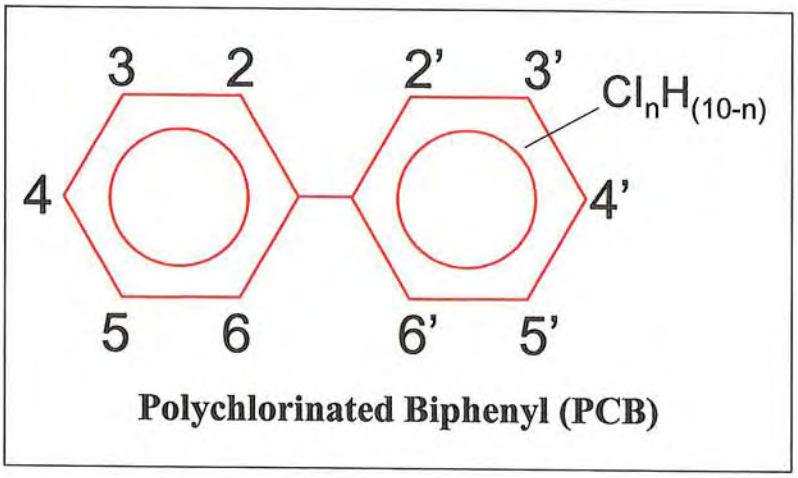
TECHNICAL REPORT

Summary of PCB Results
Richmond Field Station
University of California, Berkeley
Richmond, California



Polychlorinated Biphenyl (PCB)

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July 8, 2005

BBL®
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engineers & scientists

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Appendix A Status Report on Polychlorinated Biphenyls in the Western Storm Drain, University of California Richmond Field Station, Richmond, California

Acronyms

AOC	area of concern
BBL	Blasland, Bouck & Lee, Inc.
BCDC	San Francisco Bay Conservation and Development Commission
bgs	below ground surface
COC	chemical of concern, indicating a constituent detected in analytical samples
C-RAP	*Conceptual Remedial Action Plan, Marsh Portion of Subunit 2B, Richmond Field Station, Richmond, California* (URS, 2002a)
CSV	Cherokee Simeon Ventures
Eastern Stege Marsh	eastern portion of Stege Marsh
eastern marsh	eastern portion of Western Stege Marsh
E-SSTLs	ecological site-specific target levels
EBRPD	East Bay Regional Parks District
FSAP	*Field Sampling and Analysis Plan, University of California Berkeley, Richmond Field Station/Stege Marsh* (URS, 1999a)
FSAR	*Field Sampling and Analysis Results, University of California Berkeley, Richmond Field Station/Stege Marsh* (URS, 1999b)
HH-SSTL	human health site-specific target levels
mg/kg	milligram per kilogram
NGVD	National Geodetic Vertical Datum
PCBs	polychlorinated biphenyls
RAP	Remedial Action Plan
RFS	Richmond Field Station
Risk Evaluation	*Human Health and Ecological Tiered Risk Evaluation* (URS, 2001)
RWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SSTLs	site-specific target levels
UC Berkeley	University of California Berkeley
URS	URS Corporation
Western Stege Marsh	western portion of Stege Marsh; on RFS property
western marsh	western portion of Western Stege Marsh

WSD	Western Storm Drain
Zeneca	Zeneca, Inc.

1. Introduction

On the behalf of the University of California, Berkeley, Blasland, Bouck & Lee (BBL) and URS Corporation (URS), UC Berkeley's environmental consultants, have prepared this report presenting a summary of polychlorinated biphenyls (PCBs) analytical results and a discussion of the Site history and potential sources of PCBs. The analytical results are for sampling performed by URS and BBL at the Richmond Field Station (RFS) site (the Site) since 1999.

PCBs are synthetic organic compounds that are characterized by two phenyl groups (hexagonal rings of carbon atoms) with varying numbers of chlorine atoms. They are chemically very stable with a high resistance to degradation at high temperatures resulting in a range of industrial applications. Major applications include insulating and cooling agents for electrical equipment, hydraulic fluids for underground mining, lubricants, printing inks, and adhesives and plasticizers for plastics, coatings, and resins.

