Report

Group 5 – Central Portion of Areas III and IV RCRA Facility Investigation Report Santa Susana Field Laboratory, Ventura County, California

Volume V – RFI Site Reports Appendix H

Pond Dredge Area

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Acronyms and Abbreviations

AI	Atomics International
AOC	Area of Concern
AST	aboveground storage tank
Boeing	The Boeing Company
bgs	below ground surface
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
Cal-EPA	California Environmental Protection Agency
CCR	Current Conditions Report
CF	Chatsworth Formation
CFOU	Chatsworth Formation Operable Unit
CMS	Corrective Measures Study
COC	chemical of concern
COEC	chemical of ecological concern
COPC	chemical of potential concern
CPEC	chemical of potential ecological concern
CSM	conceptual site model
CTE	central tendency exposure
CUA	Chemical Use Area
DCA	dichloroethane
DCE	dichloroethene
Dioxins/Furans	*see list following acronyms*
DOE	United States Department of Energy
DQO	data quality objective
DTSC	Department of Toxic Substances Control
ECL	Engineering Chemistry Laboratory
EEL	Environmental Effects Laboratory
ELCR	estimated lifetime cancer risk
EPC	exposure point concentration
ERA	ecological risk assessment

ESL	ecological screening level
ETEC	Energy Technology Engineering Center
GRC	Groundwater Resource Consultants, Inc.
H&A	Haley & Aldrich, Inc.
HAR	Hydrogeologic Assessment Report
HI	hazard index
HMSA	Hazardous Material Storage Area
HQ	hazard quotient
HRA	human health risk assessment
HSA	Historical Site Assessment
ICF	ICF Kaiser Engineers
ILCR	incremental lifetime cancer risk
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
msl	mean sea level
MWH	Montgomery Watson Harza
NA	not applicable
ND	not detected
NDMA	n-nitrosodimethylamine
NFA	no further action
NPDES	National Pollutant Discharge Elimination System
NSGW	near-surface groundwater
Ogden	Ogden Environmental and Energy Services Company, Inc.
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
pCi/g	picocuries per gram
PDU	Coal Gasification Process Development Unit
pg/g	picograms per gram
ppb	parts per billion (µg/kg or µg/L)
ppm	parts per million (mg/kg or mg/L)

PRG	preliminary remediation goal
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RA	risk assessment
RBSL	risk-based screening level
RCRA	Resource Conservation and Recovery Act
RIHL	Rockwell International Hot Laboratory
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RME	reasonable maximum exposure
Rocketdyne	Rocketdyne Propulsion and Power
RWQCB	Los Angeles Regional Water Quality Control Board
SAIC	Science Applications International Corporation
SE Drum Yard	Southeast Drum Storage Yard
SMOU	Surficial Media Operable Unit
SNAP	Systems for Nuclear Auxiliary Power
SOP	standard operating procedure
SRAM	Standardized Risk Assessment Methodology
SSFL	Santa Susana Field Laboratory
STL-IV	Systems Test Laboratory IV
STP-3	Area 3 Sewage Treatment Plant
SVOC	semivolatile organic compound
SWMU	solid waste management unit
3-D	three dimensional
TCDD-TEQ	2,3,7,8-tetrachlorodibenzodioxin toxicity equivalency
TDS	total dissolved solids
TEQ	toxicity equivalency quotient
TIC	tentatively identified compound
TCE	trichloroethene
TPH	total petroleum hydrocarbons
TRV	toxicity reference value
UCL	upper confidence limit

USEPA	United States Environmental Protection Agency
UST	underground storage tank
µg/dl	micrograms per deciliter
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µg/Lv	micrograms per liter vapor
µs/cm	micro siemens per centimeter
VOC	volatile organic compound
WPA	RFI Work Plan Addendum
WPAA	RFI Work Plan Addendum Amendments

(a) Definition of dioxin/furan congeners

PCDD/PCDDs	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	toxicity equivalency quotient (normalized to 2,3,7,8 TCDD)

Appendix H

H.1 Introduction

This appendix to the Group 5 Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report presents findings and recommendations based on the results of the investigation conducted at the Pond Dredge Area of the Santa Susana Field Laboratory (SSFL). The Pond Dredge Area contains one Area of Concern (AOC)—the Pond Dredge Area. The Pond Dredge Area RFI Site, located within Area IV of the SSFL, was used in support of The Boeing Company (Boeing) operations. 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 Pond Dredge Area is 1 of 17 RFI sites included in the Group 5 RFI Report. The location of the Pond Dredge Area within the SSFL and Group 5 Reporting Area is shown in Figure H.1-1. An RFI Site is an area that includes at least one solid waste management unit (SWMU) and/or an AOC, and some adjacent land for the purpose of characterization. The other 16 Group 5 RFI sites are:

- Boeing Area IV Leach Field (AOC)
- Compound A Facility (SWMU 6.4)
- Engineering Chemistry Laboratory (ECL) (SWMUs 6.1, 6.2, 6.3, and AOC)
- Environmental Effects Laboratory (EEL) (SWMU 6.9)
- Pond Dredge Area (AOC)
- Coal Gasification Process Development Unit (PDU) (SWMU 7.10)
- Area 3 Sewage Treatment Plant (STP-3) (AOC)
- Systems Test Laboratory IV (STL-IV) (SWMUs 6.5, 6.6, and 6.7)
- Building 65 Metals Laboratory Clarifier (Building 65) (AOC)
- Building 100 Trench (SWMU 7.5)
- Department of Energy Leach Field 1 (DOE LF1) (AOC)
- Department of Energy Leach Field 2 (DOE LF2) (AOC)
- Department of Energy Leach Field 3 (DOE LF3) (AOC)
- Hazardous Material Storage Area (HMSA) (AOC),
- Rockwell International Hot Laboratory (RIHL) (SWMU 7.7)
- Systems for Nuclear Auxiliary Power Facility (SNAP) (AOC)

The Pond Dredge Area Site is located in the west-central portion of the Group 5 Reporting Area, south of the RIHL RFI Site, west of the DOE LF3 RFI Site, and east of the Group 8 Reporting Area (Figure H.1-1).

The SSFL RFI was conducted to (1) characterize the presence of SSFL-operation-related chemicals in environmental media, (2) estimate risks to human health and the environment (the ecosystem, that is), and (3) gather data for the next phase of RCRA Corrective Action to support the recommendations included in this RFI Report regarding areas recommended

for no further action (NFA), corrective measures study (CMS) areas, and interim stabilization.

The SSFL has been divided into two operable units (OUs)—the Surficial Media Operable Unit (SMOU) and the Chatsworth Formation Operable Unit (CFOU). The Pond Dredge Area Site characterization presented in this appendix comprises data for the SMOU and summaries of the CFOU data. The SMOU 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. The CFOU includes Chatsworth Formation bedrock and deeper groundwater that occurs within the unweathered bedrock of the Chatsworth Formation.

H.1.1 Report Organization

This Pond Dredge Area Site Report provides detailed sampling data and evaluation pertaining to the Pond Dredge Area Site, including a summary of the site history, a summary of the RFI sampling and analyses, risk assessment results, and site recommendations. This information is presented in sections organized as follows:

- **Section H.2 – Site History, Chemical Use, and Current Conditions.** Presents the site history and chemical use, as well as the current conditions including geology and groundwater conditions. Changes in site conditions and soil disturbance areas are also described.
- **Section H.3 – Nature and Extent of Chemical Impacts.** Presents a summary of SMOU and CFOU characterization information for the Pond Dredge Area Site.
- **Section H.4 – Summary of Risk Assessment Findings**. Presents the results of the human health risk assessment (HRA) and ecological risk assessment (ERA) for the Pond Dredge Area Site. The complete risk assessment is included in Appendix A of the Group 5 RFI Report.
- **Section H.5 – Site Actions Recommendations**. Presents a summary of the areas within the Pond Dredge Area Site that are recommended for either NFA or further evaluation in the CMS. CMS areas recommended for interim measures to prevent contaminant migration are also identified, if any.
- **Section H.6 – References.** Includes a list of cited references.

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

- **Attachment H-1**: Site-specific regulatory agency documents and correspondence.
- **Attachment H-2**: Subsurface information (soil boring, trench, piezometer, and well logs).
- **Attachment H-3**: Data quality, validation, and laboratory reports.
- **Attachment H**-4: Building surveys.

Information regarding characterization for the Pond Dredge Area Site is provided in the following figures and tables:

- Figure H.1-1: Presents the location of the Pond Dredge Area Site within the SSFL and the Group 5 Reporting Area.

- Figure H.2-1: Presents a plan view of the Pond Dredge Area Site, showing known and potential chemical use areas. Table H.2-1 presents a summary of site features at the Pond Dredge Area Site.
- Figure H.2-2: Presents a plan view of the Pond Dredge Area Site, showing soil and soil vapor sampling locations, and nearby monitoring wells.
- Figures H.2-3A and H.2-3B: Present geologic cross-sections across the Pond Dredge Area Site.
- Figures H.3-1 through H.3-11: Summarize results of soil sampling at the Pond Dredge Area Site. Soil sampling results are shown on these maps and are listed in Table H.3-2A.

Information regarding Group 5 area-wide conditions, transport and fate of chemicals between RFI sites, and other evaluations of area-wide issues are contained in the Group 5 RFI Report (Volume I) and appendices. Pertinent appendices to this Group 5 RFI Report are:

- **Appendix A:** Presents risk assessment information, including risk calculations, result tables, all transport-and-fate modeling (except groundwater), and a description of any methodology variances from the Standardized Risk Assessment Methodology (SRAM) Work Plan.
- **Appendix B:** Presents information regarding groundwater conditions in the Group 5 Reporting Area, including the Pond Dredge Area Site. Information includes groundwater occurrence and quality, chemical transport, representativeness of the data set, and supporting data (monitoring results, time-series plots, and hydrographs), as well as an evaluation of naturally occurring constituents.

H.1.2 Historical Reference Documents

A searchable database of historical document for the Group 5 Reporting Area is being submitted to DTSC along with this Group 5 RFI Report (Boeing, 2008). Included are facility records, maps and drawings, correspondence, and reports relevant to the RFI for each of Group 5 RFI sites. Documents pertaining to the entire SSFL are included if they are relevant to Group 5. The Group 5 document database includes documents relevant to the Pond Dredge Area Site. It is worth noting that information presented in this Pond Dredge Area Site report is supplemented by background documents that contain information about site and facility background, SMOU Program background, and methodologies/procedures. Key historical documents are listed below with brief descriptions:

- RCRA Facility Assessment (RFA) (Science Applications International Corporation [SAIC], 1994). This report contains:
  - 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). This report contains:
  - 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.
  - Description of SWMUs and AOCs, including 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), RFI Work Plan Addendum Amendments (WPAA) (Ogden, 2000a and 2000b). These reports contain:
  - Sampling procedures and rationale.
  - RFI site descriptions and operational history.
  - Shallow groundwater characterization sampling and analysis plan for the SSFL.
- RFI Program Report (Montgomery Watson Harza [MWH], 2004). This report contains:
  - 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 SMOU field sampling program, including work plans followed, overall sampling scope performed, sampling methods and subcontractors used, and protocol followed.
  - Details of the analytical program for the SMOU 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). This report contains:
  - Procedures for completing HRAs and ERAs.
  - Background soil concentrations and groundwater comparison concentrations.
  - A biological conditions report for the SSFL.
- Near-Surface Groundwater Characterization Report (MWH, 2003b). This report contains:
  - Nature and extent of near-surface groundwater 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 and 2003a). These reports contain:
  - 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 – 2007 (Haley & Aldrich, Inc. [H&A], 2008a).
  - Second Quarter 2007 Groundwater Monitoring Report (H&A, 2007a).
  - Third Quarter 2007 Groundwater Monitoring Report (H&A, 2007b).
  - Fourth Quarter 2007 Groundwater Monitoring Report (H&A, 2008b).
  - First Quarter 2008 Groundwater Monitoring Report (H&A, 2008c).
- Historical Site Assessment (Sapere, 2005). This report contains:
  - Facility descriptions and historical operational information for buildings used for radiological research and development in Area IV.
  - Information regarding radiological demolition activities, surveys, releases, and removal actions conducted for radiological areas within Area IV.
- Debris Area Survey and Sampling Methodology (CH2M HILL document in progress). This standard operating procedure (SOP) provides general guidelines for performing the following activities:
  - Visual inspections of the SSFL for surficial evidence of solid waste disposal (referred to herein as debris areas)
  - Sampling for chemical analytes at debris areas
- Quality Assurance Project Plan (QAPP) (MECx, 2008). This QAPP provides general guidelines, which include:
  - Quality assurance/quality control (QA/QC) procedures to ensure that field and laboratory data quality and project work achieve the data quality objectives (DQO).
  - Ensuring the project work performed is in accordance with professional standards and regulatory guidelines.
- Building Feature Evaluation and Sampling (MWH, 2008). This SOP presents the procedures for evaluating environmental conditions associated with existing buildings, concrete pads, and supporting infrastructure under the following scenarios:
  - Environmental assessment prior to building demolition
  - Environmental assessment during/after building demolition
  - Environmental assessment for buildings not planned for demolition

H.2 Site History, Chemical Use, and Current Conditions

The Pond Dredge Area Site is approximately 5.3 acres located in the central portion of Area IV at the SSFL. The site location within the SSFL is shown in Figure H.1-1, which also shows the Group 5 Reporting Area boundary. The site layout and the locations of Chemical Use Areas are shown in Figure H.2-1. The sampling locations across the site are shown in Figure H.2-2.

During the WPAA, various SWMUs and AOCs within the SSFL were identified. The Pond Dredge Area Site was identified as an AOC in the WPAA (Ogden, 2000a). No other SWMUs or AOCs were identified in the WPAA within the boundary of the Pond Dredge Area Site as it is defined in this report (Figure H.1-1).

Based on site inspections, reviews of historical aerial photographs, drawings, and facility maps, as well as on interviews with site personnel conducted during the RFI, the Pond Dredge Area Site boundary was defined to include operations associated with the Pond Dredge Area Site. There are no facilities and the only features in the AOC included numerous hummocky areas and dredged soil. Known and potential Chemical Use Areas at the Pond Dredge Area Site are shown in Figure H.2-1 and described in Table H.2-1.

The following sections describe the AOC, site history and operations, chemical uses, and current conditions at the Pond Dredge Area Site.

H.2.1 SWMUs and/or AOCs at the Pond Dredge Area Site

The Pond Dredge Area Site contains one AOC—namely, the Pond Dredge Area Site (Ogden, 2000a). A brief description of the AOC history that is included in this RFI Site Report is presented below.

H.2.1.1 Pond Dredge Area Site (AOC)

The Pond Dredge Area Site was possibly used for disposal of dredge materials from Silvernale Reservoir and R-2 Ponds during the 1960s. Boeing personnel indicate the possibility that drill cuttings and construction debris was also disposed of at this location, but no documentation was discovered. During the 2008 RFI investigation, upon brush clearing, debris piles containing likely construction debris were located corresponding with known hummocky areas. The debris contained concrete and asphalt pieces, as well as stainless steel tubing.

H.2.2 Pond Dredge Area Site History

A summary of the site chronology, including descriptions of site operations and investigation activities for the Pond Dredge Area Site, is presented in Section H.2.1 above. Facility correspondence, investigation reports, waste disposal records, facility maps, drawings, photographs, and personnel interview records were reviewed and evaluated to compile the site history information presented below. Primary sources of information are summarized Section H.1.2.

Inventories of buildings, tanks, transformers, and chemicals used at the Pond Dredge Area Site were compiled during preparation of this RFI report. Historical reports and facility

drawings were reviewed, and visual site inspections were conducted. There are no identified buildings, tanks, and transformers. The Pond Dredge Area Site is shown in Figure H.2-1. The Spill Inventory is included in Table H.2-2.

H.2.3 Pond Dredge Area Site Chemical Use Areas

Chemical Use Areas are locations where chemicals were documented to have been (or potentially have been) used, stored, spilled, discharged, and/or disposed of. Chemical Use Areas at the Pond Dredge Area Site are shown in Figure H.2-1 and are described in detail in Section H.3. The one Chemical Use Area evaluated at or near the site is listed in Table H.2-3.

The site characterization information is described relative to these Chemical Use Areas in Section H.3. In addition to known areas of chemical use, samples were collected to assess conditions in the drainages downgradient of these Chemical Use Areas. Information regarding the drainage evaluation is also provided in Section H.3.

H.2.4 Site Conditions

This section provides summaries of site conditions near the Pond Dredge Area Site, including topography, geology, soil, groundwater, surface water, seeps and springs, and biology.

H.2.4.1 General Conditions and Topography

The Pond Dredge Area Site is located within the central portion of Area IV. The site is currently inactive, and no structures were built within the limits of this RFI site. Topography in the central portion of the site slopes to the northeast. Current surface elevations at the Pond Dredge Area Site range from a low of approximately 1820 feet above mean sea level (msl) in the northeast portion of the site to a high of approximately 1890 feet msl in the southwest portion of the site. A summary site conceptual model is presented in Table H.2-5. Figure H.2-3B presents a cross section developed for the Pond Dredge Area Site (Surficial Cross Section Y-Y') detailing topography, locations and depths of alluvium, and the most recent available groundwater elevations. Location of the cross-section is shown in Figure H.2-3A.

No cleanup actions have been conducted at the Pond Dredge Area Site.

H.2.4.2 Geology

The Pond Dredge Area Site is located north of the Burro Flats Fault, within the Lower Burro Flats Member of the Upper Chatsworth Formation (Dibblee, 1992; MWH, 2002 and 200&C). A series of deformation bands is present northwest of the Pond Dredge Area Site. These deformation bands generally strike northeast-southwest and have been interpreted to comprise the western extent of the North Fault Zone (MWH, 2002).

Beds of the Lower Burro Flats Member generally strike N70°E and dip 25°NW. The Lower Burro Flats Member is predominantly composed of medium-grained sandstone with significant interbeds of siltstone and shale. Figure 2-5 of the Group 5 RFI Report (Volume I) shows the geologic units represented within the RFI site. The locations of the Burro Flats Fault and the deformation bands are shown in Plate B-1 in Appendix B of the Group 5 RFI

Report. Additional geologic information is presented in Appendix B of the Group 5 RFI Report.

H.2.4.3 Soil

Throughout most of the Pond Dredge Area Site, soil is generally thin, typically ranging from less than 4 feet to 21 feet thick. The maximum depth of backfill in the Pond Dredge Area Site is about 20 feet below current grade based on trenching and sampling conducted during the RFI investigation. A map depicting the distribution of alluvial soil within the Group 5 Reporting Area is provided as Figure 2-4 in the Group 5 RFI Report (Volume I). Dredge soil is primarily composed of silty sands, clayey silts, and silty clays. Soil in the undisturbed areas of the site consists of weathered Chatsworth Formation materials, which are primarily silty sands. Soil boring logs are included as Attachment H-2 to this appendix.

H.2.4.4 Groundwater

The groundwater system and monitoring network in RFI Group 5 is discussed in detail in Appendix B of the Group 5 RFI Report. In that appendix, Figure B-1 shows wells and piezometers that are used to monitor groundwater at and near the Pond Dredge Area Site. Figure H.2-2 shows well locations in and around the Pond Dredge Area Site.

At the Pond Dredge Area Site, no piezometers or shallow wells were installed to monitor groundwater conditions in alluvium and weathered bedrock (that is, in NSGW), while one well (RD-13) was installed to monitor groundwater conditions in the unweathered bedrock (that is, in CFOU groundwater). Construction details for this well is discussed in Table B-3 (Appendix B of the Group 5 RFI Report), and the location is shown in Figure H.2-2 in this appendix.

A cross-sectional diagram of NSGW and CFOU Groundwater occurrence is shown in Figure B-6 in Appendix B of the Group 5 RFI Report. While there are no wells screened in the weathered bedrock within the Pond Dredge Area Site, data for nearby wells indicate that NSGW is estimated to be encountered at an elevation of approximately 1800 feet msl and that NSGW flows to the southeast at a gradient of approximately 0.04 foot/foot. The occurrence of NSGW in the Pond Dredge Area Site vicinity is shown in plan view in Figure B-7 in Appendix B of the Group 5 RFI Report. Further information related to NSGW groundwater at the Pond Dredge Area Site is presented in Appendix B of the Group 5 RFI Report.

CFOU Groundwater at the Pond Dredge Area Site is encountered at depths ranging from 49 feet below ground surface (bgs) (1791 feet msl) to 54 feet bgs (1786 feet msl) at well RD-13. CFOU Groundwater at the Pond Dredge Area Site has a hydraulic gradient of approximately 0.06 foot/foot to the east. The occurrence of CFOU Groundwater in the Pond Dredge Area Site vicinity is shown in plan view in Figure B-8 in Appendix B of the Group 5 RFI Report.

H.2.4.5 Surface Water

Surface water flow at the Pond Dredge Area Site is shown in Figure 2-7b of the Group 5 RFI Report (Volume I). There are no drainages, either natural or man-made within the Pond Dredge Area Site. Surface water may exist intermittently at the Pond Dredge Area Site as the result of seasonal precipitation events. Surface water runoff from the Pond Dredge Area

Site flows east to DOE Leach Fields 3 and then southeast to STL-IV and R-2 Discharge Ponds.

Surface water runoff at the site is regularly monitored as part of the National Pollutant Discharge Elimination System (NPDES) monitoring program under the oversight of the Los Angeles Regional Water Quality Control Board (RWQCB). One monitoring location, Outfall 018, occurs downgradient at the discharge of the R-2 Ponds (Figure 2-7 in the Group 5 RFI Report [Volume I]). This discharge point is the ultimate discharge point for a large portion of the western half of SSFL.

H.2.4.6 Biology

In April 2008, a reconnaissance-level biological survey was conducted at the Group 5 RFI Sites. Biological conditions at the Pond Dredge Area Site, including habitat/vegetation types, are shown in Figure 2-10 of the Group 5 RFI Report (Volume I). The results of the biological survey and a qualitative plant evaluation are presented in Appendix A, Attachment A18, of the Group 5 RFI Report.

H.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 Pond Dredge Area 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 5 RFI Report (Volume I), Section 5, Contaminant Transport and Fate – Potential migration via surface water flow
- Group 5 RFI Report (Volume II), Appendix A, Risk Assessment – Potential volatile organic compound (VOC) migration from groundwater and subsurface soil to soil vapor and soil vapor to indoor and ambient air
- Group 5 RFI Report (Volume III), Appendix B, Groundwater Characterization – Potential migration from soil to groundwater, and groundwater migration

H.3.1 Sampling Objectives

Several soil samples were collected as part of the previous RFA and preliminary RFI sample collection events (Ogden, 2000). Based on the review of historical documents summarized in Section H.1.2, additional soil samples were collected to further characterize the site based on the RFI data quality objectives (DQOs). The process of selecting sampling locations, depths, and analytical methods considered objectives established in the Group 5 DQOs as summarized in the Group 5 RFI Report, Section 4.0 (Volume I).

To achieve these objectives, recent soil sampling was conducted as described in Table H.3-1, with consideration of the following:

- Additional information regarding site use and observed site conditions
- Site sampling results and data trends
- Knowledge of chemical properties (such as mobility, volatility, and association with other chemicals)
- SSFL SRAM-based screening concentrations for human health and ecological receptors
- Risk assessment results and knowledge of areas recommended to require further evaluation during the CMS

Groundwater has been sampled to comply with site-wide routine monitoring requirements and additional characterization objectives according to regulatory agency-approved work plans (see Section H.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 and 1995b) and the Shallow Zone Groundwater Investigation Work Plan (Ogden, 2000b).

H.3.2 Sampling Scope

A total of 62 soil matrix samples were collected between October 2000 and May 2008 to assess potential impacts associated with the chemical use areas at the Pond Dredge Area Site. Sampling locations and analytical suites were based on sampling results from previous investigations, additional facility information obtained from historical records, site inspections and/or personnel interviews, and historical and/or aerial photographs. Sampling schedules are presented in Table H.3-1. Sample locations are shown on Figure H.2-2.

The CFOU groundwater has been sampled and analyzed according to agency-approved work plans (GRC, 1995a and 1995b; Ogden, 2000b). One Chatsworth Formation well (RD-13) was used to characterize CFOU groundwater specifically at the Pond Dredge Area Site. Groundwater characterization data for the Pond Dredge Area Site are presented with the entire Group 5 groundwater data set in Appendix B in the Group 5 RFI Report.

In 2008, soil samples collected were submitted to two California-certified environmental laboratories—GEL Engineering Laboratories in Atlanta, Georgia, and Test America, Inc. in Arvada, Colorado. As an ongoing additional QA measure, the field sampling effort consisted of collecting blind duplicates and split samples at a frequency of approximately 5 percent of primary samples. Blind duplicates were submitted along with the primary samples to the two environmental laboratories. Split samples were submitted for analyses to Lancaster Laboratories in Lancaster, Pennsylvania, a California-certified environmental laboratory previously designated for analyzing split samples only. Highest concentrations of usable data from primary, duplicate, and split samples were used when evaluating contamination at the site.

Based on a QA review conducted on soil sampling results, data have been deemed usable and in compliance with RFI program requirements as defined by Quality Assurance Project Plans (QAPP) in Appendix V of the Group 5 RFI Report. The RFI QA program included individual sample data validation, assessment of the performance of each laboratory, and a qualitative review of the precision, accuracy, representativeness, reliability, and completeness parameters for the data sets collected for this RFI. A summary of the data quality evaluation is presented in Attachment H-3 of this report. Historical samples (collected prior to the beginning of the RFI in 1996) data quality evaluation is described in the RFI Program Report (MWH, 2004). Site-specific data quality summaries for the Pond Dredge Area Site are described by media in the sections below.

This report presents results of media sampling conducted, if the media exists at the RFI site, during the RFI and previous investigations at the Pond Dredge Area Site, including the following:

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

H.3.3 Key Decision Points

Site assessment was performed to address revised, DTSC-approved requirements for risk assessment and evaluate new potential Chemical Use Areas. Sampling of new Chemical Use Areas and step-out sampling procedures followed the DTSC-approved work plan protocols for the RFI (MWH, 2005).

Site-specific characterization decision points are described in Table H.3-2A. These decision points represent either assumptions upon which sampling was based, or decisions made during step-out sampling or data evaluation. Programmatic decision points (those common to all RFI sites) are described and included in the RFI Program Report (MWH, 2004).

H.3.4 Soil Matrix Findings

Soil sampling results and characterization findings are summarized in Table H.3-2A. The goals of the table are to:

1. Present summaries of sampling results, including nature and extent of impacts.
2. Evaluate the soil characterization and assess whether further sampling is warranted.
3. Indicate that soil volumes for areas recommended for CMS can be estimated 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 the risk assessment results and CMS recommendations, as well as the soil analytical data. For example, if detected concentrations are sufficiently high to indicate that further evaluation in the CMS will be necessary, the data 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, the types of historical site operations and chemical uses, and analytical detection limits.

The evaluation of site characterization data for the Pond Dredge Area Site is provided in Tables H.3-3.

H.3.4.1 Soil Data Presentation

The results by chemical group are summarized in Figures H.3-1 through H.3-11. Relevant site information, sampling rationale, analytical results, and evaluation of results are presented in Table H.3-2A. This table discusses the sampling approach for each chemical use area and a brief summary of the sampling results by chemical group, including:

- Column 1 –Chemical use number.
- Column 2 – Name of Chemical Use Area.
- Column 3 – Chemical group sampled in a particular Chemical Use Area.
- Column 4 – Sampling scope and rationale for each chemical group in a particular Chemical Use Area.

- Column 5 – Abbreviated summary of sampling results for soil from each chemical group in a particular Chemical Use Area. (A more detailed site-wide summary is presented in Section K.3.4.2 below.) 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 in Table H.3-3.
- Column 6 – Assessment of whether characterization is sufficient 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.
- Column 7 – Assessment of whether the nature and extent of chemicals is defined sufficiently to estimate soil volumes (within a factor of 10) for areas that require further consideration in the CMS (if needed).

H.3.4.2 Soil Data Summary

As detailed in Table H.2-4, one Chemical Use Area was investigated at the Pond Dredge Area Site. A summary of the chemicals detected above screening criteria is provided below by chemical analytical group. Concentrations denoted with a "J" flag indicate the results are estimated below the method reporting limits.

H.3.4.2.1 Volatile Organic Compounds

A total of 34 soil samples was collected at 17 locations and analyzed for volatile organic compounds (VOCs). Of the 34 samples, 6 samples had detectable levels of VOCs, and results are shown in Figures H.3-1 and H.3-8.

- Benzene was detected above the Residential RBSL of 0.13 micrograms per kilogram (µg/kg) in a sample collected from PDTS1000 at a depth of 0 to 1 foot bgs (1.0 J µg/kg). The extent of benzene impact is defined and further characterization is not recommended at the Pond Dredge Area Site.
- Acetone, 1,1-dichloroethene, methyl ethyl ketone, p-cymene, and styrene were detected at concentrations that did not exceed their respective RBSLs.

H.3.4.2.2 Semivolatile Organic Compounds

A total of 37 soil samples was collected at 22 locations and analyzed for semivolatile organic compounds (SVOCs). Of the 37 samples, 20 had detectable levels of SVOCs, and results are shown in Figures H.3-2 and H.3-9.

- Bis(2-ethylhexyl) phthalate was detected above the Ecological RBSLs of 4,900 µg/kg in one sample collected from PDTS1002 at a depth of 0 to 1 foot bgs (12,000 J µg/kg). The extent of bis(2-ethylhexyl) phthalate impact is defined. However, based on risk assessment findings (Section H.4), bis(2-ethylhexyl) phthalate was found to be a

[1]The use of SRAM-based screening levels for comparison purposes does not serve as a risk assessment. These screening levels are not to be 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 A in the Group 5 RFI Report.

chemical risk driver. Areas with elevated bis(2-ethylhexyl) phthalate will be part of a corrective measure study.

- Butyl benzyl phthalate, diethyl phthalate, dimethyl phthalate, and di-n-octyl phthalate were detected but did not exceed their respective RBSLs.
- Various polyaromatic hydrocarbons (PAHs) were detected in 13 samples collected. None of the detected concentrations exceeded their respective RBSLs and no further characterization of PAHs in soil is recommended at Pond Dredge Area Site.

H.3.4.2.3 Total Petroleum Hydrocarbons

A total of 34 soil samples was collected at 19 locations and analyzed for total petroleum hydrocarbons (TPHs). Of the 34 samples, 24 had detectable levels of TPH and results are shown in Figures H.3-3 and H.3-9.

- Kerosene-range hydrocarbons (C12-C14), diesel-range hydrocarbons (C15-C20), and lubricating oil hydrocarbons (C20-C30) and (C21-C30) were detected at concentrations that did not exceed the Residential RBSL of 1400 milligrams per kilogram (mg/kg).

No further characterization of TPH is required at the Pond Dredge Area Site.

H.3.4.2.4 Polychlorinated Biphenyls

A total of seven soil samples was collected at five locations and analyzed for polychlorinated biphenyls (PCBs). Of the seven samples, four had detectable levels of PCBs and results are shown in Figures H.3-4 and H.3-9.

- Aroclor 1254 and Aroclor 1260 were detected at concentrations that did not exceed their respective RBSLs.

No further characterization of PCBs is required at the Pond Dredge Area Site.

H.3.4.2.5 Metals/Inorganic Compounds

A total of 58 soil samples was collected at 29 locations and analyzed for metals. At least one or more metals were detected in all sampling locations, and results are shown in Figures H.3-5 and H.3-10.

- Aluminum, barium, cadmium, molybdenum, nickel, selenium, silver, vanadium, and zinc concentrations were detected above their respective background concentrations and Ecological RBSLs.
  - Aluminum (background of 20,000 mg/kg, Ecological RBSL of 12 mg/kg) was detected at concentrations ranging from 9,160 mg/kg to 31,000 mg/kg. Aluminum was detected above background and Ecological RBSLs in 23 samples collected.
  - Barium (background of 140 mg/kg, Ecological RBSL of 15 mg/kg) was detected at concentrations ranging from 72.8 mg/kg to 190 mg/kg. Barium was detected above background and Ecological RBSLs in 14 samples collected.
  - Cadmium (background of 1 mg/kg, Ecological RBSL of 0.0045 mg/kg) was detected at concentrations ranging from 0.16 J mg/kg to 1.4 mg/kg. Cadmium was detected

above background and Ecological RBSLs in one sample collected from PDBS1004 at a depth of 0 to 1 foot bgs (1.4 mg/kg).

- Molybdenum (background of 5.3 mg/kg, Ecological RBSL of 0.11 mg/kg) was detected at concentrations ranging from 0.16 mg/kg to 5.9 J mg/kg. Molybdenum was detected above background and Ecological RBSLs in one sample collected from PDTS02S01 at a depth of 1 to 1.5 feet bgs (5.9 J mg/kg).
- Nickel (background of 29 mg/kg, Ecological RBSL of 0.1 mg/kg) was detected at concentrations ranging from 8.85 mg/kg to 65.4 mg/kg. Nickel was detected above background and Ecological RBSLs in a sample collected from PDTS07 at 3 to 3.5 feet bgs (65.4 mg/kg).
- Selenium (background 0.655 mg/kg, Ecological RBSL of 0.17 mg/kg) was detected at concentrations ranging from 0.47 J mg/kg to 1.2 mg/kg. Selenium was detected above background and Ecological RBSLs in 12 samples collected from eight locations.
- Silver (background of 0.79 mg/kg, Ecological RBSL of 0.54 mg/kg) was detected at concentrations ranging from 0.03 J mg/kg to 5.7 J mg/kg. Silver was detected above background and Ecological RBSLs in four samples collected from PDTS02S01 at a depth of 1 to 1.5 feet bgs (4.5 mg/kg), PDTS07 at a depth of 3 to 3.5 feet bgs (4.9 J mg/kg), PDTS03 at a depth of 1.5 to 2 feet bgs (5.5 J mg/kg), and PDTS01 at a depth of 3.5 to 4 feet bgs (5.7 J mg/kg).
- Vanadium (background of 62 mg/kg, Ecological RBSL of 1.5 mg/kg) was detected at concentrations ranging from 27.5 J mg/kg to 71.9 J mg/kg. Vanadium was detected above background and Ecological RBSLs in 19 samples collected. The elevated concentrations of vanadium may be consistent with naturally occurring concentrations in the soil derived from the Santa Susana Formation.
- Zinc (background of 110 mg/kg, Ecological RBSL of 21 mg/kg) was detected at concentrations ranging from 49 J mg/kg to 130 mg/kg. Zinc was detected above background and Ecological RBSLs in one sample collected from PDBS1004 at a depth of 0 to 1 foot bgs (130 mg/kg).

- Metals detected above background (but below all RBSLs) include beryllium, chromium, potassium, sodium, and thallium. Background concentrations for metals are included in Table H.3-3. Sodium was detected at concentrations ranging from 65.7 J mg/kg to 699 mg/kg. RBSLs for sodium have not been established.
- Perchlorate was detected above its Ecological RBSL of 2.4×10^{-5} mg/kg in one sample collected from PDBS1004 at a depth of 0 to 1 foot bgs (0.0046 J mg/kg).

