Remedial Action Plan – Phase 3
Upland Portion of Subunit 2B

Meade Street Operable Unit
University of California, Berkeley

Richmond Field Station
Richmond, California

(Task 4B and 4C, RWQCB Order No. 01-102)

University of California Berkeley
Capital Projects
1936 University Avenue 2nd Floor
Berkeley, California 94720

July 13, 2004

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engineers, scientists, economists

June 28, 2004

Cecilio S. Felix
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Re: Remedial Action Plan – Phase 3, Upland Portion of Subunit 2B,
Richmond Field Station, Richmond, California
BBL Project #: 24210

Dear Mr. Felix:

In compliance with the California Regional Water Quality Control Board, San Francisco Bay Region's (RWQCB) Order No. 01-102, Task 4b and 4c, Blasland, Bouck, and Lee (BBL) is pleased to submit the enclosed document titled *Remedial Action Plan – Phase 3, Upland Portion of Subunit 2B, Meade Street Operable Unit, University of California, Berkeley, Richmond Field Station, Richmond, California, (Task 4B and 4C, RWQCB Order No. 01-102)*(RAP) on behalf of the University of California, Berkeley (UC Berkeley).

If you have any questions of need further information, please call me at (925) 274-1100.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

William B. Copeland
Senior Scientist/Manager

Enclosure

cc:
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Approval

Approvals

I have read and approved this *Remedial Action Plan – Phase 3, Upland Portion of Subunit 2B, Meade Street Operable Unit, University of California Berkeley, Richmond Field Station, Richmond, California (Task 4B and 4C, RWQCB Order No. 01-102)* Report.

Project Name: Richmond Field Station Remediation Project, University of California Berkley, Richmond, California

_____ _____

Michael P. Fleischner, P.E. Date

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Acronyms

AOC	area of concern
BCDC	Bay Conservation and Development Commission
Bgs	below ground surface
BMPs	best management practices
Cap Company	California Cap Company
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CKD	cement kiln dust
COC	chemical of concern
CWA	Clean Water Act
E-SSTLs	ecological site-specific target levels
EBRPD	East Bay Regional Parks District
EPA	Environmental Protection Agency
H-SSTL	human health site-specific target levels
LDR	land disposal restrictions
LFR	Levine Fricke
mg/kg	milligram per kilogram
MSOU	Meade Street Operable Unit
NGVD	National Geodetic Vertical Datum
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollution Discharge Elimination System
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RFS	Richmond Field Station
RWQCB	California Environmental Protection Agency, Regional Water Quality Control Board, San Francisco Bay Region

SSTL	site-specific target levels
SVOC	semivolatile organic compound
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
STLC	Soluble Threshold Limit Concentration
TC	toxicity characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TTLC	Total Threshold Limit Concentration
UC Berkeley	University of California Berkeley
UHC	underlying hazardous constituent
URS	URS Corporation
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UTS	Universal Treatment Standard
VOC	Volatile Organic Compounds
WDID	Waste Discharger Identification
Western Stege Marsh	western portion of Stege Marsh
Zeneca	Zeneca, Inc.

Executive Summary

This Remedial Action Plan (RAP) has been prepared in compliance with the California Environmental Protection Agency, Regional Water Quality Control Board, San Francisco Bay Region's (RWQCB) Order Number 01-102 (the Order), Tasks 4b and 4c. This RAP presents a summary of remedial activities for the 2004 Phase 3 cleanup activities to be conducted at the University of California, Berkeley (UC Berkeley) Richmond Field Station (RFS) property located at 1301 South 46th Street, Richmond, California. The location of the RFS is shown on Figure 1. The RFS has been designated as Subunit 2 of the Meade Street Operable Unit (MSOU) identified in the RWQCB Order. Subunit 2 was further divided into Subunits 2A and 2B as shown on Figure 2. Task 4c of the Order requires a RAP be submitted to the RWQCB for the upland portion of Subunit 2B. This RAP discusses remedial activities for a portion of the Subunit 2B uplands to be remediated in 2004.

This document reports the delineation of upland areas of concern (AOCs) as defined by results of additional investigations performed since October 2002. It summarizes recent analytical data, including data previously reported to the RWQCB in the following documents:

- Field Sampling and Analysis Plan (URS, 1999);
- Field Sampling and Analytical Results (URS, 2000); and
- Results of Additional Investigations, Upland Portion of Subunit 2B (URS, 2002b).

This document also discusses the major remedial design elements for Phase 3 consisting of the following:

- Excavation and backfilling of five upland AOCs (U1, U2 ,U3, U4, and U6);
- Excavation and backfilling of a ditch (new AOC U8) and removing sediment from and pressure-washing concrete drainage channels;
- Abandonment of the northern-most section of the western storm drain line; and
- Excavation of one new and one existing channel and additional grading in the marsh area (AOC M3) that was excavated, backfilled, and graded in Phase 2 in 2003.

A Completion Report documenting completed Phase 3 remedial actions will be submitted to the RWQCB in a separate report in spring 2005.

1. Introduction

On the behalf of the University of California, Berkeley, Blasland, Bouck and Lee (BBL) and URS Corporation (URS), UC Berkeley's environmental consultants, have prepared this Remedial Action Plan (RAP) in compliance with Tasks 4b and 4c of the California Regional Water Quality Control Board, San Francisco Bay Region's (RWQCB) Order No. 01-102 Site Cleanup Requirements (SCR) for Subunit 2B of the Meade Street Operable Unit.

The Richmond Field Station (RFS) is owned by the UC Regents and operated by the University of California, Berkeley (UC Berkeley). It is designated as Subunit 2 of the Meade Street Operable Unit. The RFS is located at 1301 S. 46th Street in Richmond, California as shown on Figure 1. Subunit 2 was divided by the RWQCB into two subunits. Subunit 2A consists of the southeastern portion of the RFS for which UC Berkeley and Zeneca are named as joint responsible parties. Subunit 2B consists of the northern and western portion of the RFS for which UC Berkeley is named as the sole responsible party. The location of Subunit 2A and 2B and their respective boundaries are shown on Figure 2. A large portion of the RFS property was previously owned by the California Cap Company (Cap Company), a manufacturer of blasting caps from 1877 to 1948. The majority of the impacts to upland soil are believed attributable to Cap Company operations. Since its purchase in October 1950, UC Berkeley has used the RFS uplands and marsh for research and educational activities.

Remediation of the marsh portion of Subunit 2 has been scheduled in multiple phases primarily due to permit restrictions that permit work in the marsh only from September 1st through January 31st. Marsh work is not permitted outside this period due to the endangered California clapper rail breeding season. Phases 1 and 2 were performed in 2002 and 2003, respectively, to remediate the upland and marsh portions of Subunit 2A and two areas in the marsh portion of Subunit 2B. Phase 3, the subject of this RAP, will address remediation in six areas in the upland portion and grading in the marsh portion of Subunit 2B as shown on Figure 3. Remediation of the remaining marsh portion of Subunit 2B is not anticipated to begin before fall 2006.

The SCR Task 4b states:

"The dischargers shall submit a technical report, acceptable to the Executive Officer, which provides the results of investigations implemented as described in the technical report required in Task 4a. If necessary, the report shall propose additional soil and/or groundwater sampling in order completely define the extent of pollution in the upland portion of Subunit 2B."

As required by Task 4b, this RAP presents the results from investigations performed by BBL and URS following submittal of "Results of Additional Soil and Groundwater Investigation" (URS, 2002b). Sampling methodology and rationales are described in "Workplan for Additional Soil and Groundwater Investigation, Upland Portion of Subunit 2B, Richmond Field Station" (Workplan) (URS, 2002a). The Workplan was submitted to the RWQCB as required in Task 4a.

The results of previous sampling events in the upland area are discussed in the following reports submitted to the RWQCB:

- Field Sampling and Analysis Plan (URS, 1999);
- Field Sampling and Analytical Results (URS, 2000); and
- Results of Additional Investigations, Upland Portion of Subunit 2B (URS, 2002b).

The objectives of the investigation performed under Task 4b were to delineate the extent of chemicals of concern (COCs) in the upland portion of Subunit 2B and develop information necessary to complete the RAP for Subunit 2B. This report presents the Phase 3 RAP.

The SCR Task 4c states:

"The dischargers shall submit a technical report, acceptable to the Executive Officer, which provides a remedial action plan for the upland portion of Subunit 2B. The report shall include detailed design criteria, construction details, and procedures and schedule for implementation of the remedial measures, as well as a residual Risk Management Plan for pollutants that may remain on-site post remediation."

To develop the RAP, the investigation focused on seven AOCs identified through previous sampling events that contain elevated concentrations of metals in the upland portion of Subunit 2B. The AOCs are defined as areas that have concentrations of COCs that exceed levels of acceptable risk to human health or the environment as identified in UC Berkeley's report titled "Human Health and Ecological Tiered Risk Evaluation, University of California Berkeley, Richmond Field Station/Stege Marsh" (risk assessment) (URS, 2001). The investigated areas were initially identified during a review of historical operations at the RFS. Following the discovery of elevated COCs in these areas, subsequent rounds of sampling were performed to delineate the horizontal and vertical extent of the AOCs. AOCs, that are to be remediated under the Phase 3 RAP and presented on Figure 3, are a subset of the AOCs identified in the risk assessment, and include the following:

- AOC U1 – Cap Company Explosives Storage Area;
- AOC U2 – Cap Company Test Pit Area;
- AOC U3 – Forest Products Area;
- AOC U4 – Cap Company Shell Manufacturing Area; and
- AOC U6 – Heron Drive Area.

Two additional areas, AOCs U5 and U7 (the Mercury Fulminate Area) will not be included in Phase 3 remedial actions and are not discussed in the investigation results and RAP included in this report for the following reasons:

- AOC U5 consists of an area of pyrite cinders in West Area 4 just north of the marsh and "bulb" fill area. This area is still being investigated and will be addressed at a later date; and

- AOC U7 consists of mercury-bearing soil at the southern boundary of the upland portion of Subunit 2B and just north of Area 4. A large portion of the AOC lies beneath an asphalt treatment pad that will be used for the treatment of marsh sediments during Phase 4. The remediation of this AOC will be addressed in a subsequent phase at a later date.

During an evaluation of the surface drainage system, polychlorinated biphenyls (PCBs) were detected in a ditch along Lark Drive near the western storm drain (AOC U8). Additional sampling was performed in and adjacent to drainage features in the northwestern upland area that connected to the western storm drain since PCBs were found in the marsh at the outfall. Remedial activities in a portion of AOC U8 and the northern portion of the Western Storm Drain are included in Phase 3 and are discussed in this RAP.

Phase 3 activities include final grading work to be performed in AOC M3 in the marsh portion of Subunit 2B. This area was excavated, backfilled, and graded during Phase 2 in 2003. However, work remaining in this area includes the excavation of a new channel that will be configured similar to the original channel and the widening

of an existing channel that extends into the eastern portion of the marsh. The channel work will enhance tidal flushing of the eastern portion of the Subunit 2A marsh.

1.1 Site Description

The RFS site shown on Figure 1 consists of both upland and offshore areas. The offshore area consists of an inner and outer portion of Western Stege Marsh. The outer portion of Western Stege Marsh (approximately 60 acres) is located south of the East Bay Regional Parks District's (EBRPD) Bay Trail and includes tidal mud flats, marsh, and open water. The upland area occupies approximately 90 acres. The inner marsh including the fill area known as the bulb occupies approximately 12 acres. A 100-foot strip of Western Stege Marsh on either side of the EBRPD Bay Trail is owned by the EBRPD. Meeker Slough, the source of tidal flushing for Western Stege Marsh, is located along the western boundary of the RFS property and is owned by the City of Richmond.

1.2 Report Organization

This report is organized as follows:

- Section 2 presents the methods and results of additional soil and groundwater investigations in the upland portion of Subunit 2B;
- Section 3 discusses the remedial design details for the upland portion of Subunit 2B and the marsh channels;
- Section 4 discusses permits and regulatory requirements; and
- Section 5 lists references relating to this report.

2. Results of Additional Investigation

2.1 Field Activities

This section provides a summary of the field activities performed by URS and BBL during the recent investigation including:

- Collection and analysis of soil samples to further delineate the upland AOCs;
- Collection and analysis of groundwater samples down gradient from five of the AOCs to evaluate potential impacts of COCs to groundwater; and
- Measurement of groundwater levels in temporary piezometers to evaluate the groundwater flow direction.

2.1.1 Soil Sampling

URS and BBL have collected 206 soil samples from 86 Geoprobe borings since the submission of the report discussing results of the additional upland characterization to the RWQCB in October 2002 (URS, 2002b). Since the initial investigation by URS in 2000, a total of 278 samples from 112 borings have been analyzed to define the boundaries of the AOCs. The boring locations are shown on Figures 4 through 9. The total number of borings and samples for the various AOCs is as follows:

	Name of Area	No. of Borings	No. of Samples Analyzed
AOC U1	Cap Explosives Storage	34	84
AOC U2	Cap Test Pit	19	41
AOC U3	Forest Products ditch	17	30
AOC U4	Cap Shell Manufacturing	28	52
AOC U6	Heron Drive	12	37
AOC U8	Lark Drive ditch	3	34

During the earlier rounds of the investigation, borings were generally installed to 10 to 15 feet bgs. As the shallow extent of COCs became apparent, borings were installed to 4 to 6 feet bgs. At virtually all locations, the vertical extent of COCs was defined by an analytical result for the deepest sample that was below the screening criteria. The horizontal extent of the AOCs was defined by stepping out from locations with concentrations of COCs that exceeded the screening criteria. This process of stepping out was repeated until soil sample analytical results were below the screening criteria.

Soil and groundwater sampling locations are shown on Figures 4 through 9. Boring logs for each boring are presented in Appendix A. Curtis & Tompkins Laboratory in Berkeley, California, a state-certified analytical laboratory, analyzed samples for priority pollutant metals by EPA Method 6010B, pH by EPA Method 9045C, and moisture content. Selected samples were analyzed for PCBs by EPA Method 8082. The results of the metal analysis for soil samples are discussed below in Section 2.2. Metals and pH data are summarized in Table 1.

The PCB sample results are presented in Table 2. The Quality Assurance/Quality Control review of the analytical data is presented in Appendix B.

2.1.2 Groundwater Sampling

BBL collected five grab groundwater samples from temporary well points approximately 30 feet down gradient of AOCs U1, U2, U3, U4, and U6. The locations are shown on Figures 4 through 7. The borings were installed under Contra Costa County permit number WP0002446 to a depth of 20 feet below ground surface (bgs) by Precision Sampling. A 10-foot section of solid PVC casing above a 10-foot section of screened casing was temporarily placed in the boring. Following recovery of the groundwater level, the borings were sampled for priority pollutant metals and pH. The boring down gradient from AOC U3 was also analyzed for VOCs because of its proximity to a previously reported VOC plume on the Cherokee Simeon Ventures (CSV) property to the east, formerly owned by Zeneca. Low-flow sampling techniques were used to minimize potential volatilization. Analytical results for the groundwater samples are discussed in Section 2.2.2. Metals and VOC results are summarized in Tables 3 and 4, respectively.

2.2 Analytical Results

2.2.1 Soil Sampling Results

Prior to 1999, several environmental investigations were performed at the RFS. These investigations are summarized in the Field Sampling and Analysis Plan and Tiered Risk Evaluation (URS, 1999). During file reviews of previous investigations prior to 1999, historical sampling locations were shown on maps but surveyed coordinates were not available. Since the locations of previous samples are approximate, they were not used to delineate AOCs but were used as a guide to establish sample areas. Locations sampled by URS and BBL since 1999 have been surveyed and are shown on Figures 4 through 9, distinguished by round dots, with the historical sampling locations shown by squares.

Site-Specific Target Levels for human (H-SSTLs) and ecological (E-SSTLs) receptors were developed and submitted to the RWQCB in the risk assessment (URS, 2001). SSTLs are used to identify areas that may pose unacceptable risk. Relevant ecological receptors on the RFS are the red-tailed hawk and ground squirrel; human health receptors are industrial workers and construction workers. Analytical results for historical and recent soil samples were screened against SSTLs and are summarized in Tables 1 and 2. Recent samples that exceeded the lowest of the H-SSTLs and E-SSTLs were used to define the lateral and vertical boundaries of the AOCs. The horizontal and vertical boundaries of the AOCs were selected as a series of points approximately mid-way between locations that exceeded the SSTLs and locations that were below the SSTLs.

The history, historical sampling, and analytical results within each of the AOCs are discussed below.

2.2.1.1 AOC U1 – Cap Company Explosive Storage Area

AOC U1 is located near an area believed to have been used by the Cap Company for the storage of blasting caps and/or their explosive components. AOC U1 is shown on Figure 4. Six historical samples contained copper exceeding the E-SSTL of 412 mg/kg. The maximum copper concentration reported was 736 mg/kg.

Of the nine recent sampling locations that exceeded SSTLs within the boundaries of the AOC, three samples contained arsenic exceeding the H-SSTL of 27.3 mg/kg. The maximum concentration of arsenic detected was 67 mg/kg. Eight samples contained copper exceeding the E-SSTL of 412 mg/kg. The maximum concentration of copper detected was 1,400 mg/kg. One sample contained lead exceeding the E-SSTL of 437 mg/kg. The

concentration of lead in this sample was 750 mg/kg. The maximum depth of exceedances was 2.5 feet below ground surface (bgs). Soil at these locations will be removed as a remedial measure in this AOC. Sampling locations, AOC boundary, and COC exceedances are shown on Figure 4. Cross sections of the AOC are presented on Figures 10 and 11. Exceedance locations and depths are also indicated. Locations of the cross section lines are shown on Figure 12.

2.2.1.2 AOC U2 – Cap Company Test Pit Area

AOC U2 is located near an area believed to have been used by the Cap Company for explosive testing of blasting caps. The location of AOC U2 is shown on Figure 3. Three historical samples contained copper exceeding the E-SSTL of 412 mg/kg. The maximum copper concentration detected was 1,600 mg/kg. One sample contained zinc exceeding the E-SSTL of 760 mg/kg. The concentration of zinc in this sample was 820 mg/kg.

Of the six recent sampling locations that exceeded SSTLs within the boundaries of the AOC, one sample contained arsenic exceeding the H-SSTL of 27.3 mg/kg. The concentration of arsenic in this sample was 56 mg/kg. Six samples contained copper exceeding the E-SSTL of 412 mg/kg. The maximum concentration of copper detected was 4,000 mg/kg. The maximum depth of the exceedances was 2.5 feet bgs. Soil at these locations will be removed as a remedial measure in this AOC. The sampling locations, AOC boundary, and COC exceedances are shown on Figure 4. Cross sections of the AOC are presented on Figures 13 and 14. Sample exceedance locations and depths are also indicated. The locations of the cross section lines are shown on Figure 12.

During paving activities in June 2004 on Egret Way within AOC U2, the asphalt and an approximately 6-inch soil layer below the pavement was excavated. A composite soil sample was collected from the exposed surface as well as the stockpile of removed soil. The soil samples were analyzed for metals, PCBs, and pH. All metals and PCB concentrations were below the SSTLs. The results of the soil sampling beneath the road are shown in Table 3.

2.2.1.3 AOC U3 – Forest Products Area Ditch

AOC U3 is located in a drainage ditch near an area used by the RFS Forest Products Lab for the research of wood preservatives. The location of AOC U3 is shown on Figure 3. Three historical samples did not contain COCs exceeding the SSTLs.

Of the five recent sampling locations that exceeded SSTLs within the boundaries of the AOC, four samples contained arsenic exceeding the H-SSTL of 27.3 mg/kg. The maximum concentration of arsenic detected was 150 mg/kg. Two samples contained copper exceeding the E-SSTL of 412 mg/kg. The maximum concentration of copper detected was 1,000 mg/kg. The maximum depth of the exceedances was 0.5 feet bgs. Soil at these locations will be removed as a remedial measure in this AOC. The sampling locations, AOC boundary, and COC exceedances are shown on Figure 5. A cross section of the AOC is presented on Figure 15 showing sample exceedance locations and depths. The location of the cross section line is shown on Figure 16.

2.2.1.4 AOC U4 – Cap Company Shell Manufacturing Area

AOC U4 is located near an area believed to have been used by the Cap Company for the manufacturing of blasting caps and/or their components. The location of AOC U4 is shown on Figure 3. Two historical samples contained exceedances. Arsenic was reported at 126 mg/kg exceeding the H-SSTL of 27.3 mg/kg. Copper was

reported at 804 mg/kg exceeding the E-SSTL of 412 mg/kg. Lead was reported at 741 mg/kg exceeding the E-SSTL of 437 mg/kg.

Of the eight recent sampling locations that exceeded SSTLs within the boundaries of the AOC, two samples contained arsenic exceeding the H-SSTL of 27.3 mg/kg. The maximum concentration of arsenic detected was 35 mg/kg. One sample contained 170 mg/kg chromium, which exceeded the E-SSTL of 157 mg/kg. Seven samples contained copper exceeding the E-SSTL of 412 mg/kg. The maximum concentration of copper detected was 1,100 mg/kg. Two samples contained lead exceeding the E-SSTL of 437 mg/kg. The maximum concentration of lead detected was 1,000 mg/kg. One sample contained 140 mg/kg mercury exceeding the E-SSTL of 42 mg/kg. The maximum depth of the exceedances was 0.5 feet bgs. Soil at these locations will be removed as a remedial measure in this AOC. The sampling locations, AOC boundary, and COC exceedances are shown on Figure 6. Cross sections of the AOC are presented on Figures 17 and 18. Sample exceedance locations and depths are also indicated. The locations of the cross section lines are shown on Figure 19.

2.2.1.5 AOC U6 – Heron Drive Area

AOC 6 is located along West Heron Drive south of Building 128 and adjacent to the former seawall in the south central area of the RFS shown on Figure 3. Two historical surface soil samples were reported to contain elevated levels of mercury (up to 97.8 mg/kg) in excess of the E-SSTL (42 mg/kg).

Of the three recent sampling locations that exceeded SSTLs within the boundaries of the AOC, two samples contained arsenic exceeding the H-SSTL of 27.3 mg/kg. The maximum concentration of arsenic detected was 87 mg/kg. Two samples contained PCBs exceeding the SSTL of 10 mg/kg. The maximum concentration of PCBs detected was 8.2 mg/kg. The maximum depth of the exceedances was 4.5 feet bgs. Soil at these locations will be removed as a remedial measure in this AOC. The sampling locations, AOC boundary, and COC exceedances are shown on Figure 7. Cross sections of the AOC are presented on Figures 20 and 21. Sample exceedance locations and depths are also indicated. The locations of the cross section lines are shown on Figure 22.

2.2.1.6 AOC U8 – Lark Drive Ditch and Western Storm Drain

Because PCBs were found in the marsh at the outfall of the western storm drain, additional sampling was performed in the western storm drain, the upland surface drainage system and upland areas to assess the source of PCBs. The western storm drain, shown on Figure 8 extending from a sewer line on the northern adjacent property to the marsh, was originally a sewer overflow line. The adjacent property north of the RFS was previously owned by PG&E.

In April 2003, a camera survey was performed of the storm drain pipe from the northern-most, on-site manhole, designated MH-11, to the outfall in the marsh. The purpose of the camera survey was to evaluate the integrity of the line. No major disruptions in the pipe such as collapse, blockages, or penetration by tree roots were observed. The line was observed to be mostly free of sediment. High water marks show that high tides and/or storm water surges have extended almost as far north of the marsh as AOC U8 shown on Figure 9. North of MH-11 could not be observed due to major blockage with tree roots.

Two sediment samples were collected from manholes along the western storm drain. One sediment sample containing 42 mg/kg PCBs was collected from the northern-most manhole on the property, MH-11. Another sediment sample was collected from the southern-most manhole just upstream of the marsh. This sample, SD2-5, contained 7.2 mg/kg PCBs. Two samples of trench backfill were collected at a depth below the bottom of the

pipe in the section north of MH-11 to the northern property boundary. These samples did not contain PCBs exceeding the reporting limit. The locations are shown on Figure 8.

In addition, 49 soil and sediment samples were collected and analyzed from 33 locations for PCBs from drainage features that drain into the western storm drain. Although the H-SSTL for PCBs in the upland area is 10 mg/kg, for protection of the marsh, this RAP addresses areas exceeding 3 mg/kg that have the potential of eroding into the marsh. Samples from six of seven locations exceeding 3 mg/kg PCBs are located in a central area of the RFS adjacent to Lark Drive and south and east of Building 277. This area is identified as AOC U8 on Figure 3. These locations are within an open ditch, a concrete-lined ditch, or catch basins. The highest concentration, 445 mg/kg PCBs at location SD2-10, is believed to be an anomaly because it could not be repeated and the next highest concentration in four soil samples taken from the same location is 11 mg/kg. These are the only results exceeding the H-SSTL of 10 mg/kg. Other samples with PCB concentrations between 3 mg/kg and 10 mg/kg, occur in pipes and shallow concrete drains for a distance of approximately 215 feet upstream from the ditch as shown on Figure 9.

The seventh location where a sample exceeds 3 mg/kg was collected from a depth of 0.7 feet adjacent to a manhole on the western storm drain just north of Building 277. The concentration of this sample was 6.9 mg/kg. Surface water from this area drains into the manhole. An enlargement of this area, showing sampling locations with PCB concentrations above 3 mg/kg, is shown on Figure 9.

During repaving activities in the area, the asphalt covering the parking area between Building 276 and Lark Drive, shown on Figure 9, was removed as well as a layer of soil a few inches thick. A composite sample from the stockpile of this material was analyzed for metals, PCBs, and pH. All metals and PCB concentrations were below the SSTLs. The results of the soil sampling beneath the paved area are shown in Table 3.

UC Berkeley believes this area in the central portion of the RFS is not the source of PCBs in the marsh because PCBs in the marsh were detected up to 61,000 mg/kg and PCBs in AOC U8 occur up to 11 mg/kg. We believe the source of marsh PCBs is the sanitary sewer overflow upstream from the RFS. The sewer overflow pipe, currently known as the Western Storm Drain, also serves as a drain for storm water on portions of the RFS site. This pipe appears to have been a former storm drain and/or sanitary sewer flowing directly to the marsh from offsite.

2.2.2 Groundwater Sampling Results

Analytical results for dissolved metals in groundwater down gradient of AOCs U1, U2, U3, U4, and U6 and VOCs down gradient of AOC U3 are summarized in Tables 3 and 4, respectively. Because the sampling locations are greater than 50 feet from the San Francisco Bay/Stege Marsh shoreline in the upland area, metals are screened against 10 times the USEPA Ambient Water Quality Criteria (AWQC) for saltwater continuous concentration. The precedent for these screening criteria was set by the RWQCB Order No. 98-072 (RWQCB, 1998) due to the predicted attenuation of constituents in groundwater.

Metals – Dissolved metals results for grab groundwater samples analyzed by EPA Method 6010 are summarized in Table 4. Groundwater in two of the five sampled locations exceeded the screening criteria. These locations are down gradient of AOC U2 and AOC U6 and their locations are shown on Figures 4 and 7, respectively. In AOC U2, the Test Pit Area, copper was reported at 140 ug/L (the screening concentration is 31 ug/L), mercury was reported at 0.27 ug/L (the screening concentration is 0.25 ug/L), and nickel was reported at 450 ug/L (the screening concentration is 82 ug/L). In AOC U6, the Heron Drive Area, mercury was reported at 0.92 ug/L (the screening concentration is 0.25 ug/L) and nickel was reported at 93 ug/L (the screening concentration is 82 ug/L).

