 1.5 feet bgs) and sump pipeline (RMBS0126 at 1 feet bgs) • Within an observed surface water pathway east of Building 4022 (RMBS0046 and RMBS0092 at 1.0 feet bgs) Samples were also collected at representative locations around the two Building 4021 and 4022, and in the Filter/Blower area: • North of Building 4021 (RMBS0148 at 0.75 feet bgs). • South of Building 4021 (RMBS0119 at 1.5 feet bgs). • Downslope of Building 4021, RMBS0108 and RMBS0117, both at 1.5 feet bgs	VOC results are shown on Figure C.3-1A. <u>Soil Vapor</u> VOCs were detected at the three soil vapor locations up to 6.6 µg/L Freon 113 at RMSV0030 (3.5 feet bgs). PCE was detected at two locations (RMSV0030 and RMSV0107) up to 0.57 µg/L (RMSV0107), slightly above the ResRBSL of 0.45 µg/L but below the EcoRBSL of (24 µg/L. With the exception of PCE in RMSV0107, no other VOCs were detected above RBSLs in soil vapor. PCE was not detected in any soil matrix samples in CUAs 1a through 1d. <u>Soil Matrix</u> Four VOCs (toluene, m- and - xylenes, naphthalene, and styrene) were detected at low concentrations in 4 of 12 locations around Buildings 4021 and 4022, and in the Filter/Blower Area, up to 0.55 µg/kg (styrene at RMBS0101). No VOCs were detected above RBSLs. VOCs were not detected at the Filter / Blower Area pipeline discharge point (RMBS0145). Based on extensive representative and targeted samples and sampling results indicating isolated, low VOC concentrations below or slightly above RBSLs, no further characterization is necessary.	YES. VOCs not detected or detected at low concentrations below RBSLs at targeted and representative sampling locations.	YES The area around Buildings 4021 and 4022 and in the Filter/Blower Area is not recommended for further evaluation in the CMS based on VOC concentrations and risk assessment results. The former Filter / Blower Area pipeline discharge point and hill slope below CUA 10a is recommended for further evaluation in the CMS based on detected metals concentrations and risk assessment results. VOCs do not drive CMS recommendation. CMS volume is delineated as described below for metals.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 2 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	via a floor drain in Vault 6. Buildings 4021 and 4022 are two of the three buildings / areas currently designated as Resource Conservation and Recovery Act (RCRA) Part A (Interim Status) permitted facilities. The area between Buildings 4021 and 4022, referred to as the Filter/Blower Area (CUA 1d), contained filtration equipment used to filter all air from Buildings 4021 and 4022. The air circulation system provided temperature control and filtration for the Building 4022 subsurface vaults and supported two fume hoods and an evaporator located in the Building 4021 Decontamination Room. Air collected from Buildings 4021 and 4022 passed through a series of high-efficiency particulate air (HEPA) filters before it was exhausted from the 130-foot tall stack on the western side of Building 4022, where it is sampled for radioactive content. The Filter/Blower Area contained three utility trenches used to support the ventilation ducts. Each of these trenches contained a floor drain used to convey surface water away from the Filter/Blower Area. The floor drains connected to a pipeline that conveyed the surface water to the RMHF north slope, bypassing the RMHF Catch Basin (CUA 10c). Buildings 4021 and 4022 included a radioactive liquid waste treatment system (CUA 1c) used to collect and treat water produced at ETEC facilities. Low-level radioactive waste (LLRW) water was stored in Holding Tank T-1, a 5,000-gallon aboveground storage tank (AST) located west of Building 4021. The low-level liquid waste was treated by a combination of filtration, evaporation, and solidification. Liquids were evaporated using a gas-powered evaporator in Building 4021, filtered through the HEPA filtration system, then exhausted from the 130-ft stack; sludge remaining after evaporation was solidified using concrete, resulting in 55-gallon drums of concentrated solidified sludge. The liquid treatment system also received water from other ETEC nuclear facilities (including the Sodium Reactor Experiment [SRE], RIHL, and		• North of Building 4022 (RMBS0109 and RMBS0118 at 0.75 and 0.5 feet bgs, respectively). • At the north and south ends of the Filter/Blower Area (RMBS0101 at RMBS0097 at 1.5 and 1.0 feet bgs, respectively) One sample was also collected to target the former Filter/Blower area trench drain pipeline discharge point on the RMHF northern slope (RMBS0145 at 0.75 feet bgs).			
		SVOCs SVOCs potentially associated with petroleum fuels and oils used and stored at the RMHF RFI Site. SVOCs tentatively identified compounds were screened at the RMHF RFI Site to address chemicals documented on the United States Environmental Protection Agency (USEPA) Biennial Reporting System (BRS) Database, including morphaline, pyridine, and nicotine.	Collected soil matrix samples at 10 locations around Building 4021 and Building 4022, and in the Filter/Blower area. Several sample locations targeted known potential sources • Adjacent to the Building 4022 Sump (RMBS0018 at 1.5 feet bgs). • Adjacent to the Building 4021 Sump (RMBS0030 at 3.5 feet bgs) Samples were also collected at representative locations around the two buildings and in the Filter/Blower area: • South of Building 4021(RMBS0019 and RMBS0119 at 1.75 and 1.5 feet bgs, respectively). • North of Building 4022 (RMBS0109 and RMBS0118 at 0.8 feet bgs). • Downslope of Building 4021, (RMBS0108 and RMBS0117 at 1.5 feet bgs) • At the north and south ends of the Filter/Blower Area (RMBS0101 RMBS0097 at 1.5 and 1 feet bgs, respectively) One targeted location at the trench drain discharge pipeline located on the RMHF northern slope (RMBS0145 at 0.75 feet bgs).	SVOC results are shown on Figures C.3-2A and C.3-2C. Polycyclic aromatic hydrocarbons (PAHs) and phthalates were detected at 3 of the 10 locations around Building 4021 and Building 4022, and in the Filter/Blower Area up to 22.4 µg/kg (fluoranthene at RMBS0030) and up to 6.15 µg/kg (di-n-butyl phthalate at RMBS0101), respectively. Benzo(a)pyrene was detected at the Building 4021 Sump at 9.47 µg/kg (RMBS0030), but at no other locations in the operational area. PAHs and phthalates were also detected at the Filter / Blower Area pipeline discharge point (RMBS0145) up to 34.8 µg/kg (fluoranthene) and 71.1 µg/kg (bis(2-ethylhexyl) phthalate), respectively. Benzo(a)pyrene was detected at 14.7 µg/kg. Detected SVOCs were below RBSLs at both areas. Based on extensive representative and targeted samples and sampling results indicating isolated, low SVOC concentrations below RBSLs, no further characterization is necessary/	YES. SVOCs detected at low concentrations (below RBSLs) at a few isolated locations.	YES The area around Buildings 4021 and 4022, and in the Filter/Blower Area is not recommended for further evaluation in the CMS based on SVOC concentrations and risk assessment results. The former Filter / Blower Area pipeline discharge point and hill slope below CUA 10a is recommended for further evaluation in the CMS based on detected metals concentrations and risk assessment results. SVOCs do not drive CMS recommendation. CMS volume is delineated as described below for metals.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 3 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	System for Nuclear Auxiliary Power [SNAP] facilities), from the Building 4022 subsurface vaults, and from the HEPA filtration system. Water from other ETEC facilities was transferred by way of a 500-gallon transfer tank. The water was poured into the Packaging Room Sump and conveyed to the Building 4021 Sump. Water that collected in the vaults flowed to a floor drain located in Vault 6 to a 200-gallon tank in the Building 4022 Sump, located outside of the southwest corner of the building. A subsurface pipeline conveyed water from the Building 4022 Sump and condensate from the HEPA filters in the Filter/Blower Area to the 3-foot below ground Building 4021 Decontamination Room Sump, located in of Building 4021. An exit pipeline then transferred the water and condensate to the 1-foot deep Building 4021 Packaging Room Sump. The collected water then flowed to the 150-gallon Building 4021 Intermediate Holdup Sump Tank and was then pumped to Holding Tank T-1 for storage or to the evaporator for treatment. Water in Holding Tank T-1 was analyzed for radioactivity. If radioactivity was present above permissible levels, the water was transferred to the Building 4021 Evaporator on an on-demand basis. Once all the water was evaporated, the remaining solids were solidified using concrete and ultimately shipped offsite for disposal in 55-gallon barrels of solidified sludge. If radioactivity was present below permissible levels, the water was discharged to the Building 4021 Leach Field via a pipeline that bypassed the septic system. Between1962 and 1963, a valve connecting Holding Tank T-1 to the Building 4021 Leach Field leaked or was inadvertently left open, allowing an undetermined volume of radioactive water to enter the Building 4021 Leach Field (CUA 4b). In 1978, following an overflow of Holding Tank T-1, the AST was removed and replaced with an 8,000-gallon UST (UT-15) located in Vault 2 of Building 4022. Water from the Building 4021 Sump was pumped to UT-15 by a pipeline that ran aboveground through Building 4021 and the					
		TPH Use and/or storage of hydraulic oils, waste oils, and diesel fuel are documented in historical records.	Collected soil matrix samples at 14 locations around Building 4021 and Building 4022, and in the Filter/Blower area. Several sample locations targeted known potential sources • North of Building 4021 targeted beneath an overhead pipeline connecting to the Building 4664 (CUA 8a) evaporator and flocculator (RMSV0107 at 3.0 feet bgs). • Adjacent to the Building 4021 Sump (RMBS0030 at 3.5 feet bgs) • Adjacent to the Building 4022 Sump (RMBS0018 at 1.5 feet bgs) and sump pipeline (RMBS0126 at 1 feet bgs) • Within an observed surface water pathway east of Building 4022 (RMBS0046 and RMBS0092 at 1.0 feet bgs). Samples were also collected at representative locations around the two buildings and in the Filter/Blower area: • South of Building 4021 (RMBS0019 and RMBS0119 at 1.75 and 1.5 feet bgs, respectively) • North of Building 4022 (RMBS0118 at 0.8 feet bgs) • Downslope of Building 4021, (RMBS0108 and RMBS0117, both at 1.5 feet bgs) • At the north and south ends of the Filter/Blower Area (RMBS0101 and RMBS0097 at 1.5 and 1 feet bgs, respectively) One sample was also collected to target the former Filter/Blower area trench drain pipeline discharge point on the RMHF northern slope (RMBS0145 at 0.75 feet bgs).	TPH results are shown on Figure C.3-3A. Petroleum hydrocarbons were detected at 13 of the 14 sample locations around Building 4021 and Building 4022, and in the Filter/Blower Area, up to 55.9 mg/kg (lubricant oil range organics [C21 – C30]) at the Building 4022 Sump Pipeline (RMBS0126). Kerosene range organics (C12 – C14) and diesel range organics (C15 – C20) were also detected at this location, up to 2.92 mg/kg; but the remaining locations with detected petroleum hydrocarbons were in the lubricant oil range (up to 20.4 mg/kg). Gasoline range organics (C08 – C11) were not detected in this area. Lubricant oil range organics were also detected at the Filter / Blower Area pipeline discharge point (RMBS0145) at 12 mg/kg. Gasoline range organics were not detected in this area. All detected petroleum hydrocarbons were below the combined RBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on extensive representative and targeted samples and sampling results indicating low lubricant oil range organics concentrations below RBSLs, no further characterization is necessary/	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at extensive targeted and representative sampling locations.	YES The area around Buildings 4021 and 4022, and in the Filter/Blower Area is not recommended for further evaluation in the CMS based on TPH concentrations and risk assessment results. The former Filter / Blower Area pipeline discharge point and hill slope below CUA 10a is recommended for further evaluation in the CMS based on detected metals concentrations and risk assessment results. TPH does not drive CMS recommendation. CMS volume is delineated as described below for metals.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 4 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	Filter/Blower Area, and then went below ground inside Building 4022, through Vault 1 to Vault 2. The portion of the pipe that ran through the Filter/Blower Area was double-walled. The Building 4022 subsurface vaults held other tanks, including two 5,000-gallon tanks stored in Vault 2 used primarily to store surface water during the Building 4021 Leach Field excavation in 1978 (CUA 4b), and a sodium melt tank stored in Vault 3 to remove residual sodium from SRE piping. The Building 4021 evaporator was taken offline in 2004, making the liquid waste treatment system inactive. In 2007, Building 4021 became inactive and all equipment was removed. Building 4021 and 4022 sump tanks and Tank UT-15 were also removed in 2007. Building 4022 and the Filter / Blower Area are still active. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon aboveground storage tank (AST), where it is tested for measureable radioactivity prior to discharge. Historically, surface water in the Filter / Blower Area collected in three concrete-lined trenches and drained via subsurface pipeline to the north RMHF slope. At some time during the RMHF operational period, the drains were plugged (date not specified in historical documents), and surface water has been conveyed to the west via sheet flow to the RMHF Catch Basin or, following the 2006 Catch Basin removal, the storm water AST. Buildings 4021, 4022, the radioactive liquid treatment system, and the Filter / Blower Area are located in the eastern portion of the RMHF fenced are, which is paved with asphalt. Soils in the area of Building 4021 range from 0.8 to 3.5 feet below ground surface (bgs).	**Metals** Storage of metals and metallic wastes, including arsenic, barium, chromium, lead, and sodium, are documented in historical records.	Collected soil matrix samples at 13 locations around Buildings 4021 and 4022, and in the Filter/Blower area. Several sample locations targeted known potential sources or likely pathways: • North of Building 4021 targeted beneath an overhead pipeline connecting to the Building 4664 (CUA 8a) evaporator and flocculator, (RMBS0107 at 3 feet bgs) • Adjacent to the Building 4021 Sump, (RMBS0030 at 3.5 feet bgs) • Adjacent to the Building 4022 Sump (RMBS0018 at 1.5 feet bgs) and sump pipeline (RMBS0126 at 1 feet bgs) • Within an observed surface water pathway east of Building 4022 (RMBS0046 and RMBS0092 at 1.0 feet bgs) Samples were also collected at representative locations around the two buildings and in the Filter/Blower area: • South of Building 4021, RMBS0019 and RMBS0119 at 1.75 and 1.5 feet bgs, respectively • Downslope of Building 4021, (RMBS0108 and RMBS0117 at 1.5 feet bgs) • North of Building 4022 (RMBS0118 at 0.8 feet bgs) • At the north and south ends of the Filter/Blower Area (RMBS0101 RMBS0097 at 1.5 and 1 feet bgs, respectively) One sample was also collected to target the former Filter/Blower area trench drain pipeline discharge point on the RMHF northern slope (RMBS0145, 0.75 feet bgs). [Note: samples at RMBS0113, RMBS0117, RMBS0126, RMBS0142, and RMBS0143 also analyzed for hexavalent chromium]	Metals results shown on Figures C.3-6A through C.3-6C. Sodium was detected above background (or ND with elevated RLs) up to 241 mg/kg (background 110 mg/kg) at 5 of the 13 locations around Buildings 4021 and 4022, and in the Filter / Blower Area. Two of these locations contained other metals above background: • Downslope of Building 4021 (RMBS0117): o Selenium: 0.75 mg/kg (background 0.655 mg/kg) o Cadmium: 1.14 mg/kg (background 1 mg/kg) o Hexavalent chromium: 0.04 mg/kg (no background). • Building 4022 Sump Pipeline (RMBS0126) o Zinc: 241 mg/kg (background 110 mg/kg) o Zirconium: 14.2 mg/kg (background 8.6 mg/kg) Hexavalent chromium was not detected in any other samples collected in CUAs 1a – 1d. No metals were detected above ResRBSLs. EcoRBSLs for cadmium, selenium, zinc, and zirconium (0.021, 0.17, 20.8, and 7.4 mg/kg, respectively) are below maximum background concentrations. There are no established RBSLs for sodium. Metals were also detected above background at the discharge point for the Filter / Blower Area pipeline (RMBS0145): • Cadmium: 4.8 mg/kg • Lead: 44.1 mg/kg (background 34 mg/kg) • Zinc: 1,240 mg/kg No metals were detected above ResRBSLs. EcoRBSLs for cadmium, lead (0.063 mg/kg), and zinc are below maximum background concentrations. Elevated zinc is also present approximately 90 feet southeast, along the Asphalt Lined Drainage Channel (CUA 10a) (zinc at 520 mg/kg at BMBS0051) and on the RMHF northern slope (zinc at 157 mg/kg at RMBS0133). The area is delineated to the east, west, north and south by zinc concentrations within background range (RMBS0031, RMBS0035, RMBS0037, and RMBS0098, RMBS0125). Based on extensive representative and targeted samples throughout the CUA and sampling results indicating isolated metals above background that are delineated by adjacent samples, no further characterization is necessary.	YES. The former Filter / Blower Area pipeline discharge point and hill slope below CUA 10a are recommended for further evaluation in the CMS based on detected metals concentrations and risk assessment results.	YES Volume is delineated laterally and vertically by metals sampling results and site topography.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 5 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams. Storage of PCB containing ballasts documented in historical records.	Collected soil matrix samples at six locations around Buildings 4021 and 4022, and in the Filter/Blower area: • Targeting the Building 4021 Sump (RMBS0030 at 1.5 and 3.5 feet bgs). • Downslope of Building 4021, (RMBS0108 and RMBS0117 at 1.5 feet bgs) • North of Building 4022 (RMBS0109 at 0.8 feet bgs) • At the north and south ends of the Filter/Blower Area (RMBS0101 at and RMBS0097 at 1.5 and1 feet bgs, respectively) Two samples were also collected to target the former Filter/Blower area trench drain pipeline discharge point (RMBS0145 at 0.75 feet bgs) and a downslope location on the RMHF northern slope (RMBS0098 at 0.75 feet bgs).	PCB results shown on Figure C.3-4A. Aroclor 1254 and 1260 were detected at three of the six locations around Buildings 4021 and 4022 - up to 30 µg/kg (Aroclor 1260) at RMBS0030, adjacent to the Building 4021 Sump (maximum location for both Aroclors). Aroclors 1254 and 1260 were also detected at the Filter / Blower Area pipeline discharge point (RMBS0145) up to 40.5 µg/kg (Aroclor 1254). Aroclor 1260 was detected at 4.9 µg/kg at RMBS0098, downslope of the discharge point. All PCBs detected around Buildings 4021 and 4022, in the Filter/Blower area, and at the discharge point were below RBSLs. PCBs were detected below RBSLs at three of the five locations downslope of the discharge point at the former Building 4021 Leach Field (RMBS0035) (see CUA 4b). Based on representative and targeted samples and sampling results indicating PCBs below RBSLs, no further characterization is necessary.	YES. PCBs not detected or detected at low concentrations below RBSLs at targeted and representative sampling locations.	YES The former Filter / Blower Area pipeline discharge point and hill slope below CUA 10a is recommended for further evaluation in the CMS based on detected metals concentrations and risk assessment results. PCBs do not drive CMS recommendation. CMS volume is delineated as described above for metals.
		Pesticides / Herbicides Pesticides and herbicides potentially used at site (unrelated to site operations)	Collected samples at two representative locations adjacent to Building 4021 (RMBS0108 at 1.5 feet bgs) and Building 4022 (RMBS0118at 0.8 feet bgs).	Pesticide / herbicide results shown on Figure C.3-4A. Pesticides and herbicides were not detected at the representative sampling locations. Based on representative sampling results, no further characterization is necessary.	YES. Pesticides and herbicides not detected.	YES The former Filter / Blower Area pipeline discharge point and hill slope below CUA 10a is recommended for further evaluation in the CMS based on detected metals concentrations and risk assessment results. Pesticides were not detected and do not drive CMS recommendation. CMS volume is delineated as described above for metals.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 6 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
2a	**Substation #721** Substation 721 was installed on the western side of Building 4021 in 1959, and provides power for all buildings within the RMHF fenced area. The substation measures approximately 5 feet by 2 feet by 7 feet tall and includes a 300 kVa transformer. The substation is currently active. Soils in the area were observed to be poorly graded sand with silt (SP-SM) extending 1 to 2 feet bgs. The area surrounding the substation has been paved with asphalt since 1959 when the site was constructed. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**PCBs** Transformer oils used before 1989 may have contained PCBs.	Soil samples collected at six discrete locations surrounding the substation at 0.5 feet bgs; three discrete samples each were composited in the laboratory for analysis (RMBS0022S70 and RMBS0023S70).	PCB results are shown on Figure C.3-4A. PCBs were not detected in the composite samples. Based on targeted sampling results, no further characterization is necessary.	YES. PCBs not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
2b	**Transformer Pole X-27A** Transformer pole X-27A is located in the northwest corner of the Building 4024 operational area south of the RMHF RFI Site. The transformer pole previously contained three pole-mounted transformers, which have since been removed. The removal date is not documented in facility records; the transformers were potentially removed in 1986 during an environmental problem to eliminate PCB-containing items. Soils in the area were observed to be silty sand with gravel (SM) extending 5.5 to 6.5 ft bgs. The area surrounding the transformer pole is paved with asphalt and has been since the early 1960s according to historical aerial photos. Surface water in the northern portion of the Building 4024 paved area flows north into an asphalt-lined drainage. Surface water within the drainage flows west to a culvert and into a storm drain within the former Building 4028 footprint (CUA 11a). The culvert also receives storm water	**PCBs** Transformer oils sampling results from 1983 indicated Aroclor 1260 detected in all three pole mounted transformers at concentrations up to 1.3 parts per million (ppm).	Soil samples collected at three discrete locations surrounding the transformer pole at 0.5 feet bgs and composited in the laboratory for analysis (U7BS0012S70). Sample collected at one discrete location (U7BS0012S01) at 0.5 feet bgs was also analyzed.	PCB results are shown on Figure C.3-4B. PCBs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. PCBs not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 7 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	runoff from the northern portion of the Building 4024 operation area and, historically, from Building 4023 and 4032 operational areas. The culvert presently receives storm water runoff from Building 4024, but the drainages from Buildings 4023 and 4032 have been blocked and covered with welded steel plating. Storm water within the drain is pumped to a lined drainage along 17th Street. From this discharge point, surface water flows down 17th Street to G Street. Surface water discharge then continues through both lined and unlined drainages to the unlined 17th Street Pond, which in turn discharges via natural drainages to the R-2 Pond (SWMU 5.26). Surface water discharge from the R-2 Pond is monitored at NPDES Outfall 018.					
2c	**Substation #728** Substation 728 was constructed in approximately 1961 top support the Building 4028 Shield Test Irradiation Reactor (STIR) Facility (CUA 11a). The substation was constructed atop a concrete foundation on the southern side of Building 4028. The substation was not used once Building 4028 became inactive in 1984, and was potentially removed in 1986 during an environmental project to eliminate PCB-containing equipment. The adjacent building and above-grade features were demolished in 1989; and all sub-grade features and the building foundation were removed in 1997. Soils in the area were observed to be silty sand (SM) extending 9.5 ft bgs. The area was paved from 1961 through 1997 when the site was demolished, at which point the paving was removed and the site was graded. Prior to building demolition and removal, surface water in the area was conveyed to the RMHF Catch Basin (CUA 10b) by a paved channel. Currently surface water discharges to the northwest via infiltration to a natural drainage.	**PCBs** Transformer oils before 1989 may have contained PCBs.	Soil samples collected at three discrete locations surrounding the substation at 0.5 feet bgs and composited in the laboratory for analysis (U7BS0024S70).	PCB results are shown on Figure C.3-4B. PCBs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. PCBs not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 8 of 62)

Map Key[1]	Chemical Use Area Name Status, How Used and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored[2]	Sampling Scope and Rationale[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	Sampling Results[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	Potential concentration gradients sufficiently characterized for risk assessment?[5]	Is delineation sufficient to estimate soil volume in CMS?[6,7] (see Figure C.5-1 for CMS areas)
3	**Diesel Storage Tank** A diesel AST (V-XXX-01) was located adjacent to the southeast corner of Building 4021 from 1958 through 1989. The use of the fuel was not specified, but possibly was used to power the 40 kW (later the 100 kW) generator and engine located in the Filter/Blower Area (CUA 1d) that would provide power to Buildings 4021 and 4022 in the case of service interruption. The tank was located on an asphalt-paved surface. Soil in the area was observed to be silty sand (SM), approximately 1.2 feet deep. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**VOCs** VOCs screened as part of site characterization.	<u>Soil Vapor</u> Collected one representative soil vapor sample at one location approximately 20-feet downslope of the former diesel AST (RMSV0019 at 4.0 feet bgs). <u>Soil Matrix</u> No soil matrix samples collected.	VOC results are shown on Figure C.3-1A. Freon 113 was detected at the representative sampling location RMSV0019 at 2.1 µg/L, below the Res and EcoRBSLs (8,800 and 91 µg/L, respectively). No other VOCs were detected at this location. Based on these sampling results, indicating VOCs present at concentrations below RBSLs, no further characterization is necessary.	YES. VOCs detected at low concentrations below RBSLs at representative sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs screened as part of site characterization.	Collected one representative soil matrix sample at one location approximately 20-feet downslope of the former diesel AST (RMBS0019) at 1.75 feet bgs.	SVOC results are shown on Figure C.3-2A. SVOCs were not detected at the representative location downslope of the former diesel AST. Based on representative sampling results, indicating SVOCs are not detected, no further characterization is necessary.	YES. SVOCs not detected at representative sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Diesel fuel stored in the specified tank.	Collected samples at two locations: • One targeted location at the former diesel AST (RMBS0065 at 1 foot bgs). • One sample approximately 20-feet downslope of the former diesel AST (RMBS0019) at 1.75 feet bgs).	TPH results are shown on Figure C.3-3A. Lubricant oil range organics (C21 – C30) were detected at the two sampled locations at concentrations up to 3.42 mg/kg (max at RMBS0019). Detected lubricant oil range organics were below the ResRBSL (1,400 mg/kg) and are not considered to be associated with the former diesel AST. Other petroleum hydrocarbon ranges (including diesel) were not detected at these locations. Based on targeted sampling results, indicating no diesel range organics at the tank location and lubricant oil range organics concentrations below RBSLs, no further characterization necessary.	YES. Lubricant oil range organics detected at low concentrations below RBSLs at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals screened as part of site characterization.	Collected samples at one representative location approximately 20-feet downslope of the former diesel AST (RMBS0019) at 1.75 feet bgs.	Metals results are shown on Figure C.3-4A. Sodium was detected at 216 mg/kg, above the background concentration (110 mg/kg). There are no established Res or EcoRBSLs for sodium. Sodium was not detected above background concentrations at locations to the southwest and southeast (RMBS0119 and RMBS0124) of the representative sample location. Based on representative sampling results, no further characterization is necessary.	YES. Metals detected below background concentrations or below RBSLs at representative sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 9 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
4a, 8a	**Building 4021 Septic Tank and Pipeline (4a), Building 4664 Low Level Radioactive Waste Processing (8a)** The Building 4021 Septic Tank and Pipeline (CUA 4a) were installed in 1959 to support Buildings 4021 and 4022 (CUA 1a and 1b, respectively). The 1,500-gallon underground storage tank (UST) received sanitary water the Building 4021 Cold Change Room floor drain, sinks, and toilet and from the Hot Change Room toilet and sink (CUA 1a). The system was operational until 1961 when the SSFL central sewer was installed; based on review of site documentation, the septic tank is assumed to be abandoned in place. Prior to the site expansion in the mid-1960s, the septic tank location was north of the RMHF fence line and the area above the septic tank was unpaved. Following the site expansion, the ground surface above the septic tank was paved with asphalt. Building 4664 (CUA 8a) was constructed in the mid-1960s to support the LLRW water treatment and waste volume reduction activities conducted at the RMHF RFI Site. The building was constructed along the northern RMHF fence line following an extension of the RMHF fenced area in the mid-1960s. The eastern portion of the structure was built atop the Building 4021 Septic Tank (CUA 4a) that was abandoned in place in 1961. Building 4664 contained a flocculation system, evaporator, cooling tower, and an incinerator. The flocculation system was designed to pre-treat LLRW water by filtration prior to evaporation. The flocculation system consisted of five tanks (T-2 through T-6) and received water from Holding Tank T-1 via an overhead pipeline from the north face of Building 4021. The evaporator installed in Building 4664 was intended to replace the one used in Building 4021 (CUA 1a), and would receive water following pre-treatment by	**VOCs** Documented use and/or storage of solvents, including chlorinated solvents. Equipment located in this area may have used coolants.	<u>Soil Vapor</u> Soil vapor samples were not collected due to shallow soils (refusal at all attempted locations) <u>Soil Matrix</u> Collected samples at six locations: • Targeting the septic tank and cooling tower (RMBS0142 and RMBS0143 at 3.5 and 3 feet bgs, respectively) • Within the former Building 4664 foundation (RMBS0043 and RMBS0044 at 1 foot bgs) • Representative locations south of the former Building 4664 operational area (RMBS0108 and RMBS0117 at 1.5 feet bgs)	VOC results are shown on Figures C.3-1A. Styrene was detected at two of the six sampled locations at concentrations up to 0.34 µg/kg (RMBS0043, 1 foot bgs), well below the Res and EcoRBSLs (7,200 and 427,000 µg/kg, respectively). No other VOCs were detected. Based on targeted and representative sampling results, no further characterization is necessary.	YES. VOCs not detected at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs potentially associated with petroleum fuels and oils used and stored at the RMHF RFI Site. SVOCs tentatively identified compounds were screened at the RMHF RFI Site to address chemicals documented on the USEPA BRS Database, including morphaline, pyridine, and nicotine.	Collected samples at five locations: • Targeting the septic tank (RMBS0142 and RMBS0143 at 3.5 and 3 feet bgs, respectively) • Within the former Building 4664 foundation (RMBS0044 at 1 foot bgs) • Representative locations south of the former Building 4664 operational area (RMBS0108 and RMBS0117 at 1.5 feet bgs)	SVOC results are shown on Figure C.3-2A. PAHs were detected at one location (RMBS0143) up to 14.5 µg/kg (benzo[b]fluoranthene). Benzo(a)pyrene was not detected. Detected PAHs were below RBSLs. SVOCs were not detected at any other locations. Based on targeted and representative sampling results, indicating SVOCs present at concentrations below RBSLs, no further characterization is necessary.	YES. SVOCs not detected or detected at low concentrations below RBSLs at targeted and representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Use and/or storage of hydraulic oils, waste oils, and diesel fuel are documented in historical records. Equipment located in this area may have used petroleum-based fuels or oils.	Collected samples at six locations: • Targeting the septic tank, RMBS0142 and RMBS0143 at 3.5 and 3 feet bgs, respectively) • Within the former Building 4664 foundation (RMBS0043 and RMBS0044 at 1 foot bgs) • Representative locations south of the former Building 4664 operational area (RMBS0108 and RMBS0117 at 1.5 feet bgs)	TPH results are shown on Figure C.3-3A. Lubricant oil range organics (C21 – C30) were detected at all six locations up to 171 mg/kg (RMBS0043). All detected concentrations were below the combined ResRBSL f or kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Other petroleum hydrocarbon ranges were not detected at these locations. Based on targeted and representative sampling results, indicating petroleum hydrocarbons present at concentrations below RBSLs, no further characterization necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 10 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	the flocculation system. The incinerator was designed to dispose of non-radiological wastes by thermal decomposition. The vapors from the incinerator and evaporator systems were filtered at a bag house located on the eastern portion of Building 4664 before they were released through an exhaust stack that was continuously monitored. According to RMHF personnel, the systems installed in Building 4664 were largely unsuccessful. The flocculation system was taken offline in the mid-1960s following a series of spills. It was reinstated in 1977 but was made unnecessary by improved filtration equipment and became inactive in 1979. The evaporator was taken offline in the mid-1960s. The incinerator was tested with non-radioactive wastes and failed to function well. It was never tested with radioactive wastes, though it was found to be radioactively contaminated during its decommissioning. Building 4664 structures, foundation, and the overhead pipeline to Building 4021 were removed in 1982. Soil in the area was observed to be silty sand, approximately 3 to 3.5 feet bgs. Before the septic tank was incorporated into the RMHF fenced area in the mid-1960s, surface water in the area of the septic tank flowed northwest down the RMHF slope via sheet flow and joined the drainage north of the RMHF. Once the septic tank was incorporated into the RMHF fenced area, surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**Metals** Storage of metals and metallic wastes, including arsenic, barium, chromium, and sodium, are documented in historical records. Hexavalent chromium potentially used in cooling tower water as anti fouling additive. Equipment used for the treatment of LLRW water, which potentially contain metals. Several spills of radioactive water are documented in this area.	Collected samples at six locations: • Targeting the septic tank and cooling tower, RMBS0142 and RMBS0143 at 3.5 and 3 feet bgs, respectively) • Within the former Building 4664 foundation (RMBS0043 and RMBS0044 at 1 foot bgs) • Representative locations south of the former Building 4664 operational area (RMBS0108 and RMBS0117 at 1.5 feet bgs)	Metals results are shown on Figure C.3-6A and C.3-6B. Metals were detected slightly above background concentrations at four of the six representative sampling locations, including: • Cadmium: 1.05 mg/kg (background 1 mg/kg) • Mercury: 0.12 mg/kg (background 0.09 mg/kg) • Selenium: 0.75 mg/kg (background 0.655 mg/kg) • Sodium: up to 137 mg/kg (background 110 mg/kg) • Hexavalent chromium: 0.04 mg/kg (no background established) at RMBS0117 Mercury was detected above the EcoRBSL (0.1 mg/kg) but below the ResRBSL (23 mg/kg). EcoRBSLs for cadmium and selenium (0.021 and 0.17 mg/kg, respectively) are below maximum background concentrations. There are no established Res or EcoRBSLs for sodium. Hexavalent chromium was detected below Eco and ResRBSLs (0.2 and 110 mg/kg, respectively). Metals detected above background are generally isolated and near background ranges. Hexavalent chromium was detected at a low concentration in one sample south former building footprint, but was not detected in samples targeting the cooling tower. Based on targeted and representative sampling results, indicating metals at or near background concentrations, no further characterization necessary.	YES. Metals detected below or slightly above background concentrations at targeted and representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams. Storage of PCB containing ballasts documented in historical records.	Collected samples at five locations: • Targeting the septic tank RMBS0142 and RMBS0143 (3.5 and 3 feet bgs, respectively) • Within the former Building 4664 foundation (RMBS0044 at 1 foot bgs) • Representative locations south of the former Building 4664 operational area (RMBS0108 and RMBS0117 at 1.5 feet bgs)	PCB results are shown on Figure C.3-4A. Aroclor 1260 was detected at one representative sample location within the Building 4664 footprint and one location adjacent to Building 4664 up to 1.6 µg/kg (RMBS0044, 1 foot bgs), below Res and EcoRBSLs (140 and 77 µg/kg). PCBs were not detected at the other three representative locations. Based on representative sample results, indicating PCBs not present or present at concentrations below RBSLs, no further characterization necessary.	YES. PCBs not detected or detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Dioxins Dioxins potentially associated with burning in the incinerator.	Collected samples at three representative locations throughout the former Building 4664 area to assess potential impacts associated with incinerator use (RMBS0043 and RMBS0044 at 1 foot bgs, and RMBS0117 at 1.5 feet bgs).	Dioxin results are shown on Figure C.3-5. Dioxins were detected within background ranges at the three representative locations. Based on representative sampling results, no further characterization is necessary	YES. Dioxins were detected within background ranges.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 11 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		Perchlorate Perchlorate use and/or storage not documented at the RMHF RFI Site.	Collected samples at two locations targeting the former septic tank (RMBS0142 and RMBS0143 at 1 to 3.5 feet bgs).	Perchlorate was not detected at the targeted sample locations. Based on targeted sampling results, no further characterization is necessary.	YES. Perchlorate not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
4b	**Building 4021 Leach Field** The Building 4021 Leach Field was installed in 1959 to support sanitary waste disposal at Building 4021 and 4022 (CUAs 1a and 1b, respectively). It was located at the bottom of the sloped perimeter approximately 70-feet north of the RMHF fence line and consisted of a 3,400-square foot transpiration bed with two parallel perforated pipes that extended 100 feet to the northeast from a concrete distribution box. The distribution box was gravity fed from the 1,500 gallon septic tank (CUA 4a), located at the top of an embankment along the north edge of the RMHF site. The distribution box was connected to the outlet of the septic tank by a 4-inch diameter cast iron sanitary sewer pipe. The leach field also received water directly from the LLRW water treatment system tank Holding Tank T-1 (CUA 1c) determined to be below acceptable limits. The leach field was in use until 1961 when the SSFL central sewer was installed. At some point during 1962 to 1963, a valve connecting Holding Tank T-1 to the Building 4021 Leach Field leaked or was inadvertently left open, allowing an undetermined volume of radioactive water to enter the Building 4021 Leach Field. During a site survey conducted in 1975, vegetation growing atop the abandoned Building 4021 Leach Field was discovered to be radioactive. Additional observations, including radioactive contamination of the leach field distribution box, identified the source of contamination as root uptake from the underlying	**VOCs** Solvents (such as Turco degreaser) were reportedly used in equipment decontamination activities in Building 4021. Solvents were also used and/or stored at other locations within the RMHF RFI Site.	<u>Soil Vapor</u> Collected soil vapor samples at four locations targeting the former leach field footprint and surrounding excavation area (SV-LF021-1, SV-LF021-2, RMSV0032 and RMVS0033 at 1.0 to 4.0 feet bgs). <u>Soil Matrix</u> Collected soil matrix samples at eight locations targeting the former leach field footprint and surrounding excavation area (RMDF-1 through RMDF-6, RMBS0035 and RMBS0037 at 0.5 to 2.25 feet bgs). Collected samples from two representative locations in the drainage downslope from the leach field (RMBS0036 and RMBS0062 at 1 foot bgs).	VOC results are shown on Figure C.3-1C. <u>Soil Vapor</u> VOCs were not detected in soil vapor samples targeting the former Building 4021 Leach Field and surrounding excavation area. <u>Soil Matrix</u> Ethylbenzene, toluene, total xylenes, and methylene chloride were detected in 1988 samples collected near the former Building 4021 Leach Field at concentrations up to 51 µg/kg (toluene, RMDF-3. 0.5 feet bgs). Ethylbenzene (max 8 µg/kg, RMDF-4, 0.5 feet bgs) and methylene chloride (max = 7 µg/kg, RMDF-1, 0.5 feet bgs) were detected above ResRBSLs (4.6 and 4 µg/kg, respectively) but below EcoRBSLs (210,000 and 25,000 µg/kg, respectively). Methylene chloride and m, p-xylenes were detected in RFI samples collected at RMBS0035 and RMBS0037 up to 4.67 µg/kg (methylene chloride, RMBS0037, 1 foot bgs). Methylene chloride was detected above ResRBSL (4 µg/kg) and below the EcoRBSL (210,000 µg/kg) at one location (RMBS0037). Sampling results indicate low-level VOCs above RBSLs are present in shallow soil in the area west of the former Building 4021 Leach Field. Area is sufficiently defined by surface topography, sampling results, and bedrock outcrops. Styrene was detected at one of the locations in the drainage downslope of the leach field (RMBS0036) at 0.44 µg/kg, below Res and EcoRBSLs (7,200 and 426,000 µg/kg). No other VOCs detected at this location or at the location farther down-drainage of the former leach field (RMBS0062). Based on these results, indicating VOCs present at levels near RBSLs in the area adjacent to the former leach field and defined by surface topography and bedrock outcrops, no further characterization is necessary.	YES. VOCs not detected or detected at low concentrations below or approximately equal to RBSLs at representative sampling locations.	YES Area not recommended for CMS based on VOC concentrations and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 12 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	leach field. The site was surveyed by drilling approximately 30 6-foot deep test holes to assess the extent of contamination and define the limits of radioactive material migration in the leach field. Following the discovery, all plant material was removed and the site was fenced and protected from further activity. During abnormally heavy rains in early 1978, contaminated runoff was detected from the Building 4021 Leach Field. Mud blocked drainage paths around the leach field, resulting in flooding of the leach field and the exploratory borings that perforated the gravel bed. The drainage point was dammed with sandbags and a sump was created to retain additional drainage. Soil was removed from the surface of the drainage channels downstream of the leach field to remove potential contamination. A temporary roof was erected to reduce generation of contaminated water. The Building 4021 Leach Field excavation was conducted in mid-1978. Non-contaminated overburden was removed and stockpiled for use as backfill material. When detected, contaminated bedrock was removed with a hydraulic jackhammer; three remaining contaminated cracks in the bedrock were sealed with bituminous mastic to seal out percolating water that could increase radioactive penetration. The field was then backfilled and finished to a grade several feet below the original surface, contoured to pass surface water to the west, and seeded with rye grass cover to prevent erosion. A final decontamination report of leach field excavation activities was published in 1982. Soils in the area are silty sand extending up to 4.0 feet bgs. The area has been unpaved during the RMHF operational history. Surface water in the area flows northwest via sheet flow to the natural drainage north of the RMHF area.	**SVOCs / Glycols / Terphenyls** SVOCs, glycols, and terphenyls analyzed to assess documented chemical use and/or storage at the RMHF.	Collected soil matrix samples at 10 locations targeting the former leach field footprint and surrounding excavation area (RMDF-1 through RMDF-6, RMBS0032, RMBS0033, RMBS0035, and RMBS0037 at 0.5 to 3.5 feet bgs). Collected samples from two representative locations in the drainage downslope from the leach field (RMBS0036 and RMBS0062 at 1 foot bgs).	SVOC results are shown on Figure C.3-2C. Di-n-butyl phthalate was detected in historical sample RMDF-6 at 40 µg/kg, below Res and EcoRBSLs (5,700,000 and 488 µg/kg, respectively). PAHs, including benzo(a)pyrene, were detected in the sample adjacent to the southern side of the leach field (RMBS0035) up to 15.9 µg/kg (max = fluoranthene). Benzo(a)pyrene was detected at 6.8 µg/kg, below Res and EcoRBSLs (60 and 5,600 µg/kg, respectively). SVOCs were not detected at other representative leach field locations. SVOCs were not detected in the drainage downslope of the former leach field. Glycols and terphenyls were not detected at the three representative locations sampled at the former Building 4021 Leach Field. Based on representative sampling results, indicating SVOCs not present or present at concentrations below RBSLs, no further characterization is necessary.	YES. SVOCs not detected or detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on SVOC concentrations and risk assessment results.
		TPH Petroleum hydrocarbons analyzed to assess documented chemical use and/or storage at the RMHF RFI Site.	Collected soil matrix samples at four locations targeting the former leach field footprint and surrounding excavation area (RMBS0032, RMBS0033, RMBS0035, and RMBS0037 at 0.5 to 3.5 feet bgs). Collected samples from two representative locations in the drainage downslope from the leach field (RMBS0036 and RMBS0062) at 1 foot bgs.	TPH results are shown on Figure C.3-3A. Lubricant oil range organics (C21 – C30) were detected at all leach field locations at concentrations up to 41.9 mg/kg (max at RMBS0035). Diesel range organics (C15 – C20) were detected at one location (RMBS0035) at 2.27 mg/kg. Diesel range organics were detected at one of the two drainage locations (RMBS0036) at 1.21 mg/kg. No petroleum hydrocarbons were detected at the other location. All detected concentrations were below the combined ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Other petroleum hydrocarbon ranges were not detected at representative leach field or drainage locations. Based on representative sampling results, indicating petroleum hydrocarbons present at concentrations below RBSLs, no further characterization necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on petroleum hydrocarbon concentrations and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 13 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		Metals Metals analyzed to assess documented chemical use and/or storage at the RMHF RFI Site. Radioactive water received from the Radioactive Water Treatment System may have contained metals.	Collected soil matrix samples at four locations targeting the former leach field footprint and surrounding excavation area (RMBS0032, RMBS0033, RMBS0035, and RMBS0037 at 0.5 to 3.5 feet bgs). Collected samples at one location downslope of the excavation area (RMBS0034 at 1.0 feet bgs). Collected samples at two representative locations in the drainage downslope from the leach field (RMBS0036 and RMBS0062 at 1 foot bgs).	Metals results are shown on Figure C.3-6D. Metals were detected above background concentrations at one location within the former leach field footprint (RMBS0032): • Selenium: 1 mg/kg (background = 0.655 mg/kg) • Sodium: 227 mg/kg (background = 110 mg/kg) • Thallium: 0.54 mg/kg (background = 0.46 mg/kg) Selenium and thallium were detected below ResRBSL (380 and 4.8 mg/kg, respectively). Thallium was detected below the EcoRBSL (2.9 mg/kg). EcoRBSL for selenium (0.17 mg/kg) is below background concentrations. Hexavalent chromium was also detected at one location within the former leach field footprint (RMBS0032) at 0.16 mg/kg, below Res and EcoRBSLs (110 and 0.2 mg/kg, respectively). Metals were not detected above background concentrations in the downslope and drainage sample locations north of the former leach field (RMBS0034, RMBS0036, and RMBS0062). Based on representative sampling results, indicating metals detected at concentrations near background or below RBSLs, no further characterization is necessary.	YES. Metals detected below or near background concentrations pr below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on metals concentrations and risk assessment results.
		Inorganics Inorganics analyzed to assess documented chemical use and/or storage at the RMHF RFI Site. Radioactive water received from the Radioactive Water Treatment System may have contained inorganic chemicals.	Collected samples from three targeted locations within the leach field footprint and excavation area (RMBS0032, RMBS0033, and RMBS0035 at 1.0 to 3.5 feet bgs).	Inorganics Results are shown on Figure C.3-6E. Chloride, fluoride, and sulfate were detected at concentrations up to 7.51 mg/kg (max = fluoride, RMBS0035, 1 foot bgs). Fluoride was detected slightly above background range (6.7 mg/kg), but below ResRBSL (4,600 mg/kg). Total cyanides were detected at one location within the former leach field footprint (RMBS0032) at 0.60 mg/kg, below Res and EcoRBSLs (1,500 and 290 mg/kg, respectively). There are no background concentrations or RBSLs for chloride or sulfate. Based on representative sampling results, indicating inorganics are at low concentrations near background range and below RBSLs, no further characterization is necessary.	YES. Inorganics s not detected or detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on inorganics concentrations and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 14 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs Storage of PCB ballasts documented in historical records.	Collected soil matrix samples at four locations targeting the former leach field footprint and surrounding excavation area (RMBS0032, RMBS0033, RMBS0035, and RMBS0037 at 0.5 to 3.5 feet bgs). Collected samples from two representative locations in the drainage downslope from the leach field (RMBS0036 and RMBS0062) at 1 foot bgs.	PCB results are shown on Figure C.3-4A. Aroclor 1242, Aroclor 1254, and/or Aroclor 1260 were detected at one location within the leach field footprint (RMBS0032) and the location adjacent to the leach field (RMBS0035) at concentrations up to 29.5 µg/kg (max = Aroclor 1254, RMBS0035, 1 foot bgs). PCBs were not detected at the other two representative leach field locations. Aroclor 1254 and Aroclor 1260 were detected at one of the two locations in the drainage north of the leach field up to 20.7 µg/kg (max = Aroclor 1254, RMBS0036). PCBs were not detected in the sample collected farther down drainage (RMBS0062). All PCBs detected in the leach field and in the drainage north of the leach field were below Res and EcoRBSLs (140 and 77 µg/kg, respectively). Based on representative sampling results, indicating PCBs not detected or detected below RBSLs, no further characterization is necessary.	YES. PCBs s not detected or detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on PCB concentrations and risk assessment results.
		Perchlorate Perchlorate use and/or storage not documented at the RMHF RFI Site but are included as part of site characterization.	Collected soil matrix samples at four locations targeting the former leach field footprint and surrounding excavation area (RMBS0032, RMBS0033, RMBS0035, and RMBS0037 at 0.5 to 3.5 feet bgs).	Perchlorate was not detected at the representative sample locations. Based on representative sampling results, no further characterization is necessary.	YES. Perchlorate not detected at representative sampling locations.	YES Area not recommended for CMS based on perchlorate concentrations and risk assessment results.
		Dioxins Drainage north of the leach field screened for dioxins for site characterization.	Collected samples from two representative locations in the drainage downslope from the leach field (RMBS0036 and RMBS0062) at 1 foot bgs.	Dioxin results shown on Figure C.3-5. 2,3,7,8-Tetrachlordibenzo-p-dioxin (2,3,7,8-TCDD) toxic equivalents (TEQs) were detected at 1.0 nanograms per kilogram (ng/kg), above background concentrations (0.87 ng/kg), at one location the drainage downslope from the leach field (RMBS0036). Calculated TEQs at this location were below Res and EcoRBSLs (6.9 and 4.3 ng/kg, respectively). Six dioxin congeners were also detected above background and below RBSLs at this location. Calculated TEQs decreased to below background farther down drainage (RMBS0062). Based on representative sampling results, indicating dioxins detected near background concentrations and below RBSLs, no further characterization is necessary.	YES Dioxins detected near or below background concentrations at representative sampling locations.	YES Area not recommended for CMS based on dioxin concentrations and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 15 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		Pesticides / Herbicides Pesticides and herbicides potentially used at site (unrelated to operations)	Collected samples at six representative locations in the drainage north of the Building 4021 Leach Field during the 1993 Multi-Media Survey (BB-16-001A, BB-16-001B, and BB-16-002 through BB-16-005 at 0.5 feet bgs). Collected a soil matrix samples at one location collocated with BB-16-001A (RMBS0156 at 1.0 feet bgs) to confirm estimated pesticide detections.	Pesticide / herbicide results shown on Figure C.3-4A. 4,4'-Dichlorodiphenyldichloroethane (4,4'-DDD) was detected at one location approximately 30 feet south of the drainage (BB-16-001A) at 200 µg/kg (estimated, detection limit 330 µg/kg), exceeding the EcoRBSL (12.4 µg/kg) and below the ResRBSL (3,600 µg/kg). Pesticides were not detected at the five other representative locations. During RFI Sampling, 4,4'-dichlorodiphenyldichloroethane (4,4'-DDD) and 4,4'-dichlorodiphenyltrichloroethane (4,4'-DDT) were detected up to 1.58 µg/kg (4,4'-DDT), below Res and EcoRBSLs (2,500 and 12.4 µg/kg, respectively). No other pesticides were detected. Based on representative sampling results, no further characterization is necessary.	YES Pesticides and herbicides not detected or detected at low concentrations below RBSLs at targeted and representative sampling locations.	YES Area not recommended for CMS based on pesticide and herbicide concentrations and risk assessment results. However, the area is recommended for CMS based on SVOC, metals, and PCB sampling results.
5a	**Building 4621 Radioactive Accountable Waste Storage** Building 4621 was constructed in the mid-1960s in the southwestern portion of the RMHF in the area previously used for open storage. Building 4621, located in the southeastern corner of the Mixed Waste Storage Yard (CUA 5b), was used for the interim storage of source materials used in research activities and for low-specific activity (LSA) containerized waste. Building 4621 and the adjacent Mixed Waste Storage Yard were also used for the storage of mixed waste and contaminated equipment. Building 4621 is currently active and is one of three buildings / areas currently designated as RCRA Part A (Interim Status) permitted facilities. Soils in the area are primarily silty sand (SM) with an area of poorly graded gravel with sand (GP), extending 1.0 to 1.8 feet bgs. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b)	**VOCs** Documented use and/or storage of solvents, including chlorinated solvents.	<u>Soil Vapor</u> Soil vapor samples were not collected due to shallow soils (refusal at all attempted locations) <u>Soil Matrix</u> Collected samples at five representative locations within the Building 4621 footprint (RMBS0001 through RMBS0003, RMBS0005, and RMBS0011) at depths ranging from 0.50 to 1.5 feet bgs.	VOC results shown on Figure C.3-1B. VOCs were detected at two of the five locations. Methylene chloride and styrene were detected at RMBS0001 and RMBS0003 up to 3.32 µg/kg (methylene chloride, RMBS0003, 1 foot bgs), below the RBSLs. VOCs were not detected at any other locations. Number and location of representative locations adequately characterize VOCs in Building 4621. Based on sampling results indicating isolated VOCs below RBSLs, no further characterization is necessary. Note: sampling results outside of Building 4621 are discussed as part of the Mixed Waste Storage Yard (CUA 5b).	YES. VOCs not detected or detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 16 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**SVOCs / Glycols / Terphenyls** SVOCs, glycols, and terphenyls potentially associated with petroleum-based fuels, chemicals, and/or antifreeze used and stored at the RMHF RFI Site. SVOCs tentatively identified compounds were screened at the RMHF RFI Site to address chemicals documented on the USEPA BRS Database, including morphaline, pyridine, and nicotine.	Collected samples at five representative locations within the Building 4621 footprint (RMBS0001 through RMBS0003, RMBS0005, and RMBS0011) at depths ranging from 0.50 to 1.5 feet bgs. Glycols and terphenyls were analyzed in RMBS0001, RMBS0005, and RMBS00011.	SVOC results shown on Figure C.3-2B. PAHs and phthalates, including benzo(a)pyrene, were detected at three of the five representative locations (RMBS001 through RMBS003) up to19.8 µg/kg (benzo[a]fluoranthene). Benzo(a)pyrene was detected at 13.4 µg/kg (RMBS0002), well below Res and EcoRBSLs (60 and 5,600 µg/kg, respectively). All other SVOCs were detected at concentrations below RBSLs. Glycols and terphenyls were not detected at the three representative locations sampled at Building 4621. Number and location of representative locations adequately characterize SVOCs in Building 4621. Based on sampling results indicating SVOCs present at levels below RBSLs, no further characterization is necessary. Note: sampling results outside of Building 4621 are discussed as part of the Mixed Waste Storage Yard (CUA 5b).	YES. SVOCs, glycols, and terphenyls not detected or detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Use and/or storage of hydraulic oils, waste oils, and diesel fuel are documented in historical records.	Collected samples at five representative locations within the Building 4621 footprint (RMBS0001 through RMBS0003, RMBS0005, and RMBS0011) at depths ranging from 0.50 to 1.5 feet bgs.	TPH results are shown on Figure C.3-3B. Lubricant oil range organics (C21 – C30) were detected at all five locations up to 14.9 mg/kg (RMBS0005). Diesel range organics (C15 – C20) were detected at one location (2.78 mg/kg at RMBS0002). No other petroleum hydrocarbon ranges were detected. Detected petroleum hydrocarbon concentrations were below the ResRBSL (1,400 mg/kg). Number and location of representative locations adequately characterize petroleum hydrocarbons in Building 4621. Based on sampling results indicating petroleum hydrocarbons present at low concentrations well below RBSLs, no further characterization necessary. Note: sampling results outside of Building 4621 are discussed as part of the Mixed Waste Storage Yard (CUA 5b).	YES. Petroleum hydrocarbons detected at low concentrations well below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 17 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		Metals Storage of metals and metallic wastes, including arsenic, barium, chromium, and sodium, are documented in historical documents.	Collected samples at five representative locations within the Building 4621 footprint (RMBS0001 through RMBS0003, RMBS0005, and RMBS0011) at depths ranging from 0.50 to 1.5 feet bgs. All samples were analyzed for hexavalent chromium.	Metals results are shown on Figure C.3-6C. Sodium was detected above background in all five samples, up to 471 mg/kg (background 110 mg/kg). Three of these locations contained other metals above background (RMBS0003, RMBS0005, and RMBS0011): • Boron in all three samples up to 12.7 mg/kg (background 9.7 mg/kg) • Copper at 62.7 mg/kg in RMBS0003 (background 29 mg/kg) • Vanadium at 75.3 mg/kg in RMBS0003 (background 62 mg/kg) All metals above background were detected well below ResRBSLs. EcoRBSLs for boron, copper, and vanadium are below maximum background concentrations. There are no established Res or EcoRBSLs for sodium. Hexavalent chromium was detected at one of the five locations (RMBS0005) at 0.349 mg/kg, exceeding the EcoRBSL (0.2 mg/kg) but below the ResRBSL (110 mg/kg). Number and location of representative locations adequately characterize metals in Building 4621. Sampling results indicate metals above background (except sodium) are primarily detected in one sample, only slightly above background or low in other samples, well below ResRBSLs; no further characterization is necessary. Note: sampling results outside of Building 4621 are discussed as part of the Mixed Waste Storage Yard (CUA 5b).	YES. Metals detected above background generally isolated or slight exceedance, and well below ResRBSLs within the building footprint.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Inorganics Storage of chemicals and chemical wastes, including acids and caustics, are documented in historical documents.	Collected samples at two representative locations within the Building 4621 footprint (RMBS0003 and RMBS0005) at 0.5 and 1.5 feet bgs, respectively.	Inorganics results are shown on Figure C.3-6C. Chloride, fluoride, nitrate, and sulfate were detected at the representative location at concentrations up to 51.3 mg/kg (sulfate, RMBS0005). Fluoride was detected up to 1.67 mg/kg, below background range (6.7 mg/kg). There are no established background concentrations or RBSLs for nitrate and sulfate. Based on representative sampling results, indicating inorganics present at low concentrations below background range, no further characterization is necessary. Note: sampling results outside of Building 4621 are discussed as part of the Mixed Waste Storage Yard (CUA 5b).	YES. Inorganics detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 18 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams. Storage of PCB containing ballasts documented in historical records.	Collected samples at two representative locations within the Building 4621 footprint (RMBS0001 and RMBS0005) at depths ranging from 1.0 to 1.5 feet bgs.	PCB results are shown on Figure C.3-4A. Aroclor 1260 was detected at one of the two representative locations at 3.2 µg/kg (RMBS0001, 1 foot bgs), below Res EcoRBSLs (140 and 77 µg/kg, respectively). Based on sampling results indicating PCBs at low concentrations well below RBSLs, no further characterization is necessary. Note: sampling results outside of Building 4621 are discussed as part of the Mixed Waste Storage Yard (CUA 5b).	YES. PCBs not detected or detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
5b	**Mixed Waste Storage Yard** The Mixed Waste Storage Yard is a fenced, asphalt-paved area that was constructed in the mid-1960s in the southwestern portion of the RMHF in the area previously used for open storage. The Mixed Waste Storage Yard was used for the storage of mixed waste and contaminated equipment. Only non-liquid wastes were stored in the Mixed Waste Storage Yard. The Mixed Waste Storage Yard is currently active and is one of three buildings / areas currently designated as RCRA Part A (Interim Status) permitted facilities. Soils in the area are primarily silty sand (SM) with areas of poorly graded sand with silty (SP-SM) and sandy silt (ML) poorly graded gravel (GP) with sand extending 1.0 to 1.8 feet bgs. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**VOCs** Documented use and/or storage of solvents, including chlorinated solvents.	<u>Soil Vapor</u> One soil vapor sample was collected at a representative location in the approximate center of the Mixed Waste Storage Yard (RMSV0006 at 3.5 feet bgs). <u>Soil Matrix</u> Collected samples at 12 representative locations distributed across the Mixed Waste Storage Yard (RMBS0004, RMBS0006 through RMBS0010, and RMBS0012 through RMBS0017 at 0.9 to 6.0 feet bgs).	VOC results are shown on Figure C.3-1B. <u>Soil Vapor</u> VOCs were not detected in soil vapor sample RMSV0006. <u>Soil Matrix</u> Toluene was detected in one sample (RMBS0010) and methylene chloride was detected in two samples (RMBS0008 and RMBS0010) at low concentrations up to 2.41 µg/kg (methylene chloride, RMBS0008, 1.3 feet bgs). Styrene was detected at very low concentrations (up to 0.236 µg/kg) in six samples. Detected VOCs were below RBSLs. Extensive, representative sampling across the Mixed Waste Storage Yard adequately characterize VOCs. Based on sampling results indicating VOCs are present at two isolated locations at low concentrations below RBSLs, no further characterization is necessary.	YES. Low VOCs detected below RBSLs at few isolated locations among extensive representative sampling.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs / Glycols / Terphenyls SVOCs, glycols, and terphenyls potentially associated with petroleum-based fuels, chemicals, and/or antifreeze used and stored at the RMHF RFI Site. SVOCs tentatively identified compounds were screened at the RMHF RFI Site to address chemicals documented on the USEPA BRS Database, including morphaline, pyridine, and nicotine.	Collected samples at 12 representative locations distributed across the Mixed Waste Storage Yard (RMBS0004, RMBS0006 through RMBS0010, and RMBS0012 through RMBS0017 at 0.9 to 6.0 feet bgs). SVOCs analyzed at all locations; all but RMBS0006 analyzed for glycols/terphenyls.	SVOC results are shown on Figure C.3-2B. PAHs, including benzo(a)pyrene, and phthalates were detected at 8 of the 12 representative locations at concentrations up to 52.2 µg/kg (benzo(b)fluoranthene at RMBS0010). Benzo(a)pyrene was detected at one location (RMBS0014) at 4 µg/kg. All detected SVOCs were below RBSLs. Glycols and terphenyls were not detected at the eleven sampled locations. Extensive, representative sampling across the Mixed Waste Storage Yard adequately characterize SVOCs. Based on extensive, representative sampling results indicating low concentrations well below RBSLs, no further characterization is necessary.	YES. SVOCs detected at low concentrations; glycols, and terphenyls not detected at extensive sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 19 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		TPH Use and/or storage of hydraulic oils, waste oils, and diesel fuel are documented in historical records.	Collected samples at 16 representative locations: • Distributed across the Mixed Waste Storage Yard (RMBS0004, RMBS0006 through RMBS0010, and RMBS0012 through RMBS0017 at 0.9 to 6.0 feet bgs) • North of the north fence line targeting high radionuclide readings (RMBS0102 through RMBS0105 at 1 to 1.5 feet bgs)	TPH results are shown on Figures C.3-3B and C.3-3C. Lubricant oil range organics (C21 – C30) were detected at all 16 sampled locations up to 300 mg/kg (at RMBS0016). Other petroleum hydrocarbon fractions were also detected at RMBS0016, with kerosene range organics (C12 – C14) and diesel range organics (C15 – C20) at 3.6 mg/kg and 27 mg/kg, respectively. Other petroleum hydrocarbon fractions were not detected at any other sample locations. All detected petroleum hydrocarbons were below the combined RBSL for kerosene diesel, and lubricant oil range organics (C21 – C30) (1,400 mg/kg). Gasoline range organics (C08 – C11) were not detected in this area. Extensive, representative sampling across the Mixed Waste Storage Yard and north of fence line adequately characterize petroleum hydrocarbons. Sampling results indicate primarily lubricant oil range organics at low concentrations below RBSLs; no further characterization is necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at extensive representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Storage of metals and metallic wastes, including arsenic, barium, chromium, lead, and sodium, are documented in historical documents.	Collected samples at 18 representative locations: • Distributed across the Mixed Waste Storage Yard (RMBS0004, RMBS0006 through RMBS0010, and RMBS0012 through RMBS0017 at 0.9 to 6.0 feet bgs) • North of the north fence line targeting high radionuclide readings (RMBS0102 through RMBS0105 at 1 to 1.5 feet bgs) • South of the south fence line (RMBS0140 and RMBS0141 at1.0 feet bgs) All samples were analyzed for hexavalent chromium in addition to the standard metals suite. Two samples were collected downslope (west) of the Mixed Waste Storage Yard (RMBS0100 and RMBS0110 at 2.0 feet bgs).	Metals results are shown on Figure C.3-6C. A total of 4 metals were detected above background concentrations at 5 of the 18 representative locations: • Boron: up to 17.6 mg/kg (background 9.7 mg/kg) at one location • Cobalt: at 29 mg/kg (background = 21 mg/kg) at one location • Sodium: up to 195 mg/kg (background = 110 mg/kg) at four locations • Thallium: at 0.51 mg/kg (background = 0.46 mg/kg) at one location Cobalt was detected above the ResRBSL (22.8 mg/kg). EcoRBSLs for boron and cobalt (6.8 and 8.9 mg/kg, respectively) are below background concentrations. Thallium was detected below the Eco and ResRBSLs (2.9 and 4.9 mg/kg, respectively). There are no established RBSLs for sodium. Hexavalent chromium was detected at five locations within the Mixed Waste Storage Yard up to 0.39 mg/kg (RMBS0012, 2 feet bgs). This single location was above the EcoRBSL of 0.2 mg/kg; all other samples were below RBSLs. All detected hexavalent chromium concentrations were below the ResRBSL (110 mg/kg). Metals exceeding background range were detected in the central and northwestern portions Mixed Waste Storage Yard extending north of the fence line. The highest concentrations were observed	YES. Metals above background detected at isolated locations among extensive representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 20 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
				in three isolated sample locations (RMBS0009, RMBS0012, and RMBS0102). Metals in downslope samples RMBS0100 and RMBS0110 were within background range. Samples collected south of the Mixed Waste Storage Yard were within background range; hexavalent chromium was not detected. Extensive, representative sampling across the Mixed Waste Storage Yard and north of fence line adequately characterize metals. Based on representative sampling results, indicating isolated, sporadic metals above background or RBSLs, no further characterization is necessary.		
		Inorganics Storage of chemicals and chemical wastes are documented in historical documents.	Collected samples at seven representative locations within the Mixed Waste Storage Yard (RMBS0008, RMBS0009, and RMBS0013 through RMBS0017 at 0.9 to 2.5 feet bgs).	Inorganics results are shown on Figure C.3-6C. Chloride, fluoride, nitrate, and sulfate were detected at the representative locations up to 9.86 mg/kg (sulfate at RMBS0013, 0.9 feet bgs). Fluoride was detected up to 4.93 mg/kg, within background range (max background 6.7 mg/kg). There are no established background concentrations or RBSLs for nitrate and sulfate. Representative sampling across the Mixed Waste Storage Yard adequately characterize inorganics. Based on representative sampling results, indicating inorganics present at low concentrations within background range, no further characterization is necessary.	YES. Inorganics detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams. Storage of PCB containing ballasts documented in historical records.	Collected samples at seven representative locations within the Mixed Waste Storage Yard (RMBS0006, RMBS0008, RMBS0009, RMBS0012, and RMBS0014 through RMBS0016 at 2.0 to 6.0 feet bgs). Two samples were collected downslope (west) of the Mixed Waste Storage Yard (RMBS0100 and RMBS0110 at 2.0 feet bgs).	PCB results are shown on Figures C.3-4A and C.3-4B. PCBs were not detected. Representative sampling across the Mixed Waste Storage Yard adequately characterize PCBs Based on representative sampling results, no further characterization is necessary.	YES. PCBs were not detected.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Pesticides / Herbicides Pesticides and herbicides potentially used at site (unrelated to operations)	Collected samples at one location adjacent to Building 4621 (RMBS0010 at 1 foot bgs) to assess potential use.	Pesticide / herbicide results shown on Figures C.3-4A and C.3-4B. Pesticides and herbicides were not detected. Based on representative sampling results, no further characterization is necessary.	YES Pesticides /herbicides were not detected.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 21 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored[2]**	**Sampling Scope and Rationale[2,8]** [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results[3]** Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?[5]**	**Is delineation sufficient to estimate soil volume in CMS?[6,7]** (see Figure C.5-1 for CMS areas)
5c	**Former Building 4663 Equipment Storage Area** Building 4663, constructed in the mid-1960s, was used for material storage and may have been used to store radioactive wastes. The building structure was demolished in the early-1970s. The concrete foundation was left in place and served as a non-radioactive material storage area. The foundation currently supports two Konex-type storage containers containing non-radioactive materials. Visible portions of the foundation appeared to be in good, intact condition with no staining. The area east of the foundation is a topographic low where water can collect, as noted in a 1989 aerial photo. Soils in the area are primarily silty sand (SM) extending 2.0 to 3.5 feet bgs. Surface water in the area flows to the west via sheet flow toward the Mixed Waste Storage Yard (CUA 5b). Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**VOCs** Documented use and/or storage of solvents, including chlorinated solvents.	<u>Soil Vapor</u> Collected one sample targeting a location adjacent (north) of the Equipment Storage Area foundation (RMSV0021 at 3.5 feet bgs). <u>Soil Matrix</u> Collected one soil matrix sample targeting a topographic low adjacent (east) of the Equipment Storage Area foundation (RMBS0123 at 1 foot bgs). Thin soil in this area precluded collection of soil vapor sample. Note: Samples collected to the south are discussed in CUA 14d.	VOC results shown on Figure C.3-1B. <u>Soil Vapor</u> Freon 113 was detected at 2.1 µg/L, below Res and EcoRBSLs (8,800 and 91 µg/L, respectively). <u>Soil Matrix</u> VOCs were not detected. Locations targeting the north and east margins of the concrete foundation adequately characterize VOCs. Based on sampling results indicating VOCs not detected or at low concentrations below RBSLs, no further characterization is necessary.	YES. VOCs not detected or detected at low concentrations below RBSLs at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs / Terphenyls SVOCs potentially associated with petroleum fuels and oils used and stored at the RMHF RFI Site. SVOCs tentatively identified compounds were screened at the RMHF RFI Site to address chemicals documented on the USEPA BRS Database, including morphaline, pyridine, and nicotine.	Collected samples at four representative or targeted locations within and adjacent to former Building 4663: • At the center of the Equipment Storage Area (RMBS0020 at 1.5 feet bgs) - also analyzed for glycols / terphenyls. • North of the Equipment Storage Area (RMBS0021 at 1.5 feet bgs). • East of the Equipment Storage Area targeting a topographic low (RMBS0123 at and RMBS0138 at 1 foot bgs). Note: Samples collected to the south are discussed in CUA 14d.	SVOC results are shown on Figure C.3-2A. Phthalates and PAHs were detected in samples east and north of the Equipment Storage Area, up to 8.7 µg/kg (di-n-octyl phthalate, RMBS0123) and 13.5 µg/kg (phenanthrene, RMBS1123), respectively. SVOCs were not detected at the center of the concrete pad (RMBS0020). Detected PAHs and phthalates were all below RBSLs. Terphenyls were not detected. Representative or targeted locations in the center, north and east of the concrete foundation adequately characterize SVOCs. Based on sampling results indicating low SVOCs below RBSLs, no further characterization required.	YES. SVOCs detected at low concentrations below RBSLs at representative and targeted locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 22 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		TPH Use and/or storage of hydraulic oils, waste oils, and diesel fuel are documented in historical records.	Collected samples at four representative or targeted locations within and adjacent to former Building 4663: • At the center of the Equipment Storage Area (RMBS0020 at 1.5 feet bgs) • North of the Equipment Storage Area (RMBS0021 at 1.5 feet bgs). • East of the Equipment Storage Area targeting a topographic low (RMBS0123 at and RMBS0138 at 1 foot bgs) Note: Samples collected to the south are discussed in CUA 14d.	TPH results shown on Figure C.3-3B. Lubricant oil range organics (C21 – C30) were detected at all four locations up to 1,030 mg/kg, with the maximum detection at the topographic low east of the Equipment Storage Area (RMBS0123). Diesel range organics were also detected at 260 mg/kg at this location. Remaining samples contained up to 14 mg/kg lubricant oil range organics. All detected concentrations were below the combined ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Representative or targeted locations in the center, north and east of the concrete foundation adequately characterize petroleum hydrocarbons. Based on representative and targeted sampling results indicating petroleum hydrocarbons below RBSLs, no further characterization is necessary.	YES. Petroleum hydrocarbons detected below RBSLs at representative and targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Storage of metals and metallic wastes, including arsenic, barium, chromium, lead, and sodium, are documented in historical documents.	Collected samples at four representative or targeted locations within and adjacent to former Building 4663: • At the center of the Equipment Storage Area (RMBS0020 at 1.5 feet bgs) • North of the Equipment Storage Area (RMBS0021 at 1.5 feet bgs). • East of the Equipment Storage Area targeting a topographic low (RMBS0123 at and RMBS0138 at 1 foot bgs). Note: Samples collected to the south are discussed with CUA 14d.	Metals results are shown on Figure C.3-6B and C.3-6C. Sodium was detected at 537 mg/kg at the center of the Equipment Storage Area (RMBS0020), above background (110 mg/kg). Res and EcoRBSLs are not established for sodium. Sodium is within background range in samples to the north, east, and west (RMBS0021, RMBS0123 and RMBS0138, RMBS0007 and RMBS0008), with the exception of samples collected within the interior of Building 4621 (CUA 5a). Representative or targeted locations in the center, north and east of the concrete foundation adequately characterize metals. Based on representative sampling results indicating one metal (sodium) above background at one sample location, no further characterization is necessary.	YES. Metals below background range or do not have associated risk (sodium).	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams. Storage of PCB containing ballasts documented in historical records.	Collected samples at three representative or targeted locations within and adjacent to former Building 4663: • At the center of the Equipment Storage Area (RMBS0020 at 1.5 feet bgs) • East of the Equipment Storage Area targeting a topographic low (RMBS0123 at and RMBS0138 at 1 foot bgs). Note: Samples collected to the south are discussed below under CUA 14d.	PCB results are shown on Figure C.3-4A. Aroclor 1260 was detected in the center of the Equipment Storage Area at 4.9 µg/kg (RMBS0020), well below Res and EcoRBSLs (140 and 78 µg/kg, respectively). PCBs were not detected at topographic low. Representative or targeted locations in the center and east of the concrete foundation adequately characterize PCBs. Based on representative sampling results indicating PCBs at low concentrations below RBSLs; no further characterization is necessary. [Note: Elevated PCBs detected south of the fence line adjacent to this area; see CUA 14d for details.]	YES. PCBs not detected or detected below RBSLs.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 23 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
6a	**Building 4075 Contaminated Equipment Storage** Building 4075 was constructed in 1971 and served as a storage area for radioactive wastes that were pending shipment for offsite disposal. Building 4075 was constructed on the northwestern portion of the RMHF fenced area and served as a support and storage area for radioactive wastes (low-level, mixed, and transuranic wastes) prior to staging in the Mixed Waste Storage Yard for shipment to offsite disposal sites. Building 4075 has a floor drain located in the designed low-point of the building, which drains to the Catch Basin Drainage Channel (CUA 10b) that leads to the RMHF Catch Basin (CUA 10c). Building 4075 was originally included in the 1989 RCRA Part A (Interim Status) permit for the storage of mixed waste, but was not used for the storage of mixed waste after permit submittal. The building has been inactive since 2001 and is currently not part of the RCRA Part A (Interim Status) permit. Soils in the area are poorly graded sand with silt (SP-SM) that extends to 4 feet bgs. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10c) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**VOCs** Documented use and/or storage of solvents, including chlorinated solvents.	<u>Soil Vapor</u> Collected samples at two targeted locations within the Building 4075 footprint: • At a floor drain/low point in the southwest corner (RMSV0106 at 4 feet bgs). • At a surface stain and crack observed during a field survey (RMSV0039 at 4.5 feet bgs). <u>Soil Matrix</u> Collected one soil matrix sample behind Building 4075 targeting a surface water pathway along the asphalt and where drums were observed in an historical photograph (RMBS0120 at 0.75 feet bgs).	VOC results are shown on Figure C.3-1B and C.3-1C. VOCs were not detected in targeted soil vapor and soil matrix samples collected at Building 4075. Targeted locations at Building 4075 adequately characterize VOCs. Based on lack of VOC detections at targeted sampling locations, no further characterization is necessary.	YES. VOCs not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs potentially associated with petroleum fuels and oils used and stored at the RMHF RFI Site. SVOCs tentatively identified compounds were screened at the RMHF RFI Site to address chemicals documented on the USEPA BRS Database, including morphaline, pyridine, and nicotine.	Collected soil matrix samples at three locations: • Targeting a floor drain at a low point in the southwest corner inside the Building 4075 footprint (RMBS0106 at 1.5 feet Bgs) • Behind Building 4075 targeting a surface water pathway and where drums were observed in an historical photograph (RMBS0120 at 0.75 feet bgs). • South of Building 4075 targeting a surface water pathway (RMBS0111 at 1.5 feet bgs).	SVOC results are shown on Figure C.3-2B. SVOCs were not detected in targeted soil matrix samples collected at Building 4075. Targeted locations within and around Building 4075 adequately characterize SVOCs. Based on non-detect sampling results sampling results, no further characterization is necessary.	YES. SVOCs not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 24 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		TPH Use and/or storage of hydraulic oils, waste oils, and diesel fuel are documented in historical records.	Collected soil matrix samples at three targeted locations within Building 4075: • At a floor drain/topographic low in the southwest corner (RMBS0106 at 1.5 feet bgs) • At two observed locations of cracking and staining (RMBS0038 and RMBS0039 at 1.5 feet bgs) Collected soil matrix samples at two locations outside of Building 4075: • Behind Building 4075 targeting a surface water pathway and where drums were observed in an historical photograph (RMBS0120 at 0.75 feet bgs) • South of Building 4075 targeting a surface water pathway (RMBS0111 at 1.5 feet bgs)	TPH results are shown on Figure C.3-3B and C.3-3C. Lubricant oil range organics were detected at all five locations up to 853 mg/kg, with the maximum concentration detected at the floor drain/ topographic low point (RMBS0106). All detected concentrations were below the combined ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Targeted locations within and around Building 4075 adequately characterize petroleum hydrocarbons. Based on targeted sampling results indicating lubricant oil range organics below RBSLs and collocated samples in which SVOCs were not detected, no further characterization is necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at targeted locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Storage of metals and metallic wastes, including arsenic, barium, chromium, and sodium, are documented in historical documents.	Collected soil matrix samples at three targeted locations within Building 4075: • At a floor drain/topographic low in the southwest corner (RMBS0106 at 1.5 feet bgs) • At two observed locations of cracking and staining (RMBS0038 and RMBS0039 at 1.5 feet bgs) Collected soil matrix samples at two locations outside of Building 4075: • Behind Building 4075 targeting a surface water pathway and where drums were observed in an historical photograph (RMBS0120 at 0.75 feet bgs) • South of Building 4075 targeting a surface water pathway along the asphalt (RMBS0111 at 1.5 feet bgs)	Metals results are shown on Figure C.3-6B. Zinc and sodium were detected above background in one sample each out of the five Building 4075 locations: • Sodium at 180 mg/kg (background 110 mg/kg) at RMBS0039 • Zinc at 272 mg/kg (Background 110 mg/kg) at RMBS0120 Zinc was detected below the ResRBSL (23,000 mg/kg). The EcoRBSL for zinc (20.8 mg/kg) is below the maximum background concentration. There are no RBSLs for sodium. Metals were not detected above background in the remaining three samples. Zinc is within background range in upslope and downslope samples in neighboring CUAs 6b, 10a, 13b, and 14b. Targeted locations within and around Building 4075 adequately characterize metals. Based on targeted sampling results indicating metals detected above background are limited to sodium and zinc at a few locations, no further characterization is necessary.	YES. Metals detected above background limited in few targeted sample locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 25 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams. Storage of PCB containing ballasts documented in historical records.	Collected soil matrix samples at three targeted locations within and around Building 4075: • At a floor drain/topographic low in the southwest corner (RMBS0106) at 1.5 feet bgs • Behind Building 4075 targeting a surface water pathway and where drums were observed in an historical photograph (RMBS0120 at 0.75 feet bgs) • South of Building 4075 targeting a surface water pathway (RMBS0111 at 1.5 feet bgs)	PCB results are shown on Figure C.3-4B. PCBs were not detected at the targeted locations, including the sample coincident with the maximum detected lubricant oil range organics. Targeted locations within and around Building 4075 adequately characterize PCBs. Based on targeted sampling results, no further characterization is necessary.	YES. PCBs not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Pesticides / Herbicides Pesticides and herbicides potentially used at site (unrelated to operations).	Collected samples at one location targeting downslope of Building 4022 (RMBS0120 at 0.75 feet bgs).	Pesticide / herbicide results shown on Figure C.3-4B. Pesticides and herbicides were not detected at the targeted sampling location. No further characterization is necessary.	YES Pesticides and herbicides not detected	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 26 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
6b	**Building 4563 Storage Area** Building 4563 was originally an asphalt-paved area designated as open storage in what later would be the locations of Buildings 4075 (CUA 6a), 4621 (CUA 5a), and the Mixed Waste Storage Yard (CUA 5b). Radioactive wastes were stored here pending shipment to an offsite disposal facility. Open storage was observed in this area in aerial photos from the early 1960s to late 1990s. In the late 1990s, an awning was added to the east side of Building 4075 was and referred to as Building 4563. The awning-covered area provided storage for non-radioactive equipment. The area is currently active, but was not being used for storage during a 2008 site inspection. Soils in the area are silty sand (SM), well-graded sand (SW), and poorly-graded sand with silt (SP-SM) ranging from 1.5 to 4 ft bgs. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**VOCs** Documented use and/or storage of solvents, including chlorinated solvents.	<u>Soil Vapor</u> Collected soil vapor samples at two locations: • One representative location at the center of Building 4563 (RMSV0040 at 4 feet bgs) • One targeted location adjacent to a manhole at the southeast corner of Building 4563 (RMSV0112 at 5 and 10 feet bgs) <u>Soil Matrix</u> Collected soil matrix samples at two targeted locations: • Northwest of Building 4563 within a surface water pathway and where drums were observed in an historical photograph (RMBS0121 at 1 foot bgs) • Adjacent to a manhole at the southeast corner of Building 4563 (RMBS0112 at 10 feet bgs), targeting soil staining observed at this sample depth.	VOC results are shown on Figure C.3-1B and C.3-1C. <u>Soil Vapor</u> Low concentrations of toluene (0.14 µg/L) and benzene (up to 0.047 µg/L) were detected at the two soil vapor sampling locations. Toluene was detected above the EcoRBSL (0.084 µg/L) but below the ResRBSL (110 µg/L). Benzene was detected below both Res and EcoRBSLs (0.095 and 0.57 µg/L, respectively). <u>Soil Matrix</u> Methylene chloride was detected at the manhole location (RMBS0112) at 8.57 µg/kg at 10 feet bgs, exceeding the ResRBSL (4 µg/kg), but below the EcoRBSL (25,000 µg/kg). The sample was collected from stained soil observed during drilling; this chemical was not detected (< 2 µg/L) in collocated soil vapor. Targeted and representative locations within and around Building 4075 adequately characterize VOCs. Based on VOCs above RBSLs at targeted and representative locations and VOCs below RBSLs in adjacent areas, no further characterization is necessary.	YES. Area including CUAs 6b and 7 recommended for further evaluation in the CMS based on observed staining, methylene chloride and benzene concentrations, and risk assessment results.	YES Volume based on methylene chloride and benzene results (non-detect or below RBSLs) in neighboring CUAs.
		SVOCs SVOCs potentially associated with petroleum fuels and oils used and stored at the RMHF RFI Site. SVOCs tentatively identified compounds were screened at the RMHF RFI Site to address chemicals documented on the USEPA BRS Database, including morphaline, pyridine, and nicotine.	Collected soil matrix samples at two targeted locations: • Northwest of Building 4563 within a surface water pathway and where drums were observed in an historical photograph (RMBS0121 at 1 foot bgs) • Adjacent to a manhole at the southeast corner of Building 4563 (RMBS0112 at 1.5 and 10 feet bgs, the deeper sample targeting soil staining)	SVOC results are shown on Figure C.3-2B. Bis(2-ethylhexyl) phthalate was detected at 22.2 µg/kg in RMBS0112 at 10 feet bgs, the depth at which staining was observed, below Res and EcoRBSLs (250,000 and 4,930 µg/kg, respectively). No other SVOCs were detected in this sample and SVOCs were not detected at other sampled depths or the location northwest of Building 4563. Targeted locations at Building 4075 adequately characterize SVOCs. Based on these sampling results, indicating one phthalate detected significantly below RBSLs in one targeted location, no further characterization is necessary.	YES. SVOCs detected significantly below RBSLs in one targeted location. Area recommended for further evaluation in the CMS based on observed staining, VOCs and risk assessment results; area not recommended for CMS based on SVOCs.	YES Volume based on VOCs as described above.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 27 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		TPH Use and/or storage of hydraulic oils, waste oils, and diesel fuel are documented in historical records.	Collected soil matrix samples at three locations: • One representative location at the center of Building 4563 (RMBS0040 at 1.5 feet bgs) • Northwest of Building 4563 targeting a surface water pathway and where drums were observed in an historical photograph (RMBS0121 at 1 feet bgs) • Adjacent to a manhole at the southeast corner of Building 4563 (RMBS0112 at 1.5 and 10 feet bgs, the deeper sample targeting soil staining)	TPH results are shown on Figure C.3-3B. Lubricant oil range organics (C21 – C30) were detected at all three locations up to 31.4 mg/kg (RMBS0112, 1.5 feet bgs), all below the combined ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Targeted and representative locations within and around Building 4075 adequately characterize petroleum hydrocarbons. Based on petroleum hydrocarbons results indicating low lubricant oil range organics well the RBSL, no further characterization is necessary.	YES. Lubricant oil range organics detected at low concentrations below RBSL at targeted and representative sampling locations. Area recommended for further evaluation in the CMS based on observed staining, VOCs and risk assessment results; area not recommended for CMS based on petroleum hydrocarbons.	YES Volume based on VOCs as described above.
		Metals Storage of metals and metallic wastes, including arsenic, barium, chromium, and sodium, are documented in historical documents.	Collected soil matrix samples at three locations: • One representative location at the center of Building 4563 (RMBS0040 at 1.5 and 4 feet bgs) • Northwest of Building 4563 targeting a surface water pathway and drums observed in an historical photograph (RMBS0121 at 1 feet bgs) • Adjacent to a manhole at the southeast corner of Building 4563 (RMBS0112 at 1.5 and 10 feet bgs, the deeper sample targeting soil staining).	Metals results are shown on Figure C.3-6B. Sodium was detected above background (110 mg/kg) at all three locations up to 559 mg/kg (RMBS0121). Lead was detected slightly above background (34 mg/kg) at RMBS0121 (1 foot bgs) at 35.4 mg/kg, below the ResRBSL (150 mg/kg). The EcoRBSL for lead (0.063 mg/kg) is below the maximum background concentration. There are no RBSLs for sodium. Targeted and representative locations within and around Building 4075 adequately characterize metals. Based on metals results indicating one slight background exceedance (lead) and elevated sodium, no further characterization necessary.	YES. Metals detected below or near background concentrations or do not have associated risk (sodium). Area recommended for further evaluation in the CMS based on observed staining, VOCs and risk assessment results; area not recommended for CMS based on metals.	YES Volume based on VOCs as described above.
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams. Storage of PCB ballasts documented in historical records.	Collected soil matrix samples at two locations: • Adjacent to a manhole at the southeast corner of Building 4563 (RMBS0112 at 1.5 and 10 feet bgs, the deeper sample targeting soil staining) • Northwest of Building 4563 targeting a surface water pathway and where drums were observed in an historical photograph (RMBS0121 at 1 feet bgs)	PCB results are shown on Figure C.3-4B. PCBs were not detected at the targeted locations. Based on targeted sampling results, no further characterization is necessary.	YES. PCBs not detected at targeted sampling locations. Area recommended for further evaluation in the CMS based on observed staining, VOCs and risk assessment results; area not recommended for CMS based on PCBs.	YES Volume based on VOCs as described above.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 28 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
7	**Waste Receiving Yard** The Waste Receiving Yard acted as a staging area for wastes received for storage at the RMHF. As described in the 1999 RCRA Part B permit, following a verification process, containers and packages sent to the RMHF were directed to the Waste Receiving Area, where they were segregated according to compatibility and stored or staged for treatment. The precise usage period for the Waste Receiving Yard is not specified in historical documents. Drums have been observed in the Waste Receiving Yard in historical aerial photos. Soils in the area are silty sand (SM) and poorly-graded sand with silt (SP-SM) ranging from 3 to 4 ft bgs. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**VOCs** Documented use and/or storage of solvents, including chlorinated solvents.	<u>Soil Vapor</u> Soil vapor samples were not collected. <u>Soil Matrix</u> Collected soil matrix samples at three representative downslope locations: • Immediately west of the Waste Receiving Yard (RMBS0042 at 1, 5, 10 and 15 feet bgs). Stained soil was observed at all depths at this location. • Approximately 40 feet southwest of the Waste Receiving Yard (RMBS0094 at 1.75 and 5 feet bgs). Stained soil was observed from 4.75 to 10.75 feet bgs at this location. • Approximately 40 feet west of the Waste Receiving Yard (RMBS0122 at 1 foot bgs)	VOC results shown on Figure C.3-1B. Acetone, styrene, methyl ethyl ketone, and methylene chloride were detected in samples collected at RMBS0042 up to 44.1 µg/kg (acetone, 15 feet bgs). Methylene chloride was detected up to 8.33 µg/kg - above the ResRBSL (4 µg/kg) – and was relatively consistent with depth down to 15 feet bgs. No other VOCs were detected above RBSLs. VOCs were either not detected or detected below RBSLs at downslope locations RMBS0094 and RMBS0122; however staining at depth in RMBS0094 and elevated reporting limits (up to 5.2 µg/kg) for methylene chloride suggest the potential for low level VOCs just above the ResRBSL in this area.	YES. Area including CUAs 6b and 7 recommended for further evaluation in the CMS based on observed staining, methylene chloride and benzene concentrations, and risk assessment results.	YES Volume based on chemical use, site topography, and chemical gradients; however, additional sampling may be needed during the CMS to define extent.
	SVOCs \ Terphenyls SVOCs potentially associated with petroleum fuels and oils used and stored at the RMHF RFI Site. SVOCs tentatively identified compounds were screened at the RMHF RFI Site to address chemicals documented on the USEPA BRS Database, including morphaline, pyridine, and nicotine.	Collected samples at three locations: • Targeting the northwest (downslope corner within the Waste Receiving Yard (RMBS0041) at 1 foot bgs. • Immediately west (downslope) of the Waste Receiving Yard (RMBS0042 at 1.5, 5, 10 and 15 feet bgs). Stained soil was observed at all depths at this location. • Approximately 40 feet southwest (downslope) of the Waste Receiving Yard (RMBS0094 at 1.5 and 5 feet bgs). Stained soil was observed from 4.75 to 10.75 feet bgs at this location.	SVOC results are shown on Figures C.3-2A and C.3-2B. SVOCs were not observed at the location within the Waste Receiving Yard (RMBS0041). Phthalates and tentatively identified compounds (TICs) were identified in downslope samples up to: • Bis(2-Ethylhexyl) phthalate: 26.3 µg/kg • 6-Isopropenyl-4,8a-dimethyl-4a,5,6,7,8,8 (TIC): 783 µg/kg Detected phthalates were well below RBSLs. RBSLs are not established for TICs. PAHs and terphenyls were not detected. Based on sampling results, indicating SVOCs at levels well below RBSLs, no further characterization is necessary.	YES. Phthalates and SVOC TICs detected well below RBSLs at representative sampling locations. Area recommended for further evaluation in the CMS based on observed staining, VOCs and risk assessment results; area not recommended for CMS based on SVOC concentrations.	YES Volume based on VOCs as described above.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 29 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		TPH Use and/or storage of hydraulic oils, waste oils, and diesel fuel are documented in historical records.	Collected samples at four locations: • Targeting the northwest (downslope corner within the Waste Receiving Yard (RMBS0041) at 1 foot bgs. • Immediately west (downslope) of the Waste Receiving Yard (RMBS0042 at 1.5, 5, 10, and 15 feet bgs). Stained soil was observed at all depths at this location. • Approximately 40 feet southwest (downslope) of Waste Receiving Yard (RMBS0094 at 1.5 and 5 feet bgs). Stained soil was observed from 4.75 to 10.75 feet bgs at this location. • Approximately 40 feet west (downslope) of the Waste Receiving Yard (RMBS0122 at 1 foot bgs)	TPH results shown on Figure C.3-3B. Lubricant oil range organics (C21 – C30) were detected at all four locations, with the highest concentrations (up to 741 mg/kg at RMBS0041) in the two samples closest to the Waste Receiving Yard. Gasoline range organics (C8 – C11) were detected in the shallow sample collected west of the Waste Receiving Yard (1.5 mg/kg at RMBS0042, 1.5 feet bgs). Diesel range organics (C15 – C20) were detected at 1.5 and 10 feet bgs at this location, up to 7.6 mg/kg. Benzene was not detected (< 0.99 µg/kg) at 1 foot bgs in this boring. Detected gasoline range organics were slightly above the ResRBSL (1.1 mg/kg). Detected lubricant oil range and diesel range organics were below the combined ResRBSL for kerosene, diesel, and lubricant oil range organics (C21 – C30) (1,400 mg/kg). Based on targeted and representative sampling results, indicating petroleum hydrocarbons detected below or slightly above RBSLs, no further characterization is necessary.	YES. Petroleum hydrocarbons detected below or near RBSLs at targeted and representative sampling locations. Area recommended for further evaluation in the CMS based on observed staining, VOCs and risk assessment results; area not recommended for CMS based on petroleum hydrocarbon concentrations.	YES Volume based on VOCs as described above.
		Metals Storage of metals and metallic wastes, including arsenic, barium, chromium, and sodium, are documented in historical records.	Collected samples at four locations: • Targeting the northwest (downslope corner within the Waste Receiving Yard (RMBS0041) at 1 foot bgs. • Immediately west (downslope) of the Waste Receiving Yard (RMBS0042 at 1.5, 4 (sodium), 5, 10 and 15 feet bgs). Stained soil was observed at all depths at this location. • Approximately 40 feet southwest (downslope) of Waste Receiving Yard (RMBS0094 at 1.5, 5 and 10 feet bgs). Stained soil was observed from 4.75 to 10.75 feet bgs at this location. • Approximately 40 feet west (downslope) of the Waste Receiving Yard (RMBS0122 at 1 foot bgs)	Metals results are shown on Figure C.3-6B. Sodium was detected above background (110 mg/kg) at all four locations up to 464 mg/kg (RMBS0042, 1.5 feet bgs). Sodium decreased to background levels below 5 feet bgs in this boring. All other metals were within background range. Based on targeted and representative sampling results indicating only sodium above background, with the highest concentrations near the waste Receiving Yard, no further characterization is necessary.	YES. Metals detected below background concentrations or have no associated risk (sodium). Area recommended for further evaluation in the CMS based on observed staining, VOCs and risk assessment results; area not recommended for CMS based on metals concentrations.	YES Volume based on VOCs as described above.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 30 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		Inorganics Storage of chemicals and chemical wastes are documented in historical records.	Collected samples at three locations: • Targeting the northwest (downslope corner within the Waste Receiving Yard (RMBS0041) at 1 foot bgs. • Immediately west (downslope) of the Waste Receiving Yard (RMBS0042 at 4 and 5 feet bgs. Staining was observed at all depths at this location. • Approximately 40 feet southwest (downslope) of Waste Receiving Yard (RMBS0094 at 1.5 and 10 feet bgs). Staining was observed from 4.75 to 10.75 feet bgs at this location.	Inorganics results are shown on Figure C.3-6B. Chloride, fluoride, nitrate, and sulfate were detected at the representative locations at concentrations up to 6.61 mg/kg (sulfate, RMBS0042, 4.0 feet bgs). Background and RBSLs are not established for nitrate, chloride and sulfate. Fluoride was detected up to 4.74 mg/kg, within background range (6.7 mg/kg). Based on targeted and representative sampling results indicating inorganics present at low concentrations or within background ranges, no further characterization is necessary.	YES. Inorganics within background. Area recommended for further evaluation in the CMS based on observed staining, VOCs and risk assessment results; are not recommended for CMS based on inorganics concentrations.	YES Volume based on VOCs as described above.
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams. Storage of PCB ballasts documented in historical records.	Collected samples at three locations: • Targeting the northwest (downslope corner within the Waste Receiving Yard (RMBS0041 at 1 foot bgs). • Immediately west (downslope) of the Waste Receiving Yard (RMBS0042 at 1.5, 5, 10 and 15 feet bgs). Staining was observed at all depths at this location. • Approximately 40 feet southwest (downslope) of Waste Receiving Yard (RMBS0094 at 1.5 and 5 feet bgs). Staining was observed from 4.75 to 10.75 feet bgs at this location.	PCB results are shown on Figures C.3-4A and C.3-4B. Aroclor 1242 was detected at 3.2 µg/kg in the shallow sample (1.25 feet bgs) at RMBS0094, well below Res and EcoRBSLs (140 and 78 µg/kg, respectively). No other PCBs were detected at this location; PCBs were not detected in any other sampled locations. Based on targeted and representative sampling results indicating PCBs detected in one sample well below RBSLs, no further characterization is necessary.	YES. PCBs detected in one sample well below RBSLs Area recommended for further evaluation in the CMS based on observed staining, VOCs and risk assessment results; area not recommended for CMS based on PCB concentrations.	YES Volume based on VOCs as described above.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 31 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
8b	**Building 4665 Radioactive Scrap Oxidation Facility** Building 4665 was constructed in 1964. Although the precise function of the oxidation facility is not specified in historical documents, the name and facility drawings suggest the building was designed to conduct thermal oxidation of LLRW liquids. The system consisted of a gas-powered burner, an oxidation mixer, and a scrubber system. According to facility drawings, the oxidation system vapors could be conveyed to the Building 4664 Bag House (CUA 8a) for filtration or to the scrubber system located inside Building 4665. Following the deactivation of the Oxidation Facility, Building 4665 was used for storage, including equipment, contaminated equipment, and emergency decontamination supplies. The building is currently empty. The area around the building has been asphalt paved since the RMHF site expansion in 1961. The building floor is concrete and is in good, intact condition. Soils in the area are silty sand (SM) extending approximately 1.2 to 2.0 ft bgs. Before the septic tank was incorporated into the RMHF fenced area in the mid-1960s, surface water in the area of the septic tank flowed northwest down the RMHF slope via sheet flow and joined the drainage north of the RMHF. Once the septic tank was incorporated into the RMHF fenced area, surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500 gallon AST, where it is tested for measureable radioactivity prior to discharge.	**VOCs** Documented use and/or storage of solvents, including chlorinated solvents.	<u>Soil Vapor</u> No soil vapor samples were collected due to shallow soils. <u>Soil Matrix</u> Collected sample at one location targeting the center of Building 4665 (RMBS0045 at 1 foot bgs).	VOC results are shown on Figure C.3-1A. VOCs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. VOCs not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs potentially associated with petroleum fuels and oils used and stored at the RMHF RFI Site. SVOCs tentatively identified compounds were screened at the RMHF RFI Site to address chemicals documented on the USEPA BRS Database, including morphaline, pyridine, and nicotine.	Collected soil matrix sample at location targeting outside the Building 4665 doorway (RMBS0113 at 1 foot bgs).	SVOC results are shown on Figure C.3-2A. SVOCs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. SVOCs not detected at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Use and/or storage of hydraulic oils, waste oils, and diesel fuel are documented in historical records. Equipment located in this area may have used petroleum-based fuels or oils.	Collected soil matrix samples at two targeted locations: • At the center of the Building 4665 footprint (RMBS0045) at 1 foot bgs • Outside of the Building 4665 doorway (RMBS0113 at 1 foot bgs).	TPH results are shown on Figure C.3-3A. Lubricant oil range organics (C21 – C30) were detected at both sample locations up to 27.7 mg/kg, with the maximum concentration detected in the building footprint (RMBS0045). All detected concentrations were well below the combined ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Based on targeted sampling results indicating low petroleum hydrocarbons at concentrations below RBSLs, no further characterization is necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at targeted locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Storage of metals and metallic wastes, including arsenic, barium, chromium, lead, and sodium, are documented in historical documents. Equipment used for the treatment of low level radioactive water, which may contain metals.	Collected soil matrix samples at two targeted locations: • At the center of the Building 4665 footprint (RMBS0045) at 1 foot bgs • Outside of the Building 4665 doorway (RMBS0113 at 1 foot bgs).	Metals results are shown on Figure C.3-6A. Metals were detected within background ranges. Based on targeted sampling results, no further characterization is necessary.	YES. Metals within background at targeted locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 32 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams. Storage of PCB ballasts documented in historical records.	Collected soil matrix sample at location targeting outside the Building 4665 doorway (RMBS0113 at 1 foot bgs).	PCB results are shown on Figure C.3-4A. Aroclor 1254 and Aroclor 1260 were detected up to 14.6 µg/kg (Aroclor 1254), below Res and EcoRBSLs (140 and 77 µg/kg, respectively). Based on representative sampling results indicating PCBs below RBSLs, no further characterization is necessary.	YES. PCBs detected at low concentrations below RBSLs at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Dioxins Dioxins potentially present from oxidation facility operation.	Collected sample at one location targeting the center of Building 4665 (RMBS0045 at 1 foot bgs).	Dioxin results are shown on Figure C.3-5. Dioxins were detected within background range, no further characterization is necessary	YES. Dioxins within background range at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Pesticides / Herbicides Pesticides and herbicides were screened for site characterization	Collected soil matrix sample at location targeting outside the Building 4665 doorway (RMBS0113 at 1 foot bgs).	Pesticide / herbicide results shown on Figure C.3-4A. 4,4'-DDT and 4,4'-DDD detected up to 5.25 µg/kg, below Eco and ResRBSLs (12.4 and 2,520 µg/kg). Based on low detected concentrations below RBSLs, no further characterization is necessary.	YES Pesticides and herbicides detected at low concentrations below RBSLs.	YES Area not recommended for CMS based on sampling and risk assessment results.
9a	**Building 4034 Radioactive Waste Facility Office and Building 4622 Counting Laboratory,** Building 4034, the Radioactive Waste Facility Office, was constructed in 1962 in the southeastern portion of the RMHF RFI Site. From its construction to the present time, the building served as the RMHF main office and as a controlled access entry point to the RMHF fenced area. . There is no documented chemical use in the building, and the building is not radiologically impacted based on the Cabrera building survey conducted in 2006. Building 4622, the RMDF Counting Building, was constructed prior to 1962 in the southeastern corner of the RMHF RFI Site. The building was used for health physics sample counting of wastes contained at the RMHF. The building was demolished in approximately 1976. There was no documented chemical use in this building. Floors in the building are linoleum and carpet covered in good, intact condition; the condition of	**VOCs** No documented solvent use in this area.	<u>Soil Vapor</u> Soil vapor samples not collected due to shallow soils. <u>Soil Matrix</u> Collected one sample at location targeting a restroom floor drain in Building 4034 (RMBS0048 at 1 foot bgs).	VOC results are shown on Figure C.3-1A. VOCs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. VOCs not detected at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH No documented petroleum hydrocarbon use in this area.	Collected samples at two locations: • One location targeting a restroom floor drain in Building 4034 (RMBS0048 at 1 foot bgs). • One representative location downslope of Building 4658 and the vehicle entry gate (RMBS0049 at 1.5 feet bgs).	TPH results are shown on Figure C.3-3A. Lubricant oil range organics (C20 – C30) were detected at both locations up to 8.95 mg/kg (RMBS0049). Diesel range organics (C15 – C20) were detected at one location at 5.19 mg/kg (RMBS0049). All detected lubricant and diesel range organics concentrations were below the combined ResRBSL for kerosene, diesel, and lubricant oil range organics (C21 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Targeted and representative locations within and around Building 4568 adequately characterize petroleum hydrocarbons. Based on sampling results indicating low petroleum hydrocarbons below RBSLs, no further characterization is necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at targeted and representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 33 of 62)

Map Key[1]	Chemical Use Area Name Status, How Used and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored[2]	Sampling Scope and Rationale[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	Sampling Results[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	Potential concentration gradients sufficiently characterized for risk assessment?[5]	Is delineation sufficient to estimate soil volume in CMS?[6,7] (see Figure C.5-1 for CMS areas)
	the concrete foundation below cannot be determined. Soils in the area are silty sand (SM) extending 1.0 to 2.5 feet bgs. The areas surrounding the buildings are paved to the north, south, and west and bedrock outcrops are present to the east and southeast. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500-gallon AST, where it is tested for measureable radioactivity prior to discharge.	**Metals** No documented metals use in this area.	Collected samples at three locations: • One location targeting a restroom floor drain in Building 4034 (RMBS0048 at 1 foot bgs). • Two representative locations downslope of Building 4658 and /or the vehicle entry gate (RMBS0049 at 1.5 feet bgs and RMBS0137 at 1 foot bgs).	Metals results are shown on Figure C.3-6A. Zinc was detected at 111 mg/kg at RMBS0048, equivalent to the background concentration (110 mg/kg). Sodium was detected at 620 mg/kg at the floor drain, above the maximum background (110 mg/kg). RBSLs are not established for sodium. All other metals were detected below background concentrations. Metals were within background range at downslope sample locations (RMBS0049 and RMBS0137). Targeted and representative locations within and around Building 4034 adequately characterize metals. Based on sampling results indicating sodium above background; no further characterization is necessary.	YES. Metals detected below background ranges of have no associated risk (sodium).	YES Area not recommended for CMS based on sampling and risk assessment results.
9b	**Building 4044 RMHF Break Room and Counting Laboratory** Building 4044 was constructed in 1966 along the eastern RMHF fence line. The building was used as a clean shop, a health physics counting laboratory, and a break room. There is no documented chemical use in this building. Radiological wastes were present in the health physics counting laboratory based on historical photos. The building is currently present and in use. The floor is linoleum-covered and is in good, intact condition; the condition of the concrete foundation below cannot be determined. Soils in the area are poorly graded sand with silt (SP-SM) and silty sand (SM), extending approximately 1.1 feet bgs. The areas surrounding the buildings are paved to the north, south, and west. A narrow unpaved area exists to the east between Building 4044 and a bedrock outcrop that is parallel to the building and the RMHF fence line. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10c) prior to its removal in 2006. Surface water is currently collected in a 1,500-gallon AST, where it is tested for measureable radioactivity prior to discharge.	**VOCs** No documented VOC use in this area.	<u>Soil Vapor</u> Soil vapor samples not collected due to shallow soils. <u>Soil Matrix</u> Collected sample at one location targeting a floor drain and industrial sink in Building 4044 (RMBS0127 at 1 foot bgs).	VOC results shown on Figure C.3-1A. VOCs were not detected Based on targeted sampling results, no further characterization is required.	YES. VOCs not detected at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH No documented petroleum hydrocarbon use in this area.	Collected sample at one location targeting a floor drain and industrial sink in Building 4044 (RMBS0127 at 1 foot bgs).	TPH results shown on Figure C.3-3A. Lubricant oil range organics (C21 – C30) were detected at 5.68 mg/kg, below the combined ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Based on targeted sampling results, indicating petroleum hydrocarbons present below RBSLs, no further characterization is necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals No documented metals use in this area.	Collected sample at one location targeting a floor drain and industrial sink in Building 4044 (RMBS0127 at 1 foot bgs).	Metals results are shown on Figure C.3-6A. Sodium was detected at 286 mg/kg, above background (110 mg/kg). There are no RBSLs established for sodium. All other metals were detected within background range. Based on targeted sampling results indicating only sodium detected above background, no further characterization is necessary.	YES. Metals detected below background ranges of have no associated risk (sodium).	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 34 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
9c, 12	**Drum Storage Area, Building 4688 Equipment Storage Area (9c); Oil Sump (12)** Building 4668 was constructed in 1959 in the northeast portion of the RMHF fenced area adjacent to the eastern fence line. The building was originally constructed as an uncovered Drum Storage Area, a concrete pad approximately 120 feet long by 20 feet wide extending to the southern face of Building 4044 (CUA 9b). A sump, designated the Oil Sump in facility drawings (CUA 12), was constructed in the center of the Drum Storage Area. The oil sump was constructed in 1959 in the center of the Drum Storage Area (CUA 9c). The sump was approximately 4-foot square area and 6 feet deep, draining to a small (<1foot square, 0.5-foot deep) depression containing the sump pump. The area surrounding the sump was historically used for open storage of containerized waste pending shipment offsite (CUA 9c). In the mid-1960s, the awning designated as Building 4688 was relocated from the Sodium Reactor Experiment to the RUMF Drum Storage Area. The awning is visible at the Drum Storage Area in aerial photos as early as 1965. The Drum Storage Area was shortened in 1966 when Building 4044 was constructed on the southeast portion of the pad. A large storage container is also visible in the portion of the Drum Storage Area north of Building 4688 in historical aerial photos from 1961 to 1989. The contents of this container were not found in historical documents. The Building 4688 area is currently used for equipment, hazardous waste, and chemical storage. Hazardous waste and chemicals are stored in three locked storage cabinets that are inspected weekly for contents, spills, and condition. The area north of Building 4688 is currently used for drum and package inspection. A metal structure with an elevated platform is	**VOCs** Flammable chemicals, potentially including solvents, and hazardous wastes are stored in this area.	<u>Soil Vapor</u> Soil vapor samples not collected due to shallow soils. <u>Soil Matrix</u> Collected samples at two locations: • Targeting the flammable chemical and hazardous waste storage area (RMBS0091 at 1 foot bgs). • Targeting the southern portion of the drum storage area (RMBS0047 at 1 foot bgs).	VOC results shown on Figure C.3-1A. VOCs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. VOCs not detected or at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs Flammable chemicals, potentially including petroleum-based fuels and hazardous wastes are stored in this area.	Collected sample targeting the southern portion of the drum storage area (RMBS0047 at 1 foot bgs).	SVOC results are shown on Figure C.3-2A. SVOCs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. SVOCs not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Flammable chemicals, potentially including petroleum-based fuels and hazardous wastes are stored in this area.	Collected samples from three locations: • Targeting the southern portion of the drum storage area (RMBS0047 at 1 foot bgs). • Targeting the flammable chemical and hazardous waste storage area (RMBS0091 at 1 foot bgs). • One location targeting cracks observed adjacent to the Drum Inspection Area (RMBS0050 at 1.5 feet bgs).	TPH results are shown on Figure C.3-3A. Lubricant oil range organics (C20 – C30) were detected at all three locations up to 9.26 mg/kg (RMBS0091). All detected lubricant oil concentrations were well below the combined ResRBSL for kerosene, diesel, and lubricant oil range organics (C21 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Based on targeted sampling results indicating petroleum hydrocarbons are present at concentrations below RBSLs, no further characterization is necessary.	YES. Petroleum hydrocarbons detected well below RBSLs at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals No documented metals use in this area, but included as part of site characterization.	Collected samples from three locations: • Targeting the southern portion of the drum storage area (RMBS0047 at 1 foot bgs). • Targeting the flammable chemical and hazardous waste storage area (RMBS0091 at 1 foot bgs). • One location targeting cracks observed adjacent to the Drum Inspection Area (RMBS0050 at 1.5 feet bgs).	Metals results are shown on Figure C.3-6A. Metals were detected within background. Based on targeted sampling results, no further characterization is necessary.	YES. Metals within background concentrations at targeted locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 35 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	present that allows for bottom inspection of waste storage containers. The oil sump (CUA 12) was taken out of service and has been excavated prior to 2008. During the removal, a 5-foot by 15-foot area was excavated. The use period, discharge point of the sump pump, and excavation details (depth, waste characterization, etc.) are not documented in historical documents. A large storage container is presently located atop the former sump between Buildings 4688 and 4044. Soils in the area are silty sand (SM), extending 1.0 to 1.5 feet bgs. The concrete foundation is generally in good condition, with compromised areas observed adjacent to the drum and package inspection area (cracked and worn concrete) and under the awning-covered area adjacent to the storage cabinets (cracked concrete). The area surrounding the pad is paved on all sides except for the eastern face, which is along the RMHF fence line. Bedrock outcrops are present to the east and southeast. Surface water in the area flows to the west via sheet flow. Surface water was historically collected in the RMHF Catch Basin (CUA 10b) prior to its removal in 2006. Surface water is currently collected in a 1,500-gallon AST, where it is tested for measureable radioactivity prior to discharge.	**PCBs** PCBs potentially associated with equipment lubricating oils or waste streams.	Collected sample targeting the southern portion of the drum storage area (RMBS0047 at 1 foot bgs).	PCB results are shown on Figure C.3-4A. PCBs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. PCBs not detected at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 36 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
10a	**Asphalt Drainage Swale** The asphalt drainage swale was constructed along the northern boundary of the RMHF fenced area in 1959 to convey surface water to the RMHF and Building 4028 Catch Basin (also known as Building or 'Site' 4614) (CUA 10c). The swale begins at the northeastern corner of the RMHF fence line, north of Building 4688 and the Drum Storage Area (CUA 9c). It then follows the RMHF fence line to the western boundary. The swale follows the western boundary line for approximately 50 feet and terminates at a culvert that leads into the Catch Basin Drainage Channel (CUA 10d). Using this surface water conveyance, water could be tested for radioactive content before release into the surface water system rather than potentially releasing water into the surrounding area. Surface water was conveyed to the Catch Basin and tested for permissible radioactivity content before released to the Catch Basin Discharge Pipeline (CUA 10c), then to surface drainages and, ultimately, to the R-2 Pond (SWMU 5.26). The asphalt drainage swale was relocated approximately 20 feet north in the mid-1960s when the site was expanded to construct Buildings 4664 and 4665 (CUA 8a and 8b, respectively). The asphalt drainage swale is still active, but currently discharges to the aboveground pipeline and 1,500-gallon AST following the removal of the Catch Basin in 2006. There have been two documented spills in the drainage swale. In both spills, small volumes (less than 10 gallons) of radioactive water were released to the asphalt drainage swale due to malfunctions at the Building 4664 flocculation tower (CUA 8a). Soils in the current location of the drainage swale are silty sand (SM) extending up to 1.0 to 2.3 feet bgs. The area to the south and east of the asphalt-paved swale is also paved, but the area to the north and west of the swale is an unpaved, steep	**TPH** Drainage swale received surface water from areas of RMHF where there was documented used and/or storage of petroleum-based fuels and waste oils.	Collected one soil matrix sample at each of three targeted locations along the asphalt drainage swale (RMBS0051 through RMBS0053 at 0.75 to 1 foot bgs).	TPH results shown on Figures C.3-3A through C.3-3C. Diesel range organics (C15 – C20) were detected in two samples and lubricant oil range organics (C21 – C30) were detected in all three samples, up to 3.7 mg/kg and 20.4 mg/kg, respectively. All detected concentrations were below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Targeted locations along the drainage swale adequately characterize petroleum hydrocarbons. Based on sampling results indicating petroleum hydrocarbons below RBSLs, no further characterization necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at targeted sampling locations. The area comprising the far eastern portion of the asphalt drainage swale and hill slope below, and the former Filter/Blower Area pipeline discharge point is recommended for further evaluation in the CMS based on metals; are not recommended for CMS based on petroleum hydrocarbon concentrations.	YES Volume based on metals as described below.
		Metals Drainage swale received surface water from areas of RMHF where there was documented used and/or storage of metals and metallic wastes.	Collected one soil matrix sample at each of three targeted locations along the asphalt drainage swale (RMBS0051 through RMBS0053 at 0.75 to 1 foot bgs).	Metals results are shown on Figure C.3-6B and C.3-6D. Four metals were detected above background along the asphalt drainage swale. Three at the easternmost sample (RMBS0051): • Cobalt at 48 mg/kg (background 21 mg/kg), slightly above the ResRBSL (22 mg/kg). • Selenium at 0.76 mg/kg (background 0.655 mg/kg) • Zinc at 520 mg/kg (background 110 mg/kg) Chromium was also detected just above background at 37.7 mg/kg (background 36.8 mg/kg) in down-swale sample (RMBS0052); hexavalent chromium was detected in westernmost sample (RMBS0053) at 0.225 mg/kg, equivalent to the EcoRBSL (0.2 mg/kg) and below the ResRBSL (110 mg/kg). No other metals were detected above background or RBSLs at the down-swale locations (RMBS0052 and RMBS0053). EcoRBSLs for cobalt, selenium, and zinc (8.95, 0.17, and 20.8 mg/kg, respectively) are below background concentrations. The highest metals concentrations were detected in the easternmost sample location, RMBS0051 and metals were mostly below background in the two down-swale samples. Metals were not detected above background at the RMHF Drainage Channel (CUA 10b) or the RMHF Catch Basin (CUA 10c), which receive	YES. The area comprising the far eastern portion of the asphalt drainage swale and hill slope below, and the former Filter/Blower Area pipeline discharge point is recommended for further evaluation in the CMS based on cobalt and zinc concentrations.	YES Volume is based on analytical results within the swale and downslope, swale configuration, and topography.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 37 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	sloped area.			drainage from the asphalt drainage swale. Targeted locations along the drainage swale adequately characterize metals. Based on sampling results indicating metals above background primarily in the easternmost sample, no further characterization is necessary.		
10b, 14b	**Catch Basin Drainage Channel, RMHF Catch Basin Drainage Channel Excavation Area** The Catch Basin Drainage Channel (CUA 10b) was a narrow asphalt channel constructed in approximately 1961 to convey surface water from the RMHF fenced area to the RMHF Catch Basin (CUA 10c) for storage pending analysis for radiological constituents. The channel was active until 2006 when the Catch Basin and channel were removed as part of on-going ETEC D&D activities. The channel was replaced with an aboveground pipeline. During the RMHF Catch Basin Final Survey conducted by Cabrera in 2006, two areas of elevated radioactivity were detected, one of which was in the area of the former Drainage Channel. The area measured approximately 160 square-feet, extending to a depth of 0.5 feet bgs. Approximately 80 cubic feet of soil was removed during the excavation. The area was not graded or backfilled following the removal. Three documented releases of radioactive water at the RMHF RFI Site have resulted in contaminated water entering the RMHF Catch Basin, including the overflow of Holding Tank T-1 (CUA 1c) and Building 4664 flocculation system malfunctions (CUA 8a). Soils in the area are silty sand and silty sand with gravel (SM), up to 1 foot deep. The area surrounding the former drainage channel is a steep, vegetated slope that drains to the west.	**VOCs** Catch Basin Drainage Channel conveyed surface water from RMHF fenced area where there was documented use and/or storage of solvents, including chlorinated solvents.	<u>Soil Vapor</u> No soil vapor samples were collected due to shallow soil. <u>Soil Matrix</u> Collected one sample targeting the drainage channel and excavation area (RMBS0055 at 1 foot bgs). Collected samples at two representative locations downslope to the northwest and southwest to assess potential release from the drainage channel (RMBS115 and RMBS116, both at 1 foot bgs).	VOC results shown on Figure C.3-1C. Methylene chloride and styrene were detected at the location targeting the drainage channel/excavation up to 2.76 µg/kg (methylene chloride), below RBSLs. VOCs were detected in hill slope samples (RMBS0015 and RMBS0016), including m-xylene & p-xylene up to 0.58 µg/kg (both samples) and methylene chloride at 3.43 µg/kg (RMBS0115), also below RBSLs. Targeted and representative locations in the channel and on adjacent hill slope adequately characterize VOCs. Based on results, indicating VOCs present at concentrations below RBSLs, no further characterization necessary.	YES. VOCs detected at low concentrations below RBSLs at representative and targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs / Terphenyls Catch Basin Drainage Channel conveyed surface water from RMHF fenced area where there was documented use and/or storage of petroleum-based fuels, oils, and other chemicals.	Collected sample at one location targeting the center of the drainage channel (RMBS0056 at 0.75 feet bgs).	SVOC results shown on Figure C.3-2C. PAHs, including benzo (a) pyrene, were detected s up to 59.1 µg/kg (fluoranthene). Benzo(a)pyrene was detected at 20.3 µg/kg, well below the Res and EcoRBSL (60 and 5,600 µg/kg, respectively). All other PAHs detected were at concentrations below RBSLs. Phthalates were not detected at this location. Terphenyls were not detected. Based on targeted channel sampling results indicating SVOCs below RBSLs, no further characterization is necessary.	YES. SVOCs detected at low concentrations below RBSLs at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 38 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	The surface water in the area of the former RMHD drainage channel flows northeast towards a natural drainage and continues in a northeasterly direction and joins with the drainage north of the RMHF at the NPDES Outfall 003.	**TPH** Catch Basin Drainage Channel conveyed surface water from areas of RMHF where there was documented use and/or storage of petroleum-based fuels and waste oils.	Collected soil matrix samples at two locations targeting the drainage channel, including the drainage channel excavation area (RMBS0055 and RMBS0056 at 1 foot and 0.75 feet bgs, respectively). Collected samples at two representative locations downslope to the northwest and southwest to assess potential release from the drainage channel (RMBS115 and RMBS116 at 1 foot bgs).	TPH results shown on Figure C.3-3C. Lubricant oil range organics (C20 – C30) were detected in both channel samples up to 41.6 mg/kg and both hill slope samples up to 17.3 mg/kg. Diesel range organics (C15 – C20) were detected in one channel sample and one hill slope sample up to 1.3 mg/kg. All detected concentrations were below the ResRBSL of 1,400 mg/kg for kerosene, diesel, and lubricant oil range organics (C12 – C30) . Targeted and representative locations in the channel and on adjacent hill slope adequately characterize TPH. Based on results indicating TPH detected below RBSLs, no further characterization is necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at targeted and representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Catch Basin Drainage Channel conveyed surface water from areas of RMHF where there was documented use and/or storage of metals and metallic wastes.	Collected soil matrix samples at two locations targeting the drainage channel, including the drainage channel excavation area (RMBS0055 and RMBS0056 at 1 foot and 0.75 feet bgs, respectively). Collected samples at two representative locations downslope to the northwest and southwest to assess potential release from the drainage channel (RMBS115 and RMBS116 at 1 foot bgs).	Metals results are shown on Figure C.3-6E. Metals were detected within background range at targeted and representative sampling locations No further characterization is necessary.	YES. Metals detected within background concentration ranges.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Inorganics Catch Basin Drainage Channel conveyed surface water from areas of RMHF where there was documented use and/or storage of inorganic chemicals and wastes.	Collected soil matrix sample at one targeted locations along the drainage channel (RMBS0056 at 0.75 feet bgs).	Inorganics results are shown on Figure C.3-6C. Chloride, fluoride, and sulfate were detected up to 8.76 mg/kg (chloride). Fluoride was detected up to 0.98 mg/kg, within background range (6.7 mg/kg). There are no established background concentrations or RBSLs for nitrate and sulfate. Cyanides were detected at 0.69 mg/kg , below both Res and EcoRBSLs (1,500 and 290 mg/kg, respectively). Based on targeted sampling results indicating inorganics at low concentrations and/or within background range, no further characterization is necessary.	YES. Inorganics detected at low concentrations and or within background.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 39 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs PCBs potentially associated with equipment lubricating oils or waste streams in areas that drained to Catch Basin Drainage Channel.	Collected soil matrix sample at one targeted locations along the drainage channel (RMBS0056 at 0.75 feet bgs).	PCB results are shown on Figure C.3-4B. Aroclor 1260 was detected at 2.9 µg/kg, well below Res and EcoRBSLs (140 and 77 µg/kg, respectively). No further characterization is necessary.	YES. PCBs detected at low concentrations below RBSLs.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Perchlorate Perchlorate use and/or storage is not documented at the RMHF RFI Site but was assessed at the Catch Basin Drainage Channel for site characterization.	Collected soil matrix samples at two representative locations along the drainage channel and the drainage channel excavation area (RMBS0055 and RMBS0056 at 1.0 and 0.75 feet bgs, respectively). Collected samples at two representative locations downslope to the northwest and southwest to assess potential release from the drainage channel (RMBS115 and RMBS116, both at 1 foot bgs).	Perchlorate was not detected at the representative sample locations. Based on representative sampling results, no further characterization is necessary.	YES. Perchlorate not detected at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
10c, 13f	**Building 4614 RMHF Catch Basin, Debris Area G07-1015** The RMHF Catch Basin (CUA 10c) was constructed in approximately 1961 to serve as a drainage sump and control system for the RMHF, Building 4028 Shield Test Irradiation Reactor (STIR) Building (CUA 11a), and Building 4024 SNAP Environmental Test Facility. Surface water was conveyed from the RMHF fenced area via the Asphalt Drainage Swale (CUA 10a) that discharged into the Catch Basin Drainage Channel (CUA 10b) and Catch Basin. Building 4028 discharged to the Catch Basin via an asphalt-paved channel adjacent to the northern border of Building 4028. Water retained in the RMHF Catch Basin was sampled for radioactive content before it was pumped to the Catch Basin Discharge Pipeline (CUA 10d) and ultimately released to the R-2 Pond (SWMU 5.26) via the Discharge Pipeline (CUA 10d) and both lined and unlined surface drainages.	**VOCs** RMHF Catch Basin received surface water from the RMHF fenced area where there was documented used and/or storage of solvents, including chlorinated solvents, and petroleum-based fuels.	<u>Soil Vapor</u> Collected soil vapor sample at one representative location within the discharge drain to catch basin (U7SV0011 at 5.25 and 8.75 feet bgs). <u>Soil Matrix</u> Collected samples at two locations targeting the former catch basin (RMBS0054 at 1 foot bgs) and within the excavation area (RMBS0114 at 1 foot bgs). Both sample locations are within the debris area.	VOC results shown on Figure C.3-1D. <u>Soil Vapor</u> VOCs were not detected . <u>Soil Matrix</u> Methylene chloride, m-xylenes and p-xylenes, and styrene were detected at RMBS0114 up to 3.93 µg/kg (methylene chloride). VOCs were not detected at RMBS0054. All detected VOCs were below Res and EcoRBSLs. Based on targeted sample results indicating limited (one sample) VOCs below RBSLs, no further characterization is necessary.	YES. Limited VOCs at low concentrations below RBSLs.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs RMHF Catch Basin received surface water from RMHF fenced area where there was documented use and/or storage of petroleum-based fuels, oils, and other chemicals.	Collected sample targeting the former catch basin (RMBS0054 at 1 foot bgs). This sample location is also within the debris area.	SVOC results are shown on Figure C.3-2C. PAHs and phthalates were detected up to 18 µg/kg (fluoranthene) and 7.74 µg/kg (bis(2-ethylhexyl) phthalate), respectively. Benzo(a)pyrene was detected at 7.82 µg/kg, below the Res and EcoRBSLs (60 and 5,600 µg/kg, respectively). All detected SVOCs below RBSLs. Based on targeted sampling results indicating SVOCs below RBSLs, no further characterization is necessary.	YES. SVOCs detected at low concentrations below RBSLs at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 40 of 62)

Map Key[1]	Chemical Use Area Name Status, How Used and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored[2]	Sampling Scope and Rationale[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	Sampling Results[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	Potential concentration gradients sufficiently characterized for risk assessment?[5]	Is delineation sufficient to estimate soil volume in CMS?[6,7] (see Figure C.5-1 for CMS areas)
	Three documented releases of radioactive water at the RMHF RFI Site have resulted in contaminated water entering the RMHF Catch Basin, including the overflow of the Holding Tank T-1 (CUA 1c) and Building 4664 flocculation system malfunctions (CUA 8a). In 2006, the RMHF Catch Basin and Catch Basin Drainage Channel were removed as part of D&D operations. A 1,500-gallon polyurethane tank and aboveground pipeline replaced the removed Catch Basin and drainage. The pond and drainage were removed and approximately 20 cubic yards of soil were excavated. The area was not backfilled. Two additional areas of elevated radioactivity were detected during the Catch Basin Final Survey and subsequently excavated (CUA 14b and 14c). Following the excavations, the Catch Basin was released for unrestricted use in 2007. A debris area (CUA 13f) was noted in the area immediately surrounding the former RMHF Catch Basin during the 2008 Waste Debris Survey. The area is approximately 10,000 square-feet and was observed to contain demolition debris, including concrete, asphalt, metal, and fence posts. The observed debris was believed to be remnants of the former RMHF Catch Basin. Soils in the area are silty sand and silty sand with gravel (SM), extending from 0.9 to 2.3 feet deep. The Catch Basin had a concrete slip that extended approximately 8 feet from the basin perimeter. The area is currently unpaved and vegetated. The debris area is bisected by a surface water divide, which occurs approximately 25 feet south of the former RMHF Catch Basin (CUA 10c). The surface water in the area east of the divide flows northeast towards a natural drainage and continues in a northeasterly direction and joins with the drainage north of the RMHF. Surface water in the area west of the divide flows northwest towards the drainage north of the RMHF RFI Site, which continues in a northwesterly direction. The two drainages converge approximately 1,300 feet northwest of the SSFL property boundary and continue to flow in a northwesterly direction.	**TPH** RMHF Catch Basin received surface water from RMHF fenced area where there was documented use and/or storage of petroleum-based fuels and waste oils.	Collected samples at two locations targeting the former catch basin (RMBS0054 at 1 foot bgs) and adjacent to the catch basin within the excavation area (RMBS0114 at 1 foot bgs). Both sample locations are within the debris area.	TPH results shown on Figure C.3-3C. Lubricant oil range organics (C20 – C30) were detected in both samples up to 23.9 mg/kg (RMBS0114). No other petroleum hydrocarbon ranges were detected. All detected concentrations were below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on targeted sampling results indicating low lubricant oil range organics below RBSLs, no further characterization necessary.	YES. Lubricant oil range organics detected at low concentrations below RBSLs.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals RMHF Catch Basin received surface water from RMHF fenced area where there was documented use and/or storage of metals and metallic wastes.	Collected samples at two locations targeting the former catch basin (RMBS0054 at 1 foot bgs) and adjacent to the catch basin within the excavation area (RMBS0114 at 1 foot bgs). Both sample locations are within the debris area. Collected sample at one representative location in the southwest portion of the debris area (U7BS0020 at 1 foot bgs).	Metals results are shown on Figure C.3-6E. Metals were detected at concentrations within background range at targeted and representative sampling locations. Based on targeted sampling results, no further characterization is necessary.	YES. Metals within background range at targeted and representative locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs RMHF Catch Basin received surface water from RMHF fenced area where there was documented use and/or storage of PCB-containing oils and wastes.	Collected sample targeting the former catch basin (RMBS0054 at 1 foot bgs). This sample location is also within the debris area.	PCB results are shown on Figure C.3-4B. PCBs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. PCBs not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Perchlorate Perchlorate use and/or storage are not documented at the RMHF RFI Site. Perchlorate assessed at the RMHF Catch Basin for site characterization since it represents a potential collection point.	Collected samples at two representative locations within the former catch basin (RMBS0054) and the catch basin excavation area (RMBS0114) at 1 foot bgs. These samples are also within the identified debris area.	Perchlorate was not detected at the targeted sample location. Based on targeted sampling results, no further characterization is necessary.	YES. Perchlorate not detected at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 41 of 62)