Based on risk assessment findings (Section H.4), barium, chromium, nickel, vanadium were found to be chemical risk drivers. Additional characterization for barium, chromium, nickel, vanadium may be required at the Pond Dredge site as part of a corrective measure study..

H.3.4.2.6 Dioxins

A total of 33 soil samples was collected at 16 locations and analyzed for dioxins. Of the 33 samples, 30 had detectable levels of dioxins that exceeded the background concentrations

of the respective congeners. None of the detected concentrations exceeded their respective RBSLs, and results are shown in Figures H.3-6 and H.3-11. Based on risk assessment findings (Section H.4), DioxinFuranPCB_TEQ_Bird was found to be a chemical risk driver. Additional characterization for DioxinFuranPCB_TEQ_Bird may be required at RFI site as part of a corrective measure study.

H.3.4.2.7 Energetics

A total of 17 samples was collected at 16 locations and analyzed for energetics. No energetics were detected in any of the soil samples, and results are presented in Figure H.3-7.

No further characterization of energetics is recommended at the Pond Dredge Area Site.

H.3.5 Groundwater Findings

Groundwater occurrence and impacts at the Pond Dredge are described below.

H.3.5.1 Groundwater Data Presentation

Groundwater sampling results and characterization findings are summarized in Table H.3-2B and Appendix B of the Group 5 RFI Report. The purpose of Table H.3-2B is to:

- Summarize soil impacts as they potentially relate to groundwater impacts.
- Summarize 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 H.3-2A, Table H.3-2B describes groundwater data by chemical group (such as metals, VOCs, and SVOCs). Table H.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 B of the Group 5 RFI Report. The groundwater appendix contains a description of hydrogeologic conditions

(such as occurrence, water levels, recharge, and yield), groundwater quality, and transport and fate. These data include the following:

- Laboratory analytical results
- Hydrographs
- Time-series plots
- Cumulative distribution plots

A sitewide report on SSFL groundwater will be prepared as part of the RFI Program. This report will comprehensively address the same characterization and transport-and-fate issues addressed in Appendix B of the Group 5 RFI Report.

H.3.5.2 Groundwater Data Summary

Groundwater conditions at the Pond Dredge Area Site are characterized by one Chatsworth Formation well (RD-13). Groundwater findings from this well are presented in Table H.3-2B in this appendix and in Appendix B of the Group 5 RFI Report. There are no NSGW wells located near the Pond Dredge Site Area. Based on extrapolation of NSGW contours presented in Appendix B, it is possible that NSGW exists at the Pond Dredge Site Area, and the potential impacts to NSGW from contaminants identified in the near-surface soil should be evaluated during the corrective measure study.

As described in Appendix B of the Group 5 RFI Report, samples from the CFOU groundwater well at the site (RD-13) were analyzed for VOCs, SVOCs, metals and inorganics, and energetics.

- Approximately 115 groundwater samples were collected at one location and analyzed for VOCs. Of the 115 samples, 35 samples had detectable levels of VOCs.
  - Methylene chloride was detected above its groundwater screening level of 5 micrograms per liter (µg/L) in one sample collected in 1998 from RD-13 (7 µg/L).
  - Trichloroethene (TCE) was detected above its groundwater screening level of 5 µg/L in two samples collected in 2000 and 2001 from RD-13 (400 J µg/L, and 11 µg/L, respectively).
  - Acetone, chloromethane, cis-1,2-dichlorethene, methyl ethyl ketone, and toluene concentrations were detected in groundwater but did not exceed their respective groundwater screening levels.
- Thirty-four groundwater samples were collected at one location and analyzed for SVOCs. Of the 34 samples, one sample had detectable levels of SVOCs.
  - bis(2-Ethylhexyl) phthalate was detected above its groundwater screening level of 4 µg/L in one sample collected in 1996 from RD-13 (6 µg/L).
- Sixteen groundwater samples were collected at one location and analyzed for dissolved metals. Concentrations for the dissolved metals detected (barium, chromium, magnesium, manganese, nickel, potassium, selenium, sodium, strontium, and zinc) in groundwater samples from well RD-16 were all below their respective screening levels except:

  - Copper was detected above its groundwater screening level of 4.7 µg/L in one sample collected in 2001 from RD-13 (6.1 µg/L).

- Concentrations for inorganic compounds detected (ammonia, fluoride, bicarbonate, chloride, sulfate, and nitrate) in groundwater samples were all below their respective screening levels except:
  - Fluoride was detected above its groundwater screening level of 800 µg/L in one sample (1,600 µg/L).
- No energetics were detected in the samples collected from the Chatsworth Formation groundwater well RD-13.

CFOU Groundwater will be discussed further in Appendix B and in the CFOU RFI Report.

It is possible that SVOCs, and metals in concentrations observed Chatsworth Formation groundwater (samples collected from well RD-13) may be attributable in part to suspect dredge material and other debris at the Pond Dredge Site Area. However, the lack of NSGW wells in the area makes it difficult to confirm the relationship between the shallow soil impacts and the Chatsworth formation groundwater impacts. Also, the observation that the risk-driving SVOCs and metals are typically limited to the near-surface soil (within the suspect dredge materials or the debris areas) indicates that theses compounds are not an ongoing threat to groundwater.

H.3.6 Surface Water Findings

Surface water may exist intermittently at the Pond Dredge Area Site primarily as a result of seasonal precipitation events. There have been no RFI and NPDES surface water samples collected at the site.

Soil within the site is not likely impacted by upgradient sites via surface water transport, since no sites are located upgradient of the Pond Dredge area. It may be possible for the near-surface soil to become mobilized during storm events and subsequently deposited at downstream sites, including DOE Leachfield 3, STL-IV, the drainage south of the Compound A Facility, and ultimately the R-2 Ponds. However, the relatively flat topography and lack of defined drainages, makes the movement of impacted soil from the Pond Dredge Site Area downgradient via surface water transport unlikely.

H.4 Summary of Risk Assessment Findings

The objective of this risk assessment (RA) is to determine whether the Pond Dredge Area Site could pose unacceptable risks that could require remedial action, or if it is eligible for an NFA designation.

The following sections summarize the findings of the HRA and ERA performed for the Pond Dredge Area Site. Details regarding how the HRA and ERA were conducted are presented in the SRAM (MWH, 2005) and in Appendix A of the Group 5 RFI Report. Details regarding the site-specific HRA and ERA are presented in Appendix A, Attachment A8, of the Group 5 RFI Report.

H.4.1 Key Decision Points

Site-specific key decision points for the HRA and ERA are listed below and are described more fully in Appendix A and Attachment A8 of the Group 5 RFI Report. 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, 2004). Site-specific key decision points include the following:

1. Both direct (drinking water) and indirect (soil vapor) exposures to groundwater COPCs were evaluated in the risk assessment (Appendix A).
2. Exposure point concentration (EPC) calculations were based on collected characterization data, as follows:
    - All CFOU Groundwater EPCs were based on maximum levels detected in a single highest-concentration well within Group 5, HAR-18, for both indirect and direct exposure.
    - A review of time-series plots for chemical constituents, groundwater gradients, and source areas indicates that maximum concentrations detected during the last consecutive 3 years conservatively represent potential future conditions for the purpose of estimating future risks.
    - Soil EPCs were calculated using ProUCL 4.0 following methods specified in the SRAM (MWH 2005). Two EPCs were used—the central tendency exposure (CTE) and the reasonable maximum exposure (RME). The CTE was the arithmetic mean of the data, and the RME was the 95 percent upper confidence limit (95UCL) as calculated by ProUCL 4.0. In cases where the 95UCL exceeded the maximum detected concentration, the RME defaulted to the maximum detected concentration. In some cases, the CTE also exceeded either the RME or the maximum detected concentration due to differences in assumptions regarding distribution (the arithmetic mean assumes a normal distribution, whereas the method for calculating the 95UCL is based on data distribution) and handling of nondetected values in ProUCL 4.0. In these cases, the value selected as the RME EPC was also used for the CTE EPC.

3. Large home-range receptors were assumed to live only in source areas within the Pond Dredge RFI Site. Risks for these receptors using home-range adjusted exposures were calculated for the purpose of evaluating RFI-site-related risks. Large home-range receptor cumulative risk across the SSFL will be presented later in a sitewide summary report of the large home-range receptor risk assessment.

H.4.2 Summary of Human Health Risk Assessment Findings

Potential risks were estimated for future urban residents (child and adult) and future recreational users (child and adult) of the Pond Dredge RFI Site. A conceptual site model diagram for human health risk assessment is presented in Figure H.4-1 and a summary of COPCs and risk estimates for human health are presented in Table H.4-1 and Table H.4-2 respectively. Results of the risk characterization indicated the following:

- Soil – No chemicals of concern (COCs) were identified for direct contact with soil or for plant consumption by future residents, or for direct contact with soil by future recreators.
- Soil Vapor – No COCs were identified for inhalation of indoor air by future residents. No COCs were identified for inhalation of ambient air by future residents or future recreators.
- Near-Surface Groundwater – No data were available for this zone and no COCs were identified.
- Chatsworth Groundwater – COCs will be identified and addressed as part of the CFOU.

The uncertainties associated with the Group 5 RFI Sites in general were discussed in Appendix A of the Group 5 RFI Report. Uncertainties specific to the Pond Dredge RFI Site are summarized in Table H.4-3.

H.4.3 Summary of Ecological Risk Assessment Findings

Potential risks were estimated for soil invertebrates and terrestrial birds and mammals. A conceptual site model diagram for ecological risk assessment is presented in Figure H.4-2. A summary of COECs and ecological risk estimates is presented in Table H.4-4. Results of the risk characterization indicated the following:

- Soil – Barium, chromium, nickel, vanadium, bis(2-ethylhexyl) phthalate, and DioxinFuranPCB_TEQ (bird) were retained as chemicals of ecological concern (COECs). Estimated risks were in the ranges of medium to high (for nickel), medium (for chromium, vanadium, bis[2-ethylhexyl] phthalate, and DioxinFuranPCB_TEQ [bird]), and medium to low (for barium). Aluminum, copper, and zinc were not retained as COECs. Aluminum was not retained because soil pH was greater than 5.5. Copper and zinc were not retained because they were below background concentrations (copper), or all estimated risks were due to background concentrations (zinc)
- Soil Vapor – No COECs. Soil vapor was not collected at the Pond Dredge Area Site. Modeled soil vapor concentrations did not exceed toxicity reference values (TRVs).

The uncertainties associated with Group 5 RFI Sites in general and the uncertainties specific to the Pond Dredge Area Site are summarized in Table H.4-5.

H.4.4 Conclusions for Pond Dredge Area Site Risk Assessment

This section presents the overall conclusions for the Pond Dredge Site according to this RA. The risk assessment provides a quantitative and qualitative appraisal of the actual or potential effects of contaminants on human health or terrestrial wildlife.

The potential sources of contamination to the Pond Dredge Site consist of suspect dredged materials and construction debris.

Potential risks associated with direct contamination of soil and soil vapor were assessed in this RA. Soil and soil vapor samples were collected and analyzed for VOCs, SVOCs, TPH, metals/inorganics, PCBs, dioxins, and energetics. Data were considered adequate to evaluate potential risks. No COCs were identified in soil and soil vapor for human health. Barium, chromium, nickel, vanadium, bis(2-ethylhexyl) phthalate, and DioxinFuranPCB_TEQ (bird) were identified as COECs in soil. No COECs were identified in soil vapor for ecological receptors.

NSGW data were not available for this zone, and no COCs were identified. Chatsworth groundwater will be addressed as part of the CFOU.

The Pond Dredge Site will require further action to address human health or ecological risk or both.

H.5 Pond Dredge Area Site Action Recommendations

This section presents a summary of RFI reporting requirements as applicable to the Pond Dredge Area Site. Section H.5.1 describes the RFI reporting requirements, particularly with respect to the identification of areas recommended for further work, or "site action" recommendations. The process and criteria used for making site action recommendations are described in Section H.5.2. Site action recommendations for the Pond Dredge Area Site are summarized in Sections H.5.3 and H.5.4.

H.5.1 RFI Reporting Requirements

As described in regulatory guidance documents for the SSFL RCRA Corrective Action Program (see Section 1.2.3 of Volume I), the purposes of the RFI are 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 completeness of the investigation, and (3) indicate if additional work is needed.

The Pond Dredge Area RFI Site Report accomplishes these requirements by:

1. Presenting detailed 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 H.3-2A and H.3-2B). Section H.3 summarizes the overall characterization of contamination nature and extent, potential source areas, and an assessment of investigation completeness.
2. Evaluating groundwater migration pathways in Appendix B of the Group 5 RFI Site Report and other potential transport pathways in Appendix A of the Group 5 RFI Site Report.
3. Identifying potential receptors and estimating potential risks at the Pond Dredge Area Site (Section H.4 and Appendix A).
4. Identifying Pond Dredge Area Site areas requiring further work (this section).

H.5.2 Basis for Site Action Recommendations

In summary, site action recommendations included in the Pond Dredge Area RFI Site Report identify areas for the following:

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

Site action recommendations are based on the characterization and risk assessment findings. Characterization findings provide definition of the nature and extent of site contaminants, based on chemical data and transport and fate evaluation. Risk assessments evaluate characterization data, estimate human health and ecological risks based on specified land use scenarios, and identify chemicals that drive or contribute to those risks.

The site action recommendations listed above result from two evaluations described below. CMS or NFA Area recommendations are based on an integrated evaluation of characterization and risk assessment results. Stabilization Area recommendations rely on characterization evaluations, including transport and fate analysis, and comparison to risk based levels. Each process is described further below.

H.5.2.1 CMS and NFA Site Action Evaluation Process

CMS or NFA site action recommendations are based on a 4-step process. This process, which is presented in detail in Section 7.1 of the Group 5 RFI Report, 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 are greater than 1 (noncancer and ecological risks), the RFI site's risks are reviewed on a chemical-by-chemical basis to identify risk-drivers and significant risk contributors to the cumulative, total risk for each potential receptor.
- **Site Action Evaluation Step 3.** Characterization findings from the entire RFI site are evaluated to 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.
- **Site Action Evaluation Step 4.** The fourth step identifies any uncertainties in the RFI site characterization and risk assessments that may affect the 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.

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

Two additional aspects of RFI reporting will serve to confirm and/or finalize the areas recommended in Group RFI 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. Updates to this report will be prepared as needed.

H.5.2.2 Source Area Stabilization Site Action Evaluation Process

Chemical data collected during the RFI are evaluated to determine the potential for 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 the following:

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

Each criterion is considered important, and a weight-of-evidence evaluation is used to make a recommendation for 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 may include the installation of straw bales, fiber rolls, and silt fencing, and/or covering of areas with plastic tarps. Erosion control measures have been applied to many surficial soil source areas at the SSFL to prevent contaminant migration. These are described in the SSFL Storm Water Pollution and Prevention Plan (MWH, 2006a).

H.5.3 CMS Site Action Recommendations

Based on the findings presented in this RFI report, the entire Pond Dredge Area Site is recommended for CMS. As presented in Section H.4, the cumulative risk for the site is within the regulatory risk range of 1×10^{-6} to 1×10^{-4} and the hazard index (HI) estimates for noncancer effects are below the regulatory threshold value of 1. However, as stated in Section H.4, barium, chromium, nickel, vanadium, bis(2-ethylhexyl) phthalate, and DioxinFuranPCB_TEQ (bird) were retained as COECs. The entire RFI site exceeds acceptable risk for ecological receptors because these compounds were detected throughout the Pond Dredge Area Site, exceeding the risk thresholds.

Site action recommendations are tabulated by Chemical Use Area, and chemical risk drivers/contributors are identified for each appropriate receptor in Table H.5-1. CMS areas are shown in Figure H.5-1 to illustrate locations and approximate areal extents, and are summarized in Table H.5-2. As noted in Section 7.2 of the Group 5 RFI Report, recommendations reported in this document will be reviewed upon completion of the sitewide groundwater report. Large home-range receptor evaluations and updates to this report will be prepared as needed.

The area of the Pond Dredge RFI Site recommended for evaluation in the CMS is listed below. The following CMS area was identified:

- **Pond Dredge -1**: The entire Pond Dredge Area Site. The chemical risk drivers are metals, SVOCs, and dioxins for ecological receptors in near-surface soil.

H.5.4 NFA Site Action Recommendations

The entire Pond Dredge Area Site is recommended for CMS due to the nature of the impacts as discussed in Section H.5.3.

H.5.5 Site Action Recommendations for Source Area Stabilization

Due to the distance from defined drainages, and the relatively flat topography, the Pond Dredge RFI Site CMS area does not require stabilization measures.

H.6 References

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Tables

Table H.2-1
Inventory of Other Site Features
Pond Dredge RFI Site

Feature ID	Location	Use Period	Status	Process/Chemical Use	Chemical Use Area Number	Comments	Reference
AOC Pond Dredge Area	South of RIHL	1960's to ?	N/A	Dredge materials from Silvernale Reservoir (SWMU 6.8) and R-2 Ponds (SWMU 5.26). Boeing personnel indicate the possibility of construction debris, but no documentation found.	1		Ogden, 2000.
AOC Pond Dredge Area	South of RIHL	1960's to ?	N/A	May contain a spent-uranium slug dropped from a helicopter during test, but not recovered.	1		Rockwell, 1989.

Table H.2-2
Spill Inventory
Pond Dredge RFI Site

Date	Building/ Feature	Chemical Spilled	Amount (gallons)	Comments	References
2/8/1982	Pond Dredge Area	Nu-Vertan (EDTA)	1500	A tanker truck was found dumping liquids at the open field south of Building 20 parking lot. It was determined later that the operator had dumped 1500 gallons of Nu-Vertan liquids on the field.	Noon & Pratt. 1994.

Table H.2-3
Site History - Investigations
Pond Dredge RFI Site

Chemical Use Area Number	Chemical Use Area Name	Date	Purpose	COPCs Analyzed*	COPCs Reported*	Comments	Reference
1	Pond Dredge	2000	Soil: Unknown	TPH, inorganics, metals, propellants, SVOC	Metals and SVOCs		MWH, 2004.

* COPCs - Chemicals of potential concern by chemical group - VOCs, SVOCs, etc.

Table H.2-4
Chemical Use Summary
Pond Dredge RFI Site

Chemical Use Area Number	Chemical Use Area Name	Potential Chemicals Used/Stored	Chemical Use Area Types and Typical Target Analytical Suites														
			Solvent	Petroleum Fuels		Hydrazine-Related Compounds	Oil-Related Materials	Metal Wastes (exclusive of debris areas)	Debris Areas/ Fill	Energetic Constituents	Transformers	Leach Field	Non-metal Inorganic Compounds	Non-metal Inorganic Compounds		Acids/ Bases	
			VOCs	TPH, VOCs [1]	SVOCs	VOCs, SVOCs (Hydrazines, Formaldehyde, NDMA, UDMH, and MMH)	SVOCs, TPH, PCBs, Metals	Metals, pH	TPH, Metals, VOCs, SVOCs, PCBs, Dioxins [2]	Energetics, Metals	PCBs		Fluoride, Chloride, Nitrate, Sulfate, Bromide	Perchlorate	Dioxins, Furans	pH	Asbestos
1	Pond Dredge	Possible dredge materials from Silvernale and R-2 Ponds and construction debris	X	X	X	X		X	X	X	X		X	X			

Notes:
1. VOCs were a COPC for TPH-gasoline.
2. SVOCs and dioxins were evaluated at COPCs if burned materials are observed. PCBs were evaluated as COPCs if elevated concentrations of lubricant oil-range TPH was detected.

Table H.2-5
Conceptual Site Model
Pond Dredge RFI Site

Chemical Use Area Name (or Site if appropriate)	Ground Surface Elevation (Feet MSL)	Alluvium Thickness (Feet)	Elevation of Unweathered Chatsworth (Feet MSL)	Elevation of Near-Surface Groundwater (Feet)	Near-Surface Groundwater Horizontal Gradient/Flow Direction (foot/foot)	Depth to Chatsworth Formation Groundwater (Feet)	Chatsworth Formation Groundwater Horizontal Gradient/Flow Direction (foot/foot)	Surface Water Present? (Yes/No)	Surface Water Flow Information	Other Information?	Reference
Pond Dredge	1820 to 1890	0	approximately 1789 to 1815	1794 to 1820	0.04/southeast	49 to 54	0.06/east	No	Surface water runoff flows east to DOE Leach Fields 3 and then southeast to STL-IV and R-2 Discharge Ponds.		SAIC, 1994 RFA.

MSL = above mean sea level

Table H.3-1
Sampling Summary for Soil
Pond Dredge RFI Site

Sample Location	Location Type	Sample Name	Collection Date	Top Depth (feet bgs)	Base Depth (feet bgs)	Sample Type	Remediation Status	Consultant	Matrix	Dioxin Furans	Energetics	Hydrocarbons	Inorganics	Metals	PCBs	SVOC	VOC
PDTS01	Grab Sample	RJ656	10/2/2000	3.5	4	Primary Sample	In Place	OGDEN Environmental and Energy Services	Soil			X	X	X		X	
PDTS02S01	Grab Sample	RJ657	10/2/2000	1	1.5	Primary Sample	In Place	OGDEN Environmental and Energy Services	Soil				X	X		X	
PDTS03	Grab Sample	RJ659	10/2/2000	1.5	2	Primary Sample	In Place	OGDEN Environmental and Energy Services	Soil			X	X	X		X	
PDTS07	Grab Sample	RJ670	10/11/2000	3	3.5	Primary Sample	In Place	OGDEN Environmental and Energy Services	Soil			X	X	X		X	
PDTS11	Grab Sample	RJ674	10/13/2000	4.5	5	Primary Sample	In Place	OGDEN Environmental and Energy Services	Soil			X	X	X		X	
PDTS1000	Trench		4/15/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil	X							X
PDTS1000	Trench	PDTS1000S01	4/15/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil		X	X	X	X	X	X	
PDTS1000	Trench		4/15/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDTS1000	Trench	PDTS1000S02	4/15/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDTS1000	Trench		4/15/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil	X							
PDTS1000	Trench	PDTS1000S03	4/15/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDTS1001	Trench		4/15/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDTS1001	Trench	PDTS1001S01	4/15/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X	X	X	X	X	X	
PDTS1001	Trench		4/15/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDTS1001	Trench	PDTS1001S02	4/15/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDTS1001	Trench		4/15/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil	X							
PDTS1001	Trench	PDTS1001S03	4/15/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDTS1002	Trench		4/16/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil	X							X
PDTS1002	Trench	PDTS1002D01	4/16/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDTS1002	Trench		4/16/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDTS1002	Trench	PDTS1002S02	4/16/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDTS1002	Trench	PDTS1002S03	4/16/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1010	Soil Boring		4/17/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1010	Soil Boring	PDBS1010S01	4/17/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDBS1010	Soil Boring		4/17/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1010	Soil Boring	PDBS1010S02	4/17/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1010	Soil Boring	PDBS1010S03	4/17/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1009	Soil Boring		4/17/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1009	Soil Boring	PDBS1009S01	4/17/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDBS1009	Soil Boring		4/17/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1009	Soil Boring	PDBS1009S02	4/17/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1009	Soil Boring	PDBS1009S03	4/17/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1012	Soil Boring		4/18/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1012	Soil Boring	PDBS1012S01	4/18/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDBS1012	Soil Boring		4/18/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1012	Soil Boring	PDBS1012S02	4/18/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1012	Soil Boring	PDBS1012S03	4/18/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1008	Soil Boring		4/18/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil	X							X
PDBS1008	Soil Boring	PDBS1008D01	4/18/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDBS1008	Soil Boring		4/18/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1008	Soil Boring	PDBS1008S02	4/18/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1007	Soil Boring		4/22/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1007	Soil Boring	PDBS1007S01	4/22/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDBS1007	Soil Boring		4/22/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1007	Soil Boring	PDBS1007S02	4/22/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1007	Soil Boring	PDBS1007S03	4/22/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1004	Soil Boring		4/22/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1004	Soil Boring	PDBS1004S01	4/22/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDBS1004	Soil Boring		4/22/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1004	Soil Boring	PDBS1004S02	4/22/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1004	Soil Boring	PDBS1004S03	4/22/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1005	Soil Boring		4/23/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil	X							X
PDBS1005	Soil Boring	PDBS1005D01	4/23/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDBS1005	Soil Boring		4/23/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1005	Soil Boring	PDBS1005S02	4/23/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1000	Soil Boring		4/24/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil	X							X
PDBS1000	Soil Boring	PDBS1000D01	4/24/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil		X	X	X	X	X	X	
PDBS1000	Soil Boring		4/24/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1000	Soil Boring	PDBS1000S02	4/24/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X	X	X	
PDBS1000	Soil Boring	PDBS1000S03	4/24/2008	9	10	Primary Sample	In Place	CH2M HILL	Soil				X				X
PDBS1002	Soil Boring		4/24/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil	X							X
PDBS1002	Soil Boring	PDBS1002S01	4/24/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil		X		X		X	X	
PDBS1011	Soil Boring		4/25/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X

Table H.3-1
Sampling Summary for Soil
Pond Dredge RFI Site

Sample Location	Location Type	Sample Name	Collection Date	Top Depth (feet bgs)	Base Depth (feet bgs)	Sample Type	Remediation Status	Consultant	Matrix	Dioxin Furans	Energetics	Hydrocarbons	Inorganics	Metals	PCBs	SVOC	VOC
PDBS1011	Soil Boring	PDBS1011S01	4/25/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X	X	X			X	
PDBS1011	Soil Boring		4/25/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1011	Soil Boring	PDBS1011S02	4/25/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1006	Soil Boring		4/25/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1006	Soil Boring	PDBS1006S01	4/25/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDBS1006	Soil Boring		4/25/2008	5	6	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil	X							X
PDBS1006	Soil Boring	PDBS1006S02	4/25/2008	5	6	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1006	Soil Boring	PDBS1006X02	4/25/2008	5	6	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil		X						
PDBS1001	Soil Boring		4/25/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1001	Soil Boring	PDBS1001S01	4/25/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X		X		X	X	
PDBS1001	Soil Boring		4/25/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1001	Soil Boring	PDBS1001S02	4/25/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil				X	X	X	X	
PDBS1003	Soil Boring		4/28/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1003	Soil Boring	PDBS1003S01	4/28/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil		X	X	X	X		X	
PDBS1003	Soil Boring		4/28/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil	X							X
PDBS1003	Soil Boring	PDBS1003S02	4/28/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1006	Soil Boring		4/30/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil								X
PDBS1006	Soil Boring	PDBS1006X02A	4/30/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil				X				
U5BS1503	Soil Boring		5/13/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil								X
U5BS1503	Soil Boring	U5BS1503S01	5/13/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil			X	X	X		X	
PDBS1402	Soil Boring	PDBS1402S01	5/29/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1402	Soil Boring	PDBS1402S02	5/29/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1400	Soil Boring	PDBS1400S01	5/29/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1400	Soil Boring	PDBS1400S02	5/29/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1401	Soil Boring	PDBS1401D01	5/29/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil					X			
PDBS1401	Soil Boring	PDBS1401S01	5/29/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil				X				
PDBS1401	Soil Boring	PDBS1401S02	5/29/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1407	Soil Boring	PDBS1407S01	5/29/2008	0	1	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1407	Soil Boring	PDBS1407S02	5/29/2008	5	6	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1405	Soil Boring	PDBS1405S01	5/30/2008	0.5	1	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1405	Soil Boring	PDBS1405S02	5/30/2008	5.5	6	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1404	Soil Boring	PDBS1404S01	5/30/2008	0.5	1	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1404	Soil Boring	PDBS1404S02	5/30/2008	5.5	6	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1408	Soil Boring	PDBS1408S01	5/30/2008	0.5	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil				X	X			
PDBS1408	Soil Boring	PDBS1408X01	5/30/2008	0	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil				X	X			
PDBS1408	Soil Boring	PDBS1408S02	5/30/2008	5.5	6	Primary Sample	In Place	CH2M HILL	Soil				X	X			
PDBS1406	Soil Boring	PDBS1406D01	5/30/2008	0.5	1	MULTIPLE SAMPLE TYPES	In Place	CH2M HILL	Soil				X	X			
PDBS1406	Soil Boring	PDBS1406S02	5/30/2008	5.5	6	Primary Sample	In Place	CH2M HILL	Soil				X	X			

Table H.3-2A
Evaluation of Soil Sampling Results
Pond Dredge RFI Site

Chemical Use Area Number	**Chemical Use Area Name** (see Section 2 texts and tables for Site History)	**Potential Chemicals Used/Stored**	**Sampling Scope and Rationale** (see Figure P.2-2 for sampling locations)	**Sampling Results** Chemical Concentrations detected greater than background and/or risk screening levels?	**Chemical Use Area sufficiently evaluated for risk assessment?**	**Is delineation sufficient to estimate soil volume in CMS?** (see Figure H.5-1 for CMS area)
1	Pond Dredge Area	VOCs	Screen for potential VOCs in pond dredge area. Soil Vapor: Samples were not collected. Soil Matrix: Samples were collected at 17 locations.	Soil Vapor N/A Soil Matrix: Benzene was detected above Residential RBSL in one sample. PDTS1000 at 0-1 ft. bgs Discussion of results is presented in Section H.3.4.2.1 and Figures H.3-1 and H.3-8.	**Yes.** The extent of VOC impacts is adequately defined by representative sampling locations. Characterization is sufficient for risk assessment.	**N/A**
		SVOCs	Screen for potential SVOCs in pond dredge area. Soil samples were collected at 22 locations.	Bis(2-Ethylhexyl) phthalate was detected above Ecological RBSLs in one sample. PDTS1002 at 0-1 ft. bgs Discussion of results is presented in Section H.3.4.2.2 and Figures H.3-2 and H.3-9.	**Yes.** The extent of SVOC impacts is adequately defined by representative sampling locations. Characterization is sufficient for risk assessment.	**Yes.** The extent of bis (2-ethylhexyl) phthalate impact is defined and the area is not recommended for further characterization based on sampling and risk assessment results.
		TPH	Screen for potential TPHs in pond dredge area. Soil samples were collected at 19 locations.	TPHs were detected but did not exceed their respective RBSLs. Discussion of results is presented in Section H.3.4.2.3 and Figures H.3-3 and H.3-9.	**Yes.** The extent of TPH impacts is adequately defined by representative sampling locations. Characterization is sufficient for risk assessment.	**N/A**
		PCBs	Screen for potential PCBs in pond dredge area. Soil samples were collected from five (5) locations.	PCBs were detected but did not exceed their respective RBSLs. Discussion of results is presented in Section H.3.4.2.4 and Figures H.3-4 and H.3-9.	**Yes.** The extent of PCB impacts is adequately defined by representative sampling locations. Characterization is sufficient for risk assessment.	**N/A**
		Metals	Screen for potential metals in pond dredge area. Soil samples were collected at 29 locations.	One or more of the following metals were detected above background screening levels and their respective Ecological RBSLs: aluminum, barium, cadmium, molebdenum, selenium, silver, vanadium, and zinc. Discussion of results is presented in Section H.3.4.2.5 and Figures H.3-5 and H.3-10.	**Yes.** Characterization is sufficient for risk assessment.	**No.** **Pond Dredge Area 1:** Metals impacts to soil are not defined and may require further characterization. Area is recommended for further characterization in CMS based on sampling and risk assessment results.
		Inorganics	Screen for potential inorganics in pond dredge area. Soil samples were collected at 17 locations.	Perchlorate was detected above the Ecological RBSL in one sample. PDBS1004 at 0-1 ft. bgs Discussion of results is presented in Section H.3.4.2.5 and Figure H.3-10.	**Yes.** The extent of inorganics impacts is adequately defined by representative sampling locations. Characterization is sufficient for risk assessment.	**N/A**

Table H.3-2A
Evaluation of Soil Sampling Results
Pond Dredge RFI Site

Chemical Use Area Number	**Chemical Use Area Name** (see Section 2 texts and tables for Site History)	**Potential Chemicals Used/Stored**	**Sampling Scope and Rationale** (see Figure P.2-2 for sampling locations)	**Sampling Results** Chemical Concentrations detected greater than background and/or risk screening levels?	**Chemical Use Area sufficiently evaluated for risk assessment?**	**Is delineation sufficient to estimate soil volume in CMS?** (see Figure H.5-1 for CMS area)
1	Pond Dredge Area	Dioxins	Screen for potential dioxins in pond dredge area. Soil samples were collected at 16 locations.	Dioxins were detected but did not exceed their respective RBSLs. Discussion of results is presented in Section H.3.4.2.6 and Figures H.3-6 and H.3-11.	**Yes.** Characterization is sufficient for risk assessment.	**No.** **Pond Dredge Area 1:** Dioxins impacts to soil are not defined and may require further characterization. Area is recommended for further characterization in CMS based on sampling and risk assessment results.
		Energetics	Screen for potential energetics in test areas. Soil samples were collected from at 16 locations.	No energetics were detected in any of the soil samples. Discussion of results is presented in Section H.3.4.2.7 and Figures H.3-7.	**Yes.** The extent of energetics impacts is adequately defined by representative sampling locations. Characterization is sufficient for risk assessment.	**N/A**

Table H.3-2B
Evaluation of Groundwater Sampling Results
Pond Dredge RFI Site

Analytical Group	**Site Soil Impacts** (Summary of relevant impacts)	**Monitored in Groundwater?**	**Constituent detected in groundwater?** (Above screening criteria?)	**Site related?**	**Groundwater characterized sufficiently for risk assessment?**
VOCs	Benzene was detected above the Ecological RBSL.	**Yes.** Monitored at RD-13 in CFOU Groundwater.	**Yes.** Methylene Chloride and TCE concentrations exceed groundwater SLs in samples collected from RD-13. All other detected concentrations were below screening levels.	**No.** VOCs detected in soil do not match VOCs of concern in samples from CFOU Groundwater.	**NSGW - N/A** **CFOU Groundwater [1]**
SVOCs	Bis(2-Ethylhexyl) phthalate was detected in a soil sample and exceeded the Ecological RBSLs.	**Yes.** Monitored at RD-13 in CFOU Groundwater.	**Yes.** Bis(2-ethylhexyl) phthalate were detected above Groundwater screening levels.	**Yes.** Bis(2-ethylhexyl) phthalate was detected above screening levels in both CFOU Groundwater and soil samples.	**NSGW - N/A** **CFOU Groundwater [1]**
TPH	TPHs were detected in soil samples but did not exceed any RBSLs.	**No.**	**N/A**	**No.**	**NSGW - Yes [2]** **CFOU Groundwater [1]**
PCBs	PCBs were detected in soil samples but did not exceed any RBSLs.	**No.**	**N/A**	**No.**	**NSGW - Yes [2]** **CFOU Groundwater [1]**
Metals	Multiple metals were detected above background screening levels and Ecological RBSLs. Perchlorate was detected in a soil sample and exceeded the Ecological RBSL.	**Yes.** Monitored at RD-13 in CFOU Groundwater	**Yes.** **C**opper was detected above the groundwater screening level in samples collected from RD-13.	**Yes.** Metals in soil may migrate into NSGW but are more likely to be bound to soil. Copper was also detected above screening levels in soil samples.	**NSGW - N/A** **CFOU Groundwater [1]**
Dioxins	Multiple dioxins were detected above background screening levels.	**No.**	**N/A**	**No.**	**NSGW - Yes [2]** **CFOU Groundwater [1]**

Table H.3-2B
Evaluation of Groundwater Sampling Results
Pond Dredge RFI Site

Analytical Group	**Site Soil Impacts** (Summary of relevant impacts)	**Monitored in Groundwater?**	**Constituent detected in groundwater?** (Above screening criteria?)	**Site related?**	**Groundwater characterized sufficiently for risk assessment?**
Energetics	No energetic compounds were detected in any of the soil samples collected.	**Yes.** Monitored at RD-13 in CFOU Groundwater.	**No.**	**No.**	**NSGW - N/A** **CFOU Groundwater** [1]

Notes:

1. Chatsworth Formation Groundwater (CFOU Groundwater) is discussed further in Appendix B and will be evaluated for risk assessment purposes in the CFOU RFI Report.