VOCs – Volatile organic compound (VOC) results for groundwater samples are summarized in Table 5. The reported results for all the VOC compounds analyzed by EPA Method 8260 are non-detect.

In summary, the concentrations of dissolved metals only slightly exceed the screening criteria at two locations for up to three metals. The screening criteria for metals are 10 times the USEPA Ambient Water Quality Criteria (AWQC). Use of these criteria is consistent with "Basis for Groundwater Action Levels" in the RWQCB Order No. 98-072. These screening criteria were adopted for locations greater than 50 feet from San Francisco Bay because dissolved metal concentrations would attenuate within the 50 feet. Because AOC U2 and AOC U6 are approximately 1,200 feet and 250 feet from the shoreline, respectively, additional attenuation would be expected as well as the improvement of groundwater quality at these locations following remediation of AOCs U2 and U6. Because surface water will be monitored in Western Stege Marsh, we do not believe that groundwater monitoring is warranted down gradient from these AOCs.

2.2.3 Temporary Piezometers

In 2002, URS constructed three piezometers at locations PB18 through PB20. The piezometers were installed to assess the direction of groundwater flow. Piezometers were constructed using ¾" PVC to a depth of 16 feet bgs. Survey data and water level measurements are summarized in Table 6. Groundwater levels, measured in May 2004, indicate that the groundwater flow direction in the southeastern portion of the RFS site adjacent to the CSV property boundary is southwesterly (S 36^{o} W). The approximate groundwater flow direction is shown on Figure 3.

3. Remedial Activities for the Upland Portion of Subunit 2B

This section presents the Phase 3 RAP including remedial activities for grading channels in portions of the marsh in Subunit 2B and for remediation of the following upland areas of Subunit 2B:

- AOC U1 – Cap Company Explosives Storage Area;
- AOC U2 – Cap Company Test Pit Area;
- AOC U3 – Forest Products Area ditch;
- AOC U4 – Cap Company Shell Manufacturing Area;
- AOC U6 – Heron Drive Area; and
- AOC U8 – Lark Drive ditch.

On behalf of UC Berkeley, BBL and URS prepared this RAP in compliance with the RWQCB Order Number 01-102, Task 4c for remedial activities to be conducted on the RFS.

The major remedial design elements for Subunit 2B consist of the following:

- survey of the remediation/excavation areas;
- excavation of impacted soil with possible treatment with limestone or cement kiln dust (CKD);
- disposal of excavated soil at an appropriate off-site facility; and
- compaction and grading of soil certified clean through testing criteria discussed in Section 3.2.

Variations from this general plan are discussed in the appropriate sections below. Following remediation, disturbed areas will be landscaped or developed by UC Berkeley. A Completion Report documenting the completed Phase 3 remedial action will be submitted to the RWQCB under a separate report in spring 2005.

3.1 Phase 3 Remediation

The following sections summarize the Subunit 2B Upland remedial activities to be performed during Phase 3, as discussed with the RWQCB during monthly meetings. The goal of the upland remediation activities is to remove exposed areas containing COCs that exceed proposed SSTLs, as assessed by delineation soil sampling presented in Section 2, or that pose a potential for migration to the marsh. Areas were identified by screening analytical data for each sample collected in Subunit 2B against the lower of E-SSTLs or H-SSTLs developed for the RFS. Sample locations with COCs above their respective SSTLs are shown on Figures 4 through 9 and listed in Tables 1 and 2. Locations sampled by URS or BBL without a listed concentration have COC concentrations below the SSTLS Soils with metals in excess of proposed SSTLs or visual surface pyrite cinders are identified for excavation. Delineation soil sampling, as discussed verbally with the RWQCB and in Section 2, adequately established the lateral and vertical extent of concentrations of COCs that exceed the SSTLs. Therefore, confirmation sampling will not be performed. Excavated soil will be disposed in an appropriate landfill, either Class I or Class II depending on the results of waste characterization sampling discussed in Section 3.3. UC Berkeley is considering the option of treating Class I soil with a reagent such as limestone or CKD to reduce the leachability of metals for acceptance into a Class II landfill. If treatment is performed, soil samples will be analyzed to evaluate conformance with landfill acceptance criteria. Erosion control measures will be implemented per the Storm Water Pollution Prevention Plan (SWPPP). Landscaped areas will be returned to their original condition. The following sections detail activities to be performed during Phase 3

activities. A summary of characteristics of each AOC, including COCs, area, volume to be excavated, and soil disposal locations, are shown on Table 7.

3.1.1 AOC U1 Remedial Activities

AOC U1 lies in an open field in the central portion of the RFS at an elevation of approximately 19 feet National Geodetic Vertical Datum (NGVD). A thin layer of pyrite cinders, less than 1 inch, occurs in scattered areas. Any observed cinders will be excavated. The surface area of the AOC excavation will be approximately 29,200 square feet and the volume will be approximately 1,630 cubic yards (cy). Most of the excavation will be to a depth of 1 foot bgs with a relatively small portion to a depth of 3 feet bgs. The excavation boundaries and depths are shown on Figure 4. A summary of the proposed remedial activities is provided in Table 7.

Following excavation, the area will be backfilled with clean backfill soil. The soil originated from a construction site on the main UC Berkeley campus and is currently stockpiled on-site in Area 4 of Subunit 2A. The soil has been tested according to the criteria discussed below in Section 3.2 prior to import on-site during Phase 2. The area will be compacted and graded to the surrounding elevation

3.1.2 AOC U2 Remedial Activities

The majority of AOC U2 lies beneath paved streets in the central portion of the RFS at an elevation of approximately 20 feet NGVD. The portions of the AOC that consist of roadways and are capped by asphalt were designated to be left in place because these areas do not pose a risk of exposure under the current use. These areas were recommended for additional investigation if the roads are removed during future development. The surface area of the excavation outside of the roadway will be approximately 4,595 square feet and the volume will be approximately 240 cy. Most of the excavation will be to a depth of 1 foot bgs with a relatively small portion to a depth of 3 feet bgs. Excavation boundaries and depths are shown on Figure 4. A summary of proposed remedial activities is provided in Table 7.

Following excavation, the area will be backfilled with clean soil. Backfill is currently stockpiled on-site and has been tested according to criteria discussed in Section 3.2. The area will be compacted and graded to the surrounding elevation.

3.1.3 AOC U3 Remedial Activities

The majority of AOC U3 lies in a ditch or grassy swale down gradient from a 4-inch diameter storm drain outfall. The AOC occurs at an elevation of approximately 21 feet. Based on delineation sampling, the top 1 foot of soil will be excavated within and adjacent to the swale. The surface area of the excavation will be approximately 963 square feet and will be approximately 20 cy in total volume based on an excavation depth of approximately 1 foot bgs. Excavation boundaries and depths are shown on Figure 5. A summary of proposed remedial activities is provided in Table 7.

Following excavation, the area will be backfilled with clean soil. Backfill is currently stockpiled on-site and has been tested according to criteria discussed in Section 3.2. The area will be compacted and restored to the previous elevation and condition.

3.1.4 AOC U4 Remedial Activities

AOC U4 lies in an open field in the south central portion of the RFS at an elevation of approximately 15 feet NGVD. A thin layer of pyrite cinders, less than 1 inch thick, occurs at the ground surface in scattered areas. An

approximately 4 inch layer of cinders was observed in post holes excavated for Phase 2 fencing. Also, a thin layer of cinders has been observed at depths of approximately 0.5 feet to 1 foot bgs in borings. These areas are included in the AOC. Any cinders observed in the vicinity of the AOC will be excavated as well. The surface area of the AOC excavation will be approximately 18,900 square feet and the volume will be approximately 700 cy based on an estimated excavation depth of 1 foot. Excavation boundaries and depths are shown on Figure 6. A summary of proposed remedial activities is provided in Table 7.

Following excavation, the area will be backfilled with clean soil. Backfill is currently stockpiled on-site and has been tested according to criteria discussed in Section 3.2. The area will be compacted and graded to the surrounding elevation.

3.1.5 AOC U6 Remedial Activities

AOC U6 lies in an open area in the south central portion of the RFS at an elevation of approximately 10 feet NGVD. This area was regraded during Phase 2 and a portion of it was removed during installation of a temporary storm drain. The surface area of the AOC excavation will be approximately 3,496 square feet and approximately 388 cy in total volume based on a maximum estimated excavation depth of 5 feet. Excavation boundaries and depths are shown on Figure 7. A summary of proposed remedial activities is provided in Table 7.

Following excavation, the area will be backfilled with clean soil. Backfill is currently stockpiled on-site and has been tested according to criteria discussed in Section 3.2. The area will be compacted and graded to the surrounding elevation.

3.1.6 AOC U8 and North End of Western Storm Drain Remedial Activities

AOC U8 is located in storm drain ditches and drains in a portion of the Subunit 2B Upland adjacent to Lark Drive and Building 277. This area was selected for Phase 3 remediation due to potential migration of PCB impacted soil into the marsh via the western storm drain. Remedial activities will occur in the following two separate areas:

- The central portion of the RFS shown as AOC U8 on Figures 3 and 9 – To reduce the risk of the erosion of soil containing greater than 3 mg/kg PCBs into the marsh, three activities will be performed as follows: 1) Approximately 215 linear feet of concrete pipe and open concrete ditches will be vacuumed and pressure-washed to remove PCB-impacted sediment in these sections. Wash water will be collected, tested, and disposed of in accordance with Title 22 of the California Code of regulations; 2) Approximately 70 linear feet of open ditch will be excavated to a depth of approximately 2 feet bgs and backfilled to the existing grade with clean soil capped with drain rock. The excavation area surface will be approximately 280 square feet and the volume of excavated soil will be approximately 20 cy; and 3) Soil will be excavated in an area approximately 10 feet in diameter and 2 feet deep surrounding a manhole just north of Building 277 (Figure 9);

- The northern approximately 430-foot portion of the western storm drain between manhole MH-11 and the property boundary, as shown on Figure 8 - In order to abandon this portion of the pipe, UC Berkeley contractors will excavate potholes in two locations to a depth of approximately 13 feet bgs just north of manhole MH-11 and just south of the northern property boundary. The excavation will intersect the storm drain pipe and sidewalls and bottom of the former trench excavation. Sediment samples from within the pipe and trench backfill samples will be collected for PCB congener analysis. The bottom portions of the excavations will be backfilled with grout to seal both ends of the pipe and

trench in this section to separate the storm drain from the sewer line north of the RFS that flows west to the Richmond Treatment Plant. Because PCBs bind to soil particles, this procedure will lessen the risk of PCB migration to the marsh from this portion of the storm drain pipe. Excavations will be backfilled with excavation spoils, compacted, and graded to the surrounding ground surface.

3.1.7 AOC M3 Restoration Activities

Phase 3 activities to enhance the restoration by increasing tidal flow and increasing cordgrass habitat within AOC M3 of Subunit 2B will consist of grading a portion of M3 to the design elevations and excavating a new channel in the clean Bay Mud backfill that was placed during Phase 2. This work was not done in 2003 due to the time constraints posed by the beginning of the California clapper rail breeding season. In addition to creating the M3 channel, a short section of previously existing channel at the southern boundary of AOC M3 will be widened to improve tidal flushing to the remediated portion the Subunit 2A marsh. The location of this proposed work is shown on Figure 3.

3.2 Backfill Acceptance Criteria

Soil designated for excavation during Phase 3 will be disposed at an appropriate offsite facility. Excavated areas will be backfilled with clean material. The total volume of backfill required is approximately 3,200 cy. Excavation volumes are shown in Table 7. These volumes are estimates and are not final replacement volumes. Approximately 1,600 cy of the required backfill are currently stockpiled at the RFS. This material originated from the Stanley Hall construction project on the main UC Berkeley campus, has been tested according to the protocol discussed below, and was used as backfill during Phase 2 remedial activities. Any additional material required will be tested using the analytical protocol below.

Samples of backfill material should be collected from a secure stockpile of material located either onsite or at the borrow site. Samples may also be collected in-situ prior to excavating fill material. Characterization samples will be collected from soil representative of material to be used in excavation areas. Backfill material will be sampled at the rate of one four-point composite sample per 1,000 to 5,000 cubic yards depending on the volume and homogeneity of the source. Each composite sample will be analyzed for priority pollutant metals, PCBs, pesticides, VOCs, polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) as motor oil and diesel. The following table summarizes the analytical parameters and analytical methods:

Parameter	Analytical Method
Priority Pollutant Metals	USEPA 6010
PCBs/Pesticides	USEPA 8081/8082
VOCs	USEPA 8260
SVOCs/PAHs	USEPA 8270 (low detection limits)
TPH motor oil	SM 8015M
TPH diesel	SM 8015M

Material used for backfill in upland Phase 3 areas will be sampled and compared to the criteria listed in Table 8. If low concentrations of organics are detected in a potential source, the borrow source may be considered on a case by case basis and will be discussed with the RWQCB.

3.3 Waste Characterization

COCs identified during site investigations included PCBs and metals. Once soil containing the COCs is excavated, the soil becomes a waste and must be classified according to federal and state waste characterization standards. Federal regulations include the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA).

Regulatory Background

The U.S. Environmental Protection Agency (USEPA) developed a regulatory definition of hazardous waste by using two different mechanisms: listing certain specific wastes as hazardous (listed waste) and identifying characteristics which, when present in a waste, make it hazardous (characteristic waste). These regulations are codified in 40 Code of Federal Regulations (CFR) 261. Hazardous waste listings describe wastes from various industrial processes, wastes from specific sectors of industry, or wastes in the form of specific chemical formulations. These wastes are described or listed in four different lists in 40 CFR 261, Subpart D (F, K, P, and U lists). A hazardous waste characteristic is a property that, when present in a waste, renders the waste a sufficient threat to merit regulation as hazardous. The four characteristics of hazardous waste are ignitability, corrosivity, reactivity, and toxicity. The USEPA designed a lab procedure known as the Toxicity Characteristic Leaching Procedure (TCLP) to determine if a waste has the toxicity characteristic. Using the TCLP on a waste sample creates a liquid leachate that is similar to the leachate USEPA would expect to find in a landfill containing the same waste. If the leachate sample contains a sufficient concentration of one of the 40 specified chemicals, then the waste exhibits the toxicity characteristic and would be designated RCRA hazardous waste. RCRA hazardous wastes are subject to Land Disposal Restrictions and may require treatment prior to disposal. RCRA hazardous wastes that meet Land Disposal Restrictions may be disposed of in a Class I landfill. PCBs wastes are regulated under the TSCA and under 40 Code of Federal Regulation (CFR) 761.61 only if the waste is RCRA-hazardous waste due to other substances than PCBs. Disposal of pre-April 18, 1978 PCB waste at PCB concentrations less than 50 mg/kg (dry weight) are not regulated under TSCA and may be disposed in a municipal solid waste landfill facility if there are no other hazardous constituents. Soil that was contaminated by a spill of PCBs that occurred after July 2, 1979 is regulated for disposal if the concentration of the original spilled material was greater than or equal to 50 mg/kg (dry weight).

In addition to federal regulations, California environmental regulations identify categories of hazardous waste that are not covered by the RCRA. Categories of California hazardous waste include characteristic waste, extremely hazardous waste, and special waste. These regulations are codified in 22 California Code of Regulations (CCR) 66261. Universal waste regulations are codified in 22 CCR 66273. A waste is a California hazardous waste if it exhibits the characteristic of corrosivity or toxicity as defined in 22 CCR 66261.22 and 66261.24. A waste exhibits the characteristic of corrosivity if its pH less than or equal to 2 or greater than or equal to 12.5 as determined using USEPA Method 9040. A waste exhibits the characteristic of toxicity in California if either of the following are true: 1) a substance listed in 22 CCR 66261.24 at a concentration in mg/kg that equals or exceeds the Total Threshold Limit Concentration (TTLC) criteria or 2) a substance listed in 22 CCR 66261.24 at a concentration in mg/l of waste extract from the Waste Extraction Test (WET) procedure that equals or exceeds the Soluble Threshold Limit Concentration (STLC) criteria. The WET is similar to but more stringent than the TCLP specified under RCRA hazardous waste regulations. Waste classified as a California hazardous waste must be disposed of in a Class I hazardous landfill facility if disposed in the State of California. California also has land disposal restrictions that are in addition to RCRA Land Disposal Restrictions.

RFS Phase 3 Remediation Project Waste Characterization

A four-point composite sample was collected for waste characterization purposes on May 4, 2004 within each AOC. The composite sample consisted of two random surface samples and two samples from a depth within the excavation depth of the AOC. In AOC U8, waste characterization samples were collected on May 11, 2004. The samples were analyzed for CAM 17 metals by EPA Method 6010, VOCs by EPA Method 8260, SVOCs by EPA Method 8270, PCBs by EPA Method 8082, percent moisture, and pH. The results of the evaluation of the waste characterization data are shown in Table 7. The waste characterization data are presented in Table 9.

Site investigation samples were analyzed for metals based upon historical samples, historical site usage, and potential sources. The COCs identified during site investigations that exceeded the SSTLs in AOC U1 included chromium, copper, and lead. Two composite samples for waste characterization purposes were collected and analyzed for both for metals and organics. The total metals concentration did not exceed the TTLC value. The samples were also analyzed for Toxic Characteristic Leaching Procedure (TCLP) chromium and lead and Waste Extraction Test (WET) chromium, copper, and lead. The samples exceeded the STLC value for copper. The samples did not exceed the TCLP criteria. The pH of the samples was in the non-hazardous range (between 2 and 12.5). VOCs and PAHs were not detected. The maximum PCB concentration detected was 16 mg/kg. PCBs wastes from a spill prior to April 18, 1978 with concentrations less than 50 mg/kg are not regulated by TSCA. The date of the PCB release is unknown, however, based upon UC Berkeley research regarding usage of the area, the spill occurred prior to 1978. Therefore, the soil is not TSCA regulated. Based upon the analytical results and the fact that the substances detected have no known RCRA listed or TSCA regulated sources, AOC U1 is classified as non-TSCA regulated, non-RCRA hazardous soil (California hazardous) that meets California land disposal restrictions. California hazardous soil may be disposed in a Class I landfill. If the soil is treated to reduce the leachability of copper to below the STLC value, the soil may be disposed of as non-TSCA regulated, non-hazardous soil in a Class II landfill.

The COCs identified during site investigations that exceeded the SSTLs in AOC U2 included arsenic and copper. One composite sample was collected and analyzed. The metals did not exceed the TTLC. The pH of the samples was in the non-hazardous range (between 2 and 12.5). VOCs were not detected. Low concentrations of TPH diesel/motor oil, PCBs, and PAHs were detected. The sample was also analyzed for TCLP mercury and WET copper, lead, and mercury. The results did not exceed the STLC or TCLP criteria. Based upon the analytical results and the fact that the substances detected have no known RCRA listed or TSCA regulated sources, AOC U2 is classified as non-TSCA regulated, non-hazardous soil. Non-hazardous soil may be disposed in a Class II landfill.

The COCs identified during site investigations that exceeded the SSTLs in AOC U3 included arsenic and copper. One composite sample was collected and analyzed. The metals did not exceed the TTLC. The pH of the samples was in the non-hazardous range (between 2 and 12.5). VOCs were not detected. Concentrations of TPH diesel/motor oil (less than 2,500 mg/kg) and low concentrations of PCBs and PAHs were detected. The sample was also analyzed for TCLP mercury and WET arsenic, copper, lead, and mercury. The sample did not exceed the STLC or TCLP criteria. Based upon the analytical results and the fact that the substances detected have no known RCRA listed or TSCA regulated sources, AOC U3 is classified as non-TSCA regulated, non-hazardous soil. Non-hazardous soil may be disposed in a Class II landfill.

The COCs identified during site investigations that exceeded the SSTLs in AOC U4 included arsenic, chromium, copper, lead, and mercury. One composite sample was collected and analyzed. Mercury exceeded the TTLC. The pH of the samples was in the non-hazardous range (between 2 and 12.5). VOCs were not detected. Low concentrations of TPH diesel/motor oil, PCBs, and PAHs were detected. The sample was also analyzed for TCLP lead and mercury. The results did not exceed the TCLP criteria. Based upon the analytical

results and the fact that the substances detected have no known RCRA listed or TSCA regulated sources, AOC U4 is classified as non-TSCA regulated, non-RCRA hazardous soil (California hazardous) and meets California land disposal restrictions. California hazardous soil may be disposed in a Class I landfill.

The COCs identified during site investigations that exceeded the SSTLs in AOC U6 included mercury and PCBs. One composite sample was collected and analyzed. Mercury exceeded the TTLC. The pH of the samples was in the non-hazardous range (between 2 and 12.5). VOCs were not detected. Low concentrations of TPH diesel/motor oil, PCBs, and PAHs were detected. The sample was also run for TCLP mercury. The sample did not exceed the TCLP criteria. Based upon the analytical results and the fact that the substances detected have no known RCRA listed or TSCA regulated sources, AOC U6 is classified as non-TSCA regulated, non-RCRA hazardous (California hazardous) and meets California land disposal restrictions. California hazardous soil may be disposed in a Class I landfill.

The COCs identified during site investigations that exceeded the SSTLs in AOC U8 included PCBs. One composite sample was collected and analyzed. No VOCs, PCBs, or PAHs were detected. Based upon the low metals concentrations, it was not necessary to run WET or TCLP analyses. Based upon the analytical results and the fact that the PCBs have no known RCRA listed or TSCA regulated sources, AOC U6 is classified as non-TSCA regulated, non-hazardous soil. Non-hazardous soil may be disposed in a Class II landfill.

Sediment to be excavated to widen the southern M3 channel is considered part of M3. M3 was characterized during Phase 2 as non-TSCA regulated, non-RCRA hazardous (California hazardous) and meets California land disposal restrictions and may be disposed in a Class I landfill. Backfill to be excavated to create the central M3 channel and to grade a portion of M3 was tested prior to backfilling and is classified as non-TSCA regulated, non-hazardous soil. M3 backfill soil that is excavated may be stockpiled onsite for reuse.

3.4 Schedule

Under the current schedule, the Phase 3 Plans and Specifications will be prepared in June 2004 for contracting. Work is anticipated to begin in August 2004. Marsh work will be done after September 1. Work is anticipated to be complete prior to the rainy season.

4. Permitting and Regulatory Requirements

The RWQCB is the lead agency designated for oversight of the remedial investigation and cleanup activities at the site. UC Berkeley submitted a California Environmental Quality Act (CEQA) Initial Study (URS, 2003) as part of the permitting process. Additional permitting requirements for Phase 3 remediation activities are presented in the following sections.

4.1 Bay Conservation and Development Commission

Excavation activities proposed for the marsh portion of Subunit 2A require a modification of the Bay Conservation and Development Commission (BCDC) permit number M01-52(b), as issued to UC Berkeley on June 27, 2002. BBL for UC Berkeley submitted a request for modification of permit number M01-52(b) to BCDC on May 18, 2004.

4.2 Army Corps of Engineers

The United States Army Corps of Engineers (USACE) issued a Nationwide 38 permit (NWP 38; File Number 28135S) to UC Berkeley on September 4, 2003 for work to be performed in jurisdictional "waters of the United States", including wetlands, on the RFS (i.e., areas in Western Stege Marsh at or below 5 feet NGVD). 401 Water Quality Certification was automatically issued with the NWP 38. The permit covers activities for a period of two years. The NWP 38 permit permits activities in jurisdictional waters until September 4, 2005.

4.3 State Water Resources Control Board

A State Water Resources Control Board (SWRCB) General Permit was issued for Phase 2 activities. A SWPPP was developed and submitted to the SWRCB in addition to a Notice of Intent to obtain a Waste Discharger Identification and the General Permit. The SWPPP will be updated as necessary to include the new Phase 3 work areas.

5. References

California Regional Water Quality Control Board, San Francisco Bay Region. 1998. Order No. 98-072. Adoption of Site Cleanup Requirements for: Catellus Development Corporation and SF Pacific Perperty, Inc., Proposed Eastshore Park Property, Berkeley and Albany (Alameda County) and Richmond (Contra Costa County).

URS Corporation, 1999. Field Sampling and Analysis Plan and Tiered Risk Evaluation. Prepared for University of California Berkeley.

URS Corporation, 2000. Field Sampling and Analytical Results. Prepared for University of California Berkeley. December.

URS Corporation, 2001. Human Health and Ecological Tiered Risk Evaluation. Prepared for University of California Berkeley. November.

URS Corporation, 2002a. Workplan for Additional Soil and Groundwater Investigation, Upland Portion of Subunit 2B. Prepared for University of California Berkeley. February 28.

URS Corporation, 2002b. Results of Additional Investigations, Upland Portion of Subunit 2B. Prepared for University of California Berkeley. October 31.

URS Corporation, 2003. California Environmental Quality Act Initial Study. Prepared for University of California Berkeley.