Map Key[1]	Chemical Use Area Name Status, How Used and Physical Characteristics (see text for Site History)	Potential Chemicals Used / Stored[2]	Sampling Scope and Rationale[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	Sampling Results[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	Potential concentration gradients sufficiently characterized for risk assessment?[5]	Is delineation sufficient to estimate soil volume in CMS?[6,7] (see Figure C.5-1 for CMS areas)
10d	**Catch Basin Discharge Pipeline** The Catch Basin Discharge Pipeline is a transite pipeline constructed in approximately 1961 to conveyed water pumped from the RMHF Catch Basin (CUA 10c) to the surface drainage on G Street. Water was pumped from the Catch Basin after it was analyzed and determined to be below acceptable levels of radioactivity. The underground Discharge Pipeline runs approximately 380-feet south and discharges Catch Basin water to a drainage culvert on north side of 17th Street adjacent to Building 4025 Sodium Component Maintenance. The water then flows along surface drainage channels, both lined and unlined southeast to G Street and to the 17th Street Pond, which discharges to the R-2 Pond (SWMU 5.26) via natural, unlined drainage channels. Soils along the pipeline are predominantly silty sand (SM) with areas of silty sand with gravel, extending 0.8 to 4.0 feet bgs. The area overlying the pipeline is primarily developed and paved.	**VOCs** Catch Basin Discharge Pipeline conveyed surface water from areas of RMHF where there was documented used and/or storage of solvents, including chlorinated solvents.	<u>Soil Vapor</u> No soil vapor samples were collected due to shallow soil. <u>Soil Matrix</u> Collected samples at one location targeting the southern portion of the discharge pipeline (RMBS0060 at 0.75 feet bgs).	VOC results shown on Figure C.3-1D. VOCs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. VOCs not detected at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Catch Basin Discharge Pipeline conveyed surface water from areas of RMHF where there was documented used and/or storage of petroleum-based fuels and waste oils.	Collected soil matrix samples at five locations targeting the discharge pipeline and at the discharge point (RMBS0057 through RMBS0061 at 1.0 to 1.5 feet bgs).	TPH results shown on Figure C.3-3C. Lubricant oil range organics (C21 – C30) were detected in all four samples, with concentrations up to 205 mg/kg at RMBS0057 and 468 mg/kg at RMBS0059. Remaining samples were less than 20 mg/kg, and no other hydrocarbon ranges were detected. All detected concentrations were below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on targeted sampling results indicating detected petroleum along the pipeline below RBSLs, no further characterization necessary.	YES. Petroleum hydrocarbons detected below RBSLs at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Catch Basin Discharge Pipeline conveyed surface water from areas of RMHF where there was documented used and/or storage of metals and metallic wastes.	Collected soil matrix samples at five targeted locations along the discharge pipeline and at the discharge point (RMBS0057 through RMBS0061 at 1 to 1.5 feet bgs; RMBS0059 also sampled at 4 feet bgs for sodium).	Metals results are shown on Figure C.3-6E. Sodium was detected above background (110 mg/kg) at three of the five locations up to 655 mg/kg (RMBS0060, 1.5 feet bgs). There are no Res or EcoRBSLs established for sodium. Selenium was detected at 2.7 mg/kg at one of the five representative location (RMBS0057, 1 foot bgs), above background (0.655 mg/kg), but below the ResRBSL (380 mg/kg). The EcoRBSL for selenium (0.17 mg/kg) is less than the maximum background concentration. A confirmation sample collected at the same location contained selenium within background range, and selenium was within background range in all other samples – indicating limited soil containing selenium above background. Based on targeted sampling results, indicating sodium above background and one other metal above background in one isolated sample; no further characterization is necessary.	YES. Metals detected below background, detected above background at one isolated location, or have no associated risk (sodium).	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 42 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		Perchlorate Perchlorate use and/or storage are not documented at the RMHF RFI Site. Perchlorate assessed along the RMHF Catch Basin Discharge Pipeline for site characterization.	Collected soil matrix samples at five targeted locations along the discharge pipeline and at the discharge point (RMBS0057 through RMBS0061 at 1 to 1.5 feet bgs).	Perchlorate was not detected at targeted sample locations Based on targeted sampling results, no further characterization is necessary.	YES. Perchlorate not detected at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
11a, 11b	**Building 4028 Shield Test Reactor (STR) / STIR / Liquid Metal Fast Breeder Reactor (LMFBR) Building (11a); Building 4811 STR / STIR / LMFBR Mechanical Support Pad (11b)** Building 4028 was constructed in 1961 to perform tests of space reactor shields using a fission plate driven by neutrons from a swimming-pool type reactor in support of the ETEC SNAP program. The building is comprised of two areas. The below grade portion of the building (the shield test room) was constructed of reinforced concrete and designed to expose materials to defined sources of neutrons and gamma radiation. The above-grade portion of the building (the reactor support building) was a standard prefabricated steel structure containing a 50 kW pool-type reactor, control room, laboratory, and change room. Personnel access to the shield test room was provided by a concrete passageway built to control potential releases of radiation. Building 4811 STR / STIR / LMFBR Mechanical Support Pad (CUA 11b) was constructed atop the shield test reactor portion of the building to support STR testing activities. The original building configuration, called STR, was operated during this period using a 50-kW reactor. The STR configuration operated from 1961 to 1964. In 1964, Building 4028 was modified to operate with a 1-MW reactor and renamed STIR. The STIR configuration operated from 1964 to 1972. In 1973, the Building 4028 reactor fuel was removed and disposed and the pool-type reactor water was drained. The building was decommissioned and made available	**VOCs** Use of solvents and petroleum-based fuels not documented; equipment at Buildings 4028 and 4811 may have used solvents or coolants.	<u>Soil Vapor</u> Collected soil vapor samples at two representative locations at the former Building 4028 (U7SV0018 and U7SV0021 at 5.0 to 19.5 feet bgs), and downslope of the operational areas (U7SV0011 at 5.25 and 8.75 feet bgs. <u>Soil Matrix</u> Collected one soil matrix sample (U7BS0023 at 1 foot bgs) at the former mechanical support pad (no soil vapor due to thin soil).	VOC results shown on Figure C.3-1D. Benzene detected at 0.04 µg/L at the southern Building 4028 sample location (U7BS0018 at 5 feet bgs), below Res and EcoRBSLs (0.095 and 0.57 µg/L, respectively). VOCs were not detected at other sample depths at this location or the two other soil vapor locations. VOCs were not detected in soil matrix sample collected at Building 4811. Based on representative sampling results indicating low level VOCs below RBSLs, no further characterization is necessary.	YES. VOCs detected at low concentrations below RBSLs at one of three representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs Use petroleum-based fuels or lubricating oils potentially containing SVOCs not documented in this area; equipment at Buildings 4028 and 4811 may have used petroleum-based fuels or oils.	Collected soil matrix samples at eight representative locations around Building 4028, 4811 and adjacent areas: • At the former Buildings 4028 and 4811 footprint (U7BS0018, U7BS0021 through U7BS0023 at 0.5 to 5 feet bgs) • Adjacent to the former building footprint (U7BS007, U7BS008, U7BS0010, and U7BS0011 (downslope) at 1 foot bgs) .	SVOC results are shown on Figure C.3-2D. PAHs and phthalates were detected at three of four locations at the former Building 4028 and 4811 footprints (U7BS0021 through U7BS0023) up to 23.2 µg/kg (benzo[b]fluoranthene, U7BS0021). Benzo(a)pyrene was detected at 15 µg/kg at one location (U7BS0021). All SVOCs were detected below Res and EcoRBSLs. SVOCs were not detected at locations adjacent to operational areas. Based on representative sampling results indicating SVOCs detected below RBSLs, no further characterization is necessary.	YES. SVOCs detected at low concentrations well below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 43 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	for alternate use in 1976. Beginning in 1977, Building 4028 was operated as the LMFBR or Arc Melt Facility to investigate the behavior of molten uranium dioxide relative to simulated reactor accidents, particularly related to flooring and structural materials. The tests were conducted at the minimum scale necessary to simulate post-accident heat removal conditions. LFMBR activities continued through 1981. Building 4811 was an uncovered equipment pad constructed in 1961 to support Building 4028 test activities (CUA 11a). The equipment pad was constructed atop the below-grade shield test reactor portion of Building 4028. During the Building 4028 STR test period, Building 4811 included a 15-ton capacity water refrigeration system, airblast heat exchanger, air-cooled condenser, ventilation system, and water storage tank. During the STIR test period, the heat exchanger was upgraded and the water refrigeration system was replaced with a one-cell, induced draft counter-flow cooling tower. The equipment configuration for the LFMBR test period is not specified. In 1984, the building became inactive under periodic surveillance. Building 4028 was also used as a fuel storage vault for 300 pounds of normal and depleted uranium oxide from 1977 through 1988. Initial D&D activities were initiated in 1988 and the aboveground portion of Building 4028 and 4811 were demolished in 1989. Building 4028 was released to unrestricted use in 1995 and the below-grade features were demolished in 1997. The area was backfilled with soil from an unspecified borrow source and graded. Soils in the area are predominantly sandy silt and sandy silt with gravel (SM) with some occurrence of clayey sand (SC), and lean clay (LC). Soil depth ranges from 2 feet to 20 feet bgs. Some asphalt and concrete debris were noted from 5 to 8 feet bgs at a sample collected at the northern portion of the building footprint. Wood debris was noted at 10 feet bgs in the southeast corner of	**TPH** Use of petroleum-based fuels not documented at Building 4028; equipment at Buildings 4028 and 4811 may have used petroleum-based fuels or oils.	Collected soil matrix samples at eight representative locations around Building 4028, 4811 and adjacent areas: • At the former Buildings 4028 and 4811 footprint (U7BS0018, U7BS0021 through U7BS0023 at 0.5 to 5 feet bgs) • Adjacent to the former building footprint (U7BS007, U7BS008, U7BS0010, and U7BS0011 (downslope) at 1 foot bgs)	TPH results are shown on Figure C.3-3C. Lubricant oil range organics (C20 – C30) were detected at all four building footprint locations and two adjacent locations up to 47.3 mg/kg (max at downslope location U7BS0011). No other petroleum hydrocarbon ranges were detected. All detected concentrations were below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on representative sampling results, indicating petroleum hydrocarbons detected at concentrations below RBSLs, no further characterization necessary.	YES. Lubricant oil range organics detected below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals potentially associated with reactor tests conducted at the facility.	Collected soil matrix samples at eight representative locations around Building 4028, 4811 and adjacent areas: • At the former Buildings 4028 and 4811 footprint (U7BS0018, U7BS0021 through U7BS0023 at 0.5 to 5 feet bgs) • Adjacent to the former building footprint (U7BS007, U7BS008, U7BS0010, and U7BS0011 (downslope) at 1 foot bgs)	Metals results are shown on Figure C.3-6B and C.3-6E. Selenium and sodium were detected above background at two of the eight representative sample locations: • Selenium: 0.73 mg/kg adjacent to the former building footprint (U7BS0008) (background of 0.655 mg/kg) • Sodium: 284 mg/kg at within the former building footprint (U7BS0018) (background of 110 mg/kg) Metals are within background range at all other locations. Based on representative sampling results indicating slight exceedance of background for selenium and elevated sodium at one location, no further characterization is necessary.	YES. Metals detected at concentrations below or near background concentrations or do not have associated risk (sodium).	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 44 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	the former footprint. During the operational period, areas around the buildings were paved with concrete and/or asphalt, but have been unpaved since 1997. Prior to building demolition and removal, surface water in the area was conveyed to the RMHF Catch Basin (CUA 10b) by a paved channel. Currently surface water discharges to the northwest via infiltration to a natural drainage.					
13a	**Building 4664 Debris Area** A disturbed soil and debris area was noted in the a sloped, unpaved, vegetated area north of Building 4664 and the RMHF fence line in a 1976 historical photograph. The area measures approximately 3,600-square feet. The cause of soil disturbance was not described in historical documents. The debris was not observed during the 2008 waste debris survey. Soil in the area are silty sands (SM) extending to depths of approximately 1 to 2 feet bgs. Surface water in the area flows northwest via sheet flow to a natural drainage north of the RMHF, which continues west through Outfall 003 and offsite in a northwesterly direction.	**VOCs** VOCs assessed to characterize debris area.	<u>Soil Vapor</u> No soil vapor samples collected due to shallow soils. <u>Soil Matrix</u> Collected samples at two representative locations within debris area (RMBS0068 [southern, upslope] and RMBS0069 [northern, downslope], at 1 and 2.25 feet bgs, respectively). Collected samples at one location downslope of the debris area (RMBS0070 at 1 foot bgs).	VOC results shown on Figure C.3-1C. Styrene was detected at 0.33 µg/kg at the southern, upslope debris location (RMBS0068). Methylene chloride and m- and p-xylenes up to 3.47 µg/kg (methylene chloride) were detected in the northern, downslope debris location (RMBS0069). Styrene was also detected in the downslope sample RMBS0070. Detected VOCs were below Res and EcoRBSLs. Based on results indicating VOCs detected are below RBSLs, no further characterization is necessary.	YES. VOCs detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs assessed to characterize debris area.	Collected samples at two representative locations within debris area (RMBS0068 [southern, upslope] and RMBS0069 [northern, downslope], at 1 and 2.25 feet bgs, respectively). Collected samples at one location downslope of the debris area (RMBS0070 at 1 foot bgs).	SVOC results are shown on Figure C.3-2A and C.3-2C. PAHs and phthalates were detected up to 89.7 µg/kg (fluoranthene, RMBS0068). Benzo(a)pyrene was detected at both debris area sample locations up to 42.8 µg/kg (RMBS0068), below the Res and EcoRBSLs (60 and 5,600 µg/kg, respectively). SVOCs were not detected in downslope sample RMBS0070. All detected SVOCs were below RBSLs. Based on results indicating detected SVOCs are below RBSLs, no further characterization is necessary.	YES. SVOCs detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 45 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		TPH Petroleum hydrocarbons assessed to characterize debris area.	Collected samples at two representative locations within debris area (RMBS0068 [southern, upslope] and RMBS0069 [northern, downslope], at 1 and 2.25 feet bgs, respectively). Collected samples at one location downslope of the debris area (RMBS0070 at 1 foot bgs).	TPH results are shown on Figure C.3-3A and C.3-3B. Kerosene range organics (C12 – C14) and lubricant oil range organics (C21 – C30) were detected at 1.74 mg/kg and up to 11.2 mg/kg, respectively. Detected concentrations were below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Petroleum hydrocarbons were not detected in downslope sample RMBS0070. Based on sampling results, indicating low petroleum hydrocarbon concentrations below RBSLs, no further characterization necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize debris area.	Collected samples at two representative locations within debris area (RMBS0068 [southern, upslope] and RMBS0069 [northern, downslope], at 1 and 2.25 feet bgs, respectively). Collected samples at one location downslope of the debris area (RMBS0070 at 1 foot bgs).	Metals results are shown on Figure C.3-6D. Zinc was detected at 113 mg/kg at one of the two representative locations (RMBS0068, 1 foot bgs), equivalent to the background concentration (110 mg/kg) and below the ResRBSL (23,000 mg/kg). The EcoRBSL for zinc (20.8 mg/kg) is below the maximum background concentration. All other metals were within background range. Based on representative sampling results indicating metals detected within background range, no further characterization is necessary.	YES. Metals detected within or approximately equal to background ranges.	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs PCBs assessed to characterize debris area.	Collected samples at two representative locations within debris area (RMBS0068 [southern, upslope] and RMBS0069 [northern, downslope], at 1 and 2.25 feet bgs, respectively). Collected samples at one location downslope of the debris area (RMBS0070 at 1 foot bgs).	PCB results are shown on Figure C.3-4A. Aroclors 1242, 1254 and 1260 were detected up to 10.6 µg/kg (Aroclor 1242, RMBS0070), below Res and EcoRBSLs. Based on representative sampling results indicating PCBs detected at concentrations well below RBSLs, no further characterization is necessary.	YES. PCBs detected well below RBSLs at representative locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 46 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
13b	**Building 4075 Debris Area (G07-2044 and G07-2045)** A disturbed soil and debris area was noted in the sloped, unpaved, vegetated area north of Building 4075 and the RMHF fence line in a 1976 historical photograph. The area measures approximately 1,400-square feet. The cause of disturbance was not documented in historical documents. During the 2008 debris survey, the area was noted as containing large concrete blocks, small concrete fragments, asphalt and metal wire. CUA 13b is defined as including the two debris locations identified during the survey and the surrounding area. Soils in the area are silty sand to silty sand with gravel (SM), approximately 1 to 2 feet thick. Surface water in the area flows northwest via sheet flow to a natural drainage north of the RMHF, which continues west through NPDES Outfall 003 and offsite in a northwest direction.	**VOCs** VOCs assessed to characterize debris area.	<u>Soil Vapor</u> No soil vapor samples collected due to shallow soils. <u>Soil Matrix</u> Collected samples targeting the two locations identified in the 2008 Waste Debris Survey (RMBS0066 [southern debris area, G07-2045] and RMBS0067 [northern debris area, G07-2044] at 0.75 and 1 foot bgs, respectively).	VOC results shown on Figure C.3-1C. Methylene chloride and styrene were detected at 2.23 µg/kg and 0.347, respectively, at southern debris area (RMBS0066). Detected VOCs were below Res and EcoRBSLs (4 µg/kg and 25,000 µg/kg, respectively, for methylene chloride). VOCs were not detected at the northern debris area. Based on these results, indicating detected VOCs are at concentrations below RBSLs, no further characterization is necessary.	YES. VOCs detected at low concentrations below RBSLs at one of two targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs assessed to characterize debris area.	Collected samples targeting the two locations identified in the 2008 Waste Debris Survey (RMBS0066 [southern debris area, G07-2045] and RMBS0067 [northern debris area, G07-2044] at 0.75 and 1 foot bgs, respectively).	SVOC results are shown on Figure C.3-2C. PAHs were detected up to 118 µg/kg (pyrene) at southern, upslope sample RMBS0066. Benzo(a)pyrene was detected in this sample at 47.3 µg/kg, below Res and EcoRBSLs (60 and 5,600 µg/kg, respectively). PAHs and phthalates were detected at very low concentrations (up to 1.5 µg/kg di-n-butyl phthalate) in northern debris area (RMBS0067). All detected SVOCs were below RBSLs. Based on targeted sampling results indicating SVOCs at low concentrations below RBSLs, no further characterization is necessary.	YES. SVOCs detected at low concentrations below RBSLs at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Petroleum hydrocarbons assessed to characterize debris area.	Collected samples targeting the two locations identified in the 2008 Waste Debris Survey (RMBS0066 [southern debris area, G07-2045] and RMBS0067 [northern debris area, G07-2044] at 0.75 and 1 foot bgs, respectively).	TPH results are shown on Figure C.3-3C. Diesel range organics (C15 – C20) and lubricant oil range organics (C21 – C30) were detected in the southern debris area up to 18.5 mg/kg (lubricant oil range organics, RMBS0066). Lubricant oil range organics were detected at 6.4 mg/kg in northern debris area (RMBS0067). All detected concentrations were below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on targeted sampling results indicating petroleum hydrocarbons detected well below RBSLs, no further characterization necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize debris area.	Collected samples targeting the two locations identified in the 2008 Waste Debris Survey (RMBS0066 [southern debris area, G07-2045] and RMBS0067 [northern debris area, G07-2044] at 0.75 and 1 foot bgs, respectively).	Metals results are shown on Figure C.3-6D. Metals were detected within background range. Based on targeted sampling results, no further characterization is necessary.	YES. Metals within background range at targeted locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 47 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs PCBs assessed to characterize debris area.	Collected samples targeting the two locations identified in the 2008 Waste Debris Survey (RMBS0066 [southern debris area, G07-2045] and RMBS0067 [northern debris area, G07-2044] at 0.75 and 1 foot bgs, respectively).	PCB results are shown on Figure C.3-4B. Aroclor 1254 and Aroclor 1260 were detected at one of the targeted locations up to 38 µg/kg (Aroclor 1254, RMBS0066), below Res and Eco RBSLs (140 and 77 µg/kg, respectively). Based on targeted sampling results indicating PCBs below RBSLs, no further characterization is necessary.	YES. PCBs detected at low concentrations below RBSLs at targeted sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
13c	**Debris Area G07-1011 and G07-2046** A debris area was noted approximately 70 feet southwest of the RMHF Catch Basin (CUA 10c) during the 2008 Waste Debris Survey. The area is approximately 3,000 square feet and was observed to contain soil piles intermixed with asphalt and concrete debris, metal pipes, and scrap metal. Soils in the area are silty sand with gravel (SM), approximately 1 foot thick. The debris area is west of the RMHF RFI Site in a sloped, unpaved, vegetated area. Surface water in the area flows west via sheet flow to a natural drainage west of the RMHF RFI Site, which continues offsite to the northwest.	**SVOCs** SVOCs assessed to characterize debris area.	Collected samples at one representative location within the debris area (U7BS0001 at 1.25 feet bgs).	SVOC results are shown on Figure C.3-2D. Butyl benzyl phthalate was detected at 6.1 µg/kg, below the Res and EcoRBSLs (377,000 and 340,000 µg/kg, respectively). No other SVOCs were detected at. Based on representative sampling results, no further characterization is necessary.	YES. SVOCs detected at low concentrations below RBSLs at representative locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Petroleum hydrocarbons assessed to characterize debris area.	Collected samples at one representative location within the debris area (U7BS0001 at 1.25 feet bgs).	TPH results are shown on Figure C.3-3C. Lubricant oil range organics (C21 – C30) were detected at 8.16 mg/kg , well below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on representative sampling results, indicating petroleum hydrocarbons detected at concentrations below RBSLs, no further characterization necessary.	YES. Lubricant oil range organics detected at low concentration below RBSL at representative sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize debris area.	Collected samples at one representative location within the debris area (U7BS0001 at 1.25 feet bgs).	Metals results are shown on Figure C.3-6F. Metals were detected within background range; no further characterization is necessary.	YES. Metals within background range at representative location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs PCBs assessed to characterize debris area.	Collected samples at one representative location within the debris area (U7BS0001 at 1.25 feet bgs).	PCB results are shown on Figure C.3-4B. Aroclor 1242 was detected at 9.5 µg/kg, below Res and EcoRBSLs (140 and 78 µg/kg, respectively). Based on representative sampling results indicating PCBs detected at below RBSLs, no further characterization is necessary.	YES. PCBs detected at low concentrations below RBSLs at representative sampling locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 48 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
13d	**Debris Area G07-1012** A debris area was noted in the area southwest of the RMHF Catch Basin (CUA 10b) during the 2008 Waste Debris Survey. The area is less than 100 square feet and observed to contain soil piles intermixed with asphalt debris. Soils in the area are silty sand (SM), less than 1 foot bgs. The debris area is west of the RMHF RFI Site in a sloped, unpaved, vegetated area. Surface water in the area flows west via sheet flow to a natural drainage west of the RMHF RFI Site, which continues offsite to the northwest.	**SVOCs** SVOCs assessed to characterize debris area.	Collected one sample targeting the debris area (U7BS0002 at 0.75 feet bgs).	SVOC results are shown on Figure C.3-2D. Butyl benzyl phthalate was detected at 5.67 µg/kg, well below the Res and EcoRBSLs (377,000 and 340,000 µg/kg, respectively). No other SVOCs were detected at the targeted sample location. Based on targeted sampling results, no further characterization is necessary.	YES. SVOCs detected below RBSLs at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Petroleum hydrocarbons assessed to characterize debris area.	Collected one sample targeting the debris area (U7BS0002 at 0.75 feet bgs).	TPH results are shown on Figure C.3-3C. Diesel range organics (C15 – C20) and lubricant oil range organics (C21 – C30) were detected up to 9.94 mg/kg (lubricant oil range organics). Detected concentrations were below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on targeted sampling results indicating petroleum hydrocarbons detected at concentrations below RBSLs, no further characterization is necessary.	YES. Petroleum hydrocarbons detected below RBSLs at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize debris area.	Collected one sample targeting the debris area (U7BS0002 at 0.75 feet bgs).	Metals results are shown on Figure C.3-6F. Sodium was detected at 209 mg/kg at the targeted sampling location, above background levels (110 mg/kg). This debris area lies within a larger disturbed soil area (CUA 15), the southern portion of which contains sodium above background at several locations. Based on targeted sampling results indicating sodium above background associated with the surrounding disturbed area, no further characterization is necessary.	YES. Metals detected below background or do not have associated risk (sodium).	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs PCBs assessed to characterize debris area.	Collected one sample targeting the debris area (U7BS0002 at 0.75 feet bgs).	PCB results shown on Figure C.3-4B. PCBs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. PCBs not detected at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 49 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
13e	**Debris Area G07-1013 and G07-1014** A debris area was noted approximately 250 feet northwest of the RMHF RFI Site during the 2008 Waste Debris Survey. The area measures approximately 2,500-square feet area and was observed to contain a soil pile intermixed with concrete, asphalt, and metal debris, and a 55-gallon drum cut in half lengthwise and partially filled with soil. CUA 13e is defined as including the two debris locations identified during the survey and the surrounding area. Soils in the area are silty sand / sandy silt (SM/ML), approximately 6 feet deep. The debris area is northwest of the RMHF RFI Site in a sloped, unpaved, vegetated area. Surface water in the area flows north via sheet flow to a natural drainage north of the RMHF, which continues and offsite in a northwesterly direction.	**VOCs** VOCs assessed to characterize debris area.	<u>Soil Vapor</u> No soil vapor samples collected. <u>Soil Matrix</u> Collected sample at one location targeting the drum in the debris area (U7BS0013 at 1 foot bgs). Based on PCE results, collected step-out samples at two locations: • Upslope within debris area (U7BS0028 at 1 foot bgs) • Downslope of debris in the natural drainage (U7BS0029 at 1 foot bgs)	VOC results shown on Figure C.3-1D. Methylene chloride, PCE, and m,p-xylenes were detected up to 2.5 µg/kg (methylene chloride). PCE was detected at 0.47 µg/kg, equivalent to the ResRBSL (0.43 µg/kg) and below the EcoRBSL (5,980 µg/kg). m,p-Xylenes were detected below RBSLs, and no other VOCs were detected. Toluene was detected at 1.26 µg/kg in the downslope step-out sample (U7BS0029), well below RBSLs. PCE was not detected in this sample and no VOCs were detected in the upslope step-out sample within the debris area. Based on results indicating VOCs detected at low concentrations below or near RBSLs, no further characterization is necessary.	YES. Detected VOCs at low concentrations at or below the ResRBSL.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs assessed to characterize debris area.	Collected sample at one location targeting a drum in the debris area (U7BS0013 at 1.5 feet bgs).	SVOC results shown on Figure C.3-2C. SVOCs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. SVOCs not detected at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Petroleum hydrocarbons assessed to characterize debris area.	Collected sample at one location targeting a drum in the debris area (U7BS0013 at 1.5 feet bgs).	TPH results are shown on Figure C.3-3C. Lubricant oil range organics (C21 – C30) were detected in targeted sample at 1.43 mg/kg. No other petroleum hydrocarbon ranges were detected. The detected concentration is below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on targeted sampling results indicating lubricant oil range organics detected below RBSL, no further characterization necessary.	YES. Lubricant oil range organics detected at very low concentration below RBSL at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize debris area.	Collected sample at one location targeting a drum in the debris area (U7BS0013 at 1.5 feet bgs).	Metals results are shown on Figure C.3-6F. Metals were detected within background range. Based on targeted sampling results, no further characterization is necessary.	YES. Metals within background at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 50 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs PCBs assessed to characterize debris area.	Collected sample at one location targeting a drum in the debris area (U7BS0013 at 1.5 feet bgs).	PCB results shown on Figure C.3-4B. PCBs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. PCBs not detected at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
13g	**Debris Area G07-1015** A debris area was observed approximately 400 feet southwest of the former RMHF Catch Basin (CUA 10c) during the 2008 Waste Debris Survey. The area measures less than 100 square-feet in area and was observed to contain two crushed five-gallon metal containers within a soil pile intermixed with asphalt and concrete. Soils in the area are silty sand (SM), approximately 1 foot thick. The debris area is southwest of the RMHF RFI Site in a sloped, unpaved, vegetated area. Surface water in the area flows north via sheet flow to a natural drainage west of the RMHF RFI Site, which continues offsite to the northwest.	**VOCs** VOCs assessed to characterize debris area.	<u>Soil Vapor</u> No soil vapor samples collected due to shallow soils. <u>Soil Matrix</u> Collected one sample at a location targeting the debris area (U7BS0014 at 1 foot bgs).	VOC results shown on Figure C.3-1D. VOCs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. VOCs not detected at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs assessed to characterize debris area.	Collected one sample at a location targeting the debris area (U7BS0014 at 0.5 foot bgs).	SVOC results shown on Figure C.3-2D. SVOCs were not detected. Based on targeted sampling results, no further characterization necessary.	YES. SVOCs not detected at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Petroleum hydrocarbons assessed to characterize debris area.	Collected one sample at a location targeting the debris area (U7BS0014 at 0.5 foot bgs).	TPH results are shown on Figure C.3-3C. Lubricant oil range organics (C21 – C30) were detected at 7.74 mg/kg. No other petroleum hydrocarbon ranges were detected. The detected concentration is below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on targeted sampling results indicating lubricant oil range organics detected below the RBSL, no further characterization is necessary.	YES. Lubricant oil range organics detected at low concentration below RBSL at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize debris area.	Collected one sample at a location targeting the debris area (U7BS0014 at 0.5 foot bgs).	Metals results are shown on Figure C.3-6F. Metals were detected within background range at the targeted sampling location; no further characterization is necessary.	YES. Metals detected within background at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 51 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs PCBs assessed to characterize debris area.	Collected one sample at a location targeting the debris area (U7BS0014 at 0.5 foot bgs).	PCB results shown on Figure C.3-4B. PCBs were not detected; no further characterization is necessary.	YES. PCBs not detected at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
13h	**Debris Area G07-1016** A debris area was observed approximately 460 feet southwest of the former RMHF Catch Basin (CUA 10c) during the 2008 Waste Debris Survey. The area measures approximately 2,500 square-feet and was observed to contain a soil pile intermixed with empty spray paint cans, ceramic insulators with attached filaments, concrete, and scrap metal. Soils in the area are silty sand (SM), approximately 2 to 5 feet deep. The debris area is southwest of the RMHF RFI Site in a sloped, unpaved, vegetated area. Surface water in the area flows north via sheet flow to a natural drainage west of the RMHF RFI Site, which continues and offsite in a northwesterly direction.	**VOCs** VOCs assessed to characterize debris area.	<u>Soil Vapor</u> No soil vapor samples collected due to shallow soils. <u>Soil Matrix</u> Collected one sample at a representative location within the debris area (U7BS0015 at 1 foot bgs).	VOC results shown on Figure C.3-1D. Methylene chloride was detected at 3.76 µg/kg, below Res and EcoRBSLs (4.0 and 25,000 µg/kg, respectively). No other VOCs were detected. Based on representative sampling results, indicating VOCs detected below Res and EcoRBSLs, no further characterization is necessary.	YES. VOCs detected at low concentrations below RBSLs at the representative location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs assessed to characterize debris area.	Collected one sample at a representative location within the debris area (U7BS0015 at 1.5 feet bgs).	SVOC results are shown on Figure C.3-2D. SVOCs were not detected. Based on representative sampling results, no further characterization is necessary.	YES. SVOCs not detected at representative location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Petroleum hydrocarbons assessed to characterize debris area.	Collected one sample at a representative location within the debris area (U7BS0015 at 1.5 feet bgs).	TPH results are shown on Figure C.3-3C. Diesel range organics (C15 – C20) and lubricant oil range organics (C21 – C30) were detected up to 17.2 mg/kg (lubricant oil range organics). No other petroleum hydrocarbon ranges were detected. Detected concentrations were below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on representative sampling results indicating petroleum hydrocarbons detected at concentrations below RBSLs, no further characterization necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSLs at representative location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize debris area.	Collected one sample at a representative location within the debris area (U7BS0015 at 1.5 feet bgs).	Metals results are shown on Figure C.3-6F. Metals were detected within background range. Based on representative sampling results, no further characterization is necessary.	YES. Metals detected within background range at representative location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs PCBs assessed to characterize debris area.	Collected one sample at a representative location within the debris area (U7BS0015 at 1.5 feet bgs).	PCB results shown on Figure C.3-4B. PCBs were not detected. Based on representative sampling results, no further characterization is necessary.	YES. PCBs not detected at representative location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 52 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
13i	**Debris Area G07-1017** A debris area was observed approximately 580 feet southwest of the former RMHF Catch Basin (CUA 10c) during the 2008 Waste Debris Survey. The area measures approximately 2,900 square-feet and was observed to contain a long narrow soil pile intermixed with concrete, asphalt, one empty spray paint can, and scrap metal. Soils in the area are silty sand (SM) approximately 1 foot deep. The debris area is southwest of the RMHF RFI Site in a sloped, unpaved, vegetated area. Surface water in the area flows north via sheet flow to a natural drainage west of the RMHF RFI Site, which continues and offsite in a northwesterly direction.	**VOCs** VOCs assessed to characterize debris area.	<u>Soil Vapor</u> No soil vapor samples collected due to shallow soils. <u>Soil Matrix</u> Collected samples at one representative location within the debris area (U7BS0016 at 0.75 feet bgs).	VOC results shown on Figure C.3-1D. VOCs were not detected. Based on representative sampling results, no further characterization is necessary.	YES. VOCs not detected at representative location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs assessed to characterize debris area.	Collected samples at one representative location within the debris area (U7BS0016 at 1 foot bgs).	SVOC results are shown on Figure C.3-2D. PAHs and phthalates were detected up to 35.5 µg/kg (benzo[b]fluoranthene). Benzo(a)pyrene was detected at 18 µg/kg, below Res and EcoRBSLs (60 and 5,600 µg/kg, respectively). All detected SVOCs below RBSLs. Based on representative sampling results indicating detected SVOCs at concentrations well below RBSLs, no further characterization is necessary.	YES. SVOCS detected at low concentrations below RBSLs at representative sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Petroleum hydrocarbons assessed to characterize debris area.	Collected samples at one representative location within the debris area (U7BS0016 at 1 foot bgs).	TPH results are shown on Figure C.3-3C. Lubricant oil range organics (C21 – C30) were detected up to 16.9 mg/kg, below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Based on representative sampling results, indicating lubricant oil range organics detected well below RBSL, no further characterization necessary.	YES. Lubricant oil range organics detected at low concentration below RBSL at representative location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize debris area.	Collected samples at one representative location within the debris area (U7BS0016 at 1 foot bgs).	Metals results are shown on Figure C.3-6F. Metals were detected at within background range. Based on representative sampling results, no further characterization is necessary.	YES. Metals detected within background at representative sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs PCBs assessed to characterize debris area.	Collected samples at one representative location within the debris area (U7BS0016 at 1 foot bgs).	PCB results shown on Figure C.3-4B. PCBs were not detected. Based on representative sampling results, no further characterization is necessary.	YES. PCBs not detected at representative sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 53 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
13j	**Building 4059 Debris Area (G07-1018 and G07-1019)** A debris area was observed approximately 700 feet southwest of the former RMHF Catch Basin (CUA 10b) in a 1969 aerial photograph. The area measures approximately 9,800 square-feet and was observed to contain soil piles intermixed with construction debris, and one 55-gallon drum. These observations were confirmed during the 2008 Waste Debris Survey. CUA 13j is defined as including the two debris locations identified during the survey and the surrounding area. Soils in the area are silty sand (SM) and silty / clayey sand (SC-SM), approximately 0.5 to 2 feet deep. The debris area is southwest of the RMHF RFI Site in a sloped, unpaved, vegetated area. Surface water in the area flows north via sheet flow to a natural drainage west of the RMHF RFI Site, which continues offsite to the northwest.	**VOCs** VOCs assessed to characterize debris area.	<u>Soil Vapor</u> No soil vapor samples collected due to shallow soils. <u>Soil Matrix</u> Collected two samples targeting debris locations identified in the 2008 Waste Debris Survey: • Identified debris location G07-1019 (U7BS0017 at 1 foot bgs) • Identified drum debris G07-1018 (U7BS0025 at 1.25 feet bgs)	VOC results shown on Figure C.3-1D. VOCs were not detected. Based on targeted sampling results. Based on targeted sampling results, no further characterization is necessary.	YES. VOCs not detected at targeted locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs SVOCs assessed to characterize debris area.	Collected two samples targeting debris locations identified in the 2008 Waste Debris Survey: • Identified debris location G07-1019 (U7BS0017 at 1 foot bgs) • Identified drum debris G07-1018 (U7BS0025 at 1.25 feet bgs)	SVOC results shown on Figure C.3-2D. SVOCs were not detected. Based on targeted sampling results, no further characterization is necessary.	YES. SVOCs not detected at targeted locations	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Petroleum hydrocarbons assessed to characterize debris area.	Collected two samples targeting debris locations identified in the 2008 Waste Debris Survey: • Identified debris location G07-1019 (U7BS0017 at 1 foot bgs) • Identified drum debris G07-1018 (U7BS0025 at 1.25 feet bgs)	TPH results are shown on Figure C.3-3C. Lubricant oil range organics (C21 – C30) were detected at the sampling location up to 10.3 mg/kg (U7BS0017), well below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Based on targeted sampling results indicating lubricant oil range organics detected at below RBSL, no further characterization necessary.	YES. Petroleum hydrocarbons detected at well below RBSL at targeted locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize debris area.	Collected two samples targeting debris locations identified in the 2008 Waste Debris Survey: • Identified debris location G07-1019 (U7BS0017 at 1 foot bgs) • Identified drum debris G07-1018 (U7BS0025 at 1.25 feet bgs)	Metals results are shown on Figure C.3-6F. Metals were detected within background range. Based on targeted sampling results, no further characterization is necessary.	YES. Metals detected within background at targeted locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 54 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs PCBs assessed to characterize debris area.	Collected two samples targeting debris locations identified in the 2008 Waste Debris Survey: • Identified debris location G07-1019 (U7BS0017 at 1 foot bgs) • Identified drum debris G07-1018 (U7BS0025 at 1.25 feet bgs)	PCB results are shown on Figure C.3-4B. Aroclor 1248 and Aroclor 1254 were detected up to 7.9 µg/kg (Aroclor 1248) at drum location U7BS0025, below the ResRBSL (140 µg/kg) and EcoRBSL (11 and 77 µg/kg for Aroclors 1248 and 1254, respectively). PCBs were not detected at the other debris location. Based on targeted sampling results indicating PCBs detected at low concentrations below RBSLs, no further characterization is necessary.	YES. PCBs detected at low concentrations below RBSLs at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
13k	**Building 4688 Debris Area (G07-3022)** A debris area was observed approximately 50 feet northeast of Building 4688 (CUA 9c) during the 2008 Waste Debris Survey. The area is less than 100 square-feet and was observed to contain two empty 5-gallon cans with wire handles, scrap metal, concrete, and asphalt debris. Based on neighboring samples and bedrock occurrence, soils are expected to be thin – likely less than 1 to 2 feet. The debris area is northeast of the RMHF fenced area in a sloped, heavily vegetated area with a bedrock outcrop to the south. During field work, dense vegetation, including thick poison oak, prevented location of this small debris area and sampling was not conducted.	NA	NA	NA	NA	NA
14a	**RMHF Northern Slope Excavation Area** Based on a 2006 Cabrera radiological survey of surface soil that indicated elevated cesium-137, the top 6 inches of soil was removed over a 100-square-foot area of the RMHF northern slope. Approximately 200 cubic feet of soil was removed. No staining, discoloration, or odors were noted during the excavation. After excavation, radiological constituents were below derived concentration guideline levels (DCGLs) in all surveyed locations. Straw waddles were placed around the excavation	**VOCs** No suspected chemical use in this area.	<u>Soil Vapor</u> No soil vapor samples were collected due to shallow soil. <u>Soil Matrix</u> Collected one targeted sample at location within the northern slope excavation area (RMBS0093 at 1 foot bgs).	VOC results shown on Figure C.3-1C. Methylene chloride was detected up to 2.25 µg/kg , below Res and Eco RBSLs (4 and 25,000 µg/kg, respectively). Styrene, a naturally occurring chemical, was detected at 034 µg/kg (Res and EcoRBSLs of 7,200 µg/kg and 427,000 µg/kg, respectively). Based on targeted sampling results, indicating methylene chloride detected at a low concentration below the RBSL, no further characterization is necessary.	YES. VOCs detected at low concentrations below RBSLs at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 55 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	area to prevent erosion and straw cover was placed over the excavated area to promote new plant growth. Based on RFI sampling soils in the area are composed of silty sand (SM) with sandstone fragments, approximately 2 feet bgs. The area is north of the Waste Receiving Yard (CUA 7) and RMHF fence line, located in an unpaved, steeply sloped, vegetated area. Surface water in the area flows northwest via sheet flow to a natural drainage north of the RMHF, which continues west through NPDES Outfall 003 and offsite in a northwesterly direction.	**SVOCs** No suspected chemical use in this area.	Collected one targeted sample at location within the northern slope excavation area (RMBS0093 at 1 foot bgs).	SVOC results are shown on Figure C.3-2A. PAHs were detected in the north slope excavation area up to 11.6 µg/kg (fluoranthene). Benzo(a)pyrene was not detected. Detected PAHs were below RBSLs. Based on targeted sampling results indicating SVOCs detected well below RBSLs, no further characterization is necessary.	YES. SVOCs detected at low concentrations below RBSLs at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH No suspected chemical use in this area.	Collected one targeted sample at location within the northern slope excavation area (RMBS0093 at 1 foot bgs).	TPH results are shown on Figure C.3-3B. Diesel range organics (C15 – C20) and lubricant oil range organics (C21 – C30) were detected up to 1.4 mg/kg and 16.4 mg/kg, respectively. No other petroleum hydrocarbon ranges were detected. All detected concentrations were well below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on representative sampling results indicating detected petroleum hydrocarbons well below RBSLs, no further characterization necessary.	YES. Petroleum hydrocarbons detected at low concentrations below RBSL at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals No suspected chemical use in this area.	Collected one targeted sample at location within the northern slope excavation area (RMBS0093 at 1 foot bgs).	Metals results are shown on Figure C.3-6D. Metals were detected within background range. Based on targeted sampling results, no further characterization is necessary.	YES. Metals detected within background range at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs No suspected chemical use in this area.	Collected one targeted sample at location within the northern slope excavation area (RMBS0093 at 1 foot bgs).	PCB results shown on Figure C.3-4A. PCBs were not detected; no further characterization is necessary.	YES. PCBs not detected at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 56 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
14c	**RMHF Excavation Area North of Catch Basin** The RMHF Catch Basin and associated Drainage Channel (CUA 10c and 10b, respectively) were removed in 2006 as part of ongoing D&D activities. During the RMHF Catch Basin Final Survey conducted by Cabrera in 2006, two areas of elevated radioactivity were detected, one of which was approximately 10 feet north of the former RMHF Catch Basin, adjacent to the northern perimeter of the catch basin's concrete slip. The area was approximately 520 square-feet, extending 0.5 feet bgs. Approximately 260 cubic feet of soil were removed during the excavation. The area was not graded or backfilled following the removal. Soils in the area were silty sand (SM) with sandstone fragments, extending approximately 1 foot bgs. The area is west of the RMHF fence line on a slight, unpaved, vegetated slope. Surface water in this area flows southwest to a natural drainage. The drainage converges with the drainage north of the RMHF fenced area west of Outfall 003 and continues offsite in a northwesterly direction.	**VOCs** Surface water from RMHF conveyed to Catch Basin. Solvent and other chemical use/storage documented at RMHF.	Collected one sample targeting within the excavation (RMBS0144 at 1 foot bgs).	VOC results shown on Figure C.3-1D. VOCs were not detected; no further characterization is necessary.	YES. VOCs not detected at targeted sampling location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		SVOCs Surface water from RMHF conveyed to Catch Basin. . Petroleum-based oil/fuel use and/or storage documented at RMHF.	Collected one sample targeting within the excavation (RMBS0144 at 1 foot bgs).	SVOC results shown on Figure C.3-2D. PAHs and phthalates were detected up to 13 µg/kg (fluoranthene) and 76 µg/kg (di-n-butyl phthalate), respectively. Benzo(a)pyrene was detected at 5 µg/kg, below Res and EcoRBSLs (60 and 5,600 µg/kg, respectively). All detected SVOCs were below Res and EcoRBSLs. Based on representative sampling results indicating detected SVOCs below RBSLs, no further characterization necessary.	YES. SVOCs detected at low concentrations below RBSLs at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		TPH Surface water from RMHF conveyed to Catch Basin. Petroleum-based fuel/oil use and/or storage documented at RMHF.	Collected one sample targeting within the excavation (RMBS0144 at 1 foot bgs).	TPH results are shown on Figure C.3-3C. Lubricant oil range organics (C21 – C30) were detected up to 8.66 mg/kg, well below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). No other petroleum hydrocarbon ranges were detected. Based on targeted sampling results indicating lubricant oil range organics detected below RBSL, no further characterization necessary.	YES. Lubricant oil range organics detected at low concentration below RBSL at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Surface water from RMHF conveyed to Catch Basin. Use and/or storage of metals and metallic wastes documented at RMHF.	Collected one sample targeting within the excavation (RMBS0144 at 1 foot bgs).	Metals results are shown on Figure C.3-6E. Zinc was detected at 173 mg/kg (duplicate result 152 mg/kg), above background (110 mg/kg), but below the ResRBSL (23,000 mg/kg). EcoRBSL for zinc (20.8 mg/kg) is less than the maximum background. No other samples at the Catch Basin, Catch basin channel or neighboring slopes contained zinc above background range. Sodium was detected at 112 mg/kg, equivalent to maximum background (110 mg/kg); there are no RBSLs established for sodium (no associated risk). Based on targeted and surrounding (associated) CUA sampling results indicating zinc above background is isolated, no further characterization is necessary.	YES. Metals detected below background or above background at isolated location below ResRBSL.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 57 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs Surface water from RMHF conveyed to Catch Basin. Storage and use of PCB oils and ballasts documented at RMHF.	Collected one sample targeting within the excavation (RMBS0144 at 1 foot bgs).	PCB results shown on Figure C.3-4B. Aroclor 1254 and Aroclor 1260 were detected up to 33 µg/kg (Aroclor 1254), well below Res and EcoRBSLs (140 and 77 µg/kg, respectively). Based on targeted and adjacent (associated) chemical use area sampling results, indicating PCBs detected below RBSLs, no further characterization is necessary.	YES. PCBs detected at low concentrations below RBSLs at targeted location.	YES Area not recommended for CMS based on sampling and risk assessment results.
14d	**RMHF Southern Slope Excavation Areas** Three areas south of Building 4621, the Mixed Waste Storage Yard, and Building 4663 (CUAs 5a – 5c) were excavated in 2003 to remove elevated radionuclides (specifically cesium-137). The three excavation areas (listed from east to west) measured approximately 120- by-10 feet, 5-by-7 feet, and 7- by-12 feet, respectively, and were all excavated to approximately 0.5 feet bgs. The excavation areas are situated on an unpaved, sparsely vegetated, flat area south of the asphalt-paved RMHF operational area. The area is bounded on the south by bedrock outcrop (in the eastern portion) and a steep slope (in the southern and western portions) that is partially covered by a patchy, cracked weathered asphalt coating. Soil in the area is primarily silty sand (SM), some poorly graded sand with silt (SP-SM), and silt (ML), ranging from approximately 0.75 to 2.25 feet deep. Surface water in the area flows south down the steep slope via sheet flow to an asphalt-lined	**VOCs** Excavated area is adjacent to RMHF fenced area, where solvent use and/or storage are documented.	<u>Soil Vapor</u> Soil vapor samples were not collected in this area due to thin soil. <u>Soil Matrix</u> Collected soil matrix samples at three excavation area locations : • Targeted samples at two excavation areas (RMBS0150 and RMBS0151 at 1 foot bgs) • East and upslope of the largest excavation area (RMBS0155 at1 foot bgs) (max PCB detect, see below) Three additional samples at downslope locations to assess potential migration: • To the west (RMBS0099 at 1 foot bgs) • Part way down the steep slope to the south, targeting a surface water pathway (RMBS0149 at 1 foot bgs) • Targeting a storm water culvert at the base of the steep, southern slope (RMBS0152 at1 foot bgs)	VOC results shown on Figure C.3-1A and C.3-1B.. The highest VOCs were detected at excavation areas and the culvert location: • Toluene was detected 0.769 µg/kg within the excavation areas (RMBS0150) . • Methyl ethyl ketone and acetone were detected up to 5.89 µg/kg (acetone) at the eastern extent of the large excavation along the fence line (RMBS0155). No other VOCs were detected within or immediately adjacent to the excavations. • Toluene was also detected at 0.479 µg/kg in slope sample along the surface water pathway (RMBS0149), and in the culvert (RMBS0152) at 1.69 µg/kg. Methyl ethyl ketone was also detected at 1.2 µg/kg at the culvert sample location. • Methylene chloride and styrene were detected up to 3.99 µg/kg at westernmost slope sample near the RMHF southern fence line (RMBS0099). All VOCs were detected at concentrations below RBSLs. Based on targeted and representative sampling results indicating detected VOCs below RBSLs with highest concentrations generally occurring near the excavation areas along the fence line and concentrations decreasing downslope, no further characterization is necessary.	YES. VOCs detected below RBSLs at representative and targeted sampling locations. Two areas recommended for further evaluation during the CMS; area not recommended for CMS based on VOC concentrations.	YES Volumes based on PCBs benzo(a)pyrene (SVOC) and metals as described in respective chemical sections.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 58 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	drainage south of the RMHF RFI Site. Surface water within the drainage flows west to a culvert and into a storm drain within the former Building 4028 footprint (CUA 11a). The culvert also receives storm water runoff from the northern portion of the Building 4024 operation area and, historically, from Building 4023 and 4032 operational areas. The culvert presently receives storm water runoff from Building 4024, but the drainages from Buildings 4023 and 4032 have been blocked and covered with welded steel plating. Storm water within the drain is pumped to a lined drainage along 17th Street. From this discharge point, surface water flows down 17th Street to G Street. Surface water discharge then continues through both lined and unlined drainages to the unlined 17th Street Pond, which in turn discharges via natural drainages to the R-2 Pond (SWMU 5.26). Surface water discharge from the R-2 Pond is monitored at NPDES Outfall 018.	**SVOCs** Excavated area is adjacent to RMHF fenced area, where solvent use and/or storage are documented.	Collected soil matrix samples at four excavation area locations : • Targeting two of the excavation areas (RMBS0139, RMBS0150 and RMBS0151 at 1 foot bgs) • East and upslope of the largest excavation area (RMBS0155 at1 foot bgs) (max PCB detect, see below) Three additional samples at downslope locations to assess potential migration: • To the west (RMBS0099 at 1 foot bgs) • Part way down the steep slope to the south, targeting a surface water pathway (RMBS0149 at 1 foot bgs) • Targeting a storm water culvert at the base of the steep, southern slope (RMBS0152 at1 foot bgs)	SVOC results shown on Figure C.3-2A and C.3-2B. PAHs were detected up to 388 µg/kg (pyrene at RMBS0150) at the western end of the large excavation along the fence line. Benzo(a)pyrene was detected up to 154 µg/kg in the same sample (RMBS0150) and at the eastern end of the large excavation (RMBS0139) , above the ResRBSL (60 µg/kg) and below the EcoRBSL (5,600 µg/kg) at both locations. No other PAHs were detected above RBSLs in these or any other samples, and PAH concentrations generally decreased to 8.91 µg/kg (pyrene) downslope toward the culvert (RMBS0152) . Phthalates were detected up to 3,690 (bis[2-ethylhexyl]phthalate) at the western sample downslope of the fence line (RMBS0099), below RBSLs. Targeted and representative sampling results indicate detected benzo(a)pyrene above the RBSLs within the large excavation along the fence line, decreasing downslope to below RBSLs; no further characterization necessary.	YES. Highest benzo(a)pyrene concentrations found within excavation along fence line and below RBSL in downslope samples. Area of former excavation recommended for further evaluation in the CMS based on detected PCBs and benzo(a)pyrene, and risk assessment results.	YES Volume based on benzo(a)pyrene and PCBs delineated by sample results, bedrock outcrop and soil depth.
		TPH Excavated area is adjacent to RMHF fenced area, where petroleum-based fuel and oil use and/or storage are documented.	Collected soil matrix samples at four excavation area locations : • Targeting two of the excavation areas (RMBS0139, RMBS0150 and RMBS0151 at 1 foot bgs) • East and upslope of the largest excavation area (RMBS0155 at1 foot bgs) (max PCB detect, see below) Three additional samples at downslope locations to assess potential migration: • To the west (RMBS0099 at 1 foot bgs) • Part way down the steep slope to the south, targeting a surface water pathway (RMBS0149 at 1 foot bgs) • Targeting a storm water culvert at the base of the steep, southern slope (RMBS0152 at1 foot bgs)	TPH results are shown on Figure C.3-3A and C.3-3B. Lubricant oil range organics (C21 – C30) were detected in samples throughout the excavation area, slope and culvert: • Up to 14.7 mg/kg within the excavations • Up to 112 mg/kg in downslope samples • At 13.4 mg/kg in the storm water culvert. All concentrations were well below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). No other hydrocarbon ranges were detected. Based on targeted and representative sampling results indicating lubricant oil range hydrocarbons detected at concentrations well below the RBSL, no further characterization necessary.	YES. Petroleum hydrocarbons detected below RBSLs at representative and targeted sampling locations Two areas recommended for further evaluation during the CMS; TPH does not drive CMS recommendation.	YES Volumes based on PCBs benzo(a)pyrene (SVOC) and metals as described in respective chemical sections.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 59 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		Metals Excavated area is adjacent to RMHF fenced area, where solvent use and/or storage are documented.	Collected soil matrix samples at four excavation area locations : • Targeting two of the excavation areas (RMBS0139, RMBS0150 and RMBS0151 at 1 foot bgs) • East and upslope of the largest excavation area (RMBS0155 at1 foot bgs) (max PCB detect, see below) Three additional samples at downslope locations to assess potential migration: • To the west (RMBS0099 at 1 foot bgs) • Part way down the steep slope to the south, targeting a surface water pathway (RMBS0149 at 1 foot bgs) • Targeting a storm water culvert at the base of the steep, southern slope (RMBS0152 at1 foot bgs)	Metals results are shown on Figure C.3-6A through C.3-6C. Chromium, hexavalent chromium, selenium, sodium, and zinc were detected above background at three locations within or adjacent (upslope) of the large excavation: • Chromium: 74.4 mg/kg (background 36.8 mg/kg) • Hexavalent chromium: 0.69 mg/kg (no background) • Selenium: 0.828 mg/kg (background 0.655 mg/kg) • Sodium: 113 mg/kg (background 110 mg/kg) • Zinc: 127 mg/kg (background 110 mg/kg) No metals were detected above respective ResRBSLs in the excavation area. Hexavalent chromium was detected above the EcoRBSL (0.2 mg/kg), and EcoRBSLs for selenium and zinc (0.17 and 20.8 mg/kg, respectively) are below background ranges. There are no established RBSLs for sodium. At the storm water culvert sampling location (RMBS0152), cobalt, copper, silver, and zinc were detected above background: • Cobalt: 152 mg/kg (background = 21 mg/kg) • Copper: 39.3 mg/kg (background = 29 mg/kg) • Silver: 9.95 mg/kg (background = 0.79 mg/kg) • Zinc: 329 mg/kg (background = 110 mg/kg) Cobalt was detected above the ResRBSL (22.8 mg/kg). EcoRBSLs for cobalt, copper, silver, and zinc (8.9, 1.1, 0.54, and 20.8 mg/kg, respectively) are below maximum background. Metals detected above background at the storm water culvert do not appear to reflect conditions on the slope or within excavation areas since the most elevated metals at the culvert (cobalt, copper, and silver) were not elevated in those areas. Zinc was detected at 127 mg/kg in the excavation area. Based on representative and targeted sampling results within the excavation areas and the RMHF southern slope indicating metals elevated primarily within the former large excavation, no further characterization of this area is necessary. Elevated metals within the culvert and “upstream” asphalt drainage are not fully characterized and may need further sampling to assess a potential source in the surrounding areas.	<u>Excavation Area</u> YES. Metals in excavation area characterized and limited in extent. The area is recommended for further evaluation in the CMS based on detected PCBs and benzo(a)pyrene, and risk assessment results. Locations where metals detected above background are included within in this CMS area. <u>Culvert</u> YES Area recommended for CMS based on detected cobalt, copper, silver, and zinc, and risk assessment results. Concentrations to the east and south require additional assessment to determine source and/or extent of metals.	<u>Excavation Area</u> YES Volume based on benzo(a)pyrene and PCBs delineated by sample results, bedrock outcrop and soil depth. <u>Culvert</u> No Volume based on dimensions of asphalt culvert extending to the east in line with extent of upslope bedrock defining area of potential influence from RMHF. Additional sampling will be required to define nature and extent of soil/sediment requiring evaluation in CMS.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 60 of 62)

Map Key[1]	**Chemical Use Area Name** **Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
		PCBs Excavated area is adjacent to RMHF fenced area, where solvent use and/or storage are documented.	Collected soil matrix samples at four excavation area locations : • Targeting two of the excavation areas (RMBS0139, RMBS0150 and RMBS0151 at 1 foot bgs) • East and upslope of the largest excavation area (RMBS0155 at1 foot bgs) (max PCB detect, see below) • South and downslope of the largest excavation area (RMBS0154 at 1 foot bgs) Three additional samples at downslope locations to assess potential migration: • To the west (RMBS0099 at 1 foot bgs) • Part way down the steep slope to the south, targeting a surface water pathway (RMBS0149 at 1 foot bgs) • Targeting a storm water culvert at the base of the steep, southern slope (RMBS0152 at1 foot bgs)	PCB results shown on Figure C.3-4A and C.3-4B. PCBs were detected in all four targeted locations within the excavation areas up to 6,710 µg/kg (Aroclor 1260 at RMBS0139), above the Res and EcoRBSLs (140 and 77 µg/kg, respectively). Aroclor 1242, Aroclor 1254, and Aroclor 1260 detected above Res and/or EcoRBSLs at the two adjacent samples to the west and southwest (RMBS0153 and RMBS0154) , up to 392 µg/kg (Aroclor 1242). All other samples to the east, west and south (downslope) analyzed for PCBs were not detected or below RBSLs. Representative and targeted sampling results indicate detected PCBs above RBSLs are within or immediately adjacent to the large excavation, with concentrations decreasing to non-detect or below RBSLs to the west, east and southwest (by bedrock outcrop to the southeast). Based on these results, no further characterization is necessary.	YES. Highest PCB concentrations found within excavation along fence line and below RBSLs in downslope samples. Area of former excavation recommended for further evaluation in the CMS based on detected PCBs and benzo(a)pyrene, and risk assessment results.	YES Volume based on benzo(a)pyrene and PCBs delineated by sample results, bedrock outcrop and soil depth.
15	**Disturbed Soil Area** A disturbed soil area measuring approximately 1 acre was noted in the area southwest of the RMHF RFI Site in a 1965 aerial photograph. The source or cause of the disturbed area was not documented in historical documents. During a 2008 field survey, the area was noted to contain soil piles and hummocks. Soil type in the area is silty sand (SM) ranging from 1 to 5 feet deep. The soil disturbance area is divided by a surface water divide, which occurs approximately 25 feet west of the former RMHF Catch Basin (CUA 10c). Surface water east of the divide flows northeast toward a natural drainage and joins the drainage located north of the RMHF. Surface water west of the divide flows west toward a	**SVOCs** SVOCs assessed to characterize disturbed soil area.	Collected samples at six representative areas to characterize the disturbed soil area (RMBS0054, RMBS0144, and U7BS0001 through U7BS0004) at 0.7 to 1.25 feet bgs.	SVOC results shown on Figure C.3-2D. PAHs and phthalates were detected at five of the six representative locations up to 76 µg/kg (di-n-butyl phthalate, RMBS0144). Benzo(a)pyrene was detected at two locations (RMBS0054 and RMBS0144) up to7.82 µg/kg, well below Res and EcoRBSLs (60 and 5,600 µg/kg, respectively). All SVOCs were detected below RBSLs. Based on representative sampling results indicating detected SVOCs below RBSLs, no further characterization is necessary.	YES. SVOCs detected at low concentrations below RBSLs at representative locations.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 61 of 62)

Map Key[1]	**Chemical Use Area Name Status, How Used and Physical Characteristics** (see text for Site History)	**Potential Chemicals Used / Stored**[2]	**Sampling Scope and Rationale**[2,8] [See Figure C.2-2A and C.2-2B for sampling locations]	**Sampling Results**[3] Chemical concentrations detected greater than background and/or risk screening levels? [4]	**Potential concentration gradients sufficiently characterized for risk assessment?**[5]	**Is delineation sufficient to estimate soil volume in CMS?**[6,7] (see Figure C.5-1 for CMS areas)
	natural drainage and continues offsite to the northwest. The two drainages converge approximately 1,300 feet northwest of the SSFL property boundary and ultimately flow north to Arroyo Simi.	**TPH** Petroleum hydrocarbons assessed to characterize disturbed soil area.	Collected samples at six representative areas to characterize the disturbed soil area (RMBS0054, RMBS0114, and U7BS0001 through U7BS0004) at 0.7 to 1.25 Feet bgs.	TPH results are shown on Figure C.3-3C. Lubricant oil range organics (C21 – C30) were detected at all locations up to 32.8 mg/kg (U7BS0004). Diesel range organics (C15 – C20) were detected at 2.48 mg/kg at one location (U7BS0002). No other petroleum hydrocarbon ranges were detected. All detected concentrations were below the ResRBSL for kerosene, diesel, and lubricant oil range organics (C12 – C30) (1,400 mg/kg). Based on representative sampling results primarily indicating detected lubricant oil range organics below RBSLs, no further characterization necessary.	YES. Primarily lubricant oil range organics at low concentrations below RBSLs at representative locations.	YES Area not recommended for CMS based on sampling and risk assessment results.
		Metals Metals assessed to characterize disturbed soil area.	Collected samples at nine representative locations to characterize the disturbed soil area (RMBS0054, RMBS0114, and U7BS0001 through U7BS0004, U7BS0020, U7BS0026 and U7BS0027) at 0.7 to 5.0 feet bgs.	Metals results are shown on Figure C.3-6E and C.3-6F. Sodium was detected up to 643 mg/kg (U7BS0027), above background at four of nine locations (U7BS0002 through U7BS0004 and U7BS0027) (background 110 mg/kg). Res and EcoRBSLs are not established for sodium (no associated risk). Sodium is highest at the sample collected adjacent to the Group 5 RFI Site (U7BS0027) and decrease downslope (U7BS0002 and U7BS0004). No other metals were detected above background. Based on representative sampling results indicating only detected sodium concentrations above background, no further characterization is necessary.	YES. Metals detected below background or do not have associated risk (sodium).	YES Area not recommended for CMS based on sampling and risk assessment results.
		PCBs PCBs assessed to characterize disturbed soil area.	Collected samples at five representative areas to characterize the disturbed soil area (RMBS0054, U7BS0001 through U7BS0004) at 0.7 to 1.25 Feet bgs.	PCB results are shown on Figure C.3-4B. Aroclor 1242 was detected at one location at 9.5 µg/kg (U7BS0001), well below Res and EcoRBSLs (140 and 78 µg/kg). PCBs were not detected in any other samples. Based on representative sampling results indicating PCBs detected in one sample below RBSLs, no further characterization is necessary.	YES. PCBs detected at low concentration in one sample below RBSL.	YES Area not recommended for CMS based on sampling and risk assessment results.

TABLE C.3-2A
DESCRIPTION OF CHEMICAL USE AREAS AT THE RMHF RFI SITE AND SOIL SAMPLING RESULTS SUMMARY
(PAGE 62 of 62)

Sources: For complete list of references, please refer to Section C.6 (References).

Notes:
1. Map Key refers to numbered chemical use area as shown on Figures C.2-1A and C.3-1A through C.3-6G.
2. Where historical records and physical characteristics do not suggest the presence of a chemical group, that chemical group was not analyzed in samples from the respective chemical use area and is not reflected in this table.
3. Complete sample analytical results are presented in Attachment C-3.
4. The use of the SRAM-based screening levels for comparison purposes does not serve as a risk assessment. These screening levels are not used to determine if a chemical use area will be recommended for further consideration in the CMS, but only as a tool to evaluate the characterization data. The SRAM-based screening levels represent conservative concentrations that pose a low level of risk.
5. Concentration gradients must be defined such that the risk assessment reflects the approximate maximum analyte concentration OR a concentration sufficiently high to result in risk requiring a recommendation for evaluation during CMS.
6. Chemicals listed as a basis for CMS recommendations include both chemical drivers (above 1 x 10^{-6} risk and HI of 1) and significant chemical contributors to overall risk.
7. Volumes for CMS evaluation must be estimable within a factor of ten for comparison of remedial alternatives.
8. A minimum of 39 soil samples are planned to be collected at Buildings 4021 and 4022 following facility closure, as prescribed in the RMHF Closure Plan (H&A, 2006) under review by DTSC. All additional sampling data will be evaluated for associated risk in a revised RMHF RFI report. Planned sample locations include:
   - 13 soil samples within the Building 4021 footprint, including the Decontamination Room and Packaging Room sumps
   - 26 soil samples within the Building 4022 footprint, including:
     - 2 samples each in Vaults 1,2, 5, and 6
     - 1 sample each in Vaults 3, 4, and 7
     - 1 sample at the Building 4022 sump
   - Additional samples will be collected as necessary based on observed conditions during pre- and post-demolition inspections.

ACRONYMS

AST = aboveground storage tank
bgs = below ground surface
BRS = Biennial Reporting System
CMS = Corrective Measures Study
CUA = Chemical Use Area
D&D = decontamination and decommissioning
DOE = United States Department of Energy
DTSC = Department of Toxic Substances Control
EcoRBSL = ecological risk based screening level
ETEC = Energy Technology Engineering Center
Freon 113 = 1,1,2-trichloro-1,2,2-trifluoroethane
LLRW = low-level radioactive waste
LMFBR = Liquid Metal Fast Breeder Reactor
LSA = low specific activity
MEK = methyl ethyl ketone
mg/kg = milligrams per kilogram
ND = non-detect
ng/kg = nanograms per kilogram
NPDES = National Pollution Discharge Elimination System
PAH = polynuclear aromatic hydrocarbon
PCB = polychlorinated biphenyl
PCE = tetrachloroethene
ppm = parts per million
RBSLs = risk based screening levels
RCRA = Resource Conservation Recovery Act
ResRBSL = residential risk based screening level
RFI = Resource Conservation and Recovery Act (RCRA) Facility Investigation
RIHL = Rockwell International Hot Laboratory
RMHF = Radioactive Materials Handling Facility
SEFOR = Southwest Experimental Fast Oxide Reactor
SNAP = System for Nuclear Auxiliary Power
SRE = Sodium Reactor Experiment
SRAM = Standardized Risk Assessment Methodology
STIR = Shield Test Irradiation Reactor
STR = Shield Test Reactor
SVOC = semivolatile organic compound
SWMU = Solid Waste Management Unit
TPH = total petroleum hydrocarbons
USEPA = United States Environmental Protection Agency
UST = underground storage tank
µg/kg = micrograms per kilogram
µg/L = micrograms per liter
VOC = volatile organic compound

TABLE C.3-2B
RMHF RFI SITE SUMMARY AND EVALUATION OF GROUNDWATER SAMPLING RESULTS
(PAGE 1 OF 5)

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts)[1]	Monitored in Groundwater? (Number of Samples/Date Range)[2]	Constituents Detected in Groundwater? (Above GWCC[3] or Regulatory Criteria?)[4]	RFI Site Related?	Groundwater Characterized Sufficiently for Risk Assessment?
VOC	**YES** Volatile organic compounds (VOCs) are potentially associated with wastes stored at RMHF, which includes waste petroleum-based fuels and solvents. Solvents, such as Turco degreaser, were also utilized in decontamination activities at Building 4021. Generally low VOC concentrations have been detected at over 50 RMHF RFI Site locations, up to: • 51 µg/kg toluene in soil at the former Building 4021 Leach Field • 6.6 µg/L 1,1,2-tricloro-1,2,2-trifluoroethane (Freon 113) in soil vapor near the Building 4021 Sump • 0.57 µg/L tetrachloroethene (PCE) in soil vapor at Building 4021/ Building 4021 Sump and 0.47 µg/kg PCE in debris area soil northwest of the former RMHF Catch Basin • 0.05 µg/L benzene in soil vapor west of the Waste Receiving Yard and at former Building 4028. Trichloroethene (TCE) was not detected in soil and soil vapor at the RMHF RFI Site or adjacent areas. VOCs were detected in soil ranging from 0.5 to 15 feet bgs.	**YES** Collected 320 groundwater samples and analyzed for VOCs at 16 RMHF groundwater monitoring locations between 1989 and 2008.	**YES** The highest groundwater VOC concentrations have been detected at and near the former Building 4021 Leach Field and the former Catch Basin. TCE, cis-1,2-dicloroethene (DCE), trans-1,2-DCE, and 1,1-DCE have been detected above MCLs in both near-surface groundwater (NSGW) and Chatsworth formation groundwater (CFGW). Within the past 3 years, only TCE and 1,1-DCE have been detected above their respective maximum contaminant levels (MCLs). TCE was detected up to 87 µg/L in RS-28, RD-30, RD-34A, RD-34B, RD-63 in the drainage north of the RMHF RFI site, and RD 98 in the former Building 4021 Leach Field, above the MCL of 5 µg/L. TCE was not detected in RD-27 located within the RMHF site. 1,1-DCE was detected at above the MCL (5 µg/L) at both RD-88 (up to 17 µg/L) and RD-90 (up to 11 µg/L), west of the catch basin. VOCs that have been detected below their respective MCLs (or for which MCLs have not been established) include: PCE, Freon 113, chloroform, chloromethane, acetone, toluene, methyl isobutyl ketone (MIBK), methyl ethyl ketone (MEK), ethylbenzene, carbon disulfide, benzene, 2-hexanone, methylene chloride, 1,4-dichlorobenzene, and 1,1,1-trichloroethane.	**YES** VOCs detected in groundwater at RMHF wells are considered likely related to releases at the former Building 4021 Leach Field and the former catchment basin based on spatial distribution of TCE in groundwater north of RMHF at and near the former leach field.	**YES**

TABLE C.3-2B
RMHF RFI SITE SUMMARY AND EVALUATION OF GROUNDWATER SAMPLING RESULTS
(PAGE 2 OF 5)

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts)[1]	Monitored in Groundwater? (Number of Samples/Date Range)[2]	Constituents Detected in Groundwater? (Above GWCC[3] or Regulatory Criteria?)[4]	RFI Site Related?	Groundwater Characterized Sufficiently for Risk Assessment?
SVOCs	**YES** Semi-volatile organic compounds (SVOCs) are potentially associated wastes stored at RMHF prior to shipment offsite, which includes waste petroleum-based oils and fuels. SVOCS have been detected in over 20 samples collected at the RMHF RFI Site. Phthalates and polycyclic aromatic hydrocarbons (PAHs) were detected across the site at concentrations up to 3,600 µg/kg (bis[2-ethylhexyl] phthalate) and 611 µg/kg (fluoranthene), respectively. Benzo(a)pyrene was detected at 15 locations up to 71.4 µg/kg. SVOCs were generally detected at the highest concentrations in the RMHF operational area and in identified debris areas adjacent to the RMHF operational area. SVOCs were detected in soils ranging from 0.5 to 6 feet bgs.	**YES** Collected 11 groundwater samples and analyzed for SVOCs at 7 RMHF groundwater monitoring locations between 1989 and 2008.	**NO** SVOCs were not detected at RMHF groundwater monitoring locations.	**NO**	**YES**
TPH	**YES** Petroleum hydrocarbons are potentially associated wastes stored at RMHF prior to shipment offsite, which includes waste petroleum-based oils and fuels. Petroleum hydrocarbons, primarily lubricant oil range organics (C20 – C30), were detected in over 100 RMHF RFI Site locations up to 1,030 mg/kg (lubricant oil range organics). Gasoline range hydrocarbons were detected in one location west of the Waste Receiving Area at 1.5 mg/kg. Petroleum hydrocarbons were detected across the site, including the RMHF operational areas, debris areas, former Building 4021 Leach Field, and drainage locations. Petroleum hydrocarbons were observed at highest concentrations within the RMHF operational areas, particularly the Waste Receiving Yard, Mixed Waste Storage Yard, and Building 4075. Petroleum hydrocarbons were detected in soils ranging from 0.5 to 15.0 feet bgs.	**YES** Collected four groundwater samples and analyzed for VOCs at three RMHF groundwater monitoring locations in 2008.	**NO** Petroleum hydrocarbons were not detected at RMHF groundwater monitoring locations.	**NO**	**YES**

TABLE C.3-2B
RMHF RFI SITE SUMMARY AND EVALUATION OF GROUNDWATER SAMPLING RESULTS
(PAGE 3 OF 5)

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts)[1]	Monitored in Groundwater? (Number of Samples/Date Range)[2]	Constituents Detected in Groundwater? (Above GWCC[3] or Regulatory Criteria?)[4]	RFI Site Related?	Groundwater Characterized Sufficiently for Risk Assessment?
PCBs	**YES** Polychlorinated biphenyls (PCBs) may be present in transformer oils used before 1989. There are two substations and one transformer pole in the RMHF RFI Site that were in use prior to 1989. PCBs were also sampled across the RMHF RFI Site to characterize sitewide storage activities. PCBs have been detected at generally low concentrations at the RMHF RFI Site, up to 91 µg/kg), with the exception of one isolated location where Aroclor 1260, Aroclor 1254, and Aroclor 1242 was detected up to 6,710 µg/kg in the shallow excavation area on the RMHF southern slope, just south RMHF fence line adjacent to the Mixed Waste Storage Yard and Building 4621. PCBs were detected in surface sediments and in soils ranging from 0.7 to 3.5 feet bgs.	**NO** PCBs have not been analyzed at RMHF groundwater monitoring locations.	**N/A**	**No** PCBs have very low mobility and have not been detected in SSFL groundwater monitored at other RFI sites.	**N/A**
Dioxins	**YES** Dioxins may be present on site due to an incinerator located at former Building 4664 and an oxidation facility in Building 4665; dioxins were also analyzed in samples collected in the drainage north of the RMHF operational area due to previous detections at NPDES Outfall 003 that exceeded permit limits. The 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxic equivalent (TEQ) was 1 ng/kg in the drainage north of the RMHF RFI Site, slightly above the background concentrations. Seven dioxin congeners were also detected above background concentrations at this location. Dioxins were detected above background concentrations in surface sediments and in soils at 1.0 feet bgs.	**NO** Dioxins have not been analyzed at RMHF groundwater monitoring locations.	**N/A**	**NO** Dioxins were detected near background at all one soil sampling locations. The prevalence of octa-chlorinated congeners in soil at RMHF is consistent with the naturally occurring distribution of dioxins in the environment.	**YES**

TABLE C.3-2B
RMHF RFI SITE SUMMARY AND EVALUATION OF GROUNDWATER SAMPLING RESULTS
(PAGE 4 OF 5)

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts)[1]	Monitored in Groundwater? (Number of Samples/Date Range)[2]	Constituents Detected in Groundwater? (Above GWCC[3] or Regulatory Criteria?)[4]	RFI Site Related?	Groundwater Characterized Sufficiently for Risk Assessment?
Metals	**YES** Metals are potentially associated with petroleum-based fuels and oils and other wastes stored at the RMHF RFI Site pending shipment. Hexavalent chromium was detected at the RMHF RFI Site up to 0.69 mg/kg. Additionally, 13 metals were detected above background concentrations at the RMHF RFI Site and adjacent areas. Metals detected above background include: • Boron: Detected at four locations up to 17.6 mg/kg • Cadmium: Detected at three locations up to 4.8 mg/kg • Chromium: Detected at one location at 37.7 mg/kg • Cobalt: Detected at three locations up to 152 mg/kg • Copper: Detected at two location at 62.7 mg/kg • Lead: Detected at two locations up to 44.1 mg/kg • Mercury: Detected at one location at 0.12 mg/kg • Selenium: Detected at five locations up to 2.7 mg/kg • Silver: Detected at one location at 9.95 mg/kg • Thallium: Detected at one location at 0.51 mg/kg • Vanadium: Detected at one location at 75.3 mg/kg • Zinc : Detected at 11 locations up to 1,240 mg/kg • Zirconium: Detected at one location at 14.2 mg/kg Metals were generally detected above background concentrations within the RMHF operational area, primarily at the Mixed Waste Storage Yard, the former Building 4664, and along the asphalt drainage swale located at the northern site boundary. Metals were also detected above background ranges outside of the operational area at discharge pipelines from the RMHF Catch Basin and the Filter/Blower Area and at the storm water culvert south of the RMHF operational area. Metals were detected above background in samples collected from 0.5 to 6.0 feet bgs.	**YES** Collected 82 groundwater samples and analyzed for metals at 10 RMHF groundwater monitoring locations between 1989 and 2008.	**NSGW – YES** Cadmium, molybdenum, manganese, and selenium were detected on at least one occasion above their respective groundwater comparison concentration (GWCC). **CFGW – YES** Barium, beryllium, cadmium, cobalt, copper, lead, molybdenum, selenium, and thallium were detected on at least one occasion above their respective GWCC.	**NSGW – NO** Cadmium and selenium detects in NSGW were less than 1.2 and 1.7 times the GWCC, respectively, and migration to groundwater is unlikely based on the generally low concentrations of soil metals. Manganese was detected at 3.5 times the GWCC in an early sample from RS-28, but has since been quantified at concentrations well below the GWCC. Molybdenum was not detected above background in soil, and detections in NSGW likely reflect natural variability. **CFGW – NO** Barium, beryllium, cadmium, cobalt, copper, lead, molybdenum, and thallium detects are accompanied by an equal or greater number of non-detect results. The most recent groundwater samples for each of these metals were non-detect. The singular detect of selenium at RD-63 (3.6 times the GWCC) is not considered site-related based on the generally low selenium in soil, and on the absence of conditions conducive to metals transport near impacted soil locations[5]. Additionally, many of the selenium detects in soil were accompanied by non-detects in associated split, duplicate, or primary samples.	**YES**
Inorganic Compounds	**YES** Inorganic compounds are potentially associated with wastes stored at the RMHF RFI Site pending shipment. Fluoride was detected above background concentrations at one location in the Building 4021 Leach Field excavation area at 7.51 mg/kg. Chloride was detected at 13 locations at concentrations up to 8.76 mg/kg. Nitrate was detected at seven locations at concentrations up to 5.86 mg/kg. Sulfate was detected at 16 locations at concentrations up to 51.3 mg/kg. Soil pH ranged from 5.4 to 9.8. Inorganic compounds were detected in soils ranging from 0.5 to 10.0 ft bgs.	**YES** Collected 63 groundwater samples and analyzed for inorganic compounds at 9 RMHF groundwater monitoring locations between 1989 and 2008.	**YES** Chloride, fluoride, nitrate, and sulfate have been detected in both NSGW and CFGW. Fluoride was detected in one sample collected from RD-63 at roughly two times the established MCL (0.8 mg/L).	**NO** Fluoride was not detected above the MCL in any of the wells surrounding RD-63. Fluoride concentrations in soil are only slightly above background.	**YES** The frequency and concentrations of fluoride detections in soil and in groundwater does not warrant further investigation.

TABLE C.3-2B
RMHF RFI SITE SUMMARY AND EVALUATION OF GROUNDWATER SAMPLING RESULTS
(PAGE 5 OF 5)

Analytical Group	Site Soil Impacts? (Summary of Relevant Impacts)[1]	Monitored in Groundwater? (Number of Samples/Date Range)[2]	Constituents Detected in Groundwater? (Above GWCC[3] or Regulatory Criteria?)[4]	RFI Site Related?	Groundwater Characterized Sufficiently for Risk Assessment?
Perchlorate	**NO** Perchlorate samples were collected at the former Building 4021 Leach Field and septic tank and at the former RMHF Catch Basin and associated drainage channel. Perchlorate was not detected.	**YES** Collected 23 groundwater samples and analyzed for perchlorate at 9 RMHF groundwater monitoring locations between 1998 and 2008.	**NO** Perchlorate was not detected in any of the samples collected from RMHF groundwater monitoring locations.	**NO**	**YES**
NDMA and formaldehyde (indicators of hydrazine)	**NO** n-Nitrosodimethylamine (NDMA) is not considered a potential site contaminant but was screened across the RMHF RFI Site as part of site characterization, including at a former cooling tower located at former Building 4664. NDMA was detected at one location in the Mixed Waste Storage Yard at 5.68 µg/kg. Formaldehyde was not analyzed at the RMHF RFI Site.	**YES** Collected 11 groundwater samples and analyzed for NDMA at 7 RMHF groundwater monitoring locations between 1989 and 2008.	**NO** NDMA was not detected in any of the samples collected from RMHF groundwater monitoring locations. It should be noted that detection limits for most analyses were above the screening value of 0.01 µg/L.	**NO**	**YES** NDMA was detected at low levels in 1 out of over 100 soil samples analyzed for this compound. No further investigation is warranted.
1,4-Dioxane	**N/A** 1,4-Dioxane not analyzed in soil matrix or soil vapor samples collected at the RMHF RFI Site. As a 1,1,1-tricloroethane (TCA) stabilizer, 1,4-dioxane may be present in soils containing TCA. TCA was not detected in soil or soil vapor samples collected at the RMHF RFI Site or adjacent areas. TCA was stored at the RMHF according to historical documents.	**YES** Collected 51 groundwater samples and analyzed for 1,4-dioxane at 7 RMHF groundwater monitoring locations between 1989 and 2008.	**NO** 1,4-Dioxane was not detected in any of the samples collected from RMHF groundwater monitoring locations. It should be noted that detection limits for most analyses were above the screening value of 3 µg/L.	**NO**	**YES** Neither 1,4-dioxane or TCA were detected in soil, and no further investigation is warranted.

Notes:
[1] See Table C.3-2A for a complete summary of soil impacts.
[2] RMHF RFI Site groundwater monitoring locations are shown on Figure D-4 in Appendix D.
[3] Groundwater comparison concentrations (GWCCs) were developed through a conservative process and approved by DTSC to be equal to or below naturally occurring background levels. See Tables D-8 through D-33 for Groundwater Results.
[4] See Tables D-8 through D-33 for the results of chemical analyses in groundwater.
[5] The migration of metals to groundwater is unlikely to occur unless local recharge conditions are high, soil pH is low, and metals are present with sufficient mass and spatial extent in soil.

Acronyms

1,1,1-TCA = 1,1,1-trichloroethane
1,2-DCE = 1,2-dichloroethene
AOC = Area of Concern
CFGW = Chatsworth formation groundwater
CMS = Corrective Measures Study
GWCC = Groundwater Comparison Concentrations
MEK = methyl ethyl ketone
MCL = Maximum Contaminant Level
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
MIBK = methyl isobutyl ketone
NDMA = n-nitrosodimethylamine
NFA = no further action
ng/kg = nanogram per kilogram
NSGW = near-surface groundwater
PAH = polynuclear aromatic hydrocarbons
PCB = polychlorinated biphenyls
PCE = tetrachloroethene
RCRA = Resource Conservation Recovery Act
RFI = RCRA Facility Investigation
SVOC = semivolatile organic compound
TCE = trichloroethene
TCDD = 2,3,7,8-trichlorodibenzo-p-dioxin
TEQ = toxicity equivalent
TPH = total petroleum hydrocarbons
µg/kg = micrograms per kilogram
µg/L = micrograms per liter
VOC = volatile organic compounds

TABLE C.3-3A
RMHF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL)
(Page 1 of 5)

Analyte Group	Constituent *	Units	Screening Levels (1)			Total Number Samples Analyzed	Detect Data Summary						Non-Detect Data Summary						Data Issue (5)	Issue Resolution (6)
			Residential (ResRBSL)	Ecological (EcoRBSL)	Background (2)		Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Number of Detected Concentrations > Background	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	NumberDL > EcoRBSL	Number DL > Background		
Asbestos (%)																				
	Asbestos	%	NA (4)	NA (4)	NA (3)	5	0	0	0	NA (4)	NA (4)	NA (3)	5	0.1	0.1	NA (4)	NA (4)	NA (3)	--	--
Dioxin/Furan (ng/kg)																				
	1,2,3,4,6,7,8,9- Octachlorodibenzo-p-dioxin	ng/kg	NA (4)	NA (4)	NA (3)	1	0	0	0	NA (4)	NA (4)	NA (3)	1	0.89	0.89	NA (4)	NA (4)	NA (3)	--	--
	1,2,3,4,6,7,8-Heptachlorodibenzofuran	ng/kg	2500000	1121	2.5	15	9	0.195	5.85	0	0	5	6	0.24	1.9	0	0	0	--	--
	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	ng/kg	13000000	959	13	14	11	1.84	23.8	0	0	2	3	2.3	5.5	0	0	0	--	--
	1,2,3,4,7,8,9-Heptachlorodibenzofuran	ng/kg	190000	427	0.19	15	6	0.247	0.92	0	0	6	9	0.116	0.994	0	0	7	--	--
	1,2,3,4,7,8-Hexachlorodibenzofuran	ng/kg	730000	47	0.73	15	8	0.17	1	0	0	1	7	0.0468	0.422	0	0	0	--	--
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	ng/kg	340000	45	0.34	15	5	0.15	0.55	0	0	1	10	0.0598	0.575	0	0	4	--	--
	1,2,3,6,7,8-Hexachlorodibenzofuran	ng/kg	300000	54	0.30	15	8	0.149	0.37	0	0	3	7	0.0451	0.465	0	0	2	--	--
	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	ng/kg	950000	106	0.95	15	7	0.37	0.879	0	0	0	8	0.0623	2.2	0	0	2	--	--
	1,2,3,7,8,9-Hexachlorodibenzofuran	ng/kg	430000	43	0.43	15	7	0.117	0.38	0	0	0	8	0.0695	0.648	0	0	2	--	--
	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	ng/kg	1100000	44	1.1	15	7	0.23	0.578	0	0	0	8	0.0652	0.88	0	0	0	--	--
	1,2,3,7,8-Pentachlorodibenzofuran	ng/kg	590000	169	0.59	15	3	0.12	0.24	0	0	0	12	0.0289	4.34	0	0	4	--	--
	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	ng/kg	180000	4.4	0.18	15	8	0.103	0.23	0	0	1	7	0.0476	0.5	0	0	5	--	--
	2,3,4,6,7,8-Hexachlorodibenzofuran	ng/kg	450000	49	0.45	15	7	0.184	0.432	0	0	0	8	0.0481	0.471	0	0	1	--	--
	2,3,4,7,8-Pentachlorodibenzofuran	ng/kg	640000	16	0.64	15	6	0.13	0.437	0	0	0	9	0.19	4.34	0	0	4	--	--
	2,3,7,8-TCDD	ng/kg	500000	4.3	0.50	15	3	0.08	0.18	0	0	0	12	0.0205	0.663	0	0	2	--	--
	2,3,7,8-TCDD TEQ	ng/kg	870000	4.3	0.87	3	3	0.0568	0.3704	0	0	0	0	0	0	0	0	0	--	--
	2,3,7,8-Tetrachlorodibenzofuran	ng/kg	1800000	43	1.8	15	2	0.26	0.26	0	0	0	13	0.193	0.87	0	0	0	--	--
	Heptachlorodibenzofurans	ng/kg	NA (4)	NA (4)	NA (3)	14	11	0.386	17.8	NA (4)	NA (4)	NA (3)	3	0.28	2.2	NA (4)	NA (4)	NA (3)	--	--
	Heptachlorodibenzo-p-dioxins	ng/kg	NA (4)	NA (4)	NA (3)	14	13	1.28	48.5	NA (4)	NA (4)	NA (3)	1	5.5	5.5	NA (4)	NA (4)	NA (3)	--	--
	Hexachlorodibenzofurans	ng/kg	NA (4)	NA (4)	NA (3)	14	13	0.0888	9.24	NA (4)	NA (4)	NA (3)	1	5.5	5.5	NA (4)	NA (4)	NA (3)	--	--
	Hexachlorodibenzo-p-dioxins	ng/kg	NA (4)	NA (4)	NA (3)	14	7	1.77	5.62	NA (4)	NA (4)	NA (3)	7	0.137	12	NA (4)	NA (4)	NA (3)	--	--
	Octachlorodibenzofuran	ng/kg	8100000	32363	8.1	15	9	0.57	11.8	0	0	1	6	0.49	8.54	0	0	1	--	--
	Octachlorodibenzo-p-dioxin	ng/kg	140000000	38660	140	15	14	8.93	394	0	0	4	1	4.5	4.5	0	0	0	--	--
	Pentachlorodibenzofurans	ng/kg	NA (4)	NA (4)	NA (3)	14	11	0.14	5.04	NA (4)	NA (4)	NA (3)	3	0.2	4.27	NA (4)	NA (4)	NA (3)	--	--
	Pentachlorodibenzo-p-dioxins	ng/kg	NA (4)	NA (4)	NA (3)	14	5	0.15	0.72	NA (4)	NA (4)	NA (3)	9	0.0476	0.51	NA (4)	NA (4)	NA (3)	--	--
	TCDD TEQ (ND = 0) 2005 WHO	ng/kg	NA (4)	NA (4)	NA (3)	14	14	0	0	NA (4)	NA (4)	NA (3)	0	0	0	NA (4)	NA (4)	NA (3)	--	--
	Tetrachlorodibenzofurans	ng/kg	NA (4)	NA (4)	NA (3)	14	10	0.26	3.23	NA (4)	NA (4)	NA (3)	4	0.193	0.487	NA (4)	NA (4)	NA (3)	--	--
	Tetrachlorodibenzo-p-dioxins	ng/kg	NA (4)	NA (4)	NA (3)	14	9	0.0444	0.296	NA (4)	NA (4)	NA (3)	5	0.246	0.663	NA (4)	NA (4)	NA (3)	--	--
Formaldehyde (mg/kg)																				
	Formaldehyde	mg/kg	12000	40	NA (3)	3	1	1.13	1.13	0	0	NA (3)	2	0.269	0.91	0	0	NA (3)	--	--
Herbicide (µg/kg)																				
	2,4,5-T	µg/kg	NA (4)	NA (4)	NA (3)	6	0	0	0	NA (4)	NA (4)	NA (3)	6	0.44	54.5	NA (4)	NA (4)	NA (3)	--	--
	2,4,5-Trichlorophenoxypropionic acid	µg/kg	NA (4)	NA (4)	NA (3)	6	0	0	0	NA (4)	NA (4)	NA (3)	6	0.44	54.5	NA (4)	NA (4)	NA (3)	--	--
	2,4-Dichlorophenoxyacetic Acid (2,4-D)	µg/kg	686090	NA (4)	NA (3)	6	0	0	0	0	NA (4)	NA (3)	6	0.06	54.5	0	NA (4)	NA (3)	--	--
	2,4-Dichlorophenoxybutyric acid	µg/kg	NA (4)	NA (4)	NA (3)	1	0	0	0	NA (4)	NA (4)	NA (3)	1	0.55	0.55	NA (4)	NA (4)	NA (3)	--	--
	4-Nitrophenol	µg/kg	NA (4)	7000	NA (3)	1	0	0	0	NA (4)	0	NA (3)	1	1.89	1.89	NA (4)	0	NA (3)	--	--
	Dalapon	µg/kg	2058271	NA (4)	NA (3)	1	0	0	0	0	NA (4)	NA (3)	1	0.1	0.1	0	NA (4)	NA (3)	--	--
	Dicamba	µg/kg	NA (4)	NA (4)	NA (3)	1	0	0	0	NA (4)	NA (4)	NA (3)	1	0.1	0.1	NA (4)	NA (4)	NA (3)	--	--
	Dichloropropane	µg/kg	NA (4)	NA (4)	NA (3)	1	0	0	0	NA (4)	NA (4)	NA (3)	1	0.2	0.2	NA (4)	NA (4)	NA (3)	--	--
	DINOSEB	µg/kg	68609	590	NA (3)	1	0	0	0	0	0	NA (3)	1	0.4	0.4	0	0	NA (3)	--	--
	MCPA	µg/kg	NA (4)	NA (4)	NA (3)	1	0	0	0	NA (4)	NA (4)	NA (3)	1	86	86	NA (4)	NA (4)	NA (3)	--	--
	MCPP	µg/kg	68609	NA (4)	NA (3)	1	0	0	0	0	NA (4)	NA (3)	1	103	103	0	NA (4)	NA (3)	--	--
	Pentachlorophenol	µg/kg	8800	6000	NA (3)	1	0	0	0	0	0	NA (3)	1	0.04	0.04	0	0	NA (3)	--	--
Inorganics																				
	% Solids	%	NA (4)	NA (4)	NA (3)	12	12	83	97	NA (4)	NA (4)	NA (3)	0	0	0	NA (4)	NA (4)	NA (3)	--	--
	Bromide	mg/kg	NA (4)	NA (4)	NA (3)	21	0	0	0	NA (4)	NA (4)	NA (3)	21	0.42	0.743	NA (4)	NA (4)	NA (3)	--	--
	Chloride	mg/kg	NA (4)	NA (4)	NA (3)	21	16	2.06	8.76	NA (4)	NA (4)	NA (3)	5	0.65	5.4	NA (4)	NA (4)	NA (3)	--	--
	Fluoride	mg/kg	NA (4)	NA (4)	NA (3)	21	21	0.817	7.51	NA (4)	NA (4)	NA (3)	0	0	0	NA (4)	NA (4)	NA (3)	--	--
	Moisture	%	NA (4)	NA (4)	NA (3)	227	227	0.738	20.9	NA (4)	NA (4)	NA (3)	0	0	0	NA (4)	NA (4)	NA (3)	--	--
	Nitrate-N	mg/kg	NA (4)	NA (4)	NA (3)	21	8	0.748	5.86	NA (4)	NA (4)	NA (3)	13	0.292	5.4	NA (4)	NA (4)	NA (3)	--	--
	Nitrite-N	mg/kg	NA (4)	NA (4)	NA (3)	21	0	0	0	NA (4)	NA (4)	NA (3)	21	0.292	0.37	NA (4)	NA (4)	NA (3)	--	--
	pH	pH Units	NA (4)	NA (4)	NA (3)	196	196	5.37	9.78	NA (4)	NA (4)	NA (3)	0	0	0	NA (4)	NA (4)	NA (3)	--	--
	Phosphate	mg/kg	NA (4)	NA (4)	NA (3)	21	0	0	0	NA (4)	NA (4)	NA (3)	21	0.55	0.743	NA (4)	NA (4)	NA (3)	--	--
	Sulfate	mg/kg	NA (4)	NA (4)	NA (3)	21	18	3.6	51.3	NA (4)	NA (4)	NA (3)	3	5.7	11.7	NA (4)	NA (4)	NA (3)	--	--
Other Organic Data																				
	Diethylene glycol	mg/kg	NA (4)	NA (4)	NA (3)	9	0	0	0	NA (4)	NA (4)	NA (3)	9	35.5	60	NA (4)	NA (4)	NA (3)	--	--
	Ethylene glycol	mg/kg	NA (4)	NA (4)	NA (3)	9	0	0	0	NA (4)	NA (4)	NA (3)	9	35.5	60	NA (4)	NA (4)	NA (3)	--	--
	m-Terphenyl	mg/kg	NA (4)	214	NA (3)	26	0	0	0	NA (4)	0	NA (3)	26	0.169	3.61	NA (4)	0	NA (3)	--	--
	o-Terphenyl	mg/kg	NA (4)	214	NA (3)	26	0	0	0	NA (4)	0	NA (3)	26	0.169	3.61	NA (4)	0	NA (3)	--	--
	Propylene glycol	mg/kg	NA (4)	NA (4)	NA (3)	9	0	0	0	NA (4)	NA (4)	NA (3)	9	35.5	60	NA (4)	NA (4)	NA (3)	--	--
	p-Terphenyl	mg/kg	NA (4)	214	NA (3)	26	0	0	0	NA (4)	0	NA (3)	26	0.169	3.61	NA (4)	0	NA (3)	--	--
	Triethylene glycol	mg/kg	NA (4)	NA (4)	NA (3)	9	0	0	0	NA (4)	NA (4)	NA (3)	9	35.5	60	NA (4)	NA (4)	NA (3)	--	--

TABLE C.3-3A
RMHF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL)
(Page 2 of 5)

Analyte Group	Constituent *	Units	Screening Levels (1)			Total Number Samples Analyzed	Detect Data Summary						Non-Detect Data Summary						Data Issue (5)	Issue Resolution (6)
			Residential (ResRBSL)	Ecological (EcoRBSL)	Background (2)		Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Number of Detected Concentrations > Background	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	NumberDL > EcoRBSL	Number DL > Background		
METALS (mg/kg)																				
	Aluminum	mg/kg	75000	12	20000	171	171	4280	19600	0	171	0	0	0	0	0	0	0	--	--
	Antimony	mg/kg	30	0.095	8.7	192	23	0.347	5.3	0	23	0	169	0.163	2.5	0	169	0	Elevated DL	a
	Arsenic	mg/kg	0.095	1.9	15	195	192	0.66	14.9	192	170	0	3	2.5	2.5	3	3	0	Elevated DL	a
	Barium	mg/kg	15000	15	140	174	174	27.1	134	0	174	0	0	0	0	0	0	0	--	--
	Beryllium	mg/kg	150	5.1	1.1	192	183	0.13	1.1	0	0	0	9	0.04	0.25	0	0	0	--	--
	Boron	mg/kg	15000	6.8	9.7	174	91	0.99	17.6	0	8	5	83	0.68	6.49	0	0	0	--	--
	Cadmium	mg/kg	78	0.021	1	192	161	0.034	4.8	0	161	0	31	0.199	0.5	0	31	0	Elevated DL	a
	Chromium	mg/kg	114000	930	37	192	192	5	38.8	0	0	2	0	0	0	0	0	0	--	--
	Cobalt	mg/kg	23	8.9	21	174	174	1.8	48	2	5	2	0	0	0	0	0	0	--	--
	Copper	mg/kg	3000	1.1	29	195	195	2.2	62.7	0	195	1	0	0	0	0	0	0	--	--
	Cyanides	mg/kg	1500	290	NA (3)	7	2	0.596	0.689	0	0	0	5	0.0699	0.258	0	0	NA (3)	--	--
	Hexavalent Chromium	mg/kg	110	0.20	NA (3)	65	13	0.0273	0.69	0	4	0	52	0.0202	0.45	0	10	NA (3)	Elevated DL	b, d, e
	Lead	mg/kg	150	0.063	34	192	192	1.7	44.1	0	192	2	0	0	0	0	0	0	--	--
	Lithium	mg/kg	152.2	10	37	171	171	6.2	32.8	0	168	0	0	0	0	0	0	0	--	--
	Mercury	mg/kg	23	0.10	0.09	192	137	0.0018	0.12	0	1	1	55	0.00142	0.25	0	18	18	Elevated DL	c
	Molybdenum	mg/kg	380	0.11	5.3	174	139	0.15	2.9	0	139	0	35	0.05	0.991	0	34	0	Elevated DL	a
	Nickel	mg/kg	1500	0.10	29	192	192	2.8	21.1	0	192	0	0	0	0	0	0	0	--	--
	Potassium	mg/kg	NA (4)	NA (4)	6400	177	177	1060	4540	0	0	0	0	0	0	0	0	0	--	--
	Selenium	mg/kg	380	0.17	0.66	193	12	0.15	2.7	0	11	7	181	0.2	1.07	0	181	3	Elevated DL	a
	Silver	mg/kg	380	0.54	0.79	192	33	0.02	0.21	0	0	0	159	0.017	1	0	19	18	Elevated DL	a, c
	Sodium	mg/kg	NA (4)	NA (4)	110	203	84	67	810	0	0	56	119	53	301	0	0	58	--	--
	Thallium	mg/kg	4.9	2.9	0.46	195	56	0.088	0.51	0	0	1	139	0.15	0.6	0	0	27	--	--
	Vanadium	mg/kg	369	1.5	62	177	177	11.5	75.3	0	177	2	0	0	0	0	0	0	--	--
	Zinc	mg/kg	23000	21	110	195	195	18	1240	0	192	12	0	0	0	0	0	0	--	--
	Zirconium	mg/kg	NA (4)	7.4	8.6	174	157	0.64	14.2	0	1	1	17	0.63	1.3	0	0	0	--	--
PCB (µg/kg)																				
	Aroclor 1016	µg/kg	140	1563	NA (3)	99	0	0	0	0	0	NA (3)	99	3.38	682	1	0	NA (3)	Elevated DL	f
	Aroclor 1221	µg/kg	140	1563	NA (3)	99	0	0	0	0	0	NA (3)	99	3.38	682	1	0	NA (3)	Elevated DL	f
	Aroclor 1232	µg/kg	140	78	NA (3)	99	0	0	0	0	0	NA (3)	99	2.1	682	1	2	NA (3)	Elevated DL	d, f
	Aroclor 1242	µg/kg	140	79	NA (3)	99	4	3.2	11	0	0	NA (3)	95	2.1	682	1	2	NA (3)	Elevated DL	d, f
	Aroclor 1248	µg/kg	140	11	NA (3)	99	1	7.9	7.9	0	0	NA (3)	98	2.1	682	1	15	NA (3)	Elevated DL	g, d, f
	Aroclor 1254	µg/kg	140	78	NA (3)	102	25	1.6	91	0	1	NA (3)	77	2.1	682	1	2	NA (3)	Elevated DL	d, f
	Aroclor 1260	µg/kg	140	78	NA (3)	99	23	1.5	6710	1	1	NA (3)	76	2.1	110	0	1	NA (3)	Elevated DL	f
	Aroclor 5442	µg/kg	NA (4)	NA (4)	NA (3)	6	0	0	0	NA (4)	NA (4)	NA (3)	6	17	21	NA (4)	NA (4)	NA (3)	--	--
	Polychlorinated terphenyls	µg/kg	NA (4)	78	NA (3)	5	0	0	0	NA (4)	0	NA (3)	5	17	21	NA (4)	0	NA (3)	--	--
Perchlorate																				
	Perchlorate	µg/kg	53258	0.024	NA (3)	1	0	0	0	0	0	NA (3)	1	4.4	4.4	0	1	NA (3)	Elevated DL	c
	Perchlorate	µg/L	53258	0.024	NA (3)	23	0	0	0	0	0	NA (3)	23	4	4	0	23	NA (3)	Elevated DL	c
Pesticide (µg/kg)																				
	4,4'-DDD	µg/kg	3573	12	NA (3)	6	0	0	0	0	0	NA (3)	6	0.27	7.24	0	0	NA (3)	--	--
	4,4'-DDE	µg/kg	2522	12	NA (3)	6	1	4.89	4.89	0	0	NA (3)	5	0.22	7.24	0	0	NA (3)	--	--
	4,4'-DDT	µg/kg	2522	12	NA (3)	6	1	5.25	5.25	0	0	NA (3)	5	0.22	7.24	0	0	NA (3)	--	--
	a-Chlordane	µg/kg	NA (4)	NA (4)	NA (3)	5	0	0	0	NA (4)	NA (4)	NA (3)	5	0.717	3.62	NA (4)	NA (4)	NA (3)	--	--
	Aldrin	µg/kg	50	427	NA (3)	6	0	0	0	0	0	NA (3)	6	0.23	3.62	0	0	NA (3)	--	--
	alpha-BHC	µg/kg	318	214	NA (3)	6	0	0	0	0	0	NA (3)	6	0.27	3.62	0	0	NA (3)	--	--
	ALPHA-CHLORDANE	µg/kg	NA (4)	NA (4)	NA (3)	1	0	0	0	NA (4)	NA (4)	NA (3)	1	0.2	0.2	NA (4)	NA (4)	NA (3)	--	--
	beta-BHC	µg/kg	572	214	NA (3)	6	0	0	0	0	0	NA (3)	6	0.37	3.62	0	0	NA (3)	--	--
	delta-BHC	µg/kg	NA (4)	NA (4)	NA (3)	6	0	0	0	NA (4)	NA (4)	NA (3)	6	0.15	3.62	NA (4)	NA (4)	NA (3)	--	--
	Dieldrin	µg/kg	54	85	NA (3)	6	0	0	0	0	0	NA (3)	6	0.2	7.24	0	0	NA (3)	--	--
	Endosulfan I	µg/kg	411654	641	NA (3)	6	0	0	0	0	0	NA (3)	6	0.2	3.62	0	0	NA (3)	--	--
	Endosulfan II	µg/kg	411654	641	NA (3)	6	0	0	0	0	0	NA (3)	6	0.24	7.24	0	0	NA (3)	--	--
	Endosulfan sulfate	µg/kg	411654	641	NA (3)	6	0	0	0	0	0	NA (3)	6	0.27	7.24	0	0	NA (3)	--	--
	Endrin	µg/kg	20583	44	NA (3)	6	0	0	0	0	0	NA (3)	6	0.25	7.24	0	0	NA (3)	--	--
	Endrin aldehyde	µg/kg	NA (4)	NA (4)	NA (3)	6	0	0	0	NA (4)	NA (4)	NA (3)	6	0.44	7.24	NA (4)	NA (4)	NA (3)	--	--
	Endrin ketone	µg/kg	NA (4)	NA (4)	NA (3)	6	0	0	0	NA (4)	NA (4)	NA (3)	6	0.3	7.24	NA (4)	NA (4)	NA (3)	--	--
	gamma-BHC	µg/kg	780	214	NA (3)	6	0	0	0	0	0	NA (3)	6	0.21	3.62	0	0	NA (3)	--	--
	gamma-Chlordane	µg/kg	NA (4)	NA (4)	NA (3)	6	0	0	0	NA (4)	NA (4)	NA (3)	6	0.19	3.62	NA (4)	NA (4)	NA (3)	--	--
	Heptachlor	µg/kg	209	555	NA (3)	6	0	0	0	0	0	NA (3)	6	0.23	3.62	0	0	NA (3)	--	--
	Heptachlor epoxide	µg/kg	156	5.3	NA (3)	6	0	0	0	0	0	NA (3)	6	0.23	3.62	0	0	NA (3)	--	--
	METHOXYCHLOR	µg/kg	343045	10678	NA (3)	1	0	0	0	0	0	NA (3)	1	0.39	0.39	0	0	NA (3)	--	--
	p,p'-Methoxychlor	µg/kg	NA (4)	NA (4)	NA (3)	5	0	0	0	NA (4)	NA (4)	NA (3)	5	7.17	36.2	NA (4)	NA (4)	NA (3)	--	--
	Toxaphene	µg/kg	715	34168	NA (3)	6	0	0	0	0	0	NA (3)	6	17	181	0	0	NA (3)	--	--
SVOC (µg/kg)																				
	1,2,4-Trichlorobenzene	µg/kg	142	20000	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	57	0	NA (3)	Elevated DL	g, c
	1,2-Dichlorobenzene	µg/kg	1800	370000	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	1	0	NA (3)	Elevated DL	g

TABLE C.3-3A
RMHF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL)
(Page 3 of 5)

Analyte Group	Constituent *	Units	Screening Levels (1)			Total Number Samples Analyzed	Detect Data Summary						Non-Detect Data Summary						Data Issue (5)	Issue Resolution (6)
			Residential (ResRBSL)	Ecological (EcoRBSL)	Background (2)		Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Number of Detected Concentrations > Background	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	NumberDL > EcoRBSL	Number DL > Background		
	1,2-Diphenylhydrazine	µg/kg	NA (4)	NA (4)	NA (3)	45	0	0	0	NA (4)	NA (4)	NA (3)	45	30	3590	NA (4)	NA (4)	NA (3)	--	--
	1,3-Dichlorobenzene	µg/kg	1700	160165	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	1	0	NA (3)	Elevated DL	g
	1,4-Dichlorobenzene	µg/kg	5.6	20000	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	63	0	NA (3)	Elevated DL	c, e
	1-Methyl naphthalene	µg/kg	NA (4)	NA (4)	NA (3)	128	1	0.7	0.7	NA (4)	NA (4)	NA (3)	127	1.7	360	NA (4)	NA (4)	NA (3)	--	--
	1-Methyl naphthaleneM	µg/kg	NA (4)	NA (4)	NA (3)	3	0	0	0	NA (4)	NA (4)	NA (3)	3	19.1	19.1	NA (4)	NA (4)	NA (3)	--	--
	2- (2-Ethoxyethoxy) ethanol	µg/kg	NA (4)	NA (4)	NA (3)	2	0	0	0	NA (4)	NA (4)	NA (3)	2	0	0	NA (4)	NA (4)	NA (3)	--	--
	2,4,5-Trichlorophenol	µg/kg	5700000	9000	NA (3)	57	0	0	0	0	0	NA (3)	57	179	3590	0	0	NA (3)	--	--
	2,4,6-Trichlorophenol	µg/kg	10000	10000	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	0	0	NA (3)	--	--
	2,4-Dichlorophenol	µg/kg	170000	1281	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	0	3	NA (3)	Elevated DL	g
	2,4-Dimethylphenol	µg/kg	1100000	110000	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	0	0	NA (3)	--	--
	2,4-Dinitrophenol	µg/kg	110000	590	NA (3)	63	0	0	0	0	0	NA (3)	63	200	7190	0	54	NA (3)	Elevated DL	g, c, e
	2,4-Dinitrotoluene	µg/kg	NA (4)	NA (4)	NA (3)	63	0	0	0	NA (4)	NA (4)	NA (3)	63	30	3590	NA (4)	NA (4)	NA (3)	--	--
	2,6-Dinitrotoluene	µg/kg	NA (4)	NA (4)	NA (3)	63	0	0	0	NA (4)	NA (4)	NA (3)	63	30	3590	NA (4)	NA (4)	NA (3)	--	--
	2-Chloronaphthalene	µg/kg	4600000	530000	NA (3)	63	0	0	0	0	0	NA (3)	63	17.9	1500	0	0	NA (3)	--	--
	2-Chlorophenol	µg/kg	290000	21355	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	0	0	NA (3)	--	--
	2-Methylnaphthalene	µg/kg	230000	210000	NA (3)	149	1	0.8	0.8	0	0	NA (3)	148	1.7	420	0	0	NA (3)	--	--
	2-Nitroaniline	µg/kg	NA (4)	NA (4)	NA (3)	57	0	0	0	NA (4)	NA (4)	NA (3)	57	179	3590	NA (4)	NA (4)	NA (3)	--	--
	2-Nitrophenol	µg/kg	NA (4)	11532	NA (3)	63	0	0	0	NA (4)	0	NA (3)	63	30	3590	NA (4)	0	NA (3)	--	--
	3,3'-Dichlorobenzidine	µg/kg	NA (4)	NA (4)	NA (3)	63	0	0	0	NA (4)	NA (4)	NA (3)	63	60	3800	NA (4)	NA (4)	NA (3)	--	--
	3-Nitroaniline	µg/kg	NA (4)	NA (4)	NA (3)	57	0	0	0	NA (4)	NA (4)	NA (3)	57	179	3590	NA (4)	NA (4)	NA (3)	--	--
	4,4'-DDD	µg/kg	3573	12	NA (3)	15	1	200	200	0	1	0	14	330	330	0	14	NA (3)	Elevated DL	c
	4,4'-DDE	µg/kg	2522	12	NA (3)	15	0	0	0	0	0	NA (3)	15	330	330	0	15	NA (3)	Elevated DL	c
	4,4'-DDT	µg/kg	2522	12	NA (3)	15	0	0	0	0	0	NA (3)	15	330	330	0	15	NA (3)	Elevated DL	c
	4,6-Dinitro-o-cresol	µg/kg	NA (4)	NA (4)	NA (3)	63	0	0	0	NA (4)	NA (4)	NA (3)	63	179	3590	NA (4)	NA (4)	NA (3)	--	--
	4-Bromophenyl phenyl ether	µg/kg	NA (4)	NA (4)	NA (3)	63	0	0	0	NA (4)	NA (4)	NA (3)	63	30	3590	NA (4)	NA (4)	NA (3)	--	--
	4-Chlorophenylphenyl ether	µg/kg	NA (4)	NA (4)	NA (3)	63	0	0	0	NA (4)	NA (4)	NA (3)	63	30	3590	NA (4)	NA (4)	NA (3)	--	--
	4-Nitrophenol	µg/kg	NA (4)	7000	NA (3)	63	0	0	0	NA (4)	0	NA (3)	63	179	3800	NA (4)	0	NA (3)	--	--
	Acenaphthene	µg/kg	3400000	2456	NA (3)	155	3	0.41	10.4	0	0	NA (3)	152	1.7	420	0	0	NA (3)	--	--
	Acenaphthylene	µg/kg	3400000	270384	NA (3)	155	1	5.65	5.65	0	0	NA (3)	154	1.7	420	0	0	NA (3)	--	--
	Aldrin	µg/kg	50	427	NA (3)	15	0	0	0	0	0	NA (3)	15	330	330	15	0	NA (3)	Elevated DL	c
	alpha-BHC	µg/kg	318	214	NA (3)	15	0	0	0	0	0	NA (3)	15	330	330	15	15	NA (3)	Elevated DL	c
	Aniline	µg/kg	130000	10678	NA (3)	39	0	0	0	0	0	NA (3)	39	179	3590	0	0	NA (3)	--	--
	Anthracene	µg/kg	17000000	2384	NA (3)	155	9	0.5	27.8	0	0	NA (3)	146	1.38	420	0	0	NA (3)	--	--
	Benzidine	µg/kg	NA (4)	NA (4)	NA (3)	45	0	0	0	NA (4)	NA (4)	NA (3)	45	179	7400	NA (4)	NA (4)	NA (3)	--	--
	Benzo(a)anthracene	µg/kg	600	1418	NA (3)	155	16	2.8	176	0	0	NA (3)	139	5.9	420	0	0	NA (3)	--	--
	Benzo(a)pyrene	µg/kg	60	5595	NA (3)	155	18	4	71.4	1	0	NA (3)	137	2.56	420	21	0	NA (3)	Elevated DL	g, c
	Benzo(b)fluoranthene	µg/kg	600	4360	NA (3)	155	24	0.27	142	0	0	NA (3)	131	2.54	420	0	0	NA (3)	--	--
	Benzo(ghi)perylene	µg/kg	NA (4)	NA (4)	NA (3)	155	13	0.25	30.6	NA (4)	NA (4)	NA (3)	142	6.24	420	NA (4)	NA (4)	NA (3)	--	--
	Benzo(k)fluoranthene	µg/kg	600	5763	NA (3)	154	2	0.18	3.6	0	0	NA (3)	152	2.68	420	0	0	NA (3)	--	--
	Benzoic acid	µg/kg	230000000	4438	NA (3)	57	0	0	0	0	0	NA (3)	57	359	7190	0	1	NA (3)	Elevated DL	g
	Benzyl alcohol	µg/kg	17000000	4438	NA (3)	56	0	0	0	0	0	NA (3)	56	179	3590	0	0	NA (3)	--	--
	beta-BHC	µg/kg	572	214	NA (3)	15	0	0	0	0	0	NA (3)	15	330	330	0	15	NA (3)	Elevated DL	c
	bis(2-Chloroethoxy)methane	µg/kg	NA (4)	150000	NA (3)	63	0	0	0	NA (4)	0	NA (3)	63	30	3590	NA (4)	0	NA (3)	--	--
	bis(2-Chloroethyl) ether	µg/kg	NA (4)	NA (4)	NA (3)	63	0	0	0	NA (4)	NA (4)	NA (3)	63	30	3590	NA (4)	NA (4)	NA (3)	--	--
	bis(2-Chloroisopropyl) ether	µg/kg	NA (4)	NA (4)	NA (3)	63	0	0	0	NA (4)	NA (4)	NA (3)	63	30	3590	NA (4)	NA (4)	NA (3)	--	--
	bis(2-Ethylhexyl) phthalate	µg/kg	NA (4)	NA (4)	NA (3)	155	25	6.77	3690	NA (4)	NA (4)	NA (3)	130	4.33	360	NA (4)	NA (4)	NA (3)	--	--
	Butyl benzyl phthalate	µg/kg	377249	339549	NA (3)	155	11	5.17	130	0	0	NA (3)	144	7.95	400	0	0	NA (3)	--	--
	Chrysene	µg/kg	6000	2359	NA (3)	155	21	0.55	236	0	0	NA (3)	134	4.33	420	0	0	NA (3)	--	--
	delta-BHC	µg/kg	NA (4)	NA (4)	NA (3)	15	0	0	0	NA (4)	NA (4)	NA (3)	15	330	330	NA (4)	NA (4)	NA (3)	--	--
	Dibenzo(a,h)anthracene	µg/kg	NA (4)	NA (4)	NA (3)	155	2	0.97	2	NA (4)	NA (4)	NA (3)	153	7.95	420	NA (4)	NA (4)	NA (3)	--	--
	Dibenzofuran	µg/kg	110000	62000	NA (3)	57	0	0	0	0	0	NA (3)	57	179	3590	0	0	NA (3)	--	--
	Dieldrin	µg/kg	54	85	NA (3)	15	0	0	0	0	0	NA (3)	15	330	330	15	15	NA (3)	Elevated DL	c
	Diethyl phthalate	µg/kg	NA (4)	NA (4)	NA (3)	155	1	12	12	NA (4)	NA (4)	NA (3)	154	13.9	420	NA (4)	NA (4)	NA (3)	--	--
	Dimethyl phthalate	µg/kg	570000000	4438	NA (3)	155	0	0	0	0	0	NA (3)	155	15.5	420	0	0	NA (3)	--	--
	Di-n-butyl phthalate	µg/kg	NA (4)	NA (4)	NA (3)	155	26	1.5	86	NA (4)	NA (4)	NA (3)	129	10.1	420	NA (4)	NA (4)	NA (3)	--	--
	Di-n-octyl phthalate	µg/kg	2300000	13000	NA (3)	155	4	8.7	60	0	0	NA (3)	151	14.7	420	0	0	NA (3)	--	--
	Diphenylamine	µg/kg	NA (4)	NA (4)	NA (3)	37	0	0	0	NA (4)	NA (4)	NA (3)	37	179	3590	NA (4)	NA (4)	NA (3)	--	--
	Endosulfan sulfate	µg/kg	411654	641	NA (3)	15	0	0	0	0	0	NA (3)	15	330	330	0	0	NA (3)	--	--
	Endrin	µg/kg	20583	44	NA (3)	15	0	0	0	0	0	NA (3)	15	330	330	0	15	NA (3)	Elevated DL	c
	Fluoranthene	µg/kg	2300000	38000	NA (3)	154	27	0.39	611	0	0	NA (3)	127	3.18	420	0	0	NA (3)	--	--
	Fluorene	µg/kg	2300000	1646	NA (3)	155	2	0.31	0.92	0	0	NA (3)	153	1.7	420	0	0	NA (3)	--	--
	gamma-BHC	µg/kg	NA (4)	NA (4)	NA (3)	15	0	0	0	NA (4)	NA (4)	NA (3)	15	330	330	0	15	NA (3)	Elevated DL	c
	Heptachlor	µg/kg	209	555	NA (3)	15	0	0	0	0	0	NA (3)	15	330	330	15	0	NA (3)	Elevated DL	c
	Heptachlor epoxide	µg/kg	156	5.3	NA (3)	15	0	0	0	0	0.0	NA (3)	15	330	330	15	15	NA (3)	Elevated DL	c
	Hexachlorobenzene	µg/kg	400	342	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	5	37	NA (3)	Elevated DL	b, c, g
	Hexachlorobutadiene	µg/kg	9200	854	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	0	3	NA (3)	Elevated DL	g
	Hexachlorocyclopentadiene	µg/kg	340000	12813	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3800	0	0	NA (3)	--	--
	Hexachloroethane	µg/kg	18000	2136	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	0	1	NA (3)	Elevated DL	g
	Hydroquinone	µg/kg	NA (4)	NA (4)	NA (3)	2	0	0	0	NA (4)	NA (4)	NA (3)	2	0	0	0	0	NA (3)	--	--
	Indeno(1,2,3-cd)pyrene	µg/kg	600	5821	NA (3)	155	10	1.9	28.5	0	0	NA (3)	145	3.74	420	0	0	NA (3)	--	--
	Isophorone	µg/kg	750000	320329	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	0	0	NA (3)	--	--

TABLE C.3-3A
RMHF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL)
(Page 4 of 5)

Analyte Group	Constituent *	Units	Screening Levels (1)			Total Number Samples Analyzed	Detect Data Summary						Non-Detect Data Summary						Data Issue (5)	Issue Resolution (6)
			Residential (ResRBSL)	Ecological (EcoRBSL)	Background (2)		Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Number of Detected Concentrations > Background	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	NumberDL > EcoRBSL	Number DL > Background		
	Morpholine	µg/kg	NA (4)	NA (4)	NA (3)	2	0	0	0	NA (4)	NA (4)	NA (3)	2	0	0	0	0	NA (3)	--	--
	Naphthalene	µg/kg	1146591	210000	NA (3)	155	2	0.38	0.76	0	0	NA (3)	153	8.53	420	0	0	NA (3)	--	--
	Nicotine	µg/kg	NA (4)	NA (4)	NA (3)	2	0	0	0	NA (4)	NA (4)	NA (3)	2	0	0	0	0	NA (3)	--	--
	Nitrobenzene	µg/kg	29000	1965	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	0	1	NA (3)	Elevated DL	g
	n-Nitrosodimethylamine	µg/kg	45	20000	NA (3)	137	1	5.68	5.68	0	0	NA (3)	136	1.7	376	8	0	NA (3)	Elevated DL	b, g
	n-Nitrosodi-n-propylamine	µg/kg	100	27762	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	57	0	NA (3)	Elevated DL	b, c, g
	n-Nitrosodiphenylamine	µg/kg	80000	20000	NA (3)	26	0	0	0	0	0	NA (3)	26	30	1500	0	0	NA (3)	--	--
	o-Cresol	µg/kg	NA (4)	NA (4)	NA (3)	57	0	0	0	NA (4)	NA (4)	NA (3)	57	179	3590	0	0	NA (3)	--	--
	p-Chloroaniline	µg/kg	NA (4)	NA (4)	NA (3)	57	0	0	0	NA (4)	NA (4)	NA (3)	57	179	3590	0	0	NA (3)	--	--
	p-Chloro-m-cresol	µg/kg	NA (4)	NA (4)	NA (3)	63	0	0	0	NA (4)	NA (4)	NA (3)	63	30	3590	0	0	NA (3)	--	--
	p-Cresol	µg/kg	NA (4)	NA (4)	NA (3)	57	0	0	0	NA (4)	NA (4)	NA (3)	57	179	3590	0	0	NA (3)	--	--
	Pentachlorophenol	µg/kg	8800	6000	NA (3)	63	1	37.4	37.4	0	0	NA (3)	62	179	3800	0	0	NA (3)	--	--
	Phenanthrene	µg/kg	17000000	1314	NA (3)	155	19	1.8	86.7	0	0	NA (3)	136	5.18	420	0	0	NA (3)	--	--
	Phenol	µg/kg	18000000	5015	NA (3)	63	0	0	0	0	0	NA (3)	63	30	3590	0	0	NA (3)	--	--
	p-Nitroaniline	µg/kg	NA (4)	NA (4)	NA (3)	57	0	0	0	NA (4)	NA (4)	NA (3)	57	179	3800	0	0	NA (3)	--	--
	Pyrene	µg/kg	1700000	18000	NA (3)	155	29	0.21	579	0	0	NA (3)	126	4.82	420	0	0	NA (3)	--	--
	Pyridine	µg/kg	NA (4)	NA (4)	NA (3)	2	0	0	0	NA (4)	NA (4)	NA (3)	2	710	3000	0	0	NA (3)	--	--
TPH (mg/kg)																				
	Diesel Range Organics (C10-C28)	mg/kg	1400	NA (4)	NA (3)	3	0	0	0	0	NA (4)	NA (3)	3	3	3	0	NA (4)	NA (3)	--	--
	Diesel Range Organics (C15-C20)	mg/kg	1400	NA (4)	NA (3)	164	20	1.2	260	0	NA (4)	NA (3)	144	3.37	183	0	NA (4)	NA (3)	--	--
	Gasoline Range Organics (C08-C11)	mg/kg	1.1	NA (4)	NA (3)	164	1	1.5	1.5	1	NA (4)	NA (3)	163	3.36	183	163	NA (4)	NA (3)	Elevated DL	c, f, g
	Kerosene Range Organics (C12-C14)	mg/kg	1400	NA (4)	NA (3)	164	3	1.31	3.6	0	NA (4)	NA (3)	161	3.36	183	0	NA (4)	NA (3)	--	--
	Lubricant Oil Range Organics (C21-C30)	mg/kg	1400	NA (4)	NA (3)	165	152	1.27	1030	0	NA (4)	NA (3)	13	3.41	33.7	0	NA (4)	NA (3)	--	--
	Oil Range Organics (C28+)	mg/kg	1400	NA (4)	NA (3)	3	0	0	0	0	NA (4)	NA (3)	3	17	17	0	NA (4)	NA (3)	--	--
	Total Petroleum Hydrocarbons	mg/kg	1400	NA (4)	NA (3)	3	0	0	0	0	NA (4)	NA (3)	3	0.2	0.2	0	NA (4)	NA (3)	--	--
VOC (µg/kg)																				
	1,1,1,2-Tetrachloroethane	µg/kg	2.0	76281	NA (3)	100	0	0	0	0	0	NA (3)	100	0.856	6	1	0	NA (3)	Elevated DL	g
	1,1,1-Trichloroethane	µg/kg	1114	4300000	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	0	0	NA (3)	--	--
	1,1,2,2-Tetrachloroethane	µg/kg	1.4	5979	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	26	0	NA (3)	Elevated DL	c, g
	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/kg	16000	582999	NA (3)	103	0	0	0	0	0	NA (3)	103	4.28	11	0	0	NA (3)	--	--
	1,1,2-Trichloroethane	µg/kg	1.2	8329	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	33	0	NA (3)	Elevated DL	c, g
	1,1-Dichloroethane	µg/kg	1.6	210000	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	26	0	NA (3)	Elevated DL	b, c, g
	1,1-Dichloroethene	µg/kg	8.0	10678	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	0	0	NA (3)	--	--
	1,1-Dichloropropene	µg/kg	NA (4)	NA (4)	NA (3)	100	0	0	0	0	NA (4)	NA (3)	100	0.856	6	0	NA (4)	NA (3)	--	--
	1,2,3-Trichlorobenzene	µg/kg	142	20000	NA (3)	99	0	0	0	0	0	NA (3)	99	0.856	6	0	0	NA (3)	--	--
	1,2,3-Trichloropropane	µg/kg	66	12194	NA (3)	100	0	0	0	0	0	NA (3)	100	0.856	6	0	0	NA (3)	--	--
	1,2,4-Trichlorobenzene	µg/kg	142	20000	NA (3)	99	0	0	0	0	0	NA (3)	99	0.856	6	0	0	NA (3)	--	--
	1,2,4-Trimethylbenzene	µg/kg	41	64066	NA (3)	99	0	0	0	0	0	NA (3)	99	0.856	6	0	0	NA (3)	--	--
	1,2-Dibromo-3-chloropropane	µg/kg	29	21782	NA (3)	100	0	0	0	0	0	NA (3)	100	0.856	6	0	0	NA (3)	--	--
	1,2-Dibromoethane	µg/kg	0.24	25000	NA (3)	100	0	0	0	0	0	NA (3)	100	0.856	6	100	0	NA (3)	Elevated DL	c, g
	1,2-Dichlorobenzene	µg/kg	1800	370000	NA (3)	116	0	0	0	0	0	NA (3)	116	0.856	6	0	0	NA (3)	--	--
	1,2-Dichloroethane	µg/kg	0.50	76337	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	125	0	NA (3)	Elevated DL	c, g
	1,2-Dichloroethenes	µg/kg	14	68337	NA (3)	3	0	0	0	0	0	NA (3)	3	6	6	0	0	NA (3)	--	--
	1,2-Dichloropropane	µg/kg	0.57	25000	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	125	0	NA (3)	Elevated DL	b, c, g
	1,3,5-Trimethylbenzene	µg/kg	36	64066	NA (3)	99	0	0	0	0	0	NA (3)	99	0.856	6	0	0	NA (3)	--	--
	1,3-Dichlorobenzene	µg/kg	1700	160165	NA (3)	115	0	0	0	0	0	NA (3)	115	0.856	6	0	0	NA (3)	--	--
	1,3-Dichloropropane	µg/kg	NA (4)	NA (4)	NA (3)	100	0	0	0	NA (4)	NA (4)	NA (3)	100	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	1,3-Dichloropropene	µg/kg	NA (4)	NA (4)	NA (3)	6	0	0	0	NA (4)	NA (4)	NA (3)	6	5	5	NA (4)	NA (4)	NA (3)	--	--
	1,4-Dichlorobenzene	µg/kg	5.6	20000	NA (3)	115	0	0	0	0	0	NA (3)	115	0.856	6	1	0	NA (3)	Elevated DL	g
	2-Chloro-1,1,1-trifluoroethane	µg/kg	NA (4)	NA (4)	NA (3)	26	0	0	0	NA (4)	NA (4)	NA (3)	26	6	12.6	NA (4)	NA (4)	NA (3)	--	--
	2-Chloroethylvinyl ether	µg/kg	0.010	726	NA (3)	116	0	0	0	0	0	NA (3)	116	4.28	11	116	0	NA (3)	Elevated DL	c
	2-Hexanone	µg/kg	NA (4)	1220000	NA (3)	119	0	0	0	NA (4)	0	NA (3)	119	4.28	25	NA (4)	0	NA (3)	--	--
	Acetone	µg/kg	482144	42711	NA (3)	119	5	3	44.1	0	0	NA (3)	114	4.28	30.1	0	0	NA (3)	--	--
	Benzene	µg/kg	0.13	110000	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	125	0	NA (3)	Elevated DL	c
	Bromobenzene	µg/kg	NA (4)	NA (4)	NA (3)	100	0	0	0	NA (4)	NA (4)	NA (3)	100	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Bromochloromethane	µg/kg	NA (4)	NA (4)	NA (3)	100	0	0	0	NA (4)	NA (4)	NA (3)	100	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Bromodichloromethane	µg/kg	0.31	15290	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	125	0	NA (3)	Elevated DL	c, g
	Bromoform	µg/kg	NA (4)	NA (4)	NA (3)	125	0	0	0	NA (4)	NA (4)	NA (3)	125	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Bromomethane	µg/kg	NA (4)	NA (4)	NA (3)	125	0	0	0	NA (4)	NA (4)	NA (3)	125	0.856	13	NA (4)	NA (4)	NA (3)	--	--
	Carbon Disulfide	µg/kg	68	46982	NA (3)	19	0	0	0	0	0	NA (3)	19	5	6	0	0	NA (3)	--	--
	Carbon Tetrachloride	µg/kg	0.04	1516	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	125	0	NA (3)	Elevated DLs	h
	Chlorobenzene	µg/kg	80	40000	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	0	0	NA (3)	--	--
	Chloroethane	µg/kg	NA (4)	190000	NA (3)	125	0	0	0	NA (4)	0	NA (3)	125	0.856	13	NA (4)	0	NA (3)	--	--
	Chloroform	µg/kg	0.77	11019	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	125	0	NA (3)	Elevated DLs	h
	Chloromethane	µg/kg	NA (4)	NA (4)	NA (3)	125	0	0	0	NA (4)	NA (4)	NA (3)	125	0.856	13	NA (4)	NA (4)	NA (3)	--	--
	Chlorotrifluoroethylene	µg/kg	NA (4)	NA (4)	NA (3)	26	0	0	0	NA (4)	NA (4)	NA (3)	26	6	12.6	NA (4)	NA (4)	NA (3)	--	--
	cis-1,2-Dichloroethene	µg/kg	14	68337	NA (3)	116	0	0	0	0	0	NA (3)	116	0.856	6	0	0	NA (3)	--	--
	cis-1,3-Dichloropropene	µg/kg	NA (4)	NA (4)	NA (3)	119	0	0	0	NA (4)	NA (4)	NA (3)	119	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Cumene	µg/kg	NA (4)	NA (4)	NA (3)	99	0	0	0	NA (4)	NA (4)	NA (3)	99	0.856	6	NA (4)	NA (4)	NA (3)	--	--

TABLE C.3-3A
RMHF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL)
(Page 5 of 5)

Analyte Group	Constituent *	Units	Screening Levels (1)			Total Number Samples Analyzed	Detect Data Summary						Non-Detect Data Summary						Data Issue (5)	Issue Resolution (6)
			Residential (ResRBSL)	Ecological (EcoRBSL)	Background (2)		Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Number of Detected Concentrations > Background	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	NumberDL > EcoRBSL	Number DL > Background		
	Dibromochloromethane	µg/kg	NA (4)	NA (4)	NA (3)	125	0	0	0	NA (4)	NA (4)	NA (3)	125	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Dibromomethane	µg/kg	NA (4)	NA (4)	NA (3)	100	0	0	0	NA (4)	NA (4)	NA (3)	100	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Dichlorodifluoromethane	µg/kg	15	64066	NA (3)	100	0	0	0	0	0	NA (3)	100	0.856	6	0	0	NA (3)	--	--
	Ethylbenzene	µg/kg	4.6	210000	NA (3)	125	5	0.318	8	4	0	NA (3)	120	0.856	6	20	0	NA (3)	Elevated DL	c, g
	Hexachlorobutadiene	µg/kg	9200	854	NA (3)	99	0	0	0	0	0	NA (3)	99	0.856	6	0	0	NA (3)	--	--
	Methyl ethyl ketone	mg/kg	NA (4)	NA (4)	NA (3)	1	1	0.01	0.01	NA (4)	NA (4)	NA (3)	0	0	0	NA (4)	NA (4)	NA (3)	--	--
	Methyl ethyl ketone	µg/kg	NA (4)	NA (4)	NA (3)	119	2	1.83	9.92	NA (4)	NA (4)	NA (3)	117	4.28	25	NA (4)	NA (4)	NA (3)	--	--
	Methyl isobutyl ketone (MIBK)	µg/kg	NA (4)	NA (4)	NA (3)	119	0	0	0	NA (4)	NA (4)	NA (3)	119	4.28	25	NA (4)	NA (4)	NA (3)	--	--
	Methyl tert-butyl ether	µg/kg	NA (4)	NA (4)	NA (3)	100	0	0	0	NA (4)	NA (4)	NA (3)	100	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Methylene chloride	µg/kg	4.0	24986	NA (3)	125	25	1.99	8.57	8	0	NA (3)	100	4.28	73	100	0	NA (3)	Elevated DL	c, g
	m-Xylene & p-Xylene	µg/kg	150	64066	NA (3)	116	10	0.285	0.679	0	0	NA (3)	106	1.71	6	0	0	NA (3)	--	--
	Naphthalene	µg/kg	1146591	210000	NA (3)	74	1	0.241	0.241	0	0	NA (3)	73	0.856	1.35	0	0	NA (3)	--	--
	n-Butylbenzene	µg/kg	NA (4)	NA (4)	NA (3)	99	0	0	0	NA (4)	NA (4)	NA (3)	99	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	n-Propylbenzene	µg/kg	203	210000	NA (3)	99	0	0	0	0	0	NA (3)	99	0.856	6	0	0	NA (3)	--	--
	o-Chlorotoluene	µg/kg	NA (4)	NA (4)	NA (3)	99	0	0	0	NA (4)	NA (4)	NA (3)	99	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	o-Xylene	µg/kg	190	64066	NA (3)	116	0	0	0	0	0	NA (3)	116	0.856	6	0	0	NA (3)	--	--
	p-Chlorotoluene	µg/kg	NA (4)	NA (4)	NA (3)	99	0	0	0	NA (4)	NA (4)	NA (3)	99	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	p-Cymene	µg/kg	NA (4)	NA (4)	NA (3)	99	0	0	0	NA (4)	NA (4)	NA (3)	99	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	sec-Butylbenzene	µg/kg	29755	210000	NA (3)	99	0	0	0	0	0	NA (3)	99	0.856	6	0	0	NA (3)	--	--
	sec-Dichloropropane	µg/kg	NA (4)	NA (4)	NA (3)	100	0	0	0	NA (4)	NA (4)	NA (3)	100	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Styrene	µg/kg	7200	427106	NA (3)	119	26	0.191	0.552	0	0	NA (3)	93	0.878	6	0	0	NA (3)	--	--
	tert-Butylbenzene	µg/kg	NA (4)	NA (4)	NA (3)	99	0	0	0	NA (4)	NA (4)	NA (3)	99	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Tetrachloroethene	µg/kg	0.43	5979	NA (3)	125	2	0.224	0.472	1	0	NA (3)	123	0.878	6	123	0	NA (3)	Elevated DL	c, g
	Toluene	µg/kg	234	3417	NA (3)	125	10	0.291	51	0	0	NA (3)	115	0.878	6	0	0	NA (3)	--	--
	trans-1,2-Dichloroethene	µg/kg	14	970000	NA (3)	122	0	0	0	0	0	NA (3)	122	0.856	6	0	0	NA (3)	--	--
	trans-1,3-Dichloropropene	µg/kg	NA (4)	NA (4)	NA (3)	119	0	0	0	NA (4)	NA (4)	NA (3)	119	0.856	6	NA (4)	NA (4)	NA (3)	--	--
	Trichloroethene	µg/kg	2.2	2990	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	6	26	0	NA (3)	Elevated DL	c, g
	Trichlorofluoromethane	µg/kg	110	300000	NA (3)	116	0	0	0	0	0	NA (3)	116	0.856	10	0	0	NA (3)	--	--
	Vinyl acetate	µg/kg	NA (4)	NA (4)	NA (3)	2	0	0	0	NA (4)	NA (4)	NA (3)	2	13	13	NA (4)	NA (4)	NA (3)	--	--
	Vinyl chloride	µg/kg	0.010	726	NA (3)	125	0	0	0	0	0	NA (3)	125	0.856	13	125	0	NA (3)	Elevated DL	c
	Xylenes, Total	mg/kg	150	64066	NA (3)	6	6	0.01	0.03	0	0	NA (3)	0	0	0	0	0	NA (3)	--	--
	Xylenes, Total	µg/kg	150	64066	NA (3)	3	0	0	0	0	0	NA (3)	3	6	6	0	0	NA (3)	--	--

* Analytical data screening summary includes only results collected prior to May 8, 2009. For information regarding additional samples collected on May 8, 2009, see the 'Additional Data' folder of Attachment C-3 of this report. These Group 7 data gap sample results are considered for site action recommendations presented in the Group 7 RFI Report, but could not be included in the quantitative site risk assessments.

Notes:

(1) Risk-based screening levels for human health (ResRBSL) and Ecological (EcoRBSL) receptors are provided as reference points for assessing adequacy of data quality. ResRBSL is based on residential receptor for a risk level of 1×10^{-6} cancer risk or noncancer Hazard Index.
(2) Reference: Soil Background Report (MWH 2005)
(3) Not applicable - Background values only established for naturally occuring constituents.
(4) RBSL not available for this constituent.
(5) Elevated DLs are DLs that are above one or both of the RBSLs. For metals and dioxins, elevated DLs are DLs that are above background, EcoRBSL, or ResRBSL. In cases that DLs are below background but above an RBSL, the DL is not considered to be elevated.
(6) The following statements indicate standard DL issue resolutions throughout the group. Each issue resolution note listed for each analyte do not apply to all elevated DLs for that analyte. Instead, each issue resolution note may only apply to a subset of samples with elevated DLs for the analyte, but taken as a whole, the list of issue resolutions addresses all of the elevated DLs.

Data Issue Resolution Notes:

-- Indicates that the constituent does not have elevated detection limits.
(a) DL are below background levels.
(b) Elevated DL is reported for a split sample, DL for the associated primary sample is below RBSL
(c) DL concentrations achieved were within practicable laboratory reporting limits at the time the sample was collected. The adequacy assessment of sample results for characterization decisions was made based on surrounding sampling results, potential for laboratory interference, data trends, and reporting limits with respect to screening levels.
(d) DLs elevated due to contamination in the associated method, field, or equipment blank.
(e) The source of the elevated DL is unkown
(f) Sample diluted due to high levels of other constituents
(g) The MDL is less than the RBSL, so if the compound was present at concentrations greater than the MDL, but less than the RL, it would have been reported.
(h) Compound is a commonly used laboratory solvent and often has elevated DLs due to laboratory contamination.

Acronyms

DL - detection limit
EcoRBSL - ecological risk-based screening level
ResRBSL - residential risk-based screening level
NA - not applicable

TABLE C.3-3B
RMHF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SOIL VAPOR)
(Page 1 of 1)

Analyte Group	Constituent	Units	Screening Levels (1)		Total Number Samples Analyzed	Detect Data Summary					Non-Detect Data Summary					Data Issue (3)	Issue Resolution (4)
			Residential (ResRBSL)	Ecological (EcoRBSL)		Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	Number DLs > EcoRBSL		
VOCs (µg/L)																	
	1,1,1,2-Tetrachloroethane	µg/L	48	NA (2)	24	0	0	0	0	NA (2)	24	0.1	0.1	0	NA (2)	-	--
	1,1,1-Trichloroethane	µg/L	640000	38000	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	1,1,2,2-Tetrachloroethane	µg/L	48	NA (2)	24	0	0	0	0	NA (2)	24	0.2	0.2	0	NA (2)	-	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	8800000	91000	24	5	2.1	6.6	0	0	19	0.5	0.5	0	0	-	--
	1,1,2-Trichloroethane	µg/L	170	57	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	1,1-Dichloroethane	µg/L	1700	36000	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	1,1-Dichloroethene	µg/L	58000	600	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	1,2-Dichloroethane	µg/L	130	42000	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	Benzene	µg/L	95	570	24	3	0.036	0.047	0	0	21	0.05	0.1	0	0	-	--
	Carbon Tetrachloride	µg/L	63	630	24	0	0	0	0	0	24	0.05	0.1	0	0	-	--
	Chloroethane	µg/L	NA (2)	992000	24	0	0	0	NA (2)	0	24	0.1	0.1	NA (2)	0	-	--
	Chloroform	µg/L	500	240	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	cis-1,2-Dichloroethene	µg/L	10000	1900	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	Dichlorodifluoromethane	µg/L	58000	91000	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	Ethylbenzene	µg/L	290000	23000	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	Isopropanol	µg/L	NA (2)	NA (2)	8	0	0	0	NA (2)	NA (2)	8	1	1	NA (2)	NA (2)	-	--
	Methylene chloride	µg/L	2700	870	24	0	0	0	0	0	24	2	5	0	0	-	--
	m-Xylene & p-Xylene	µg/L	29000	16000	24	0	0	0	0	0	24	0.2	0.2	0	0	-	--
	o-Xylene	µg/L	29000	16000	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	Tetrachloroethene	µg/L	452	24000	24	3	0.41	0.57	0	0	21	0.1	0.1	0	0	-	--
	Toluene	µg/L	110000	84	24	1	0.14	0.14	0	0	23	0.1	0.1	0	0	-	--
	trans-1,2-Dichloroethene	µg/L	20000	1900	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	Trichloroethene	µg/L	1400	6400	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	Trichlorofluoromethane	µg/L	200000	91000	24	0	0	0	0	0	24	0.1	0.1	0	0	-	--
	Vinyl chloride	µg/L	35	560	24	0	0	0	0	0	24	0.05	0.1	0	0	-	--
	VOC in vapor screen (All ND)	µg/L	NA (2)	NA (2)	2	0	0	0	NA (2)	NA (2)	2	0	0	NA (2)	NA (2)	-	--

Notes:

(1) Risk-based screening levels for human health (ResRBSL) and Ecological (EcoRBSL) receptors are provided as reference points for assessing adequacy of data quality. ResRBSL is based on residential receptor for a risk level of 1 x 10-6 cancer risk or noncancer Hazard Index.
(2) RBSL not available for this constituent.
(3) Elevated DLs are DLs that are above one or both of the RBSLs. For metals and dioxins, elevated DLs are DLs that are above background, EcoRBSL, or ResRBSL. In cases that DLs are below background but above an RBSL, the DL is not considered to be elevated.
(4) The following statements indicate standard DL issue resolutions throughout the group. Each issue resolution note listed for each analyte do not apply to all elevated DLs for that analyte. Instead, each issue resolution note may only apply to a subset of samples with elevated DLs for the analyte, but taken as a whole, the list of issue resolutions addresses all of the elevated DLs.

Data Issue Resolution Notes:

-- Indicates that the constituent does not have elevated detection limits.

Acronyms

DL - detection limit
EcoRBSL - ecological risk-based screening level
ResRBSL - residential risk-based screening level
NA - not applicable

TABLE C.3-3C
RMHF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SURFACE WATER)
(Page 1 of 2)

Analyte Group	Constituent	Units	Screening Levels (1)		Total Number Samples Analyzed	Detect Data Summary					Non-Detect Data Summary					Data Issue	Issue Resolution (3)
			Residential (ResRBSL)	Ecological (EcoRBSL)		Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	Number DLs > EcoRBSL		
Metals (µg/L)																	
	Antimony	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	50	50	NA (4)	NA (4)	--	--
	Arsenic	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	10	NA (4)	NA (4)	--	--
	Beryllium	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Cadmium	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	10	NA (4)	NA (4)	--	--
	Chromium	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	10	NA (4)	NA (4)	--	--
	Copper	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	20	20	NA (4)	NA (4)	--	--
	Lead	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	3	3	NA (4)	NA (4)	--	--
	Mercury	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.5	0.5	NA (4)	NA (4)	--	--
	Nickel	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	20	20	NA (4)	NA (4)	--	--
	Selenium	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Silver	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	10	NA (4)	NA (4)	--	--
	Thallium	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	10	NA (4)	NA (4)	--	--
	Zinc	µg/L	NA (4)	NA (4)	4	2	0.021	16	NA (4)	NA (4)	2	20	20	NA (4)	NA (4)	--	--
SVOCs (µg/L)																	
	Acenaphthene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.08	10	NA (4)	NA (4)	--	--
	Acenaphthylene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.16	10	NA (4)	NA (4)	--	--
	Anthracene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	10	NA (4)	NA (4)	--	--
	Benzo(a)anthracene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	20	NA (4)	NA (4)	--	--
	Benzo(a)pyrene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	20	NA (4)	NA (4)	--	--
	Benzo(b)fluoranthene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	20	NA (4)	NA (4)	--	--
	Benzo(ghi)perylene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	50	NA (4)	NA (4)	--	--
	Benzo(k)fluoranthene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.08	20	NA (4)	NA (4)	--	--
	Chrysene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	20	NA (4)	NA (4)	--	--
	Dibenzo(a,h)anthracene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	50	NA (4)	NA (4)	--	--
	Fluoranthene	µg/L	NA (4)	NA (4)	4	1	0.33	0.33	NA (4)	NA (4)	3	0.08	10	NA (4)	NA (4)	--	--
	Fluorene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	10	NA (4)	NA (4)	--	--
	Indeno(1,2,3-cd)pyrene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	50	NA (4)	NA (4)	--	--
	Naphthalene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.16	10	NA (4)	NA (4)	--	--
	Phenanthrene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	10	NA (4)	NA (4)	--	--
	Pyrene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	0.008	10	NA (4)	NA (4)	--	--
VOCs (µg/L)																	
	1,1,1-Trichloroethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	1,1,2,2-Tetrachloroethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--
	1,1,2-Trichloroethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	1,1-Dichloroethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	1,1-Dichloroethene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	1,2-Dichlorobenzene	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--
	1,2-Dichloroethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	1,2-Dichloroethenes	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--
	1,2-Dichloropropane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	1,3-Dichlorobenzene	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--
	1,4-Dichlorobenzene	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--
	2-Chloroethylvinyl ether	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	10	10	NA (4)	NA (4)	--	--
	2-Hexanone	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	50	NA (4)	NA (4)	--	--
	Acetone	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	100	NA (4)	NA (4)	--	--
	Benzene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Bromodichloromethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Bromoform	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--

TABLE C.3-3C
RMHF RFI SITE ANALYTICAL DATA SCREENING SUMMARY AND DATA QUALITY (SURFACE WATER)
(Page 2 of 2)

Analyte Group	Constituent	Units	Screening Levels (1)		Total Number Samples Analyzed	Detect Data Summary					Non-Detect Data Summary					Data Issue	Issue Resolution (3)
			Residential (ResRBSL)	Ecological (EcoRBSL)		Total Samples w/ Detections	Minimum Detected Concentration	Maximum Detected Concentration	Number of Detected Concentrations > Res RBSL	Number of Detected Concentrations > Eco RBSL	Total Samples ND	Minimum Detection Limit	Maximum Detection Limit	Number DLs > ResRBSL	Number DLs > EcoRBSL		
	Bromomethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	10	NA (4)	NA (4)	--	--
	Carbon Disulfide	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Carbon Tetrachloride	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Chlorobenzene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Chloroethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	10	NA (4)	NA (4)	--	--
	Chloroform	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Chloromethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	10	NA (4)	NA (4)	--	--
	cis-1,2-Dichloroethene	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--
	cis-1,3-Dichloropropene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Dibromochloromethane	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Ethylbenzene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Methyl ethyl ketone	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	100	NA (4)	NA (4)	--	--
	Methyl isobutyl ketone (MIBK)	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	50	NA (4)	NA (4)	--	--
	Methylene chloride	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	m-Xylene & p-Xylene	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--
	o-Xylene	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--
	Styrene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Tetrachloroethene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Toluene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	trans-1,2-Dichloroethene	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--
	trans-1,3-Dichloropropene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Trichloroethene	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	5	5	NA (4)	NA (4)	--	--
	Trichlorofluoromethane	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	10	10	NA (4)	NA (4)	--	--
	Vinyl acetate	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	10	10	NA (4)	NA (4)	--	--
	Vinyl chloride	µg/L	NA (4)	NA (4)	4	0	0	0	NA (4)	NA (4)	4	10	10	NA (4)	NA (4)	--	--
	Xylenes, Total	µg/L	NA (4)	NA (4)	2	0	0	0	NA (4)	NA (4)	2	5	5	NA (4)	NA (4)	--	--

Notes:

(1) Risk-based screening levels for human health (ResRBSL) and Ecological (EcoRBSL) receptors are provided as reference points for assessing adequacy of data quality. ResRBSL is based on residential receptor for a risk level of 1 x 10^{6} cancer risk or noncancer Hazard Index.
(2) Reference: Soil Background Report (MWH 2005)
(3) Not applicable - Background values only established for naturally occuring constituents.
(4) RBSL not available for this constituent.
(5) Elevated DLs are DLs that are above one or both of the RBSLs. For metals and dioxins, elevated DLs are DLs that are above background, EcoRBSL, or ResRBSL. In cases that DLs are below background but above an RBSL, the DL is not considered to be elevated.
(6) The following statements indicate standard DL issue resolutions throughout the group. Each issue resolution note listed for each analyte do not apply to all elevated DLs for that analyte. Instead, each issue resolution note may only apply to a subset of samples with elevated DLs for the analyte, but taken as a whole, the list of issue resolutions addresses all of the elevated DLs.