2. Although PCBs, Dioxins, and TPH have not been monitored in NSGW at the Pond Dredge Site, NSGW is not expected to have been impacted by PCBs, Dioxins, and TPH due to the high affinity of these classes of chemicals for soil and due to the low PCBs, Dioxins, and TPH concentrations detected at the site.

3. NSGW - Near Surface Groundwater

Table H.3-3
Data Screening and Statistical Summary for Soil
Pond Dredge RFI Site

		Screening Levels			Detect Data Summary						
Constituent	**Units**	**Residential RBSL**	**Ecological RBSL**	**Background**	**Number of Samples**	**Number of Detects**	**Minimum Detected Value**	**Maximum Detected Value**	**Number of Detects > Residential RBSL**	**Number of Detects > Ecological RBSL**	**Number of Detects > Background SL**
Dioxin_Furans											
1,2,3,4,6,7,8-Heptachlorodibenzofuran	mg/kg	0.00069	0.00049	0.0000025	32	16	1.6E-07	2.4E-05			8
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	mg/kg	0.00069	0.00096	0.000013	32	24	2.2E-07	2.1E-04			9
1,2,3,4,7,8,9-Heptachlorodibenzofuran	mg/kg	0.00069	0.00043	0.00000019	31	2	1.7E-06	1.8E-06			2
1,2,3,4,7,8-Hexachlorodibenzofuran	mg/kg	0.000069	0.000047	0.00000073	31	2	3.6E-07	4.4E-07			
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	mg/kg	0.000069	0.000045	0.00000034	32	1	5.9E-07	5.9E-07			1
1,2,3,6,7,8-Hexachlorodibenzofuran	mg/kg	0.000069	0.000054	0.0000003	31	4	1.7E-07	3.4E-07			1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	mg/kg	0.000069	0.000046	0.00000095	31	8	2.2E-07	7.5E-06			7
1,2,3,7,8,9-Hexachlorodibenzofuran	mg/kg	0.000069	0.000043	0.00000043	32	4	1.5E-07	2.1E-07			
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	mg/kg	0.000069	0.0000435	0.0000011	32	13	1.4E-07	2.3E-06			2
1,2,3,7,8-Pentachlorodibenzofuran	mg/kg	0.00023	0.0001	0.00000059	32	2	1.3E-07	1.3E-07			
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	mg/kg	0.0000069	0.0000044	0.00000018	31	1	4.2E-07	4.2E-07			1
2,3,4,6,7,8-Hexachlorodibenzofuran	mg/kg	0.000069	0.000049	0.00000045	31	4	1.8E-07	4.5E-07			
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	0.000023	0.0000098	0.00000064	33	3	8.3E-08	3.8E-07			
2,3,7,8-TCDD	mg/kg	0.0000069	0.0000043	0.0000005	33						
2,3,7,8-Tetrachlorodibenzofuran	mg/kg	0.000069	0.0000044	0.0000018	32	7	1.1E-07	3.5E-07			
2,3,7,8-TCDD_TEQ	mg/kg	0.0000069	0.0000043	0.00000087	33	29	2.5E-10	4.0E-06			0
Heptachlorodibenzofurans	mg/kg				29	15	2.6E-07	4.3E-05			
Heptachlorodibenzo-p-dioxins	mg/kg				31	25	2.2E-07	3.6E-04			
Hexachlorodibenzofurans	mg/kg				26	12	2.0E-07	1.3E-05			
Hexachlorodibenzo-p-dioxins	mg/kg				28	13	1.8E-07	3.0E-05			
Octachlorodibenzofuran	mg/kg	0.023	0.097	0.0000081	32	17	3.8E-07	6.5E-05			8
Octachlorodibenzo-p-dioxin	mg/kg	0.023	0.12	0.00014	33	23	8.2E-07	2.3E-03			9
Pentachlorodibenzofurans	mg/kg				26	10	2.0E-07	4.5E-06			
Pentachlorodibenzo-p-dioxins	mg/kg				31	5	1.6E-07	5.8E-06			
Tetrachlorodibenzofurans	mg/kg				27	9	1.1E-07	1.9E-06			
Tetrachlorodibenzo-p-dioxins	mg/kg				32	4	1.3E-06	8.8E-06			
Energetics											
1,3-Dinitrobenzene	mg/kg		0.75		17						
2,4,6-Trinitrotoluene	mg/kg		0.21		17						
2,4-diamino-6-nitrotoluene	mg/kg				17						
2,4-Dinitrotoluene	mg/kg		0.43		17						
2,6-diamino-4-nitrotoluene	mg/kg				17						
2,6-Dinitrotoluene	mg/kg		1.71		17						
2-Amino-4,6-Dinitrotoluene	mg/kg		0.43		17						
2-Nitrotoluene	mg/kg		0.43		17						
3-Nitrotoluene	mg/kg		0.43		17						
4-Am-2,6-DNT	mg/kg		0.43		17						
4-Nitrotoluene	mg/kg		0.43		17						
HMX	mg/kg	3100	64		17						
Nitrobenzene	mg/kg	29	2		17						
Nitroglycerin	mg/kg				17						
PETN	mg/kg				17						
RDX	mg/kg	6.9	43		17						
sym-Trinitrobenzene	mg/kg		11		17						
Tetryl	mg/kg		28		17						
Hydrocarbons											
Diesel Range Hydrocarbons (C14-C20)	mg/kg	1400			4						
Diesel Range Hydrocarbons (C15-C20)	mg/kg	1400			29	6	1.2	4.3			
Gasoline Range Hydrocarbons (C8-C11)	mg/kg	1.1			21						
Gasoline Range Hydrocarbons (C8-C11)	mg/kg	1.1			4						

Table H.3-3
Data Screening and Statistical Summary for Soil
Pond Dredge RFI Site

		Screening Levels			Detect Data Summary						
Constituent	**Units**	**Residential RBSL**	**Ecological RBSL**	**Background**	**Number of Samples**	**Number of Detects**	**Minimum Detected Value**	**Maximum Detected Value**	**Number of Detects > Residential RBSL**	**Number of Detects > Ecological RBSL**	**Number of Detects > Background SL**
Kerosene Range Hydrocarbons (C12-C14)	mg/kg	1400			29	1	1.8	1.8			
Kerosene Range Hydrocarbons (C11-C14)	mg/kg	1400			4						
Lubricating Oil Range Hydrocarbons (C20-C30)	mg/kg	1400			4	4	3.3	42			
Lubricating Oil Range Hydrocarbons (C21-C30)	mg/kg	1400			29	19	1.7	33			
Total Petroleum Hydrocarbons	mg/kg				3	2	7.7	11			
Inorganics											
% Solids	%				6	6	85.9	97.6			
Bromide	mg/kg				31	1	0.49	0.49			
Chloride	mg/kg				31	25	2.01	8.3			
Fluoride	mg/kg	4600		6.7	31	1	1.5	1.5			
Moisture	%				35	35	2.4	24.77			
Nitrate-N	mg/kg	120000			25	21	0.42	9			
Nitrate-NO3	mg/kg				3	3	1.2	5.1			
Nitrite-N	mg/kg				26	2	0.46	0.48			
Orthophosphate as P	mg/kg				13	5	0.4175	2.9			
Perchlorate	mg/kg	9.1	0.000024		17	1	0.0046	0.0046		1	
pH	pH Units				21	21	6.42	8.55			
Phosphate	mg/kg				13	2	5.3	20.6			
Sulfate	mg/kg				28	17	3.24	31.8			
Total Solids	%				26	26	74	96			
Metals											
Aluminum	mg/kg	75000	12	20000	54	54	9160	31000		54	23
Antimony	mg/kg	30	0.095	8.7	48	5	0.47	1.2		5	
Arsenic	mg/kg	0.095	1.9	15	50	50	2.8	7.2	50	50	
Barium	mg/kg	15000	15	140	57	57	72.8	190		57	14
Beryllium	mg/kg	150	5	1.1	50	50	0.415	1.7			17
Boron	mg/kg	15000	6.76	9.7	50	38	1.3	9.1		6	
Cadmium	mg/kg	39	0.0045	1	50	45	0.16	1.4		45	1
Calcium	mg/kg				5	5	2270	21200			
Chromium	mg/kg	3400	930	36.8	52	52	14.2	43.7			15
Cobalt	mg/kg	1500	8.9	21	50	50	4.75	14		29	
Copper	mg/kg	3000	1.1	29	50	50	8.6	25		50	
Iron	mg/kg			28000	5	5	14800	22900			
Lead	mg/kg	150	0.013	34	50	50	6	26		50	
Lithium	mg/kg	1521.66006		37	45	45	14.9	29.1			
Magnesium	mg/kg				5	5	3740	10800			
Manganese	mg/kg	1800	59	495	5	5	216	423		5	
Mercury	mg/kg	23	0.1	0.09	50	36	0.0026	0.057125			
Molybdenum	mg/kg	380	0.11	5.3	50	45	0.16	5.9		45	1
Nickel	mg/kg	1500	0.1	29	50	50	8.85	65.4		50	1
Potassium	mg/kg			6400	50	50	2170	7190			6
Selenium	mg/kg	380	0.17	0.655	52	23	0.47	1.2		23	12
Silver	mg/kg	380	0.54	0.79	50	47	0.03	5.7		4	4
Sodium	mg/kg			110	53	31	65.7	699			11
Thallium	mg/kg	6.1	2.9	0.46	50	43	0.23	2			4
Vanadium	mg/kg	76	1.5	62	55	55	27.5	71.9		55	19
Zinc	mg/kg	23000	21	110	50	50	49	130		50	1
Zirconium	mg/kg			8.6	45	41	1.85	7			
PCBs											
Aroclor 1016	mg/kg	3.9	1.6		7						
Aroclor 1221	mg/kg	0.35	1.6		7						

Table H.3-3
Data Screening and Statistical Summary for Soil
Pond Dredge RFI Site

		Screening Levels			Detect Data Summary						
Constituent	**Units**	**Residential RBSL**	**Ecological RBSL**	**Background**	**Number of Samples**	**Number of Detects**	**Minimum Detected Value**	**Maximum Detected Value**	**Number of Detects > Residential RBSL**	**Number of Detects > Ecological RBSL**	**Number of Detects > Background SL**
Aroclor 1232	mg/kg	0.35	0.077		7						
Aroclor 1242	mg/kg	0.35	0.079		7						
Aroclor 1248	mg/kg	0.35	0.0114		7						
Aroclor 1254	mg/kg	0.35	0.077		7	4	0.0016	0.03175			
Aroclor 1260	mg/kg	0.35	0.077		7	2	0.0047	0.0107			
SVOC											
1,1-Dimethylhydrazine	mg/kg		0.05		1						
1-Methyl naphthalene	mg/kg	230			32	1	0.0008	0.0008			
2-Methylnaphthalene	mg/kg	230	210		37	1	0.0015	0.0015			
Acenaphthene	mg/kg	3400	2.46		37	2	0.00027	0.012			
Acenaphthylene	mg/kg	1700	370		37						
Anthracene	mg/kg	17000	2.4		37	3	0.00044	0.025			
Benzo(a)anthracene	mg/kg	0.6	5.6		37	7	0.000495	0.07			
Benzo(a)pyrene	mg/kg	0.06	5.6		37	7	0.00071	0.053			
Benzo(b)fluoranthene	mg/kg	0.6	5.6		34	9	0.00019	0.0467			
Benzo(ghi)perylene	mg/kg		6.4		37	3	0.000765	0.018			
Benzo(k)fluoranthene	mg/kg	0.6	5.8		36	5	0.00087	0.054			
bis(2-Ethylhexyl) phthalate	mg/kg	250	4.9		23	9	0.00781	12		1	
Butyl benzyl phthalate	mg/kg	11000	340		25	2	0.0007	0.0083			
Chrysene	mg/kg	6	2.4		37	9	0.00025	0.072			
Dibenzo(a,h)anthracene	mg/kg	0.17	5.6		37	1	0.011	0.011			
Diethyl phthalate	mg/kg	46000	6940		21	2	0.00036	0.00791			
Dimethyl phthalate	mg/kg	570000	4.4		29	2	0.00059	0.00127			
Di-n-butyl phthalate	mg/kg	5700	0.49		23						
Di-n-octyl phthalate	mg/kg	2300	39		31	1	0.30865	0.30865			
Fluoranthene	mg/kg	2300	38		37	8	0.0012	0.13			
Fluorene	mg/kg	2300	1.6		37	2	0.002	0.011			
Hydrazine	mg/kg		0.05		1						
Indeno(1,2,3-cd)pyrene	mg/kg	0.6	5.8		37	3	0.0006	0.021			
Monomethylhydrazine	mg/kg		0.05		1						
Naphthalene	mg/kg	6	210		37	5	0.00057	0.0014			
n-Nitrosodimethylamine	mg/kg	0.045	20		37						
Phenanthrene	mg/kg	1700	1.3		37	7	0.00085	0.1			
Pyrene	mg/kg	1700	18		37	8	0.0011	0.13			
VOC											
1,1,1,2-Tetrachloroethane	mg/kg	0.00025	76		33						
1,1,1-Trichloroethane	mg/kg	0.49	4300		33						
1,1,2,2-Tetrachloroethane	mg/kg	0.0014	6		33						
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	16	583		33						
1,1,2-Trichloroethane	mg/kg	0.0012	8.3		33						
1,1-Dichloroethane	mg/kg	0.0016	210		33						
1,1-Dichloroethene	mg/kg	0.023	10.7		33	3	0.00081	0.0012			
1,1-Dichloropropene	mg/kg		22		33						
1,2,3-Trichlorobenzene	mg/kg	0.124604521	20		33						
1,2,3-Trichloropropane	mg/kg	0.000051	12		33						
1,2,4-Trichlorobenzene	mg/kg	0.124604521	20		33						
1,2,4-Trimethylbenzene	mg/kg	0.035	64		33						
1,2-Dibromo-3-chloropropane	mg/kg	0.029	22		33						
1,2-Dibromoethane	mg/kg		25		33						
1,2-Dichlorobenzene	mg/kg	1.8	370		33						
1,2-Dichloroethane	mg/kg	0.0005	76		33						

Table H.3-3
Data Screening and Statistical Summary for Soil
Pond Dredge RFI Site

		Screening Levels			Detect Data Summary						
Constituent	Units	Residential RBSL	Ecological RBSL	Background	Number of Samples	Number of Detects	Minimum Detected Value	Maximum Detected Value	Number of Detects > Residential RBSL	Number of Detects > Ecological RBSL	Number of Detects > Background SL
1,2-Dichloropropane	mg/kg		250		33						
1,3,5-Trimethylbenzene	mg/kg	0.036	64		33						
1,3-Dichlorobenzene	mg/kg	1.7	160		33						
1,3-Dichloropropane	mg/kg		22		33						
1,4-Dichlorobenzene	mg/kg	0.01	20		33						
2-Chloro-1,1,1-trifluoroethane	mg/kg				16						
2-Chloroethylvinyl ether	mg/kg	9.56905E-06	0.73		33						
2-Hexanone	mg/kg		1220		33						
Acetone	mg/kg	51	43		26	1	0.0399725	0.0399725			
Benzene	mg/kg	0.00013	110		33	1	0.001	0.001	1		
Bromobenzene	mg/kg		110		33						
Bromochloromethane	mg/kg		25		33						
Bromodichloromethane	mg/kg	0.00031	15		33						
Bromoform	mg/kg		38		33						
Bromomethane	mg/kg		25		33						
Carbon Tetrachloride	mg/kg	0.000042	1.5		33						
Chlorobenzene	mg/kg	0.097	40		33						
Chloroethane	mg/kg		190		33						
Chloroform	mg/kg	0.00077	11		33						
Chloromethane	mg/kg		25		33						
Chlorotrifluoroethylene	mg/kg		10.7		16						
cis-1,2-Dichloroethene	mg/kg	0.014	68		33						
cis-1,3-Dichloropropene	mg/kg		22		33						
Cumene	mg/kg	0.382558451	210		33						
Dibromochloromethane	mg/kg		46		33						
Dibromomethane	mg/kg		25		33						
Dichlorodifluoromethane	mg/kg	0.015	64		33						
Ethylbenzene	mg/kg	1.2	210		33						
Formaldehyde	mg/kg	12000	40.1		3						
Hexachlorobutadiene	mg/kg	9.2	0.85		33						
Methyl ethyl ketone	mg/kg	62	2540		32	1	0.0044725	0.0044725			
Methyl isobutyl ketone (MIBK)	mg/kg	19.63756975	2540		33						
Methyl tert-butyl ether	mg/kg		120		33						
Methylene chloride	mg/kg	0.004	25		30						
m-Xylene & p-Xylene	mg/kg	0.15	64		33						
n-Butylbenzene	mg/kg		210		33						
n-Propylbenzene	mg/kg	0.203267508	210		33						
o-Chlorotoluene	mg/kg	1222.098214	160		33						
o-Xylene	mg/kg	0.19	64		33						
p-Chlorotoluene	mg/kg	1222.098214	160		33						
p-Cymene	mg/kg		64		33	1	0.000411	0.000411			
sec-Butylbenzene	mg/kg	76.76404578	210		33						
sec-Dichloropropane	mg/kg		22		33						
Styrene	mg/kg	7.2	427		33	1	0.000275	0.000275			
tert-Butylbenzene	mg/kg		210		33						
Tetrachloroethene	mg/kg	0.00043	6		33						
Toluene	mg/kg	0.3	3.4		33						
trans-1,2-Dichloroethene	mg/kg	0.016	970		33						
trans-1,3-Dichloropropene	mg/kg		4.4		33						
Trichloroethene	mg/kg	0.0022	3		33						
Trichlorofluoromethane	mg/kg	0.11	300		33						

Table H.3-3
Data Screening and Statistical Summary for Soil
Pond Dredge RFI Site

		Screening Levels			Detect Data Summary						
Constituent	**Units**	**Residential RBSL**	**Ecological RBSL**	**Background**	**Number of Samples**	**Number of Detects**	**Minimum Detected Value**	**Maximum Detected Value**	**Number of Detects > Residential RBSL**	**Number of Detects > Ecological RBSL**	**Number of Detects > Background SL**
Vinyl chloride	mg/kg	0.0000096	0.73		33						
Xylenes, Total	mg/kg	0.15	64		34						

Table H.4-1
Chemicals of Potential Concern for Human Health
Pond Dredge RFI Site

Medium	Depth (ft.)	Chemical	Exceeds Background? (Y/N)	Selected as COPC?	Reason for Exclusion
Soil	0-2	1,1-Dichloroethene		Y	
Soil	0-2	1,2,3,4,6,7,8-Heptachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,4,7,8,9-Heptachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,4,7,8-Hexachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,6,7,8-Hexachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,7,8,9-Hexachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,7,8-Pentachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1,2,3,7,8-Pentachlorodibenzo-p-dioxin		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	1-Methyl naphthalene		Y	
Soil	0-2	2,3,4,6,7,8-Hexachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	2,3,4,7,8-Pentachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	2,3,7,8-Tetrachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	2-Methylnaphthalene		Y	
Soil	0-2	Acenaphthene		Y	
Soil	0-2	Acetone		Y	
Soil	0-2	Aluminum	Y	Y	
Soil	0-2	Anthracene		Y	
Soil	0-2	Antimony	N	N	Below Background
Soil	0-2	Aroclor 1254		Y	
Soil	0-2	Aroclor 1260		Y	
Soil	0-2	Arsenic	N	N	Below Background
Soil	0-2	Barium	Y	Y	
Soil	0-2	Benzene		Y	
Soil	0-2	Benzo(a)anthracene		Y	
Soil	0-2	Benzo(a)pyrene		Y	
Soil	0-2	Benzo(b)fluoranthene		Y	
Soil	0-2	Benzo(ghi)perylene		Y	
Soil	0-2	Benzo(k)fluoranthene		Y	
Soil	0-2	Beryllium	Y	Y	
Soil	0-2	bis(2-Ethylhexyl) phthalate		Y	
Soil	0-2	Boron	N	N	Below Background
Soil	0-2	Butyl benzyl phthalate		Y	
Soil	0-2	Cadmium	Y	Y	
Soil	0-2	Chromium	Y	Y	
Soil	0-2	Chrysene		Y	
Soil	0-2	Cobalt	Y	Y	
Soil	0-2	Copper	Y	Y	
Soil	0-2	Dibenzo(a,h)anthracene		Y	
Soil	0-2	Diesel Range Hydrocarbons (C15-C20)		N	See BTEX, PAHs
Soil	0-2	Diethyl phthalate		Y	
Soil	0-2	Dimethyl phthalate		Y	
Soil	0-2	Di-n-octyl phthalate		Y	
Soil	0-2	DioxinFuran_TEQ_Mammal		Y	
Soil	0-2	Fluoranthene		Y	
Soil	0-2	Fluorene		Y	
Soil	0-2	Fluoride		Y	
Soil	0-2	Heptachlorodibenzofurans	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Heptachlorodibenzo-p-dioxins	Y	N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Hexachlorodibenzofurans	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Hexachlorodibenzo-p-dioxins	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Indeno(1,2,3-cd)pyrene		Y	
Soil	0-2	Iron	N	N	Below Background
Soil	0-2	Lead	N	N	Below Background
Soil	0-2	Lithium	N	N	Below Background
Soil	0-2	Lubricating Oil Range Hydrocarbons (C20-C30)		N	See BTEX, PAHs
Soil	0-2	Lubricating Oil Range Hydrocarbons (C21-C30)		N	See BTEX, PAHs
Soil	0-2	Manganese	N	N	Below Background
Soil	0-2	Mercury	N	N	Below Background
Soil	0-2	Methyl ethyl ketone		Y	
Soil	0-2	Molybdenum	N	N	Below Background
Soil	0-2	Naphthalene		Y	
Soil	0-2	Nickel	Y	Y	

Table H.4-1
Chemicals of Potential Concern for Human Health
Pond Dredge RFI Site

Medium	Depth (ft.)	Chemical	Exceeds Background? (Y/N)	Selected as COPC?	Reason for Exclusion
Soil	0-2	Nitrate-N		Y	
Soil	0-2	Nitrate-NO3		Y	
Soil	0-2	Nitrite-N		Y	
Soil	0-2	Octachlorodibenzofuran	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Octachlorodibenzo-p-dioxin	Y	N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Pentachlorodibenzofurans	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Pentachlorodibenzo-p-dioxins	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Perchlorate		Y	
Soil	0-2	Phenanthrene		Y	
Soil	0-2	Pyrene		Y	
Soil	0-2	Selenium	N	N	Below Background
Soil	0-2	Silver	N	N	Below Background
Soil	0-2	Styrene		Y	
Soil	0-2	Tetrachlorodibenzofurans		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Tetrachlorodibenzo-p-dioxins		N	See DioxinFuran_TEQ_Mammal
Soil	0-2	Thallium	N	N	Below Background
Soil	0-2	Total Petroleum Hydrocarbons		N	See BTEX, PAHs
Soil	0-2	Vanadium	Y	Y	
Soil	0-2	Zinc	Y	Y	
Soil	0-2	Zirconium	N	N	Below Background
Soil	0-10	1,1-Dichloroethene		Y	
Soil	0-10	1,2,3,4,6,7,8-Heptachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	1,2,3,4,7,8,9-Heptachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	1,2,3,4,7,8-Hexachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin		N	< 5% Detection
Soil	0-10	1,2,3,6,7,8-Hexachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	1,2,3,7,8,9-Hexachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	1,2,3,7,8-Pentachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	1,2,3,7,8-Pentachlorodibenzo-p-dioxin		N	< 5% Detection
Soil	0-10	1-Methyl naphthalene		N	< 5% Detection
Soil	0-10	2,3,4,6,7,8-Hexachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	2,3,4,7,8-Pentachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	2,3,7,8-Tetrachlorodibenzofuran		N	See DioxinFuran_TEQ_Mammal
Soil	0-10	2-Methylnaphthalene		N	< 5% Detection
Soil	0-10	Acenaphthene		Y	
Soil	0-10	Acetone		N	< 5% Detection
Soil	0-10	Aluminum	Y	Y	
Soil	0-10	Anthracene		Y	
Soil	0-10	Antimony	N	N	Below Background
Soil	0-10	Aroclor 1254		Y	
Soil	0-10	Aroclor 1260		Y	
Soil	0-10	Arsenic	Y	Y	
Soil	0-10	Barium	Y	Y	
Soil	0-10	Benzene		N	< 5% Detection
Soil	0-10	Benzo(a)anthracene		Y	
Soil	0-10	Benzo(a)pyrene		Y	
Soil	0-10	Benzo(b)fluoranthene		Y	
Soil	0-10	Benzo(ghi)perylene		Y	
Soil	0-10	Benzo(k)fluoranthene		Y	
Soil	0-10	Beryllium	Y	Y	
Soil	0-10	bis(2-Ethylhexyl) phthalate		Y	
Soil	0-10	Boron	N	N	Below Background
Soil	0-10	Bromide		N	< 5% Detection
Soil	0-10	Butyl benzyl phthalate		Y	
Soil	0-10	Cadmium	Y	Y	
Soil	0-10	Chromium	Y	Y	
Soil	0-10	Chrysene		Y	
Soil	0-10	Cobalt	Y	Y	
Soil	0-10	Copper	Y	Y	
Soil	0-10	Dibenzo(a,h)anthracene		N	< 5% Detection
Soil	0-10	Diesel Range Hydrocarbons (C15-C20)		N	See BTEX, PAHs

Table H.4-1
Chemicals of Potential Concern for Human Health
Pond Dredge RFI Site

Medium	Depth (ft.)	Chemical	Exceeds Background? (Y/N)	Selected as COPC?	Reason for Exclusion
Soil	0-10	Diethyl phthalate		Y	
Soil	0-10	Dimethyl phthalate		Y	
Soil	0-10	Di-n-octyl phthalate		N	< 5% Detection
Soil	0-10	DioxinFuran_TEQ_Mammal		Y	
Soil	0-10	Fluoranthene		Y	
Soil	0-10	Fluorene		Y	
Soil	0-10	Fluoride		N	< 5% Detection
Soil	0-10	Heptachlorodibenzofurans	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	Heptachlorodibenzo-p-dioxins	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	Hexachlorodibenzofurans	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	Hexachlorodibenzo-p-dioxins	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	Indeno(1,2,3-cd)pyrene		Y	
Soil	0-10	Iron	N	N	Below Background
Soil	0-10	Kerosene Range Hydrocarbons (C12-C14)		N	< 5% Detection
Soil	0-10	Lead	N	N	Below Background
Soil	0-10	Lithium	N	N	Below Background
Soil	0-10	Lubricating Oil Range Hydrocarbons (C20-C30)		N	See BTEX, PAHs
Soil	0-10	Lubricating Oil Range Hydrocarbons (C21-C30)		N	See BTEX, PAHs
Soil	0-10	Manganese	N	N	Below Background
Soil	0-10	Mercury	N	N	Below Background
Soil	0-10	Methyl ethyl ketone		N	< 5% Detection
Soil	0-10	Molybdenum	N	N	Below Background
Soil	0-10	Naphthalene		Y	
Soil	0-10	Nickel	Y	Y	
Soil	0-10	Nitrate-N		Y	
Soil	0-10	Nitrate-NO3		Y	
Soil	0-10	Nitrite-N		Y	
Soil	0-10	Octachlorodibenzofuran	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	Octachlorodibenzo-p-dioxin	Y	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	p-Cymene		N	< 5% Detection
Soil	0-10	Pentachlorodibenzofurans	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	Pentachlorodibenzo-p-dioxins	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	Perchlorate		Y	
Soil	0-10	Phenanthrene		Y	
Soil	0-10	Pyrene		Y	
Soil	0-10	Selenium	N	N	Below Background
Soil	0-10	Silver	N	N	Below Background
Soil	0-10	Styrene		N	< 5% Detection
Soil	0-10	Tetrachlorodibenzofurans	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	Tetrachlorodibenzo-p-dioxins	N	N	See DioxinFuran_TEQ_Mammal
Soil	0-10	Thallium	N	N	Below Background
Soil	0-10	Total Petroleum Hydrocarbons		N	See BTEX, PAHs
Soil	0-10	Vanadium	Y	Y	
Soil	0-10	Zinc	Y	Y	
Soil	0-10	Zirconium	N	N	Below Background
Soil Vapor	0-10	No analyses			
Groundwater	-	No analyses			

Table H.4-2
Human Health Risk Estimates[1]
Pond Dredge RFI Site

Receptor	Soil Media[2]						Groundwater[3]						Total for Site Media[4]					
	HI Range		CD[5]	Risk Range		CD	HI Range		CD	Risk Range		CD	HI Range		CD	Risk Range		CD
Future Adult Recreator	0.00002	- 0.002		3E-09	- 2E-07		NA	- NA		NA	- NA		<0.01	- <0.01		3E-09	- 2E-07	
Future Child Recreator	0.0003	- 0.008		4E-08	- 2E-07		NA	- NA		NA	- NA		<0.01	- <0.01		4E-08	- 2E-07	
Future Adult Resident	0.04	- 0.08		4E-06	- 2E-05	a	NA	- NA		NA	- NA		0.04	- 0.08		4E-06	- 2E-05	a
Future Child Resident	0.3	- 0.8		2E-05	- 5E-05	a	NA	- NA		NA	- NA		0.3	- 0.8		2E-05	- 5E-05	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 exposure routes, including incidental ingestion, dermal contact, and dust inhalation.
3. Groundwater media risk estimates are for domestic use of shallow groundwater.
4. Includes combined exposure from 1) direct contact with soil, 2) inhalation of indoor and ambient air vapors originating from soil gas, subsurface soil, and groundwater, and 3) domestic use of shallow groundwater.
5. Chemical risk drivers are those COPCs detected onsite with an HI > 1 or risk > 1x10-6. Only major risk contributors listed if cumulative HI >> 1 or cancer risk >> 1x10-6.

a = Arsenic

CD = Chemical risk driver
COPC = Chemical of potential concern
HI = Hazard index
NA = Not Applicable

Table H.4-3
Human Health Risk Assessment Uncertainty Analysis
Pond Dredge RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
COPC Selection	Several inorganics, including arsenic, were selected as COPCs since it could not be demonstrated that they are consistent with background concentrations through the Wilcoxon Rank Sum test. For site data sets that are small,	Moderate	Conservative
	Acetone, 1,1-dichloroethene, benzene, and naphthalene were selected as soil vapor COPCs because they were detected in soil but not analyzed for in soil vapor.	Moderate	Conservative
	Petroleum hydrocarbons were not selected as COPCs since TPH-related constituents (BTEX and PAHs) were analyzed for.	Low	Realistic
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
	Future land use of the site is currently undecided but may be recreational, which has lower risks than for urban residential. If land use is assumed agricultural, risk estimates may be	Moderate	Uncertain
	Risk estimates for fruit and vegetable consumption are based on conservative models that are based on associations with physical-chemical properties, such as Koc.	Moderate	Conservative
	Although risks were estimated for arsenic, these risks may represent the risk from naturally-occurring rather than site-related concentrations. Higher concentrations of arsenic are often associated with shales, which are present at the SSFL and in the site vicinity.	High	Conservative
EPC Calculations	EPCs are based on some data that are over 8 years old. In these cases available analytical data may not accurately reflect current site conditions. Source concentrations assumed constant over time. Chemical concentrations may decline as a result of migration or degradation.	Low	Conservative
	Use of upper confidence limits and maximum detected concentrations will likely overestimate site risks.	Low	Conservative
	Soil vapor exposure point concentration for acetone, 1,1-dichloroethene, benzene, and naphthalene are estimated using soil to soil vapor partitioning extrapolations, introducing some degree of uncertainty.	Moderate	Conservative
	The 95% UCL concentration of some chemicals is greater than the maximum concentration, therefore the maximum was used as the EPC. This is considered to be a likely overestimation of the representative EPC because samples were collected in areas with the highest likelihood to detect the highest concentrations at the site.	Moderate	Conservative
	The maximum detected concentration of each COPC detected in groundwater was used as the EPC.	Moderate	Conservative

Table H.4-3
Human Health Risk Assessment Uncertainty Analysis
Pond Dredge RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
	The extrapolation of soil Aroclor 1254 and Aroclor 1260 concentrations to individual PCB congener concentrations introduces some uncertainty into the EPC estimates for the PCB congeners.	Low	Conservative
	Vapor migration into indoor air has been estimated using a model which is being validated for the site. Migration	Moderate	Uncertain

Table H.4-3
Human Health Risk Assessment Uncertainty Analysis
Pond Dredge RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
Cancer Slope Factor	Extrapolation of dose-response data from laboratory animals to humans.	High	Conservative
	Assumes that all carcinogens do not have a threshold below which carcinogenic response occurs, and therefore, any	Moderate	Conservative
	Not all slope factors represent the same degree of certainty. All are subject to change as new evidence becomes available. Some slope factors derived by OEHHA and considerably more conservative that corresponding factors derived by USEPA (e.g. arsenic, PCBs)	Moderate	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	Moderate	Conservative
Reference Dose	No dermal toxicity values are available, oral toxicity factors are used for the dermal route.	Moderate	Conservative
	High degree of uncertainty in extrapolation of dose-response data from laboratory animals to humans.	High	Conservative

Notes:
BTEX - benzene, toluene, ethylbenzene, and xylenes
COPC - chemical of potential concern
EPC - exposure point concentration
Koc - Organic carbon partition coefficient
OEHHA - Office of Environmental Health Hazard Assessment
PAH - polycyclic aromatic hydrocarbon
TPH - total petroleum hydrocarbons
UCL - upper confidence limit
USEPA - United States Environmental Protection Agency

Table H.4-4
Chemicals of Ecological Concern - Soil
Pond Dredge RFI Site

Preferred Analyte Name	Range of HQs - RME Exposure (Refined Calculations)												Identification of COECs	
	Soil Invertebrate	Hermit Thrush	Red-Tailed Hawk	Deer Mouse	Bobcat	Mule Deer	Soil Invertebrates	Hermit Thrush	Red-Tailed Hawk	Deer Mouse	Bobcat	Mule Deer	COEC	Rationale
Aluminum	**7.84**	No TRV -- **22**	No TRV -- <1	**144** -- **1443**	<1 -- <1	**1.4** -- **14.1**	**2.7**	-- -- **7.5**	-- -- <1	**53** -- **529**	<1 -- <1	<1 -- **4.9**	No	-USEPA guidance indicates no risk from aluminum when pH is greater than 5.5. -site pH was 7.7.
Barium	<1	**1.3** -- **2.6**	<1 -- <1	**2.1** -- **8.3**	<1 -- <1	<1 -- <1	<1	<1 -- **1.2**	<1 -- <1	**1.03** -- **4.0**	<1 -- <1	<1 -- <1	**Yes**	-Estimated risks for two receptors (thrush and mouse) at both Low and High TRVs. -Incremental risks >1 -Over 1/2 of results exceed maximum background concentration (0-6 ft bgs).
Chromium	<1	**7.1** -- **35**	<1 -- <1	No TRV -- <1	No TRV -- <1	No TRV -- <1	<1	**2.4** -- **12**	<1 -- <1	-- -- <1	-- -- <1	-- -- <1	**Yes**	-Estimated risks for thrush at both Low and High TRVs. -Incremental risks >1 for both Low and High TRV.
Copper	<1	<1 -- **16**	<1 -- <1	<1 -- **7.6**	<1 -- <1	<1 -- <1	<1	<1 -- **4.3**	<1 -- <1	<1 -- **1.7**	<1 -- <1	<1 -- <1	No	-Estimated risks for two receptors (thrush and mouse) at both Low TRV only. -Incremental risks >1 (Low TRV) -Maximum site concentration (25 mg/kg) less than maximum background concentration (29 mg/kg)
Nickel	<1	<1 -- **13**	<1 -- <1	<1 -- **201**	<1 -- <1	<1 -- **2.0**	<1	<1 -- **2.8**	<1 -- <1	<1 -- **63**	<1 -- <1	<1 -- <1	**Yes (hot spot)**	-Estimated risks for thrush, mouse, and deer (Low TRV only). -Incremental risks >1 for thrush, mouse, and deer (Low TRV). -Estimated risks for mouse driven by one high result (65.4 mg/kg) at 3 ft bgs (location PDTS07). -All other data (0-6 ft bgs) are below the maximum background concentration.
Vanadium	<1	No TRV -- <1	No TRV -- <1	**3.5** -- **35**	<1 -- <1	<1 -- <1	<1	-- -- <1	-- -- <1	**1.2** -- **12**	<1 -- <1	<1 -- <1	**Yes**	-Estimated risks for this mouse (Low and High TRV). -Incremental risks for mouse (Low and High TRV). -Approximately 1/3 of the results (0-6 ft bgs) are greater than the maximum background concentration.
Zinc	<1	<1 -- **3.0**	<1 -- <1	<1 -- **3.4**	<1 -- <1	<1 -- <1	<1	<1 -- <1	<1 -- <1	<1 -- <1	<1 -- <1	<1 -- <1	No	-Estimated risks for thrush and mouse only (Low TRV). -Incremental risks <1 for all receptors.
bis(2-Ethylhexyl) phthalate	No TRV	No TRV -- **22**	No TRV -- <1	<1 -- <1	<1 -- <1	<1 -- <1	n/a	n/a -- n/a	n/a -- n/a	n/a -- n/a	n/a -- n/a	n/a -- n/a	**Yes**	-Estimated risks to thrush (Low TRV).
DioxinFuranPCB_TEQ_Bird	<1	**1.1** -- **11**	<1 -- <1	n/a -- n/a	n/a -- n/a	n/a -- n/a	n/a	n/a -- n/a	n/a -- n/a	n/a -- n/a	n/a -- n/a	n/a -- n/a	**Yes**	-Estimated risks to thrush (Low TRV). -Chemical class HI also exceeds 1 for thrush (Low TRV).