TABLE 1
ANALYTICAL RESULTS WITH SCREENING FOR METALS AND pH IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Antimony (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)	pH (SU)
Upland Soil Screening Criteria[1]			--	27.3	--	147	157	412	437	42	621	10200	10200	135	760	--
AOC U1 - Explosives Storage Area																
ES101	0	3/17/2000	<3.6	3.3	0.4	1	31 J	18	6.7	0.13	33 J	0.74	<0.3	1	43	6
	4	3/17/2000	<3.4	3.4	0.35	1.5	38 J	20	4.9	0.14	60 J	<0.29	<0.29	0.66	42	7.3
ES102	0	3/17/2000	<4.1	7.2	0.4	2.2	46 J	76	40	0.2	56 J	0.72	<0.34	0.58	100	6.1
	4	3/17/2000	<3.4	1.8	0.42	0.71	23 J	11	4.4	0.11	31 J	0.34	<0.28	0.62	13	8.4
SH2-1	0	12/12/2002	<3.8	4.1	0.38	1.6	37	21	14	2.8 J	34	0.54	<0.32	<0.32	39	5.8
	2	12/12/2002	<3.2	4.5	0.59	2.5	53	23	13	0.061 J	190	0.49	<0.27	<0.27	43	6.3
SH2-2	0	12/12/2002	<2.9	4.6	0.11	1.6	36	320	16	0.96 J	25	0.54	<0.24	<0.24	35	3.4
	2	12/12/2002	<3.2	7.5	0.27	2.2	46	17	9.2	<0.021	56	0.69	<0.27	<0.27	46	7.8
SH2-3	0	12/12/2002	<3.2	**64**	<0.11	8.3	7.5	400	160	0.081	38	3.9	2.8	0.43	110	4.2
	2	12/12/2002	<3.2	8.4	0.47	2.5	50	25	13	0.061	72	0.38	<0.26	<0.26	39	7.3
SH2-4	0	12/12/2002	<3.1	4.6	0.54	<0.26	52	20	7.3	2.3	57 J	0.43	<0.26	0.52	29	NA
	2	12/12/2002	<3.5	4.4	0.47	<0.29	48	16	6.1	0.031	73 J	<0.29	<0.29	1.4	35	NA
	4	12/12/2002	<3.2	6.2	0.49	<0.26	51	24	8.2	0.077	68 J	<0.26	<0.26	<0.26	48	NA
SH2-5	0	12/12/2002	<3.4	4.8	0.53	2.1	38	**1,400**	11	0.63	31	0.74	<0.28	<0.28	82	3.7
	2	12/12/2002	<2.6	4.7	0.44	1.5	41	38	9	0.23	94	1.3	<0.22	2.4	94	4.9
SH2-6	0	12/12/2002	<3.5	18	0.32	5.4	30	350	94	0.48 J	56	2	0.69	<0.29	160	6.2
	2	12/12/2002	<3.2	4.4	0.28	1.3	37	9.4	13	0.046 J	26	0.69	<0.27	<0.27	21	5.7
SH2-7	0	12/12/2002	<3.3	**31**	0.26	6.1	27	**730**	83	0.56 J	43	2.2	1.1	<0.27	200	4.3
	2	12/12/2002	<3.4	4.1	0.29	1.7	46	16	13	0.037 J	39	<0.28	<0.28	<0.28	41	5.2
SH2-8	0	12/12/2002	<3.1	5	0.49	1.7	34	**1,200**	15	0.64 J	34	0.72	<0.26	1.4	70	4.4
	2	12/12/2002	<3.2	4.3	0.28	2.2	45	19	13	0.061 J	37	0.47	<0.27	<0.27	25	5.6
SH2-9	0	12/12/2002	<2.8	6.5	0.35	2.3	49	53	22	1.6 J	66	0.8	<0.23	<0.23	50	6.5
	2	12/12/2002	<3	3.7	0.25	2.1	46	16	14	<0.021 J	31	0.43	<0.25	<0.25	25	6.8
SH2-10	0	12/12/2002	<2.7 J	9.8	0.49	2.6	65	78	40	0.2 J	98	1.6	<0.23	1	130	7.8
	2	12/12/2002	<3.6	3.8	0.52	1.9	33	**490**	15	0.25 J	35	1.1	<0.3	4.6	120	6
	3.5	12/12/2002	<3.5	5.1	0.59	2.3	53	23	12	0.087	160	<0.3	<0.3	0.7	59	NA
SH2-11	0	12/12/2002	<2.9	4.2	0.38	1.5	34	**580**	12	0.2	24	0.5	<0.25	<0.25	24	5
	2	12/12/2002	<2.9	5.6	0.68	2.5	50	25	15	0.046	230	0.68	<0.24	<0.24	38	4.7
SH2-12	0	12/12/2002	<3.4	4.1	0.39	1.8	31	51	13	0.35 J	54	0.88	<0.28	1.1	200	4.8
	2	12/12/2002	<2.6	4.3	0.5	2.7	50	17	15	0.065 J	61	0.76	<0.22	<0.22	30	5.2
SH2-13	0	1/20/2003	<2.8	12	0.46	4.3	40	160	68	1.4	67 J	<0.23	0.28	<0.23	160	NA
	2	1/20/2003	<2.7	3.8	0.5	1.3	37	14	17	0.043	30 J	<0.23	<0.23	1.9	20	NA
SH2-14	0	1/20/2003	<2.8	14	0.39	4.6	60	360	37	1.9	91 J	<0.23	0.46	<0.23	150	NA
	2	1/20/2003	<3.2	3.3	0.54	1.9	46	**620**	9.4	0.054	33 J	<0.27	<0.27	<0.27	130	NA
	4	1/20/2003	<6.6	3.1	1.2	2.5	70	340	20	0.033	86	<0.55	<0.55	<0.55	570	NA
SH2-15	0	1/20/2003	<3.3	4.9	0.47	1.2	33	19	14	0.75	49 J	0.34	<0.27	2.2	26	NA
	2	1/20/2003	<3.3	**47**	0.39	2.3	37	350	58	<0.024	37 J	<0.28	<0.28	<0.28	130	NA
	3.5	1/20/2003	<3.5	1.8	0.55	1.1	41	12	11	0.055	41	<0.29	<0.29	<0.29	20	NA
SH2-16	0	1/17/2003	<3.9	6.2	0.76	2.1	44	87	17	1.7	47 J	<0.32	<0.32	1.3	120	NA
	2	1/17/2003	<3.6	7.4	0.77	1.9	56	17	11	0.075	86 J	<0.3	<0.3	0.95	32	NA
SH2-17	0	1/17/2003	<2.6	12	0.8	2.5	38	16	7.1	0.092	75 J	<0.21	<0.21	1	47	NA
	2	1/17/2003	<3	7.9	0.57	2.2	33	120	**750**	0.78	43 J	<0.25	<0.25	0.98	110	NA
	3	1/17/2003	<3	5.2	0.38	2.2	42	20	8.4	0.09	64	0.53	<0.25	0.59	37	NA
SH2-18	0	1/20/2003	<2.6	11	0.32	3.3	35	170	86	0.33	46 J	0.68	0.83	<0.22	120	NA
	2	1/20/2003	<3.4	4.7	1.2	2	55	21	15	0.11	100 J	<0.28	<0.28	<0.28	36	NA
SH2-19	0	1/20/2003	<3.8	5	0.62	2.7	41	410	12	2.3	40 J	0.58	<0.31	1.4	640	NA
	2	1/20/2003	<3.6	2.9	0.27	1.2	37	12	9.7	0.049	25 J	<0.3	<0.3	<0.3	43	NA

TABLE 1
ANALYTICAL RESULTS WITH SCREENING FOR METALS AND pH IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Antimony (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)	pH (SU)
Upland Soil Screening Criteria[1]			--	27.3	--	147	157	412	437	42	621	10200	10200	135	760	--
SH2-20	0	1/17/2003	<3.6	5.5	0.69	1.4	40	64	17	4.8	33 J	<0.3	<0.3	0.68	73	NA
	2	1/17/2003	<2.8	4.8	1.1	1.9	56	17	11	0.064	98 J	<0.23	<0.23	0.69	35	NA
ES3-1	0 - 0.5	4/22/2004	<3.7	**67**	0.42	0.37	40	27	17	2.1	42	0.88	<0.31	<0.31	41	6.8
	2 - 2.5	4/22/2004	<3.2	3.1	0.45	<0.27	22	11	5.3	0.26	27	<0.27	<0.27	<0.27	13	7
ES3-2	0 - 0.5	4/22/2004	<3.4	4.4	0.39	0.34	32	15	5.1	0.44	38	0.82	<0.28	<0.28	31	6.1
	2 - 2.5	4/22/2004	<3.3	3.6	0.26	0.32	44	16	4	0.14	31	0.71	<0.27	<0.27	23	5.4
ES3-3	0 - 0.5	4/22/2004	<3.3	4.9	0.34	0.41	41	48	18	0.12	24	0.9	<0.28	<0.28	100	6.7
	2 - 2.5	4/22/2004	<3.2	3	0.28	<0.27	32	17	4.2	0.099	27	0.63	<0.27	<0.27	23	6.7
ES3-4	0 - 0.5	4/26/2004	3.5	21	0.28	1.9	21	**1,000**	36	0.28	17	2.3	<0.28	<0.28	97	5.9
	2	5/11/2004	<3.4	7.6	0.52	<0.28	62	35	7.2	0.11	66	0.68	<0.28	<0.28	48	5.8
	4	5/11/2004	<3.7	6.7	0.59	<0.31	48	16	4.1	0.26	53	0.48	<0.31	<0.31	34	5.9
ES3-5	0 - 0.5	4/26/2004	<3.3	7.8	0.34	0.98	32	**1,300**	15	0.52	19	1.1	<0.28	<0.28	69	4.8
	2	5/11/2004	<2.8	1.8	0.37	<0.24	48	12	4.1	0.069	27	0.68	<0.24	<0.24	110	5.8
	4	5/11/2004	<3	5	0.58	0.54	52	22	4.9	0.16	58	<0.25	<0.25	<0.25	45	8.1
ES3-6	0 - 0.5	5/6/2004	<2.9	7	0.48	0.54	37	24	17	0.083	36	0.69	<0.24	<0.24	26	5.7
	2 - 2.5	5/6/2004	<3.2	4.8	0.57	0.61	38	19	5.8	1.3	79	0.43	<0.27	<0.27	27	7.4
ES3-7	0 - 0.5	5/6/2004	<3.1	6.1	0.47	0.72	40	29	18	0.12	41	0.61	0.52	<0.26	45	7.4
	2 - 2.5	5/6/2004	<3.1	5.7	0.49	0.92	40	20	6	0.13	72	0.32	<0.26	<0.26	31	8.5
ES3-8	0 - 0.5	5/6/2004	<3.3	6.8	0.5	0.62	39	24	15	0.054	39	0.75	<0.28	<0.28	33	6.5
	2 - 2.5	5/6/2004	<3.2	4.5	0.55	0.55	37	17	4.7	0.47	59	0.36	<0.26	<0.26	25	7.2
ES3-9	0 - 0.5	5/6/2004	<3.6	8.7	0.43	1	34	240	16	0.081	33	1.5	<0.3	<0.3	79	5.8
	2 - 2.5	5/6/2004	<3.4	5	1.4	0.7	45	17	4.6	0.82	91	0.54	<0.28	<0.28	30	6.7
ES3-10	0 - 0.5	5/6/2004	<3.3	6.9	0.4	2.4	33	**770**	19	0.042	21	0.75	<0.28	<0.28	460	4.6
	2 - 2.5	5/6/2004	<3	3.3	0.39	0.85	46	50	9.5	0.034	27	0.88	<0.25	<0.25	170	5.4
ES3-11	0 - 0.5	5/6/2004	3	24	0.4	3.2	37	**490**	91	1.1	52	3.2	0.2	<0.19	230	6.2
	2 - 2.5	5/6/2004	<3.3	3	0.56	1.2	38	240	7	0.03	35	0.46	<0.27	<0.27	220	4.9
ES3-12	0	5/11/2004	<3	12	0.62	0.3	84	120	36	0.22	110	1	<0.25	<0.25	110	7.7
	2	5/11/2004	<3.7	3	0.72	<0.31	58	17	6.5	0.048	54	0.63	<0.31	<0.31	28	6.6
	4	5/11/2004	<2.6	5.8	0.58	<0.21	61	20	5.4	0.04	74	0.26	<0.21	<0.21	38	8.2
Historical - location approximate																
B1ES	0.5 - 1.5	2/1/1991	NA	1.3	NA	3.3	31.7	**654**	8.5	0.28	NA	<0.87	NA	NA	260	NA
B3ES	0.5 - 1.5	2/1/1991	NA	0.96	NA	1.4	28.3	**736**	5	<0.12	NA	<0.9	NA	NA	266	NA
B5ES	0.5 - 1.5	2/1/1991	NA	2.8	NA	1.3	24.7	44.1	10.5	0.8	NA	<0.84	NA	NA	177	NA
B7ES	0.5 - 1.5	2/1/1991	NA	10.2	NA	4.6	44.4	**516**	24.3	1.37	NA	<0.87	NA	NA	138	NA
B9ES	0.5 - 1.5	2/1/1991	NA	3.6	NA	3.4	56.8	77.8	18	0.51	NA	<3.5	NA	NA	222	NA
B11ES	0.5 - 1.5	2/1/1991	NA	<8.7	NA	0.81	42.2	21.2	6.9	<0.12	NA	<8.7	NA	NA	24.4	NA
AOC U2 - Test Pit Area																
TP101	0	2/24/2000	<3.6	6.8	0.21	1.5	31	**570**	23	0.62	24	0.68	<0.3	0.49	79	5
	2	2/24/2000	<3.5	1.9	0.44	0.67	25	12	4.3	0.16	26	<0.29	<0.29	0.64	68	5.1
TP102	0	2/24/2000	<3.7	3.3	0.43	1.8	24	**800**	12	0.89	25	0.43	<0.31	1.2	130	5.8
	2	2/24/2000	<3.7	1.3	0.36	1	27	20	3.1	0.067	18	0.54	<0.31	<0.31	100	5.1
	5	2/24/2000	<3.4	4.5	0.44	1.5	34	18	5.3	0.072	65	<0.28	<0.28	1.1	35	6.2
TP2-1	0	12/13/2002	<3.6	7.4	0.52	2.8	69	**1,900**	32	18	69	2.3	<0.3	1	180	NA
	2	12/13/2002	<3.2	2.3	0.43	0.9	36	12	8.6	0.83	27	0.73	<0.27	<0.27	25	NA
	4	12/13/2002	<3.2	5.9	0.51	1.4	48	18	8.9	0.068	94	0.36	<0.27	<0.27	39	NA
TP2-2	0	12/13/2002	<3.6	7	0.62	2.7	66	170	34	2.2	59	2	<0.3	<0.3	120	NA
	2	12/13/2002	<3	3.3	0.63	1	50	14	11	0.087	44	0.37	<0.25	0.53	24	NA
	4	12/13/2002	<3.1	5.9	0.42	1.6	53	15	7.9	0.12	110	0.93	<0.26	0.59	44	NA

TABLE 1
ANALYTICAL RESULTS WITH SCREENING FOR METALS AND pH IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Antimony (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)	pH (SU)
Upland Soil Screening Criteria[1]			--	27.3	--	147	157	412	437	42	621	10200	10200	135	760	--
TP2-3	0	12/13/2002	<3.5	14	0.48	4.3	53	380	140	5.8	72	1.9	0.72	<0.29	330	NA
	2	12/13/2002	<3.5	1.8	0.56	0.89	44	13	9.7	0.5	46	0.69	<0.3	<0.3	54	NA
	4	12/13/2002	<3.4	8.8	0.49	1.5	58	18	9.2	0.076	73	0.82	<0.28	1.2	38	NA
TP2-4	0	12/13/2002	<3.3	9.1	0.27	2.9	28	140	54	1.1	49	1.4	<0.27	0.6	120	NA
	2	12/13/2002	<3	4.6	0.45	1.4	40	**500**	12	0.14	31	1.5	<0.25	3.2	61	NA
	4	12/13/2002	<2.6	3.7	0.54	1.5	49	20	10	0.21	78	1.5	<0.22	1.4	42	NA
TP2-5	0	12/13/2002	<3.2	15	0.5	2.5	40	300	150	6.9	42	2.3	<0.26	4.8	110	NA
	2	12/13/2002	<3.4	4.1	0.36	1.3	48	13	11	0.068	36	0.56	<0.29	<0.29	50	NA
	4	12/13/2002	<3.6	6.7	0.65	1.5	47	22	11	0.071	140	1.4	<0.3	1.8	41	NA
TP2-6	0	1/17/2003	<2.7 J	2	0.21	1.2	23	62	23	17	25	<0.23	<0.23	<0.23	68	NA
	2	1/17/2003	<3.3	3.5	0.72	2.7	51	390	14	0.11	49 J	<0.28	<0.28	1.9	420	NA
TP2-7	0	1/17/2003	<2.7 J	**56**	0.28	4.5	13	**4,000**	100	0.94	31	<0.22	3.4	1.1	680	NA
	2	1/17/2003	<3.7 J	2.7	0.36	1.4	38	11	9	0.084	32	<0.31	<0.31	<0.31	28	NA
TP2-8	0	1/20/2003	<3.3	5	0.49	1.3	33	56	22	0.45	29 J	<0.27	<0.27	<0.27	77	NA
	2	1/20/2003	<3.8	4.3	0.52	1.7	43	20	10	0.1	37 J	<0.32	<0.32	<0.32	28	NA
TP2-9	0	1/17/2003	<3.1	6	0.42	2.5	20	120	65	0.45	32 J	<0.26	<0.26	<0.26	78	NA
	2	1/17/2003	<3.3	3.4	0.43	1.2	37	**440**	13	0.7	20 J	<0.28	<0.28	<0.28	50	NA
TP2-10	0	1/17/2003	<2.9	5.3	0.48	1.6	32	30	24	0.11	50 J	<0.24	<0.24	0.92	73	NA
	1.5	1/17/2003	<3.4	4.4	0.55	1.2	34	18	11	0.054	36 J	<0.28	<0.28	0.65	120	NA
TP3-1	0 - 0.5	4/22/2004	<3.3	3.5	0.31	<0.27	30	27	9.7	1.1	21	0.48	<0.27	<0.27	27	6.9
	2 - 2.5	4/22/2004	<3.1	2.9	0.39	<0.26	33	17	3.8	0.051	27	0.8	<0.26	<0.26	21	5.6
TP3-2	0 - 0.5	4/22/2004	<3.1	8.8	0.35	0.93	43	100	40	1.4	54	1.4	<0.26	<0.26	110	7.6
	2 - 2.5	4/22/2004	<3.7	3.1	0.48	<0.31	38	17	8.2	0.064	36	0.45	<0.31	<0.31	22	6.1
TP3-3	0 - 0.5	4/22/2004	<3.5	4	0.43	<0.29	32	17	9.9	0.12	25	0.63	<0.29	<0.29	31	5.7
	2 - 2.5	4/22/2004	<3.8	3.3	0.59	<0.31	36	26	6.8	0.087	41	0.6	<0.31	<0.31	26	6.1
TP3-4	0 - 0.5	4/23/2004	<3.2	2.1	0.61	0.27	17	24	9.2	1.5	19	0.71	<0.26	<0.26	33	7.1
TP3-5	0 - 0.5	4/23/2004	<3.1	2.9	0.64	0.29	10	12	8.1	0.86	19	0.67	<0.26	<0.26	29	8.3
TP3-6	0 - 0.5	4/23/2004	<2.6	4.1	0.34	0.5	30	50	15	5.3	38	0.73	<0.22	<0.22	41	5.8
Historical - location approximate																
B1TP	0.5 - 1.5	2/1/1991	NA	21.2	NA	9.9	36.1	**899**	49.2	6.66	NA	<0.72	NA	NA	227	NA
B2TP	0.5 - 1.5	2/1/1991	NA	4.3	NA	2.8	34	**1,140**	46.4	2.91	NA	<9.1	NA	NA	142	NA
AOC U3 - Forest Products Area																
FP101	0	2/24/2000	<4	4.5	0.33	1.8	29	28	19	0.37	27	0.73	<0.33	1.3	73	5.8
	2	2/24/2000	<3.4	3.3	0.34	1.7	37	12	7	0.063	33	0.3	<0.28	1.1	28	4.7
FP102	0	2/24/2000	<3.1	3.2	0.79	1.5	12	19	11	0.41	17	<2.6	<2.6	0.51	52	6.3
	2	2/24/2000	<3.3	2.3	0.29	0.96	26	12	4.7	0.51	23	0.33	<0.27	0.88	23	6.9
FP103	2	2/24/2000	<3.1	3.7	0.37	1.4	39	11	5.3	0.07	36	0.4	<0.26	1	23	5.9
FP104	0	2/24/2000	<3.4	**66**	0.39	1.8	46	34	8.3	1.2	54	0.55	<0.28	1.2	55	6
	4	2/24/2000	<3.4	27	0.31	1.4	31	29	4.5	0.45	50	0.52	<0.28	1.1	39	6.2
FP105	2	2/24/2000	<3.4	3.6	0.39	1.4	28	17	9.1	<0.044	25	<0.28	<0.28	0.62	31	6.4
FP106	0	3/17/2000	<4.3	3.4	0.51	0.88	33 J	18	5.3	1.3	52 J	<0.36	<0.36	<0.36	24	7.1
	2.5	3/17/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.9
	4	3/17/2000	<3.5	3.6	0.51	1.2	33 J	20	8.3	0.17	120 J	0.68	<0.29	2.2	29	NA
	6	3/17/2000	<3.5	6.5	0.47	2	35	20	6.1	<0.048	70 J	<0.29	<0.29	1.2	37	NA
FP2-1	0	9/9/2002	<2.9 J	**55**	0.4	2.1	33	170	38	3	34 J	0.61	<0.24	1.3	100	5.6
	2	1/10/2002	<2.9 J	14	0.48	1.5	34	20	11	0.23	51 J	0.46	<0.24	1.3	39	5.6
FP2-2	0	1/10/2002	<2.8 J	6.5	0.29	3.4	24	**740**	39	1.2	27 J	1.1	<0.23	<0.23	61	6.3
	2	1/10/2002	<3.4 J	4.6	0.7	4.7	43	19	12	0.1	47 J	0.53	<0.28	<0.28	26	6.1

TABLE 1
ANALYTICAL RESULTS WITH SCREENING FOR METALS AND pH IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Antimony (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)	pH (SU)
Upland Soil Screening Criteria[(1)]			--	27.3	--	147	157	412	437	42	621	10200	10200	135	760	--
FP2-3	0	1/10/2002	<2.1 J	2.9	0.45	3.4	11	13	15	0.49	21 J	0.28	<0.18	<0.18	37	6.9
	2	1/10/2002	<2.9 J	6.8	0.35	3.5	27	280	54	0.51	32 J	0.83	<0.24	<0.24	93	5.4
FP2-4	0	1/7/2002	<2.9	5.6	0.33	2.2	23	60	44	0.061	29	0.53	<0.24	<0.24	110	NA
FP2-5	0	1/7/2002	<2.7	**150**	0.35	2.2	36	**1,000**	97	4.8	32	0.71	<0.23	<0.23	100	NA
FP2-6	0	1/7/2002	<2.8	5.7	0.42	1.6	29	80	30	0.29	34	0.69	<0.23	<0.23	75	NA
FP2-7	0	1/7/2002	<2.8	1.5	0.31	0.63	7	9.7	5.6	0.18	11	<0.23	<0.23	<0.23	20	NA
FP2-8	0	1/20/2003	<3.7	**28**	0.37	2	35	310	51	9.5	35 J	0.48	<0.31	<0.31	120	NA
	2	1/20/2003	<3.2	3.3	0.39	1.5	40	15	11	0.13	35 J	<0.26	<0.26	<0.26	29	NA
FP2-9	0	1/20/2003	<3.5	12	0.37	1.7	35	87	26	0.98	44 J	<0.29	<0.29	<0.29	93	NA
	2	1/20/2003	<3.1	6.5	0.57	1.3	38	20	15	0.33	39 J	<0.26	<0.26	2.1	23	NA
FP3-1	0 - 0.5	4/22/2004	<3.6	11	0.45	0.35	30	130	24	9.5	28	1.2	<0.3	<0.3	71	5.6
	2 - 2.5	4/22/2004	<3	3.6	0.41	<0.25	31	15	4.5	0.2	26	0.65	<0.25	<0.25	22	5.9
FP3-2	0 - 0.5	4/22/2004	<2.7	9.1	0.38	0.77	32	250	48	7.3	32	1.4	<0.22	<0.22	120	6
	2 - 2.5	4/22/2004	<3.2	7.2	0.53	0.71	42	86	18	3.9	60	1.1	<0.27	<0.27	84	7.1
Historical - location approximate																
BF1		6/1/1990	NA	NA	NA	NA	14	49	NA	NA	NA	NA	NA	NA	NA	NA
BF2		6/1/1990	NA	16	NA	NA	14	120	NA	NA	NA	NA	NA	NA	NA	NA
BF3		6/1/1990	NA	NA	NA	NA	12	32	NA	NA	NA	NA	NA	NA	NA	NA
AOC U4 - Shell Manufacturing Area																
PC101	0	2/25/2000	<3.3	3.7 J	0.18	1.2	34	**550**	15	<0.43	22	0.61 J	<0.27	0.91 J	42	4.3
	2	2/25/2000	<3.8	3	0.4	1.4	39	320	4.2	1	40	0.5	<0.32	0.43 J	150	5.2
	5	2/25/2000	<3.6	3.6	0.47	1.9	42	88	4.8	<0.45	110	0.73	<0.3	1 J	170	6
SH101	0	2/25/2000	<3.6	3.2 J	0.49	1.7	30	**840**	6.4	**140**	26	0.49 J	<0.3	1 J	140	4.6
	2	2/25/2000	<3.8	4.3 J	0.33	1.8	57	56	6.1	<0.5	47	0.69 J	<0.32	<0.32 J	100	5.1
	5	2/25/2000	<3.4	3.1 J	0.19	0.96	27	12	2.4	<0.45	41	0.34 J	<0.28	0.45 J	28	6.5
SH102	0	2/25/2000	<3.7	**28**	0.15	4.1	20	**440**	**850**	2.6	36	2.5	1.9	1.5 J	130	4.5
	2	2/25/2000	<3.8	3.3	0.4	1.6	56	16	7.4	<0.49	45	0.7	<0.31	0.36	34	5.6
	5	2/25/2000	<3.3	3.8	0.29	1.5	42	17	3.1	<0.42	46	0.79	<0.27	1.9 J	32	6.9
SM2-1	0	9/9/2002	<2.7	13	0.43	1.9	24	340 J	140 J	13	35	1.5	0.22	1.3	160	6
	2	9/9/2002	<3.2	5.8	0.58	1.4	56	21 J	19 J	0.71	65	0.41	<0.27	2.6	62	5.6
SM2-2	0	9/9/2002	<3.1	6	0.71	0.96	32	19 J	22 J	5.4	82	2.3	<0.26	9.4	33	6
	2	9/9/2002	<3.2	4	0.55	1.1	57	11 J	14 J	0.087	66	0.49	<0.26	1.9	35	6.5
SM2-3	0	9/9/2002	<3	6.4	0.59	1	35	55 J	88 J	14	43	1.6	<0.25	2.5	68	5.3
	2	9/9/2002	<3.2	5.7	0.55	1.1	64	13 J	13 J	0.096	55	<0.27	<0.27	<0.27	32	5.7
SM2-4	0	9/9/2002	3.1	11	0.57	1.8	39	300 J	**1,000 J**	4	38	1.6	0.24	0.94	130	5.9
	2	9/9/2002	<3.2	2.8	0.46	0.78	49	15 J	17 J	0.067	31	0.53	<0.27	<0.27	29	6.8
SM2-5	0	9/9/2002	4.6	19	0.6	2.9	**170**	**530 J**	300 J	7.9	54	2.8	0.33	<0.28	300	5.5
	2	9/9/2002	<3.1	2.6	0.53	1.1	57	17 J	19 J	0.23	50	<0.26	<0.26	0.96	110	5.8
SM2-6	0	9/9/2002	3.5	25	0.72	2.7	28	**520 J**	230 J	16	48	1.3	0.8	1	350	5.5
	2	9/9/2002	<3	5.7	0.55	1.1	63	17 J	17 J	<0.14	55	<0.25	<0.25	<0.25	33	4.8
SM2-7	0	9/10/2002	<2.4 J	6.7	0.42	1.6	23	330	110	10	38 J	1.5	<0.2	2.7	130	7.3
	2	9/10/2002	<2.8 J	1.9	0.37	0.67	25	10	6.3	0.053	23 J	0.53	<0.23	<0.23	22	6.6
SM2-8	0	9/10/2002	<3 J	4.5	0.41	1.2	22	72	56	3.4	46 J	1.4	<0.25	2.7	99	6.7
	2	9/10/2002	<3.4 J	2.3	0.28	0.67	27	8.6	7.4	0.15	28 J	<0.28	<0.28	<0.28	15	5
SM2-9	0	9/9/2002	<3 J	3.6	0.4	2.2	26	190	25	5.7	50 J	0.62	<0.25	1.3	480	4.7
SM2-10	0	1/7/2002	<2.8	2.1	0.7	0.85	9.3	11	9.3	0.18	18	0.48	<0.23	<0.23	25	NA
SM2-11	0	1/7/2002	<2.7	3.5	0.35	1.3	53	17	12	2.4	37	0.8	<0.22	0.6	43	NA
SM2-12	0	1/7/2002	<2.6	5.5	0.38	2.1	34	370	40	0.83	32	0.82	<0.22	0.69	250	NA