Data Issue Resolution Notes:

-- Indicates that the constituent does not have elevated detection limits.

Acronyms

DL - detection limit
EcoRBSL - ecological risk-based screening level
ResRBSL - residential risk-based screening level
NA - not applicable

Table C.4-1

Chemicals of Potential Concern for Human Health
RMHF RFI Site

Chemical	Soil (0 to 2 feet bgs)	Soil (0 to 10 feet bgs)	Radioactive Materials Handling Facility RFI Site Groundwater (Indirect Pathway)	Group 7 Groundwater (Direct Pathway)	Soil Vapor
Inorganic Compound					
Cadmium	X	X			
Cobalt	X	X			
Copper	X	X			
Cyanide	X	X			
Hexavalent chromium	X	X			
Nickel					
Selenium	X	X			
Zinc	X	X			
VOCs					
1,1,2-Trichloro-1,2,2-trifluoroethane			X	X	X
1,1-Dichloroethane			X	X	
1,1-Dichloroethene			X	X	
2-Butanone		X			X
Benzene					X
Chloroform			X	X	
cis-1,2-Dichloroethene			X	X	
m,p-Xylene	X	X			X
Methylene chloride	X	X			X
Styrene	X	X			X
Tetrachloroethene	X	X	X	X	X
Toluene	X	X			X
Trichloroethene			X	X	
SVOCs					
1-Methylnaphthalene	X	X			
2-Methylnaphthalene	X	X			
Acenaphthene	X	X			
Acenaphthylene	X	X			
Anthracene	X	X			
Benzo(a)anthracene	X	X			
Benzo(a)pyrene	X	X			
Benzo(b)fluoranthene	X	X			
Benzo(e)pyrene	X	X			
Benzo(g,h,i)perylene	X	X			
Benzo(k)fluoranthene	X	X			
bis(2-Ethylhexyl)phthalate	X	X			
Butyl benzyl phthalate	X	X			
Chrysene	X	X			
Dibenz(a,h)anthracene	X	X			
Di-n-butylphthalate	X	X			
Fluoranthene	X	X			
Fluorene	X	X			
Indeno(1,2,3-cd)pyrene	X	X			
Naphthalene	X	X			
Perylene	X	X			
Phenanthrene	X	X			
Pyrene	X	X			
Pesticides					
4,4'-DDE	X	X			
4,4'-DDT	X	X			
Total Petroleum Hydrocarbon					
C11-C14(Kerosene Range)	X	X			
C14-C20(Diesel Range)	X	X			
C20-C30(Lubricant Oil Range)	X	X			
PCDD/PCDFs					
2,3,7,8-TCDD	X	X			
1,2,3,7,8-PeCDD	X	X			
1,2,3,4,7,8-HxCDD	X	X			
1,2,3,6,7,8-HxCDD	X	X			

Table C.4-1

Chemicals of Potential Concern for Human Health
RMHF RFI Site

Chemical	Soil (0 to 2 feet bgs)	Soil (0 to 10 feet bgs)	Radioactive Materials Handling Facility RFI Site Groundwater (Indirect Pathway)	Group 7 Groundwater (Direct Pathway)	Soil Vapor
1,2,3,7,8,9-HxCDD	X	X			
1,2,3,4,6,7,8-HpCDD	X	X			
OCDD	X	X			
2,3,7,8-TCDF	X	X			
1,2,3,7,8-PeCDF	X	X			
2,3,4,7,8-PeCDF	X	X			
1,2,3,4,7,8-HxCDF	X	X			
1,2,3,6,7,8-HxCDF	X	X			
2,3,4,6,7,8-HxCDF	X	X			
1,2,3,7,8,9-HxCDF	X	X			
1,2,3,4,6,7,8-HpCDF	X	X			
1,2,3,4,7,8,9-HpCDF	X	X			
OCDF	X	X			
PCDD/PCDF	X	X			
PCBs					
Aroclor 1242	X	X			
Aroclor 1248	X	X			
Aroclor 1254	X	X			
Aroclor 1260	X	X			
PCB-105	X	X			
PCB-114	X	X			
PCB-118	X	X			
PCB-123	X	X			
PCB-126	X	X			
PCB-156	X	X			
PCB-157	X	X			
PCB-167	X	X			
PCB-169	X	X			
PCB-189	X	X			
PCB-77	X	X			
PCB-81	X	X			

Notes:
bgs - below ground surface
PCDD/PCDF - polychlorinated dibenzo-p-dioxin and dibenzofurans
PCBs - polychlorinated biphenyls
SVOC - semi-volatile organic compound
VOC - volatile organic compound
X - selected as a chemical of potential concern

Table C.4-2

Human Health Risk Estimate Summary [1]
RMHF RFI Site

Receptor	Soil Media[2]				Groundwater[3]				Total for Site Media			
	HI Range	CD[4]	Risk Range	CD	HI Range	CD	Risk Range	CD	HI Range	CD	Risk Range	CD
Future Adult Recreator	<0.001 - 0.007	-	5E-09 - 2E-06	a	<0.001 - <0.001	-	1E-11 - 1E-10	-	<0.001 - 0.007	-	5E-09 - 2E-06	a
Future Child Recreator	0.02 - 0.08	-	7E-08 - 1E-06	-	<0.001 - <0.001	-	6E-11 - 2E-10	-	0.02 - 0.08	-	7E-08 - 1E-06	-
Future Adult Resident	0.01 - 0.03	-	1E-07 - 2E-06	a	<0.001 - 0.001	-	2E-08 - 1E-07	-	0.01 - 0.03	-	1E-07 - 2E-06	a
Future Child Resident	0.1 - 0.3	-	6E-07 - 5E-06	a	0.002 - 0.003	-	7E-08 - 1E-07	-	0.1 - 0.3	-	6E-07 - 5E-06	a

Notes:

1. Risk estimates shown are a sum of all exposure pathways per media; the range reported is for the central tendency and reasonable maximum exposures, respectively.
2. Soil media risk estimates are a sum of all direct and indirect exposure, so site soil and soil vapor.
3. Groundwater media risk estimates are for indirect exposure only and assume no domestic use of groundwater.
4. Chemical risk drivers are those COPCs detected onsite with an HI > 1, risk > $1x10^{6}$, or blood lead concentration > 10 µg/dl. Only major risk contributors listed if cumulative HI >> 1 or cancer risk >> $1x10^{6}$.

a = Aroclor 1260

CD = Chemical risk driver
COPC = Chemical of potential concern
HI = Hazard index
NA = Not Applicable
µg/dl - micrograms per deciliter

Table C.4-3

Human Health Risk Assessment Uncertainty Analysis
RMHF RFI Site

Uncertainty	Magnitude of Impact	Direction of Impact
COPC Selection		
Cadmium, cobalt, copper, selenium and zinc were demonstrated to be consistent with background concentrations by the Wilcoxon Rank Sum test but was included as a COPC because the maximum detected concentration was greater than 2-times the maximum detected background concentrations.	Medium	Conservative
As described in Section 1.0 of the Group 7 RFI Report some additional soil samples were collected at the RMHF RFI Site after the site risk assessment was completed. Data for these additional samples could not be assessed quantitatively, which results in some uncertainty. The additional samples were analyzed for VOCs, SVOCs, pesticides, PCBs, TPH, and metals. VOC, TPH, and pesticide compounds were detected at concentrations similar or lower than the concentrations detected previously, so including the additional data for these compounds would not affect the overall conclusions of the risk assessment. Several PAHs and metals were detected in the additional samples at concentrations greater than those detected previously. As a result, risk estimates for these compounds were likely underestimated for this site. However, the additional samples with higher concentrations of PAHs and metals are located in areas proposed for CMS and/or further evaluation.	Low	Not Conservative
Potential impacts of the Topanga fire on the selection of COPCs and risks have been evaluated. The evaluation concluded that there were no measurable impacts of fire ash on soil metal concentrations at the RMHF RFI Site.	Medium	Uncertain
EPC Calculations		
Where available, site-specific (actual) chemical data were used in the risk assessment. Where data were not available, risks associated with polynuclear aromatic hydrocarbons (PAHs) are estimated based, in part, on extrapolation factors using site TPH data as described in the SRAM (MWH, 2005). The estimation of PAH concentrations from TPH concentrations is considered conservative since the extrapolation factors used to estimate PAH concentrations are based on the maximum ratio of the TPH concentration to the individual petroleum constituent concentration in the dataset.	Low	Conservative
TPH-G was detected in a single surface sample out of 139 samples; the chemical is not considered site related and not all BTEX-related compounds were detected in any soil or active/passive soil gas samples near the location, therefore extrapolation of TPH-G was not conducted.	Medium	Realistic
Where VOCs are detected in one medium, and analyzed for in another medium to which the VOC could migrate but were not detected, media-to-media extrapolations were conducted (e.g., soil-to-soil vapor). This procedure is expected to overestimate potential exposures.	Low	Conservative
When VOC soil vapor samples were available, soil matrix-to-soil vapor extrapolations were only conducted for non-colocated soil matrix samples with detects.	Low	Conservative
One sample was included in SV from 10.25 ft which is below the range 3-10 ft bgs. It was technically outside the assumed exposure range, but was very close and represented a station without other data at higher depths.	Low	Conservative
The maximum detected concentration of each COPC detected in groundwater was utilized as the EPC. This is likely to result in an overestimation of potential exposures.	Medium	Conservative

Table C.4-3

Human Health Risk Assessment Uncertainty Analysis
RMHF RFI Site

Uncertainty	Magnitude of Impact	Direction of Impact
The 95% UCL concentration of some chemicals is greater than the maximum concentration, therefore the maximum concentration was used as the RME EPC. This is considered to be a likely overestimation of the representative exposure point concentration because samples were collected in areas with the highest likelihood to detect the highest concentrations at the site, and a receptor using the site is not always exposed to the location of highest concentrations.	Medium	Conservative
The mean concentration for some chemicals exceeded the selected RME concentration; therefore, the RME concentration was also used as the CTE concentration under some circumstances.	Medium	Conservative
EPCs were calculated including data collected outside the RMHF Site boundary and downgradient.	High	Conservative
Data from drainage areas at Brendeis Bardine included a detected concentration of DDD. Later data were not analyzed for pesticides and were not included in the RMHF RFI Site calculations. This uncertainty is low because site data did not include high pesticide contributions to risk and therefore drainage from RMHF would also not likely contribute to site-related risks.	Low	Uncertain
Some additional soil samples were collected at the RMHF RFI Site after the site risk assessment was completed. Data for these additional samples could not be assessed quantitatively, which results in some uncertainty. The additional samples were analyzed for VOCs, SVOCs, pesticides, PCBs, TPH, and metals. VOC, TPH, and pesticide compounds were detected at concentrations similar or lower than the concentrations detected previously, so including the additional data for these compounds would not affect the overall conclusions of the risk assessment. Several PAHs and metals were detected in the additional samples at concentrations greater than those detected previously. As a result, risk estimates for these compounds were likely underestimated for this site. However, the additional samples with higher concentrations of PAHs and metals are located in areas proposed for CMS and/or further evaluation.	Medium	Not Conservative
Vapor migration into indoor air has been estimated using a model which is being validated for the site. Preliminary findings show that the model conservatively over-predicts air concentrations when compared to flux chamber measurements.	Low	Conservative
Exposure Pathways		
Risks associated with drinking of groundwater are not realistic because the groundwater beneath the SSFL is not currently used as a drinking water source and the presence of the contamination will likely require a restriction on its future use as well.	High	Conservative
The RMHF RFI site has been used for handling and storage of radioactive materials. However, radioactive risks are evaluated separately for this site.	Low	Uncertain
Future land use of the site is currently undecided but may be recreational, which has lower risks than residential.	Medium	Uncertain

Table C.4-3

Human Health Risk Assessment Uncertainty Analysis
RMHF RFI Site

Uncertainty	Magnitude of Impact	Direction of Impact
Cancer Slope Factor		
To develop cancer slope factors and reference doses, dose-response data are extrapolated from laboratory animals to humans.	High	Conservative
Assumes that all carcinogens do not have a threshold below which carcinogenic response does not occur, and therefore, any dose, no matter how small, results in some potential risk.	Medium	Conservative
Cancer slope factors derived from animal studies are the upper-bound maximum likelihood estimates based on a linear dose-response curve, and therefore, overstate carcinogenic potency.	Medium	Conservative
Risk Calculations		
Although benzo(g,h,i)perylene was selected as COPCs for soil from 0 to 10 feet bgs, risks could not be evaluated for these constituents since toxicity values are not available. This is not expected to affect the overall results of the risk assessment since other PAHs are evaluated in the risk assessment for soil.	Low	Not Conservative
Site boundaries for the RMHF RFI Site were altered after the calculation of risks. The overall Site area increased from 4.1 acres to 4.47 acres. The increase in overall area decreases the particulate emission factor which increases the estimated dust inhalation dose. Therefore, site risks were underestimated for the dust inhalation pathway. However, the dust inhalation pathway has a small contribution to total risks and would not likely impact the	Low	Not Conservative

Notes:
Low - This uncertainty is considered to have minimal impact on the total risk estimate.
Medium - This uncertainty is considered to have moderate impact on the total risk estimate.
High - This uncertainty is considered to have significant impact on the total risk estimate.

bgs - below ground surface
BTEX - benzene, toluene, ethylbenzene, and xylenes
COPC - chemical of potential concern
EPC - exposure point concentration
HHRA - human health risk assessment
PAH - polycyclic aromatic hydrocarbons
TPH - total petroleum hydrocarbons

Table C.4-4

Chemicals of Potential Ecological Concern
RMHF RFI Site

Chemical	Soil (0 to 2 feet bgs)	Soil (0 to 4 feet bgs)	Soil (0 to 6 feet bgs)	Soil Vapor (0 to 6 feet bgs)
Inorganic Compounds				
Cadmium	X	X	X	
Cobalt	X	X	X	
Copper	X	X	X	
Cyanide	X	X	X	
Hexavalent chromium	X	X	X	
Selenium	X	X	X	
Zinc	X	X	X	
VOCs				
1,1,2-Trichloro-1,2,2-trifluoroethane				X
Benzene				X
m,p-Xylene	X	X	X	X
Methylene chloride	X	X	X	X
Styrene	X	X	X	X
Tetrachloroethene	X	X	X	X
Toluene	X	X	X	X
Trichloroethene				X
SVOCs				
1-Methylnaphthalene	X	X	X	
2-Methylnaphthalene	X	X	X	
Acenaphthene	X	X	X	
Acenaphthylene	X	X	X	
Anthracene	X	X	X	
Benzo(a)anthracene	X	X	X	
Benzo(a)pyrene	X	X	X	
Benzo(b)fluoranthene	X	X	X	
Benzo(e)pyrene	X	X	X	
Benzo(g,h,i)perylene	X	X	X	
Benzo(k)fluoranthene	X	X	X	
bis(2-Ethylhexyl)phthalate	X	X	X	
Butyl benzyl phthalate	X	X	X	
Chrysene	X	X	X	
Dibenz(a,h)anthracene	X	X	X	
Di-n-butylphthalate	X	X	X	
Fluoranthene	X	X	X	
Fluorene	X	X	X	
Indeno(1,2,3-cd)pyrene	X	X	X	
Naphthalene	X	X	X	
Perylene	X	X	X	
Phenanthrene	X	X	X	
Pyrene	X	X	X	
Pesticides				
4,4'-DDE	X	X	X	
4,4'-DDT	X	X	X	
Total Petroleum Hydrocarbons				
C11-C14(Kerosene Range)	X	X	X	
C14-C20(Diesel Range)	X	X	X	
C20-C30(Lubricant Oil Range)	X	X	X	
PCDD/PCDFs				
2,3,7,8-TCDD	X	X	X	
1,2,3,7,8-PeCDD	X	X	X	
1,2,3,4,7,8-HxCDD	X	X	X	
1,2,3,6,7,8-HxCDD	X	X	X	
1,2,3,7,8,9-HxCDD	X	X	X	

Table C.4-4

Chemicals of Potential Ecological Concern
RMHF RFI Site

Chemical	Soil (0 to 2 feet bgs)	Soil (0 to 4 feet bgs)	Soil (0 to 6 feet bgs)	Soil Vapor (0 to 6 feet bgs)
1,2,3,4,6,7,8-HpCDD	X	X	X	
OCDD	X	X	X	
2,3,7,8-TCDF	X	X	X	
1,2,3,7,8-PeCDF	X	X	X	
2,3,4,7,8-PeCDF	X	X	X	
1,2,3,4,7,8-HxCDF	X	X	X	
1,2,3,6,7,8-HxCDF	X	X	X	
2,3,4,6,7,8-HxCDF	X	X	X	
1,2,3,7,8,9-HxCDF	X	X	X	
1,2,3,4,6,7,8-HpCDF	X	X	X	
1,2,3,4,7,8,9-HpCDF	X	X	X	
OCDF	X	X	X	
PCDD/PCDF	X	X	X	
PCBs				
Aroclor 1242	X	X	X	
Aroclor 1248	X	X	X	
Aroclor 1254	X	X	X	
Aroclor 1260	X	X	X	
PCB-105	X	X	X	
PCB-114	X	X	X	
PCB-118	X	X	X	
PCB-123	X	X	X	
PCB-126	X	X	X	
PCB-156	X	X	X	
PCB-157	X	X	X	
PCB-167	X	X	X	
PCB-169	X	X	X	
PCB-189	X	X	X	
PCB-77	X	X	X	
PCB-81	X	X	X	

Notes:
a. Chemical selected as a CPEC since it was selected as a CPEC in groundwater
bgs - below ground surface
PCB - polychlorinated biphenyl
PCDD/PCDF - polychlorinated dibenzo-p-dioxin and dibenzofurans
SVOC - semi-volatile organic compound
VOC - volatile organic compound
X - selected as a chemical of potential ecological concern

Table C.4-5

Ecological Hazard Estimate Summary
RMHF RFI Site

Receptor	Chemical Risk Driver[1]
Deer Mouse	Total Aroclors (7), Cadmium(10), Copper (4), Selenium (2), Zinc (6)
without inhalation pathway	Total Aroclors (7), Cadmium(10), Copper (4), Selenium (2), Zinc (6)
Hermit Thrush	Total Aroclors (7), Copper (8), Zinc (5)
Red-Tailed Hawk	Total Aroclors (2), Zinc (2)
Using Large Home Range Factor[2]	None
Bobcat	None
Using Large Home Range Factor[2]	None
Mule Deer	Cadmium (2)
Using Large Home Range Factor[2]	None

Notes:

1. Chemical risk drivers are those CPECs detected onsite with an HQ > 1, the RME HQ is provided after the chemical name. "None" indicates that no chemical's HQs > 1.
2. The HIs for hawk, mule deer, and bobcat assume that their home ranges are equal to the RFI site acreage. This is an extremely conservative assumption; RFI site acreage is typically only a small fraction of a large animal's home range. The estimated HIs decrease to the values indicated above if an adjustment is made to reflect a more realistic home range for these receptors.

CPEC = Chemical of potential ecological concern
HI = Hazard index
HQ = Hazard Quotient
RME - reasonable maximum exposure

Table C.4-6

Ecological Risk Assessment Uncertainty Analysis
RMHF RFI Site

Uncertainty	Magnitude of Impact	Direction of Impact
CPEC Selection		
Cadmium, cobalt, copper, selenium and zinc were demonstrated to be consistent with background concentrations by the Wilcoxon Rank Sum test but was included as a CPEC because the maximum detected concentrations were substantially above the maximum detected background concentration.	High	Conservative
As described in Section 1.0 of the Group 7 RFI Report, some additional soil samples were collected at the RMHF RFI Site after the site risk assessment was completed. Data for these additional samples could not be assessed quantitatively, which results in some uncertainty. The additional samples were analyzed for VOCs, SVOCs, pesticides, PCBs, TPH, and metals. VOC, TPH, and pesticide compounds were detected at concentrations similar or lower than the concentrations detected previously, so including the additional data for these compounds would not affect the overall conclusions of the risk assessment. Several PAHs and metals were detected in the additional samples at concentrations greater than those detected previously. As a result, risk estimates for these compounds were likely underestimated for this site. However, the additional samples with higher concentrations of PAHs and metals are located in areas proposed for CMS and/or further evaluation.	Low	Not Conservative
Potential impacts of the Topanga fire on the selection of CPECs and risks have been evaluated. The evaluation concluded that there were no measurable impacts of fire ash on soil metal concentrations at the RMHF RFI Site.	Low	Uncertain
EPC Calculations		
Where available, site-specific (actual) chemical data were used in the risk assessment. Where data were not available, risks associated with polynuclear aromatic hydrocarbons (PAHs) are estimated based, in part, on extrapolation factors using site TPH data as described in the SRAM (MWH, 2005). The estimation of PAH concentrations from TPH concentrations is considered conservative since the extrapolation factors used to estimate PAH concentrations are based on the maximum ratio of TPH concentration to petroleum constituent concentration in the dataset.	Low	Conservative
TPH-G was detected in a single surface sample out of 139 samples; the chemical is not considered site related and not all BTEX-related compounds were detected in any soil or active/passive soil gas samples near the location, therefore extrapolation of TPH-G was not conducted.	Medium	Not Conservative
Where VOCs are detected in one medium, and analyzed for in another medium to which the VOC could migrate but were not detected, media-to-media extrapolations were conducted (e.g., soil-to-soil vapor). This procedure is expected to overestimate potential exposures.	Medium	Conservative
When VOC soil vapor samples were available, soil matrix to soil vapor extrapolations were only conducted for non-collocated soil matrix samples with detects.	Low	Conservative
Soil and soil vapor CTE EPCs were calculated using 1/2 the SQL for CPECs in soil and soil vapor samples when there were too few samples to calculate a mean in ProUCL.	Medium	Conservative

Table C.4-6

Ecological Risk Assessment Uncertainty Analysis
RMHF RFI Site

Uncertainty	Magnitude of Impact	Direction of Impact
One sample was included in SV from 10.25 ft which is below the range 3-10 ft bgs. It was technically outside the assumed exposure range, but was very close and represented a station without other data at higher depths.	Low	Conservative
The 95% UCL concentration of some chemicals is greater than the maximum concentration, therefore the maximum concentration was used as the RME EPC. This is considered to be a likely overestimation of the representative exposure point concentration because samples were collected in areas with the highest likelihood to detect the highest concentrations at the site, and a receptor using the site is not always exposed to the location of highest concentrations.	Medium	Conservative
The mean concentration for some chemicals exceeded the selected RME concentrations; therefore, the RME concentration was also used as the CTE concentration under some circumstances.	Medium	Conservative
EPCs were calculated including data collected outside the RMHF Site boundary and downgradient.	High	Conservative
Data from drainage areas at Brendeis Bardine included a detected concentration of DDD. Later data were not analyzed for pesticides and were not included in the RMHF RFI Site calculations. This uncertainty is low because site data did not include high pesticide contributions to risk and therefore drainage from RMHF would also not likely contribute to site-related risks.	Low	Uncertain
Some additional soil samples were collected at the RMHF RFI Site after the site risk assessment was completed. Data for these additional samples could not be assessed quantitatively, which results in some uncertainty. The additional samples were analyzed for VOCs, SVOCs, pesticides, PCBs, TPH, and metals. VOC, TPH, and pesticide compounds were detected at concentrations similar or lower than the concentrations detected previously, so including the additional data for these compounds would not affect the overall conclusions of the risk assessment. Several PAHs and metals were detected in the additional samples at concentrations greater than those detected previously. As a result, risk estimates for these compounds were likely underestimated for this site. However, the additional samples with higher concentrations of PAHs and metals are located in areas proposed for CMS and/or further evaluation.	Medium	Not Conservative
Estimation of soil vapor concentrations overstates actual burrow concentrations due to the following: 1. Model is conservative 2. Model does not account for attenuation between 12 feet bgs depth to groundwater and 0 to 6 feet bgs interval for burrows 3. Air flow in burrows is not accounted for	Medium	Conservative
Wildlife Exposure Factors		
Some wildlife exposure factors were based on taxonomically similar species.	Low	Uncertain

Table C.4-6

Ecological Risk Assessment Uncertainty Analysis
RMHF RFI Site

Uncertainty	Magnitude of Impact	Direction of Impact
Hazard estimates for the hawk, bobcat and mule deer assume that these species spend all of their time at the RMHF RFI Site. This assumption is unlikely to be true and it results in an overestimation of potential risks to these species due to chemicals present in soils at the site. The minimum reported foraging ranges for the red-tailed hawk, bobcat and mule deer are 195, 1,152 and 192 acres, respectively, as compared to 4.1 acres for the RMHF RFI Site. When the foraging ranges of these species are accounted for in the ERA, the RME HQs are all less than one. Hazard estimates for large-home-range receptors (hawk, bobcat and mule deer) will be addressed for the entire SSFL facility after all RFI site assessments have been completed and potential site-specific risks are evaluated.	High	Conservative
Site boundaries for the RMHF RFI Site were altered after the calculation of risks. The overall Site area increased from 4.1 acres to 4.47 acres. An increase in site area increases the home range factor for the red-tailed hawk, mule deer and bobcat receptors. Therefore, large home range factor hazard calculations were underestimated. These species had low hazard estimates without using a large home range factor and the increased home range factor is not expected to alter the overall results of the risk assessment.	Low	Not Conservative
Exposure Pathways		
Dermal and inhalation (for surface-dwelling animals) exposure pathways were not quantified.	Low	Not Conservative
The RMHF RFI site has been used for handling and storage of radioactive materials. However, radioactive risks are evaluated separately for this site.	Medium	Conservative
Toxicity Reference Value		
High degree of uncertainty in extrapolation of dose-response data from laboratory animals to representative receptors.	High	Uncertain
Use of acute/subchronic-to-chronic and endpoint-to-NOAEL uncertainty factors to estimate chronic NOAEL-equivalent TRVs.	Medium	Conservative
Lack of TRVs for amphibians and reptiles -- note that no threatened or endangered amphibians or reptiles are known to reside at SSFL	Medium	Not Conservative
Use of chronic NOAEL-equivalent TRVs	High	Conservative

Notes:
Low - This uncertainty is considered to have minimal impact on the total risk estimate.
Medium - This uncertainty is considered to have moderate impact on the total risk estimate.
High - This uncertainty is considered to have significant impact on the total risk estimate.

bgs - below ground surface
BTEX - benzene, toluene, ethylbenzene, and xylenes
CPEC - chemical of potential ecological concern
CTE - central tendency exposure
EPC - exposure point concentration
ERA - ecological risk assessment
ESL - ecological screening level
HI - hazard index
NOAEL - no observable adverse effects level

Table C.4-6

Ecological Risk Assessment Uncertainty Analysis
RMHF RFI Site

Uncertainty	Magnitude of Impact	Direction of Impact

PAH - polycyclic aromatic hydrocarbon
RFI - Resource Conservation and Recovery Act Facility Investigation
RME - reasonable maximum exposure
SSFL - Santa Susana Field Laboratory
SQL - sample quantitation limit
SVOC - semivolatile organic chemicals
TPH - total petroleum hydrocarbons
TRV - toxicity reference value
UCL - upper confidence limit

TABLE C.5-1
RMHF RFI SITE SURFICIAL MEDIA ACTION RECOMMENDATIONS
(Page 1 of 2)

Area	Chemical Use Area Number	CMS Areas [1]	Recommended for Further Consideration in CMS Based On:		
			Residential Receptor [2]	Recreational Receptor [2]	Ecological Receptor [2]
Building 4021 Radioactive Waste Decontamination and Packaging	1a	--	--	--	--
Building 4022 Radioactive Vault Storage Building	1b	--	--	--	--
Radioactive Water Treatment System	1c	--	--	--	--
Filter/Blower Area, Asphalt Drainage Swale	1d, 10a [3]	RMHF-3	--	--	Cadmium (DM, MD), Cobalt (DM), Zinc (DM, T, H)
Transformers and Substations	2a – 2c	--	--	--	--
Diesel AST	3	--	--	--	--
Building 4021 Septic Tank, Pipeline, and Leach Field	4a – 4b	--	--	--	--
Building 4621 Radioactive Accountable Waste Storage	5a	--	--	--	--
Mixed Waste Storage Yard	5b	--	--	--	--
Building 4663 Equipment Storage Building	5c	--	--	--	--
Building 4075 Contaminated Storage	6a	--	--	--	--
Building 4563 Storage Area, Waste Receiving Yard	6b [3], 7 [3]	RMHF-2	Benzene, methylene chloride	--	--
Building 4664 Low Level Waste Processing Building	8a	--	--	--	--
Building 4665 Radioactive Scrap Oxidation Facility	8b	--	--	--	--
Building 4034 (Office) and Building 4622 (Counting Building)	9a	--	--	--	--
Building 4044 Break Room and Counting Lab	9b	--	--	--	--
Building 4688 Equipment and Hazardous Waste Storage Area	9c	--	--	--	--
Catch Basin Drainage Channel	10b	--	--	--	--
RMHF Catch Basin	10c	--	--	--	--
RMHF Drainage Pipeline	10d	--	--	--	--
Building 4029 STIR/LMFBR Test facility	11a	--	--	--	--
Building 4811 STIR/LMFBR Mechanical Support Pad	11b	--	--	--	--
Former Oil Sump	12	--	--	--	--
Debris Areas G07-1013 and G07-1014	13e	--	--	--	--
Debris Areas	13a – 13d, 13f – 13j	--	--	--	--
RMHF Northern Slope Excavation	14a	--	--	--	--

TABLE C.5-1
RMHF RFI SITE SURFICIAL MEDIA ACTION RECOMMENDATIONS
(Page 2 of 2)

Area	Chemical Use Area Number	CMS Areas (1)	Recommended for Further Consideration in CMS Based On:		
			Residential Receptor (2)	Recreational Receptor (2)	Ecological Receptor (2)
Area					
RMHF Catch Basin Drainage Channel Excavation Area	14b	--	--	--	--
RMHF Catch Basin Excavation Area	14c	--	--	--	--
RMHF South Slope Excavation Area	14d	RMHF-1	Aroclor 1260, Aroclor 1254, Aroclor 1242, benzo(a)pyrene	Aroclor 1260, Aroclor 1254, Aroclor 1242	Aroclor 1260 (DM, T, MD), Aroclor 1242 (DM), Aroclor 1254 (DM. T)
RMHF Soil Disturbance Area	15	--	--	--	--
Southern Culvert Area	--	RMHF-4*	Cobalt		Cobalt (DM), Copper (DM, T), Silver (DM), Zinc (DM, T)

General Notes:
'--' Indicates area is recommended for No Further Action (NFA) for respective receptor, or parameter not applicable; not recommended for CMS evaluation.
'*' Indicates area also recommended for source stabilization to address potential surficial migration of contaminants.

Notes:
(1) Extent of CMS Areas shown on Figures C.5-1 and are approximate and reflect site action recommendations based on characterization and risk assessment results inclusive for all receptors (See Section C.5).
(2) CMS recommendations are based on compounds considered risk drivers (excess cancer risk > 1 x 10^{-6} or hazard index > 1) and/or significant risk contributors.
(3) The CMS area only covers a portion of this chemical use area.

Acronyms:
AOC = Area of Concern
AST = aboveground storage tank
BC = bobcat
CMS = Corrective Measures Study
DM = deer mouse
H = hawk
LMFBR = Liquid Metal Fast Breeder Reactor
MD = mule deer
NFA = no further action
PCE = tetrachloroethene
RFI = RCRA Facility Investigation
RMHF = Radioactive Materials Handling Facility
STIR = Shield Test Irradiation Reactor
SVOC = Semivolatile organic compound
SWMU = Solid Waste Management Unit
T = thrush
VOCs = Volatile Organic Compound

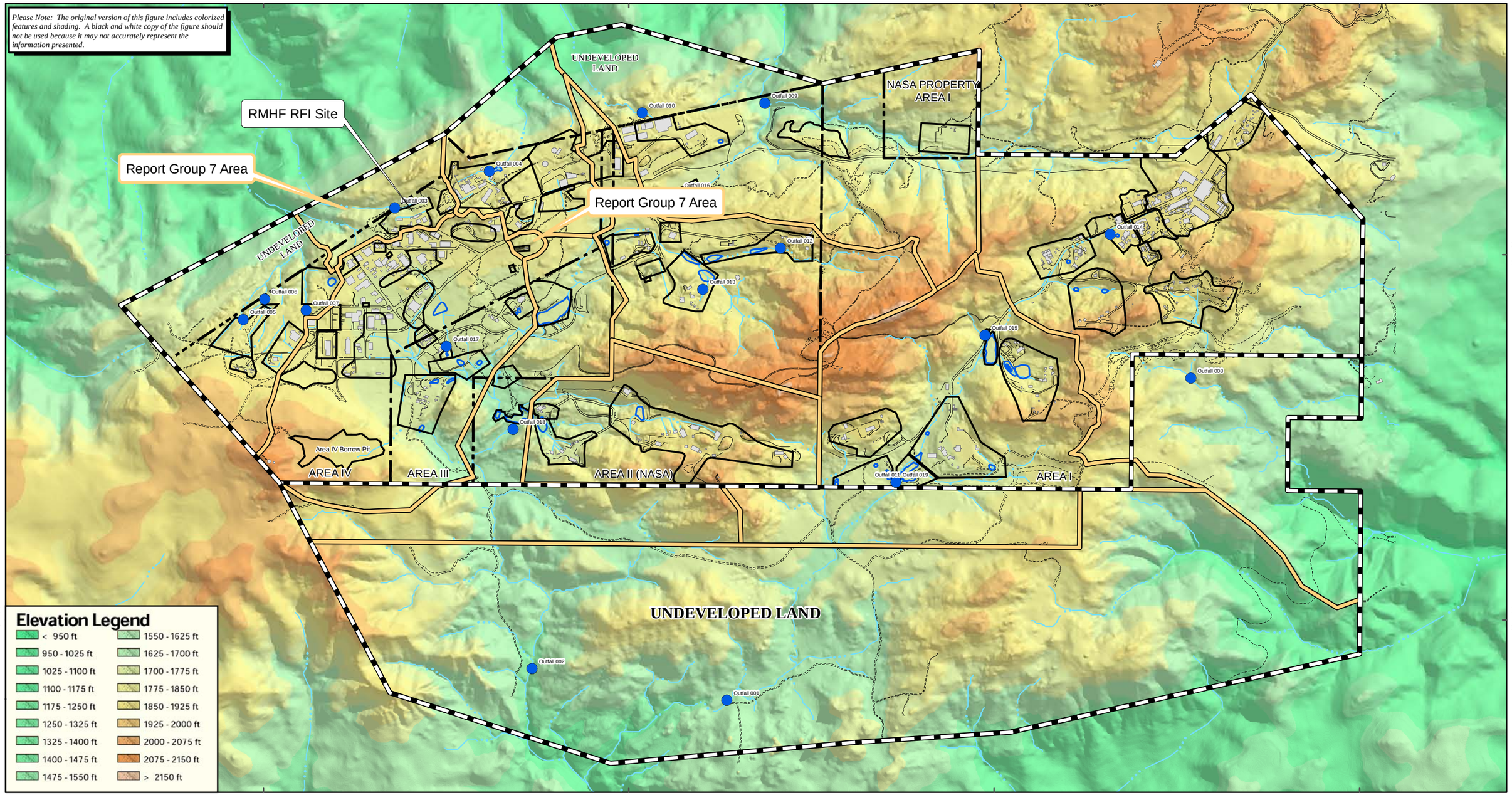
TABLE C.5-2
SUMMARY OF RMHF RFI SITE SURFICIAL MEDIA CMS RECOMMENDATIONS
(Page 1 of 1)

CMS Area	Description	Chemical Risk Drivers and Contributors	Rationale
RMHF-1	RMHF Southern Slope Excavation Area	Aroclor 1260, Benzo(a)pyrene, Aroclor 1242, Aroclor 1254	Elevated Aroclor 1260 and benzo(a)pyrene detected south of the RMHF fence line. Extent delineated based on sampling results, thin soils, and bedrock outcrop.
RMHF-2	Waste Receiving Yard Area	Benzene, Methylene Chloride, SVOC uncertainty	Elevated methylene chloride and benzene detected in stained soil in the area between the Waste Receiving Yard and Building 4563 Storage Area. SVOCs also with elevated detection limits in area. Extent delineated based on sampling results and thin soils to north.
RMHF-3	Northeast Slope Area	Cadmium, Cobalt, Zinc	Elevated cadmium and zinc detected at the discharge point for the Filter/Blower Area drainage pipeline, and elevated cobalt and zinc detected at the eastern border of the asphalt drainage swale. Extent delineated based on sampling results and bedrock outcrops.
RMHF-4*	Southern Culvert Area	Cobalt, Copper, Silver, Zinc	Elevated cobalt, cadmium, silver, and zinc detected in the asphalt-lined drainage channel south of the RMHF RFI Site, adjacent to a storm water culvert. The asphalt-lined drainage and culvert receive surface water from the RMHF southern slope area and the Building 4024 and 4025 operational areas. Extent delineated based on sampling results, bedrock outcrops, and surface water flow.

'*' Indicates area also recommended for source stabilization to address potential surficial migration of contaminants.

FIGURES

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.



0 1,300
FEET

MAP COORDINATES IN STATEPLANE, NAD 27, ZONE V

AREA I
SWMU 4.1 - B1 Area
SWMU 4.2 - Area I Landfill
SWMUs 4.3, 4.4 and AOC - Instrument and Equipment Laboratories (IEL)
SWMU 4.5, 4.6 - LOX Plant Former Sump/Clarifier and Drum Disposal Area
SWMU 4.7 - Component Test Laboratory III (CTL-III) Area
SWMU 4.8 - Area I Burn Pit
SWMU 4.9, 4.10, 4.11, AOC - Advanced Propulstion Test Facility (APTF) Area
SWMU 4.12 - Laser Engineering Test Facility (LETF) Component Test Lab (CTL-1) Area
SWMU 4.14 Canyon Area
SWMU 4.15 and AOC - Bowl Area and Building 901 Leachfield
SWMU 4.16 - Area I Reservoir (R-1 Pond)
SWMU 4.17 - Perimeter Pond
AOC - Building 1359 Sump
AOC - Happy Valley Area
AOC - CTL-V

AREA II
SWMU 5.1 - Area II Landfill
SWMU 5.2 - ELV Final Assembly Building 2206
SWMU 5.5 and AOC - Building 2204 Area
SWMU 5.6 - Former Incinerator Ash Pile
SWMU 5.7 - Hazardous Waste Storage Area Waste Coolant Tank (WCT)
SWMU 5.9, 5.10, 5.11 - Alfa Area
SWMU 5.12, 5.13, 5.14, 5.15 - Alfa/Bravo Skim Pond and Bravo Area
SWMU 5.18, 5.19 - Coca Area
SWMU 5.20, 5.21, 5.22 - Propellant Load Facility (PLF)
SWMU 5.23, 5.24 - Delta Area
SWMU 5.26 - R-2A and R2B Ponds
AOC - Building 2515 Sewage Treatment Plant
AOC - Storable Propellant Area (SPA)
AOC - Alfa/Bravo Fuel Farm
AOC - Coca/Delta Fuel Farm

AREA II (cont)
AOC - Building 2224 Leach Field

AREA III
SWMUs 6.1, 6.3, AOC - Engineering Chemistry Laboratory (ECL) Area
SWMU 6.4 - Compound A Facility
SWMU 6.5 - Systems Test Laboratory IV (STL-IV) Area
SWMU 6.8 - Silvernale Reservoir
SWMU 6.9 - Environmental Effects Laboratory (EEL)
AOC - SewageTreatment Plant (STL) Pond Area

AREA IV
SWMU 7.1 - Building 4056 Landfill
SWMU 7.2 - Building 4133, Sodium Burn Facility
SWMU 7.3 -Former Sodium Disposal Facility (FSDF)
SWMU 7.4 - Old Conservation Yard (OCY)
SWMU 7.5 - Building 4100 Trench
SWMU 7.6 - Radioactive Materials Handling Facility (RMHF)

AREA IV (cont)
SWMU 7.7 - Rockwell International Hot Laboratory (RIHL)
SWMU 7.8 - New Conservation Yard (NCY)
SWMU 7.9 - ESADA Chemical Storage Area
SWMU 7.10 - Former Coal Gasification PDU
SWMU 7.11 - Building 4029, Reactive Metal Storage Yard
AOC - Former Hazardous Materials Storage Area (HMSA)
AOC - Chemistry Laboratory Metals Clarifier
AOC - Pond Dredge Area
AOC - Sodium Reactor Experiment (SRE) Area
AOC - SE Drum Storage Yard
AOC - SNAP Facility
AOC - Boeing Area IV Leach Fields
AOC - DOE Area IV Leach Fields
AOC - Building 4008 Warehouse

Legend
- SSFL Property Boundary
- Administrative Boundary
- Report Group Boundary
- RFI Site Boundary
- Building
- Pond
- Drainage
- Dirt Road
- Road
- NPDES Outfall

RMHF
RFI Site Location Map
SANTA SUSANA FIELD LABORATORY

Document: RFI-Report-Group7-Appendix-RMHF-RFI_Site_Location.mxd

MWH

Date: Jun 08, 2009

FIGURE C.1-1

Chemical Use Areas
RMHF RFI Site

Chemical Use Area ID	Chemical Use Area Name	Chemical Type
1a	Building 4021 Radioactive Waste Decontamination and Packaging	Multiple Use
1b	Building 4022 Radioactive Waste Vault Storage	Multiple Use
1c	Radioactive Water Treatment System	Multiple Use
1d	Filter/Blower Area	Multiple Use
2a	Substation 721	Oils / PCBs
2b	Transformer Pole X-27A	Oils / PCBs
2c	Substation 728	Oils / PCBs
3	Diesel AST	Petroleum
4a	Building 4021 Septic Tank and Pipeline	Leach Field
4b	Building 4021 Leach Field	Leach Field
5a	Building 4621 Radioactive Accountable Waste Storage	Multiple Use
5b	Mixed Waste Storage Yard	Multiple Use
5c	Building 4663 Equipment Storage Area	Multiple Use
6a	Building 4075 Contaminated Storage	Metals
6b	Building 4563 Storage Area	Metals
7	Waste Receiving Yard	Multiple Use
8a	Building 4664 Low Level Waste Processing Building	Multiple Use
8b	Building 4665 Radioactive Scrap Oxidation Facility	Multiple Use
9a	Building 4034 (Office) and Building 4622 (Counting Building)	Potential
9b	Building 4044 Break Room and Counting Lab	Potential
9c	Building 4688 Equipment and Hazardous Waste Storage Area	Potential
10a	Asphalt Drainage Swale	Multiple Use
10b	Catch Basin Drainage Channel	Multiple Use
10c	Building 4614 Former Catch Basin	Multiple Use
10d	Catch Basin Discharge Pipeline	Multiple Use
11a	Building 4028 STIR/LFMBR Test Facility	Multiple Use
11b	Building 4811 STIR/LFMBR Mechanical Support Pad	Multiple Use
12	Former Oil Sump	Petroleum
13a	Building 4664 Debris Area	Debris
13b	Building 4075 Debris Area (G07-2044 and G07-2045)	Debris
13c	Debris Areas G07-1011 and G07-2046	Debris
13d	Debris Area G07-1012	Debris
13e	Debris Areas G07-1013 and G07-1014	Debris
13f	Debris Area G07-2043	Debris
13g	Debris Area G07-1015	Debris
13h	Debris Area G07-1016	Debris
13i	Debris Area G07-1017	Debris
13j	Building 4059 Debris Area (G07-1018 and G07-1019)	Debris
13k	Building 4688 Debris Area (G07-3022)	Debris
14a	RMHF Northern Slope Excavation Area	Potential
14b	RMHF Catch Basin Drainage Channel Excavation Area	Potential
14c	RMHF Catch Basin Excavation Area	Potential
14d	RMHF Southern Slope Excavation Areas	Potential
15	RMHF Soil Disturbance Area	Potential

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- Sewer Line
- Manhole
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Excavation
- Elevation Contour

(R) = Removed Tank

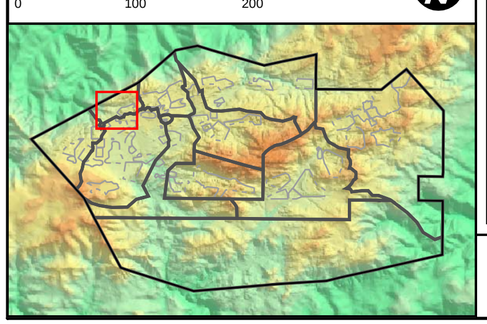
Chemical Use Area

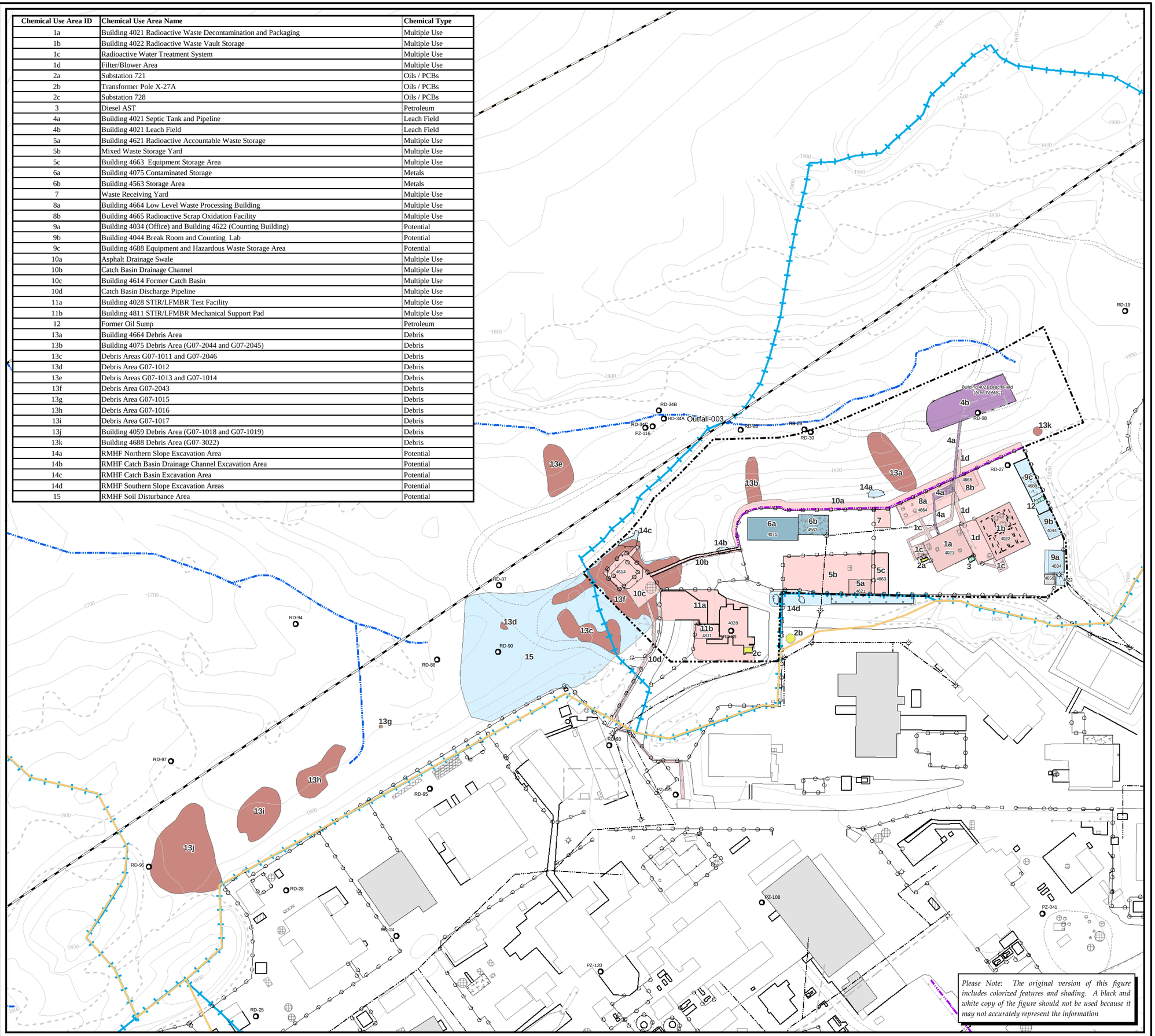
- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Appendix-RMHF-CUA_C.mxd Date: Jun 11, 2009

1 inch = 100 feet

0 100 200 Feet





Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

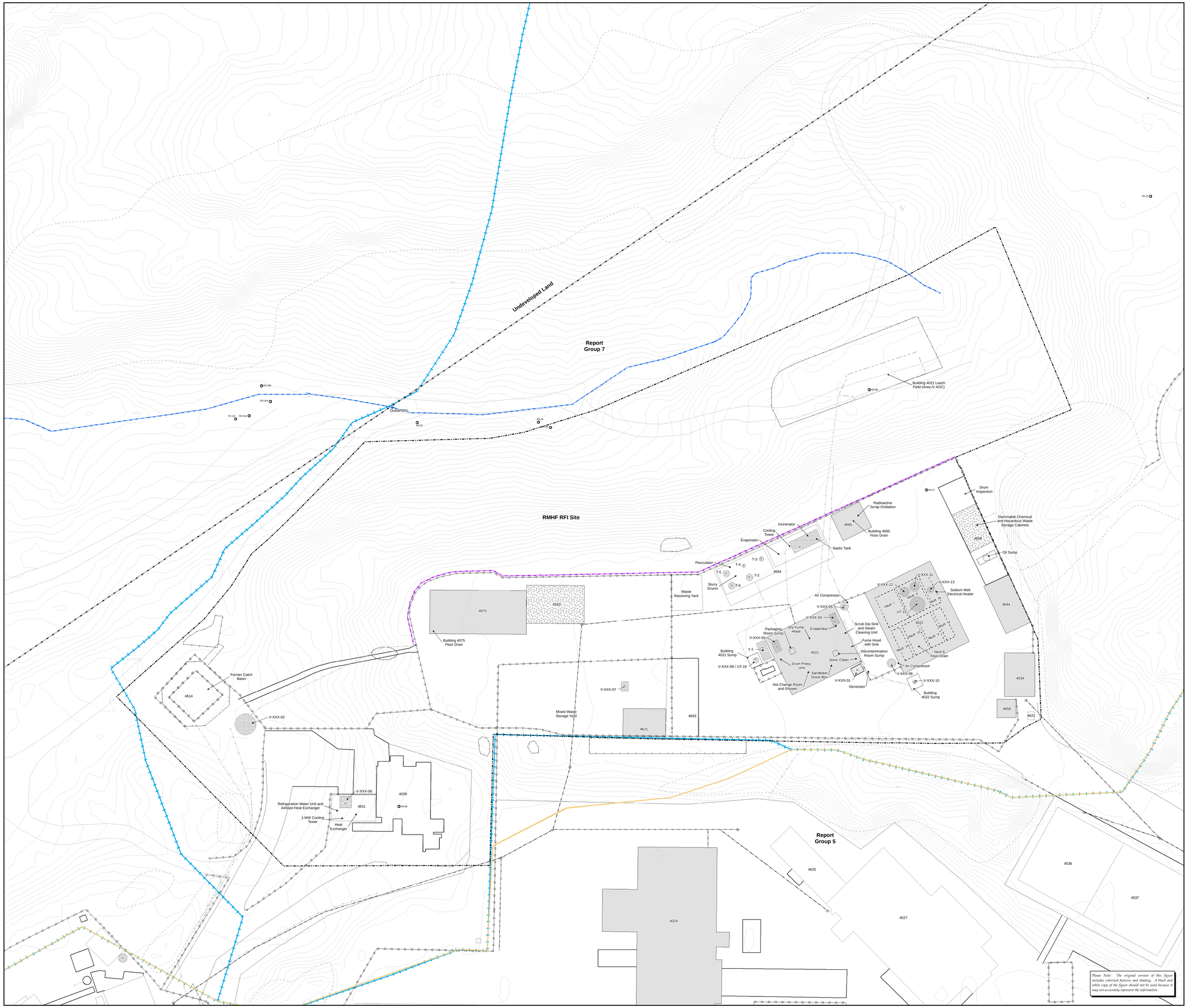
SANTA SUSANA FIELD LABORATORY

FIGURE C.2-1A

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- Sewer Line
- Manhole
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Excavation
- Elevation Contour

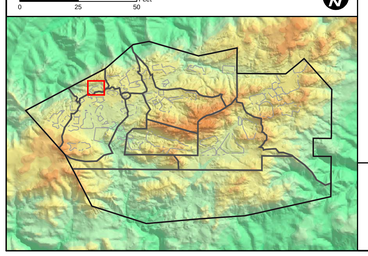
(R) = Removed Tank



Document: RFI-Report-Group7-Appendix-RMHF-SitePlan_E.mxd Date: Jun 11, 2009

1 inch = 25 feet

0 25 50 Feet



Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

Plot Plan - RMHF RFI Site

FIGURE C.2-1B

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving

(R) = Removed Tank

- Fence
- Pipe
- Leach Field
- Sewer Line
- Manhole
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Cross Section
- Elevation Contour
- Excavation

Sample Location Legend

- RMHF Sample Location

Drainage Northwest of RMHF

1 inch = 100 feet

0 100 200 Feet

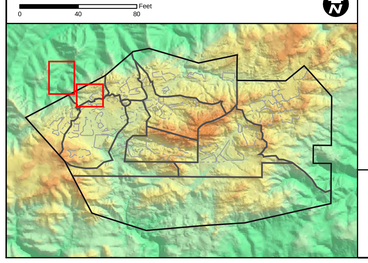
BB-03-001
BB-03-092
BB-03-079
BB-03-025
BB-03-017
BB-03-005
05-02
428480
424760
05-01
Brandeis-2
05-05
05-05A
BBBS0005
Brandeis-1
RD-59A
RD-59B
RD-59C
BBBS0004
416380
BBBS0003
05-04
RD-97
BB-17-004
RD-94
BB-17-003
U7BS0006
BB-17-002
U7BS0005
RD-96
U7BS0002
RD-90
U7BS0003
U7BS0004
U7BS0027
U7BS0026
U7BS0014
BB-17-001
U7BS0015
RD-91
U7BS0017
U7BS0016
RD-95
U7BS0025
RD-28
RMBS0058
RMBS0059
RD-93
RMBS0060
RMBS0061
P2-121
P2-120
BB-16-005
BB-16-003
RMBS0156
BB-16-002
RD-66
BB-16-001B
RD-65A
RMBS0064
RMBS0063
RD-MC
RD-64
BB-16-004
BB-16-001A
U7BS0029
U7BS0013
U7BS0028
Outfall-003
RD-67
RMBS0062
RMBS0070
RMBS0069
RMBS0098
RMBS0067
RMBS0034
RMBS0036
RMDF1
RMBS0033
RMDF2
SVLF021-1
RMSV0033
RMDF5
RMDF3
RMSV0032
RMDF4
RD-35
RMBS0032
RMDF6
SVLF021-2
RMBS0035
RMBS0037
RMBS0133
RMBS0125
RMBS0145
RMBS0051
RMBS0031
RMBS0045
RMBS0113
RMBS0050
RMBS0135
RMBS0068
4665
B
B'
RMBS0091
RMBS0136
RMBS0134
RMBS0066
RMBS0053
RMBS0121
RMBS0122
RMBS0093
RMBS0052
RMBS0043
RMBS0142
RMBS0143
RMBS0118
RMBS0047
RMBS0120
RMBS0038
RMBS0041
RMBS0042
4664
RMBS0103
RMBS0101
RMBS0092
4075
RMSV0040
RMBS0040
RMBS0108
RMBS0117
RMBS0148
RMBS0046
4044
RMBS0127
RMBS0115
RMBS0144
RMBS0039
RMSV0039
RMSV0112
RMBS0112
RMBS0021
RMBS0107
RMSV0107
RMBS0095
RMBS0106
RMSV0106
RMBS0094
4022
RMBS0055
RMBS0111
RMBS0030
RMSV0030
RMBS0022S70
RMBS0022S02
RMBS0097
RMBS0048
RMBS0056
RMBS0102
RMBS0104
RMBS0105
RMSV0021
RMBS0103
4021
RMBS0007
RMBS0022S01
RMBS0065
RMBS0126
RMBS0018
4034
RMBS0137
RMBS0054
4614
RMBS0014
RMBS0009
RMBS0023S01
RMBS0110
RMBS0010
RMBS0012
RMBS0008
RMBS0022S03
RMBS0023S02
RMBS0023S70
RMBS0019
RMSV0019
4658
RMBS0124
RMBS0049
4622
RMBS0116
RMSV0100
RMSV0006
RMBS0006
RMBS0011
RMBS0001
RMBS0138
RMBS0119
RMBS0123
RMBS0099
RMBS0015
RMBS0141
RMBS0150
RMBS0139
RMBS0155
RMBS0151
RMBS0149
RMBS0013
RMBS0140
RMBS0005
RMBS0154
RMBS0153
RMBS0152
RMBS0003
RMBS0002
U7BS0020
B
U7BS0001
U7BS0011
U7SV0011
U7SV0021
U7BS0021
U7BS0023
4811
4028
RD-89
U7BS0010
U7BS0022
U7BS0007
U7BS0018
U7SV0018
U7BS00245001
U7BS00245002
U7BS00245003
U7BS00245004
U7BS0012S01
U7BS0012S02
U7BS0012S70
U7BS0012S03
A
A'
U7BS0008
RMBS0057
RMBS0058
RMBS0059
RMBS0060
RMBS0061
P2-121
P2-120

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

Document: RFI-Report-Group7-Appendix-RMHF-SampleLocations_E.mxd Date: Jun 08, 2009

1 inch = 40 feet

0 40 80 Feet

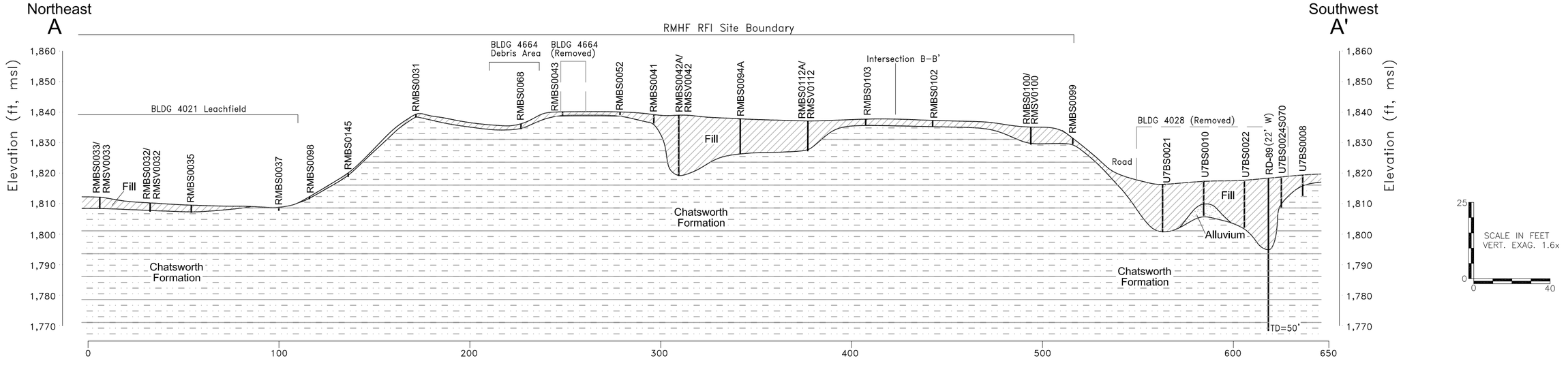


MWH

SANTA SUSANA FIELD LABORATORY

Sample and Trench Locations
RMHF RFI Site

FIGURE C.2-2



MWH

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
MAY 2009

SURFICIAL CROSS SECTIONS A-A' & B-B' RMHF RFI SITE

FIGURE C.2-3

JOB No. ---- FILE No. ---- INDUSTRIAL\CAD_MLUEBKE\BOEING_SANTA_SUSANA\GROUP_7_-_FIGS\SHALLOW CORSS ECTIONS

Soil Disturbance Areas
RMHF RFI Site

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building
- Removed Building
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Excavation
- Elevation Contour

Note: This figure is created to depict current conditions.

Soil Disturbance Areas

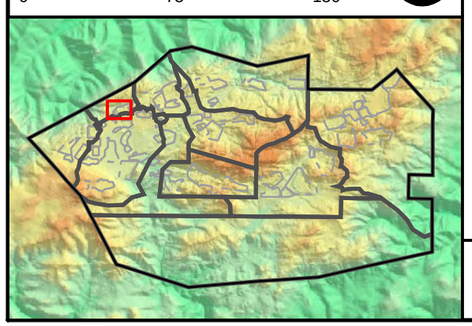
- Excavation
- Excavation-Backfill
- Grading
- Building Foundation & Asphalt / Concrete Demolition (minimal grading)

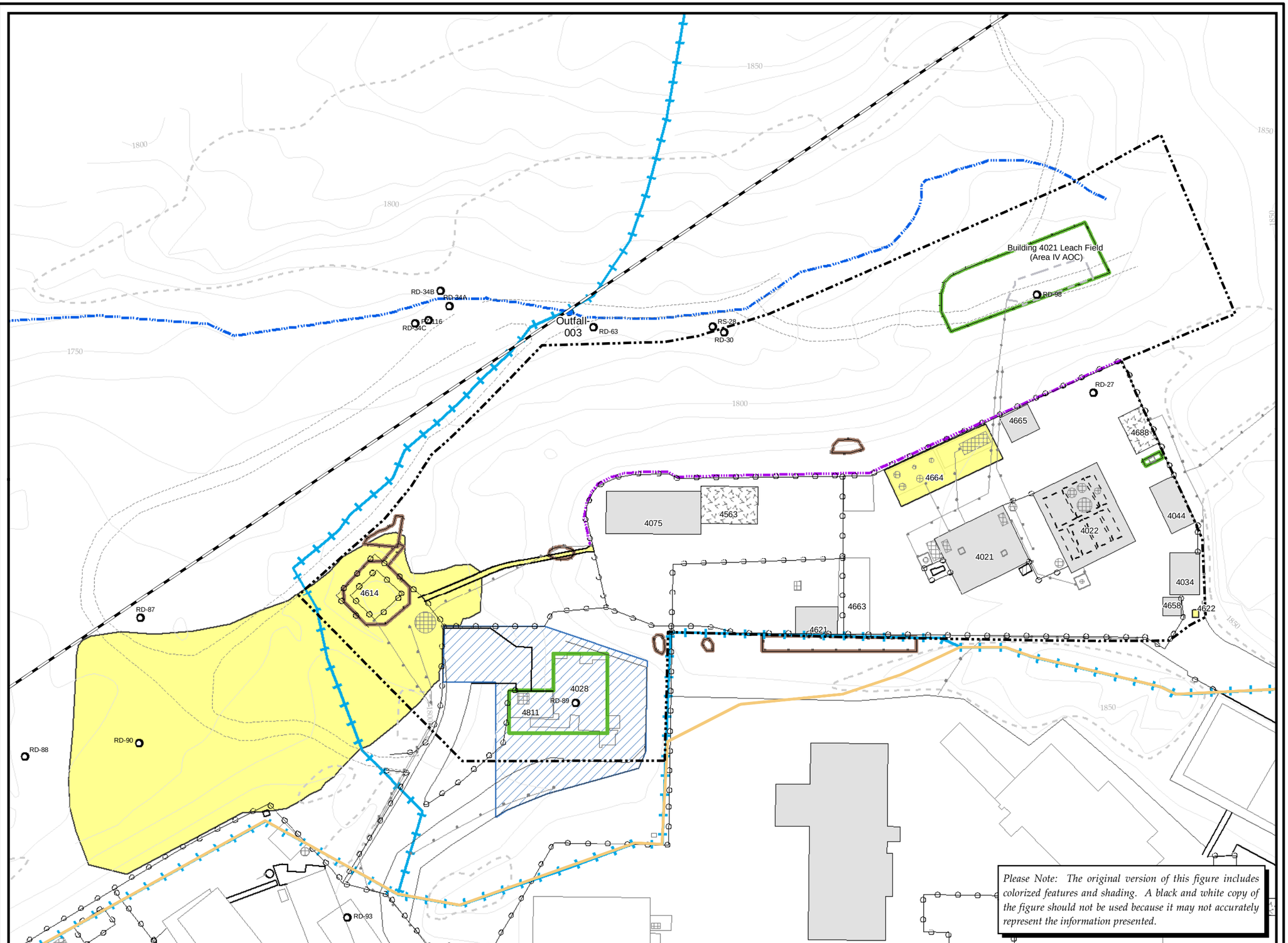
Note: The soil disturbances shown include only those areas or features found within the RFI Site.

Document: RFI-Report-Group7-Appendix-RMHF-SoilDisturbance_11x17.mxd Date: Jun 11, 2009

1 inch = 75 feet

0 75 150 Feet





Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

MWH

SANTA SUSANA FIELD LABORATORY

FIGURE C.2-4

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected VOCs Chemical Data**
- ▲ **Soil sample location with no detected VOCs Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for VOCs Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: **RMDF5**

1.00	Depth in Feet
Primary	Sample Type
RMDF5S01	Unique Sample Identifier
7/10/2005	Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

	Res RBSL	Eco RBSL
Soil Matrix VOCs	**(mg/kg)**	**(mg/kg)**
Acetone	482.1439	42.7106
Methyl ethyl ketone	62.0000	2,540.0000
m-Xylene & p-Xylene	-	-
o-Xylene	0.1900	64.0659
Soil Matrix VOCs	**(ug/kg)**	**(ug/kg)**
1,2,4-Trimethylbenzene	40.7349	64,065.8554
1,3,5-Trimethylbenzene	36.0000	64,065.8554
Acetone	482143.9253	42,710.5703
Cumene	-	-
Ethylbenzene	4.6450	210,000.0000
Methyl ethyl ketone	62000.0000	2,540,000.0000
Methylene chloride	4.0000	24,985.6836
Naphthalene	1146590.7159	210,000.0000
m-Xylene & p-Xylene	-	-
n-Butylbenzene	0.0000	-
n-Propylbenzene	203.2675	210,000.0000
o-Xylene	190.0000	64,065.8554
p-Cymene	-	-
sec-Butylbenzene	29754.6624	210,000.0000
Styrene	7200.0000	427,105.7027
Tetrachloroethene	0.4300	5,979.4798
Toluene	233.5017	3,416.8456
Xylenes, Total	150.0000	64,065.8554
Soil Vapor VOCs	**(µg/L)**	**(µg/L)**
1,1,2-Trichloro-1,2,2-trifluoroethane	-	-
Benzene	0.0950	0.5700
Ethylbenzene	290.0000	23.0000
m-Xylene & p-Xylene	-	-
o-Xylene	29.0000	16.0000
Tetrachloroethene	0.4523	24.0000
Toluene	110.0000	0.0840
Xylenes, Total	-	-

Note: (µg/kg) = micrograms per kilogram
Note: (µg/L) = micrograms per liter
Note: (µg) = micrograms

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a VOCs analyte, this indicates the analyte was not analyzed.

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

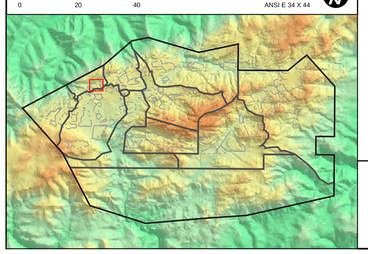
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

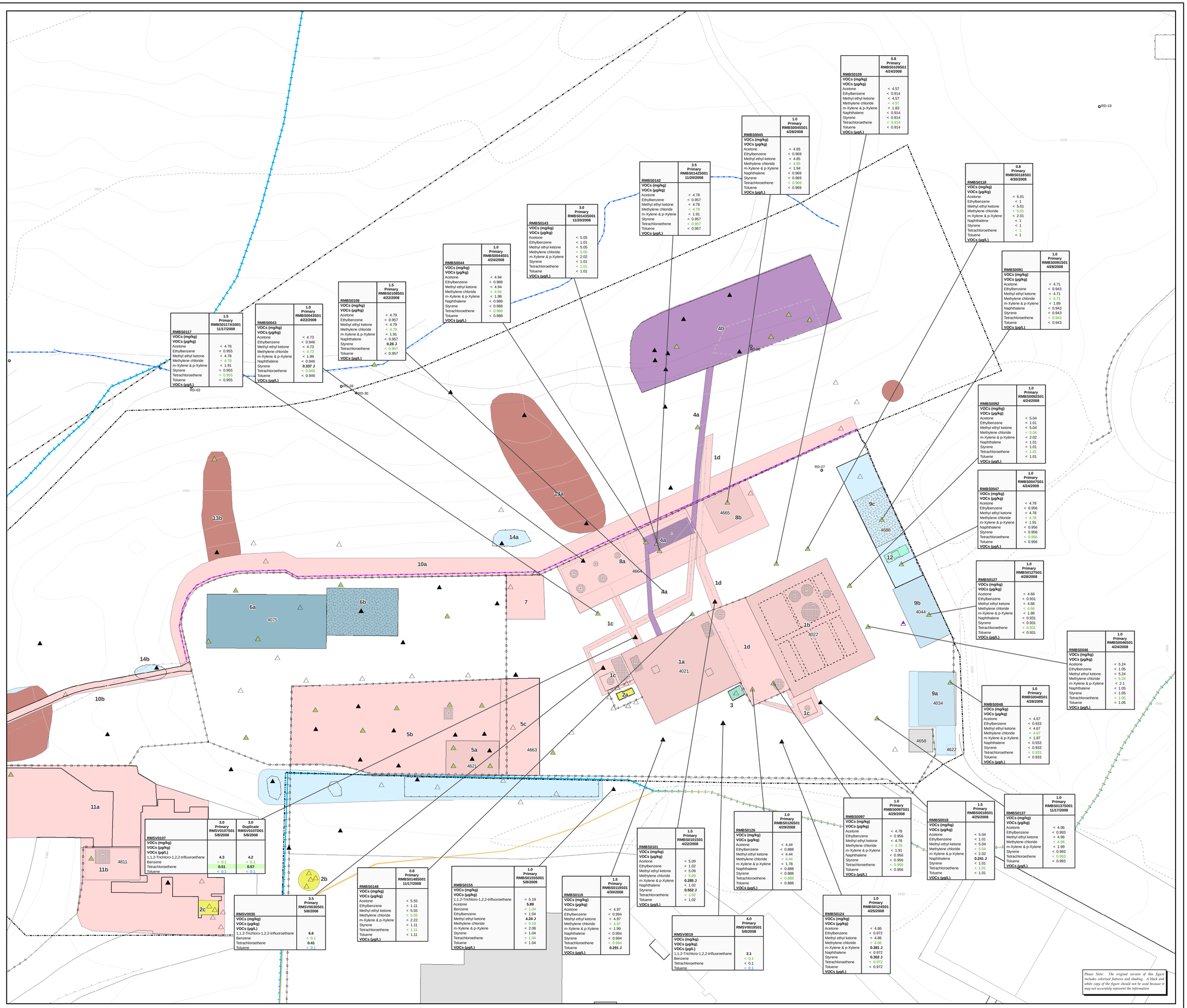
Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-VOC_East.mxd
Date: Jun 10, 2009

1 inch = 20 feet
0 20 40 Feet
ANSI E 34 X 44




RMBS0117 — 1.5 Primary RMBS0117AS001 11/17/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.78
Ethylbenzene < 0.955
Methyl ethyl ketone < 4.78
Methylene chloride < 4.78
m-Xylene & p-Xylene < 1.91
Styrene < 0.955
Tetrachloroethene < 0.955
Toluene < 0.955
VOCs (µg/L) -
RD-63
RMBS0043 — 1.0 Primary RMBS0043S01 4/22/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.73
Ethylbenzene < 0.946
Methyl ethyl ketone < 4.73
Methylene chloride < 4.73
m-Xylene & p-Xylene < 1.89
Naphthalene < 0.946
Styrene 0.337 J
Tetrachloroethene < 0.946
Toluene < 0.946
VOCs (µg/L) -
RD-28
RD-30
RMBS0108 — 1.5 Primary RMBS0108S01 4/22/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.79
Ethylbenzene < 0.957
Methyl ethyl ketone < 4.79
Methylene chloride < 4.79
m-Xylene & p-Xylene < 1.91
Naphthalene < 0.957
Styrene 0.26 J
Tetrachloroethene < 0.957
Toluene < 0.957
VOCs (µg/L) -
RMBS0143 — 3.0 Primary RMBS0143S01 11/20/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 5.05
Ethylbenzene < 1.01
Methyl ethyl ketone < 5.05
Methylene chloride < 5.05
m-Xylene & p-Xylene < 2.02
Styrene < 1.01
Tetrachloroethene < 1.01
Toluene < 1.01
VOCs (µg/L) -
RMBS0044 — 1.0 Primary RMBS0044S01 4/24/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.94
Ethylbenzene < 0.988
Methyl ethyl ketone < 4.94
Methylene chloride < 4.94
m-Xylene & p-Xylene < 1.98
Naphthalene < 0.988
Styrene < 0.988
Tetrachloroethene < 0.988
Toluene < 0.988
VOCs (µg/L) -
RMBS0142 — 3.5 Primary RMBS0142S001 11/20/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.78
Ethylbenzene < 0.957
Methyl ethyl ketone < 4.78
Methylene chloride < 4.78
m-Xylene & p-Xylene < 1.91
Styrene < 0.957
Tetrachloroethene < 0.957
Toluene < 0.957
VOCs (µg/L) -
RMBS0045 — 1.0 Primary RMBS0045S01 4/28/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.85
Ethylbenzene < 0.969
Methyl ethyl ketone < 4.85
Methylene chloride < 4.85
m-Xylene & p-Xylene < 1.94
Naphthalene < 0.969
Styrene < 0.969
Tetrachloroethene < 0.969
Toluene < 0.969
VOCs (µg/L) -
RMBS0109 — 0.8 Primary RMBS0109S01 4/24/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.57
Ethylbenzene < 0.914
Methyl ethyl ketone < 4.57
Methylene chloride < 4.57
m-Xylene & p-Xylene < 1.83
Naphthalene < 0.914
Styrene < 0.914
Tetrachloroethene < 0.914
Toluene < 0.914
VOCs (µg/L) -
RD-19
RMBS0118 — 0.8 Primary RMBS0118S01 4/30/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 5.01
Ethylbenzene < 1
Methyl ethyl ketone < 5.01
Methylene chloride < 5.01
m-Xylene & p-Xylene < 2.01
Naphthalene < 1
Styrene < 1
Tetrachloroethene < 1
Toluene < 1
VOCs (µg/L) -
RMBS0091 — 1.0 Primary RMBS0091S01 4/28/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.71
Ethylbenzene < 0.943
Methyl ethyl ketone < 4.71
Methylene chloride < 4.71
m-Xylene & p-Xylene < 1.89
Naphthalene < 0.943
Styrene < 0.943
Tetrachloroethene < 0.943
Toluene < 0.943
VOCs (µg/L) -
RD-08
RMBS0092 — 1.0 Primary RMBS0092S01 4/24/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 5.04
Ethylbenzene < 1.01
Methyl ethyl ketone < 5.04
Methylene chloride < 5.04
m-Xylene & p-Xylene < 2.02
Naphthalene < 1.01
Styrene < 1.01
Tetrachloroethene < 1.01
Toluene < 1.01
VOCs (µg/L) -
RD-27
RMBS0047 — 1.0 Primary RMBS0047S01 4/24/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.78
Ethylbenzene < 0.956
Methyl ethyl ketone < 4.78
Methylene chloride < 4.78
m-Xylene & p-Xylene < 1.91
Naphthalene < 0.956
Styrene < 0.956
Tetrachloroethene < 0.956
Toluene < 0.956
VOCs (µg/L) -
RMBS0127 — 1.0 Primary RMBS0127S01 4/28/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.66
Ethylbenzene < 0.931
Methyl ethyl ketone < 4.66
Methylene chloride < 4.66
m-Xylene & p-Xylene < 1.86
Naphthalene < 0.931
Styrene < 0.931
Tetrachloroethene < 0.931
Toluene < 0.931
VOCs (µg/L) -
RMBS0046 — 1.0 Primary RMBS0046S01 4/24/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 5.24
Ethylbenzene < 1.05
Methyl ethyl ketone < 5.24
Methylene chloride < 5.24
m-Xylene & p-Xylene < 2.1
Naphthalene < 1.05
Styrene < 1.05
Tetrachloroethene < 1.05
Toluene < 1.05
VOCs (µg/L) -
RMBS0048 — 1.0 Primary RMBS0048S01 4/28/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.67
Ethylbenzene < 0.933
Methyl ethyl ketone < 4.67
Methylene chloride < 4.67
m-Xylene & p-Xylene < 1.87
Naphthalene < 0.933
Styrene < 0.933
Tetrachloroethene < 0.933
Toluene < 0.933
VOCs (µg/L) -
RMBS0097 — 1.0 Primary RMBS0097S01 4/28/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.78
Ethylbenzene < 0.956
Methyl ethyl ketone < 4.78
Methylene chloride < 4.78
m-Xylene & p-Xylene < 1.91
Naphthalene < 0.956
Styrene < 0.956
Tetrachloroethene < 0.956
Toluene < 0.956
VOCs (µg/L) -
RMBS0018 — 1.5 Primary RMBS0018S01 4/25/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 5.04
Ethylbenzene < 1.01
Methyl ethyl ketone < 5.04
Methylene chloride < 5.04
m-Xylene & p-Xylene < 2.02
Naphthalene 0.241 J
Styrene < 1.01
Tetrachloroethene < 1.01
Toluene < 1.01
VOCs (µg/L) -
RMBS0137 — 1.0 Primary RMBS0137S001 11/17/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.96
Ethylbenzene < 0.993
Methyl ethyl ketone < 4.96
Methylene chloride < 4.96
m-Xylene & p-Xylene < 1.99
Styrene < 0.993
Tetrachloroethene < 0.993
Toluene < 0.993
VOCs (µg/L) -
RMBS0124 — 1.0 Primary RMBS0124S01 4/25/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.86
Ethylbenzene < 0.972
Methyl ethyl ketone < 4.86
Methylene chloride < 4.86
m-Xylene & p-Xylene 0.381 J
Naphthalene < 0.972
Styrene 0.302 J
Tetrachloroethene < 0.972
Toluene < 0.972
VOCs (µg/L) -
RMBS0101 — 1.5 Primary RMBS0101S01 4/22/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 5.09
Ethylbenzene < 1.02
Methyl ethyl ketone < 5.09
Methylene chloride 0.285 J
m-Xylene & p-Xylene < 1.02
Naphthalene 0.552 J
Styrene < 1.02
Tetrachloroethene < 1.02
Toluene < 1.02
VOCs (µg/L) -
RMBS0126 — 1.0 Primary RMBS0126S01 4/29/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.44
Ethylbenzene < 0.888
Methyl ethyl ketone < 4.44
Methylene chloride < 4.44
m-Xylene & p-Xylene < 1.78
Naphthalene < 0.888
Styrene < 0.888
Tetrachloroethene < 0.888
Toluene < 0.888
VOCs (µg/L) -
RMBS0119 — 1.5 Primary RMBS0119S01 4/30/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 4.97
Ethylbenzene < 0.994
Methyl ethyl ketone < 4.97
Methylene chloride < 4.97
m-Xylene & p-Xylene < 1.99
Naphthalene < 0.994
Styrene < 0.994
Tetrachloroethene < 0.994
Toluene 0.291 J
VOCs (µg/L) -
RMBS0155 — 1.0 Primary RMBS0155S001 5/8/2009
VOCs (mg/kg) / VOCs (µg/kg)
1,1,2-Trichloro-1,2,2-trifluoroethane < 5.19
Acetone 5.89
Benzene < 1.04
Ethylbenzene < 1.04
Methyl ethyl ketone 4.24 J
Methylene chloride < 5.19
m-Xylene & p-Xylene < 2.08
Styrene < 1.04
Tetrachloroethene < 1.04
Toluene < 1.04
VOCs (µg/L) -
RMBS0148 — 0.8 Primary RMBS0148S001 11/17/2008
VOCs (mg/kg) / VOCs (µg/kg)
Acetone < 5.55
Ethylbenzene < 1.11
Methyl ethyl ketone < 5.55
Methylene chloride < 5.55
m-Xylene & p-Xylene < 2.22
Styrene < 1.11
Tetrachloroethene < 1.11
Toluene < 1.11
VOCs (µg/L) -
RMSV0107 — 3.0 Primary RMSV0107S01 5/8/2008 / 3.0 Duplicate RMSV0107D01 5/8/2008
VOCs (mg/kg) / VOCs (µg/kg) / VOCs (µg/L)
1,1,2-Trichloro-1,2,2-trifluoroethane 4.3 / 4.2
Benzene < 0.1 / < 0.1
Tetrachloroethene 0.51 / 0.57
Toluene < 0.1 / < 0.1
RMSV0030 — 3.5 Primary RMSV0030S01 5/8/2008
VOCs (mg/kg) / VOCs (µg/kg) / VOCs (µg/L)
1,1,2-Trichloro-1,2,2-trifluoroethane 6.6
Benzene < 0.1
Tetrachloroethene 0.41
Toluene < 0.1
RMBS0019 — 4.0 Primary RMSV0019S01 5/8/2008
VOCs (mg/kg) / VOCs (µg/kg) / VOCs (µg/L)
1,1,2-Trichloro-1,2,2-trifluoroethane 2.1
Benzene < 0.1
Tetrachloroethene < 0.1
Toluene < 0.1
4a
4b
1d
8b
4665
13a
13b
14a
10a
8a
4663
1c
6a
4075
6b
7
14b
10b
1a
4021
2a
3
1b
4022
9c
4688
9b
4044
12
5c
5b
5a
4621
9a
4034
4658
4622
11a
11b
4811
2b
2c
Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

VOC Chemical Data Results
RMHF RFI Site
East RMHF Area

FIGURE C.3-1A

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected VOCs Chemical Data**
- ▲ **Soil sample location with no detected VOCs Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for VOCs Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

- 1.00 — Depth in Feet
- Primary — Sample Type
- RMDF5S01 — Unique Sample Identifier
- 7/10/2005 — Date

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

Soil Matrix VOCs	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
Acetone	482.1439	42.7106
Methyl ethyl ketone	62.0000	2,540.0000
m-Xylene & p-Xylene		
o-Xylene	0.1900	64.0659
Soil Matrix VOCs	**(ug/kg)**	**(ug/kg)**
1,2,4-Trimethylbenzene	40.7349	64,065.8554
1,3,5-Trimethylbenzene	36.0000	64,065.8554
Acetone	482143.9253	42,710.5703
Cumene	-	-
Ethylbenzene	4.6450	210,000.0000
Methyl ethyl ketone	62000.0000	2,540,000.0000
Methylene chloride	4.0000	24,985.6836
Naphthalene	1146590.7159	210,000.0000
m-Xylene & p-Xylene	-	-
n-Butylbenzene	0.0000	-
n-Propylbenzene	203.2675	210,000.0000
o-Xylene	190.0000	64,065.8554
p-Cymene		
sec-Butylbenzene	29754.6624	210,000.0000
Styrene	7200.0000	427,105.7027
Tetrachloroethene	0.4300	5,979.4798
Toluene	233.5017	3,416.8456
Xylenes, Total	150.0000	64,065.8554
Soil Vapor VOCs	**(µg/L)**	**(µg/L)**
1,1,2-Trichloro-1,2,2-trifluoroethane	-	-
Benzene	0.0950	0.5700
Ethylbenzene	290.0000	23.0000
m-Xylene & p-Xylene		
o-Xylene	29.0000	16.0000
Tetrachloroethene	0.4523	24.0000
Toluene	110.0000	0.0840
Xylenes, Total	-	-

Note: (µg/kg) = micrograms per kilogram
Note: (µg/L) = micrograms per liter
Note: (µg) = micrograms
Note: For the chemical result boxes, if results are not listed for a VOCs analyte, this indicates the analyte was not analyzed.

Data Date: April 2009

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

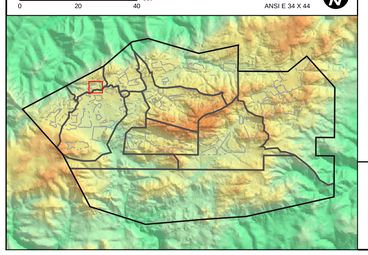
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

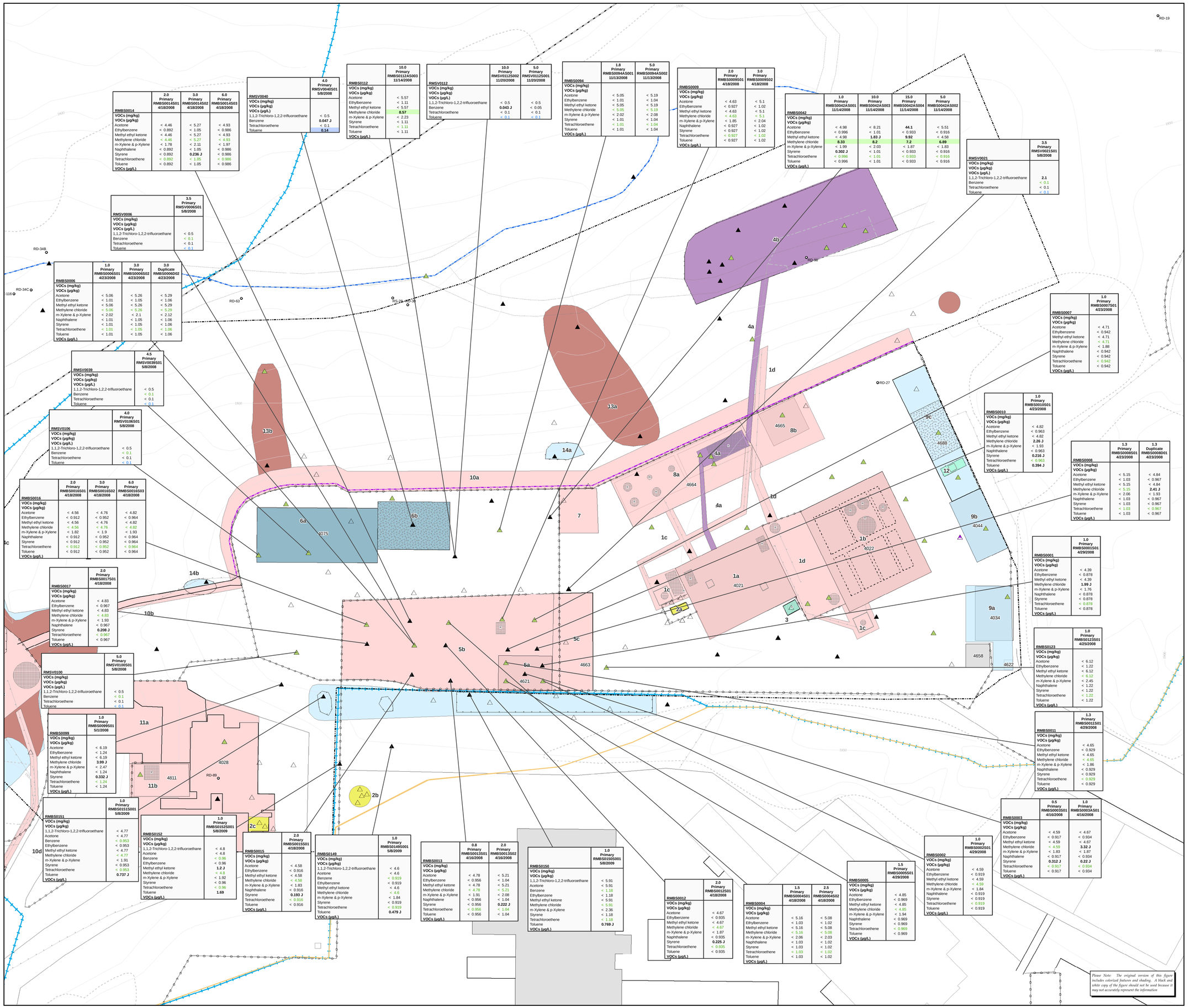
Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-VOC_West.mxd Date: Jun 10, 2009

1 inch = 20 feet
0 20 40 Feet
ANSI E 34 X 44





RMBS0014	2.0 Primary RMBS0014S01 4/18/2008	3.0 Primary RMBS0014S02 4/18/2008	6.0 Primary RMBS0014S03 4/18/2008
VOCs (mg/kg)			
VOCs (µg/kg)			
Acetone	< 4.46	< 5.27	< 4.93
Ethylbenzene	< 0.892	< 1.05	< 0.986
Methyl ethyl ketone	< 4.46	< 5.27	< 4.93
Methylene chloride	< 4.46	< 5.27	< 4.93
m-Xylene & p-Xylene	< 1.78	< 2.11	< 1.97
Naphthalene	< 0.892	< 1.05	< 0.986
Styrene	< 0.892	**0.236 J**	< 0.986
Tetrachloroethene	< 0.892	< 1.05	< 0.986
Toluene	< 0.892	< 1.05	< 0.986
VOCs (µg/L)			

RMSV0040	4.0 Primary RMSV0040S01 5/8/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
VOCs (µg/L)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5
Benzene	**0.047 J**
Tetrachloroethene	< 0.1
Toluene	**0.14**

RMBS0112	10.0 Primary RMBS0112AS003 11/14/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.57
Ethylbenzene	< 1.11
Methyl ethyl ketone	< 5.57
Methylene chloride	**8.57**
m-Xylene & p-Xylene	< 2.23
Styrene	< 1.11
Tetrachloroethene	< 1.11
Toluene	< 1.11
VOCs (µg/L)	

RMSV0112	10.0 Primary RMSV0112S002 11/20/2008	5.0 Primary RMSV0112S001 11/20/2008
VOCs (mg/kg)		
VOCs (µg/kg)		
VOCs (µg/L)		
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5	< 0.5
Benzene	**0.043 J**	< 0.05
Tetrachloroethene	< 0.1	< 0.1
Toluene	< 0.1	< 0.1

RMBS0094	1.8 Primary RMBS0094AS001 11/13/2008	5.0 Primary RMBS0094AS002 11/13/2008
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 5.05	< 5.19
Ethylbenzene	< 1.01	< 1.04
Methyl ethyl ketone	< 5.05	< 5.19
Methylene chloride	< 5.05	< 5.19
m-Xylene & p-Xylene	< 2.02	< 2.08
Styrene	< 1.01	< 1.04
Tetrachloroethene	< 1.01	< 1.04
Toluene	< 1.01	< 1.04
VOCs (µg/L)		

RMBS0009	2.0 Primary RMBS0009S01 4/18/2008	3.0 Primary RMBS0009S02 4/18/2008
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 4.63	< 5.1
Ethylbenzene	< 0.927	< 1.02
Methyl ethyl ketone	< 4.63	< 5.1
Methylene chloride	< 4.63	< 5.1
m-Xylene & p-Xylene	< 1.85	< 2.04
Naphthalene	< 0.927	< 1.02
Styrene	< 0.927	< 1.02
Tetrachloroethene	< 0.927	< 1.02
Toluene	< 0.927	< 1.02
VOCs (µg/L)		

RMBS0042	1.0 Primary RMBS0042AS001 11/14/2008	10.0 Primary RMBS0042AS003 11/14/2008	15.0 Primary RMBS0042AS004 11/14/2008	5.0 Primary RMBS0042AS002 11/14/2008
VOCs (mg/kg)				
VOCs (µg/kg)				
Acetone	< 4.98	< 8.21	**44.1**	< 5.51
Ethylbenzene	< 0.996	< 1.01	< 0.933	< 0.916
Methyl ethyl ketone	< 4.98	**1.83 J**	**9.92**	< 4.58
Methylene chloride	**8.33**	**8.2**	**7.2**	**6.89**
m-Xylene & p-Xylene	< 1.99	< 2.03	< 1.87	< 1.83
Styrene	**0.302 J**	< 1.01	< 0.933	< 0.916
Tetrachloroethene	< 0.996	< 1.01	< 0.933	< 0.916
Toluene	< 0.996	< 1.01	< 0.933	< 0.916
VOCs (µg/L)				

RMSV0021	3.5 Primary RMSV0021S01 5/8/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
VOCs (µg/L)	
1,1,2-Trichloro-1,2,2-trifluoroethane	**2.1**
Benzene	< 0.1
Tetrachloroethene	< 0.1
Toluene	< 0.1

RMSV0006	3.5 Primary RMSV0006S01 5/8/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
VOCs (µg/L)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5
Benzene	< 0.1
Tetrachloroethene	< 0.1
Toluene	< 0.1

RMBS0006	1.0 Primary RMBS0006S01 4/23/2008	3.0 Primary RMBS0006S02 4/23/2008	3.0 Duplicate RMBS0006D02 4/23/2008
VOCs (mg/kg)			
VOCs (µg/kg)			
Acetone	< 5.06	< 5.26	< 5.29
Ethylbenzene	< 1.01	< 1.05	< 1.06
Methyl ethyl ketone	< 5.06	< 5.26	< 5.29
Methylene chloride	< 5.06	< 5.26	< 5.29
m-Xylene & p-Xylene	< 2.02	< 2.1	< 2.12
Naphthalene	< 1.01	< 1.05	< 1.06
Styrene	< 1.01	< 1.05	< 1.06
Tetrachloroethene	< 1.01	< 1.05	< 1.06
Toluene	< 1.01	< 1.05	< 1.06
VOCs (µg/L)			

RMBS0007	1.0 Primary RMBS0007S01 4/23/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.71
Ethylbenzene	< 0.942
Methyl ethyl ketone	< 4.71
Methylene chloride	< 4.71
m-Xylene & p-Xylene	< 1.88
Naphthalene	< 0.942
Styrene	< 0.942
Tetrachloroethene	< 0.942
Toluene	< 0.942
VOCs (µg/L)	

RMSV0039	4.5 Primary RMSV0039S01 5/8/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
VOCs (µg/L)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5
Benzene	< 0.1
Tetrachloroethene	< 0.1
Toluene	< 0.1

RMSV0106	4.0 Primary RMSV0106S01 5/8/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
VOCs (µg/L)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5
Benzene	< 0.1
Tetrachloroethene	< 0.1
Toluene	< 0.1

RMBS0010	1.0 Primary RMBS0010S01 4/23/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.82
Ethylbenzene	< 0.963
Methyl ethyl ketone	< 4.82
Methylene chloride	**2.26 J**
m-Xylene & p-Xylene	< 1.93
Naphthalene	< 0.963
Styrene	**0.216 J**
Tetrachloroethene	< 0.963
Toluene	**0.394 J**
VOCs (µg/L)	

RMBS0008	1.3 Primary RMBS0008S01 4/23/2008	1.3 Duplicate RMBS0008D01 4/23/2008
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 5.15	< 4.84
Ethylbenzene	< 1.03	< 0.967
Methyl ethyl ketone	< 5.15	< 4.84
Methylene chloride	< 5.15	**2.41 J**
m-Xylene & p-Xylene	< 2.06	< 1.93
Naphthalene	< 1.03	< 0.967
Styrene	< 1.03	< 0.967
Tetrachloroethene	< 1.03	< 0.967
Toluene	< 1.03	< 0.967
VOCs (µg/L)		

RMBS0016	2.0 Primary RMBS0016S01 4/18/2008	3.0 Primary RMBS0016S02 4/18/2008	6.0 Primary RMBS0016S03 4/18/2008
VOCs (mg/kg)			
VOCs (µg/kg)			
Acetone	< 4.56	< 4.76	< 4.82
Ethylbenzene	< 0.912	< 0.952	< 0.964
Methyl ethyl ketone	< 4.56	< 4.76	< 4.82
Methylene chloride	< 4.56	< 4.76	< 4.82
m-Xylene & p-Xylene	< 1.82	< 1.9	< 1.93
Naphthalene	< 0.912	< 0.952	< 0.964
Styrene	< 0.912	< 0.952	< 0.964
Tetrachloroethene	< 0.912	< 0.952	< 0.964
Toluene	< 0.912	< 0.952	< 0.964
VOCs (µg/L)			

RMBS0017	2.0 Primary RMBS0017S01 4/18/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.83
Ethylbenzene	< 0.967
Methyl ethyl ketone	< 4.83
Methylene chloride	< 4.83
m-Xylene & p-Xylene	< 1.93
Naphthalene	< 0.967
Styrene	**0.208 J**
Tetrachloroethene	< 0.967
Toluene	< 0.967
VOCs (µg/L)	

RMSV0100	5.0 Primary RMSV0100S01 5/8/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
VOCs (µg/L)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5
Benzene	< 0.1
Tetrachloroethene	< 0.1
Toluene	< 0.1

RMBS0099	1.0 Primary RMBS0099S01 5/1/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 6.19
Ethylbenzene	< 1.24
Methyl ethyl ketone	< 6.19
Methylene chloride	**3.99 J**
m-Xylene & p-Xylene	< 2.47
Naphthalene	< 1.24
Styrene	**0.332 J**
Tetrachloroethene	< 1.24
Toluene	< 1.24
VOCs (µg/L)	

RMBS0151	1.0 Primary RMBS0151S001 5/8/2009
VOCs (mg/kg)	
VOCs (µg/kg)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 4.77
Acetone	< 4.77
Benzene	< 0.953
Ethylbenzene	< 0.953
Methyl ethyl ketone	< 4.77
Methylene chloride	< 4.77
m-Xylene & p-Xylene	< 1.91
Styrene	< 0.953
Tetrachloroethene	< 0.953
Toluene	**0.737 J**
VOCs (µg/L)	

RMBS0152	1.0 Primary RMBS0152S001 5/8/2009
VOCs (mg/kg)	
VOCs (µg/kg)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 4.8
Acetone	< 4.8
Benzene	< 0.96
Ethylbenzene	< 0.96
Methyl ethyl ketone	**1.2 J**
Methylene chloride	< 4.8
m-Xylene & p-Xylene	< 1.92
Styrene	< 0.96
Tetrachloroethene	< 0.96
Toluene	**1.69**
VOCs (µg/L)	

RMBS0015	2.0 Primary RMBS0015S01 4/18/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.58
Ethylbenzene	< 0.916
Methyl ethyl ketone	< 4.58
Methylene chloride	< 4.58
m-Xylene & p-Xylene	< 1.83
Naphthalene	< 0.916
Styrene	**0.193 J**
Tetrachloroethene	< 0.916
Toluene	< 0.916

RMBS0149	1.0 Primary RMBS0149S001 5/8/2009
VOCs (mg/kg)	
VOCs (µg/kg)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 4.6
Acetone	< 4.6
Benzene	< 0.919
Ethylbenzene	< 0.919
Methyl ethyl ketone	< 4.6
Methylene chloride	< 4.6
m-Xylene & p-Xylene	< 1.84
Styrene	< 0.919
Tetrachloroethene	< 0.919
Toluene	**0.479 J**
VOCs (µg/L)	

RMBS0013	0.8 Primary RMBS0013S01 4/16/2008	2.0 Primary RMBS0013S02 4/16/2008
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 4.78	< 5.21
Ethylbenzene	< 0.956	< 1.04
Methyl ethyl ketone	< 4.78	< 5.21
Methylene chloride	< 4.78	< 5.21
m-Xylene & p-Xylene	< 1.91	< 2.08
Naphthalene	< 0.956	< 1.04
Styrene	< 0.956	**0.222 J**
Tetrachloroethene	< 0.956	< 1.04
Toluene	< 0.956	< 1.04
VOCs (µg/L)		

RMBS0150	1.0 Primary RMBS0150S001 5/8/2009
VOCs (mg/kg)	
VOCs (µg/kg)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 5.91
Acetone	< 5.91
Benzene	< 1.18
Ethylbenzene	< 1.18
Methyl ethyl ketone	< 5.91
Methylene chloride	< 5.91
m-Xylene & p-Xylene	< 2.36
Styrene	< 1.18
Tetrachloroethene	< 1.18
Toluene	**0.769 J**
VOCs (µg/L)	

RMBS0012	2.0 Primary RMBS0012S01 4/18/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.67
Ethylbenzene	< 0.935
Methyl ethyl ketone	< 4.67
Methylene chloride	< 4.67
m-Xylene & p-Xylene	< 1.87
Naphthalene	< 0.935
Styrene	**0.225 J**
Tetrachloroethene	< 0.935
Toluene	< 0.935
VOCs (µg/L)	

RMBS0004	1.5 Primary RMBS0004S01 4/18/2008	2.5 Primary RMBS0004S02 4/18/2008
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 5.16	< 5.08
Ethylbenzene	< 1.03	< 1.02
Methyl ethyl ketone	< 5.16	< 5.08
Methylene chloride	< 5.16	< 5.08
m-Xylene & p-Xylene	< 2.06	< 2.03
Naphthalene	< 1.03	< 1.02
Styrene	< 1.03	< 1.02
Tetrachloroethene	< 1.03	< 1.02
Toluene	< 1.03	< 1.02
VOCs (µg/L)		

RMBS0005	1.5 Primary RMBS0005S01 4/29/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.85
Ethylbenzene	< 0.969
Methyl ethyl ketone	< 4.85
Methylene chloride	< 4.85
m-Xylene & p-Xylene	< 1.94
Naphthalene	< 0.969
Styrene	< 0.969
Tetrachloroethene	< 0.969
Toluene	< 0.969
VOCs (µg/L)	

RMBS0002	1.0 Primary RMBS0002S01 4/29/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.59
Ethylbenzene	< 0.919
Methyl ethyl ketone	< 4.59
Methylene chloride	< 4.59
m-Xylene & p-Xylene	< 1.84
Naphthalene	< 0.919
Styrene	< 0.919
Tetrachloroethene	< 0.919
Toluene	< 0.919
VOCs (µg/L)	

RMBS0001	1.0 Primary RMBS0001S01 4/29/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.39
Ethylbenzene	< 0.878
Methyl ethyl ketone	< 4.39
Methylene chloride	**1.99 J**
m-Xylene & p-Xylene	< 1.76
Naphthalene	< 0.878
Styrene	< 0.878
Tetrachloroethene	< 0.878
Toluene	< 0.878
VOCs (µg/L)	

RMBS0123	1.0 Primary RMBS0123S01 4/29/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 6.12
Ethylbenzene	< 1.22
Methyl ethyl ketone	< 6.12
Methylene chloride	< 6.12
m-Xylene & p-Xylene	< 2.45
Naphthalene	< 1.22
Styrene	< 1.22
Tetrachloroethene	< 1.22
Toluene	< 1.22
VOCs (µg/L)	

RMBS0011	1.3 Primary RMBS0011S01 4/29/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.65
Ethylbenzene	< 0.929
Methyl ethyl ketone	< 4.65
Methylene chloride	< 4.65
m-Xylene & p-Xylene	< 1.86
Naphthalene	< 0.929
Styrene	< 0.929
Tetrachloroethene	< 0.929
Toluene	< 0.929
VOCs (µg/L)	

RMBS0003	0.5 Primary RMBS0003S01 4/16/2008	1.0 Primary RMBS0003A01 4/16/2008
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 4.59	< 4.67
Ethylbenzene	< 0.917	< 0.934
Methyl ethyl ketone	< 4.59	< 4.67
Methylene chloride	< 4.59	**3.32 J**
m-Xylene & p-Xylene	< 1.83	< 1.87
Naphthalene	< 0.917	< 0.934
Styrene	**0.312 J**	**0.22 J**
Tetrachloroethene	< 0.917	< 0.934
Toluene	< 0.917	< 0.934
VOCs (µg/L)		

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

VOC Chemical Data Results
RMHF RFI Site
West RMHF Area

FIGURE C.3-1B

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected VOCs Chemical Data**
- ▲ **Soil sample location with no detected VOCs Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for VOCs Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

- 1.00 — Depth in Feet
- Primary — Sample Type
- RMDF5S01 — Unique Sample Identifier
- 7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

	Res RBSL	Eco RBSL
Soil Matrix VOCs	**(mg/kg)**	**(mg/kg)**
Acetone	482.1439	42.7106
Methyl ethyl ketone	62.0000	2,540.0000
m-Xylene & p-Xylene	-	-
o-Xylene	0.1900	64.0659
Soil Matrix VOCs	**(ug/kg)**	**(ug/kg)**
1,2,4-Trimethylbenzene	40.7349	64,065.8554
1,3,5-Trimethylbenzene	36.0000	64,065.8554
Acetone	482143.9253	42,710.5703
Cumene	-	-
Ethylbenzene	4.6450	210,000.0000
Methyl ethyl ketone	62000.0000	2,540,000.0000
Methylene chloride	4.0000	24,985.6836
Naphthalene	1146590.7159	210,000.0000
m-Xylene & p-Xylene	-	-
n-Butylbenzene	0.0000	-
n-Propylbenzene	203.2675	210,000.0000
o-Xylene	190.0000	64,065.8554
p-Cymene	-	-
sec-Butylbenzene	29754.6624	210,000.0000
Styrene	7200.0000	427,105.7027
Tetrachloroethene	0.4300	5,979.4798
Toluene	233.5017	3,416.8456
Xylenes, Total	150.0000	64,065.8554
Soil Vapor VOCs	**(µg/L)**	**(µg/L)**
1,1,2-Trichloro-1,2,2-trifluoroethane	-	-
Benzene	0.0950	0.5700
Ethylbenzene	290.0000	23.0000
m-Xylene & p-Xylene	-	-
o-Xylene	29.0000	16.0000
Tetrachloroethene	0.4523	24.0000
Toluene	110.0000	0.0840
Xylenes, Total	-	-

Note: (µg/kg) = micrograms per kilogram
Note: (µg/L) = micrograms per liter
Note: (µg) = micrograms
Note: For the chemical result boxes, if results are not listed for a VOCs analyte, this indicates the analyte was not analyzed.

Data Date: April 2009

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

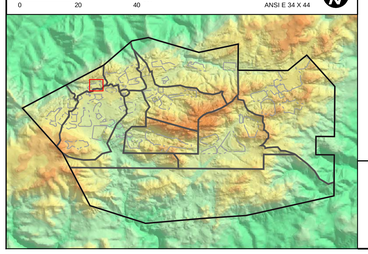
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

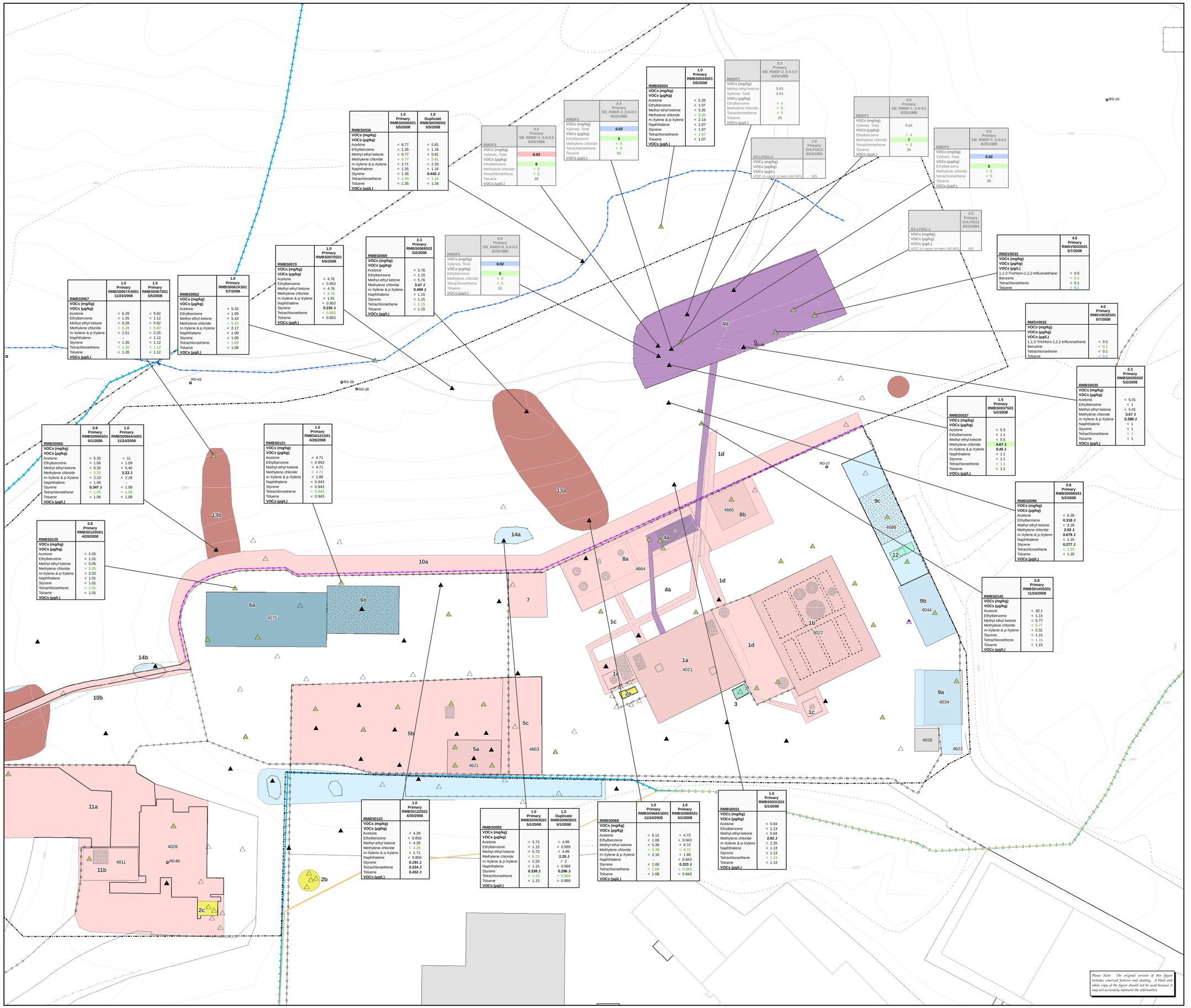
Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-VOC_North.mxd Date: Jun 10, 2009

1 inch = 20 feet
0 20 40 Feet
ANSI E 34 X 44





Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

VOC Chemical Data Results
RMHF RFI Site
North RMHF Area

FIGURE C.3-1C

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected VOCs Chemical Data**
- ▲ **Soil sample location with no detected VOCs Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for VOCs Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

- 1.00 — Depth in Feet
- Primary — Sample Type
- RMDF5S01 — Unique Sample Identifier
- 7/10/2005 — Date

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

	Res RBSL	Eco RBSL
Soil Matrix VOCs	**(mg/kg)**	**(mg/kg)**
Acetone	482.1439	42.7106
Methyl ethyl ketone	62.0000	2,540.0000
m-Xylene & p-Xylene	-	-
o-Xylene	0.1900	64.0659
Soil Matrix VOCs	**(ug/kg)**	**(ug/kg)**
1,2,4-Trimethylbenzene	40.7349	64,065.8554
1,3,5-Trimethylbenzene	36.0000	64,065.8554
Acetone	482143.9253	42,710.5703
Cumene	-	-
Ethylbenzene	4.6450	210,000.0000
Methyl ethyl ketone	62000.0000	2,540,000.0000
Methylene chloride	4.0000	24,985.6836
Naphthalene	1146590.7159	210,000.0000
m-Xylene & p-Xylene	-	-
n-Butylbenzene	0.0000	-
n-Propylbenzene	203.2675	210,000.0000
o-Xylene	190.0000	64,065.8554
p-Cymene	-	-
sec-Butylbenzene	29754.6624	210,000.0000
Styrene	7200.0000	427,105.7027
Tetrachloroethene	0.4300	5,979.4798
Toluene	233.5017	3,416.8456
Xylenes, Total	150.0000	64,065.8554
Soil Vapor VOCs	**(µg/L)**	**(µg/L)**
1,1,2-Trichloro-1,2,2-trifluoroethane	-	-
Benzene	0.0950	0.5700
Ethylbenzene	290.0000	23.0000
m-Xylene & p-Xylene	-	-
o-Xylene	29.0000	16.0000
Tetrachloroethene	0.4523	24.0000
Toluene	110.0000	0.0840
Xylenes, Total	-	-

Data Date: April 2009

Note: (µg/kg) = micrograms per kilogram
Note: (µg/L) = micrograms per liter
Note: (µg) = micrograms
Note: For the chemical result boxes, if results are not listed for a VOCs analyte, this indicates the analyte was not analyzed.

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

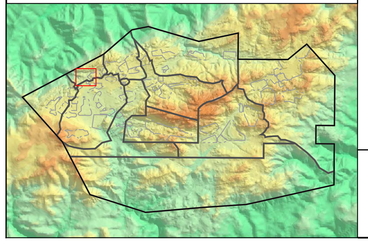
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-VOC_South.mxd Date: Jun 10, 2009

1 inch = 30 feet
Feet
0 30 60
ANSI E 34 X 44



BB-16-005	0.5 Primary BB16005 4/22/1992
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 25
Ethylbenzene	< 5
Methyl ethyl ketone	< 25
Methylene chloride	< 5
m-Xylene & p-Xylene	< 5
Styrene	< 5
Tetrachloroethene	< 5
Toluene	< 5
VOCs (µg/L)	

BB-16-004	0.5 Primary BB16004 4/22/1992
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 25
Ethylbenzene	< 5
Methyl ethyl ketone	< 25
Methylene chloride	< 5
m-Xylene & p-Xylene	< 5
Styrene	< 5
Tetrachloroethene	< 5
Toluene	< 5
VOCs (µg/L)	

RMBS0064	1.5 Primary RMBS0064S01 5/6/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.12
Ethylbenzene	< 1.02
Methyl ethyl ketone	< 5.12
Methylene chloride	< 5.12
m-Xylene & p-Xylene	< 2.05
Naphthalene	< 1.02
Styrene	< 1.02
Tetrachloroethene	< 1.02
Toluene	< 1.02
VOCs (µg/L)	

BB-16-003	0.5 Primary BB16003 4/22/1992	0.5 Duplicate BB16003-DUP 4/22/1992
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 25	< 25
Ethylbenzene	< 5	< 5
Methyl ethyl ketone	< 25	< 25
Methylene chloride	< 5	< 5
m-Xylene & p-Xylene	< 5	< 5
Styrene	< 5	< 5
Tetrachloroethene	< 5	< 5
Toluene	< 5	< 5
VOCs (µg/L)		

RMBS0063	1.5 Primary RMBS0063S01 5/6/2008	1.5 Duplicate RMBS0063D01 5/6/2008
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 5.72	< 5.84
Ethylbenzene	< 1.14	< 1.17
Methyl ethyl ketone	< 5.72	< 5.84
Methylene chloride	< 5.72	< 5.84
m-Xylene & p-Xylene	< 2.29	< 2.33
Naphthalene	< 1.14	< 1.17
Styrene	0.307 J	< 1.17
Tetrachloroethene	< 1.14	< 1.17
Toluene	< 1.14	< 1.17
VOCs (µg/L)		

BB-16-002	0.5 Primary BB16002 4/22/1992
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 25
Ethylbenzene	< 5
Methyl ethyl ketone	< 25
Methylene chloride	< 5
m-Xylene & p-Xylene	< 5
Styrene	< 5
Tetrachloroethene	< 5
Toluene	< 5
VOCs (µg/L)	

BB-16-001B	0.5 Primary BB16001B 4/22/1992	0.5 Split BB16001B-USEPA 4/22/1992
VOCs (mg/kg)		
VOCs (µg/kg)		
1,1,2-Trichloro-1,2,2-trifluoroethane	-	< 6
Acetone	< 25	10 J
Benzene	< 5	< 6
Ethylbenzene	< 5	< 6
Methyl ethyl ketone	< 25	< 13
Methylene chloride	< 5	7
m-Xylene & p-Xylene	< 5	-
Styrene	< 5	< 6
Tetrachloroethene	< 5	< 6
Toluene	< 5	< 6
Xylenes, Total	-	< 6
VOCs (µg/L)		

BB-16-001A	0.5 Primary BB16001A 4/22/1992
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	25
Ethylbenzene	< 5
Methyl ethyl ketone	< 25
Methylene chloride	< 5
m-Xylene & p-Xylene	< 5
Styrene	< 5
Tetrachloroethene	< 5
Toluene	< 5
VOCs (µg/L)	

RMBS0115	1.0 Primary RMBS0115S01 5/2/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 6.02
Ethylbenzene	< 1.2
Methyl ethyl ketone	< 6.02
Methylene chloride	3.43 J
m-Xylene & p-Xylene	0.58 J
Naphthalene	< 1.2
Styrene	< 1.2
Tetrachloroethene	< 1.2
Toluene	< 1.2
VOCs (µg/L)	

U7BS0029	1.0 Primary U7BS0029S001 5/8/2009
VOCs (mg/kg)	
VOCs (µg/kg)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 5.55
Acetone	< 5.55
Benzene	< 1.11
Ethylbenzene	< 1.11
Methyl ethyl ketone	< 5.55
Methylene chloride	< 5.55
m-Xylene & p-Xylene	< 2.22
Styrene	< 1.11
Tetrachloroethene	< 1.11
Toluene	1.26
VOCs (µg/L)	

U7BS0013	1.0 Primary U7BS0013AS001 11/24/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.73
Ethylbenzene	< 1.15
Methyl ethyl ketone	< 5.73
Methylene chloride	2.5 J
m-Xylene & p-Xylene	0.377 J
Styrene	< 1.15
Tetrachloroethene	0.472 J
Toluene	< 1.15
VOCs (µg/L)	

U7BS0028	1.0 Primary U7BS0028S001 5/8/2009
VOCs (mg/kg)	
VOCs (µg/kg)	
1,1,2-Trichloro-1,2,2-trifluoroethane	< 4.8
Acetone	< 4.8
Benzene	< 0.959
Ethylbenzene	< 0.959
Methyl ethyl ketone	< 4.8
Methylene chloride	< 4.8
m-Xylene & p-Xylene	< 1.92
Styrene	< 0.959
Tetrachloroethene	< 0.959
Toluene	< 0.959
VOCs (µg/L)	

RMBS0114	1.0 Primary RMBS0114S01 5/2/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.29
Ethylbenzene	< 1.06
Methyl ethyl ketone	< 5.29
Methylene chloride	3.93 J
m-Xylene & p-Xylene	0.463 J
Naphthalene	< 1.06
Styrene	0.249 J
Tetrachloroethene	< 1.06
Toluene	< 1.06
VOCs (µg/L)	

RMBS0144	1.0 Primary RMBS0144S001 11/24/2008	1.0 Split RMBS0144S001SP 11/24/2008
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 5.71	< 22
Ethylbenzene	< 1.14	< 6
Methyl ethyl ketone	< 5.71	< 11
Methylene chloride	< 5.71	< 6
m-Xylene & p-Xylene	< 2.28	< 6
Styrene	< 1.14	< 6
Tetrachloroethene	< 1.14	< 6
Toluene	< 1.14	< 6
VOCs (µg/L)		

RMBS0055	1.0 Primary RMBS0055S01 5/1/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.68
Ethylbenzene	< 1.14
Methyl ethyl ketone	< 5.68
Methylene chloride	2.76 J
m-Xylene & p-Xylene	< 2.27
Naphthalene	< 1.14
Styrene	0.25 J
Tetrachloroethene	< 1.14
Toluene	< 1.14
VOCs (µg/L)	

BB-17-004	0.5 Primary BB17004 4/21/1992
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 25
Ethylbenzene	< 5
Methyl ethyl ketone	< 25
Methylene chloride	< 5
m-Xylene & p-Xylene	< 5
Styrene	< 5
Tetrachloroethene	< 5
Toluene	2 J
VOCs (µg/L)	

RMBS0054	1.0 Primary RMBS0054S01 5/7/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.72
Ethylbenzene	< 0.945
Methyl ethyl ketone	< 4.72
Methylene chloride	< 4.72
m-Xylene & p-Xylene	< 1.89
Naphthalene	< 0.945
Styrene	< 0.945
Tetrachloroethene	< 0.945
Toluene	< 0.945
VOCs (µg/L)	

U7SV0011	5.3 Primary U7SV0011D001 11/20/2008	5.3 Primary U7SV0011S001 11/20/2008	8.8 Primary U7SV0011S002 11/20/2008
VOCs (mg/kg)			
VOCs (µg/kg)			
VOCs (µg/L)			
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5	< 0.5	< 0.5
Benzene	< 0.05	< 0.05	< 0.05
Tetrachloroethene	< 0.1	< 0.1	< 0.1
Toluene	< 0.1	< 0.1	< 0.1

U7SV0021	10.3 Primary U7SV00215002 11/20/2008	15.5 Primary U7SV00215003 11/20/2008	5.3 Primary U7SV00215001 11/20/2008
VOCs (mg/kg)			
VOCs (µg/kg)			
VOCs (µg/L)			
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5	< 0.5	< 0.5
Benzene	< 0.05	< 0.05	< 0.05
Tetrachloroethene	< 0.1	< 0.1	< 0.1
Toluene	< 0.1	< 0.1	< 0.1

BB-17-003	0.5 Primary BB17003 4/21/1992
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 25
Ethylbenzene	< 5
Methyl ethyl ketone	< 25
Methylene chloride	< 5
m-Xylene & p-Xylene	< 5
Styrene	< 5
Tetrachloroethene	< 5
Toluene	< 5
VOCs (µg/L)	

U7BS0023	1.0 Primary U7BS0023S001 11/17/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.03
Ethylbenzene	< 1.01
Methyl ethyl ketone	< 5.03
Methylene chloride	< 5.03
m-Xylene & p-Xylene	< 2.01
Styrene	< 1.01
Tetrachloroethene	< 1.01
Toluene	< 1.01
VOCs (µg/L)	

BB-17-002	0.5 Primary BB17002 4/21/1992
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 25
Ethylbenzene	< 5
Methyl ethyl ketone	< 25
Methylene chloride	< 5
m-Xylene & p-Xylene	< 5
Styrene	< 5
Tetrachloroethene	< 5
Toluene	< 5
VOCs (µg/L)	

U7BS0014	1.0 Primary U7BS0014AS001 11/21/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.84
Ethylbenzene	< 1.17
Methyl ethyl ketone	< 5.84
Methylene chloride	< 5.84
m-Xylene & p-Xylene	< 2.34
Styrene	< 1.17
Tetrachloroethene	< 1.17
Toluene	< 1.17
VOCs (µg/L)	

BB-17-001	0.5 Primary BB17001 4/21/1992	0.5 Split BB17001-USEPA 4/21/1992
VOCs (mg/kg)		
VOCs (µg/kg)		
Acetone	< 25	3 J
Ethylbenzene	< 5	< 6
Methyl ethyl ketone	< 25	< 12
Methylene chloride	< 5	7 B
m-Xylene & p-Xylene	< 5	-
Styrene	< 5	< 6
Tetrachloroethene	< 5	< 6
Toluene	< 5	< 6
Xylenes, Total	-	< 6
VOCs (µg/L)		

U7SV0018	10.0 Primary U7SV0018S02 5/7/2008	15.0 Primary U7SV0018S03 5/7/2008	19.5 Primary U7SV0018S04 5/7/2008	5.0 Primary U7SV0018S01 5/7/2008
VOCs (mg/kg)				
VOCs (µg/kg)				
VOCs (µg/L)				
1,1,2-Trichloro-1,2,2-trifluoroethane	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	< 0.1	< 0.1	< 0.1	0.036 J
Tetrachloroethene	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	< 0.1	< 0.1	< 0.1	< 0.1

U7BS0017	1.0 Primary U7BS0017AS001 11/20/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.7
Ethylbenzene	< 1.14
Methyl ethyl ketone	< 5.7
Methylene chloride	< 5.7
m-Xylene & p-Xylene	< 2.28
Styrene	< 1.14
Tetrachloroethene	< 1.14
Toluene	< 1.14
VOCs (µg/L)	

U7BS0015	1.0 Primary U7BS0015AS001 11/21/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.57
Ethylbenzene	< 1.11
Methyl ethyl ketone	< 5.57
Methylene chloride	3.76 J
m-Xylene & p-Xylene	< 2.23
Styrene	< 1.11
Tetrachloroethene	< 1.11
Toluene	< 1.11
VOCs (µg/L)	

U7BS0016	0.8 Primary U7BS0016AS001 11/21/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 5.83
Ethylbenzene	< 1.17
Methyl ethyl ketone	< 5.83
Methylene chloride	< 5.83
m-Xylene & p-Xylene	< 2.33
Styrene	< 1.17
Tetrachloroethene	< 1.17
Toluene	< 1.17
VOCs (µg/L)	

U7BS0025	1.3 Primary U7BS0025S001 11/20/2008
VOC (mg/kg)	
VOC (µg/kg)	
Acetone	< 5.86
Ethylbenzene	< 1.17
Methyl ethyl ketone	< 5.86
Methylene chloride	< 5.86
m-Xylene & p-Xylene	< 2.34
Styrene	< 1.17
Tetrachloroethene	< 1.17
Toluene	< 1.17
VOC (µg/L)	

RMBS0060	0.8 Primary RMBS0060AS001 11/20/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 4.94
Ethylbenzene	< 0.988
Methyl ethyl ketone	< 4.94
Methylene chloride	< 4.94
m-Xylene & p-Xylene	< 1.98
Styrene	< 0.988
Tetrachloroethene	< 0.988
Toluene	< 0.988
VOCs (µg/L)	

RMBS0116	1.0 Primary RMBS0116S01 5/2/2008
VOCs (mg/kg)	
VOCs (µg/kg)	
Acetone	< 6.1
Ethylbenzene	< 1.22
Methyl ethyl ketone	< 6.1
Methylene chloride	2.55 J
m-Xylene & p-Xylene	0.567 J
Naphthalene	< 1.22
Styrene	0.251 J
Tetrachloroethene	< 1.22
Toluene	< 1.22
VOCs (µg/L)	

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

VOC Chemical Data Results
RMHF RFI Site
South RMHF Area

FIGURE C.3-1D

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected SVOCs Chemical Data**
- ▲ **Soil sample location with no detected SVOCs Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for SVOCs Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical | Sample)

Sample Location ID: RMDF5

1.00	Depth in Feet
Primary	Sample Type
RMDF5S001	Unique Sample Identifier
7/1/02005	Date

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

SVOCs	Res RBSL (µg/kg)	Eco RBSL (µg/kg)
1-Methyl naphthalene	24716.0871	210000.0000
2-Methylnaphthalene	230000.0000	210000.0000
Acenaphthene	3400000.0000	2455.5351
Acenaphthylene	3400000.0000	270383.6107
Anthracene	17000000.0000	2384.0085
Benzo(a)anthracene	600.0000	1418.4033
Benzo(a)pyrene	60.0000	5595.0847
Benzo(b)fluoranthene	600.0000	4359.7436
Benzo(ghi)perylene	0.0000	6411.1389
Benzo(k)fluoranthene	600.0000	5762.7470
Butyl benzyl phthalate	377249.0243	339549.0336
Chrysene	6000.0000	2358.9445
Di-n-butyl phthalate	5700000.0000	488.2013
Di-n-octyl phthalate	2300000.0000	13000.0000
Dibenzo(a,h)anthracene	170.0000	5595.0847
Diethyl phthalate	46000000.0000	6940467.6688
Dimethyl phthalate	570000000.0000	4438.1939
Fluoranthene	2300000.0000	38000.0000
Fluorene	2300000.0000	1645.5450
Indeno(1,2,3-cd)pyrene	600.0000	5820.8899
Naphthalene	1146590.7159	210000.0000
Phenanthrene	17000000.0000	1313.8397
Pyrene	1700000.0000	18000.0000
bis(2-Ethylhexyl) phthalate	250000.0000	4926.3953
n-Nitrosodimethylamine	45.0000	20000.0000

Note: (µg/kg) = micrograms per kilogram Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a SVOCs analyte, this indicates the analyte was not analyzed.