PCBs were widely used as dielectric fluids (insulating material used in electrical equipment, separating the conduction surfaces) for a long period from 1929 to 1977, mainly in industrial transformers and capacitors. Approximately 70% of PCBs produced between 1929 and 1975 (approximately 965,000,000 pounds) were used in capacitors and transformers (USEPA, 1997). Particularly large volumes were produced from the 1950's to the 1970's. The stability of PCBs has given this chemical a tendency to persist in the environment for long periods as well as to accumulate up the food chain.

A specific PCB molecule with a specific number of chlorine atoms in specific locations is called a congener and is named by the number and location of the chlorine atoms. There are 209 possible congeners based on the degree of chlorination but only about 130 are likely to be found in commercial mixtures. Various mixtures of many PCB congeners were primarily sold under the trade name Aroclor by the Monsanto Company. Aroclor is the best known of the PCB formulations and has served as a standard. The Aroclor number refers to the percent chlorine by weight (e.g., Aroclor 1248 was approximately 48% chlorine by weight). However, environmental degradation results in the loss of chlorine so that PCBs that are analyzed as Aroclor 1248 may have actually been released as Aroclor 1260.

The results of investigations and sampling for PCBs since 1999 are discussed in the following reports contained in files at the UC Berkeley Department of Capital Projects:

- Field Sampling and Analysis Plan, Prepared by URS, December 1999;
- Field Sampling and Analyses Results, Prepared by URS, December 2000;
- Human Health and Ecological Tiered Risk Evaluation, Prepared by URS, November 2001;
- Results of Additional Soil and Groundwater Investigations and Groundwater Monitoring Plan, Upland Portion of Subunit 2A. Task 2A & 2B, Prepared by URS, November 21, 2001;
- Results of Additional Soil and Groundwater Investigations and Surface Water Monitoring Plan, Marsh Portion of Subunit 2A, Tasks 3A & 3B, Prepared by URS, November 21, 2001;
- Workplan for Additional Sediment and Surface Water Sampling, Marsh Portion of Subunit 2B, Richmond Field Station, Task 5A, Prepared by URS, February 28, 2002;

- Workplan for Additional Soil and Groundwater Investigation, Upland Portion of Subunit 2B, Richmond Field Station, Task 4A, February 28, 2002;

- Results of Additional Soil and Groundwater Investigations, Upland Portion of Subunit 2B, Task 4B, Prepared by URS, October 2002;

- Conceptual Remedial Action Plan, Marsh Portion of Subunit 2B, Task 5B, Prepared by URS, December 17, 2002;

- Remedial Design Details – Addendum, Subunit 2A, Meade Street Operable Unit, Tasks 2D & 3D, Prepared by URS, August 2002;

- Remedial Action Plan - Phase 2, Subunits 2A and 2B Marsh, Richmond Field Station, University of California Berkeley, Richmond, California, Task 5C, Prepared by URS, April 15, 2003;

- Remedial Action Plan - Phase 3, Upland Portion of Subunit 2B Meade Street Operable Unit, Task 4B and 4c, Prepared by BBL, July 13, 2004;

- Letter to RWQCB regarding PCBs in Upland AOC U1, Prepared by BBL, August 24, 2004; and

- DRAFT Conceptual Remedial Action Plan – Addendum, Prepared by BBL, June 3, 2005.

Based on the investigations and the site cleanup requirements contained in California Regional Water Quality Control Board (RWQCB) Order No. 01-102, UC Berkeley has performed three rounds of remediation in Phases 1 through 3. The remediation work is discussed in the following reports:

- Implementation Report, Phase 1, Subunit 2A, Meade Street Operable Unit, Richmond Field Station, Richmond, CA, Tasks 2E and 3E, Prepared by URS, September 2003;

- Implementation Report, Phase 2, Subunit 2A and 2B, Meade Street Operable Unit, University of California, Berkeley Richmond Field Station, Richmond, CA, Tasks 2E, 3E, and 5D, RWQCB Order No. 01-102, Prepared by URS, December 3, 2004; and

- Implementation Report, Phase 3 – Upland Portion of Subunit 2B, Prepared by URS, June 16, 2005.