TABLE 1
ANALYTICAL RESULTS WITH SCREENING FOR METALS AND pH IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Antimony (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)	pH (SU)
Upland Soil Screening Criteria[1]			--	27.3	--	147	157	412	437	42	621	10200	10200	135	760	--
SM2-13	0	1/7/2002	<2.4	7.3	0.3	2	25	200	130	2.1	30	1	0.31	<0.2	88	NA
SM2-14	0	1/7/2002	<3	2	<0.099	0.42	4.1	67	16	0.087	31	1.3	<0.25	1.3	65	NA
SM2-15	0	1/7/2002	<2.8	2.4	0.15	0.69	12	50	26	0.32	17	0.76	<0.24	<0.24	61	NA
SM2-16	0	1/17/2003	<3.3	1.9	0.26	0.93	8.1	36	60	3.8	16	0.72	<0.27	<0.27	75	NA
	2	1/17/2003	<3.3	2.7	0.5	1.5	44	15	12	0.025	31	<0.28	<0.28	<0.28	26	NA
SM2-17	0	1/17/2003	<3.6	6	0.43	2.4	53	75	40	0.44	49	<0.3	<0.3	<0.3	84	NA
	2	1/17/2003	<2.9	3.3	0.41	1.8	58	12	10	0.056	51	<0.24	<0.24	<0.24	25	NA
SM2-18	0	1/17/2003	<3.1	4.3	0.65	1.6	35	170	120	3.7	33	<0.26	<0.26	0.84	120	NA
	2	1/17/2003	<3.6	5.6	0.56	2.7	64	16	15	0.07	73	<0.3	<0.3	<0.3	42	NA
SM2-19	0	1/17/2003	<3.3 J	1.9	0.26	0.93	8.1	36	60	3.8	16	0.72	<0.27	<0.27	75	NA
	2	1/17/2003	<3.3 J	2.7	0.5	1.5	44	15	12	0.025	31	<0.28	<0.28	<0.28	26	NA
SM2-20	0	1/17/2003	<3.6 J	6	0.43	2.4	53	75	40	0.44	49	<0.3	<0.3	<0.3	84	NA
	2	1/17/2003	<2.9 J	3.3	0.41	1.8	58	12	10	0.056	51	<0.24	<0.24	<0.24	25	NA
SM2-21	0	1/17/2003	<3.1 J	4.3	0.65	1.6	35	170	120	3.7	33	<0.26	<0.26	0.84	120	NA
	2	1/17/2003	<3.6 J	5.6	0.56	2.7	64	16	15	0.07	73	<0.3	<0.3	<0.3	42	NA
SM3-1	0 - 0.5	4/22/2004	<3	4.3	0.38	0.27	29	24	23	3.6	34	0.53	<0.25	<0.25	31	6.1
	2 - 2.5	4/22/2004	<3.6	2.3	0.36	<0.3	34	11	4.8	0.096	26	0.92	<0.3	<0.3	21	5.7
SM3-2	0 - 0.5	4/22/2004	<3.7	3.6	0.45	<0.31	29	34	38	12	34	0.68	<0.31	<0.31	78	5.7
	2 - 2.5	4/22/2004	<3.3	1.9	0.26	<0.27	27	13	14	0.85	24	0.33	<0.27	<0.27	24	5.1
SM3-3	0 - 0.5	4/26/2004	<2.8	4.3	0.38	0.53	29	**1,100**	22	7	23	0.41	<0.23	<0.23	49	4.3
SM3-4	0 - 0.5	4/26/2004	5.2	**35**	0.19	2.3	25	**780**	280	10	17	3.1	1	<0.3	130	3.5
Historical - location approximate																
B14SH	1.3	2/1/1991	NA	3.2	NA	0.87	22.5	22.5	12.9	2.48	NA	<0.71	NA	NA	54.7	NA
B15SH	1.5	2/1/1991	NA	**126**	NA	4.2	25.9	408	**741**	6.42	NA	<8.6	NA	NA	366	NA
	4	2/1/1991	NA	1.9	NA	5.1	71.2	32.3	6.5	0.3	NA	<9.3	NA	NA	48.4	NA
	6.5	2/1/1991	NA	2.7	NA	2.9	58	54.3	9.7	0.26	NA	<9.2	NA	NA	65.7	NA
	9	2/1/1991	NA	<8.8	NA	2.5	69.8	25.3	4.2	0.11	NA	<8.8	NA	NA	58.7	NA
	11.5	2/1/1991	NA	3.2	NA	1.7	63.3	62.7	4.2	0.11	NA	<9	NA	NA	89.3	NA
	14	2/1/1991	NA	1.7	NA	1.9	43.3	25.5	3.2	0.25	NA	<9.5	NA	NA	48.5	NA
B16SH	1.3	2/1/1991	NA	3.6	NA	0.88	22.4	**804**	9.3	1.17	NA	<0.76	NA	NA	71.4	NA
B31	0 - 3	5/1/1990	NA	NA	NA	NA	NA	NA	NA	6.7	NA	NA	NA	NA	NA	NA
B32	0 - 3	5/1/1990	NA	NA	NA	NA	NA	NA	NA	1.4	NA	NA	NA	NA	NA	NA
B35	0 - 3	5/1/1990	NA	NA	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	NA	NA
B38	0 - 3	5/1/1990	NA	NA	NA	NA	NA	200	NA	2.5	NA	NA	NA	NA	170	NA
B39	0 - 3	5/1/1990	NA	NA	NA	NA	NA	160	NA	6.7	NA	NA	NA	NA	180	NA
AOC U6 - Heron Drive Area																
HD2-1	0	9/9/2002	<3	6.5	0.58	1.2	26	75 J	79 J	24	43	0.69	<0.25	2.7	120	6.7
	2	9/9/2002	<0.28	3.5	0.55	0.93	42	12 J	12 J	0.85	40	<0.23	<0.23	0.25	31	6.8
	4	9/9/2002	NA	NA	NA	NA	NA	NA	NA	3.8	NA	NA	NA	NA	NA	NA
	7.5	9/9/2002	NA	NA	NA	NA	NA	NA	NA	0.074	NA	NA	NA	NA	NA	NA
HD2-2	0	9/9/2002	<2.8	8.6	0.49	1.4	26	200 J	130 J	**87**	40	0.86	<0.23	1.4	170	6.3
	2	9/9/2002	<3.3	4.2	0.67	0.93	43	14 J	14 J	1.8	42	<0.27	<0.27	0.86	25	6.4
	2 - 2.5	5/6/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.8
	4	9/9/2002	NA	NA	NA	NA	NA	NA	NA	<0.022	NA	NA	NA	NA	NA	NA
	4 - 4.5	5/6/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.5
	6 - 6.5	5/6/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8

TABLE 1
ANALYTICAL RESULTS WITH SCREENING FOR METALS AND pH IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Antimony (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)	pH (SU)
Upland Soil Screening Criteria[1]			--	27.3	--	147	157	412	437	42	621	10200	10200	135	760	--
HD2-3	0	9/9/2002	<2.8	1.6	0.58	0.56	9.7	7.5 J	11 J	1.3	17	<0.24	<0.24	0.84	28	8.8
	1.5	9/9/2002	<3.4	9.7	0.6	1.1	31	82 J	140 J	**60**	41	1.6	<0.28	3.4	86	7.6
	2 - 2.5	5/6/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.4
	4	9/9/2002	NA	NA	NA	NA	NA	NA	NA	23	NA	NA	NA	NA	NA	NA
	4 - 4.5	5/6/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.1
	6 - 6.5	5/6/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.4
	7.5	9/9/2002	NA	NA	NA	NA	NA	NA	NA	0.058	NA	NA	NA	NA	NA	NA
HD2-4	0	12/11/2002	R	5.3	0.47	0.87	30	88 J	36	0.89	34	0.34	<0.19	0.93	42	NA
	1.5	12/11/2002	R	3.9	0.56	0.83	35	45 J	15	22	37	<0.21	<0.21	0.53	34	NA
	3	12/11/2002	R	6.6	0.8	1	43	16 J	9	7.4	93	<0.29	<0.29	0.43	38	NA
HD2-5	0	12/11/2002	R	5.4	0.49	1.4	33	26 J	21	0.62	44	0.55	<0.24	0.7	69	NA
	1.5	12/11/2002	R	5.2	0.61	1.1	45	15 J	13	1.6	69	0.41	<0.27	0.38	30	NA
	3	12/11/2002	R	3.7	0.45	0.84	35	11 J	10	1.1	38	0.36	<0.27	0.48	22	NA
HD2-6	0	12/11/2002	R	5.2	0.51	1.4	42	46 J	50	0.9	49	0.74	<0.3	0.34	89	NA
	1.5	12/11/2002	R	4.6	0.65	1.2	55	110 J	14	1.8	43	0.58	<0.29	0.35	73	NA
	3	12/11/2002	R	4.2	0.43	1	37	13 J	6.7	0.1	65	0.45	<0.26	0.83	26	NA
HD2-7	0	12/11/2002	R	6.7	0.72	2	59	85 J	41	8.9	76	1.3	<0.36	2.8	100	NA
	1.5	12/11/2002	R	3.7	0.47	1.1	40	120 J	11	11	37	0.29	<0.26	1	78	NA
	3	12/11/2002	R	4.3	0.52	1	37	160 J	13	0.9	52	0.32	<0.25	0.87	43	NA
HD2-8	0	12/11/2002	R	5.9	0.51	1.5	40	73 J	31	5.2	57	0.53	<0.25	0.6	98	NA
	1.5	12/11/2002	R	3.6	0.42	0.89	36	11 J	9.2	14	30	<0.25	<0.25	<0.25	22	NA
	3	12/11/2002	R	4.6	0.42	1.2	34	54 J	24	0.42	46	0.35	<0.2	0.35	73	NA
HD2-9	0	12/11/2002	R	6.1	0.51	1	19	54 J	62	39	27	0.35	<0.28	0.98	84	NA
	1.5	12/11/2002	R	4.8	0.47	1.2	31	34 J	120	35	39	0.67	<0.26	1.8	110	NA
	3	12/11/2002	R	5.1	0.46	1.1	22	66 J	120	0.46	30	<0.27	0.28	0.93	110	NA
HD2-10	0	1/17/2003	<3.5 J	6.1	0.51	1.7	32	99	63	9.6	38	0.55	<0.29	0.96	130	NA
	2	1/17/2003	<2.5 J	3.5	0.58	1.1	33	13	12	0.38	38	<0.21	<0.21	0.65	18	NA
	4.5	1/17/2003	<3.1 J	3.8	0.52	1.1	32	16	11	0.53	37	<0.26	<0.26	<0.26	21	NA
HD2-12	0	1/31/2003	<3 J	3.4	0.6	2	16	19	22	34	29	0.51	<0.25	<0.25	60	NA
	2	1/31/2003	<3.2 J	3.5	0.35	2	42	13	8.7	0.13	38	0.27	<0.26	<0.26	24	NA
	3.5	1/31/2003	<3 J	4.4	0.44	2	42	15	7	0.37	46	0.34	<0.25	<0.25	32	NA
Historical - location approximate																
B7SH	1.3	2/1/1991	NA	3	NA	<0.76	17.8	38.9	20.6	**80.1**	NA	<0.73	NA	NA	47.6	NA
B8SH	1.3	2/1/1991	NA	6.5	NA	1.6	20.7	181	121	**97.8**	NA	<0.7	NA	NA	114	NA
AOC U8 - Lark Drive																
MH11		No Date	<60	<5	<2	<5	<10	12	<3	<0.2	<20	<5	<5	<5	98	NA
SD MH-9	11 - 11.5	5/6/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7
SD MH-11	7 - 7.5	5/6/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.4
	10 - 10.5	5/6/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7
SD2-5	0.5	4/10/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SD2-6	0.5	4/10/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4 - 4.5	4/23/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5.5	5/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8
SD2-19	0 - 1.5	7/18/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SD2-20	0 - 1.3	7/18/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SD2-21	0 - 0.3	7/18/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SD3-1	0 - 0.5	4/23/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2 - 2.5	4/23/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 1
ANALYTICAL RESULTS WITH SCREENING FOR METALS AND pH IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Antimony (mg/kg)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)	pH (SU)
Upland Soil Screening Criteria[(1)]			--	27.3	--	147	157	412	437	42	621	10200	10200	135	760	--
	4 - 4.5	4/23/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SD3-2	0	5/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.6
	2	5/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8
	4	5/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.2
	5.5	5/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.2
Historical - location approximate																
B1BC	0.5 - 1.5	2/1/1991	NA	5.5	NA	2.2	27.1	207	19.1	0.83	NA	<0.92	NA	NA	135	NA
B2BC	0.5 - 1.5	2/1/1991	NA	3.5	NA	2.5	15.8	232	19.8	1.04	NA	<0.96	NA	NA	171	NA
B3BC	0.5 - 1.5	2/1/1991	NA	1.2	NA	2	24.3	70.8	69.5	1.75	NA	<0.91	NA	NA	392	NA
B4BC	0.5 - 1.5	2/1/1991	NA	<0.89	NA	2.2	18.7	149	17.1	1.06	NA	<0.89	NA	NA	223	NA

Notes:
(1) screening criteria are lowest of Ecological Site Specific Target Levels (E-SSTLs) or Human Health SSTLs (H-SSTLs)
J=result qualified
NA = not analyzed
ND = non detect
shaded cell = result exceeds screening criteria

TABLE 2
ANALYTICAL RESULT WITH SCREENING FOR PCBs IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Total PCBs (mg/kg)	Aroclor-1016 (mg/kg)	Aroclor-1221 (mg/kg)	Aroclor-1232 (mg/kg)	Aroclor-1242 (mg/kg)	Aroclor-1248 (mg/kg)	Aroclor-1254 (mg/kg)	Aroclor-1260 (mg/kg)
Screening - H-SSTL			10	--	--	--	--	--	--	--
AOC U2 - Test Pit Area										
TP103	0	No Date	0.3	<0.016	<0.032	<0.016	<0.016	<0.016	0.3	<0.016
	2	No Date	ND	<0.016	<0.032	<0.016	<0.016	<0.016	<0.016	<0.016
AOC U3 - Forest Products Area										
FP2-1	0	9/9/2002	0.15	<0.013	<0.026	<0.013	<0.013	<0.013	0.15 J	<0.013
AOC U4 - Shell Manufacturing Area										
SM2-1	0	9/9/2002	ND	<0.013	<0.025	<0.013	<0.013	<0.013	<0.013	<0.013
SM2-4	0	9/9/2002	0.047	<0.012	<0.025	<0.012	<0.012	<0.012	0.028	0.019
AOC U6 - Heron Drive Area										
HD2-1	0	9/9/2002	8.2	<0.25	<0.5	<0.25	<0.25	<0.25	7.1	1.1
	4	9/9/2002	4.6	R	R	R	R	4.6 J	R	R
HD2-2	0	9/9/2002	0.208	<0.013	<0.025	<0.013	<0.013	<0.013	0.15	0.058
	2 - 2.5	5/6/2004	ND	<0.015	<0.029	<0.015	<0.015	<0.015	<0.015	<0.015
	4 - 4.5	5/6/2004	ND	<0.014	<0.028	<0.014	<0.014	<0.014	<0.014	<0.014
	6 - 6.5	5/6/2004	ND	<0.014	<0.028	<0.014	<0.014	<0.014	<0.014	<0.014
HD2-3	2 - 2.5	5/6/2004	ND	<0.014	<0.028	<0.014	<0.014	<0.014	<0.014	<0.014
	4 - 4.5	5/6/2004	ND	<0.015	<0.03	<0.015	<0.015	<0.015	<0.015	<0.015
	6 - 6.5	5/6/2004	ND	<0.014	<0.027	<0.014	<0.014	<0.014	<0.014	<0.014
HD2-4	0	12/11/2002	ND	<0.063	<0.13	<0.063	<0.063	<0.063	<0.063	<0.063
	1.5	12/11/2002	ND	<0.012	<0.025	<0.012	<0.012	<0.012	<0.012	<0.012
	3	12/11/2002	0.1	<0.014	<0.029	<0.014	<0.014	<0.014	0.1	<0.014
HD2-5	0	12/11/2002	0.2	<0.067	<0.13	<0.067	<0.067	<0.067	0.2	<0.067
	1.5	12/11/2002	ND	<0.015	<0.03	<0.015	<0.015	<0.015	<0.015	<0.015
	3	12/11/2002	0.123	<0.014	<0.027	<0.014	<0.014	<0.014	0.082	0.041
HD2-6	0	12/11/2002	ND	<0.015	<0.03	<0.015	<0.015	<0.015	<0.015	<0.015
	1.5	12/11/2002	ND	<0.016	<0.032	<0.016	<0.016	<0.016	<0.016	<0.016
	3	12/11/2002	ND	<0.014	<0.027	<0.014	<0.014	<0.014	<0.014	<0.014
HD2-7	0	12/11/2002	0.02	<0.018	<0.035	<0.018	<0.018	<0.018	0.02	<0.018
	1.5	12/11/2002	ND	<0.013	<0.027	<0.013	<0.013	<0.013	<0.013	<0.013
	3	12/11/2002	ND	<0.014	<0.028	<0.014	<0.014	<0.014	<0.014	<0.014
HD2-8	0	12/11/2002	0.11	<0.015	<0.029	<0.015	<0.015	<0.015	0.11	<0.015
	1.5	12/11/2002	ND	<0.013	<0.026	<0.013	<0.013	<0.013	<0.013	<0.013
	3	12/11/2002	ND	<0.013	<0.026	<0.013	<0.013	<0.013	<0.013	<0.013
HD2-9	0	12/11/2002	0.69	<0.014	<0.029	<0.014	<0.014	<0.014	0.69	<0.014
	1.5	12/11/2002	ND	<0.013	<0.026	<0.013	<0.013	<0.013	<0.013	<0.013

TABLE 2
ANALYTICAL RESULT WITH SCREENING FOR PCBs IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Total PCBs (mg/kg)	Aroclor-1016 (mg/kg)	Aroclor-1221 (mg/kg)	Aroclor-1232 (mg/kg)	Aroclor-1242 (mg/kg)	Aroclor-1248 (mg/kg)	Aroclor-1254 (mg/kg)	Aroclor-1260 (mg/kg)
Screening - H-SSTL			10	--	--	--	--	--	--	--
	3	12/11/2002	ND	<0.013	<0.026	<0.013	<0.013	<0.013	<0.013	<0.013
HD2-10	0	1/17/2003	0.367	<0.017	<0.034	<0.017	<0.017	<0.017	0.28	0.087
	2	1/17/2003	ND	<0.015	<0.029	<0.015	<0.015	<0.015	<0.015	<0.015
	4.5	1/17/2003	ND	<0.015	<0.029	<0.015	<0.015	<0.015	<0.015	<0.015
HD2-11	6	1/17/2003	ND	<0.012	<0.024	<0.012	<0.012	<0.012	<0.012	<0.012
	7.5	1/17/2003	ND	<0.012	<0.024	<0.012	<0.012	<0.012	<0.012	<0.012
HD2-12	0	1/31/2003	ND	<0.013	<0.026	<0.013	<0.013	<0.013	<0.013	<0.013
	2	1/31/2003	ND	<0.015	<0.03	<0.015	<0.015	<0.015	<0.015	<0.015
	3.5	1/31/2003	ND	<0.013	<0.027	<0.013	<0.013	<0.013	<0.013	<0.013
AOC U8 - Lark Drive										
MH11		No Date	**42**	NA	NA	NA	NA	42	NA	NA
SD MH-9	11 - 11.5	5/6/2004	ND	<0.013	<0.026	<0.013	<0.013	<0.013	<0.013	<0.013
SD MH-11	7 - 7.5	5/6/2004	ND	<0.014	<0.027	<0.014	<0.014	<0.014	<0.014	<0.014
	10 - 10.5	5/6/2004	ND	<0.013	<0.026	<0.013	<0.013	<0.013	<0.013	<0.013
SD2-1	0.5 - 1	3/13/2003	ND	<0.12	<0.24	<0.12	<0.12	<0.12	<0.12	<0.12
SD2-2	0.5 - 1	3/13/2003	ND	<0.12	<0.24	<0.12	<0.12	<0.12	<0.12	<0.12
SD2-3	0 - 0.5	3/13/2003	2.12	<0.12	<0.24	<0.12	<0.12	<0.12	1.8	0.32
	0 - 0.5	6/17/2004	0.725	<0.010	<0.021	<0.010	<0.010	0.3	0.35	0.075
	2 - 2.5	6/17/2004	ND	<0.011	<0.021	<0.011	<0.011	<0.011	<0.011	<0.011
SD2-4	0.5 - 1	3/13/2003	ND	<0.12	<0.24	<0.12	<0.12	<0.12	<0.12	<0.12
SD2-5	0.5 - 1	4/10/2003	7.2	<0.46	<0.91	<0.46	<0.46	7.2	<0.46	<0.46
SD2-6	0.5 - 1	4/10/2003	**11**	<0.42	<0.84	<0.42	<0.42	11	<0.42	<0.42
	4 - 4.5	4/23/2004	1.46	<0.031	<0.062	<0.031	<0.031	1.4	<0.031	0.063
	5.5 - 6	5/11/2004	ND	<0.013	<0.027	<0.013	<0.013	<0.013	<0.013	<0.013
SD2-7	0.5 - 1	5/12/2003	3.51	<0.015	<0.03	<0.015	<0.015	3.3	<0.015	0.21
SD2-8	0.5 - 1	5/12/2003	0.51	<0.016	<0.032	<0.016	<0.016	0.51	<0.016	<0.016
SD2-9	0.5 - 1	5/12/2003	**10.33**	<0.024	<0.049	<0.024	<0.024	10	<0.024	0.33
SD2-10	0.5 - 1	5/12/2003	**445**	<7.7	<15	<7.7	<7.7	430	<7.7	15
SD2-11	0.5 - 1	5/12/2003	2.91	<0.017	<0.034	<0.017	<0.017	2.7	<0.017	0.21
SD2-12	0 - 0.5	5/23/2003	1.2	<0.019	<0.037	<0.019	<0.019	1.2	<0.019	<0.019
SD2-13	0.5 - 1	5/23/2003	2.8	<0.07	<0.14	<0.07	<0.07	2.8	<0.07	<0.07
SD2-14	0 - 0.5	5/23/2003	0.23	<0.013	<0.025	<0.013	<0.013	<0.013	<0.013	0.23
SD2-15	0 - 0.5	6/6/2003	5.52	<0.014	<0.027	<0.014	<0.014	5.2	<0.014	0.32
SD2-16	0.67	6/6/2003	6.9	<0.013	<0.027	<0.013	<0.013	6.9	<0.013	<0.013
SD2-17	0.67	6/6/2003	0.4	<0.013	<0.027	<0.013	<0.013	0.32	<0.013	0.08

TABLE 2
ANALYTICAL RESULT WITH SCREENING FOR PCBs IN SOIL
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Depth (Feet)	Date Collected	Total PCBs (mg/kg)	Aroclor-1016 (mg/kg)	Aroclor-1221 (mg/kg)	Aroclor-1232 (mg/kg)	Aroclor-1242 (mg/kg)	Aroclor-1248 (mg/kg)	Aroclor-1254 (mg/kg)	Aroclor-1260 (mg/kg)
Screening - H-SSTL			10	--	--	--	--	--	--	--
SD2-18	1.5 - 2	6/6/2003	6.15	<0.014	<0.027	<0.014	<0.014	5.8	<0.014	0.35
SD2-19	0 - 1.5	7/18/2003	3.8	<0.15	<0.3	<0.15	<0.15	3.8	<0.15	<0.15
SD2-20	0 - 1.3	7/18/2003	ND	<0.015	<0.03	<0.015	<0.015	<0.015	<0.015	<0.015
SD2-21	0 - 0.3	7/18/2003	6.2	<0.16	<0.31	<0.16	<0.16	6.2	<0.16	<0.16
SD3-1	0 - 0.5	4/23/2004	0.031	<0.014	<0.029	<0.014	<0.014	<0.014	0.031	<0.014
	2 - 2.5	4/23/2004	ND	<0.015	<0.03	<0.015	<0.015	<0.015	<0.015	<0.015
	4 - 4.5	4/23/2004	ND	<0.015	<0.029	<0.015	<0.015	<0.015	<0.015	<0.015
SD3-2	0 - 0.5	5/11/2004	ND	<0.015	<0.03	<0.015	<0.015	<0.015	<0.015	<0.015
	2 - 2.5	5/11/2004	ND	<0.015	<0.03	<0.015	<0.015	<0.015	<0.015	<0.015
	4 - 4.5	5/11/2004	ND	<0.014	<0.027	<0.014	<0.014	<0.014	<0.014	<0.014
	5.5 - 6	5/11/2004	ND	<0.014	<0.028	<0.014	<0.014	<0.014	<0.014	<0.014
SD3-3	2 - 2.5	6/17/2004	ND	<0.016	<0.031	<0.016	<0.016	<0.016	<0.016	<0.016
	4 - 4.5	6/17/2004	ND	<0.014	<0.027	<0.014	<0.014	<0.014	<0.014	<0.014
	6 - 6.5	6/17/2004	ND	<0.014	<0.027	<0.014	<0.014	<0.014	<0.014	<0.014
SD3-4	0 - 0.5	6/17/2004	0.621	<0.011	<0.022	<0.011	<0.011	0.28	0.25	0.091
	2 - 2.5	6/17/2004	ND	<0.011	<0.022	<0.011	<0.011	<0.011	<0.011	<0.011
SD3-5	0 - 0.5	6/17/2004	4.53	<0.011	<0.022	<0.011	<0.011	2.0	2.1	0.43
	2 - 2.5	6/17/2004	ND	<0.012	<0.023	<0.012	<0.012	<0.012	<0.012	<0.012
SD3-6	0 - 0.5	6/17/2004	0.061	<0.011	<0.022	<0.011	<0.011	0.036	0.025	<0.011
SD3-7	0 - 0.5	6/17/2004	0.012	<0.011	<0.021	<0.011	<0.011	<0.011	0.012	<0.011
	2 - 2.5	6/17/2004	ND	<0.011	<0.023	<0.011	<0.011	<0.011	<0.011	<0.011
SD3-8	0 - 0.5	6/17/2004	0.023	<0.010	<0.021	<0.010	<0.010	<0.010	0.023	<0.010
	2 - 2.5	6/17/2004	ND	<0.011	<0.022	<0.011	<0.011	<0.011	<0.011	<0.011
SD3-9	0 - 0.5	6/17/2004	0.038	<0.011	<0.022	<0.011	<0.011	<0.011	0.038	<0.011
	2 - 2.5	6/17/2004	ND	<0.012	<0.024	<0.012	<0.012	<0.012	<0.012	<0.012
SD3-12	0 - 0.5	6/17/2004	0.61	<0.050	<0.10	<0.050	<0.050	<0.050	0.61	<0.050
SD3-13	0 - 0.5	6/17/2004	0.117	<0.010	<0.021	<0.010	<0.010	0.056	0.061	<0.010
SD3-14	0 - 0.5	6/17/2004	0.018	<0.010	<0.021	<0.010	<0.010	<0.010	0.018	<0.010

Notes:
J=result qualified
ND = non detect
10.33 = exceeds screening criteria

TABLE 3
ANALYTICAL RESULTS FOR REPAVED AREAS
AOC U2 AND AOC U8
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

AOC:			AOC U2 (1)	AOC U2 (2)	AOC U8 (3)
Sample ID: / Date Collected:	Upland Soil	Units	EGRET-BLG 445 06/11/04	EGRET 445 STKPL 06/11/04	BLG 276 STKPL 06/11/04
Metals					
Antimony	- -	mg/kg	<2.8	<3.3	<2.7
Arsenic	27.3	mg/kg	3	2.7	5.8
Beryllium	- -	mg/kg	0.6	0.34	0.61
Cadmium	147	mg/kg	<0.23	<0.27	<0.23
Chromium	157	mg/kg	14	14	51
Copper	412	mg/kg	16	30	45
Lead	437	mg/kg	12	13	68
Mercury	42	mg/kg	0.16	0.096	0.77
Nickel	621	mg/kg	20	25	44
Selenium	10200	mg/kg	0.43	0.52	1
Silver	10200	mg/kg	<0.23	<0.27	<0.23
Thallium	135	mg/kg	<0.23	<0.27	<0.23
Zinc	760	mg/kg	37	31	260
PCBs					
Aroclor-1016	- -	mg/kg	<0.01	<0.049	<0.013
Aroclor-1221	- -	mg/kg	<0.02	<0.098	<0.026
Aroclor-1232	- -	mg/kg	<0.01	<0.049	<0.013
Aroclor-1242	- -	mg/kg	<0.01	<0.049	<0.013
Aroclor-1248	- -	mg/kg	<0.01	<0.049	0.15
Aroclor-1254	- -	mg/kg	<0.01	0.065	0.077
Aroclor-1260	- -	mg/kg	<0.01	<0.049	0.037
Total PCBs	10	mg/kg	ND	0.065	0.264
Miscellaneous					
pH	- -	SU	8.5	8.6	7.6