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

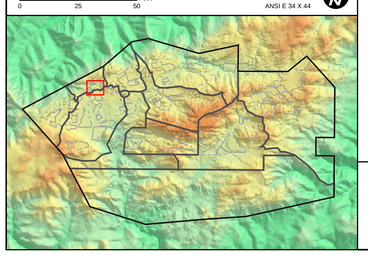
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-SVOC_East.mxd Date: Jun 10, 2009

1 inch = 25 feet
0 25 50 Feet
ANSI E 34 X 44



RMBS0042	1.5 Primary RMBS0042S01 4/21/2008	1.5 Split RMBS0042S01SP 4/21/2008	10.0 Primary RMBS0042AS003 11/14/2008	15.0 Primary RMBS0042AS004 11/14/2008	5.0 Primary RMBS0042AS002 11/14/2008
SVOCs (µg/kg)					
1-Methyl naphthalene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Acenaphthene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Benzo(a)anthracene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Benzo(a)pyrene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Benzo(b)fluoranthene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Benzo(ghi)perylene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Benzo(k)fluoranthene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
bis(2-Ethylhexyl) phthalate	< 18.4	< 360	**26.3**	**21.2**	**24**
Butyl benzyl phthalate	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Chrysene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Dibenzo(a,h)anthracene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Dimethyl phthalate	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Di-n-butyl phthalate	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Di-n-octyl phthalate	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Fluoranthene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Indeno(1,2,3-cd)pyrene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
n-Nitrosodiphenylamine	-	< 360	-	-	-
Phenanthrene	< 18.4	< 360	< 18.2	< 18.3	< 18.3
Pyrene	< 18.4	< 360	< 18.2	< 18.3	< 18.3

RMBS0093	1.0 Primary RMBS0093S01 5/1/2008	1.0 Duplicate RMBS0093D01 5/1/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 19.1	< 17.3
Acenaphthene	< 19.1	< 17.3
Benzo(a)anthracene	< 19.1	< 17.3
Benzo(a)pyrene	< 19.1	< 17.3
Benzo(b)fluoranthene	< 19.1	**6.13 J**
Benzo(ghi)perylene	< 19.1	< 17.3
Benzo(k)fluoranthene	< 19.1	< 17.3
bis(2-Ethylhexyl) phthalate	< 24.8	< 22.3
Butyl benzyl phthalate	< 19.1	< 17.3
Chrysene	< 19.1	**5.58 J**
Dibenzo(a,h)anthracene	< 19.1	< 17.3
Dimethyl phthalate	< 19.1	< 17.3
Di-n-butyl phthalate	< 19.1	< 17.6
Di-n-octyl phthalate	< 19.1	< 17.3
Fluoranthene	< 19.1	**11.6 J**
Indeno(1,2,3-cd)pyrene	< 19.1	< 17.3
Naphthalene	< 19.1	< 17.3
Phenanthrene	< 19.1	< 17.3
Pyrene	< 19.1	**9.84 J**

RMBS0117	1.5 Split RMBS0117S01 4/30/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 19.1
Acenaphthene	< 8.22
Benzo(a)anthracene	< 5.9
Benzo(a)pyrene	< 2.56
Benzo(b)fluoranthene	< 2.54
Benzo(ghi)perylene	< 6.24
Benzo(k)fluoranthene	< 2.68
bis(2-Ethylhexyl) phthalate	< 7.95
Butyl benzyl phthalate	< 4.33
Chrysene	< 4.33
Dibenzo(a,h)anthracene	< 7.95
Dimethyl phthalate	< 15.5
Di-n-butyl phthalate	< 10.1
Di-n-octyl phthalate	< 14.7
Fluoranthene	< 3.18
Indeno(1,2,3-cd)pyrene	< 3.74
Naphthalene	< 8.53
Phenanthrene	< 5.18
Pyrene	< 4.82

RMBS0068	1.0 Primary RMBS0068S01 5/1/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.9
Acenaphthene	< 17.9
Benzo(a)anthracene	**33.8**
Benzo(a)pyrene	**42.8**
Benzo(b)fluoranthene	**89.2**
Benzo(ghi)perylene	**30.6**
Benzo(k)fluoranthene	< 17.9
bis(2-Ethylhexyl) phthalate	< 37.9
Butyl benzyl phthalate	< 17.9
Chrysene	**53.6**
Dibenzo(a,h)anthracene	< 17.9
Dimethyl phthalate	< 17.9
Di-n-butyl phthalate	< 19.8
Di-n-octyl phthalate	< 17.9
Fluoranthene	**89.7**
Indeno(1,2,3-cd)pyrene	**21.1**
Naphthalene	< 17.9
Phenanthrene	**44.1**
Pyrene	**89.5**

RMBS0044	1.0 Primary RMBS0044S01 4/24/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.2
Acenaphthene	< 18.2
Benzo(a)anthracene	< 18.2
Benzo(a)pyrene	< 18.2
Benzo(b)fluoranthene	< 18.2
Benzo(ghi)perylene	< 18.2
Benzo(k)fluoranthene	< 18.2
bis(2-Ethylhexyl) phthalate	< 18.2
Butyl benzyl phthalate	< 18.2
Chrysene	< 18.2
Dibenzo(a,h)anthracene	< 18.2
Dimethyl phthalate	< 18.2
Di-n-butyl phthalate	< 18.2
Di-n-octyl phthalate	< 18.2
Fluoranthene	< 18.2
Indeno(1,2,3-cd)pyrene	< 18.2
Naphthalene	< 18.2
Phenanthrene	< 18.2
Pyrene	< 18.2

RMBS0142	3.5 Primary RMBS0142S001 11/19/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.1
Acenaphthene	< 18.1
Benzo(a)anthracene	< 18.1
Benzo(a)pyrene	< 18.1
Benzo(b)fluoranthene	< 18.1
Benzo(ghi)perylene	< 18.1
Benzo(k)fluoranthene	< 18.1
bis(2-Ethylhexyl) phthalate	< 13.2
Butyl benzyl phthalate	< 18.1
Chrysene	< 18.1
Dibenzo(a,h)anthracene	< 18.1
Dimethyl phthalate	< 18.1
Di-n-butyl phthalate	< 18.1
Di-n-octyl phthalate	< 18.1
Fluoranthene	< 18.1
Indeno(1,2,3-cd)pyrene	< 18.1
Naphthalene	< 18.1
Phenanthrene	< 18.1
Pyrene	< 18.1

RMBS0143	3.0 Primary RMBS0143S001 11/19/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.7
Acenaphthene	< 17.7
Benzo(a)anthracene	< 17.7
Benzo(a)pyrene	< 17.7
Benzo(b)fluoranthene	**14.5 J**
Benzo(ghi)perylene	< 17.7
Benzo(k)fluoranthene	< 17.7
bis(2-Ethylhexyl) phthalate	< 17.7
Butyl benzyl phthalate	< 17.7
Chrysene	< 17.7
Dibenzo(a,h)anthracene	< 17.7
Dimethyl phthalate	< 17.7
Di-n-butyl phthalate	< 17.7
Di-n-octyl phthalate	< 17.7
Fluoranthene	< 17.7
Indeno(1,2,3-cd)pyrene	< 17.7
Naphthalene	< 17.7
Phenanthrene	**8.41 J**
Pyrene	**8.63 J**

RMBS0101	1.5 Primary RMBS0101S01 4/22/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.2
Acenaphthene	< 18.2
Benzo(a)anthracene	< 18.2
Benzo(a)pyrene	< 18.2
Benzo(b)fluoranthene	< 18.2
Benzo(ghi)perylene	< 18.2
Benzo(k)fluoranthene	< 18.2
bis(2-Ethylhexyl) phthalate	< 18.2
Butyl benzyl phthalate	< 18.2
Chrysene	< 18.2
Dibenzo(a,h)anthracene	< 18.2
Dimethyl phthalate	< 18.2
Di-n-butyl phthalate	**6.15 J**
Di-n-octyl phthalate	< 18.2
Fluoranthene	< 18.2
Indeno(1,2,3-cd)pyrene	< 18.2
Naphthalene	< 18.2
Phenanthrene	< 18.2
Pyrene	< 18.2

RMBS0125	1.0 Primary RMBS0125S01 5/1/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17
Acenaphthene	< 17
Benzo(a)anthracene	< 17
Benzo(a)pyrene	< 17
Benzo(b)fluoranthene	< 17
Benzo(ghi)perylene	< 17
Benzo(k)fluoranthene	< 17
bis(2-Ethylhexyl) phthalate	< 32.8
Butyl benzyl phthalate	< 17
Chrysene	< 17
Dibenzo(a,h)anthracene	< 17
Dimethyl phthalate	< 17
Di-n-butyl phthalate	< 25.1
Di-n-octyl phthalate	< 17
Fluoranthene	< 17
Indeno(1,2,3-cd)pyrene	< 17
Naphthalene	< 17
Phenanthrene	< 17
Pyrene	< 17

RMBS0113	1.0 Primary RMBS0113S01 4/24/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18
Acenaphthene	< 18
Benzo(a)anthracene	< 18
Benzo(a)pyrene	< 18
Benzo(b)fluoranthene	< 18
Benzo(ghi)perylene	< 18
Benzo(k)fluoranthene	< 18
bis(2-Ethylhexyl) phthalate	< 18
Butyl benzyl phthalate	< 18
Chrysene	< 18
Dibenzo(a,h)anthracene	< 18
Dimethyl phthalate	< 18
Di-n-butyl phthalate	< 18
Di-n-octyl phthalate	< 18
Fluoranthene	< 18
Indeno(1,2,3-cd)pyrene	< 18
Naphthalene	< 18
Phenanthrene	< 18
Pyrene	< 18

RMBS0118	0.8 Primary RMBS0118S01 4/30/2008	0.8 Split RMBS0118S01 4/30/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 18	< 19.1
Acenaphthene	< 18	< 8.22
Benzo(a)anthracene	< 18	< 5.9
Benzo(a)pyrene	< 18	< 2.56
Benzo(b)fluoranthene	< 18	< 2.54
Benzo(ghi)perylene	< 18	< 6.24
Benzo(k)fluoranthene	< 18	< 2.68
bis(2-Ethylhexyl) phthalate	< 23	< 4.33
Butyl benzyl phthalate	< 18	< 7.95
Chrysene	< 18	< 4.33
Dibenzo(a,h)anthracene	< 18	< 7.95
Dimethyl phthalate	< 18	< 15.5
Di-n-butyl phthalate	**6.15 J**	< 10.1
Di-n-octyl phthalate	< 18	< 14.7
Fluoranthene	< 18	< 3.18
Indeno(1,2,3-cd)pyrene	< 18	< 3.74
Naphthalene	< 18	< 8.53
Phenanthrene	< 18	< 5.18
Pyrene	< 18	< 4.82

RMBS0047	1.0 Primary RMBS0047S01 4/24/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.4
Acenaphthene	< 18.4
Benzo(a)anthracene	< 18.4
Benzo(a)pyrene	< 18.4
Benzo(b)fluoranthene	< 18.4
Benzo(ghi)perylene	< 18.4
Benzo(k)fluoranthene	< 18.4
bis(2-Ethylhexyl) phthalate	< 18.4
Butyl benzyl phthalate	< 18.4
Chrysene	< 18.4
Dibenzo(a,h)anthracene	< 18.4
Dimethyl phthalate	< 18.4
Di-n-butyl phthalate	< 30.5
Di-n-octyl phthalate	< 18.4
Fluoranthene	< 18.4
Indeno(1,2,3-cd)pyrene	< 18.4
Naphthalene	< 18.4
Phenanthrene	< 18.4
Pyrene	< 18.4

RMBS0109	0.8 Primary RMBS0109S01 4/24/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18
Acenaphthene	< 18
Benzo(a)anthracene	< 18
Benzo(a)pyrene	< 18
Benzo(b)fluoranthene	< 18
Benzo(ghi)perylene	< 18
Benzo(k)fluoranthene	< 18
bis(2-Ethylhexyl) phthalate	< 18
Butyl benzyl phthalate	< 18
Chrysene	< 18
Dibenzo(a,h)anthracene	< 18
Dimethyl phthalate	< 18
Di-n-butyl phthalate	< 18
Di-n-octyl phthalate	< 18
Fluoranthene	< 18
Indeno(1,2,3-cd)pyrene	< 18
Naphthalene	< 18
Phenanthrene	< 18
Pyrene	< 18

RMBS0018	1.5 Primary RMBS0018S01 4/25/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.8
Acenaphthene	< 18.8
Benzo(a)anthracene	< 18.8
Benzo(a)pyrene	< 18.8
Benzo(b)fluoranthene	< 18.8
Benzo(ghi)perylene	< 18.8
Benzo(k)fluoranthene	< 18.8
bis(2-Ethylhexyl) phthalate	< 18.8
Butyl benzyl phthalate	< 18.8
Chrysene	< 18.8
Dibenzo(a,h)anthracene	< 18.8
Dimethyl phthalate	< 18.8
Di-n-butyl phthalate	< 18.8
Di-n-octyl phthalate	< 18.8
Fluoranthene	< 18.8
Indeno(1,2,3-cd)pyrene	< 18.8
Naphthalene	< 18.8
Phenanthrene	< 18.8
Pyrene	< 18.8

RMBS0097	1.0 Primary RMBS0097S01 4/29/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.8
Acenaphthene	< 17.8
Benzo(a)anthracene	< 17.8
Benzo(a)pyrene	< 17.8
Benzo(b)fluoranthene	< 17.8
Benzo(ghi)perylene	< 17.8
Benzo(k)fluoranthene	< 17.8
bis(2-Ethylhexyl) phthalate	< 17.8
Butyl benzyl phthalate	< 17.8
Chrysene	< 17.8
Dibenzo(a,h)anthracene	< 17.8
Dimethyl phthalate	< 17.8
Di-n-butyl phthalate	< 17.8
Di-n-octyl phthalate	< 17.8
Fluoranthene	< 17.8
Indeno(1,2,3-cd)pyrene	< 17.8
Naphthalene	< 17.8
Phenanthrene	< 17.8
Pyrene	< 17.8

RMBS0019	1.8 Primary RMBS0019S01 4/25/2008	1.8 Duplicate RMBS0019D01 4/25/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 19.3	< 20.3
Acenaphthene	< 19.3	< 20.3
Benzo(a)anthracene	< 19.3	< 20.3
Benzo(a)pyrene	< 19.3	< 20.3
Benzo(b)fluoranthene	< 19.3	< 20.3
Benzo(ghi)perylene	< 19.3	< 20.3
Benzo(k)fluoranthene	< 19.3	< 25.5
bis(2-Ethylhexyl) phthalate	< 19.3	< 20.3
Butyl benzyl phthalate	< 19.3	< 20.3
Chrysene	< 19.3	< 20.3
Dibenzo(a,h)anthracene	< 19.3	< 20.3
Dimethyl phthalate	< 19.3	< 20.3
Di-n-butyl phthalate	< 19.3	< 20.3
Di-n-octyl phthalate	< 19.3	< 20.3
Fluoranthene	< 19.3	< 20.3
Indeno(1,2,3-cd)pyrene	< 19.3	< 20.3
Naphthalene	< 19.3	< 20.3
Phenanthrene	< 19.3	< 20.3
Pyrene	< 19.3	< 20.3

RMBS0108	1.5 Primary RMBS0108S01 4/22/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.2
Acenaphthene	< 18.2
Benzo(a)anthracene	< 18.2
Benzo(a)pyrene	< 18.2
Benzo(b)fluoranthene	< 18.2
Benzo(ghi)perylene	< 18.2
Benzo(k)fluoranthene	< 18.2
bis(2-Ethylhexyl) phthalate	< 30.6
Butyl benzyl phthalate	< 18.2
Chrysene	< 18.2
Dibenzo(a,h)anthracene	< 18.2
Dimethyl phthalate	< 18.2
Di-n-butyl phthalate	< 18.2
Di-n-octyl phthalate	< 18.2
Fluoranthene	< 18.2
Indeno(1,2,3-cd)pyrene	< 18.2
Naphthalene	< 18.2
Phenanthrene	< 18.2
Pyrene	< 18.2

RMBS0119	1.5 Primary RMBS0119S01 4/30/2008	1.5 Split RMBS0119S01 4/30/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 17.9	< 19.1
Acenaphthene	< 17.9	< 8.22
Benzo(a)anthracene	< 17.9	< 5.9
Benzo(a)pyrene	< 17.9	< 2.56
Benzo(b)fluoranthene	< 17.9	< 2.54
Benzo(ghi)perylene	< 17.9	< 6.24
Benzo(k)fluoranthene	< 17.9	< 2.68
bis(2-Ethylhexyl) phthalate	< 17.9	< 4.33
Butyl benzyl phthalate	< 17.9	< 7.95
Chrysene	< 17.9	< 4.33
Dibenzo(a,h)anthracene	< 17.9	< 7.95
Dimethyl phthalate	< 17.9	< 15.5
Di-n-butyl phthalate	< 17.9	< 10.1
Di-n-octyl phthalate	< 17.9	< 14.7
Fluoranthene	< 17.9	< 3.18
Indeno(1,2,3-cd)pyrene	< 17.9	< 3.74
Naphthalene	< 17.9	< 8.53
Phenanthrene	< 17.9	< 5.18
Pyrene	< 17.9	< 4.82

RMBS0155	1.0 Primary RMBS0155S001 5/8/2009
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.5
2-Methylnaphthalene	< 17.5
Acenaphthene	< 17.5
Anthracene	< 17.5
Benzo(a)anthracene	**14.4 J**
Benzo(a)pyrene	**12.1 J**
Benzo(b)fluoranthene	**38.2**
Benzo(ghi)perylene	**8.31 J**
Benzo(k)fluoranthene	< 17.5
bis(2-Ethylhexyl) phthalate	< 52.8
Butyl benzyl phthalate	**13.5 J**
Chrysene	**24.1**
Dibenzo(a,h)anthracene	< 17.5
Diethyl phthalate	< 17.5
Di-n-butyl phthalate	**27.5**
Di-n-octyl phthalate	< 17.5
Fluoranthene	**38.1**
Fluorene	< 17.5
Indeno(1,2,3-cd)pyrene	**14.2 J**
Naphthalene	< 17.5
n-Nitrosodimethylamine	< 17.5
Phenanthrene	< 17.5
Pyrene	**44.2**

RMBS0139	1.0 Primary RMBS0139S001 11/20/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17
Acenaphthene	**10.4 J**
Benzo(a)anthracene	**70.3**
Benzo(a)pyrene	**71.4**
Benzo(b)fluoranthene	**142**
Benzo(ghi)perylene	**23**
Benzo(k)fluoranthene	< 17
bis(2-Ethylhexyl) phthalate	< 75.5
Butyl benzyl phthalate	< 17
Chrysene	**104**
Dibenzo(a,h)anthracene	< 17
Dimethyl phthalate	< 17
Di-n-butyl phthalate	**17**
Di-n-octyl phthalate	< 17
Fluoranthene	**181**
Indeno(1,2,3-cd)pyrene	**26.2**
Naphthalene	< 17
Phenanthrene	**86.7**
Pyrene	**157**

RMBS0123	1.0 Primary RMBS0123S01 4/25/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.5
Acenaphthene	< 18.5
Benzo(a)anthracene	**10.8 J**
Benzo(a)pyrene	< 18.5
Benzo(b)fluoranthene	**6.43 J**
Benzo(ghi)perylene	< 18.5
Benzo(k)fluoranthene	< 18.5
bis(2-Ethylhexyl) phthalate	< 18.5
Butyl benzyl phthalate	< 18.5
Chrysene	< 18.5
Dibenzo(a,h)anthracene	< 18.5
Dimethyl phthalate	< 18.5
Di-n-butyl phthalate	< 18.5
Di-n-octyl phthalate	**8.7 J**
Fluoranthene	**6.86 J**
Indeno(1,2,3-cd)pyrene	< 18.5
Naphthalene	< 18.5
Phenanthrene	**13.5 J**
Pyrene	**11.9 J**

RMBS0138	1.0 Primary RMBS0138S001 11/17/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.4
Acenaphthene	< 17.4
Benzo(a)anthracene	< 17.4
Benzo(a)pyrene	< 17.4
Benzo(b)fluoranthene	< 17.4
Benzo(ghi)perylene	< 17.4
Benzo(k)fluoranthene	< 17.4
bis(2-Ethylhexyl) phthalate	**6.77 J**
Butyl benzyl phthalate	< 17.4
Chrysene	< 17.4
Dibenzo(a,h)anthracene	< 17.4
Dimethyl phthalate	< 17.4
Di-n-butyl phthalate	< 17.4
Di-n-octyl phthalate	< 17.4
Fluoranthene	< 17.4
Indeno(1,2,3-cd)pyrene	< 17.4
Naphthalene	< 17.4
Phenanthrene	< 17.4
Pyrene	< 17.4

RMBS0030	1.5 Primary RMBS0030S01 4/22/2008	3.5 Primary RMBS0030S02 4/22/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 18.4	< 18.6
Acenaphthene	< 18.4	< 18.6
Benzo(a)anthracene	**11.2 J**	< 18.6
Benzo(a)pyrene	**9.47 J**	< 18.6
Benzo(b)fluoranthene	**18.8 J**	< 18.6
Benzo(ghi)perylene	**6.21 J**	< 18.6
Benzo(k)fluoranthene	< 18.4	< 18.6
bis(2-Ethylhexyl) phthalate	< 18.4	< 18.6
Butyl benzyl phthalate	< 18.4	< 18.6
Chrysene	**11.3 J**	< 18.6
Dibenzo(a,h)anthracene	< 18.4	< 18.6
Dimethyl phthalate	< 18.4	< 18.6
Di-n-butyl phthalate	< 18.4	< 18.6
Di-n-octyl phthalate	< 18.4	< 18.6
Fluoranthene	**22.4 J**	< 18.6
Indeno(1,2,3-cd)pyrene	< 18.4	< 18.6
Naphthalene	< 18.4	< 18.6
Phenanthrene	**9.76 J**	< 18.6
Pyrene	**19.4 J**	< 18.6

RMBS0021	1.5 Primary RMBS0021S01 4/22/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.2
Acenaphthene	< 18.2
Benzo(a)anthracene	< 18.2
Benzo(a)pyrene	< 18.2
Benzo(b)fluoranthene	< 18.2
Benzo(ghi)perylene	< 18.2
Benzo(k)fluoranthene	< 18.2
bis(2-Ethylhexyl) phthalate	< 18.2
Butyl benzyl phthalate	< 18.2
Chrysene	< 18.2
Dibenzo(a,h)anthracene	< 18.2
Dimethyl phthalate	< 18.2
Di-n-butyl phthalate	**6.43 J**
Di-n-octyl phthalate	< 18.2
Fluoranthene	< 18.2
Indeno(1,2,3-cd)pyrene	< 18.2
Naphthalene	< 18.2
Phenanthrene	< 18.2
Pyrene	< 18.2

RMBS0020	1.5 Primary RMBS0020S01 4/22/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18
Acenaphthene	< 18
Benzo(a)anthracene	< 18
Benzo(a)pyrene	< 18
Benzo(b)fluoranthene	< 18
Benzo(ghi)perylene	< 18
Benzo(k)fluoranthene	< 18
bis(2-Ethylhexyl) phthalate	< 18
Butyl benzyl phthalate	< 18
Chrysene	< 18
Dibenzo(a,h)anthracene	< 18
Dimethyl phthalate	< 18
Di-n-butyl phthalate	< 18
Di-n-octyl phthalate	< 18
Fluoranthene	< 18
Indeno(1,2,3-cd)pyrene	< 18
Naphthalene	< 18
Phenanthrene	< 18
Pyrene	< 18

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

SVOC Chemical Data Results
RMHF RFI Site
East RMHF Area

FIGURE C.3-2A

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected SVOCs Chemical Data**
- ▲ **Soil sample location with no detected SVOCs Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for SVOCs Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical | Sample)

Sample Location ID: RMDF5

- 1.00 — Depth in Feet
- Primary — Sample Type
- RMDF5S01 — Unique Sample Identifier
- 7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

SVOCs	Res RBSL (µg/kg)	Eco RBSL (µg/kg)
1-Methyl naphthalene	24716.0871	210000.0000
2-Methylnaphthalene	230000.0000	210000.0000
Acenaphthene	3400000.0000	2455.5351
Acenaphthylene	3400000.0000	270383.6107
Anthracene	17000000.0000	2384.0085
Benzo(a)anthracene	600.0000	1418.4033
Benzo(a)pyrene	60.0000	5595.0847
Benzo(b)fluoranthene	600.0000	4359.7436
Benzo(ghi)perylene	0.0000	6411.1389
Benzo(k)fluoranthene	600.0000	5762.7470
Butyl benzyl phthalate	377249.0243	339549.0336
Chrysene	6000.0000	2358.9445
Di-n-butyl phthalate	57000000.0000	488.2013
Di-n-octyl phthalate	2300000.0000	13000.0000
Dibenzo(a,h)anthracene	170.0000	5595.0847
Diethyl phthalate	46000000.0000	6940467.6688
Dimethyl phthalate	570000000.0000	4438.1939
Fluoranthene	2300000.0000	38000.0000
Fluorene	2300000.0000	1645.5450
Indeno(1,2,3-cd)pyrene	600.0000	5820.8899
Naphthalene	1146590.7159	210000.0000
Phenanthrene	170000000.0000	1313.8397
Pyrene	170000000.0000	18000.0000
bis(2-Ethylhexyl) phthalate	250000.0000	4926.3953
n-Nitrosodimethylamine	45.0000	20000.0000

Note: (µg/kg) = micrograms per kilogram — Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a SVOCs analyte, this indicates the analyte was not analyzed.

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

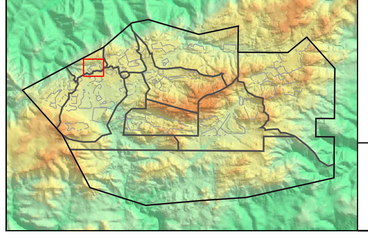
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-SVOC_West.mxd — Date: Jun 10, 2009

1 inch = 30 feet
0 30 60 Feet
ANSI E 34 X 44



RMBS0106	1.5 Primary RMBS0106S01 4/17/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.9
Acenaphthene	< 17.9
Benzo(a)anthracene	< 17.9
Benzo(a)pyrene	< 17.9
Benzo(b)fluoranthene	< 17.9
Benzo(ghi)perylene	< 17.9
Benzo(k)fluoranthene	< 17.9
bis(2-Ethylhexyl) phthalate	< 17.9
Butyl benzyl phthalate	< 17.9
Chrysene	< 17.9
Dibenzo(a,h)anthracene	< 17.9
Dimethyl phthalate	< 17.9
Di-n-butyl phthalate	< 17.9
Di-n-octyl phthalate	< 17.9
Fluoranthene	< 17.9
Fluorene	< 17.9
Indeno(1,2,3-cd)pyrene	< 17.9
Naphthalene	< 17.9
n-Nitrosodimethylamine	< 17.9
Phenanthrene	< 17.9
Pyrene	< 17.9

RMBS0110	2.0 Primary RMBS0110S01 4/17/2008
SVOC (µg/kg)	
1-Methyl naphthalene	< 19.1
2-Methylnaphthalene	< 19.1
Acenaphthene	< 19.1
Anthracene	< 19.1
Benzo(a)anthracene	< 19.1
Benzo(a)pyrene	< 19.1
Benzo(b)fluoranthene	< 19.1
Benzo(ghi)perylene	< 19.1
Benzo(k)fluoranthene	< 19.1
bis(2-Ethylhexyl) phthalate	< 19.1
Butyl benzyl phthalate	< 19.1
Chrysene	< 19.1
Dibenzo(a,h)anthracene	< 19.1
Diethyl phthalate	< 19.1
Di-n-butyl phthalate	< 19.1
Di-n-octyl phthalate	< 19.1
Fluoranthene	< 19.1
Fluorene	< 19.1
Indeno(1,2,3-cd)pyrene	< 19.1
Naphthalene	< 19.1
n-Nitrosodimethylamine	< 19.1
Phenanthrene	< 19.1
Pyrene	< 19.1

RMBS0016	2.0 Primary RMBS0016S01 4/18/2008	2.0 Split RMBS0016S01SP 4/18/2008	3.0 Primary RMBS0016S02 4/18/2008	6.0 Primary RMBS0016S03 4/18/2008
SVOC (µg/kg)				
1-Methyl naphthalene	< 17.9	< 24	< 17.7	< 17.9
2-Methylnaphthalene	< 17.9	< 24	< 17.7	< 17.9
Acenaphthene	< 17.9	< 24	< 17.7	< 17.9
Anthracene	< 17.9	< 24	< 17.7	< 17.9
Benzo(a)anthracene	< 17.9	< 24	< 17.7	< 17.9
Benzo(a)pyrene	< 17.9	< 24	< 17.7	< 17.9
Benzo(b)fluoranthene	< 17.9	**0.27 J**	< 17.7	< 17.9
Benzo(ghi)perylene	< 17.9	**0.33 J**	< 17.7	< 17.9
Benzo(k)fluoranthene	< 17.9	**0.18 J**	< 17.7	< 17.9
bis(2-Ethylhexyl) phthalate	< 17.9	< 24	< 18.5	< 19
Butyl benzyl phthalate	< 17.9	< 24	< 17.7	< 17.9
Chrysene	< 17.9	**0.55 J**	< 17.7	< 17.9
Dibenzo(a,h)anthracene	< 17.9	< 24	< 17.7	< 17.9
Diethyl phthalate	< 17.9	< 24	< 17.7	< 17.9
Di-n-butyl phthalate	**7.17 J**	< 24	**8.3 J**	**6.78 J**
Di-n-octyl phthalate	< 17.9	< 24	< 17.7	< 17.9
Fluoranthene	< 17.9	**0.39 J**	< 17.7	< 17.9
Fluorene	< 17.9	< 24	< 17.7	< 17.9
Indeno(1,2,3-cd)pyrene	< 17.9	< 24	< 17.7	< 17.9
Naphthalene	< 17.9	< 24	< 17.7	< 17.9
n-Nitrosodimethylamine	< 17.9	< 24	< 17.7	< 17.9
Phenanthrene	< 17.9	< 24	< 17.7	< 17.9
Pyrene	< 17.9	**0.33 J**	< 17.7	< 17.9

RMBS0100	2.0 Primary RMBS0100S01 4/17/2008
SVOC (µg/kg)	
1-Methyl naphthalene	< 19.3
2-Methylnaphthalene	< 19.3
Acenaphthene	< 19.3
Anthracene	< 19.3
Benzo(a)anthracene	< 19.3
Benzo(a)pyrene	< 19.3
Benzo(b)fluoranthene	< 19.3
Benzo(ghi)perylene	< 19.3
Benzo(k)fluoranthene	< 19.3
bis(2-Ethylhexyl) phthalate	< 19.3
Butyl benzyl phthalate	< 19.3
Chrysene	< 19.3
Dibenzo(a,h)anthracene	< 19.3
Diethyl phthalate	< 19.3
Di-n-butyl phthalate	< 19.3
Di-n-octyl phthalate	< 19.3
Fluoranthene	< 19.3
Fluorene	< 19.3
Indeno(1,2,3-cd)pyrene	< 19.3
Naphthalene	< 19.3
n-Nitrosodimethylamine	< 19.3
Phenanthrene	< 19.3
Pyrene	< 19.3

RMBS0111	1.5 Primary RMBS0111S01 4/21/2008
SVOC (µg/kg)	
1-Methyl naphthalene	< 17.9
2-Methylnaphthalene	< 17.9
Acenaphthene	< 17.9
Anthracene	< 17.9
Benzo(a)anthracene	< 17.9
Benzo(a)pyrene	< 17.9
Benzo(b)fluoranthene	< 17.9
Benzo(ghi)perylene	< 17.9
Benzo(k)fluoranthene	< 17.9
bis(2-Ethylhexyl) phthalate	< 17.9
Butyl benzyl phthalate	< 17.9
Chrysene	< 17.9
Dibenzo(a,h)anthracene	< 17.9
Diethyl phthalate	< 17.9
Di-n-butyl phthalate	< 17.9
Di-n-octyl phthalate	< 17.9
Fluoranthene	< 17.9
Fluorene	< 17.9
Indeno(1,2,3-cd)pyrene	< 17.9
Naphthalene	< 17.9
n-Nitrosodimethylamine	< 17.9
Phenanthrene	< 17.9
Pyrene	< 17.9

RMBS0120	0.8 Primary RMBS0120S01 4/28/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.1
Acenaphthene	< 18.1
Benzo(a)anthracene	< 18.1
Benzo(a)pyrene	< 18.1
Benzo(b)fluoranthene	< 18.1
Benzo(ghi)perylene	< 18.1
Benzo(k)fluoranthene	< 18.1
bis(2-Ethylhexyl) phthalate	< 18.1
Butyl benzyl phthalate	< 18.1
Chrysene	< 18.1
Dibenzo(a,h)anthracene	< 18.1
Dimethyl phthalate	< 18.1
Di-n-butyl phthalate	< 18.1
Di-n-octyl phthalate	< 18.1
Fluoranthene	< 18.1
Indeno(1,2,3-cd)pyrene	< 18.1
Naphthalene	< 18.1
Phenanthrene	< 18.1
Pyrene	< 18.1

RMBS0096	1.0 Primary RMBS0096S01 4/23/2008	3.0 Primary RMBS0096S02 4/23/2008	3.0 Duplicate RMBS0096D02 4/23/2008
SVOC (µg/kg)			
1-Methyl naphthalene	< 18.2	< 18.2	< 18.3
2-Methylnaphthalene	< 18.2	< 18.2	< 18.3
Acenaphthene	< 18.2	< 18.2	< 18.3
Anthracene	< 18.2	< 18.2	< 18.3
Benzo(a)anthracene	< 18.2	< 18.2	< 18.3
Benzo(a)pyrene	< 18.2	< 18.2	< 18.3
Benzo(b)fluoranthene	< 18.2	< 18.2	< 18.3
Benzo(ghi)perylene	< 18.2	< 18.2	< 18.3
Benzo(k)fluoranthene	< 18.2	< 18.2	< 18.3
bis(2-Ethylhexyl) phthalate	< 18.2	< 18.2	< 18.3
Butyl benzyl phthalate	< 18.2	< 18.2	< 18.3
Chrysene	< 18.2	< 18.2	< 18.3
Dibenzo(a,h)anthracene	< 18.2	< 18.2	< 18.3
Diethyl phthalate	< 18.2	< 18.2	< 18.3
Di-n-butyl phthalate	< 18.2	**6.34 J**	**6.02 J**
Di-n-octyl phthalate	< 18.2	< 18.2	< 18.3
Fluoranthene	< 18.2	< 18.2	< 18.3
Fluorene	< 18.2	< 18.2	< 18.3
Indeno(1,2,3-cd)pyrene	< 18.2	< 18.2	< 18.3
Naphthalene	< 18.2	< 18.2	< 18.3
n-Nitrosodimethylamine	< 18.2	< 18.2	**5.68 J**
Phenanthrene	< 18.2	< 18.2	< 18.3
Pyrene	< 18.2	< 18.2	< 18.3

RMBS0014	2.0 Primary RMBS0014S01 4/18/2008	2.0 Split RMBS0014S01SP 4/18/2008	3.0 Primary RMBS0014S02 4/18/2008	6.0 Primary RMBS0014S03 4/18/2008
SVOC (µg/kg)				
1-Methyl naphthalene	< 18.4	**0.7 J**	< 18.3	< 18.7
2-Methylnaphthalene	< 18.4	**0.8 J**	< 18.3	< 18.7
Acenaphthene	< 18.4	**0.41 J**	< 18.3	< 18.7
Anthracene	< 18.4	**0.5 J**	< 18.3	< 18.7
Benzo(a)anthracene	< 18.4	**5.4 J**	< 18.3	< 18.7
Benzo(a)pyrene	< 18.4	**4 J**	< 18.3	< 18.7
Benzo(b)fluoranthene	< 18.4	**8 J**	< 18.3	< 18.7
Benzo(ghi)perylene	< 18.4	**4.7 J**	< 18.3	< 18.7
Benzo(k)fluoranthene	< 18.4	<	< 18.3	< 18.7
bis(2-Ethylhexyl) phthalate	< 30.2	< 22	< 18.3	< 20.3
Butyl benzyl phthalate	< 18.4	< 22	< 18.3	< 18.7
Chrysene	< 18.4	**19 J**	< 18.3	< 18.7
Dibenzo(a,h)anthracene	< 18.4	< 22	< 18.3	< 18.7
Diethyl phthalate	< 18.4	< 22	< 18.3	< 18.7
Di-n-butyl phthalate	**7.66 J**	< 22	< 18.3	**16.2 J**
Di-n-octyl phthalate	< 18.4	< 22	< 18.3	< 18.7
Fluoranthene	< 18.4	**7 J**	< 18.3	< 18.7
Fluorene	< 18.4	**0.92 J**	< 18.3	< 18.7
Indeno(1,2,3-cd)pyrene	< 18.4	**1.9 J**	< 18.3	< 18.7
Naphthalene	< 18.4	< 22	< 18.3	< 18.7
n-Nitrosodimethylamine	< 18.4	< 22	< 18.3	< 18.7
Phenanthrene	< 18.4	**8.9 J**	< 18.3	< 18.7
Pyrene	< 18.4	**8.2 J**	< 18.3	< 18.7

RMBS0121	1.0 Primary RMBS0121S01 4/28/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.9
Acenaphthene	< 17.9
Anthracene	< 17.9
Benzo(a)anthracene	< 17.9
Benzo(a)pyrene	< 17.9
Benzo(b)fluoranthene	< 17.9
Benzo(ghi)perylene	< 17.9
Benzo(k)fluoranthene	< 17.9
bis(2-Ethylhexyl) phthalate	< 17.9
Butyl benzyl phthalate	< 17.9
Chrysene	< 17.9
Dibenzo(a,h)anthracene	< 17.9
Diethyl phthalate	< 17.9
Di-n-butyl phthalate	< 17.9
Di-n-octyl phthalate	< 17.9
Fluoranthene	< 17.9
Fluorene	< 17.9
Indeno(1,2,3-cd)pyrene	< 17.9
Naphthalene	< 17.9
n-Nitrosodimethylamine	< 17.9
Phenanthrene	< 17.9
Pyrene	< 17.9

RMBS0012	2.0 Primary RMBS0012S01 4/18/2008
SVOC (µg/kg)	
1-Methyl naphthalene	< 17.7
2-Methylnaphthalene	< 17.7
Acenaphthene	< 17.7
Anthracene	< 17.7
Benzo(a)anthracene	< 17.7
Benzo(a)pyrene	< 17.7
Benzo(b)fluoranthene	< 17.7
Benzo(ghi)perylene	< 17.7
Benzo(k)fluoranthene	< 17.7
bis(2-Ethylhexyl) phthalate	< 17.7
Butyl benzyl phthalate	< 17.7
Chrysene	< 17.7
Dibenzo(a,h)anthracene	< 17.7
Diethyl phthalate	< 17.7
Di-n-butyl phthalate	**5.35 J**
Di-n-octyl phthalate	< 17.7
Fluoranthene	< 17.7
Fluorene	< 17.7
Indeno(1,2,3-cd)pyrene	< 17.7
Naphthalene	< 17.7
n-Nitrosodimethylamine	< 17.7
Phenanthrene	< 17.7
Pyrene	< 17.7

RMBS0112	1.5 Primary RMBS0112S01 4/23/2008	10.0 Primary RMBS0112SA003 11/14/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 17.7	< 18.5
Acenaphthene	< 17.7	< 18.5
Benzo(a)anthracene	< 17.7	< 18.5
Benzo(a)pyrene	< 17.7	< 18.5
Benzo(b)fluoranthene	< 17.7	< 18.5
Benzo(ghi)perylene	< 17.7	< 18.5
Benzo(k)fluoranthene	< 17.7	< 18.5
bis(2-Ethylhexyl) phthalate	< 17.7	**22.2**
Butyl benzyl phthalate	< 17.7	< 18.5
Chrysene	< 17.7	< 18.5
Dibenzo(a,h)anthracene	< 17.7	< 18.5
Dimethyl phthalate	< 17.7	< 18.5
Di-n-butyl phthalate	< 17.7	< 18.5
Di-n-octyl phthalate	< 17.7	< 18.5
Fluoranthene	**24**	< 18.5
Indeno(1,2,3-cd)pyrene	< 18.2	< 18.5
Naphthalene	< 18.2	< 18.5
Phenanthrene	**11.2**	< 18.5
Pyrene	**15.1 J**	< 18.5

RMBS0004	1.5 Primary RMBS0004S01 4/18/2008	2.5 Primary RMBS0004S02 4/18/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 18.2	< 18.3
Acenaphthene	< 18.2	< 18.3
Benzo(a)anthracene	< 18.2	< 18.3
Benzo(a)pyrene	< 18.2	< 18.3
Benzo(b)fluoranthene	< 18.2	< 18.3
Benzo(ghi)perylene	< 18.2	< 18.3
Benzo(k)fluoranthene	< 18.2	< 18.3
bis(2-Ethylhexyl) phthalate	< 18.2	< 18.3
Butyl benzyl phthalate	< 18.2	< 18.3
Chrysene	< 18.2	< 18.3
Dibenzo(a,h)anthracene	< 18.2	< 18.3
Dimethyl phthalate	< 18.2	< 18.3
Di-n-butyl phthalate	**6.04 J**	**6.76 J**
Di-n-octyl phthalate	< 18.2	< 18.3
Fluoranthene	**24**	< 18.3
Indeno(1,2,3-cd)pyrene	< 18.2	< 18.3
Naphthalene	< 18.2	< 18.3
Phenanthrene	**11.2**	< 18.3
Pyrene	**15.1 J**	< 18.3

RMBS0094	1.3 Primary RMBS0094BS001 11/17/2008	1.5 Primary RMBS0094S01 4/21/2008	5.0 Primary RMBS0094AS002 11/13/2008	5.0 Primary RMBS0094BS002 11/17/2008
SVOC (µg/kg)				
1-Methyl naphthalene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Acenaphthene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Anthracene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Benzo(a)anthracene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Benzo(a)pyrene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Benzo(b)fluoranthene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Benzo(ghi)perylene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Benzo(k)fluoranthene	< 18.4	[2] < 18.3	< 36.7	< 37.6
bis(2-Ethylhexyl) phthalate	**6.02 J**	[2] < 184	< 183	< 188
Butyl benzyl phthalate	< 18.4	[2] < 18.3	< 367	< 376
Chrysene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Dibenzo(a,h)anthracene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Diethyl phthalate	< 18.4	[2] < 18.3	< 367	< 376
Di-n-butyl phthalate	< 18.4	[2] < 18.3	< 367	< 376
Di-n-octyl phthalate	< 18.4	[2] < 18.3	< 367	< 376
Fluoranthene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Fluorene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Indeno(1,2,3-cd)pyrene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Naphthalene	< 18.4	[2] < 18.3	< 36.7	< 37.6
n-Nitrosodimethylamine	< 18.4	[2] < 18.3	< 367	< 376
Phenanthrene	< 18.4	[2] < 18.3	< 36.7	< 37.6
Pyrene	< 18.4	[2] < 18.3	< 36.7	< 37.6

RMBS0009	2.2 Primary RMBS0009S01 4/18/2008	2.0 Primary RMBS0009S02 4/18/2008
SVOC (µg/kg)		
1-Methyl naphthalene	< 18.2	< 18
2-Methylnaphthalene	< 18.2	< 18
Acenaphthene	< 18.2	< 18
Anthracene	< 18.2	< 18
Benzo(a)anthracene	< 18.2	< 18
Benzo(a)pyrene	< 18.2	< 18
Benzo(b)fluoranthene	< 18.2	< 18
Benzo(ghi)perylene	< 18.2	< 18
Benzo(k)fluoranthene	< 18.2	< 18
bis(2-Ethylhexyl) phthalate	< 19.4	< 18
Butyl benzyl phthalate	< 18.2	< 18
Chrysene	< 18.2	< 18
Dibenzo(a,h)anthracene	< 18.2	< 18
Diethyl phthalate	< 18.2	< 18
Di-n-butyl phthalate	< 18.2	< 18
Di-n-octyl phthalate	< 18.2	< 18
Fluoranthene	< 18.2	< 18
Fluorene	< 18.2	< 18
Indeno(1,2,3-cd)pyrene	< 18.2	< 18
Naphthalene	< 18.2	< 18
n-Nitrosodimethylamine	< 18.2	< 18
Phenanthrene	< 18.2	< 18
Pyrene	< 18.2	< 18

RMBS0007	1.0 Primary RMBS0007S01 4/23/2008
SVOC (µg/kg)	
1-Methyl naphthalene	< 18.2
2-Methylnaphthalene	< 18.2
Acenaphthene	< 18.2
Anthracene	< 18.2
Benzo(a)anthracene	< 18.2
Benzo(a)pyrene	< 18.2
Benzo(b)fluoranthene	**13.5 J**
Benzo(ghi)perylene	< 18.2
Benzo(k)fluoranthene	< 18.2
bis(2-Ethylhexyl) phthalate	< 18.2
Butyl benzyl phthalate	< 18.2
Chrysene	< 18.2
Dibenzo(a,h)anthracene	< 18.2
Diethyl phthalate	< 18.2
Di-n-butyl phthalate	**20.6**
Di-n-octyl phthalate	< 18.2
Fluoranthene	**7.16 J**
Fluorene	< 18.2
Indeno(1,2,3-cd)pyrene	< 18.2
Naphthalene	< 18.2
n-Nitrosodimethylamine	< 18.2
Phenanthrene	**5.84 J**
Pyrene	**7.5 J**

RMBS0010	1.0 Primary RMBS0010AS01 4/30/2008	3.0 Primary RMBS0010S01 4/23/2008
SVOC (µg/kg)		
1-Methyl naphthalene	[2] < 18.2	< 71.6
2-Methylnaphthalene	[2] < 18.2	< 71.6
Acenaphthene	[2] < 18.2	< 71.6
Anthracene	[2] < 18.2	< 71.6
Benzo(a)anthracene	[2] < 18.2	< 71.6
Benzo(a)pyrene	[2] < 18.2	< 71.6
Benzo(b)fluoranthene	[2] < 18.2	**52.2 J**
Benzo(ghi)perylene	[2] < 18.2	< 71.6
Benzo(k)fluoranthene	[2] < 18.2	< 71.6
bis(2-Ethylhexyl) phthalate	[2] < 179	< 71.6
Butyl benzyl phthalate	[2] < 18.2	< 71.6
Chrysene	[2] < 18.2	< 71.6
Dibenzo(a,h)anthracene	[2] < 18.2	< 71.6
Diethyl phthalate	[2] < 18.2	< 71.6
Di-n-butyl phthalate	[2] < 358	< 71.6
Di-n-octyl phthalate	[2] < 18.2	< 71.6
Fluoranthene	[2] < 18.2	< 71.6
Fluorene	[2] < 18.2	< 71.6
Indeno(1,2,3-cd)pyrene	[2] < 18.2	< 71.6
Naphthalene	[2] < 18.2	< 71.6
n-Nitrosodimethylamine	[2] < 18.2	< 71.6
Phenanthrene	[2] < 18.2	< 71.6
Pyrene	[2] < 18.2	< 71.6

RMBS0008	1.3 Primary RMBS0008S01 4/23/2008	1.3 Duplicate RMBS0008D01 4/23/2008
SVOC (µg/kg)		
1-Methyl naphthalene	< 17.9	< 17.6
2-Methylnaphthalene	< 17.9	< 17.6
Acenaphthene	< 17.9	< 17.6
Anthracene	< 17.9	< 17.6
Benzo(a)anthracene	< 17.9	< 17.6
Benzo(a)pyrene	< 17.9	< 17.6
Benzo(b)fluoranthene	< 17.9	< 17.6
Benzo(ghi)perylene	< 17.9	< 17.6
Benzo(k)fluoranthene	< 17.9	< 17.6
bis(2-Ethylhexyl) phthalate	< 17.9	< 17.6
Butyl benzyl phthalate	< 17.9	< 17.6
Chrysene	< 17.9	< 17.6
Dibenzo(a,h)anthracene	< 17.9	< 17.6
Diethyl phthalate	< 17.9	< 17.6
Di-n-butyl phthalate	< 17.9	< 17.6
Di-n-octyl phthalate	< 17.9	< 17.6
Fluoranthene	< 17.9	< 17.6
Fluorene	< 17.9	< 17.6
Indeno(1,2,3-cd)pyrene	< 17.9	< 17.6
Naphthalene	< 17.9	< 17.6
n-Nitrosodimethylamine	< 17.9	< 17.6
Phenanthrene	< 17.9	< 17.6
Pyrene	< 17.9	< 17.6

RMBS0001	1.0 Primary RMBS0001S01 4/29/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.5
Acenaphthene	< 17.5
Benzo(a)anthracene	< 17.5
Benzo(a)pyrene	< 17.5
Benzo(b)fluoranthene	< 17.5
Benzo(ghi)perylene	< 17.5
bis(2-Ethylhexyl) phthalate	< 17.5
Butyl benzyl phthalate	< 17.5
Chrysene	< 17.5
Dibenzo(a,h)anthracene	< 17.5
Dimethyl phthalate	< 17.5
Di-n-butyl phthalate	**5.74 J**
Di-n-octyl phthalate	< 17.5
Fluoranthene	< 17.5
Indeno(1,2,3-cd)pyrene	< 17.5
Naphthalene	< 17.5
Phenanthrene	< 17.5
Pyrene	< 17.5

RMBS0002	1.0 Primary RMBS0002S01 4/29/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.4
Acenaphthene	< 17.4
Benzo(a)anthracene	< 17.4
Benzo(a)pyrene	**13.4 J**
Benzo(b)fluoranthene	**19.8**
Benzo(ghi)perylene	< 17.4
Benzo(k)fluoranthene	< 17.4
bis(2-Ethylhexyl) phthalate	< 17.4
Butyl benzyl phthalate	< 17.4
Chrysene	**12.4 J**
Dibenzo(a,h)anthracene	< 17.4
Dimethyl phthalate	< 17.4
Di-n-butyl phthalate	**6.26 J**
Di-n-octyl phthalate	< 17.4
Fluoranthene	**15.6 J**
Fluorene	< 17.4
Indeno(1,2,3-cd)pyrene	< 17.4
Naphthalene	< 17.4
n-Nitrosodimethylamine	< 17.4
Phenanthrene	< 17.4
Pyrene	**15.6 J**

RMBS0011	1.3 Primary RMBS0011S01 4/29/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.3
Acenaphthene	< 17.3
Benzo(a)anthracene	< 17.3
Benzo(a)pyrene	< 17.3
Benzo(b)fluoranthene	< 17.3
Benzo(ghi)perylene	< 17.3
Benzo(k)fluoranthene	< 17.3
bis(2-Ethylhexyl) phthalate	< 19.6
Butyl benzyl phthalate	< 17.3
Chrysene	< 17.3
Dibenzo(a,h)anthracene	< 17.3
Dimethyl phthalate	< 17.3
Di-n-butyl phthalate	< 17.3
Di-n-octyl phthalate	< 17.3
Fluoranthene	< 17.3
Indeno(1,2,3-cd)pyrene	< 17.3
Naphthalene	< 17.3
Phenanthrene	< 17.3
Pyrene	< 17.3

RMBS0003	6.5 Primary RMBS0003S01 4/16/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 16.8
Acenaphthene	< 16.8
Benzo(a)anthracene	< 16.8
Benzo(a)pyrene	< 16.8
Benzo(b)fluoranthene	< 16.8
Benzo(ghi)perylene	< 16.8
Benzo(k)fluoranthene	< 16.8
bis(2-Ethylhexyl) phthalate	< 83.7
Butyl benzyl phthalate	**13.6 J**
Chrysene	< 16.8
Dibenzo(a,h)anthracene	< 16.8
Dimethyl phthalate	< 16.8
Di-n-butyl phthalate	< 16.8
Di-n-octyl phthalate	< 16.8
Fluoranthene	< 16.8
Indeno(1,2,3-cd)pyrene	< 16.8
Naphthalene	< 16.8
Phenanthrene	< 16.8
Pyrene	< 16.8

RMBS0017	2.0 Primary RMBS0017S01 4/18/2008
SVOC (µg/kg)	
1-Methyl naphthalene	< 17.4
2-Methylnaphthalene	< 17.4
Acenaphthene	< 17.4
Anthracene	< 17.4
Benzo(a)anthracene	< 17.4
Benzo(a)pyrene	< 17.4
Benzo(b)fluoranthene	< 17.4
Benzo(ghi)perylene	< 17.4
Benzo(k)fluoranthene	< 17.4
bis(2-Ethylhexyl) phthalate	< 17.4
Butyl benzyl phthalate	< 17.4
Chrysene	< 17.4
Dibenzo(a,h)anthracene	< 17.4
Diethyl phthalate	< 17.4
Di-n-butyl phthalate	**7.45 J**
Di-n-octyl phthalate	< 17.4
Fluoranthene	< 17.4
Fluorene	< 17.4
Indeno(1,2,3-cd)pyrene	< 16.4
Naphthalene	< 46.9
n-Nitrosodimethylamine	< 17.4
Phenanthrene	**42.2**
Pyrene	**46.1**

RMBS0151	1.0 Primary RMBS0151S01 5/8/2009
SVOCs (µg/kg)	
1-Methy

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected SVOCs Chemical Data**
- ▲ **Soil sample location with no detected SVOCs Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for SVOCs Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical | Sample)

Sample Location ID: **RMDF5**

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

SVOCs	Res RBSL (µg/kg)	Eco RBSL (µg/kg)
1-Methyl naphthalene	24716.0871	210000.0000
2-Methylnaphthalene	230000.0000	210000.0000
Acenaphthene	3400000.0000	2455.5351
Acenaphthylene	3400000.0000	270383.6107
Anthracene	17000000.0000	2384.0085
Benzo(a)anthracene	600.0000	1418.4033
Benzo(a)pyrene	60.0000	5595.0847
Benzo(b)fluoranthene	600.0000	4359.7436
Benzo(ghi)perylene	0.0000	6411.1389
Benzo(k)fluoranthene	600.0000	5762.7470
Butyl benzyl phthalate	377249.0243	339549.0336
Chrysene	6000.0000	2358.9445
Di-n-butyl phthalate	57000000.0000	488.2013
Di-n-octyl phthalate	2300000.0000	13000.0000
Dibenzo(a,h)anthracene	170.0000	5595.0847
Diethyl phthalate	460000000.0000	6940467.6688
Dimethyl phthalate	570000000.0000	4438.1939
Fluoranthene	2300000.0000	38000.0000
Fluorene	2300000.0000	1645.5450
Indeno(1,2,3-cd)pyrene	600.0000	5820.8899
Naphthalene	1146590.7159	210000.0000
Phenanthrene	170000000.0000	1313.8397
Pyrene	170000000.0000	18000.0000
bis(2-Ethylhexyl) phthalate	250000.0000	4926.3953
n-Nitrosodimethylamine	45.0000	20000.0000

Note: (µg/kg) = micrograms per kilogram

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a SVOCs analyte, this indicates the analyte was not analyzed.

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

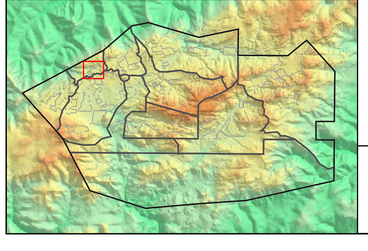
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

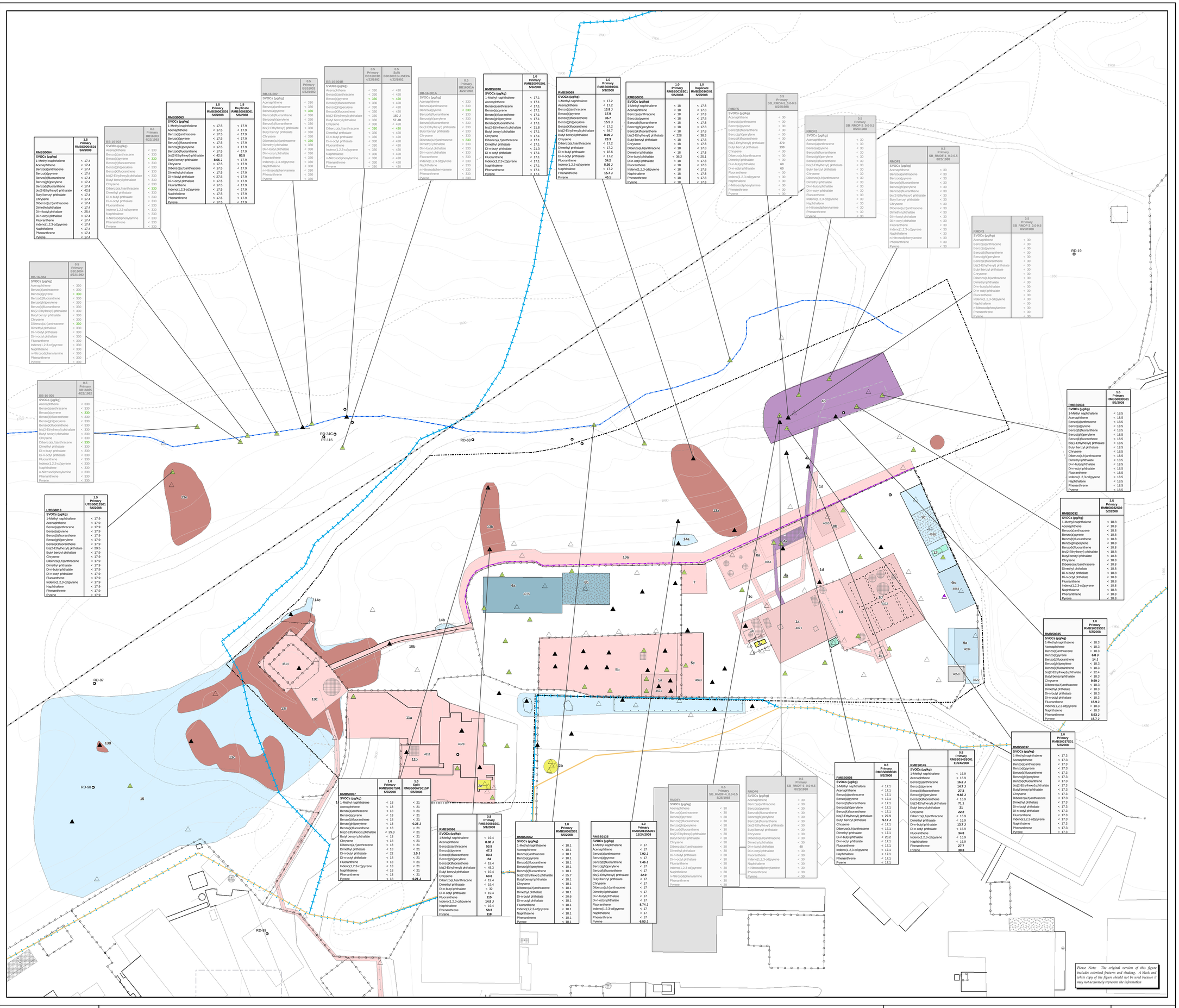
Chemical Use Area

- Multiple Use
- Solvents
- Petroleum
- Oils / PCBs
- Metals / Inorganics
- Perchlorate / Energetics
- Hydrazine
- Debris
- Leach Field
- Potential

Document: RFI-Report-Group7-Boxplot-RMHF-SVOC_North.mxd — Date: Jun 11, 2009

1 inch = 30 feet
0 30 60 Feet
ANSI E 34 X 44





RMB50064	1.5 Primary RMB50064S01 5/6/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.4
Acenaphthene	< 17.4
Benzo(a)anthracene	< 17.4
Benzo(a)pyrene	< 17.4
Benzo(b)fluoranthene	< 17.4
Benzo(ghi)perylene	< 17.4
Benzo(k)fluoranthene	< 17.4
bis(2-Ethylhexyl) phthalate	< 42.8
Butyl benzyl phthalate	< 17.4
Chrysene	< 17.4
Dibenzo(a,h)anthracene	< 17.4
Dimethyl phthalate	< 17.4
Di-n-butyl phthalate	< 25.4
Di-n-octyl phthalate	< 17.4
Fluoranthene	< 17.4
Indeno(1,2,3-cd)pyrene	< 17.4
Naphthalene	< 17.4
Phenanthrene	< 17.4
Pyrene	< 17.4

BB-16-003	0.5 Primary BB16003 4/22/1992
SVOCs (µg/kg)	
Acenaphthene	< 330
Benzo(a)anthracene	< 330
Benzo(a)pyrene	< 330
Benzo(b)fluoranthene	< 330
Benzo(ghi)perylene	< 330
Benzo(k)fluoranthene	< 330
bis(2-Ethylhexyl) phthalate	< 330
Butyl benzyl phthalate	< 330
Chrysene	< 330
Dibenzo(a,h)anthracene	< 330
Dimethyl phthalate	< 330
Di-n-butyl phthalate	< 330
Di-n-octyl phthalate	< 330
Fluoranthene	< 330
Indeno(1,2,3-cd)pyrene	< 330
Naphthalene	< 330
n-Nitrosodiphenylamine	< 330
Phenanthrene	< 330
Pyrene	< 330

RMB50063	1.5 Primary RMB50063S01 5/6/2008	1.5 Duplicate RMB50063D01 5/6/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 17.5	< 17.9
Acenaphthene	< 17.5	< 17.9
Benzo(a)anthracene	< 17.5	< 17.9
Benzo(a)pyrene	< 17.5	< 17.9
Benzo(b)fluoranthene	< 17.5	< 17.9
Benzo(ghi)perylene	< 17.5	< 17.9
Benzo(k)fluoranthene	< 17.5	< 17.9
bis(2-Ethylhexyl) phthalate	< 42.8	**83.5**
Butyl benzyl phthalate	**8.66 J**	< 17.9
Chrysene	< 17.5	< 17.9
Dibenzo(a,h)anthracene	< 17.5	< 17.9
Dimethyl phthalate	< 17.5	< 17.9
Di-n-butyl phthalate	< 27.5	< 17.9
Di-n-octyl phthalate	< 17.5	< 17.9
Fluoranthene	< 17.5	< 17.9
Indeno(1,2,3-cd)pyrene	< 17.5	< 17.9
Naphthalene	< 17.5	< 17.9
Pyrene	< 17.5	< 17.9

BB-16-002	0.5 Primary BB16002 4/22/1992
SVOCs (µg/kg)	
Acenaphthene	< 330
Benzo(a)anthracene	< 330
Benzo(a)pyrene	< **330**
Benzo(b)fluoranthene	< 330
Benzo(ghi)perylene	< 330
Benzo(k)fluoranthene	< 330
bis(2-Ethylhexyl) phthalate	< 330
Butyl benzyl phthalate	< 330
Chrysene	< 330
Dibenzo(a,h)anthracene	< **330**
Dimethyl phthalate	< 330
Di-n-butyl phthalate	< 330
Di-n-octyl phthalate	< 330
Fluoranthene	< 330
Indeno(1,2,3-cd)pyrene	< 330
Naphthalene	< 330
n-Nitrosodiphenylamine	< 330
Phenanthrene	< 330
Pyrene	< 330

BB-16-001B	0.5 Primary BB160018 4/22/1992	0.5 Split BB16001B-USEPA 4/22/1992
SVOCs (µg/kg)		
Acenaphthene	< 330	< 420
Benzo(a)anthracene	< 330	< 420
Benzo(a)pyrene	< **330**	< **420**
Benzo(b)fluoranthene	< 330	< 420
Benzo(ghi)perylene	< 330	< 420
Benzo(k)fluoranthene	< 330	< 420
bis(2-Ethylhexyl) phthalate	< 330	**150 J**
Butyl benzyl phthalate	< 330	**57 JB**
Chrysene	< 330	< 420
Dibenzo(a,h)anthracene	< **330**	< **420**
Dimethyl phthalate	< 330	< 420
Di-n-butyl phthalate	< 330	< 420
Di-n-octyl phthalate	< 330	< 420
Fluoranthene	< 330	< 420
Indeno(1,2,3-cd)pyrene	< 330	< 420
Naphthalene	< 330	< 420
n-Nitrosodiphenylamine	< 330	< 420
Phenanthrene	< 330	< 420
Pyrene	< 330	< 420

BB-16-001A	0.5 Primary BB16001A 4/22/1992
SVOCs (µg/kg)	
Acenaphthene	< 330
Benzo(a)anthracene	< 330
Benzo(a)pyrene	< **330**
Benzo(b)fluoranthene	< 330
Benzo(ghi)perylene	< 330
Benzo(k)fluoranthene	< 330
bis(2-Ethylhexyl) phthalate	< 330
Butyl benzyl phthalate	< 330
Chrysene	< 330
Dibenzo(a,h)anthracene	< 330
Dimethyl phthalate	< 330
Di-n-butyl phthalate	< 330
Di-n-octyl phthalate	< 330
Fluoranthene	< 330
Indeno(1,2,3-cd)pyrene	< 330
Naphthalene	< 330
n-Nitrosodiphenylamine	< 330
Phenanthrene	< 330
Pyrene	< 330

RMB50070	1.0 Primary RMB50070S01 5/5/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.1
Acenaphthene	< 17.1
Benzo(a)anthracene	< 17.1
Benzo(a)pyrene	< 17.1
Benzo(b)fluoranthene	< 17.1
Benzo(ghi)perylene	< 17.1
Benzo(k)fluoranthene	< 17.1
bis(2-Ethylhexyl) phthalate	< 31.8
Butyl benzyl phthalate	< 17.1
Chrysene	< 17.1
Dibenzo(a,h)anthracene	< 17.1
Dimethyl phthalate	< 17.1
Di-n-butyl phthalate	< 21.3
Di-n-octyl phthalate	< 17.1
Fluoranthene	< 17.1
Indeno(1,2,3-cd)pyrene	< 17.1
Naphthalene	< 17.1
Phenanthrene	< 17.1
Pyrene	< 17.1

RMB50069	1.0 Primary RMB50069S01 5/5/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.2
Acenaphthene	< 17.2
Benzo(a)anthracene	**13.8 J**
Benzo(a)pyrene	**17.9**
Benzo(b)fluoranthene	**35.7**
Benzo(ghi)perylene	**15.5 J**
Benzo(k)fluoranthene	< 17.2
bis(2-Ethylhexyl) phthalate	< 54.7
Butyl benzyl phthalate	**8.09 J**
Chrysene	**23.3**
Dibenzo(a,h)anthracene	< 17.2
Dimethyl phthalate	< 17.2
Di-n-butyl phthalate	< 18.6
Di-n-octyl phthalate	< 17.2
Fluoranthene	**34.2**
Indeno(1,2,3-cd)pyrene	**5.36 J**
Naphthalene	< 17.2
Phenanthrene	**15.7 J**
Pyrene	**40.1**

RMB50036	1.0 Primary RMB50036S01 5/5/2008	1.0 Duplicate RMB50036D01 5/5/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 18	< 17.8
Acenaphthene	< 18	< 17.8
Benzo(a)anthracene	< 18	< 17.8
Benzo(a)pyrene	< 18	< 17.8
Benzo(b)fluoranthene	< 18	< 17.8
Benzo(ghi)perylene	< 18	< 17.8
Benzo(k)fluoranthene	< 18	< 17.8
bis(2-Ethylhexyl) phthalate	< 18	< 17.8
Butyl benzyl phthalate	< 228	< 38.3
Chrysene	< 18	< 17.8
Dibenzo(a,h)anthracene	< 18	< 17.8
Dimethyl phthalate	< 18	< 17.8
Di-n-butyl phthalate	< 36.2	< 25.1
Di-n-octyl phthalate	< 18	< 17.8
Fluoranthene	< 18	< 17.8
Indeno(1,2,3-cd)pyrene	< 18	< 17.8
Naphthalene	< 18	< 17.8
Phenanthrene	< 18	< 17.8
Pyrene	< 18	< 17.8

RMDF5	0.5 Primary SB_RMDF-5_0.0-0.5 8/25/1988
SVOCs (µg/kg)	
Acenaphthene	< 30
Benzo(a)anthracene	< 30
Benzo(a)pyrene	< 30
Benzo(b)fluoranthene	< 30
Benzo(ghi)perylene	< 30
Benzo(k)fluoranthene	< 30
bis(2-Ethylhexyl) phthalate	270
Butyl benzyl phthalate	130
Chrysene	< 30
Dibenzo(a,h)anthracene	< 30
Dimethyl phthalate	< 30
Di-n-butyl phthalate	60
Di-n-octyl phthalate	60
Fluoranthene	< 30
Indeno(1,2,3-cd)pyrene	< 30
Naphthalene	< 30
n-Nitrosodiphenylamine	< 30
Phenanthrene	< 30
Pyrene	< 30

RMDF2	0.5 Primary SB_RMDF-2_0.0-0.5 8/25/1988
SVOCs (µg/kg)	
Acenaphthene	< 30
Benzo(a)anthracene	< 30
Benzo(a)pyrene	< 30
Benzo(b)fluoranthene	< 30
Benzo(ghi)perylene	< 30
Benzo(k)fluoranthene	< 30
bis(2-Ethylhexyl) phthalate	< 30
Butyl benzyl phthalate	< 30
Chrysene	< 30
Dibenzo(a,h)anthracene	< 30
Dimethyl phthalate	< 30
Di-n-butyl phthalate	< 30
Di-n-octyl phthalate	< 30
Fluoranthene	< 30
Indeno(1,2,3-cd)pyrene	< 30
Naphthalene	< 30
n-Nitrosodiphenylamine	< 30
Phenanthrene	< 30
Pyrene	< 30

RMDF1	0.5 Primary SB_RMDF-1_0.0-0.5 8/25/1988
SVOCs (µg/kg)	
Acenaphthene	< 30
Benzo(a)anthracene	< 30
Benzo(a)pyrene	< 30
Benzo(b)fluoranthene	< 30
Benzo(ghi)perylene	< 30
Benzo(k)fluoranthene	< 30
bis(2-Ethylhexyl) phthalate	< 30
Butyl benzyl phthalate	< 30
Chrysene	< 30
Dibenzo(a,h)anthracene	< 30
Dimethyl phthalate	< 30
Di-n-butyl phthalate	< 30
Di-n-octyl phthalate	< 30
Fluoranthene	< 30
Indeno(1,2,3-cd)pyrene	< 30
Naphthalene	< 30
n-Nitrosodiphenylamine	< 30
Phenanthrene	< 30
Pyrene	< 30

RMDF3	0.5 Primary SB_RMDF-3_0.0-0.5 8/25/1988
SVOCs (µg/kg)	
Acenaphthene	< 30
Benzo(a)anthracene	< 30
Benzo(a)pyrene	< 30
Benzo(b)fluoranthene	< 30
Benzo(ghi)perylene	< 30
Benzo(k)fluoranthene	< 30
bis(2-Ethylhexyl) phthalate	< 30
Butyl benzyl phthalate	< 30
Chrysene	< 30
Dibenzo(a,h)anthracene	< 30
Dimethyl phthalate	< 30
Di-n-butyl phthalate	< 30
Di-n-octyl phthalate	< 30
Fluoranthene	< 30
Indeno(1,2,3-cd)pyrene	< 30
Naphthalene	< 30
n-Nitrosodiphenylamine	< 30
Phenanthrene	< 30
Pyrene	< 30

RMB50033	1.5 Primary RMB50033S01 5/1/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.5
Acenaphthene	< 18.5
Benzo(a)anthracene	< 18.5
Benzo(a)pyrene	< 18.5
Benzo(b)fluoranthene	< 18.5
Benzo(ghi)perylene	< 18.5
Benzo(k)fluoranthene	< 18.5
bis(2-Ethylhexyl) phthalate	< 18.5
Butyl benzyl phthalate	< 18.5
Chrysene	< 18.5
Dibenzo(a,h)anthracene	< 18.5
Dimethyl phthalate	< 18.5
Di-n-butyl phthalate	< 18.5
Di-n-octyl phthalate	< 18.5
Fluoranthene	< 18.5
Indeno(1,2,3-cd)pyrene	< 18.5
Naphthalene	< 18.5
Pyrene	< 18.5

RMB50032	3.5 Primary RMB50032S02 5/2/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.8
Acenaphthene	< 18.8
Benzo(a)anthracene	< 18.8
Benzo(a)pyrene	< 18.8
Benzo(b)fluoranthene	< 18.8
Benzo(ghi)perylene	< 18.8
Benzo(k)fluoranthene	< 18.8
bis(2-Ethylhexyl) phthalate	< 18.8
Butyl benzyl phthalate	< 18.8
Chrysene	< 18.8
Dibenzo(a,h)anthracene	< 18.8
Dimethyl phthalate	< 18.8
Di-n-butyl phthalate	< 18.8
Di-n-octyl phthalate	< 18.8
Fluoranthene	< 18.8
Indeno(1,2,3-cd)pyrene	< 18.8
Naphthalene	< 18.8
Phenanthrene	< 18.8
Pyrene	< 18.8

RMB50035	1.0 Primary RMB50035S01 5/2/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.3
Acenaphthene	< 18.3
Benzo(a)anthracene	< 18.3
Benzo(a)pyrene	**6.8 J**
Benzo(b)fluoranthene	**14 J**
Benzo(ghi)perylene	< 18.3
Benzo(k)fluoranthene	< 18.3
bis(2-Ethylhexyl) phthalate	< 22.4
Butyl benzyl phthalate	< 18.3
Chrysene	**9.99 J**
Dibenzo(a,h)anthracene	< 18.3
Dimethyl phthalate	< 18.3
Di-n-butyl phthalate	< 18.3
Di-n-octyl phthalate	< 18.3
Fluoranthene	**15.9 J**
Indeno(1,2,3-cd)pyrene	< 18.3
Naphthalene	< 18.3
Phenanthrene	**5.93 J**
Pyrene	**15.7 J**

RMB50037	1.0 Primary RMB50037S01 5/2/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.3
Acenaphthene	< 17.3
Benzo(a)anthracene	< 17.3
Benzo(a)pyrene	< 17.3
Benzo(b)fluoranthene	< 17.3
Benzo(ghi)perylene	< 17.3
Benzo(k)fluoranthene	< 17.3
bis(2-Ethylhexyl) phthalate	< 17.3
Butyl benzyl phthalate	< 17.3
Chrysene	**9.66 J**
Dibenzo(a,h)anthracene	< 16.9
Dimethyl phthalate	< 17.3
Di-n-butyl phthalate	< 17.3
Di-n-octyl phthalate	< 17.3
Fluoranthene	< 17.3
Indeno(1,2,3-cd)pyrene	< 17.3
Naphthalene	< 17.3
Phenanthrene	< 17.3
Pyrene	< 17.3

RMB50145	0.8 Primary RMB50145S001 11/24/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 16.9
Acenaphthene	< 16.9
Benzo(a)anthracene	**16.2 J**
Benzo(a)pyrene	**14.7 J**
Benzo(b)fluoranthene	**27.3**
Benzo(ghi)perylene	**9.66 J**
Benzo(k)fluoranthene	< 16.9
bis(2-Ethylhexyl) phthalate	**71.1**
Butyl benzyl phthalate	**21**
Chrysene	**22.2**
Dibenzo(a,h)anthracene	< 16.9
Dimethyl phthalate	< 16.9
Di-n-butyl phthalate	**13.7 J**
Di-n-octyl phthalate	< 16.9
Fluoranthene	**34.8**
Indeno(1,2,3-cd)pyrene	< 16.9
Naphthalene	< 16.9
Phenanthrene	**27.7**
Pyrene	**30.3**

RMB50098	0.8 Primary RMB50098S01 5/2/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.1
Acenaphthene	< 17.1
Benzo(a)anthracene	< 17.1
Benzo(a)pyrene	< 17.1
Benzo(b)fluoranthene	< 17.1
Benzo(ghi)perylene	< 17.1
Benzo(k)fluoranthene	< 17.1
bis(2-Ethylhexyl) phthalate	< 27.9
Butyl benzyl phthalate	**5.17 J**
Chrysene	< 17.1
Dibenzo(a,h)anthracene	< 17.1
Dimethyl phthalate	< 17.1
Di-n-butyl phthalate	< 20.2
Di-n-octyl phthalate	< 17.1
Fluoranthene	< 17.1
Indeno(1,2,3-cd)pyrene	< 17.1
Naphthalene	< 17.1
Phenanthrene	< 17.1
Pyrene	< 17.1

RMDF4	0.5 Primary SB_RMDF-4_0.0-0.5 8/25/1988
SVOCs (µg/kg)	
Acenaphthene	< 30
Benzo(a)anthracene	< 30
Benzo(a)pyrene	< 30
Benzo(b)fluoranthene	< 30
Benzo(ghi)perylene	< 30
Benzo(k)fluoranthene	< 30
bis(2-Ethylhexyl) phthalate	< 30
Butyl benzyl phthalate	< 30
Chrysene	< 30
Dibenzo(a,h)anthracene	< 30
Dimethyl phthalate	< 30
Di-n-butyl phthalate	< 30
Di-n-octyl phthalate	< 30
Fluoranthene	< 30
Indeno(1,2,3-cd)pyrene	< 30
Naphthalene	< 30
n-Nitrosodiphenylamine	< 30
Phenanthrene	< 30
Pyrene	< 30

RMDF6	0.5 Primary SB_RMDF-6_0.0-0.5 8/25/1988
SVOCs (µg/kg)	
Acenaphthene	< 30
Benzo(a)anthracene	< 30
Benzo(a)pyrene	< 30
Benzo(b)fluoranthene	< 30
Benzo(ghi)perylene	< 30
Benzo(k)fluoranthene	< 30
bis(2-Ethylhexyl) phthalate	< 30
Butyl benzyl phthalate	< 30
Chrysene	< 30
Dibenzo(a,h)anthracene	< 30
Dimethyl phthalate	< 30
Di-n-butyl phthalate	40
Di-n-octyl phthalate	< 30
Fluoranthene	< 30
Indeno(1,2,3-cd)pyrene	< 30
Naphthalene	< 30
n-Nitrosodiphenylamine	< 30
Phenanthrene	< 30
Pyrene	< 30

BB-16-004	0.5 Primary BB16004 4/22/1992
SVOCs (µg/kg)	
Acenaphthene	< 330
Benzo(a)anthracene	< 330
Benzo(a)pyrene	< **330**
Benzo(b)fluoranthene	< 330
Benzo(ghi)perylene	< 330
Benzo(k)fluoranthene	< 330
bis(2-Ethylhexyl) phthalate	< 330
Butyl benzyl phthalate	< 330
Chrysene	< 330
Dibenzo(a,h)anthracene	< **330**
Dimethyl phthalate	< 330
Di-n-butyl phthalate	< 330
Di-n-octyl phthalate	< 330
Fluoranthene	< 330
Indeno(1,2,3-cd)pyrene	< 330
Naphthalene	< 330
n-Nitrosodiphenylamine	< 330
Phenanthrene	< 330
Pyrene	< 330

BB-16-005	0.5 Primary BB16005 4/22/1992
SVOCs (µg/kg)	
Acenaphthene	< 330
Benzo(a)anthracene	< 330
Benzo(a)pyrene	< **330**
Benzo(b)fluoranthene	< 330
Benzo(ghi)perylene	< 330
Benzo(k)fluoranthene	< 330
bis(2-Ethylhexyl) phthalate	< 330
Butyl benzyl phthalate	< 330
Chrysene	< 330
Dibenzo(a,h)anthracene	< **330**
Dimethyl phthalate	< 330
Di-n-butyl phthalate	< 330
Di-n-octyl phthalate	< 330
Fluoranthene	< 330
Indeno(1,2,3-cd)pyrene	< 330
Naphthalene	< 330
n-Nitrosodiphenylamine	< 330
Phenanthrene	< 330
Pyrene	< 330

U7BS0013	1.0 Primary U7BS0013S01 5/6/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17.9
Acenaphthene	< 17.9
Benzo(a)anthracene	< 17.9
Benzo(a)pyrene	< 17.9
Benzo(b)fluoranthene	< 17.9
Benzo(ghi)perylene	< 17.9
Benzo(k)fluoranthene	< 17.9
bis(2-Ethylhexyl) phthalate	< 29.5
Butyl benzyl phthalate	< 17.9
Chrysene	< 17.9
Dibenzo(a,h)anthracene	< 17.9
Dimethyl phthalate	< 17.9
Di-n-butyl phthalate	< 17.9
Di-n-octyl phthalate	< 17.9
Fluoranthene	< 17.9
Indeno(1,2,3-cd)pyrene	< 17.9
Naphthalene	< 17.9
Phenanthrene	< 17.9
Pyrene	< 17.9

RMB50067	1.0 Primary RMB50067S01 5/5/2008	1.0 Split RMBS0067S01SP 5/5/2008
SVOCs (µg/kg)		
1-Methyl naphthalene	< 18	< 21
Acenaphthene	< 18	< 21
Benzo(a)anthracene	< 18	< 21
Benzo(a)pyrene	< 18	< 21
Benzo(b)fluoranthene	< 18	< 21
Benzo(ghi)perylene	< 18	**0.25 J**
Benzo(k)fluoranthene	< 18	< 21
bis(2-Ethylhexyl) phthalate	< 29.3	< 21
Butyl benzyl phthalate	< 18	< 21
Chrysene	< 18	< 21
Dibenzo(a,h)anthracene	< 18	< 21
Dimethyl phthalate	< 18	< 21
Di-n-butyl phthalate	< 22	**1.5 J**
Di-n-octyl phthalate	< 18	< 21
Fluoranthene	< 18	< 21
Indeno(1,2,3-cd)pyrene	< 18	< 21
Naphthalene	< 18	< 21
Phenanthrene	< 18	< 21
Pyrene	< 18	**0.21 J**

RMB50066	0.8 Primary RMBS0066S01 5/1/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 19.4
Acenaphthene	**8.08 J**
Benzo(a)anthracene	**53.5**
Benzo(a)pyrene	**47.3**
Benzo(b)fluoranthene	**80.3**
Benzo(ghi)perylene	**24**
Benzo(k)fluoranthene	< 19.4
bis(2-Ethylhexyl) phthalate	< 45.3
Butyl benzyl phthalate	< 19.4
Chrysene	**60.8**
Dibenzo(a,h)anthracene	< 19.4
Dimethyl phthalate	< 19.4
Di-n-butyl phthalate	< 32
Di-n-octyl phthalate	< 19.4
Fluoranthene	**115**
Indeno(1,2,3-cd)pyrene	**14.8 J**
Naphthalene	< 19.4
Phenanthrene	**58.3**
Pyrene	**116**

RMB50062	1.0 Primary RMBS0062S01 5/5/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 18.1
Acenaphthene	< 18.1
Benzo(a)anthracene	< 18.1
Benzo(a)pyrene	< 18.1
Benzo(b)fluoranthene	< 18.1
Benzo(ghi)perylene	< 18.1
Benzo(k)fluoranthene	< 18.1
bis(2-Ethylhexyl) phthalate	< 25.7
Butyl benzyl phthalate	< 18.1
Chrysene	< 18.1
Dibenzo(a,h)anthracene	< 18.1
Dimethyl phthalate	< 18.1
Di-n-butyl phthalate	< 20.6
Di-n-octyl phthalate	< 18.1
Fluoranthene	< 18.1
Indeno(1,2,3-cd)pyrene	< 18.1
Naphthalene	< 18.1
Phenanthrene	< 18.1
Pyrene	< 18.1

RMBS0135	1.0 Primary RMBS0135S001 11/24/2008
SVOCs (µg/kg)	
1-Methyl naphthalene	< 17
Acenaphthene	< 17
Benzo(a)anthracene	**7.92 J**
Benzo(a)pyrene	< 17
Benzo(b)fluoranthene	**7.46 J**
Benzo(ghi)perylene	< 17
Benzo(k)fluoranthene	< 17
bis(2-Ethylhexyl) phthalate	**32.9**
Butyl benzyl phthalate	< 17
Chrysene	< 17
Dibenzo(a,h)anthracene	< 17
Dimethyl phthalate	< 17
Di-n-butyl phthalate	< 17
Di-n-octyl phthalate	< 17
Fluoranthene	**8.74 J**
Indeno(1,2,3-cd)pyrene	< 17
Naphthalene	< 17
Phenanthrene	< 17
Pyrene	**6.53 J**

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

SVOC Chemical Data Results
RMHF RFI Site
North RMHF Area

FIGURE C.3-2C

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected SVOCs Chemical Data**
- ▲ **Soil sample location with no detected SVOCs Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for SVOCs Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/1/2005 — Date

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

SVOCs	Res RBSL (µg/kg)	Eco RBSL (µg/kg)
1-Methyl naphthalene	24716.0871	210000.0000
2-Methylnaphthalene	230000.0000	210000.0000
Acenaphthene	3400000.0000	2455.5351
Acenaphthylene	3400000.0000	270383.6107
Anthracene	17000000.0000	2384.0085
Benzo(a)anthracene	600.0000	1418.4033
Benzo(a)pyrene	60.0000	5595.0847
Benzo(b)fluoranthene	600.0000	4359.7436
Benzo(ghi)perylene	0.0000	6411.1389
Benzo(k)fluoranthene	600.0000	5762.7470
Butyl benzyl phthalate	377249.0243	339549.0336
Chrysene	6000.0000	2358.9445
Di-n-butyl phthalate	5700000.0000	488.2013
Di-n-octyl phthalate	2300000.0000	13000.0000
Dibenzo(a,h)anthracene	170.0000	5595.0847
Diethyl phthalate	46000000.0000	6940467.6688
Dimethyl phthalate	570000000.0000	4438.1939
Fluoranthene	2300000.0000	38000.0000
Fluorene	2300000.0000	1645.5450
Indeno(1,2,3-cd)pyrene	600.0000	5820.8899
Naphthalene	1146590.7159	210000.0000
Phenanthrene	17000000.0000	1313.8397
Pyrene	1700000.0000	18000.0000
bis(2-Ethylhexyl) phthalate	250000.0000	4926.3953
n-Nitrosodimethylamine	45.0000	20000.0000

Note: (µg/kg) = micrograms per kilogram

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a SVOCs analyte, this indicates the analyte was not analyzed.

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

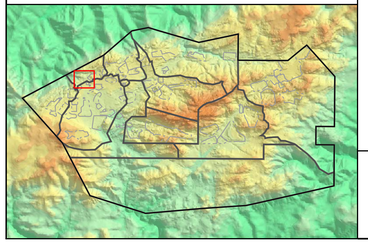
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

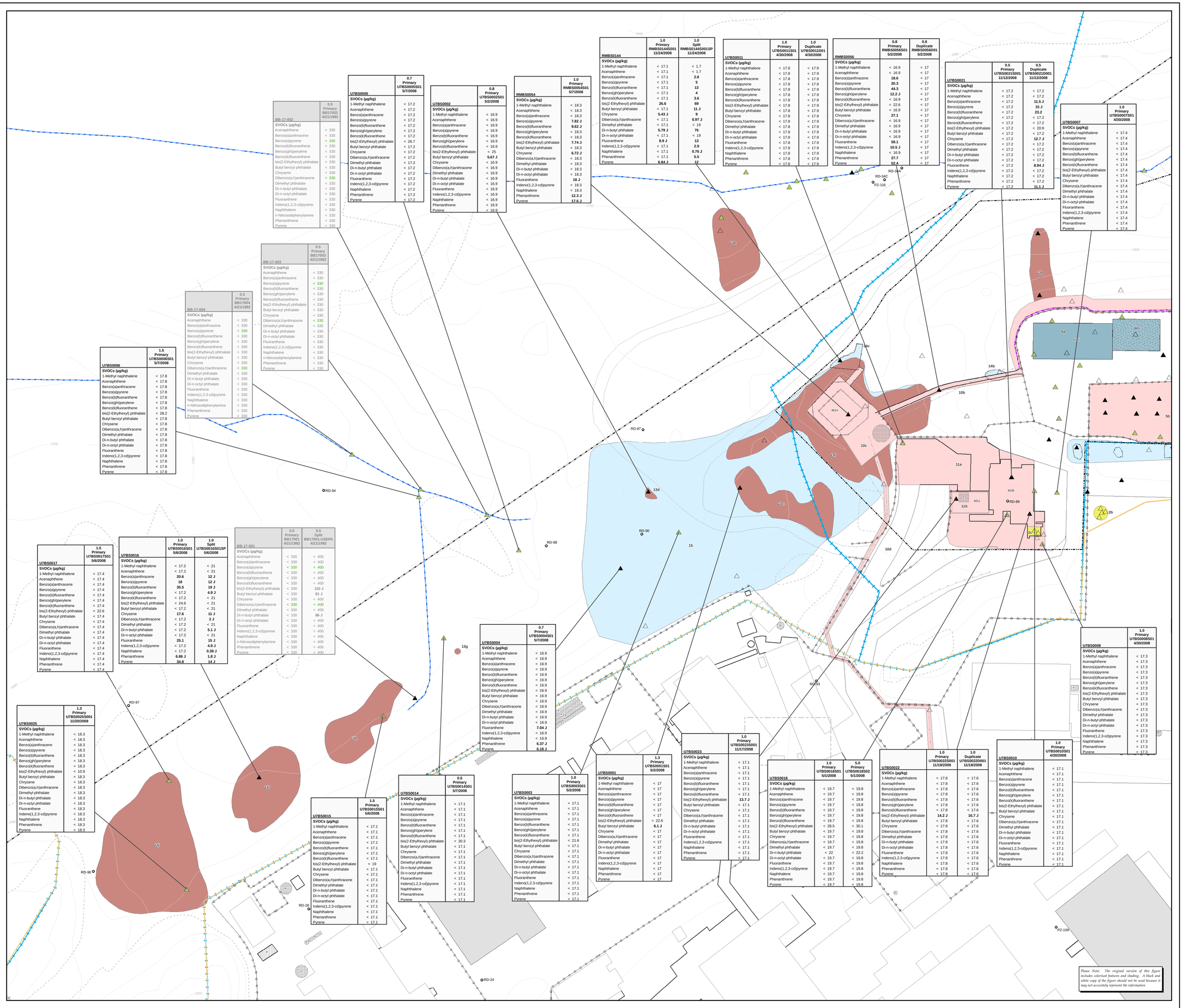
Chemical Use Area

- Multiple Use
- Solvents
- Petroleum
- Oils / PCBs
- Metals / Inorganics
- Perchlorate / Energetics
- Hydrazine
- Debris
- Leach Field
- Potential

Document: RFI-Report-Group7-Boxplot-RMHF-SVOC_South.mxd Date: Jun 10, 2009

1 inch = 30 feet
0 30 60 Feet
ANSI E 34 X 44





Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

SVOC Chemical Data Results
RMHF RFI Site
South RMHF Area

FIGURE C.3-2D

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected TPH Chemical Data**
- ▲ **Soil sample location with no detected TPH Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for TPH Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical | Sample)

Sample Location ID: **RMDF5** | **1.00** (Depth in Feet) | **Primary** (Sample Type) | **RMDFS501** (Unique Sample Identifier) | **7/1/2005** (Date)

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect 12.05 **Non-Detect** <0.06 Exceeds Res RBSL

Comparison Levels

TPHs	Res RBSL (mg/kg)
Gasoline Range Organics (C08-C11)	1.1
Gasoline Range Organics (C9-C22)	1.1
Kerosene Range Organics (C12-C14)	1,400.0
Diesel Range Organics (C15 - C22)	1,400.0
Lubricant Oil Range Organics (C21-C30)	1,400.0

Note: (mg/kg) = milligrams per kilogram

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a TPH analyte this indicates the analyte was not analyzed.

Note: Kerosene, diesel and lubricant oil range organics have a combined ResRBSL of 1.400 mg/kg for all three hydrocarbon ranges (C12-C30).

Res RBSL **Residential Risk-Based Screening Level**

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

Chemical Use Area

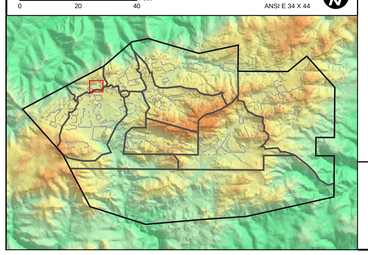
- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

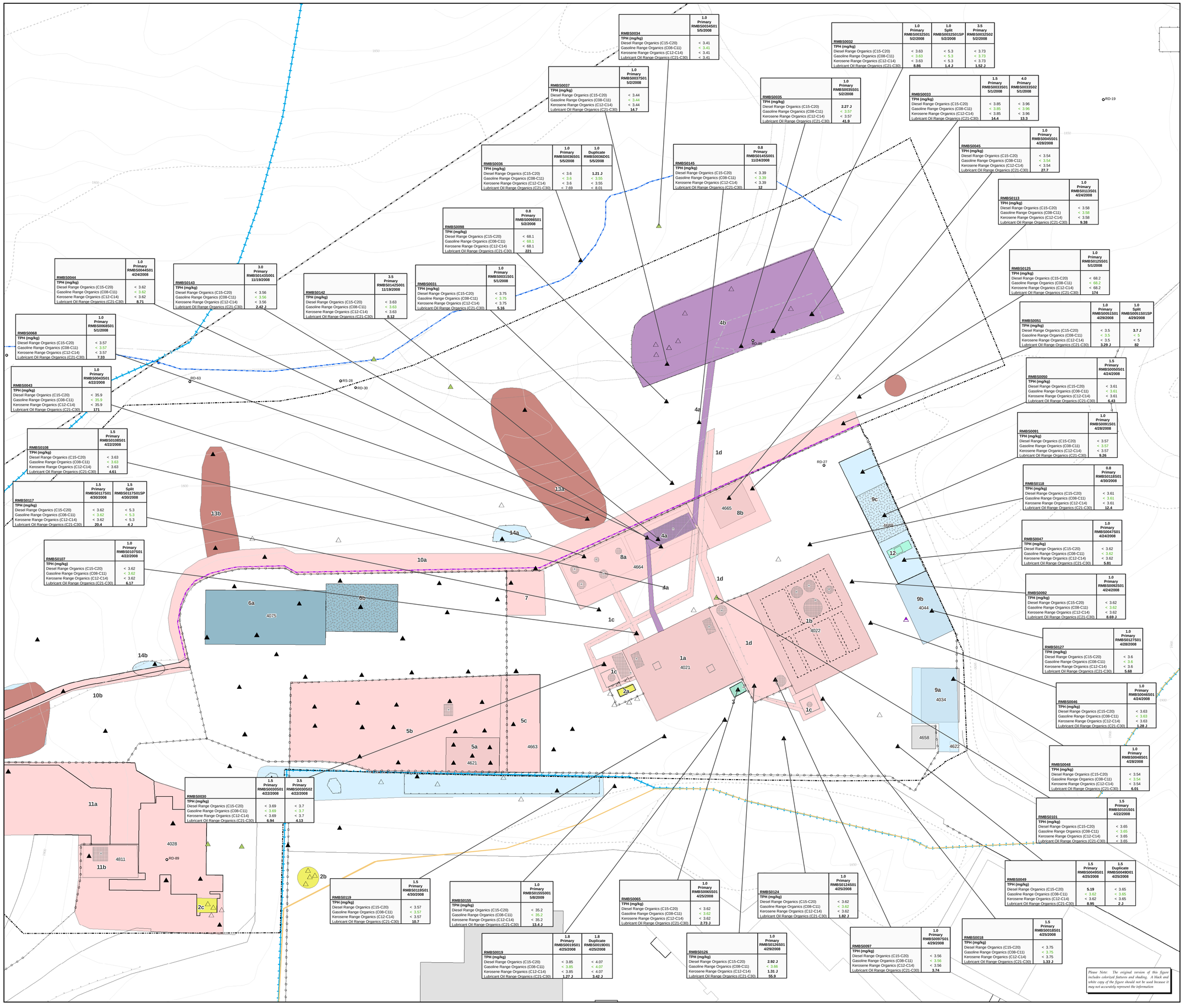
Document: RFI-Report-Group7-Boxplot-RMHF-TPH_East.mxd Date: Jun 10, 2009

1 inch = 20 feet

0 20 40 Feet

ANSI E 34 X 44





Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

TPH Chemical Data Results
RMHF RFI Site
East RMHF Area

FIGURE C.3-3A

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected TPH Chemical Data**
- ▲ **Soil sample location with no detected TPH Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for TPH Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

- 1.00 — Depth in Feet
- Primary — Sample Type
- RMDFS5501 — Unique Sample Identifier
- 7/1/02005 — Date

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Detect 12.05 **Non-Detect** <0.06 Exceeds Res RBSL

Comparison Levels

TPHs	Res RBSL (mg/kg)
Gasoline Range Organics (C08-C11)	1.1
Gasoline Range Organics (C9-C22)	1.1
Kerosene Range Organics (C12-C14)	1,400.0
Diesel Range Organics (C15 - C22)	1,400.0
Lubricant Oil Range Organics (C21-C30)	1,400.0

Note: (mg/kg) = milligrams per kilogram

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a TPH analyte this indicates the analyte was not analyzed.

Note: Kerosene, diesel and lubricant oil range organics have a combined ResRBSL of 1.400 mg/kg for all three hydrocarbon ranges (C12-C30).

Res RBSL **Residential Risk-Based Screening Level**

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

Chemical Use Area

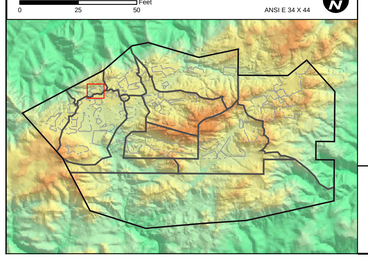
- Multiple Use
- Solvents
- Petroleum
- Oils / PCBs
- Metals / Inorganics
- Perchlorate / Energetics
- Hydrazine
- Debris
- Leach Field
- Potential

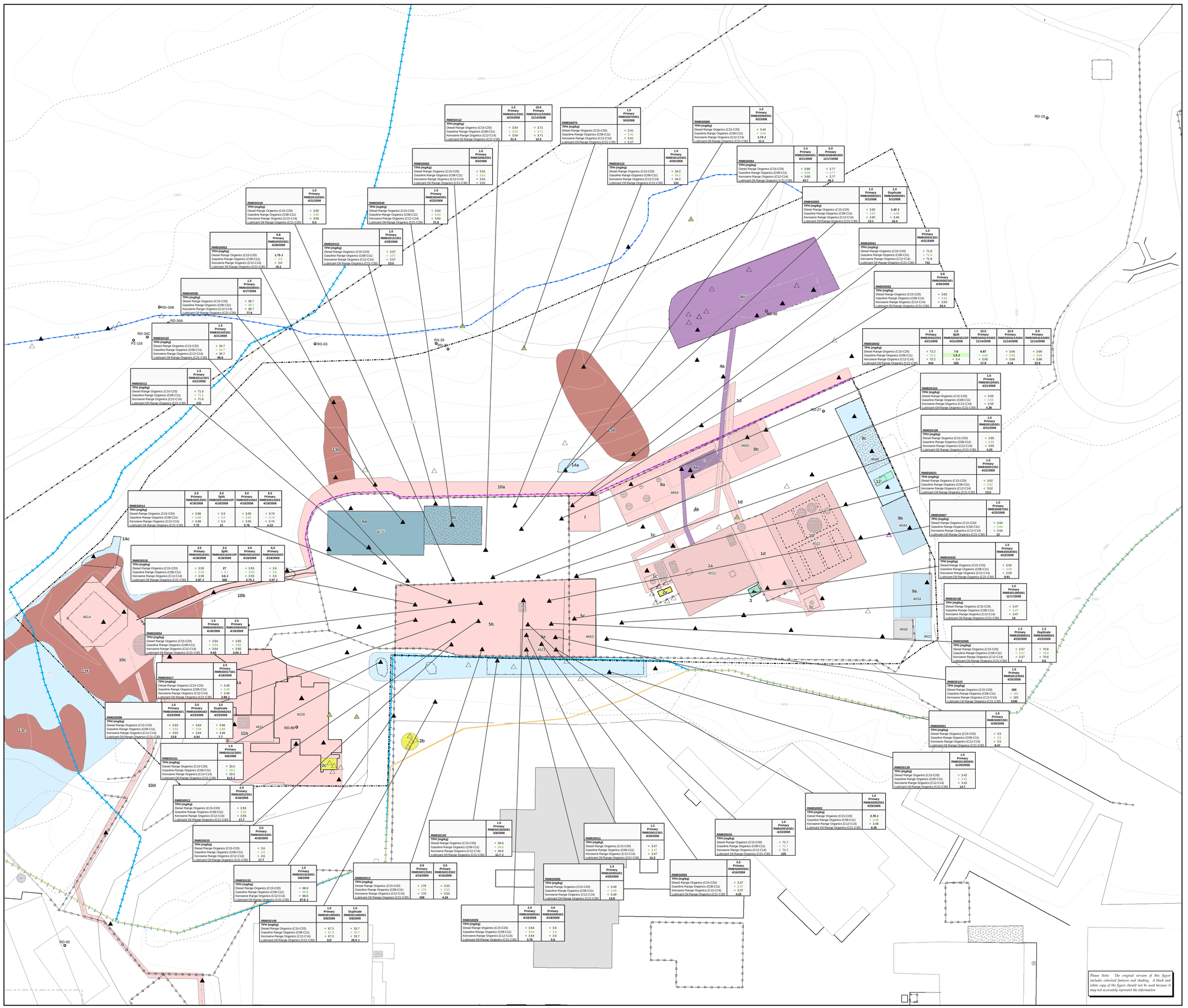
Document: RFI-Report-Group7-Boxplot-RMHF-TPH_West.mxd Date: Jun 10, 2009

1 inch = 25 feet

0 25 50 Feet

ANSI E 34 X 44





MWH

SANTA SUSANA FIELD LABORATORY

TPH Chemical Data Results
RMHF RFI Site
West RMHF Area

FIGURE C.3-3B

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected TPH Chemical Data**
- ▲ **Soil sample location with no detected TPH Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for TPH Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: **RMDF5**

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/1/02005 — Date

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Detect **12.05** — **Non-Detect** <0.06 — Exceeds Res RBSL

Comparison Levels

TPHs	Res RBSL (mg/kg)
Gasoline Range Organics (C08-C11)	1.1
Gasoline Range Organics (C9-C22)	1.1
Kerosene Range Organics (C12-C14)	1,400.0
Diesel Range Organics (C15 - C22)	1,400.0
Lubricant Oil Range Organics (C21-C30)	1,400.0

Note: (mg/kg) = milligrams per kilogram — Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a TPH analyte this indicates the analyte was not analyzed.

Note: Kerosene, diesel and lubricant oil range organics have a combined ResRBSL of 1400 mg/kg for all three hydrocarbon ranges (C12-C30).

Res RBSL **Residential Risk-Based Screening Level**

Base Map Legend

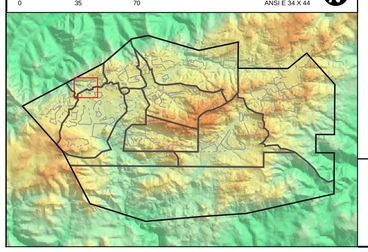
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

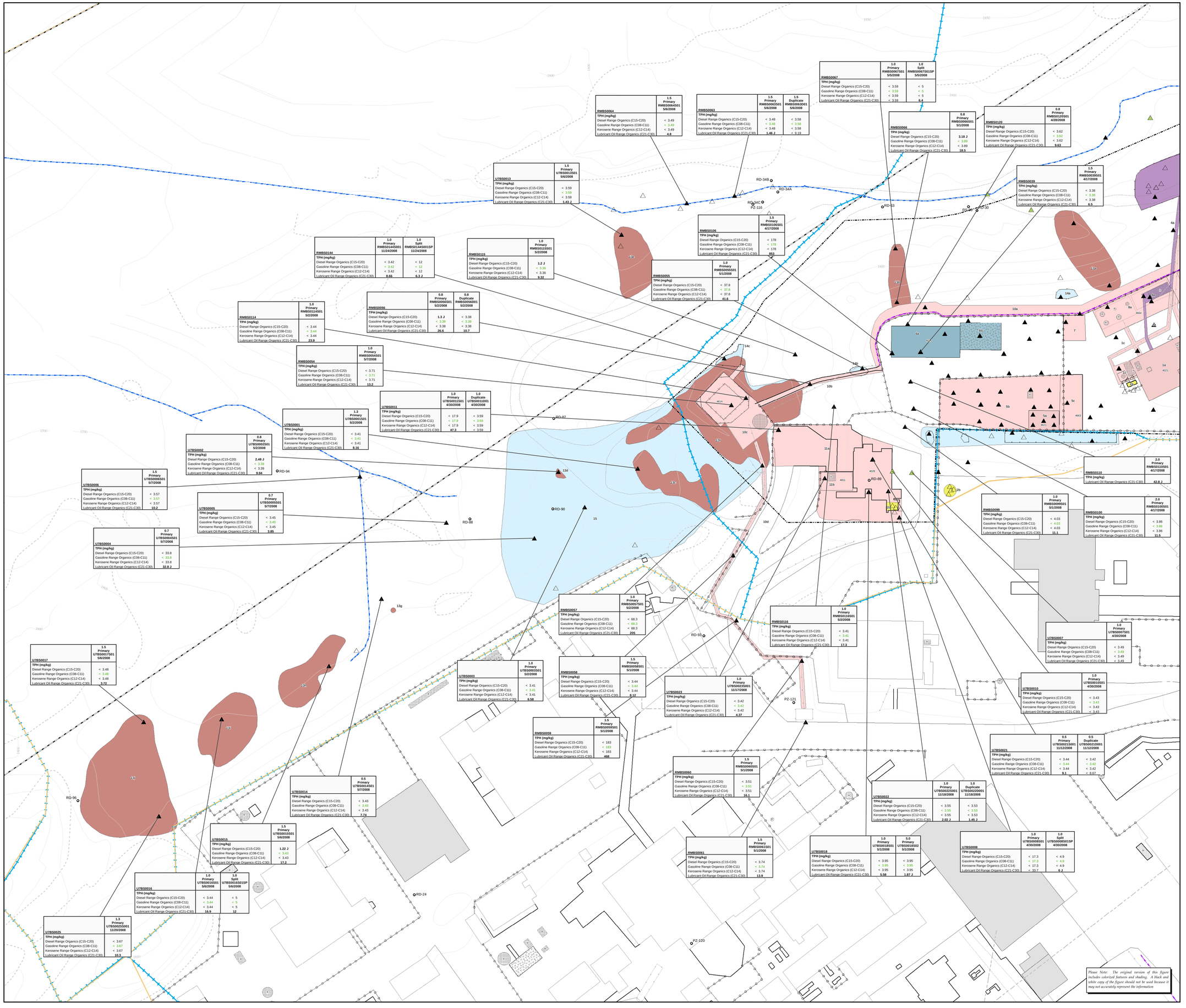
Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-TPH_South.mxd — Date: Jun 10, 2009

1 inch = 35 feet (0, 35, 70 Feet) — ANSI E 34 X 44





RMBS0064	**1.5 Primary RMBS0064S01 5/6/2008**
TPH (mg/kg)	
Diesel Range Organics (C15-C20)	< 3.49
Gasoline Range Organics (C08-C11)	< 3.49
Kerosene Range Organics (C12-C14)	< 3.49
Lubricant Oil Range Organics (C21-C30)	**4.8**

RMBS0063	**1.5 Primary RMBS0063S01 5/6/2008**	**1.5 Duplicate RMBS0063D01 5/6/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.48	< 3.58
Gasoline Range Organics (C08-C11)	< 3.48	< 3.58
Kerosene Range Organics (C12-C14)	< 3.48	< 3.58
Lubricant Oil Range Organics (C21-C30)	**1.46 J**	< 9.19

RMBS0067	**1.0 Primary RMBS0067S01 5/5/2008**	**1.0 Split RMBS0067S01SP 5/5/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.59	< 5
Gasoline Range Organics (C08-C11)	< 3.59	< 5
Kerosene Range Organics (C12-C14)	< 3.59	< 5
Lubricant Oil Range Organics (C21-C30)	< 3.59	**5.4**

RMBS0066	**0.8 Primary RMBS0066S01 5/1/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.58	
Gasoline Range Organics (C08-C11)	< 3.89	
Kerosene Range Organics (C12-C14)	< 3.89	
Lubricant Oil Range Organics (C21-C30)	**3.18 J**	
	18.5	

RMBS0120	**0.8 Primary RMBS0120S01 4/28/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.62	
Gasoline Range Organics (C08-C11)	< 3.62	
Kerosene Range Organics (C12-C14)	< 3.62	
Lubricant Oil Range Organics (C21-C30)	**9.03**	

U7BS0013	**1.5 Primary U7BS0013S01 5/6/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.59	
Gasoline Range Organics (C08-C11)	< 3.59	
Kerosene Range Organics (C12-C14)	< 3.59	
Lubricant Oil Range Organics (C21-C30)	**1.43 J**	

RMBS0039	**1.5 Primary RMBS0039S01 4/17/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.38	
Gasoline Range Organics (C08-C11)	< 3.38	
Kerosene Range Organics (C12-C14)	< 3.38	
Lubricant Oil Range Organics (C21-C30)	**6.5**	

RMBS0106	**1.5 Primary RMBS0106S01 4/17/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 178	
Gasoline Range Organics (C08-C11)	< 178	
Kerosene Range Organics (C12-C14)	< 178	
Lubricant Oil Range Organics (C21-C30)	**853**	

RMBS0055	**1.0 Primary RMBS0055S01 5/1/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 37.8	
Gasoline Range Organics (C08-C11)	< 37.8	
Kerosene Range Organics (C12-C14)	< 37.8	
Lubricant Oil Range Organics (C21-C30)	**41.6**	

RMBS0144	**1.0 Primary RMBS0144S001 11/24/2008**	**1.0 Split RMBS0144S001SP 11/24/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.42	< 12
Gasoline Range Organics (C08-C11)	< 3.42	< 12
Kerosene Range Organics (C12-C14)	< 3.42	< 12
Lubricant Oil Range Organics (C21-C30)	**8.66**	**6.3 J**

RMBS0115	**1.0 Primary RMBS0115S01 5/2/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	**1.2 J**	
Gasoline Range Organics (C08-C11)	< 3.36	
Kerosene Range Organics (C12-C14)	< 3.36	
Lubricant Oil Range Organics (C21-C30)	**9.32**	

RMBS0114	**1.0 Primary RMBS0114S01 5/2/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.44	
Gasoline Range Organics (C08-C11)	< 3.44	
Kerosene Range Organics (C12-C14)	< 3.44	
Lubricant Oil Range Organics (C21-C30)	**23.9**	

RMBS0056	**0.8 Primary RMBS0056S01 5/2/2008**	**0.8 Duplicate RMBS0056D01 5/2/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	**1.3 J**	< 3.38
Gasoline Range Organics (C08-C11)	< 3.38	< 3.38
Kerosene Range Organics (C12-C14)	< 3.38	< 3.38
Lubricant Oil Range Organics (C21-C30)	**26.6**	**10.7**

RMBS0054	**1.0 Primary RMBS0054S01 5/7/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.71	
Gasoline Range Organics (C08-C11)	< 3.71	
Kerosene Range Organics (C12-C14)	< 3.71	
Lubricant Oil Range Organics (C21-C30)	**13.2**	

U7BS0011	**1.0 Primary U7BS0011S01 4/30/2008**	**1.0 Duplicate U7BS0011D01 4/30/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 17.9	< 3.59
Gasoline Range Organics (C08-C11)	< 17.9	< 3.59
Kerosene Range Organics (C12-C14)	< 17.9	< 3.59
Lubricant Oil Range Organics (C21-C30)	**47.3**	< 3.59

U7BS0001	**1.3 Primary U7BS0015S01 5/2/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.41	
Gasoline Range Organics (C08-C11)	< 3.41	
Kerosene Range Organics (C12-C14)	< 3.41	
Lubricant Oil Range Organics (C21-C30)	**8.16**	

U7BS0023	**0.8 Primary U7BS0002S01 5/2/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	**2.48 J**	
Gasoline Range Organics (C08-C11)	< 3.39	
Kerosene Range Organics (C12-C14)	< 3.39	
Lubricant Oil Range Organics (C21-C30)	**9.94**	

U7BS0006	**1.5 Primary U7BS0006S01 5/7/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.57	
Gasoline Range Organics (C08-C11)	< 3.57	
Kerosene Range Organics (C12-C14)	< 3.57	
Lubricant Oil Range Organics (C21-C30)	**10.2**	

U7BS0005	**0.7 Primary U7BS0005S01 5/7/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.45	
Gasoline Range Organics (C08-C11)	< 3.45	
Kerosene Range Organics (C12-C14)	< 3.45	
Lubricant Oil Range Organics (C21-C30)	**3.85**	

U7BS0004	**0.7 Primary U7BS0004S01 5/7/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 33.8	
Gasoline Range Organics (C08-C11)	< 33.8	
Kerosene Range Organics (C12-C14)	< 33.8	
Lubricant Oil Range Organics (C21-C30)	**32.8 J**	

U7BS0017	**1.5 Primary U7BS0017S01 5/6/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.48	
Gasoline Range Organics (C08-C11)	< 3.48	
Kerosene Range Organics (C12-C14)	< 3.48	
Lubricant Oil Range Organics (C21-C30)	**3.72**	

U7BS0003	**1.0 Primary U7BS0003S01 5/2/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.41	
Gasoline Range Organics (C08-C11)	< 3.41	
Kerosene Range Organics (C12-C14)	< 3.41	
Lubricant Oil Range Organics (C21-C30)	**6.58**	

RMBS0057	**1.0 Primary RMBS0057S01 5/2/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 68.3	
Gasoline Range Organics (C08-C11)	< 68.3	
Kerosene Range Organics (C12-C14)	< 68.3	
Lubricant Oil Range Organics (C21-C30)	**205**	

RMBS0058	**1.5 Primary RMBS0058S01 5/1/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.44	
Gasoline Range Organics (C08-C11)	< 3.44	
Kerosene Range Organics (C12-C14)	< 3.44	
Lubricant Oil Range Organics (C21-C30)	**8.12**	

RMBS0059	**1.5 Primary RMBS0059S01 5/1/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 183	
Gasoline Range Organics (C08-C11)	< 183	
Kerosene Range Organics (C12-C14)	< 183	
Lubricant Oil Range Organics (C21-C30)	**468**	

U7BS0023	**1.0 Primary U7BS0023S01 11/17/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.42	
Gasoline Range Organics (C08-C11)	< 3.42	
Kerosene Range Organics (C12-C14)	< 3.42	
Lubricant Oil Range Organics (C21-C30)	**4.37**	

RMBS0060	**1.5 Primary RMBS0060S01 5/1/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.51	
Gasoline Range Organics (C08-C11)	< 3.51	
Kerosene Range Organics (C12-C14)	< 3.51	
Lubricant Oil Range Organics (C21-C30)	**16.1**	

U7BS0022	**1.0 Primary U7BS0022S01 11/18/2008**	**1.0 Duplicate U7BS0022D01 11/18/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.55	< 3.53
Gasoline Range Organics (C08-C11)	< 3.55	< 3.53
Kerosene Range Organics (C12-C14)	< 3.55	< 3.53
Lubricant Oil Range Organics (C21-C30)	**2.02 J**	**1.45 J**

U7BS0021	**0.5 Primary U7BS0021S01 11/12/2008**	**0.5 Duplicate U7BS0021D01 11/12/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.44	< 3.42
Gasoline Range Organics (C08-C11)	< 3.44	< 3.42
Kerosene Range Organics (C12-C14)	< 3.44	< 3.42
Lubricant Oil Range Organics (C21-C30)	**9.1**	< 8.67

RMBS0110	**2.0 Primary RMBS0110S01 4/17/2008**	
TPH (mg/kg)		
Lubricant Oil Range Organics (C21-C30)	**42.8 J**	

RMBS0099	**1.0 Primary RMBS0099S01 5/1/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 4.03	
Gasoline Range Organics (C08-C11)	< 4.03	
Kerosene Range Organics (C12-C14)	< 4.03	
Lubricant Oil Range Organics (C21-C30)	**11.1**	

RMBS0100	**2.0 Primary RMBS0100S01 4/17/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.86	
Gasoline Range Organics (C08-C11)	< 3.86	
Kerosene Range Organics (C12-C14)	< 3.86	
Lubricant Oil Range Organics (C21-C30)	**11.5**	

U7BS0007	**1.0 Primary U7BS0007S01 4/30/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.49	
Gasoline Range Organics (C08-C11)	< 3.49	
Kerosene Range Organics (C12-C14)	< 3.49	
Lubricant Oil Range Organics (C21-C30)	< 3.49	

U7BS0010	**1.0 Primary U7BS0010S01 4/30/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.43	
Gasoline Range Organics (C08-C11)	< 3.43	
Kerosene Range Organics (C12-C14)	< 3.43	
Lubricant Oil Range Organics (C21-C30)	< 3.43	

U7BS0008	**1.0 Primary U7BS0008S01 4/30/2008**	**1.0 Split U7BS0008S01SP 4/30/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 17.3	< 4.9
Gasoline Range Organics (C08-C11)	< 17.3	< 4.9
Kerosene Range Organics (C12-C14)	< 17.3	< 4.9
Lubricant Oil Range Organics (C21-C30)	< 33.7	**6.3**

U7BS0018	**1.0 Primary U7BS0018S01 5/1/2008**	**5.0 Primary U7BS0018S02 5/1/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.95	< 3.95
Gasoline Range Organics (C08-C11)	< 3.95	< 3.95
Kerosene Range Organics (C12-C14)	< 3.95	< 3.95
Lubricant Oil Range Organics (C21-C30)	**5.58**	**1.87 J**

RMBS0061	**1.5 Primary RMBS0061S01 5/1/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.74	
Gasoline Range Organics (C08-C11)	< 3.74	
Kerosene Range Organics (C12-C14)	< 3.74	
Lubricant Oil Range Organics (C21-C30)	**13.9**	

U7BS0014	**0.5 Primary U7BS0014S01 5/7/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.43	
Gasoline Range Organics (C08-C11)	< 3.43	
Kerosene Range Organics (C12-C14)	< 3.43	
Lubricant Oil Range Organics (C21-C30)	**7.74**	

U7BS0015	**1.5 Primary U7BS0015S01 5/6/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	**1.22 J**	
Gasoline Range Organics (C08-C11)	< 3.43	
Kerosene Range Organics (C12-C14)	< 3.43	
Lubricant Oil Range Organics (C21-C30)	**17.2**	

U7BS0016	**1.0 Primary U7BS0016S01 5/6/2008**	**1.0 Split U7BS0016S01SP 5/6/2008**
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.44	< 5
Gasoline Range Organics (C08-C11)	< 3.44	< 5
Kerosene Range Organics (C12-C14)	< 3.44	< 5
Lubricant Oil Range Organics (C21-C30)	**16.9**	**12**

U7BS0025	**1.3 Primary U7BS0025S01 11/20/2008**	
TPH (mg/kg)		
Diesel Range Organics (C15-C20)	< 3.67	
Gasoline Range Organics (C08-C11)	< 3.67	
Kerosene Range Organics (C12-C14)	< 3.67	
Lubricant Oil Range Organics (C21-C30)	**10.3**	

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

TPH Chemical Data Results
RMHF RFI Site
South RMHF Area

FIGURE C.3-3C

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected Other Organics Chemical Data**
- ▲ **Soil sample location with no detected Other Organics Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for Other Organics Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

Sample Location ID		(Historical Sample)
RMDF5	1.00 Primary RMDFSS01 7/10/2005	

- 1.00 — Depth in Feet
- Primary — Sample Type
- RMDFSS01 — Unique Sample Identifier
- 7/10/2005 — Date

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

PCBs	Res RBSL (µg/kg)	Eco RBSL (µg/kg)
Aroclor 1242	140.0000	78.7201
Aroclor 1248	140.0000	11.4087
Aroclor 1254	140.0000	77.5792
Aroclor 1260	140.0000	77.5792
Pesticides	**(µg/kg)**	**(µg/kg)**
4,4'-DDD	3573.3866	12.4269
4,4'-DDE	2522.3905	12.4269
4,4'-DDT	2522.3627	12.4269

Note: (µg/kg) = micrograms per kilogram
Note: (mg/kg) = milligrams per kilogram

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for an Other Organics analyte, this indicates the analyte was not analyzed.

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

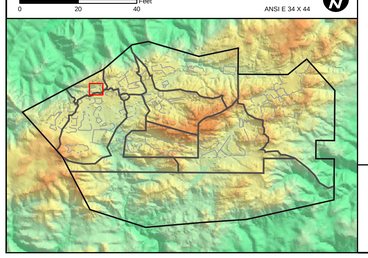
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-OtherOrganics_East.mxd Date: Jun 10, 2009

1 inch = 20 feet
0 20 40 Feet
ANSI E 34 X 44



RMBS0042	1.5 Primary RMBS0042S01 4/21/2008	1.5 Split RMBS0042S01SP 4/21/2008	10.0 Primary RMBS0042AS003 11/14/2008	15.0 Primary RMBS0042AS004 11/14/2008	5.0 Primary RMBS0042AS002 11/14/2008
PCB (µg/kg)					
Aroclor 1242	< 18.1	< 110	< 3.65	< 3.67	< 3.65
Aroclor 1248	< 18.1	< 110	< 3.65	< 3.67	< 3.65
Aroclor 1254	< 18.1	< 110	< 3.65	< 3.67	< 3.65
Aroclor 1260	< 18.1	< 110	< 3.65	< 3.67	< 3.65
Pesticide (µg/kg)					

RMBS0093	1.0 Primary RMBS0093S01 5/1/2008	1.0 Duplicate RMBS0093D01 5/1/2008
PCB (µg/kg)		
Aroclor 1242	< 3.81	< 3.44
Aroclor 1248	< 3.81	< 3.44
Aroclor 1254	< 3.81	< 3.44
Aroclor 1260	< 3.81	< 3.44
Pesticide (µg/kg)		

RMBS0069	1.0 Primary RMBS0069S01 5/2/2008
PCB (µg/kg)	
Aroclor 1242	< 3.44
Aroclor 1248	< 3.44
Aroclor 1254	6.7
Aroclor 1260	7.5
Pesticide (µg/kg)	

RMBS0068	1.0 Primary RMBS0068S01 5/1/2008
PCB (µg/kg)	
Aroclor 1242	< 3.56
Aroclor 1248	< 3.56
Aroclor 1254	2.4 J
Aroclor 1260	< 3.56
Pesticide (µg/kg)	

RMBS0036	1.0 Primary RMBS0036S01 5/5/2008	1.0 Duplicate RMBS0036D01 5/5/2008
PCB (µg/kg)		
Aroclor 1242	< 3.6	< 3.56
Aroclor 1248	< 3.6	< 3.56
Aroclor 1254	8.3	20.7
Aroclor 1260	7.5 J	10.7 J
Pesticide (µg/kg)		

RMBS0037	1.0 Primary RMBS0037S01 5/2/2008
PCB (µg/kg)	
Aroclor 1242	< 3.44
Aroclor 1248	< 3.44
Aroclor 1254	< 3.44
Aroclor 1260	< 3.44
Pesticide (µg/kg)	

RMBS0035	1.0 Primary RMBS0035S01 5/2/2008
PCB (µg/kg)	
Aroclor 1242	
Aroclor 1248	11
Aroclor 1254	< 3.64
Aroclor 1260	29.5
Pesticide (µg/kg)	25.8

RMBS0032	3.5 Primary RMBS0032S02 5/2/2008
PCB (µg/kg)	
Aroclor 1242	< 3.73
Aroclor 1248	< 3.73
Aroclor 1254	< 3.73
Aroclor 1260	1.7 J
Pesticide (µg/kg)	

RMBS0098	0.8 Primary RMBS0098S01 5/2/2008
PCB (µg/kg)	
Aroclor 1242	< 3.41
Aroclor 1248	< 3.41
Aroclor 1254	< 3.41
Aroclor 1260	4.9
Pesticide (µg/kg)	

RMBS0142	3.5 Primary RMBS01425001 11/19/2008
PCB (µg/kg)	
Aroclor 1242	< 3.63
Aroclor 1248	< 3.63
Aroclor 1254	< 3.63
Aroclor 1260	< 3.63
Pesticide (µg/kg)	

RMBS0044	1.0 Primary RMBS0044S01 4/24/2008
PCB (µg/kg)	
Aroclor 1242	< 3.62
Aroclor 1248	< 3.62
Aroclor 1254	< 3.62
Aroclor 1260	1.6 J
Pesticide (µg/kg)	

RMBS0033	1.5 Primary RMBS0033S01 5/1/2008
PCB (µg/kg)	
Aroclor 1242	< 3.86
Aroclor 1248	< 3.86
Aroclor 1254	< 3.86
Aroclor 1260	< 3.86
Pesticide (µg/kg)	

RMBS0145	0.8 Primary RMBS0145S001 11/24/2008
PCB (µg/kg)	
Aroclor 1242	< 3.39
Aroclor 1248	< 3.39
Aroclor 1254	40.5
Aroclor 1260	15.8
Pesticide (µg/kg)	

RMBS0125	1.0 Primary RMBS0125S01 5/1/2008
PCB (µg/kg)	
Aroclor 1242	< 3.4
Aroclor 1248	< 3.4
Aroclor 1254	1.7 J
Aroclor 1260	2 J
Pesticide (µg/kg)	

RMBS0031	1.0 Primary RMBS0031S01 5/1/2008
PCB (µg/kg)	
Aroclor 1242	< 3.74
Aroclor 1248	< 3.74
Aroclor 1254	< 3.74
Aroclor 1260	< 3.74
Pesticide (µg/kg)	

RMBS0113	1.0 Primary RMBS0113S01 4/24/2008
PCB (µg/kg)	
Aroclor 1242	< 3.6
Aroclor 1248	< 3.6
Aroclor 1254	14.6 J
Aroclor 1260	4.8 J
Pesticide (µg/kg)	
4,4'-DDD	< 1.43
4,4'-DDE	4.89
4,4'-DDT	5.25

RMBS0143	3.0 Primary RMBS0143S001 11/19/2008
PCB (µg/kg)	
Aroclor 1242	< 3.56
Aroclor 1248	< 3.56
Aroclor 1254	< 3.56
Aroclor 1260	< 3.56
Pesticide (µg/kg)	

RMBS0118	0.8 Primary RMBS0118S01 4/30/2008	0.8 Split RMBS0118S01 4/30/2008
PCB (µg/kg)		
Pesticide (µg/kg)		
4,4'-DDD	< 1.44	< 0.27
4,4'-DDE	< 1.44	< 0.22
4,4'-DDT	< 1.44	< 0.22

RMBS0047	1.0 Primary RMBS0047S01 4/24/2008
PCB (µg/kg)	
Aroclor 1242	< 3.68
Aroclor 1248	< 3.68
Aroclor 1254	< 3.68
Aroclor 1260	< 3.68
Pesticide (µg/kg)	

RMBS0109	0.8 Primary RMBS0109S01 4/24/2008
PCB (µg/kg)	
Aroclor 1242	< 3.58
Aroclor 1248	< 3.58
Aroclor 1254	4.1 J
Aroclor 1260	13 J
Pesticide (µg/kg)	

RMBS0101	1.5 Primary RMBS0101S01 4/22/2008
PCB (µg/kg)	
Aroclor 1242	< 3.65
Aroclor 1248	< 3.65
Aroclor 1254	< 3.65
Aroclor 1260	< 3.65
Pesticide (µg/kg)	

RMBS0108	1.5 Primary RMBS0108S01 4/22/2008
PCB (µg/kg)	
Aroclor 1242	< 3.66
Aroclor 1248	< 3.66
Aroclor 1254	< 3.66
Aroclor 1260	1.5 J
Pesticide (µg/kg)	
4,4'-DDD	< 7.24
4,4'-DDE	< 7.24
4,4'-DDT	< 7.24

RMBS0097	1.0 Primary RMBS0097S01 4/29/2008
PCB (µg/kg)	
Aroclor 1242	< 3.57
Aroclor 1248	< 3.57
Aroclor 1254	< 3.57
Aroclor 1260	< 3.57
Pesticide (µg/kg)	

RMBS0117	1.5 Split RMBS0117S01 4/30/2008	1.5 Split RMBS0117S01SP 4/30/2008
PCB (µg/kg)		
Aroclor 1242	< 2.1	< 21
Aroclor 1248	< 2.1	< 21
Aroclor 1254	< 2.1	< 21
Aroclor 1260	< 2.1	< 21
Pesticide (µg/kg)		

RMBS0030	1.5 Primary RMBS0030S01 4/22/2008	3.5 Primary RMBS0030S02 4/22/2008
PCB (µg/kg)		
Aroclor 1242	< 3.68	< 3.71
Aroclor 1248	< 3.68	< 3.71
Aroclor 1254	22.9 J	< 3.71
Aroclor 1260	30 J	< 3.71
Pesticide (µg/kg)		

RMBS0155	1.0 Primary RMBS0155S001 5/8/2009
PCB (µg/kg)	
Aroclor 1242	< 3.52
Aroclor 1248	< 3.52
Aroclor 1254	15.4
Aroclor 1260	13.4
Pesticide (µg/kg)	

RMBS0123	1.0 Primary RMBS0123S01 4/25/2008
PCB (µg/kg)	
Aroclor 1242	< 3.71
Aroclor 1248	< 3.71
Aroclor 1254	< 3.71
Aroclor 1260	< 3.71
Pesticide (µg/kg)	

RMBS0154	1.0 Primary RMBS0154S001 5/8/2009
PCB (µg/kg)	
Aroclor 1242	392
Aroclor 1248	< 17.3
Aroclor 1254	231
Aroclor 1260	57.1
Pesticide (µg/kg)	

RMBS0139	1.0 Primary RMBS01395001 11/20/2008
PCB (µg/kg)	
Aroclor 1242	< 682
Aroclor 1248	< 682
Aroclor 1254	< 682
Aroclor 1260	6710
Pesticide (µg/kg)	

RMBS0153	1.0 Primary RMBS0153S001 5/8/2009
PCB (µg/kg)	
Aroclor 1242	< 17.3
Aroclor 1248	< 17.3
Aroclor 1254	141
Aroclor 1260	194
Pesticide (µg/kg)	

RMBS0020	1.5 Primary RMBS0020S01 4/22/2008
PCB (µg/kg)	
Aroclor 1242	< 3.59
Aroclor 1248	< 3.59
Aroclor 1254	< 3.59
Aroclor 1260	4.9
Pesticide (µg/kg)	

RMBS0023S70	1.0 Composite RMBS0023S70 4/19/2008
PCB (µg/kg)	
Aroclor 1242	< 3.57
Aroclor 1248	< 3.57
Aroclor 1254	< 3.57
Aroclor 1260	< 3.57
Pesticide (µg/kg)	

RMBS0022S70	1.0 Composite RMBS0022S70 4/19/2008
PCB (µg/kg)	
Aroclor 1242	< 3.61
Aroclor 1248	< 3.61
Aroclor 1254	< 3.61
Aroclor 1260	< 3.61
Pesticide (µg/kg)	

RMBS0094	1.3 Primary RMBS0094BS001 11/17/2008	1.5 Primary RMBS0094S01 4/21/2008	5.0 Primary RMBS0094BS002 11/17/2008
PCB (µg/kg)			
Aroclor 1242	3.2 J	< 3.68	< 3.78
Aroclor 1248	< 3.69	< 3.68	< 3.78
Aroclor 1254	< 3.69	< 3.68	< 3.78
Aroclor 1260	< 3.69	< 3.68	< 3.78
Pesticide (µg/kg)			

RMBS0041	1.0 Primary RMBS0041S01 4/21/2008
PCB (µg/kg)	
Aroclor 1242	< 18
Aroclor 1248	< 18
Aroclor 1254	< 18
Aroclor 1260	< 18
Pesticide (µg/kg)	

RMBS0070	1.0 Primary RMBS0070S01 5/5/2008
PCB (µg/kg)	
Aroclor 1242	10.6
Aroclor 1248	< 3.42
Aroclor 1254	2.5 J
Aroclor 1260	< 3.42
Pesticide (µg/kg)	

RMBS0138	1.0 Primary RMBS0138S001 11/17/2008
PCB (µg/kg)	
Aroclor 1242	< 3.47
Aroclor 1248	< 3.47
Aroclor 1254	< 3.47
Aroclor 1260	< 3.47
Pesticide (µg/kg)	

RMBS0009	3.0 Primary RMBS0009S02 4/18/2008
PCB (µg/kg)	
Aroclor 1242	< 3.6
Aroclor 1248	< 3.6
Aroclor 1254	< 3.6
Aroclor 1260	< 3.6
Pesticide (µg/kg)	

RMBS0008	1.3 Primary RMBS0008S01 4/23/2008	1.3 Duplicate RMBS0008D01 4/23/2008
PCB (µg/kg)		
Aroclor 1242	< 3.57	< 3.55
Aroclor 1248	< 3.57	< 3.55
Aroclor 1254	< 3.57	< 3.55
Aroclor 1260	< 3.57	< 3.55
Pesticide (µg/kg)		

RMBS0010	1.0 Primary RMBS0010AS01 4/30/2008
PCB (µg/kg)	
Pesticide (µg/kg)	
4,4'-DDD	< 1.44
4,4'-DDE	< 1.44
4,4'-DDT	< 1.44

RMBS0001	1.0 Primary RMBS0001S01 4/29/2008
PCB (µg/kg)	
Aroclor 1242	< 3.5
Aroclor 1248	< 3.5
Aroclor 1254	< 3.5
Aroclor 1260	3.2 J
Pesticide (µg/kg)	

RMBS0005	1.5 Primary RMBS0005S01 4/29/2008
PCB (µg/kg)	
Aroclor 1242	< 3.49
Aroclor 1248	< 3.49
Aroclor 1254	< 3.49
Aroclor 1260	< 3.49
Pesticide (µg/kg)	

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

Other Organics Chemical Data Results
RMHF RFI Site
East RMHF Area

FIGURE C.3-4A

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected Other Organics Chemical Data**
- ▲ **Soil sample location with no detected Other Organics Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for Other Organics Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Res RBSL
12.05	<0.06	Exceeds Eco RBSL
12.05	<0.06	Exceeds Res RBSL + Eco RBSL

Comparison Levels

PCBs	Res RBSL (µg/kg)	Eco RBSL (µg/kg)
Aroclor 1242	140.0000	78.7201
Aroclor 1248	140.0000	11.4087
Aroclor 1254	140.0000	77.5792
Aroclor 1260	140.0000	77.5792
Pesticides	**(µg/kg)**	**(µg/kg)**
4,4'-DDD	3573.3866	12.4269
4,4'-DDE	2522.3905	12.4269
4,4'-DDT	2522.3627	12.4269

Note: (µg/kg) = micrograms per kilogram
Note: (mg/kg) = milligrams per kilogram

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for an Other Organics analyte, this indicates the analyte was not analyzed.

Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

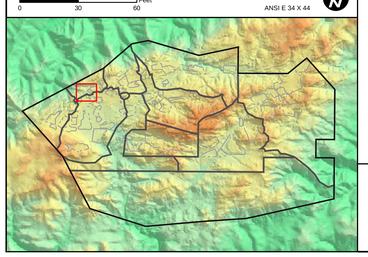
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

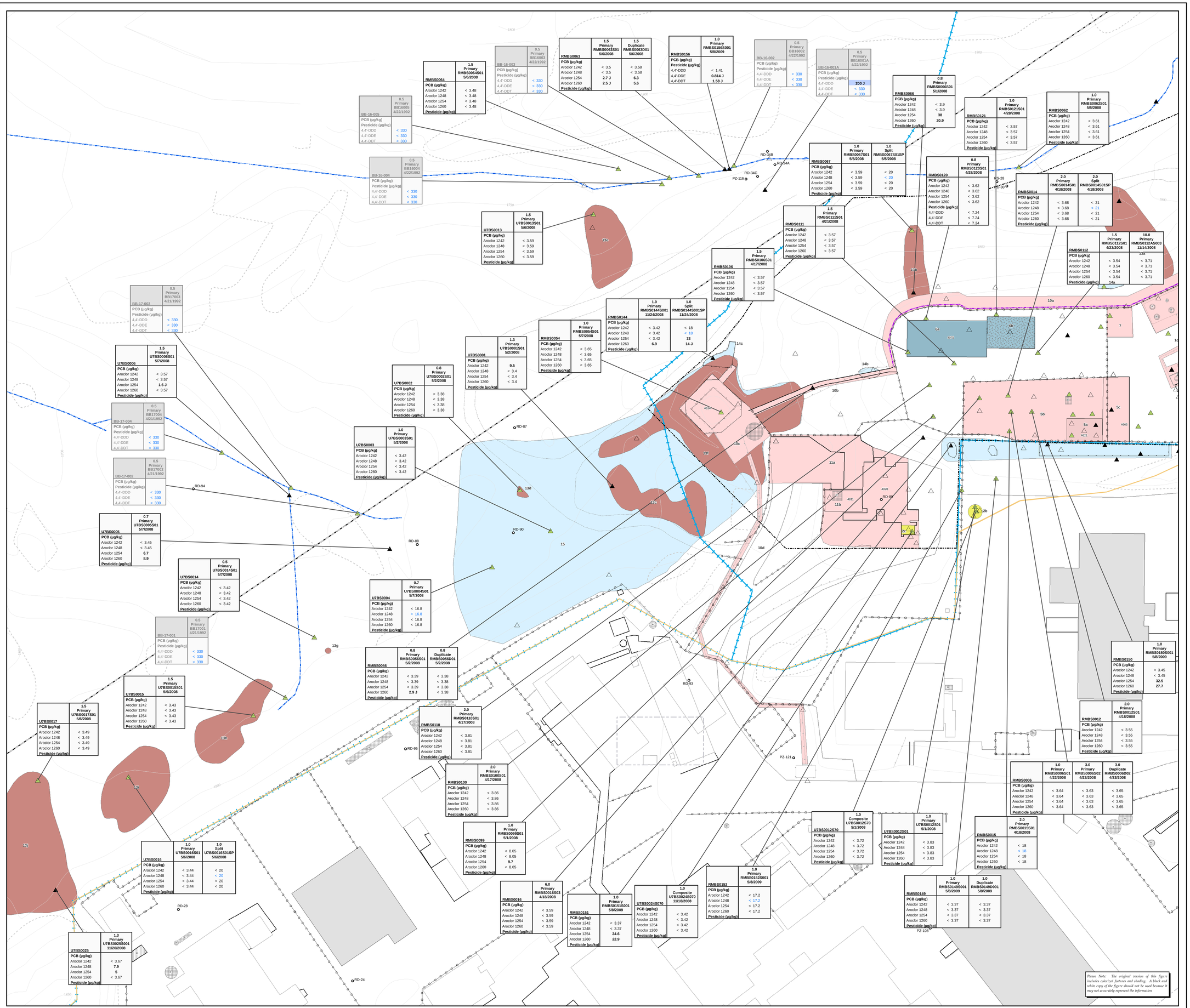
Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-OtherOrganics_West.mxd Date: Jun 10, 2009

1 inch = 30 feet
0 30 60 Feet
ANSI E 34 X 44





MWH

SANTA SUSANA FIELD LABORATORY

Other Organics Chemical Data Results
RMHF RFI Site
West RMHF Area

FIGURE C.3-4B

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected Dioxins Chemical Data**
- ▲ **Soil sample location with no detected Dioxins Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for Dioxins Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Background
12.05	<0.06	Exceeds Background + Res RBSL
12.05	<0.06	Exceeds Background + Eco RBSL
12.05	<0.06	Exceeds Background + Res RBSL + Eco RBSL

Comparison Levels

Dioxins	Background (ng/kg)	Res RBSL (ng/kg)	Eco RBSL (ng/kg)
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	13.0000	690.0000	959.0342
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.5000	690.0000	1120.7571
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.1900	690.0000	427.1057
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.3400	69.0000	45.4299
1,2,3,4,7,8-Hexachlorodibenzofuran	0.7300	69.0000	47.1490
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.9500	69.0000	105.7732
1,2,3,6,7,8-Hexachlorodibenzofuran	0.3000	69.0000	54.0000
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.1000	69.0000	43.5000
1,2,3,7,8,9-Hexachlorodibenzofuran	0.4300	69.0000	42.7106
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.1800	6.9000	4.4179
2,3,4,6,7,8-Hexachlorodibenzofuran	0.4500	69.0000	48.5195
2,3,4,7,8-Pentachlorodibenzofuran	0.6400	23.0000	16.4006
Heptachlorodibenzo-p-dioxins	-	-	-
Heptachlorodibenzofurans	-	-	-
Hexachlorodibenzofurans	-	-	-
Hexachlorodibenzofurans	-	-	-
Octachlorodibenzo-p-dioxin	140.0000	23000.0000	38659.8365
Octachlorodibenzofuran	8.1000	23000.0000	32363.0048
Pentachlorodibenzo-p-dioxins	-	-	-
Pentachlorodibenzofurans	-	-	-
TCDD TEQ (ND = 0) 2005 WHO	0.8700	6.9000	4.2711
Tetrachlorodibenzo-p-dioxins	-	-	-
Tetrachlorodibenzofurans	-	-	-

Note: (ng/kg) = nanograms per kilogram
Note: (pg/g) = picograms per gram
Note: (ng/kg) = (pg/g)

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a Dioxins analyte, this indicates the analyte was not analyzed.