Notes:
n/a - not applicable
HQs listed are based on Refined Screen
Low hazard quotient = EPC/High TRV
High hazard quotient = EPC/Low TRV
COEC - chemical of ecological concern
CTE - central tendency exposure
HI - hazard index
HQ - hazard quotient
RME - reasonable maximum exposure
TRV - toxicity reference value

Table H.4-5
Ecological Risk Assessment Uncertainty Analysis
Pond Dredge RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
Problem Formulation			
Fate and Transport	It is assumed that chemical concentrations will not change over time, and that concentrations are constant during the exposure duration. Natural attenuation and/or other degradation processes may be significant in some areas resulting in an over-estimation of exposure.	Moderate	Over-estimation of exposure/risk
Data Collection/Analysis	Variability in analyses, laboratories, representativeness of samples, sampling errors, and homogeneity of the sample matrix can influence quality and quantity of data used in the risk assessment. Data were validated, but historical sampling programs may not have had the same standards as more recent ones.	Unknown	Over- or under-estimation of exposure/risk
Data Collection/Analysis	Detection Limits. Historical data were noted to have overly high detection limits, especially in regard to metals. Recent sampling was designed to have detection limits meeting ESLs. However, as data are combined into the EPCs, high detection limits may influence the resulting mean and 95UCLs.	Moderate	Over-estimation of exposure/risk
Data Collection/Analysis	Surface water samples were not collected from surface drainages. Potential exposure and risk to aquatic receptors could not be evaluated.	Moderate	Under-estimation of exposure/risk
Representative Species	Representative species were selected to reduce uncertainty; however, differences among species including physiology, reproductive biology, and/or foraging habits can result in different exposures and sensitivities for different receptors.	Low	Over- or under-estimation of exposure/risk
CPEC Selection	Background Comparison. Background evaluation was based on the WRS test. For some inorganics, the WRS test indicated that the site exceeded background, but site maximum, CTE, and RME concentrations were similar to or below background maximum, CTE, and/or RME concentrations.	Low	Over-estimation of exposure/risk
CPEC Selection	VOC Comparison. VOCs that were detected in soil but were not analyzed for in soil gas were retained as CPECs under the matrix "Modeled Soil Vapor". Concentrations were modeled from soil concentrations using SRAM Appendix G Equation 18.	Low	Over-estimation of exposure/risk
CPEC Selection	SQL Comparison. Chemicals that were never detected at the site were included as CPECs if they met the criteria in the SQL screening process: a) SQL>ESL b) at least 5 samples were collected c) at least 2 other chemicals in the same chemical class were detected.	Low	Over-estimation of exposure/risk
Exposure Pathway Analysis	Dermal and inhalation (for surface-dwelling animals) exposure pathways were not quantified.	Low	Under-estimation of exposure/risk
Analysis			
Wildlife Exposure Factors	Assumptions regarding exposure - likelihood, contact with contaminated media, concentrations at exposure points, and frequency/duration of contact are based on available information and assumptions of wildlife habits at the SSFL. Assumptions tend to simplify actual site conditions and may over- or under-estimate actual exposure.	Moderate	Over- or under-estimation of exposure/risk

Table H.4-5
Ecological Risk Assessment Uncertainty Analysis
Pond Dredge RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
Bioaccumulation Factors	Site-specific data on CPEC concentrations in wildlife foods were used to derive BAFs for a limited number of CPECs (SRAM 2005). For the remaining CPECs, literature-based BAFs and regression models were used to estimate bioaccumulation. The suitability of these bioaccumulation models to conditions at the site is unknown. Therefore, concentrations of CPECs in biota present at the site and, consequently, the dietary exposures of birds and mammals, may be either higher or lower than values estimated in the Group 5 ERAs.	Moderate	Over- or under-estimation of exposure/risk
Bioavailability	Bioavailability of CPECs was assumed to be 100 percent. This likely overestimates risk to receptors at the site.	Low	Over-estimation of exposure/risk
Area Use Factors	Area use factors (AUFs) of less than 1 were applied to exposure estimates for wide-ranging receptors (red-tailed hawk, bobcat, and mule deer) in the "refined" assessment to account for the foraging range of the receptor. Use of the site may be greater or less than that predicted by the AUF.	Low	Over- or under-estimation of exposure/risk
Exposure Point Concentrations	CTE EPC. CTE EPC is based on the arithmetic mean per the SRAM (MWH 2005). This assumes normal distribution. In some cases the CTE was >RME and/or CTE was >Maximum detect. The mean (CTE) could be biased high by higher detection limits from historic data. The RME EPC was used for the CTE EPC when the CTE was >RME or CTE was >Maximum.	Moderate	Over-estimation of exposure/risk
Exposure Point Concentrations	RME EPC. The RME EPC is the 95UCL, unless the 95UCL exceeds the maximum detect in which case the maximum detect is used as the RME EPC. Use of the maximum detect is considered to be a likely overestimation of the representative exposure point concentration because samples were collected in areas likely to have the highest concentrations at the site.	Moderate	Over-estimation of exposure/risk
Exposure Point Concentrations	The extrapolation of soil Aroclor 1254 and Aroclor 1260 concentrations to individual dioxin-like PCB congener concentrations introduces some uncertainty into the EPC estimates for the PCB congeners.	Low	Over- or under-estimation of exposure/risk
Exposure Point Concentrations	Soil vapor concentrations extrapolated from soil concentrations were used to calculate soil vapor EPC.	Moderate	Over- or under-estimation of exposure/risk
Exposure Point Concentrations	Estimation of soil vapor concentrations overstates actual burrow concentrations: 1) Model is conservative. 2) Air flow in burrows is not accounted for. 3) Model does not account for attenuation between depth to soil and 0-6 ft bgs interval for burrows.	Moderate	Over- or under-estimation of exposure/risk
Toxicity Reference Values	Toxicity data were not available for all CPECs or media considered in the Group 5 ERAs. CPECs for which toxicity data were unavailable were not evaluated, or surrogate toxicity data were used. Risks may be overestimated or underestimated.	Moderate	Over- or under-estimation of exposure/risk
Toxicity Reference Values	Literature-derived toxicity data from laboratory studies were the only toxicity data used to evaluate risk to all receptor groups. Effects observed in laboratory species were assumed to be indicative of effects that would occur in wild species. The suitability of this assumption is unknown. Therefore, risk may be either overestimated or underestimated.	Moderate	Over- or under-estimation of risks
Toxicity Reference Values	There is uncertainty in extrapolation of dose-response data from laboratory animals to other wildlife.	Moderate	Over- or under-estimation of risks
Toxicity Reference Values	Use of standardized uncertainty factors to estimate chronic NOAEL-equivalent TRVs.	Moderate	Over- or under-estimation of risks

Table H.4-5
Ecological Risk Assessment Uncertainty Analysis
Pond Dredge RFI Site

Assessment Element	Uncertainty	Magnitude of Impact	Direction of Impact
Toxicity Reference Values	Use of chronic NOAEL-equivalent TRVs may overestimate risk.	High	Over-estimation of exposure/risk
Toxicity Reference Values	TRVs based on high dose laboratory exposures (LD50) were adjusted to a NOAEL-equivalent TRV. The more variables that are normalized using uncertainty factors, the greater the uncertainty in the resulting value.	Moderate	Over-estimation of exposure/risk
Toxicity Reference Values	Sources of TRVs occasionally apply different uncertainty factors than those used in the SRAM to adjust a study to what they label a "Chronic NOAEL". When details of the study were available, SRAM-specified uncertainty factors were used. If the details of the study were not presented or were not sufficiently complete to make a determination, then the interpretations made by the source document were used.	Low	Over- or under-estimation of risks
Risk Characterization			
Risk Estimation	Potential ecological risks were quantified using the HQ approach. The magnitude of the HQ indicates potential for ecological risk, but is not an exact estimation of risk. For example, the actual risk from a chemical with an HQ of 70 could be less than that for a chemical with an HQ of 20 because of uncertainties involved in estimating exposure, selection of effects criteria (TRVs), or field conditions affecting exposure.	Moderate	Over- or under-estimation of risks
Risk Estimation	Data necessary to estimate potential risks from all pathways for all chemicals in the food-chain uptake model were not always available. For these chemicals and/or areas, the food-chain uptake model was completed using the available data.	Moderate	Under-estimation of exposure/risk
Risk Estimation	Risks estimated for exposure to some inorganics may represent a background risk, rather than a site-related risk. Although the WRS test sometimes indicated that the site exceeded background, the Maximum, CTE, and/or RME EPC concentrations, it was sometimes found that site values were less than or comparable to the background Maximum, CTE, and/or RME concentrations.	Moderate	Over- or under-estimation of exposure/risk
Risk Description	The soluble and toxic forms of aluminum are only present in soil under soil pH values of less than 5.5 (USEPA 2003), and the average pH for the soils at the Group 5 sites exceeds 5.5. Aluminum, while evaluated in the ERA as a CPEC and identified as a risk driver, most likely does not cause effects to the various ecological receptors due to the soil pH range.	Moderate	Over-estimation of exposure/risk

Notes:

BAF - bioaccumulation factor
CPEC - chemical of potential ecological concern
CTE - central tendency exposure
EPC - exposure point concentration
ERA - ecological risk assessment
ESL - ecological screening level
LD50 - lethal doses to 50% of test animals
NOAEL - no observed adverse effect level
RME - reasonable maximum exposure
SQL - sample quantitation limit
TRV - toxicity reference value
UCL - upper confidence limit on the mean
VOC - volatile organic chemical
WRS - Wilcoxon Rank Sum test

Table H.5-1
Surficial Media Site Action Recommendations
Pond Dredge RFI Site

Chemical Use Area	Chemical Use Area Name	CMS Area [1]	Recommended for further consideration in CMS based on:				
			Residential Receptor [2]	Recreational Receptor [2]	Ecological Receptor [2]		
1	Pond Dredge	Pond Dredge Area-1	No HRA COCs identified	No HRA COCs identified	***Soil Results***		
					Any HQ>1?	COEC	Rationale
					Aluminum	No	ERA-1
					Barium	Yes	ERA-3
					Chromium	Yes	ERA-3
					Copper	No	ERA-2
					Nickel	Yes	ERA-6
					Vanadium	Yes	ERA-3
					Zinc	No	ERA-3
					bis(2-Ethylhexyl) phthalate	Yes	ERA-7
					DioxinFuranPCB_TEQ_Bird	Yes	ERA-5
					Soil Vapor Results		
					Any HQ>1?	COEC	Rationale
					None	None	ERA-4

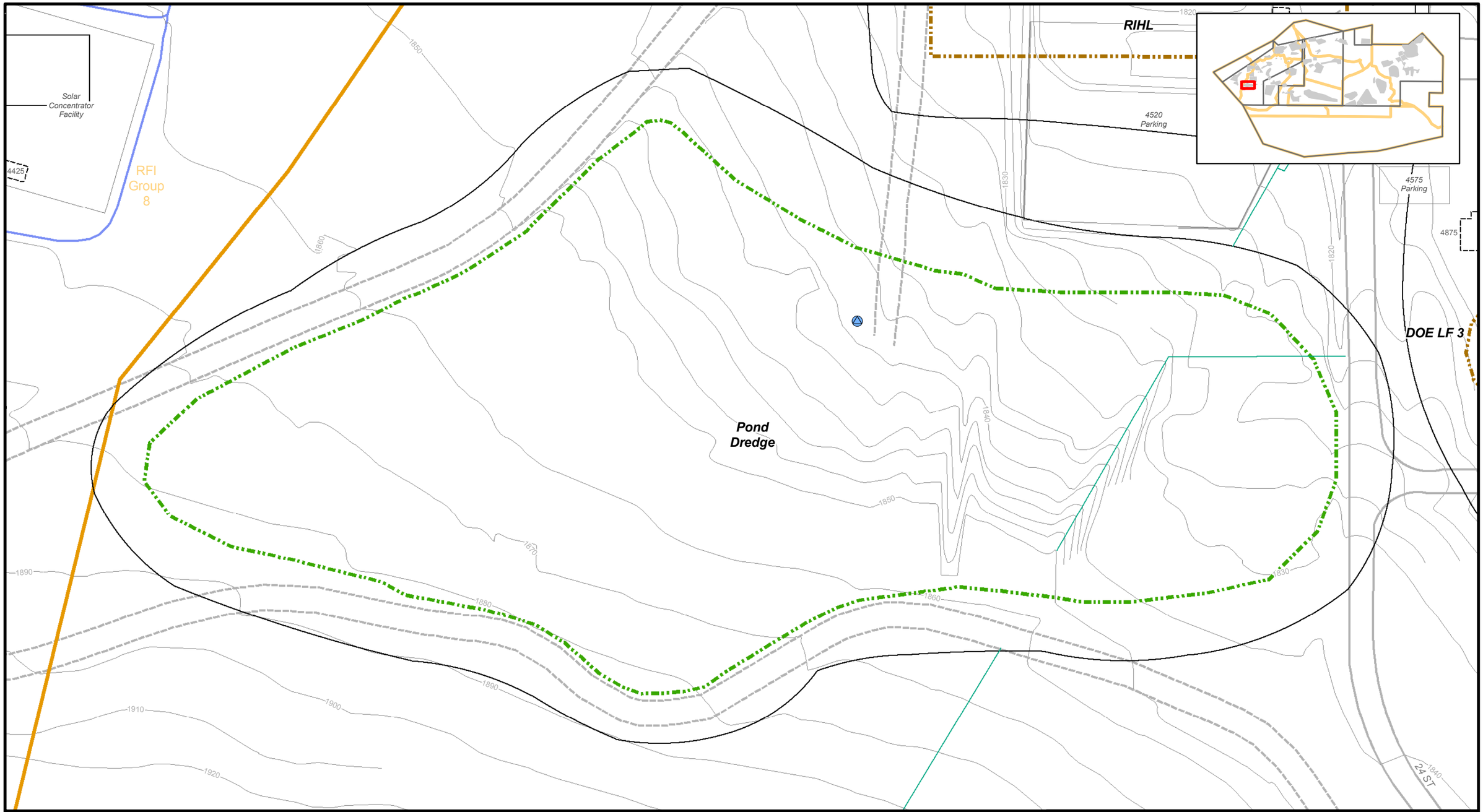
Notes:
1. NFA - Indicates area is recommended for No Further Action (NFA) for the CUA; not recommended for CMS evaluation.
2. CMS recommendations are based on compounds considered risk drivers (excess cancer risk > 1 x 10-6 or hazard index > 1) and/or significant risk contributors.

ERA-1 USEPA guidance indicates no risk from aluminum when pH is greater than 5.5. Site pH >5.5.
ERA-2 Site maximum concentration is below background maximum concentration. Site RME is similar to background RME.
ERA-3 Estimated risks and or incremental risks >1 for 1 or more receptors. Magnitude of exceedance indicate potential risk.
ERA-4 No chemicals of potential ecological concern exceeded Low or High TRVs under either the CTE or RME scenarios.
ERA-5 Estimated risks >1 for 1 or more receptors. Chemical class Hazard Index >1.
ERA-6 Estimated risks for thrush, mouse, deer. Risks for mouse driven by single high result (65.4 mg/kg) at 3 ft bgs. All other results from 0-6 ft bgs are below the maximum background concentration.
ERA-7 Estimated risks to thrush only (Low TRV). All incremental risks <1.

Table H.5-2
Summary of Site Surficial Media CMS Recommendations
Pond Dredge RFI Site

CMS Area	Description	Chemical Risk Drivers and Contributors	Rationale
Pond Dredge - 1	The entire Pond Dredge Area.	Barium, chromium, nickel, vanadium, bis(2-Ethylhexyl) phthalate, and DioxinFuranPCB_TEQ_Bird.	Estimated ecological hazard quotients exceed 1 for barium, chromium, nickel, vanadium, bis(2-Ethylhexyl) phthalate, and DioxinFuranPCB_TEQ_Bird. Ecological risk drivers in soil detected throughout hummocky areas and also in step-out locations throughout the Pond Dredge Area.

Figures



Basemap Legend

- Groundwater Monitoring Well
- Piezometer
- Groundwater Extraction Well
- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Leachfield
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Surface Drainage Divide
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond
- Pipe

Site Location
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

October 29, 2008

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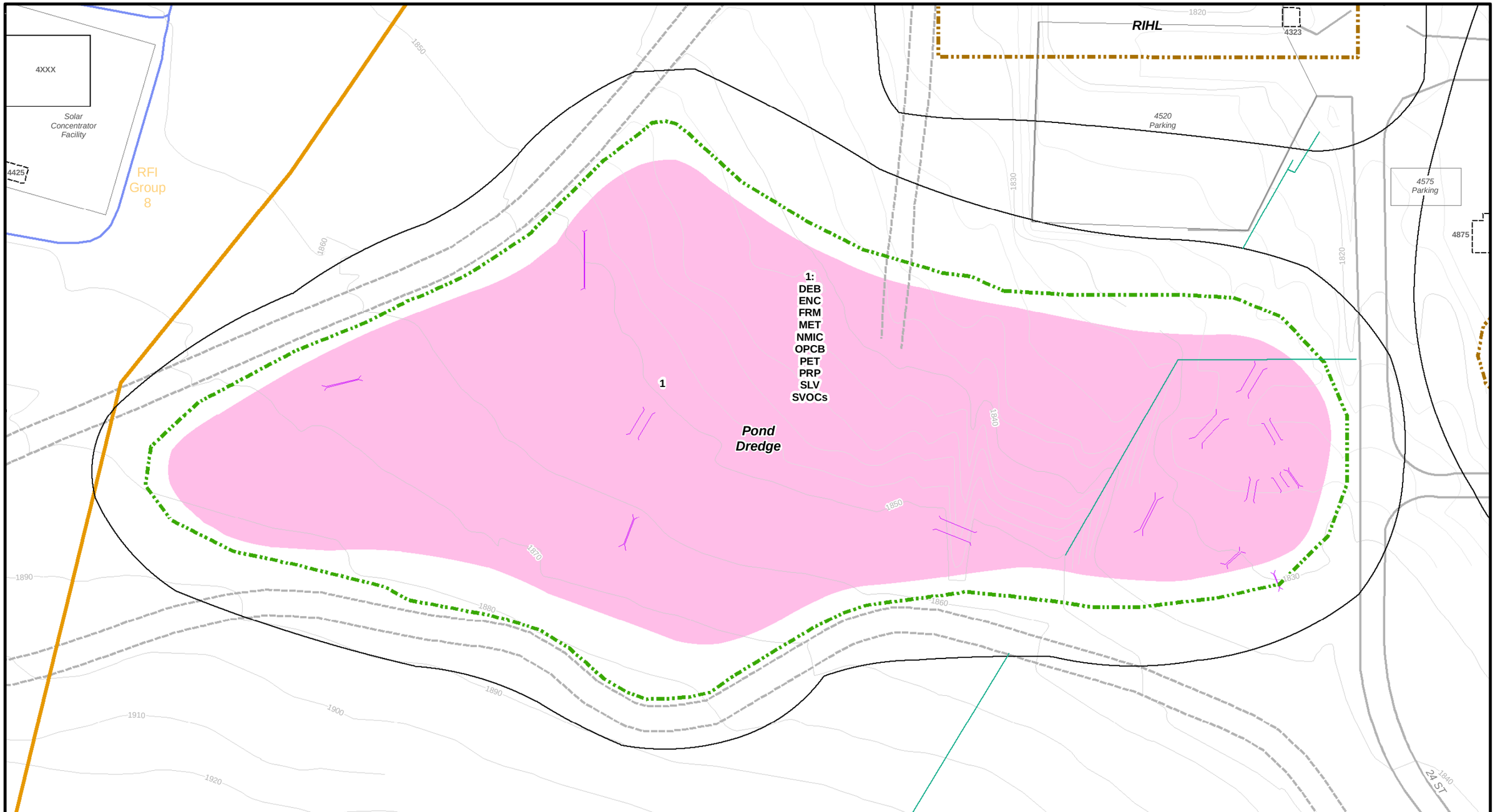
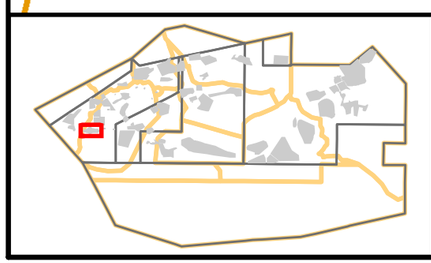
WORKING DRAFT

FIGURE H.1-1





Chemical Use

- Debris
- Multiple Use
- Solvent
- Petroleum
- Oil/PCBs
- Metals
- Energetic Constituents
- Propellants
- Leach Field
- Non-metal Inorganic Constituents
- Screening for Potential Impacts

Multiple Use Key

ACB - Acids and Bases
ASB - Asbestos
DEB - Debris
DIOX - Dioxins and Furans
ENC - Energetic Constituents
FRM - Formaldehyde
LCF - Leach Field
MET - Metals
NMIC - Non-metal Inorganic Constituents
OPCB - Oil/PCBs
PET - Petroleum
PRP - Propellants
SLV - Solvents
SVOC - SVOCs

Basemap Legend

- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Excavation
- Trench
- Leachfield
- Pipe
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- RFI Site Buffer
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Surface Drainage Divide
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond
- Waste Debris Area

Chemical Use Areas
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

June 24, 2008

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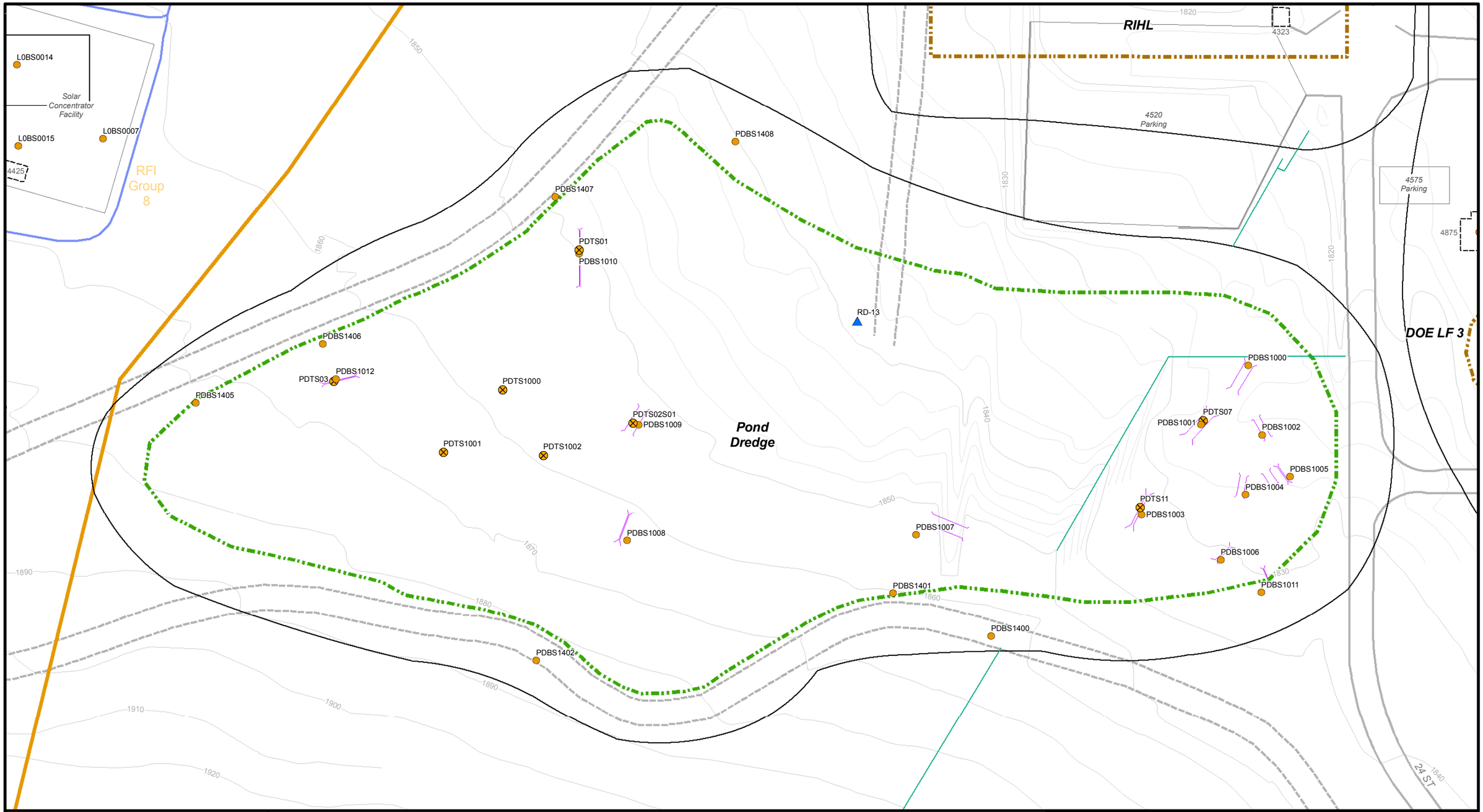
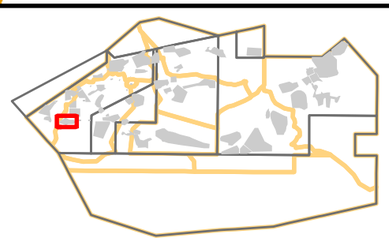
FIGURE H.2-1





Sample Type

- Soil
- Soil - Composite
- Soil - Sediment
- Soil - Surface
- Air - Soil Vapor
- SV points that were not sampled due to refusal or poor air flow
- Air
- Groundwater
- Groundwater - Lysimeter
- Groundwater - Spring
- Water - Artificial
- Water - Discharge
- Water - Surface
- Water - Surface (Seep)
- Biological
- Other
- Sump

Basemap Legend

- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Excavation
- Trench
- Leachfield
- Pipe
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Surface Drainage Divide
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond

Sample Locations
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

November 05, 2008

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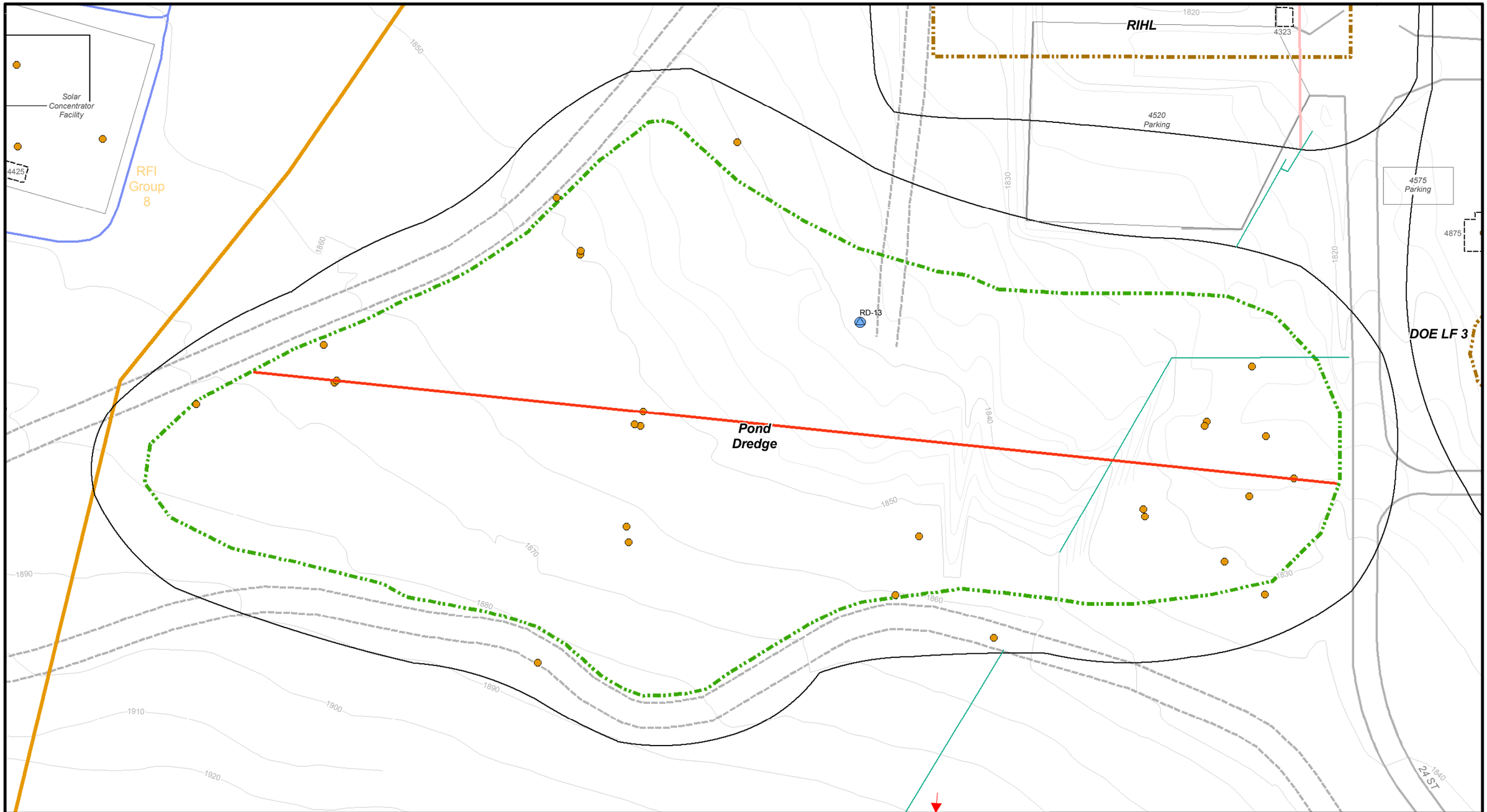
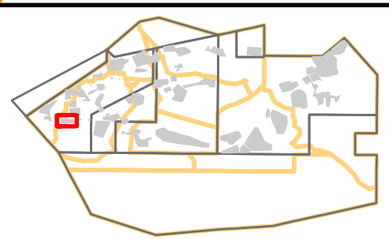
WORKING DRAFT

FIGURE H.2-2





Cross-section Line

- Soil Boring
- Confirmation Sample
- Groundwater Monitoring Well
- Piezometer
- Groundwater Extraction Well
- Abandoned Groundwater Monitoring Well

Basemap Legend

- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Drainage
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond
- Leachfield
- Pipe

Pond Dredge Cross Section Locations

Z-Z'

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

November 03, 2008

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Grp5RFIReport_CrossSct_BL_PLTS.mxd