Notes:
(1) surface beneath Egret Way pavement
(2) stockpile of ground asphalt and soil from beneath Egret Way
(3) stockpile of ground asphalt and soil from beneath parking area adjacent to Building 276

TABLE 4
ANALYTICAL RESULTS WITH SCREENING FOR METALS AND pH IN GROUNDWATER
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID	Date Collected	Antimony (ug/L)	Arsenic (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)	Mercury (ug/L)	Nickel (ug/L)	Selenium (ug/L)	Silver (ug/L)	Thallium (ug/L)	Zinc (ug/L)	pH (SU)
Screening for GW=10xAWQC*		--	360	--	8.8	500	31	81	0.25	82	710	--	--	810	--
AOC U1															
AOC1-GW	5/6/2004	<60	<5	<2	<5	<10	10	3.7	<0.2	31	<5	<5	<5	31	6.7
AOC U2															
AOC2-GW	5/6/2004	<60	32	5.2	6.5	160	**140**	3.4	**0.27**	**450**	<5	<5	<5	140	6.6
AOC U3															
AOC3-GW	5/6/2004	<60 [<60]	27 [29]	5.3 [6.6]	<5 [<5]	<10 [15]	**50 [54]**	5 [4]	<0.2 [<0.2]	52 [83]	<5 [<5]	<5 [<5]	<5 [<5]	70 [96]	6.7 [6.6]
AOC U4															
AOC4-GW	5/6/2004	<60	<5	2.3	<5	14	**33**	16	<0.2	64	<5	<5	<5	46	7.2
AOC U6															
AOC6-GW	5/6/2004	<60	<5	<2	<5	26	15	5.3	**0.92**	**93**	<5	<5	<5	40	6.9
AOC U7															
MF3-1	5/23/2003	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA
MF3-2	5/23/2003	NA	NA	NA	NA	NA	NA	NA	**0.39**	NA	NA	NA	NA	NA	NA
MF3-3	5/23/2003	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA
MF3-4	5/23/2003	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA
MW1		<60	<5	<2	<5	<10	<10	<3	<0.2	<20	<5	<5 UJ	<5	<20	

Note: Sample duplicate results reported in brackets
*AWQC = USEPA Ambient Water Quality Criteris for Freshwater, Continuous Concentration

TABLE 5
ANALYTICAL RESULTS FOR VOCs IN GROUNDWATER
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID: / Date Collected:		AOC3-GW 05/06/04
VOCs	**Units**	
1,1,1,2-Tetrachloroethane	ug/L	<5
1,1,1-Trichloroethane	ug/L	<5
1,1,2,2-Tetrachloroethane	ug/L	<5
1,1,2-Trichloroethane	ug/L	<5
1,1-Dichloroethane	ug/L	<5
1,1-Dichloroethene	ug/L	<5
1,1-Dichloropropene	ug/L	<5
1,2,3-Trichlorobenzene	ug/L	<5
1,2,3-Trichloropropane	ug/L	<5
1,2,4-Trichlorobenzene	ug/L	<5
1,2,4-Trimethylbenzene	ug/L	<5
1,2-Dibromo-3-Chloropropane	ug/L	<5
1,2-Dibromoethane	ug/L	<5
1,2-Dichlorobenzene	ug/L	<5
1,2-Dichloroethane	ug/L	<5
1,2-Dichloropropane	ug/L	<5
1,3,5-Trimethylbenzene	ug/L	<5
1,3-Dichlorobenzene	ug/L	<5
1,3-Dichloropropane	ug/L	<5
1,4-Dichlorobenzene	ug/L	<5
2,2-Dichloropropane	ug/L	<5
2-Butanone	ug/L	<10
2-Chlorotoluene	ug/L	<5
2-Hexanone	ug/L	<10
4-Chlorotoluene	ug/L	<5
4-Isopropyl Toluene	ug/L	<5
4-Methyl-2-Pentanone	ug/L	<10
Acetone	ug/L	<20
Benzene	ug/L	<5
Bromobenzene	ug/L	<5
Bromochloromethane	ug/L	<10
Bromodichloromethane	ug/L	<5
Bromoform	ug/L	<5
Bromomethane	ug/L	<10
Carbon Disulfide	ug/L	<5
Carbon Tetrachloride	ug/L	<5
Chlorobenzene	ug/L	<5
Chloroethane	ug/L	<10
Chloroform	ug/L	<5
Chloromethane	ug/L	<10
cis-1,2-Dichloroethene	ug/L	<5
cis-1,3-Dichloropropene	ug/L	<5
Dibromochloromethane	ug/L	<5
Dibromomethane	ug/L	<5
Ethylbenzene	ug/L	<5
Freon 113	ug/L	<5

TABLE 5
ANALYTICAL RESULTS FOR VOCs IN GROUNDWATER
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Sample ID: / Date Collected:		AOC3-GW 05/06/04
Freon 12	ug/L	<10
Hexachlorobutadiene	ug/L	<5
Isopropylbenzene	ug/L	<5
m&p-Xylene	ug/L	<5
Methylene Chloride	ug/L	<20
MTBE	ug/L	<5
n-Butylbenzene	ug/L	<5
Naphthalene	ug/L	<5
o-Xylene	ug/L	<5
Propylbenzene	ug/L	<5
sec-Butylbenzene	ug/L	<5
Styrene	ug/L	<5
tert-Butylbenzene	ug/L	<5
Tetrachloroethene	ug/L	<5
Toluene	ug/L	<5
trans-1,2-Dichloroethene	ug/L	<5
trans-1,3-Dichloropropene	ug/L	<5
Trichloroethene	ug/L	<5
Trichlorofluoromethane	ug/L	<5
Vinyl Acetate	ug/L	<50
Vinyl Chloride	ug/L	<10

Note: The sample from AOC U3 only was analyzed for VOCs.
Results for a duplicate sample were also ND.

TABLE 6
GROUNDWATER LEVELS IN TEMPORARY PIEZOMETERS
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Location	Date	Depth to Groundwater	Elevation (Top of Casing)	Groundwater Elevation
		(ft)	(ft)	(ft)
PB18	9/10/2002	9.82	13.61	3.79
PB19	9/10/2002	8.83	12.48	3.65
PB20	9/10/2002	8.57	13.31	4.74
PB18	12/5/2002	9.55	13.61	4.06
PB19	12/5/2002	8.42	12.48	4.06
PB20	12/5/2002	8.58	13.31	4.73
PB18	3/13/2003	8.63	13.61	4.98
PB19	3/13/2003	7.51	12.48	4.97
PB20	3/13/2003	6.75	13.31	6.56
PB18	5/7/2004	7.78	10.95	3.17
PB19	5/7/2004	9.15	12.47	3.32
PB20	5/7/2004	6.94	13.31	6.37

TABLE 7
PHASE 3 REMEDIAL ACTION SUMMARY
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Area of Concern	Description	Type of Material	Chemicals of Concern	Area (acres)	Area (square feet)	Approximate Depth of Excavation (feet)	Approximate Elevation of Excavation Bottom (feet MSL)	Approximate Excavated Volume (insitu cubic yards)	Waste Characterization	Treatment	Disposal Location
U1	Explosives Storage Area	soil	As, Cu, Pb	0.67	29,188	3	16	1,630	Non-RCRA Hazardous	None necessary. May treat with limestone to reduce disposal costs	Class I or Class II with treatment
U2	Test Pit Area	soil	As, Cu	0.11	4,595	1	18	240	Non-Hazardous	None	Class II
U3	Forest Products Area ditch	soil	As, Cu	0.02	963	1	20	36	Non-Hazardous	None	Class II
U4	Shell Manufacturing Area	soil	As, Cr, Cu, Pb, Hg	0.43	18,860	1	14	699	Non-RCRA Hazardous	None	Class I
U6	Heron Drive Area	soil	Hg, PCBs	0.08	3,496	5	5	388	Non-RCRA Hazardous	None	Class I
U8	Lark Drive, adjacent to Bld 277, ditch	soil	PCBs	0.01	255	2	11	20	Non-Hazardous	None	Class II
M3	Marsh portion of Subunit 2B, channel widening	sediment, backfill	As, Hg	0.03	1,440	1.5	0	60	Non-RCRA Hazardous for sediment, Non-Hazardous for backfill	Drying agent such as CKD for sediment, None for backfill	Class I for sediment, stockpile onsite for backfill
M3	Marsh portion of Subunit 2B, new channel	backfill	none	0.05	2,000	2	0	70	Non-Hazardous	None	Stockpile onsite

NOTES:
An = Antimony; As = Arsenic; Cd = Cadmium; Cu = Copper; Pb = Lead; Hg = Mercury; Se = Selenium; Ag = Silver; Zn = Zinc; PCBs = Polychlorinated Biphenyls
AOC = Area of Concern
MSL = Mean Sea Level
N/A = Not Applicable
cy = cubic yard

TABLE 8
UPLAND FILL CRITERIA
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Analyte	Upland Fill Criteria	Method
Metals [mg/kg]		USEPA 6010
Antimony	5.9	
Arsenic	14	
Beryllium	0.9	
Cadmium	1.50	
Chromium	91.4	
Copper	59.6	
Lead	14.7	
Mercury	0.3	
Nickel	120.2	
Selenium	5.6	
Silver	1.7	
Thallium	5.2	
Zinc	91.5	
Pesticides [mg/kg]		USEPA 8081
Chlordane	1.62	
DDT	1.72	
DDE	2.43	
DDD	1.72	
Dieldrin	0.030	
Endrin	10.7	
Heptachlor	0.108	
Heptachlor epoxide	0.053	
Hexachlorocyclohexane (HCH) (alpha)	0.090	
Hexachlorocyclohexane (HCH) (beta)	0.315	
Hexachlorocyclohexane (HCH) (gamma)	0.436	
Hexachlorocyclohexane (HCH) (delta)	0.142	
PCBs [mg/kg] (EPA Residential PRG)		USEPA 8082
Aroclor 1016	3.9	
Aroclor 1221	0.22	
Aroclor 1232	0.22	
Aroclor 1242	0.22	
Aroclor 1248	0.22	
Aroclor 1254	0.22	
Aroclor 1260	0.22	
Aroclor 1262	0.22	
Pentachlorophenol [mg/kg]	2.97	USEPA 8270
PAHs [mg/kg]		USEPA 8310
Naphthalene	56	
Acenaphtylene	-	
Acenaphthene	3,700	
Fluorene	2,600	
Phenanthrene	-	

TABLE 8
UPLAND FILL CRITERIA
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

Analyte	Upland Fill Criteria	Method
Anthracene	22,000	
Fluoranthene	2,300	
Pyrene	2,300	
Benzo(a)anthracene	0.62	
Chrysene	6.1	
Benzo(b)fluoranthene	0.62	
Benzo(k)fluoranthene	0.61	
Benzo(a)pyrene	0.062	
Dibenz(a,h)anthracene	-	
Benzo(g,h,i)perylene	-	
Ideno(1,2,3-cd)pyrene	0.62	

TABLE 9
WASTE CHARACTERIZATION RESULTS
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

AOC:		AOC U1		AOC U2	AOC U3	AOC U4	AOC U6	AOC U8	Regulatory Criteria		
		A	B						CA Haz		Fed Haz
Date Collected:	Units	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/11/04	TTLC	STLC	TCLP
Metals											
Antimony	mg/kg	3.5	<3.7	<2.7	<3	<3.3	<3.2	<2.9	500	-	-
Arsenic	mg/kg	15	5.4	12	59	14	6.3	5.4	500	-	-
Barium	mg/kg	320	230	160	210	150	210	170	10,000	-	-
Beryllium	mg/kg	0.42	0.6	0.41	0.45	0.41	0.44	0.46	75	-	-
Cadmium	mg/kg	2	0.89	0.96	1.3	0.68	1.1	0.54	100	-	-
Chromium	mg/kg	120	40	33	43	34	29	47	5,000	-	-
Cobalt	mg/kg	20	38	10	10	9.5	12	11	8,000	-	-
Copper	mg/kg	560	1200	470	290	230	750	22	2,500	-	-
Lead	mg/kg	160	12	69	61	150	98	6.6	1,000	-	-
Mercury	mg/kg	1.8	0.73	6	9.4	**22**	**40**	0.13	20	-	-
Molybdenum	mg/kg	29	<1.2	1.4	1.6	1.7	<1.1	<0.96	3,500	-	-
Nickel	mg/kg	47	27	23	38	36	33	73	2,000	-	-
Selenium	mg/kg	0.74	<0.31	0.78	0.53	1.1	<0.27	0.94	100	-	-
Silver	mg/kg	<0.25	<0.31	<0.22	<0.25	<0.28	0.31	<0.24	500	-	-
Thallium	mg/kg	<0.25	<0.31	<0.22	<0.25	<0.28	<0.27	<0.24	700	-	-
Vanadium	mg/kg	31	38	33	37	29	29	34	2,400	-	-
Zinc	mg/kg	260	110	210	140	150	230	33	5,000	-	-
Metals-Wet Leachate											
Arsenic	ug/L	NA	NA	NA	<2500	NA	NA	NA	-	5,000	-
Chromium	ug/L	260	NA	NA	NA	NA	NA	NA	-	5,000	-
Copper	ug/L	**33,000**	**50,000**	24,000	12,000	NA	NA	NA	-	25,000	-
Lead	ug/L	<1500	NA	<1500	1,700	NA	NA	NA	-	5,000	-
Mercury	ug/L	NA	NA	<1	6.9	NA	NA	NA	-	200	-
Metals-TCLP											
Chromium	ug/L	<10	NA	NA	NA	NA	NA	NA	-	-	5,000
Lead	ug/L	<300	NA	NA	NA	<300	NA	NA	-	-	5,000
Mercury	ug/L	NA	NA	<1	<1	<1	<1	NA	-	-	200
PCBs											
Aroclor-1016	mg/kg	<0.13	<0.014	<0.013	<0.013	<0.015	<0.014	<0.015			
Aroclor-1221	mg/kg	<0.26	<0.028	<0.026	<0.026	<0.03	<0.027	<0.03			
Aroclor-1232	mg/kg	<0.13	<0.014	<0.013	<0.013	<0.015	<0.014	<0.015			
Aroclor-1242	mg/kg	<0.13	<0.014	<0.013	<0.013	<0.015	<0.014	<0.015	50	5	-
Aroclor-1248	mg/kg	<0.13	<0.014	<0.013	<0.013	<0.015	<0.014	<0.015			
Aroclor-1254	mg/kg	16	0.036	0.026	0.068	0.055	0.36	<0.015			
Aroclor-1260	mg/kg	1.9	0.027	0.019	<0.13	<0.015	0.078	<0.015			
Miscellaneous											
Percent Moisture	%	9	14	7	10	20	11	19	-	-	-

TABLE 9
WASTE CHARACTERIZATION RESULTS
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

AOC:		AOC U1		AOC U2	AOC U3	AOC U4	AOC U6	AOC U8	Regulatory Criteria		
		A	B						CA Haz		Fed Haz
Date Collected:	Units	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/11/04	TTLC	STLC	TCLP
pH	SU	4.8	4.4	5.5	5.4	6.5	6.5	8.3	2-12.5	-	-
SVOCs											
1,2,4-Trichlorobenzene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
1,2-Dichlorobenzene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
1,3-Dichlorobenzene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
1,4-Dichlorobenzene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2,4,5-Trichlorophenol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2,4,6-Trichlorophenol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2,4-Dichlorophenol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2,4-Dimethylphenol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2,4-Dinitrophenol	ug/kg	<4500	<2000	<1800	<1900	<2100	<1900	<2100	-	-	-
2,4-Dinitrotoluene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2,6-Dinitrotoluene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2-Chloronaphthalene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2-Chlorophenol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2-Methylnaphthalene	ug/kg	<180	<78	<72	<74	<83	<75	<83	-	-	-
2-Methylphenol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
2-Nitroaniline	ug/kg	<1800	<780	<720	<740	<830	<750	<830	-	-	-
2-Nitrophenol	ug/kg	<1800	<780	<720	<740	<830	<750	<830	-	-	-
3,3'-Dichlorobenzidine	ug/kg	<1800	<780	<720	<740	<830	<750	<830	-	-	-
3-Nitroaniline	ug/kg	<1800	<780	<720	<740	<830	<750	<830	-	-	-
4,6-Dinitro-2-methylphenol	ug/kg	<4500	<2000	<1800	<1900	<2100	<1900	<2100	-	-	-
4-Bromophenyl-phenylether	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
4-Chloro-3-methylphenol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
4-Chloroaniline	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
4-chlorophenyl-phenylether	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
4-Methylphenol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
4-Nitroaniline	ug/kg	<1800	<780	<720	<740	<830	<750	<830	-	-	-
4-Nitrophenol	ug/kg	<1800	<780	<720	<740	<830	<750	<830	-	-	-
Acenaphthene	ug/kg	<180	<78	<72	<74	<83	<75	<83	-	-	-
Acenaphthylene	ug/kg	<180	<78	<72	<74	<83	<75	<83	-	-	-
Anthracene	ug/kg	<180	<78	<72	<74	<83	120	<83	-	-	-
Azobenzene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Benzo (a) anthracene	ug/kg	<180	<78	<72	<74	160	<75	<83	-	-	-
Benzo (a) pyrene	ug/kg	<180	<78	<72	<74	140	<75	<83	-	-	-
Benzo (b) fluoranthene	ug/kg	<180	<78	90	150	190	160	<83	-	-	-
Benzo (k) fluoranthene	ug/kg	<180	<78	<72	<74	110	<75	<83	-	-	-
Benzo(g,h,i)perylene	ug/kg	<180	<78	<72	110	<83	<75	<83	-	-	-
Benzoic acid	ug/kg	<4500	<2000	<1800	<1900	<2100	<1900	<2100	-	-	-

TABLE 9
WASTE CHARACTERIZATION RESULTS
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

AOC:		AOC U1		AOC U2	AOC U3	AOC U4	AOC U6	AOC U8	Regulatory Criteria		
		A	B						CA Haz		Fed Haz
Date Collected:	Units	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/11/04	TTLC	STLC	TCLP
Benzyl alcohol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
bis(2-Chloroethoxy) methane	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
bis(2-Chloroethyl)ether	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
bis(2-Chloroisopropyl)ether	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
bis(2-Ethylhexyl) phthalate	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Butylbenzylphthalate	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Chrysene	ug/kg	<180	<78	<72	91	200	<75	<83	-	-	-
Di-n-butylphthalate	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Di-n-octylphthalate	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Dibenz(a,h)anthracene	ug/kg	<180	<78	<72	<74	<83	<75	<83	-	-	-
Dibenzofuran	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Diethylphthalate	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Dimethylphthalate	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Fluoranthene	ug/kg	<180	<78	<72	86	370	130	<83	-	-	-
Fluorene	ug/kg	<180	<78	<72	<74	<83	<75	<83	-	-	-
Hexachlorobenzene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Hexachlorobutadiene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Hexachlorocyclopentadiene	ug/kg	<4500	<2000	<1800	<1900	<2100	<1900	<2100	-	-	-
Hexachloroethane	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Indeno(1,2,3-cd)pyrene	ug/kg	<180	<78	<72	81	<83	<75	<83	-	-	-
Isophorone	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
N-Nitroso-di-n-propylamine	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
N-Nitrosodimethylamine	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
N-Nitrosodiphenylamine	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Naphthalene	ug/kg	<180	<78	<72	<74	<83	<75	<83	-	-	-
Nitrobenzene	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Pentachlorophenol	ug/kg	<1800	<780	<720	<740	<830	<750	<830	-	-	-
Phenanthrene	ug/kg	<180	<78	<72	<74	280	<75	<83	-	-	-
Phenol	ug/kg	<900	<390	<360	<370	<420	<380	<410	-	-	-
Pyrene	ug/kg	<180	<78	<72	93	470	<75	<83	-	-	-
VOCs											
1,1,1,2-Tetrachloroethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,1,1-Trichloroethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,1,2,2-Tetrachloroethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,1,2-Trichloroethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,1-Dichloroethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,1-Dichloroethene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,1-Dichloropropene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,2,3-Trichlorobenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			

TABLE 9
WASTE CHARACTERIZATION RESULTS
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

AOC:		AOC U1		AOC U2	AOC U3	AOC U4	AOC U6	AOC U8	Regulatory Criteria		
		A	B						CA Haz		Fed Haz
Date Collected:	Units	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/11/04	TTLC	STLC	TCLP
1,2,3-Trichloropropane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,2,4-Trichlorobenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,2,4-Trimethylbenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,2-Dibromo-3-Chloropropane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,2-Dibromoethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,2-Dichlorobenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,2-Dichloroethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,2-Dichloropropane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,3,5-Trimethylbenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,3-Dichlorobenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,3-Dichloropropane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
1,4-Dichlorobenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
2,2-Dichloropropane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
2-Butanone	ug/kg	<11	<11	<11	<11	<11	<11	<12			
2-Chlorotoluene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
2-Hexanone	ug/kg	<11	<11	<11	<11	<11	<11	<12			
4-Chlorotoluene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
4-Isopropyl Toluene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
4-Methyl-2-Pentanone	ug/kg	<11	<11	<11	<11	<11	<11	<12			
Acetone	ug/kg	<21	<21	<22	<22	<22	<21	<23			
Benzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Bromobenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Bromochloromethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Bromodichloromethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Bromoform	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Bromomethane	ug/kg	<11	<11	<11	<11	<11	<11	<12			
Carbon Disulfide	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Carbon Tetrachloride	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Chlorobenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Chloroethane	ug/kg	<11	<11	<11	<11	<11	<11	<12			
Chloroform	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Chloromethane	ug/kg	<11	<11	<11	<11	<11	<11	<12			
cis-1,2-Dichloroethene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
cis-1,3-Dichloropropene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Dibromochloromethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Dibromomethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Ethylbenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Freon 113	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Freon 12	ug/kg	<11	<11	<11	<11	<11	<11	<12			

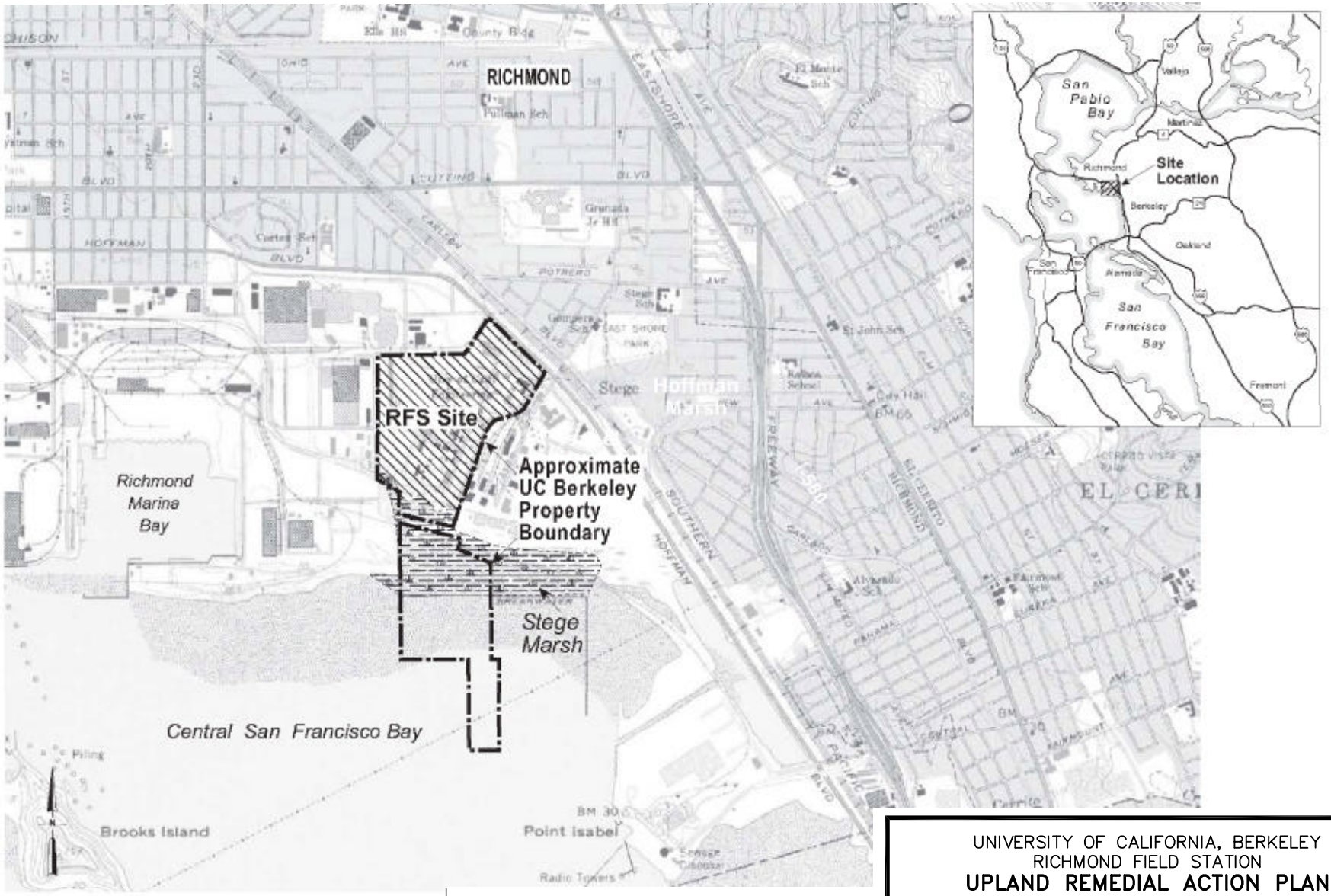
TABLE 9
WASTE CHARACTERIZATION RESULTS
UPLAND SUBUNIT 2B
RICHMOND FIELD STATION

AOC:		AOC U1		AOC U2	AOC U3	AOC U4	AOC U6	AOC U8	Regulatory Criteria		
		A	B						CA Haz		Fed Haz
Date Collected:	Units	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/04/04	05/11/04	TTLC	STLC	TCLP
Hexachlorobutadiene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Isopropylbenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
m&p-Xylene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Methylene Chloride	ug/kg	<21	<21	<22	<22	<22	<21	<23			
MTBE	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
n-Butylbenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Naphthalene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
o-Xylene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Propylbenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
sec-Butylbenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Styrene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
tert-Butylbenzene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Tetrachloroethene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Toluene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
trans-1,2-Dichloroethene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
trans-1,3-Dichloropropene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Trichloroethene	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Trichlorofluoromethane	ug/kg	<5.3	<5.3	<5.4	<5.6	<5.6	<5.3	<5.8			
Vinyl Acetate	ug/kg	<53	<53	<54	<56	<56	<53	<58			
Vinyl Chloride	ug/kg	<11	<11	<11	<11	<11	<11	<12	-	-	-
Hydrocarbons											
Diesel C10-C24	mg/kg	990 HY	5.3 HY	90 HY	380 HY	250 HY	35 HY	<1.2	-	-	-
Motor Oil C24-C36	mg/kg	300 LY	13 L	130 L	2000	380 L	110 L	<6.2	-	-	-

4 point composite samples. Wet weight.