Background — **Background Level**
Res RBSL — **Residential Risk-Based Screening Level**
Eco RBSL — **Ecological Risk-Based Screening Level**

Base Map Legend

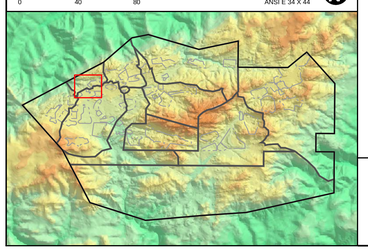
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

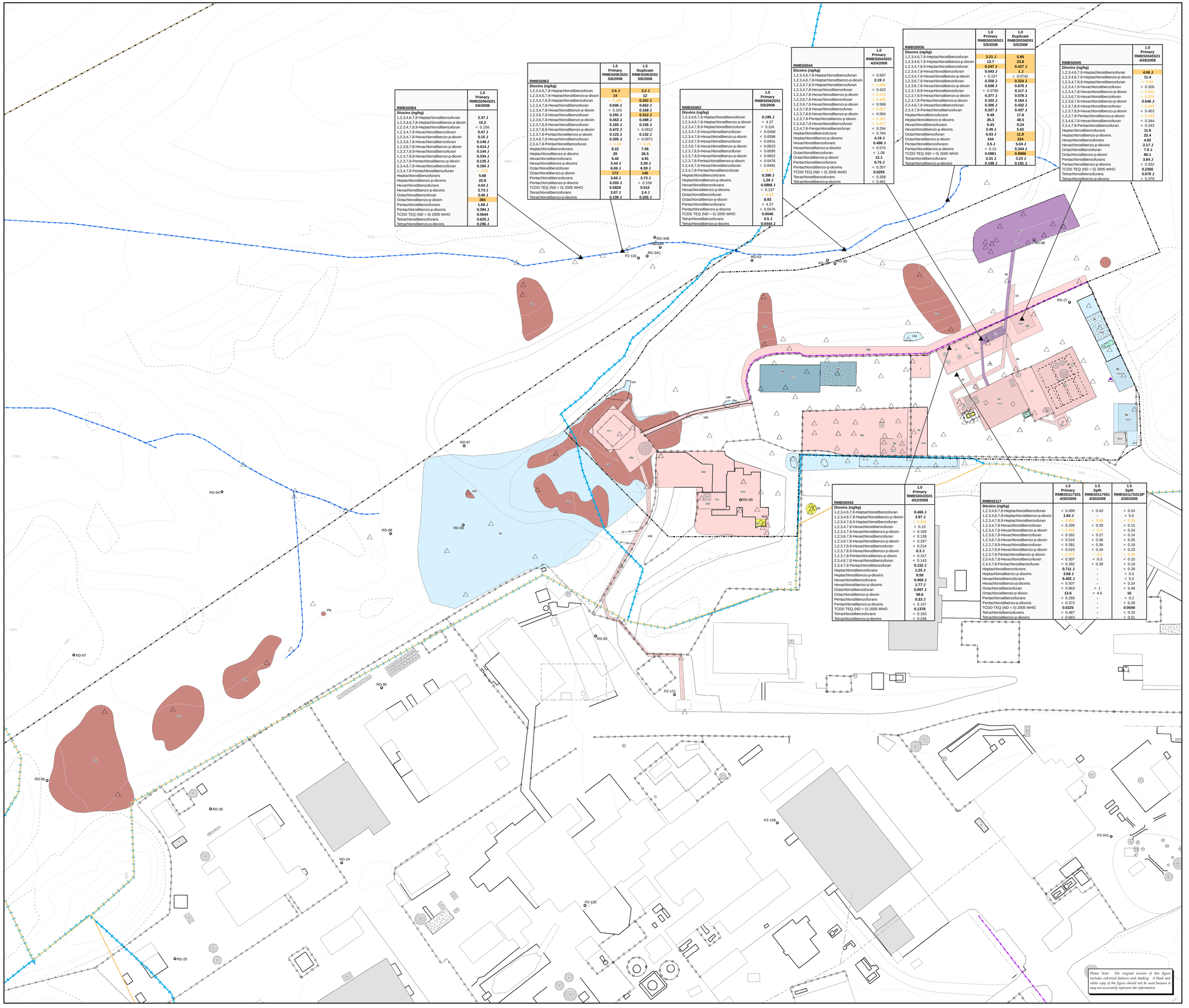
Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-Dioxin.mxd — Date: Jun 10, 2009

1 inch = 40 feet
0 — 40 — 80 Feet
ANSI E 34 X 44





RMBS0064

Dioxins (ng/kg)	1.5 Primary RMBS0064S01 5/6/2008
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.37 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	10.2
1,2,3,4,7,8,9-Heptachlorodibenzofuran	< 0.158
1,2,3,4,7,8-Hexachlorodibenzofuran	0.47 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.15 J
1,2,3,6,7,8-Hexachlorodibenzofuran	0.149 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.414 J
1,2,3,7,8,9-Hexachlorodibenzofuran	0.144 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.334 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.135 J
2,3,4,6,7,8-Hexachlorodibenzofuran	0.184 J
2,3,4,7,8-Pentachlorodibenzofuran	< 4.23
Heptachlorodibenzofurans	5.68
Heptachlorodibenzo-p-dioxins	22.8
Hexachlorodibenzofurans	4.04 J
Hexachlorodibenzo-p-dioxins	3.73 J
Octachlorodibenzofuran	3.46 J
Octachlorodibenzo-p-dioxin	394
Pentachlorodibenzofurans	1.68 J
Pentachlorodibenzo-p-dioxins	0.394 J
TCDD TEQ (ND = 0) 2005 WHO	0.5644
Tetrachlorodibenzofurans	0.625 J
Tetrachlorodibenzo-p-dioxins	0.296 J

RMBS0063

Dioxins (ng/kg)	1.5 Primary RMBS0063S01 5/6/2008	1.5 Duplicate RMBS0063D01 5/6/2008
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.6 J	3.2 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	14	12
1,2,3,4,7,8,9-Heptachlorodibenzofuran	< 0.089	0.262 J
1,2,3,4,7,8-Hexachlorodibenzofuran	0.606 J	0.662 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	< 0.103	0.168 J
1,2,3,6,7,8-Hexachlorodibenzofuran	0.291 J	0.312 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.463 J	0.498 J
1,2,3,7,8,9-Hexachlorodibenzofuran	0.165 J	0.156 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.472 J	< 0.0912
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.123 J	0.132 J
2,3,4,6,7,8-Hexachlorodibenzofuran	0.305 J	< 0.0971
2,3,4,7,8-Pentachlorodibenzofuran	< 4.34	< 4.25
Heptachlorodibenzofurans	8.22	7.56
Heptachlorodibenzo-p-dioxins	29	26.5
Hexachlorodibenzofurans	5.42	4.91
Hexachlorodibenzo-p-dioxins	3.44 J	3.39 J
Octachlorodibenzofuran	6.06 J	6.59 J
Octachlorodibenzo-p-dioxin	173	146
Pentachlorodibenzofurans	3.66 J	3.73 J
Pentachlorodibenzo-p-dioxins	0.203 J	< 0.158
TCDD TEQ (ND = 0) 2005 WHO	0.5829	0.512
Tetrachlorodibenzofurans	3.07 J	2.4 J
Tetrachlorodibenzo-p-dioxins	0.108 J	0.205 J

RMBS0062

Dioxins (ng/kg)	1.0 Primary RMBS0062S01 5/5/2008
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.195 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	< 4.27
1,2,3,4,7,8,9-Heptachlorodibenzofuran	< 0.116
1,2,3,4,7,8-Hexachlorodibenzofuran	< 0.0468
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	< 0.0598
1,2,3,6,7,8-Hexachlorodibenzofuran	< 0.0451
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	< 0.0623
1,2,3,7,8,9-Hexachlorodibenzofuran	< 0.0695
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	< 0.0652
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	< 0.0476
2,3,4,6,7,8-Hexachlorodibenzofuran	< 0.0481
2,3,4,7,8-Pentachlorodibenzofuran	< 4.27
Heptachlorodibenzofurans	0.386 J
Heptachlorodibenzo-p-dioxins	1.28 J
Hexachlorodibenzofurans	0.0888 J
Hexachlorodibenzo-p-dioxins	< 0.137
Octachlorodibenzofuran	< 0.84
Octachlorodibenzo-p-dioxin	8.93
Pentachlorodibenzofurans	< 4.27
Pentachlorodibenzo-p-dioxins	< 0.0476
TCDD TEQ (ND = 0) 2005 WHO	0.0046
Tetrachlorodibenzofurans	0.5 J
Tetrachlorodibenzo-p-dioxins	0.0444 J

RMBS0044

Dioxins (ng/kg)	1.0 Primary RMBS0044S01 4/24/2008
1,2,3,4,6,7,8-Heptachlorodibenzofuran	< 0.597
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.19 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	< 1.094
1,2,3,4,7,8-Hexachlorodibenzofuran	< 0.422
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	< 0.575
1,2,3,6,7,8-Hexachlorodibenzofuran	< 0.465
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	< 0.569
1,2,3,7,8,9-Hexachlorodibenzofuran	< 0.557
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	< 0.584
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	< 0.357
2,3,4,6,7,8-Hexachlorodibenzofuran	< 0.471
2,3,4,7,8-Pentachlorodibenzofuran	< 0.294
Heptachlorodibenzofurans	< 0.764
Heptachlorodibenzo-p-dioxins	4.19 J
Hexachlorodibenzofurans	0.498 J
Hexachlorodibenzo-p-dioxins	< 0.575
Octachlorodibenzofuran	< 1.08
Octachlorodibenzo-p-dioxin	12.1
Pentachlorodibenzofurans	0.75 J
Pentachlorodibenzo-p-dioxins	< 0.357
TCDD TEQ (ND = 0) 2005 WHO	0.0255
Tetrachlorodibenzofurans	< 0.358
Tetrachlorodibenzo-p-dioxins	< 0.461

RMBS0036

Dioxins (ng/kg)	1.0 Primary RMBS0036S01 5/5/2008	1.0 Duplicate RMBS0036D01 5/5/2008
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.21 J	5.85
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	12.7	23.8
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.247 J	0.427 J
1,2,3,4,7,8-Hexachlorodibenzofuran	0.543 J	1.3
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	< 0.107	< 0.0742
1,2,3,6,7,8-Hexachlorodibenzofuran	0.259 J	0.324 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.508 J	0.879 J
1,2,3,7,8,9-Hexachlorodibenzofuran	< 0.0795	0.117 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.377 J	0.578 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.103 J	0.164 J
2,3,4,6,7,8-Hexachlorodibenzofuran	0.306 J	0.432 J
2,3,4,7,8-Pentachlorodibenzofuran	0.337 J	0.437 J
Heptachlorodibenzofurans	9.49	17.8
Heptachlorodibenzo-p-dioxins	26.3	48.5
Hexachlorodibenzofurans	5.43	9.24
Hexachlorodibenzo-p-dioxins	3.49 J	5.62
Octachlorodibenzofuran	6.53 J	11.8
Octachlorodibenzo-p-dioxin	104	224
Pentachlorodibenzofurans	3.5 J	5.04 J
Pentachlorodibenzo-p-dioxins	< 0.13	0.344 J
TCDD TEQ (ND = 0) 2005 WHO	0.5981	0.9996
Tetrachlorodibenzofurans	2.31 J	3.23 J
Tetrachlorodibenzo-p-dioxins	0.198 J	0.191 J

RMBS0045

Dioxins (ng/kg)	1.0 Primary RMBS0045S01 4/28/2008
1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.06 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	11.4
1,2,3,4,7,8,9-Heptachlorodibenzofuran	< 0.64
1,2,3,4,7,8-Hexachlorodibenzofuran	< 0.326
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	< 0.405
1,2,3,6,7,8-Hexachlorodibenzofuran	< 0.385
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.546 J
1,2,3,7,8,9-Hexachlorodibenzofuran	< 0.648
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	< 0.453
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	< 0.332
2,3,4,6,7,8-Hexachlorodibenzofuran	< 0.344
2,3,4,7,8-Pentachlorodibenzofuran	< 0.243
Heptachlorodibenzofurans	11.9
Heptachlorodibenzo-p-dioxins	22.4
Hexachlorodibenzofurans	4.82
Hexachlorodibenzo-p-dioxins	2.17 J
Octachlorodibenzofuran	7.9 J
Octachlorodibenzo-p-dioxin	80.1
Pentachlorodibenzofurans	3.84 J
Pentachlorodibenzo-p-dioxins	< 0.332
TCDD TEQ (ND = 0) 2005 WHO	0.2356
Tetrachlorodibenzofurans	0.576 J
Tetrachlorodibenzo-p-dioxins	< 0.279

RMBS0043

Dioxins (ng/kg)	1.0 Primary RMBS0043S01 4/22/2008
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.465 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	3.97 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	< 0.316
1,2,3,4,7,8-Hexachlorodibenzofuran	< 0.13
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	< 0.199
1,2,3,6,7,8-Hexachlorodibenzofuran	< 0.138
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	< 0.197
1,2,3,7,8,9-Hexachlorodibenzofuran	< 0.214
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.3 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	< 0.157
2,3,4,6,7,8-Hexachlorodibenzofuran	< 0.143
2,3,4,7,8-Pentachlorodibenzofuran	0.152 J
Heptachlorodibenzofurans	1.25 J
Heptachlorodibenzo-p-dioxins	9.59
Hexachlorodibenzofurans	0.909 J
Hexachlorodibenzo-p-dioxins	1.77 J
Octachlorodibenzofuran	0.807 J
Octachlorodibenzo-p-dioxin	58.6
Pentachlorodibenzofurans	0.33 J
Pentachlorodibenzo-p-dioxins	< 0.157
TCDD TEQ (ND = 0) 2005 WHO	0.1378
Tetrachlorodibenzofurans	< 0.193
Tetrachlorodibenzo-p-dioxins	< 0.246

RMBS0117

Dioxins (ng/kg)	1.5 Primary RMBS0117501 4/30/2008	1.5 Split RMBS0117501 4/30/2008	1.5 Split RMBS0117501SP 4/30/2008
1,2,3,4,6,7,8-Heptachlorodibenzofuran	< 0.499	< 0.43	< 0.24
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.84 J	-	< 5.5
1,2,3,4,7,8,9-Heptachlorodibenzofuran	< 0.955	< 0.58	< 0.33
1,2,3,4,7,8-Hexachlorodibenzofuran	< 0.299	< 0.29	< 0.15
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	< 0.491	< 0.4	< 0.24
1,2,3,6,7,8-Hexachlorodibenzofuran	< 0.291	< 0.27	< 0.14
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	< 0.516	< 0.36	< 0.26
1,2,3,7,8,9-Hexachlorodibenzofuran	< 0.381	< 0.36	< 0.18
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	< 0.515	< 0.34	< 0.23
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	< 0.372	< 0.5	< 0.28
2,3,4,6,7,8-Hexachlorodibenzofuran	< 0.307	< 0.3	< 0.15
2,3,4,7,8-Pentachlorodibenzofuran	< 0.282	< 0.39	< 0.19
Heptachlorodibenzofurans	0.711 J	-	< 0.28
Heptachlorodibenzo-p-dioxins	3.68 J	-	< 5.5
Hexachlorodibenzofurans	0.402 J	-	< 5.5
Hexachlorodibenzo-p-dioxins	< 0.507	-	< 0.24
Octachlorodibenzofuran	< 0.963	< 1	< 0.49
Octachlorodibenzo-p-dioxin	13.6	< 4.5	16
Pentachlorodibenzofurans	< 0.269	-	< 0.2
Pentachlorodibenzo-p-dioxins	< 0.372	-	< 0.28
TCDD TEQ (ND = 0) 2005 WHO	0.0225	-	0.0048
Tetrachlorodibenzofurans	< 0.487	-	< 0.33
Tetrachlorodibenzo-p-dioxins	< 0.663	-	< 0.51

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

Dioxin Chemical Data Results
RMHF RFI Site

FIGURE C.3-5

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample location with no detected Metals/pH/Inorganics Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Background
12.05	<0.06	Exceeds Background + Res RBSL
12.05	<0.06	Exceeds Background + Eco RBSL
12.05	<0.06	Exceeds Background + Res RBSL + Eco RBSL

Comparison Levels

Metals	Background (mg/kg)	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
Aluminum	20,000	75,000	12.0000
Antimony	8.7000	30.0000	0.0949
Arsenic	15.0000	0.0950	1.9180
Barium	140.0000	15000.0000	14.6026
Beryllium	1.1000	150.3254	5.0873
Boron	9.7000	15000.0000	6.7600
Cadmium	1.0000	77.8248	0.0208
Chromium	36.8000	114000.0000	930.0000
Cobalt	21.0000	22.7763	8.9498
Copper	29.0000	3000.0000	1.0886
Hexavalent Chromium	0.0000	110.0000	0.2000
Iron	-	-	-
Lead	34.0000	150.0000	0.0632
Lithium	37.0000	152.2000	10.0000
Mercury	0.0900	23.0000	0.1000
Molybdenum	5.3000	380.0000	0.1073
Nickel	29.0000	1500.0000	0.1020
Phosphate	-	-	-
Potassium	6,400.0000	-	-
Selenium	0.6550	380.4156	0.1738
Silver	0.7900	380.4197	0.5397
Sodium	110.0000	-	-
Thallium	0.4600	4.9455	2.8798
Vanadium	62.0000	369.1094	1.5000
Zinc	110.0000	23000.0000	20.7553
Zirconium	8.6000	0.0000	7.4316
Inorganics			
Chloride	-	-	-
Cyanide	-	1,500.0000	290.0000
Fluoride	6.7000	4600.0000	0.0000
Nitrate-N	-	-	-
Sulfate	-	-	-
pH			
pH	-	-	-

Note: (mg/kg) = milligrams per kilogram Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a Metal/pH/Inorganic analyte, this indicates the analyte was not analyzed.

Background — **Background Level**
Res RBSL — **Residential Risk-Based Screening Level**
Eco RBSL — **Ecological Risk-Based Screening Level**

Base Map Legend

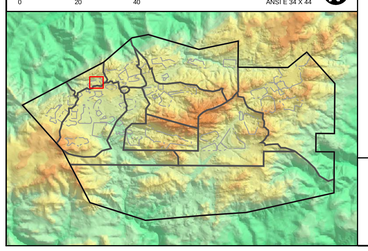
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-Metals_East.mxd Date: Jun 10, 2009

1 inch = 20 feet
0 20 40 Feet
ANSI E 34 X 44



RMBS0107	1.0 Primary RMBS0107S01 4/22/2008
Metals (mg/kg)	
Aluminum	13000
Antimony	< 1.62
Arsenic	2.8
Barium	85.5 J
Beryllium	0.55
Boron	1.2 J
Cadmium	0.068 J
Chromium	11.2 J
Cobalt	4
Copper	4.4
Lead	4.8
Lithium	19.2 J
Mercury	0.0059 J
Molybdenum	0.41
Nickel	6.8
Potassium	2320 J
Selenium	< 0.523
Silver	< 0.0419
Sodium	< 96.7
Thallium	0.24
Vanadium	20.7 J
Zinc	51
Zirconium	1.8
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.8

RMBS0065	1.0 Primary RMBS0065S01 4/25/2008
Metals (mg/kg)	
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.43

RMBS0108	1.5 Primary RMBS0108S01 4/22/2008
Metals (mg/kg)	
Aluminum	8080
Antimony	< 0.611
Arsenic	3
Barium	65.5 J
Beryllium	0.37
Boron	< 1.06
Cadmium	0.081 J
Chromium	11.1 J
Cobalt	4
Copper	4.3
Lead	3.2
Lithium	24.7 J
Mercury	< 0.0016
Molybdenum	0.29
Nickel	5.9
Potassium	2540 J
Selenium	< 0.537
Silver	< 0.043
Sodium	< 141
Thallium	< 0.22
Vanadium	20.9 J
Zinc	56.3
Zirconium	1.4
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.5

RMBS0044	1.0 Primary RMBS0044S01 4/24/2008
Metals (mg/kg)	
Aluminum	7020
Antimony	< 0.336
Arsenic	2.3
Barium	71.5
Beryllium	0.36 J
Boron	< 1.08
Cadmium	0.16 J
Chromium	9
Cobalt	3.9
Copper	5
Hexavalent Chromium	< 0.108
Lead	3.6
Lithium	20.9 J
Mercury	0.017
Molybdenum	0.23
Nickel	5.3
Potassium	3200
Selenium	< 0.517
Silver	< 0.0414
Sodium	< 259
Thallium	< 0.23
Vanadium	17.6
Zinc	52.4
Zirconium	0.93
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.51

RMBS0143	3.0 Primary RMBS0143S01 11/19/2008
Metals (mg/kg)	
Aluminum	8490
Antimony	< 1.1
Arsenic	1.8
Barium	75.6
Beryllium	0.24 J
Boron	2.3 J
Cadmium	0.074 J
Chromium	8 J
Cobalt	3.9
Copper	5.6 J
Hexavalent Chromium	< 0.037
Lead	2.7 J
Lithium	18.1 J
Mercury	< 0.0041
Molybdenum	0.34 J
Nickel	5.6 J
Potassium	2670
Selenium	< 0.526
Silver	< 0.0421
Sodium	137 J
Thallium	0.19 J
Vanadium	20.3
Zinc	42.6 J
Zirconium	0.9
Inorganics (mg/kg)	
Inorganics (pH Units)	

RMBS0142	3.5 Primary RMBS0142S001 11/19/2008
Metals (mg/kg)	
Aluminum	8010
Antimony	< 1.1
Arsenic	2.9
Barium	60.1
Beryllium	0.22 J
Boron	2.4 J
Cadmium	0.038 J
Chromium	11.2 J
Cobalt	2.9
Copper	5 J
Hexavalent Chromium	< 0.0281
Lead	4.1 J
Lithium	17.5 J
Mercury	0.011 J
Molybdenum	0.36 J
Nickel	5.7 J
Potassium	2550
Selenium	< 0.526
Silver	< 0.0421
Sodium	131 J
Thallium	0.22
Vanadium	24.2
Zinc	42.9 J
Zirconium	1.5
Inorganics (mg/kg)	
Inorganics (pH Units)	

RMBS0101	1.5 Primary RMBS0101S01 4/22/2008
Metals (mg/kg)	
Aluminum	8590
Antimony	< 0.376
Arsenic	3.5
Barium	27.1 J
Beryllium	0.32
Boron	< 1.05
Cadmium	0.038 J
Chromium	10.5 J
Cobalt	2.1
Copper	3.8
Lead	3.3
Lithium	8.8 J
Mercury	0.0052 J
Molybdenum	0.2
Nickel	4.2
Potassium	1230 J
Selenium	< 0.545
Silver	< 0.0436
Sodium	< 130
Thallium	< 0.218
Vanadium	19.4 J
Zinc	38.4
Zirconium	1.2
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8

RMBS0045	1.0 Primary RMBS0045S01 4/24/2008
Metals (mg/kg)	
Aluminum	7130
Antimony	0.347 J
Arsenic	1.81
Barium	91.9
Beryllium	0.243
Boron	6.88
Cadmium	0.142 J
Chromium	7.37
Cobalt	4.66 J
Copper	6.4 J
Hexavalent Chromium	< 0.0213
Lead	4.66
Lithium	14.9 J
Mercury	0.0047 J
Molybdenum	0.157
Nickel	4.72 J
Potassium	2580 J
Selenium	< 0.524
Silver	< 0.0419
Sodium	< 107
Thallium	< 0.21
Vanadium	16.2
Zinc	58.6 J
Zirconium	0.851
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	9.66

RMBS0113	1.0 Primary RMBS0113S01 4/24/2008
Metals (mg/kg)	
Aluminum	8710
Antimony	< 0.327
Arsenic	3.2
Barium	66.7
Beryllium	0.57
Boron	1.1 J
Cadmium	0.14 J
Chromium	15.8
Cobalt	4.5
Copper	7.8
Hexavalent Chromium	< 0.0214
Lead	4.3
Lithium	27 J
Mercury	< 0.0016
Molybdenum	0.28
Nickel	8.6
Potassium	3530
Selenium	< 0.53
Silver	< 0.0424
Sodium	< 266
Thallium	< 0.22
Vanadium	27.4
Zinc	59.4
Zirconium	1.3
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.14

RMBS0109	0.8 Primary RMBS0109S01 4/24/2008
Metals (mg/kg)	
Aluminum	7330
Antimony	1.8 J
Arsenic	2.9
Barium	70.6
Beryllium	0.44 J
Boron	< 1.05
Cadmium	0.16 J
Chromium	9.5
Cobalt	3.6 J
Copper	6.1
Lead	13.9 J
Lithium	18.8 J
Mercury	0.0099 J
Molybdenum	0.49
Nickel	5.8 J
Potassium	2550
Selenium	< 0.524
Silver	< 0.0419
Sodium	< 702
Thallium	< 0.209
Vanadium	18.6
Zinc	65.3
Zirconium	1.5 J
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.97

RMBS0118	0.8 Primary RMBS0118S01 4/30/2008	0.8 Split RMBS0118S01 4/30/2008
Metals (mg/kg)		
Aluminum	7410	-
Antimony	< 0.322	0.779
Arsenic	2.3	3.41
Barium	67.2	71.9
Beryllium	0.34 J	< 0.04
Boron	1.5 J	-
Cadmium	0.15 J	1.14
Chromium	9.1	11.9
Cobalt	4.1	5.81
Copper	7.4	5.98
Lead	9.3	6.41
Lithium	18.5	-
Mercury	0.0036 J	< 0.01
Molybdenum	0.29	0.707
Nickel	6	8.01
Potassium	2410	-
Selenium	< 0.535	< 0.2
Silver	< 0.0428	< 0.05
Sodium	< 268	-
Thallium	< 0.214	< 0.15
Vanadium	19	26.6
Zinc	49.3	57.6
Zirconium	1.3	-
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.35	9.08

RMBS0050	1.5 Primary RMBS0050S01 4/24/2008
Metals (mg/kg)	
Aluminum	8530
Antimony	< 0.321
Arsenic	2.9
Barium	73.1
Beryllium	0.45 J
Boron	< 1.04
Cadmium	0.17 J
Chromium	11.3
Cobalt	7.4
Copper	6.1
Lead	3.9
Lithium	23.6 J
Mercury	< 0.0016
Molybdenum	0.19
Nickel	6.7
Potassium	3260
Selenium	< 0.523
Silver	< 0.0418
Sodium	< 261
Thallium	< 0.22
Vanadium	20.9
Zinc	53.6
Zirconium	1
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.59

RMBS0092	1.0 Primary RMBS0092S01 4/24/2008
Metals (mg/kg)	
Aluminum	6570
Antimony	< 0.337
Arsenic	1.4
Barium	78.3
Beryllium	0.29 J
Boron	< 1.09
Cadmium	0.18 J
Chromium	9.9
Cobalt	4.2
Copper	8
Lead	2.6
Lithium	10.5 J
Mercury	0.041 J
Molybdenum	0.29 J
Nickel	6.2
Potassium	1850
Selenium	< 0.525
Silver	< 0.042
Sodium	223 J
Thallium	< 0.21
Vanadium	20.3
Zinc	35.3
Zirconium	1.4 J
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.35

RMBS0091	1.0 Primary RMBS0091S01 4/28/2008
Metals (mg/kg)	
Aluminum	7550
Antimony	< 0.321
Arsenic	3.44
Barium	67.2
Beryllium	0.262
Boron	1.08 J
Cadmium	0.215
Chromium	9.54
Cobalt	4.96 J
Copper	5.3 J
Lead	4.09
Lithium	18.1 J
Mercury	0.004 J
Molybdenum	0.185
Nickel	5.33 J
Potassium	2700 J
Selenium	< 0.513
Silver	< 0.041
Sodium	< 88.3
Thallium	0.269
Vanadium	15.6
Zinc	57.1 J
Zirconium	0.93
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.63

RMBS0047	1.0 Primary RMBS0047S01 4/24/2008
Metals (mg/kg)	
Aluminum	9610
Antimony	< 1.63
Arsenic	2.5
Barium	82.7
Beryllium	0.52 J
Boron	< 1.05
Cadmium	0.16 J
Chromium	10.8
Cobalt	5.6
Copper	7.3
Lead	5.2
Lithium	26 J
Mercury	0.0054 J
Molybdenum	0.2
Nickel	7.3
Potassium	3880
Selenium	< 0.544
Silver	< 0.0435
Sodium	< 272
Thallium	0.28
Vanadium	21
Zinc	66.9
Zirconium	0.64
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.5

RMBS0127	1.0 Primary RMBS0127S01 4/28/2008
Metals (mg/kg)	
Aluminum	7310
Antimony	< 0.319
Arsenic	2
Barium	93.7
Beryllium	0.229
Boron	1.32 J
Cadmium	0.15 J
Chromium	8.59
Cobalt	13.7 J
Copper	10.7 J
Lead	5.27
Lithium	11.5 J
Mercury	0.0162
Molybdenum	0.25
Nickel	6.33 J
Potassium	2810 J
Selenium	< 0.516
Silver	< 0.0413
Sodium	286
Thallium	< 0.21
Vanadium	17.4
Zinc	42.9 J
Zirconium	1.25
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.84

RMBS0046	1.0 Primary RMBS0046S01 4/24/2008
Metals (mg/kg)	
Aluminum	8150
Antimony	< 0.322
Arsenic	3.1
Barium	93.5
Beryllium	0.53
Boron	< 1.04
Cadmium	0.19 J
Chromium	11.7
Cobalt	4.9
Copper	7.8
Lead	4.3
Lithium	25.9 J
Mercury	< 0.0016
Molybdenum	0.24
Nickel	8.2
Potassium	3750
Selenium	< 0.527
Silver	< 0.0422
Sodium	< 264
Thallium	0.29
Vanadium	25.1
Zinc	72
Zirconium	0.95
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.19

RMBS0048	1.0 Primary RMBS0048S01 4/28/2008
Metals (mg/kg)	
Aluminum	6710
Antimony	< 0.321
Arsenic	8.86
Barium	73.7
Beryllium	0.311
Boron	6.68
Cadmium	0.41
Chromium	18
Cobalt	5.77 J
Copper	14.2 J
Lead	26.4
Lithium	17.9 J
Mercury	0.0193
Molybdenum	0.881
Nickel	12.8 J
Potassium	2340 J
Selenium	< 0.53
Silver	0.0583 J
Sodium	620
Thallium	< 0.224
Vanadium	34.2
Zinc	111 J
Zirconium	1.68
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	9.42

RMBS0137	1.0 Primary RMBS0137S001 11/17/2008
Metals (mg/kg)	
Sodium	103
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.52

RMBS0049	1.5 Primary RMBS0049S01 4/25/2008	1.5 Duplicate RMBS0049D01 4/25/2008
Metals (mg/kg)		
Aluminum	9690	8230
Antimony	< 0.335	0.55 J
Arsenic	3 J	3.3 J
Barium	78	114
Beryllium	0.48 J	0.46 J
Boron	< 1.08	1.1 J
Cadmium	0.18 J	0.29
Chromium	15.4 J	13.2 J
Cobalt	5	5.1
Copper	8.5	8.9
Lead	4.4	4.9
Lithium	24.5	11.4
Mercury	0.003 J	0.0028 J
Molybdenum	0.26 J	0.91 J
Nickel	9.6	9.1
Potassium	2720	2360
Selenium	< 0.538	< 0.528
Silver	< 0.043	0.046 J
Sodium	< 269	< 264
Thallium	< 0.22	< 0.211
Vanadium	25.4 J	24.5 J
Zinc	52.3	38
Zirconium	1.8	6
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.28	8.2

RMBS0018	1.5 Primary RMBS0018S01 4/25/2008
Metals (mg/kg)	
Aluminum	19600
Antimony	< 0.347
Arsenic	4.2 J
Barium	44
Beryllium	0.42 J
Boron	1.2 J
Cadmium	0.084 J
Chromium	14.7 J
Cobalt	2.3
Copper	2.8
Lead	6.9
Lithium	32.8
Mercury	0.036
Molybdenum	0.92 J
Nickel	4.4
Potassium	1930
Selenium	< 0.557
Silver	0.077 J
Sodium	< 89.1
Thallium	< 0.223
Vanadium	29.6 J
Zinc	34.1
Zirconium	1.9
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	6

RMBS0097	1.0 Primary RMBS0097S01 4/29/2008
Metals (mg/kg)	
Aluminum	9890
Antimony	< 0.323
Arsenic	4.1
Barium	84.1
Beryllium	0.51
Boron	< 1.04
Cadmium	0.067 J
Chromium	16.9
Cobalt	4.1
Copper	8.7
Lead	5.5
Lithium	20
Mercury	< 0.01
Molybdenum	0.26
Nickel	8.7
Potassium	2220
Selenium	< 0.51
Silver	< 0.0408
Sodium	111
Thallium	< 0.21
Vanadium	36.7
Zinc	53.6
Zirconium	2.2
Inorganics (mg/kg)	
Inorganics (pH Units)	

RMBS0124	1.0 Primary RMBS0124S01 4/25/2008
Metals (mg/kg)	
Aluminum	10400
Antimony	< 0.322
Arsenic	3.6 J
Barium	76.1
Beryllium	0.52 J
Boron	< 1.04
Cadmium	0.17 J
Chromium	18.5 J
Cobalt	5.5
Copper	10.4
Lead	5
Lithium	23.3
Mercury	0.0032 J
Molybdenum	0.4 J
Nickel	11.3
Potassium	2460
Selenium	< 0.541
Silver	< 0.0433
Sodium	< 271
Thallium	< 0.23
Vanadium	29.4 J
Zinc	47.9
Zirconium	2.2
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.25

RMBS0126	1.0 Primary RMBS0126S01 4/29/2008
Metals (mg/kg)	
Aluminum	6420
Antimony	< 0.338
Arsenic	4.1
Barium	132
Beryllium	0.22
Boron	< 1.09
Cadmium	0.56
Chromium	13.5
Cobalt	6.3
Copper	13.4
Hexavalent Chromium	< 0.022
Lead	3.4
Lithium	6.2
Mercury	0.061
Molybdenum	0.34
Nickel	10.1
Potassium	2000
Selenium	< 0.535
Silver	< 0.0428
Sodium	202
Thallium	< 0.214
Vanadium	35.2
Zinc	241
Zirconium	14.2
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.2

RMBS0119	1.5 Primary RMBS0119S01 4/30/2008	1.5 Split RMBS0119S01 4/30/2008
Metals (mg/kg)		
Aluminum	10100	-
Antimony	< 0.328	0.531
Arsenic	2.2	2
Barium	71.1	51.8
Beryllium	0.52 J	< 0.04
Boron	1.8 J	-
Cadmium	0.12 J	0.778
Chromium	10.7	6.82
Cobalt	3.8	3.91
Copper	5	5.56
Lead	4.2	4.82
Lithium	18.2	-
Mercury	0.0042 J	< 0.01
Molybdenum	0.47	1.55
Nickel	7	5.73
Potassium	1990	-
Selenium	< 0.526	< 0.2
Silver	< 0.0421	< 0.05
Sodium	< 263	-
Thallium	< 0.211	< 0.15
Vanadium	18.1	17.3
Zinc	38.9	30.8
Zirconium	1.4	-
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	7.76	8.9

RMBS0019	1.8 Primary RMBS0019S01 4/25/2008	1.8 Duplicate RMBS0019D01 4/25/2008	4.0 Primary RMBS0019S02 4/25/2008
Metals (mg/kg)			
Aluminum	12800	18700	-
Antimony	< 0.352	< 0.364	-
Arsenic	1.5 J	10.1 J	-
Barium	45.2	54.7	-
Beryllium	0.37	1.1	-
Boron	< 1.13	< 1.17	-
Cadmium	0.12 J	0.17 J	-
Chromium	9.8 J	16.8 J	-
Cobalt	1.8	4.8	-
Copper	2.4	5.4	-
Lead	4.6	8.8	-
Lithium	14.4	19.9	-
Mercury	0.0064 J	0.0018 J	-
Molybdenum	0.19 J	0.8 J	-
Nickel	3.2	7.1	-
Potassium	1060	1850	-
Selenium	< 0.56	< 0.603	-
Silver	0.051 J	0.053 J	-
Sodium	< 104	< 301	216
Thallium	< 0.224	< 0.241	-
Vanadium	16.1 J	39 J	-
Zinc	26.2	39.5	-
Zirconium	1.3	2.7	-
Inorganics (mg/kg)			
Inorganics (pH Units)			
pH	7.41	7.42	7.7

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

Metals / pH / Inorganics Chemical Data Results
RMHF RFI Site
East RMHF Area

FIGURE C.3-6A

Soil Sample Location Symbol Legend

- ▲ Soil sample location with detected Metals/pH/Inorganics Chemical Data
- ▲ Soil sample location with no detected Metals/pH/Inorganics Chemical Data
- △ Contained unit soil sample
- △ Refused sample (refusal depth < 1' below ground surface)
- △ Soil sample not analyzed for Metals/pH/Inorganics Chemical Data
- ▲ Soil sample not analyzed by any sample method

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Background
12.05	<0.06	Exceeds Background + Res RBSL
12.05	<0.06	Exceeds Background + Eco RBSL
12.05	<0.06	Exceeds Background + Res RBSL + Eco RBSL

Comparison Levels

Metals	Background (mg/kg)	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
Aluminum	20,000	75,000	12.0000
Antimony	8.7000	30.0000	0.0949
Arsenic	15.0000	0.0950	1.9180
Barium	140.0000	15000.0000	14.6026
Beryllium	1.1000	150.3254	5.0873
Boron	9.7000	15000.0000	6.7600
Cadmium	1.0000	77.8248	0.0208
Chromium	36.8000	114000.0000	930.0000
Cobalt	21.0000	22.7763	8.9498
Copper	29.0000	3000.0000	1.0886
Hexavalent Chromium	0.0000	110.0000	0.2000
Iron	-	-	-
Lead	34.0000	150.0000	0.0632
Lithium	37.0000	152.2000	10.0000
Mercury	0.0900	23.0000	0.1000
Molybdenum	5.3000	380.0000	0.1073
Nickel	29.0000	1500.0000	0.1020
Phosphate		-	-
Potassium	6,400.0000	-	-
Selenium	0.6550	380.4156	0.1738
Silver	0.7900	380.4197	0.5397
Sodium	110.0000	-	-
Thallium	0.4600	4.9455	2.8798
Vanadium	62.0000	369.1094	1.5000
Zinc	110.0000	23000.0000	20.7553
Zirconium	8.6000	0.0000	7.4316
Inorganics			
Chloride	-	-	-
Cyanide	-	1,500.0000	290.0000
Fluoride	6.7000	4600.0000	0.0000
Nitrate-N	-	-	-
Sulfate	-	-	-
pH			
pH	-	-	-

Note: (mg/kg) = milligrams per kilogram

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a Metal/pH/Inorganic analyte, this indicates the analyte was not analyzed.

Background Background Level
Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

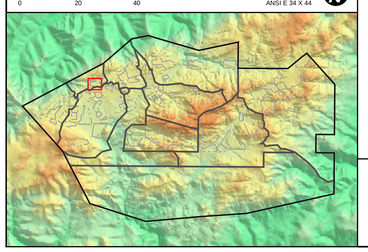
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

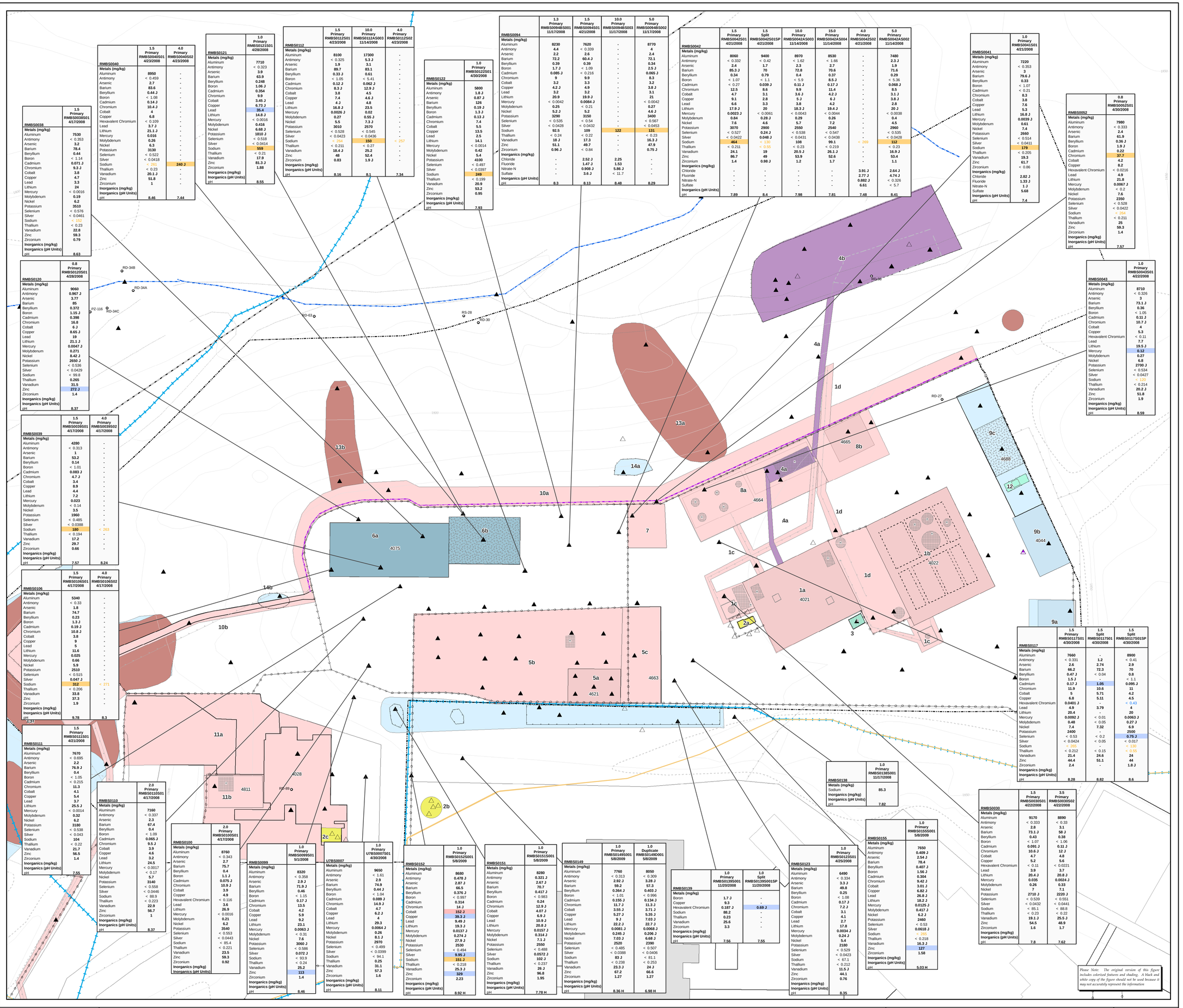
Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-Metals_West.mxd Date: Jun 10, 2009

1 inch = 20 feet
0 20 40 Feet
ANSI E 34 X 44





RMBS0040	1.5 Primary RMBS0040S01 4/23/2008	4.0 Primary RMBS0040S02 4/23/2008
Metals (mg/kg)		
Aluminum	8950	-
Antimony	< 0.459	-
Arsenic	2.7	-
Barium	83.6	-
Beryllium	0.44 J	-
Boron	< 1.08	-
Cadmium	0.14 J	-
Chromium	10.4 J	-
Cobalt	4	-
Copper	6.8	-
Hexavalent Chromium	< 0.109	-
Lead	3.7 J	-
Lithium	21.1 J	-
Mercury	0.016	-
Molybdenum	0.26	-
Nickel	6.3	-
Potassium	3130	-
Selenium	< 0.522	-
Silver	< 0.0418	-
Sodium	< 261	240 J
Thallium	< 0.23	-
Vanadium	20.1 J	-
Zinc	51.8	-
Zirconium	1	-
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.46	7.44

RMBS0121	1.0 Primary RMBS0121S01 4/28/2008
Metals (mg/kg)	
Aluminum	7710
Antimony	< 0.323
Arsenic	3.9
Barium	63.9
Beryllium	0.248
Boron	1.06 J
Cadmium	0.354
Chromium	9.9
Cobalt	3.45 J
Copper	6.73 J
Lead	35.4
Lithium	14.8 J
Mercury	< 0.0016
Molybdenum	0.416
Nickel	6.68 J
Potassium	1810 J
Selenium	< 0.518
Silver	< 0.0414
Sodium	559
Thallium	< 0.21
Vanadium	17.9
Zinc	81.3 J
Zirconium	1.88
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.55

RMBS0112	1.5 Primary RMBS0112S01 4/23/2008	10.0 Primary RMBS0112A S003 11/14/2008	4.0 Primary RMBS0112S02 4/23/2008
Metals (mg/kg)			
Aluminum	8100	17300	-
Antimony	< 0.325	5.3 J	-
Arsenic	1.9	3.1	-
Barium	89.7	83.1	-
Beryllium	0.33 J	0.61	-
Boron	< 1.05	< 5.41	-
Cadmium	0.12 J	0.062 J	-
Chromium	8.3 J	12.9 J	-
Cobalt	3.8	4.5	-
Copper	7.4	4.6 J	-
Lead	4 J	4.8	-
Lithium	16.8 J	23.5	-
Mercury	0.0026 J	0.02	-
Molybdenum	0.27	0.55 J	-
Nickel	5.5	7.3 J	-
Potassium	3010	2570	-
Selenium	< 0.528	< 0.545	-
Silver	< 0.0423	< 0.0436	-
Sodium	< 264	150	< 257
Thallium	< 0.211	< 0.27	-
Vanadium	18.4 J	25.2	-
Zinc	48	52.4	-
Zirconium	0.83	1.9 J	-
Inorganics (mg/kg)			
Inorganics (pH Units)			
pH	8.16	8.1	7.34

RMBS0122	1.0 Primary RMBS0122S01 4/30/2008
Metals (mg/kg)	
Aluminum	5800
Antimony	1.8 J
Arsenic	0.87 J
Barium	126
Beryllium	0.19 J
Boron	1.3 J
Cadmium	0.13 J
Chromium	7.4
Cobalt	5.5
Copper	13.5
Lead	2.5
Lithium	14.1
Mercury	< 0.0014
Molybdenum	0.42
Nickel	5.4
Potassium	4100
Selenium	< 0.497
Silver	< 0.0397
Sodium	249
Thallium	< 0.199
Vanadium	20.9
Zinc	53.2
Zirconium	0.95
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.93

RMBS0094	1.3 Primary RMBS0094BS001 11/17/2008	1.5 Primary RMBS0094S01 4/21/2008	10.0 Primary RMBS0094BS003 11/17/2008	5.0 Primary RMBS0094BS002 11/17/2008
Metals (mg/kg)				
Aluminum	8230	7620	-	8770
Antimony	4.4	< 0.339	-	4
Arsenic	2.2	2.6	-	2.4
Barium	72.2	60.4 J	-	72.1
Beryllium	0.39	0.39	-	0.34
Boron	1.7 J	< 1.09	-	2.5 J
Cadmium	0.085 J	< 0.216	-	0.065 J
Chromium	9	9.9	-	8.3
Cobalt	3.2	3.3	-	3.2
Copper	4.2 J	4.9	-	3.8 J
Lead	3.2	3.2	-	3.1
Lithium	20.9	19.9 J	-	21
Mercury	< 0.0042	0.0084 J	-	< 0.0042
Molybdenum	0.25	< 0.21	-	0.27
Nickel	5.2 J	5.2	-	4.6 J
Potassium	3290	3150	-	3400
Selenium	< 0.535	< 0.54	-	< 0.567
Silver	< 0.0428	< 0.0432	-	< 0.0453
Sodium	92.5	109	122	131
Thallium	< 0.24	< 0.22	-	< 0.23
Vanadium	18 J	17.3	-	16.3 J
Zinc	51.1	49.7	-	47.9
Zirconium	0.96 J	< 0.84	-	0.75 J
Inorganics (mg/kg)				
Chloride	-	2.52 J	2.25	-
Fluoride	-	1.47 J	1.53	-
Nitrate-N	-	0.908 J	5.86 J	-
Sulfate	-	3.6 J	< 11.7	-
Inorganics (pH Units)				
pH	8.3	8.13	8.48	8.29

RMBS0042	1.5 Primary RMBS0042S01 4/21/2008	1.5 Split RMBS0042S01SP 4/21/2008	10.0 Primary RMBS0042AS003 11/14/2008	15.0 Primary RMBS0042AS004 11/14/2008	4.0 Primary RMBS0042S02 4/21/2008	5.0 Primary RMBS0042AS002 11/14/2008
Metals (mg/kg)						
Aluminum	8060	9400	8970	8530	-	7480
Antimony	< 0.332	< 0.42	< 1.62	< 1.66	-	2.3 J
Arsenic	2.4	1.7	2.3	2.7	-	1.9
Barium	85.3 J	70	72.8	70.6	-	71.6
Beryllium	0.34	0.79	0.4	0.37	-	0.29
Boron	< 1.07	< 1.1	< 5.9	8.5 J	-	< 5.36
Cadmium	< 0.27	0.039 J	0.11 J	0.17 J	-	0.068 J
Chromium	12.5	8.6	9.9	11.4	-	8.5
Cobalt	4.7	3.1	3.6 J	4.2 J	-	3.1 J
Copper	9.1	2.8	5 J	6 J	-	3.8 J
Lead	6.6	3.3	3.8	4.2	-	2.8
Lithium	17.9 J	20	18.3 J	19.4 J	-	20 J
Mercury	0.0023 J	< 0.0061	< 0.0043	< 0.0044	-	< 0.0038
Molybdenum	0.84	0.28 J	0.29	0.26	-	0.4
Nickel	7.6	4.6	5.7	7.2	-	4.5
Potassium	3070	2900	2550	2540	-	2960
Selenium	< 0.527	0.24 J	< 0.538	< 0.547	-	< 0.535
Silver	< 0.0422	0.048 J	< 0.0431	< 0.0438	-	< 0.0428
Sodium	464	< 130	108	99.1	< 269	112
Thallium	< 0.211	< 0.55	< 0.23	< 0.219	-	< 0.23
Vanadium	24.1	19	20.5 J	26.1 J	-	16.9 J
Zinc	86.7	49	53.9	52.6	-	53.4
Zirconium	1.4	0.88 J	1.2	1.7	-	1.1
Inorganics (mg/kg)						
Chloride	-	-	-	-	3.91 J	2.64 J
Fluoride	-	-	-	-	2.77 J	4.74 J
Nitrate-N	-	-	-	-	0.882 J	< 0.326
Sulfate	-	-	-	-	6.61	< 5.7
Inorganics (pH Units)						
pH	7.89	8.4	7.98	7.81	7.48	8.41

RMBS0041	1.0 Primary RMBS0041S01 4/21/2008
Metals (mg/kg)	
Aluminum	7220
Antimony	< 0.353
Arsenic	3
Barium	79.6 J
Beryllium	0.33
Boron	< 1.07
Cadmium	< 0.21
Chromium	8.3
Cobalt	3.8
Copper	7.6
Lead	5.3
Lithium	16.8 J
Mercury	0.0039 J
Molybdenum	0.61
Nickel	7.4
Potassium	2660
Selenium	< 0.514
Silver	< 0.0411
Sodium	179
Thallium	< 0.205
Vanadium	19.3
Zinc	61.7
Zirconium	< 0.86
Inorganics (mg/kg)	
Chloride	2.82 J
Fluoride	1.33 J
Nitrate-N	1 J
Sulfate	5.68
Inorganics (pH Units)	
pH	7.4

RMBS0052	0.8 Primary RMBS0052S01 4/30/2008
Metals (mg/kg)	
Aluminum	7980
Antimony	< 0.333
Arsenic	2.4
Barium	61.9
Beryllium	0.36 J
Boron	1.9 J
Cadmium	0.22
Chromium	37.7
Cobalt	4.2
Copper	8.2
Hexavalent Chromium	< 0.0216
Lead	4.9
Lithium	21.8
Mercury	0.0067 J
Molybdenum	< 0.2
Nickel	7.6
Potassium	2350
Selenium	< 0.528
Silver	< 0.0422
Sodium	< 264
Thallium	< 0.211
Vanadium	25
Zinc	59.3
Zirconium	1.4
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.57

RMBS0043	1.0 Primary RMBS0043S01 4/22/2008
Metals (mg/kg)	
Aluminum	8710
Antimony	< 0.326
Arsenic	3
Barium	73.1 J
Beryllium	0.36
Boron	< 1.05
Cadmium	0.11 J
Chromium	10.7 J
Cobalt	4
Copper	5.3
Hexavalent Chromium	< 0.11
Lead	7.7
Lithium	19.5 J
Mercury	0.12
Molybdenum	0.27
Nickel	6.8
Potassium	2700 J
Selenium	< 0.534
Silver	< 0.0427
Sodium	< 120
Thallium	< 0.214
Vanadium	20.2 J
Zinc	51.8
Zirconium	1.9
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.59

RMBS0117	1.5 Primary RMBS0117S01 4/30/2008	1.5 Split RMBS0117S01 4/30/2008	1.5 Split RMBS0117S01SP 4/30/2008
Metals (mg/kg)			
Aluminum	7660	-	8900
Antimony	< 0.331	1.2	< 0.41
Arsenic	2.6	2.74	2.9
Barium	66.2	72.3	70
Beryllium	0.47 J	< 0.04	0.8
Boron	1.5 J	-	< 1.1
Cadmium	0.17 J	1.05	0.095 J
Chromium	11.9	10.6	11
Cobalt	5	5.71	4.2
Copper	6.8	5.11	4.5
Hexavalent Chromium	0.0401 J	-	< 0.43
Lead	4.9	3.79	4
Lithium	20.4	-	20
Mercury	0.0092 J	< 0.01	0.0063 J
Molybdenum	0.48	< 0.05	0.27 J
Nickel	7.4	7.32	6.9
Potassium	2400	-	2500
Selenium	< 0.53	< 0.2	0.75 J
Silver	< 0.0424	< 0.05	< 0.017
Sodium	< 265	-	< 130
Thallium	< 0.212	< 0.15	< 0.55
Vanadium	21.4	24.6	24
Zinc	44.4	51.1	44
Zirconium	2.4	-	1.8 J
Inorganics (mg/kg)			
Inorganics (pH Units)			
pH	8.28	8.82	8.6

RMBS0138	1.0 Primary RMBS0138S001 11/17/2008
Metals (mg/kg)	
Sodium	85.3
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.82

RMBS0139	1.0 Primary RMBS0139S001 11/20/2008	1.0 Split RMBS0139S001SP 11/20/2008
Metals (mg/kg)		
Boron	1.7 J	-
Copper	9.3	-
Hexavalent Chromium	0.187 J	0.69 J
Sodium	88.2	-
Thallium	0.23	-
Vanadium	25.6	-
Zirconium	3.3	-
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	7.56	7.55

RMBS0155	1.0 Primary RMBS0155S001 5/8/2009
Metals (mg/kg)	
Aluminum	7650
Antimony	0.409 J
Arsenic	2.54 J
Barium	78.4
Beryllium	0.407 J
Boron	1.56 J
Cadmium	0.304
Chromium	9.42 J
Cobalt	3.01 J
Copper	6.82 J
Lead	26.8 J
Lithium	18.2 J
Mercury	0.0125 J
Molybdenum	0.417 J
Nickel	6.2 J
Potassium	2460
Selenium	< 0.53
Silver	0.0618 J
Sodium	< 260
Thallium	< 0.218
Vanadium	16.3 J
Zinc	127
Zirconium	1.58
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	5.03 H

RMBS0123	1.0 Primary RMBS0123S01 4/25/2008
Metals (mg/kg)	
Aluminum	6490
Antimony	< 0.334
Arsenic	3.3 J
Barium	49.8
Beryllium	0.25
Boron	< 1.08
Cadmium	0.17 J
Chromium	7.2 J
Cobalt	3.1
Copper	4.1
Lead	2.7
Lithium	17.8
Mercury	0.0034 J
Molybdenum	0.24 J
Nickel	5.4
Potassium	2180
Selenium	< 0.529
Silver	< 0.0423
Sodium	< 67.1
Thallium	< 0.212
Vanadium	11.5 J
Zinc	44.1
Zirconium	0.76
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.35

RMBS0030	1.5 Primary RMBS0030S01 4/22/2008	3.5 Primary RMBS0030S02 4/22/2008
Metals (mg/kg)		
Aluminum	9170	8890
Antimony	< 0.333	< 0.33
Arsenic	2.8	3.1
Barium	73.1 J	58 J
Beryllium	0.43	0.38
Boron	< 1.07	< 1.06
Cadmium	0.091 J	0.11 J
Chromium	10.6 J	12 J
Cobalt	4.7	4.8
Copper	5.2	5.6
Hexavalent Chromium	< 0.11	< 0.0221
Lead	3.9	3.7
Lithium	20.4 J	20.8 J
Mercury	0.035	0.0024 J
Molybdenum	0.26	0.33
Nickel	7	7.1
Potassium	2710 J	2220 J
Selenium	< 0.539	< 0.551
Silver	< 0.0432	< 0.0441
Sodium	< 85.1	< 88.8
Thallium	< 0.23	< 0.22
Vanadium	19.1 J	25.5 J
Zinc	54.5	48.9
Zirconium	1.6	1.7
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	7.8	7.62

RMBS0120	0.8 Primary RMBS0120S01 4/28/2008
Metals (mg/kg)	
Aluminum	9060
Antimony	0.967 J
Arsenic	3.77
Barium	85
Beryllium	0.372
Boron	1.15 J
Cadmium	0.398
Chromium	16.8
Cobalt	6 J
Copper	8.65 J
Lead	19
Lithium	21.1 J
Mercury	0.0047 J
Molybdenum	0.271
Nickel	8.42 J
Potassium	2650 J
Selenium	< 0.536
Silver	< 0.0429
Sodium	< 99.8
Thallium	0.265
Vanadium	31.5
Zinc	272 J
Zirconium	1.4
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.37

RMBS0039	1.5 Primary RMBS0039S01 4/17/2008	4.0 Primary RMBS0039S02 4/17/2008
Metals (mg/kg)		
Aluminum	4280	-
Antimony	< 0.313	-
Arsenic	1	-
Barium	53.2	-
Beryllium	0.14	-
Boron	< 1.01	-
Cadmium	0.083 J	-
Chromium	4.7 J	-
Cobalt	3.4	-
Copper	8.9	-
Lead	4.4	-
Lithium	7.2	-
Mercury	0.023	-
Molybdenum	< 0.14	-
Nickel	3.5	-
Potassium	1960	-
Selenium	< 0.485	-
Silver	< 0.0388	-
Sodium	180	< 263
Thallium	< 0.194	-
Vanadium	17.2	-
Zinc	29.7	-
Zirconium	0.66	-
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	7.57	8.24

RMBS0106	1.5 Primary RMBS0106S01 4/17/2008	4.0 Primary RMBS0106S02 4/17/2008
Metals (mg/kg)		
Aluminum	5340	-
Antimony	< 0.33	-
Arsenic	1.8	-
Barium	74.7	-
Beryllium	0.23	-
Boron	1.3 J	-
Cadmium	0.19 J	-
Chromium	10.8 J	-
Cobalt	3.8	-
Copper	9	-
Lead	5	-
Lithium	11.6	-
Mercury	0.025	-
Molybdenum	0.66	-
Nickel	5.9	-
Potassium	2510	-
Selenium	< 0.515	-
Silver	0.047 J	-
Sodium	312	< 271
Thallium	< 0.206	-
Vanadium	33.8	-
Zinc	37.3	-
Zirconium	1.9	-
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	9.78	8.3

RMBS0111	1.5 Primary RMBS0111S01 4/21/2008
Metals (mg/kg)	
Aluminum	7670
Antimony	< 0.695
Arsenic	2.2
Barium	76.9 J
Beryllium	0.4
Boron	< 1.05
Cadmium	< 0.215
Chromium	11.3
Cobalt	4.1
Copper	5.4
Lead	3.7
Lithium	25.5 J
Mercury	< 0.0014
Molybdenum	0.32
Nickel	6.2
Potassium	3180
Selenium	< 0.538
Silver	< 0.043
Sodium	104
Thallium	< 0.22
Vanadium	21.7
Zinc	56.5
Zirconium	1.4
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.55

RMBS0110	2.0 Primary RMBS0110S01 4/17/2008
Metals (mg/kg)	
Aluminum	7160
Antimony	< 0.337
Arsenic	2.3
Barium	67.4
Beryllium	0.4
Boron	< 1.09
Cadmium	0.065 J
Chromium	9.5 J
Cobalt	3.9
Copper	4.6
Lead	3.2
Lithium	24.5
Mercury	< 0.0017
Molybdenum	< 0.17
Nickel	5.7
Potassium	3140
Selenium	< 0.558
Silver	< 0.0446
Sodium	< 88.9
Thallium	< 0.223
Vanadium	22.9
Zinc	56.7
Zirconium	1
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.37

RMBS0100	2.0 Primary RMBS0100S01 4/17/2008
Metals (mg/kg)	
Aluminum	8760
Antimony	< 0.343
Arsenic	2.7
Barium	75.7
Beryllium	0.4
Boron	1.1 J
Cadmium	0.075 J
Chromium	10.9 J
Cobalt	3.9
Copper	4.9
Hexavalent Chromium	< 0.116
Lead	3.6
Lithium	26.9
Mercury	< 0.0016
Molybdenum	0.21
Nickel	6.2
Potassium	3540
Selenium	< 0.553
Silver	< 0.0443
Sodium	< 85.4
Thallium	< 0.221
Vanadium	23.5
Zinc	59.3
Zirconium	0.92
Inorganics (mg/kg)	
Inorganics (pH Units)	

RMBS0099	1.0 Primary RMBS0099S01 5/1/2008
Metals (mg/kg)	
Aluminum	8320
Antimony	< 0.358
Arsenic	2.5 J
Barium	71.9 J
Beryllium	0.46
Boron	< 1.15
Cadmium	0.17 J
Chromium	13.5
Cobalt	4.2
Copper	5.9
Lead	9.2
Lithium	23.1
Mercury	0.0063 J
Molybdenum	< 0.31
Nickel	7.6
Potassium	3060 J
Selenium	< 0.586
Silver	0.072 J
Sodium	< 93.9
Thallium	< 0.24
Vanadium	25.2
Zinc	113
Zirconium	1.4
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.46

U7BS0007	1.0 Primary U7BS0007S01 4/30/2008
Metals (mg/kg)	
Aluminum	9650
Antimony	< 1.61
Arsenic	2.9
Barium	74.9
Beryllium	0.44 J
Boron	< 1.04
Cadmium	0.089 J
Chromium	14.9 J
Cobalt	4.7
Copper	6.2 J
Lead	4
Lithium	29.3
Mercury	0.0064 J
Molybdenum	0.26
Nickel	8.1 J
Potassium	2970
Selenium	< 0.499
Silver	< 0.0399
Sodium	< 94.1
Thallium	0.25
Vanadium	31.1
Zinc	57.3
Zirconium	1.6
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.11

RMBS0152	1.0 Primary RMBS0152S001 5/8/2009
Metals (mg/kg)	
Aluminum	8680
Antimony	0.478 J
Arsenic	2.87 J
Barium	66.5
Beryllium	0.376 J
Boron	< 0.997
Cadmium	0.314
Chromium	9.1 J
Cobalt	152 J
Copper	39.3 J
Lead	9.89 J
Lithium	19.3 J
Mercury	0.0137 J
Molybdenum	0.274 J
Nickel	27.9 J
Potassium	2530
Selenium	< 0.494
Silver	9.95 J
Sodium	151 J
Thallium	< 0.218
Vanadium	25.3 J
Zinc	329
Zirconium	2.23
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.92 H

RMBS0151	1.0 Primary RMBS0151S001 5/8/2009
Metals (mg/kg)	
Aluminum	8280
Antimony	0.321 J
Arsenic	2.67 J
Barium	70.7
Beryllium	0.417 J
Boron	< 0.983
Cadmium	0.24
Chromium	12.9 J
Cobalt	4.07 J
Copper	6.9 J
Lead	10.9 J
Lithium	20.8 J
Mercury	0.0157 J
Molybdenum	0.314 J
Nickel	7.1 J
Potassium	2550
Selenium	< 0.488
Silver	0.0572 J
Sodium	102 J
Thallium	< 0.237
Vanadium	26 J
Zinc	96.8
Zirconium	1.95
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.78 H

RMBS0149	1.0 Primary RMBS0149S001 5/8/2009	1.0 Duplicate RMBS0149D001 5/8/2009
Metals (mg/kg)		
Aluminum	7760	8050
Antimony	< 0.313	< 0.309
Arsenic	2.92 J	3.28 J
Barium	59.2	57.3
Beryllium	0.364 J	0.403 J
Boron	< 1.01	< 0.996
Cadmium	0.155 J	0.134 J
Chromium	11.7 J	11.3 J
Cobalt	3.55 J	3.71 J
Copper	5.27 J	5.35 J
Lead	9 J	7.03 J
Lithium	22.2 J	22.7 J
Mercury	0.0081 J	0.0068 J
Molybdenum	0.245 J	0.206 J
Nickel	7.03 J	6.68 J
Potassium	2520	2390
Selenium	< 0.485	< 0.507
Silver	< 0.0388	< 0.0406
Sodium	83 J	< 81.1
Thallium	< 0.238	< 0.253
Vanadium	23.3 J	24 J
Zinc	67.2	66.6
Zirconium	1.27	1.27
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.36 H	6.98 H

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

Metals / pH / Inorganics Chemical Data Results
RMHF RFI Site
West RMHF Area

FIGURE
C.3-6B

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample location with no detected Metals/pH/Inorganics Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample not analyzed for Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: **RMDF5** | **1.00** Depth in Feet | **Primary** Sample Type | **RMDF5S01** Unique Sample Identifier | **7/10/2005** Date

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified. Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Detect	Non-Detect	
12.05	<0.06	Exceeds Background
12.05	<0.06	Exceeds Background + Res RBSL
12.05	<0.06	Exceeds Background + Eco RBSL
12.05	<0.06	Exceeds Background + Res RBSL + Eco RBSL

Comparison Levels

Metals	Background (mg/kg)	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
Aluminum	20,000	75,000	12.0000
Antimony	8.7000	30.0000	0.0949
Arsenic	15.0000	0.0950	1.9180
Barium	140.0000	15000.0000	14.6026
Beryllium	1.1000	150.3254	5.0873
Boron	9.7000	15000.0000	6.7600
Cadmium	1.0000	77.8248	0.0208
Chromium	36.8000	114000.0000	930.0000
Cobalt	21.0000	22.7763	8.9498
Copper	29.0000	3000.0000	1.0886
Hexavalent Chromium	0.0000	110.0000	0.2000
Iron	-	-	-
Lead	34.0000	150.0000	0.0632
Lithium	37.0000	152.2000	10.0000
Mercury	0.0900	23.0000	0.1000
Molybdenum	5.3000	380.0000	0.1073
Nickel	29.0000	1500.0000	0.1020
Phosphate	-	-	-
Potassium	6,400.0000	-	-
Selenium	0.6550	380.4156	0.1738
Silver	0.7900	380.4197	0.5397
Sodium	110.0000	-	-
Thallium	0.4600	4.9455	2.8798
Vanadium	62.0000	369.1094	1.5000
Zinc	110.0000	23000.0000	20.7553
Zirconium	8.6000	0.0000	7.4316
Inorganics			
Chloride	-	-	-
Cyanide	-	1,500.0000	290.0000
Fluoride	6.7000	4600.0000	0.0000
Nitrate-N	-	-	-
Sulfate	-	-	-
pH			
pH	-	-	-

Note: (mg/kg) = milligrams per kilogram — Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a Metal/pH/Inorganic analyte, this indicates the analyte was not analyzed.

Background Background Level
Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

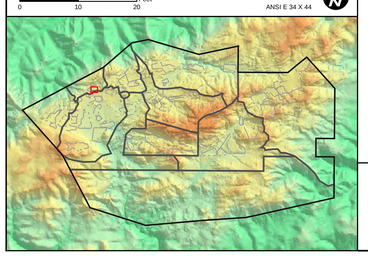
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

Chemical Use Area

Multiple Use; Metals / Inorganics; Leach Field; Solvents; Perchlorate / Energetics; Potential; Petroleum; Hydrazine; Oils / PCBs; Debris

Document: RFI-Report-Group7-Boxplot-RMHF-Metals_MWSY.mxd — Date: Jun 10, 2009

1 inch = 10 feet; 0 10 20 Feet; ANSI E 34 X 44



RMBS0014	2.0 Primary RMBS0014S01 4/18/2008	2.0 Split RMBS0014S01SP 4/18/2008	3.0 Primary RMBS0014S02 4/18/2008	6.0 Primary RMBS0014S03 4/18/2008
Metals (mg/kg)				
Aluminum	**6660**	**11000**	**10600**	**14300**
Antimony	< 0.414	< 0.41	< 0.596	< 0.579
Arsenic	**2**	**1.6**	**1.7**	**2.5**
Barium	**66.4**	**65**	**64.8**	**74.3**
Beryllium	**0.39**	**0.86**	**0.4**	**0.57**
Boron	**1.6 J**	**3.6 J**	**3.3 J**	**3.3 J**
Cadmium	**0.11 J**	**0.034 J**	**0.1 J**	**0.12 J**
Chromium	**10.2 J**	**8.6**	**7.9 J**	**12.7 J**
Cobalt	**3.6**	**2.5**	**2.7**	**3.9**
Copper	**4.7 J**	**2.2**	**3.8 J**	**5 J**
Hexavalent Chromium	**0.0375 J**	< 0.44	**0.0567 J**	**0.0382 J**
Lead	**3.5**	**2.4**	**4.2**	**5**
Lithium	**17.7 J**	**19**	**17.1 J**	**20.7 J**
Mercury	**0.0046 J**	< 0.006	**0.0069 J**	**0.0075 J**
Molybdenum	**0.23 J**	**0.19 J**	**0.32 J**	**0.4 J**
Nickel	**6.1 J**	**4.2**	**4.2 J**	**6.3 J**
Potassium	**2600 J**	**2800**	**2010 J**	**2290 J**
Selenium	< 0.542	**0.15 J**	< 0.542	< 0.546
Silver	< 0.0434	< 0.017	< 0.0433	< 0.0436
Sodium	< 156	< 130	< 142	< 145
Thallium	< 0.22	< 0.05	< 0.217	< 0.23
Vanadium	**17.8 J**	**17**	**16.3 J**	**24.4 J**
Zinc	**50.3 J**	**48**	**42.7 J**	**47.7 J**
Zirconium	< 0.83	**1.2 J**	< 1	**1.9**
Inorganics (mg/kg)				
Chloride	-	-	**2.73**	-
Fluoride	-	-	**1.81 J**	-
Nitrate-N	-	-	**1.37**	-
Sulfate	-	-	**4.77**	-
Inorganics (pH Units)				
pH	**8.12**	**8.2**	**7.79**	**7.38**

RMBS0103	1.5 Primary RMBS0103S01 4/21/2008
Metals (mg/kg)	
Aluminum	**8330**
Antimony	< 1.62
Arsenic	**0.88 J**
Barium	**108 J**
Beryllium	**0.18**
Boron	< 1.04
Cadmium	< 0.209
Chromium	**6.4**
Cobalt	**8.8**
Copper	**12.9**
Hexavalent Chromium	< 0.108
Lead	**2.3**
Lithium	**11.5 J**
Mercury	< 0.0016
Molybdenum	< 0.15
Nickel	**5.3**
Potassium	**3380**
Selenium	< 0.523
Silver	< 0.0419
Sodium	**273**
Thallium	< 0.209
Vanadium	**22.7**
Zinc	**41.6**
Zirconium	**1.1**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**7.66**

RMBS0004	1.5 Primary RMBS0004S01 4/18/2008	2.5 Primary RMBS0004S02 4/18/2008
Metals (mg/kg)		
Aluminum	**11000**	**9070**
Antimony	< 0.619	< 0.656
Arsenic	**2.4**	**1.8**
Barium	**69.6**	**70**
Beryllium	**0.49**	**0.34**
Boron	**8**	**5.5**
Cadmium	**0.11 J**	**0.099 J**
Chromium	**11.2 J**	**8.3 J**
Cobalt	**3.4**	**3.1**
Copper	**4.7 J**	**4.2 J**
Hexavalent Chromium	< 0.0219	**0.0762 J**
Lead	**4.5**	**3.3**
Lithium	**17.8 J**	**17.9 J**
Mercury	**0.0084 J**	**0.0031 J**
Molybdenum	**0.36 J**	**0.23 J**
Nickel	**5.7 J**	**4.3 J**
Potassium	**2150 J**	**3080 J**
Selenium	< 0.544	< 0.547
Silver	< 0.0435	< 0.0437
Sodium	< 146	< 147
Thallium	< 0.22	< 0.24
Vanadium	**20.8 J**	**16.1 J**
Zinc	**46 J**	**54.1 J**
Zirconium	< 1.2	< 1
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	**7.87**	**8.25**

RMBS0104	1.0 Primary RMBS0104S01 4/21/2008
Metals (mg/kg)	
Aluminum	**9740**
Antimony	< 0.319
Arsenic	**2.7**
Barium	**73.2 J**
Beryllium	**0.5**
Boron	< 1.03
Cadmium	< 0.211
Chromium	**11.1**
Cobalt	**3.9**
Copper	**5.7**
Hexavalent Chromium	< 0.107
Lead	**4.1**
Lithium	**23 J**
Mercury	**0.0079 J**
Molybdenum	**0.29**
Nickel	**5.8**
Potassium	**3280**
Selenium	< 0.529
Silver	< 0.0423
Sodium	**125**
Thallium	**0.26**
Vanadium	**21.8**
Zinc	**55.8**
Zirconium	**1.2**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**7.16**

RMBS0009	2.0 Primary RMBS0009S01 4/18/2008	3.0 Primary RMBS0009S02 4/18/2008
Metals (mg/kg)		
Aluminum	**9980**	**10500**
Antimony	< 0.558	< 0.329
Arsenic	**2**	**2.9**
Barium	**73.8**	**90.2**
Beryllium	**0.33**	**0.34**
Boron	**12.5**	**17.6**
Cadmium	**0.12 J**	**0.12 J**
Chromium	**10.4 J**	**12.3 J**
Cobalt	**3.5**	**4.4**
Copper	**5.5 J**	**6 J**
Hexavalent Chromium	**0.0273 J**	< 0.0214
Lead	**3.3**	**3.2**
Lithium	**20.9 J**	**24.9 J**
Mercury	**0.0023 J**	**0.0028 J**
Molybdenum	**0.57 J**	**0.18 J**
Nickel	**5.6 J**	**6.7 J**
Potassium	**3300 J**	**2690 J**
Selenium	< 0.533	< 0.527
Silver	< 0.0426	< 0.0422
Sodium	< 174	**195**
Thallium	**0.27**	< 0.22
Vanadium	**18 J**	**25.3 J**
Zinc	**55.8 J**	**57 J**
Zirconium	< 0.77	< 1.3
Inorganics (mg/kg)		
Chloride	-	< 0.712
Fluoride	-	**2.18 J**
Nitrate-N	-	**1.12**
Sulfate	-	**3.86 J**
Inorganics (pH Units)		
pH	**8.78**	**8.35**

RMBS0010	1.0 Primary RMBS0010S01 4/23/2008
Metals (mg/kg)	
Aluminum	**7850**
Antimony	< 0.417
Arsenic	**2.9**
Barium	**66.6**
Beryllium	**0.42 J**
Boron	**1.5 J**
Cadmium	**0.13 J**
Chromium	**12.1 J**
Cobalt	**4.4**
Copper	**5.8**
Hexavalent Chromium	< 0.108
Lead	**3.1 J**
Lithium	**24 J**
Mercury	< 0.0016
Molybdenum	**0.15**
Nickel	**6.8**
Potassium	**2620**
Selenium	< 0.529
Silver	< 0.0423
Sodium	< 264
Thallium	< 0.212
Vanadium	**22.4 J**
Zinc	**52.3**
Zirconium	**1.4**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**8.69**

RMBS0105	1.0 Primary RMBS0105S01 4/21/2008
Metals (mg/kg)	
Aluminum	**8650**
Antimony	< 0.521
Arsenic	**2.7**
Barium	**67.5 J**
Beryllium	**0.46**
Boron	< 1.09
Cadmium	< 0.209
Chromium	**10.3**
Cobalt	**5**
Copper	**5.7**
Hexavalent Chromium	< 0.0218
Lead	**3.9**
Lithium	**22 J**
Mercury	**0.018**
Molybdenum	**0.33**
Nickel	**7.8**
Potassium	**3020**
Selenium	< 0.522
Silver	< 0.0418
Sodium	**109**
Thallium	< 0.23
Vanadium	**20.5**
Zinc	**52.5**
Zirconium	**1.1**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**7.43**

RMBS0007	1.0 Primary RMBS0007S01 4/23/2008
Metals (mg/kg)	
Aluminum	**11300**
Antimony	< 1.61
Arsenic	**4.5**
Barium	**99**
Beryllium	**0.61**
Boron	**3.6 J**
Cadmium	**0.18 J**
Chromium	**16 J**
Cobalt	**9.5**
Copper	**8.8**
Hexavalent Chromium	< 0.0218
Lead	**8.2 J**
Lithium	**24.7 J**
Mercury	**0.0022 J**
Molybdenum	**0.25**
Nickel	**9.5**
Potassium	**3000**
Selenium	< 0.536
Silver	< 0.0429
Sodium	< 268
Thallium	**0.25**
Vanadium	**25.6 J**
Zinc	**62.8**
Zirconium	**1.7**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**8.71**

RMBS0021	1.5 Primary RMBS0021S01 4/22/2008
Metals (mg/kg)	
Aluminum	**8230**
Antimony	< 0.453
Arsenic	**3.2**
Barium	**60.7 J**
Beryllium	**0.39**
Boron	< 1.05
Cadmium	**0.074 J**
Chromium	**9.3 J**
Cobalt	**3.6**
Copper	**5.2**
Lead	**3.4**
Lithium	**20.6 J**
Mercury	**0.0034 J**
Molybdenum	**0.23**
Nickel	**5.6**
Potassium	**2370 J**
Selenium	< 0.528
Silver	< 0.0423
Sodium	< 82.7
Thallium	< 0.211
Vanadium	**21.4 J**
Zinc	**48.6**
Zirconium	**1.2**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**8.56**

RMBS0008	1.3 Primary RMBS0008S01 4/23/2008	1.3 Duplicate RMBS0008D01 4/23/2008
Metals (mg/kg)		
Aluminum	**8480**	**8420**
Antimony	< 1.6	< 0.452
Arsenic	**2.9**	**3.2**
Barium	**72.6**	**73.3**
Beryllium	**0.38 J**	**0.42 J**
Boron	**1.7 J**	< 1.06
Cadmium	**0.16 J**	**0.16 J**
Chromium	**12 J**	**12.2 J**
Cobalt	**4.2**	**4.2**
Copper	**6.4**	**5.5**
Hexavalent Chromium	< 0.0212	< 0.106
Lead	**5.1 J**	**2.8 J**
Lithium	**23.4 J**	**26.2 J**
Mercury	< 0.0014	**0.0056 J**
Molybdenum	**0.33**	**0.17**
Nickel	**6.9**	**6.4**
Potassium	**2450**	**3010**
Selenium	< 0.527	< 0.527
Silver	< 0.0421	< 0.0421
Sodium	< 263	< 263
Thallium	< 0.211	< 0.211
Vanadium	**21.6 J**	**23.1 J**
Zinc	**54.2**	**52**
Zirconium	**1.2**	**1.6**
Inorganics (mg/kg)		
Chloride	**2.21**	< 0.685
Fluoride	**1.53**	**1.44**
Nitrate-N	< 0.298	< 0.311
Sulfate	**5.3**	**4.82**
Inorganics (pH Units)		
pH	**8.34**	**8.64**

RMBS0020	1.5 Primary RMBS0020S01 4/22/2008
Metals (mg/kg)	
Aluminum	**8670**
Antimony	< 0.332
Arsenic	**2.9**
Barium	**71.6 J**
Beryllium	**0.41**
Boron	**1.4 J**
Cadmium	**0.099 J**
Chromium	**10.8 J**
Cobalt	**4**
Copper	**7.2**
Lead	**5.3**
Lithium	**19.7 J**
Mercury	< 0.0016
Molybdenum	**0.28**
Nickel	**6.3**
Potassium	**2370 J**
Selenium	< 0.531
Silver	< 0.0425
Sodium	**537**
Thallium	< 0.23
Vanadium	**20.4 J**
Zinc	**57**
Zirconium	**1.7**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**9.4**

RMBS0001	1.0 Primary RMBS0001S01 4/29/2008
Metals (mg/kg)	
Aluminum	**7260**
Antimony	**0.46 J**
Arsenic	**3.1**
Barium	**57.8**
Beryllium	**0.28**
Boron	**3.5 J**
Cadmium	**0.091 J**
Chromium	**8.6**
Cobalt	**3.6**
Copper	**4.8**
Hexavalent Chromium	< 0.105
Lead	**6.9**
Lithium	**15.9**
Mercury	< 0.011
Molybdenum	**0.21**
Nickel	**7.4**
Potassium	**1960**
Selenium	< 0.517
Silver	< 0.0414
Sodium	**187**
Thallium	< 0.207
Vanadium	**41.8**
Zinc	**47.4**
Zirconium	**1.3**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**8.9**

RMBS0002	1.0 Primary RMBS0002S01 4/29/2008
Metals (mg/kg)	
Aluminum	**7950**
Antimony	< 1.57
Arsenic	**3.7**
Barium	**66.1**
Beryllium	**0.38 J**
Boron	**3 J**
Cadmium	**0.073 J**
Chromium	**11.7**
Cobalt	**3.8**
Copper	**6**
Hexavalent Chromium	< 0.104
Lead	**8.6**
Lithium	**19.7**
Mercury	**0.016**
Molybdenum	**0.24**
Nickel	**6.8**
Potassium	**2820**
Selenium	< 0.507
Silver	< 0.0405
Sodium	**344**
Thallium	< 0.22
Vanadium	**34**
Zinc	**59.1**
Zirconium	**1.3**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**9.09**

RMBS0003	0.5 Primary RMBS0003S01 4/16/2008
Metals (mg/kg)	
Aluminum	**4720**
Antimony	< 1.51
Arsenic	**7.3**
Barium	**75.9**
Beryllium	**0.22**
Boron	**12 J**
Cadmium	**0.29**
Chromium	**10.5**
Cobalt	**4.9 J**
Copper	**62.7 J**
Hexavalent Chromium	< 0.101
Lead	**8.3 J**
Lithium	**12.3**
Mercury	**0.0075 J**
Molybdenum	**0.24**
Nickel	**12.6 J**
Potassium	**2370 J**
Selenium	< 0.499
Silver	**0.04 J**
Sodium	**263 J**
Thallium	< 0.199
Vanadium	**75.3**
Zinc	**42.4**
Zirconium	**2.5**
Inorganics (mg/kg)	
Chloride	< 0.65
Fluoride	**0.817 J**
Nitrate-N	**0.748 J**
Sulfate	**8.4**
Inorganics (pH Units)	
pH	**9.58**

RMBS0011	1.3 Primary RMBS0011S01 4/29/2008
Metals (mg/kg)	
Aluminum	**7460**
Antimony	< 0.322
Arsenic	**3.3**
Barium	**83.4**
Beryllium	**0.38**
Boron	**10.2 J**
Cadmium	**0.068 J**
Chromium	**10.7**
Cobalt	**4.7**
Copper	**5.6**
Hexavalent Chromium	< 0.0207
Lead	**3.7**
Lithium	**20.7**
Mercury	< 0.0103
Molybdenum	**0.2**
Nickel	**6.4**
Potassium	**2870**
Selenium	< 0.51
Silver	< 0.0408
Sodium	**471**
Thallium	< 0.204
Vanadium	**30.8**
Zinc	**51.6**
Zirconium	**1.3**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**9.41**

RMBS0005	1.5 Primary RMBS0005S01 4/29/2008
Metals (mg/kg)	
Aluminum	**9960**
Antimony	< 1.56
Arsenic	**2.6**
Barium	**116**
Beryllium	**0.36**
Boron	**12.7**
Cadmium	**0.11 J**
Chromium	**9.9**
Cobalt	**8.9**
Copper	**7.5**
Hexavalent Chromium	**0.349**
Lead	**4.4**
Lithium	**18.1**
Mercury	< 0.0098
Molybdenum	**0.31**
Nickel	**7.4**
Potassium	**3090**
Selenium	< 0.518
Silver	< 0.0415
Sodium	**324**
Thallium	< 0.22
Vanadium	**27.9**
Zinc	**87.7**
Zirconium	**1.4**
Inorganics (mg/kg)	
Chloride	**3.21**
Fluoride	**1.67**
Nitrate-N	< 0.309
Sulfate	**51.3**
Inorganics (pH Units)	
pH	**8.5**

RMBS0140	1.0 Primary RMBS0140S001 11/20/2008
Metals (mg/kg)	
Boron	**1.7 J**
Copper	**5.7**
Hexavalent Chromium	< 0.0204
Sodium	**93**
Thallium	**0.088 J**
Vanadium	**26.8**
Zirconium	**3.5**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**7.82**

RMBS0150	1.0 Primary RMBS0150S001 5/8/2009
Metals (mg/kg)	
Aluminum	**5250**
Antimony	**0.393 J**
Arsenic	**6.54 J**
Barium	**50.3**
Beryllium	**0.284 J**
Boron	< 1.02
Cadmium	**0.296**
Chromium	**74.4 J**
Cobalt	**5.75 J**
Copper	**8.31 J**
Lead	**6.55 J**
Lithium	**8.72 J**
Mercury	**0.0162 J**
Molybdenum	**1.4 J**
Nickel	**18.7 J**
Potassium	**1440**
Selenium	**0.828 J**
Silver	**0.279 J**
Sodium	**113 J**
Thallium	< 0.206
Vanadium	**43.9 J**
Zinc	**72.3**
Zirconium	**4.09**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**7.93 H**

RMBS0013	0.8 Primary RMBS0013S01 4/16/2008	2.0 Primary RMBS0013S02 4/16/2008
Metals (mg/kg)		
Aluminum	**8630**	**9040**
Antimony	< 0.329	< 0.414
Arsenic	**3.1**	**3.4**
Barium	**66.6**	**59.8**
Beryllium	**0.38**	**0.32**
Boron	< 1.06	< 1.05
Cadmium	**0.15 J**	**0.17 J**
Chromium	**13.3**	**13.9**
Cobalt	**4.8 J**	**4.8 J**
Copper	**5.2 J**	**6 J**
Hexavalent Chromium	< 0.107	< 0.0212
Lead	**3.5 J**	**3.3 J**
Lithium	**22.7**	**25.3**
Mercury	**0.028**	**0.0045 J**
Molybdenum	**0.24**	**0.29**
Nickel	**7.7 J**	**7.8 J**
Potassium	**2940 J**	**2820 J**
Selenium	< 0.514	< 0.52
Silver	< 0.0411	< 0.0416
Sodium	< 84.6	< 90.4
Thallium	**0.25**	< 0.23
Vanadium	**25.8**	**27.3**
Zinc	**53.6**	**57.2**
Zirconium	**1.4**	**1.5**
Inorganics (mg/kg)		
Chloride	**3.37**	-
Fluoride	**1.33**	-
Nitrate-N	< 0.317	-
Sulfate	**9.86**	-
Inorganics (pH Units)		
pH	**8.47**	**8.53**

RMBS0012	2.0 Primary RMBS0012S01 4/18/2008
Metals (mg/kg)	
Aluminum	**9460**
Antimony	< 0.5
Arsenic	**4.6**
Barium	**71.2**
Beryllium	**0.5**
Boron	**2.6 J**
Cadmium	**0.16 J**
Chromium	**12.3 J**
Cobalt	**4.7**
Copper	**6.7 J**
Hexavalent Chromium	**0.389**
Lead	**6.3**
Lithium	**18.5 J**
Mercury	**0.0039 J**
Molybdenum	**0.38 J**
Nickel	**7 J**
Potassium	**2680 J**
Selenium	< 0.528
Silver	< 0.0422
Sodium	< 139
Thallium	**0.34**
Vanadium	**25.8 J**
Zinc	**60.4 J**
Zirconium	< 1.2
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**7.91**

RMBS0141	1.0 Primary RMBS0141S001 11/20/2008
Metals (mg/kg)	
Boron	**1.9 J**
Copper	**7.9**
Hexavalent Chromium	< 0.0202
Sodium	**67**
Thallium	**0.22**
Vanadium	**23.2**
Zirconium	**1.5**
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	**7.55**

RMBS0015	2.0 Primary RMBS0015S01 4/18/2008
Metals (mg/kg)	
Aluminum	**13000**
Antimony	< 0.482
Arsenic	**2.1**
Barium	**64.2**
Beryllium	**0.42**
Boron	**3.7 J**
Cadmium	**0.11 J**
Chromium	**9.8 J**
Cobalt	**3.5**
Copper	**4.9 J**
Hexavalent Chromium	< 0.0214
Lead	**3.9**
Lithium	**18.8 J**
Mercury	**0.0048 J**
Molybdenum	**0.3 J**
Nickel	**5.7 J**
Potassium	**2420 J**
Selenium	< 0.533
Silver	< 0.0426
Sodium	< 103
Thallium	< 0.22
Vanadium	**19 J**
Zinc	**47 J**
Zirconium	< 1.3
Inorganics (mg/kg)	
Chloride	**4.32**
Fluoride	**4.93 J**
Nitrate-N	< 0.32
Sulfate	**7.88**
Inorganics (pH Units)	
pH	**8.21**

RMBS0006	1.0 Primary RMBS0006S01 4/23/2008	3.0 Primary RMBS0006S02 4/23/2008	3.0 Duplicate RMBS0006D02 4/23/2008
Metals (mg/kg)			
Aluminum	**9940**	**10100**	**9950**
Antimony	< 0.882	< 1.63	< 0.561
Arsenic	**2.3**	**4.4**	**2.2**
Barium	**78.4**	**81.7**	**76.1**
Beryllium	**0.54**	**0.67**	**0.47 J**
Boron	**1.9 J**	**1.9 J**	**2.2 J**
Cadmium	**0.13 J**	**0.19 J**	**0.13 J**
Chromium	**9.7 J**	**7.9 J**	**8.2 J**
Cobalt	**3.6**	**4.2**	**3.4**
Copper	**5.1**	**5.4**	**4.3**
Hexavalent Chromium	< 0.0217	< 0.109	< 0.0217
Lead	**4.2 J**	**5.6 J**	**3.8 J**
Lithium	**19.7 J**	**19.7 J**	**19.4 J**
Mercury	< 0.0015	**0.003 J**	**0.0033 J**
Molybdenum	**0.35**	**0.32**	**0.27**
Nickel	**5.7**	**6**	**4.7**
Potassium	**2760**	**3390**	**2700**
Selenium	< 0.523	< 0.532	< 0.53
Silver	< 0.0419	< 0.0426	< 0.0424
Sodium	< 262	< 266	< 265
Thallium	< 0.22	**0.51**	< 0.23
Vanadium	**18.1 J**	**18.4 J**	**16 J**
Zinc	**51.2**	**73.6**	**55.4**
Zirconium	**1**	**0.95**	**0.82**
Inorganics (mg/kg)			
Inorganics (pH Units)			
pH	**7.69**	**7.76**	**7.83**

RMBS0016	2.0 Primary RMBS0016S01 4/18/2008	2.0 Split RMBS0016S01SP 4/18/2008	3.0 Primary RMBS0016S02 4/18/2008	6.0 Primary RMBS0016S03 4/18/2008
Metals (mg/kg)				
Aluminum	**7880**	**7700**	**7990**	**7890**
Antimony	< 0.447	< 0.46	< 0.542	< 0.556
Arsenic	**2.3**	**2.5**	**2.8**	**2**
Barium	**69.6**	**59**	**64.6**	**50.3**
Beryllium	**0.37**	**0.36**	**0.4**	**0.32**
Boron	**1.3 J**	< 1.2	< 1.03	< 1.04
Cadmium	**0.11 J**	**0.052 J**	**0.1 J**	**0.11 J**
Chromium	**9.8 J**	**10**	**10.8 J**	**10.7 J**
Cobalt	**3.5**	**3.4**	**3.8**	**3**
Copper	**5.1 J**	**3.8**	**5.2 J**	**4.6 J**
Hexavalent Chromium	< 0.0214	< 0.42	**0.0549 J**	< 0.0216
Lead	**3.7**	**2.9**	**3.3**	**2.8**
Lithium	**19.1 J**	**21**	**20.7 J**	**16.6 J**
Mercury	**0.0034 J**	< 0.0067	**0.0025 J**	**0.0038 J**
Molybdenum	**0.36 J**	**0.27 J**	**0.22 J**	**0.68 J**
Nickel	**5.4 J**	**5.6**	**6.3 J**	**5 J**
Potassium	**2620 J**	**2800**	**2600 J**	**2120 J**
Selenium	< 0.52	**0.26 J**	< 0.515	< 0.54
Silver	< 0.0416	< 0.019	< 0.0412	< 0.0432
Sodium	< 82.4	< 140	< 92.7	< 109
Thallium	< 0.23	< 0.6	**0.24**	< 0.216
Vanadium	**18.2 J**	**21**	**23 J**	**16.2 J**
Zinc	**52.4 J**	**48**	**53.1 J**	**40.5 J**
Zirconium	< 0.96	**1.2 J**	< 0.89	< 1.1
Inorganics (mg/kg)				
Chloride	-	-	< 0.693	-
Fluoride	-	-	**2.86 J**	-
Nitrate-N	-	-	**0.861 J**	-
Sulfate	-	-	**4.07 J**	-
Inorganics (pH Units)				
pH	**7.91**	**8.4**	**8.29**	**8.28**

RMBS0017	2.0 Primary RMBS0017S01 4/18/2008
Metals (mg/kg)	
Aluminum	**7620**
Antimony	< 0.569
Arsenic	**2.7**
Barium	**57**
Beryllium	**0.31**
Boron	< 0.998
Cadmium	**0.11 J**
Chromium	**9.4 J**
Cobalt	**3.3**
Copper	**5 J**
Hexavalent Chromium	< 0.0208
Lead	**3.1**
Lithium	**17.9 J**
Mercury	**0.0029 J**
Molybdenum	**0.22 J**
Nickel	**5.5 J**
Potassium	**2480 J**
Selenium	< 0.52
Silver	< 0.0416
Sodium	< 83.6
Thallium	< 0.21
Vanadium	**17.5 J**
Zinc	**48.1 J**
Zirconium	< 0.79
Inorganics (mg/kg)	
Chloride	**2.29**
Fluoride	**1.27 J**
Nitrate-N	< 0.311
Sulfate	**4.28**
Inorganics (pH Units)	
pH	**8.13**

RMBS0102	1.5 Primary RMBS0102S01 4/21/2008
Metals (mg/kg)	
Aluminum	**7290**
Antimony	< 1.57
Arsenic	**0.66 J**
Barium	**134 J**
Beryllium	**0.13**
Boron	< 1.01
Cadmium	< 0.199
Chromium	**5.5**
Cobalt	**29**
Copper	**13**
Hexavalent Chromium	< 0.0208
Lead	**1.7**
Lithium	**12 J**
Mercury	< 0.0015
Molybdenum	< 0.11
Nickel	**8.5**
Potassium	**4540**
Selenium	< 0.497
Silver	< 0.0398
Sodium	**236**
Thallium	< 0.2
Vanadium	**25.9**
Zinc	**44.7**

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample location with no detected Metals/pH/Inorganics Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: **RMDF5**

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Background
12.05	<0.06	Exceeds Background + Res RBSL
12.05	<0.06	Exceeds Background + Eco RBSL
12.05	<0.06	Exceeds Background + Res RBSL + Eco RBSL

Comparison Levels

Metals	Background (mg/kg)	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
Aluminum	20,000	75,000	12.0000
Antimony	8.7000	30.0000	0.0949
Arsenic	15.0000	0.0950	1.9180
Barium	140.0000	15000.0000	14.6026
Beryllium	1.1000	150.3254	5.0873
Boron	9.7000	15000.0000	6.7600
Cadmium	1.0000	77.8248	0.0208
Chromium	36.8000	114000.0000	930.0000
Cobalt	21.0000	22.7763	8.9498
Copper	29.0000	3000.0000	1.0886
Hexavalent Chromium	0.0000	110.0000	0.2000
Iron	-	-	-
Lead	34.0000	150.0000	0.0632
Lithium	37.0000	152.2000	10.0000
Mercury	0.0900	23.0000	0.1000
Molybdenum	5.3000	380.0000	0.1073
Nickel	29.0000	1500.0000	0.1020
Phosphate		-	-
Potassium	6,400.0000	-	-
Selenium	0.6550	380.4156	0.1738
Silver	0.7900	380.4197	0.5397
Sodium	110.0000	-	-
Thallium	0.4600	4.9455	2.8798
Vanadium	62.0000	369.1094	1.5000
Zinc	110.0000	23000.0000	20.7553
Zirconium	8.6000	0.0000	7.4316
Inorganics			
Chloride	-	-	-
Cyanide	-	1,500.0000	290.0000
Fluoride	6.7000	4600.0000	0.0000
Nitrate-N	-	-	-
Sulfate	-	-	-
pH			
pH	-	-	-

Note: (mg/kg) = milligrams per kilogram — Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a Metal/pH/Inorganic analyte, this indicates the analyte was not analyzed.

Background — **Background Level**
Res RBSL — **Residential Risk-Based Screening Level**
Eco RBSL — **Ecological Risk-Based Screening Level**

Base Map Legend

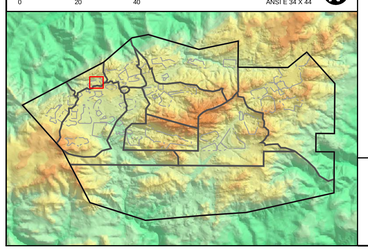
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

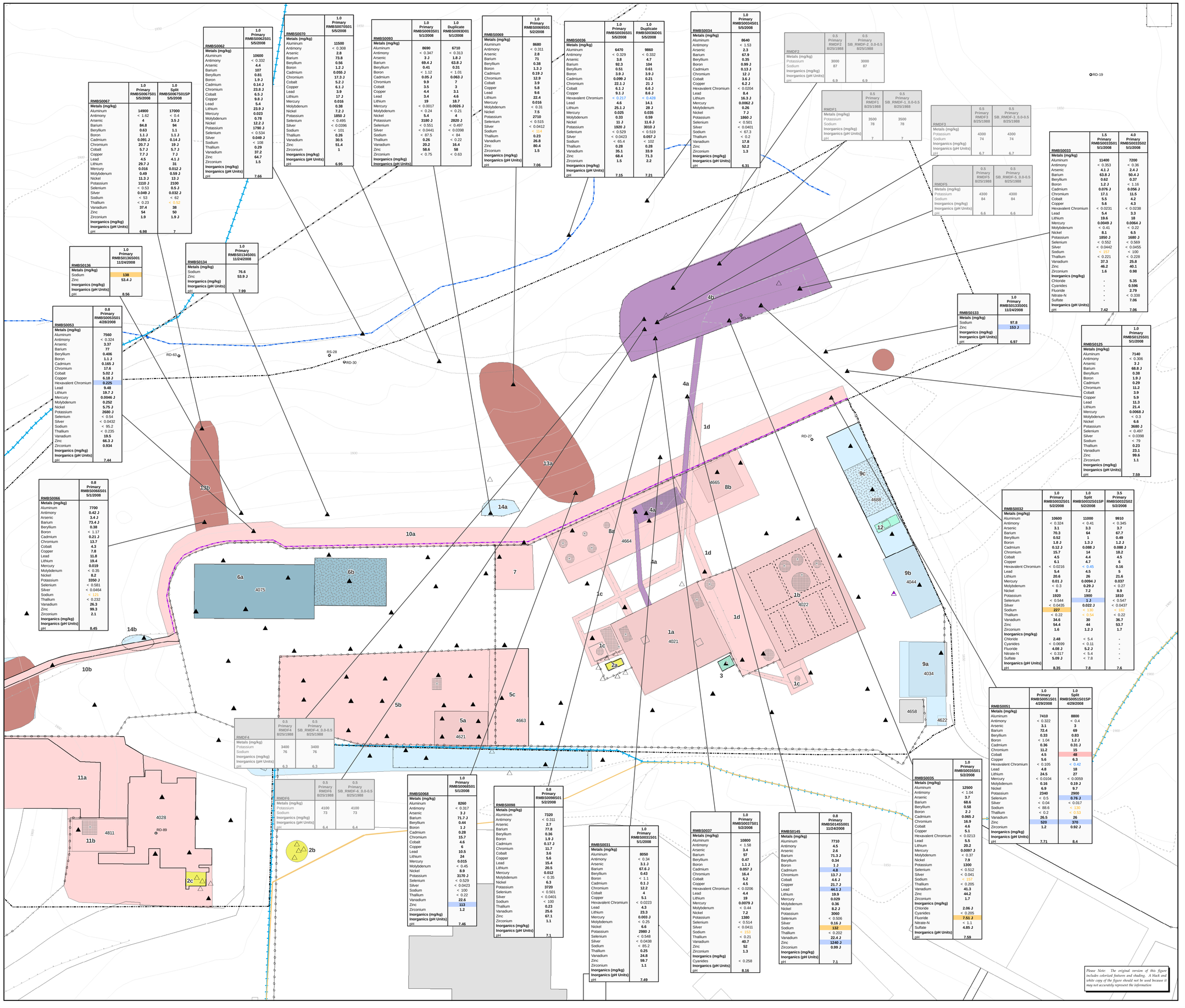
Chemical Use Area

- Multiple Use
- Solvents
- Petroleum
- Oils / PCBs
- Metals / Inorganics
- Perchlorate / Energetics
- Hydrazine
- Debris
- Leach Field
- Potential

Document: RFI-Report-Group7-Boxplot-RMHF-Metals_North.mxd — Date: Jun 10, 2009

1 inch = 20 feet
0 — 20 — 40 Feet
ANSI E 34 X 44





Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

Metals / pH / Inorganics Chemical Data Results
RMHF RFI Site
North RMHF Area

FIGURE C.3-6D

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample location with no detected Metals/pH/Inorganics Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: **RMDF5**

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Background
12.05	<0.06	Exceeds Background + Res RBSL
12.05	<0.06	Exceeds Background + Eco RBSL
12.05	<0.06	Exceeds Background + Res RBSL + Eco RBSL

Comparison Levels

Metals	Background (mg/kg)	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
Aluminum	20,000	75,000	12.0000
Antimony	8.7000	30.0000	0.0949
Arsenic	15.0000	0.0950	1.9180
Barium	140.0000	15000.0000	14.6026
Beryllium	1.1000	150.3254	5.0873
Boron	9.7000	15000.0000	6.7600
Cadmium	1.0000	77.8248	0.0208
Chromium	36.8000	114000.0000	930.0000
Cobalt	21.0000	22.7763	8.9498
Copper	29.0000	3000.0000	1.0886
Hexavalent Chromium	0.0000	110.0000	0.2000
Iron	-	-	-
Lead	34.0000	150.0000	0.0632
Lithium	37.0000	152.2000	10.0000
Mercury	0.0900	23.0000	0.1000
Molybdenum	5.3000	380.0000	0.1073
Nickel	29.0000	1500.0000	0.1020
Phosphate			-
Potassium	6,400.0000	-	-
Selenium	0.6550	380.4156	0.1738
Silver	0.7900	380.4197	0.5397
Sodium	110.0000	-	-
Thallium	0.4600	4.9455	2.8798
Vanadium	62.0000	369.1094	1.5000
Zinc	110.0000	23000.0000	20.7553
Zirconium	8.6000	0.0000	7.4316
Inorganics			
Chloride	-	-	-
Cyanide	-	1,500.0000	290.0000
Fluoride	6.7000	4600.0000	0.0000
Nitrate-N	-	-	-
Sulfate	-	-	-
pH			
pH	-	-	-

Note: (mg/kg) = milligrams per kilogram

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a Metal/pH/Inorganic analyte, this indicates the analyte was not analyzed.

Background — **Background Level**
Res RBSL — **Residential Risk-Based Screening Level**
Eco RBSL — **Ecological Risk-Based Screening Level**

Base Map Legend

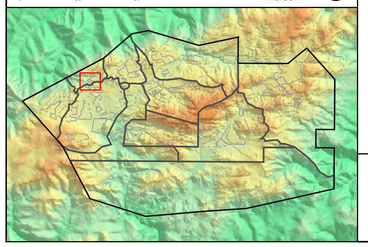
- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

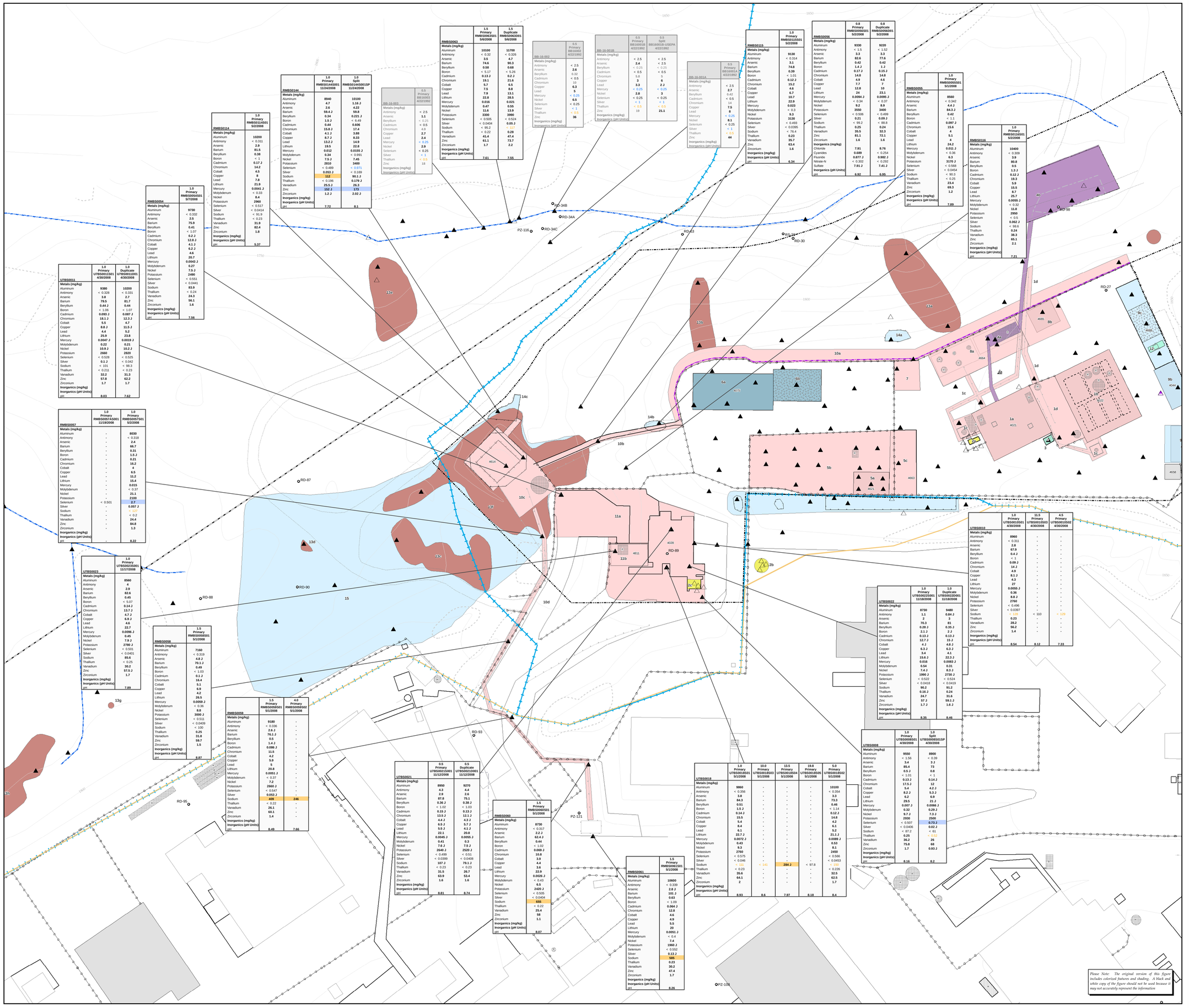
Chemical Use Area

- Multiple Use
- Metals / Inorganics
- Leach Field
- Solvents
- Perchlorate / Energetics
- Potential
- Petroleum
- Hydrazine
- Oils / PCBs
- Debris

Document: RFI-Report-Group7-Boxplot-RMHF-Metals_CatchBasin.mxd — Date: Jun 10, 2009

1 inch = 30 feet
0 — 30 — 60 Feet
ANSI E 34 X 44





RMB50144	1.0 Primary RMB50144S001 11/24/2008	1.0 Split RMB50144S001SP 11/24/2008
Metals (mg/kg)		
Aluminum	8940	10100
Antimony	4.7	1.16 J
Arsenic	2.6	4.22
Barium	59.4 J	59.8
Beryllium	0.34	0.221 J
Boron	1.5 J	< 6.49
Cadmium	0.44	0.606
Chromium	15.8 J	17.4
Cobalt	4.1 J	3.88
Copper	8.7 J	8.33
Lead	13.2 J	14.9
Lithium	19.5	22.8
Mercury	0.012	0.0155 J
Molybdenum	0.34	< 0.991
Nickel	7.5 J	7.45
Potassium	2810	3400
Selenium	< 0.489	< 0.971
Silver	0.053 J	< 0.169
Sodium	112	90.1 J
Thallium	< 0.196	0.179 J
Vanadium	25.5 J	26.3
Zinc	152 J	173
Zirconium	1.2 J	2.02 J
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	7.72	8.1

RMB50114	1.0 Primary RMB50114S01 5/2/2008
Metals (mg/kg)	
Aluminum	10200
Antimony	< 0.311
Arsenic	2.9
Barium	81.5
Beryllium	0.38
Boron	< 1
Cadmium	0.17 J
Chromium	14.2
Cobalt	4.5
Copper	8
Lead	7.8
Lithium	21.9
Mercury	0.0041 J
Molybdenum	< 0.33
Nickel	8.4
Potassium	2960
Selenium	< 0.517
Silver	< 0.0414
Sodium	< 91.9
Thallium	< 0.23
Vanadium	31.9
Zinc	82.4
Zirconium	1.8
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	5.37

RMB50054	1.0 Primary RMB50054S01 5/7/2008
Metals (mg/kg)	
Aluminum	9730
Antimony	< 0.332
Arsenic	2.5
Barium	75.9
Beryllium	0.41
Boron	< 1.07
Cadmium	0.2 J
Chromium	12.8 J
Cobalt	4.1 J
Copper	6.2 J
Lead	4.6
Lithium	20.7
Mercury	0.0043 J
Molybdenum	0.27
Nickel	7.5 J
Potassium	2490
Selenium	< 0.551
Silver	< 0.0441
Sodium	83.9
Thallium	< 0.24
Vanadium	24.3
Zinc	56.1
Zirconium	1.6
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.56

U7BS0031	1.0 Primary U7BS0031S01 4/30/2008	1.0 Duplicate U7BS0031D01 4/30/2008
Metals (mg/kg)		
Aluminum	9380	10200
Antimony	< 0.328	< 0.331
Arsenic	3.8	2.7
Barium	79.5	81.7
Beryllium	0.44 J	0.44
Boron	< 1.06	< 1.07
Cadmium	0.093 J	0.087 J
Chromium	18.1 J	12.3 J
Cobalt	5.5	4.7
Copper	8.8 J	11.5 J
Lead	4.4	5.2
Lithium	25.9	23.8
Mercury	0.0047 J	0.0019 J
Molybdenum	0.22	0.21
Nickel	10.9 J	10.2 J
Potassium	2660	2820
Selenium	< 0.528	< 0.525
Silver	0.1 J	< 0.042
Sodium	< 101	< 98.3
Thallium	< 0.211	< 0.23
Vanadium	32.2	31.3
Zinc	57.8	62.2
Zirconium	1.7	1.7
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.03	7.62

RMB50057	1.0 Primary RMB50057AS001 11/19/2008	1.0 Primary RMB50057S01 5/2/2008
Metals (mg/kg)		
Aluminum	-	8030
Antimony	-	< 0.318
Arsenic	-	2.4
Barium	-	66.7
Beryllium	-	0.31
Boron	-	1.5 J
Cadmium	-	0.21
Chromium	-	16.2
Cobalt	-	4
Copper	-	6.5
Lead	-	11.2
Lithium	-	15.4
Mercury	-	0.015
Molybdenum	-	< 0.37
Nickel	-	21.1
Potassium	-	2100
Selenium	< 0.501	2.7
Silver	-	0.057 J
Sodium	-	107
Thallium	-	< 0.2
Vanadium	-	24.4
Zinc	-	84.8
Zirconium	-	1.3
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	-	8.22

U7BS0023	1.0 Primary U7BS0023S001 11/17/2008
Metals (mg/kg)	
Aluminum	8560
Antimony	4
Arsenic	2.9
Barium	82.6
Beryllium	0.45
Boron	< 5.07
Cadmium	0.14 J
Chromium	13.7 J
Cobalt	4.7 J
Copper	6.9 J
Lead	4.6
Lithium	22.7
Mercury	0.0096 J
Molybdenum	0.45
Nickel	7.9 J
Potassium	2780 J
Selenium	< 0.501
Silver	< 0.0401
Sodium	85.6
Thallium	< 0.25
Vanadium	30.2
Zinc	57.5 J
Zirconium	1.7
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.89

RMB50058	1.5 Primary RMB50058S01 5/1/2008
Metals (mg/kg)	
Aluminum	7160
Antimony	< 0.319
Arsenic	4.8 J
Barium	70.1 J
Beryllium	0.49
Boron	< 1.03
Cadmium	0.1 J
Chromium	16.4
Cobalt	5.1
Copper	6.9
Lead	4.2
Lithium	26.5
Mercury	0.0059 J
Molybdenum	< 0.36
Nickel	8.8
Potassium	3000 J
Selenium	< 0.511
Silver	< 0.0409
Sodium	< 100
Thallium	0.25
Vanadium	31.8
Zinc	59.7
Zirconium	1.5
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.87

RMB50059	1.5 Primary RMB50059S01 5/1/2008	4.0 Primary RMB50059S02 5/1/2008
Metals (mg/kg)		
Aluminum	9180	-
Antimony	< 0.336	-
Arsenic	2.6 J	-
Barium	76.1 J	-
Beryllium	0.5	-
Boron	1.4 J	-
Cadmium	0.086 J	-
Chromium	11.5	-
Cobalt	4.2	-
Copper	5.9	-
Lead	5	-
Lithium	20.8	-
Mercury	0.0051 J	-
Molybdenum	< 0.37	-
Nickel	7.2	-
Potassium	2660 J	-
Selenium	< 0.547	-
Silver	0.053 J	-
Sodium	409	246
Thallium	< 0.22	-
Vanadium	26.1	-
Zinc	60.1	-
Zirconium	1.4	-
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.49	7.66

U7BS0021	0.5 Primary U7BS0021S01 11/12/2008	0.5 Duplicate U7BS0021D001 11/12/2008
Metals (mg/kg)		
Aluminum	8950	9270
Antimony	4.3	4.4
Arsenic	2.9	2.6
Barium	87.8	75.1
Beryllium	0.36 J	0.38 J
Boron	< 1.02	< 1.03
Cadmium	0.15 J	0.13 J
Chromium	13.5 J	12.1 J
Cobalt	4.4 J	4.3 J
Copper	6.5 J	5.7 J
Lead	5.5 J	4.1 J
Lithium	22.1	20.8
Mercury	0.0045 J	0.0055 J
Molybdenum	0.41	0.3
Nickel	7.6 J	7.5 J
Potassium	2640 J	2520 J
Selenium	< 0.499	< 0.51
Silver	< 0.0399	< 0.0408
Sodium	107 J	79.1 J
Thallium	< 0.23	< 0.23
Vanadium	31.5	26.7
Zinc	63.9	53.4
Zirconium	1.6	1.6
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.81	8.74

RMB50060	1.5 Primary RMB50060S01 5/1/2008
Metals (mg/kg)	
Aluminum	8730
Antimony	< 0.317
Arsenic	2.2 J
Barium	62.4 J
Beryllium	0.44
Boron	< 1.02
Cadmium	0.069 J
Chromium	10.8
Cobalt	3.9
Copper	4.4
Lead	3.6
Lithium	22.9
Mercury	0.0026 J
Molybdenum	< 0.43
Nickel	6.5
Potassium	2420 J
Selenium	< 0.505
Silver	< 0.0404
Sodium	655
Thallium	< 0.22
Vanadium	25.4
Zinc	58
Zirconium	1.1
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.07

RMB50061	1.5 Primary RMB50061S01 5/1/2008
Metals (mg/kg)	
Aluminum	10600
Antimony	< 0.339
Arsenic	2.8 J
Barium	101 J
Beryllium	0.63
Boron	< 1.09
Cadmium	0.064 J
Chromium	12.8
Cobalt	4.6
Copper	4.9
Lead	5.5
Lithium	20
Mercury	0.0051 J
Molybdenum	< 0.4
Nickel	7.4
Potassium	1960 J
Selenium	< 0.552
Silver	0.13 J
Sodium	585
Thallium	0.23
Vanadium	30.2
Zinc	47.4
Zirconium	1.7
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.26

BB-16-003	0.5 Primary BB16003 4/22/1992
Metals (mg/kg)	
Antimony	< 2.5
Arsenic	1.1
Beryllium	< 0.25
Cadmium	< 0.5
Chromium	4.9
Copper	2.7
Lead	2.4
Mercury	< 0.25
Nickel	2.9
Selenium	< 0.25
Silver	< 1
Thallium	< 0.5
Zinc	18
Inorganics (mg/kg)	
Inorganics (pH Units)	

BB-16-002	0.5 Primary BB16002 4/22/1992
Metals (mg/kg)	
Antimony	< 2.5
Arsenic	2.6
Beryllium	0.32
Cadmium	< 0.5
Chromium	19
Copper	6.3
Lead	5
Mercury	< 0.25
Nickel	6.5
Selenium	< 0.25
Silver	< 1
Thallium	< 0.5
Zinc	36
Inorganics (mg/kg)	
Inorganics (pH Units)	

BB-16-001B	0.5 Primary BB16001B 4/22/1992	0.5 Split BB16001BUSEPA 4/22/1992
Metals (mg/kg)		
Antimony	< 2.5	< 2.5
Arsenic	2.4	< 2.5
Beryllium	< 0.25	< 0.25
Cadmium	< 0.5	< 0.5
Chromium	5.8	5
Copper	3	6
Lead	3.3	2.2
Mercury	< 0.25	< 0.25
Nickel	2.8	3
Selenium	< 0.25	< 0.25
Silver	< 1	< 1
Thallium	< 0.5	< 0.5
Zinc	19	21.1
Inorganics (mg/kg)		
Inorganics (pH Units)		

BB-16-001A	0.5 Primary BB16001A 4/22/1992
Metals (mg/kg)	
Antimony	< 2.5
Arsenic	2.7
Beryllium	0.42
Cadmium	< 0.5
Chromium	14
Copper	7.5
Lead	8
Mercury	< 0.25
Nickel	8.1
Selenium	< 0.25
Silver	< 1
Thallium	< 0.5
Zinc	44
Inorganics (mg/kg)	
Inorganics (pH Units)	

RMB50115	1.0 Primary RMB50115S01 5/2/2008
Metals (mg/kg)	
Aluminum	9130
Antimony	< 0.314
Arsenic	3.1
Barium	74.8
Beryllium	0.39
Boron	< 1.01
Cadmium	0.12 J
Chromium	15.2
Cobalt	4.6
Copper	6.7
Lead	10.7
Lithium	22.9
Mercury	0.023
Molybdenum	< 0.3
Nickel	9.3
Potassium	3130
Selenium	< 0.493
Silver	< 0.0395
Sodium	< 76.4
Thallium	0.23
Vanadium	35.7
Zinc	63.4
Zirconium	1.6
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	6.34

RMB50056	0.8 Primary RMB50056S01 5/2/2008	0.8 Duplicate RMB50056D01 5/2/2008
Metals (mg/kg)		
Aluminum	9330	9220
Antimony	< 1.5	< 1.52
Arsenic	3.3	3.3
Barium	82.6	77.6
Beryllium	0.42	0.42
Boron	1.4 J	1 J
Cadmium	0.17 J	0.15 J
Chromium	14.8	14.8
Cobalt	4.9	4.6
Copper	7.7	7
Lead	12.8	10
Lithium	24	23.1
Mercury	0.0094 J	0.0095 J
Molybdenum	< 0.34	< 0.37
Nickel	9.2	8.9
Potassium	3950	3400
Selenium	< 0.506	< 0.499
Silver	0.21	0.09 J
Sodium	< 99.2	< 88.8
Thallium	0.25	0.24
Vanadium	35.5	32.3
Zinc	81.1	72.1
Zirconium	1.6	1.6
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	7.91	7.41
	6.92	6.95

RMB50055	1.0 Primary RMB50055S01 5/1/2008
Metals (mg/kg)	
Aluminum	8560
Antimony	< 0.342
Arsenic	4.4 J
Barium	84.3 J
Beryllium	0.42
Boron	< 1.1
Cadmium	0.097 J
Chromium	15.6
Cobalt	4
Copper	5.1
Lead	4
Lithium	24.2
Mercury	0.011 J
Molybdenum	< 0.36
Nickel	6.3
Potassium	3170 J
Selenium	< 0.568
Silver	< 0.0454
Sodium	< 90.3
Thallium	< 0.25
Vanadium	23.4
Zinc	69.3
Zirconium	1.2
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.89

RMB50116	1.0 Primary RMB50116S01 5/2/2008
Metals (mg/kg)	
Aluminum	10400
Antimony	< 0.309
Arsenic	3.9
Barium	80.8
Beryllium	0.5
Boron	1.3 J
Cadmium	0.12 J
Chromium	19.3
Cobalt	5.9
Copper	15.5
Lead	8.7
Lithium	25.7
Mercury	0.0055 J
Molybdenum	< 0.32
Nickel	11.8
Potassium	2950
Selenium	< 0.5
Silver	0.062 J
Sodium	< 98.6
Thallium	0.24
Vanadium	38.3
Zinc	65.1
Zirconium	2.1
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.21

U7BS0010	1.0 Primary U7BS0010S01 4/30/2008	11.5 Primary U7BS0010S03 4/30/2008	4.5 Primary U7BS0010S02 4/30/2008
Metals (mg/kg)			
Aluminum	8960	-	-
Antimony	< 0.311	-	-
Arsenic	2.8	-	-
Barium	67.9	-	-
Beryllium	0.4 J	-	-
Boron	< 1	-	-
Cadmium	0.09 J	-	-
Chromium	14 J	-	-
Cobalt	4.9	-	-
Copper	8.1 J	-	-
Lead	4.3	-	-
Lithium	27	-	-
Mercury	0.0055 J	-	-
Molybdenum	0.36	-	-
Nickel	8.8 J	-	-
Potassium	2760	-	-
Selenium	< 0.496	-	-
Silver	< 0.0397	-	-
Sodium	< 220	< 110	< 129
Thallium	0.23	-	-
Vanadium	28.2	-	-
Zinc	56.2	-	-
Zirconium	1.4	-	-
Inorganics (mg/kg)			
Inorganics (pH Units)			
pH	8.54	8.12	7.33

U7BS0022	1.0 Primary U7BS0022S001 11/18/2008	1.0 Duplicate U7BS0022D001 11/18/2008
Metals (mg/kg)		
Aluminum	8730	9480
Antimony	1.1	0.84 J
Arsenic	2	3
Barium	70.3	81
Beryllium	0.28 J	0.35 J
Boron	2.1 J	2 J
Cadmium	0.13 J	0.13 J
Chromium	12.7 J	15 J
Cobalt	4 J	4.8 J
Copper	6.3 J	6.3 J
Lead	3.4	4.1
Lithium	15.6 J	22.3 J
Mercury	0.016	0.0083 J
Molybdenum	0.54	0.31
Nickel	7.4 J	8.3 J
Potassium	1990 J	2730 J
Selenium	< 0.522	< 0.524
Silver	< 0.0418	< 0.0419
Sodium	90.2	91.2
Thallium	0.16 J	0.24
Vanadium	24.7	31.6
Zinc	57.2	59.1 J
Zirconium	1.7 J	1.8 J
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.35	8.46

U7BS0008	1.0 Primary U7BS0008S01 4/30/2008	1.0 Split U7BS0008S01SP 4/30/2008
Metals (mg/kg)		
Aluminum	9550	8900
Antimony	< 1.56	< 0.39
Arsenic	3.4	3.3
Barium	85.4	73
Beryllium	0.5 J	0.8
Boron	< 1.01	< 1
Cadmium	0.13 J	0.14 J
Chromium	17.5 J	12
Cobalt	5.4	4.2 J
Copper	8.2 J	5.3 J
Lead	6.2	6.9
Lithium	29.5	21.2
Mercury	0.007 J	0.0066 J
Molybdenum	0.32	0.29 J
Nickel	9.7 J	7.3 J
Potassium	2930	2505
Selenium	< 0.507	0.73 J
Silver	< 0.0406	0.02 J
Sodium	< 87.2	< 61
Thallium	0.25	< 0.22
Vanadium	36.2	26
Zinc	75.8	66
Zirconium	1.7	0.93 J
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.16	8.2

U7BS0018	1.0 Primary U7BS0018S01 5/1/2008	10.0 Primary U7BS0018S03 5/1/2008	13.5 Primary U7BS0018S04 5/1/2008	19.8 Primary U7BS0018S05 5/1/2008	5.0 Primary U7BS0018S02 5/1/2008
Metals (mg/kg)					
Aluminum	9060	-	-	-	10100
Antimony	< 0.356	-	-	-	< 0.354
Arsenic	3.8	-	-	-	3.3
Barium	84.3	-	-	-	73.3
Beryllium	0.51	-	-	-	0.46
Boron	1.5 J	-	-	-	< 1.14
Cadmium	0.14 J	-	-	-	0.12 J
Chromium	15.5	-	-	-	14.8
Cobalt	5.4	-	-	-	4.2
Copper	8.4	-	-	-	6.1
Lead	6.1	-	-	-	5.2
Lithium	22.7 J	-	-	-	21.1 J
Mercury	0.0072 J	-	-	-	0.0089 J
Molybdenum	0.43	-	-	-	0.53
Nickel	9.3	-	-	-	8.1
Potassium	2760	-	-	-	2450
Selenium	< 0.575	-	-	-	< 0.566
Silver	< 0.046	-	-	-	< 0.0453
Sodium	< 316	< 141	284 J	< 97.8	< 109
Thallium	< 0.23	-	-	-	< 0.226
Vanadium	35.6	-	-	-	32.5
Zinc	64.1	-	-	-	62.5
Zirconium	2	-	-	-	1.7
Inorganics (mg/kg)					
Inorganics (pH Units)					
pH	8.93	8.6	7.97	8.18	8.4

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

SANTA SUSANA FIELD LABORATORY

Metals / pH / Inorganics Chemical Data Results
RMHF RFI Site
RMHF Catch Basin

FIGURE C.3-6E

Soil Sample Location Symbol Legend

- ▲ **Soil sample location with detected Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample location with no detected Metals/pH/Inorganics Chemical Data**
- △ **Contained unit soil sample**
- △ **Refused sample (refusal depth < 1' below ground surface)**
- △ **Soil sample location not analyzed for Metals/pH/Inorganics Chemical Data**
- ▲ **Soil sample not analyzed by any sample method**

Data Box Information

(Historical Sample)

Sample Location ID: RMDF5

1.00 — Depth in Feet
Primary — Sample Type
RMDF5S01 — Unique Sample Identifier
7/10/2005 — Date

12.05	Detect with sample concentration shown
<0.06	Non-Detect with lab detection limit shown
J	Analyte positively identified; Associated numerical value is considered estimated
*	Data validation not performed
E	Data not validated, laboratory qualifier for estimated value
QC	Data not validated, laboratory qualifier for internal lab QC issue
NA	Analysis not conducted
[#]	If more than one result per column, the maximum is presented, with number of results in backets.

Note: "12.05" and "<0.06" are for reference only and may not represent actual sample results.

Detect	Non-Detect	
12.05	<0.06	Exceeds Background
12.05	<0.06	Exceeds Background + Res RBSL
12.05	<0.06	Exceeds Background + Eco RBSL
12.05	<0.06	Exceeds Background + Res RBSL + Eco RBSL

Comparison Levels

Metals	Background (mg/kg)	Res RBSL (mg/kg)	Eco RBSL (mg/kg)
Aluminum	20,000	75,000	12.0000
Antimony	8.7000	30.0000	0.0949
Arsenic	15.0000	0.0950	1.9180
Barium	140.0000	15000.0000	14.6026
Beryllium	1.1000	150.3254	5.0873
Boron	9.7000	15000.0000	6.7600
Cadmium	1.0000	77.8248	0.0208
Chromium	36.8000	114000.0000	930.0000
Cobalt	21.0000	22.7763	8.9498
Copper	29.0000	3000.0000	1.0886
Hexavalent Chromium	0.0000	110.0000	0.2000
Iron	-	-	-
Lead	34.0000	150.0000	0.0632
Lithium	37.0000	152.2000	10.0000
Mercury	0.0900	23.0000	0.1000
Molybdenum	5.3000	380.0000	0.1073
Nickel	29.0000	1500.0000	0.1020
Phosphate			-
Potassium	6,400.0000	-	-
Selenium	0.6550	380.4156	0.1738
Silver	0.7900	380.4197	0.5397
Sodium	110.0000	-	-
Thallium	0.4600	4.9455	2.8798
Vanadium	62.0000	369.1094	1.5000
Zinc	110.0000	23000.0000	20.7553
Zirconium	8.6000	0.0000	7.4316
Inorganics			
Chloride	-	-	-
Cyanide	-	1,500.0000	290.0000
Fluoride	6.7000	4600.0000	0.0000
Nitrate-N	-	-	-
Sulfate	-	-	-
pH			
pH	-	-	-

Note: (mg/kg) = milligrams per kilogram

Data Date: April 2009

Note: For the chemical result boxes, if results are not listed for a Metal/pH/Inorganic analyte, this indicates the analyte was not analyzed.

Background Background Level
Res RBSL Residential Risk-Based Screening Level
Eco RBSL Ecological Risk-Based Screening Level

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building or Structure
- Removed Building or Structure
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Trench
- Excavation
- Elevation Contour

Chemical Use Area

- Multiple Use
- Solvents
- Petroleum
- Oils / PCBs
- Metals / Inorganics
- Perchlorate / Energetics
- Hydrazine
- Debris
- Leach Field
- Potential

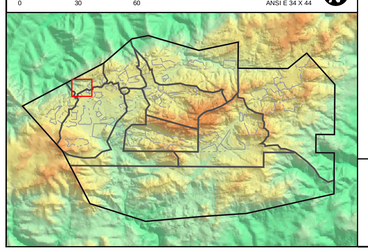
Document: RFI-Report-Group7-Boxplot-RMHF-Metals_South.mxd

Date: Jun 10, 2009

1 inch = 30 feet

0 30 60 Feet

ANSI E 34 X 44



U7BS0001	1.3 Primary U7BS0001S01 5/2/2008
Metals (mg/kg)	
Aluminum	9620
Antimony	< 1.55
Arsenic	4.2
Barium	81.9
Beryllium	0.42
Boron	1.2 J
Cadmium	0.14 J
Chromium	17.5
Cobalt	5.4
Copper	7.3
Lead	7.8
Lithium	23.4
Mercury	0.0064 J
Molybdenum	0.31
Nickel	10.3
Potassium	3060
Selenium	< 0.487
Silver	< 0.039
Sodium	< 79.7
Thallium	0.25
Vanadium	38.8
Zinc	61.3
Zirconium	1.9
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.98

U7BS0002	0.8 Primary U7BS0002S01 5/2/2008
Metals (mg/kg)	
Aluminum	8400
Antimony	< 0.309
Arsenic	3.3
Barium	76
Beryllium	0.39
Boron	1.2 J
Cadmium	0.14 J
Chromium	20.1
Cobalt	5.1
Copper	8.3
Lead	9.9
Lithium	24.9
Mercury	0.0073 J
Molybdenum	0.31
Nickel	10.9
Potassium	2630
Selenium	< 0.505
Silver	0.077 J
Sodium	209
Thallium	< 0.22
Vanadium	41.4
Zinc	61.2
Zirconium	1.5
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.39

U7BS0003	1.0 Primary U7BS0003S01 5/2/2008	2.5 Primary U7BS0003S02 5/2/2008
Metals (mg/kg)		
Aluminum	10200	-
Antimony	< 1.55	-
Arsenic	2.9	-
Barium	75.4	-
Beryllium	0.41	-
Boron	1.6 J	-
Cadmium	0.12 J	-
Chromium	16.1	-
Cobalt	4.9	-
Copper	6.8	-
Lead	5.6	-
Lithium	21.3	-
Mercury	0.0064 J	-
Molybdenum	0.29	-
Nickel	9.2	-
Potassium	2770	-
Selenium	< 0.508	-
Silver	< 0.0406	-
Sodium	632	460
Thallium	0.23	-
Vanadium	39.2	-
Zinc	56.6	-
Zirconium	1.8	-
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	8.41	8.51

BB-17-004	0.5 Primary BB17004 4/21/1992
Metals (mg/kg)	
Antimony	< 2.5
Arsenic	1.9
Beryllium	0.46
Cadmium	< 0.5
Chromium	14
Copper	8.3
Lead	14
Mercury	< 0.25
Nickel	8.3
Selenium	< 0.25
Silver	< 1
Thallium	< 0.5
Zinc	43
Inorganics (mg/kg)	
Inorganics (pH Units)	

BB-17-003	0.5 Primary BB17003 4/21/1992
Metals (mg/kg)	
Antimony	< 2.5
Arsenic	2.6
Beryllium	0.44
Cadmium	< 0.5
Chromium	12
Copper	8.3
Lead	14
Mercury	< 0.25
Nickel	8.6
Selenium	< 0.25
Silver	< 1
Thallium	< 0.5
Zinc	40
Inorganics (mg/kg)	
Inorganics (pH Units)	

U7BS0006	1.5 Primary U7BS0006S01 5/7/2008
Metals (mg/kg)	
Aluminum	8510
Antimony	< 0.325
Arsenic	3.7
Barium	81.7
Beryllium	0.46
Boron	1.8 J
Cadmium	0.29
Chromium	17
Cobalt	5.2
Copper	9.7
Lead	9
Lithium	20
Mercury	0.016 J
Molybdenum	0.51
Nickel	11.3
Potassium	2930
Selenium	< 0.51
Silver	0.051 J
Sodium	< 85.9
Thallium	0.27
Vanadium	33.1
Zinc	57.8
Zirconium	1.9
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	6.79

BB-17-002	0.5 Primary BB17002 4/21/1992
Metals (mg/kg)	
Antimony	< 2.5
Arsenic	3
Beryllium	0.32
Cadmium	< 0.5
Chromium	16
Copper	8.6
Lead	11
Mercury	< 0.25
Nickel	8.4
Selenium	< 0.25
Silver	< 1
Thallium	< 0.5
Zinc	46
Inorganics (mg/kg)	
Inorganics (pH Units)	

U7BS0005	0.7 Primary U7BS0005S01 5/7/2008
Metals (mg/kg)	
Aluminum	9400
Antimony	< 0.306
Arsenic	3.3
Barium	87.8
Beryllium	0.42
Boron	1.6 J
Cadmium	0.26
Chromium	18.4
Cobalt	5.2
Copper	8.4
Lead	10.6
Lithium	21.8
Mercury	0.012 J
Molybdenum	0.37
Nickel	10.7
Potassium	3270
Selenium	< 0.507
Silver	0.071 J
Sodium	< 80.5
Thallium	0.25
Vanadium	35.3
Zinc	58.6
Zirconium	1.8
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.2

U7BS0014	0.5 Primary U7BS0014S01 5/7/2008
Metals (mg/kg)	
Aluminum	8840
Antimony	< 0.305
Arsenic	3.1
Barium	95.4
Beryllium	0.39
Boron	< 0.985
Cadmium	0.19 J
Chromium	18
Cobalt	8.6
Copper	7.5
Lead	5
Lithium	20
Mercury	0.014 J
Molybdenum	0.42
Nickel	10.4
Potassium	2350
Selenium	< 0.502
Silver	< 0.0402
Sodium	< 65.7
Thallium	0.27
Vanadium	34.8
Zinc	51.3
Zirconium	1.7
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	6.56

U7BS0017	1.5 Primary U7BS0017S01 5/6/2008
Metals (mg/kg)	
Aluminum	10400
Antimony	< 0.32
Arsenic	3.9
Barium	77.4
Beryllium	0.6
Boron	< 5.17
Cadmium	0.093 J
Chromium	22.8 J
Cobalt	8.9 J
Copper	8.6
Lead	6
Lithium	18.7
Mercury	0.0088 J
Molybdenum	0.42
Nickel	15.1 J
Potassium	2530
Selenium	< 0.514
Silver	< 0.0411
Sodium	< 66.4
Thallium	0.23
Vanadium	41.5
Zinc	60.1
Zirconium	1.9 J
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	6.34

U7BS0025	1.3 Primary U7BS00255001 11/20/2008
Metals (mg/kg)	
Aluminum	16500
Antimony	4.1
Arsenic	5.1
Barium	109
Beryllium	0.78
Boron	< 2.8
Cadmium	0.22 J
Chromium	27.7
Cobalt	7.3
Copper	11.4
Lead	7.8
Lithium	22.7
Mercury	0.023
Molybdenum	< 0.26
Nickel	14.5
Potassium	2480
Selenium	< 0.547
Silver	0.051 J
Sodium	94 J
Thallium	< 0.27
Vanadium	53.9
Zinc	57
Zirconium	4.5
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.44

U7BS0016	1.0 Primary U7BS0016S01 5/6/2008	1.0 Split U7BS0016S01SP 5/6/2008
Metals (mg/kg)		
Aluminum	8990	12000
Antimony	< 1.01	< 0.39
Arsenic	2.9	2.3
Barium	82.3	75
Beryllium	0.45	0.8
Boron	< 5.07	2.2 J
Cadmium	0.14 J	0.16 J
Chromium	13.8 J	12
Cobalt	5 J	4.2
Copper	7.1	5.9
Lead	6.2	6.6
Lithium	21.3	22
Mercury	0.023	0.025 J
Molybdenum	0.31	0.25 J
Nickel	8.7 J	7.1
Potassium	3400	3400
Selenium	< 0.503	0.38 J
Silver	< 0.0403	0.021 J
Sodium	< 54	< 61
Thallium	< 0.22	< 0.52
Vanadium	31.1	23
Zinc	57.5	53
Zirconium	1.9 J	2.2 J
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	7.1	8

U7BS0015	1.5 Primary U7BS0015S01 5/6/2008
Metals (mg/kg)	
Aluminum	9320
Antimony	< 0.318
Arsenic	2.8
Barium	70.4
Beryllium	0.46 J
Boron	< 5.13
Cadmium	0.14 J
Chromium	15.6 J
Cobalt	4.5 J
Copper	7
Lead	5.4
Lithium	21.5
Mercury	0.012
Molybdenum	0.34
Nickel	8.9 J
Potassium	2730
Selenium	< 0.513
Silver	< 0.041
Sodium	< 256
Thallium	0.23
Vanadium	25.8
Zinc	42.9
Zirconium	2 J
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	6.99

BB-17-001	0.5 Primary BB17001 4/21/1992	0.5 Split BB17001-USEPA 4/21/1992
Metals (mg/kg)		
Antimony	< 2.5	< 2.5
Arsenic	2.4	< 2.5
Beryllium	0.39	< 0.25
Cadmium	< 0.5	< 0.5
Chromium	12	13
Copper	6.7	13
Lead	9.7	4.5
Mercury	< 0.25	< 0.25
Nickel	6.6	9
Selenium	< 0.25	< 0.25
Silver	< 1	< 1
Thallium	< 0.5	< 0.5
Zinc	42	54.4
Inorganics (mg/kg)		
Inorganics (pH Units)		

U7BS0026	1.0 Primary U7BS0026S001 11/21/2008
Metals (mg/kg)	
Sodium	< 81.7
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.11

U7BS0020	1.0 Primary U7BS0020S001 11/18/2008
Metals (mg/kg)	
Sodium	77.6
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	6.95

U7BS0013	1.5 Primary U7BS0013S01 5/6/2008
Metals (mg/kg)	
Aluminum	13000
Antimony	< 0.329
Arsenic	6.2
Barium	69.8
Beryllium	0.76
Boron	< 5.3
Cadmium	0.14 J
Chromium	20.4 J
Cobalt	5.8 J
Copper	7.6
Lead	4.9
Lithium	27.3
Mercury	0.026
Molybdenum	0.72
Nickel	11.1 J
Potassium	3090
Selenium	< 0.528
Silver	0.053 J
Sodium	< 84.5
Thallium	0.23
Vanadium	35.9
Zinc	42.2
Zirconium	2 J
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	7.27

BB-16-005	0.5 Primary BB16005 4/22/1992
Metals (mg/kg)	
Antimony	< 2.5
Arsenic	1.6
Beryllium	< 0.25
Cadmium	< 0.5
Chromium	5
Copper	2.5
Lead	2.6
Mercury	< 0.25
Nickel	2.8
Selenium	< 0.25
Silver	< 1
Thallium	< 0.5
Zinc	18
Inorganics (mg/kg)	
Inorganics (pH Units)	

RMBS0064	1.5 Primary RMBS0064S01 5/6/2008
Metals (mg/kg)	
Aluminum	8550
Antimony	< 0.323
Arsenic	3.2
Barium	59.8
Beryllium	0.42
Boron	< 5.2
Cadmium	0.077 J
Chromium	15.1
Cobalt	5.2
Copper	5.8
Lead	4.2
Lithium	23.1
Mercury	0.0062 J
Molybdenum	0.3
Nickel	9
Potassium	2990
Selenium	< 0.514
Silver	< 0.0411
Sodium	< 69.9
Thallium	< 0.21
Vanadium	31.8
Zinc	51.9
Zirconium	1.3
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.01

BB-16-004	0.5 Primary BB16004 4/22/1992
Metals (mg/kg)	
Antimony	< 2.5
Arsenic	2.5
Beryllium	0.39
Cadmium	< 0.5
Chromium	9.9
Copper	6.5
Lead	14
Mercury	< 0.25
Nickel	5.7
Selenium	< 0.25
Silver	< 1
Thallium	< 0.5
Zinc	120
Inorganics (mg/kg)	
Inorganics (pH Units)	

U7BS0004	0.7 Primary U7BS0004S01 5/7/2008
Metals (mg/kg)	
Aluminum	9270
Antimony	< 0.99
Arsenic	2.8
Barium	75.7
Beryllium	0.44
Boron	2.3 J
Cadmium	0.2
Chromium	14.2
Cobalt	4.3
Copper	7.2
Lead	7.8
Lithium	17.8
Mercury	0.0096 J
Molybdenum	0.62
Nickel	8.1
Potassium	2260
Selenium	< 0.488
Silver	0.063 J
Sodium	261
Thallium	0.23
Vanadium	26.8
Zinc	54.5
Zirconium	2
Inorganics (mg/kg)	
Inorganics (pH Units)	
pH	8.19

U7BS0027	1.0 Primary U7BS00275001 11/19/2008	5.0 Primary U7BS00275002 11/19/2008
Metals (mg/kg)		
Sodium	643	416
Inorganics (mg/kg)		
Inorganics (pH Units)		
pH	-	8.73

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information

MWH

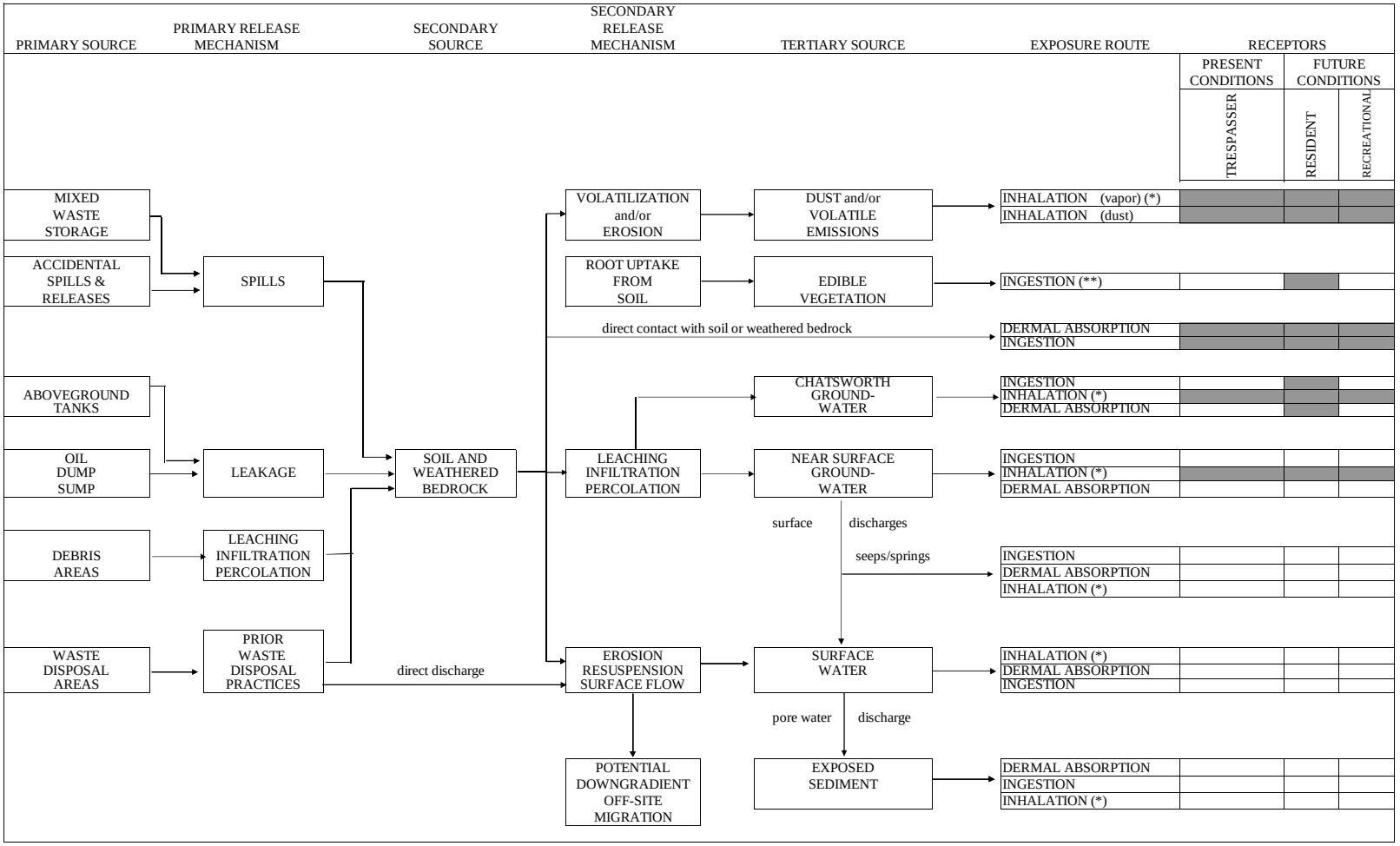
SANTA SUSANA FIELD LABORATORY

Metals / pH / Inorganics Chemical Data Results
RMHF RFI Site
South RMHF Area

FIGURE C.3-6F

Figure C.4-1

Human Health Risk Assessment Conceptual Site Model
RMHF RFI Site



NOTES:

As described in the SRAM (MWH 2005), note that risk estimates for the potential future recreational user (recreator) are used as surrogate risk estimates for the trespasser.