WORKING DRAFT

FIGURE N.2-3A

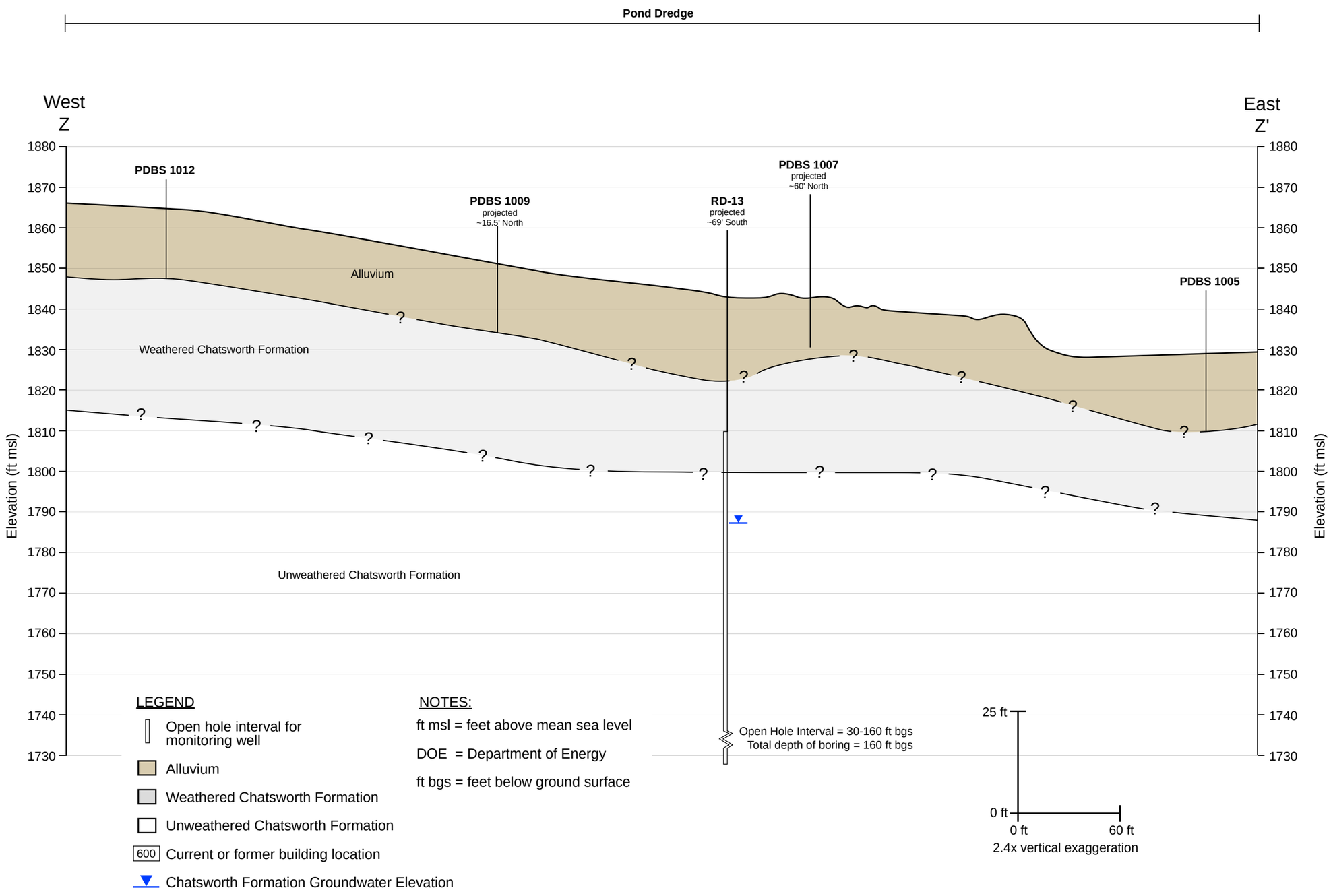
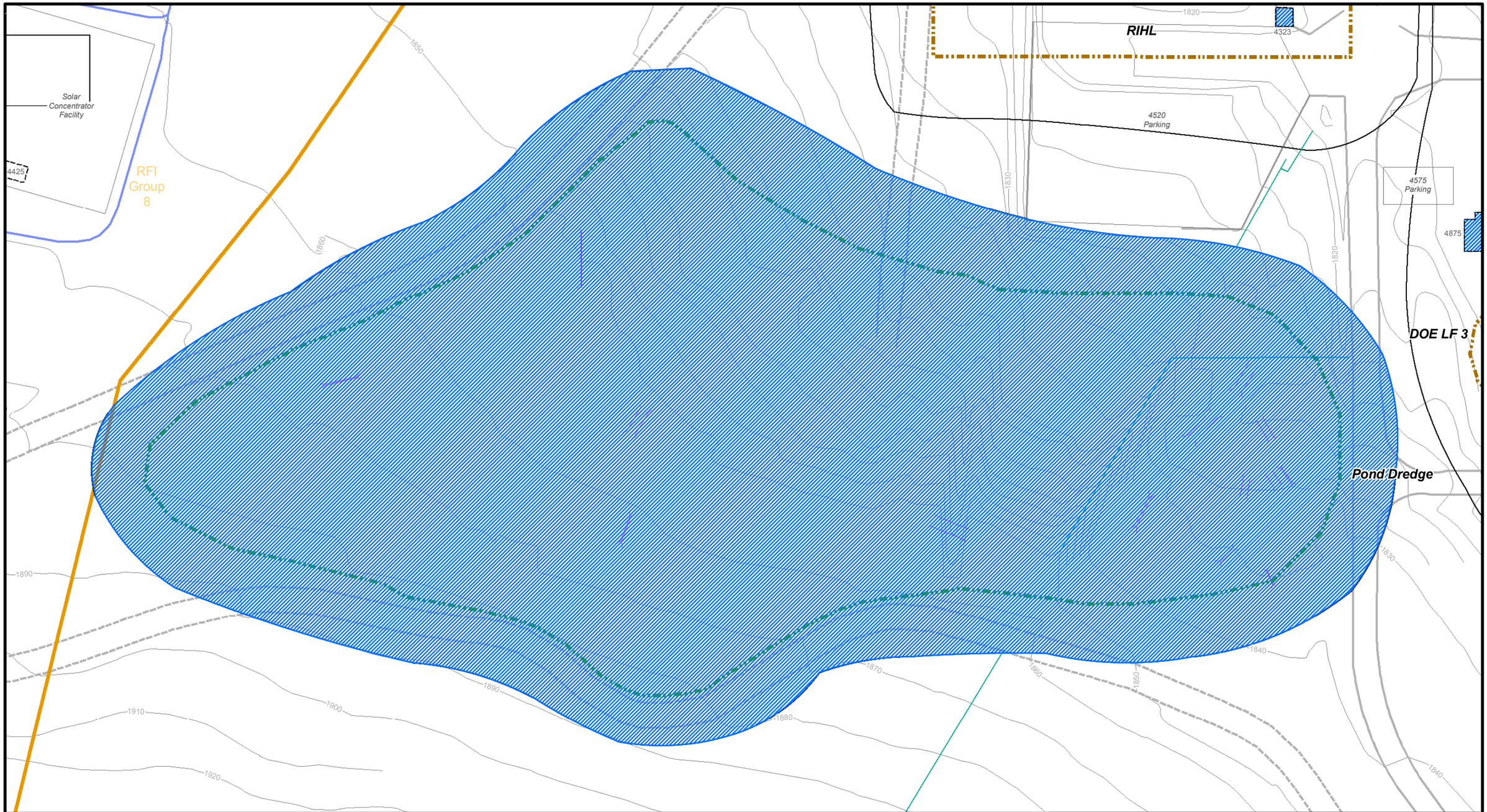
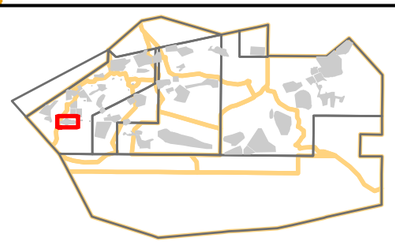


FIGURE H.2-3B
Surficial Cross Section Z-Z'
Pond Dredge
Santa Susana Field Laboratory
CH2MHILL

ES072007017SCO362070.FP.5A.05.BO CrossSect_ZZ.ai 9/08





Approximate Areas of Soil Disturbance

- Grading
- Excavation - Backfill

Basemap Legend

- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Leachfield
- Excavation
- Trench
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Surface Drainage Divide
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond
- Pipe

Soil Disturbance Area
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

November 06, 2008

CH2MHILL

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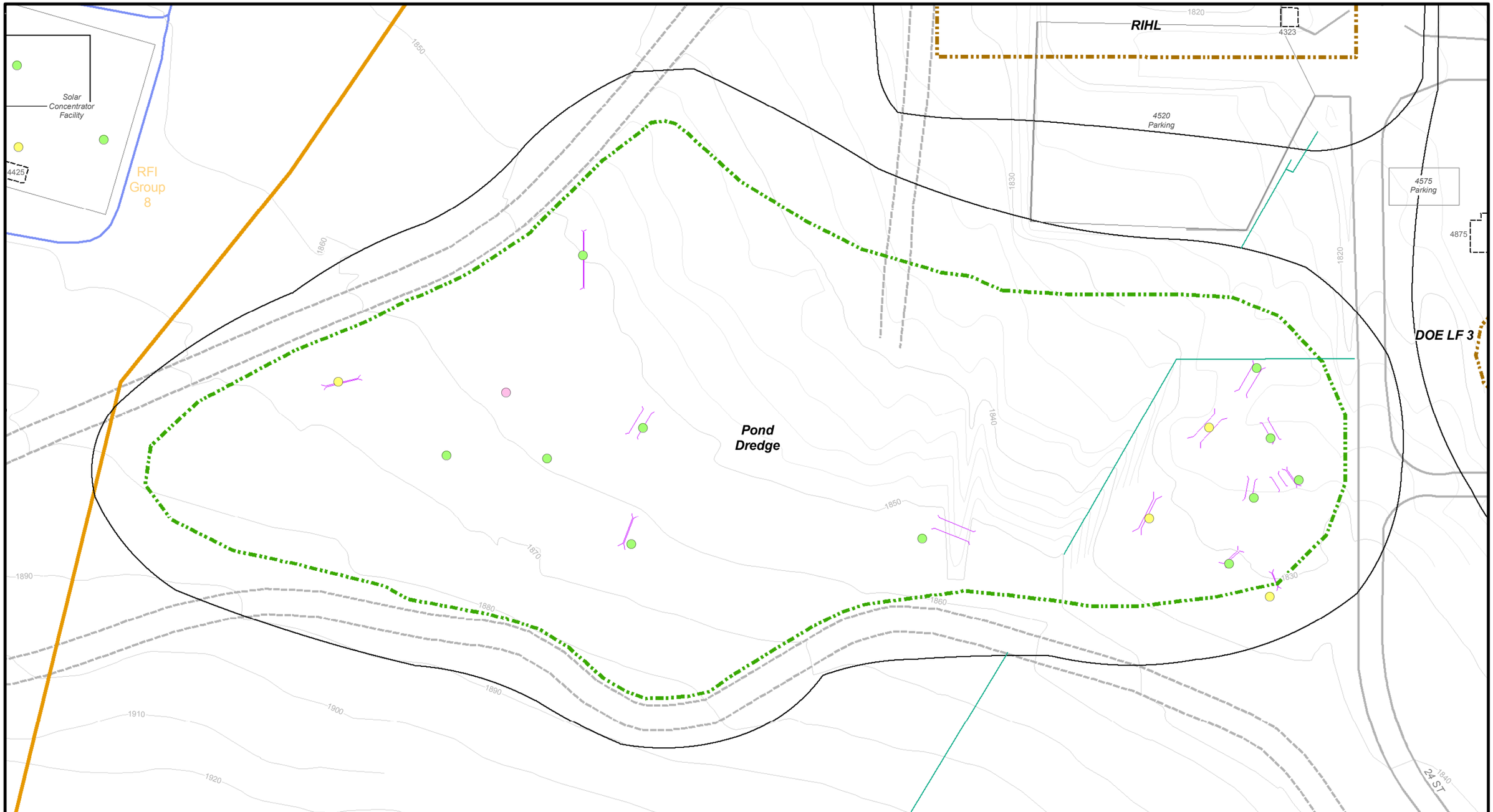
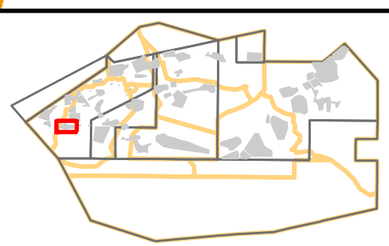
WORKING DRAFT

FIGURE H.2-4





VOCs in Soil

- Exceeds Residential RBSL + Eco RBSL
- Exceeds Residential RBSL
- Detect, Below All Screening Levels
- Non-detect

Basemap Legend

Transformer Poles	Building - Existing	RFI Site - Boeing	Drainage
Tank - UST	Building - Removed	RFI Site - DOE	Road - Asphalt
Tank - AST	Building - Not Yet Determined	RFI Site - NASA	Roads - Dirt
Tank - Not Yet Determined	Transformer - Existing	Investigation Boundary	Rocks
Excavation	Transformer - Removed	RFI Group Boundary	Streams
Leachfield	Transformer - Not Yet Determined	Administrative Area	Pond
Pipe		Property Boundary	

VOCs in Soil
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

October 30, 2008

CH2MHILL

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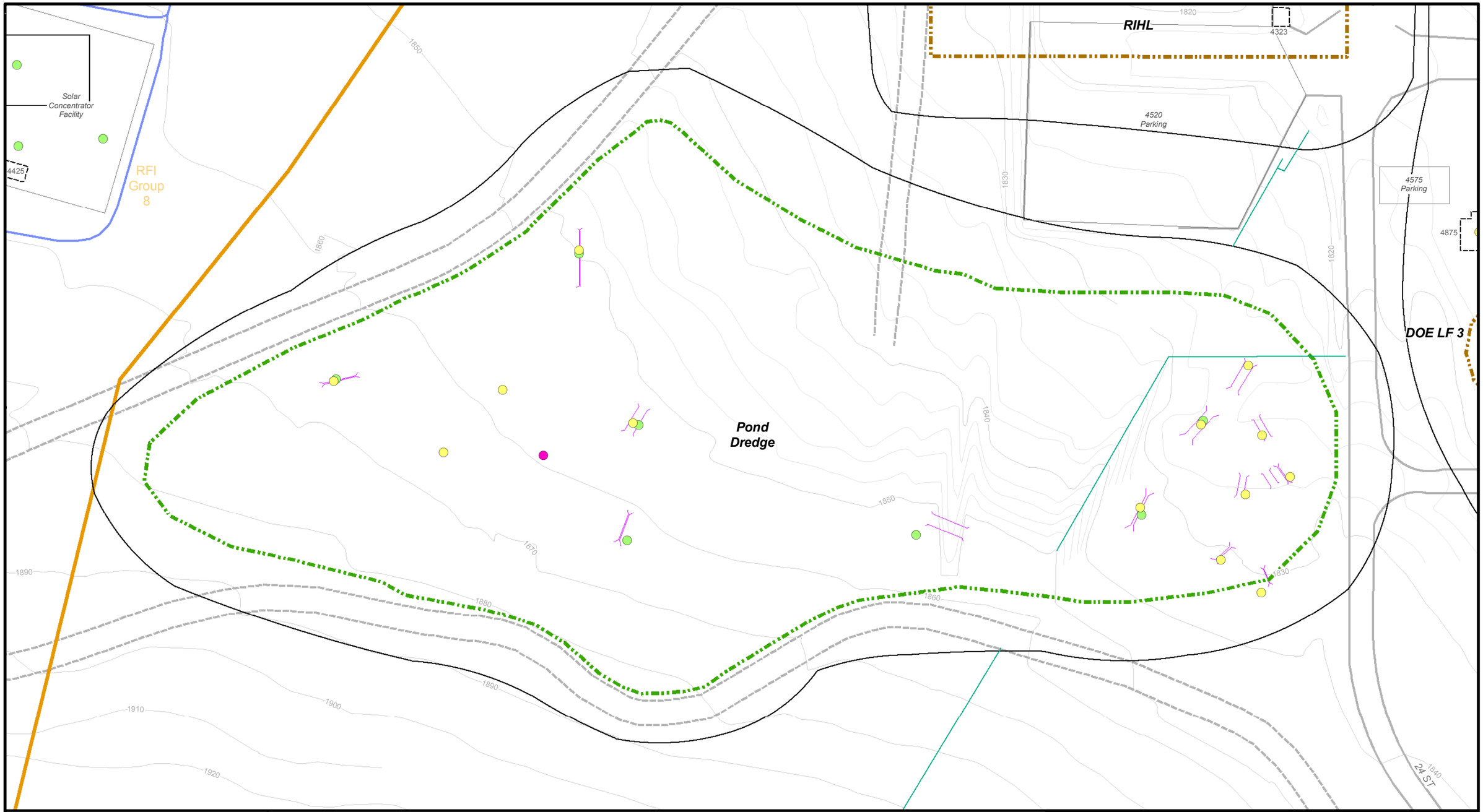
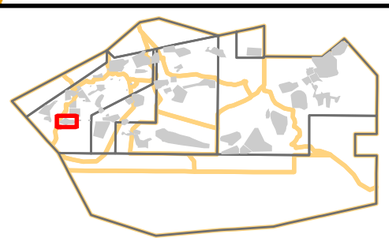
WORKING DRAFT

FIGURE H.3-1





SVOCs in Soil

- Exceeds Residential RBSL + Eco RBSL
- Exceeds Eco RBSL
- Exceeds Residential RBSL
- Detect, Below All Screening Levels
- Non-detect

Basemap Legend

Transformer Poles	Building - Existing	RFI Site - Boeing	Drainage
Tank - UST	Building - Removed	RFI Site - DOE	Road - Asphalt
Tank - AST	Building - Not Yet Determined	RFI Site - NASA	Roads - Dirt
Tank - Not Yet Determined	Transformer - Existing	RFI Site Buffer	Rocks
Excavation	Transformer - Removed	RFI Group Boundary	Streams
Leachfield	Transformer - Not Yet Determined	Administrative Area	Pond
Pipe		Property Boundary	

SVOCs in Soil
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

60 120 Feet

August 20, 2008

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\\...RFI_05\RFI_Report\CDot_BL_PLTS\RFIGrp5_CDotSVCsSoil_BL_PLTS.mxd

WORKING DRAFT

FIGURE H.3-2

Solar Concentrator Facility

4425

RFI Group 8

RIHL

4323

4520 Parking

4575 Parking

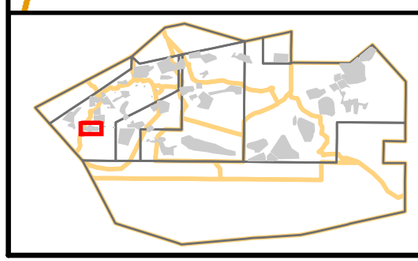
4875

DOE LF 3

Pond Dredge

24 ST

1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920



TPH in Soil

- Exceeds Residential RBSL
- Detect, Below Residential RBSL
- Non-detect

Basemap Legend

- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Excavation
- Leachfield
- Pipe
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- RFI Site Buffer
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Drainage
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond

TPH in Soil
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

August 20, 2008

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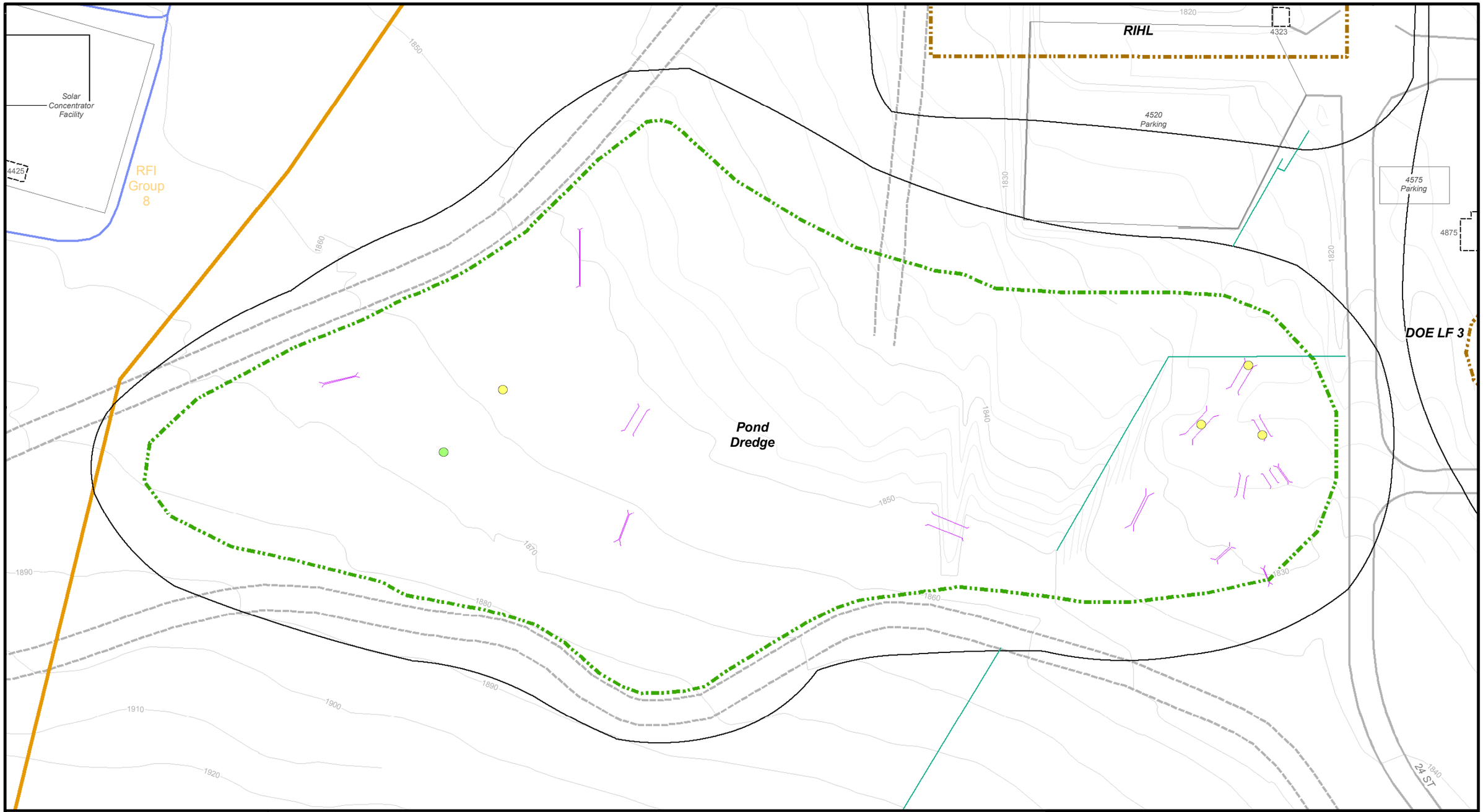
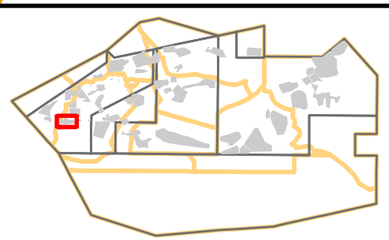
WORKING DRAFT

FIGURE H.3-3





PCBs in Soil

- Exceeds Residential RBSL + Eco RBSL
- Exceeds Eco RBSL
- Detect, Below All Screening Levels
- Non-detect

Basemap Legend

Transformer Poles	Building - Existing	RFI Site - Boeing	Drainage
Tank - UST	Building - Removed	RFI Site - DOE	Road - Asphalt
Tank - AST	Building - Not Yet Determined	RFI Site - NASA	Roads - Dirt
Tank - Not Yet Determined	Transformer - Existing	Investigation Boundary	Rocks
Excavation	Transformer - Removed	RFI Group Boundary	Streams
Leachfield	Transformer - Not Yet Determined	Administrative Area	Pond
Pipe		Property Boundary	

PCBs in Soil
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

September 11, 2008

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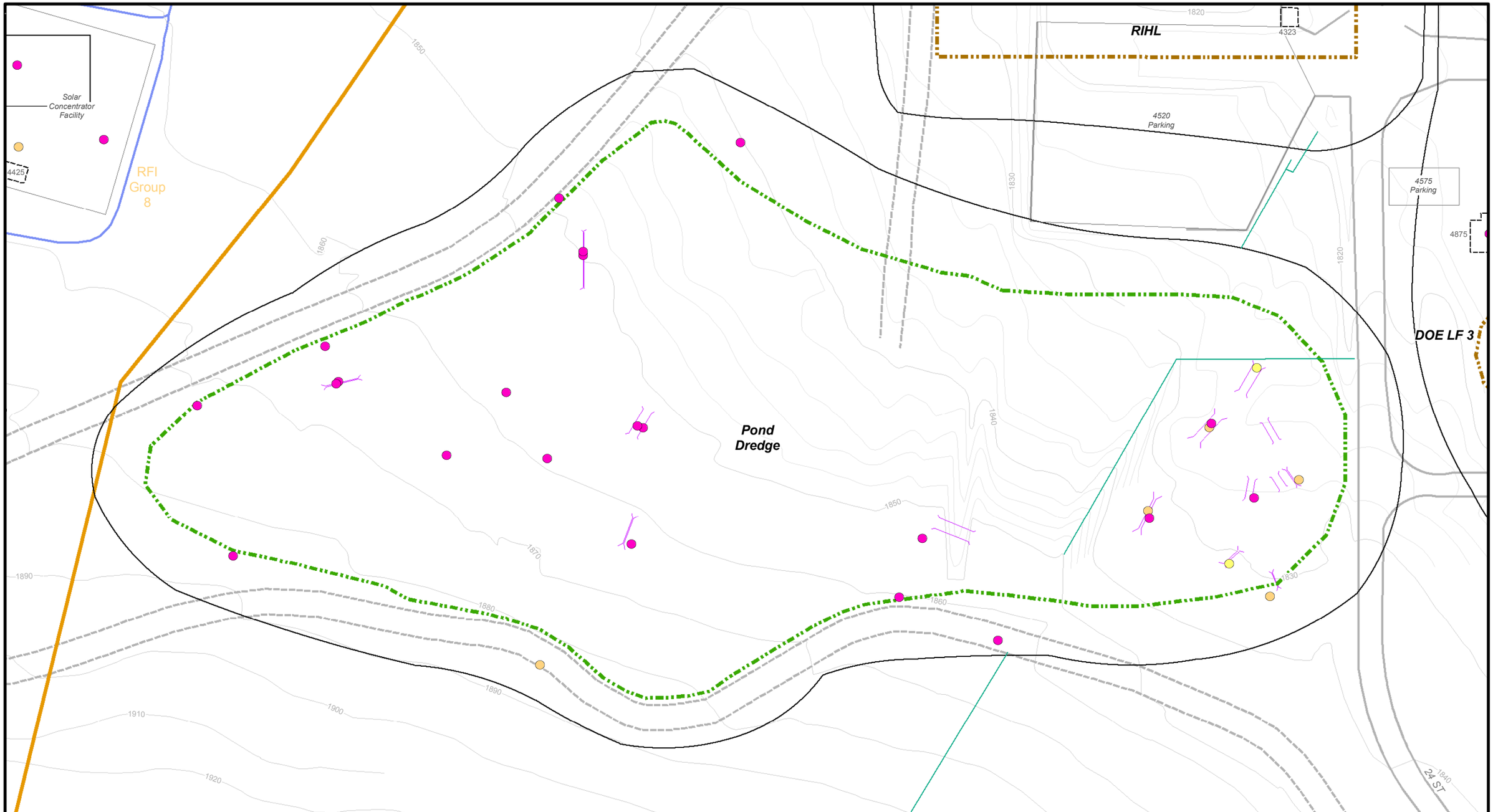
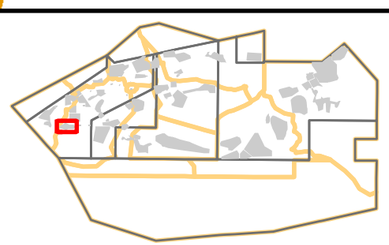
WORKING DRAFT

FIGURE H.3-4





Metals in Soil

- Exceeds Background + Residential RBSL + Eco RBSL
- Exceeds Background + Eco RBSL
- Exceeds Background
- Dectect, Below Background Concentration
- Non-detect

Basemap Legend

- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Excavation
- Leachfield
- Pipe
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Drainage
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond

Metals in Soil
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

September 11, 2008

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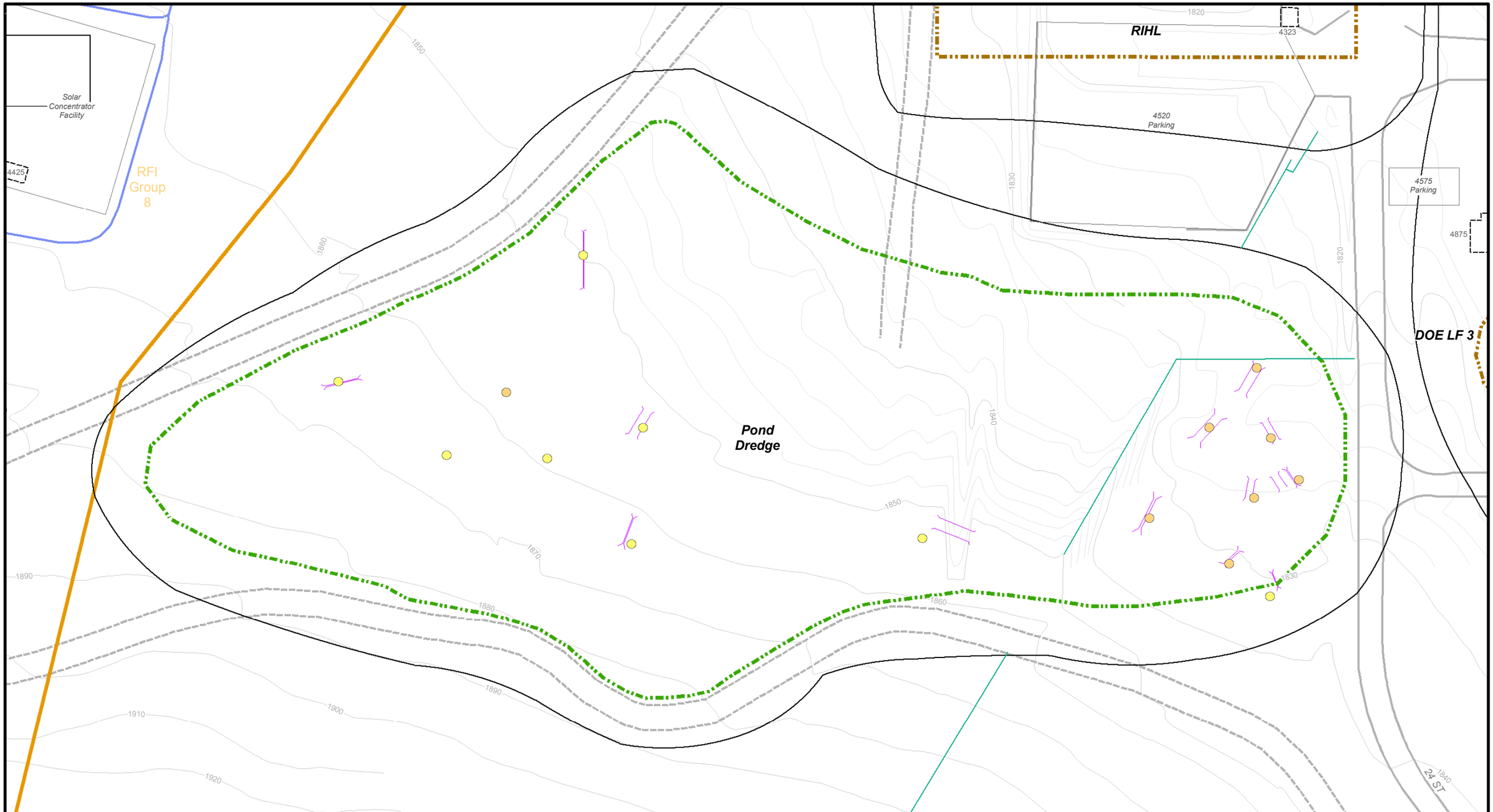
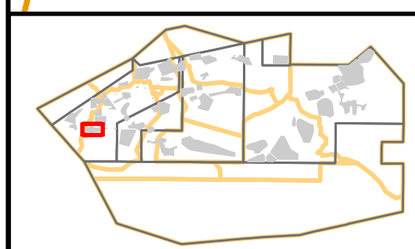
WORKING DRAFT

FIGURE H.3-5





Dioxins in Soil

- Exceeds Background + Residential RBSL + Eco RBSL
- Exceeds Background + Eco RBSL
- Exceeds Background + Residential RBSL
- Exceeds Background
- Detect, Below Background Concentration
- Non-detect

Basemap Legend

- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Excavation
- Leachfield
- Pipe
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Drainage
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond

Dioxins in Soil
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

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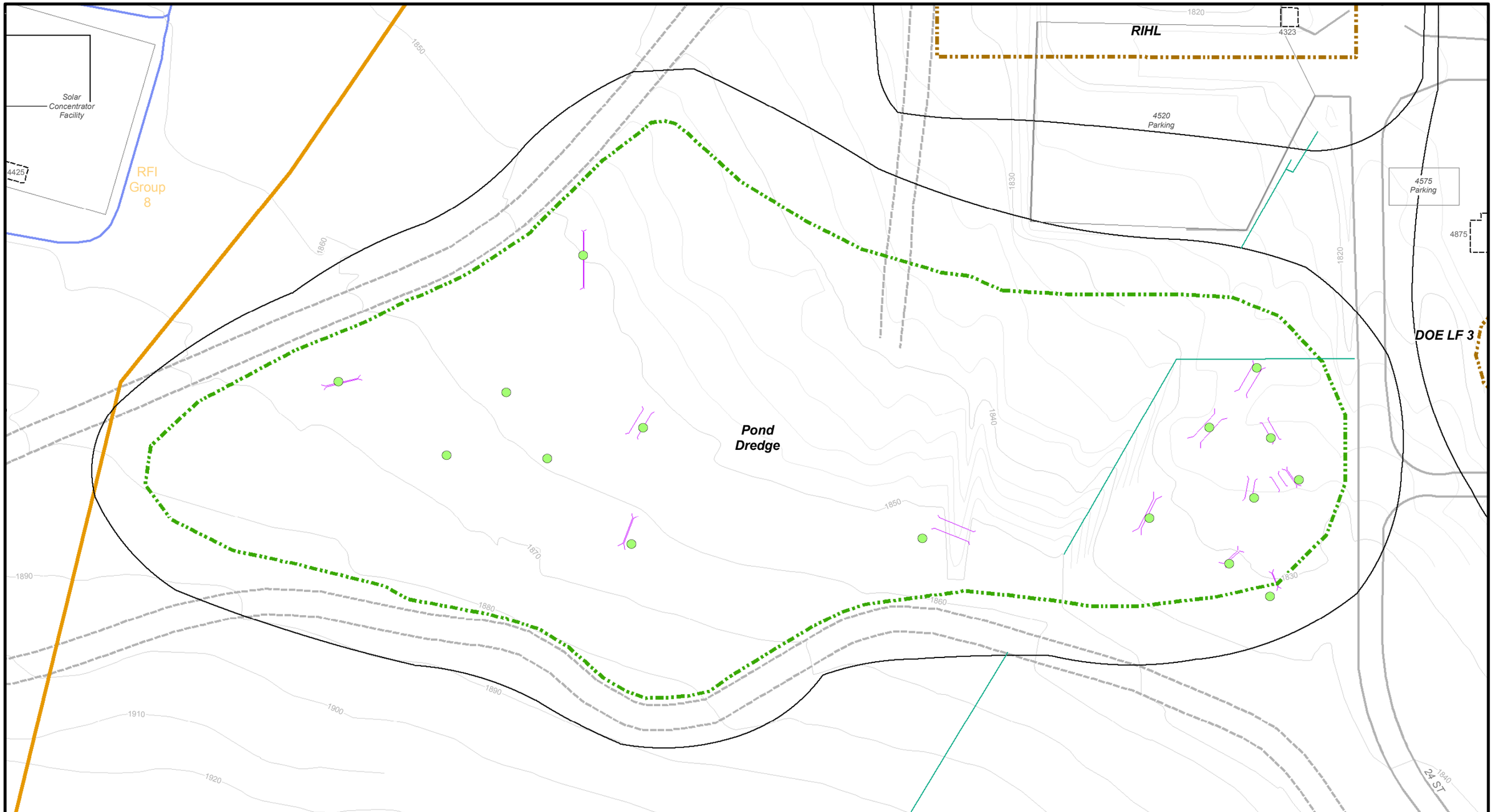
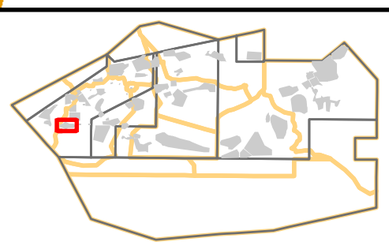
WORKING DRAFT