BOLD = Exceeds regulatory threshold

ND = Not Detected
NA = Not Analyzed
mg/kg = milligram per kilogram
mg/L = milligram per liter



Map Source: USGS, 7.5 min. Quadrangle map, Richmond, California, 1980 revised

NOTE:
MAP WAS PREPARED FROM A USGS TOPOGRAPHIC 7.5 MIN QUADRANGLE PROVIDED BY URS ON 7/8/03

X: FIGURE 1 SITE LOC MAP.TIFF
L: OFF=REF
P: PAGESET/PLT-AL
5/7/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210G01.DWG

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RICHMOND FIELD STATION
UPLAND REMEDIAL ACTION PLAN

SITE LOCATION MAP

BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

FIGURE
1

LEGEND:

ZENECA PROPERTY (SUBUNIT 1)

RICHMOND FIELD STATION PROPERTY (SUBUNIT 2 & OFFSHORE PROPERTY)

NOTE:

FIGURE PROVIDED BY URS CORPORATION.

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RICHMOND FIELD STATION
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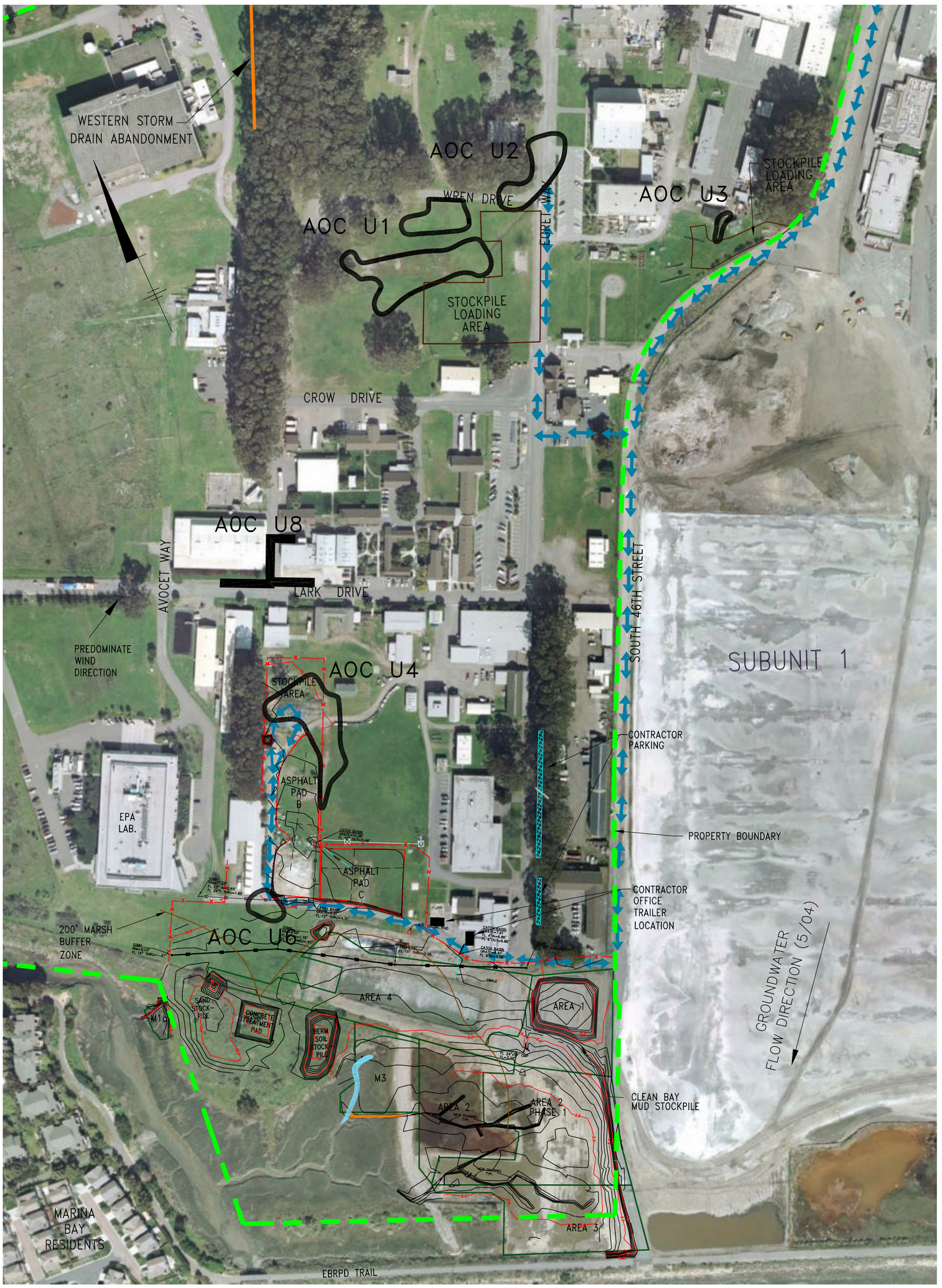
SUBUNITS 2A AND 2B LOCATIONS AND BOUNDARIES

BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

FIGURE **2**

L: OFF=REF
P: PAGESET/PLT-BL
5/7/04 IRV-85-JMS
F:/IBM/CAD/2004PROJ/24210.310/24210G02.DWG



LEGEND

- MARSH 200' BUFFER ZONE
- FENCE
- FENCE GATE (ALL FENCES)
- HAUL ROUTES
- EBRPD – EAST BAY REGIONAL PARK DISTRICT
- STOCKPILE AND WORK AREAS
- REMEDIATION AREAS
- 12 KV OVERHEAD WIRES
- SLOUGH CHANNELS TO BE EXCAVATED
- SLOUGH CHANNELS TO BE WIDENED
- PROPERTY BOUNDARY

0 200' 400'

GRAPHIC SCALE

X: FIELD_STATION_40SMALL.JPG
L: OFF=REF
P: PAGESET/PLT-DP
6/2/04 IRV-85-JMS
F:/IBM/CAD/2004PROJ/24210.310/24210B18

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REMEDIAL DESIGN
LAYOUT FACILITIES

BLASLAND, BOUCK & LEE, INC.
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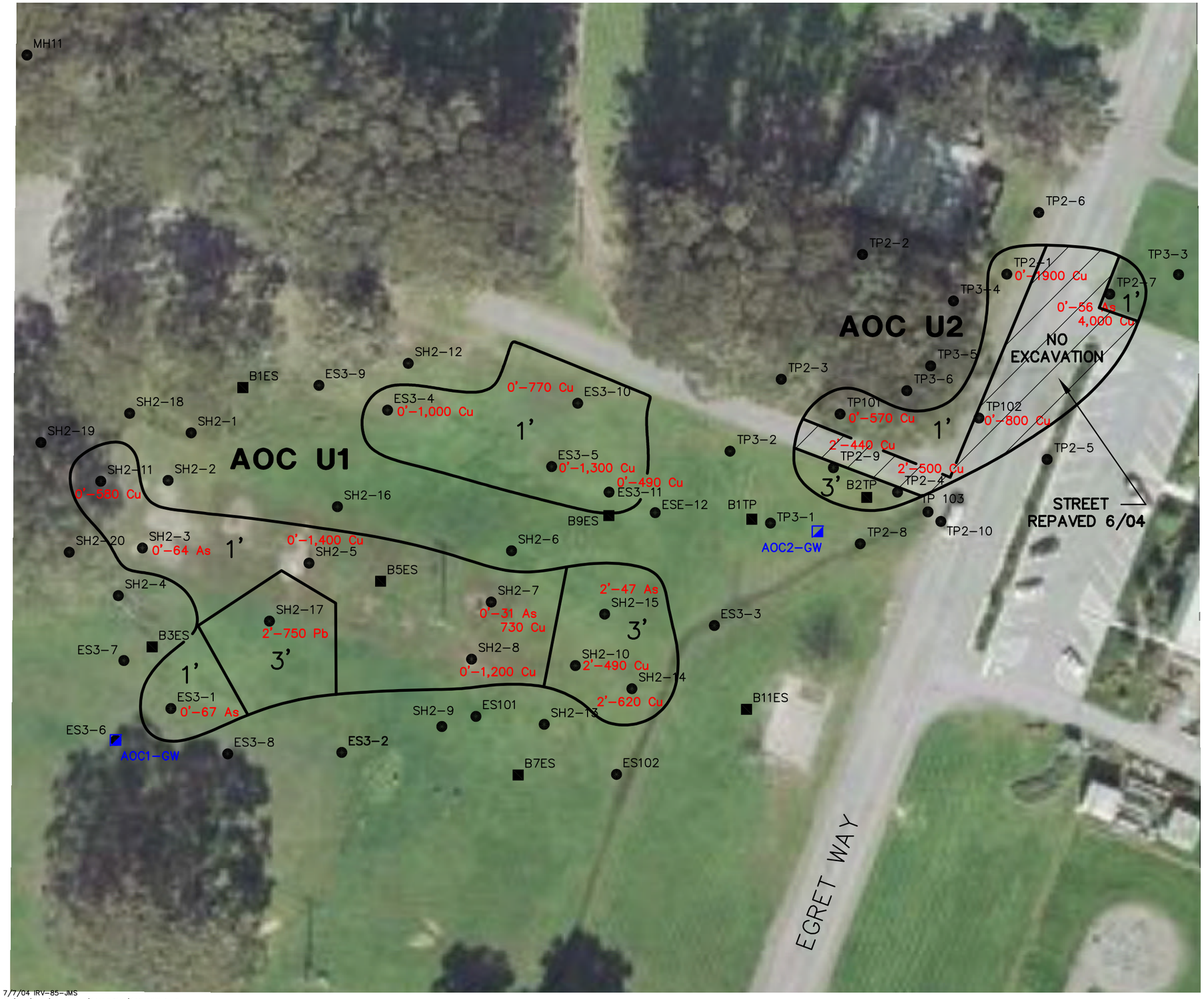
FIGURE
3



LEGEND:

- ■ HISTORICAL SOIL SAMPLE LOCATIONS
- ● URS/BBL SOIL SAMPLE LOCATIONS
- ◪ GRAB GROUNDWATER SAMPLE LOCATIONS
- ⬭ AREAS OF CONCERN (AOC) BOUNDARY
- 0'–800 Cu DEPTH AND CONCENTRATION OF SSTL EXCEEDANCE
- 1' DEPTH OF EXCAVATION

NOTES:

1. ONLY EXCEEDANCES OF THE LOWER OF THE H–SSTL AND E–SSTL ARE SHOWN.
2. UNITS ARE mg/kg.
3. AERIAL PHOTO SUPPLIED BY URS.

0 50' 100'

GRAPHIC SCALE

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UPLAND REMEDIAL ACTION PLAN

AOC U1 AND AOC U2

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FIGURE **4**

7/7/04 IRV-85-JMS
F:/IBM/CAD/2004PROJ/24210.310/24210B01.DWG

LEGEND:

- HISTORICAL SOIL SAMPLE LOCATIONS
- URS/BBL SOIL SAMPLE LOCATIONS
- GRAB GROUNDWATER SAMPLE LOCATION
- AREAS OF CONCERN (AOC) BOUNDARY
- 0'-800 Cu — DEPTH AND CONCENTRATION OF SSTL EXCEEDANCE
- 1' — DEPTH OF EXCAVATION

0 50' 100'

GRAPHIC SCALE

NOTES:

1. ONLY EXCEEDANCES OF THE LOWER OF THE H-SSTL AND E-SSTL ARE SHOWN.
2. UNITS ARE mg/kg.
3. AERIAL PHOTO SUPPLIED BY URS.

X: (XREF)
L: OFF=REF
P: PAGESET/PLT-AP1
6/2/05 IRV-85-JMS
F:/IBM/CAD/2004PROJ/24210.310/24210B02.DWG

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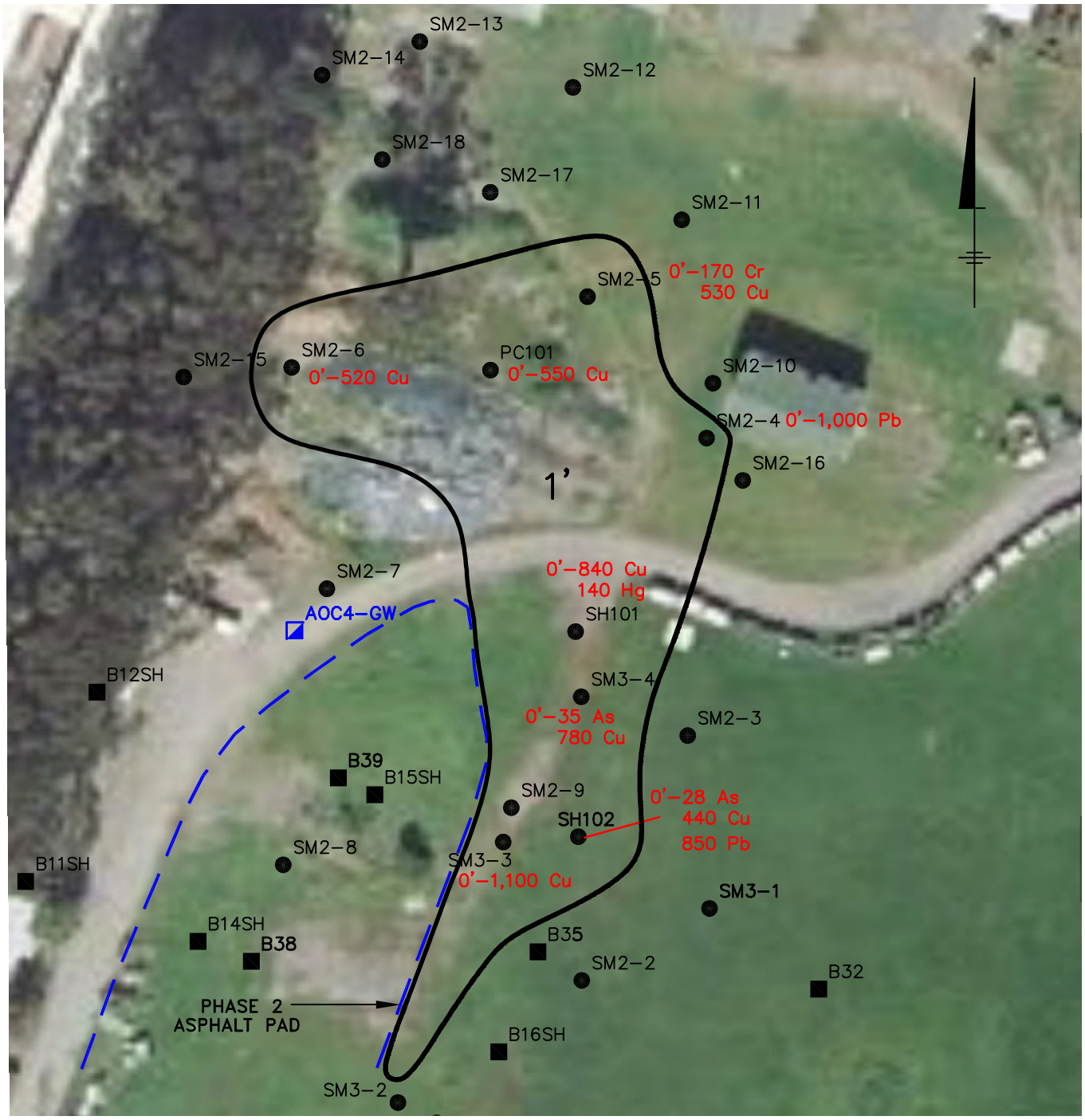
UPLAND REMEDIAL ACTION PLAN

AOC U3

BBL BLASLAND, BOUCK & LEE, INC. engineers, scientists, economists

FIGURE
5



LEGEND:

- HISTORICAL SOIL SAMPLE LOCATIONS
- URS/BBL SOIL SAMPLE LOCATIONS
- GRAB GROUNDWATER SAMPLE LOCATION
- AREAS OF CONCERN (AOC) BOUNDARY
- 0'–800 Cu — DEPTH AND CONCENTRATION OF SSTL EXCEEDANCE
- 1' — DEPTH OF EXCAVATION
- PHASE 2 ASPHALT PAD

NOTES:

1. ONLY EXCEEDANCES OF THE LOWER OF THE H-SSTL AND E-SSTL ARE SHOWN.
2. UNITS ARE mg/kg.
3. AERIAL PHOTO SUPPLIED BY URS.

0 50' 100'

GRAPHIC SCALE

X: FIELD_STATION_RED40_SMALL.JPG
L: OFF=REF
P: PAGESET/PLT-AP1
6/29/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210B03.DWG

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UPLAND REMEDIAL ACTION PLAN

AOC U4

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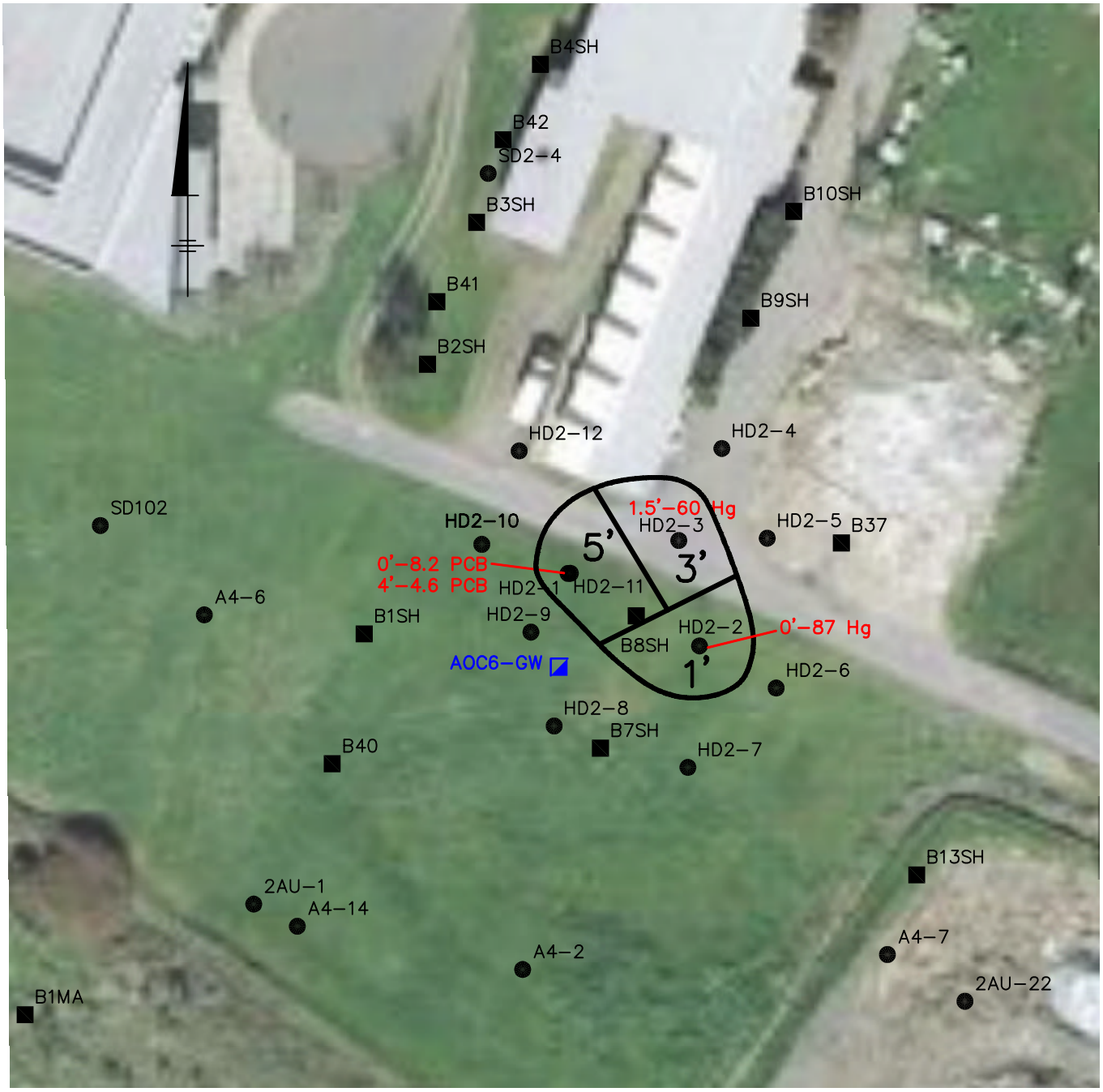
FIGURE 6



LEGEND:

- HISTORICAL SOIL SAMPLE LOCATIONS
- URS/BBL SOIL SAMPLE LOCATIONS
- GRAB GROUNDWATER SAMPLE LOCATION
- AREAS OF CONCERN (AOC) BOUNDARY
- 0'-800 Cu — DEPTH AND CONCENTRATION OF SSTL EXCEEDANCE
- 1' — DEPTH OF EXCAVATION

0 50' 100'

GRAPHIC SCALE

NOTES:

1. ONLY EXCEEDANCES OF THE LOWER OF THE H-SSTL AND E-SSTL ARE SHOWN.
2. UNITS ARE mg/kg.
3. AERIAL PHOTO SUPPLIED BY URS.

X: FIELD_STATION_RED40_SMALL.JPG
L: OFF=REF
P: PAGESET/PLT-AP1
6/29/05 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210B04.DWG

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RICHMOND FIELD STATION

UPLAND REMEDIAL ACTION PLAN

AOC U6

BLASLAND, BOUCK & LEE, INC.
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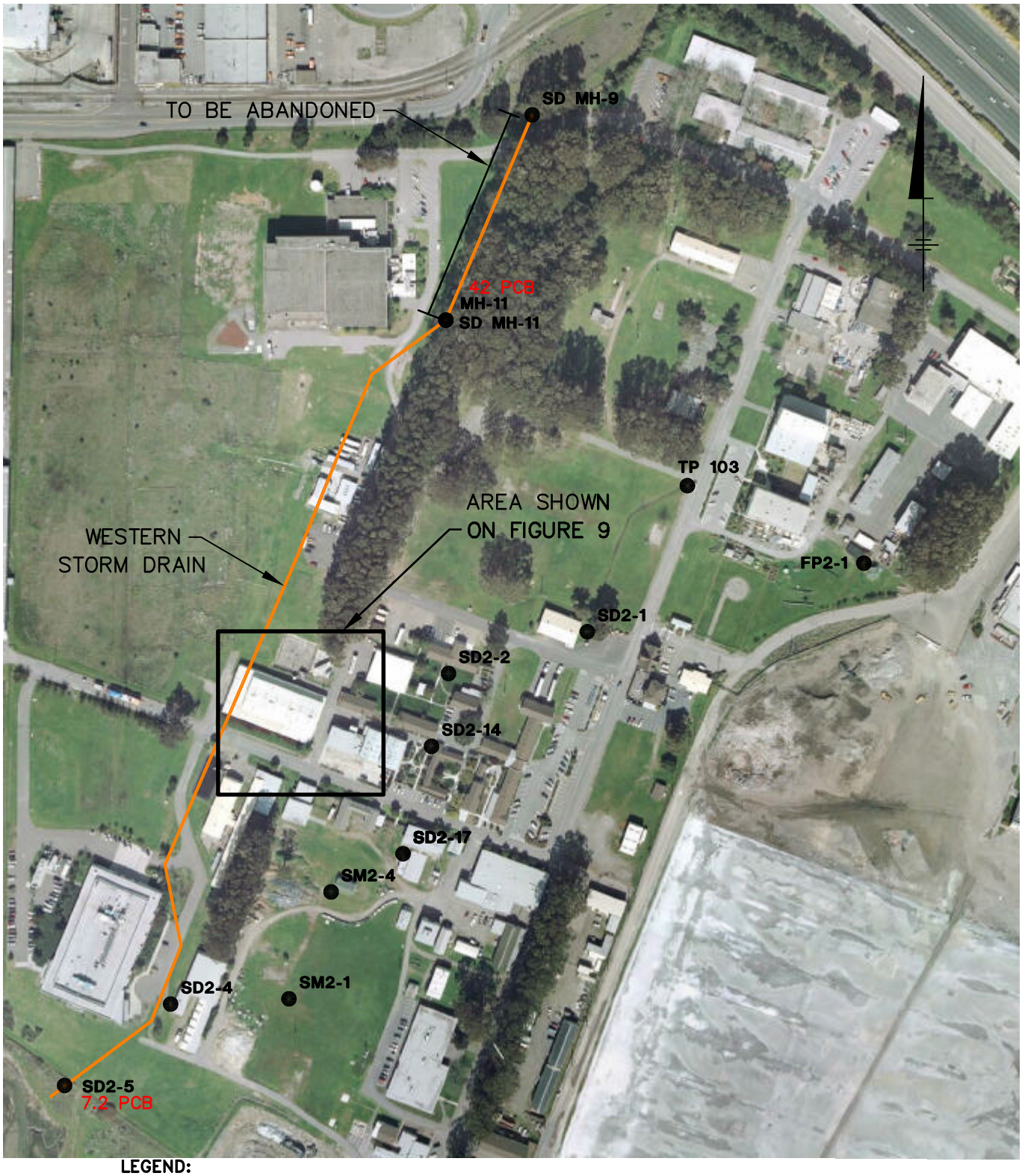
FIGURE
7



LEGEND:

- URS/BBL SOIL SAMPLE LOCATIONS
- 7.2 PCB — DEPTH AND CONCENTRATION OF SSTL EXCEEDANCE
- APPROXIMATE STORM DRAIN LOCATION

NOTES:

1. ONLY EXCEEDANCES OF THE LOWER OF THE H-SSTL AND E-SSTL ARE SHOWN.
2. UNITS ARE mg/kg.
3. AERIAL PHOTO SUPPLIED BY URS.
4. LOCATIONS SHOWN, EXCEPT AOC U6, WERE ANALYZED FOR PCBs.