(*) Exposure limited to volatile compounds as defined in the text; residential and worker receptors include both indoor and outdoor air exposure to volatiles; non-residental and non-worker receptors include only outdoor air exposure. For workers, inhalation of volatiles from groundwater beneath the RFI site includes pathways associated with both migration to indoor air and ambient air (domestic groundwater use is an incomplete exposure pathway). For residents, exposures to reporting area perched groundwater includes pathways associated with domestic use.
Exposure to fugitive dust is limited to non-VOC compounds. For residents, exposures to Chatsworth formation groundwater includes pathways associated with migration to indoor and outdoor air.

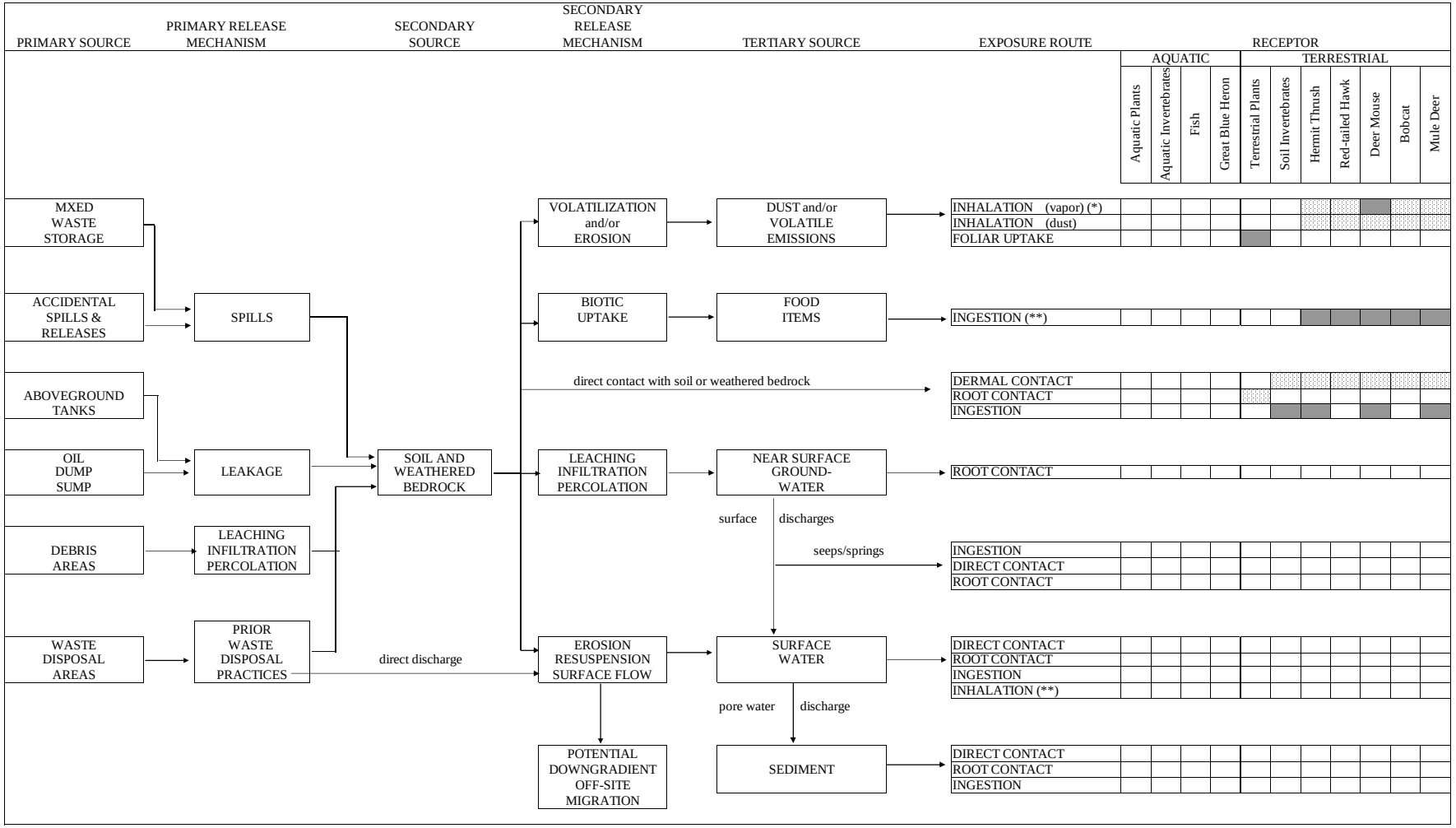
(**) Exposure limited to bioaccumulatable compounds as described in the text.

- complete and potentially complete exposure pathways evaluated in this risk assessment

- incomplete exposure pathways not evaluated in this risk assessment

Figure C.4-2

Ecological Risk Assessment Conceptual Site Model
RMHF RFI Site



NOTES:
(*) Exposure limited to volatile compounds as defined in the text.
(**) Exposures limited to bioacummulative compounds as defined in the text.

- complete and potentially complete exposure pathways evaluated in this risk assessment

- incomplete exposure pathways not evaluated in this risk assessment

- minor exposure pathway not evaluated in this risk assessment

Surficial Media Site Action Recommendtions RMHF RFI Site

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- Existing Building
- Removed Building
- Other Tanks
- Solvent Tank
- Petroleum Fuel/Oil Tank
- Hydrazine Tank
- Awning
- Sump
- Vaults and Pits
- Ponds
- Dirt Road
- A/C Paving
- Fence
- Pipe
- Leach Field
- NPDES Outfall
- Well
- Drainage
- Lined Drainage
- Surface Water Divide
- Rock Outcrop
- Excavation
- Elevation Contour

Note: This figure is created to depict current conditions.

CMS Areas

- RMHF CMS Area

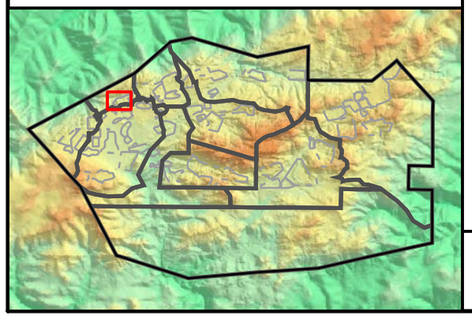
CMS Areas recommended for further evaluation in Corrective Measures Study (CMS)

CMS Area Designations described in Table C.5-2

Document: RFI-Report-Group7-Appendix-RMHF-CMS_11x17.mxd Date: Jun 11, 2009

1 inch = 75 feet

0 75 150 Feet



Shaded locations represent the approximate extent of areas recommended for further evaluation in the CMS and are those listed in Table C.5-2. These approximate areas, and associated chemical driver or contributors (shown in inset table), are based on comprehensive evaluation of all potential receptors. CMS areas may be refined during the CMS based on land use scenarios and further risk assessment.

RD-34B RD-34A PZ-116 RD-34C Outfall 003 RD-63 RS-28 RS-30 RD-98 Building 4021 Leach Field (Area IV AOC) RMHF-3 RD-27 4665 4688 4664 4075 4563 RMHF-2 4044 4022 4021 4034 4658 4622 4614 RD-87 4663 4621 RMHF-1 4028 4811 RD-89 RMHF-4 RD-88 RD-90

CMS Area	Drivers
RMHF-1	Aroclor 1260, Aroclor 1242, Aroclor 1254, Benzo(a)pyrene
RMHF-2	Benzene, Methylene Chloride
RMHF-3	Cadmium, Cobalt, Zinc
RMHF-4	Cobalt, Copper, Silver, Zinc

Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

MWH

SANTA SUSANA FIELD LABORATORY

FIGURE C.5-1

APPENDIX C

ATTACHMENT C-1

REGULATORY AGENCY CORRESPONDENCE
(Electronic Copy)

DOE F 1325.8
(8-89)

United States Government **Department of Energy**

memorandum

DATE: January 23, 1997

REPLY TO
ATTN OF: DOE Oakland Operations Office/ER

SUBJECT: Release of Decontaminated Building 028 without Radiological Restrictions at the Energy Technology Engineering Center.

TO: Donald Williams, EM-44

The Oakland Operations Office (OAK) has implemented environmental restoration projects at the Energy Technology Engineering Center (ETEC) as part of the Environmental Restoration Program (ERP) per Headquarters Northwestern Area Program Office direction. The objective of the program is to identify and cleanup or otherwise control facilities where residual radioactive contamination remains from activities carried out under contract to the Atomic Energy Commission and the Energy Research and Development Administration during the early years of the Nation's atomic energy program.

The Energy Technology Engineering Center performed testing of equipment, materials, and components for nuclear and energy related programs. These nuclear energy research and development programs began in 1946 and ended in 1995. Numerous buildings and land areas became radiologically contaminated as a result of facility operations and site activities. One such area that has been designated for cleanup under the ERP is Building T028.

Building T028 originally housed the Shield Test Reactor which was used to perform tests on space nuclear test shields. This reactor was operated from 1961 to 1964. After modifications it was renamed the Shield Test and Irradiation Reactor and operated through 1972. Following shutdowns of the test program, the reactor was removed and the facility was decontaminated. From 1977 to 1981 experiments were conducted in the building to investigate the behavior of molten uranium oxide, which resulted in recontamination of the building. A decision to terminate operations at Building T028 was made in 1984.

Decontamination of Building T028 was performed in 1988. Surplus normal and depleted uranium oxide was removed. Equipment, electrical components, and ventilation ducting were also removed, and building surfaces were decontaminated. The above grade portion of the building was demolished in 1989 leaving only the concrete floor, below-grade test vault and stairwell intact.

The Environmental Survey and Site Assessment Program of the Oak Ridge Institute for Science and Education (ORISE) has completed independent verification of the Building decontamination project.

Post remedial action surveys have demonstrated, and the DOE Oakland Operations Office hereby certifies, that the subject property is in compliance with DOE decontamination criteria and standards established to protect members of the general public and occupants of the property.

Final project closeout documents have been submitted to your office under separate cover.

DOE/OAK requests approval for release of this property without radiological restrictions to Rockwell International, in accordance with the closeout provisions of the contract, and authorization to remove this facility from the DOE/OAK real property records.

Michael Lopez
ETEC PM
Environmental
Restoration Division

STATEMENT OF CERTIFICATION: Energy Technology Engineering Center, Building 028

The U.S. Department of Energy, Oakland Operations Office, Environmental Restoration Division, has reviewed and analyzed the radiological data obtained following decontamination of the Energy Technology Engineering Center Building 028. Based on this analysis of all data collected, the Department of Energy (DOE) certifies that the following property is in compliance with DOE decontamination criteria and standards. This certification of compliance provides assurance that future use of the property will result in no radiological exposure above applicable guidelines established to protect members of the general public or site occupants. Accordingly, the property specified below is released from DOE's Environmental Restoration Program.

Property owned by Rockwell International Corporation:

Building 028, at the Energy Technology Engineering Center, located in a portion of Tract "A" of Rancho Simi, in the County of Ventura, State of California, as per map recorded in Book 3, Page 7 of Miscellaneous Records of Ventura County.

CERTIFICATION:

Roger Liddle, Director, ERD

1/23/97
Date

DOE F-1325.8
(8-89)
EFG (07-90)

United States Government **Department of Energy**

memorandum

DATE: FEB 21 1997

REPLY TO ATTN OF: EM-44 (D. Williams, 903-8173)

SUBJECT: Draft Certification Docket for Building 028 at the Energy Technology Engineering Center

TO: Assistant General Counsel for Environment, GC-51

I am requesting your review and concurrence of the attached package concerning the cleanup of contamination associated with the former Atomic Energy Commission and Energy Research and Development Administration (AEC/ERDA) activities at Building 028 at the Energy Technology Engineering Center (ETEC) near Chatsworth, California.

The Office of Northwestern Area Programs has implemented a decontamination and decommissioning project at ETEC as part of the Environmental Restoration Program. The objective of the program is to identify and clean up or otherwise control sites where residual radioactive contamination remains from activities carried out under contract to AEC/ERDA during the early years of the Nation's atomic energy program. In October 1987, Building 028 was formally designated by the Department of Energy (DOE) for cleanup.

ETEC Building 028 was constructed in 1961 to support testing of space reactor shields using a fission plate driven by neutrons from the thermal column of a 50-KW and a 1-MW reactor designated the Shield Test Reactor and Shield Test and Irradiation Reactor, respectively. Space reactor shield testing terminated in 1972. In 1977, experiments to investigate the behavior of molten uranium-oxide, relative to simulated reactor accidents, on the reactor floor and structural materials were conducted until 1981. The building remained inactive until 1988 when decontamination was completed. Post-decontamination surveys completed in 1993 demonstrated, and DOE's Oakland Operations Office has certified, that the decontamination project resulted in compliance with DOE decontamination criteria and standards established to protect members of the general public and occupants of the building. Further, future use of the property will result in no radiological exposure above applicable radiological guidelines to the general public or the building occupants.

A draft Federal Register Notice has been prepared as part of the docket and will also be transmitted to the Office of Federal Register for approval after we have received your concurrence on the docket.

The final Federal Register Notice and Certification Statement will be compiled in final docket form by the Office of Northwestern Area Programs and will be made available for public review in DOE Reading Rooms and local libraries.

Your review and comments are requested by March 10, 1997. Mr. Don Williams of my staff is the point-of-contact and can be reached at 903-8173.

Sally A. Robison

Sally A. Robison, Ph.D.
Director
Office of Northwestern Area Programs
Environmental Restoration

Attachment

HDMSP00014813

DOE F 1325.8
(8-89)
E.G. (07-90)

United States Government **Department of Energy**

memorandum

DATE: MAR 19 1997

REPLY TO ATTN OF: EM-44 (D. Williams, 301-903-8173)

SUBJECT: Recommendation for Certification of Cleanup at Building 028 at the Energy Technology Engineering Center

TO: Acting Deputy Assistant Secretary for Environmental Restoration, EM-40

I am attaching for your signature a Federal Register Notice concerning the cleanup of contamination associated with the former Atomic Energy Commission and Energy Research and Development Administration (AEC/ERDA) activities at Building 028, at the Energy Technology Engineering Center (ETEC) near Chatsworth, California.

The Oakland Operations Office has implemented a decontamination and decommissioning project at ETEC as part of the Environmental Restoration Program. The objective of the program is to identify and clean up or otherwise control sites where residual radioactive contamination remains from activities carried out under contract to AEC/ERDA during the early years of the Nation's atomic energy program. In October 1987, Building 028 was formally designated by the Department of Energy (DOE) for cleanup under Environmental Restoration.

ETEC Building 028 was constructed in 1961 to support testing of space reactor shields using a fission plate driven by neutrons from the thermal column of a 50-kW and a 1-MW reactor designated the Shield Test Reactor and Shield Test and Irradiation Reactor, respectively. Space reactor shield testing terminated in 1972. In 1977, experiments to investigate the behavior of molten uranium oxide, relative to simulated reactor accidents, on the reactor floor and structural materials were conducted until 1981. The building remained inactive until 1988 when decontamination was completed. Final radiological and independent verification surveys completed in 1993 demonstrated, and DOE's Oakland Operations Office has certified, that the decontamination project resulted in compliance with DOE decontamination criteria and standards established to protect members of the general public and occupants of the building. Further, future use of the property without radiological restrictions will result in no exposure above applicable radiological guidelines to the general public and occupants of the building.

This office is preparing the certification docket for the subject property and Building 029. The completed docket will be provided to the Oakland Operations Office for their use in preparation of similar dockets for future property releases. The Federal Register Notice will be part of the docket.

I recommend that you sign the attached Federal Register Notice, as well as the transmittal memorandum to the Federal Liaison Officer (Clara Barley, GC-75). The documents transmitted with the certification statement and the Federal Register Notice will be compiled in final docket form by the Office of Northwestern Area Programs and will be made available for public review in DOE Reading Rooms and local libraries.

Sally A. Robison

Sally A. Robison, Ph.D.
Director
Office of Northwestern Area Programs
Environmental Restoration

Attachment

HDMSP00014815

DOE F 1325.8
(8-89)
E.G. (07-90)

United States Government **Department of Energy**

memorandum

DATE: March 27, 1997

REPLY TO ATTN OF: EM-44 (D. Williams, 301-903-8173)

SUBJECT: Federal Register Notice for Certification of Cleanup of Building 028 at the Energy Technology Engineering Center

TO: Clara Barley, GC-75

Attached are the original and three copies of the signed Federal Register Notice certifying the completion of remedial action at Building 028 located at the Energy Technology Engineering Center. This surplus building was decontaminated by the Department's Environmental Restoration Program. The attached Notice has been reviewed by and concurred in by the Office of General Counsel (GC-51), and a copy of that concurrence is also attached for your information and use.

Also attached for your signature is a transmittal letter to forward the disk containing the Federal Register Notice to the Office of the Federal Register.

Please forward the attached Notice to the Federal Register for publication.

James J. Fiore
Acting Deputy Assistant Secretary
for Environmental Restoration

3 Attachments

HDMSP00014816

Department of Energy
Washington, DC 20585

Mr. Raymond A. Mosley
Director, Office of the Federal Register
National Archives and Records Administration
Washington, D.C. 20408

Dear Mr. Mosley:

This letter is to certify that the enclosed disk is a true copy of the Certification of the Radiological Condition of Building 028 at the Energy Technology Engineering Center located near Chatsworth, California. The disk should be used by the Government Printing Office in preparing the document for publication in the Federal Register.

Sincerely,

James J. Fiore
Acting Deputy Assistant Secretary
for Environmental Restoration

Clara Barley
DOE Federal Register Liaison
Officer

Enclosure

Printed with soy ink on recycled paper

HDMSP00014817

U.S. Department of Energy
DOCKET NO. ETEC-028

Certification of the Radiological Condition of Building 028 at the Energy Technology Engineering Center near Chatsworth, California

AGENCY: U.S. Department of Energy, Office of Environmental Restoration

ACTION: Notice of Certification

SUMMARY: The Department of Energy (DOE) has completed radiological surveys and taken remedial action to decontaminate Building 028 located at the Energy Technology Engineering Center (ETEC) near Chatsworth, California. This property previously was found to contain radioactive materials from activities carried out for the Atomic Energy Commission and the Energy Research and Development Administration (AEC/ERDA), predecessor agencies to DOE. Although DOE owns the majority of the buildings and equipment, a subsidiary of Rockwell International, Rocketdyne, owned the land. Rocketdyne has recently been sold to Boeing North American Incorporated.

FOR FURTHER INFORMATION CONTACT:

Don Williams, Program Manager
Office of Northwestern Area Programs
Office of Environmental Restoration (EM-44)
U.S. Department of Energy
Washington, D.C. 20585

SUPPLEMENTARY INFORMATION:

DOE has implemented environmental restoration projects at ETEC (Ventura County, Map Book 3, Page 7, Miscellaneous Records) as part of DOE's Environmental Restoration Program. One objective of the program is to identify and clean up or otherwise control facilities where residual radioactive contamination remains from activities carried out under contract

HDMSP00014818

to AEC/ERDA during the early years of the Nation's atomic energy program.

ETEC is comprised of a number of facilities and structures located within Administrative Area IV of the Santa Susana Field Laboratory. The work performed for DOE at ETEC consisted primarily of testing of equipment, materials, and components for nuclear and energy related programs. These nuclear energy research and development programs, conducted by Atomics International under contract to AEC/ERDA, began in 1946. Several buildings and land areas became radiologically contaminated as a result of facility operations and site activities. Building 028 is one ETEC area that has been designated for cleanup under the DOE Environmental Restoration Program. Other areas undergoing decontamination will be released as they are completed and are verified to meet established cleanup criteria and standards for release without radiological restrictions as established in DOE Order 5400.5.

Building 028 is located in the north-central section of ETEC. The above-grade concrete slab is approximately 300 m^2 in area. The below-grade vault measures approximately 60 m^2 with 6 m (20 ft.) ceilings. Construction consists of a concrete slab floor with concrete walls and ceilings.

Building 028 was originally constructed to perform tests of space reactor shields using a fission plate driven by neutrons from the thermal column of a 50-kW swimming pool-type reactor. This reactor was designated the Shield Test Reactor and operated from 1961 to 1964, when it was replaced with another reactor design to operate at 1 MW. This latter configuration was named the Shield Test and Irradiation Reactor (STIR) and operated through 1972.

HDMSP00014819

Following shutdown of the test program and removal of the reactor, the facility was decommissioned and made available for alternate use in March 1976.

In 1977, operations were started to investigate the behavior of molten uranium-oxide relative to simulated reactor accidents, in particular, its reaction with floor and structural materials. These experiments resulted in some recontamination of various parts of the building that were used for preparation and melting of the uranium-oxide. Tests continued intermittently into 1981. Some facility modifications were made, and a decision to terminate operations was made later in 1981. The building remained inactive, under periodic surveillance, until decontamination began in 1988.

To allow the release of Building 028 for use without radiological restriction, all detectable radioactive material/contamination was removed from the facility. This decontamination and decommissioning was performed in two phases, starting in 1975 (STIR facility) with the removal of the core tank, the activated concrete structures surrounding the core tank, thermal column, reactor shield, test vault carriage, water cooling systems, water shield door, and the partially dismantled exhaust system.

The second and final stage of decontamination of Building 028 began in 1988 and required slightly less than five months to complete.

HDMSP00014820

Briefly, the decontamination steps involved in the second stage: (1) removal of surplus normal and depleted uranium oxide; (2) decontamination and removal of equipment and electrical components, including the furnace system used for the uranium-oxide experiments; (3) removal of the radiologically contaminated ducting system; (4) building surfaces decontamination, including scabbling of the concrete floor in Room 101A; (5) final miscellaneous cleanup operations; and (6) final radiological survey of the building (above-grade and basement).

Rockwell/Rocketdyne performed a radiological survey in 1991. The Environmental Survey and Site Assessment Program of the Oak Ridge Institute for Science and Education performed independent verification of the decontamination project in 1993. Post-decontamination surveys have demonstrated that Building 028 is in compliance with DOE decontamination criteria and standards for release without radiological restrictions. The State of California Department of Health Services has concurred that the proposed release guidelines provide adequate assurance for release without further radiological restrictions. In the event of property transfer, DOE intends to comply with applicable Federal, State, and local requirements.

The external radiation exposure of the nine people directly associated with the STIR project, particularly the dismantling operations, during the period of September 23, 1975, through January 31, 1976, averaged 193 mrem, with a maximum individual exposure of 420 mrem. The entire operation was performed with a total radiation exposure of 1.7 man-rem.

HDMSP00014821

None of the engineering or radiation and nuclear safety personnel assigned to the Building 028 decommissioning project received any measurable exposure to ionizing radiation.

Final costs for the decontamination of the STIR project were $134,922.

Final costs for the decontamination of Building 028 were $239,970.

The certification docket will be available for review between 9:00 a.m. and 4:00 p.m., Monday through Friday (except Federal holidays), in the U.S. DOE Public Reading Room located in Room 1E-190 of the Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C. Copies of the certification docket will also be available at the following locations: DOE Public Document Room, U.S. DOE, Oakland Operations Office, the Federal Building, 1301 Clay Street, Oakland, California; California State University, Northridge, Urban Archives Center, Oviatt Library, Room 4, 18111 Nordhoff, Northridge, California; Simi Valley Library, 2629 Tapo Canyon Road, Simi Valley, California; and the Platt Branch, Los Angeles Public Library, 23600 Victory Boulevard, Woodland Hills, California.

DOE has issued the following statement of certification:

HDMSP00014822

STATEMENT OF CERTIFICATION: Energy Technology Engineering Center, Building 028

The U.S. Department of Energy, Oakland Operations Office, Environmental Restoration Division, has reviewed and analyzed the radiological data obtained following decontamination of Building 028 at the Energy Technology Engineering Center. Based on analysis of all data collected and the results of independent verification, DOE certifies that the following property is in compliance with DOE radiological decontamination criteria and standards as established in DOE Order 5400.5. This certification of compliance provides assurance that future use of the property will result in no radiological exposure above applicable guidelines established to protect members of the general public or site occupants. Accordingly, the property specified below is released from DOE's Environmental Restoration Program.

Property owned by Boeing North American Incorporated:

Building 028, at the Energy Technology Engineering Center (situated within Area IV of the Santa Susana Field Laboratory), located in a portion of Tract "A" of Rancho Simi, in the County of Ventura, State of California, as per map recorded in Book 3, Page 7 of Miscellaneous Records of Ventura County.

Issued in Washington, D.C., on March 27, 1997.

James J. Fiore
Acting Deputy Assistant Secretary
for Environmental Restoration

HDMSP00014823

DOE F 1325.8
(08-93)

United States Government | Department of Energy

memorandum

DATE: APR 02 1997

REPLY TO ATTN OF: EM-44 (D. Williams, 903-8173)

SUBJECT: Release of Decontaminated Building 028 without Radiological Restrictions at the Energy Technology Engineering Center

TO: R. Liddle, Oakland Operations Office

We have completed our review of all documents related to the remediation, final survey, certification, release limits, and independent verification of Building 028 at the Energy Technology Engineering Center (ETEC). We have determined that decontamination of this property has been completed in compliance with the established criteria and standards as required by the Department of Energy (DOE) guidelines and Orders, is consistent with other appropriate Nuclear Regulatory Commission guidelines, and is protective of public health and the environment. Therefore, approval is granted to release subject property to Boeing North American Incorporated without radiological controls pursuant to DOE Order 5400.5, Chapter IV. This property should be removed from the DOE Real Property Inventory in accordance with DOE Order 4300.

In accordance with DOE Order 5820.2A, Section V, the data package compiled for this project must be retained permanently in the Oakland Operations Office (OAK) files.

We recommend that a letter be forwarded to Boeing North American Incorporated requiring prior DOE-OAK notification of any activity which could potentially recontaminate the subject property until final release of the remaining ETEC properties has been completed. Please provide us with a copy of the letter, as well as the distribution list, for our files.

Sally A. Robison

Sally A. Robison, Ph.D.
Director
Office of Northwestern Area Programs
Environmental Restoration

Printed on recycled paper

DATES: Written objections must be filed not later June 3, 1997.

ADDRESSES: U.S. Army Waterways Experiment Station, 3909 Halls Ferry Road, Vicksburg, MS 39180–6199. ATTN: CEWES–OC.

FOR FURTHER INFORMATION CONTACT: Mr. Phil Stewart (601) 634–4113, e-mail stewarp@exl.wes.army.mil

SUPPLEMENTARY INFORMATION: The Concrete Armor Unit was invented by Jeffrey A. Melby and George F. Turk. Rights to the patent applications identified above have been assigned to the United States of America as represented by the Secretary of the Army. The United States of America as represented by the Secretary of the Army intends to grant an exclusive license for all fields of use, in the manufacture, use, and sale in the territories and possessions, including territorial waters of each of the listed countries to SOGELREG-SOGREAH, 8P 172, 38042, Grenoble Cedex 9, France.

Pursuant to 37 CFR 404.7(b)(1)(i), any interested party may file a written objection to this prospective exclusive license agreement.

Gregory D. Showalter,

Army Federal Register Liaison Officer.

[FR Doc. 97–8603 Filed 4–3–97; 8:45 am]

BILLING CODE 3710–92–M

DEPARTMENT OF ENERGY

Office of Arms Control and Nonproliferation; Proposed Subsequent Arrangements

AGENCY: Department of Energy.

ACTION: Subsequent arrangements.

Pursuant to Section 131 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2160), notice is hereby given of a proposed "subsequent arrangement" under the Agreement for Cooperation between the Government of the United States of America and the Government of the Federative Republic of Brazil concerning Civil Uses of Atomic Energy:

The subsequent arrangement to be carried out under the above-mentioned agreement involves approval of the following retransfer: RTD/BR(EU)–10, for the transfer from the Republic of Germany to Brazil of 54,658 pieces of zircaloy-4 cladding tubes, weighing 42,852 kilograms, to be incorporated into uranium fuel assemblies, with an enrichment level between 1.9% and 3.2% of uranium-235, for ultimate use in the Angra-2 reactor.

In accordance with Section 131 of the Atomic Energy Act of 1954, as amended, it has been determined that these subsequent arrangements will not be inimical to the common defense and security.

This subsequent arrangement will take effect no sooner than fifteen days after the date of publication of this notice.

Issued in Washington, D.C. on March 31, 1997.

Cherie P. Fitzgerald,

Director, International Policy and Analysis Division, Office of Arms Control and Nonproliferation.

[FR Doc. 97–8638 Filed 4–3–97; 8:45 am]

BILLING CODE 6450–01–P

Atomic Energy Agreements

AGENCY: Department of Energy.

ACTION: Subsequent arrangement.

SUMMARY: Pursuant to Section 131 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2160), notice is hereby given of a proposed "subsequent arrangement" under the Agreement for Cooperation in the Peaceful Uses of Nuclear Energy between the United States of America and the European Atomic Energy Community (EURATOM) and the Agreement for Cooperation between the Government of the United States of America and the Government of Canada concerning Civil Uses of Atomic Energy, as amended.

The subsequent arrangement to be carried out under the above-mentioned agreements involves approval of the following retransfer: RTD/EU(CA)–13, for the transfer of 127.8 kilograms of unirradiated low enriched uranium fuel fabrication scrap, containing 25.241 kilograms of the isotope uranium-235 (19.75% enrichment), from AECL in Chalk River, Canada, to UKAEA in Dounreay, United Kingdom, for the purpose of recovering the uranium for return to Canada in the form of uranium metal pieces.

In accordance with Section 131 of the Atomic Energy Act of 1954, as amended, it has been determined that this subsequent arrangement will not be inimical to the common defense and security.

This subsequent arrangement will take effect no sooner that fifteen days after the date of publication of this notice.

Dated: March 31, 1997.

For the Department of Energy.

Cherie Fitzgerald,

Director, International Policy and Analysis Division, Office of Arms Control and Nonproliferation.

[FR Doc. 97–8639 Filed 4–3–97; 8:45 am]

BILLING CODE 6450–01–P

[Docket No. ETEC–028]

Certification of the Radiological Condition of Building 028 at the Energy Technology Engineering Center Near Chatsworth, California

AGENCY: U.S. Department of Energy, Office of Environmental Restoration.

ACTION: Notice of certification.

SUMMARY: The Department of Energy (DOE) has completed radiological surveys and taken remedial action to decontaminate Building 028 located at the Energy Technology Engineering Center (ETEC) near Chatsworth, California. This property previously was found to contain radioactive materials from activities carried out for the Atomic Energy Commission and the Energy Research and Development Administration (AEC/ERDA), predecessor agencies to DOE. Although DOE owns the majority of the buildings and equipment, a subsidiary of Rockwell International, Rocketdyne, owned the land. Rocketdyne has recently been sold to Boeing North American Incorporated.

FOR FURTHER INFORMATION CONTACT: Don Williams, Program Manager, Office of Northwestern Area Programs, Office of Environmental Restoration (EM–44), U.S. Department of Energy, Washington, D.C. 20585.

SUPPLEMENTARY INFORMATION: DOE has implemented environmental restoration projects at ETEC (Ventura County, Map Book 3, Page 7, Miscellaneous Records) as part of DOE's Environmental Restoration Program. One objective of the program is to identify and clean up or otherwise control facilities where residual radioactive contamination remains from activities carried out under contract to AEC/ERDA during the early years of the Nation's atomic energy program.

ETEC is comprised of a number of facilities and structures located within Administrative Area IV of the Santa Susana Field Laboratory. The work performed for DOE at ETEC consisted primarily of testing of equipment, materials, and components for nuclear and energy related programs. These nuclear energy research and development programs, conducted by Atomics International under contract to AEC/ERDA, began in 1946. Several buildings and land areas became radiologically contaminated as a result of facility operations and site activities. Building 028 is one ETEC area that has been designated for cleanup under the DOE Environmental Restoration Program. Other areas undergoing decontamination will be released as

HDMSP00014825

they are completed and are verified to meet established cleanup criteria and standards for release without radiological restrictions as established in DOE Order 5400.5.

Building 028 is located in the north-central section of ETEC. The above-grade concrete slab is approximately 300 m^2 in area. The below-grade vault measures approximately 60 m^2 with 6 m (20 ft.) ceilings. Construction consists of a concrete slab floor with concrete walls and ceilings.

Building 028 was originally constructed to perform tests of space reactor shields using a fission plate driven by neutrons from the thermal column of a 50-kW swimming pool-type reactor. This reactor was designated the Shield Test Reactor and operated from 1961 to 1964, when it was replaced with another reactor design to operate at 1 MW. This latter configuration was named the Shield Test and Irradiation Reactor (STIR) and operated through 1972.

Following shutdown of the test program and removal of the reactor, the facility was decommissioned and made available for alternate use in March 1976.

In 1977, operations were started to investigate the behavior of molten uranium-oxide relative to simulated reactor accidents, in particular, its reaction with floor and structural materials. These experiments resulted in some recontamination of various parts of the building that were used for preparation and melting of the uranium-oxide. Tests continued intermittently into 1981. Some facility modifications were made, and a decision to terminate operations was made later in 1981. The building remained inactive, under periodic surveillance, until decontamination began in 1988.

To allow the release of Building 028 for use without radiological restriction, all detectable radioactive material/contamination was removed from the facility. This decontamination and decommissioning was performed in two phases, starting in 1975 (STIR facility) with the removal of the core tank, the activated concrete structures surrounding the core tank, thermal column, reactor shield, test vault carriage, water cooling systems, water shield door, and the partially dismantled exhaust system.

The second and final stage of decontamination of Building 028 began in 1988 and required slightly less than five months to complete.

Briefly, the decontamination steps involved in the second stage: (1) Removal of surplus normal and depleted uranium oxide; (2) decontamination and removal of equipment and electrical components, including the furnace system used for the uranium-oxide experiments; (3) removal of the radiologically contaminated ducting system; (4) building surfaces decontamination, including scabbling of the concrete floor in Room 101A; (5) final miscellaneous cleanup operations; and (6) final radiological survey of the building (above-grade and basement).

Rockwell/Rocketdyne performed a radiological survey in 1991. The Environmental Survey and Site Assessment Program of the Oak Ridge Institute for Science and Education performed independent verification of the decontamination project in 1993. Post-decontamination surveys have demonstrated that Building 028 is in compliance with DOE decontamination criteria and standards for release without radiological restrictions. The State of California Department of Health Services has concurred that the proposed release guidelines provide adequate assurance for release without further radiological restrictions. In the event of property transfer, DOE intends to comply with applicable Federal, State, and local requirements.

The external radiation exposure of the nine people directly associated with the STIR project, particularly the dismantling operations, during the period of September 23, 1975, through January 31, 1976, averaged 193 mrem, with a maximum individual exposure of 420 mrem. The entire operation was performed with a total radiation exposure of 1.7 man-rem.

None of the engineering or radiation and nuclear safety personnel assigned to the Building 028 decommissioning project received any measurable exposure to ionizing radiation.

Final costs for the decontamination of the STIR project were $134,922.

Final costs for the decontamination of Building 028 were $239,970.

The certification docket will be available for review between 9:00 a.m. and 4:00 p.m., Monday through Friday (except Federal holidays), in the U.S. DOE Public Reading Room located in Room 1E–190 of the Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C. Copies of the certification docket will also be available at the following locations: DOE Public Document Room, U.S. DOE, Oakland Operations Office, the Federal Building, 1301 Clay Street, Oakland, California; California State University, Northridge, Urban Archives Center, Oviatt Library, Room 4, 18111 Nordhoff, Northridge, California; Simi Valley Library, 2629 Tapo Canyon Road, Simi Valley, California; and the Platt Branch, Los Angeles Public Library, 23600 Victory Boulevard, Woodland Hills, California.

DOE has issued the following statement of certification:

Statement of Certification: Energy Technology Engineering Center, Building 028

The U.S. Department of Energy, Oakland Operations Office, Environmental Restoration Division, has reviewed and analyzed the radiological data obtained following decontamination of Building 028 at the Energy Technology Engineering Center. Based on analysis of all data collected and the results of independent verification, DOE certifies that the following property is in compliance with DOE radiological decontamination criteria and standards as established in DOE Order 5400.5. This certification of compliance provides assurance that future use of the property will result in no radiological exposure above applicable guidelines established to protect members of the general public or site occupants. Accordingly, the property specified below is released from DOE's Environmental Restoration Program.

Property owned by Boeing North American Incorporated:

Building 028, at the Energy Technology Engineering Center (situated within Area IV of the Santa Susana Field Laboratory), located in a portion of Tract "A" of Rancho Simi, in the County of Ventura, State of California, as per map recorded in Book 3, Page 7 of Miscellaneous Records of Ventura County.

Issued in Washington, DC, on March 27, 1997.

James J. Fiore,

Acting Deputy Assistant Secretary for Environmental Restoration.

Statement of Certification: Energy Technology Engineering Center, Building 028

The U.S. Department of Energy, Oakland Operations Office, Environmental Restoration Division, has reviewed and analyzed the radiological data obtained following decontamination of the Energy Technology Engineering Center Building 028. Based on this analysis of all data collected, the Department of Energy (DOE) certifies that the following property is in compliance with DOE decontamination criteria and standards. This certification of compliance provides assurance that future use of the property will result in no radiological exposure above applicable guidelines established to protect members of the general public or site occupants. Accordingly, the property specified below is released from DOE's Environmental Restoration Program.

HDMSP00014826

Property owned by Rockwell International Corporation:

Building 028, at the Energy Technology Engineering Center, located in a portion of Tract "A" of Rancho Simi, in the County of Ventura, State of California, as per map recorded in Book 3, Page 7 of Miscellaneous Records of Ventura County.

Certification:

Dated: January 23, 1997.

Roger Liddle,

Director, ERD.

[FR Doc. 97-8640 Filed 4-3-97; 8:45 am]

BILLING CODE 6450-01-P

Office of Energy Efficiency and Renewable Energy

[Case No. F-089]

Energy Conservation Program for Consumer Products: Granting of the Application for Interim Waiver and Publishing of the Petition for Waiver of Rheem Manufacturing Company From the DOE Furnace Test Procedure

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice.

SUMMARY: Today's notice grants an Interim Waiver to Rheem Manufacturing Company (Rheem) from the existing Department of Energy (DOE or Department) test procedure regarding blower time delay for the company's GFD upflow residential, modulating type, gas-fired furnaces.

Today's notice also publishes a "Petition for Waiver" from Rheem. Rheem's Petition for Waiver requests DOE to grant relief from the DOE furnace test procedure relating to the blower time delay specification. Rheem seeks to test using a blower delay time of 20 seconds for its GFD upflow residential, modulating type, gas-fired furnaces instead of the specified 1.5-minute delay between burner on-time and blower on-time. The Department is soliciting comments, data, and information respecting the Petition for Waiver.

DATES: DOE will accept comments, data, and information not later than May 5, 1997.

ADDRESSES: Written comments and statements shall be sent to: Department of Energy, Office of Codes and Standards, Case No. F-089, Mail Stop EE-43, Room 1J-018, Forrestal Building, 1000 Independence Avenue, SW, Washington, D.C. 20585-0121, (202) 586-7140.

FOR FURTHER INFORMATION CONTACT: Mr. Cyrus H. Nasseri, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Mail Station EE-43, Forrestal Building, 1000 Independence Avenue, SW., Washington, D.C. 20585-0121, (202) 586-9138, or Mr. Eugene Margolis, Esq., U.S. Department of Energy, Office of General Counsel, Mail Station GC-72, Forrestal Building, 1000 Independence Avenue, SW., Washington, D.C. 20585-0103, (202) 586-9507.

SUPPLEMENTARY INFORMATION: The Energy Conservation Program for Consumer Products (other than automobiles) was established pursuant to the Energy Policy and Conservation Act, as amended, (EPCA) which requires DOE to prescribe standardized test procedures to measure the energy consumption of certain consumer products, including furnaces.

The intent of the test procedures is to provide a comparable measure of energy consumption that will assist consumers in making purchasing decisions. These test procedures appear at Title 10 CFR Part 430, Subpart B.

The Department amended the test procedure rules to provide for a waiver process by adding Section 430.27 to Title 10 CFR Part 430. 45 FR 64108, September 26, 1980. Subsequently, DOE amended the waiver process to allow the Assistant Secretary for Energy Efficiency and Renewable Energy (Assistant Secretary) to grant an Interim Waiver from test procedure requirements to manufacturers that have petitioned DOE for a waiver of such prescribed test procedures. Title 10 CFR Part 430, Section 430.27(a)(2).

The waiver process allows the Assistant Secretary to waive temporarily test procedures for a particular basic model when a petitioner shows that the basic model contains one or more design characteristics which prevent testing according to the prescribed test procedures, or when the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption as to provide materially inaccurate comparative data. Waivers generally remain in effect until final test procedure amendments become effective, resolving the problem that is the subject of the waiver.

An Interim Waiver will be granted if it is determined that the applicant will experience economic hardship if the Application for Interim Waiver is denied, if it appears likely that the Petition for Waiver will be granted, and/or the Assistant Secretary determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the Petition for Waiver. Title 10 CFR Part 430, Section 430.27 (g). An Interim Waiver remains in effect for a period of 180 days or until DOE issues its determination on the Petition for Waiver, whichever is sooner, and may be extended for an additional 180 days, if necessary.

On January 29, 1997, Rheem filed an Application for Interim Waiver and a Petition for Waiver regarding blower time delay. Rheem's Application seeks an Interim Waiver from the DOE test provisions that require a 1.5-minute time delay between the ignition of the burner and starting of the circulating air blower. Instead, Rheem requests the allowance to test using a 20-second blower time delay when testing its GFD upflow residential, modulating type, gas-fired furnaces. Rheem states that the 20-second delay is indicative of how these furnaces actually operate. Such a delay results in an average of approximately 2.0 percent increase in AFUE. Since current DOE test procedures do not address this variable blower time delay, Rheem asks that the Interim Waiver be granted.

The Department has published a Notice of Proposed Rulemaking on August 23, 1993, (58 FR 44583) to amend the furnace test procedure, which addresses the above issue.

Previous Petitions for Waiver for this type of time blower delay control have been granted by DOE to Coleman Company, 50 FR 2710, January 18, 1985; Magic Chef Company, 50 FR 41553, October 11, 1985; Rheem Manufacturing Company, 53 FR 48574, December 1, 1988, 56 FR 2920, January 25, 1991, 57 FR 10166, March 24, 1992, 57 FR 34560, August 5, 1992; 59 FR 30577, June 14, 1994, and 59 FR 55470, November 7, 1994; Trane Company, 54 FR 19226, May 4, 1989, 56 FR 6021, February 14, 1991, 57 FR 10167, March 24, 1992, 57 FR 22222, May 27, 1992, 58 FR 68138, December 23, 1993, and 60 FR 62835, December 7, 1995; Lennox Industries, 55 FR 50224, December 5, 1990, 57 FR 49700, November 3, 1992, 58 FR 68136, December 23, 1993, and 58 FR 68137, December 23, 1993; Inter-City Products Corporation, 55 FR 51487, December 14, 1990, 56 FR 63945, December 6, 1991 and 61 FR 27057, May 30, 1996; DMO Industries, 56 FR 4622, February 5, 1991, and 59 FR 30579, June 14, 1994; Heil-Quaker Corporation, 56 FR 6019, February 14, 1991; Carrier Corporation, 56 FR 6018, February 14, 1991, 57 FR 38830, August 27, 1992, 58 FR 68131, December 23, 1993, 58 FR 68133, December 23, 1993, 59 FR 14394, March 28, 1994, and 60 FR 62832, December 7, 1995; Amana Refrigeration Inc., 56 FR 27958, June 18, 1991, 56 FR 63940, December 6, 1991, 57 FR 23392, June 3,

HDMSP00014827

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY PETE WILSON, Governor

DEPARTMENT OF HEALTH SERVICES
744 P STREET
P.O. BOX 942732
SACRAMENTO, CA 94234-7320

December 21, 1995

JAN 2 1996

P. D. Rutherford, Manager
Radiation Protection and Health Physics Services
Rocketdyne Division
Rockwell International Corporation
P.O. Box 7922 M/S T100
Canoga Park, California 91309-7922

Dear Mr. Rutherford:

RE: Rocketdyne's letter dated July 6, 1995 with attachments concerning the release of Buildings T029, T028 and OCY.

Radiologic Health Branch (RHB) staff has reviewed the above documents submitted for concurrence of release of buildings T028, T029 and the Old Conservation Yard (OCY) for unrestricted use. The review showed that a comprehensive survey for both fixed and removable contamination had been conducted.

The results of the surveys performed on September 14, 1995 by RHB staff showed no residual contamination exceeding the current limits for unrestricted release. Therefore, RHB concurs that buildings T028, T029, and the OCY may be released for unrestricted use.

If there are any questions please contact Mr. Steve Hsu at (916) 322-4797.

Sincerely,

Gerard Wong, Ph.D., Chief
Radioactive Material Licensing Sec.
Radiologic Health Branch

cc: Edgar D. Bailey, C.H.P., Chief
Radiologic Health Branch

Mike Lopez, DOE/OAK

000127 RC

The Boeing Company
Santa Susana Field Laboratory
5800 Woolsey Canyon Road
Canoga Park, CA 91304-1148

Certified Mail

February 12, 2008
In reply refer to SHEA-106973

BOEING

Mr. Norman Riley
SSFL Project Director
California Department of Toxic Substances Control
1001 "I" Street
PO Box 806
Sacramento, California 95812-0806

SUBJECT: RCRA Facility Investigation of Radioactive Materials Handling Facility Santa Susana Field Laboratory

Dear Mr. Riley:

On behalf of the Department of Energy (DOE), The Boeing Company (Boeing) will be submitting a RCRA Facility Investigation (RFI) Work Plan Addendum Amendment (Work Plan) for sampling and analysis to be performed at the Radioactive Materials Handling Facility (RMHF) located in Area IV at the Santa Susana Field Laboratory (SSFL). Portions of the RMHF are included in a Part A permit issued to Boeing and DOE, and the latest revision of the closure plan for these radiological facilities was submitted to DTSC in October 2006. Implementation of the RMHF closure activities will be completed following DOE's completion of the Area IV Environmental Impact Statement (EIS) and final DTSC approval of the RMHF closure plan.

DOE and Boeing respectfully request a variance to the standard approach for RFI sampling at the RMHF to allow timely characterization of potential chemical impacts in accessible portions of the site. As specified in the RFI Work Plan Addendum (prepared by Ogden Environmental and Energy Services in 1996), RFI sampling at former radiological facilities has been performed following their release for (radiological) unrestricted use by DOE. Since the RMHF closure and release for (radiological) unrestricted use will not occur until both the Area IV EIS and the RMHF decontamination and decommissioning (D&D) activities are complete (now estimated to be in 2013), a significant delay in the RFI schedule would result if this approach is taken for the RFI sampling at the RMHF. Thus, to continue to achieve progress on the RFI and to meet the Consent Order completion date of 2017, DOE and Boeing request that DTSC allow investigation of the RMHF prior its release by DOE for (radiological) unrestricted use.

DOE and Boeing realize that this request requires additional measures to be implemented, including analysis of all RFI samples for radiochemistry, and implementation of additional health and safety measures for compliance with DOE regulation 10 CFR 835 (Occupational Radiation Protection). These additional requirements will be described in detail in the RMHF RFI Work Plan, planned to be submitted to DTSC in early March.

BOEING

As will be described in the RMHF RFI Work Plan, the proposed field work will include collection and analysis of samples from accessible locations within one of the RMHF permitted radiological facilities, specifically at Building 4621 and the associated Mixed Waste Storage Yard. This sampling was originally included as part of the RMHF Closure Plan (H&A, 2006). Although the closure plan has not yet been approved by DTSC, this sampling is being included as part of the RFI Work Plan in order to obtain as much characterization data as possible prior to preparation of the Group 7 RFI Report, which is currently planned for submittal in June 2009, several years before the closure and demolition activities of the radiological facilities in 2013. Any additional sampling or analysis requirements included in the final DTSC-approved RMHF closure plan will be implemented along with completion of the RMHF closure plan sampling at the currently inaccessible areas (i.e., inside Buildings 4021 and 4022). All data to be collected as part of the RMHF closure (i.e., samples collected during both the RFI sampling program and during the facility closure activities) will be reviewed by DTSC as either part of the RFI process for completion and approval of the Group 7 RFI Report, or as part of the RMHF permitted facility closure process.

DOE and Boeing would appreciate DTSC's response to this request at your earliest convenience. Implementation of the RMHF RFI Work Plan prior to radiological facility and DOE release for (radiological) unrestricted use will allow for timely RFI reporting and progress toward site closure. If you have any questions, please call me at (818) 466-8782.

Sincerely,

Ravnesh C Amar

Ravnesh Amar
Boeing Program Manager
DOE Site Closure

cc:
Mr. Gerard Abrams, DTSC
Mr. Thomas Johnson, DOE
Mr. Art Lenox, Boeing
Ms. Dixie Hambrick, MWH

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maureen F. Gorsen, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Arnold Schwarzenegger
Governor

February 15, 2008

Mr. Ravnesh Amar
Boeing Program Manager
DOE Site Closure
The Boeing Company
5800 Woolsey Canyon Road
Canoga Park, California 91304-1148

Dear Mr. Amar:

Thank you for your February 12, 2008 letter regarding the investigation of the RMHF at the SSFL. Your letter specifically requests approval to proceed with chemical characterization in ***accessible*** portions of the RMHF. The existing workplan envisions that work of this nature will be performed following "release for unrestricted use" by DOE. Because a release for unrestricted use cannot occur before the Area IV EIS and RMHF D&D work is completed, a significant and undesirable delay in achieving the 2017 target date would likely result if this RFI work is postponed until after the EIS and D&D work is completed. Boeing plans to submit a revised RMHF RFI workplan in March 2008 that will reflect additional measures that include analysis of all RFI samples for radioactivity and the implementation of additional health and safety measures.

Consistent with DTSC's letter of June 26, 2007 to Mr. Thomas Johnson, we agree that it is appropriate to continue with RFI data gathering and report preparation and we therefore agree it is appropriate for Boeing to submit a revised RFI workplan for DTSC's review and approval subject to the usual constraints. We look forward to receiving the amended workplan.

Sincerely,

Norman E. Riley
SSFL Project Director

cc: See next page

Printed on Recycled Paper

cc: Ms. Nancy Long
Senior Staff Counsel
Office of Legal Affairs
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

Mr. Jim Pappas, P.E., Chief
Northern California Permitting and
Corrective Action Branch
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826-3200

SSFL file 3.1-5

Department of Toxic Substances Control

Alan C. Lloyd, Ph.D.
Agency Secretary
Cal/EPA

8800 Cal Center Drive
Sacramento, California 95826-3200

Arnold Schwarzenegger
Governor

June 30, 2005

Mr. Arthur J Lenox
The Boeing Company
6633 Canoga Avenue
P.O. Box 7922
Canoga Park, California 91309-7922

CLARIFICATION OF RCRA FACILITY INVESTIGATION (RFI) REQUIREMENTS, SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA

Dear Mr. Lenox:

This letter is a follow-up regarding clarification of RFI requirements discussed in meetings on April 4, 2005 (soil background) and April 20, 2005 (general RFI Characterization issues) between DTSC and Boeing. RFI requirements clarified during the meetings included the following:

i. Modify the Soil Background Data Set
ii. Sampling at pole mounted transformers
iii. Need to resurvey topography after RFI sampling completed if any changes have occurred (i.e. minor grading, building demo or interim measures).
iv. Need to characterize artificial fill placed after RFI sampling completed (i.e. Old Conservation Yard (OCY) "unknown" fill source).
v. Soil Sampling prior to Corrective Measures Study (CMS) to further define clean-up boundaries
vi. Inclusion of DOE radiological data in RFI Reports
vii. Providing a bibliography and access to DOE reports

The following has been agreed to:

i. Soil Background Data Set.

Samples from BG03 location differ chemically and geologically from background samples from onsite formations and will be removed. Prior DTSC site decisions using soil background will not be affected by this data set modification for the RFI. All remaining existing background sample locations will remain in the dataset.

RECEIVED JUL 12 2005

001448 RC

Boeing will collect additional samples at existing background sample locations to augment the existing soil background dataset for metals not analyzed during previous sampling events or replace sample data that had elevated analytical detection limits.

Information regarding the supplemental Soil Background Sampling is summarized in a letter from Boeing to DTSC dated April 8, 2005, which details the locations and analysis of the samples. Additional background locations or sampling depths are not required.

Results from the proposed sampling that show an order of magnitude or greater difference for metal concentrations (i.e. the dataset) will be evaluated further for possible anthropogenic impacts and acceptability before the data is incorporated into the background data set. Boeing and DTSC will use best professional judgment in determining acceptability of supplemental metal results. The final soil background data set from this and earlier sampling will be published in a separate report for DTSC review and approval.

The Standard Risk Assessment Methodology (SRAM) will use 95% UCL of 99% percentile (or max if lower) and the Wilcoxon Rank Sum (WRS) Test per SRAM Workplan (2005) for risk assessment.

Characterization will also use the 95% UCL of the 99 percentile (or max if lower) along with other site information (e.g., sampling data trends, risk assessment findings, historical operations) in a best professional judgment approach to make additional sampling decisions.

ii. PCB sampling at pole mounted transformers

The soil beneath onsite Boeing pole mounted transformers (installed prior to 1980) will be visually inspected for staining.

At locations where there is a single pole-mounted transformer (installed pre-1980) and no staining or leakage is identified, soil sampling/analysis for PCBs would not be conducted. If, however, staining of the soil is identified, then soil sampling will be conducted.

Where two or more transformers (installed prior to 1980) are or have been mounted on a pole(s) above an unpaved surface, then soil sampling will be conducted regardless of staining conditions on the poles or transformers. This approach is suggested due to the combined volume of multiple transformers.

If, the ground surface beneath the two or more mounted transformers (installed pre-1980) is covered with asphalt or concrete and staining is not identified, then soil sampling/analysis for PCBs will not be conducted. If, however, staining is identified on the paved surface, then soil sampling will be conducted.

If PCBs are detected from nearby SWMUs, samples will also be collected beneath pole mounted transformers adjacent to or within the SWMU.

A map showing all onsite Boeing owned pole mounted transformers will be prepared. Pole mounted transformers installed prior to 1980 will be identified (based on available information).

The RFI report(s) will have an affirmative statement summarizing the results of the pole mounted investigation within/near the reporting area.

All SSFL transformer inspection, sampling, and data will be reported to the DTSC. All reports will be signed by licensed professional (standard practice).

iii. Need to resurvey topography after RFI sampling completed if any changes have occurred (i.e. significant and minor grading, building demolition or interim measures).

For the Old Conservation Yard (OCY) site:

The RFI report will identify estimated extent of fill placement area and depth. The extent of fill in the Old Conservation Yard will be mapped and shown on a figure in the RFI report. Instead of re-surveying, depth estimates of the fill at OCY will be supported with hand auger data collected from 2 to 3 locations to document existing soil conditions. A note will also be provided on the figure that describes the topographical changes relative to fill.

Other RFI site locations:

In areas where significant changes in topography occur (due to import of fill material or building demolition), Boeing will resurvey the topography and provide information regarding the thickness and extent of fill at SWMUs and AOCs. Where resurveys are not conducted, Boeing will map in the extent of the fill. The figures will be modified to show the most recent topographic changes. In summary, these include: (1) text to describe amount of fill and/or topographic changes, (2) a figure showing the extent and location of fill material, along with a note to describe topographic changes; (3) hand

auger data will be collected to confirm fill depth in areas of broad fill placement (small building demolitions will be noted but not checked with hand auger).

Fill will not be placed above known areas of elevated soil concentrations resulting in estimated unacceptable risks.

Re-surveying will be conducted at areas where significant soil disturbance has occurred at SWMUs or AOCs. For example, following significant soil excavations at Interim Measures clean up activities (FSDF, Building 203 and Happy Valley) surveying was conducted. In addition, building demolition at SWMU and AOC locations that involve extensive soil movement (e.g., Building 4059) may warrant surveying to ensure excavation boundaries are documented so that subsequent RFI soil sampling will be performed and located correctly. If surveying information is not available, then the report should clearly indicate this and existing figures and photos will be used to document excavation boundaries.

The above requirements for mapping and re-surveying apply to SWMUs and AOCs sites investigated during the RFI.

iv. Fill from unknown sources, regardless of thickness, must be documented and adequately characterized when emplaced after RFI sampling is completed.

Boeing will provide statements in the RFI report that will either describe (1) the origin of the fill material (when documentation is available), or (2) state that the origin of the fill is unknown (if documentation does not exist). Boeing will provide supporting data that demonstrate that the fill is not impacted (e.g., sampling data, visual observations during construction, boring or trench logs, or photographs), photographs or other documentation that describes the current condition of the fill material. The RFI report will provide a statement (signed by an appropriate licensed professional) affirming that the fill is not impacted and does not pose a risk to human health or the environment.

In the case of the Old Conservation Yard site, analytical data of the fill material, description of DTSC-directed investigation of the berm soils subsequently used as fill material, and photographs will be included in the revised RFI report.

v. Soil Sampling prior to CMS to further define clean up boundaries

During the course of RFI sampling, it may be efficient to defer further sampling of an impacted area in a SWMU to the CMS or CMI phase of work provided sufficient characterization has been completed to delineate the volume and extent of

contamination. This is predicated upon the assumption that (1) the risks posed by the impacted area will require remediation and (2) existing RFI characterization results enable a volumetric estimate that would not change CMS evaluation of appropriate cleanup technologies, or CEQA-related determinations (i.e. the characterization should be sufficient that the volumes estimated generally are within a factor of 10).

The Old Conservation Yard site has a localized area that meets these criteria. RFI sampling has identified an area that has elevated dioxin concentrations in soil that will require remediation (excavation is presumed). The source of the dioxins is from burned and charred telephone poles and the extent of impacts is based on visual indicators (e.g. location of charred poles, the lateral extent is partially bounded with paved surfaces and bedrock). Since the extent and volume of the impacted soils is discernable and the soils will need to be removed then it may be efficient to defer further sampling until after the cleanup action (i.e., CMI) at which time more complete confirmation sampling will be conducted.

The remaining two DOE issues (i.e., vi. inclusion of radiological data in RFI Reports, and vii. providing an Area IV bibliography and access to DOE reports), still need to be resolved and we look forward to hearing from you soon.

If you have any questions regarding these issues, please do not hesitate to give me a call at (916) 255-3600.

Sincerely,

For

Gerard J Abrams, C.HG.
Senior Engineering Geologist
Northern California Permitting and Corrective Action Branch

cc: Mr. Stephen Baxter
Department of Toxic Substances Control
1011 Grandview Avenue
Glendale, California 912101-2205

Ms. Laura Rainey
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

GA:mm
GA36W.065

Department of Toxic Substances Control

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

Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

MEMORANDUM

TO: Gerard Abrams, C.HG.
Senior Engineering Geologist
Brownfields and Environmental Restoration Program

FROM: Laura Rainey, P.G.
Senior Engineering Geologist
Geological Services Unit
Geology and Remediation Engineering Branch

DATE: January 2, 2009

SUBJECT: COMMENTS ON THE RADIOACTIVE MATERIALS HANDLING FACILITY (RMHF) RCRA FACILITY INVESTIGATION WORK PLAN ADDENDUM AMENDMENTS, SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA

PCA 22120 Site Code 300381-48 MPC 37 Tracking Number 840125

As requested, the Geological Services Unit (GSU) at the Department of Toxic Substances Control (DTSC) reviewed the "Radioactive Materials Handling Facility (RMHF) RCRA Facility Investigation Work Plan Addendum Amendment" (Work Plan). The Work Plan, dated March 7, 2008, was prepared by MWH for the United States Department of Energy (DOE) and the Boeing Company (Boeing). The Work Plan presents the site history, previous sampling results, existing groundwater conditions, and proposed Resource Conservation and Recovery Authority (RCRA) Facility Investigation (RFI) characterization sampling for the RMHF, located in Administrative Area IV of the Santa Susana Field Laboratory (SSFL).

DTSC's Industrial Hygiene and Safety Branch also reviewed the Site-Specific Health and Safety Plan associated with the Work Plan and provided comments. The California Department of Health Services Radiological Health Branch (DPH) also reviewed and provided comments on the Work Plan.

On April 8, 2008, GSU visited the RMHF to view the sample locations that were proposed in the Work Plan. Based on observed site conditions, GSU discussed with

Printed on Recycled Paper

MWH criteria for placement of sample locations as well as requiring additional sample locations. For example, GSU observed the health physicist contractor (Cabrera) conduct radiological screening of the ground surface near the "Mixed Waste Storage Yard" using a sodium iodide scintillation counter. Somewhat elevated gamma readings were observed that appeared to coincide with an asphalt seal that trended east-west just north of the fence line. As a result, additional samples were included in this area along the fence line. Elevated gamma and beta readings were also observed along the western portion of the asphalt swale that runs westerly along the northern portion of the RMHF. The proposed swale sample location was relocated to cover this area. Some sample locations were slightly relocated to address surface site conditions, such as asphalt cracks and swales. GSU also required additional samples to address former storage areas, doorways and floor drains of buildings as well as sampling of an active transformer.

GSU's request for locating samples for chemical analysis in areas showing elevated radiologic readings is based on the concern that chemical impacts could potentially be commingled with radiologic impacts, since this facility handled, treated and stored mixed waste.

Soon after submittal of the Work Plan, Boeing submitted electronic files containing historical documents related to the RMHF. These files include RMHF Addendum #1 (Boeing, April 3, 2008), RMHF Addendum #2 (Boeing, July 22, 2008), and historical photographs (via email from MWH, April 10, 2008). The following historical documents were submitted to aid GSU in review of the Work plan:

- Historical photographs (1960's through approximately 1970's): submitted via email.
- Historical Documents (1950's through 1990's): submitted as three disks.
- Historical Site Plan and Details (1960's through 1980's).
- Historical Sewer Plans (1960's through 1990's).
- Water Distribution System Plans (1970's through 1990's).
- Natural Gas System and Gas Distribution Plans (1970's through 1990's).

As a result of review of the Work Plan and associated historical documents, GSU generated numerous preliminary comments. These comments were provided to Boeing via email on April 16, 2008. GSU's comments included the need for more samples at more locations, inclusion of more analytes based on review of available documentation, and clarification of analytical methods proposed. GSU also requested clarification regarding locations of documented historical releases, as well as information regarding historical site drainage. GSU's comments were also based on conditions observed during recent field visits to the RMHF.

On April 18, 2008, GSU met with Boeing to discuss GSU's comments regarding the Work Plan and recent site visits. Based on GSU's comments and requirement for additional work, Boeing responded by including numerous additional sample locations and increased analyses for various chemicals. Based on the scope of work described in the response, GSU agreed to Boeing's request to initiate sampling activities. GSU and DPH subsequently conducted site visits during the sampling activities.

A complete summary of GSU's preliminary comments on the RMHF Work Plan is included as Appendix A of the RMHF RCRA Facility Investigation Work Plan Addendum, Second Amendment (MWH, October 2008). The RMHF Work Plan Second Amendment was submitted in response to DTSC's request for an amendment to the Work Plan that documents information provided to DTSC during implementation of the Work Plan and that presents modifications to the field program. The RMHF Work Plan, the Work Plan Addendum Second Amendment and associated historical documents are available at DTSC's SSFL web site at: http://www.dtsc-ssfl.com.

Based on GSU's review of the Work Plan and associated historical documents provided, the Work Plan Addendum, Second Amendment appears to have adequately addressed GSU's preliminary comments. GSU recommends approval of the RMHF Work Plan and its associated Work Plan Addendum Second Amendment under the following conditions:

- the lowest reasonably attainable Method Reporting Limits be used,
- Senate Bill 990 (SB 990)-compliant Risk-Based Screening Levels be used, and
- updated chemical and radionuclide soil background values be utilized in the Final Group 7 RFI Report.

Thank you for the opportunity to comment on this document. If you have any questions or require clarification, please feel free to contact me at (714) 484-5434.

Peer reviewed by: Thomas Seckington, C.HG.
Senior Engineering Geologist
Geological Services Unit
Geology and Remediation Engineering

APPENDIX C

ATTACHMENT C-2

SUBSURFACE INFORMATION
(Electronic Copy)

SOIL BORING LOGS

MWH

Boring ID: **RMBS0001**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267802.78**	Easting (ft): **1785403.11**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-29-2008**	Start Time: **09:59**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-29-2008**	Finish Time: **10:21**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **NE corner of concrete floor inside building**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-29-2008**	Backfill Time: **10:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 4 inches thick over 2 inches of gravel					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist, contains sandstone fragments, pieces of plastic [Fill]				80	20
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0002**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267793.14**	Easting (ft): **1785403.52**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-29-2008**	Start Time: **10:34**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-29-2008**	Finish Time: **10:47**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **SE corner of concrete floor; cleared 2 in. of debris off soil before sampling**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-29-2008**	Backfill Time: **10:59**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 4 inches thick					
S			0.4				SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist, trace non-native gravel, sandstone fragments [Fill]	tr			70	30
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0003**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267797.56**	Easting (ft): **1785392.27**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-16-2008**	Start Time: **11:30**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-16-2008**	Finish Time: **12:04**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	

Comments: **Concrete floor inside building**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**	Soil Backfill Date: **04-16-2008**	Backfill Time: **12:24**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 4 inches thick					
S			0.0				GP	Poorly Graded Gravel with Sand, gray (10YR 6/1), dense, moist, angular granitic gravel 1/2 in. to 3 in. dia.; yellowish brown (10YR 5/4) below 1 ft [Fill - Road Base]	50	20	20	10	
					2			Total Depth = 1.3 ft (15 in.); refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0003A**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.3**	Project: **SSFL Group 7 RFI Sampling**	
Northing (ft):	Easting (ft):	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-18-2008**	Start Time:	Logged By: **C. Nevison**	Reviewed By: **C. Carter, P.G.**
Drill Finish Date: **04-18-2008**	Finish Time:	Drilling Contractor: **BL Hall**	Field Instrumentation:
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete floor inside building.**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide Hammer with Drive Sampler**		Soil Backfill Date: **04-18-2008**	Backfill Time:

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S					0		GP	Concrete 4" thick. Poorly Graded Gravel with Sand, gray (10YR 6/1), dense, moist, [Fill - Road Base]	50	20	20	10	
								becomes yellowish brown (10YR 5/4) Total Depth = 1.3 ft; refusal on weathered Chatsworth Formation Sandstone.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

Log Continued on Next Page

MWH

Boring ID: **RMBS0003A**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.3**	Project: **SSFL Group 7 RFI Sampling**	
Northing (ft):	Easting (ft):	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-18-2008**	Start Time:	Logged By: **C. Nevison**	Reviewed By: **C. Carter, P.G.**
Drill Finish Date: **04-18-2008**	Finish Time:	Drilling Contractor: **BL Hall**	Field Instrumentation:
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	

Comments: **Concrete floor inside building.**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide Hammer with Drive Sampler**	Soil Backfill Date: **04-18-2008**	Backfill Time:

Sample Interval Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
									Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					20								
					22								
					24								
					26								
					28								
					30								
					32								
					34								
					36								
					38								
					40								

MWH

Boring ID: **RMBS0004**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **3.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267829.23**	Easting (ft): **1785345.23**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-18-2008**	Start Time: **12:03**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-18-2008**	Finish Time: **12:30**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed 5-6 in. soil beneath asphalt to keep asphalt debris from subsurface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-18-2008**	Backfill Time: **12:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt					
S			0.1				SM	Silty Sand, yellowish brown (10YR 5/6), dense, moist, contains weathered sandstone fragments [Fill]		tr	5	80	15
S			0.1		2								
			1.1										
					4			Total Depth = 3.5 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil samples S01 and S02.					
					6			Backfilled with native soil and bentonite.					
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0004A**

Borehole Diam. (in.): **2**	Total Depth (ft): **7.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267829.23**	Easting (ft): **1785345.23**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-13-2008**	Start Time: **11:05**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-13-2008**	Finish Time: **11:35**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-13-2008**	Backfill Time: **11:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S	100		0.3		2		SM	Silty Sand, yellowish brown (10YR 5/6), medium dense, moist, micaceous, trace rock fragments, no staining or odor				60	40
S	100		0.2		4								
					6								
					8			Total Depth = 7.0 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil samples S001 and S002. Backfilled with geoprobe cuttings and asphalt surface patch.					
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0005**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267793.14**	Easting (ft): **1785380.62**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-29-2008**	Start Time: **12:35**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-29-2008**	Finish Time: **12:49**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **SW corner of concrete floor inside building**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-29-2008**	Backfill Time: **13:03**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 6 inches thick over 6 inches of non-native gravel and sand fill					
S							SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist [Fill]				70	30
					2			Total Depth = 1.8 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0006/RMSV0006

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267815.25**	Easting (ft): **1785323.95**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-23-2008**	Start Time: **10:47**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-23-2008**	Finish Time: **11:18**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-23-2008**	Backfill Time: **11:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 5 inches thick					
S			2.1				SM	Silty Sand, dark yellowish brown (10YR 4/4), loose, moist, contains asphalt, sandstone, and gravel fragments [Fill]			tr	70	30
S					2		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist			tr	90	10
S			1.8				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist			tr	70	30
								Blue Vapor Probe Installation Hydrated bentonite seal ... 0-2.25 ft #3 sand filterpack ... 2.25-3.5 ft Perforated HDPE tubing ... 2.5-3.5 ft					
					4			Total Depth = 3.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S02 and D02. Installed soil vapor probe RMSV0006 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0007**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.1**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267830.90**	Easting (ft): **1785398.29**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-23-2008**	Start Time: **13:27**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-23-2008**	Finish Time: **13:59**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	

Comments: **Removed asphalt debris after punching through pavement with geoprobe** | Well Comp. Date: **N/A** | Completion Time: **N/A**

Samplers: **Geoprobe macrocore with acetate sleeve** | Soil Backfill Date: **04-23-2008** | Backfill Time: **14:10**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt and gravel 6 inches thick					
S			3.2				SP	Poorly Graded Sand, yellowish brown (10YR 5/4), dense, moist		tr	5	90	5
								Total Depth = 1.1 ft (13 in.); refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0007A**

Borehole Diam. (in.): **2**	Total Depth (ft): **0.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267830.90**	Easting (ft): **1785398.29**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-13-2008**	Start Time: **10:25**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-13-2008**	Finish Time: **10:40**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-13-2008**	Backfill Time: **10:38**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 3 inches thick					
	S	100		0.7				SM	Silty Sand, yellowish brown (10YR 5/6), medium dense, moist, micaceous, trace rock fragments, no staining or odor				60	40
									Total Depth = 0.8 ft; refusal on weathered Chatsworth Formation Sandstone. Attempted one step-out boring; met refusal at similar depth.					
						2			Collected soil sample S001.					
									Backfilled with geoprobe cuttings and asphalt surface patch.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0008**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267813.16**	Easting (ft): **1785399.84**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-23-2008**	Start Time:	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-23-2008**	Finish Time:	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-23-2008**	Backfill Time:

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt and asphalt debris					
	S			1.1				SM	Silty Sand, brown (10YR 4/3), dense, moist [Fill]		5	5	65	25
	S								Total Depth = 1.3 ft (15 in.); refusal on Chatsworth Formation Sandstone.					
						2			Collected soil samples S01 and D01.					
									Backfilled with native soil and bentonite.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0009**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **3.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267831.37**	Easting (ft): **1785378.27**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-18-2008**	Start Time: **13:15**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-18-2008**	Finish Time: **13:41**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed 5-6 in. soil beneath asphalt to keep asphalt debris from subsurface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-18-2008**	Backfill Time: **13:52**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 5 inches thick					
S			2.2				SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/6) to dark yellowish brown (10YR 4/6), medium dense, moist, contains sandstone fragments			tr	90	10
S					2								
S			1.5										
								Total Depth = 3.0 ft; refusal on Chatsworth Formation Sandstone.					
					4			Collected soil samples S01, S01MS/MSD, and S02.					
								Backfilled with native soil and bentonite.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0009A**

Borehole Diam. (in.): **2**	Total Depth (ft): **1.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267831.37**	Easting (ft): **1785378.27**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-13-2008**	Start Time: **10:42**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-13-2008**	Finish Time: **11:00**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-13-2008**	Backfill Time: **10:56**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S	100		0.6				SM	Silty Sand, brownish yellow (10YR 6/6), medium dense, moist, micaceous, trace rock fragments, no staining or odor				60	40
					2			Total Depth = 1.8 ft; refusal on weathered Chatsworth Formation Sandstone. Attempted one step-out boring; met refusal at similar depth.					
								Collected soil sample S001.					
								Backfilled with geoprobe cuttings and asphalt surface patch.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0010**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267812.62**	Easting (ft): **1785381.73**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-23-2008**	Start Time: **09:01**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-23-2008**	Finish Time: **09:18**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-23-2008**	Backfill Time: **09:23**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 4 inches thick					
	S			9.4				SM	Silty Sand, dark yellowish brown (10YR 4/6), dense, moist [Fill]			tr	70	30
						2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone.					
									Collected soil samples S01 and S01MS/MSD.					
									Backfilled with native soil and bentonite.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0011**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.9**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267804.39**	Easting (ft): **1785380.62**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-29-2008**	Start Time: **11:11**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-29-2008**	Finish Time: **11:41**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	

Comments: **NW corner of concrete floor inside building** | Well Comp. Date: **N/A** | Completion Time: **N/A**

Samplers: **Slide hammer with drive sampler** | Soil Backfill Date: **04-29-2008** | Backfill Time: **11:57**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 6 inches thick over 4 inches of gravel					
S			0.1 0.0		2		SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist [Fill]	tr			70	30
								Total Depth = 1.9 ft (23 in.); refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0012**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **2.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267815.30**	Easting (ft): **1785343.32**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-18-2008**	Start Time: **07:40**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-18-2008**	Finish Time: **07:53**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed 5 in. soil beneath asphalt to keep asphalt debris from subsurface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-18-2008**	Backfill Time: **08:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S			0.0		2		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist, occasional fragments of weathered sandstone				90	10
								Total Depth = 2.3 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0013**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267793.40**	Easting (ft): **1785346.27**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-16-2008**	Start Time: **12:21**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-16-2008**	Finish Time: **13:04**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-16-2008**	Backfill Time: **13:15**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, occasional fragments of weathered sandstone			10	70	20
S													
S			0.0		2			Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil samples S01 and S02.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0014**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **6.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267830.38**	Easting (ft): **1785321.14**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-18-2008**	Start Time: **10:52**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-18-2008**	Finish Time: **11:23**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	

Comments: **Removed 5-6 in. soil beneath asphalt to keep asphalt debris from subsurface** | Well Comp. Date: **N/A** | Completion Time: **N/A**

Samplers: **Geoprobe macrocore with acetate sleeve** | Soil Backfill Date: **04-18-2008** | Backfill Time: **11:37**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S			0.0		2		SM	Silty Sand, yellowish brown (10YR 5/6) to dark yellowish brown (10YR 4/6), medium dense, moist, contains sandstone fragments, occasional voids [Fill]		tr	5	65	30
S			0.3		4								
S			0.8		6								
					8			Total Depth = 6.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01SP, S02, and S03. Backfilled with native soil and bentonite.					
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0015**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267797.07**	Easting (ft): **1785322.39**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-18-2008**	Start Time: **08:03**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-18-2008**	Finish Time: **08:27**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed 5-6 in. soil beneath asphalt to keep asphalt debris from subsurface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-18-2008**	Backfill Time: **08:31**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick					
S			0.8		2		SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, contains fragments of weathered sandstone			tr	85	15
								Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0016**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **7.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267828.03**	Easting (ft): **1785294.35**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-18-2008**	Start Time:	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-18-2008**	Finish Time:	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed 5-6 in. soil beneath asphalt to keep asphalt debris from subsurface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-18-2008**	Backfill Time:

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick					
S			1.5				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, contains chips and fragments of hard, consolidated sandstone			10	75	15
S			0.8		2			sand grades slightly finer			5	80	15
								becomes medium dense, apparent voids in subsurface (samplers do not fill up)					
S			1.8		4								
S			1.3		6		ML	Sandy Silt, dark yellowish brown (10YR 3/4), soft, moist			tr	30	70
								Sandstone [Chatsworth Formation]					
					8			Total Depth = 7.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01SP, S02, S03, and S04. Backfilled with native soil and bentonite.					
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0017**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267816.13**	Easting (ft): **1785294.61**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-18-2008**	Start Time: **08:34**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-18-2008**	Finish Time: **08:47**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed 5 in. soil beneath asphalt to keep asphalt debris from subsurface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-18-2008**	Backfill Time: **08:56**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick					
S			2.4		2		SM	Silty Sand, yellowish brown (10YR 5/6), dense, moist, contains fragments of weathered sandstone			tr	75	25
								Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0018**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267832.90**	Easting (ft): **1785609.79**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-25-2008**	Start Time: **07:57**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-25-2008**	Finish Time: **08:25**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-25-2008**	Backfill Time: **08:31**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt and gravel 6 inches thick					
	S			0.0				SC	Clayey Sand, gray (10YR 6/1) to light brownish gray (10YR 6/2) with 1/4-inch-thick layers of very dark gray (10YR 3/1), medium dense, moist, possible staining			tr	60	40
						2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0019/RMSV0019

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267819.82**	Easting (ft): **1785548.98**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-25-2008**	Start Time: **10:31**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-25-2008**	Finish Time: **11:01**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed 6 in. soil beneath asphalt to keep asphalt debris from subsurface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-25-2008**	Backfill Time: **11:15**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S			0.0		2		SM	Silty Sand, light brownish gray (10YR 6/2), medium dense, moist, iron oxide staining over about 25% of soil				70	30
			0.0					**Clear Vapor Probe Installation** Hydrated bentonite seal ... 0-3.5 ft #3 sand filterpack ... 3.5-4 ft Perforated HDPE tubing ... 3.75-4 ft					
S			0.0		4			← decrease in iron oxide staining					
								Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, D01, and S02. Installed soil vapor probe RMSV0019 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0020**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267817.15**	Easting (ft): **1785417.74**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-22-2008**	Start Time: **09:12**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time: **09:23**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete pad (under temporary storage) at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time: **09:25**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 6 inches thick					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist [Fill]			10	70	20
					2			Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0021/RMSV0021

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267850.04**	Easting (ft): **1785419.45**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-22-2008**	Start Time: **08:37**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time: **08:51**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete pad (under temporary storage) at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time: **09:06**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Concrete 6 inches thick					
	S			0.9				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist [Fill]		5	15	60	20
						2		SM	Silty Sand, very dark brown (10YR 2/2), medium dense, moist [Native]			5	65	30
	S			0.1					**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-2.25 ft #3 sand filterpack ... 2.25-3.5 ft Perforated HDPE tubing ... 2.5-3.5 ft					
						4			Total Depth = 3.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0021 as detailed above.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0022(DL-1)/RMBS0022S70**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267844.74**	Easting (ft): **1785488.68**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-19-2008**	Start Time: **09:20**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-19-2008**	Finish Time: **09:44**	Drilling Contractor: **MWH**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Brian Martasin**	
Comments: **Asphalt surface north of transformer**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Hand auger bucket**		Soil Backfill Date: **04-19-2008**	Backfill Time:

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 5 inches thick					
S							SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/4), medium dense to dense, moist, few non-native gravel [Fill]	10			80	10
					2			Total Depth = 1.3 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S01RAD. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0022(DL-2)/RMBS0022S70**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267841.96**	Easting (ft): **1785483.13**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-19-2008**	Start Time: **08:52**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-19-2008**	Finish Time: **09:14**	Drilling Contractor: **MWH**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Brian Martasin**	
Comments: **Asphalt surface north of transformer**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Hand auger bucket**		Soil Backfill Date: **04-19-2008**	Backfill Time:

Sample Interval Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 5 inches thick					
S			0.1				SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/4), medium dense, moist, few non-native gravel [Fill]	10			80	10
					2			Total Depth = 1.3 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S02 and S02RAD. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0022(DL-3)/RMBS0022S70

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267829.19**	Easting (ft): **1785480.47**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-19-2008**	Start Time: **10:18**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-19-2008**	Finish Time: **10:44**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Asphalt surface west of transformer**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-19-2008**	Backfill Time: **10:52**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 4 inches thick					
	S			0.4				SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/4), medium dense, moist, few non-native gravel [Fill]	10			80	10
									Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
						2			Collected soil samples S03 and S03RAD.					
									Backfilled with native soil and bentonite.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0023(DL-1)/RMBS0023S70

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267832.99**	Easting (ft): **1785494.63**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-19-2008**	Start Time: **07:45**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-19-2008**	Finish Time: **08:14**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Asphalt surface (cored) south of transformer**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Hand auger bucket**		Soil Backfill Date: **04-19-2008**	Backfill Time: **08:28**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S			0.0				SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/4), medium dense, moist, few non-native gravel [Fill]	10			80	10
			0.0		2		SP	Poorly Graded Sand, yellowish brown (10YR 5/4), medium dense, moist [Native]				100	tr
								Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone, dark yellowish brown (10YR 4/4).			10	85	5
					4			Collected soil samples S01 and S01RAD.					
								Backfilled with native soil and bentonite.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0023(DL-2)/RMBS0023S70**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267830.66**	Easting (ft): **1785489.68**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-19-2008**	Start Time: **08:37**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-19-2008**	Finish Time: **09:03**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Asphalt surface south of transformer**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-19-2008**	Backfill Time: **09:16**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S			0.0				SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/4), medium dense, moist, few non-native gravel [Fill]	10			80	10
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S02 and S02RAD. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0023(DL-3)/RMBS0023S70**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267836.14**	Easting (ft): **1785477.87**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-19-2008**	Start Time: **09:25**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-19-2008**	Finish Time: **10:00**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Asphalt surface west of transformer**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-19-2008**	Backfill Time: **10:06**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick					
S			0.4				SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/4), medium dense, moist, few non-native gravel [Fill]	10			80	10
					2			Total Depth = 1.3 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S03 and S03RAD. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0030/RMSV0030

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267854.38**	Easting (ft): **1785474.02**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-22-2008**	Start Time: **09:42**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time: **09:59**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface inside bermed area around transformer**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time: **10:04**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 6 inches thick					
	S			0.6				SM	Silty Sand, brown (10YR 4/3), loose to medium dense, moist [Fill]		tr	5	70	25
	S													
						2			becomes interbedded with Poorly Graded Sand (SP), light to dark brown					
	S								**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-2.25 ft #3 sand filterpack ... 2.25-3.5 ft Perforated HDPE tubing ... 2.5-3.5 ft					
	S			0.2										
						4			Total Depth = 3.5 ft; refusal on Chatsworth Formation Sandstone.					
									Collected soil samples S01 and S02.					
									Installed soil vapor probe RMSV0030 as detailed above.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0031**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267966.86**	Easting (ft): **1785516.22**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **05-01-2008**	Start Time: **11:59**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **12:10**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Old, cracked asphalt surface 1 in. thick removed before augering**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-01-2008**	Backfill Time: **12:15**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, contains sandstone fragments				70	30
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone. Attempted two step-outs, 3 ft to west and 3 ft to north; met refusal at approx. 1.0 ft. Collected soil sample S01. Backfilled with native soil.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0032/RMSV0032

Borehole Diam. (in.): **3**	Total Depth (ft): **3.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268061.20**	Easting (ft): **1785578.97**	Job Number: **1891451**	Site: **RMHF Leachfield**
Drill Start Date: **05-02-2008**	Start Time: **08:12**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **09:02**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	

Comments: **Grass and weeds at surface; vapor probe installed in third step-out**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**	Soil Backfill Date: **05-02-2008**	Backfill Time: **09:35**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist		5	25	50	20
					2			occasional fine gravel to 3/4 inch dia.					
								Vapor Probe Installation Hydrated bentonite seal ... 0-2.25 ft #3 sand filterpack ... 2.25-3.5 ft Perforated HDPE tubing ... 2.5-3.5 ft					
S			0.0										
					4			Total Depth = 3.5 ft at step-out 5 ft to north of original location; refusal on Chatsworth Formation Sandstone. Original location and two step-outs to east and west met refusal at less than 0.5 ft. Collected soil samples S01, S01SP, S01RAD, S02, and S02RAD. Installed soil vapor probe RMSV0032 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0033/RMSV0033

Borehole Diam. (in.): **3**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268071.71**	Easting (ft): **1785603.06**	Job Number: **1891451**	Site: **RMHF Leachfield**
Drill Start Date: **05-01-2008**	Start Time: **13:52**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **14:37**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Thick weeds 12 in. tall at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-01-2008**	Backfill Time: **14:59**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S					0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry to moist, contains sandstone fragments, occasional non-native gravel (one piece at 2.5 ft) [Fill]		tr	tr	70	30
S								becomes moist **Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-2.75 ft #3 sand filterpack ... 2.75-4 ft Perforated HDPE tubing ... 3-4 ft					
S					2			becomes moist to wet, increase in silt, mica				60	40
					4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0033 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0034**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268126.43**	Easting (ft): **1785508.07**	Job Number: **1891451**	Site: **North of RMHF Leachfield**
Drill Start Date: **05-05-2008**	Start Time: **12:01**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-05-2008**	Finish Time: **12:07**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-05-2008**	Backfill Time: **12:11**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, light yellowish brown (10YR 6/4), loose to medium dense, moist		10	30	40	20
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S01RAD. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0035**

Borehole Diam. (in.): **3**	Total Depth (ft): **2.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268051.86**	Easting (ft): **1785559.14**	Job Number: **1891451**	Site: **RMHF Leachfield**
Drill Start Date: **05-02-2008**	Start Time: **09:41**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **09:58**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Grass and weeds at surface; deeper sample from step-out 5 ft to north**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **10:01**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist		5	30	45	20
S			0.0		2			← refusal at 1.4 ft in original boring at 09:48; backfilled at 10:01					
								Total Depth = 2.3 ft at step-out 5 ft to north of original location; refusal on Chatsworth Formation Sandstone. Original location met refusal at 1.4 ft. Collected soil samples S01 and S01RAD from original boring, S02 and S02MS/MSD from step-out. Backfilled with native soil.					

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0036**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268105.06**	Easting (ft): **1785459.47**	Job Number: **1891451**	Site: **North of RMHF Leachfield**
Drill Start Date: **05-05-2008**	Start Time: **12:20**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-05-2008**	Finish Time: **12:31**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments:		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-05-2008**	Backfill Time: **12:39**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, light yellowish brown (10YR 6/4), medium dense, moist		10	30	40	20
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil samples S01, S01RAD, D01, and D01RAD.					
								Backfilled with native soil.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0037**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268040.76**	Easting (ft): **1785513.16**	Job Number: **1891451**	Site: **RMHF Leachfield**
Drill Start Date: **05-02-2008**	Start Time: **11:12**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **11:27**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments:		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **11:33**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0			Sandstone, light yellowish brown (10YR 6/4), moist, friable; drills as fine sand [Weathered Chatsworth Formation]					
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0038**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267883.73**	Easting (ft): **1785288.82**	Job Number: **1891451**	Site: **RMHF - Building 4075**
Drill Start Date: **04-17-2008**	Start Time: **08:52**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-17-2008**	Finish Time: **09:07**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete floor inside building**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-17-2008**	Backfill Time: **09:09**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Concrete 4 inches thick					
	S			0.1		2		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist, occasional fragments of weathered sandstone [Fill]				90	10
	S			0.3		4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Backfilled with native soil and bentonite.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0039/RMSV0039

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **4.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267884.13**	Easting (ft): **1785240.22**	Job Number: **1891451**	Site: **RMHF - Building 4075**
Drill Start Date: **04-17-2008**	Start Time: **09:31**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-17-2008**	Finish Time: **09:40**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete floor inside building**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-17-2008**	Backfill Time: **09:56**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 5 inches thick					
S			1.0		2		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist, occasional fragments of weathered sandstone [Fill]				90	10
S			1.8		4			Sandstone, yellowish brown (10YR 5/4), weathered; drills as fine sand [Chatsworth Formation]					
					6			Total Depth = 4.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0039 as detailed above.					
					8								
					10								
					12								
					14								
					16								
					18								
					20								

Blue Vapor Probe Installation
Hydrated bentonite seal ... 0-3.25 ft
#3 sand filterpack ... 3.25-4.5 ft
Perforated HDPE tubing ... 3.75-4.5 ft

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0040/RMSV0040

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267889.82**	Easting (ft): **1785322.96**	Job Number: **1891451**	Site: **RMHF - Building 4075**
Drill Start Date: **04-23-2008**	Start Time: **08:20**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-23-2008**	Finish Time: **08:41**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-23-2008**	Backfill Time: **08:52**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 5 inches thick					
S			0.0				SW	Well Graded Sand, yellowish brown (10YR 5/4), medium dense, moist [Fill]		10	30	60	tr
					2		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist [Native]					
								Vapor Probe Installation Hydrated bentonite seal ... 0-2.75 ft #3 sand filterpack ... 2.75-4 ft Perforated HDPE tubing ... 3-4 ft					
S			3.1		4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0040 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0041/RMSV0041

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267904.90**	Easting (ft): **1785416.28**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-21-2008**	Start Time: **13:38**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **13:49**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **13:56**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 2 inches road base					
s			0.1				SP	Poorly Graded Sand, brown (10YR 4/3), dense, moist, contains weathered sandstone fragments [Fill]		5	20	70	tr
					2		SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, sandstone fragments		tr	5	80	15
s			0.0					**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-1.75 ft #3 sand filterpack ... 1.75-3 ft Perforated HDPE tubing ... 2-3 ft					
								Total Depth = 3.0 ft; refusal on Chatsworth Formation Sandstone.					
					4			Collected soil samples S01 and S02.					
								Installed soil vapor probe RMSV0041 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0042**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267894.62**	Easting (ft): **1785407.87**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-21-2008**	Start Time: **11:51**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **12:20**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **12:26**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick over 2 inches road base					
S			0.4				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist [Fill]		tr	tr	80	20
S					2								
S			0.8					sand grades finer, increase in silt				70	30
S					4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil samples S01, S01SP, and S02.					
					6			Backfilled with native soil and bentonite.					
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0042A**

Borehole Diam. (in.): **2**	Total Depth (ft): **19.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267894.62**	Easting (ft): **1785407.87**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-14-2008**	Start Time: **08:15**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-14-2008**	Finish Time: **12:50**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-14-2008**	Backfill Time: **12:40**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 3 inches thick					
	S			0.2				SM	Silty Sand, olive (5Y 5/4), loose to medium dense, moist, micaceous, staining throughout				60	40
		100				2								
						4			← wood debris					
	S			0.1										
		100				6								
						8								
	S			0.6										
		100				10			← becomes greenish black (GLEY 1 10Y 2.5/1)					
						12								
		100				14								
	S			0.9					← becomes mottled dark greenish gray (GLEY 2 5BG 4/1) and black (GLEY 1 N 2.5/)					
						16								
		100				18			Collected soil samples S001, S002, S003, S004, and S005. Attempted two step-out borings to collect additional soil volume at each sample depth; met refusal at 15 ft and 16 ft. Backfilled all borings with hydrated bentonite.					
	S			0.1					← becomes black (GLEY 1 N 2.5/), slight increase in moisture, trace clay, roots					
									Sandstone, olive (5Y 4/3), fine- to medium-grained [Chatsworth Formation]					
						20			Total Depth = 19.5 ft; refusal on weathered Chatsworth Formation Sandstone.					

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0043**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267921.26**	Easting (ft): **1785461.57**	Job Number: **1891451**	Site: **RMHF - Building 4664**
Drill Start Date: **04-22-2008**	Start Time: **11:19**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time: **11:38**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time: **11:43**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over road base					
S			0.4				SM	Silty Sand		10	20	40	30
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0044**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267932.95**	Easting (ft): **1785500.77**	Job Number: **1891451**	Site: **RMHF - Building 4664**
Drill Start Date: **04-24-2008**	Start Time: **08:02**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-24-2008**	Finish Time: **08:28**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **FID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-24-2008**	Backfill Time: **08:39**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 1 inch road base					
S			0.0				SP-SM	Poorly Graded Sand with Silt, brown (10YR 5/3), non-native gravel [Fill]	10	10	15	55	10
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0045**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267957.61**	Easting (ft): **1785551.65**	Job Number: **1891451**	Site: **RMHF - Building 4665**
Drill Start Date: **04-28-2008**	Start Time: **10:49**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-28-2008**	Finish Time: **11:07**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete floor inside building**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-28-2008**	Backfill Time: **11:10**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 5 inches thick					
S							SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist, contains weathered sandstone fragments [Fill]				70	30
					2			Total Depth = 1.3 ft (16 in.); refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0046**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267880.03**	Easting (ft): **1785639.52**	Job Number: **1891451**	Site: **RMHF - Building 4044**
Drill Start Date: **04-24-2008**	Start Time: **11:30**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-24-2008**	Finish Time: **11:41**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **FID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface at bottom of drainage channel**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-24-2008**	Backfill Time: **12:07**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt and road base 5 inches thick					
S			0.0				SM	Silty Sand, brown (10YR 5/3), medium dense, moist, trace non-native gravel, sandstone fragments [Fill]	tr	5	10	60	25
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0047**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267919.14**	Easting (ft): **1785660.35**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-24-2008**	Start Time: **10:06**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-24-2008**	Finish Time: **10:26**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **FID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete pad at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-24-2008**	Backfill Time:

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Concrete 6 inches thick					
	S			0.0				SM	Silty Sand, dark yellowish brown (10YR 4/6), dense, moist [Fill]			5	75	20
						2			Total Depth = 1.8 ft; refusal on Chatsworth Formation Sandstone.					
									Collected soil sample S01.					
									Backfilled with native soil and bentonite.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0048**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267845.23**	Easting (ft): **1785690.88**	Job Number: **1891451**	Site: **RMHF - Building 4034**
Drill Start Date: **04-28-2008**	Start Time: **09:47**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-28-2008**	Finish Time: **10:11**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	

Comments: **Tile surface over concrete in restroom**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**	Soil Backfill Date: **04-28-2008**	Backfill Time: **10:14**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 6 inches thick					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist, few coarse non-native gravel 1 to 1-1/2 inches dia., weathered sandstone fragments [Fill]	5			75	20
					2			Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0049**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267803.41**	Easting (ft): **1785656.38**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-25-2008**	Start Time: **08:58**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-25-2008**	Finish Time: **09:21**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-25-2008**	Backfill Time: **09:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt and gravel base 6 inches thick					
S			0.0		2		SM	Silty Sand, dark yellowish brown (10YR 4/4), dense, moist			tr	80	20
								Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil samples S01 and D01.					
								Backfilled with native soil and bentonite.					

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0050**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267973.84**	Easting (ft): **1785634.56**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-24-2008**	Start Time: **09:18**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-24-2008**	Finish Time:	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **FID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete pad at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-24-2008**	Backfill Time:

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 6 inches thick					
S			0.1				SM	Silty Sand, brown (10YR 5/3), dense, moist [Fill]			tr	70	30
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0051**

Borehole Diam. (in.): **3**	Total Depth (ft): **0.9**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268003.86**	Easting (ft): **1785622.62**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-29-2008**	Start Time: **08:11**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-29-2008**	Finish Time: **08:26**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt swale, northeast corner outside RMHF fence; asphalt was cored**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-29-2008**	Backfill Time: **08:31**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist, contains sandstone fragments				80	20
					1			Total Depth = 0.9 ft (11 in.); refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0052**

Borehole Diam. (in.): **6 x 12**	Total Depth (ft): **0.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267913.89**	Easting (ft): **1785431.53**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-30-2008**	Start Time: **07:32**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-30-2008**	Finish Time: **08:47**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Trowel**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt swale, at bend north of RMHF fence; asphalt was sawcut**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Hand trowel**		Soil Backfill Date: **04-30-2008**	Backfill Time: **09:12**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 6 inches thick					
S							SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, sandstone fragments				80	20
					1			Total Depth = 0.8 ft (9 in.); refusal on Chatsworth Formation Sandstone. Dug out 6-in. x 12-in. rectangle of asphalt, removed debris, and sampled from thin layer of native soil on bedrock. Collected soil sample S01. Backfilled with native soil.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0053**

Borehole Diam. (in.): **3**	Total Depth (ft): **0.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267920.91**	Easting (ft): **1785263.39**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-28-2008**	Start Time: **12:05**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-28-2008**	Finish Time: **12:37**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt swale**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-28-2008**	Backfill Time: **12:41**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over concrete 2 inches thick					
S			0.2				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist [Fill]				80	20
					1			Total Depth = 0.8 ft (9 in.); refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0054**

Borehole Diam. (in.): **3**	Total Depth (ft): **2.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267814.61**	Easting (ft): **1785052.99**	Job Number: **1891451**	Site: **West of RMHF**
Drill Start Date: **05-07-2008**	Start Time: **08:13**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-07-2008**	Finish Time: **08:31**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments:		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-07-2008**	Backfill Time: **08:47**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist			25	40	35
					2			Total Depth = 2.3 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01SP, and MS/MSD. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0055**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267854.50**	Easting (ft): **1785195.23**	Job Number: **1891451**	Site: **West of RMHF**
Drill Start Date: **05-01-2008**	Start Time: **07:50**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **08:15**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Vegetation on surface of slope**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-01-2008**	Backfill Time: **08:19**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, pale brown (10YR 6/3), loose, dry, occasional non-native gravel, sandstone fragments [Fill]				70	30
					2			Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone. Two step-outs 1 to 1.5 ft to south and to north of original location met refusal at approx. 1.0 ft. Collected soil sample S01. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0056**

Borehole Diam. (in.): **3**	Total Depth (ft): **0.6**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267837.62**	Easting (ft): **1785138.34**	Job Number: **1891451**	Site: **West of RMHF**
Drill Start Date: **05-02-2008**	Start Time: **09:00**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **09:20**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass, weeds, and asphalt debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **09:24**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SM	Silty Sand with Gravel, light yellowish brown (10YR 6/4), loose, dry, asphalt [Fill]	20	20	30	10	20
	S			0.0				SM	Silty Sand with Gravel, light yellowish brown (10YR 6/4), loose to medium dense, dry, subangular gravel, roots and rootlets, porous [Slopewash / Colluvium]	15	10	30	20	25
						1			Total Depth = 0.6 ft (7 in.); refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01RAD, D01, and D01RAD. Three step-outs required for sample volume. Backfilled with native soil.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0057**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267749.09**	Easting (ft): **1785086.51**	Job Number: **1891451**	Site: **Along Catch Basin Pipeline**
Drill Start Date: **05-02-2008**	Start Time: **07:40**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **08:00**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **08:05**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, light yellowish brown (10YR 6/4), medium dense, dry, leaves and roots within top 3 inches [Alluvium]		10	35	20	35
					2			Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S01RAD. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0057A**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267749.09**	Easting (ft): **1785086.51**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-19-2008**	Start Time: **09:00**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-19-2008**	Finish Time: **09:40**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-19-2008**	Backfill Time: **09:35**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry, micaceous, no staining or odor		5	10	45	40
S			1.5					← refusal on piece of rebar in first attempt becomes light yellowish brown (10YR 6/4), sand grades fine				60	40
					2			Total Depth = 1.8 ft in second attempt (west side of pipe); refusal on weathered Chatsworth Formation Sandstone. Refusal at 1.0 ft on piece of rebar in first attempt (east side of pipe). Collected soil sample S001. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0058**

Borehole Diam. (in.): **2**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267651.47**	Easting (ft): **1785054.84**	Job Number: **1891451**	Site: **Along Catch Basin Pipeline**
Drill Start Date: **05-01-2008**	Start Time: **12:08**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **12:36**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **05-01-2008**	Backfill Time: **12:37**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0			Asphalt 2 inches thick over 1 to 2 inches base					
S								Silty Sandstone, yellowish brown (10YR 5/4), hard, dry to moist [Weathered Chatsworth Formation]					
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S01RAD. Backfilled with soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0059**

Borehole Diam. (in.): **2**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267580.87**	Easting (ft): **1785058.41**	Job Number: **1891451**	Site: **Along Catch Basin Pipeline**
Drill Start Date: **05-01-2008**	Start Time: **12:43**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **13:10**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **05-01-2008**	Backfill Time: **13:18**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 2 inches thick over 1 to 2 inches base					
S							SM	Silty Sand with Gravel, brown (10YR 5/3) and very pale yellow (10YR 7/4), medium dense, moist, angular to subangular "salt and pepper" gravel [Fill]	20	15	20	20	25
S			0.0		2								
							SM	Silty Sand, very dark brown (10YR 2/2), medium dense, moist, luster (mica) [Alluvium]		10	40	30	20
S			0.0		4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01RAD, S02, and S02RAD. Three step-outs required for sample volume. Backfilled with native soil and bentonite.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0060**

Borehole Diam. (in.): **2**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267536.93**	Easting (ft): **1785129.50**	Job Number: **1891451**	Site: **Along Catch Basin Pipeline**
Drill Start Date: **05-01-2008**	Start Time: **13:20**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **13:40**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **05-01-2008**	Backfill Time: **13:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 2 inches thick over 2 inches base					
S			0.0				SM	Silty Sand with Gravel, brown (10YR 4/3) to yellowish brown (10YR 5/4), medium dense to dense, dry to moist, angular to subangular gravel, luster (mica) [Fill]	20	15	30	10	25
S					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S01RAD. Three step-outs required for sample volume. Backfilled with soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0060A**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **0.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267536.93**	Easting (ft): **1785129.50**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-19-2008**	Start Time: **08:15**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-19-2008**	Finish Time: **08:50**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Geoprobe rig used to break asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-19-2008**	Backfill Time: **08:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S			0.9				SM	Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist, micaceous, no staining or odor			5	55	40
								Total Depth = 0.8 ft; refusal on brownish yellow (10YR 6/6) weathered Chatsworth Formation Sandstone.					
					2			Collected soil sample S001.					
								Backfilled with auger cuttings and asphalt surface patch.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0061**

Borehole Diam. (in.): **2**	Total Depth (ft): **2.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267470.25**	Easting (ft): **1785133.71**	Job Number: **1891451**	Site: **Southwest of RMHF**
Drill Start Date: **05-01-2008**	Start Time: **13:50**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **14:15**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **05-01-2008**	Backfill Time: **14:20**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 2 inches base					
S			0.0				SM	Silty Sand, brown (10YR 4/3), dense, moist, iron oxide marbling, minor rootlets [Fill]		10	30	20	40
S													
S			1.2		2								
								Total Depth = 2.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01RAD, S02, and S02RAD. Two step-outs required for sample volume. Backfilled with soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0062**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268043.68**	Easting (ft): **1785331.18**	Job Number: **1891451**	Site: **North of RMHF**
Drill Start Date: **05-05-2008**	Start Time: **09:21**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-05-2008**	Finish Time: **09:28**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments:		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-05-2008**	Backfill Time: **09:33**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), loose to medium dense, moist		10	35	30	25
					2			Total Depth = 1.8 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01SP, and S01RAD. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0063**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268041.81**	Easting (ft): **1785056.39**	Job Number: **1891451**	Site: **Northwest of RMHF**
Drill Start Date: **05-06-2008**	Start Time: **13:00**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-06-2008**	Finish Time: **13:25**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Leaves and soil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-06-2008**	Backfill Time: **13:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S S			0.0		0		SM	Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist [Alluvium]		20	25	25	30
					2			Total Depth = 1.5 ft; refusal on sandstone boulder. Collected soil samples S01, S01RAD, D01, and D01RAD. Two step-outs required for sample volume. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0064**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268033.79**	Easting (ft): **1785004.49**	Job Number: **1891451**	Site: **Northwest of RMHF**
Drill Start Date: **05-06-2008**	Start Time: **11:50**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-06-2008**	Finish Time: **12:05**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Leaves and soil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-06-2008**	Backfill Time: **12:08**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, brown (10YR 4/3), loose to medium dense, moist [Alluvium]		20	30	15	35
S													
					2			Total Depth = 1.5 ft; refusal on sandstone boulder.					
								Collected soil samples S01 and S01RAD.					
								Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0065**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.2**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267838.60**	Easting (ft): **1785557.11**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-25-2008**	Start Time: **11:21**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-25-2008**	Finish Time: **11:44**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **FID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-25-2008**	Backfill Time: **11:48**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick					
s			0.0				SM	Silty Sand, yellowish brown (10YR 5/6), dense, moist, trace non-native gravel, sandstone fragments [Fill]	tr	5	5	70	20
								Total Depth = 1.2 ft (14 in.); refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0066**

Borehole Diam. (in.): **12**	Total Depth (ft): **0.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267926.54**	Easting (ft): **1785232.81**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **05-01-2008**	Start Time: **09:01**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **09:26**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger / Hand Trowel**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Sparse dry vegetation on flat area at top of slope, on concrete debris pile**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Hand trowel**		Soil Backfill Date: **05-01-2008**	Backfill Time: **09:28**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand with Gravel, brown (10YR 4/3), loose, dry to moist, non-native gravel, rock fragments, and concrete debris [Fill]	15			65	20
					1			Total Depth = 0.8 ft; refusal on concrete debris. Attempted two step-outs about 3 ft to west and to east of original hole; auger refusal at <1.0 ft at both step-outs. Used trowel to excavate 12-in.-dia. area to collect soil sample S01. Backfilled with native soil.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0066A**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267926.54**	Easting (ft): **1785232.81**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-24-2008**	Start Time: **08:30**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **09:10**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Benny and Ben**	
Comments: **Concrete debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **09:00**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.3		0		SM	Silty Sand, light yellowish brown (10YR 6/4), loose, dry, fine gravel, micaceous, no staining or odor [Fill]	10	tr	tr	50	40
					2			Total Depth = 1.5 ft; refusal on concrete debris and gravel. Collected soil sample S001. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0067**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267984.74**	Easting (ft): **1785231.26**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **05-05-2008**	Start Time: **09:53**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-05-2008**	Finish Time: **10:02**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-05-2008**	Backfill Time: **10:11**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist			25	45	30
								Total Depth = 1.3 ft; refusal on Chatsworth Formation Sandstone.					
					2			Collected soil samples S01, S01SP, and S01RAD.					
								Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0067A**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267984.74**	Easting (ft): **1785231.26**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-24-2008**	Start Time: **09:20**	Logged By: **S. Dawson**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **09:50**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **On steep slope covered with concrete debris, boulders, and brush**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **09:50**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.5		0		SM	Silty Sand, pale brown (10YR 6/3), very loose, dry, fine gravel-size subrounded sandstone fragments, micaceous	5	10	10	35	40
					2			Total Depth = 1.5 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil sample S001. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0068**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267944.63**	Easting (ft): **1785463.60**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **05-01-2008**	Start Time: **11:23**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **11:41**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Sparse dry vegetation on steep slope about 15 ft north of fence**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-01-2008**	Backfill Time: **11:43**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist					
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Attempted two step-outs, 3 ft to east and 3 ft downslope; auger refusal at both locations. Collected soil sample S01. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0068A**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267944.63**	Easting (ft): **1785463.60**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-24-2008**	Start Time: **10:33**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **10:45**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Benny and Ben**	
Comments: **Fill and debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **10:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.3		0		SM	Silty Sand, light yellowish brown (10YR 6/4), loose, dry, fine gravel, trace cobbles, micaceous, no staining or odor	10	tr	tr	50	40
					2			Total Depth = 1.5 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil sample S001. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0069**

Borehole Diam. (in.): **3**	Total Depth (ft): **2.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268012.18**	Easting (ft): **1785424.88**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **05-02-2008**	Start Time: **12:37**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **12:50**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **13:04**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, dark yellowish brown (10YR 4/4), medium dense, moist		10	35	30	25
S			0.0		2			Total Depth = 2.3 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01RAD, and S02 (no vapor probe installed). Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0070**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268026.53**	Easting (ft): **1785378.75**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **05-05-2008**	Start Time: **08:06**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-05-2008**	Finish Time: **08:15**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-05-2008**	Backfill Time: **08:31**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S					0		SM	Silty Sand, light yellowish brown (10YR 6/4), loose to medium dense, moist		25	40	20	15
					2			Total Depth = 1.3 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01RAD, and S01MS/MSD. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0091**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267946.84**	Easting (ft): **1785648.13**	Job Number: **1891451**	Site: **RMHF - Building 4688**
Drill Start Date: **04-28-2008**	Start Time: **07:52**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-28-2008**	Finish Time: **08:23**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete pad at surface, under middle of building canopy**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-28-2008**	Backfill Time: **08:27**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 6 inches thick					
S							SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist				80	20
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0092**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267905.66**	Easting (ft): **1785627.96**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-24-2008**	Start Time: **10:42**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-24-2008**	Finish Time:	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **FID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-24-2008**	Backfill Time:

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt and gravel base 5 inches thick					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), loose to medium dense, moist, trace non-native gravel, sandstone fragments [Fill]	tr	5	10	65	20
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0093**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267932.13**	Easting (ft): **1785410.75**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **05-01-2008**	Start Time: **09:35**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **10:05**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Sparse dry vegetation on slope near bend in asphalt swale north of fence**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-01-2008**	Backfill Time: **10:10**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry to moist, contains sandstone fragments				80	20
					2			Total Depth = 1.8 ft (22 in.); refusal on Chatsworth Formation Sandstone. Attempted two step-outs, one upslope and one downslope; met refusal at both locations. Collected soil samples S01, D01, and D01RAD. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0094/RMSV0094

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267886.59**	Easting (ft): **1785376.70**	Job Number: **1891451**	Site: **RMHF - East of Building 4563**
Drill Start Date: **04-21-2008**	Start Time: **10:51**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **11:12**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **11:18**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 3 inches thick over 5 inches road base					
	S			0.1		2		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist, contains sandstone fragments [Fill] becomes dark yellowish brown (10YR 4/4) with depth			tr	70	30
	S			0.4		4			**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-2.75 ft #3 sand filterpack ... 2.75-4 ft Perforated HDPE tubing ... 3-4 ft					
									Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0094 as detailed above.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0094A**

Borehole Diam. (in.): **2**	Total Depth (ft): **10.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267886.59**	Easting (ft): **1785376.70**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-13-2008**	Start Time: **12:30**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-13-2008**	Finish Time: **13:45**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-13-2008**	Backfill Time: **13:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S	100		1.7		2		SM	Silty Sand, brownish yellow (10YR 6/6), medium dense, moist, micaceous, trace rock fragments, no staining or odor				60	40
S	100		0.6		4			becomes stained olive (5Y 4/3)					
S	100		0.2		6								
					8								
					10			Total Depth = 10.8 ft; refusal on weathered Chatsworth Formation Sandstone.					
					12			Collected soil samples S001, S002, and S003.					
					14			Backfilled with geoprobe cuttings and hydrated bentonite, patched with asphalt.					
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0094B**

Borehole Diam. (in.): **2**	Total Depth (ft): **11.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267886.59**	Easting (ft): **1785376.70**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-17-2008**	Start Time: **10:40**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-17-2008**	Finish Time: **11:10**	Drilling Contractor: **Strongarm**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-17-2008**	Backfill Time: **11:08**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S	100				0			Boring advanced only to collect additional soil samples; no logging performed. Subsurface conditions are assumed to be similar to co-located soil boring RMBS0094A. Refer to Log of Boring RMBS0094A for lithology.					
S	100				2								
S	100				4								
					6								
					8								
					10			Total Depth = 11.0 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil samples S001, S002, and S003. Backfilled with hydrated bentonite.					
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0095**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267882.06**	Easting (ft): **1785661.52**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-24-2008**	Start Time: **12:18**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-24-2008**	Finish Time:	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-24-2008**	Backfill Time:

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 3 inches road base					
S			0.0				SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), medium dense, moist, trace non-native gravel, sandstone fragments [Fill]	tr	10	20	60	10
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0097**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267844.78**	Easting (ft): **1785580.33**	Job Number: **1891451**	Site: **RMHF - West of Building 4022**
Drill Start Date: **04-29-2008**	Start Time: **14:01**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-29-2008**	Finish Time: **14:21**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete surface west of building**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-29-2008**	Backfill Time: **14:33**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 8 inches thick					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist [Fill]				70	30
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0098**

Borehole Diam. (in.): **3**	Total Depth (ft): **0.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268017.46**	Easting (ft): **1785512.77**	Job Number: **1891451**	Site: **North of RMHF**
Drill Start Date: **05-02-2008**	Start Time: **12:22**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **12:25**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments:		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **12:31**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry	5	15	30	30	20
					1			Total Depth = 0.8 ft (9 in.); refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0099**

Borehole Diam. (in.): **3**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267791.04**	Easting (ft): **1785241.68**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **05-01-2008**	Start Time: **08:26**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **08:42**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Sparse dry vegetation on slope**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-01-2008**	Backfill Time: **08:51**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, brown (10YR 4/3), loose, moist, contains sandstone fragments				70	30
					2			Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone. Attempted two step-outs, 2.5 ft to north (upslope) and 2.5 ft to east; met refusal at both locations. Collected soil sample S01. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0100/RMSV0100**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **5.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267810.78**	Easting (ft): **1785251.06**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-17-2008**	Start Time: **10:55**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-17-2008**	Finish Time: **12:22**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-17-2008**	Backfill Time: **12:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt drive 8 inches thick					
S			1.4		2		SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, occasional sandstone fragments [Fill]				85	15
S			0.9		4			**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-3.75 ft #3 sand filterpack ... 3.75-5.5 ft Perforated HDPE tubing ... 4-5 ft					
					6			Total Depth = 5.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S02, and splits for DTSC. Installed soil vapor probe RMSV0100 as detailed above.					
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0101**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267895.72**	Easting (ft): **1785543.85**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-22-2008**	Start Time:	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time:	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time:

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 5 inches thick					
S			0.0				SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist [Fill]				90	10
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0102**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267846.46**	Easting (ft): **1785288.63**	Job Number: **1891451**	Site: **RMHF - Mixed Waste Storage**
Drill Start Date: **04-21-2008**	Start Time: **08:50**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **09:09**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface (cored to 4 in. dia.); removed debris before sampling**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **09:12**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 3 inches base					
S			0.3				SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist, trace to few gravel, sandstone fragments [Fill]	5			70	25
S					2			Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0103**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267847.67**	Easting (ft): **1785323.62**	Job Number: **1891451**	Site: **RMHF - Mixed Waste Storage**
Drill Start Date: **04-21-2008**	Start Time: **09:15**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **09:29**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface (cored to 4 in. dia.); removed debris before sampling**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **09:41**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 3 inches road base (sand and gravel)					
S			0.7				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, contains sandstone fragments [Fill]				70	30
			0.8		2			← possible staining at 2 ft, olive brown, no odor					
								Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0104**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267849.25**	Easting (ft): **1785354.68**	Job Number: **1891451**	Site: **RMHF - Mixed Waste Storage**
Drill Start Date: **04-21-2008**	Start Time: **10:09**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **10:21**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface (cored to 4 in. dia.); removed debris before sampling**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **10:27**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 3 inches road base					
S			0.6		1		SM	Silty Sand, brown (10YR 4/3), dense, moist [Fill]		tr	tr	70	30
					2			Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0105**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267849.80**	Easting (ft): **1785389.70**	Job Number: **1891451**	Site: **RMHF - Mixed Waste Storage**
Drill Start Date: **04-21-2008**	Start Time: **10:30**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **10:36**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface (cored to 4 in. dia.); removed debris before sampling**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **10:41**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 3 inches gravel road base					
S			0.5				SM	Silty Sand, brown (10YR 4/3), dense, moist [Fill]		tr	tr	70	30
			1.1		2			Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0106/RMSV0106

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267871.67**	Easting (ft): **1785232.38**	Job Number: **1891451**	Site: **RMHF - Building 4075**
Drill Start Date: **04-17-2008**	Start Time: **10:20**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-17-2008**	Finish Time: **10:31**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete floor in building**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-17-2008**	Backfill Time: **10:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 5 inches thick					
S			1.5				SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist, occasional fragments of weathered sandstone [Fill]				90	10
S					2								
								Blue Vapor Probe Installation Hydrated bentonite seal ... 0-2.75 ft #3 sand filterpack ... 2.75-4 ft Perforated HDPE tubing ... 3-4 ft					
S			2.0		4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0106 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0107/RMSV0107**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267873.55**	Easting (ft): **1785494.16**	Job Number: **1891451**	Site: **RMHF - Building 4664**
Drill Start Date: **04-22-2008**	Start Time: **11:50**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time: **12:04**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time: **12:19**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick					
S			0.6				SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist [Fill]			tr	70	30
					2			**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-1.75 ft #3 sand filterpack ... 1.75-3 ft Perforated HDPE tubing ... 2-3 ft					
S			0.2					becomes dark yellowish brown (10YR 4/4)				70	30
								Total Depth = 3.0 ft; refusal on Chatsworth Formation Sandstone.					
					4			Collected soil samples S01 and S02.					
								Installed soil vapor probe RMSV0107 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0108**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267901.78**	Easting (ft): **1785511.90**	Job Number: **1891451**	Site: **RMHF - Building 4664**
Drill Start Date: **04-22-2008**	Start Time: **12:34**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time: **12:49**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time: **12:50**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick					
S							SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist [Fill]			tr	70	30
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0109**

Borehole Diam. (in.): **12 x 12 square**	Total Depth (ft): **0.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267919.51**	Easting (ft): **1785582.26**	Job Number: **1891451**	Site: **RMHF - North of Building 4022**
Drill Start Date: **04-24-2008**	Start Time: **07:36**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-24-2008**	Finish Time: **07:49**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore unsuitable, sample collected using a hand trowel**		Soil Backfill Date: **04-24-2008**	Backfill Time: **13:38**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt and gravel road base 6 inches thick					
	S			0.0				SM	Silty Sand, yellowish brown (10YR 5/6), dense, moist [Weathered Sandstone]				80	20
						1			Total Depth = 0.8 ft (10 in.); refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Macrocore unsuitable for sampling. Thus, a 1-ft square of asphalt was broken out, the road base removed, and a sample collected from a 3-in.-thick soil layer using a hand trowel. Backfilled with native soil and bentonite.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0110**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **3.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267840.21**	Easting (ft): **1785247.67**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-17-2008**	Start Time: **13:29**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-17-2008**	Finish Time: **14:20**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-17-2008**	Backfill Time: **14:29**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 8 inches thick					
s							SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist, occasional roots, sandstone fragments [Fill]		tr	5	85	10
s			2.2		2								
			1.8										
					4			Total Depth = 3.8 ft (deepest of four attempts); refusal on Chatsworth Formation Sandstone. Refusal on bedrock at 2.8, 3.0, and 3.5 ft in other step-outs. Collected soil samples S01, S01SP (DTSC split), and S01MS/MSD. Backfilled with native soil and bentonite.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0111**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267860.55**	Easting (ft): **1785270.69**	Job Number: **1891451**	Site: **RMHF - North of Mixed Waste Storage**
Drill Start Date: **04-21-2008**	Start Time: **08:13**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **08:36**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed 5-6 in. soil beneath asphalt to keep asphalt debris from subsurface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **08:42**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 3 inches thick					
	S			0.1				SP	Poorly Graded Sand, yellowish brown (10YR 5/4), loose, moist, contains sandstone fragments [Fill]			10	90	tr
						2		SM	Silty Sand, yellowish brown (10YR 5/4), loose to medium dense, moist, contains sandstone fragments [Fill]				70	30
	S			0.2		4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone.					
									Collected soil samples S01 and S02.					
									Backfilled with native soil and bentonite.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0112**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267870.32**	Easting (ft): **1785349.05**	Job Number: **1891451**	Site: **RMHF - South of Building 4563**
Drill Start Date: **04-23-2008**	Start Time: **07:40**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-23-2008**	Finish Time: **08:01**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface near manhole; cleared asphalt debris before sampling**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-23-2008**	Backfill Time: **08:08**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt and gravel base 5 inches thick					
S			3.6				SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist [Fill]		tr	10	70	20
S					2								
							SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist [Fill]			10	80	10
S			2.8										
S					4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil samples S01, S01MS/MSD, and S02.					
								Backfilled with native soil and bentonite.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0112A

Borehole Diam. (in.): **2**	Total Depth (ft): **10.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267870.32**	Easting (ft): **1785349.05**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-14-2008**	Start Time: **13:00**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-14-2008**	Finish Time: **13:30**	Drilling Contractor: **Strongarm**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-14-2008**	Backfill Time: **13:20**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Boring advanced only to collect soil samples at depth; no logging performed. Subsurface conditions are assumed to be similar to co-located boring/soil vapor probe installation RMSV0112A. Refer to log of boring RMSV0112A for lithology.					
	100				2								
					4								
	100				6								
					8								
S	100				10			Total Depth = 10.0 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil sample S003. Backfilled with cuttings and hydrated bentonite, patched with asphalt.					
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0113**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267963.42**	Easting (ft): **1785566.16**	Job Number: **1891451**	Site: **RMHF - East of Building 4665**
Drill Start Date: **04-24-2008**	Start Time: **08:45**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-24-2008**	Finish Time: **09:01**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-24-2008**	Backfill Time: **09:13**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt and road base 6 inches thick					
S			0.0 0.0		2		SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, contains fragments of weathered sandstone			5	80	15
								Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0114**

Borehole Diam. (in.): **3**	Total Depth (ft): **0.9**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267822.39**	Easting (ft): **1785068.82**	Job Number: **1891451**	Site: **West of RMHF**
Drill Start Date: **05-02-2008**	Start Time: **09:35**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **09:57**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **10:00**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand with Gravel, light yellowish brown (10YR 6/4), loose to medium dense, dry, roots and rootlets, porous [Slopewash / Colluvium]					
								Total Depth = 0.9 ft (11 in.); refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S01RAD. Backfilled with native soil.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0115**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267869.70**	Easting (ft): **1785122.32**	Job Number: **1891451**	Site: **West of RMHF**
Drill Start Date: **05-02-2008**	Start Time: **08:20**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **08:30**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **08:35**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, light yellowish brown (10YR 6/4), loose to medium dense, dry, few subangular sandstone gravel and cobbles, roots and rootlets, bioturbation [Slopewash / Colluvium]	10	15	25	15	35
					2			Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S01RAD. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0116**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267812.92**	Easting (ft): **1785164.51**	Job Number: **1891451**	Site: **West of RMHF**
Drill Start Date: **05-02-2008**	Start Time: **10:25**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **10:45**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **10:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand with Gravel, light yellowish brown (10YR 6/4), loose to medium dense, dry, subangular gravel, roots and rootlets [Slopewash / Colluvium]	15	15	30	15	25
					2			Total Depth = 1.3 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S01RAD. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0117**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **2.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267888.32**	Easting (ft): **1785470.80**	Job Number: **1891451**	Site: **RMHF - South of Building 4664**
Drill Start Date: **04-30-2008**	Start Time: **09:27**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-30-2008**	Finish Time: **10:19**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-30-2008**	Backfill Time: **10:38**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick over 2 inches gravel road base					
S S			0.0		2		SM	Silty Sand, yellowish brown (10YR 5/6), dense, moist, occasional non-native gravel, fragments of weathered sandstone [Fill]		tr	5	75	20
					4			Total Depth = 2.8 ft; refusal on Chatsworth Formation Sandstone. Attempted several step-outs to collect a second sample at depth; met refusal at all locations. Collected soil samples S01, S01SP (for DTSC), and S01RAD. Backfilled with native soil and bentonite.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0117A**

Borehole Diam. (in.): **2**	Total Depth (ft): **2.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267888.32**	Easting (ft): **1785470.80**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-17-2008**	Start Time: **11:10**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-17-2008**	Finish Time: **11:30**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-17-2008**	Backfill Time: **11:20**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S	100		1.1		2		SM	Silty Sand, brownish yellow (10YR 6/8), medium dense to dense, moist, micaceous, no staining or odor			5	65	30
					4			Total Depth = 2.8 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil sample S001. Backfilled with geoprobe cuttings and asphalt surface patch.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0118**

Borehole Diam. (in.): **12 x 12 square**	Total Depth (ft): **0.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267928.74**	Easting (ft): **1785601.80**	Job Number: **1891451**	Site: **RMHF - North of Building 4022**
Drill Start Date: **04-30-2008**	Start Time:	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-30-2008**	Finish Time:	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore unsuitable, samples collected using a hand trowel**		Soil Backfill Date: **04-30-2008**	Backfill Time:

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 5 inches gravel road base					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist				80	20
					1			Total Depth = 0.8 ft (10 in.); refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S01SP (for DTSC), and S01RAD. Macrocore unsuitable for sampling. Macrocore unsuitable for sampling. Thus, a 1-ft square of asphalt was broken out, the road base removed, and samples collected from a 2-in.-thick soil layer using a hand trowel. Backfilled with native soil and bentonite.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0119**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267809.58**	Easting (ft): **1785511.41**	Job Number: **1891451**	Site: **RMHF - South of Building 4021**
Drill Start Date: **04-30-2008**	Start Time: **11:14**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-30-2008**	Finish Time: **11:49**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through driveway with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-30-2008**	Backfill Time: **11:57**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 3 inches thick over 3 inches gravel base and asphalt debris					
	S			0.0				SM	Silty Sand, dark yellowish brown (10YR 4/4), dense, moist [Fill]				70	30
	S			0.0										
						2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone.					
									Collected soil samples S01, S01SP (for DTSC), and S01RAD.					
									Backfilled with native soil and bentonite.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0120**

Borehole Diam. (in.): **3**	Total Depth (ft): **0.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267902.66**	Easting (ft): **1785244.54**	Job Number: **1891451**	Site: **RMHF - North of Building 4075**
Drill Start Date: **04-28-2008**	Start Time: **12:58**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-28-2008**	Finish Time: **13:12**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-28-2008**	Backfill Time: **13:18**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 2 inches gravel base					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist [Weathered Sandstone]				80	20
					1			Total Depth = 0.8 ft (9 in.); refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0121**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267906.17**	Easting (ft): **1785310.22**	Job Number: **1891451**	Site: **RMHF - North of Building 4563**
Drill Start Date: **04-28-2008**	Start Time: **11:18**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-28-2008**	Finish Time: **11:41**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface north of building canopy, south of fence**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-28-2008**	Backfill Time: **11:47**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 3 inches gravel road base					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, contains weathered sandstone fragments [Fill]				80	20
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0122**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **2.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267904.67**	Easting (ft): **1785371.74**	Job Number: **1891451**	Site: **RMHF - East of Building 4563**
Drill Start Date: **04-30-2008**	Start Time: **08:06**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-30-2008**	Finish Time: **08:21**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface east of building, near fence**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-30-2008**	Backfill Time: **08:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 3 inches asphalt debris					
S			0.0		2		SM	Silty Sand, yellowish brown (10YR 5/6), dense, moist, occasional weathered sandstone fragments [Fill]				80	20
								Total Depth = 2.3 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0123**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.1**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267801.47**	Easting (ft): **1785442.76**	Job Number: **1891451**	Site: **RMHF - East of Building 4663**
Drill Start Date: **04-25-2008**	Start Time:	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-25-2008**	Finish Time:	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-25-2008**	Backfill Time:

Sample Interval Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt and gravel base 6 inches thick					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist [Fill]				80	20
					2			Total Depth = 1.1 ft (13 in.); refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0124**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267808.32**	Easting (ft): **1785585.61**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-25-2008**	Start Time: **09:39**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-25-2008**	Finish Time: **09:54**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	

Comments: **Removed asphalt debris after punching through pavement with geoprobe** | Well Comp. Date: **N/A** | Completion Time: **N/A**

Samplers: **Geoprobe macrocore with acetate sleeve** | Soil Backfill Date: **04-25-2008** | Backfill Time: **10:25**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S			0.0				SP	Poorly Graded Sand, yellowish brown (10YR 5/4), dense, moist, contains sandstone fragments [Fill]			5	90	5
								Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0125**

Borehole Diam. (in.): **3**	Total Depth (ft): **2.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268020.42**	Easting (ft): **1785632.51**	Job Number: **1891451**	Site: **Northeast of RMHF**
Drill Start Date: **05-01-2008**	Start Time: **12:42**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **13:10**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Sparse vegetation on steep slope**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-01-2008**	Backfill Time: **13:16**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, brown (10YR 5/3), loose, dry to moist, trace gravel, organics	tr	5	15	50	30
					2			Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone. Attempted two step-outs, 4 ft to west and 2 ft to southwest; met refusal at both locations. Collected soil sample S01. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0126**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267840.92**	Easting (ft): **1785567.28**	Job Number: **1891451**	Site: **RMHF - West of Building 4022**
Drill Start Date: **04-29-2008**	Start Time: **13:19**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-29-2008**	Finish Time: **13:51**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Wooden form between asphalt and concrete, north of former diesel AST**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **04-29-2008**	Backfill Time: **13:58**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Rotted wood and voids					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist [Fill]	tr		10	60	30
					2			Total Depth = 1.8 ft (21 in.); refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0127**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.1**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267887.54**	Easting (ft): **1785677.49**	Job Number: **1891451**	Site: **RMHF - Building 4044**
Drill Start Date: **04-28-2008**	Start Time: **09:05**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-28-2008**	Finish Time: **09:30**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	

Comments: **Tile surface over concrete slab in janitor closet inside building**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**	Soil Backfill Date: **04-28-2008**	Backfill Time: **09:33**

Sample Interval Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 6 inches thick					
S			0.0				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, contains weathered sandstone fragments [Fill]				85	15
								Total Depth = 1.1 ft (13 in.); refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil and bentonite.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0133**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **268032.56**	Easting (ft): **1785619.24**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-24-2008**	Start Time: **11:05**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **11:20**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Benny and Ben**	
Comments: **Fill and debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **11:15**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S S			0.3		0		SM	Silty Sand, dark brown (10YR 3/3), loose, dry, micaceous, contains organic debris, no staining or odor [Alluvium]			5	55	40
								Total Depth = 1.0 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil samples S001 and S001SP. Backfilled with auger cuttings.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0134**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267931.38**	Easting (ft): **1785309.20**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-24-2008**	Start Time: **09:37**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **09:50**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Benny and Ben**	
Comments: **Fill and debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **09:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.2		0		SM	Silty Sand, light yellowish brown (10YR 6/4), loose, dry, fine gravel, micaceous, no staining or odor [Fill]	tr	tr	tr	60	40
					2			Total Depth = 1.8 ft; refusal on sandstone boulders (debris). Collected soil sample S001. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0135**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.3**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267953.04**	Easting (ft): **1785410.40**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-24-2008**	Start Time: **09:55**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **10:30**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Benny and Ben**	
Comments: **Fill and debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **10:25**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			1.2		0		SM	Silty Sand, light yellowish brown (10YR 6/4), loose, dry, fine gravel, trace cobbles, micaceous, no staining or odor [Fill]	10	tr	tr	50	40
					2			Total Depth = 1.3 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil sample S001. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0136**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267932.24**	Easting (ft): **1785255.74**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-24-2008**	Start Time: **09:15**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **09:35**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Benny and Ben**	
Comments: **Fill and debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **09:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.2		0		SM	Silty Sand, light yellowish brown (10YR 6/4), loose, dry, fine gravel, micaceous, contains asphalt debris, no staining or odor [Fill]	tr	tr	tr	60	40
								Total Depth = 1.0 ft; refusal on heavy asphalt debris. Attempted one step-out boring; met refusal at same depth. Collected soil sample S001. Backfilled with auger cuttings.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0137**

Borehole Diam. (in.): **2**	Total Depth (ft): **2.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267822.84**	Easting (ft): **1785645.13**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-17-2008**	Start Time: **12:55**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-17-2008**	Finish Time: **13:30**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-17-2008**	Backfill Time: **13:20**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S	100		0.3		0			Asphalt 3 inches thick					
								SM	Silty Sand, brownish yellow (10YR 6/8), medium dense to dense, moist, micaceous, no staining or odor			5	65	30
						2			Total Depth = 2.5 ft; refusal on weathered Chatsworth Formation Sandstone.					
									Collected soil sample S001.					
									Backfilled with geoprobe cuttings and asphalt surface patch.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0138**

Borehole Diam. (in.): **2**	Total Depth (ft): **3.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267814.11**	Easting (ft): **1785454.43**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-17-2008**	Start Time: **13:35**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-17-2008**	Finish Time: **13:55**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-17-2008**	Backfill Time: **13:50**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S	100		0.7		2		SM	Silty Sand, brownish yellow (10YR 6/8), medium dense to dense, moist, micaceous, no staining or odor			5	65	30
					4			Total Depth = 3.5 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil sample S001. Backfilled with geoprobe cuttings and asphalt surface patch.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0139**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **2.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267785.03**	Easting (ft): **1785441.70**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-20-2008**	Start Time: **09:55**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-20-2008**	Finish Time: **10:30**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-20-2008**	Backfill Time: **10:25**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S S					0		SM	Silty Sand, light yellowish brown (10YR 6/4), medium dense, dry, micaceous, no staining or odor [Alluvium]		tr		60	40
					2			Total Depth = 2.8 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil samples S001 and S001SP. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0140**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **2.3**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267784.69**	Easting (ft): **1785369.63**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-20-2008**	Start Time: **09:00**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-20-2008**	Finish Time: **09:50**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-20-2008**	Backfill Time: **09:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.9		0		SM	Silty Sand, light yellowish brown (10YR 6/4), medium dense, dry, micaceous, no staining or odor [Alluvium]		tr		60	40
					2			becomes brownish yellow (10YR 6/6)					
								Total Depth = 2.3 ft; refusal on weathered Chatsworth Formation Sandstone.					
								Collected soil sample S001.					
								Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0141**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267781.26**	Easting (ft): **1785335.66**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-20-2008**	Start Time: **08:20**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-20-2008**	Finish Time: **08:55**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-20-2008**	Backfill Time: **08:50**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			1.8		0		SM	Silty Sand, light yellowish brown (10YR 6/4), medium dense, dry, micaceous, no staining or odor [Alluvium]		tr		60	40
					2			Total Depth = 1.5 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil sample S001. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0142**

Borehole Diam. (in.): **2**	Total Depth (ft): **3.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267932.05**	Easting (ft): **1785507.53**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-19-2008**	Start Time: **12:00**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-19-2008**	Finish Time: **12:45**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-19-2008**	Backfill Time: **12:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
							SM	Silty Sand, brownish yellow (10YR 6/8), medium dense, moist, micaceous, no staining or odor	tr			60	40
	100				2								
S			0.1										
					4			Total Depth = 3.5 ft; refusal on weathered Chatsworth Formation Sandstone. Attempted one step-out boring to achieve target depth of 8 ft; met refusal at 3.5 ft.					
								Collected soil sample S001.					
								Backfilled both borings with geoprobe cuttings and hydrated bentonite, patched with asphalt.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0143**

Borehole Diam. (in.): **2**	Total Depth (ft): **3.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267927.43**	Easting (ft): **1785509.31**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-19-2008**	Start Time: **12:50**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-19-2008**	Finish Time: **13:50**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface; logged deepest of three attempts to reach target 8-ft depth**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-19-2008**	Backfill Time: **13:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
	100				2		SM	Silty Sand, yellowish brown (10YR 5/6), medium dense, moist, micaceous, no staining or odor			5	55	40
S			0.2										
					4			Total Depth = 3.0 ft at second attempt (logged above); refusal on weathered Chatsworth Formation Sandstone. First attempt to achieve target depth of 8 ft met refusal at 1.3 ft and third attempt met refusal at 1 ft. Collected soil sample S001. Backfilled each boring with geoprobe cuttings and hydrated bentonite, patched with asphalt.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0144**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267865.33**	Easting (ft): **1785045.24**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-24-2008**	Start Time: **12:00**	Logged By: **S. Dawson**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **12:15**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Brush and concrete debris at surface, pipes and rubber hose nearby**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **12:20**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S S			1.1		0		ML	Sandy Silt, brownish yellow (10YR 6/6), soft, dry, nonplastic, micaceous			10	30	60
								Total Depth = 1.0 ft; refusal on boulder or Chatsworth Formation Sandstone. Collected soil samples S001 and S001SP. Backfilled with auger cuttings.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0145**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **0.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **268004.63**	Easting (ft): **1785533.05**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-24-2008**	Start Time: **08:35**	Logged By: **S. Dawson**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **08:50**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Steep rocky grade with concrete debris and brush, 4 ft N of UST drain pipe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **08:55**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.5		0		SM	Silty Sand, yellowish brown (10YR 5/4), very loose, dry, fine gravel-size subrounded sandstone fragments, micaceous	5	10	5	40	40
								Total Depth = 0.8 ft; refusal on boulder or Chatsworth Formation Sandstone. Collected soil sample S001. Backfilled with auger cuttings.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0148**

Borehole Diam. (in.): **2**	Total Depth (ft): **2.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267887.98**	Easting (ft): **1785529.73**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-17-2008**	Start Time: **12:20**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-17-2008**	Finish Time: **12:50**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-17-2008**	Backfill Time: **12:45**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 3 inches thick					
	S	100		1.2				SM	Silty Sand, brownish yellow (10YR 6/8), medium dense, moist, micaceous, no staining or odor			5	65	30
						2			Total Depth = 2.0 ft; refusal on weathered Chatsworth Formation Sandstone.					
									Collected soil sample S001.					
									Backfilled with geoprobe cuttings and asphalt surface patch.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **RMBS0149**