FIGURE H.3-6





Energetics in Soil

- Detect, Below All Screening Levels
- Non-detect

Basemap Legend

- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Excavation
- Leachfield
- Pipe
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Drainage
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond

Energetics in Soil
Pond Dredge RFI Site

SANTA SUSANA FIELD LABORATORY

1 inch equals 60 feet

0 60 120 Feet

September 11, 2008

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WORKING DRAFT

FIGURE H.3-7

Soil Sample Locations

- Soil Sample Location With Detected VOCs Data
- Soil Sample Location Not Analyzed for VOCs Data
- Soil Sample Location With No Detected VOCs Data

Data Box Information

Sample Location ID: B9BS01

1.00	Depth in Feet
Primary	Sample Type
B9BS01S01	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
NA and [-]	Analysis not conducted
[#]	If more than one result per sample depth, 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 (Metals + Dioxins Only)
12.05	<0.06	Exceeds Res RBSL or Exceeds Background + Res RBSL (Metals +Dioxins Only)
12.05	<0.06	Exceeds Eco RBSL or Exceeds Background + Eco RBSL (Metals + Dioxins Only)
12.05	<0.06	Exceeds Res RBSL + Eco RBSL or Exceeds Background + Res RBSL + Eco RBSL (Metals + Dioxins Only)

= 2008 Data

= Pre-2008 Data

Basemap Legend

- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Road - Asphalt
- Roads - Dirt
- Rocks
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Debris
- Multiple Use
- Solvent
- Petroleum
- Oil/PCBs
- Metals
- Energetic Constituents
- Propellants
- Leach Field
- Non-metal Inorganic Constituents
- Screening for Potential Impacts

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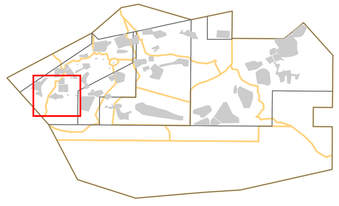
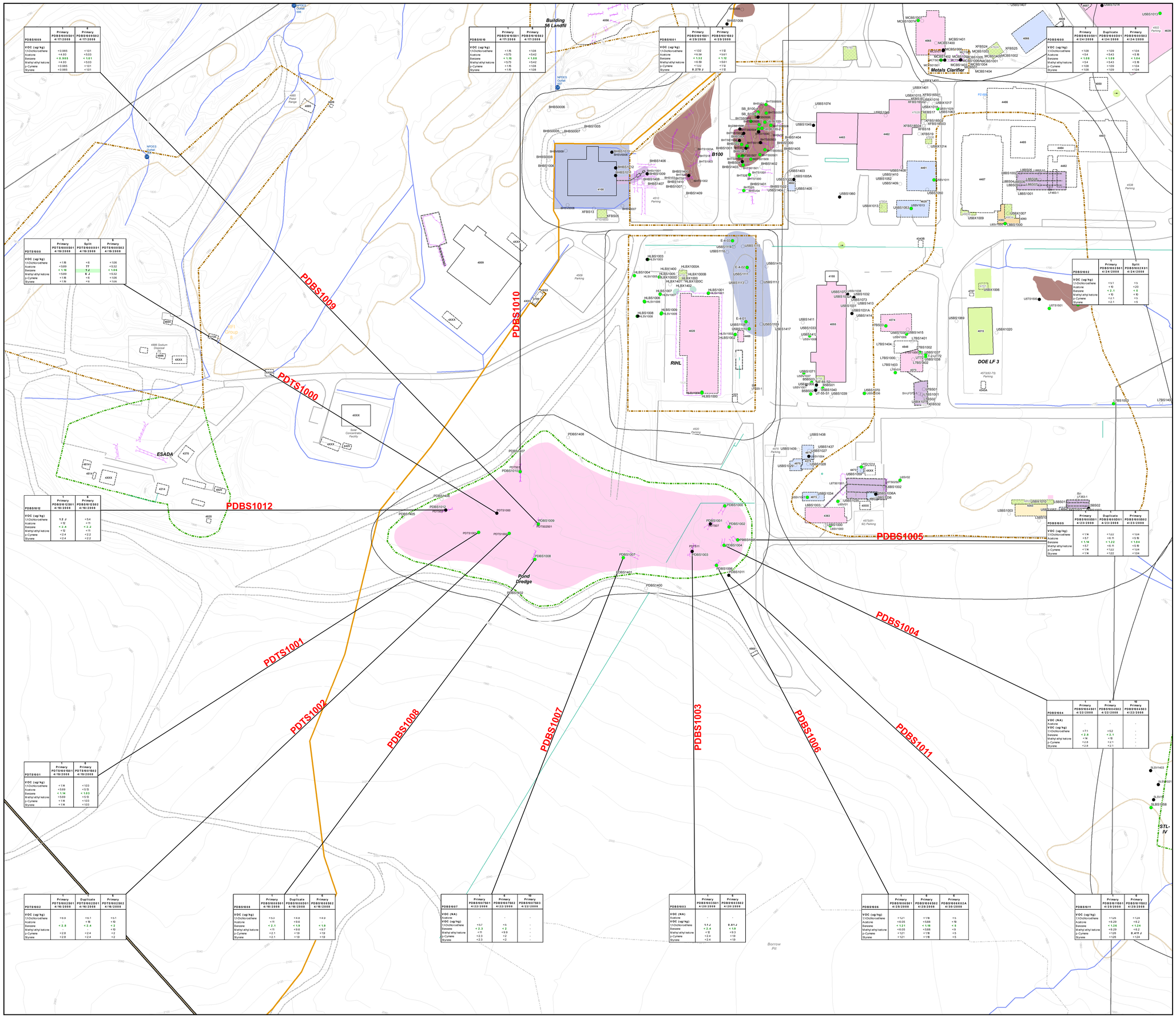
0 140

1 inch equals 70 feet

Feet





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SANTA SUSANA FIELD LABORATORY

VOCs Data Results
Pond Dredge RFI Site

FIGURE H.3-8

Soil Sample Locations

- Soil Sample Location With Detected SVOCs, TPH, and PCBs Data
- Soil Sample Location Not Analyzed for SVOCs, TPH, and PCBs Data
- Soil Sample Location With No Detected SVOCs, TPH, and PCBs Data

Data Box Information

Sample Location ID		
B9BS01	1.00	Depth in Feet
	Primary	Sample Type
	B9BS01S01	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
NA and [-]	Analysis not conducted
[#]	If more than one result per sample depth, 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 (Metals + Dioxins Only)
12.05	<0.06	Exceeds Res RBSL or Exceeds Background + Res RBSL (Metals +Dioxins Only)
12.05	<0.06	Exceeds Eco RBSL or Exceeds Background + Eco RBSL (Metals + Dioxins Only)
12.05	<0.06	Exceeds Res RBSL + Eco RBSL or Exceeds Background + Res RBSL + Eco RBSL (Metals + Dioxins Only)

= 2008 Data

= Pre-2008 Data

Basemap Legend

- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Road - Asphalt
- Roads - Dirt
- Rocks
- Debris
- Multiple Use
- Solvent
- Petroleum
- Oil/PCBs
- Metals
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Energetic Constituents
- Propellants
- Leach Field
- Non-metal Inorganic Constituents
- Screening for Potential Impacts

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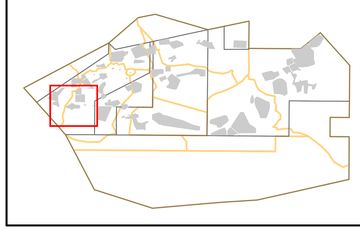
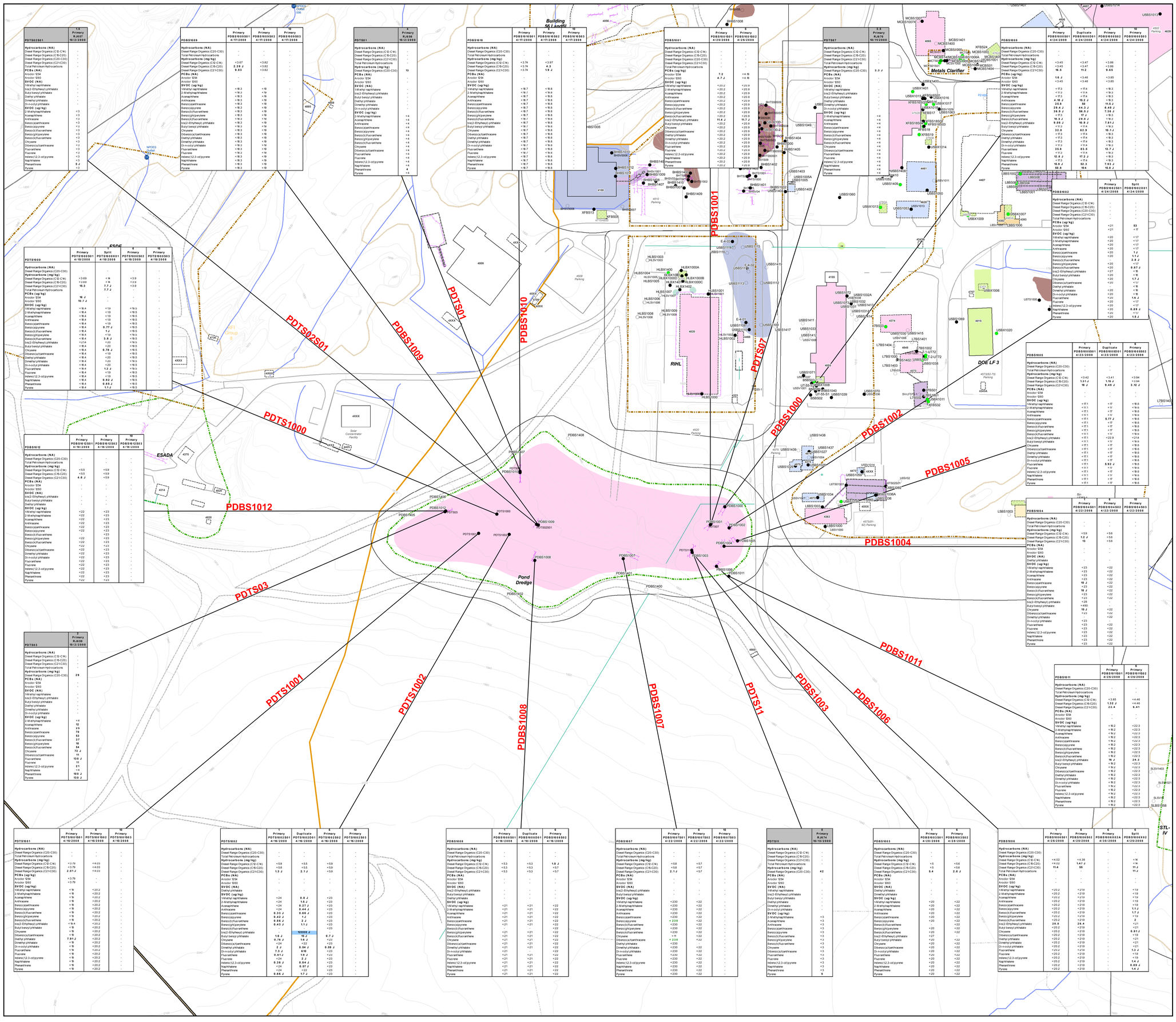
0 140

1 inch equals 70 feet

Feet





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SANTA SUSANA FIELD LABORATORY

SVOCs, TPH, and PCBs Data Results
Pond Dredge RFI Site

FIGURE H.3-9

Soil Sample Locations

- Soil Sample Location With Detected Metals and Inorganics Data
- Soil Sample Location Not Analyzed for Metals and Inorganics Data
- Soil Sample Location With No Detected Metals and Inorganics Data

Data Box Information

Sample Location ID: B9BS01 — 1.00 = Depth in Feet; Primary = Sample Type; B9BS01S01 = 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
- NA and [-] — Analysis not conducted
- [#] — If more than one result per sample depth, 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 (Metals + Dioxins Only)
12.05	<0.06	Exceeds Res RBSL or Exceeds Background + Res RBSL (Metals +Dioxins Only)
12.05	<0.06	Exceeds Eco RBSL or Exceeds Background + Eco RBSL (Metals + Dioxins Only)
12.05	<0.06	Exceeds Res RBSL + Eco RBSL or Exceeds Background + Res RBSL + Eco RBSL (Metals + Dioxins Only)

= 2008 Data

= Pre-2008 Data

Basemap Legend

- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Road - Asphalt
- Roads - Dirt
- Rocks
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Debris
- Multiple Use
- Solvent
- Petroleum
- Oil/PCBs
- Metals
- Energetic Constituents
- Propellants
- Leach Field
- Non-metal Inorganic Constituents
- Screening for Potential Impacts

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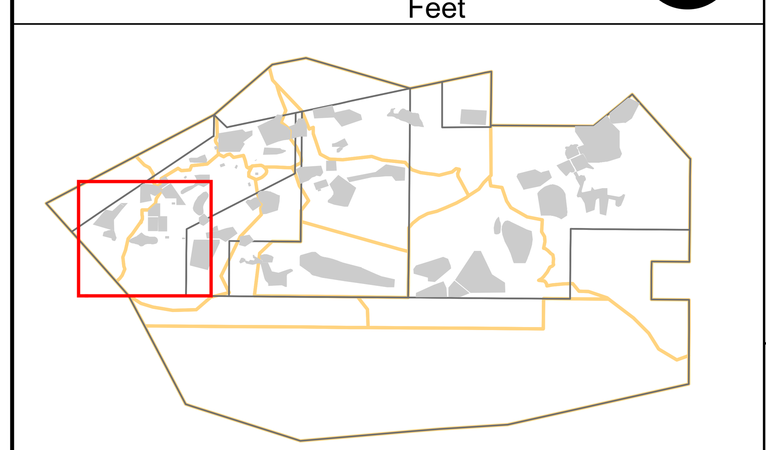
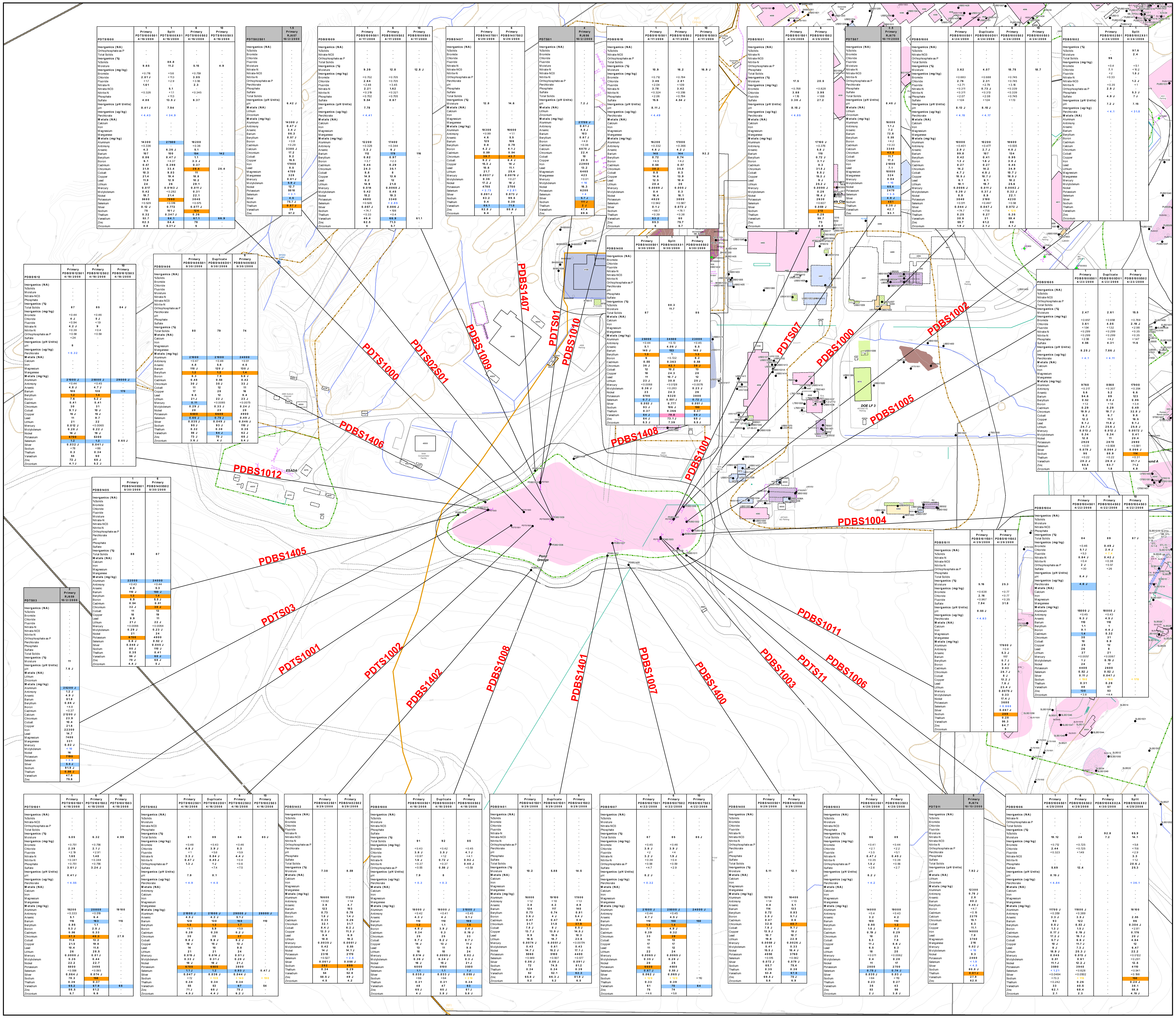
1 inch equals 100 feet — 0 — 200 Feet





PDTS1000	1 Primary PDTS1000S01 4/15/2008	1 Split PDTS1000X01 4/15/2008	6 Primary PDTS1000S02 4/15/2008	10 Primary PDTS1000S03 4/15/2008
Inorganics (NA)				
Orthophosphate as P	-	-	-	-
Total Solids	-	-	-	-
Inorganics (%)				
%Solids	-	88.8	-	-
Moisture	9.65	11.2	5.15	4.9
Inorganics (mg/kg)				
Bromide	<0.716	<5.6	<0.759	-
Chloride	2.01 J	<11.3	3.05	-
Fluoride	<1.7	<2.9	<3.56	-
Nitrate-N	1.61	-	2.3	-
Nitrate-NO3	-	5.1	-	-
Nitrite-N	<0.326	<1.1	<0.345	-
Phosphate	-	<11.3	-	-
Sulfate	4.88	13.5 J	6.37	-
Inorganics (pH Units)				
pH	8.41 J	7.94	-	-
Inorganics (ug/kg)				
Perchlorate	<4.43	<34.9	-	-
Metals (NA)				
Calcium	-	-	-	-
Iron	-	-	-	-
Magnesium	-	-	-	-
Manganese	-	-	-	-
Metals (mg/kg)				
Aluminum	14300	27500	18200	-
Antimony	<0.336	-	<0.36	-
Arsenic	4.3	6.36 J	5.1	-
Barium	107	100	154	142
Beryllium	0.86	0.47 J	1.1	-
Boron	6.1	<4.37	3.3 J	-
Cadmium	0.57	0.398	0.37	-
Chromium	31.9	33.4	39.4	26.4
Cobalt	10.3	9.03	11	-
Copper	21.4	19.4	18.8	-
Lead	11.9	12.9	10.2	-
Lithium	24	26	29.1	-
Mercury	0.017	0.0143 J	0.011 J	-
Molybdenum	0.42	<0.282	0.31	-
Nickel	19.7	21.4	22.1	-
Potassium	5680	7060	3840	-
Selenium	<0.529	<0.518	<0.575	-
Silver	0.12 J	0.772	0.077 J	-
Sodium	75	101 J	124	-
Thallium	0.32	0.347 J	0.36	-
Vanadium	53.7	64.1	67.1	66.9
Zinc	82.3	84.4	78	-
Zirconium	4.8	5.31 J	6	-

PDTS02S01	1.5 Primary RJ657 10/2/2000
Inorganics (NA)	
%Solids	-
Bromide	-
Chloride	-
Fluoride	-
Moisture	-
Nitrate-N	-
Nitrate-NO3	-
Nitrite-N	-
Orthophosphate as P	-
Perchlorate	-
Phosphate	-
Sulfate	-
Total Solids	-
Inorganics (pH Units)	
pH	6.42 J
Metals (NA)	
Lithium	-
Zirconium	-
Metals (mg/kg)	
Aluminum	14300 J
Antimony	0.47 J
Arsenic	3.4 J
Barium	86.3
Beryllium	0.57 J
Boron	<3.8
Cadmium	<0.29
Calcium	3380 J
Chromium	17.2
Cobalt	9.2
Copper	15.5
Iron	17900
Lead	8.5
Magnesium	4700
Manganese	328
Mercury	0.01 J
Molybdenum	5.9 J
Nickel	12.7
Potassium	5010
Selenium	<3.1
Silver	4.5
Sodium	75.7 J
Thallium	0.87 J
Vanadium	36
Zinc	57.2

PDBS1009	1 Primary PDBS1009S01 4/17/2008	6 Primary PDBS1009S02 4/17/2008	10 Primary PDBS1009S03 4/17/2008
Inorganics (NA)			
%Solids	-	-	-
Nitrate-NO3	-	-	-
Orthophosphate as P	-	-	-
Total Solids	-	-	-
Inorganics (%)			
Moisture	9.39	12.8	12.8 J
Inorganics (mg/kg)			
Bromide	<0.702	<0.705	-
Chloride	2.64	<0.705	-
Fluoride	<2.48	<3.45	-
Nitrate-N	2.21	1.62	-
Nitrite-N	<0.319	<0.321	-
Phosphate	<0.702	<0.705	-
Sulfate	9.54	8.67	-
Inorganics (pH Units)			
pH	7.78	-	-
Inorganics (ug/kg)			
Perchlorate	<4.41	-	-
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	12200	17400	-
Antimony	<0.326	<0.344	-
Arsenic	3.3 J	6 J	-
Barium	112	179	116
Beryllium	0.62	0.97	-
Boron	<3.7	<2.3	-
Cadmium	0.44	0.29	-
Chromium	24.3	35.1	-
Cobalt	8.8	8	-
Copper	14.8	13.6	-
Lead	8.2	12	-
Lithium	14.9	21.8	-
Mercury	0.014	0.0068 J	-
Molybdenum	0.42	0.45	-
Nickel	15.2	19.3	-
Potassium	4680	3340	-
Selenium	<0.526	<2.85	-
Silver	0.057 J	0.086 J	-
Sodium	<74.7	<108	-
Thallium	<0.33	<0.4	-
Vanadium	46.4	66.9	61.1
Zinc	62.5	71.3	-
Zirconium	4	5.7	-

PDBS1407	1 Primary PDBS1407S01 5/29/2008	6 Primary PDBS1407S02 5/29/2008
Inorganics (NA)		
%Solids	-	-
Bromide	-	-
Chloride	-	-
Fluoride	-	-
Nitrate-N	-	-
Nitrate-NO3	-	-
Nitrite-N	-	-
Orthophosphate as P	-	-
Perchlorate	-	-
pH	-	-
Phosphate	-	-
Sulfate	-	-
Total Solids	-	-
Inorganics (%)		
Moisture	12.8	14.6
Metals (NA)		
Calcium	-	-
Iron	-	-
Magnesium	-	-
Manganese	-	-
Metals (mg/kg)		
Aluminum	18300	16600
Antimony	<0.99	<1.1
Arsenic	4.6	5.5
Barium	125	106
Beryllium	0.8	0.79
Boron	4.2 J	4.1 J
Cadmium	0.59	0.54
Chromium	39.7	43.7
Cobalt	9.2 J	8.4 J
Copper	15.3 J	14 J
Lead	10.6	11.1
Lithium	21.7	25.4
Mercury	0.0037 J	0.0076 J
Molybdenum	0.36	<0.27
Nickel	17.2 J	18 J
Potassium	4780	2700
Selenium	<2.73	<2.81
Silver	0.081 J	0.073 J
Sodium	83.2	99.5
Thallium	0.4	0.38
Vanadium	65.1	71.8
Zinc	82.8 J	80.6 J
Zirconium	6.4	7

PDTS01	4 Primary RJ656 10/2/2000
Inorganics (NA)	
%Solids	-
Bromide	-
Chloride	-
Fluoride	-
Moisture	-
Nitrate-N	-
Nitrate-NO3	-
Nitrite-N	-
Orthophosphate as P	-
Phosphate	-
Sulfate	-
Total Solids	-
Inorganics (pH Units)	
pH	7.2 J
Metals (NA)	
Lithium	-
Zirconium	-
Metals (mg/kg)	
Aluminum	21700 J
Antimony	0.81 J
Arsenic	4.5 J
Barium	103
Beryllium	0.67 J
Boron	<4.9
Cadmium	<0.38
Calcium	6870 J
Chromium	22.4
Cobalt	10
Copper	20.5
Iron	22900
Lead	13.2
Magnesium	6460
Manganese	423
Mercury	<0.01
Molybdenum	<10
Nickel	16.3
Potassium	6200
Selenium	<4
Silver	5.7 J
Sodium	111 J
Thallium	2 J
Vanadium	47.4
Zinc	69.6

PDBS1010	1 Primary PDBS1010S01 4/17/2008	6 Primary PDBS1010S02 4/17/2008	10 Primary PDBS1010S03 4/17/2008
Inorganics (NA)			
%Solids	-	-	-
Nitrate-NO3	-	-	-
Orthophosphate as P	-	-	-
Total Solids	-	-	-
Inorganics (%)			
Moisture	10.9	16.2	16.9 J
Inorganics (mg/kg)			
Bromide	<0.712	<0.784	-
Chloride	3.46	2.81	-
Fluoride	<2.04	<1.09	-
Nitrate-N	3.78	3.42	-
Nitrite-N	<0.324	<0.356	-
Phosphate	<2.06	<0.784	-
Sulfate	15.6	4.54 J	-
Inorganics (pH Units)			
pH	8.11 J	-	-
Inorganics (ug/kg)			
Perchlorate	<4.49	-	-
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	16200	17000	-
Antimony	<0.332	<0.366	-
Arsenic	4.6 J	4.2 J	-
Barium	148	144	92.2
Beryllium	0.72	0.74	-
Boron	<4.5	<4.2	-
Cadmium	0.58	0.57	-
Chromium	38.2	35.8	-
Cobalt	8.5	8.3	-
Copper	14.6	13.9	-
Lead	12.5	10.4	-
Lithium	20.4	20	-
Mercury	0.0089 J	0.005 J	-
Molybdenum	0.4	0.3	-
Nickel	16.4	16.1	-
Potassium	4820	3800	-
Selenium	<0.542	<0.587	-
Silver	0.1 J	0.073 J	-
Sodium	<88.7	<78.1	-
Thallium	<0.39	<0.38	-
Vanadium	63.2	60	-
Zinc	85.3	75.7	-
Zirconium	6	5.7	-

PDBS1001	1 Primary PDBS1001S01 4/25/2008	6 Primary PDBS1001S02 4/25/2008
Inorganics (NA)		
%Solids	-	-
Nitrate-N	-	-
Nitrate-NO3	-	-
Nitrite-N	-	-
Orthophosphate as P	-	-
Phosphate	-	-
Total Solids	-	-
Inorganics (%)		
Moisture	17.5	20.5
Inorganics (mg/kg)		
Bromide	<0.768	<0.828
Chloride	3.68	3.98
Fluoride	<1.16	<1.68
Sulfate	3.38 J	27.2
Inorganics (pH Units)		
pH	8.15 J	-
Inorganics (ug/kg)		
Perchlorate	<4.85	-
Metals (NA)		
Calcium	-	-
Iron	-	-
Magnesium	-	-
Manganese	-	-
Metals (mg/kg)		
Aluminum	-	17100 J
Antimony	-	<0.376
Arsenic	-	5.8 J
Barium	-	110
Beryllium	-	0.72 J
Boron	-	3.1 J
Cadmium	-	0.3
Chromium	-	31.5 J
Cobalt	-	9.5 J
Copper	-	15.2 J
Lead	-	9 J
Lithium	-	25.2 J
Mercury	-	0.0098 J
Molybdenum	-	0.26
Nickel	-	19.4 J
Potassium	-	2630
Selenium	-	<0.607
Silver	-	0.059 J
Sodium	-	213
Thallium	-	0.28
Vanadium	-	59.7
Zinc	-	73
Zirconium	-	4.8

PDTS07	3.5 Primary RJ670 10/11/2000
Inorganics (NA)	
%Solids	-
Bromide	-
Chloride	-
Fluoride	-
Moisture	-
Nitrate-N	-
Nitrate-NO3	-
Nitrite-N	-
Orthophosphate as P	-
Perchlorate	-
Phosphate	-
Sulfate	-
Total Solids	-
Inorganics (pH Units)	
pH	8.48 J
Metals (NA)	
Lithium	-
Zirconium	-
Metals (mg/kg)	
Aluminum	16000
Antimony	1.1 J
Arsenic	7.2
Barium	72.8
Beryllium	0.55
Boron	<4.2
Cadmium	<0.33
Calcium	3340
Chromium	43.5
Cobalt	11.7
Copper	17.3
Iron	21800
Lead	7.1
Magnesium	10800
Manganese	324
Mercury	0.04
Molybdenum	<10
Nickel	65.4
Potassium	2470
Selenium	<3.5
Silver	4.9 J
Sodium	481
Thallium	0.38 J
Vanadium	42.7
Zinc	63.1

PDBS1000	1 Primary PDBS1000S01 4/24/2008	1 Duplicate PDBS1000D01 4/24/2008	6 Primary PDBS1000S02 4/24/2008	10 Primary PDBS1000S03 4/24/2008
Inorganics (NA)				
%Solids	-	-	-	-
Nitrate-NO3	-	-	-	-
Orthophosphate as P	-	-	-	-
Total Solids	-	-	-	-
Inorganics (%)				
Moisture	3.62	4.07	18.75	18.7
Inorganics (mg/kg)				
Bromide	<0.683	<0.688	<0.745	-
Chloride	2.76	2.31	<0.745	-
Fluoride	<2.71	<2.79	<3.16	-
Nitrate-N	<0.311	0.73 J	<0.339	-
Nitrite-N	<0.311	<0.313	<0.339	-
Phosphate	<2.07	<2.08	<0.745	-
Sulfate	<1.04	<1.04	<1.13	-
Inorganics (pH Units)				
pH	8.13 J	8.15 J	-	-
Inorganics (ug/kg)				
Perchlorate	<4.15	<4.17	-	-
Metals (NA)				
Calcium	-	-	-	-
Iron	-	-	-	-
Magnesium	-	-	-	-
Manganese	-	-	-	-
Metals (mg/kg)				
Aluminum	10000	10200	18600	-
Antimony	<0.401	<0.477	<0.535	-
Arsenic	2.9 J	2.7 J	4.8 J	-
Barium	99.8	107	134	-
Beryllium	0.42	0.41	0.95	-
Boron	1.3 J	1.6 J	3.8 J	-
Cadmium	0.27	0.27	0.45	-
Chromium	14.2	14.2	34.9	-
Cobalt	4.7 J	4.8 J	10.7 J	-
Copper	10.5 J	10.7 J	18.5 J	-
Lead	6.1	6.1	10.2	-
Lithium	18.1	19.7	25.6	-
Mercury	0.0086 J	0.011 J	0.0082 J	-
Molybdenum	0.39 J	0.37 J	0.32 J	-
Nickel	8.8	8.9	22.1	-
Potassium	3040	3180	4230	-
Selenium	<0.511	<0.497	<0.58	-
Silver	0.044 J	0.047 J	0.072 J	-
Sodium	<74.7	<71.6	<126	-
Thallium	0.25	0.27	0.35	-
Vanadium	30.6	31	59.4	-
Zinc	55.7	61.2	80	-
Zirconium	1.9 J	2.1 J	4.1 J	-

PDBS1002	1 Primary PDBS1002S01 4/24/2008	1 Split PDBS1002X01 4/24/2008
Inorganics (%)		
%Solids	-	97.6
Moisture	-	2.4
Total Solids	96	-
Inorganics (mg/kg)		
Bromide	<0.4	<5.1
Chloride	7.1	<10.2
Fluoride	<2	1.5 J
Nitrate-N	<0.33	-
Nitrate-NO3	-	1.2 J
Nitrite-N	<0.35	<1
Orthophosphate as P	2.9 J	-
Phosphate	-	5.3 J
Sulfate	4.9 J	7 J
Inorganics (pH Units)		
pH	7.2 J	7.15
Inorganics (ug/kg)		
Perchlorate	<4.1	<31.8
Metals (NA)		
Aluminum	-	-
Antimony	-	-
Arsenic	-	-
Barium	-	-
Beryllium	-	-
Boron	-	-
Cadmium	-	-
Calcium	-	-
Chromium	-	-
Cobalt	-	-
Copper	-	-
Iron	-	-
Lead	-	-
Lithium	-	-
Magnesium	-	-
Manganese	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	-	-
Potassium	-	-
Selenium	-	-
Silver	-	-
Sodium	-	-
Thallium	-	-
Vanadium	-	-
Zinc	-	-
Zirconium	-	-

PDBS1012	1 Primary PDBS1012S01 4/18/2008	6 Primary PDBS1012S02 4/18/2008	10 Primary PDBS1012S03 4/18/2008
Inorganics (NA)			
%Solids	-	-	-
Moisture	-	-	-
Nitrate-NO3	-	-	-
Phosphate	-	-	-
Inorganics (%)			
Total Solids	87	85	84 J
Inorganics (mg/kg)			
Bromide	<0.44	<0.46	-
Chloride	4 J	5 J	-
Fluoride	<0.94	<1.9	-
Nitrate-N	4.2 J	9	-
Nitrite-N	<0.39	<0.4	-
Orthophosphate as P	<0.58	<0.59	-
Sulfate	<24	-	-
Inorganics (pH Units)			
pH	8	-	-
Inorganics (ug/kg)			
Perchlorate	<0.32	-	-
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	21000 J	25000 J	29000 J
Antimony	<0.44	<0.45	-
Arsenic	4.8 J	4.7 J	-
Barium	100	130	170
Beryllium	1.2	1.4	-
Boron	7.6	5.2 J	-
Cadmium	0.41	0.41	-
Chromium	30	31	-
Cobalt	9.1 J	10 J	-
Copper	15 J	15 J	-
Lead	11	9.7	-
Lithium	21	22	-
Mercury	0.012 J	<0.0065	-
Molybdenum	0.28 J	0.22 J	-
Nickel	18 J	19 J	-
Potassium	6700	5300	-
Selenium	1.2	1.2	0.65 J
Silver	0.032 J	0.041 J	-
Sodium	<78	<86	-
Thallium	0.3	0.34	-
Vanadium	55	60	-
Zinc	72 J	68 J	-
Zirconium	4.1 J	5.2 J	-