X: FIELD_STATION_RED_SMALL40.JPG
L: OFF=REF
P: PAGESET/PLT-AP1
6/11/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210B06.DWG

0 300' 600'
GRAPHIC SCALE

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UPLAND REMEDIAL ACTION PLAN

WESTERN STORM DRAIN

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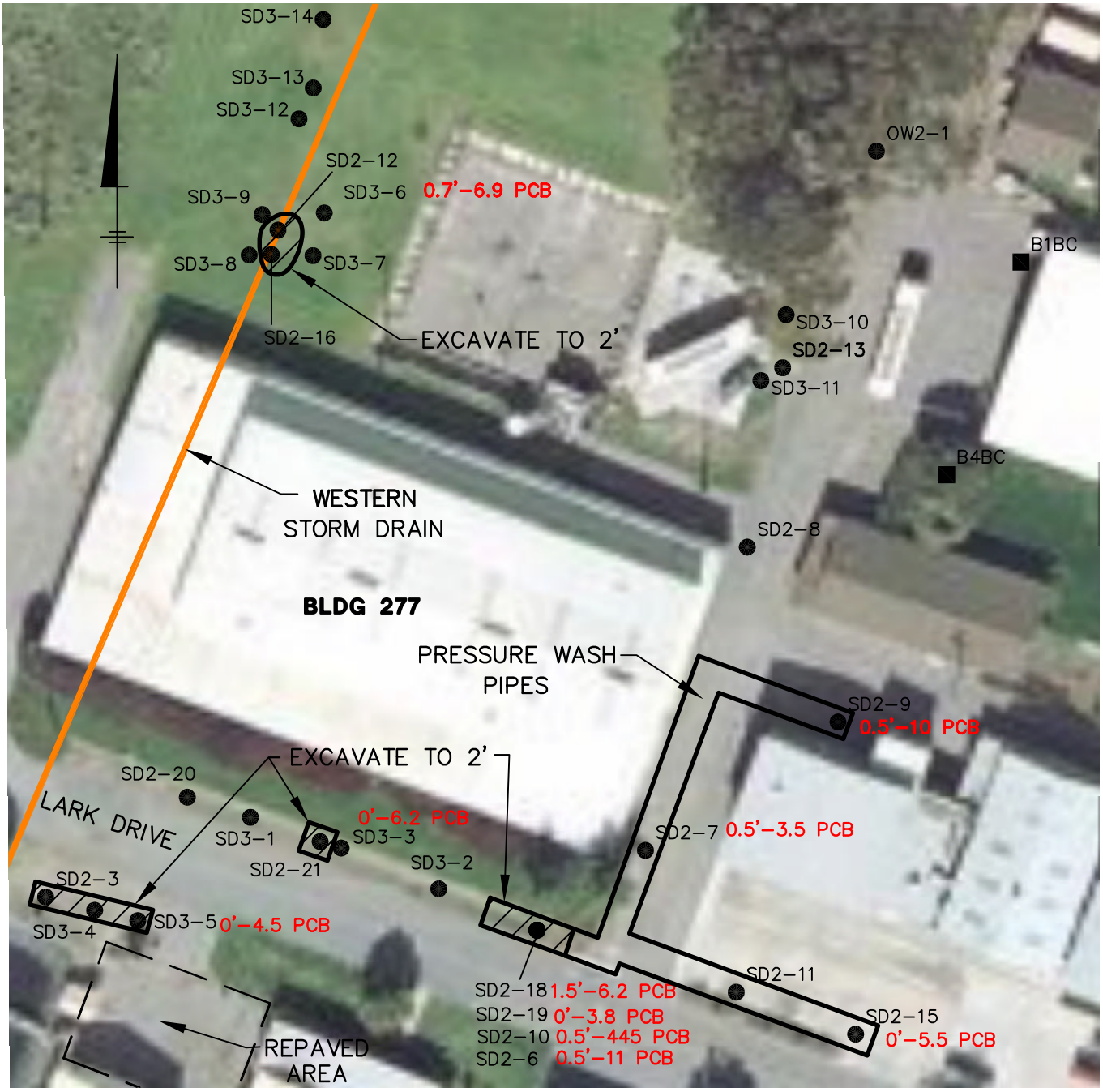
FIGURE
8



LEGEND:

- HISTORICAL SOIL SAMPLE LOCATIONS
- URS/BBL SOIL SAMPLE LOCATIONS
- AREAS OF CONCERN (AOC) BOUNDARY
- 0'-6.2 PCB — DEPTH AND CONCENTRATION EXCEEDING 3 mg/kg.
- APPROXIMATE STORM DRAIN LOCATION

0 50' 100'

GRAPHIC SCALE

NOTES:

1. ONLY CONCENTRATIONS EXCEEDING 3 mg/kg ARE SHOWN. ALTHOUGH THE H-SSTL IS 10 mg/kg, THIS RAP ADDRESSES AREAS EXCEEDING 3 mg/kg PCBs THAT HAVE THE POTENTIAL OF ERODING TO THE MARSH.
2. UNITS ARE mg/kg.
3. AERIAL PHOTO SUPPLIED BY URS.

X: FIELD_STATION_RED40_SMALL.JPG
L: OFF=REF
P: PAGESET/PLT-AP1
7/7/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210B05.DWG

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UPLAND REMEDIAL ACTION PLAN

AOC U8

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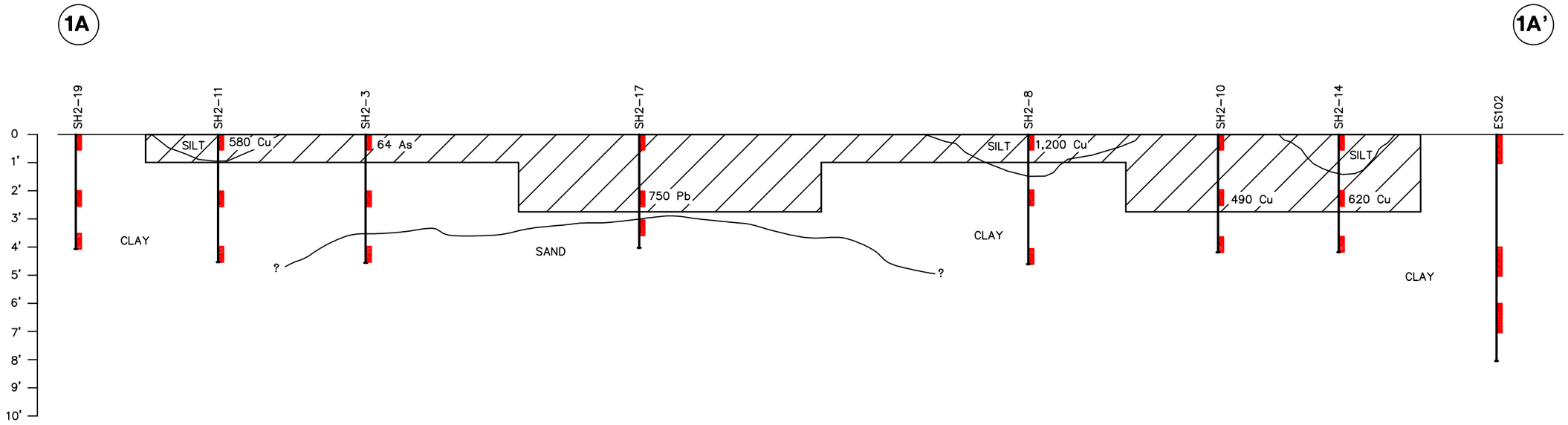
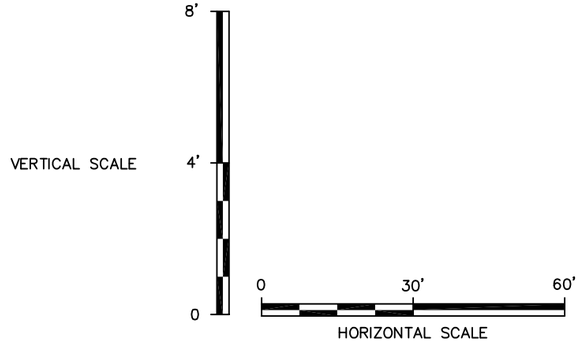
FIGURE
9





LEGEND:

SAMPLE COLLECTED

NOTE:

ONLY ANALYTICAL DATA EXCEEDING THE LOWEST OF THE H-SSTL OR E-SSTL ARE SHOWN. UNIT IS mg/kg.

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AOC U1, CROSS SECTION 1A-1A'

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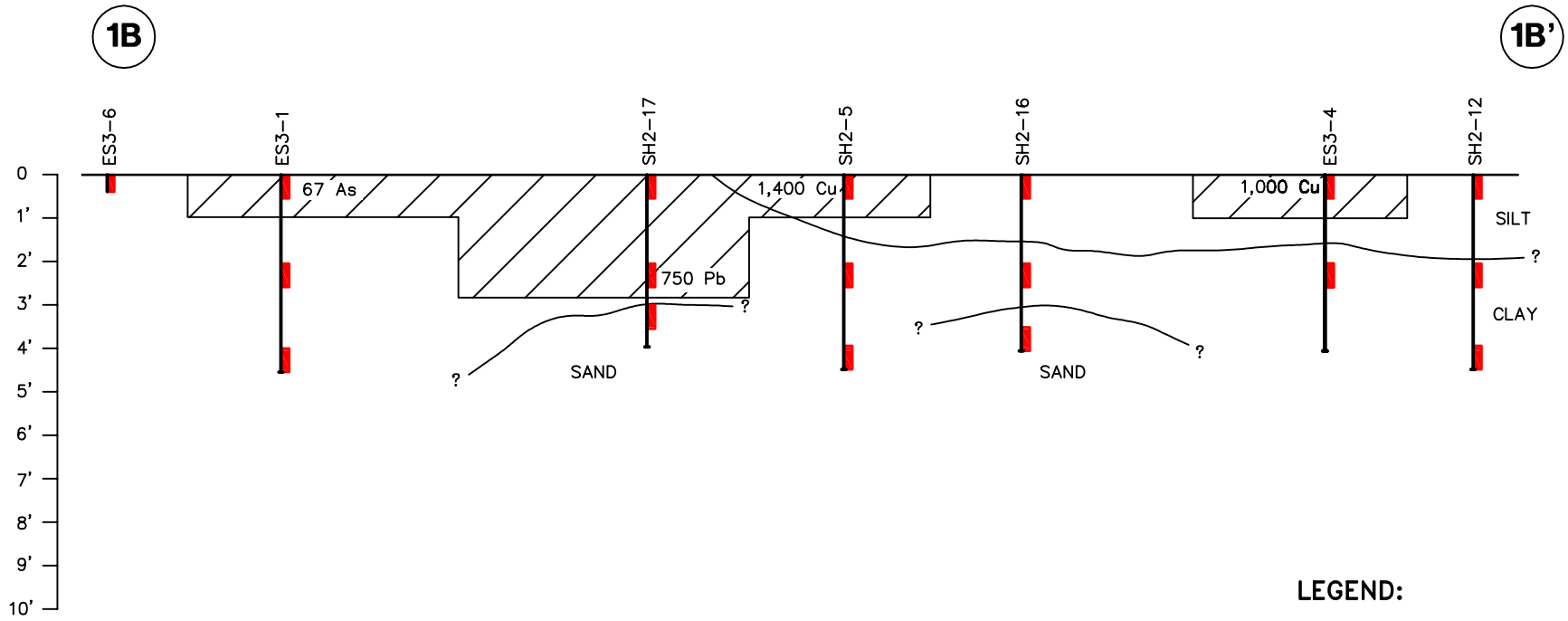
FIGURE **10**

L: OFF=*
P: PAGESET/PLT-AL
5/11/04 IRV-BS-JMS
F:/IBM/CAD/2004PROJ/24210.310/24210CS1.DWG

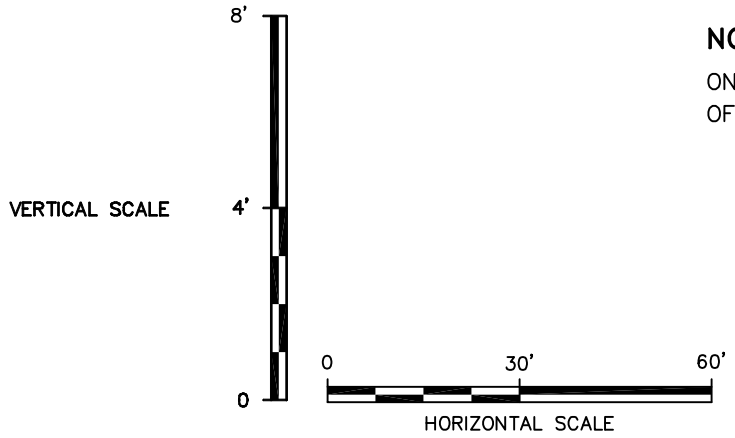


LEGEND:

SAMPLE COLLECTED

NOTE:

ONLY ANALYTICAL DATA EXCEEDING THE LOWEST OF THE H-SSTL OR E-SSTL ARE SHOWN. UNIT IS mg/kg.



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UPLAND REMEDIAL ACTION PLAN

AOC U1, CROSS SECTION 1B-1B'

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FIGURE
11

L: OFF=*
P: PAGESET/PLT-AL
5/11/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210CS9.DWG

LEGEND:

- AREAS OF CONCERN (AOC) BOUNDARY
- HISTORICAL SOIL SAMPLE LOCATIONS
- URS/BBL SOIL SAMPLE LOCATIONS
- 2A — 2A' CROSS-SECTION LINE

NOTE:

1. AERIAL PHOTO SUPPLIED BY URS.

0 50' 100'

GRAPHIC SCALE

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RICHMOND FIELD STATION

UPLAND REMEDIAL ACTION PLAN

CROSS SECTION LOCATIONS, AOC U1 AND AOC U2

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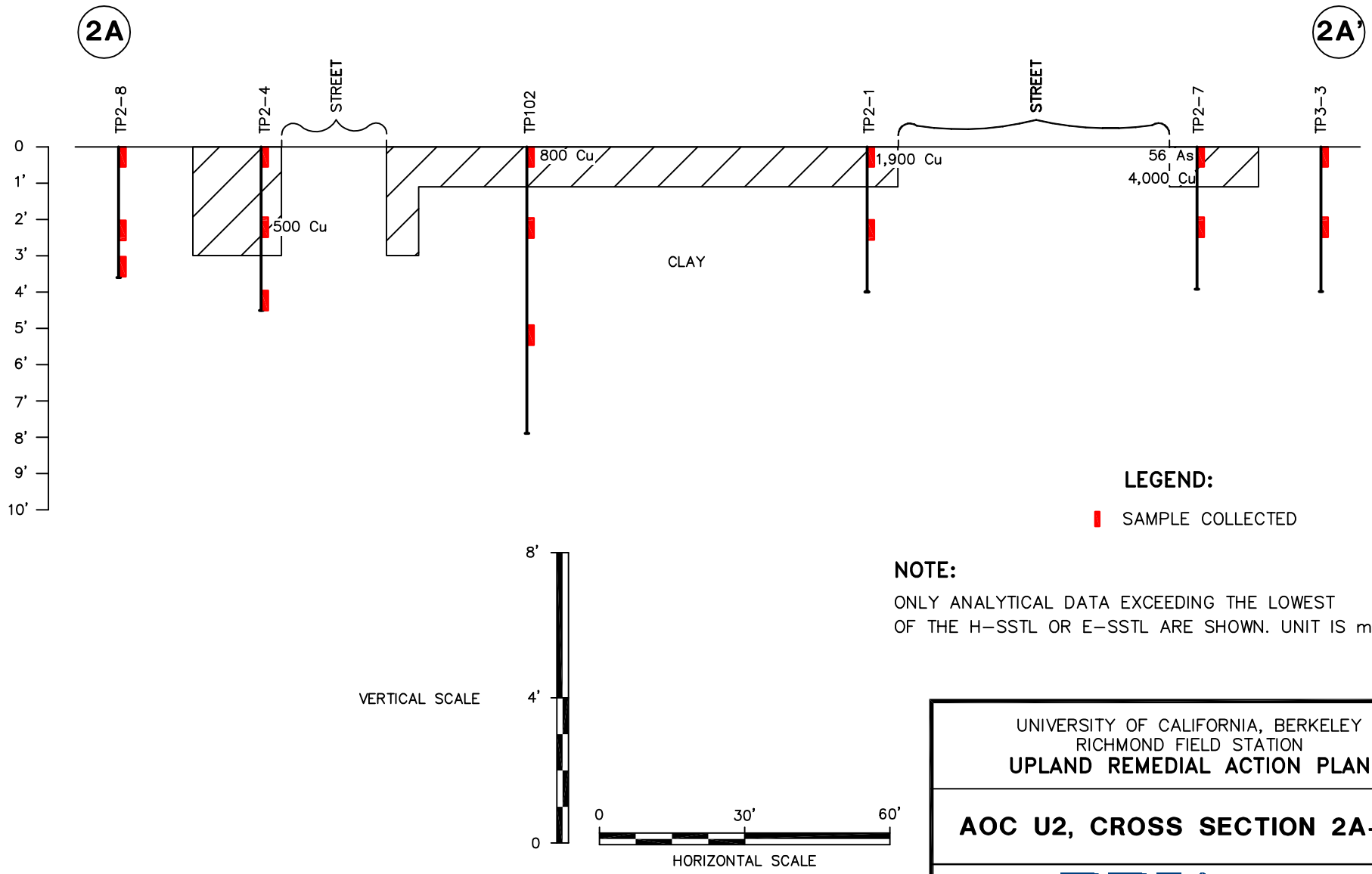
FIGURE 12

6/29/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210B08.DWG



L: OFF=*
P: PAGESET/PLT-AL
5/11/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210CS2.DWG

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UPLAND REMEDIAL ACTION PLAN

AOC U2, CROSS SECTION 2A-2A'

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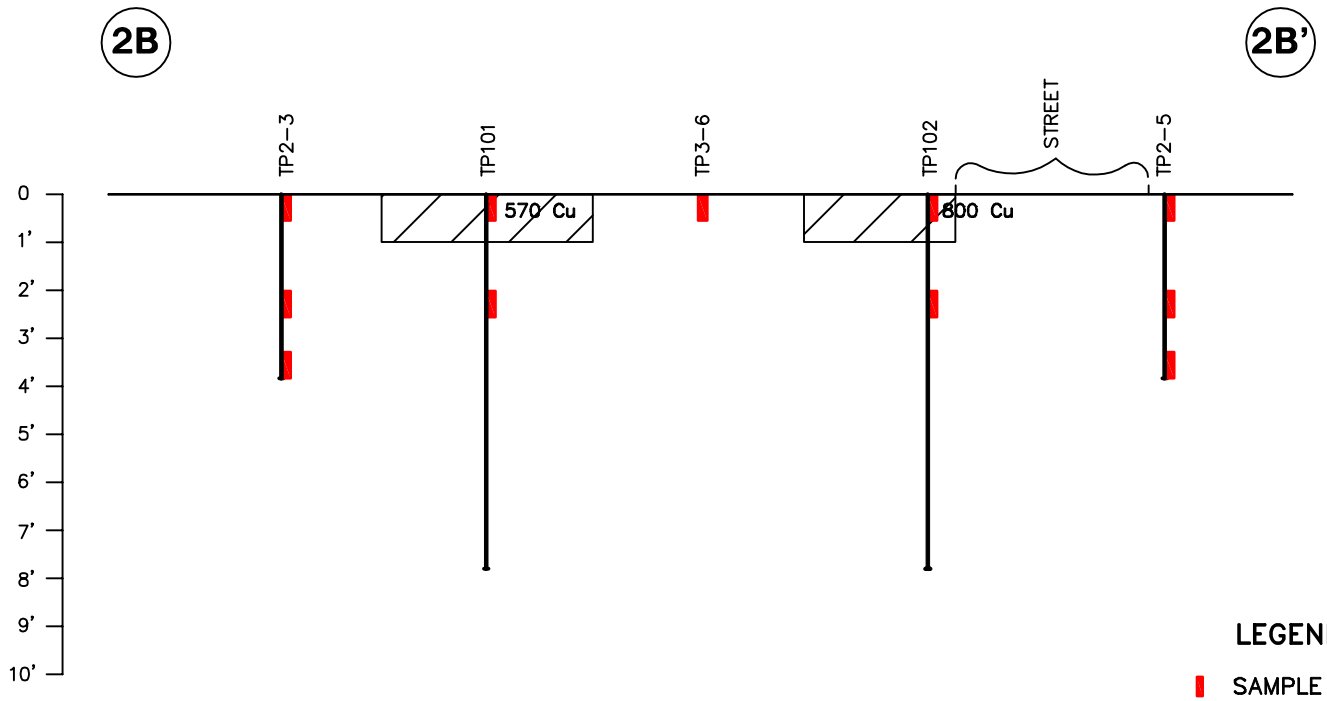
FIGURE
13

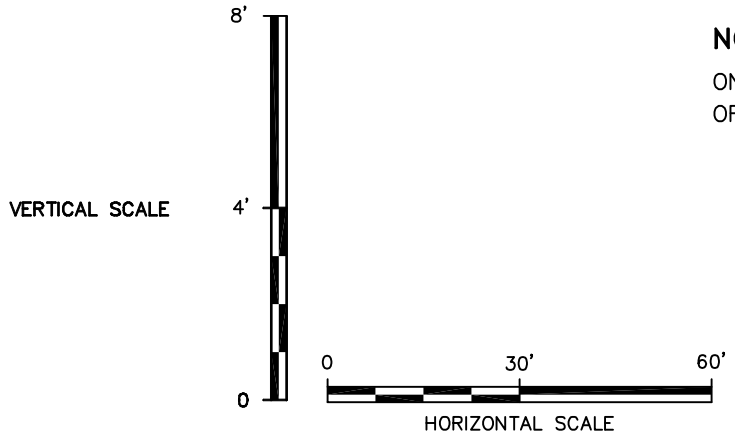


LEGEND:

SAMPLE COLLECTED

NOTE:

ONLY ANALYTICAL DATA EXCEEDING THE LOWEST OF THE H-SSTL OR E-SSTL ARE SHOWN. UNIT IS mg/kg.



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UPLAND REMEDIAL ACTION PLAN

AOC U2, CROSS SECTION 2B-2B'

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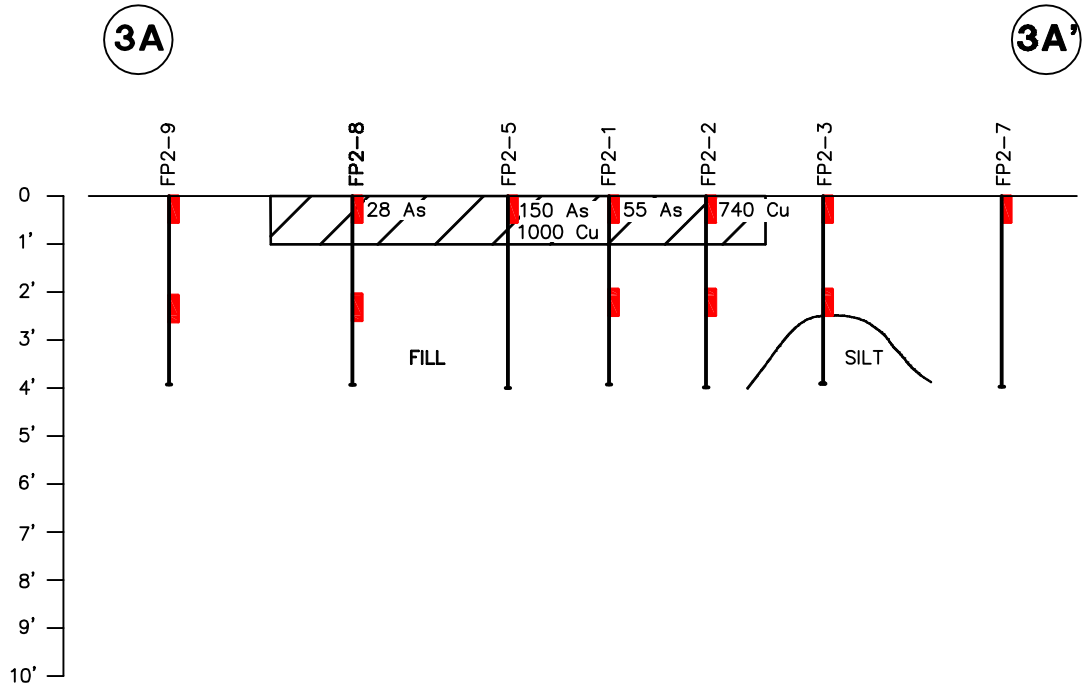
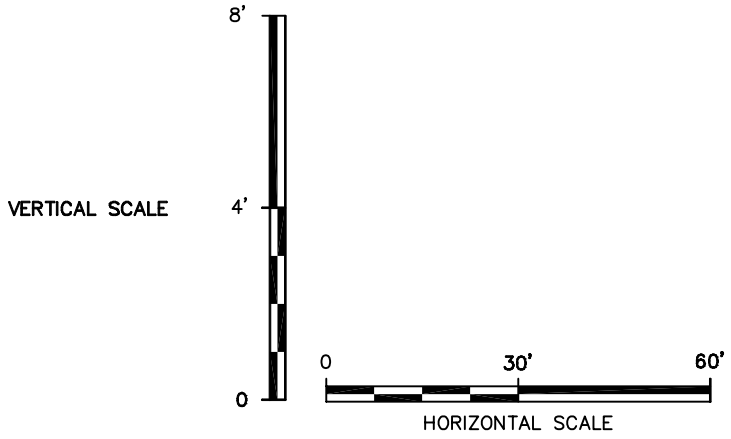
FIGURE
14

L: OFF=*
P: PAGESET/PLT-AL
5/11/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210CS8.DWG





LEGEND:

SAMPLE COLLECTED

NOTE:

ONLY ANALYTICAL DATA EXCEEDING THE LOWEST OF THE H-SSTL OR E-SSTL ARE SHOWN. UNIT IS mg/kg.