Borehole Diam. (in.): **3**	Total Depth (ft): **0.8**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **267752.77**	Easting (ft): **1785309.92**	Job Number: **1006217.730706**	Site: **RMHF**
Drill Start Date: **05-08-2009**	Start Time: **11:45**	Logged By: **S. Valenzuela**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **11:55**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **On southern hillside of RMHF; 1 inch of very weathered asphalt/tar at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**		Soil Backfill Date: **05-08-2009**	Backfill Time: **11:55**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Surface Elevation: 1828.8 ft					
S			0.0				SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), loose, moist, no cementation [Alluvium]	tr	5	25	60	10
S								SANDSTONE, yellow (10YR 7/6), very dense, fine [Chatsworth Formation]					
					1			Total Depth = 0.8 ft (9 inches); refusal on Chatsworth Formation Sandstone.					
								Collected soil samples S001 and D001.					
								Backfilled with auger cuttings.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: **RMBS0150**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **267784.67**	Easting (ft): **1785358.01**	Job Number: **1006217.730706**	Site: **RMHF**
Drill Start Date: **05-08-2009**	Start Time: **10:50**	Logged By: **S. Valenzuela**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **11:00**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **In excavation area; exposed soil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**		Soil Backfill Date: **05-08-2009**	Backfill Time: **11:15**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
								Surface Elevation: 1832.6 ft					
					0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry, nonplastic, some rootlets [Fill]	tr			70	30
								becomes yellow (10YR 7/6), medium dense, moist, decrease in silt, no roots	tr			80	20
S			6.7		1								
								SANDSTONE, yellow (10YR 7/8), dense, moist, fine-grained, weathered [Chatsworth Formation]					
					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil sample S001.					
								Backfilled with auger cuttings.					
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: **RMBS0151**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **267783.59**	Easting (ft): **1785267.68**	Job Number: **1006217.730706**	Site: **RMHF**
Drill Start Date: **05-08-2009**	Start Time: **11:15**	Logged By: **S. Valenzuela**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **11:30**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	

Comments: **Exposed soil on hillside, some surficial asphalt and tar in area**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**	Soil Backfill Date: **05-08-2009**	Backfill Time: **11:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
								Surface Elevation: 1835.7 ft					
S			0.3		0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry, subangular coarse sand and trace gravel [Fill]	tr	5	10	50	35
					1			Total Depth = 1.0 ft; terminated prior to bedrock, no refusal. Collected soil sample S001. Backfilled with auger cuttings.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: **RMBS0152**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **267741.99**	Easting (ft): **1785277.80**	Job Number: **1006217.730706**	Site: **RMHF**
Drill Start Date: **05-08-2009**	Start Time: **12:00**	Logged By: **S. Valenzuela**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **12:15**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **In asphalt swale, near culvert to storm drain**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**		Soil Backfill Date: **05-08-2009**	Backfill Time: **12:15**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Surface Elevation: 1821.2 ft Asphalt 2 inches thick over 3 inches of gravel base					
S			1.4				SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist [Alluvium]			tr	70	30
					1			Total Depth = 1.0 ft; terminated prior to bedrock, no refusal. Collected soil sample S001. Backfilled with auger cuttings.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: **RMBS0153**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.1**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **267783.94**	Easting (ft): **1785411.62**	Job Number: **1006217.730706**	Site: **RMHF**
Drill Start Date: **05-08-2009**	Start Time: **10:35**	Logged By: **S. Valenzuela**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **10:45**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **In excavation area; exposed soil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**		Soil Backfill Date: **05-08-2009**	Backfill Time: **10:45**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SM	Surface Elevation: 1843.4 ft Silty Sand, yellow (10YR 7/6), medium dense, moist, trace sandstone gravel [Fill]	tr			80	20
	S			15.5										
						1			SANDSTONE, yellow (10YR 7/8), dense, moist, fine-grained, weathered [Chatsworth Formation]					
									Total Depth = 1.1 ft (13 in.); refusal on Chatsworth Formation Sandstone. Collected soil sample S001. Backfilled with auger cuttings.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: **RMBS0154**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **267770.51**	Easting (ft): **1785422.58**	Job Number: **1006217.730706**	Site: **RMHF**
Drill Start Date: **05-08-2009**	Start Time: **10:20**	Logged By: **S. Valenzuela**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **10:30**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Surface covered with dry grass, some debris (metal)**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**		Soil Backfill Date: **05-08-2009**	Backfill Time: **10:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Surface Elevation: 1841.5 ft					
S			3.8				SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist, nonplastic, no cementation [Alluvium]				75	25
					1			Total Depth = 1.0 ft; terminated prior to bedrock, no refusal. Collected soil sample S001. Backfilled with auger cuttings.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: **RMBS0155**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **267778.67**	Easting (ft): **1785480.49**	Job Number: **1006217.730706**	Site: **RMHF**
Drill Start Date: **05-08-2009**	Start Time: **09:40**	Logged By: **M. Milman-Barris**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **09:47**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Surface covered with dry grass, some debris (metal, concrete, glass)**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**		Soil Backfill Date: **05-08-2009**	Backfill Time: **10:06**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
								Surface Elevation: 1842.6 ft					
S			6.9		0		ML	Silt, brown (10YR 5/3), very soft, moist, low plasticity, weak cementation, roots, no debris [Fill]					100
					1		SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, no debris [Fill]				80	20
					2			Total Depth = 1.5 ft; terminated prior to bedrock, no refusal. Collected soil sample S001. Backfilled with auger cuttings.					
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: **RMBS0156**

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **268042.15**	Easting (ft): **1785060.70**	Job Number: **1006217.730706**	Site: **RMHF**
Drill Start Date: **05-08-2009**	Start Time: **NR**	Logged By: **M. Milman-Barris**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **NR**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Vegetation-covered surface about 2 ft downstream of Outfall 003 culvert**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**		Soil Backfill Date: **05-08-2009**	Backfill Time: **13:20**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0		ML	Surface Elevation: 1764.2 ft Silt, dark yellowish brown (10YR 4/4), stiff, moist, low plasticity, weak cementation, rootlets, few fine gravel, no debris [Fill]	5			5	90
S			0.1		1			Total Depth = 1.0 ft; terminated prior to bedrock, no refusal. Collected soil sample S001. Backfilled with auger cuttings.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: RMBS0006/RMSV0006

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267815.25**	Easting (ft): **1785323.95**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-23-2008**	Start Time: **10:47**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-23-2008**	Finish Time: **11:18**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-23-2008**	Backfill Time: **11:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 5 inches thick					
S			2.1				SM	Silty Sand, dark yellowish brown (10YR 4/4), loose, moist, contains asphalt, sandstone, and gravel fragments [Fill]			tr	70	30
S					2		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist			tr	90	10
S			1.8				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist			tr	70	30
								Blue Vapor Probe Installation Hydrated bentonite seal ... 0-2.25 ft #3 sand filterpack ... 2.25-3.5 ft Perforated HDPE tubing ... 2.5-3.5 ft					
					4			Total Depth = 3.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S02 and D02. Installed soil vapor probe RMSV0006 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0019/RMSV0019

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267819.82**	Easting (ft): **1785548.98**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-25-2008**	Start Time: **10:31**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-25-2008**	Finish Time: **11:01**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed 6 in. soil beneath asphalt to keep asphalt debris from subsurface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-25-2008**	Backfill Time: **11:15**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
S			0.0		2		SM	Silty Sand, light brownish gray (10YR 6/2), medium dense, moist, iron oxide staining over about 25% of soil				70	30
			0.0					**Clear Vapor Probe Installation** Hydrated bentonite seal ... 0-3.5 ft #3 sand filterpack ... 3.5-4 ft Perforated HDPE tubing ... 3.75-4 ft					
S			0.0		4			← decrease in iron oxide staining					
								Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, D01, and S02. Installed soil vapor probe RMSV0019 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0021/RMSV0021

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267850.04**	Easting (ft): **1785419.45**	Job Number: **1891451**	Site: **RMHF - Building 4621**
Drill Start Date: **04-22-2008**	Start Time: **08:37**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time: **08:51**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete pad (under temporary storage) at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time: **09:06**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Concrete 6 inches thick					
	S			0.9				SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist [Fill]		5	15	60	20
						2		SM	Silty Sand, very dark brown (10YR 2/2), medium dense, moist [Native]			5	65	30
	S			0.1					**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-2.25 ft #3 sand filterpack ... 2.25-3.5 ft Perforated HDPE tubing ... 2.5-3.5 ft					
						4			Total Depth = 3.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0021 as detailed above.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0030/RMSV0030

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267854.38**	Easting (ft): **1785474.02**	Job Number: **1891451**	Site: **RMHF - Building 4021**
Drill Start Date: **04-22-2008**	Start Time: **09:42**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time: **09:59**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt surface inside bermed area around transformer**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time: **10:04**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 6 inches thick					
	S			0.6				SM	Silty Sand, brown (10YR 4/3), loose to medium dense, moist [Fill]		tr	5	70	25
	S													
						2			becomes interbedded with Poorly Graded Sand (SP), light to dark brown					
	S								**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-2.25 ft #3 sand filterpack ... 2.25-3.5 ft Perforated HDPE tubing ... 2.5-3.5 ft					
	S			0.2										
						4			Total Depth = 3.5 ft; refusal on Chatsworth Formation Sandstone.					
									Collected soil samples S01 and S02.					
									Installed soil vapor probe RMSV0030 as detailed above.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0032/RMSV0032

Borehole Diam. (in.): **3**	Total Depth (ft): **3.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268061.20**	Easting (ft): **1785578.97**	Job Number: **1891451**	Site: **RMHF Leachfield**
Drill Start Date: **05-02-2008**	Start Time: **08:12**	Logged By: **M. Baumgardner**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **09:02**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	

Comments: **Grass and weeds at surface; vapor probe installed in third step-out**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**	Soil Backfill Date: **05-02-2008**	Backfill Time: **09:35**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist		5	25	50	20
					2			occasional fine gravel to 3/4 inch dia.					
								Vapor Probe Installation Hydrated bentonite seal ... 0-2.25 ft #3 sand filterpack ... 2.25-3.5 ft Perforated HDPE tubing ... 2.5-3.5 ft					
S			0.0										
					4			Total Depth = 3.5 ft at step-out 5 ft to north of original location; refusal on Chatsworth Formation Sandstone. Original location and two step-outs to east and west met refusal at less than 0.5 ft. Collected soil samples S01, S01SP, S01RAD, S02, and S02RAD. Installed soil vapor probe RMSV0032 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0033/RMSV0033

Borehole Diam. (in.): **3**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **268071.71**	Easting (ft): **1785603.06**	Job Number: **1891451**	Site: **RMHF Leachfield**
Drill Start Date: **05-01-2008**	Start Time: **13:52**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **14:37**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Thick weeds 12 in. tall at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-01-2008**	Backfill Time: **14:59**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S					0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry to moist, contains sandstone fragments, occasional non-native gravel (one piece at 2.5 ft) [Fill]		tr	tr	70	30
S								becomes moist **Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-2.75 ft #3 sand filterpack ... 2.75-4 ft Perforated HDPE tubing ... 3-4 ft					
S					2			becomes moist to wet, increase in silt, mica				60	40
					4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0033 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0039/RMSV0039

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **4.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267884.13**	Easting (ft): **1785240.22**	Job Number: **1891451**	Site: **RMHF - Building 4075**
Drill Start Date: **04-17-2008**	Start Time: **09:31**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-17-2008**	Finish Time: **09:40**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete floor inside building**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-17-2008**	Backfill Time: **09:56**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 5 inches thick					
S			1.0		2		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist, occasional fragments of weathered sandstone [Fill]				90	10
S			1.8		4			Sandstone, yellowish brown (10YR 5/4), weathered; drills as fine sand [Chatsworth Formation]					
					6			Total Depth = 4.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0039 as detailed above.					
					8								
					10								
					12								
					14								
					16								
					18								
					20								

Blue Vapor Probe Installation
Hydrated bentonite seal ... 0-3.25 ft
#3 sand filterpack ... 3.25-4.5 ft
Perforated HDPE tubing ... 3.75-4.5 ft

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0040/RMSV0040

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267889.82**	Easting (ft): **1785322.96**	Job Number: **1891451**	Site: **RMHF - Building 4075**
Drill Start Date: **04-23-2008**	Start Time: **08:20**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-23-2008**	Finish Time: **08:41**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-23-2008**	Backfill Time: **08:52**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 5 inches thick					
S			0.0				SW	Well Graded Sand, yellowish brown (10YR 5/4), medium dense, moist [Fill]		10	30	60	tr
					2		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist [Native]					
								Vapor Probe Installation Hydrated bentonite seal ... 0-2.75 ft #3 sand filterpack ... 2.75-4 ft Perforated HDPE tubing ... 3-4 ft					
S			3.1		4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0040 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0041/RMSV0041

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267904.90**	Easting (ft): **1785416.28**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-21-2008**	Start Time: **13:38**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **13:49**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **13:56**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick over 2 inches road base					
s			0.1				SP	Poorly Graded Sand, brown (10YR 4/3), dense, moist, contains weathered sandstone fragments [Fill]		5	20	70	tr
					2		SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, sandstone fragments		tr	5	80	15
s			0.0					**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-1.75 ft #3 sand filterpack ... 1.75-3 ft Perforated HDPE tubing ... 2-3 ft					
								Total Depth = 3.0 ft; refusal on Chatsworth Formation Sandstone.					
					4			Collected soil samples S01 and S02.					
								Installed soil vapor probe RMSV0041 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0094/RMSV0094

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267886.59**	Easting (ft): **1785376.70**	Job Number: **1891451**	Site: **RMHF - East of Building 4563**
Drill Start Date: **04-21-2008**	Start Time: **10:51**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-21-2008**	Finish Time: **11:12**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-21-2008**	Backfill Time: **11:18**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 3 inches thick over 5 inches road base					
	S			0.1		2		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist, contains sandstone fragments [Fill] becomes dark yellowish brown (10YR 4/4) with depth			tr	70	30
	S			0.4		4			**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-2.75 ft #3 sand filterpack ... 2.75-4 ft Perforated HDPE tubing ... 3-4 ft					
									Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0094 as detailed above.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0100/RMSV0100**

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **5.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267810.78**	Easting (ft): **1785251.06**	Job Number: **1891451**	Site: **RMHF**
Drill Start Date: **04-17-2008**	Start Time: **10:55**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-17-2008**	Finish Time: **12:22**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Removed asphalt debris after punching through pavement with geoprobe**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-17-2008**	Backfill Time: **12:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt drive 8 inches thick					
S			1.4		2		SM	Silty Sand, yellowish brown (10YR 5/4), dense, moist, occasional sandstone fragments [Fill]				85	15
S			0.9		4			**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-3.75 ft #3 sand filterpack ... 3.75-5.5 ft Perforated HDPE tubing ... 4-5 ft					
					6			Total Depth = 5.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S02, and splits for DTSC. Installed soil vapor probe RMSV0100 as detailed above.					
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: RMBS0106/RMSV0106

Borehole Diam. (in.): **2-1/2**	Total Depth (ft): **4.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267871.67**	Easting (ft): **1785232.38**	Job Number: **1891451**	Site: **RMHF - Building 4075**
Drill Start Date: **04-17-2008**	Start Time: **10:20**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-17-2008**	Finish Time: **10:31**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Concrete floor in building**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-17-2008**	Backfill Time: **10:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Concrete 5 inches thick					
S			1.5				SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), dense, moist, occasional fragments of weathered sandstone [Fill]				90	10
S					2								
								Blue Vapor Probe Installation Hydrated bentonite seal ... 0-2.75 ft #3 sand filterpack ... 2.75-4 ft Perforated HDPE tubing ... 3-4 ft					
S			2.0		4			Total Depth = 4.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S02. Installed soil vapor probe RMSV0106 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMBS0107/RMSV0107**

Borehole Diam. (in.): **2-1/4**	Total Depth (ft): **3.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267873.55**	Easting (ft): **1785494.16**	Job Number: **1891451**	Site: **RMHF - Building 4664**
Drill Start Date: **04-22-2008**	Start Time: **11:50**	Logged By: **C. Nevison**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-22-2008**	Finish Time: **12:04**	Drilling Contractor: **Hydro Geo Spectrum**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Alex Smith**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-22-2008**	Backfill Time: **12:19**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 4 inches thick					
S			0.6				SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, moist [Fill]			tr	70	30
					2			**Blue Vapor Probe Installation** Hydrated bentonite seal ... 0-1.75 ft #3 sand filterpack ... 1.75-3 ft Perforated HDPE tubing ... 2-3 ft					
S			0.2					becomes dark yellowish brown (10YR 4/4)				70	30
								Total Depth = 3.0 ft; refusal on Chatsworth Formation Sandstone.					
					4			Collected soil samples S01 and S02.					
								Installed soil vapor probe RMSV0107 as detailed above.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **RMSV0112**

Borehole Diam. (in.): **2**	Total Depth (ft): **10.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267871.36**	Easting (ft): **1785344.59**	Job Number: **1891589.021101**	Site: **RMHF**
Drill Start Date: **11-13-2008**	Start Time: **09:08**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-13-2008**	Finish Time: **10:20**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve (no samples retained)**		Soil Backfill Date: **11-13-2008**	Backfill Time: **10:10**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 3 inches thick					
								SM	Silty Sand, light yellowish brown (10YR 6/4), medium dense, moist, fine to coarse gravel, micaceous	tr			60	40
						2								
						4			**Blue Vapor Probe Installation (SVS001)** Hydrated bentonite seal ... 0-3.5 ft #3 sand filterpack ... 3.5-5 ft Perforated HDPE tubing ... 3.75-4.75 ft					
									sandstone cobbles					
						6								
									sandstone cobble					
				0.7		8			mottled staining, greenish gray (GLEY 2 10BG 5/1) and olive (5Y 4/3)					
				0.3					**Red Vapor Probe Installation (SVS002)** Hydrated bentonite seal ... 5-8.5 ft #3 sand filterpack ... 8.5-10 ft Perforated HDPE tubing ... 8.75-9.75 ft					
						10			Total Depth = 10.0 ft; refusal on boulder or Chatsworth Formation Sandstone. No soil samples collected. Nested soil vapor probes RMSV0112A S001 and S002 installed as detailed above.					
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0001

Borehole Diam. (in.): **3**	Total Depth (ft): **1.2**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267745.64**	Easting (ft): **1784951.21**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-02-2008**	Start Time: **11:20**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **11:43**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass, weeds, and asphalt debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **11:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand with Gravel, light yellowish brown (10YR 6/4), loose to medium dense, dry, subangular to subrounded gravel [Fill]	15	15	30	10	30
								Total Depth = 1.2 ft; refusal on Chatsworth Formation Sandstone.					
					2			Collected soil sample S01.					
								Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0002

Borehole Diam. (in.): **3**	Total Depth (ft): **0.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267742.02**	Easting (ft): **1784865.01**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-02-2008**	Start Time: **12:40**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time: **13:00**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass, weeds, and asphalt debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **13:05**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, light yellowish brown (10YR 6/4), dense, dry, weathered bedrock that drills like soil		25	30	15	30
					1			Total Depth = 0.8 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0003

Borehole Diam. (in.): **3**	Total Depth (ft): **2.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267703.64**	Easting (ft): **1784893.66**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-02-2008**	Start Time:	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-02-2008**	Finish Time:	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass, weeds, and debris (asphalt and metal) at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-02-2008**	Backfill Time: **12:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, light yellowish brown (10YR 6/4), medium dense, dry, few gravel, roots and rootlets [Fill]	10	10	30	20	30
S			0.0		2			Silty Sandstone, light yellowish brown (10YR 6/4), moderately hard, dry to moist [Weathered Chatsworth Formation]					
								Total Depth = 2.5 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil samples S01 and S02.					
					4			Backfilled with native soil.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0004

Borehole Diam. (in.): **3**	Total Depth (ft): **0.7**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267669.88**	Easting (ft): **1784838.93**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-07-2008**	Start Time: **08:00**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-07-2008**	Finish Time: **08:25**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	

Comments: **Grass, weeds, and debris (asphalt, metal, glass) at surface** | Well Comp. Date: **N/A** | Completion Time: **N/A**

Samplers: **Slide hammer with drive sampler** | Soil Backfill Date: **05-07-2008** | Backfill Time: **08:27**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand with Gravel, yellowish brown (10YR 5/4), medium dense, dry, debris (asphalt, metal, glass) [Fill]	15	15	25	10	35
					1			Total Depth = 0.7 ft (8 in.); refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Two step-outs required to collect sample volume. Backfilled with native soil.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0005

Borehole Diam. (in.): **3**	Total Depth (ft): **0.7**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267686.90**	Easting (ft): **1784743.32**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-07-2008**	Start Time: **08:35**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-07-2008**	Finish Time: **08:50**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-07-2008**	Backfill Time: **08:50**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, dry [Colluvium]		10	30	25	35
						1			Total Depth = 0.7 ft (8 in.); refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Two step-outs required to collect sample volume. Backfilled with native soil.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0006

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267737.01**	Easting (ft): **1784649.48**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-07-2008**	Start Time: **09:10**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-07-2008**	Finish Time: **09:30**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass, weeds, and shrubs at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-07-2008**	Backfill Time: **09:35**

Sample Interval / Retained / Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0		SP	Poorly Graded Sand, yellowish brown (10YR 5/4), loose, dry [Alluvium]		30	40	30	
S			0.0				SM	Silty Sand, brown (10YR 4/3), medium dense, moist, rootlets, slightly porous [Alluvium]		15	30	20	35
S					2			Total Depth = 1.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0007

Borehole Diam. (in.): **2**	Total Depth (ft): **6.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267741.18**	Easting (ft): **1785249.16**	Job Number: **1891451**	Site: **Group 7 Unaffiliated (4028)**
Drill Start Date: **04-30-2008**	Start Time: **10:30**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-30-2008**	Finish Time: **10:56**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-30-2008**	Backfill Time: **11:00**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand with Gravel, brown (10YR 4/3), medium dense, moist, subangular gravel [Fill]	15	15	25	20	25
			0.0		2		SM	Silty Sand with Gravel, dark yellowish brown (10YR 3/4), dense, moist, subangular to subrounded gravel, roots and rootlets [Alluvium]	20	15	20	20	25
S			0.0		4								
S			0.0		6			Silty Sandstone, light yellowish brown (10YR 6/4), hard, moist [Weathered Chatsworth Formation]					
					8			Total Depth = 6.8 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S02, and S03. Backfilled with native soil and bentonite.					
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0008

Borehole Diam. (in.): **2**	Total Depth (ft): **6.9**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267692.62**	Easting (ft): **1785235.39**	Job Number: **1891451**	Site: **Group 7 Unaffiliated (4028)**
Drill Start Date: **04-30-2008**	Start Time: **12:15**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-30-2008**	Finish Time: **12:48**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-30-2008**	Backfill Time: **12:50**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.1		0		SM	Silty Sand with Gravel, brown (10YR 4/3), medium dense, dry to moist, roots and rootlets, asphalt debris in upper 12 inches [Fill]	15	15	25	15	30
					2								
								Silty Sandstone, light yellowish brown (10YR 6/4), hard, moist [Weathered Chatsworth Formation]					
S			0.0		4								
					6								
S			0.1					Total Depth = 6.9 ft; refusal on Chatsworth Formation Sandstone.					
					8			Collected soil samples S01, S01SP, S02, and S03.					
								Backfilled with native soil and bentonite.					
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0010

Borehole Diam. (in.): **2**	Total Depth (ft): **11.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267742.69**	Easting (ft): **1785228.09**	Job Number: **1891451**	Site: **Group 7 Unaffiliated (4028)**
Drill Start Date: **04-30-2008**	Start Time: **11:05**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-30-2008**	Finish Time: **11:40**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-30-2008**	Backfill Time: **11:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand with Gravel, dark yellowish brown (10YR 3/4), medium dense to dense, moist, subangular gravel [Fill]	15	20	30	10	25
S			0.0		4								
			0.0		6		SC	Clayey Sand, brown (10YR 4/3), dark yellowish brown (10YR 3/4), and yellowish brown (10YR 5/8), dense, moist, few subrounded gravel, mottled, slightly porous [Alluvium]	5	15	30	15	35
					8								
S			0.0		10			Silty Sandstone, light yellowish brown (10YR 6/4), hard, moist [Weathered Chatsworth Formation]					
					12			Total Depth = 11.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S02, and S03. Backfilled with native soil and bentonite.					
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **U7BS0011**

Borehole Diam. (in.): **2**	Total Depth (ft): **9.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267787.74**	Easting (ft): **1785104.21**	Job Number: **1891451**	Site: **Group 7 Unaffiliated (4811)**
Drill Start Date: **04-30-2008**	Start Time: **13:30**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **04-30-2008**	Finish Time: **13:48**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **04-30-2008**	Backfill Time: **13:50**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt					
	S			0.0				SM	Silty Sand with Gravel, dark yellowish brown (10YR 4/4), dense, moist, angular to subangular gravel [Fill]	15	15	30	20	20
	S			0.0		4		SM	Silty Sand, dark brown (10YR 3/3), medium dense, moist, roots and rootlets, slightly porous [Alluvium]					
	S			0.0		8								
						10			Total Depth = 9.8 ft; refusal on unknown (no sandstone in shoe). Collected soil samples S01, S01SP, S02, and S03. Backfilled with native soil and bentonite.					
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0012(DL-1)/U7BS0012S70

Borehole Diam. (in.): **2**	Total Depth (ft): **8.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267726.24**	Easting (ft): **1785290.30**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-01-2008**	Start Time: **08:35**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **09:00**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	

Comments: **North of power pole to east of Building 4028, asphalt at surface**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**	Soil Backfill Date: **05-01-2008**	Backfill Time: **09:05**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 2.5 inches thick over 2 inches base					
S			0.0		2		SM	Silty Sand with Gravel, dark yellowish brown (10YR 4/4) and very pale brown (10YR 7/4), medium dense, moist, "salt and pepper" coloring, subangular gravel [Fill]	20	10	30	15	25
					4		SM	Silty Sand with Gravel, dark grayish brown (10YR 4/2), medium dense, moist, roots and rootlets, subrounded gravel [Possible Alluvium]	15	10	35	20	20
					6			Silty Sandstone, dark yellowish brown (10YR 4/6), hard, moist [Weathered Chatsworth Formation]					
S			0.0		8			Total Depth = 8.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S04. Backfilled with native soil and bentonite.					
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0012(DL-2)/U7BS0012S70

Borehole Diam. (in.): **2**	Total Depth (ft): **6.3**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267723.16**	Easting (ft): **1785294.58**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-01-2008**	Start Time: **08:00**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **08:25**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **East of power pole to east of Building 4028, asphalt at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **05-01-2008**	Backfill Time: **08:30**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Asphalt 2.5 inches thick over 2 inches base					
	S			0.0		2		SM	Silty Sand with Gravel, dark yellowish brown (10YR 4/4) and very pale brown (10YR 7/4), medium dense, moist, "salt and pepper" coloring, subangular gravel [Fill]	20	10	30	15	25
						4		SM	Silty Sand, very dark grayish brown (10YR 3/2), medium dense, moist [Possible Alluvium]		20	30	20	30
	S			0.0		6			Silty Sandstone, dark yellowish brown (10YR 4/6), hard, moist [Weathered Chatsworth Formation]					
									Total Depth = 6.3 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S02 and S05. Backfilled with native soil and bentonite.					
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0012(DL-3)/U7BS0012S70

Borehole Diam. (in.): **2**	Total Depth (ft): **8.7**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267717.96**	Easting (ft): **1785288.86**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-01-2008**	Start Time: **09:08**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **09:35**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	

Comments: **South of power pole to east of Building 4028, asphalt at surface**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**	Soil Backfill Date: **05-01-2008**	Backfill Time: **09:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 2 inches thick over 2 inches base					
S			0.0		2		SM	Silty Sand with Gravel, dark yellowish brown (10YR 4/4) and very pale brown (10YR 7/4), medium dense, moist, "salt and pepper" coloring, subangular gravel [Fill]	20	10	30	15	25
					4		SM	Silty Sand with Gravel, dark grayish brown (10YR 4/2), medium dense, moist, subrounded gravel, roots and rootlets [Possible Alluvium]	15	10	35	20	20
					6			Silty Sandstone, dark yellowish brown (10YR 4/6), hard, moist [Weathered Chatsworth Formation]					
S			0.0		8								
					10			Total Depth = 8.7 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S03 and S06. Backfilled with native soil and bentonite.					
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0013

Borehole Diam. (in.): **3**	Total Depth (ft): **6.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267999.56**	Easting (ft): **1784933.64**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-06-2008**	Start Time: **12:15**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-06-2008**	Finish Time: **12:45**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	

Comments: **Downslope of 50-gal. drum; leaves, weeds, trees, and debris at surface**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**	Soil Backfill Date: **05-06-2008**	Backfill Time: **12:50**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, light yellowish brown (10YR 6/4), medium dense to dense, moist, increasing moisture with depth [Alluvium]		15	30	15	40
S					2								
S			0.0		4								
S			0.0		6			Silty Sandstone, light yellowish brown (10YR 6/4), hard, moist [Weathered Chatsworth Formation]					
					8			Total Depth = 6.5 ft; refusal on boulders (Chatsworth Formation Sandstone). Collected soil samples S01, S02, and S03. Backfilled with native soil.					
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **U7BS0013A**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267999.56**	Easting (ft): **1784933.64**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-24-2008**	Start Time: **10:10**	Logged By: **S. Dawson**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-24-2008**	Finish Time: **11:10**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Dense brush, trees, and poison oak at surface, rusted 50-gal. drum nearby**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-24-2008**	Backfill Time: **11:10**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S S					0		SM/ML	Silty Sand / Sandy Silt, pale brown (10YR 6/3), very loose, dry, micaceous			5	45	50
								Total Depth = 1.0 ft; refusal on weathered Chatsworth Formation Sandstone. Collected soil samples S001 and S001SP. Backfilled with auger cuttings.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0014

Borehole Diam. (in.): **3**	Total Depth (ft): **0.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267604.28**	Easting (ft): **1784672.90**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-07-2008**	Start Time: **10:15**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-07-2008**	Finish Time: **10:30**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Dense brush at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger**		Soil Backfill Date: **05-07-2008**	Backfill Time: **10:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0			Sandstone to Silty Sandstone, yellowish brown (10YR 5/4), loose at surface to hard below 3 inches, dry to moist [Weathered Chatsworth Formation]					
								Total Depth = 0.5 ft (6 in.); refusal on Chatsworth Formation Sandstone. Collected soil sample S01. Two step-outs required to collect sample volume. Backfilled with native soil.					
					1								
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0014A

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267604.28**	Easting (ft): **1784672.90**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-21-2008**	Start Time: **10:00**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-21-2008**	Finish Time: **10:45**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-21-2008**	Backfill Time: **10:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.8		0		SM	Silty Sand, yellowish brown (10YR 5/6), loose, dry, micaceous, no staining or odor		tr	5	55	40
								Total Depth = 1.0 ft; refusal on weathered Chatsworth Formation Sandstone. Attempted one step-out boring 1 ft to N; met refusal at same depth.					
					2			Collected soil sample S001.					
								Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0015

Borehole Diam. (in.): **3**	Total Depth (ft): **6.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267531.18**	Easting (ft): **1784615.81**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-06-2008**	Start Time: **09:28**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-06-2008**	Finish Time: **10:10**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass, weeds, trees, and debris (asphalt, glass, metal) at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-06-2008**	Backfill Time: **10:15**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, brown (10YR 4/3), medium dense, dry, bioturbated, rootlets [Alluvium]	10	20	20	20	30
S					2								
S			0.0		4								
S			0.0		6			Silty Sandstone, light yellowish brown (10YR 6/4), hard, dry to moist [Weathered Chatsworth Formation]					
					8			Total Depth = 6.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S02, and S03. Backfilled with native soil.					
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0015A

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **2.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267531.18**	Easting (ft): **1784615.81**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-21-2008**	Start Time: **08:10**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-21-2008**	Finish Time: **08:55**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-21-2008**	Backfill Time: **08:50**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.5		0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry, micaceous, roots, no staining or odor [Alluvium]		tr	tr	60	40
					2			Total Depth = 2.0 ft at third and deepest of four attempts; refusal on weathered Chatsworth Formation Sandstone. Refusal at 1.5 ft at staked location, 0.8 ft at second location 1 ft to SE, 2.0 ft at third location 2 ft to N, and 1.5 ft at fourth location 2 ft to NW. Collected soil sample S001 from third and deepest boring. Backfilled each boring with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0016

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267473.50**	Easting (ft): **1784499.25**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-06-2008**	Start Time: **08:49**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-06-2008**	Finish Time: **09:20**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	
Comments: **Grass, weeds, trees, and debris (asphalt, paint can) at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**		Soil Backfill Date: **05-06-2008**	Backfill Time: **09:20**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, brown (10YR 4/3), medium dense, dry, bioturbated, roots and rootlets [Alluvium]	10	20	30	20	20
					2			Total Depth = 1.0 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01 and S01SP. Two step-outs required to collect sample volume. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0016A

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **0.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267473.50**	Easting (ft): **1784499.25**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-21-2008**	Start Time: **09:00**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-21-2008**	Finish Time: **09:50**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-21-2008**	Backfill Time: **09:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			3.3		0		SM	Silty Sand, yellowish brown (10YR 5/4), loose to medium dense, dry, micaceous, roots, no staining or odor [Alluvium]				60	40
								Total Depth = 0.8 ft; refusal on weathered Chatsworth Formation Sandstone. Attempted two step-out borings, 1 ft S and 1 ft SE; each met refusal at 0.5 ft.					
					2			Collected soil sample S001.					
								Backfilled each boring with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0017

Borehole Diam. (in.): **3**	Total Depth (ft): **1.5**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267470.47**	Easting (ft): **1784414.55**	Job Number: **1891451**	Site: **Group 7 Unaffiliated**
Drill Start Date: **05-06-2008**	Start Time: **07:28**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-06-2008**	Finish Time: **07:55**	Drilling Contractor: **Envirosolve**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Serg**	

Comments: **Grass, weeds, trees, and debris (glass, steel drum) at surface**	Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with drive sampler**	Soil Backfill Date: **05-06-2008**	Backfill Time: **08:00**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.0		0		SM	Silty Sand, brown (10YR 4/3), medium dense, dry to moist [Fill / Slopewash]		20	20	20	40
S								Silty Sandstone, light yellowish brown (10YR 6/4), hard, dry to moist [Weathered Chatsworth Formation]					
					2			Total Depth = 1.5 ft; refusal on cobble or boulder [possible Chatsworth Formation Sandstone]. Collected soil sample S01. Backfilled with native soil.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: **U7BS0017A**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267470.47**	Easting (ft): **1784414.55**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-20-2008**	Start Time: **13:05**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-20-2008**	Finish Time: **13:45**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **N/A**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-20-2008**	Backfill Time: **13:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S					0		SM	Silty Sand, yellowish brown (10YR 5/6), medium dense, dry, micaceous, no staining or odor		tr	tr	60	40
								Total Depth = 1.0 ft; refusal on brownish yellow (10YR 6/6) weathered Chatsworth Formation Sandstone. Attempted one step-out boring; refusal at same depth. Collected soil sample S001. Backfilled both borings with auger cuttings.					
					2								
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0018/U7SV0018

Borehole Diam. (in.): **2**	Total Depth (ft): **19.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267720.25**	Easting (ft): **1785202.25**	Job Number: **1891451**	Site: **Group 7 Unaffiliated (4028)**
Drill Start Date: **05-01-2008**	Start Time: **09:50**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **11:15**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **05-01-2008**	Backfill Time: **11:20**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SM	Silty Sand with Gravel, dark yellowish brown (10YR 4/4), medium dense, moist, slightly mottled, subangular gravel [Fill]	15	10	30	20	25
	S			0.0		4			**Yellow Vapor Probe Installation** Hydrated bentonite seal ... 0-3.9 ft #3 sand filterpack ... 3.9-5.3 ft Perforated HDPE tubing ... 4-5 ft					
	S			0.0		6			becomes brown (10YR 4/3), medium dense to dense, slightly porous, with subrounded gravel and rootlets	15	10	35	10	30
	S			0.0		8			**Clear Vapor Probe Installation** Hydrated bentonite seal ... 5.3-8.9 ft #3 sand filterpack ... 8.9-10.3 ft Perforated HDPE tubing ... 9-10 ft					
	S			0.0		12		SC	Clayey Sand with Gravel, very dark brown (10YR 2/2), medium dense to dense, moist, stiff to very stiff plastic fines, iron oxide marbling, possible staining, debris (brick fragments) [Fill]	15	5	25	15	40
	S			0.0		14		SM	Silty Sand with Gravel, dark yellowish brown (10YR 4/4), dense, moist, debris (rubber, plastic, glass), large sandstone clasts [Fill]	20	10	30	15	25
						16			**Blue Vapor Probe Installation** Hydrated bentonite seal ... 10.3-13.9 ft #3 sand filterpack ... 13.9-15.3 ft Perforated HDPE tubing ... 14-15 ft					
						18			**Red Vapor Probe Installation** Hydrated bentonite seal ... 15.3-18.3 ft #3 sand filterpack ... 18.3-19.8 ft Perforated HDPE tubing ... 18.6-19.6 ft					
	S			0.0		20			Silty Sandstone, yellowish brown (10YR 5/4), hard, moist [Weathered Chatsworth Formation] Total Depth = 19.8 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S02, S03, S04, and S05. Installed nested soil vapor probes U7SV0018 as detailed above.					

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0020

Borehole Diam. (in.): **2**	Total Depth (ft): **2.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267790.40**	Easting (ft): **1784974.05**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-18-2008**	Start Time: **13:10**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-18-2008**	Finish Time: **13:45**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-18-2008**	Backfill Time: **13:40**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S	100		11.7		0		SM	Silty Sand, yellow (10YR 7/6), dense, dry, micaceous, no staining or odor				60	40
						2			Sandstone, yellow (10YR 7/6), fine-grained [Weathered Chatsworth Formation]					
									Total Depth = 2.5 ft; refusal on Chatsworth Formation Sandstone.					
									Collected soil sample S001.					
						4			Backfilled with geoprobe cuttings and hydrated bentonite.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0021/U7SV0021

Borehole Diam. (in.): **2**	Total Depth (ft): **15.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267755.53**	Easting (ft): **1785206.47**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-12-2008**	Start Time: **11:15**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-12-2008**	Finish Time: **13:57**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Advanced in fill area**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-12-2008**	Backfill Time: **13:50**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S S	75		0.2		0		SM	Silty Sand, yellowish brown (10YR 5/6), loose, dry, micaceous, no staining or odor [Fill]	tr		tr	60	40
					2			**Blue Vapor Probe Installation (SVS001)** Hydrated bentonite seal ... 0-3.75 ft #3 sand filterpack ... 3.75-5.25 ft Perforated HDPE tubing ... 4-5 ft					
S	85		0.0		4			concrete rubble					
					6			← asphalt pieces					
S	75		0.0		8			**Yellow Vapor Probe Installation (SVS002)** Hydrated bentonite seal ... 5.25-8.75 ft #3 sand filterpack ... 8.75-10.25 ft Perforated HDPE tubing ... 9-10 ft					
					10								
S	100		0.0		12			**Red Vapor Probe Installation (SVS003)** Hydrated bentonite seal ... 10.25-14 ft #3 sand filterpack ... 14-15.5 ft Perforated HDPE tubing ... 14.25-15.25 ft					
					14								
					16			Total Depth = 15.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S001, D001, S002, S003, and S004. Installed nested soil vapor probes U7SV0021 S001, S002, and S003 as detailed above.					
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0022

Borehole Diam. (in.): **2**	Total Depth (ft): **15.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267721.14**	Easting (ft): **1785223.44**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-18-2008**	Start Time: **NR**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-18-2008**	Finish Time: **08:50**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-18-2008**	Backfill Time: **08:45**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.3		0		SM	Silty Sand, yellowish brown (10YR 5/8), medium dense, moist, fine granitic gravel (non-native), trace cobbles, micaceous, no staining or odor	tr	tr	5	55	40
S	100				2								
S			0.1		4								
	100				6								
S			0.0		8								
	100				10		CL	Lean Clay, dark brown (10YR 3/3), stiff, moist, trace to no sand, wood debris				tr	100
							SM	Silty Sand, dark yellowish brown (10YR 3/4), medium dense, moist, micaceous, no staining or odor			5	55	40
					12								
	100				14								
S			0.4					Sandstone [Weathered Chatsworth Formation]					
					16			Total Depth = 15.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S001, D001, S002, S003, and S004. Backfilled with geoprobe cuttings and hydrated bentonite.					
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0023

Borehole Diam. (in.): **3**	Total Depth (ft): **2.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267735.26**	Easting (ft): **1785154.38**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-17-2008**	Start Time: **09:00**	Logged By: **S. Dawson**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-17-2008**	Finish Time: **09:30**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben**	
Comments: **Planned soil vapor probe not installed due to shallow refusal**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-17-2008**	Backfill Time: **09:30**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.4		0		SM	Silty Sand, yellowish brown (10YR 5/4), very loose, dry, fine gravel, no odor or staining	10	5		45	40
					2			Total Depth = 2.0 ft; refusal on Chatsworth Formation Sandstone. Attempted two step-out borings; both met refusal at similar depth. Collected soil sample S001. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0024S070

Borehole Diam. (in.): **2**	Total Depth (ft): **10.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267705.48**	Easting (ft): **1785228.10**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-18-2008**	Start Time: **08:55**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-18-2008**	Finish Time: **10:05**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Log represents sampling at three separate locations**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-18-2008**	Backfill Time: **10:03**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	s			0.0		0		SM	Silty Sand, yellowish brown (10YR 5/6), loose, dry, fine gravel, micaceous, no staining or odor	tr	tr	5	55	40
		75				2								
	s			0.0		4			becomes dark yellowish brown (10YR 4/4)					
		85				6								
						8								
		100				10			Sandstone, yellowish brown (10YR 5/6) [Weathered Chatsworth Formation]					
									Total Depth = 10.0 ft; refusal on Chatsworth Formation Sandstone.					
									Collected soil samples at 0.5-1.0 ft and 4.5-5.0 ft from three separate locations: S001 and S004 from first location, S002 and S005 from second location, and S003 and S006 from third location.					
						12			Backfilled each boring with geoprobe cuttings and hydrated bentonite.					
						14								
						16								
						18								
						20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **U7BS0025**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **2.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267368.14**	Easting (ft): **1784431.15**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-20-2008**	Start Time: **12:30**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-20-2008**	Finish Time: **13:00**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Soil and fill debris at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-20-2008**	Backfill Time: **12:55**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt chunks, steel cable wire, and other debris [Fill]					
S			2.0		2		SC-SM	Silty, Clayey Sand, dark yellowish brown (10YR 4/6), medium dense to dense, moist, silt and low plasticity clay, no staining or odor			5	55	40
								Total Depth = 2.5 ft; refusal on Chatsworth Formation Sandstone. Attempted one step-out borings; met refusal at 2.3 ft. Collected soil sample S001. Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: **U7BS0026**

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267615.77**	Easting (ft): **1784862.33**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-21-2008**	Start Time: **10:45**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-21-2008**	Finish Time: **11:00**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Fill soil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-21-2008**	Backfill Time: **10:55**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.2		0		SM	Silty Sand, brown (10YR 5/3), medium dense, dry, micaceous, no staining or odor [Fill]	tr			60	40
								Total Depth = 1.0 ft; terminated before refusal.					
								Collected soil sample S001.					
					2			Backfilled with auger cuttings.					
					4								
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0027

Borehole Diam. (in.): **3-1/4**	Total Depth (ft): **5.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267662.70**	Easting (ft): **1784948.24**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-19-2008**	Start Time: **09:50**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-19-2008**	Finish Time: **10:45**	Drilling Contractor: **Jacob & Hefner Assoc.**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Rob Giberson**	
Comments: **Topsoil at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Grab from auger head**		Soil Backfill Date: **11-19-2008**	Backfill Time: **10:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			2.7		0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry, micaceous, no staining or odor	tr	tr	5	55	40
					2								
								← becomes dark yellowish brown (10YR 4/6)					
S			3.2		4								
					6			Total Depth = 5.5 ft; refusal on Chatsworth Formation Sandstone.					
								Collected soil samples S001 and S002.					
								Backfilled with auger cuttings.					
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0028

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **267987.20**	Easting (ft): **1784932.73**	Job Number: **1006217.730706**	Site: **Unaffiliated Areas**
Drill Start Date: **05-08-2009**	Start Time: **13:00**	Logged By: **M. Milman-Barris**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **13:05**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Removed 6 inches of heavy vegetation and debris (asphalt, metal scraps)**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**		Soil Backfill Date: **05-08-2009**	Backfill Time: **13:10**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S			0.3		0		SM	Silty Sand, yellowish brown (10YR 5/4), medium dense, dry, fine to coarse gravel (1/2 to 1-1/2 in.), weak cementation, rootlets, no debris [Alluvium]	10			70	20
					1			Total Depth = 1.0 ft; terminated prior to bedrock, no refusal. Collected soil sample S001. Backfilled with auger cuttings.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: U7BS0029

Borehole Diam. (in.): **3**	Total Depth (ft): **1.0**	Project: **SSFL Group 7 RFI Sampling - May 2009**	
Northing (ft): **268026.86**	Easting (ft): **1784925.16**	Job Number: **1006217.730706**	Site: **Unaffiliated Areas**
Drill Start Date: **05-08-2009**	Start Time: **13:25**	Logged By: **M. Milman-Barris**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **05-08-2009**	Finish Time: **13:30**	Drilling Contractor: **B.L. Hall**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Hand Auger**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ben Cisneros**	
Comments: **Removed 6 inches of heavy vegetation; metal container 3 ft downgradient**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Slide hammer with 6-inch stainless steel sleeve**		Soil Backfill Date: **05-08-2009**	Backfill Time: **13:40**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Surface Elevation: 1744.4 ft					
S			0.1				ML/CL	Clayey Silt, dark yellowish brown (10YR 4/4), stiff, moist, low plasticity, weak cementation, rootlets, no debris [Alluvium]					100
					1			Total Depth = 1.0 ft; terminated prior to bedrock, no refusal. Collected soil sample S001. Backfilled with auger cuttings.					
					2								
					3								
					4								
					5								
					6								
					7								
					8								
					9								
					10								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 5/18/09

MWH

Boring ID: **U7SV0011**

Borehole Diam. (in.): **2**	Total Depth (ft): **8.8**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267792.61**	Easting (ft): **1785093.13**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-17-2008**	Start Time: **09:20**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-17-2008**	Finish Time: **09:55**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Asphalt surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve (no sampled retained)**		Soil Backfill Date: **11-17-2008**	Backfill Time: **09:40**

Sample Interval Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
					0			Asphalt 3 inches thick					
							SM	Silty Sand, dark yellowish brown (10YR 4/4), loose, moist, micaceous, no staining or odor	tr	tr		60	40
			1.1		2								
					4			**Blue Vapor Probe Installation (SVS001)** Hydrated bentonite seal ... 0-3.75 ft #3 sand filterpack ... 3.75-5.25 ft Perforated HDPE tubing ... 4-5 ft					
			0.4		6								
			0.3		8			**Red Vapor Probe Installation (SVS002)** Hydrated bentonite seal ... 5.25-7.25 ft #3 sand filterpack ... 7.25-8.8 ft Perforated HDPE tubing ... 7.5-8.5 ft					
					10			Total Depth = 8.8 ft; refusal on Chatsworth Formation Sandstone. No soil samples collected. Installed nested soil vapor probes U7SV0011A S001 and S002 as detailed above.					
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

MWH

Boring ID: U7BS0018/U7SV0018

Borehole Diam. (in.): **2**	Total Depth (ft): **19.8**	Project: **Group 7 SSFL RFI Data Gap Sampling**	
Northing (ft): **267720.25**	Easting (ft): **1785202.25**	Job Number: **1891451**	Site: **Group 7 Unaffiliated (4028)**
Drill Start Date: **05-01-2008**	Start Time: **09:50**	Logged By: **A. Goldenberg**	Reviewed By: **B. Martasin, P.G.**
Drill Finish Date: **05-01-2008**	Finish Time: **11:15**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken Lauerman**	
Comments: **Grass and weeds at surface**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **05-01-2008**	Backfill Time: **11:20**

Sample Interval	Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SM	Silty Sand with Gravel, dark yellowish brown (10YR 4/4), medium dense, moist, slightly mottled, subangular gravel [Fill]	15	10	30	20	25
	S			0.0		4			**Yellow Vapor Probe Installation** Hydrated bentonite seal ... 0-3.9 ft #3 sand filterpack ... 3.9-5.3 ft Perforated HDPE tubing ... 4-5 ft					
	S			0.0		6			becomes brown (10YR 4/3), medium dense to dense, slightly porous, with subrounded gravel and rootlets	15	10	35	10	30
	S			0.0		8			**Clear Vapor Probe Installation** Hydrated bentonite seal ... 5.3-8.9 ft #3 sand filterpack ... 8.9-10.3 ft Perforated HDPE tubing ... 9-10 ft					
	S			0.0		12		SC	Clayey Sand with Gravel, very dark brown (10YR 2/2), medium dense to dense, moist, stiff to very stiff plastic fines, iron oxide marbling, possible staining, debris (brick fragments) [Fill]	15	5	25	15	40
	S			0.0		14		SM	Silty Sand with Gravel, dark yellowish brown (10YR 4/4), dense, moist, debris (rubber, plastic, glass), large sandstone clasts [Fill]	20	10	30	15	25
						16			**Blue Vapor Probe Installation** Hydrated bentonite seal ... 10.3-13.9 ft #3 sand filterpack ... 13.9-15.3 ft Perforated HDPE tubing ... 14-15 ft					
						18			**Red Vapor Probe Installation** Hydrated bentonite seal ... 15.3-18.3 ft #3 sand filterpack ... 18.3-19.8 ft Perforated HDPE tubing ... 18.6-19.6 ft					
	S			0.0		20			Silty Sandstone, yellowish brown (10YR 5/4), hard, moist [Weathered Chatsworth Formation] Total Depth = 19.8 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S01, S02, S03, S04, and S05. Installed nested soil vapor probes U7SV0018 as detailed above.					

LOG OF BORING GROUP7_2008.GPJ MWH WC.GDT 10/3/08

MWH

Boring ID: U7BS0021/U7SV0021

Borehole Diam. (in.): **2**	Total Depth (ft): **15.5**	Project: **SSFL Group 7 RFI Sampling - November 2008**	
Northing (ft): **267755.53**	Easting (ft): **1785206.47**	Job Number: **1891589.021101**	Site: **Unaffiliated Areas**
Drill Start Date: **11-12-2008**	Start Time: **11:15**	Logged By: **S. Aichner**	Reviewed By: **S. Valenzuela, P.G.**
Drill Finish Date: **11-12-2008**	Finish Time: **13:57**	Drilling Contractor: **Strongarm**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **N/A**	Date / Time: **N/A**	Drill Rig Type/Method: **Geoprobe/Direct Push**	
Depth H_2O After Drilling (ft): **N/A**	Date / Time: **N/A**	Driller's Name: **Ken and Dan**	
Comments: **Advanced in fill area**		Well Comp. Date: **N/A**	Completion Time: **N/A**
Samplers: **Geoprobe macrocore with acetate sleeve**		Soil Backfill Date: **11-12-2008**	Backfill Time: **13:50**

Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
S S	75		0.2		0		SM	Silty Sand, yellowish brown (10YR 5/6), loose, dry, micaceous, no staining or odor [Fill]	tr		tr	60	40
					2			**Blue Vapor Probe Installation (SVS001)** Hydrated bentonite seal ... 0-3.75 ft #3 sand filterpack ... 3.75-5.25 ft Perforated HDPE tubing ... 4-5 ft					
S	85		0.0		4			concrete rubble					
					6			← asphalt pieces					
S	75		0.0		8			**Yellow Vapor Probe Installation (SVS002)** Hydrated bentonite seal ... 5.25-8.75 ft #3 sand filterpack ... 8.75-10.25 ft Perforated HDPE tubing ... 9-10 ft					
					10								
S	100		0.0		12			**Red Vapor Probe Installation (SVS003)** Hydrated bentonite seal ... 10.25-14 ft #3 sand filterpack ... 14-15.5 ft Perforated HDPE tubing ... 14.25-15.25 ft					
					14								
					16			Total Depth = 15.5 ft; refusal on Chatsworth Formation Sandstone. Collected soil samples S001, D001, S002, S003, and S004. Installed nested soil vapor probes U7SV0021 S001, S002, and S003 as detailed above.					
					18								
					20								

LOG OF BORING GROUP7_2008.GPJ BOEING.GDT 1/23/09

PIEZOMETER LOGS

MONTGOMERY WATSON

Boring #: PT-106 MW#: P2-116 Sheet 1 of 3

Project: DOE SHALLOW GROUNDWATER

Job #: Site: RMHF / SSFL

Logged By: T. HALL Reviewed By:

Drilling Contractor: LAYNE

Drill Rig Type/Method: CME 850 / HSA

Drillers Name: ENRIQUE PEREZ

Borehole Diam./Drill Bit Type: 8" / CARBIDE

Total Depth:

Ref. Elev.:

Sampler Type: 1.5' SPLIT SPOON

Site Sketch Map

Depth to 1st Water (▽): Time/Date:

Depth to Water After Drilling (▼): Time/Date:

Depth to other Water Bearing Zones:

Drill Start Time/Date: 10/31/01 1030 Drill Finish Time/Date: 1350

Well Completion Time/Date: 1500

Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Gravel	Sand Coarse	Sand Medium	Sand Fine	Silt/clay
0.0						CONCRETE	0	SM	FILL: SILTY SAND, WITH OCCASIONAL GRAVEL, LOW PLASTICITY, MED DENSE, MOIST, STRONG BROWN, FINE-COARSE SAND GRAINS	NL 5	10	20	45	20
							1							
							2							
							3		COLOR CHANGE @ 4 TO YELLOWISH-BROWN (NO CHANGE IN DRILLING HARNESS)					
							4	B.2						
0.0		6"	100			CEMENT GROUT MIXTURE	5		SANDSTONE: FINE-MED GRAINS, MICACEOUS, SLIGHTLY CEMENTED, MOIST, BROWNISH-YELLOW, OXIDIZED	-	-	30	50	20
							6							
							7							
							8							
							9							
0.0		4"	49				10		SAME AS ABOVE WITH MODERATE CEMENTATION IN SHOE. ALSO THIN (1/8") ZONES OF GREY THROUGHOUT					
0.0		6"	65				11							
							12							

QA/QC

Boring #: PT-106 MW#: PZ-116 Project: DOE SHALLOW GROUNDH2O Sheet 2 of 3

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 In.	Retained for Analysis.	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Sand: Gravel	Coarse	Med.	Fine	Silt/Clay
					2" DIAM SCH 40 BLANK PVC CASING	CEMENT GROUT MIX	2		HARDER DRILLING @ 13-16 WITH COLOR CHANGE TO YELLOWISH-BROWN					
							3							
							4							
							5							
0.0		5"	100/5"						SANDSTONE: FINE-VERY FINE GRAINS, MICACEOUS, MODERATELY CEMENTED, OXIDIZED, YELLOWISH-BROWN, MOIST (MORE THAN ABOVE)	—	—	—	80	20
							6							
							7							
						BENTONITE	8							
							9		INCREASED HARDNESS 16-21.5'					
							10							
0.0		4"	100/4"						SAME AS ABOVE WITH INCREASED CEMENTATION (MODERATE TO WELL)					
							1							
							2		INCREASED HARDNESS 21.5-27.5					
							3							
							4							
							5							
0.0		3"	100/3"		2" DIAM SCH 40 PVC SCREEN (0.020" SLOTS)	RMC #3 MONTEREY BEACH SAND			SAME AS ABOVE					
							6		VERY HARD @ 27.5 WITH COLOR CHANGE TO					
							7		OLIVE. PIECES ARE GREY LIGHT GREY @ 29-30'					
							8							
							9							
							30							
0.0		1"	100/3"						SANDSTONE: FINE TO MED GRAINS, MICACEOUS, WELL CEMENTED, OXIDIZED, MOIST YELLOWISH-BROWN	—	—	20	60	20
							1							
							2							

QA/QC

Boring #: PT-106 MW#: PZ-116 Project: DOE SHALLOW GROUNDWATER Sheet 3 of 3

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis.	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Sand: Gravel	Coarse	Med.	Fine	Silt/Clay
					SUMP	#3 SAND	2		VERY HARD 32'-33', 33.5-34					
							3		REFUSAL @ 34'					
							4							
0.0	↓	1"	100/1"					TD	SAME AS ABOVE. WELL CEMENTED.					
							35							
							6		3.5 BAGS RMC #3 NATURAL MONTEREY BEACH SAND					
							7		1 BAG WYOBEN ENVIROPLUG MED CHIPS. HYDRATED IN 1.5' LIFTS					
							8		BY ADDING H_2O.					
							9		4 BGS COLTON PORTLAND CEMENT					
							40		TYPE II/I MIXED WITH 22 GALS					
							1		OF H_2O.					
							2							
							3							
							4							
							45							
							6							
							7							
							8							
							9							
							50							
							1							
							2							

QA/QC

WELL LOGS

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-180

LITHOLOGIC LOG OF WELL OS-2

(Log obtained from State of California Department of Water Resources)

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
0 - 3	Soil
3 - 80	Blue grey sandstone - hard
80 - 85	Blue and grey sand - soft
85 - 485	Blue and grey sandstone - hard
485 - 503	Blue and grey sandstone - softer and coarser
503 - 700	Blue and grey sandstone - hard

TOTAL DEPTH OF BOREHOLE: 700 feet

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-181

LITHOLOGIC LOG OF WELL OS-3

(Log obtained from State of California Department of Water Resources)

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
0 - 7	Sand, gravel & boulders.
7 - 53	Shale
53 - 250	Sandstone

TOTAL DEPTH OF BOREHOLE: 250 feet

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-182

LITHOLOGIC LOG OF WELL OS-4

(Log obtained from State of California Department of Water Resources)

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
0 - 6	Fill
6 - 15	Sandy clay
15 - 50	Grey sandstone
50 - 60	Coarse gravel
60 - 100	Quartzite

TOTAL DEPTH OF BOREHOLE: 100 feet

TABLE A-104

LITHOLOGIC LOG OF MONITOR WELL RD-27

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 1	ASPHALT CONCRETE & AGGREGATE SUB-BASE	
1 - 21	SANDSTONE	Yellow-brown, fine to coarse, poorly sorted, dry, with thin siltstone interbeds.
21 - 30	SILTSTONE	Blue-grey with yellow sandstone interbeds.
		From 25 to 27 feet, yellow sandstone interbed, slightly fine-grained, well sorted, slightly moist.
		From 29 to 30 feet, yellow sandstone interbed, slightly fine-grained, well sorted, slightly moist.
30 - 50	SANDSTONE	Grey and brown, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.
50 - 55	SHALE	Grey and brown, calcareous, moderate moisture content.
55 - 100	SANDSTONE	Brown, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, moderate moisture content.
		From 70 to 80 feet, color changes to grey.
		From 80 to 95 feet, carbonate cement increases.
100 - 110	SHALE	Dark grey, moderately cemented, moderate moisture content, some siltstone.
110 - 150	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.

TABLE A-104
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-27

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
110 - 150 (con't)	At 120 feet, color is dark grey, high moisture content. At 125 feet, very high moisture content. At 126 feet, encountered groundwater, approximately 4-5 gpm.

TOTAL DEPTH OF BOREHOLE: 150 FEET

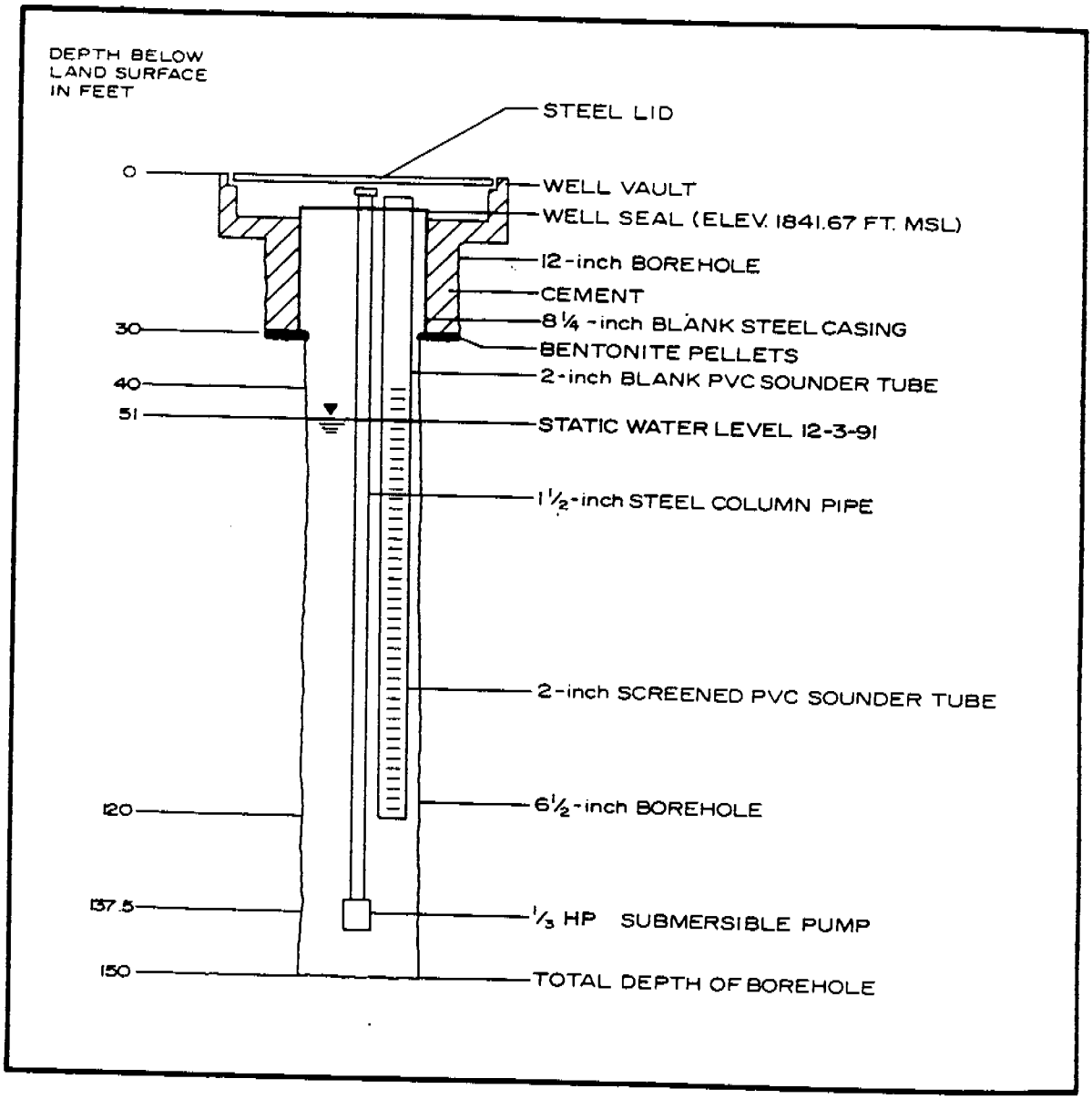


FIGURE E-29
SCHEMATIC DIAGRAM OF MONITOR WELL RD-27

TABLE A-107

LITHOLOGIC LOG OF MONITOR WELL RD-30

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 4	SAND	Brown, fine-grained, sand, loose, low plasticity, moderate moisture content.
4 - 75	SANDSTONE	Brown, fine-grained, moderately to well sorted, subrounded to subangular, weakly cemented, moderate moisture content.
		At 20 feet, high moisture content.
		At 25 feet, very high moisture content.
		At 30 feet, encountered groundwater, approximately 1-2 gpm.
		At 40 feet, increasingly grey.
		At 55 feet, grey sandstone.

TOTAL DEPTH OF BOREHOLE: 75 FEET

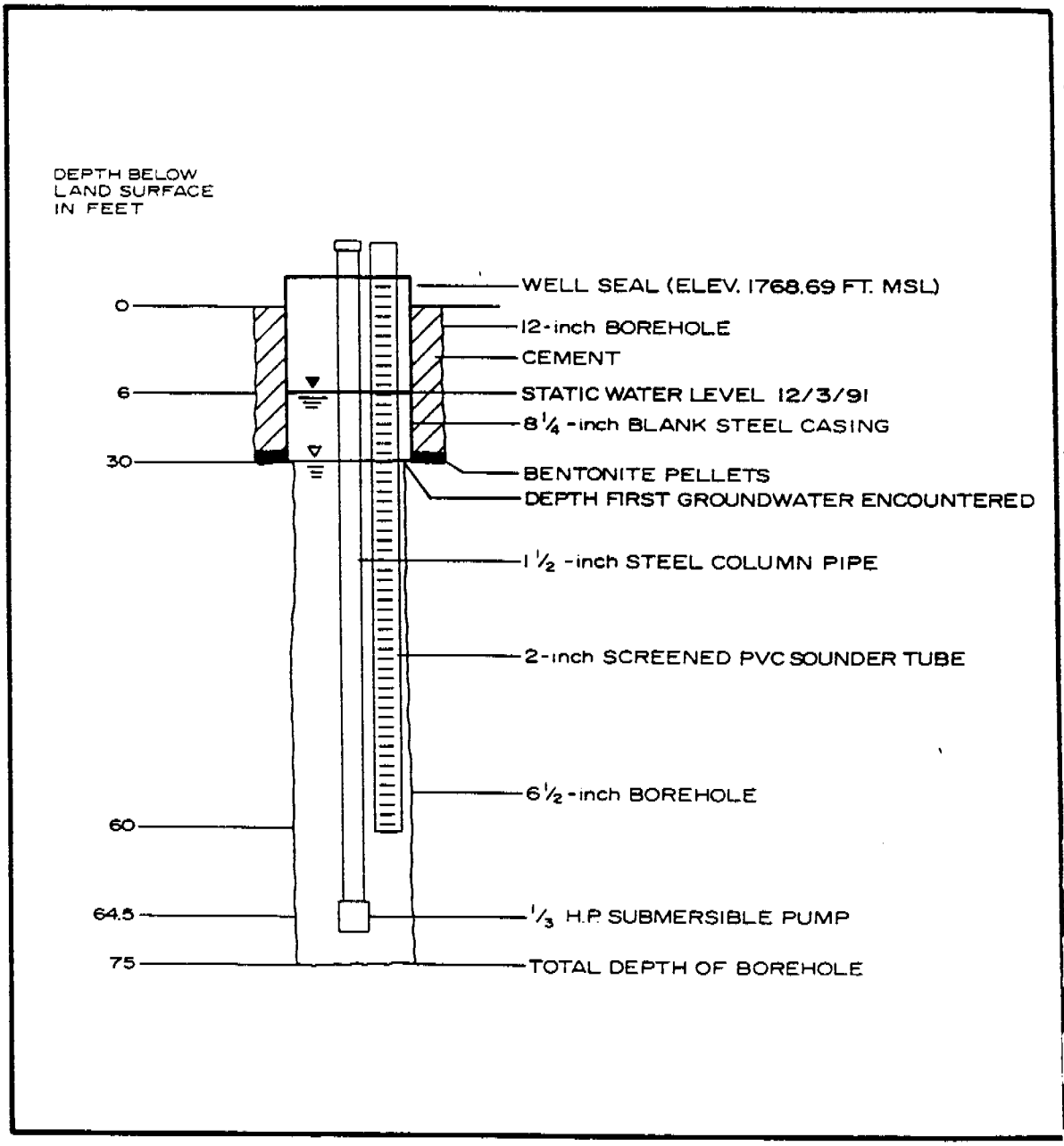


FIGURE E-32
SCHEMATIC DIAGRAM OF MONITOR WELL RD-30

TABLE A-113

LITHOLOGIC LOG OF MONITOR WELL RD-34A

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 8	CLAYEY SAND	Light brown, trace gravel, fine to coarse sand, poorly sorted, subangular, loose, slight plasticity, no cementation, dry, no odor.
8 - 32	SANDSTONE	Buff, some silt, trace very fine gravel fine-grained, moderately sorted, subrounded, compact, upper five feet weathered, weakly cemented, non-calcareous, dry, no odor. At ten feet becomes slightly moist. At twelve feet unweathered. At 18 feet becomes moist. At 27 feet cementation increases to moderate.
32 - 60	SANDSTONE	Blue-grey, very fine to fine grained, trace silt, moderately sorted, subrounded, compact, strongly cemented, calcareous, slightly moist, no odor. From 42-43 feet buff non-calcareous sandstone interlayers. From 47-48 feet buff non-calcareous sandstone interlayer. At 49 feet becomes wet, probable fracture zone 49 to 51 feet.

TOTAL DEPTH OF BOREHOLE: 60 FEET

TABLE A-114

LITHOLOGIC LOG OF MONITOR WELL RD-34B

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 8	CLAYEY SAND	Light brown, fine to medium sand, moderately sorted, subangular, loose, slight plasticity, no cementation, wet, no odor.
		At two feet moist.
8 - 22	SANDSTONE	Buff, some silt, trace very fine gravel, fine-grained, well sorted, subrounded, compact, upper four feet weathered, weakly cemented, non-calcareous, slightly moist, no odor.
		At twelve feet unweathered, moderately cemented.
		At 18 feet becomes dry.
22 - 230	SANDSTONE	Blue-grey, some silt, very fine to fine grained, moderate to well sorted, subrounded, very dense, moderately cemented, calcareous, dry, no odor.
		At 30 feet color change to grey, becomes moist.
		From 40 to 60 feet cementation becomes weak, very slightly calcareous.
		From 55 to 60 feet some claystone interlayers.
		At 60 feet calcareous cement increases.
		At 71 feet possible fracture.
		At 92 feet water is present, increasing with depth.
		At 101 feet possible fracture.

TABLE A-114
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-34B

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
22 - 230 (cont'd)	SANDSTONE	Below 102 feet grain size increases, some coarse sand and fine gravel present. Below 120 feet some thin black claystone beds appear. From 173 to 175 feet possible fractures. From 175 to 180 feet white, calcareous, vein filling. From 200-215 large amount of white calcareous vein filling. From 215-220 possible small fractures.
230 - 240	SANDSTONE/ CLAYSTONE	Dark grey, fine grained sandstone interbedded with black claystone, compact, weak to moderate cement, non-calcareous.

TOTAL DEPTH OF BOREHOLE: 240 FEET

TABLE A-115

LITHOLOGIC LOG OF MONITOR WELL RD-34C

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 7	CLAYEY SAND	Light brown, trace gravel, fine to coarse sand, poorly sorted, subangular, loose, slight plasticity, no cementation, slightly moist, no odor.
7 - 22	SANDSTONE	Buff, some silt, very fine to fine-grained, well sorted, subrounded, compact, upper two feet weathered, weakly cemented, non-calcareous, dry, no odor.
		At nine feet unweathered, moderately cemented.
		From 18 to 19 feet some very coarse sand and very fine gravel present.
22 - 32	SANDSTONE	Blue-grey, fine to medium grained, moderately sorted, subrounded, very dense, strongly cemented, highly calcareous, dry, no odor.
32 - 60	SILTY SANDSTONE	Brown, some clay, medium grained, moderately, sorted, subrounded, compact, slight plasticity, weak to moderate cement, non-calcareous, moist, no odor.
		At 38 feet wet.
		From 45 to 55 feet interbedded dark claystone layers are present.
60 - 220	SANDSTONE	Blue-grey, some silt and clay, fine to medium grained, well sorted, subrounded, very dense, moderately cemented, calcareous, wet, no odor.
		From 74 to 75 feet fracture.
		From 77 to 79 feet some claystone interlayers.
		From 107 to 110 feet several fractures.
		From 115 to 117 feet some calcite.

TABLE A-115
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-34C

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
60 - 220 (cont'd)	SANDSTONE	Below 120 feet slight grain size increase to medium - coarse.
		At 137 feet fracture.
		Below 140 feet some fine gravel present.
		From 150 to 160 feet gravelly interbeds present.
		Below 182 feet cementation increases to strong.
		From 183 to 186 feet some grey claystone interlayers.
		From 200 to 205 feet some brown clayey sandstone interlayers.
		From 205 to 210 feet some gravel and claystone, claystone increasing with depth.
220 - 258	SANDSTONE	Grey-black, with claystone interlayers, fine grained, moderately sorted, subrounded, compact, moderate cementation, calcareous, wet, no odor.
		From 228 to 232 feet fractured.
		Below 245 feet claystone interlayers decrease.
258 - 450	SANDSTONE	Blue-grey, trace silt, occasional claystone interlayers, very fine to fine-grained, well sorted, subrounded, dense, moderate cementation, calcareous, wet, no odor.
		From 282 to 285 feet claystone interlayers.
		From 300 to 305 feet cementation is weak.

TABLE A-115
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-34C

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
258 - 450 (cont'd)	SANDSTONE	From 317 to 326 feet some claystone interlayers. From 330 to 345 feet fractured, hole making more water. Below 370 feet calcareous cement decreasing. From 378 to 395 feet cementation increases to hard. From 388 to 390 feet some brown clayey sandstone interlayers. Below 395 feet cementation decreases to moderate. From 400 to 412 feet some black claystone interlayers. Below 425 feet cementation increases to hard. From 430 to 440 feet some black claystone and brown clayey sandstone interlayers.

TOTAL DEPTH OF BOREHOLE: 450 FEET

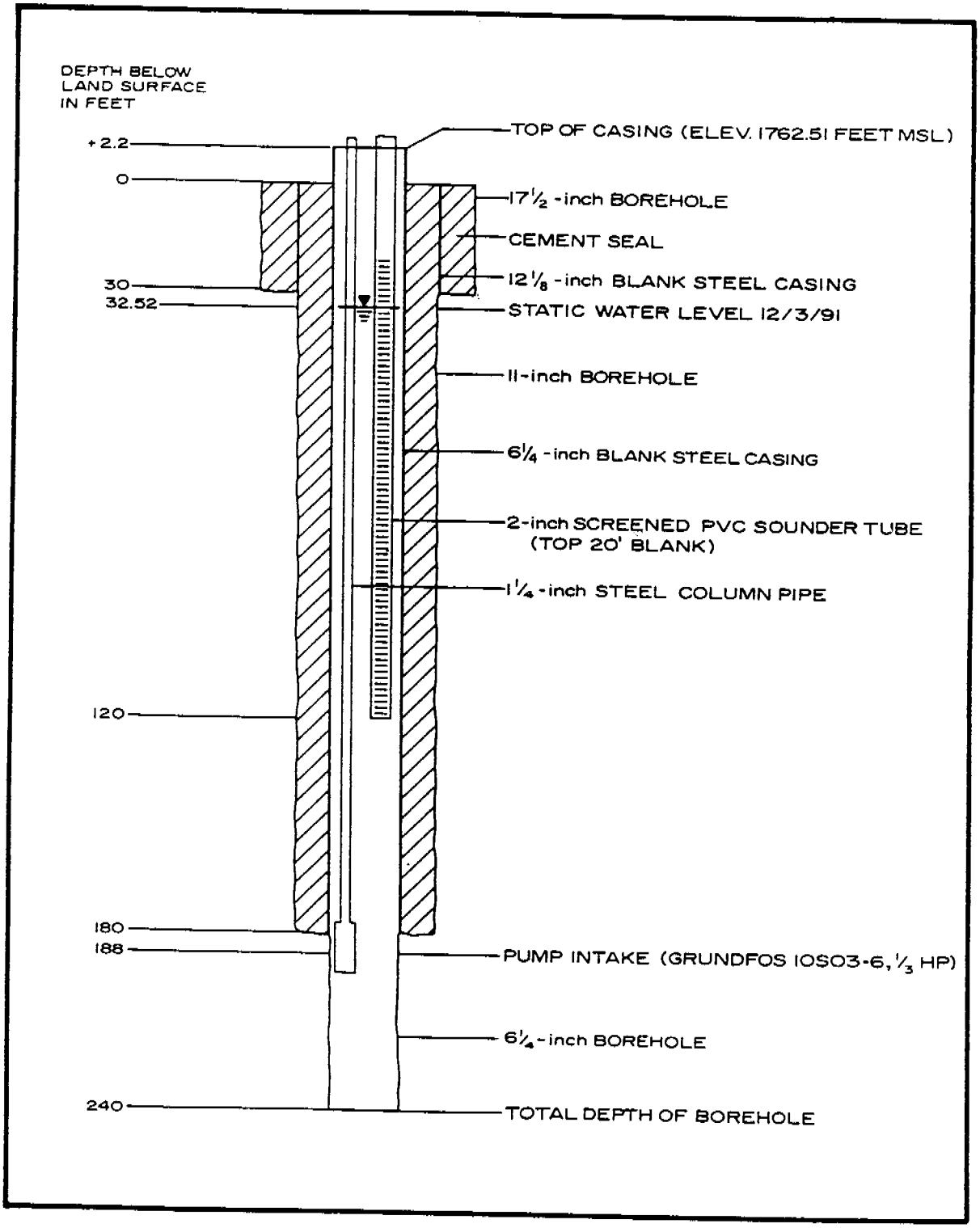


FIGURE E-39
SCHEMATIC DIAGRAM OF MONITOR WELL RD-34B

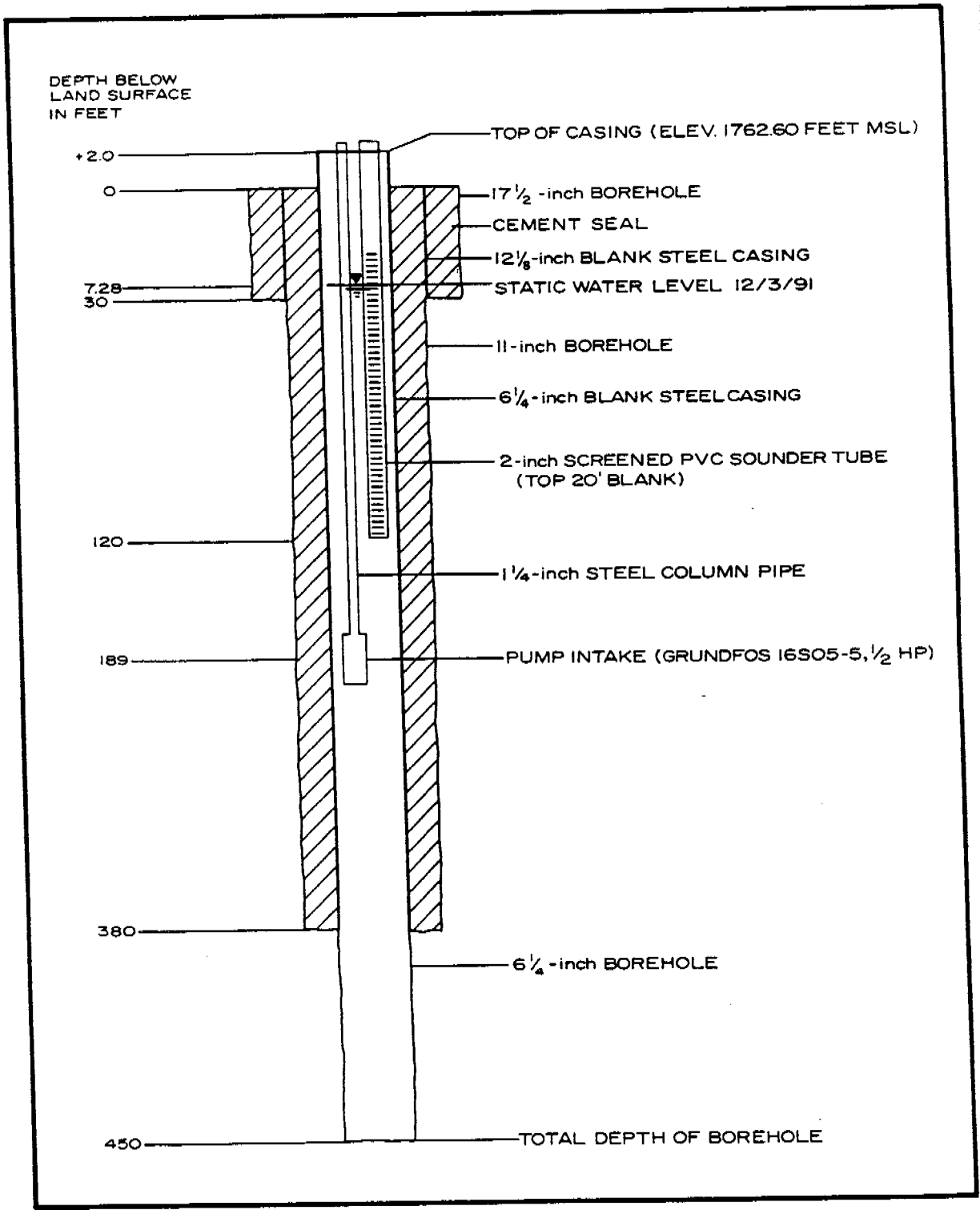


FIGURE E-40
SCHEMATIC DIAGRAM OF MONITOR WELL RD-34C

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-161

LITHOLOGIC LOG OF MONITOR WELL RD-59A

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 2	TOPSOIL - CLAYEY SAND	Dark brown, fine grained, silty, poorly graded, subangular, subrounded, compact, high plasticity, slightly moist.
2 - 58	CLAYEY SANDSTONE	Yellow brown, very fine grained, poorly graded, subangular, subrounded, compact to dense, medium to high plasticity, strongly calcareous cementation, laminated.
		@ 10' light brown grey, fine grained, minor medium grains, poorly to moderately graded, dense, medium plasticity, weak calcareous cementation, dry.
		@ 20' light grey, siltier, increased percentage of fine and very fine grains, poorly graded, low to medium plasticity.
		@ 22' dark grey to dark grey brown, no calcareous cementation, very moist.
		@ 26' brown, fine to very fine grained, trace medium grained, medium plasticity, moist to slightly moist.
		@ 29' strong calcareous cementation.
		@ 30' light grey to light brown grey, very fine grained, medium to high plasticity.
		@ 35' moderate calcareous cementation.
		From 38' to 41.5', no cuttings return, wet.
		@ 43' dark grey, fine grained, medium plasticity, moist to slightly moist.
		@ 45' grey.
		@ 48.5' dense to very dense, moderate calcareous cementation.
		@ 50' medium to high plasticity.
		@ 52' fine to very fine grained.

TOTAL DEPTH OF BOREHOLE: 58 FEET

TABLE A-162

LITHOLOGIC LOG OF MONITOR WELL RD-59B

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 15	SILTSTONE/ CLAYSTONE	Olive brown, fine grained, some fine sandstone, poorly graded, compact to dense, medium to high plasticity, laminated, uncemented, slightly moist.
		@ 10' olive brown to light yellow brown, interbedded siltstone/claystone and fine grained sandstone, subangular and subrounded, dense, weak, calcareous cementation.
15 - 53	CLAYEY SANDSTONE	Light yellow brown, very fine grained, some siltstone/claystone, high plasticity, strong calcareous cementation, moist.
		@ 20' dark grey brown, slightly moist.
		@ 24' one-half foot thick claystone bed.
		@ 27' moderate to strong calcareous cementation, slightly moist to moist.
		@ 30' grey.
		@ 32' increase in fines.
		@ 38.5' very moist.
		@ 40' dark grey brown, fine to very fine grained, very dense, strong calcareous cementation.
		@ 41.5' decrease in fines, dense.
		@ 44' wet.
		@ 47' grey and brown clayey sandstone and shale/claystone sandstone, sandstone strongly calcareous, shale weakly calcareous.
		@ 51' predominantly clayey sandstone, some siltstone/claystone and shale.

TABLE A-162
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-59B

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
53 - 214	SILTY SANDSTONE	Fine grained, trace medium grained, some clay, low plasticity, weak to no calcareous cementation. @ 55' very fine grained, continued interbedded siltstone/claystone. @ 61' Grey, very fine grained, silty, poorly graded, subangular and subrounded, dense, medium plasticity, moderate calcareous cementation. @ 77' fine to very fine grained. @ 80' very fine to medium grained, trace coarse grained, well graded, angular to subangular and subrounded, strong calcareous cementation. @ 84' less coarse grained, moderately graded, moderate calcareous cementation. @ 88' fine to very fine grained, trace medium, poorly graded. @ 100' increase in medium grains, moderately to poorly graded, some shaley partings. @ 108' grey brown sandstone, very fine grained, poorly graded, strong calcareous cementation, interbedded with dark grey shale. @ 115' less shale. @ 122' grey silty clayey sandstone, very fine grained, some fine grained. From 136-138' dark grey shale, brown claystone and sandy clay, dense to very dense. From 138-138.5' very dense. @ 139' dense to very dense. From 146-146.5' dark grey shale. @ 150' fine to very fine grained. @ 155' dense.

TABLE A-162
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-59B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
53 - 214 (cont'd)	SILTY SANDSTONE	From 171-171.5' dark grey shale and brown clay, moderate to strong calcareous cementation. @ 175' some medium grained sand, moderately to poorly graded. From 180-182' beds of dark grey and brown shale and clay, strong calcareous cementation. @ 185' moderate to strong calcareous cementation. @ 192' fine to very fine grained, poorly graded, strong calcareous cementation. @ 200' moderate to strong calcareous cementation. @ 205' some fine grained. @ 213' fracture.

TOTAL DEPTH OF BOREHOLE: 214 FEET

TABLE A-163

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-59C

LITHOLOGY			FRACTURES				
DEPTH (ft)	DESCRIPTION		DEPTH (ft) TOP	DEPTH (ft) BOTTOM	OPENNESS (inches)	TYPE	COMMENTS
0 - 90	Sandstone/ Clayey Sandstone	Light yellow brown, silty, very fine grained, poorly graded, angular to subangular and subrounded, dense, medium plasticity, weak to no calcareous cementation, laminated locally, micaceous, slightly moist. @ 8' some dark brown siltstone (thin beds). @ 11' light grey, harder, fine to very fine grained, trace of medium grains, moderately to poorly graded, subangular and subrounded, dense to very dense, moderate to strong calcareous cementation. @ 15' low plasticity. @ 19' grey brown, poorly graded, high plasticity, moderate calcareous cementation, wet to moist. @ 25' clayey sandstone, very fine with trace of fine grained. @ 31' hard, very dense. @ 39' light grey, increase in fines, very fine grained, poorly graded, medium to high plasticity, moderate to strong calcareous cementation, slightly moist. @ 43' increase in fines. @ 64' decrease in fines, some fine grained, medium plasticity. @ 67' strong calcareous cementation. @ 78' wet. @ 85' grey, fine to medium grained, moderately graded, moderate calcareous cementation.	24 30 45 54 58 65 75 84 88	25 31 --- 55 59 66 76 85 90	1/16 - 1/4 1/16 - 1 ? 1/16 - 1/8 1/16 - 1/8 filled 1/16 - 1/8 filled 1/16 - filled	Bedding Structural Bedding Structural Structural Structural Structural Structural Structural	Multiple bedding planes? Multiple fractures, highly fractured zone Possible bedding plane fractures Two fractures Multiple fractures, partially filled

TABLE A-163
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-59C

LITHOLOGY			FRACTURES				
DEPTH (ft)	DESCRIPTION		DEPTH (ft) TOP	DEPTH (ft) BOTTOM	OPENNESS (inches)	TYPE	COMMENTS
90 - 93	Silty Sandstone	Low to no plasticity, very moist.	92	97	1/16 - filled	Structural	Multiple fractures
93 - 110	Silty and Clayey Sandstone	Dark grey, fine to very fine grained, poorly to moderately graded, medium to high plasticity, moderate to strong calcareous cementation, moist. @ 95' trace medium grained, some rounded, poorly graded. @ 98' strong calcareous cementation. @ 99' some clayey siltstone/shale, dense, no calcareous cementation. @ 104' clayey siltstone/shale plug, wet. @ 108' very dense.	108	---	1/16	Structural	Bisecting fractures, low angle
110 - 135	Clayey Siltstone/ Shale and Clayey Sandstone	Dark grey and grey, predominantly very fine to fine grained, trace medium grained, dense, weak to no calcareous cementation, wet. @ 114' very dense. @ 120' dense. @ 122' moderate to strong calcareous cementation. @ 125' strong calcareous cementation.	119 127	120 ---	1/4 - 1/2 1/16	Bedding? ?	Fracture zone, irregular

TABLE A-163
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-59C

LITHOLOGY			FRACTURES				
DEPTH (ft)	DESCRIPTION		DEPTH (ft) TOP	DEPTH (ft) BOTTOM	OPENNESS (inches)	TYPE	COMMENTS
135 - 398	Clayey Silty Sandstone	Grey, fine to very fine grained, medium plasticity.	135	135.5	1/16	Bedding	
		@ 138' dense to very dense.	138	138.5	1/16 - 1/4	Bedding	Weak zone (1-2 inches)
			142	143	?	Bedding	
		@ 145' trace medium gravel.	148.5	149	?	Bedding	Weak zone (1/2-inch)
			158	158.5	?	Bedding?	Weak zone (6-inches) possibly bedding plane fractures
		@ 147' very fine to medium grained, poorly to moderately graded.	171	?	?	Bedding	
			178	178.5	1/16	Structural	
		@ 152' fine to very fine grained, poorly graded.	179	180	1/8 - 1/4	?	Multiple fractures, bedding/structural
			185	186	1/16 - 1/4	?	Horizontal
		@ 162' few shaley partings.	189	---	1/2	Structural	Multiple fractures
			190.5	194	1/16 - 1/2	Structural	
		@ 174' increase in very fine grained sand.	197	198	1/16	Structural	
			198	199	filled - 1/16	Structural	Multiple fractures
		@ 180' few thin clay beds.	200	201	1/16 - 1/4	Structural	Multiple fractures
			213.5	214	1/16 - 1/4	Structural	Large void, highly fractured zone
		@ 206.5' fracture.	217	220	large void	Structural	Large void, highly fractured zone
			225	227	large void		
		@ 224' decrease in very fine grained sand, very fine to medium grained, moderately poorly graded.					
		@ 225' fine to very fine grained, moderate calcareous cementation.					
		@ 230' predominantly very fine grained, poorly graded.					
		@ 241' harder, very dense, strong calcareous cementation.					
		@ 244' shaley partings.					
		@ 248' increase in very fine grained, low to medium plasticity.					
		@ 250' fine to very fine grained, trace medium grained.					
		@ 252' no medium grained, moderate calcareous cementation.					

TABLE A-163
(continued)
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-59C

LITHOLOGY			FRACTURES				COMMENTS
DEPTH (ft)	DESCRIPTION		DEPTH (ft) TOP	DEPTH (ft) BOTTOM	OPENNESS (inches)	TYPE	
135 - 398 (cont'd)	Clayey Silty Sandstone	From 266.5-267' increased clay content, medium plasticity. @ 274.5' possible fracture. @ 299.5' possible fracture. @ 325' moderate to strong calcareous cementation. @ 335' weak to moderate calcareous cementation. @ 340' strong calcareous cementation. @ 355' increase in fines, medium plasticity. From 360-365' shaley partings. @ 368' decreasing fines, low to medium plasticity. @ 370' moderate calcareous cementation. @ 375' moderate to strong calcareous cementation. @ 383.75' possible fracture. @ 387' possible fracture. @ 390' increasing fines, medium plasticity. @ 392' decrease in fines, low to medium plasticity. @ 395' weak to moderate calcareous cementation.					

TOTAL DEPTH OF BOREHOLE: 398 FEET **TOTAL VIDEO LOG DEPTH: 227 FEET**

NOTE: Unsafe to video log below 227 feet due to potential falling rock.

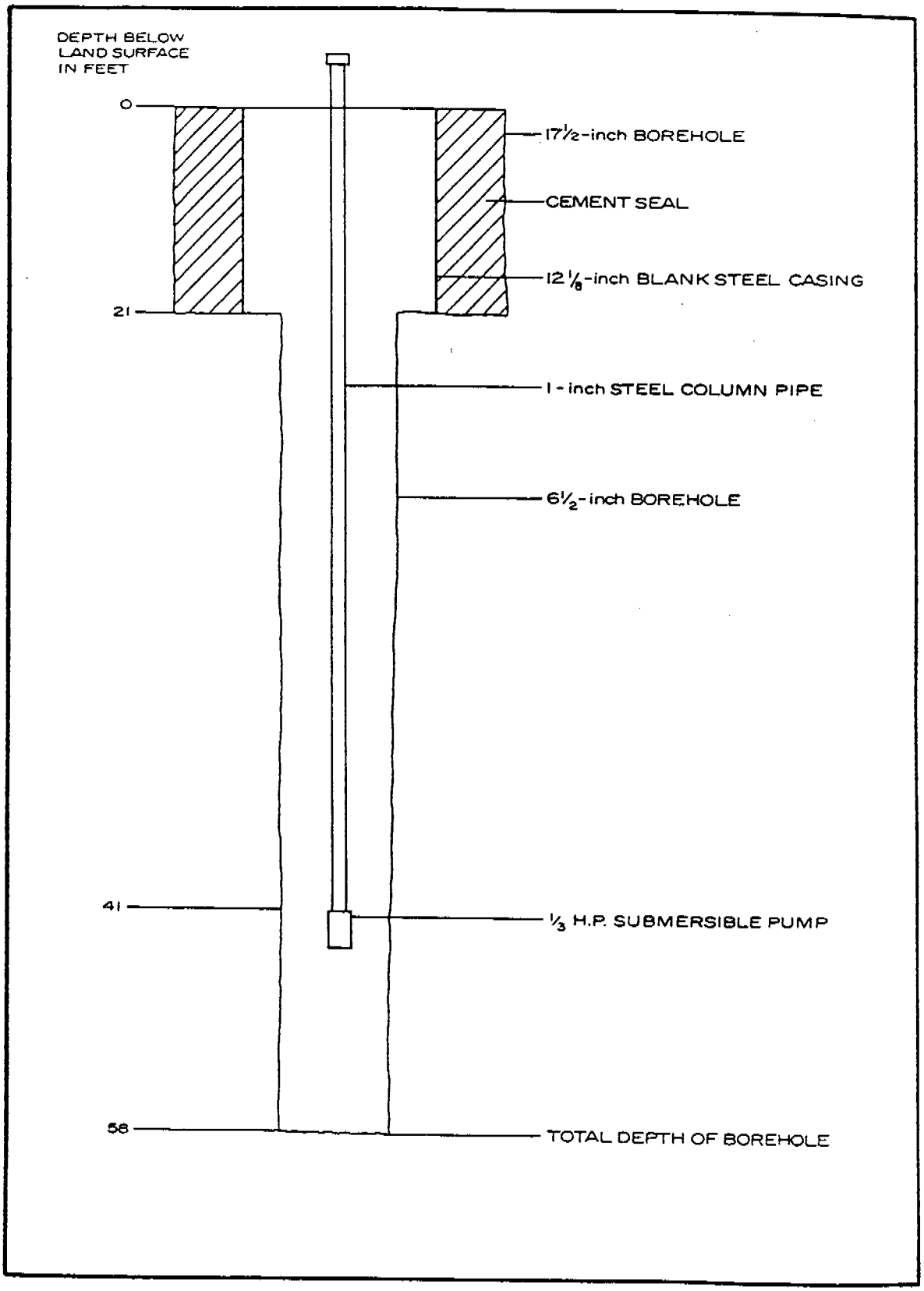


FIGURE E-86
SCHEMATIC DIAGRAM OF MONITOR WELL RD-59A

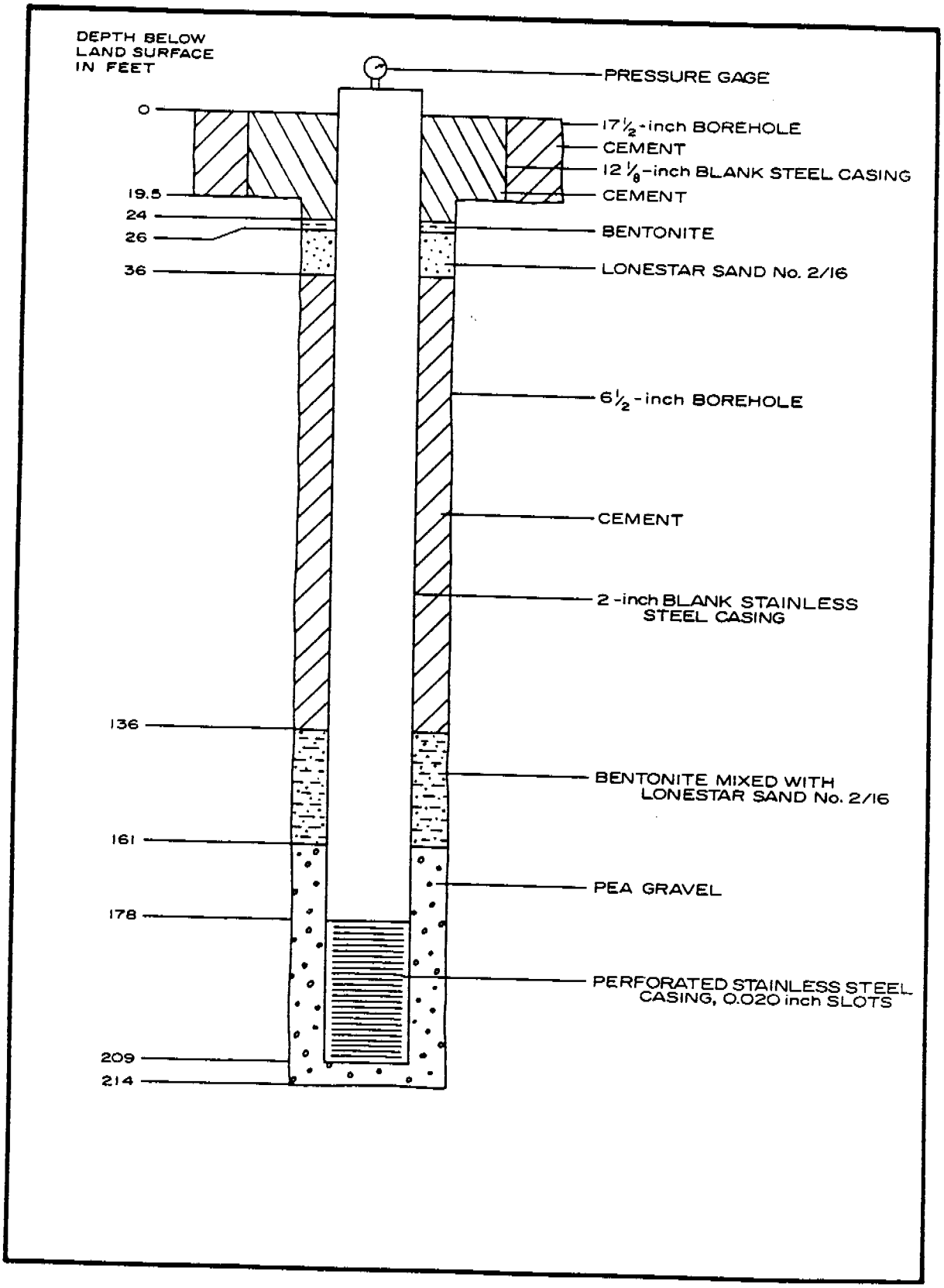


FIGURE E-87
SCHEMATIC DIAGRAM OF MONITOR WELL RD-59B

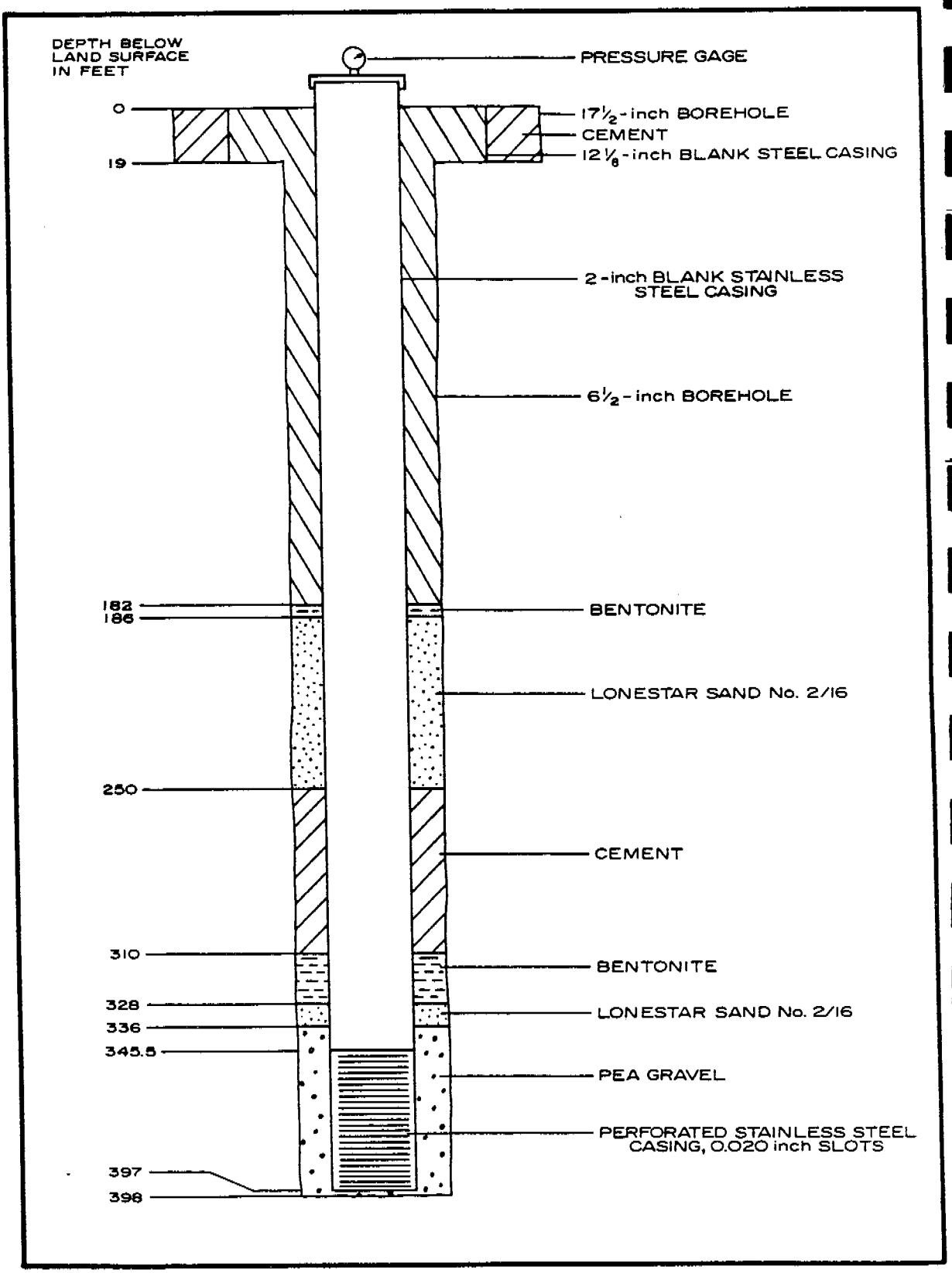


FIGURE E-88
SCHEMATIC DIAGRAM OF MONITOR WELL RD-59C

TABLE A-167

LITHOLOGIC LOG OF MONITOR WELL RD-63

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
0 - 46	SILTY SANDSTONE	Yellow brown, fine to very fine grained, trace medium grained, very weathered, clayey, poorly graded, subangular to angular and subrounded, compact, non-calcareous, moist.
		@ 3' moderate plasticity.
		@ 5' light yellow brown.
		@ 8' compact to dense, slightly moist to moist.
		@ 18.5' wet.
		@ 20' moist.
		@ 24' weakly to moderately calcareous.
		@ 25' grey and brown grey, strongly calcareous.
		@ 33' increased percentage of fines, very fine grained sand.
		@ 36' brown and grey brown, very moist.
		@ 36.5' fracture.
		@ 37' fine and medium grained, moderately graded.
		@ 42' yellow brown, moderately calcareous.
46 - 50	CLAYEY SANDSTONE	Very fine grained, increased percentage of clay fines, poorly graded, high plasticity.
		@ 48' wet.
50 - 115	SANDSTONE	Dark grey and dark yellow brown, fine grained, dense, weakly to moderately calcareous.
		@ 51' no to low plasticity.
		@ 66' yellow brown and dark grey brown.
		@ 70' dark grey, dark yellow brown, grey and yellow brown.
		@ 80' predominantly grey, some yellow brown.

TABLE A-167
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-63

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
50 - 115 (cont'd)	SANDSTONE	@ 85' strongly calcareous.
		@ 90' grey.
		@ 100' grey and yellow brown, weakly to strongly calcareous.
		@ 103' grey.
		From 108 to 109.5' very dense, strongly calcareous.
		@ 109.5' some medium and coarse grained sand, moderately to well graded, dense, moderately calcareous.
115 - 140	SILTY SANDSTONE	Fine grained, some medium grained, very micaceous, clayey, poorly to moderately graded, high plasticity, weakly to moderately calcareous.
		@ 120' strongly calcareous.
		@ 121' possible fracture, poorly graded.
		From 126.5 to 127' harder.
		@ 127' softer, low to moderate plasticity.
		@ 130' weakly to moderately calcareous.
140 - 141.5	SILTSTONE/ CLAYSTONE	Black, non-calcareous.
141.5 - 181	SILTY SANDSTONE	Light grey to grey.
		@ 151.5' possible small fracture.
		@ 175' fine to medium grained, moderately calcareous.
181 - 188.5	SILTSTONE/ CLAYSTONE	Black, some fractures, compact to dense, non-calcareous.
188.5 - 190	SILTY SANDSTONE	Dense.
190 - 191	SILTSTONE/ CLAYSTONE	Black, compact to dense.

TABLE A-167
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-63

DEPTH INTERVAL (feet)		DESCRIPTION OF MATERIAL
191 - 230	SILTY SANDSTONE	Grey, fine grained, dense, moderately to strongly calcareous. @ 219' strongly calcareous. @ 225' moderately to strongly calcareous. @ 227.5' fracture.

TOTAL DEPTH OF BOREHOLE: 230 FEET

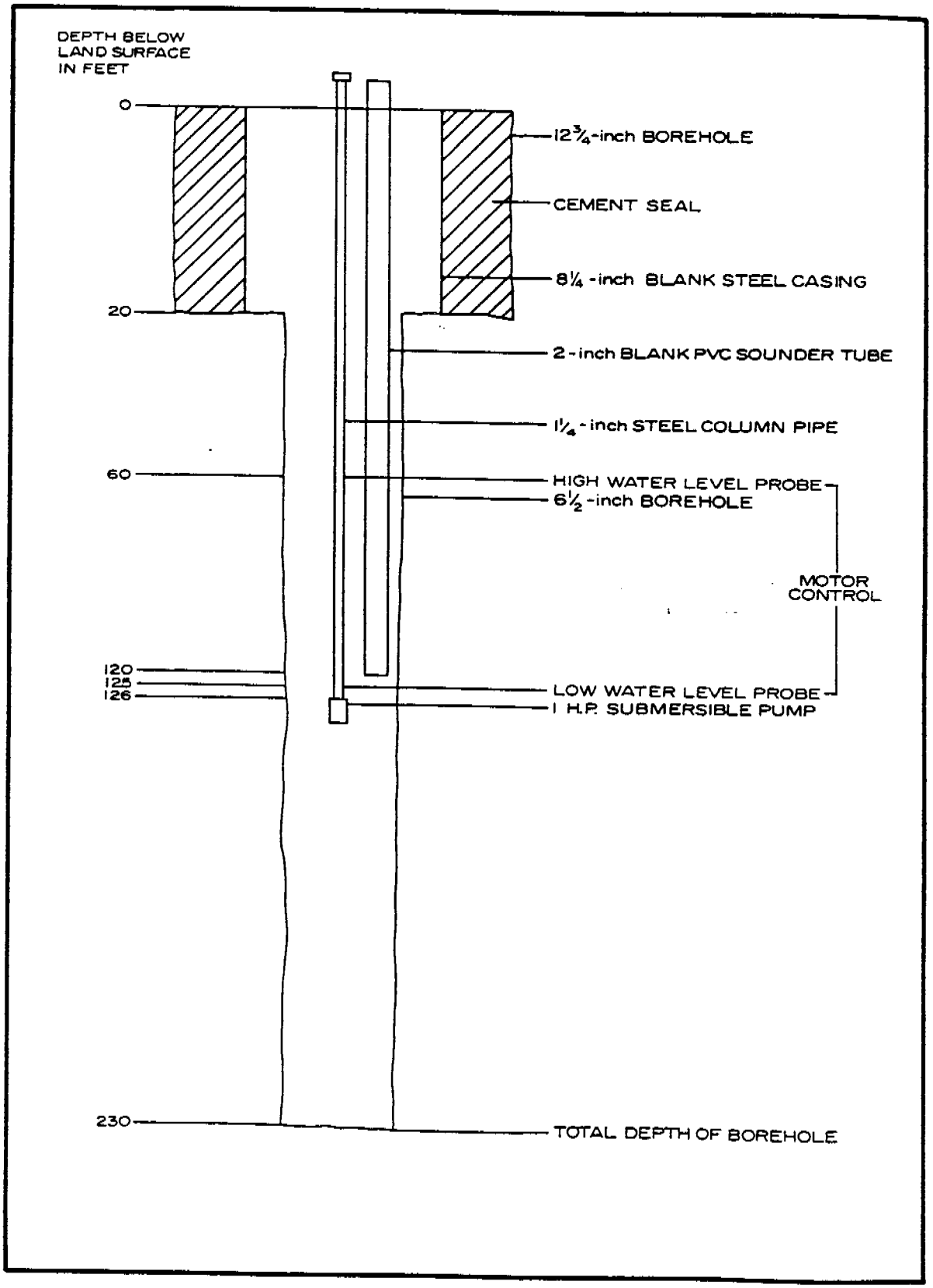


FIGURE E-92
SCHEMATIC DIAGRAM OF MONITOR WELL RD-63

TABLE C-3
RD-87 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

| | | |

TABLE C-3
RD-87 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks		**Client:**	Boeing - ETEC			
Boring Number/Location:	RD-87		**Drilling Co:**	WDC Exploration		**Job No:**	26411-037
Length, Kelly:	10' **Rods:** 20'	**Collars:** ---	**94mm pipe:**	13'3"	**Bit:** 7"	**Height of K.B.:**	**Date Started:** 8/10/2004
Type/Diameter of Bit:	coring/5" OD		**Drilling Fluid:**	Air	**Rig Type:** Speedstar 30K		**Date Finished:** 8/11/2004

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
15								light gray sandstone; predominantly medium/coarse																												
								sand, relatively homogeneous throughout; slightly moist																													
16																																			
17	80	85	GL2 5/1		4	10	0.0							100			x			x		x				x		x					x			
18																																			
19																																			
20								predominantly light gray sandstone w/ occasional light																													
								orange brown intervals; fractures (bedding plane?) at	?																											
21								~22, 23 and 24.5 ft, with oxidation staining along fracture																													
								planes																												
22																																			
	100	60	GL2 6/1		5	16								100		x				x		x				x		x					x			
23																																			
								predominantly fine sand to ~24', then predominantly																													
24								medium sand, possible thin mudstone layer at ~23'																													
25																																			
								light orange brown sandstone with occasional bluish gray																													
26								zones; several fractures (high angle) between 25.5 - 29'																													
27																																			
	90	70	7.5YR 6/6		6	12								100			x			x		x			x			x					x			
28								possible intersecting fractures 29-30'																													
								coarsens downwards to ~28.5' then finer grained to bottom,																													
29								slightly moist	?																											

Total Depth of Borehole (feet): 60
Groundwater, Depth Encountered: NA
Static Water Level: 45'

TABLE C-3
RD-87 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks			**Client:**	Boeing - ETEC		
Boring Number/Location:	RD-87			**Drilling Co:**	WDC Exploration	**Job No:**	26411-037
Length, Kelly:	10' **Rods:** 20'	**Collars:** ---		**94mm pipe:**	13'3" **Bit:** 7"	**Height of K.B.:**	**Date Started:** 8/10/2004
Type/Diameter of Bit:	coring/5" OD			**Drilling Fluid:**	Air	**Rig Type:** Speedstar 30K	**Date Finished:** 8/11/2004

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
30								medium/coarse sandstone, mostly light orange brown																												
								w/ occasional bluish gray zones																												
31								healed high angle fracture from 31 - 32'																												
								between 32.5 - 34',color change from																												
32	100	95	GL2 5/1		7	12	0.0	light orange-brown to bluish gray divides core vertically																												
			7.5YR 5/6					moist						100			x			x		x				x			x					x		
33																																				
34																																				
35								light orange brown sandstone; lost bottom 2' of core;																													
								near vertical fracture from 36 - 38', likely continues																												
36								into lost core below 38'																												
								predominantly medium sand; oxidized staining on fracture																												
37								trace																												
	60	20			8	11								100			x			x		x				x			x					x		
38																																				
39									?																											
40								light brownish gray sandstone top (lost from previous																													
								core), then light gray sandstone, hard, predominantly																												
41	67	50	GL2 6/1		9	5		fine/medium sand, dry; 2.5' run						100			x			x		x					x			x					x		
42																																				
43								gray sandstone, predominantly medium/coarse grained,																													
								one high-angle, healed fracture between 43 - 43.5'																												
44	100	33			10	5		2.5' run						100			x			x		x					x			x					x		

Total Depth of Borehole (feet):	60
Groundwater, Depth Encountered:	NA
Static Water Level:	45'

TABLE C-3
RD-87 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

| | | |

TABLE C-4
RD-88 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks	**Client:**	Boeing - ETEC			
Boring Number/Location:	RD-88/ N. of B/4012	**Drilling Co:**	WDC Exploration		**Job No:**	26411-037
Length, Kelly:	10' **Rods:** 20' **Collars:** ---	**94mm pipe:**	13'3" **Bit:** 7"	**Height of K.B.:** N/A	**Date Started:**	8/12/2004
Type/Diameter of Bit:	coring/5" OD	**Drilling Fluid:**	Air	**Rig Type:** Speedstar 30K	**Date Finished:**	8/16/2004

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/HCL None	Weak	Moderate	Strong
								0 - 2'; silty fine sand																												
1																																				
								3 - 5' light brownish gray sandstone; predominantly																														
	60	30			1	12	0.0	medium/coarse sand						100		x			x		x				x			x					x			
								possible high angle fractures at 3.5 and 5 ft, hard, dry																														
5								coarse, light brownish gray sandstone w/ layer of																														
								mudstone clasts upper 6", then medium/fine																														
								sandstone, light brownish gray/ light orange brown,																														
								possible fracture at ~8'; core broken into small pieces,																														
								rock is relatively soft, dry																														
	90	10	5YR 4/3		2	15								100		x			x		x			x				x					x			
10								light brown sandstone, with occ. Gray mottling 10-11';																														
								thin mudstone layer (~3") at 11'; coarse layer (1") ~12'																														
								with fine gravels																														
								moist interval 11 - 14'																														
								probable fractures at 12, 13 and 14 ft																														
	100	75			3	14									5	95		x		x		x			x			x					x			

Total Depth of Borehole (feet):	30
Groundwater, Depth Encountered:	NA
Static Water Level:	26

TABLE C-4
RD-88 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

| | | |

TABLE C-5
RD-89 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks		**Client:**	Boeing - Area IV			
Boring Number/Location:	RD-89		**Drilling Co:**	WDC Exploration		**Job No**	26411-041
Length, Kelly:	10' **Rods:** 10'	**Collars:** 8'	**Subs:** NA	**Bit:** 6"	**Height of K.B.:**	**Date Started:**	5/16/2005
Type/Diameter of Bit:	coring / 3.8" OD		**Drilling Fluid:** Air		**Rig Type:** CME 85	**Date Finished:**	5/18/2005

Depth (feet)	Core: % Rec	Core: Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution %: Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting: Well	Medium	Poor	Grain Shape: Angular	Subangular	Rounded	Subrounded	Apparent Density: Very Loose	Loose	Compact	Dense	Very Dense	Plasticity: None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/HCL: None	Weak	Moderate	Strong
0								fill from building excavation																												
								considerable concrete and pieces of																													
								sandstone with sand, silt, and clay to 24'-25'																													
5																																			
10																																			

Total Depth of Borehole (feet):	50'	
Groundwater, Depth Encountered:	~30'	5/18/2005
Static Water Level:	18'	5/20/2005

TABLE C-5
RD-89 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks		**Client:**	Boeing - Area IV			
Boring Number/Location:	RD-89		**Drilling Co:**	WDC Exploration		**Job No:**	26411-041
Length, Kelly:	10' **Rods:** 10'	**Collars:** 8'	**Subs:** NA	**Bit:** 6"	**Height of K.B.**	**Date Started:**	5/16/2005
Type/Diameter of Bit:	coring / 3.8" OD		**Drilling Fluid:** Air		**Rig Type:** CME 85	**Date Finished:**	5/18/2005

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
15								fill from building excavation																											
								considerable concrete and pieces of																											
								sandstone with sand, silt, and clay to 24'-25'																											
20																																			
25	100	90			2	15		hard, orange-brown to olive brown sandstone						100				x		x		x			x			x					x			
								predominantly medium to coarse grained																											
								no obvious fractures, wet																											
								a few mudstone clasts at 27-28'																											
								no reaction with HCl																											

Total Depth of Borehole (feet):	50'	
Groundwater, Depth Encountered:	~30'	5/18/2005
Static Water Level:	18'	5/20/2005

TABLE C-5
RD-89 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks		**Client:**	Boeing - Area IV			
Boring Number/Location:	RD-89		**Drilling Co:**	WDC Exploration		**Job No:**	26411-041
Length, Kelly:	10' **Rods:** 10'	**Collars:** 8'	**Subs:** NA	**Bit:** 6"	**Height of K.B.**	**Date Started:**	5/16/2005
Type/Diameter of Bit:	coring / 3.8" OD		**Drilling Fluid:**	Air	**Rig Type:** CME 85	**Date Finished:**	5/18/2005

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
30	70	0			3	4		hard, olive-brown sandstone in upper 3-4"																											
								contact with dense, laminated gray to olive-gray mudstone																											
	60	25			4	13		predominantly mudstone, dense, olive-gray with						10	90										x			x					x			
								frequent oxidized partings, moist, no apparent fractures																											
35	80	70			5	17		hard, light reddish-brown sandstone, coarsens downward						100			x			x		x				x		x					x			
								from fine sand to predominantly coarse at bottom																											
								high angle fracture at 37.5', thin mudstone layer at ~36.5'																											
								wet																											
40	100	65			6	15		hard, olive-brown to olive-gray sandstone																											
								several high-angle fractures with oxidation staining																											
								predominantly coarse sand at top contacts with medium																											
								sand at first fracture ~41'																											
								fracture at bottom (44-45') has mineralization on face						100			x			x		x				x		x					x			
								and possible slickensides																											

Total Depth of Borehole (feet):	50'	
Groundwater, Depth Encountered:	~30'	5/18/2005
Static Water Level:	18'	5/20/2005

TABLE C-5
RD-89 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks		**Client:**	Boeing - Area IV			
Boring Number/Location:	RD-89		**Drilling Co:**	WDC Exploration		**Job No:**	26411-041
Length, Kelly:	10' **Rods:** 10'	**Collars:** 8'	**Subs:** NA	**Bit:** 6"	**Height of K.B.**	**Date Started:**	5/16/2005
Type/Diameter of Bit:	coring / 3.8" OD		**Drilling Fluid:**	Air	**Rig Type:** CME 85	**Date Finished:**	5/18/2005

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
45	100	90			7	18		hard, olive-brown sandstone, predominantly medium and						100			x			x		x					x	x						x		
								coarse grained sand, continuation of 45' fracture into top																													
								of core, intact core from 45-49', similar fracture at 49-49.5'																													
								with mineralization on face and slickensides																													
50								TOTAL DEPTH = 50 FEET																													

Total Depth of Borehole (feet):	50'	
Groundwater, Depth Encountered:	~30'	5/18/2005
Static Water Level:	18'	5/20/2005

TABLE C-6
RD-90 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

| | | |

TABLE C-6
RD-90 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks							Client: Boeing - SSFL ETEC																	Page 2 of 5	
Boring Number/Location: RD-90							Drilling Co: WDC Exploration																	Job No: 26411-019	
Length, Kelly: 10 ft.		Rods: 20 ft.		Collars:			Subs: 5.7 ft.				Bit: 0.5			Height of K.B.:										Date Started: 03/10/04	
Type/Diameter of Bit: 6 in. Hammer							Drilling Fluid: Air							Rig Type: Speedstar 30K										Date Finished: 03/11/04	
Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting		Grain Shape			Apparent Density				Plasticity				Odor Gas, etc (Air Rotary)	Reaction w/ HCL			
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High		None	Weak	Moderate	Strong
30				dry	x	Massive SANDSTONE, light yellowish brown, fine to medium grained	1/8				100			x			x		x			x						x		
						post-completion static water level at ~31'																					none			
35					x																								x		
40			10YR 6/4	dry	x	massive SANDSTONE, light yellowish brown, fine to medium	1/8				100			x			x		x			x						x		
						grained, dry																									
						high angle fracture at 42-43', possibly healed, approximately																									
						perpendicular to bedding																									
						slightly coarser grained from 44.5-46.5'																									
45					x	below 47' color is occasionally slightly darker, occasional fine																								x		
						grained laminations																									
50				dry	x	slightly coarser from 51-54', distinct bedding contact ~54' with	1/8				100			x			x		x			x						x		
						fine grained layer																									
55					x	thin bed of bluish-gray SANDSTONE at 56', with thin gray																								x		
						fine grained layer below																									

Total Depth of Borehole (feet): 125 ft.
Groundwater, Depth Encountered: 78 ft.
Static Water Level: 31 ft.

TABLE C-6
RD-90 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks			Client: Boeing - SSFL ETEC		Page 3 of 5
Boring Number/Location: RD-90			Drilling Co: WDC Exploration		Job No: 26411-019
Length, Kelly: 10 ft.	Rods: 20 ft.	Collars:	Subs: 5.7 ft.	Bit: 0.5	Height of K.B.: Date Started: 03/10/04
Type/Diameter of Bit: 6 in. Hammer			Drilling Fluid: Air		Rig Type: Speedstar 30K Date Finished: 03/11/04

Depth (feet)	Time Begin	Time End	Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Reaction w/ HCL None	Weak	Moderate	Strong
60			10YR 6/3	dry	x	SANDSTONE, pale brown, coarse grained with fine	1/4			10	90		x			x		x	x			x			x						x	
						gravel, dry																							none				
						gravelly layer from 59.8 to 60.5'																											
						healed, high angle fracture at 61.5, 63, and 64.5'																											
						color change to bluish gray below 65.5'																											
65					x	SANDSTONE, gray, below 65.5' with occasional																											
			GL2 6/1			light brown banding, relatively fine grained from 68-70'																											
70				sl. moist	x	coarsens below 70' to coarse sand and fine gravel from	1/24				90	10	x			x		x	x			x			x						x	
						72.5 - 75'																											
						becoming moist at 73'																											
75					x	another coarsening downward unit from 75 - 80.5'																											
						cut by two fractures approximately perpendicular to																											
						bedding at 79-80'																											
						oxidation staining adjacent to fractures																											
						fractures producing water (<1 gal/min)																											
80				moist	x	probable load cast at base of coarse grained unit	1/4			10	90		x			x		x	x			x			x						x	
						washout in fine grained unit from 82-82.5', gray fine sand																											
						and silt																											
85					x	thin, light brownish gray layers between 84 and 86'																											x
						high angle, partially healed fractures from 84.5-86.4'																											
						oxidation staining adjacent to fractures																											

Total Depth of Borehole (feet): 125 ft.
Groundwater, Depth Encountered: 78 ft.
Static Water Level: 31 ft.

TABLE C-6
RD-90 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

| | | |

TABLE C-6
RD-90 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks							Client: Boeing - SSFL ETEC																Page 5 of 5	
Boring Number/Location: RD-90							Drilling Co: WDC Exploration																Job No: 26411-019	
Length, Kelly: 10 ft.		Rods: 20 ft.			Collars:		Subs: 5.7 ft.				Bit: 0.5			Height of K.B.:									Date Started: 03/10/04	
Type/Diameter of Bit: 6 in. Hammer							Drilling Fluid: Air							Rig Type: Speedstar 30K									Date Finished: 03/11/04	
Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting			Grain Shape			Apparent Density				Plasticity				Odor Gas, etc (Air Rotary)	Reaction w/ HCL			
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High		None	Weak	Moderate	Strong
120			GL2 6/1	sl. moist	x	slight coarsening of sand near 123', then contact with	1/16				100			x			x		x			x					x		
						finer grained sandstone from 123-123.5'																				none			
						thin mudstone parting at 124.5'																							
125					x	TD = 125' bls.																							

Total Depth of Borehole (feet): 125 ft.
Groundwater, Depth Encountered: 78 ft.
Static Water Level: 31 ft.

TABLE C-8
RD-92 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks						Client: Boeing - SSFL ETEC																		Page 1 of 4	
Boring Number/Location: RD-92						Drilling Co: WDC Exploration																		Job No: 26411-019	
Length, Kelly: 10 ft.		Rods: 20 ft.		Collars:		Subs: 5.7 ft.				Bit: 0.5				Height of K.B.:										Date Started: 03/15/04	
Type/Diameter of Bit: 6 in. Hammer						Drilling Fluid: Air								Rig Type: Speedstar 30K										Date Finished: 03/16/04	
Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting			Grain Shape			Apparent Density				Plasticity			Odor Gas, etc (Air Rotary)	Reaction w/ HCL			
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High		None	Weak	Moderate	Strong
0																															
																									None						
5			5YR 3/1	sl. moist	x	dark brown clayey SILT with some fine sand					5	95	x							x				x					x		
						lightly moist, loose																										
						bedrock around 5'																										
10			10YR 7/6	sl. moist	x	WEATHERED SANDSTONE, yellow					95	5	x					x		x				x					x		
						fine to medium grained																										
15			2.5Y 6/3	sl. moist	x	SANDSTONE, light grayish yellow	1/16				95	5	x					x		x				x					x		
						fine to medium grained, slightly moist																										
			2.5Y 7/2			color change to light gray at 18'																										
20					x	no sample collected - no cuttings return																										
25			2.5Y 7/2	sl. moist	x	SANDSTONE, light gray	1/16				95	5	x					x		x				x					x		
						fine to medium grained, slightly moist																										

Total Depth of Borehole (feet): 105 ft.
Groundwater, Depth Encountered: ~75 ft.
Static Water Level: 61 ft.

TABLE C-8
RD-92 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks			Client: Boeing - SSFL ETEC		Page 2 of 4
Boring Number/Location: RD-92			Drilling Co: WDC Exploration		Job No: 26411-019
Length, Kelly: 10 ft.	Rods: 20 ft.	Collars:	Subs: 5.7 ft.	Bit: 0.5	Height of K.B.: Date Started: 03/15/04
Type/Diameter of Bit: 6 in. Hammer			Drilling Fluid: Air		Rig Type: Speedstar 30K Date Finished: 03/16/04

Depth (feet)	Time Begin	Time End	Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Reaction w/ HCL None	Weak	Moderate	Strong
30				sl. moist	x	SANDSTONE, massive, light gray, hard, slightly moist					100			x		x		x				x		x						x	
						continues to ~43.5'																							None			
35				sl. moist	x						100			x		x		x				x		x						x	
40				sl. moist	x	color change to bluish gray at 43.5'	1/16				100			x		x		x				x		x						x	
						fine to medium grained, predominantely fine grained																										
						slightly moist																										
45			2.5Y 7/1	sl. moist	x						95	5	x					x												x	
50			GL2 6/1	sl. moist	x	SANDSTONE, bluish gray, hard, slightly moist; fine/medium sand	1/16				95	5	x			x		x				x		x						x	
						possible healed fracture from 52-53'																										
55				sl. moist	x	soft drilling from 55-60'																									x	

Total Depth of Borehole (feet): 105 ft.
Groundwater, Depth Encountered: ~75 ft.
Static Water Level: 61 ft.

TABLE C-8
RD-92 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

| | | |

TABLE C-8
RD-92 ROTARY DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By: Chris Brooks						Client: Boeing - SSFL ETEC																		Page 4 of 4	
Boring Number/Location: RD-92						Drilling Co: WDC Exploration																		Job No: 26411-019	
Length, Kelly: 10 ft.		Rods: 20 ft.		Collars:		Subs: 5.7 ft.				Bit: 0.5				Height of K.B.:										Date Started: 03/15/04	
Type/Diameter of Bit: 6 in. Hammer						Drilling Fluid: Air								Rig Type: Speedstar 30K										Date Finished: 03/16/04	
	Time							Particle Size Distribution %					Sorting			Grain Shape			Apparent Density			Plasticity			Reaction w/ HCL	
Depth (feet)	Begin	End	Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded / Subrounded	Very Loose	Loose / Compact	Dense / Very Dense	None	Low / Medium / High	Odor Gas, etc (Air Rotary)	None / Weak / Moderate / Strong
90			2.5Y 5/3	moist	x	SANDSTONE, light olive brown, fine to medium grained					95	5	x					x			x	x			x
						predominantly medium grained, moist																			
95			2.5Y 6/1	moist	x	SANDSTONE, light gray from 95-105'	1/8				95	5	x					x			x	x			x
						fine to medium grained, moist																			
						below 95', predominantly bluish gray sandstone																		None	
						coarsening downward unit from 94-98'																			
						coarse sand at 98'																			
100			GL2 5/1	moist	x	contacts with mudstone layer from 98-98.5					95	5	x					x			x	x			x
						SANDSTONE, bluish gray to 105'																			
						high angle fractures from 102-105' with oxidation staining																			
105				moist	x		1/16				95	5	x					x			x	x			x

Total Depth of Borehole (feet): 105 ft.
Groundwater, Depth Encountered: ~75 ft.
Static Water Level: 61 ft.

TABLE C-10
RD-94 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks	**Client:**	Boeing - Area IV		
Boring Number/Location:	RD-94; below RD-88 in B/10 drainage	**Drilling Co:**	WDC Exploration	**Job No**	26411-041
Length, Kelly:	10' **Rods:** 10' **Collars:** 8'	**Subs:** NA	**Bit:** 6" **Height of K.B.:**	**Date Started:**	5/12/2005
Type/Diameter of Bit:	coring / 3.8" OD	**Drilling Fluid:**	Air **Rig Type:** CME 85	**Date Finished:**	5/15/2005

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/HCL None	Weak	Moderate	Strong
0	20	0			1	6		Alluvium (silty sand) and weathered sandstone																												
								to approximately 4'																												
5	100	50			2	9		soft, light orange-brown to olive brown sandstone						90	10	x			x		x		x					x					x			
								moist in 4'-9' interval																												
								several fractures and bedding plane partings																												
								predominantly medium to coarse sand with with																												
								occasional mudstone pebble inclusions																												
10	100	80			3	11		hard, olive brown sandstone						100			x		x		x				x		x					x			
								color changes to gray from 11.5'-12.5'																												
								primarily fine to medium grained sand																												
								bedding plane fractures from 12'-13'																												
								near-vertical fracture from 13'-14'																												
								moist																												

Total Depth of Borehole (feet):	35'	
Groundwater, Depth Encountered:	~10'	5/15/2005
Static Water Level:	~5'	5/20/2005

TABLE C-10
RD-94 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks		**Client:**	Boeing - Area IV			
Boring Number/Location:	RD-94; below RD-88 in B/10 drainage		**Drilling Co:**	WDC Exploration		**Job No:**	26411-041
Length, Kelly:	10' **Rods:** 10'	**Collars:** 8'	**Subs:** NA	**Bit:** 6"	**Height of K.B.**	**Date Started:**	5/12/2005
Type/Diameter of Bit:	coring / 3.8" OD		**Drilling Fluid:**	Air	**Rig Type:** CME 85	**Date Finished:**	5/15/2005

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
15	100	80			9	13		hard olive-brown sandstone																											
								predominantly fine to medium grained sand																											
								near vertical fracture at top																											
								multiple bedding plane fractures from 17'-19'																											
								color change to gray in bottom 4"																											
								moist																											
20	100	100			10	6		hard, dense gray sandstone; predominantly fine/medium sand						100			x			x		x				x		x					x			
								oxidation staining from 21'-21.5'																											
								several bedding plane fractures																											
								wet; water in hole																											
	50	80			11	20		fine to medium sandstone																											
								hard, dense, gray																											
								oxidation staining 24'-24.5'																											
								wet																											
25	80	50			12	15		fine to medium sandstone						100			x			x		x				x		x					x			
								hard, dense, gray																											
								oxidized staining at fractures																											
								wet						90	10		x			x		x				x		x					x			

Total Depth of Borehole (feet):	35'	
Groundwater, Depth Encountered:	~10'	5/15/2005
Static Water Level:	~5'	5/20/2005

TABLE C-10
RD-94 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Brooks	**Client:**	Boeing - Area IV				
Boring Number/Location:	RD-94; below RD-88 in B/10 drainage	**Drilling Co:**	WDC Exploration			**Job No:**	26411-041
Length, Kelly:	10' **Rods:** 10' **Collars:** 8'	**Subs:** NA	**Bit:** 6"	**Height of K.B.**		**Date Started:**	5/12/2005
Type/Diameter of Bit:	coring / 3.8" OD	**Drilling Fluid:**	Air	**Rig Type:**	CME 85	**Date Finished:**	5/15/2005

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Rounded	Subrounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
30					13	17		lost 29.5'-31.5' interval																												
								likely soft, weathered sandstone																													
								hard, olive-brown sandstone from 31.5'-32'																														
								predominantly fine to medium sand																													
								moist to wet																												
								~3" very hard, dry, light gray sandstone at 32' grades into						100			x			x		x				x		x					x			
								hard gray sandstone from 32'-34'																													
								moist, predominantly fine to medium sand																													
								mudstone at ~34'																													
35								fractures from 34'-34.5'																													
								TOTAL DEPTH = 35' FEET																													
40																																				

TABLE C-12
RD-96 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Turner	**Client:**	Boeing - Area IV
Boring Number/Location:	RD-96; ~200 feet northwest of former Building 4059 location	**Drilling Co:**	WDC Exploration
Length, Kelly:	17' **Rods:** 5' and 10' **Collars:** NA	**Subs:** NA	**Bit:** 4" O.D. **Height of K.B.:** NA
Type/Diameter of Bit:	Boart Longyear HQ3 coring bit / 4" O.D.	**Drilling Fluid:**	Air

Job No: 20060-915
Date Started: 5/1/2006
Rig Type: CME 85
Date Finished: 5/3/2006

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Subrounded	Rounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/HCL None	Weak	Moderate	Strong
0	63%	39%	brown	moist	1		0.0	0'-5': medium-hard, brown, fine to medium grained sandstone. Moderately weathered. Moist.						100		x					x				x				x								
5	17%	0%	brown	moist	2			5'-6': medium-hard, brown, fine to medium grained sandstone. Trace coarse sand. Moderately weathered. Moist.						100		x					x				x				x								
								6'-10': no recovery. Coring action indicates soft rock 6' to 9' BLS.																												
10	67%	23%	brown	moist	3			10-12.2': medium-hard, brown, fine to medium grained sandstone. Highly oxidized zone from 11.0'-11.4'. Moderately weathered. Moist						100		x					x				x				x								
								12.2'-13.4': hard, tan, fine to medium grained sandstone Trace coarse sand. Slightly weathered. Moist						100		x					x					x			x								
								13.4'-15': no recovery																												

Total Depth of Borehole (feet): 90
Groundwater, Depth Encountered: ~63
Static Water Level: 47.14

Analytical Samples: RD96-01, RD96-02(12.8'-13.4')
Geotechnical Samples: none

TABLE C-12
RD-96 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Turner	**Client:**	Boeing - Area IV		
Boring Number/Location:	RD-96; ~200 feet northwest of former Building 4059 location	**Drilling Co:**	WDC Exploration	**Job No:**	20060-915
Length, Kelly:	17' **Rods:** 5' and 10' **Collars:** NA	**Subs:** NA	**Bit:** 4" O.D. **Height of K.B.:** NA	**Date Started:**	5/1/2006
Type/Diameter of Bit:	Boart Longyear HQ3 coring bit / 4" O.D.	**Drilling Fluid:**	**Rig Type:** CME 85	**Date Finished:**	5/3/2006

Depth (feet)	Core % Rec	Core RQD	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Subrounded	Rounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
15	90%	80%	brn/gray	moist	4			15'-17': medium-hard, brown, fine to medium grained sandstone. Slightly weathered. Moist.						100			x				x					x			x								
								17'-20': hard, gray, fine to coarse grained sandstone Fresh. Moist. Moderate oxidation staining on fracture surfaces.						100				x			x					x			x								
								Coring action indicates very hard rock 16'-19'																													
20	94%	86%	gray	moist	5			20'-20.8': hard, gray, fine to coarse sandstone. Fresh. Moist						100			x				x						x		x								
								20.8'-22.9': hard, gray, fine to medium grained sandstone. Fresh. Moist.						100			x				x						x		x								
								22.9'-24.5': hard, gray, medium to coarse grained sandstone. Trace fine sand. Fresh. Moist. Abundant micaceous minerals (~20%)						100			x				x						x		x								
25	98%	63%	gray	dry	6			24.5'-28.7': hard, gray, fine to coarse grained sandstone. Trace very coarse sand. Fresh. Dry. Mudstone layer 0.07 ft thick @ 25.7' Mudstone layer 0.03 ft thick @ 26'						100				x			x						x		x								
								28.7'-29.5': hard, gray, fine grained sandstone. Fresh. Dry. 28.7-28.9' interval contains dark gray/black microlaminations of fine sand.						100		x										x		x								

Total Depth of Borehole (feet): 90
Groundwater, Depth Encountered: ~63
Static Water Level: 47.14

Analytical Samples: RD96-03(18.3'-18.8'), RD96-05(23.1'-23.6'), RD96-06(25.1'-25.6')
Geotechnical Samples: RD96-04(18.8'-19.4'), RD96-07(27.8'-28.4')

TABLE C-12
RD-96 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Turner	**Client:**	Boeing - Area IV		
Boring Number/Location:	RD-96; ~200 feet northwest of former Building 4059 location	**Drilling Co:**	WDC Exploration	**Job No:**	20060-915
Length, Kelly:	17' **Rods:** 5' and 10' **Collars:** NA	**Subs:** NA	**Bit:** 4" O.D. **Height of K.B.:** NA	**Date Started:**	5/1/2006
Type/Diameter of Bit:	Boart Longyear HQ3 coring bit / 4" O.D.	**Drilling Fluid:**	**Rig Type:** CME 85	**Date Finished:**	5/3/2006

Depth (feet)	Core % Rec	Core RQD	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Subrounded	Rounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
30	88%	72%	gray	dry/moist	7			29.5'-31.5': hard, gray, fine to medium grained sandstone						100			x				x					x		x								
								Trace coarse sand. Fresh. Dry.																													
								31.5'-34.5': hard, gray, fine to medium grained sandstone						100			x				x					x		x								
								Trace coarse sand. Fresh. Moist.																													
35	83%	92%	gray	moist	8			34.5'-35.3': hard, gray, fine to coarse sandstone. Fresh. Moist						100				x			x					x		x								
								35.3'-38.7': hard, gray, fine to medium grained sandstone.						100			x				x					x		x								
								Abrupt change from fine-medium sand to fine sand @ 35.3'																													
								Coarsens downward from clean fine sandstone to fine-																													
								medium sandstone with trace coarse sand. Fresh. Moist.																													
40	100%	100%	gray	moist/wet	9			39.3'-44.5': hard, gray, fine to medium grained sandstone.						100			x				x					x		x								
								Trace coarse sand. Fresh. Moist 39.3'-41.4'. Wet 41.4'-44.5'																													

Total Depth of Borehole (feet):	90	Analytical Samples: RD96-08(35.4'-35.9'), RD96-09(40.7'-41.3')	
Groundwater, Depth Encountered:	~41	Geotechnical Samples: none	
Static Water Level:	47.14		

TABLE C-12
RD-96 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Turner	**Client:**	Boeing - Area IV
Boring Number/Location:	RD-96; ~200 feet northwest of former Building 4059 location	**Drilling Co:**	WDC Exploration
Length, Kelly:	17' **Rods:** 5' and 10' **Collars:** NA	**Subs:** NA	**Bit:** 4" O.D. **Height of K.B.:** NA
Type/Diameter of Bit:	Boart Longyear HQ3 coring bit / 4" O.D.	**Drilling Fluid:**	**Rig Type:** CME 85

Job No: 20060-915
Date Started: 5/1/2006
Date Finished: 5/3/2006

Depth (feet)	Core % Rec	Core RQD	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Subrounded	Rounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
45	97%	71%	gray/brn	wet	10			44.5'-45.5': hard, gray, fine to medium grained sandstone.						100			x				x					x			x								
								Trace coarse sand. Fresh. Wet.																														
								45.5'-48.1': hard, brown, fine to medium grained sandstone						100			x				x					x			x								
								Trace coarse sand. Fresh. Wet.																														
								48.5'-49.5': hard, brown, fine to medium grained sandstone.						100			x				x					x			x								
								Trace coarse sand. Fresh. Wet.																														
50	97%	21%	brn/gray	moist	11			49.5'-54.2': moderately hard, brown, fine to medium grained						100			x				x					x			x								
								sandstone. Trace coarse sand. Slightly to moderately																														
								weathered. Moist.																														
								54.2'-54.5': moderately-hard, gray, fine to medium grained						100			x				x					x			x								
								sandstone. Fresh. Moist.																														
55	100%	100%	gray	wet	12			54.5'-59.5': hard, gray, fine to medium grained sandstone.						100			x				x					x			x								
								Trace coarse sand. Fresh. Wet.																														