PDBS1406	1 Primary PDBS1406S01 5/30/2008	1 Duplicate PDBS1406D01 5/30/2008	6 Primary PDBS1406S02 5/30/2008
Inorganics (NA)			
%Solids	-	-	-
Bromide	-	-	-
Chloride	-	-	-
Fluoride	-	-	-
Moisture	-	-	-
Nitrate-N	-	-	-
Nitrate-NO3	-	-	-
Nitrite-N	-	-	-
Orthophosphate as P	-	-	-
Perchlorate	-	-	-
pH	-	-	-
Phosphate	-	-	-
Sulfate	-	-	-
Inorganics (%)			
Total Solids	80	79	74
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	21000	21000	24000
Antimony	<0.47	<0.48	<0.51
Arsenic	4.8	5.6	4.5
Barium	110 J	120 J	130 J
Beryllium	1.2	1.2	1.4
Boron	8.3	7.9	5.6 J
Cadmium	0.48	0.58	0.42
Chromium	30 J	35 J	33 J
Cobalt	11	12	11
Copper	17	20	16
Lead	9.5	12	9.4
Lithium	21 J	22 J	23 J
Mercury	0.11	<0.0085	<0.0075
Molybdenum	0.29 J	0.33 J	0.24 J
Nickel	20	23	20
Potassium	6500	6600	4900
Selenium	0.66 J	0.75 J	0.49 J
Silver	0.035 J	0.049 J	0.046 J
Sodium	95 J	93 J	110 J
Thallium	0.32	0.38	0.35
Vanadium	56 J	64 J	62 J
Zinc	73 J	70 J	68 J
Zirconium	3.6 J	4 J	5.4 J

PDBS1408	1 Primary PDBS1408S01 5/30/2008	1 Split PDBS1408X01 5/30/2008	6 Primary PDBS1408S02 5/30/2008
Inorganics (NA)			
Bromide	-	-	-
Chloride	-	-	-
Fluoride	-	-	-
Nitrate-N	-	-	-
Nitrate-NO3	-	-	-
Nitrite-N	-	-	-
Orthophosphate as P	-	-	-
Perchlorate	-	-	-
pH	-	-	-
Phosphate	-	-	-
Sulfate	-	-	-
Inorganics (%)			
%Solids	-	88.3	-
Moisture	-	11.7	-
Total Solids	87	-	85
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	25000	34500	23000
Antimony	<0.44	<0.13	<0.45
Arsenic	5.1	4.06 J	6.5
Barium	140 J	153	140 J
Beryllium	1.3	1	1.3
Boron	6	<0.722	6.2
Cadmium	0.55	0.363	0.58
Chromium	36 J	42.1	39 J
Cobalt	12	10.2	13
Copper	18	24.3	20
Lead	11	10.7 J	12
Lithium	23 J	30.8	25 J
Mercury	<0.0068	<0.0128	<0.0076
Molybdenum	0.36 J	<0.283	0.23 J
Nickel	23	24.3	26
Potassium	5700	6320	3800
Selenium	0.7 J	0.551 J	0.72 J
Silver	0.053 J	0.777	0.051 J
Sodium	93 J	106 J	150
Thallium	0.37	0.366	0.37
Vanadium	64 J	79.8	69 J
Zinc	64 J	73.1 J	68 J
Zirconium	5.3 J	7.39	5.5 J

PDBS1005	1 Primary PDBS1005S01 4/23/2008	1 Duplicate PDBS1005D01 4/23/2008	6 Primary PDBS1005S02 4/23/2008
Inorganics (NA)			
%Solids	-	-	-
Nitrate-NO3	-	-	-
Orthophosphate as P	-	-	-
Total Solids	-	-	-
Inorganics (%)			
Moisture	2.47	2.61	15.5
Inorganics (mg/kg)			
Bromide	<0.657	<0.658	<0.769
Chloride	3.61	4.05	2.19 J
Fluoride	<1.54	<1.32	<2.98
Nitrate-N	<0.299	<0.299	<0.35
Nitrite-N	<0.299	<0.299	<0.35
Phosphate	<2.56	<4.2	<1.47
Sulfate	4.56	4.31	11.6
Inorganics (pH Units)			
pH	8.25 J	7.86 J	-
Inorganics (ug/kg)			
Perchlorate	<4.1	<4.11	-
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	9760	8560	17900
Antimony	<0.317	<0.307	<0.354
Arsenic	5.6	5.2	6.6
Barium	94.6	89	123
Beryllium	0.52	0.5 J	0.96
Boron	<1.3	<1.8	<3.4
Cadmium	0.29	0.29	0.49
Chromium	19.9 J	19.7 J	32.8 J
Cobalt	6.2	6.7	9.8
Copper	12.2	11.3	16.5
Lead	9.1 J	11.8 J	9.1 J
Lithium	24.7 J	25.6 J	25.8 J
Mercury	0.013 J	0.012 J	0.0072 J
Molybdenum	0.34	0.34	0.41
Nickel	12.8	11	20.4
Potassium	2920	2870	2690
Selenium	<0.51	<0.508	<0.581
Silver	0.079 J	0.064 J	0.066 J
Sodium	90	88.9	114
Thallium	<0.22	<0.22	<0.31
Vanadium	28.2 J	26.8 J	51.7 J
Zinc	65.8	63.7	71.2
Zirconium	1.9	1.8	4.9

PDBS1004	1 Primary PDBS1004S01 4/22/2008	6 Primary PDBS1004S02 4/22/2008	10 Primary PDBS1004S03 4/22/2008
Inorganics (NA)			
%Solids	-	-	-
Moisture	-	-	-
Nitrate-NO3	-	-	-
Phosphate	-	-	-
Inorganics (%)			
Total Solids	84	89	87 J
Inorganics (mg/kg)			
Bromide	<0.46	0.49 J	-
Chloride	5.1 J	2.4 J	-
Fluoride	<5.3	<7.4	-
Nitrate-N	0.64 J	0.42 J	-
Nitrite-N	<0.4	<0.38	-
Orthophosphate as P	2 J	<0.57	-
Sulfate	<30	<26	-
Inorganics (pH Units)			
pH	8.4 J	-	-
Inorganics (ug/kg)			
Perchlorate	4.6 J	-	-
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	15000 J	18000 J	-
Antimony	<0.45	<0.43	-
Arsenic	6.3 J	4.5 J	-
Barium	110	110	-
Beryllium	1.1	1	-
Boron	9.1	4.4 J	-
Cadmium	1.4	0.32	-
Chromium	30	31	-
Cobalt	10	8.9	-
Copper	25	12	-
Lead	26	8	-
Lithium	27	21	-
Mercury	<0.0057	<0.0067	-
Molybdenum	1 J	0.19 J	-
Nickel	24	17	-
Potassium	4400	2600	-
Selenium	0.52 J	0.52 J	-
Silver	0.11 J	0.047 J	-
Sodium	<190	<160	<170
Thallium	0.31	0.28	-
Vanadium	48	57	-
Zinc	130	53	-
Zirconium	<3.8	<4.4	-

PDBS1011	1 Primary PDBS1011S01 4/25/2008	6 Primary PDBS1011S02 4/25/2008
Inorganics (NA)		
%Solids	-	-
Nitrate-N	-	-
Nitrate-NO3	-	-
Nitrite-N	-	-
Orthophosphate as P	-	-
Phosphate	-	-
Total Solids	-	-
Inorganics (%)		
Moisture	5.16	25.3
Inorganics (mg/kg)		
Bromide	<0.638	<0.77
Chloride	2.16	<0.77
Fluoride	<0.967	<0.35
Sulfate	7.94	31.8
Inorganics (pH Units)		
pH	8.55 J	-
Inorganics (ug/kg)		
Perchlorate	<4.63	-
Metals (NA)		
Calcium	-	-
Iron	-	-
Magnesium	-	-
Manganese	-	-
Metals (mg/kg)		
Aluminum	-	17600 J
Antimony	-	<0.4
Arsenic	-	5.3 J
Barium	-	117
Beryllium	-	0.7 J
Boron	-	3.4 J
Cadmium	-	0.43
Chromium	-	28.7 J
Cobalt	-	8 J
Copper	-	13.2 J
Lead	-	7.8 J
Lithium	-	23.4 J
Mercury	-	0.0075 J
Molybdenum	-	0.33
Nickel	-	17.4 J
Potassium	-	3680
Selenium	-	<0.668
Silver	-	0.087 J
Sodium	-	289
Thallium	-	0.28
Vanadium	-	56.3
Zinc	-	64.7
Zirconium	-	5

PDBS1405	1 Primary PDBS1405S01 5/30/2008	6 Primary PDBS1405S02 5/30/2008
Inorganics (NA)		
%Solids	-	-
Bromide	-	-
Chloride	-	-
Fluoride	-	-
Moisture	-	-
Nitrate-N	-	-
Nitrate-NO3	-	-
Nitrite-N	-	-
Orthophosphate as P	-	-
Perchlorate	-	-
pH	-	-
Phosphate	-	-
Sulfate	-	-
Inorganics (%)		
Total Solids	88	87
Metals (NA)		
Calcium	-	-
Iron	-	-
Magnesium	-	-
Manganese	-	-
Metals (mg/kg)		
Aluminum	22000	24000
Antimony	<0.43	<0.44
Arsenic	4.8	5.3
Barium	110 J	150 J
Beryllium	1.3	1.4
Boron	6.9	5.5 J
Cadmium	0.54	0.51
Chromium	32 J	38 J
Cobalt	11	13
Copper	18	19
Lead	9.9	11
Lithium	21 J	22 J
Mercury	<0.0066	<0.0064
Molybdenum	0.29 J	0.23 J
Nickel	21	24
Potassium	6700	4800
Selenium	0.6 J	0.52 J
Silver	0.048 J	0.045 J
Sodium	80 J	110 J
Thallium	0.35	0.41
Vanadium	56 J	68 J
Zinc	70 J	68 J
Zirconium	4.4 J	5 J

PDTS03	2 Primary RJ659 10/2/2000
Inorganics (NA)	
%Solids	-
Bromide	-
Chloride	-
Fluoride	-
Nitrate-N	-
Nitrate-NO3	-
Nitrite-N	-
Orthophosphate as P	-
Perchlorate	-
Phosphate	-
Sulfate	-
Total Solids	-
Inorganics (%)	
Moisture	11
Inorganics (pH Units)	
pH	7.6 J
Metals (NA)	
Lithium	-
Zirconium	-
Metals (mg/kg)	
Aluminum	25200 J
Antimony	1.2 J
Arsenic	4.9 J
Barium	81.8
Beryllium	0.66 J
Boron	<4.8
Cadmium	<0.37
Calcium	21200 J
Chromium	23.9
Cobalt	10.4
Copper	21.6
Iron	22300
Lead	14.7
Magnesium	7480
Manganese	331
Mercury	0.02 J
Molybdenum	<10
Nickel	16
Potassium	7190
Selenium	<3.9
Silver	5.5 J
Sodium	91.9 J
Thallium	0.56 J
Vanadium	47.8
Zinc	75.6

PDTS1001	1 Primary PDTS1001S01 4/15/2008	6 Primary PDTS1001S02 4/15/2008	10 Primary PDTS1001S03 4/15/2008
Inorganics (NA)			
%Solids	-	-	-
Nitrate-NO3	-	-	-
Orthophosphate as P	-	-	-
Total Solids	-	-	-
Inorganics (%)			
Moisture	5.05	6.32	4.99
Inorganics (mg/kg)			
Bromide	<0.751	<0.756	-
Chloride	2.39	2.1 J	-
Fluoride	<2.19	<2.91	-
Nitrate-N	1.65	1.48	-
Nitrite-N	<0.341	<0.344	-
Phosphate	<0.751	<0.756	-
Sulfate	3.61 J	3.24 J	-
Inorganics (pH Units)			
pH	8.41 J	-	-
Inorganics (ug/kg)			
Perchlorate	<4.55	-	-
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	15200	20800	19100
Antimony	<0.333	<0.519	-
Arsenic	5.1	6.4	-
Barium	116	163	115
Beryllium	0.95	1.1	-
Boron	5.3 J	2.8 J	-
Cadmium	0.56	0.33	-
Chromium	37.3	40.3	27.8
Cobalt	11.6	13.2	-
Copper	21.5	19.8	-
Lead	10.4	11.8	-
Lithium	26	28.5	-
Mercury	0.0088 J	0.01 J	-
Molybdenum	0.35	0.44	-
Nickel	22.2	22.7	-
Potassium	5800	3490	-
Selenium	<0.558	<0.593	-
Silver	0.064 J	0.074 J	-
Sodium	78.3	158	-
Thallium	0.36	0.37	-
Vanadium	65.2	67.9	68
Zinc	86.5	81.2	-
Zirconium	5.7	6.6	-

PDTS1002	1 Primary PDTS1002S01 4/16/2008	1 Duplicate PDTS1002D01 4/16/2008	6 Primary PDTS1002S02 4/16/2008	10 Primary PDTS1002S03 4/16/2008
Inorganics (NA)				
%Solids	-	-	-	-
Moisture	-	-	-	-
Nitrate-NO3	-	-	-	-
Phosphate	-	-	-	-
Inorganics (%)				
Total Solids	81	89	84	85 J
Inorganics (mg/kg)				
Bromide	<0.48	<0.43	<0.46	-
Chloride	4.8 J	3.9 J	8.3	-
Fluoride	<1	<5.6	<5.9	-
Nitrate-N	3.3 J	0.84 J	4.4 J	-
Nitrite-N	0.47 J	0.45 J	<0.4	-
Orthophosphate as P	1.3 J	1 J	<0.6	-
Sulfate	-	<7.4	<7.5	-
Inorganics (pH Units)				
pH	7.9	8.1	-	-
Inorganics (ug/kg)				
Perchlorate	<4.9	<4.5	-	-
Metals (NA)				
Antimony	-	-	-	-
Calcium	-	-	-	-
Iron	-	-	-	-
Magnesium	-	-	-	-
Manganese	-	-	-	-
Metals (mg/kg)				
Aluminum	21000 J	21000 J	29000 J	28000 J
Arsenic	4.5 J	4.3 J	5.1 J	-
Barium	120	130	160	110
Beryllium	1.3	1.3	1.7	-
Boron	<6.1	5.9	<5.9	-
Cadmium	0.39	0.38	0.2 J	-
Chromium	30	30	37	-
Cobalt	9.8 J	9.6 J	9.2 J	-
Copper	16 J	15 J	13 J	-
Lead	14	10	9.8	-
Lithium	21	21	24	-
Mercury	0.015 J	0.014 J	0.01 J	-
Molybdenum	0.33 J	0.31 J	0.28 J	-
Nickel	18 J	18 J	21 J	-
Potassium	6700	6500	3800	-
Selenium	1.1 J	1.2	0.93 J	0.47 J
Silver	0.047 J	0.036 J	0.044 J	-
Sodium	<72	<130	<140	<190
Thallium	0.34	0.34	0.34	-
Vanadium	55	53	67	54
Zinc	71 J	68 J	75 J	-
Zirconium	4.5 J	4.4 J	6.2 J	-

PDBS1402	1 Primary PDBS1402S01 5/29/2008	6 Primary PDBS1402S02 5/29/2008
Inorganics (NA)		
%Solids	-	-
Bromide	-	-
Chloride	-	-
Fluoride	-	-
Nitrate-N	-	-
Nitrate-NO3	-	-
Nitrite-N	-	-
Orthophosphate as P	-	-
Perchlorate	-	-
pH	-	-
Phosphate	-	-
Sulfate	-	-
Total Solids	-	-
Inorganics (%)		
Moisture	7.38	8.59
Metals (NA)		
Calcium	-	-
Iron	-	-
Magnesium	-	-
Manganese	-	-
Metals (mg/kg)		
Aluminum	16600	17200
Antimony	<0.92	<1.4
Arsenic	3.9	4.7
Barium	123	103
Beryllium	0.73	0.78
Boron	1.8 J	1.4 J
Cadmium	0.33	0.26
Chromium	32.1	31.7
Cobalt	8.4 J	6.2 J
Copper	12.3 J	11.3 J
Lead	9.4	6.9
Lithium	18.8	19.2
Mercury	0.0035 J	0.0051 J
Molybdenum	0.42	0.55
Nickel	14 J	14.1 J
Potassium	2310	2170
Selenium	<0.527	<2.6
Silver	0.061 J	0.058 J
Sodium	282	699
Thallium	0.34	0.29
Vanadium	54	52.8
Zinc	58.5 J	49 J
Zirconium	4.5	4.2

PDBS1008	1 Primary PDBS1008S01 4/18/2008	1 Duplicate PDBS1008D01 4/18/2008	6 Primary PDBS1008S02 4/18/2008
Inorganics (NA)			
%Solids	-	-	-
Moisture	-	-	-
Nitrate-NO3	-	-	-
Phosphate	-	-	-
Sulfate	-	-	-
Inorganics (%)			
Total Solids	91	92	85
Inorganics (mg/kg)			
Bromide	<0.43	<0.42	<0.45
Chloride	3.6 J	3.5 J	4.1 J
Fluoride	<0.97	<1.2	<4.1
Nitrate-N	1.6 J	0.72 J	0.92 J
Nitrite-N	<0.37	<0.37	0.48 J
Orthophosphate as P	<0.55	0.56 J	<0.59
Inorganics (pH Units)			
pH	7.9	8	-
Inorganics (ug/kg)			
Perchlorate	<0.3	<0.3	-
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	18000 J	18000 J	31000 J
Antimony	<0.42	<0.41	<0.45
Arsenic	4.3 J	4 J	5.1 J
Barium	110	110	190
Beryllium	1.2	1.1	1.6
Boron	4.6 J	3.9 J	2.4 J
Cadmium	0.34	0.3	0.16 J
Chromium	25	25	33
Cobalt	8.7 J	8.2 J	8.7 J
Copper	14 J	13 J	11 J
Lead	13	11	9.5
Lithium	18	18	24
Mercury	0.014 J	0.0085 J	0.02 J
Molybdenum	0.36 J	0.34 J	0.3 J
Nickel	16 J	15 J	21 J
Potassium	6000	5100	3500
Selenium	1.1	1.1	1 J
Silver	0.035 J	0.033 J	0.055 J
Sodium	<66	<64	<310
Thallium	0.31	0.31	0.34
Vanadium	48	47	63
Zinc	65 J	60 J	61 J
Zirconium	4 J	3.8 J	5.8 J

PDBS1401	1 Primary PDBS1401S01 5/29/2008	1 Duplicate PDBS1401D01 5/29/2008	6 Primary PDBS1401S02 5/29/2008
Inorganics (NA)			
%Solids	-	-	-
Bromide	-	-	-
Chloride	-	-	-
Fluoride	-	-	-
Nitrate-N	-	-	-
Nitrate-NO3	-	-	-
Nitrite-N	-	-	-
Orthophosphate as P	-	-	-
Perchlorate	-	-	-
pH	-	-	-
Phosphate	-	-	-
Sulfate	-	-	-
Total Solids	-	-	-
Inorganics (%)			
Moisture	10.2	5.88	14.5
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	16800	19100	17800
Antimony	<1.2	<1.6	<1.3
Arsenic	3.8	4.3	4.9
Barium	124	117	140
Beryllium	0.73	0.74	0.81
Boron	3.6 J	4 J	5.4 J
Cadmium	0.47	0.47	0.6
Chromium	31.7	31.8	37.9
Cobalt	7.8 J	8 J	8.5 J
Copper	13.7 J	13.9 J	14.5 J
Lead	9.9	10.5	10.3
Lithium	18.6	18.7	23.6
Mercury	0.0074 J	0.0051 J	<0.00174
Molybdenum	0.43	0.61	0.43
Nickel	14.7 J	15.2 J	17.1 J
Potassium	5060	5180	4400
Selenium	<0.549	<0.507	<0.577
Silver	0.06 J	0.06 J	0.091 J
Sodium	72	74.5	81.2
Thallium	0.34	0.34	0.39
Vanadium	52	52.1	62.3
Zinc	65.8 J	66.3 J	81.9 J
Zirconium	5.2	5.2	6.5

PDBS1007	1 Primary PDBS1007S01 4/22/2008	6 Primary PDBS1007S02 4/22/2008	10 Primary PDBS1007S03 4/22/2008
Inorganics (NA)			
%Solids	-	-	-
Moisture	-	-	-
Nitrate-NO3	-	-	-
Phosphate	-	-	-
Inorganics (%)			
Total Solids	87	85	85 J
Inorganics (mg/kg)			
Bromide	<0.45	<0.46	-
Chloride	3.6 J	3.9 J	-
Fluoride	<2	<4	-
Nitrate-N	3.2 J	1.9 J	-
Nitrite-N	<0.39	<0.4	-
Orthophosphate as P	<0.58	<0.59	-
Sulfate	<4.7	<2.9	-
Inorganics (pH Units)			
pH	8.2 J	-	-
Inorganics (ug/kg)			
Perchlorate	<0.32	-	-
Metals (NA)			
Calcium	-	-	-
Iron	-	-	-
Magnesium	-	-	-
Manganese	-	-	-
Metals (mg/kg)			
Aluminum	21000 J	25000 J	24000 J
Antimony	<0.44	<0.45	-
Arsenic	4.7 J	4.5 J	-
Barium	110	150	150
Beryllium	1.2	1.4	-
Boron	7.1	4.9 J	-
Cadmium	0.39	0.32	-
Chromium	33	39	-
Cobalt	11	13	-
Copper	17	17	-
Lead	11	12	-
Lithium	22	24	-
Mercury	0.0065 J	0.0065 J	-
Molybdenum	0.35 J	0.28 J	-
Nickel	20	25	-
Potassium	6600	4500	-
Selenium	0.67 J	0.55 J	-
Silver	0.062 J	0.065 J	-
Sodium	<120	<120	<110
Thallium	0.33	0.39	-
Vanadium	61	70	64
Zinc	75	74	-
Zirconium	<4.6	<5.8	-

PDBS1400	1 Primary PDBS1400S01 5/29/2008	6 Primary PDBS1400S02 5/29/2008
Inorganics (NA)		
%Solids	-	-
Bromide	-	-
Chloride	-	-
Fluoride	-	-
Nitrate-N	-	-
Nitrate-NO3	-	-
Nitrite-N	-	-
Orthophosphate as P	-	-
Perchlorate	-	-
pH	-	-
Phosphate	-	-
Sulfate	-	-
Total Solids	-	-
Inorganics (%)		
Moisture	5.11	12.1
Metals (NA)		
Calcium	-	-
Iron	-	-
Magnesium	-	-
Manganese	-	-
Metals (mg/kg)		
Aluminum	15700	18400
Antimony	<1.4	<1.5
Arsenic	4.4	5.1
Barium	114	133
Beryllium	0.72	0.83
Boron	3.8 J	5.1 J
Cadmium	0.47	0.6
Chromium	32.8	40.7
Cobalt	7.8 J	9.1 J
Copper	13.5 J	15 J
Lead	10.7	10.7
Lithium	19.8	22.9
Mercury	0.0058 J	0.0026 J
Molybdenum	0.41	0.33
Nickel	15.5 J	18.4 J
Potassium	4050	3760
Selenium	<0.515	<0.542
Silver	0.072 J	0.079 J
Sodium	65.7	75.4
Thallium	0.35	0.38
Vanadium	53.8	67.5
Zinc	69.5 J	75 J
Zirconium	5.6	6.9

PDBS1003	1 Primary PDBS1003S01 4/28/2008	6 Primary PDBS1003S02 4/28/2008
Inorganics (NA)		
%Solids	-	-
Moisture	-	-
Nitrate-NO3	-	-
Phosphate	-	-
Inorganics (%)		
Total Solids	96	89
Inorganics (mg/kg)		
Bromide	<0.41	<0.44
Chloride	<2.1	<2.2
Fluoride	<3.5	<5.1
Nitrate-N	0.47 J	0.45 J
Nitrite-N	<0.35	<0.38
Orthophosphate as P	1.5 J	<0.56
Sulfate	<2.6	<2.7
Inorganics (pH Units)		
pH	8.2 J	-
Inorganics (ug/kg)		
Perchlorate	<4.2	-
Metals (NA)		
Calcium	-	-
Iron	-	-
Magnesium	-	-
Manganese	-	-
Metals (mg/kg)		
Aluminum	14000	19000
Antimony	<0.4	<0.43
Arsenic	3.2	4.2
Barium	100	110
Beryllium	0.98	1.2
Boron	1.8 J	4 J
Cadmium	0.19 J	0.29
Chromium	18	23
Cobalt	5.3	7.8
Copper	11 J	8.6 J
Lead	6.5	6.3
Lithium	18	20
Mercury	<0.011	<0.0062
Molybdenum	0.4	0.28
Nickel	11	17
Potassium	2800	2700
Selenium	0.75 J	0.74 J
Silver	0.035 J	0.03 J
Sodium	<84	<110
Thallium	0.23	0.27
Vanadium	35	43
Zinc	53	56
Zirconium	2 J	3.8 J

PDTS11	5 Primary RJ674 10/13/2000
Inorganics (NA)	
%Solids	-
Bromide	-
Chloride	-
Fluoride	-
Moisture	-
Nitrate-N	-
Nitrate-NO3	-
Nitrite-N	-
Orthophosphate as P	-
Perchlorate	-
Phosphate	-
Sulfate	-
Total Solids	-
Inorganics (pH Units)	
pH	7.92 J
Metals (NA)	
Lithium	-
Zirconium	-
Metals (mg/kg)	
Aluminum	12300
Antimony	0.76 J
Arsenic	2.8
Barium	80.2
Beryllium	0.45 J
Boron	<4.7
Cadmium	<0.18
Calcium	2270
Chromium	15.1
Cobalt	6.3
Copper	11.1
Iron	14800
Lead	7.9
Magnesium	3740
Manganese	216
Mercury	0.02 J
Molybdenum	<10
Nickel	9.3
Potassium	2460
Selenium	<1.9
Silver	<4.5
Sodium	80.8 J
Thallium	0.81 J
Vanadium	27.9
Zinc	62.8

PDBS1006	1 Primary PDBS1006S01 4/25/2008	6 Primary PDBS1006S02 4/25/2008	6 Primary PDBS1006X02A 4/30/2008	6 Split PDBS1006X02 4/25/2008
Inorganics (NA)				
Nitrate-N	-	-	-	-
Orthophosphate as P	-	-	-	-
Total Solids	-	-	-	-
Inorganics (%)				
%Solids	-	-	92.8	85.9
Moisture	19.12	24	7.2	14.1
Inorganics (mg/kg)				
Bromide	<0.712	<0.725	-	<5.8
Chloride	2.44	<0.725	-	<11.6
Fluoride	<0.323	<1.49	-	<2.9
Nitrate-NO3	-	-	-	3.3
Nitrite-N	-	-	-	<1.2
Phosphate	-	-	-	20.6 J
Sulfate	5.69	12.4	-	25.3
Inorganics (pH Units)				
pH	8.15 J	-	-	-
Inorganics (ug/kg)				
Perchlorate	<4.84	-	-	<36.1
Metals (NA)				
Calcium	-	-	-	-
Iron	-	-	-	-
Magnesium	-	-	-	-
Manganese	-	-	-	-
Metals (mg/kg)				
Aluminum	11700 J	11800 J	-	18100
Antimony	<0.359	<0.389	-	-
Arsenic	3.3 J	3.5 J	-	2.55
Barium	93	122	-	96
Beryllium	0.5 J	0.53 J	-	0.304 J
Boron	1.3 J	1.5 J	-	<2.81
Cadmium	0.17 J	0.19 J	-	0.176
Chromium	17.2 J	19.1 J	-	20 J
Cobalt	5.7 J	6.6 J	-	4.64
Copper	10 J	11.7 J	-	12
Lead	6 J	7.3 J	-	6.47
Lithium	18.9 J	20.3 J	-	22.2
Mercury	0.045	0.013 J	-	<0.0122
Molybdenum	0.51	0.61	-	<0.291
Nickel	11.1 J	12.2 J	-	12.5
Potassium	3590	3940	-	4110
Selenium	<1.21	<0.628	-	<0.541
Silver	<0.0484	<0.0502	-	<0.198
Sodium	<73.3	<116	-	150
Thallium	<0.242	0.26	-	0.24 J
Vanadium	33	40.5	-	38.1
Zinc	62.1	68.4	-	58.8
Zirconium	2.1	2.3	-	4.15 J

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SANTA SUSANA FIELD LABORATORY

Metals and Inorganics Data Results
Pond Dredge RFI Site

FIGURE H.3-10

Soil Sample Locations

- Soil Sample Location With Detected Dioxins Data
- Soil Sample Location Not Analyzed for Dioxins Data
- Soil Sample Location With No Detected Dioxins Data

Data Box Information

Sample Location ID: B9BS01 — 1.00: Depth in Feet; Primary: Sample Type; B9BS01S01: 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
NA and [-]	Analysis not conducted
[#]	If more than one result per sample depth, 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 (Metals + Dioxins Only)
12.05	<0.06	Exceeds Res RBSL or Exceeds Background + Res RBSL (Metals +Dioxins Only)
12.05	<0.06	Exceeds Eco RBSL or Exceeds Background + Eco RBSL (Metals + Dioxins Only)
12.05	<0.06	Exceeds Res RBSL + Eco RBSL or Exceeds Background + Res RBSL + Eco RBSL (Metals + Dioxins Only)

= 2008 Data

= Pre-2008 Data

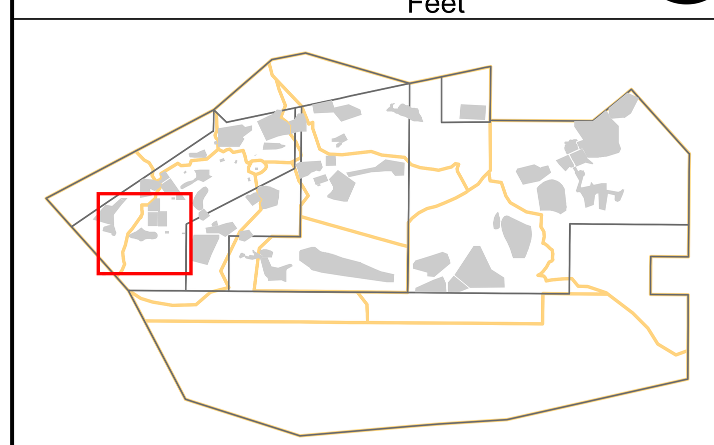
Basemap Legend

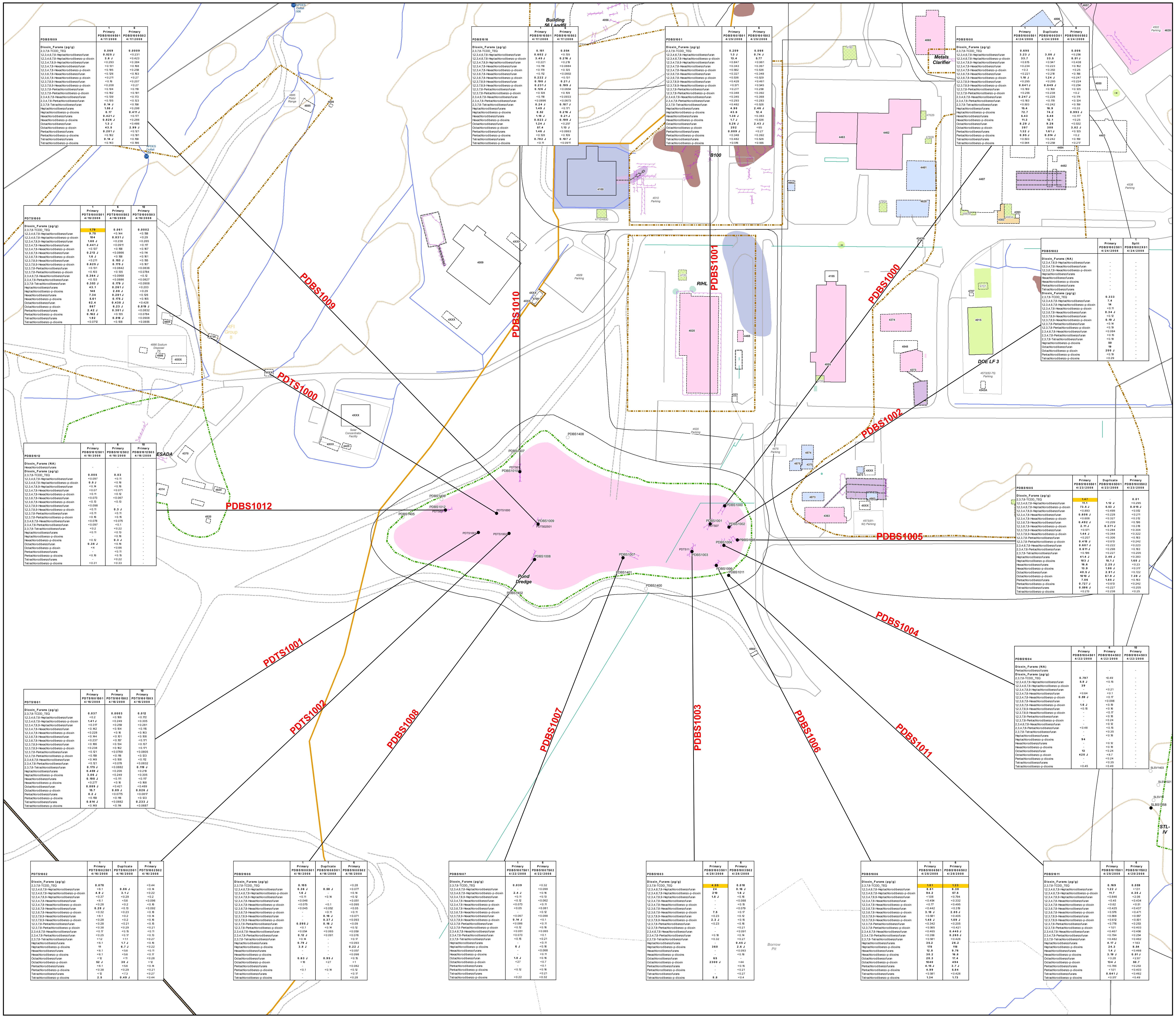
Building - Existing; Building - Removed; Building - Not Yet Determined; Road - Asphalt; Roads - Dirt; Rocks; RFI Site - Boeing; RFI Site - DOE; RFI Site - NASA; Investigation Boundary; RFI Group Boundary; Administrative Area; Property Boundary

Debris; Multiple Use; Solvent; Petroleum; Oil/PCBs; Metals; Energetic Constituents; Propellants; Leach Field; Non-metal Inorganic Constituents; Screening for Potential Impacts