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RICHMOND FIELD STATION
UPLAND REMEDIAL ACTION PLAN

AOC U3, CROSS SECTION 3A-3A'

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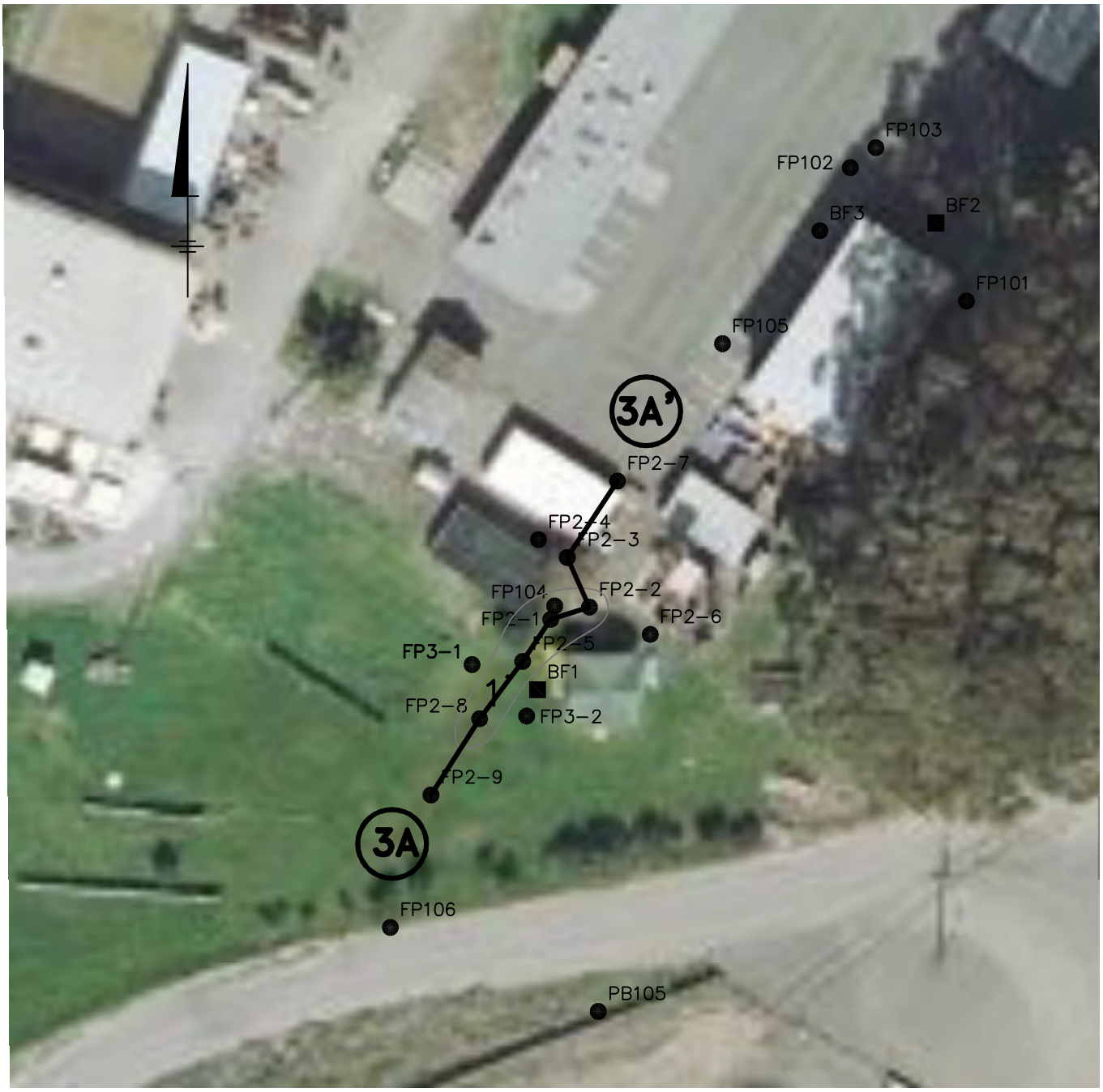
FIGURE
15

L: OFF=*
P: PAGESET/PLT-AL
5/11/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210CS3.DWG



LEGEND:

AREAS OF CONCERN (AOC) BOUNDARY

HISTORICAL SOIL SAMPLE LOCATIONS

URS/BBL SOIL SAMPLE LOCATIONS

3A 3A'

CROSS-SECTION LINE

0 50' 100'

GRAPHIC SCALE

NOTES:

1. AERIAL PHOTO SUPPLIED BY URS.

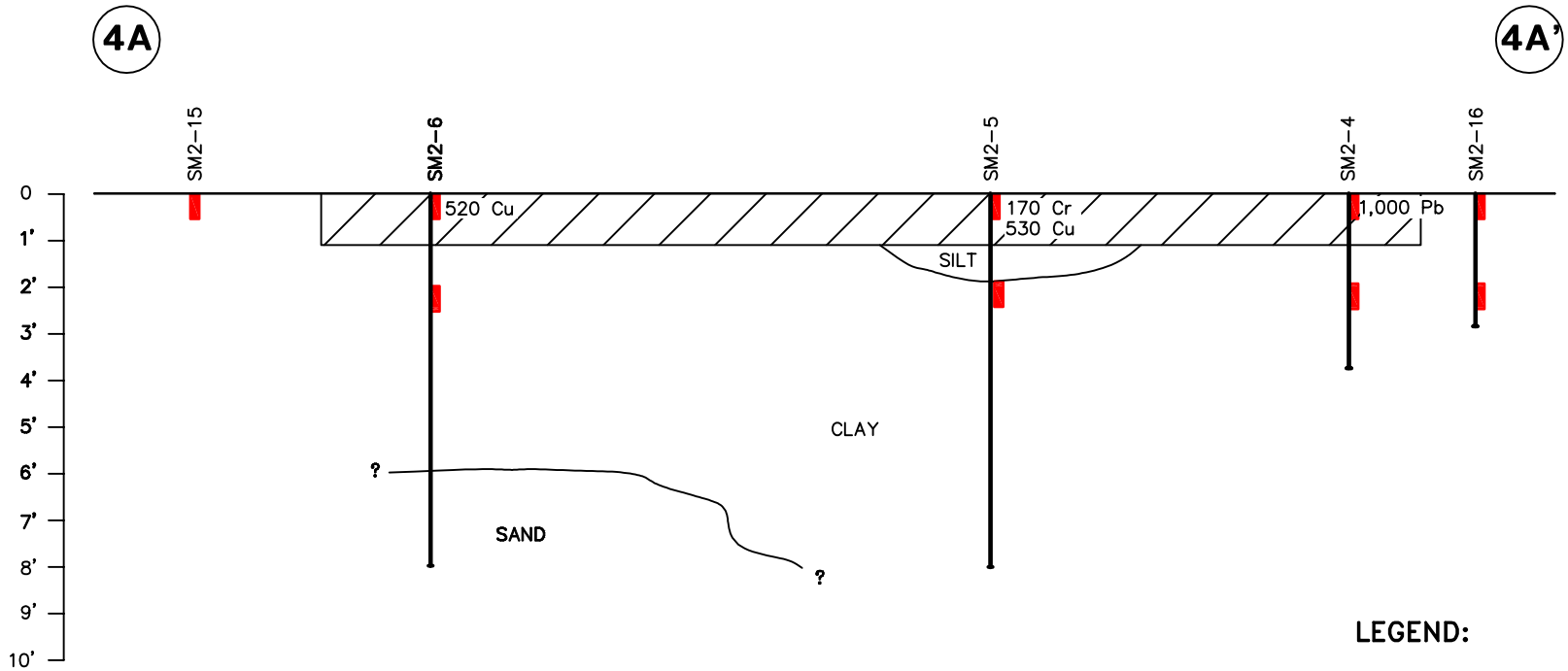
X: FIELD_STATION_RED40_SMALL.JPEG
L: OFF=REF
P: PAGESET/PLT-AP1
6/29/04 IRV-85-JMS
F:/IBM/CAD/2004PROJ/24210.310/24210B09.DWG

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
UPLAND REMEDIAL ACTION PLAN

CROSS SECTION LOCATIONS, AOC U3

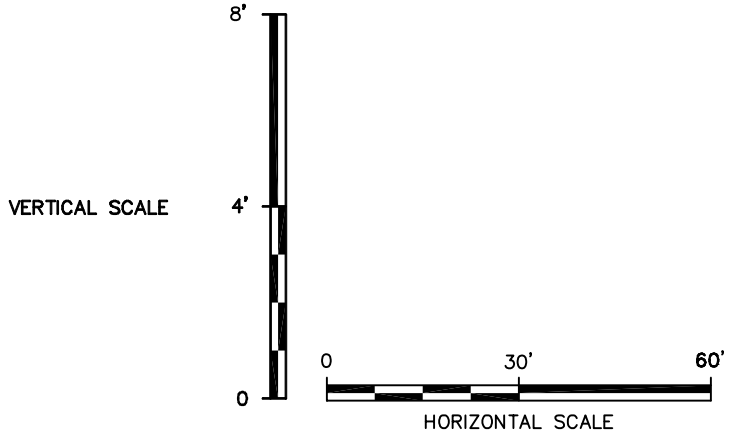
BBL BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

FIGURE
16



LEGEND:

SAMPLE COLLECTED



NOTE:

ONLY ANALYTICAL DATA EXCEEDING THE LOWEST OF THE H-SSTL OR E-SSTL ARE SHOWN. UNIT IS mg/kg.

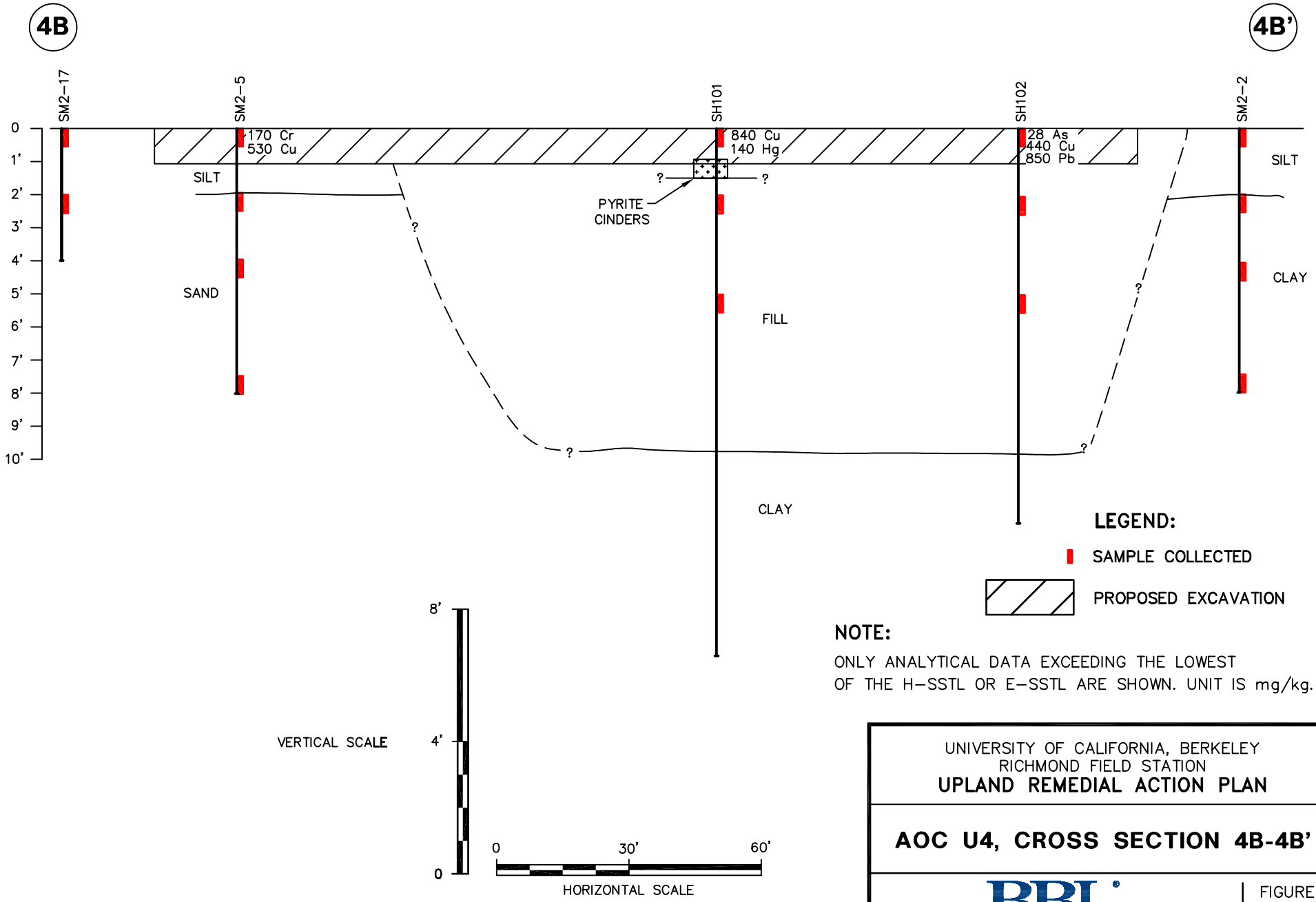
UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
UPLAND REMEDIAL ACTION PLAN

AOC U4, CROSS SECTION 4A-4A'

BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

FIGURE
17

L: OFF=*
P: PAGESET/PLT-AL
5/13/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210CS5.DWG



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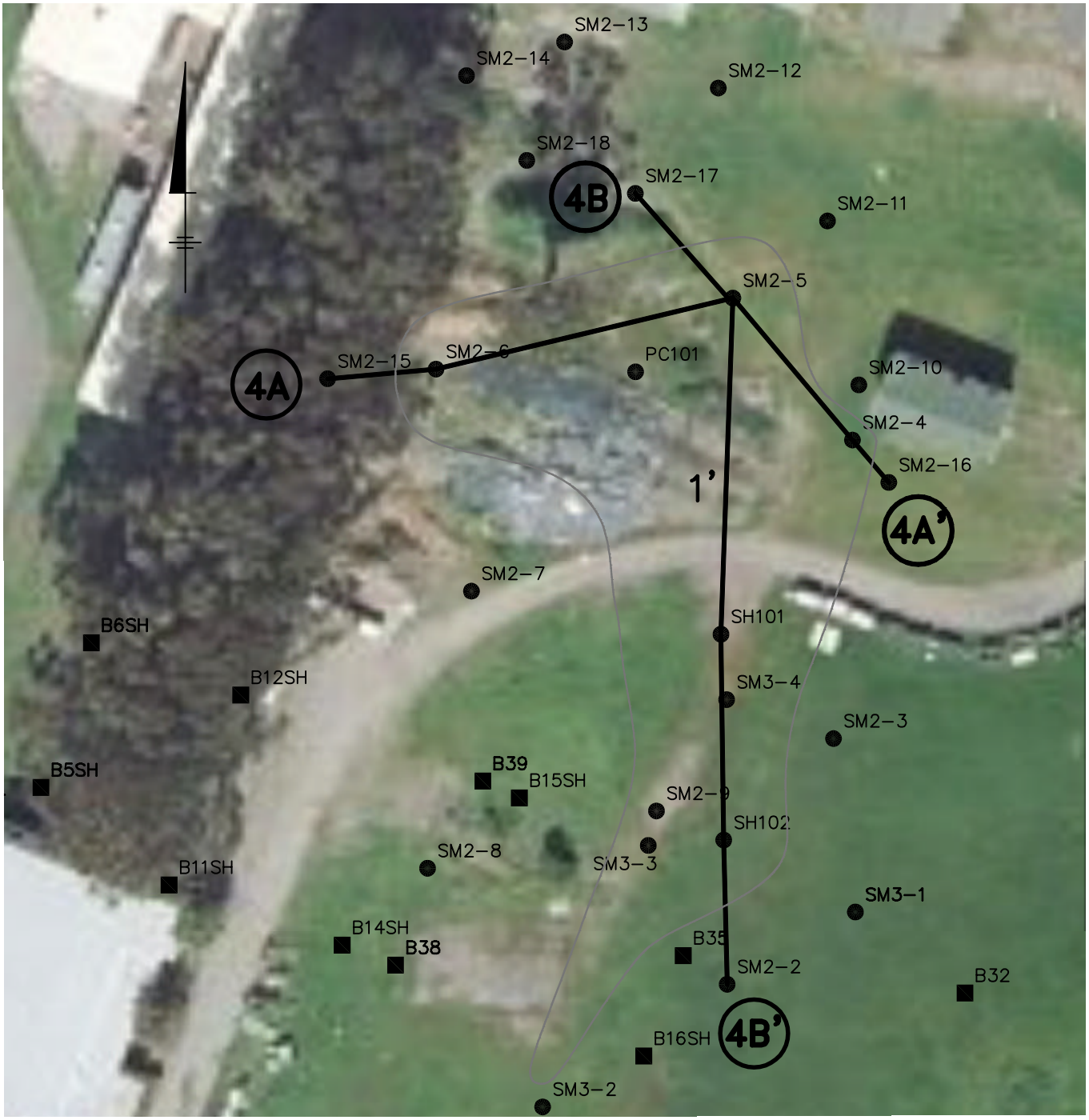
UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
UPLAND REMEDIAL ACTION PLAN

AOC U4, CROSS SECTION 4B-4B'

BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

FIGURE
18



LEGEND:

AREAS OF CONCERN (AOC) BOUNDARY

HISTORICAL SOIL SAMPLE LOCATIONS

URS/BBL SOIL SAMPLE LOCATIONS

4A 4A'

CROSS-SECTION LINE

0 50' 100'

GRAPHIC SCALE

NOTES:

1. AERIAL PHOTO SUPPLIED BY URS.

X: FIELD_STATION_RED40_SMALL.JPG
L: OFF=REF
P: PAGESET/PLT-AP1
6/29/04 IRV-85-JMS
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UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
UPLAND REMEDIAL ACTION PLAN

CROSS SECTION LOCATIONS, AOC U4

BLASLAND, BOUCK & LEE, INC.
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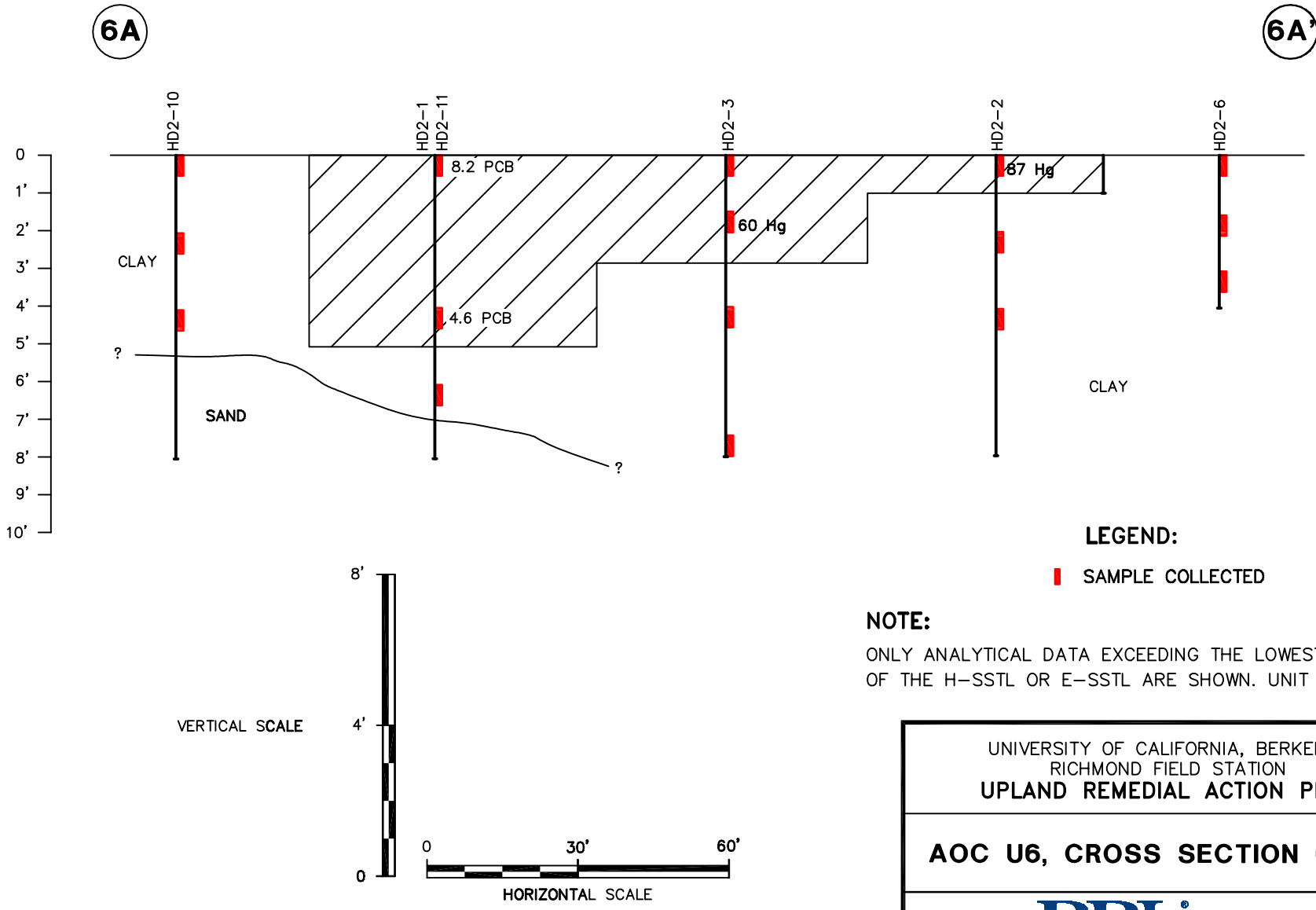
FIGURE
19



LEGEND:

SAMPLE COLLECTED

NOTE:

ONLY ANALYTICAL DATA EXCEEDING THE LOWEST OF THE H-SSTL OR E-SSTL ARE SHOWN. UNIT IS mg/kg.

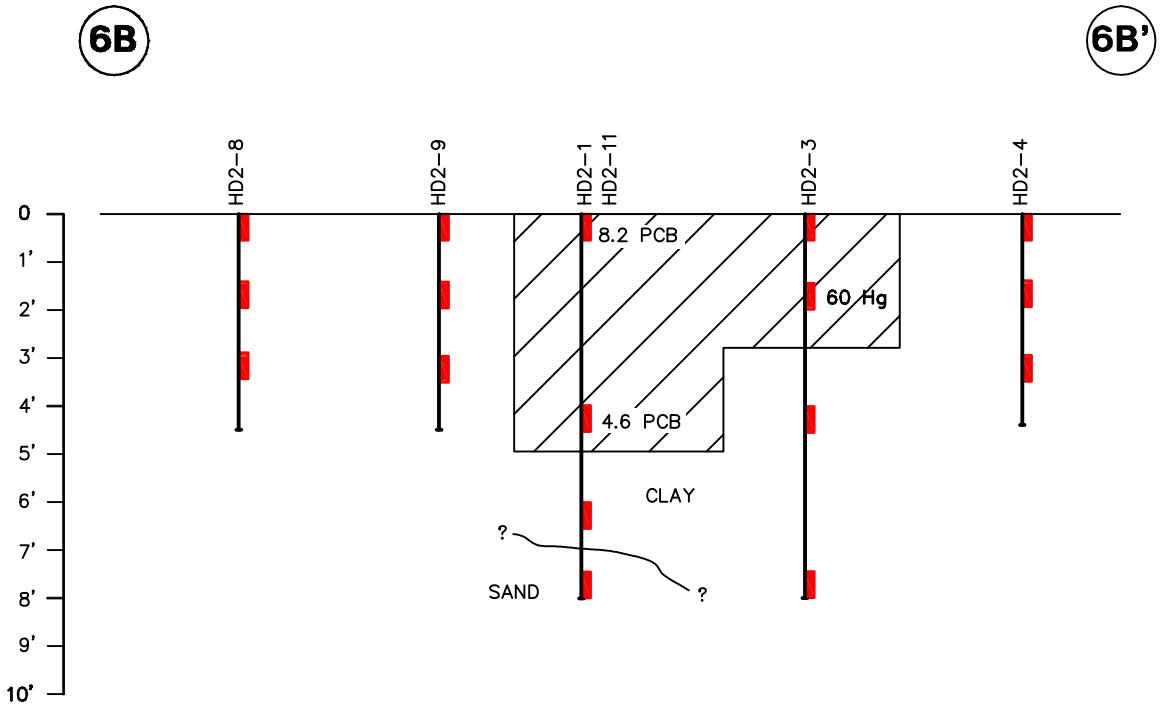
UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
UPLAND REMEDIAL ACTION PLAN

AOC U6, CROSS SECTION 6A-6A'

BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

FIGURE
20

L: OFF=*
P: PAGESET/PLT-AL
5/11/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210CS6.DWG

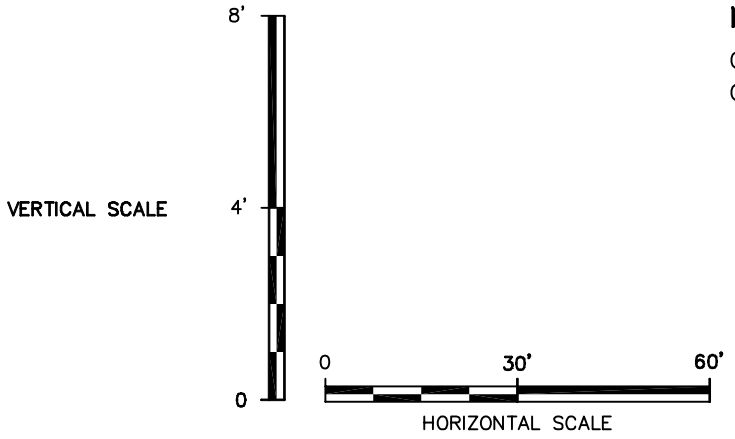


LEGEND:

SAMPLE COLLECTED

NOTE:

ONLY ANALYTICAL DATA EXCEEDING THE LOWEST OF THE H-SSTL OR E-SSTL ARE SHOWN. UNIT IS mg/kg.



UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
UPLAND REMEDIAL ACTION PLAN

AOC U6, CROSS SECTION 6B-6B'

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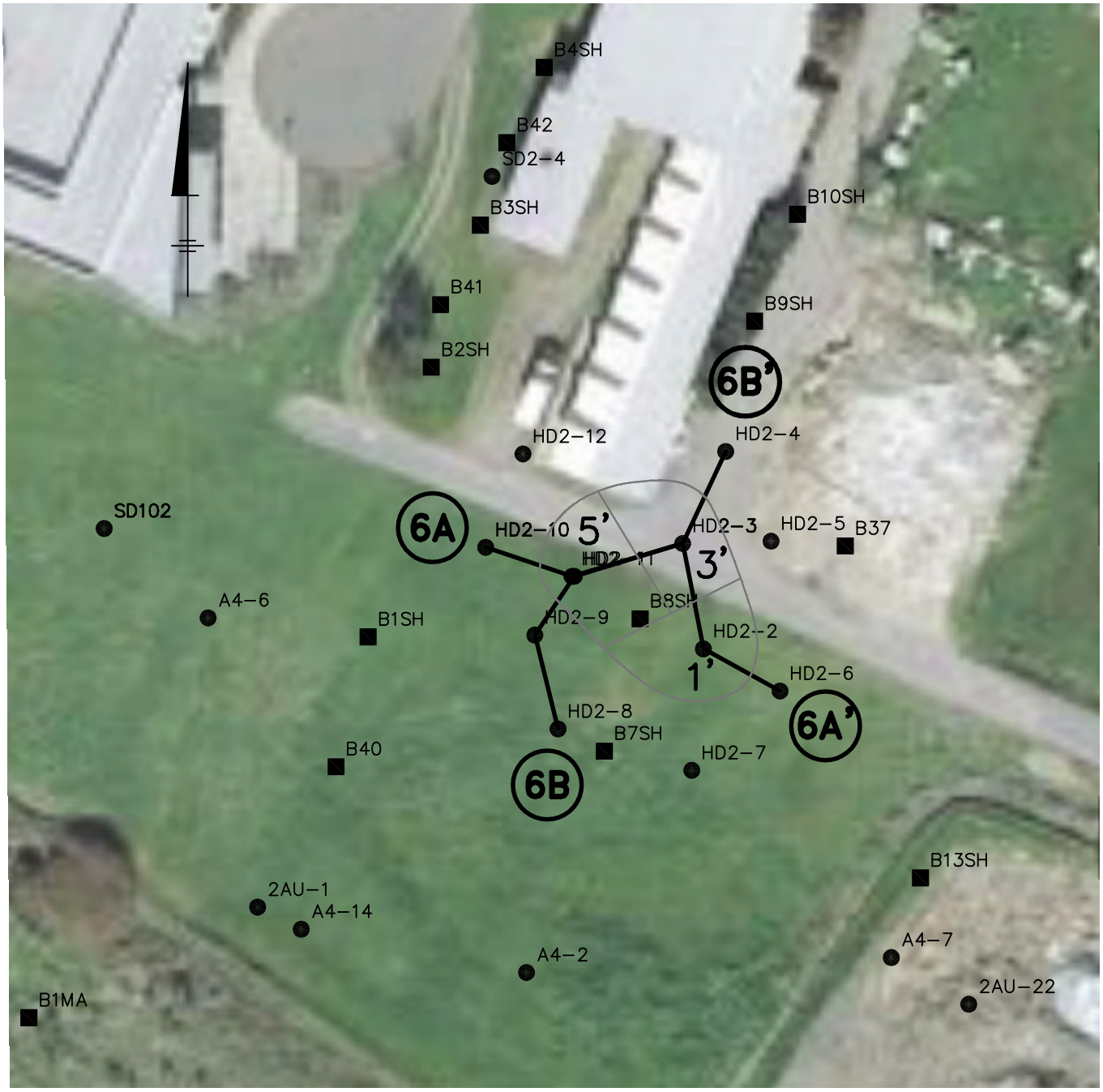
FIGURE 21

L: OFF=*
P: PAGESET/PLT-AL
5/11/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210CS7.DWG



LEGEND:

AREAS OF CONCERN (AOC) BOUNDARY

HISTORICAL SOIL SAMPLE LOCATIONS

URS/BBL SOIL SAMPLE LOCATIONS

6A 6A' CROSS-SECTION LINE

0 50' 100'

GRAPHIC SCALE

NOTES:

1. AERIAL PHOTO SUPPLIED BY URS.

X: FIELD_STATION_RED40_SMALL.JPG
L: OFF=REF
P: PAGESET/PLT-AP1
6/29/04 IRV-85-JMS
F: /IBM/CAD/2004PROJ/24210.310/24210B17.DWG

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
UPLAND REMEDIAL ACTION PLAN

CROSS SECTION LOCATIONS, AOC U6

BLASLAND, BOUCK & LEE, INC.
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FIGURE
22