Total Depth of Borehole (feet): 90
Groundwater, Depth Encountered: ~63
Static Water Level: 47.14

Analytical Samples: RD96-10(46.1'-46.7'), RD96-12(50.0'-50.6'), RD96-14(58.0'-58.5')
Geotechnical Samples: RD96-11(46.7'-47.3'), RD96-13(50.7'-51.2')

TABLE C-12
RD-96 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

| | | |

TABLE C-12
RD-96 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

| | | |

TABLE C-13
RD-97 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Turner	**Client:**	Boeing - Area IV
Boring Number/Location:	RD-97; ~300 feet north/northwest of former Building 4059 location	**Drilling Co:**	WDC Exploration
Length, Kelly:	17' **Rods:** 5' and 10' **Collars:** NA	**Subs:** NA	**Bit:** 4" O.D. **Height of K.B.:** NA
Type/Diameter of Bit:	Boart Longyear HQ3 coring bit / 4" O.D.	**Drilling Fluid:** Air	**Rig Type:** CME 85

Job No: 20060-915
Date Started: 4/26/2006
Date Finished: 4/28/2006

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Subrounded	Rounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/HCL None	Weak	Moderate	Strong
0	0%	0%	brown	n/a	1			0-4': no recovery. Cuttings indicate highly weathered orange-brown sandstone																												
5	75%	0%	brown	moist	2	2.5		5.0'-7.5': medium-hard, brown, fine to medium grained sandstone. Moderately to highly weathered. Moist possible healed fracture @ 5.2'						100			x				x					x				x								
	100%	88%	brown	moist	3	2		7.5'-10.0': medium-hard, brown, fine to medium grained sandstone. Moderately weathered. Moist						100			x				x					x				x								
10	100%	85%	gray/brn	moist	4	6		10'-12': hard, orange brown, fine to medium grained sandstone. Slightly weathered. Moist. Transitions to gray between 11.7' and 12.0'.						100			x				x					x				x								
								12'-15': hard, grey, fine to medium grained sandstone with trace coarse sand. Fresh. Moist.						100			x				x					x				x								

Total Depth of Borehole (feet): 74.5'
Groundwater, Depth Encountered: ~50'
Static Water Level: 40.52

Analytical Samples: RD97-01(7.7'-8.2'), RD97-02(10.5'-10.9'), RD97-04(14.4'-14.9')
Geotechnical Samples: RD97-03 (13.9'-14.4')

TABLE C-13
RD-97 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Turner	**Client:**	Boeing - Area IV		
Boring Number/Location:	RD-97; ~300 feet north/northwest of former Building 4059 location	**Drilling Co:**	WDC Exploration	**Job No:**	20060-915
Length, Kelly:	17' **Rods:** 5' and 10' **Collars:** NA	**Subs:** NA	**Bit:** 4" O.D. **Height of K.B.:** NA	**Date Started:**	4/26/2006
Type/Diameter of Bit:	Boart Longyear HQ3 coring bit / 4" O.D.	**Drilling Fluid:**	Air	**Rig Type:** CME 85	**Date Finished:** 4/28/2006

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Subrounded	Rounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
15	98%	85%	gray/brn	moist	5			15'-17.5': hard, gray, fine to medium grained sandstone						100			x				x						x									
								Fresh. Wet from 15' to 16.1'. Dry from 16.1' to 18.3'																														
								17.5'-18.9': hard, orange-brown, fine to medium grained						100			x				x						x									
								sandstone. Slightly weathered. Moist. Low RQD																														
								18.9'-20': hard, gray, fine to medium sandstone. Fresh.						100			x				x						x									
								Moist from 18.3' to 20'																														
20	97%	62%	brn/gray	moist	6	5		20'-21.3': hard, orange-brown fine to medium grained						100			x				x						x									
								sandstone. Slightly weathered. Moist.																														
								21.3'-22.2': hard, gray, fine to coarse grained sandstone.						100				x			x						x									
								Fresh. Moist 21.3'-21.9'. Dry 21.9'-22.1'																														
								22.2'-23.5': hard, orange-brown, fine to coarse grained						100				x			x						x									
								sandstone. Slightly weathered. Moist.																														
								23.5'-25': hard, gray, fine to coarse grained sandstone.						100				x			x						x									
								Fresh. Moist.																														
25	92%	76%	gray/brn	moist	7			25'-27.5': hard, gray, fine to coarse grained sandstone.						100				x			x						x									
								Fresh. Moist.																														
								27.5'-30': moderately hard, orange-brown, fine to coarse						100				x			x					x									
								grained sandstone. Slightly to moderately weathered. Moist																														

Total Depth of Borehole (feet):	74.5'	Analytical Samples: RD97-05(18.6'-19.3'), RD97-06(22.2'-23.0'), RD97-07(28.0'-28.75')	
Groundwater, Depth Encountered:	~50'	Geotechnical Samples: none	
Static Water Level:	40.52		

TABLE C-13
RD-97 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Turner	**Client:**	Boeing - Area IV		
Boring Number/Location:	RD-97; ~300 feet north/northwest of former Building 4059 location	**Drilling Co:**	WDC Exploration	**Job No:**	20060-915
Length, Kelly:	17' **Rods:** 5' and 10' **Collars:** NA	**Subs:** NA	**Bit:** 4" O.D. **Height of K.B.:** NA	**Date Started:**	4/26/2006
Type/Diameter of Bit:	Boart Longyear HQ3 coring bit / 4" O.D.	**Drilling Fluid:**	Air	**Rig Type:** CME 85	**Date Finished:** 4/28/2006

Depth (feet)	Core % Rec	Core RQD	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Subrounded	Rounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
30	97%	24%	gray/brn	moist	8			30'-31.3': hard, gray to brown, fine to coarse grained sandstone. Fresh to slightly weathered. Moist						100				x			x					x			x								
								31.3'-33.6': hard, gray, fine to coarse grained sandstone. Fresh. Moist.						100				x			x					x			x								
								33.6'-35': soft, gray, fine to coarse grained sandstone. Fresh. Moist. Pulverized in several locations by coring action.						100				x			x			x					x								
35	97%	93%	gray	moist	9			35'-37.4': hard, gray, fine to coarse grained sandstone. Fresh. Moist						100				x			x					x			x								
	90%	0%	gray	moist	10			37.4'-39': medium-hard, gray, fine to coarse grained sandstone. Fresh. Moist.						100				x			x					x			x								
								39'-40': soft, gray, fine to coarse gray sandstone. Moist Fresh; no oxidation staining to indicate weathering.						100				x			x			x					x								
40	95%	68%	gray	dry/wet	11			40'-41.5': hard, gray, fine to coarse grained sandstone. Fresh. Wet						100				x			x					x			x								
								41.5'-42.2': very hard, gray, fine to coarse grained sandstone. Fresh. Dry.						100				x			x							x	x								
								42.2'-45': hard, gray, fine to coarse grained sandstone. Fresh. Moist						100				x			x					x			x								

Total Depth of Borehole (feet):	74.5'
Groundwater, Depth Encountered:	~50'
Static Water Level:	40.52

Analytical Samples: RD97-08(34.2'-34.8'), RD97-10(37.4'-38.0'), RD97-11(43.6'-44.3')
Geotechnical Samples: RD96-09(36.0'-36.5')

TABLE C-13
RD-97 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Turner	**Client:**	Boeing - Area IV		
Boring Number/Location:	RD-97; ~300 feet north/northwest of former Building 4059 location	**Drilling Co:**	WDC Exploration	**Job No:**	20060-915
Length, Kelly:	17' **Rods:** 5' and 10' **Collars:** NA	**Subs:** NA	**Bit:** 4" O.D. **Height of K.B.:** NA	**Date Started:**	4/26/2006
Type/Diameter of Bit:	Boart Longyear HQ3 coring bit / 4" O.D.	**Drilling Fluid:**	Air	**Rig Type:** CME 85	**Date Finished:** 4/28/2006

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Subrounded	Rounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
45	100%	42%	gray	moist/wet	12			45'-48.3': hard, gray, fine to coarse grained sandstone.						100				x			x					x		x								
								Fresh. Wet from 45' to 45.7'. Moist below 45.7'. Several																													
								fracture surfaces with heavy oxidation staining.																													
								48.3'-50': hard, gray, fine to coarse grained sandstone. Fresh						100				x			x					x		x								
								Moist. Very broken section of core with no apparent																													
								weathering - likely a result of coring action.																													
50	98%	97%	gray	moist/wet	13			50'-55': hard, gray, fine to coarse grained sandstone. Fresh						100				x			x					x		x								
								Wet from 50'-51'. Dry 51'-51.7'. Moist 51.7'-55' Dry interval is																													
								very hard. Mudstone layer @ 51.3' is 0.03 ft in thickness																													
55	88%	28%	gray	wet	14			55'-60': hard, gray, fine to coarse grained sandstone. Fresh						100				x			x					x		x								
								Wet. Slightly weathered at fracture surfaces. High angle																													
								fracture @58.3'-59.4' shows heavy oxidation staining with																													
								oxication halo penetrating ~0.5 inches into surrounding rock																													

Total Depth of Borehole (feet):	74.5'	Analytical Samples: RD97-12(46.2'-46.8'), RD97-13(51.7'-52.2'), RD97-14(58.4'-59.1')	
Groundwater, Depth Encountered:	~50'	Geotechnical Samples: none	
Static Water Level:	40.52		

TABLE C-13
RD-97 CORE DRILLING DATA
BOEING SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Logged By:	Chris Turner	**Client:**	Boeing - Area IV
Boring Number/Location:	RD-97; ~300 feet north/northwest of former Building 4059 location	**Drilling Co:**	WDC Exploration
Length, Kelly:	17' **Rods:** 5' and 10' **Collars:** NA	**Subs:** NA	**Bit:** 4" O.D. **Height of K.B.:** NA
Type/Diameter of Bit:	Boart Longyear HQ3 coring bit / 4" O.D.	**Drilling Fluid:**	Air

Job No: 20060-915
Date Started: 4/26/2006
Rig Type: CME 85
Date Finished: 4/28/2006

Depth (feet)	Core % Rec	Core Rqd	Color	Moisture Content (Air Rotary)	Core Run No.	Minutes/Run	HNU	Description	Fracture Profile	Analytical Sample	Particle Size Distribution % Boulders	Cobbles	Gravel	Sand	Silt & Clay	Sorting Well	Medium	Poor	Grain Shape Angular	Subangular	Subrounded	Rounded	Apparent Density Very Loose	Loose	Compact	Dense	Very Dense	Plasticity None	Low	Medium	High	Odor Gas, etc (Air Rotary)	Rxn w/ HCL None	Weak	Moderate	Strong
60	92%	76%	gray	wet	15			60'-65': hard, gray, fine to coarse grained sandstone. Fresh. Wet. Slightly higher coarse sand fraction than above.						100				x			x						x		x								
65	80%	46%	gray	wet	16			65'-70': hard, gray, fine to coarse grained sandstone. Fresh. Wet. No oxidation staining on possible fracture surfaces.						100				x			x						x		x								
70	100%	55%	gray	wet	17			70'-74.5': hard, gray, fine to coarse grained sandstone. Fresh Wet. Soft core from 73.8' to 74.5' likely crushed by coring action. Mudstone layer 0.07 ft in thickness @71.2'. Healed or partially healed high angle fractures with no visible oxidation staining. TOTAL DEPTH = 74.5 FEET						95	5			x			x						x		x								

Total Depth of Borehole (feet): 74.5'
Groundwater, Depth Encountered: ~50'
Static Water Level: 40.52

Analytical Samples: RD97-15(60.6'-61.1'), RD97-17(63.6'-64.2'), RD97-18(68.5'-69.0'), RD97-19(72.3'-72.7')
Geotechnical Samples: RD97-16(63.1'-63.6')

HALEY & ALDRICH
326 S. Wilmot #A200
Tucson, Az 85711
Phone 520.326.1898
Fax 520.747.3491

ROTARY BORING DATA

Boeing Santa Susana Field Laboratory

Logged By: J. Raucci	Client: DOE/SSFL		Page 1 of 1
Boring Number/Location: RD-98 / RMHF	Drilling Co: WDC Exploration		Job No: 20060-497
Length, Kelly: 10' Rods: 20' Collars: NA	Subs: Bit:	Height of K.B.:	Date Started: 6/3/2008
Type/Diameter of Bit: Tri-cone/13 3/8" to 20 feet, down-hole hammer/ 5 1/2" to TD	Drilling Fluid: Mud to 20 feet, then air+water to TD	Rig Type: Star 30K	Date Finished: 6/4/2008

Depth (feet)	Time		Color	Moisture Content (Air Rotary)	Sample	Description	Maximum Size (in.)	Particle Size Distribution %					Sorting			Grain Shape				Apparent Density					Plasticity				Odor Gas, etc (Air Rotary)	Reaction with HCl			
	Begin	End						Boulders	Cobbles	Gravel	Sand	Silt & Clay	Well	Medium	Poor	Angular	Subangular	Rounded	Subrounded	Very Loose	Loose	Compact	Dense	Very Dense	None	Low	Medium	High		None	Weak	Moderate	Strong
0-6	0800		10YR 6/2			Unconsolidated fill/soil. Silty Sand, light brown,					65	35			X		X				X											
						poorly sorted, loose, dry																										
6-16						Sandstone, medium yellowish-brown, medium to					100			X			X		X													
						coarse-grained, arkosic - Chatsworth Formation,																										
						weathered																										
16-20		1500	10YR5/4			Silty Sandstone, medium yellowish-brown, fine-					70	30			X				X												
						grained w/ some clay - Chatsworth Formation																										
						NOTE: switched from mud rotary to air rotary with																										
						water at 20 feet depth																										
20-25	0825		10YR5/4			Sandstone w/ silt, medium yellowish-brown, fine-					85	15			X				X												
						to coarse- grained, poorly sorted																										
25-33			10YR5/4			Silty Sandstone, medium yellowish-brown, fine-					80	20		X					X												
						grained, moderately sorted																										
33-40			N6			Sandstone, fine- to medium-grained, medium gray,					90	10		X				X	X													
						micaceous, moderately sorted, well-cemented																										
40-50						Interbedded brown Silty Sandstone (as above)					80	20		X					X												
						with gray Sandstone (as above).					90	10		X					X												
50-65		1140	10YR5/4			Silty sandstone, medium yellowish brown					80	20		X					X												
						AS ABOVE																										

Total Depth of Borehole (feet): 65 feet
Groundwater, Depth Encountered: below 50'
Static: 35' below ground surface (after 15 hours recharge)

TABLE A-38

LITHOLOGIC LOG OF MONITOR WELL RS-28

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 1	ASPHALT CONCRETE & AGGREGATE SUB-BASE	
1 - 3	SAND	Brown, fine-grained, silty, moderately sorted, loose, moderate moisture content.
3 - 19	SANDSTONE	Orange-brown, fine-grained, moderately to well sorted, subrounded or subangular, weakly cemented, moderate moisture content.

TOTAL DEPTH OF BOREHOLE: 19 FEET

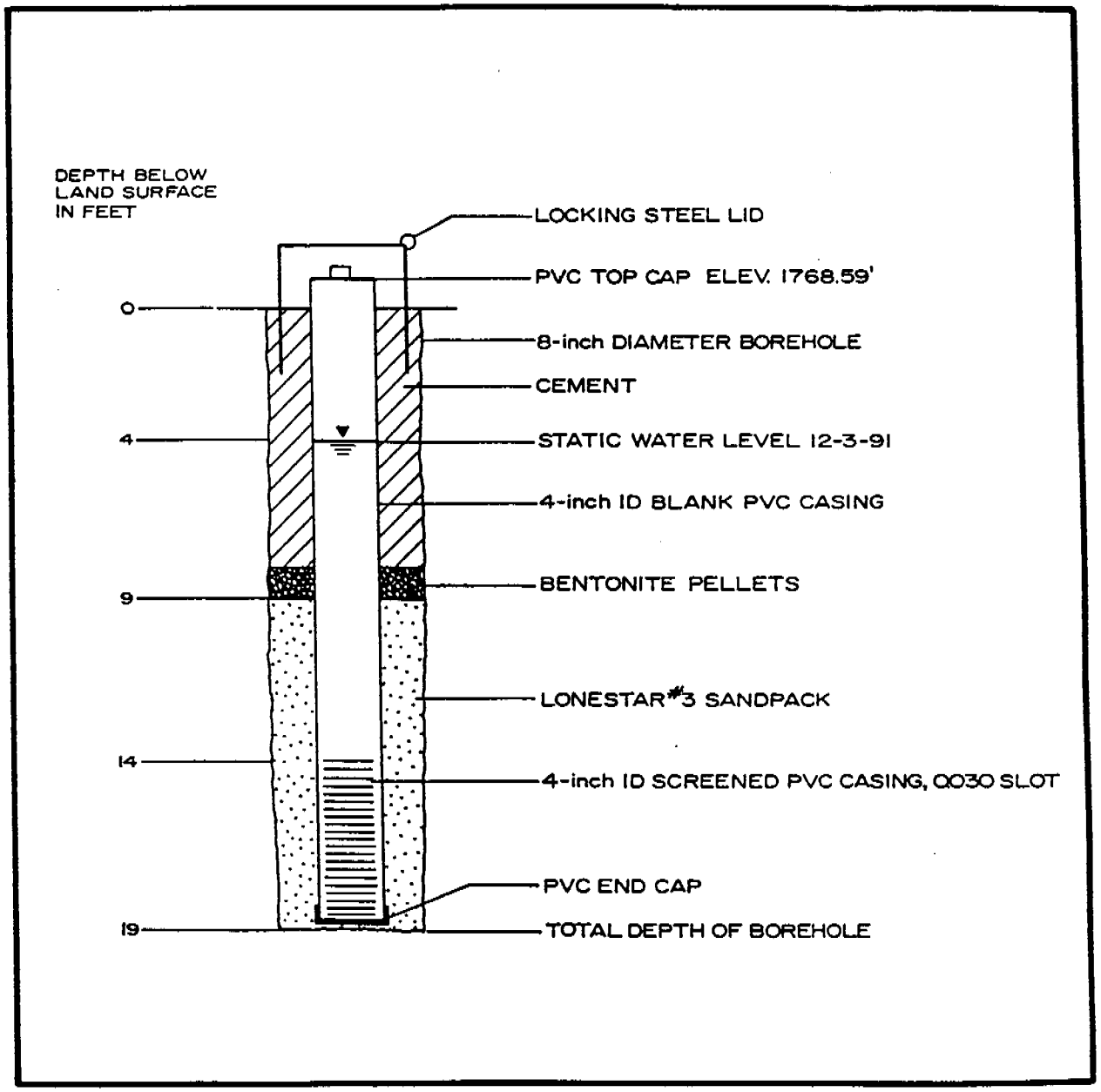


FIGURE C-27
SCHEMATIC DIAGRAM OF MONITOR WELL RS-28

APPENDIX C

ATTACHMENT C-3

DATA QUALITY, VALIDATION AND LABORATORY REPORTS
(Electronic Copies Available on Request)

APPENDIX C

ATTACHMENT C-4

BUILDING EVALUATION DOCUMENTATION LOGS
(Electronic Copy)

Building Feature Documentation Logs

This attachment contains Building Feature Documentation Logs and map(s) showing the building feature locations. As required by DTSC, building feature inspections were performed and sampling requirements were determined consistent with the Standard Operating Procedures: Building Feature Evaluation and Sampling (MWH/CH2M HILL, 2008).

The logs presented in this attachment describe building feature conditions at the time of the site inspection, and they reflect sample recommendations as of the inspection date. The map(s) show recommended sample locations for both pre- and post-demolition samples.

Consistent with the standard operating procedures referenced above, pre-demolition samples were collected and analyzed prior to the publication of this report. In addition, post-demolition samples were collected for buildings that were demolished prior to the publication of this report. Therefore, since the map shows all recommended samples (both pre-demolition and post demolition), it should be noted that some of the locations have been sampled as of the date of this report, while others have not. For pre-demolition samples that were recommended as a result of the inspection, sample identification numbers are included on the logs. To further clarify:

- For building features where pre-demolition samples were warranted, sampling was completed, and the sample identification number(s) are presented on these logs. The sample locations and identification numbers are presented together on map(s) in the main body of this Appendix.

- For building features where post-demolition sampling was recommended and the buildings were demolished prior to the date of this report, samples were collected. The sample locations and identification numbers are presented together on map(s) in the main body of this Appendix.

- For building features where post-demolition sampling was recommended but buildings were not demolished prior the date of this report, samples will be collected at a later date. Recommended sample locations are shown on the map(s) within this attachment, but not on map(s) in the main body of this Appendix; sample identification numbers have not yet been assigned.

Base Map Legend

- Study Areas
- RFI Groups
- Existing Building / Structure
- Removed Building / Structure
- Other Tanks
- Sumps
- Awnings
- Miscellaneous Instrastructure
- Surface Water Divide
- A/C Paving
- Concrete
- Retaining Wall
- Fences
- DirtRoads
- Excavation
- Leachfield
- Bedrock Outcrops
- Pipe
- Elevation Contour
- Well

Figure Legend

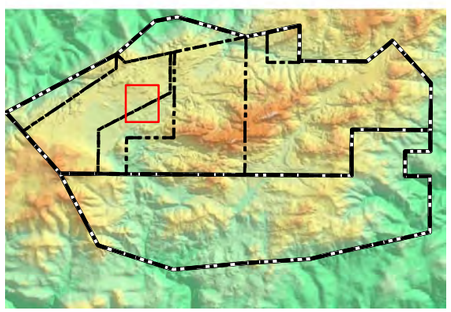
- Air Vent / Intake
- Bathroom Sinks
- Compressor
- Culvert
- Drain Line Discharge
- Floor Drain
- Lab Sinks
- Manhole
- Removed Sink
- Sewer Cleanout
- Drainage Swale
- Door
- Crack
- Drain Line
- Trench
- Equipment Support
- Soil Pre-Demo Sample Location
- Soil / Soil Vapor Pre-Demo Sample Location
- Post-Demo Sample Location
- Asphalt Swale
- Chem Storage
- Stains
- Cracked Concrete
- Degraded Concrete
- Drum / Box Inspection Area
- Storage
- Substation
- Sump
- Trench

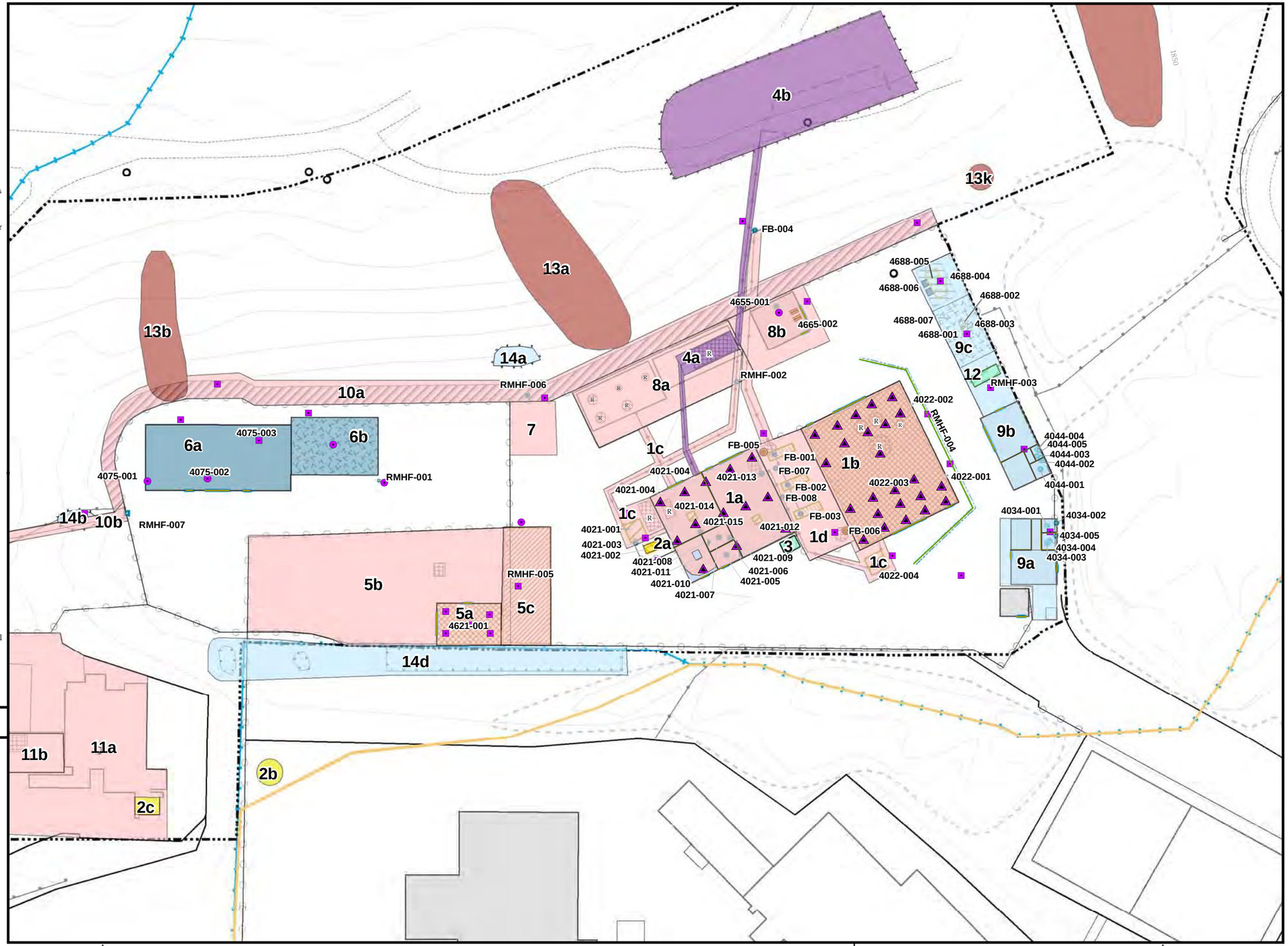
Chemical Use Area

- Multiple Use
- Metal
- Potential
- Petroleum
- Debris Areas
- Oil / PCBs
- Leach Field

Document: BFD_RMHF_CUA.mxd Date: May 20, 2009

Feet
0 25 50





MWH

SANTA SUSANA FIELD LABORATORY

Internal Building Features
RMHF
Group 7

FIGURE C-4A

Base Map Legend

- Study Areas
- RFI Groups
- Existing Building / Structure
- Removed Building / Structure
- Other Tanks
- Sumps
- Awnings
- Miscellaneous Instrastructure
- Surface Water Divide
- A/C Paving
- Concrete
- Retaining Wall
- Fences
- DirtRoads
- Excavation
- Leachfield
- Bedrock Outcrops
- Pipe
- Elevation Contour
- Well

Figure Legend

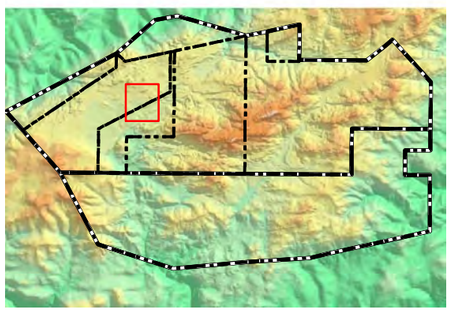
- Air Vent / Intake
- Bathroom Sinks
- Compressor
- Culvert
- Drain Line Discharge
- Floor Drain
- Lab Sinks
- Manhole
- Removed Sink
- Sewer Cleanout
- Drainage Swale
- Door
- Crack
- Drain Line
- Trench
- Equipment Support
- Soil Pre-Demo Sample Location
- Soil / Soil Vapor Pre-Demo Sample Location
- Post-Demo Sample Location
- Asphalt Swale
- Chem Storage
- Stains
- Cracked Concrete
- Degraded Concrete
- Drum / Box Inspection Area
- Storage
- Substation
- Sump
- Trench

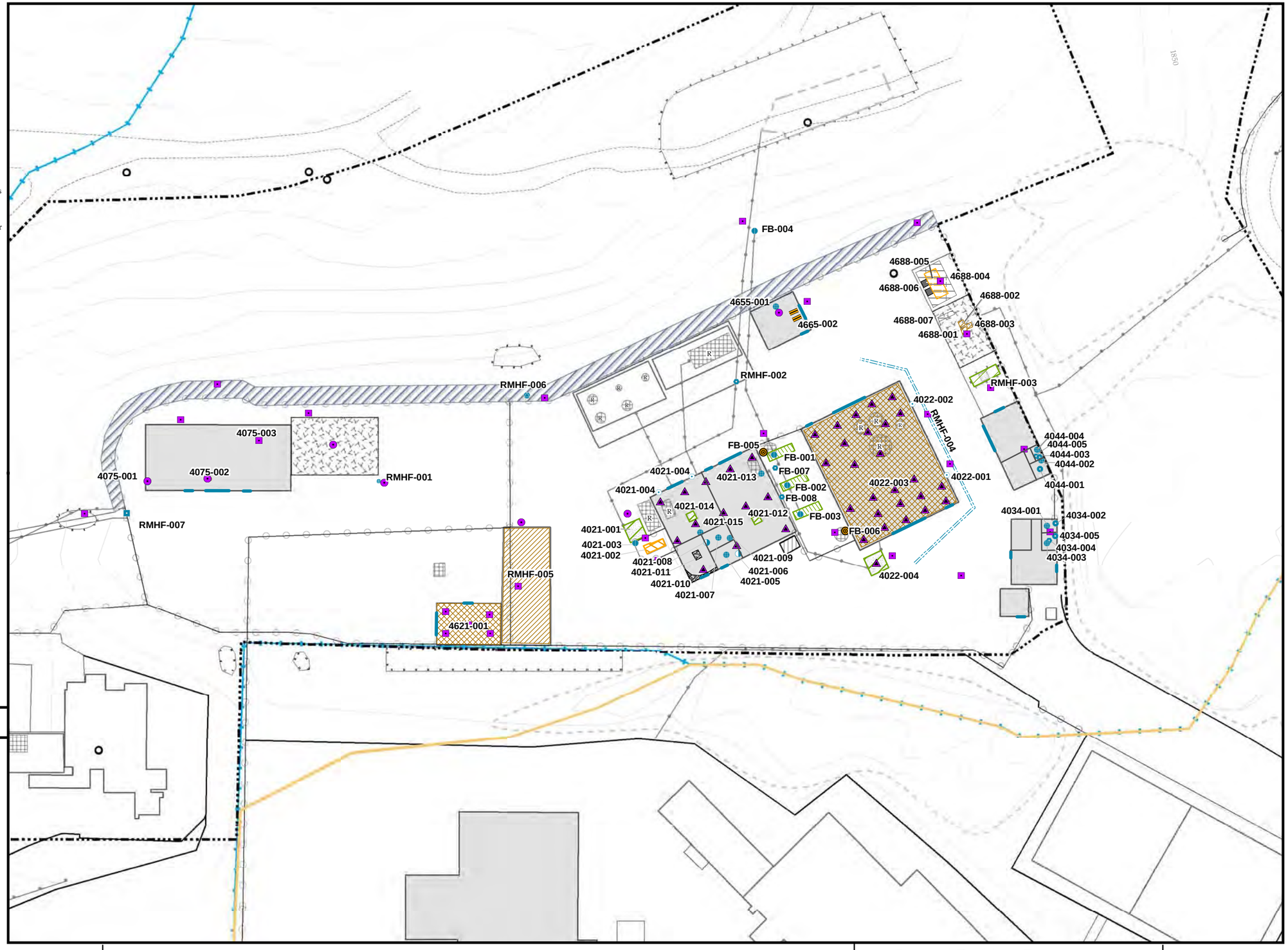
Document: BFD_RMHF.mxd

Date: May 20, 2009

Feet

0 25 50





MWH

S A N T A S U S A N A F I E L D L A B O R A T O R Y

Internal Building Features
RMHF
Group 7

FIGURE C-4B

Base Map Legend

- Study Areas
- RFI Groups
- Existing Building / Structure
- Removed Building / Structure
- Other Tanks
- Sumps
- Awnings
- Miscellaneous Instrastructure
- Surface Water Divide
- A/C Paving
- Concrete
- Retaining Wall
- Fences
- DirtRoads
- Excavation
- Leachfield
- Bedrock Outcrops
- Pipe
- Elevation Contour
- Well

Figure Legend

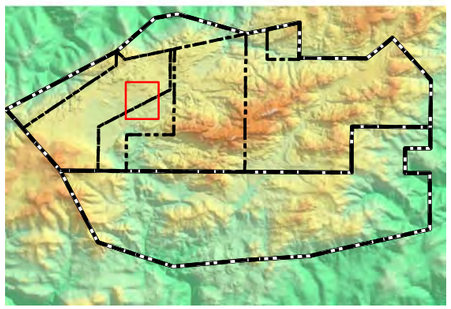
- Sinks
- Floor Drain
- Sewer Cleanout
- Door
- Drain Line
- Soil Pre-Demo Sample Location
- Soil / Soil Vapor Pre-Demo Sample Location
- Post-Demo Sample Location



Document: BFD_RMHF.mxd

Date: May 20, 2009

0 5 10 20 Feet



MWH

SANTA SUSANA FIELD LABORATORY

Internal Building Features
RMHF
Group 7

FIGURE C-4C

Base Map Legend

- Study Areas
- RFI Groups
- Existing Building / Structure
- Removed Building / Structure
- Other Tanks
- Sumps
- Awnings
- Miscellaneous Instrastructure
- Surface Water Divide
- A/C Paving
- Concrete
- Retaining Wall
- Fences
- DirtRoads
- Excavation
- Leachfield
- Bedrock Outcrops
- Pipe
- Elevation Contour
- Well

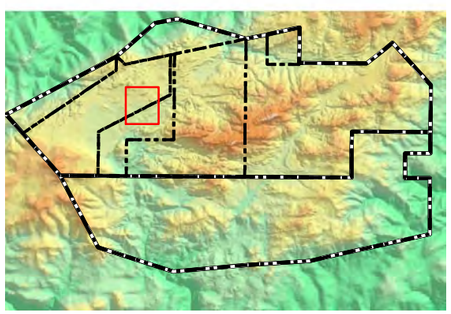
Figure Legend

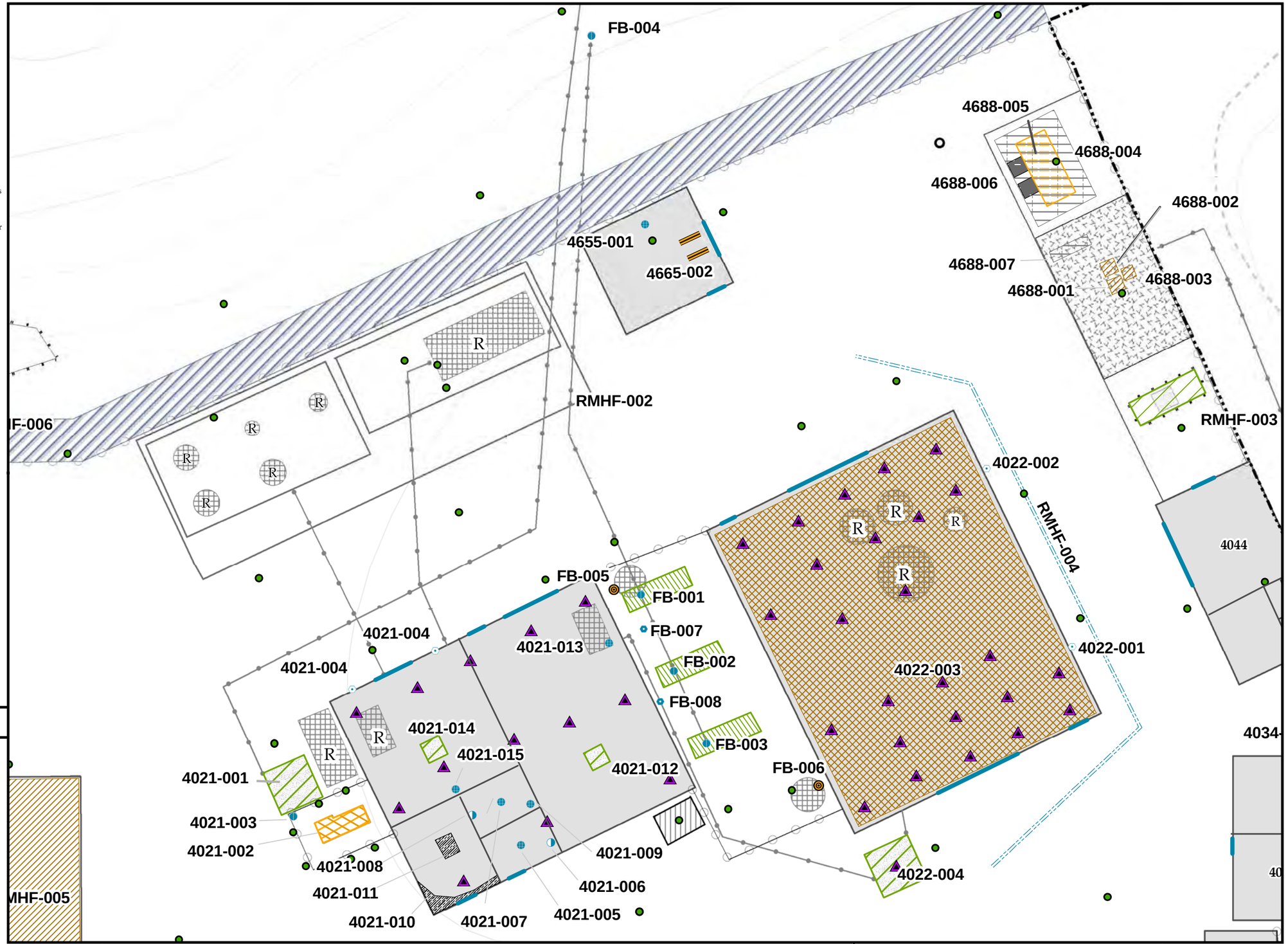
- Air Vent / Intake
- Compressor
- Drain Line Discharge
- Floor Drain
- Removed Sink/Shower
- Sewer Cleanout
- Door
- Surface Water Path
- Equipment Support
- Sump
- Trench
- Asphalt Swale
- Chem Storage
- Stains
- Cracked Concrete
- Degraded Concrete
- Drum / Box Inspection Area
- Storage
- Substation
- Soil Pre-Demo Sample Location
- Soil / Soil Vapor Pre-Demo Sample Location
- Post-Demo Sample Location

Document: BFD_RMHF.mxd

Date: May 20, 2009

Feet
0 5 10 20





MWH

SANTA SUSANA FIELD LABORATORY

Internal Building Features
RMHF
Group 7

FIGURE C-4D

Base Map Legend

- Study Areas
- RFI Groups
- Existing Building / Structure
- Removed Building / Structure
- Other Tanks
- Sumps
- Awnings
- Miscellaneous Instrastructure
- Surface Water Divide
- A/C Paving
- Concrete
- Retaining Wall
- Fences
- DirtRoads
- Excavation
- Leachfield
- Bedrock Outcrops
- Pipe
- Elevation Contour
- Well

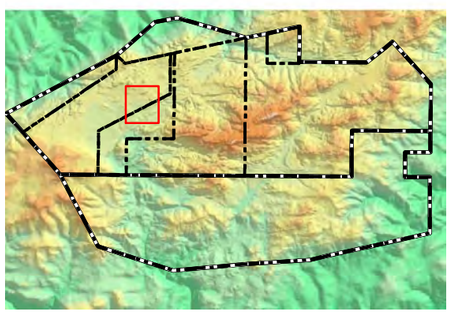
Figure Legend

- Floor Drain
- Manhole
- Door
- Cracked Concrete
- Asphalt Swale
- Chem Storage
- Storage
- Soil Pre-Demo Sample Location
- Soil / Soil Vapor Pre-Demo Sample Location
- Post-Demo Sample Location

RMHF-006
4075-003
4075-002
4075-001
RMHF-001
RMHF-007
RMHF-005
4621-001

Document: BFD_RMHF.mxd Date: May 20, 2009

Feet
0 5 10 20



MWH

SANTA SUSANA FIELD LABORATORY

Internal Building Features
RMHF
Group 7

FIGURE C-4E

TABLE C-4A
RMHF RFI SITE BUILDING FEATURE COORDINATES
(Page 1 of 2)

Group Number	RFI Site	Building Number	Feature ID	Easting	Northing
7	RMHF	4021	4021-001	1785472.546	267846.59
7	RMHF	4021	4021-002	1785487.077	267837.89
7	RMHF	4021	4021-003	1785447.918	267839.503
7	RMHF	4021	4021-004	1785507.026	267873.5
7	RMHF	4021	4021-005	1785524.644	267833.547
7	RMHF	4021	4021-006	1785530.735	267834.143
7	RMHF	4021	4021-007	1785520.566	267842.358
7	RMHF	4021	4021-008	1785514.623	267839.817
7	RMHF	4021	4021-009	1785526.583	267841.976
7	RMHF	4021	4021-010	1785511.744	267822.448
7	RMHF	4021	4021-011	1785509.561	267833.373
7	RMHF	4021	4021-012	1785540.33	267851.45
7	RMHF	4021	4021-013	1785542.657	267874.941
7	RMHF	4021	4021-014	1785506.594	267853.376
7	RMHF	4021	4021-015	1785511.227	267845.055
7	RMHF	4022	4022-001	1785637.829	267874.303
7	RMHF	4022	4022-002	1785620.242	267910.839
7	RMHF	4022	4022-003	1785601.662	267879.327
7	RMHF	4022	4022-004	1785601.595	267829.044
7	RMHF	4034	4034-001	1785689.262	267848.168
7	RMHF	4034	4034-002	1785693.711	267849.617
7	RMHF	4034	4034-003	1785689.288	267839.658
7	RMHF	4034	4034-004	1785690.374	267840.848
7	RMHF	4034	4034-005	1756893.452	267843.279
7	RMHF	4044	4044-001	1785685.766	267877.382
7	RMHF	4044	4044-002	1785686.268	267881.918
7	RMHF	4044	4044-003	1785685.501	267883.352
7	RMHF	4044	4044-004	1785683.7	267884.052
7	RMHF	4044	4044-005	1785684.267	267887.454
7	RMHF	4075	4075-001	1785227.526	267870.789
7	RMHF	4075	4075-002	1785258.88	267872.372
7	RMHF	4075	4075-003	1785285.08	267891.787
7	RMHF	4665	4665-001	1785550.115	267960.868
7	RMHF	4665	4665-002	1785560.073	267956.883
7	RMHF	4688	4688-001	1785646.856	267948.695
7	RMHF	4688	4688-002	1785645.488	267932.141
7	RMHF	4688	4688-003	1785649.34	267951.026
7	RMHF	4688	4688-004	1785634.933	267975.974
7	RMHF	4688	4688-005	1785630.943	267974.282
7	RMHF	4688	4688-006	1785626.903	267972.792
7	RMHF	4688	4688-007	1785635.504	267954.523
7	RMHF	Filter / Blower Area	FB-001	1785549.23	267885.037
7	RMHF	Filter / Blower Area	FB-002	1785556.027	267869.345
7	RMHF	Filter / Blower Area	FB-003	1785562.718	267854.418

TABLE C-4A
RMHF RFI SITE BUILDING FEATURE COORDINATES
(Page 2 of 2)

Group Number	RFI Site	Building Number	Feature ID	Easting	Northing
7	RMHF	Filter / Blower Area	FB-004	1785539.039	267999.904
7	RMHF	Filter / Blower Area	FB-005	1785543.702	267886.017
7	RMHF	Filter / Blower Area	FB-006	1785585.823	267845.72
7	RMHF	RMHF	RMHF-001	1785346.238	267871.37
7	RMHF	RMHF	RMHF-002	1785529.761	267922.299
7	RMHF	RMHF	RMHF-003	1785656.717	267925.171
7	RMHF	RMHF	RMHF-004	1785618.347	267889.111
7	RMHF	RMHF	RMHF-005	1785422.551	267817.961
7	RMHF	RMHF	RMHF-006	1785422.246	267915.339
7	RMHF	RMHF	RMHF-007	1785217.674	267851.24

MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**RMHF Fenced Area**

Photograph ID: 001

Date: Mar 4, 2009

Location / Direction:
RMHF Fenced Area/
North

Comments:
RMHF gated entryway. Buildings 4021, 4022 and 4658 are visible.



Photograph ID: 002

Date: Feb 24, 2009

Location / Direction:
RMHF Fenced Area/
North

Comments:
RMHF surface water drainage pathway east of Building 4022. Buildings 4044 (corner) and 4688 visible on right hand side.



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**RMHF Fenced Area**

Photograph ID: 003

Date: Feb 24, 2009

Location / Direction:
RMHF Fenced Area/
South

Comments:
Eastern RMHF buildings -- Buildings 4044 and 4034 on left hand side, Building 4022 on right hand side.



Photograph ID: 004

Date: Feb 24, 2009

Location / Direction:
RMHF Fenced Area/
Southeast

Comments:
Buildings 4021 and 4022



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**RMHF Fenced Area**

Photograph ID: 005

Date: Feb 24, 2009

Location / Direction:
RMHF Fenced Area/
East

Comments:
View of eastern RMHF from western boundary. Note that RMHF fenced area is sloped to the west. Buildings 4075 and 4563 on left hand side, Building 4621 on right hand side, Buildings 4021 and 4022 in center



Photograph ID: 006

Date: Apr 14, 2009

Location / Direction:
RMHF Fenced Area/
West

Comments:
View of western RMHF from western boundary. Note that RMHF fenced area is sloped to the west. Building 4022 on left hand side, Building 4665 on right hand side, Buildings 4075 and 4563 in far-field.



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**RMHF Fenced Area**

Photograph ID: 007

Date: Mar 4, 2009

Location / Direction:
RMHF Fenced Area - Beginning of Asphalt-Lined Drainage/
West

Comments:
Asphalt lined drainage begins just north of Building 4688. Building 4665 visible near center of photo.



Photograph ID: 008

Date: Mar 4, 2009

Location / Direction:
RMHF Fenced Area - Beginning of Asphalt-Lined Drainage/
West

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**RMHF Fenced Area**

Photograph ID: 009

Date: Mar 4, 2009

Location / Direction:
RMHF Fenced Area - Beginning of Asphalt-Lined Drainage/
West

Comments:
Buildings 4563 and 4075 visible near center of photo.



Photograph ID: 011

Date: Feb 24, 2009

Location / Direction:
RMHF Fenced Area - Waste Receiving Yard/
Northwest

Comments:
Waste Receiving Yard located near the center of the RMHF fenced area along the northern fence line.



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**RMHF Fenced Area**

Photograph ID: 012

Date: Mar 4, 2009

Location / Direction:
RMHF Fenced Area - Building 4621 and Mixed Waste Storage Yard/
South

Comments:



Photograph ID: 013

Date: Apr 14, 2009

Location / Direction:
RMHF Fenced Area - Mixed Waste Storage Yard Entrance/
Southwest

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**RMHF Fenced Area**

Photograph ID: 014

Date: Mar 4, 2009

Location / Direction:
RMHF Fenced Area - Building 4663 Storage Area/ Southeast

Comments:
Building 4663 Located on the Eastern boundry of the Mixed Waste Storage Yard



Building Feature Documentation Log
Feature Number: RMHF-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **RMHF Area**
Building Owner: **DOE**
Building Name: **RMHF Area**
Building Use: **RMHF Area**

Feature Description:
Feature Type: **Manhole**
Operational Use / Process: **Sanitary waste conveyance**
Associated Chemicals: **None**
Discharge: **Yes**
Size: **2.5 ft Diameter**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4563, downslope from 4021/4022**
Likelihood of Impact from Other Source: **Potential**
Comments:
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Collected sample adjacent to manhole during Group 7 Data Gap Sampling.**
Sampling Type: **Soil Vapor / Soil Matrix**
Sample ID Number(s): **RMSV0112 / RMBS0112**
Analyses: **VOCs, SVOCs, TPH, Metals, PCBs**

Photo 1-Looking West



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: RMHF-002
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **RMHF Area**
Building Owner: **DOE**
Building Name: **RMHF Area**
Building Use: **RMHF Area**

Feature Description:
Feature Type: **Cleanout**
Operational Use / Process: **Sanitary waste conveyance**
Associated Chemicals: **None**
Discharge: **Yes**
Size: **5" diameter**
Construction Material: **Metal**
Status: **Abandoned in Place / Backfilled**

Feature Condition:
General Condition: **Intact, but has standing water and rust**
Debris: **No**
Staining: **Yes (rust)**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to 4021/4022**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cleanout for former Building 4021 Leach Field or Building 4021/4022 low-level radioactive waste water system**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 1-Looking Northwest



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: RMHF-002
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: RMHF-003
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **RMHF Area**
Building Owner: **DOE**
Building Name: **RMHF Area**
Building Use: **RMHF Area**

Feature Description:
Feature Type: **Former Oil Sump**
Operational Use / Process: **Sump**
Associated Chemicals: **Not documented, but may have included oils, fuels, solvents, liquid wastes.**
Discharge: **No**
Size: **4' by 4' by 9' deep**
Construction Material: **Concrete**
Status: **Removed**

Feature Condition:
General Condition: **Removed**
Debris: **Cannot inspect**
Staining: **Cannot inspect**
Odor: **Cannot inspect**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Between Buildings 4044 and 4688**
Likelihood of Impact from Other Source: **Potential**
Comments: **Sump removed in 2007 and is assumed to be backfilled. Concrete was not repaired, but was covered with a metal plate. Due to storage container atop plate, former sump are could not be inspected.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Collected sample at the storage unit to assess potential impacts from former oil sump during Group 7 Data Gap Sampling**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0047**

Photo 1-Looking East



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: RMHF-003
Santa Susana Field Laboratory, Ventura County, California

Analyses: **VOCs, SVOCs, TPH, Metals, PCBs**

Photo 3 -Looking North



MWH

Inspector: M. Chell
Date: Apr 14, 2009

Building Feature Documentation Log
Feature Number: RMHF-004
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **RMHF Area**
Building Owner: **DOE**
Building Name: **RMHF Area**
Building Use: **RMHF Area**

Feature Description:
Feature Type: **Drainage pathway**
Operational Use / Process: **Storm water conveyance**
Associated Chemicals: **None**
Discharge: **Yes**
Size: **1 ft wide by 160 ft long**
Construction Material: **Asphalt**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **Yes (water)**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Buildings 4022, 4034, 4044**
Likelihood of Impact from Other Source: **Potential**
Comments: **Collects drainage water from Buildings 4022, 4034, 4044, 4688 and potentially the Filter/Blower Area**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Collected samples along the surface water pathway during the Group 7 Data Gap sampling**
Sampling Type:
Sample ID Number(s): **RMBS0046, RMBS0092**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking Southwest

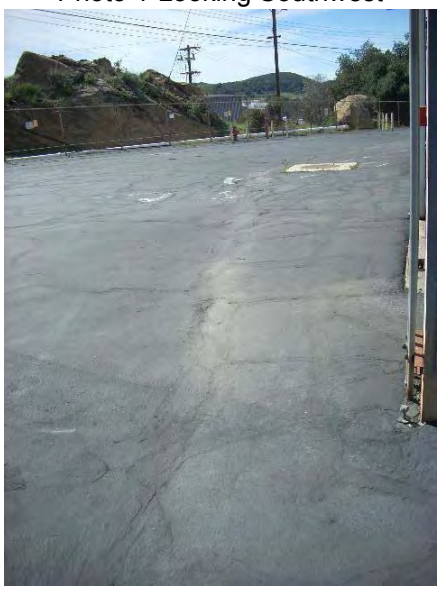
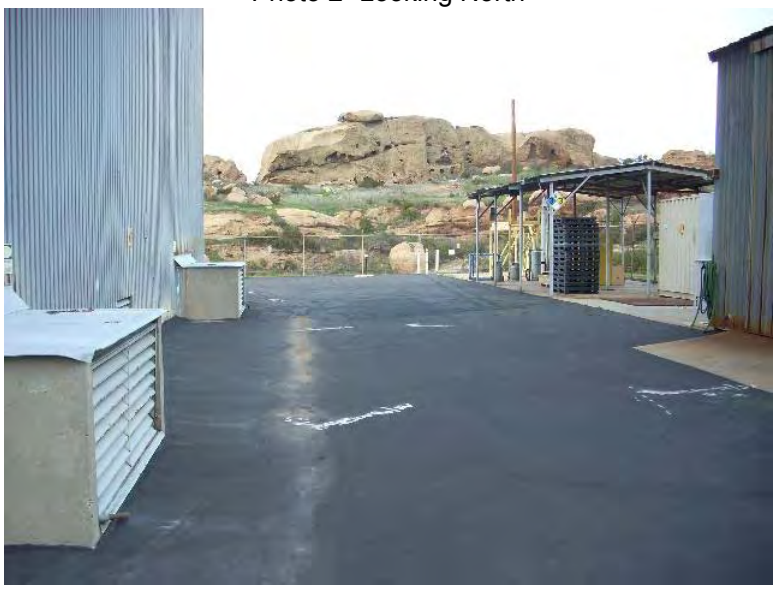


Photo 2 -Looking North



Building Feature Documentation Log
Feature Number: RMHF-004
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking Southeast



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: RMHF-005
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **RMHF Area**
Building Owner: **DOE**
Building Name: **RMHF Area**
Building Use: **RMHF Area**

Feature Description:
Feature Type: **Former Building 4663 Foundation**
Operational Use / Process: **Storage Area**
Associated Chemicals: **None**
Discharge: **No**
Size: **30 ft by 60 ft**
Construction Material: **Concrete**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Upslope from Building 4621 and the Mixed Waste Storage Yard**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Former storage area now holds two large metal storage containers**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Collected samples at the Building 4663 Equipment Storage Area during Group 7 Data Gap Sampling**
Sampling Type: **Soil Vapor / Soil Matrix**
Sample ID Number(s): **RMBS0020, RMSV0021 / RMBS0021**
Analyses: **VOCs, SVOCs, TPH, Metals, PCBs**

Photo 1-Looking South



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: RMHF-006
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **RMHF Area**
Building Owner: **DOE**
Building Name: **RMHF Area**
Building Use: **RMHF Area**

Feature Description:
Feature Type: **Drainage swale**
Operational Use / Process: **Storm water conveyance**
Associated Chemicals: **None**
Discharge: **Yes**
Size: **3 ft by 100 ft**
Construction Material: **Asphalt**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4075**
Likelihood of Impact from Other Source: **Potential**
Comments: **Conveys surface water from all buildings upslope (4021, 4022, 4034, 4044, 4563, 4688)**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Collected samples along the asphalt lined drainage swale during the Group 7 Data Gap sampling event.**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0051 through RMBS0053, RMBS0120, RMBS0121**
Analyses: **VOCs, SVOCs, TPH, Metals, PCBs**

Photo 1-Looking West

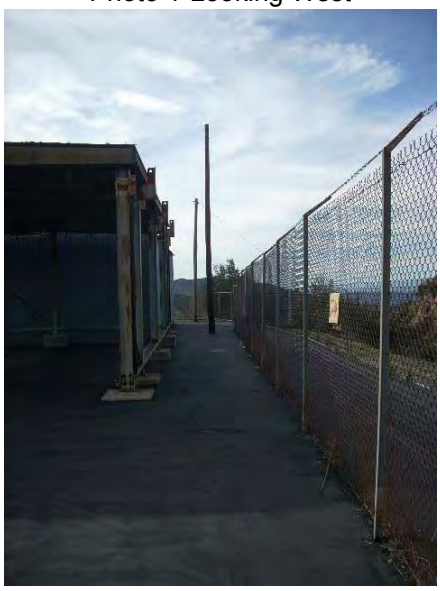


Photo 2 -Looking West

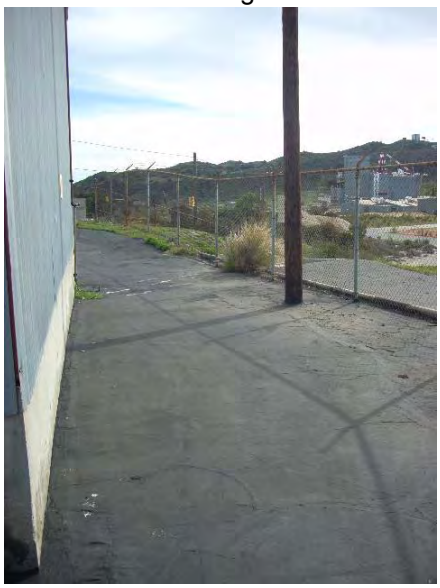


MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: RMHF-006
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking Southwest



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: RMHF-007
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **RMHF Area**
Building Owner: **DOE**
Building Name: **RMHF Area**
Building Use: **RMHF Area**

Feature Description:
Feature Type: **Culvert**
Operational Use / Process: **Storm water conveyance**
Associated Chemicals: **None**
Discharge: **Yes**
Size: **6 ft by 3 ft**
Construction Material: **Concrete**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4075**
Likelihood of Impact from Other Source: **Potential**
Comments: **Conveys surface water from all RMHF buildings and area. Also collects water from Building 4075 floor drain.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Collected samples along the former discharge channel during the Group 7 Data Gap Sampling**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0055, RMBS0056**
Analyses: **VOCs, SVOCs, TPH, Metals, PCBs**

Photo 1-Looking West



MWH

Inspector: M. Chell
Date: Feb 24, 2009

MWH

Photographic Log - RMHF RFI SIte

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI SIte**	**Site Location:**	**Building 4021 Radioactive Material Decontamination and Packaging**

Photograph ID: 001

Date: Apr 14, 2009

Location / Direction: Building 4021 Radioactive Waste Decontamination and Packaging - Southern Exterior/ North

Comments:



Photograph ID: 002

Date: Apr 14, 2009

Location / Direction: Building 4021 Radioactive Waste Decontamination and Packaging - Northern Exterior/ South

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI SIte**	**Site Location:**	**Building 4021 Radioactive Material Decontamination and Packaging**

Photograph ID: 003

Date: Apr 14, 2009

Location / Direction: Building 4021 Radioactive Waste Decontamination and Packaging - Western Exterior/ East

Comments:



Photograph ID: 004

Date: Apr 14, 2009

Location / Direction: Building 4021 Radioactive Waste Decontamination and Packaging - Office, Western Side/ Northwest

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI SIte**	**Site Location:**	**Building 4021 Radioactive Material Decontamination and Packaging**

Photograph ID: 005 **Date:** Apr 14, 2009 **Location / Direction:** Building 4021 Radioactive Waste Decontamination and Packaging - Office, Eastern Side/ Northeast **Comments:**	
Photograph ID: 006 **Date:** Apr 14, 2009 **Location / Direction:** Building 4021 Radioactive Waste Decontamination and Packaging - Cold Change Room/ Northwest **Comments:**	

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI SIte**	**Site Location:**	**Building 4021 Radioactive Material Decontamination and Packaging**

Photograph ID: 007 **Date:** Apr 14, 2009 **Location / Direction:** Building 4021 Radioactive Waste Decontamination and Packaging - Cold Change Room/ Northeast **Comments:**	
Photograph ID: 008 **Date:** Apr 14, 2009 **Location / Direction:** Building 4021 Radioactive Waste Decontamination and Packaging - Cold Change Room/ Southeast **Comments:**	

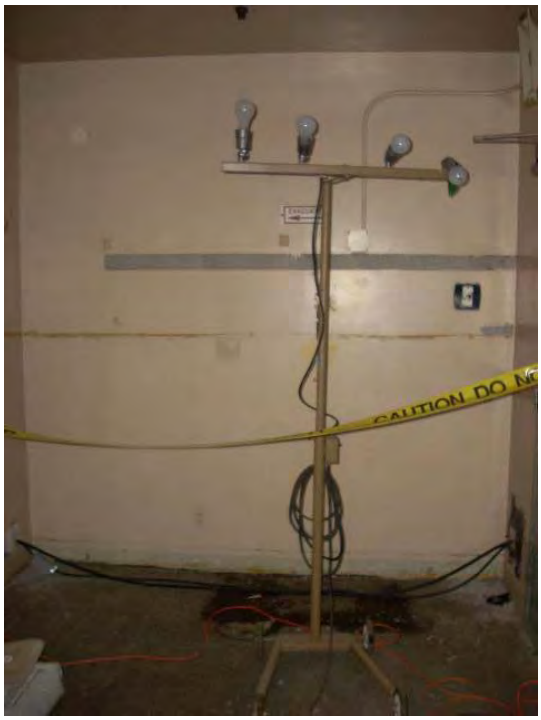
Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI SIte**	**Site Location:**	**Building 4021 Radioactive Material Decontamination and Packaging**

Photograph ID: 009

Date: Feb 24, 2009

Location / Direction:
Building 4021 Radioactive Waste Decontamination and Packaging - Hot Change Room/
West

Comments:



Photograph ID: 010

Date: Feb 24, 2009

Location / Direction:
Building 4021 Radioactive Waste Decontamination and Packaging - Hot Change Room/
East

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI SIte**	**Site Location:**	**Building 4021 Radioactive Material Decontamination and Packaging**

Photograph ID: 011

Date: Apr 14, 2009

Location / Direction: Building 4021 Radioactive Waste Decontamination and Packaging - Hot Change Room former shower location/ Southeast

Comments:



Photograph ID: 012

Date: Feb 24, 2009

Location / Direction: Building 4021 Radioactive Waste Decontamination and Packaging - Decontamination Room/ South

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI SIte**	**Site Location:**	**Building 4021 Radioactive Material Decontamination and Packaging**

Photograph ID: 013

Date: Feb 24, 2009

Location / Direction: Building 4021 Radioactive Waste Decontamination and Packaging - Packaging Room/ Southeast

Comments:



Photograph ID: 014

Date: Feb 24, 2009

Location / Direction: Building 4021 Radioactive Waste Decontamination and Packaging - Packaging Room/ Southwest

Comments:



Building Feature Documentation Log
Feature Number: 4021-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Sump**
Operational Use / Process: **Radioactive Water Conveyance**
Associated Chemicals: **Radioactive Water/Mixed Waste**
Discharge: **Yes,**
Size:
Construction Material: **Concrete/Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Cannot Inspect**
Debris: **Cannot Inspect**
Staining: **Cannot Inspect**
Odor: **Cannot Inspect**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4021, part of radioactive water conveyance system connecting Buildings 4021, 4022, and former 4664**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect due to radioactivity hazard.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample post-demolition**
Sampling Description/Notes:
Sampling Type: **Soil / Soil Vapor**
Sample ID Number(s): **RMSV0030 / RMBS0030**

Photo 1-Looking East

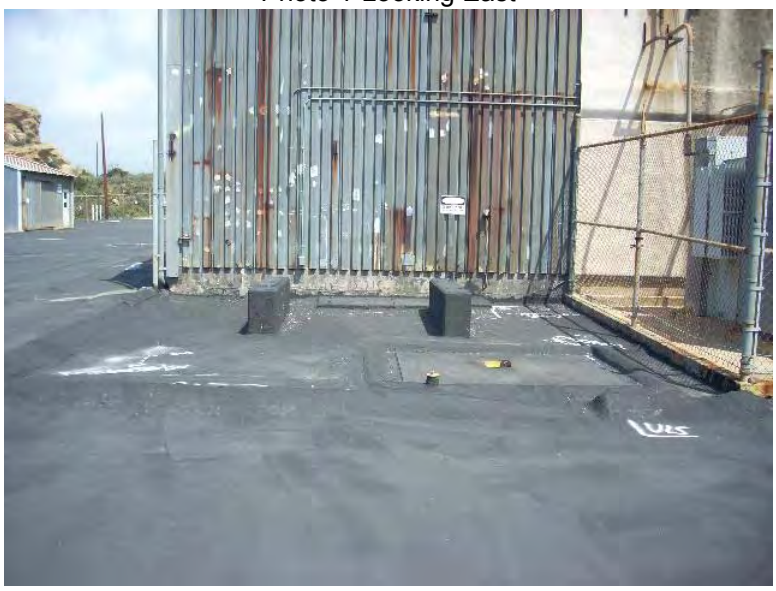


Photo 2 -Looking West



MWH

Inspector:
Date:

Building Feature Documentation Log
Feature Number: 4021-001
Santa Susana Field Laboratory, Ventura County, California

Analyses: **VOCs, SVOCs, TPH, PCBs, Metals**

MWH

Inspector: M. Chell
Date: Apr 14, 2009

Building Feature Documentation Log
Feature Number: 4021-002
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Substation**
Operational Use / Process: **Electricity distribution**
Associated Chemicals: **Oils/PCBs**
Discharge: **No**
Size: **4 ft by 4 ft by 8 ft tall**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4021**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Transformers installed prior to 1983 may have used oils that contained PCBs**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample pre-demolition**
Sampling Description/Notes:
Sampling Type: **Soil**
Sample ID Number(s): **RMBS0022, RMBS0023**
Analyses: **PCBs**

Photo 1-Looking North



Photo 2 -Looking East



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4021-003
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Sump with drainpipe**
Operational Use / Process: **Storm water conveyance**
Associated Chemicals: **None documented**
Discharge: **Yes**
Size: **1 ft by 1.5 ft**
Construction Material: **Concrete/Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

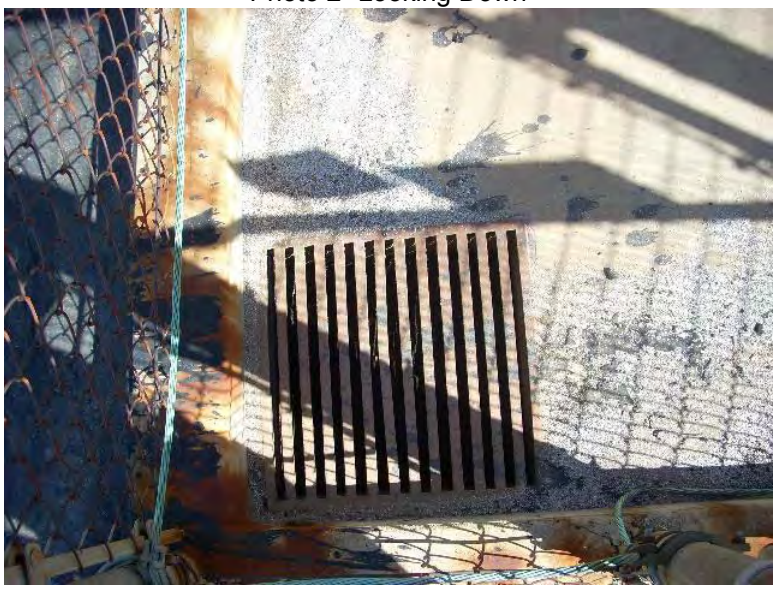
Additional Information:
Proximity to Nearest Chemical Use Area: **Inside bermed area surrounding Building 4021 Substation.**
Likelihood of Impact from Other Source: **Potential**
Comments: **Conveys stormwater onto surface outside of berm via 2" diameter pipe (visible in Photo 2)**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes:
Sampling Type: **Soil**
Sample ID Number(s): **RMBS0022, RMBS0023**
Analyses:

Photo 1-Looking East



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4021-004
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Air Intakes (2)**
Operational Use / Process: **Ventilation**
Associated Chemicals: **None documented**
Discharge: **No**
Size: **2.5 ft by 3 ft by 1.5 ft**
Construction Material: **Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **On northern face of Building 4021, approximately 2 ft off the ground**
Likelihood of Impact from Other Source: **Unlikely**
Comments:
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **No**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 1-Looking South



Photo 2 -Looking South



Building Feature Documentation Log
Feature Number: 4021-004
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking South



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4021-005
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Floor Drain**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.**
Discharge: **Yes**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in Cold Change Room, adjacent to Hot Change Room**
Likelihood of Impact from Other Source: **Potential**
Comments: **Conveys water from the Cold Change Room to the sanitary sewer line**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**

Photo 1-Looking East



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4021-005
Santa Susana Field Laboratory, Ventura County, California

Sampling Type:
Sample ID Number(s):
Analyses:

Building Feature Documentation Log
Feature Number: 4021-006
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Patches for removed sink and toilet**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.None**
Discharge: **Yes**
Size: **Approx 5" Diameter**
Construction Material: **Concrete**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Removed**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in Cold Change Room, adjacent to Hot Change Room**
Likelihood of Impact from Other Source: **Potential**
Comments: **Conveys water from the Cold Change Room to the sanitary sewer line**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**

Photo 1-Looking East



Photo 2 -Looking Down



Building Feature Documentation Log
Feature Number: 4021-006
Santa Susana Field Laboratory, Ventura County, California

Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**
Sampling Type:
Sample ID Number(s):
Analyses:

Building Feature Documentation Log
Feature Number: 4021-007
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Floor Drain**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.None**
Discharge: **Yes**
Size: **4" Diameter**
Construction Material: **Metal/Concrete**
Status: **Abandoned in Place / Backfilled**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in Hot Change Room, adjacent to Decontamination Room**
Likelihood of Impact from Other Source: **Potential**
Comments: **Conveys water from the Hot Change Room to the sanitary sewer line**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**

Photo 1-Looking Down



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4021-007
Santa Susana Field Laboratory, Ventura County, California

Sampling Type:
Sample ID Number(s):
Analyses:

Building Feature Documentation Log
Feature Number: 4021-008
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Floor Drain**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.None**
Discharge: **Yes**
Size: **4" Diameter**
Construction Material: **Metal/Concrete**
Status: **Abandoned in Place / Backfilled**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **Yes (rust)**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in Hot Change Room (shower area), adjacent to Decontamination Room**
Likelihood of Impact from Other Source: **Potential**
Comments: **Conveys water from the Hot Change Room to the sanitary sewer line**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**

Photo 1-Looking West

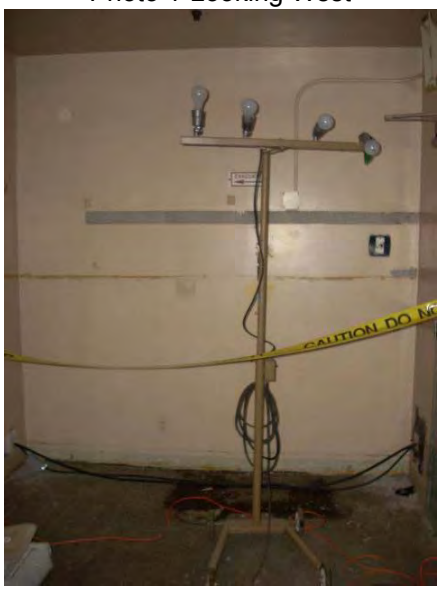


Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4021-008
Santa Susana Field Laboratory, Ventura County, California

Sampling Type:
Sample ID Number(s):
Analyses:

Building Feature Documentation Log
Feature Number: 4021-009
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Patch for removed shower**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.None**
Discharge: **Yes**
Size: **5" Diameter**
Construction Material: **Metal/Concrete**
Status: **Abandoned in Place / Backfilled**

Feature Condition:
General Condition: **Removed**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in Hot Change Room (shower area), adjacent to Decontamination Room**
Likelihood of Impact from Other Source: **Potential**
Comments: **Conveys water from the Hot Change Room to the sanitary sewer line**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**

Photo 1-Looking Down

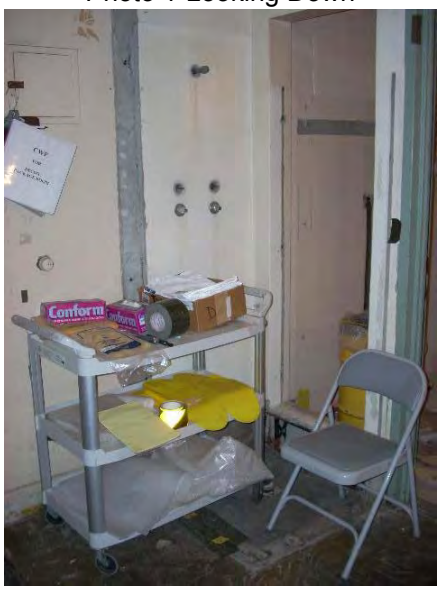


Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4021-009
Santa Susana Field Laboratory, Ventura County, California

Sampling Type:
Sample ID Number(s):
Analyses:

Building Feature Documentation Log
Feature Number: 4021-010
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Staining on Linoleum Floor**
Operational Use / Process: **Water conveyance (Former Laundry Room)**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.None**
Discharge: **Yes**
Size: **60 ft by 10 ft**
Construction Material: **Concrete/Linoleum**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Linoleum is mostly in tact with some degradation. Cannot determine condition of concrete.**
Debris: **No**
Staining: **Yes**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in Office/Laundry Room, adjacent to Cold Change Room and Packaging Room**
Likelihood of Impact from Other Source: **Potential**
Comments: **Source of staining not known, potentially related to laundry room activities. Could also be unrelated to building activities. Concrete below linoleum needs to be inspected to determine potential impact to subsurface.**

Photo 1-Looking Southwest



Photo 2 -Looking South



MWH

Inspector: M. Chell
Date: Apr 14, 2009

Building Feature Documentation Log
Feature Number: 4021-010
Santa Susana Field Laboratory, Ventura County, California

GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 3 -Looking Southeast



Building Feature Documentation Log
Feature Number: 4021-011
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Staining/Mark on Linoleum Floor**
Operational Use / Process: **Not Documented**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.Not Documented**
Discharge: **No**
Size: **2 ft by 5 ft**
Construction Material: **Linoleum**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Mostly intact, some degradation. Cannot determine condition of concrete.**
Debris: **No**
Staining: **Yes**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in Office/Laundry Room, adjacent to Cold Change Room and Packaging Room**
Likelihood of Impact from Other Source: **Potential**
Comments: **Source of staining not know, potentially related to laundry room activities. Could also be unrelated to building activities. Concrete below**

Photo 1-Looking West



Photo 2 -Looking South



Building Feature Documentation Log
Feature Number: 4021-011
Santa Susana Field Laboratory, Ventura County, California

linoleum needs to be inspected to determine potential impact to subsurface.
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**
Sampling Type:
Sample ID Number(s):
Analyses:

Building Feature Documentation Log
Feature Number: 4021-012
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Decontamination Room Sump**
Operational Use / Process: **Radioactive Water Conveyance**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.Radioactive Water/Mixed Waste**
Discharge: **Yes, discharged water to Packaging Room Sump and ultimately to Building 4021 Sump.**
Size: **2 ft by 2 ft by 3 ft deep**
Construction Material: **Concrete/Metal**
Status: **Closed/Inactive**

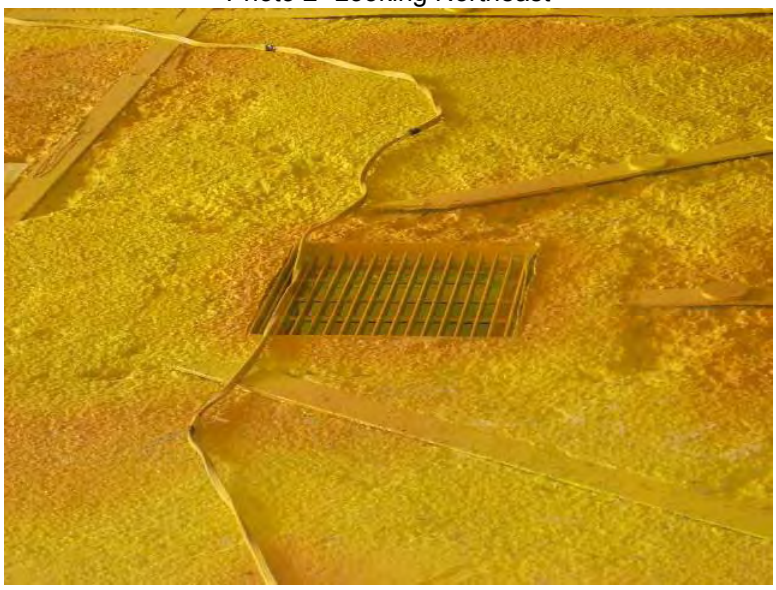
Feature Condition:
General Condition: **Cannot inspect**
Debris: **Cannot inspect**
Staining: **Cannot inspect**
Odor: **Cannot inspect**
PID Reading: **Cannot inspect**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in center of Decontamination Room, collected radioactive water from Decontamination room and from Building 4022 subsurface vaults. Outlet pipe located on side of sump approximately 1 ft from bottom to allow solids to settle.**
Likelihood of Impact from Other Source: **Potential**

Photo 1-Looking Northeast



Photo 2 -Looking Northeast



Building Feature Documentation Log
Feature Number: 4021-012
Santa Susana Field Laboratory, Ventura County, California

Comments: **Cannot inspect due to ambient radiation in Decontamination Room.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample pre-demolition**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 3 -Looking South



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4021-013
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Evaporator Floor Drain**
Operational Use / Process: **Radioactive Water Conveyance**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.Radioactive Water/Mixed Waste**
Discharge: **Yes, discharged water to Decontamination Room Sump and ultimately to Building 4021 Sump.**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Cannot inspect**
Debris: **Cannot inspect**
Staining: **Cannot inspect**
Odor: **Cannot inspect**
PID Reading: **Cannot inspect**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in Decontamination Room in bermed area designed to contain spills from the former evaporator.**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect due to ambient radiation in Decontamination Room.**
GPS Coordinates:

Sampling Information:

Photo 1-Looking Northeast

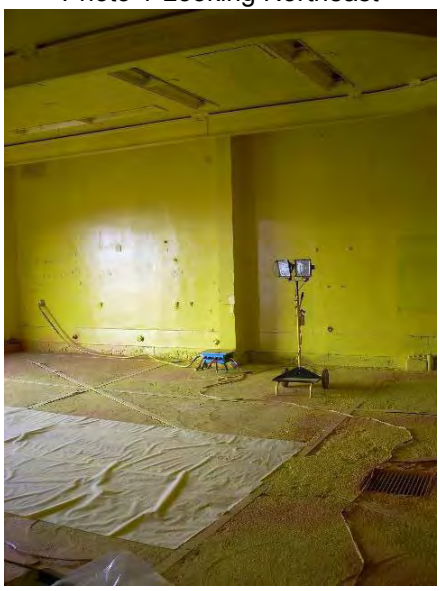


Photo 2 -Looking Southeast



Building Feature Documentation Log
Feature Number: 4021-013
Santa Susana Field Laboratory, Ventura County, California

Sampling Warranted?: **Yes, sample pre-demolition**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**
Sampling Type:
Sample ID Number(s):
Analyses:

Building Feature Documentation Log
Feature Number: 4021-014
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Packaging Room Sump**
Operational Use / Process: **Radioactive Water Conveyance**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.Radioactive Water/Mixed Waste**
Discharge: **Yes, discharged water to Building 4021 Sump.**
Size: **2 ft by 2 ft by 1 ft deep**
Construction Material: **Concrete/Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Cannot inspect**
Debris: **Cannot inspect**
Staining: **Cannot inspect**
Odor: **Cannot inspect**
PID Reading: **Cannot inspect**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located in Packaging Room. Collected all liquids in Packaging Room and conveyed to Building 4021 Sump. Outlet pipe in center of sump bottom, elevated approximately 8" to allow solids to settle.**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect due to ambient radiation in Decontamination Room.**
GPS Coordinates:

Photo 1-Looking South



Building Feature Documentation Log
Feature Number: 4021-014
Santa Susana Field Laboratory, Ventura County, California

Sampling Information:
Sampling Warranted?: **Yes, sample pre-demolition**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**
Sampling Type:
Sample ID Number(s):
Analyses:

Building Feature Documentation Log
Feature Number: 4021-015
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4021**
Building Owner: **DOE**
Building Name: **Decontamination and Packaging**
Building Use: **Decontamination and Packaging: processing materials contaminated with mixed and fissionable fuels**

Feature Description:
Feature Type: **Packaging Room Floor Drain**
Operational Use / Process: **Radioactive Water Conveyance**
Associated Chemicals: **Building 4021 operational areas used for decontamination and packaging of low-level radioactive and mixed wastes. Documented chemicals include Turco degreaser and alkali rust remover.Radioactive Water/Mixed Waste**
Discharge: **Yes, discharged water to Packaging Room Sump and ultimately to Building 4021 Sump.**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Cannot inspect**
Debris: **Cannot inspect**
Staining: **Cannot inspect**
Odor: **Cannot inspect**
PID Reading: **Cannot inspect**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Conveyed liquids to Packaging Room Sump and ultimately to Building 4021 Sump.**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect due to ambient radiation in Decontamination Room.**
GPS Coordinates:

Sampling Information:

Photo 1-Looking South



Photo 2 -Looking South



Building Feature Documentation Log
Feature Number: 4021-015
Santa Susana Field Laboratory, Ventura County, California

Sampling Warranted?: **Yes, sample pre-demolition**
Sampling Description/Notes: **Sample as discussed in RMHF Closure Plan**
Sampling Type:
Sample ID Number(s):
Analyses:

MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4022 Radioactive Waste Vault Storage**

Photograph ID: 001

Date: Feb 24, 2009

Location / Direction: Building 4022 Radioactive Waste Vault Storage - Southern Exterior/ North

Comments:



Photograph ID: 002

Date: Apr 14, 2009

Location / Direction: Building 4022 Radioactive Waste Vault Storage - Northern Exterior/ Southeast

Comments:



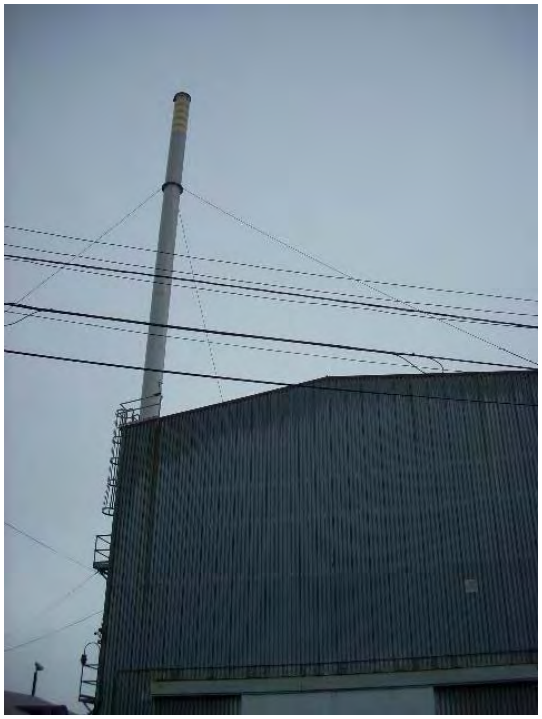
Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4022 Radioactive Waste Vault Storage**

Photograph ID: 003

Date: Mar 4, 2009

Location / Direction:
Building 4022 Radioactive Waste Vault Storage - Exhaust Stack/
Up

Comments:



Photograph ID: 004

Date: Feb 24, 2009

Location / Direction:
Building 4022 Radioactive Waste Vault Storage - Air Intake Sumps on Eastern Exterior/
North

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4022 Radioactive Waste Vault Storage**

Photograph ID: 005

Date: Feb 24, 2009

Location / Direction:
Building 4022 Radioactive Waste Vault Storage - Storage Vaults/
North

Comments:



Photograph ID: 006

Date: Feb 24, 2009

Location / Direction:
Building 4022 Radioactive Waste Vault Storage - Vaults/
Down

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4022 Radioactive Waste Vault Storage**

Photograph ID: 007

Date: Feb 24, 2009

Location / Direction:
Building 4022 Radioactive Waste Vault Storage - Storage Vault Interior/
Down

Comments:



Photograph ID: 008

Date: Apr 14, 2009

Location / Direction:
Building 4022 Radioactive Waste Vault Storage - Southern Exterior and Building 4022 Sump/
North

Comments:



Building Feature Documentation Log
Feature Number: 4022-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4022**
Building Owner: **DOE**
Building Name: **Radioactive Vault Storage**
Building Use: **Radioactive Vault Storage: handling and storing materials containing mixed fission products and fuel**

Feature Description:
Feature Type: **Air Intake Vents**
Operational Use / Process: **Ventilation to Subsurface Storage Vaults**
Associated Chemicals: **Not documented**
Discharge: **Yes, equipped with sump and sump pump to remove water from groundwater intrusion and surface water collection**
Size: **5 ft by 10 ft by 3 ft tall above ground, extend approximately 15 ft below grade**
Construction Material: **Metal/Concrete**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4022, ductwork connects vents to subsurface vaults**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect vents, sumps located in vents, or ductwork connecting vents to vaults. Will need to be inspected during building demolition.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):

Photo 1-Looking West



Photo 2 -Looking North



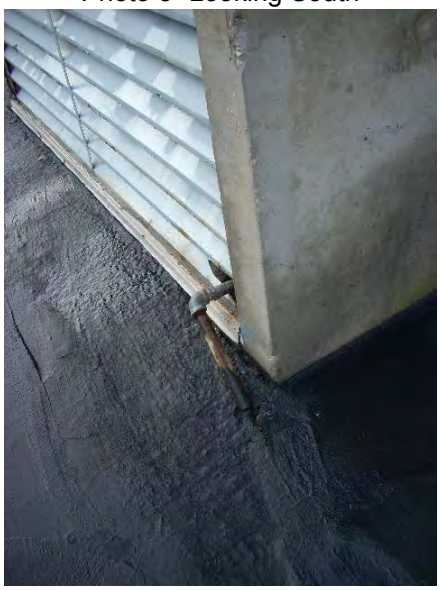
MWH

Inspector:
Date:

Building Feature Documentation Log
Feature Number: 4022-001
Santa Susana Field Laboratory, Ventura County, California

Analyses:

Photo 3 -Looking South



Building Feature Documentation Log
Feature Number: 4022-002
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4022**
Building Owner: **DOE**
Building Name: **Radioactive Vault Storage**
Building Use: **Radioactive Vault Storage: handling and storing materials containing mixed fission products and fuel**

Feature Description:
Feature Type: **Air Intake Vents**
Operational Use / Process: **Ventilation to Subsurface Storage Vaults**
Associated Chemicals: **Not documented**
Discharge: **Yes, equipped with sump and sump pump to remove water from groundwater intrusion and surface water collection**
Size: **5 ft by 10 ft by 3 ft tall above ground, extend approximately 15 ft below grade**
Construction Material: **Metal/Concrete**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4022, ductwork connects vents to subsurface vaults**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect vents, sumps located in vents, or ductwork connecting vents to vaults. Will need to be inspected during building demolition.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):

Photo 1-Looking West



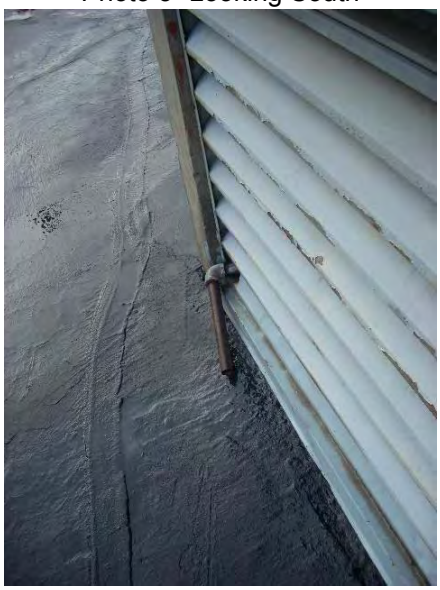
Photo 2 -Looking North



Building Feature Documentation Log
Feature Number: 4022-002
Santa Susana Field Laboratory, Ventura County, California

Analyses:

Photo 3 -Looking South



Inspector: M. Chell
Date: Mar 4, 2009

Building Feature Documentation Log
Feature Number: 4022-004
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4022**
Building Owner: **DOE**
Building Name: **Radioactive Vault Storage**
Building Use: **Radioactive Vault Storage: handling and storing materials containing mixed fission products and fuel**

Feature Description:
Feature Type: **Subsurface Vaults**
Operational Use / Process: **Radioactive Waste/Source Storage**
Associated Chemicals: **Radioactive Sources/Waste**
Discharge: **Yes, discharged water to Building 4022 sump via drain in Vault 6**
Size: **50 ft by 70 ft by up to 30 ft below grade**
Construction Material: **Metal/Concrete**
Status: **Active**

Feature Condition:
General Condition: **Cannot Inspect**
Debris: **Cannot Inspect**
Staining: **Cannot Inspect**
Odor: **Cannot Inspect**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Acjacent to Building 4021 from which it receives radioactive process water**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect vaults due to radiation hazard, confined space entry, extremely heavy vault covers (up to 88,000 lbs), and heavy equipment/storage atop vaults.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample post-demolition**
Sampling Description/Notes: **Sample in accorance with RMHF Closure Plan. Include sample targetting Vault 2**

Photo 1-Looking North

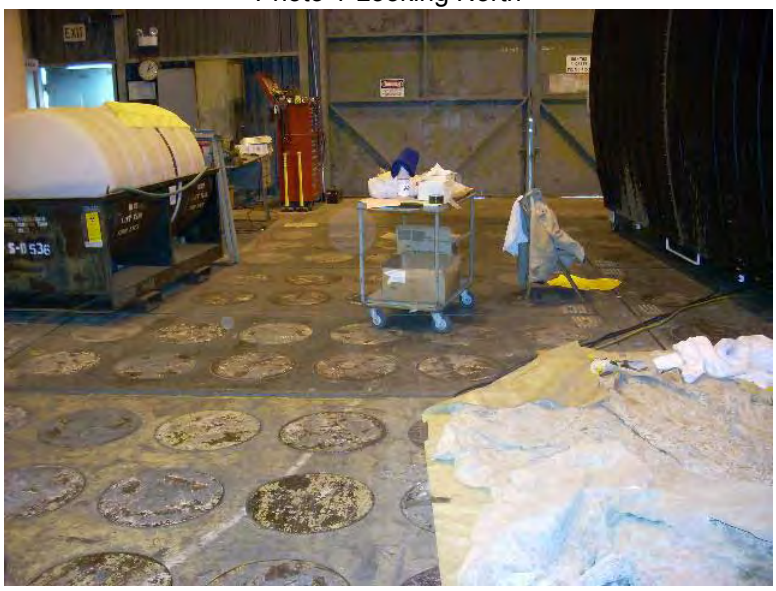


Photo 2 -Looking Down



Building Feature Documentation Log
Feature Number: 4022-004
Santa Susana Field Laboratory, Ventura County, California

(radioative water tank and sodium reaction tanks) and Vault 6 (topographic low spot with floor drain).
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 3 -Looking Down



Building Feature Documentation Log
Feature Number: 4022-003
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4022**
Building Owner: **DOE**
Building Name: **Radioactive Vault Storage**
Building Use: **Radioactive Vault Storage: handling and storing materials containing mixed fission products and fuel**

Feature Description:
Feature Type: **Building 4022 Sump**
Operational Use / Process: **Radioactive Water/Mixed Waste Conveyance**
Associated Chemicals: **Radioactive Water/Mixed Waste Conveyance**
Discharge: **Yes, conveyed water collected in the subsurface vaults to the Building 4021 Sump**
Size:
Construction Material: **Metal/Concrete**
Status: **Active**

Feature Condition:
General Condition: **Cannot Inspect**
Debris: **Cannot Inspect**
Staining: **Cannot Inspect**
Odor: **Cannot Inspect**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4022, receives water from subsurface vaults via a floor drain in Vault 6.**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect sump due to radiation hazard. Sump was targeted by nearby sample during Group 7 RFI Data Gap Sampling.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample post-demolition**
Sampling Description/Notes: **Sample in accorance with RMHF Closure Plan**
Sampling Type: **Soil**

Photo 1-Looking North



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4022-003
Santa Susana Field Laboratory, Ventura County, California

Sample ID Number(s): **RMBS0018**
Analyses: **VOCs, SVOCs, TPH, metals**

Inspector: M. Chell
Date: Mar 4, 2009

MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Filter-Blower Area**

Photograph ID: 001

Date: Feb 24, 2009

Location / Direction:
Filter-Blower Area/
South

Comments:
Filter-blower area is located between Building 4021 and Building 4022



Photograph ID: 002

Date: Feb 24, 2009

Location / Direction:
Filter Blower Area/
South

Comments:



MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Filter-Blower Area**

Photograph ID: 003

Date: Apr 14, 2009

Location / Direction:
Filter-Blower Area/
North

Comments:



Photograph ID: 005

Date: Mar 4, 2009

Location / Direction:
Filter-Blower Area/
North

Comments:



Building Feature Documentation Log
Feature Number: FB-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **Filter/Blower Area (FB)**
Building Owner: **DOE**
Building Name: **Filter/Blower Area (FB)**
Building Use: **Air Filtration System for 4021/4022**

Feature Description:
Feature Type: **Trench with Drain**
Operational Use / Process: **Surface Water Conveyance/Equipment Isolation**
Associated Chemicals: **None associated with this feature. Lubricant oils and coolants potentially used by adjacent features.**
Discharge: **Yes**
Size: **4 ft by 14 ft, depth not known**
Construction Material: **Concrete/Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Cannot Determine**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located between Buildings 4021 and 4022, adjacent to air compressor**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect trench condition or drain due to standing water, equipment, and metal plates. Trenches designed to drain collected surface water to North RMHF Slope.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample post-demolition**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 1-Looking South



Photo 2 -Looking North

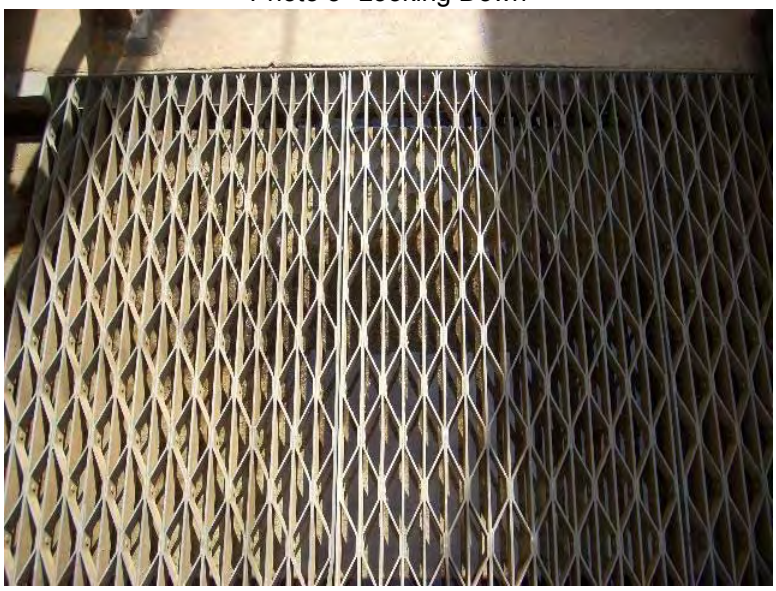


MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: FB-001
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: FB-002
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **Filter/Blower Area (FB)**
Building Owner: **DOE**
Building Name: **Filter/Blower Area (FB)**
Building Use: **Air Filtration System for 4021/4022**

Feature Description:
Feature Type: **Trench with Drain**
Operational Use / Process: **Surface Water Conveyance/Equipment Isolation**
Associated Chemicals: **None associated with this feature. Lubricant oils and coolants potentially used by adjacent features.**
Discharge: **Yes**
Size: **4 ft by 14 ft, 1.5 ft deep**
Construction Material: **Concrete/Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Intact**
Debris: **Yes, in stagnant water**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located between Buildings 4021 and 4022**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect trench condition or drain due to standing water, equipment, and metal plates. Trenches designed to drain collected surface water to North RMHF Slope.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample post-demolition**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 1-Looking North



Photo 2 -Looking West



Building Feature Documentation Log
Feature Number: FB-002
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: FB-003
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **Filter/Blower Area (FB)**
Building Owner: **DOE**
Building Name: **Filter/Blower Area (FB)**
Building Use: **Air Filtration System for 4021/4022**

Feature Description:
Feature Type: **Trench with Drain**
Operational Use / Process: **Surface Water Conveyance/Equipment Isolation**
Associated Chemicals: **None associated with this feature. Lubricant oils and coolants potentially used by adjacent features.**
Discharge: **Yes**
Size: **4 ft by 11 ft, depth unknown**
Construction Material: **Concrete/Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located between Buildings 4021 and 4022, adjacent to air compressor and compressor blowdown barrel**
Likelihood of Impact from Other Source: **Potential**
Comments: **Cannot inspect trench condition or drain due to standing water, equipment, and metal plates. Trenches designed to drain collected surface water to North RMHF Slope.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample post-demolition**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):

Photo 1-Looking West



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: FB-003
Santa Susana Field Laboratory, Ventura County, California

Analyses:

Photo 3 -Looking Down



Inspector: M. Chell
Date: Dec 31, 2002

Building Feature Documentation Log
Feature Number: FB-004
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **Filter/Blower Area (FB)**
Building Owner: **DOE**
Building Name: **Filter/Blower Area (FB)**
Building Use: **Air Filtration System for 4021/4022**

Feature Description:
Feature Type: **Pipeline: Surface Water**
Operational Use / Process: **Surface water conveyance**
Associated Chemicals: **None associated with this feature. Lubricant oils and coolants potentially used by adjacent features.**
Discharge: **Yes**
Size: **4" diameter**
Construction Material: **Metal**
Status: **Abandoned in Place / Backfilled**

Feature Condition:
General Condition: **Cannot Determine**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **May be the exit point for drains in Filter/Blower Area trenches**
Likelihood of Impact from Other Source: **Likely**
Comments: **Pipeline is located on the North RMHF Slope, and may be the discharge point for the floor drain located in Building 4665 or discharge point for trenches located in the Filter/Blower Area**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample pre-demolition**
Sampling Description/Notes: **Collected sample downslope of pipeline discharge point during Group 7 Data Gap Sampling**
Sampling Type: **Soil Matrix**

Photo 1-Looking North



Photo 2 -Looking East



Building Feature Documentation Log
Feature Number: FB-004
Santa Susana Field Laboratory, Ventura County, California

Sample ID Number(s): **RMBS0145**
Analyses: **VOCs, SVOCs, TPH, Metals, PCBs**

MWH

Inspector: M. Chell
Date: Feb 17, 2009

Building Feature Documentation Log
Feature Number: FB-005
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **Filter/Blower Area (FB)**
Building Owner: **DOE**
Building Name: **Filter/Blower Area (FB)**
Building Use: **Air Filtration System for 4021/4022**

Feature Description:
Feature Type: **Air Compressor**
Operational Use / Process: **Support equipment**
Associated Chemicals: **Lubricant oils, coolants (small quantities)**
Discharge: **No**
Size: **4.5 ft by 8 ft**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4022 and trench with drain**
Likelihood of Impact from Other Source: **Unlikely**
Comments:
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Collected sample adjacent to compressor during Group 7 Data Gap Sampling**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0101**
Analyses: **VOCs, SVOCs, TPH, Metals, PCBs**

Photo 1-Looking West



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: FB-006
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **Filter/Blower Area (FB)**
Building Owner: **DOE**
Building Name: **Filter/Blower Area (FB)**
Building Use: **Air Filtration System for 4021/4022**

Feature Description:
Feature Type: **Air Compressor with Blowback Water Drum**
Operational Use / Process: **Support equipment**
Associated Chemicals: **Lubricant oils, coolants (small quantities)**
Discharge: **Yes**
Size: **4.5 ft by 8 ft**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to Building 4022 and trench with drain**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Compressor includes large drum (approximately 55 gallon) containing blowback water, which contains trace oils**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Collected sample adjacent to compressor during Group 7 Data Gap Sampling**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0097**

Photo 1-Looking West



Photo 2 -



Building Feature Documentation Log
Feature Number: FB-006
Santa Susana Field Laboratory, Ventura County, California

Analyses: **VOCs, SVOCs, TPH, Metals, PCBs**

MWH

Inspector: M. Chell
Date: Mar 4, 2009

MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4034 Office**

Photograph ID: 001

Date: Apr 14, 2009

Location / Direction:
Building 4034 Office - Western Exterior/ East

Comments:



Photograph ID: 002

Date: Mar 4, 2009

Location / Direction:
Building 4034 Office - Eastern Exterior/ Northeast

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4034 Office**

Photograph ID: 003

Date: Mar 4, 2009

Location / Direction: Building 4034 Office Interiior/ South

Comments:

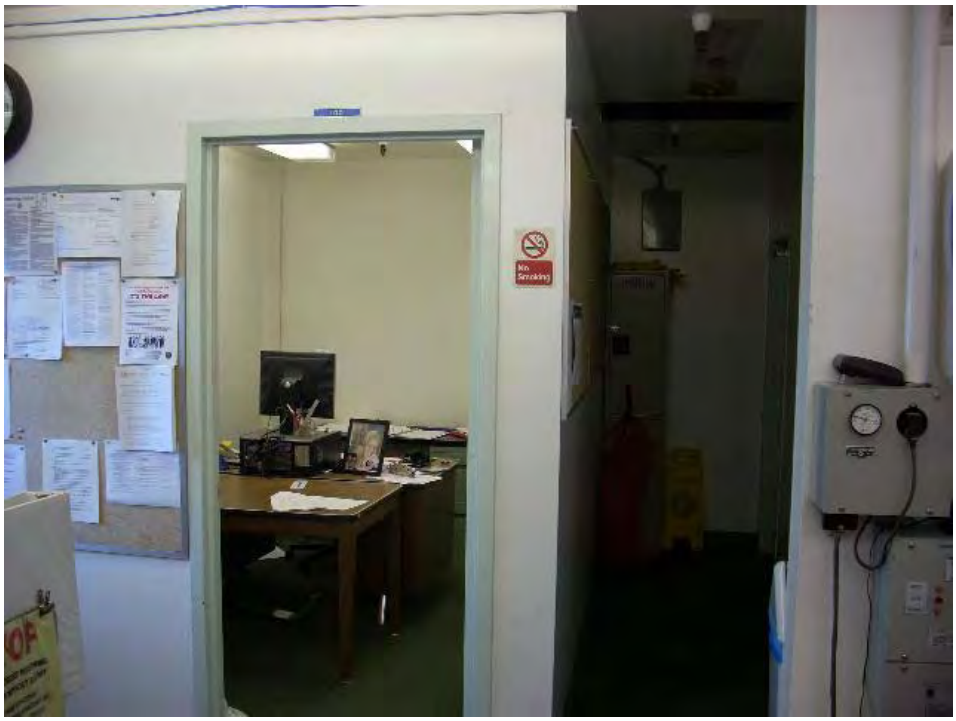


Photograph ID: 004

Date: Mar 4, 2009

Location / Direction: Building 4034 Office Interiior/ North

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4034 Office**

Photograph ID: 005

Date: Mar 4, 2009

Location / Direction:
Building 4034 Office Interiior - Restrooms/
North

Comments:



Building Feature Documentation Log
Feature Number: 4034-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4034**
Building Owner: **DOE**
Building Name: **Office Building**
Building Use: **Office Building**

Feature Description:
Feature Type: **Floor Drain**
Operational Use / Process: **Sanitary waste conveyance**
Associated Chemicals: **Not documented**
Discharge: **Yes, discharged to SSFL sanitary sewer system**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside Building 4034**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Located inside Building 4034, which has no documented chemical use.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **No**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 1-Looking South



Building Feature Documentation Log
Feature Number: 4034-002
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4034**
Building Owner: **DOE**
Building Name: **Office Building**
Building Use: **Office Building**

Feature Description:
Feature Type: **Sanitary Sink**
Operational Use / Process: **Sanitary waste conveyance**
Associated Chemicals: **Not documented**
Discharge: **Yes, discharged to SSFL sanitary sewer system**
Size: **1.5 ft by 1.5 ft**
Construction Material: **Porcelain, fiberglass metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside Building 4034**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Located inside Building 4034, which has no documented chemical use.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **No**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 1-Looking East



Photo 2 -Looking Down



Building Feature Documentation Log
Feature Number: 4034-003
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4034**
Building Owner: **DOE**
Building Name: **Office Building**
Building Use: **Office Building**

Feature Description:
Feature Type: **Floor Drain**
Operational Use / Process: **Sanitary waste conveyance**
Associated Chemicals: **Not documented**
Discharge: **Yes, discharged to SSFL sanitary sewer system**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside Building 4034**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Located inside Building 4034, which has no documented chemical use.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Sampled as part of Group 7 RFI Report Data GapsNo**
Sampling Description/Notes:
Sampling Type: **Soil**
Sample ID Number(s): **RMBS0048**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking South



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4034-004
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4034**
Building Owner: **DOE**
Building Name: **Office Building**
Building Use: **Office Building**

Feature Description:
Feature Type: **Cleanout**
Operational Use / Process: **Sanitary waste conveyance**
Associated Chemicals: **Not documented**
Discharge: **Yes, discharged to SSFL sanitary sewer system**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside Building 4034**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Located inside Building 4034, which has no documented chemical use.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Sampled as part of Group 7 RFI Report Data Gaps**
Sampling Description/Notes:
Sampling Type: **Soil**
Sample ID Number(s): **RMBS0048**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking South



MWH

Inspector: M. Chell
Date: Feb 24, 2009

Building Feature Documentation Log
Feature Number: 4034-005
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4034**
Building Owner: **DOE**
Building Name: **Office Building**
Building Use: **Office Building**

Feature Description:
Feature Type: **Sanitary Sink**
Operational Use / Process: **Sanitary waste conveyance**
Associated Chemicals: **Not documented**
Discharge: **Yes, discharged to SSFL sanitary sewer system**
Size: **1.5 ft by 1.5 ft**
Construction Material: **Porcelain, fiberglass metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside Building 4034**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Located inside Building 4034, which has no documented chemical use.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Sampled as part of Group 7 RFI Report Data GapsNo**
Sampling Description/Notes:
Sampling Type: **Soil**
Sample ID Number(s): **RMBS0048**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking East



Photo 2 -Looking Down



MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4044 Break Room and Counting Lab**

Photograph ID: 001

Date: Feb 24, 2009

Location / Direction:
Building 4044 Break Room and Counting Lab - Western Exterior/
Northeast

Comments:



Photograph ID: 002

Date: Apr 14, 2009

Location / Direction:
Building 4044 Break Room and Counting Lab - Northern Exterior/
Southeast

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4044 Break Room and Counting Lab**

Photograph ID: 003

Date: Mar 4, 2009

Location / Direction:
Building 4044 Break Room and Counting Lab - Eastern Exterior/
Southwest

Comments:

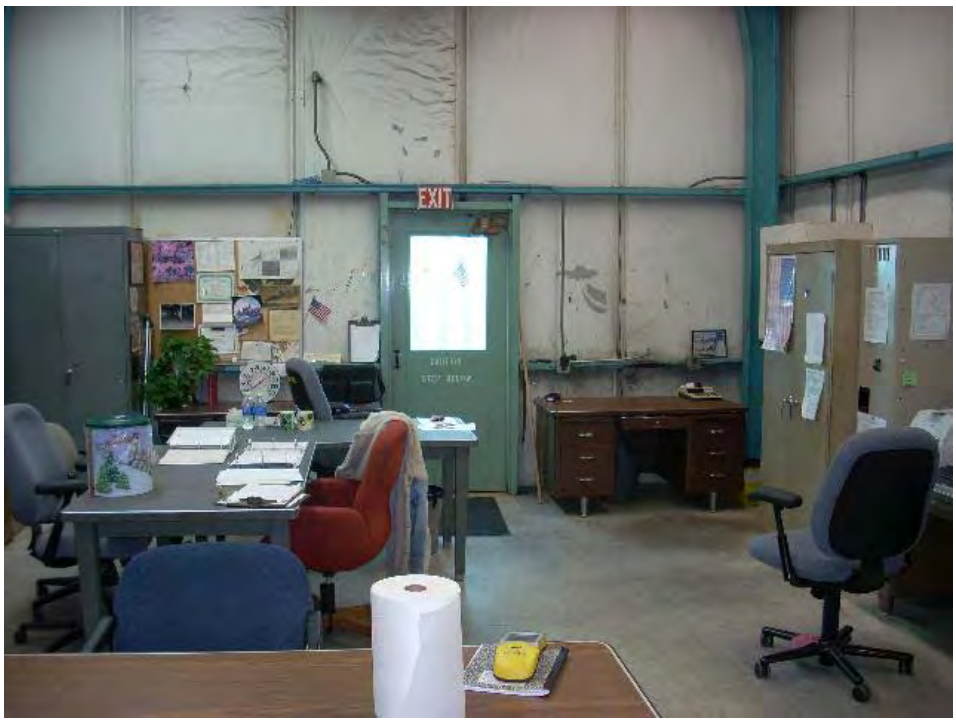


Photograph ID: 004

Date: Mar 4, 2009

Location / Direction:
Building 4044 Break Room and Counting Lab - Break Room/
North

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4044 Break Room and Counting Lab**

Photograph ID: 005

Date: Feb 24, 2009

Location / Direction:
Building 4044 Break Room and Counting Lab - Break Room/
South

Comments:



Photograph ID: 006

Date: Apr 14, 2009

Location / Direction:
Building 4044 Break Room and Counting Lab - Counting Lab Doorway /
South

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4044 Break Room and Counting Lab**

Photograph ID: 007

Date: Mar 4, 2009

Location / Direction:
Building 4044 Break Room and Counting Lab - Counting Lab/
Southwest

Comments:



Photograph ID: 008

Date: Apr 14, 2009

Location / Direction:
Building 4044 Break Room and Counting Lab - Counting Lab Door/
Northeast

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4044 Break Room and Counting Lab**

Photograph ID: 009

Date: Apr 14, 2009

Location / Direction: Building 4044 Break Room and Counting Lab - Utility Closet with Sink and Floor Drain/ Southeast

Comments:



Photograph ID: 010

Date: Apr 14, 2009

Location / Direction: Building 4044 Break Room and Counting Lab - Restroom/ South

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4044 Break Room and Counting Lab**

Photograph ID: 011

Date: Apr 14, 2009

Location / Direction: Building 4044 Break Room and Counting Lab - Restroom/ Northeast

Comments:



Building Feature Documentation Log
Feature Number: 4044-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4044**
Building Owner: **DOE**
Building Name: **Clean Shop, Support Lab**
Building Use: **Counting Lab and Break Room**

Feature Description:
Feature Type: **Sink:Sanitary**
Operational Use / Process: **Sanitary waste conveyance**
Associated Chemicals: **None documented**
Discharge: **Yes**
Size: **18" by 18"**
Construction Material: **Porcelain, Fiberglass, Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No (some rust)**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Storage area with industrial sink is in the adjacent room**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Storage area has its own floor drain, so impact from the storage area is unlikely**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **No**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 1-Looking East



Photo 2 -Looking Down



Building Feature Documentation Log
Feature Number: 4044-002
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4044**
Building Owner: **DOE**
Building Name: **Clean Shop, Support Lab**
Building Use: **Counting Lab and Break Room**

Feature Description:
Feature Type: **Floor Drain**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **None documented**
Discharge: **Yes**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Storage area with industrial sink is in the adjacent room**
Likelihood of Impact from Other Source: **Unlikely**
Comments: **Storage area has its own floor drain, so impact from the storage area is unlikely**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **No**
Sampling Description/Notes:
Sampling Type:
Sample ID Number(s):
Analyses:

Photo 1-Looking Down

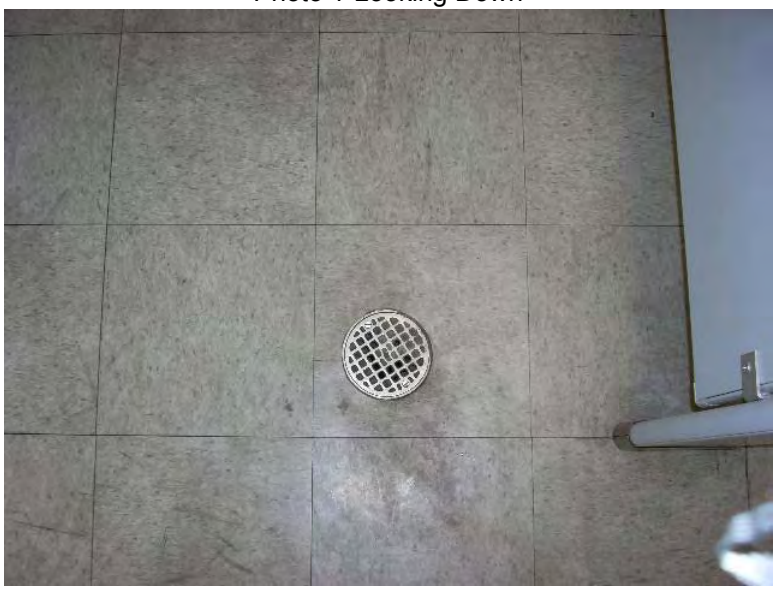


Photo 2 -Looking Down



Building Feature Documentation Log
Feature Number: 4044-003
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4044**
Building Owner: **DOE**
Building Name: **Clean Shop, Support Lab**
Building Use: **Counting Lab and Break Room**

Feature Description:
Feature Type: **Sink:Industrial**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **None documented**
Discharge: **Yes**
Size: **2 ft by 2 ft**
Construction Material: **Porcelain, Fiberglass, Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No (some rust)**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside storage area, adjacent to former counting room.**
Likelihood of Impact from Other Source: **Potential**
Comments: **Chemical use inside storage area is not documented. Sink is located adjacent to former counting room.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Sampled as part of Group 7 RFI Report Data Gaps**
Sampling Description/Notes:
Sampling Type: **Soil**
Sample ID Number(s): **RMBS0127**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking East



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 23, 2009

Building Feature Documentation Log
Feature Number: 4044-003
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 23, 2009

Building Feature Documentation Log
Feature Number: 4044-004
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4044**
Building Owner: **DOE**
Building Name: **Clean Shop, Support Lab**
Building Use: **Counting Lab and Break Room**

Feature Description:
Feature Type: **Floor Drain**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **None documented**
Discharge: **Yes**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside storage area, adjacent to former counting room.**
Likelihood of Impact from Other Source: **Potential**
Comments: **Chemical use inside storage area is not documented. Sink is located adjacent to former counting room.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Sampled as part of Group 7 RFI Report Data Gaps**
Sampling Description/Notes:
Sampling Type: **Soil**
Sample ID Number(s): **RMBS0137**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking East



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 23, 2009

Building Feature Documentation Log
Feature Number: 4044-005
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4044**
Building Owner: **DOE**
Building Name: **Clean Shop, Support Lab**
Building Use: **Counting Lab and Break Room**

Feature Description:
Feature Type: **Cleanout**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **None documented**
Discharge: **Yes**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside storage area, adjacent to former counting room.**
Likelihood of Impact from Other Source: **Potential**
Comments: **Chemical use inside storage area is not documented. Sink is located adjacent to former counting room.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Sampled as part of Group 7 RFI Report Data Gaps**
Sampling Description/Notes:
Sampling Type: **Soil**
Sample ID Number(s): **RMBS0137**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking East

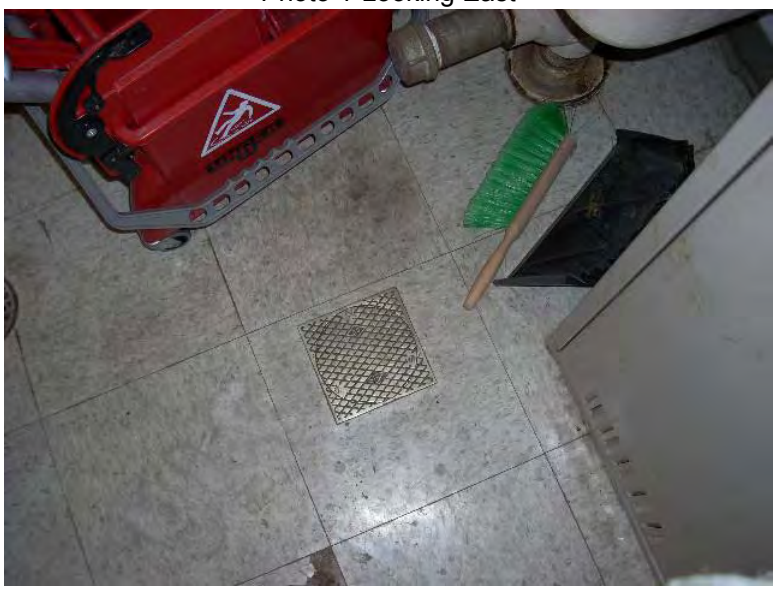


Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 23, 2009

MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4075 Contaminated Storage**

Photograph ID: 001

Date: Mar 4, 2009

Location / Direction: Building 4075 Contaminated Storage - Southern Exterior/ North

Comments:



Photograph ID: 002

Date: Apr 14, 2009

Location / Direction: Building 4075 Contaminated Storage - Western Exterior/ North

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4075 Contaminated Storage**

Photograph ID: 003

Date: Mar 4, 2009

Location / Direction: Building 4075 Contaminated Storage - Northern Exterior/ West

Comments:



Photograph ID: 004

Date: Mar 4, 2009

Location / Direction: Building 4075 Contaminated Storage - Eastern Exterior / Northwest

Comments: Building 4563 visible at



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4075 Contaminated Storage**

Photograph ID: 005

Date: Apr 14, 2009

Location / Direction: Building 4075 Contaminated Storage - Eastern Interior/ East

Comments:



Photograph ID: 006

Date: Apr 14, 2009

Location / Direction: Building 4075 Contaminated Storage - Western Interior/ West

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4075 Contaminated Storage**

Photograph ID: 007

Date: Apr 14, 2009

Location / Direction: Building 4075 Contaminated Storage - Western Interior, Floor Drain in Southwest Corner/

Comments: Drains to storm water culver on western RMHF fenced area perimeter via subsurface pipeline



Photograph ID: 008

Date: Feb 24, 2009

Location / Direction: Subsurface pipeline to drainage culvert/

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4075 Contaminated Storage**

Photograph ID: 009

Date: Feb 23, 2009

Location / Direction:
Storm Water Culvert/

Comments:
Receives water from Building 4075 floor drain via subsurface pipeline. Arrow indicates pipeline discharge point.



Building Feature Documentation Log
Feature Number: 4075-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4075**
Building Owner: **DOE**
Building Name: **Contaminated Equipment Storage Building**
Building Use: **Contaminated Equipment Storage Building: storage of low-level radioactive waste prior to shipment**

Feature Description:
Feature Type: **Floor Drain**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **Building 4075 used for storage of equipment, low level radioactive waste, and mixed waste prior to shipment offsite.**
Discharge: **Yes**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No (some rust)**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside Building 4075**
Likelihood of Impact from Other Source: **Likely**
Comments: **Building 4075 was used as a storage facility and may have been used to store mixed waste. Building 4075 is designed so that the floor drain was located in the topographic low point of the building, so any spilled chemicals would flow to the drain. The drain was controlled by a valve located on the western face of Building 4075, and drained into the culvert located on the western RMHF slope.**
GPS Coordinates:

Photo 1-Looking West



Photo 2 -Looking Down



MWH

Inspector:
Date:

Building Feature Documentation Log
Feature Number: 4075-001
Santa Susana Field Laboratory, Ventura County, California

Sampling Information:
Sampling Warranted?: **Yes, sample pre-demolition**
Sampling Description/Notes: **Sample collected during data gap analysis targeting floor drain**
Sampling Type: **Soil / Soil Vapor**
Sample ID Number(s): **RMSV0106/RMBS0106**
Analyses: **VOCs, SVOCs, TPH, PCBs, Metals**

Photo 3 -Looking West



Building Feature Documentation Log
Feature Number: 4075-002
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4075**
Building Owner: **DOE**
Building Name: **Contaminated Equipment Storage Building**
Building Use: **Contaminated Equipment Storage Building: storage of low-level radioactive waste prior to shipment**

Feature Description:
Feature Type: **Potential Low Point/Cracked Concrete**
Operational Use / Process: **None**
Associated Chemicals: **Building 4075 used for storage of equipment, low level radioactive waste, and mixed waste prior to shipment offsite.**
Discharge: **No**
Size: **6 ft by 2 ft**
Construction Material: **Concrete**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Compromised: Cracked**
Debris: **No**
Staining: **Yes (water staining)**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside Building 4075**
Likelihood of Impact from Other Source: **Likely**
Comments: **Building 4075 was used as a storage facility and may have been used to store mixed waste. This low point is downslope of the majority of the building and appears to be a location where liquids collected.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample pre-demolition**

Photo 1-Looking West



Photo 2 -Looking North



MWH

Inspector: M. Chell
Date: Feb 23, 2009

Building Feature Documentation Log
Feature Number: 4075-002
Santa Susana Field Laboratory, Ventura County, California

Sampling Description/Notes: **Sample collected during data gap analysis targeting floor drain**
Sampling Type: **Soil / Soil Vapor**
Sample ID Number(s): **RMBS0038**
Analyses: **TPH, Metals**

Photo 3 -



MWH

Inspector: M. Chell
Date: Apr 14, 2009

Building Feature Documentation Log
Feature Number: 4075-003
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4075**
Building Owner: **DOE**
Building Name: **Contaminated Equipment Storage Building**
Building Use: **Contaminated Equipment Storage Building: storage of low-level radioactive waste prior to shipment**

Feature Description:
Feature Type: **Potential Low Point/Cracked Concrete**
Operational Use / Process: **None**
Associated Chemicals: **Building 4075 used for storage of equipment, low level radioactive waste, and mixed waste prior to shipment offsite.**
Discharge: **No**
Size: **3 ft by 2 ft**
Construction Material: **Concrete**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Compromised: Cracked**
Debris: **No**
Staining: **Yes (water staining)**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located inside Building 4075**
Likelihood of Impact from Other Source: **Likely**
Comments: **Building 4075 was used as a storage facility and may have been used to store mixed waste. This low point is downslope of the majority of the building and appears to be a location where liquids collected.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample pre-demolition**

Photo 1-Looking South



Photo 2 -Looking Down



MWH

Inspector: M. Chell
Date: Apr 14, 2009

Building Feature Documentation Log
Feature Number: 4075-003
Santa Susana Field Laboratory, Ventura County, California

Sampling Description/Notes: **Sample collected during data gap analysis targeting floor drain**
Sampling Type: **Soil / Soil Vapor**
Sample ID Number(s): **RMSV0039/RMBS0039**
Analyses: **VOCs, TPH, PCBs, Metals**

Photo 3 -Looking Down



MWH

Inspector: M. Chell
Date: Apr 14, 2009

MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4563 Storage Area**

Photograph ID: 001

Date: Feb 23, 2009

Location / Direction: Building 4563 Storage Area/ West

Comments:



Photograph ID: 002

Date: Feb 23, 2009

Location / Direction: Building 4563 Storage Area/ North

Comments:



MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4563 Storage Area**

Photograph ID: 003

Date: Apr 14, 2009

Location / Direction:
Building 4563 Storage Area/ West

Comments:



MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4021 Radioactive Accountable Waste Storage**

Photograph ID: 001

Date: Mar 4, 2009

Location / Direction:
Building 4621 Radioactive Accountable Waste Storage - Northern Exterior/
South

Comments:



Photograph ID: 002

Date: Apr 14, 2009

Location / Direction:
Building 4621 Radioactive Accountable Waste Storage - Western Exterior/
East

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4021 Radioactive Accountable Waste Storage**

Photograph ID: 003

Date: Feb 23, 2009

Location / Direction:
Building 4621 Radioactive Accountable Waste Storage - Interior/
West

Comments:



Photograph ID: 004

Date: Feb 23, 2009

Location / Direction:
Building 4621 Radioactive Accountable Waste Storage - Interior/
East

Comments:



Building Feature Documentation Log
Feature Number: 4621-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4621**
Building Owner: **DOE**
Building Name: **Storage**
Building Use: **Storage of containerized mixed waste before shipment offsite**

Feature Description:
Feature Type: **Mixed Waste Storage Containters**
Operational Use / Process: **Short-term storage of mixed wastes prior to shipment**
Associated Chemicals: **Mixed Waste**
Discharge: **No**
Size: **Various (5 gallon to 1,000 gallon containers)**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading:
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located within Mixed Waste Storage Building**
Likelihood of Impact from Other Source: **Potential**
Comments: **Waste containers are inspected regularly; facility is permitted for waste storage**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **Samples collected during the Group 7 RFI Report Data Gaps**
Sampling Type: **Soil**
Sample ID Number(s): **RMBS0001, RMBS0002, RMBS0003, RMBS0005, RMBS0011**

Photo 1-Looking East



Photo 2 -Looking South



MWH

Inspector:
Date:

Building Feature Documentation Log
Feature Number: 4621-001
Santa Susana Field Laboratory, Ventura County, California

Analyses: **VOCs, SVOCs, TPH, PCBs, Metals**

Photo 3 -Looking West



MWH

Inspector: M. Chell
Date: Feb 23, 2009

MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4658 Guard Shack**

Photograph ID: 001

Date: Feb 24, 2009

Location / Direction:
Building 4658 Guard Shack - Exterior/
North

Comments:



Photograph ID: 002

Date: Feb 24, 2009

Location / Direction:
Building 4658 Guard Shack - Interior/
North

Comments:



MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4665 Radioactive Scrap Oxidation**

Photograph ID: 001

Date: Apr 14, 2009

Location / Direction:
Building 4665 Radioactive Scrap Oxidation - Southern Exterior/
North

Comments:



Photograph ID: 002

Date: Apr 14, 2009

Location / Direction:
Building 4665 Radioactive Scrap Oxidation - Eastern Exterior/
West

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4665 Radioactive Scrap Oxidation**

Photograph ID: 003

Date: Apr 14, 2009

Location / Direction: Building 4665 Radioactive Scrap Oxidation - Western Exterior/ East

Comments:



Photograph ID: 004

Date: Apr 14, 2009

Location / Direction: Building 4665 Radioactive Scrap Oxidation - Interior/ North

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4665 Radioactive Scrap Oxidation**

Photograph ID: 005

Date: Apr 14, 2009

Location / Direction: Building 4665 Radioactive Scrap Oxidation - Interior/ Southwest

Comments:



Building Feature Documentation Log
Feature Number: 4665-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4665**
Building Owner: **DOE**
Building Name: **Oxidation Facility, Equipment Storage**
Building Use: **Oxidation Facility, Equipment Storage**

Feature Description:
Feature Type: **Floor Drain**
Operational Use / Process: **Water conveyance**
Associated Chemicals: **Not documented**
Discharge: **Yes**
Size: **5" Diameter**
Construction Material: **Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located adjacent to removed oxidation equipment**
Likelihood of Impact from Other Source: **Likely**
Comments: **Oxidation equipment used to treat radioactive water generated at ETEC facilities**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, sample pre-demolition**
Sampling Description/Notes:
Sampling Type: **Soil Vapor/Soil Matrix**
Sample ID Number(s): **RMSV0045/RMBS0045**
Analyses: **VOCs, TPH, Metals, Dioxins**

Photo 1-Looking North



Photo 2 -Looking Down



Building Feature Documentation Log
Feature Number: 4665-001
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 23, 2009

Building Feature Documentation Log
Feature Number: 4665-002
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4665**
Building Owner: **DOE**
Building Name: **Oxidation Facility, Equipment Storage**
Building Use: **Oxidation Facility, Equipment Storage**

Feature Description:
Feature Type: **Tracks**
Operational Use / Process: **Equipment Support**
Associated Chemicals: **Not documented**
Discharge: **No**
Size: **10.5 ft long, 1in wide, 3 ft apart**
Construction Material: **Metal**
Status: **Closed/Inactive**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Unlikely**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located below removed oxidation equipment**
Likelihood of Impact from Other Source: **Potential**
Comments: **Oxidation equipment used to treat radioactive water generated at ETEC facilities. Concrete appears intact.**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes:
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0113**
Analyses: **SVOCs, PCBs, Metals**

Photo 1-Looking East



Photo 2 -Looking North



MWH

Photographic Log - RMHF RFI Site

Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4688 Equipment and Hazardous Waste Storage**

Photograph ID: 001

Date: Apr 14, 2009

Location / Direction:
Building 4688 Equipment and Hazardous Waste Storage Area/
Northeast

Comments:



Photograph ID: 002

Date: Feb 24, 2009

Location / Direction:
Building 4688 Equipment and Hazardous Waste Storage Area/
Northeast

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4688 Equipment and Hazardous Waste Storage**

Photograph ID: 003

Date: Apr 14, 2009

Location / Direction:
Building 4688 Equipment and Hazardous Waste Storage Area/
South

Comments:



Photograph ID: 004

Date: Mar 4, 2009

Location / Direction:
Building 4688 Equipment and Hazardous Waste Storage Area - Drum and Box Inspection Area/
East

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4688 Equipment and Hazardous Waste Storage**

Photograph ID: 005

Date: Mar 4, 2009

Location / Direction: Building 4688 Equipment and Hazardous Waste Storage Area - Hazardous Waste Storage Cabinets/ East

Comments:



Photograph ID: 006

Date: Feb 24, 2009

Location / Direction: Building 4688 Equipment and Hazardous Waste Storage Area - Storage Container/ Northeast

Comments:



Customer:	**Department of Energy**	**Project Name:**	
Site Name:	**RMHF RFI Site**	**Site Location:**	**Building 4688 Equipment and Hazardous Waste Storage**

Photograph ID: 007

Date: Apr 14, 2009

Location / Direction:
Building 4688 Equipment and Hazardous Waste Storage Area - Former Oil Sump Excavation Area/
Down

Comments:



Building Feature Documentation Log
Feature Number: 4688-001
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4688**
Building Owner: **DOE**
Building Name: **Equipment Storage**
Building Use: **Equipment Storage**

Feature Description:
Feature Type: **Flammable Chemical Storage**
Operational Use / Process: **Hazardous material containment/Storage**
Associated Chemicals: **Fuels, solvents**
Discharge: **No**
Size: **3 ft x 2 ft by 5 ft**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **Yes**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to hazardous waste storage containers and drum inspection structure**
Likelihood of Impact from Other Source: **Potential**
Comments: **Container is inspected weekly for contents, spills, and condition**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **In addition, collected sample downslope of hazardous waste storage cabinet during Group 7 Data Gap Sampling.**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0091**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking Northwest



Photo 2 -Looking North



Building Feature Documentation Log
Feature Number: 4688-002
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4688**
Building Owner: **DOE**
Building Name: **Equipment Storage**
Building Use: **Equipment Storage**

Feature Description:
Feature Type: **Hazardous Waste Storage**
Operational Use / Process: **Hazardous material containment/Storage**
Associated Chemicals: **Hazardous Waste**
Discharge: **No**
Size: **3 ft by 4 ft by 5 ft tall**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to hazardous waste storage containers and drum inspection structure**
Likelihood of Impact from Other Source: **Potential**
Comments: **Container is inspected weekly for contents, spills, and condition**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **In addition, collected sample downslope of hazardous waste storage cabinet during Group 7 Data Gap Sampling.**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0091**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking East



Photo 2 -Looking South



MWH

Inspector: M. Chell
Date: Feb 23, 2009

Building Feature Documentation Log
Feature Number: 4688-002
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking East



MWH

Inspector: M. Chell
Date: Feb 23, 2009

Building Feature Documentation Log
Feature Number: 4688-003
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4688**
Building Owner: **DOE**
Building Name: **Equipment Storage**
Building Use: **Equipment Storage**

Feature Description:
Feature Type: **Hazardous Waste Storage**
Operational Use / Process: **Hazardous material containment/Storage**
Associated Chemicals: **Hazardous Waste**
Discharge: **No**
Size: **3 ft by 1.5 ft by 2 ft tall**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Adjacent to hazardous waste storage containers and drum inspection structure**
Likelihood of Impact from Other Source: **Potential**
Comments: **Container is inspected weekly for contents, spills, and condition**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **In addition, collected sample downslope of hazardous waste storage cabinet during Group 7 Data Gap Sampling.**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0091**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking Northwest



Photo 2 -Looking West



Inspector: M. Chell
Date: Apr 14, 2009

Building Feature Documentation Log
Feature Number: 4688-003
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking West



MWH

Inspector: M. Chell
Date: Apr 14, 2009

Building Feature Documentation Log
Feature Number: 4688-007
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4688**
Building Owner: **DOE**
Building Name: **Equipment Storage**
Building Use: **Equipment Storage**

Feature Description:
Feature Type: **Cracked Concrete**
Operational Use / Process: **Equipment Storage Area**
Associated Chemicals: **Hazardous Waste**
Discharge: **No**
Size: **12 ft by 12 ft**
Construction Material: **Concrete**
Status: **Active**

Feature Condition:
General Condition: **Compromised: Cracked**
Debris: **No**
Staining: **Yes (rust)**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located below drum/barrel inspection structure**
Likelihood of Impact from Other Source: **Potential**
Comments: **Drum/barrel inspection structure is used to inspect hazardous waste packaging prior to shipment**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **In addition, collected sample adjacent to cracked concrete and drum/box inspection area during Group 7 Data Gap Sampling.**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0050**
Analyses: **TPH, Metals**

Photo 1-Looking Northwest



Photo 2 -Looking North



Building Feature Documentation Log
Feature Number: 4688-007
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking Down



MWH

Inspector: M. Chell
Date: Feb 23, 2009

Building Feature Documentation Log
Feature Number: 4688-005
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4688**
Building Owner: **DOE**
Building Name: **Equipment Storage**
Building Use: **Equipment Storage**

Feature Description:
Feature Type: **Box/Barrel Inspection Structure**
Operational Use / Process: **Inspecting packaging for hazardous wastes prior to shipment**
Associated Chemicals: **Hazardous Waste**
Discharge: **No**
Size: **12 ft by 5.5 ft by 10 ft tall**
Construction Material: **Metal**
Status: **Active**

Feature Condition:
General Condition: **Intact**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located adjacent to hazardous waste and flammable chemical storage cabinets**
Likelihood of Impact from Other Source: **Potential**
Comments: **Drum/barrel inspection structure is used to inspect hazardous waste packaging prior to shipment**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **In addition, collected sample downslope of hazardous waste storage cabinet during Group 7 Data Gap Sampling.**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0050**
Analyses: **TPH, Metals**

Photo 1-Looking Northwest



Photo 2 -Looking East



Building Feature Documentation Log
Feature Number: 4688-006
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4688**
Building Owner: **DOE**
Building Name: **Equipment Storage**
Building Use: **Equipment Storage**

Feature Description:
Feature Type: **Worn Concrete**
Operational Use / Process: **Equipment Storage Area**
Associated Chemicals: **Hazardous Waste**
Discharge: **No**
Size: **3 ft by 1 ft**
Construction Material: **Concrete**
Status: **Active**

Feature Condition:
General Condition: **Compromised: Etched/Degraded**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located below drum/barrel inspection structure**
Likelihood of Impact from Other Source: **Potential**
Comments: **Drum/barrel inspection structure is used to inspect hazardous waste packaging prior to shipment**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **In addition, collected sample downslope of hazardous waste storage cabinet during Group 7 Data Gap Sampling.**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0050**
Analyses: **TPH, Metals**

Photo 1-Looking North



Photo 2 -Looking East



MWH

Inspector: M. Chell
Date: Apr 14, 2009

Building Feature Documentation Log
Feature Number: 4688-006
Santa Susana Field Laboratory, Ventura County, California

Photo 3 -Looking Down



MWH

Inspector: M. Chell
Date: Apr 14, 2009

Building Feature Documentation Log
Feature Number: 4688-004
Santa Susana Field Laboratory, Ventura County, California

Feature Location:
RFI Site: **RMHF** RFI Reporting Group: **7**
Building Number: **4688**
Building Owner: **DOE**
Building Name: **Equipment Storage**
Building Use: **Equipment Storage**

Feature Description:
Feature Type: **Cracked Concrete**
Operational Use / Process: **Equipment Storage Area**
Associated Chemicals: **Hazardous Waste**
Discharge: **No**
Size: **6 ft**
Construction Material: **Concrete**
Status: **Active**

Feature Condition:
General Condition: **Compromised: Cracked**
Debris: **No**
Staining: **No**
Odor: **No**
PID Reading: **N/A**
Likelihood of Impact from Feature: **Potential**

Additional Information:
Proximity to Nearest Chemical Use Area: **Located adjacent to hazardous waste and flammable chemical storage cabinets**
Likelihood of Impact from Other Source: **Potential**
Comments: **Containers are inspected weekly for contents, spills, and condition**
GPS Coordinates:

Sampling Information:
Sampling Warranted?: **Yes, inspect and sample, if warranted**
Sampling Description/Notes: **In addition, collected sample downslope of hazardous waste storage cabinet during Group 7 Data Gap Sampling.**
Sampling Type: **Soil Matrix**
Sample ID Number(s): **RMBS0091**
Analyses: **VOCs, TPH, Metals**

Photo 1-Looking North



Photo 2 -Looking Down



Inspector: M. Chell
Date: Apr 14, 2009