\\MapFiles\RFI_05\RFI_Report\SpiderDiagram\RFIGrp5_SpiderDiagram_EL.mxd

1 inch equals 70 feet — 0 70 140 Feet





PDBS1009	1 Primary PDBS1009S01 4/17/2008	6 Primary PDBS1009S02 4/17/2008
Dioxin_Furans (pg/g)		
2,3,7,8-TCDD_TEQ	0.069	0.0009
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.525 J	<0.231
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	3.6 J	<0.423
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.293	<0.384
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.131	<0.168
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.195	<0.258
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.126	<0.163
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	<0.211	<0.27
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.16	<0.207
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.208	<0.27
1,2,3,7,8-Pentachlorodibenzofuran	<0.104	<0.119
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.162	<0.191
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.139	<0.173
2,3,4,7,8-Pentachlorodibenzofuran	<0.105	<0.123
2,3,7,8-Tetrachlorodibenzofuran	0.14 J	<0.158
Heptachlorodibenzofurans	1.55 J	<0.298
Heptachlorodibenzo-p-dioxins	8.17	0.411 J
Hexachlorodibenzofurans	0.421 J	<0.177
Hexachlorodibenzo-p-dioxins	0.826 J	<0.266
Octachlorodibenzofuran	1.3 J	<0.486
Octachlorodibenzo-p-dioxin	43.5	2.99 J
Pentachlorodibenzofurans	0.201 J	<0.121
Pentachlorodibenzo-p-dioxins	<0.162	<0.191
Tetrachlorodibenzofurans	0.14 J	<0.158
Tetrachlorodibenzo-p-dioxins	<0.143	<0.186

PDBS1010	1 Primary PDBS1010S01 4/17/2008	6 Primary PDBS1010S02 4/17/2008
Dioxin_Furans (pg/g)		
2,3,7,8-TCDD_TEQ	0.151	0.054
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.602 J	<0.135
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	3.45 J	0.216 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.221	<0.219
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.118	<0.0884
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.178	<0.125
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.112	<0.0853
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.222 J	<0.131
1,2,3,7,8,9-Hexachlorodibenzofuran	0.198 J	0.21 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.231 J	0.199 J
1,2,3,7,8-Pentachlorodibenzofuran	0.126 J	<0.0654
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.128	<0.109
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.118	<0.0933
2,3,4,7,8-Pentachlorodibenzofuran	<0.0896	<0.0673
2,3,7,8-Tetrachlorodibenzofuran	0.24 J	0.107 J
Heptachlorodibenzofurans	1.49 J	<0.171
Heptachlorodibenzo-p-dioxins	8.52	0.216 J
Hexachlorodibenzofurans	1.18 J	0.21 J
Hexachlorodibenzo-p-dioxins	0.823 J	0.199 J
Octachlorodibenzofuran	1.24 J	<0.257
Octachlorodibenzo-p-dioxin	57.4	1.13 J
Pentachlorodibenzofurans	1.46 J	<0.0663
Pentachlorodibenzo-p-dioxins	<0.128	<0.109
Tetrachlorodibenzofurans	0.782 J	0.107 J
Tetrachlorodibenzo-p-dioxins	<0.11	<0.0911

PDBS1001	1 Primary PDBS1001S01 4/25/2008	6 Primary PDBS1001S02 4/25/2008
Dioxin_Furans (pg/g)		
2,3,7,8-TCDD_TEQ	0.209	0.066
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.3 J	0.74 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	13.4	5.77
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.847	<0.961
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.343	<0.367
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.582	<0.536
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.327	<0.348
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	<0.536	<0.529
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.428	<0.461
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.571	<0.545
1,2,3,7,8-Pentachlorodibenzofuran	<0.277	<0.258
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.348	<0.392
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.345	<0.368
2,3,4,7,8-Pentachlorodibenzofuran	<0.293	<0.283
2,3,7,8-Tetrachlorodibenzofuran	<0.482	<0.526
Heptachlorodibenzofurans	4.98	2.46 J
Heptachlorodibenzo-p-dioxins	43.6	12.4
Hexachlorodibenzofurans	1.38 J	<0.383
Hexachlorodibenzo-p-dioxins	1.7 J	<0.536
Octachlorodibenzofuran	5.26 J	2.43 J
Octachlorodibenzo-p-dioxin	202	<65
Pentachlorodibenzofurans	0.889 J	<0.27
Pentachlorodibenzo-p-dioxins	<0.348	<0.392
Tetrachlorodibenzofurans	<0.482	<0.526
Tetrachlorodibenzo-p-dioxins	<0.516	<0.555

PDBS1000	1 Primary PDBS1000S01 4/24/2008	1 Duplicate PDBS1000D01 4/24/2008	6 Primary PDBS1000S02 4/24/2008
Dioxin_Furans (pg/g)			
2,3,7,8-TCDD_TEQ	0.695	-	0.006
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.23 J	3.86 J	<0.256
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	33.7	33.5	0.51 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.615	<0.547	<0.438
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.234	<0.223	<0.162
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.3	<0.353	<0.25
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.221	<0.218	<0.156
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.18 J	1.24 J	<0.247
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.295	<0.295	<0.224
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.641 J	0.649 J	<0.254
1,2,3,7,8-Pentachlorodibenzofuran	<0.169	<0.168	<0.125
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.255	<0.238	<0.2
2,3,4,6,7,8-Hexachlorodibenzofuran	0.247 J	<0.228	<0.174
2,3,4,7,8-Pentachlorodibenzofuran	<0.163	<0.178	<0.124
2,3,7,8-Tetrachlorodibenzofuran	<0.503	<0.242	<0.159
Heptachlorodibenzofurans	15.4	16.9	<0.33
Heptachlorodibenzo-p-dioxins	72.7	74.2	0.993 J
Hexachlorodibenzofurans	5.43	5.48	<0.177
Hexachlorodibenzo-p-dioxins	11.3	12.1	<0.25
Octachlorodibenzofuran	8.29 J	9.26	<0.532
Octachlorodibenzo-p-dioxin	397	388	3.82 J
Pentachlorodibenzofurans	1.32 J	1.61 J	<0.125
Pentachlorodibenzo-p-dioxins	0.95 J	0.514 J	<0.2
Tetrachlorodibenzofurans	<0.503	<0.242	<0.159
Tetrachlorodibenzo-p-dioxins	<0.544	<0.258	<0.217

PDTS1000	1 Primary PDTS1000S01 4/15/2008	6 Primary PDTS1000S02 4/15/2008	10 Primary PDTS1000S03 4/15/2008
Dioxin_Furans (pg/g)			
2,3,7,8-TCDD_TEQ	1.79	0.061	0.0002
1,2,3,4,6,7,8-Heptachlorodibenzofuran	9.75	<0.144	<0.158
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	104	0.831 J	<0.29
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.68 J	<0.238	<0.265
1,2,3,4,7,8-Hexachlorodibenzofuran	0.441 J	<0.0911	<0.117
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.137	<0.158	<0.167
1,2,3,6,7,8-Hexachlorodibenzofuran	0.213 J	<0.0866	<0.114
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.6 J	<0.158	<0.161
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.211	0.153 J	<0.155
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.625 J	0.175 J	<0.167
1,2,3,7,8-Pentachlorodibenzofuran	<0.131	<0.0842	<0.0836
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.103	<0.135	<0.0784
2,3,4,6,7,8-Hexachlorodibenzofuran	0.364 J	<0.0968	<0.12
2,3,4,7,8-Pentachlorodibenzofuran	<0.133	<0.0886	<0.0827
2,3,7,8-Tetrachlorodibenzofuran	0.353 J	0.179 J	<0.0908
Heptachlorodibenzofurans	43.1	0.261 J	<0.203
Heptachlorodibenzo-p-dioxins	148	2.08 J	<0.29
Hexachlorodibenzofurans	7.34	0.281 J	<0.126
Hexachlorodibenzo-p-dioxins	5.61	0.175 J	<0.165
Octachlorodibenzofuran	62.4	0.438 J	<0.428
Octachlorodibenzo-p-dioxin	867	6.23 J	0.819 J
Pentachlorodibenzofurans	2.42 J	0.301 J	<0.0832
Pentachlorodibenzo-p-dioxins	0.162 J	<0.135	<0.0784
Tetrachlorodibenzofurans	1.92	0.518 J	<0.0908
Tetrachlorodibenzo-p-dioxins	<0.0712	<0.108	<0.0655

PDBS1002	1 Primary PDBS1002S01 4/24/2008	1 Split PDBS1002X01 4/24/2008
Dioxin_Furans (NA)		
1,2,3,4,7,8,9-Heptachlorodibenzofuran	-	-
1,2,3,4,7,8-Hexachlorodibenzofuran	-	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	-	-
Heptachlorodibenzofurans	-	-
Hexachlorodibenzofurans	-	-
Hexachlorodibenzo-p-dioxins	-	-
Pentachlorodibenzofurans	-	-
Tetrachlorodibenzofurans	-	-
Dioxin_Furans (pg/g)		
2,3,7,8-TCDD_TEQ	0.333	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran	7.4	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	14	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.11	-
1,2,3,6,7,8-Hexachlorodibenzofuran	0.34 J	-
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.12	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19 J	-
1,2,3,7,8-Pentachlorodibenzofuran	<0.14	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.19	-
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.084	-
2,3,4,7,8-Pentachlorodibenzofuran	<0.15	-
2,3,7,8-Tetrachlorodibenzofuran	<0.19	-
Heptachlorodibenzo-p-dioxins	50	-
Octachlorodibenzofuran	19	-
Octachlorodibenzo-p-dioxin	200 J	-
Pentachlorodibenzo-p-dioxins	<0.19	-
Tetrachlorodibenzo-p-dioxins	<0.29	-

PDBS1012	1 Primary PDBS1012S01 4/18/2008	6 Primary PDBS1012S02 4/18/2008	10 Primary PDBS1012S03 4/18/2008
Dioxin_Furans (NA)			
Hexachlorodibenzofurans	-	-	-
Dioxin_Furans (pg/g)			
2,3,7,8-TCDD_TEQ	0.005	0.03	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran	<0.097	<0.11	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.5 J	<0.16	-
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.14	<0.16	-
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.07	<0.071	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.11	<0.12	-
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.073	<0.067	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	<0.13	<0.13	-
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.098	-	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.11	0.3 J	-
1,2,3,7,8-Pentachlorodibenzofuran	<0.11	<0.11	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.16	<0.15	-
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.078	<0.075	-
2,3,4,7,8-Pentachlorodibenzofuran	<0.097	<0.1	-
2,3,7,8-Tetrachlorodibenzofuran	<0.2	<0.22	-
Heptachlorodibenzofurans	<0.11	<0.13	-
Heptachlorodibenzo-p-dioxins	-	<0.16	-
Hexachlorodibenzo-p-dioxins	<0.12	0.3 J	-
Octachlorodibenzofuran	0.38 J	<0.16	-
Octachlorodibenzo-p-dioxin	<4	<0.66	-
Pentachlorodibenzofurans	-	<0.11	-
Pentachlorodibenzo-p-dioxins	<0.16	<0.15	-
Tetrachlorodibenzofurans	-	<0.22	-
Tetrachlorodibenzo-p-dioxins	<0.31	<0.33	-

PDBS1005	1 Primary PDBS1005S01 4/23/2008	1 Duplicate PDBS1005D01 4/23/2008	6 Primary PDBS1005S02 4/23/2008
Dioxin_Furans (pg/g)			
2,3,7,8-TCDD_TEQ	1.47	-	0.01
1,2,3,4,6,7,8-Heptachlorodibenzofuran	11.1	1.12 J	<0.295
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	73.5 J	5.53 J	0.815 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.893	<0.498	<0.512
1,2,3,4,7,8-Hexachlorodibenzofuran	0.606 J	<0.228	<0.211
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.606	<0.327	<0.312
1,2,3,6,7,8-Hexachlorodibenzofuran	0.492 J	<0.209	<0.196
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	2.11 J	0.371 J	<0.318
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.571	<0.284	<0.304
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.44 J	<0.344	<0.322
1,2,3,7,8-Pentachlorodibenzofuran	<0.207	<0.306	<0.163
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.418 J	<0.613	<0.242
2,3,4,6,7,8-Hexachlorodibenzofuran	0.687 J	<0.222	<0.223
2,3,4,7,8-Pentachlorodibenzofuran	0.611 J	<0.298	<0.163
2,3,7,8-Tetrachlorodibenzofuran	<0.196	<0.227	<0.205
Heptachlorodibenzofurans	41.4 J	3.46 J	<0.383
Heptachlorodibenzo-p-dioxins	183 J	15.1 J	1.68 J
Hexachlorodibenzofurans	16.6	2.25 J	<0.23
Hexachlorodibenzo-p-dioxins	13.9	1.98 J	<0.317
Octachlorodibenzofuran	40.5 J	2.91 J	<0.722
Octachlorodibenzo-p-dioxin	1010 J	67.9 J	7.39 J
Pentachlorodibenzofurans	7.06	1.85 J	<0.163
Pentachlorodibenzo-p-dioxins	0.727 J	<0.613	<0.242
Tetrachlorodibenzofurans	0.596 J	<0.227	<0.205
Tetrachlorodibenzo-p-dioxins	<0.213	<0.238	<0.25

PDBS1004	1 Primary PDBS1004S01 4/22/2008	6 Primary PDBS1004S02 4/22/2008	10 Primary PDBS1004S03 4/22/2008
Dioxin_Furans (NA)			
Pentachlorodibenzofurans	-	-	-
Dioxin_Furans (pg/g)			
2,3,7,8-TCDD_TEQ	0.797	<0.49	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran	5.8 J	<0.15	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	39	-	-
1,2,3,4,7,8,9-Heptachlorodibenzofuran	-	<0.21	-
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.64	<0.1	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.59 J	<0.17	-
1,2,3,6,7,8-Hexachlorodibenzofuran	-	<0.098	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.6 J	<0.19	-
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.15	<0.16	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	-	<0.17	-
1,2,3,7,8-Pentachlorodibenzofuran	-	<0.18	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	-	<0.24	-
2,3,4,6,7,8-Hexachlorodibenzofuran	-	<0.12	-
2,3,4,7,8-Pentachlorodibenzofuran	<0.48	<0.15	-
2,3,7,8-Tetrachlorodibenzofuran	-	<0.35	-
Heptachlorodibenzofurans	-	<0.18	-
Heptachlorodibenzo-p-dioxins	94	-	-
Hexachlorodibenzofurans	-	<0.12	-
Hexachlorodibenzo-p-dioxins	-	<0.18	-
Octachlorodibenzofuran	13	<0.24	-
Octachlorodibenzo-p-dioxin	420 J	<8.7	-
Pentachlorodibenzo-p-dioxins	-	<0.24	-
Tetrachlorodibenzofurans	-	<0.35	-
Tetrachlorodibenzo-p-dioxins	<0.45	<0.49	-

PDTS1001	1 Primary PDTS1001S01 4/15/2008	6 Primary PDTS1001S02 4/15/2008	10 Primary PDTS1001S03 4/15/2008
Dioxin_Furans (pg/g)			
2,3,7,8-TCDD_TEQ	0.037	0.0003	0.012
1,2,3,4,6,7,8-Heptachlorodibenzofuran	<0.2	<0.166	<0.172
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.41 J	<0.249	<0.305
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.317	<0.259	<0.281
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.142	<0.104	<0.115
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.228	<0.16	<0.163
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.144	<0.101	<0.108
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	<0.237	<0.157	<0.171
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.186	<0.134	<0.137
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.238	<0.162	<0.171
1,2,3,7,8-Pentachlorodibenzofuran	<0.121	<0.0769	<0.0805
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.159	<0.118	<0.123
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.149	<0.108	<0.112
2,3,4,7,8-Pentachlorodibenzofuran	<0.121	<0.078	<0.0832
2,3,7,8-Tetrachlorodibenzofuran	0.175 J	<0.0882	0.119 J
Heptachlorodibenzofurans	0.459 J	<0.206	<0.219
Heptachlorodibenzo-p-dioxins	3.06 J	<0.249	<0.305
Hexachlorodibenzofurans	0.198 J	<0.111	<0.117
Hexachlorodibenzo-p-dioxins	<0.277	<0.16	<0.168
Octachlorodibenzofuran	0.889 J	<0.421	<0.489
Octachlorodibenzo-p-dioxin	15.7	0.89 J	0.826 J
Pentachlorodibenzofurans	0.2 J	<0.0775	<0.0817
Pentachlorodibenzo-p-dioxins	<0.159	<0.118	<0.123
Tetrachlorodibenzofurans	0.614 J	<0.0882	0.233 J
Tetrachlorodibenzo-p-dioxins	<0.149	<0.114	<0.0687

PDTS1002	1 Primary PDTS1002S01 4/16/2008	1 Duplicate PDTS1002D01 4/16/2008	6 Primary PDTS1002S02 4/16/2008
Dioxin_Furans (pg/g)			
2,3,7,8-TCDD_TEQ	0.078	-	<0.44
1,2,3,4,6,7,8-Heptachlorodibenzofuran	<6.1	0.86 J	<0.14
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	4.9 J	3.1 J	<0.22
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.37	<0.29	<0.2
1,2,3,4,7,8-Hexachlorodibenzofuran	<6.1	<5.6	<0.096
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.28	<0.2	<0.16
1,2,3,6,7,8-Hexachlorodibenzofuran	0.28 J	<0.13	<0.092
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	<0.32	<0.23	<0.18
1,2,3,7,8,9-Hexachlorodibenzofuran	<6.1	<0.2	<0.14
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.28	<0.2	<0.16
1,2,3,7,8-Pentachlorodibenzofuran	<0.28	<0.21	<0.15
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.38	<0.29	<0.21
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.17	<0.15	<0.11
2,3,4,7,8-Pentachlorodibenzofuran	<0.25	<0.17	<0.13
2,3,7,8-Tetrachlorodibenzofuran	<12	<11	<0.27
Heptachlorodibenzofurans	<6.1	1.7 J	<0.16
Heptachlorodibenzo-p-dioxins	11	6.7 J	<0.22
Hexachlorodibenzofurans	<6.1	<5.6	<0.11
Hexachlorodibenzo-p-dioxins	<6.1	<5.6	<0.17
Octachlorodibenzofuran	<12	<11	<0.28
Octachlorodibenzo-p-dioxin	52 J	30 J	<12
Pentachlorodibenzofurans	<6.1	<5.6	<0.14
Pentachlorodibenzo-p-dioxins	<0.38	<0.29	<0.21
Tetrachlorodibenzofurans	<12	<7.3	<0.27
Tetrachlorodibenzo-p-dioxins	2.5	0.49 J	<0.44

PDBS1008	1 Primary PDBS1008S01 4/18/2008	1 Duplicate PDBS1008D01 4/18/2008	6 Primary PDBS1008S02 4/18/2008
Dioxin_Furans (pg/g)			
2,3,7,8-TCDD_TEQ	0.105	-	<0.28
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.36 J	0.58 J	<0.077
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.6 J	-	<0.14
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.11	<0.14	<0.12
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.046	-	<0.051
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.075	<0.1	<0.095
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.045	<0.052	<0.05
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	-	<0.11	<0.11
1,2,3,7,8,9-Hexachlorodibenzofuran	-	0.18 J	<0.071
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	-	0.37 J	<0.093
1,2,3,7,8-Pentachlorodibenzofuran	0.095 J	0.16 J	<0.09
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.1	<0.14	<0.12
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.054	<0.065	<0.059
2,3,4,7,8-Pentachlorodibenzofuran	0.12 J	<0.091	<0.076
2,3,7,8-Tetrachlorodibenzofuran	<0.14	-	<0.17
Heptachlorodibenzofurans	0.79 J	-	<0.093
Heptachlorodibenzo-p-dioxins	3.8 J	-	0.22 J
Hexachlorodibenzofurans	-	-	<0.057
Hexachlorodibenzo-p-dioxins	-	-	<0.098
Octachlorodibenzofuran	0.63 J	0.95 J	<0.15
Octachlorodibenzo-p-dioxin	<18	<27	<1
Pentachlorodibenzofurans	-	-	<0.082
Pentachlorodibenzo-p-dioxins	<0.1	<0.14	<0.12
Tetrachlorodibenzofurans	-	-	<0.17
Tetrachlorodibenzo-p-dioxins	-	-	<0.28

PDBS1007	1 Primary PDBS1007S01 4/22/2008	6 Primary PDBS1007S02 4/22/2008
Dioxin_Furans (pg/g)		
2,3,7,8-TCDD_TEQ	0.039	<0.32
1,2,3,4,6,7,8-Heptachlorodibenzofuran	-	<0.099
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.4 J	<0.16
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.11	<0.13
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.12	<0.062
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.073	<0.11
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.05	<0.061
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	-	<0.12
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.067	<0.088
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.14 J	<0.1
1,2,3,7,8-Pentachlorodibenzofuran	<0.086	<0.11
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.12	<0.16
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.051	<0.065
2,3,4,7,8-Pentachlorodibenzofuran	<0.073	<0.1
2,3,7,8-Tetrachlorodibenzofuran	<0.15	<0.21
Heptachlorodibenzofurans	-	<0.11
Heptachlorodibenzo-p-dioxins	6 J	<0.16
Hexachlorodibenzofurans	-	<0.068
Hexachlorodibenzo-p-dioxins	-	<0.11
Octachlorodibenzofuran	1.8 J	<0.16
Octachlorodibenzo-p-dioxin	<27	<0.7
Pentachlorodibenzofurans	-	<0.1
Pentachlorodibenzo-p-dioxins	<0.12	<0.16
Tetrachlorodibenzofurans	-	<0.21
Tetrachlorodibenzo-p-dioxins	<0.22	<0.32

PDBS1003	1 Primary PDBS1003S01 4/28/2008	6 Primary PDBS1003S02 4/28/2008
Dioxin_Furans (pg/g)		
2,3,7,8-TCDD_TEQ	4.05	0.018
1,2,3,4,6,7,8-Heptachlorodibenzofuran	24	0.16 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	210	1.6 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.8 J	<0.16
1,2,3,4,7,8-Hexachlorodibenzofuran	-	<0.088
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	-	<0.15
1,2,3,6,7,8-Hexachlorodibenzofuran	-	<0.079
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	7.5	<0.17
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.23	<0.12
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2.3 J	<0.15
1,2,3,7,8-Pentachlorodibenzofuran	<0.23	<0.16
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	-	<0.21
2,3,4,6,7,8-Hexachlorodibenzofuran	-	<0.091
2,3,4,7,8-Pentachlorodibenzofuran	<0.18	<0.14
2,3,7,8-Tetrachlorodibenzofuran	<0.32	<0.27
Heptachlorodibenzofurans	-	0.45 J
Heptachlorodibenzo-p-dioxins	360	2.6 J
Hexachlorodibenzofurans	-	<0.093
Hexachlorodibenzo-p-dioxins	-	<0.16
Octachlorodibenzofuran	65	-
Octachlorodibenzo-p-dioxin	2300 J	<44
Pentachlorodibenzofurans	-	<0.15
Pentachlorodibenzo-p-dioxins	-	<0.21
Tetrachlorodibenzofurans	-	<0.27
Tetrachlorodibenzo-p-dioxins	8.8	<0.4

PDBS1006	1 Primary PDBS1006S01 4/25/2008	6 Primary PDBS1006S02 4/25/2008
Dioxin_Furans (pg/g)		
2,3,7,8-TCDD_TEQ	1.81	1.23
1,2,3,4,6,7,8-Heptachlorodibenzofuran	8.61	6.38
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	94.2	57.5
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<1.08	<0.794
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.454	<0.332
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.77	<0.495
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.442	<0.319
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	3.18 J	2.05 J
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.581	<0.405
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.48 J	1.09 J
1,2,3,7,8-Pentachlorodibenzofuran	<0.342	<0.205
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.565	<0.421
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.465	0.445 J
2,3,4,7,8-Pentachlorodibenzofuran	<0.356	0.265 J
2,3,7,8-Tetrachlorodibenzofuran	<0.581	<0.426
Heptachlorodibenzofurans	35.2	26.2
Heptachlorodibenzo-p-dioxins	178	118
Hexachlorodibenzofurans	12.8	9.76
Hexachlorodibenzo-p-dioxins	30.2	16.8
Octachlorodibenzofuran	20.3	17.4
Octachlorodibenzo-p-dioxin	1040	494
Pentachlorodibenzofurans	4.15 J	3.7 J
Pentachlorodibenzo-p-dioxins	4.99	5.84
Tetrachlorodibenzofurans	<0.581	<0.426
Tetrachlorodibenzo-p-dioxins	1.34	1.73

PDBS1011	1 Primary PDBS1011S01 4/25/2008	6 Primary PDBS1011S02 4/25/2008
Dioxin_Furans (pg/g)		
2,3,7,8-TCDD_TEQ	0.169	0.059
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.22 J	<1.31
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	11.7	4.35 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.846	<2.06
1,2,3,4,7,8-Hexachlorodibenzofuran	<0.45	<0.434
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.62	<0.51
1,2,3,6,7,8-Hexachlorodibenzofuran	<0.425	<0.437
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	<0.576	<0.471
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.568	<0.557
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.612	<0.501
1,2,3,7,8-Pentachlorodibenzofuran	<0.778	<0.253
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<1.01	<0.403
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.467	<0.456
2,3,4,7,8-Pentachlorodibenzofuran	<0.794	<0.254
2,3,7,8-Tetrachlorodibenzofuran	<0.482	<0.462
Heptachlorodibenzofurans	4.17 J	<1.63
Heptachlorodibenzo-p-dioxins	24.3	8.54
Hexachlorodibenzofurans	1.4 J	<0.468
Hexachlorodibenzo-p-dioxins	3.19 J	0.51 J
Octachlorodibenzofuran	<3.28	<2.67
Octachlorodibenzo-p-dioxin	134 J	50.7
Pentachlorodibenzofurans	<0.786	<0.253
Pentachlorodibenzo-p-dioxins	<1.01	<0.403
Tetrachlorodibenzofurans	0.641 J	<0.462
Tetrachlorodibenzo-p-dioxins	<0.517	<0.49

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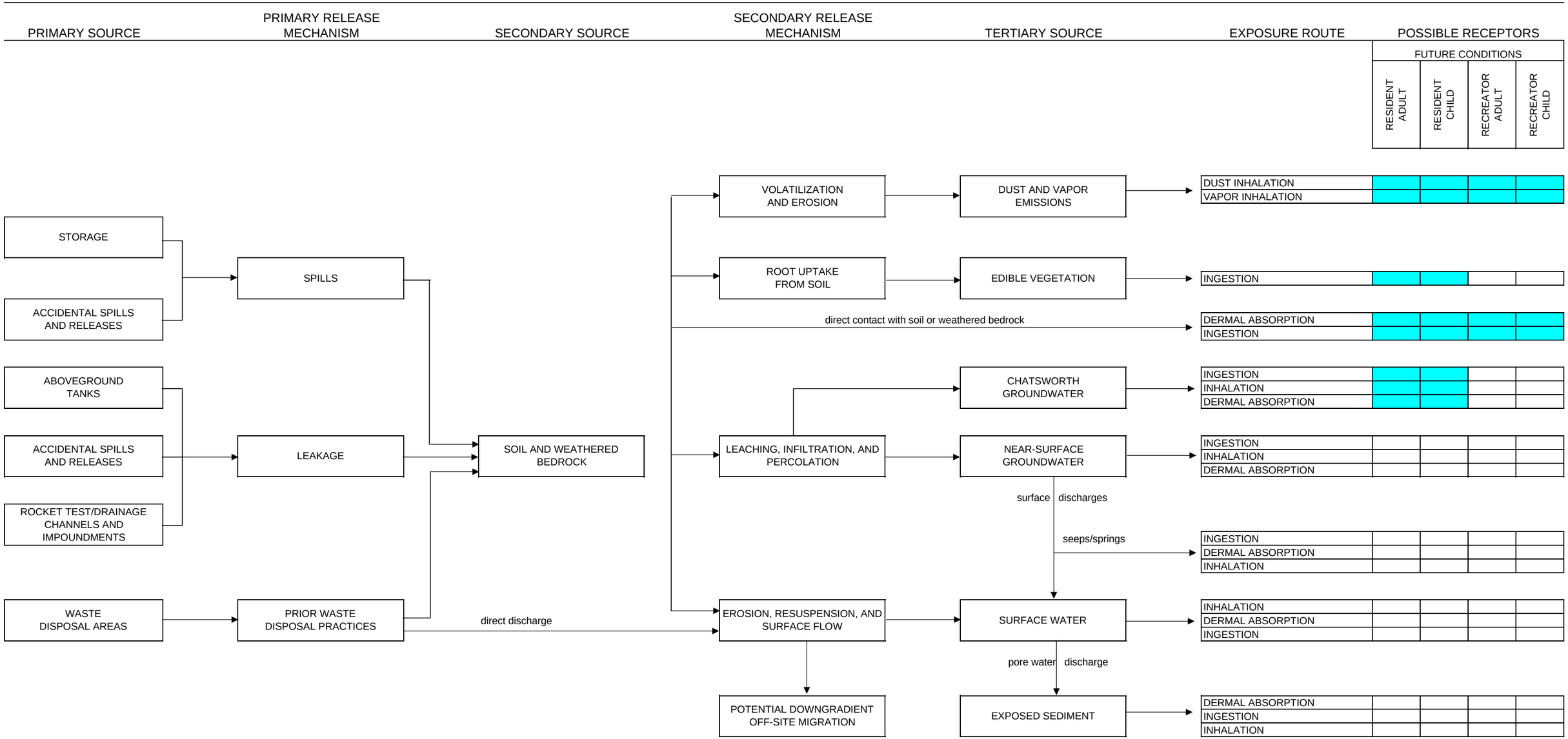
Dioxins Data Results Pond Dredge RFI Site

FIGURE H.3-11

Figure H.4-1

Human Health Risk Assessment Conceptual Site Model

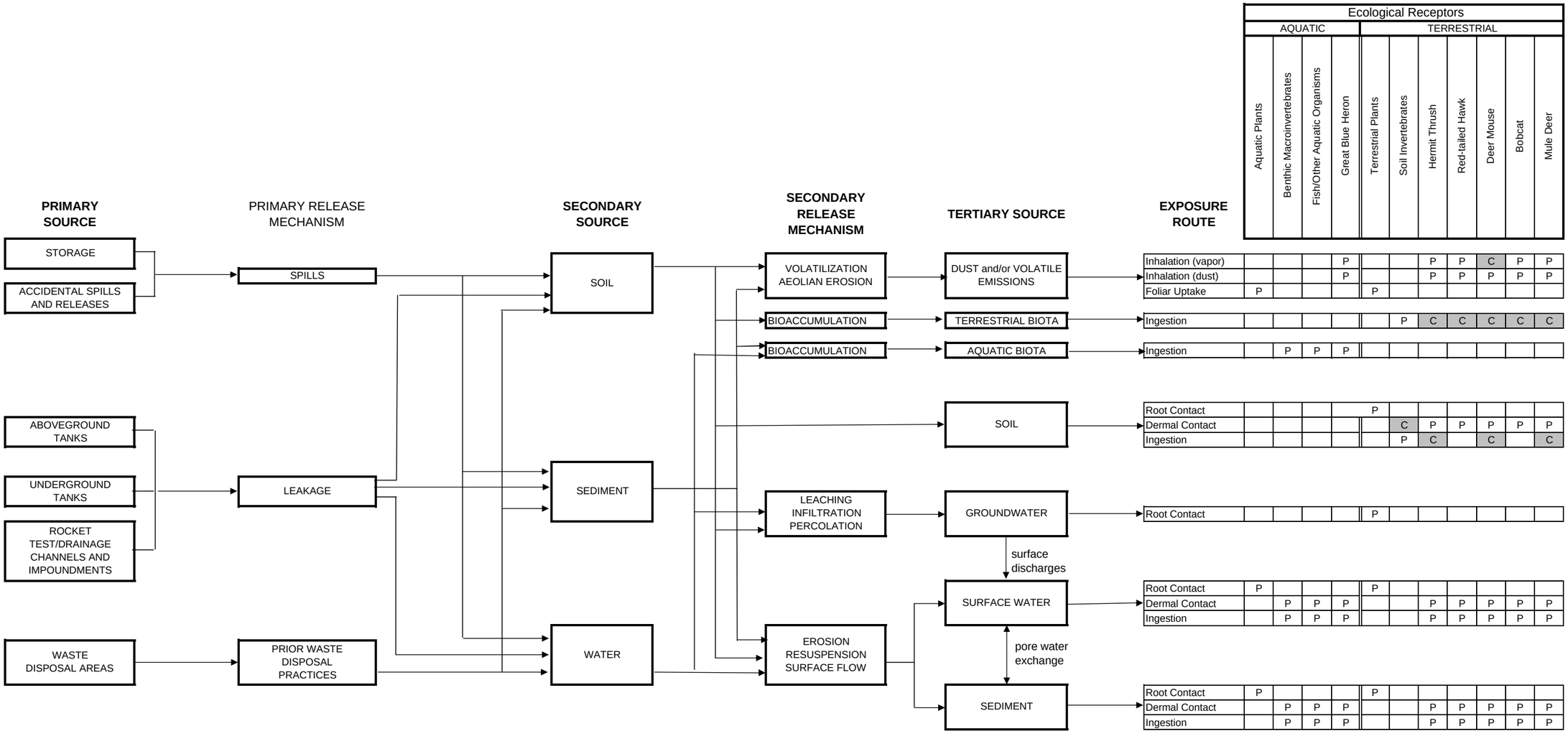
Pond Dredge RFI Site



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.

- complete and potentially complete exposure pathways evaluated in this risk assessment

- incomplete exposure pathways not evaluated in this risk assessment



C - Pathway considered complete for purposes of ecological risk assessment

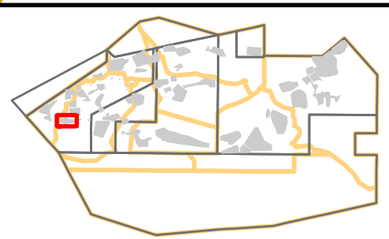
P - Pathway considered potentially complete

Q - Pathway evaluated qualitatively unless site conditions indicate need for quantitative evaluation

Pathways evaluated qualitatively or quantitatively in ecological risk assessment

Figure H.4-2

Ecological Conceptual Site Model
Group 5 RFI Report, Pond Dredge Area
Santa Susana Field Laboratory



Basemap Legend

- Transformer Poles
- Tank - UST
- Tank - AST
- Tank - Not Yet Determined
- Excavation
- Trench
- Leachfield
- Pipe
- Building - Existing
- Building - Removed
- Building - Not Yet Determined
- Transformer - Existing
- Transformer - Removed
- Transformer - Not Yet Determined
- RFI Site - Boeing
- RFI Site - DOE
- RFI Site - NASA
- Investigation Boundary
- RFI Group Boundary
- Administrative Area
- Property Boundary
- Surface Drainage Divide
- Road - Asphalt
- Roads - Dirt
- Rocks
- Streams
- Pond
- Waste Debris Area
- CMS Area

Surficial Media Site Action Recommendations
Pond Dredge RFI Site
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1 inch equals 60 feet

0 60 120 Feet

October 31, 2008

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\\...MapFiles\RFI_05\RFI_Report\RFIGrp5_CMS_BL_PLTS.mxd

WORKING DRAFT

FIGURE H.5-1

Attachments