1.1 Site Description

The RFS site consists of approximately 150 acres of 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. A layout of RFS facilities is shown on Figure 1.

The major natural habitat types occurring at the RFS include coastal scrub, native grasslands, non-native grasslands, meadows and seeps, and tidal marsh. There are also several man-made, landscaped habitats, such as herbaceous groundcovers and eucalyptus and other ornamental tree groves. Many habitats within the project area have been previously disturbed from activities primarily associated with the development of the RFS (e.g., introduction of fill, landscaping/mowing regimes, and application of herbicides). Coastal scrub habitat is present on the northern portion of the marsh in a backfill area known as the "Bulb". Formation of tidal wetlands in the marsh primarily occurred following construction in 1959 of the former Southern Pacific railroad spur, currently known as the EBRPD Bay Trail. Establishment of the railroad grade, breakwaters, and dock altered local hydrology, allowing sediment deposition and resultant vegetation growth inboard and outboard of the railroad spur. The EBRPD Bay Trail forms the southern boundary of the inner portion of tidal marsh habitat. Tidal marsh habitat on the RFS is bounded by approximately the 5.0 foot National Geodetic Vertical Datum (NGVD) elevation. A full description of the ecological setting of the RFS is provided in the Biological Assessment (BBL, 2003a) or the Initial Study, California Environmental Quality Act (URS, 2003a).

1.2 Groundwater and Surface Water Flow Directions

In 2002, three temporary piezometers were constructed at locations PB18 through PB20 in the southeast area of the Site adjacent to buildings 110, 163, and 120. Details of construction and water level measurements are in Remedial Action Plan – Phase 3 (BBL, 2004). Groundwater measurements indicate that the groundwater flow direction in the southeastern portion of the RFS site adjacent to the Cherokee-Simeon Ventures (CSV) property boundary is southwesterly (S 36° W) towards San Francisco Bay.

Surface water, which is collected and conveyed by the onsite storm drain system, generally flows through open ditches in the central and northern portions of the Site and through underground pipes in the southern portion before discharging into the Marsh. The storm drain system consists of two storm drain pipes located on the eastern and western sides of the RFS property. A pipe in the central portion of the RFS connects these two systems.

The Western Storm Drain (WSD) also served as a sanitary sewer overflow from a manhole just north of the northern property boundary as shown on Figure 1. The connection with the sanitary sewer was abandoned by pumping grout into the pipe in 2004. This work is discussed in the Phase 3 Implementation Report. Prior to abandonment, sewage and possible industrial waste in the sanitary sewer system flowing from areas of Richmond north of the Site could flow directly into the marsh during periods of high flow when the sewer line to the sewage treatment plant would be backed up.

1.3 Site History

This section contains a discussion of the history of the RFS site. Although portions of the discussion are not relevant to the occurrence of PCBs, they are included for completeness. Historically, the area was known as "Los Cuchiyunes" (Rancho San Pablo), granted to Don Francisco Castro in 1823, a 17,000 acre Rancho and subsequent port facility where grain schooners or barges transported grain across the Bay to San Francisco. Around 1870 to 1875 chemical and explosive industries began to acquire sections of the property. Around 1871 Hercules Powder Company moved into the area, and in 1877 sold their property to the California Cap Company (the Cap Company). A high-explosives blasting cap manufacturing plant was located on what is now the eastern portion of the RFS property. The Cap Company flourished as a family operation under the leadership of William Letts Oliver and was for a time the largest supplier of dynamite caps in the United States (from a Sanitary Engineering Research Laboratory annual report,

~1972-1975). According to an article published in the July 1922 edition of The Detonator, the Cap Company manufacturing plant consisted of approximately 150 buildings including administration buildings, a shell and metal drawing unit, a wire drawing unit, the blasting cap line unit, an electric blasting cap unit, and fulminate nitrating and recovery units. All components of the blasting caps were reportedly manufactured on site, including explosives, shells, copper containers, tin boxes, paper cartons, and insulated wire. The chief constituent of the explosive used by the Cap Company was a guncotton (nitro cellulose) base called "Tonite". Manufacturing of the explosive included the production of mercury fulminate, Hg(CNO)2, a whitish-gray solid material derived by treating mercury with nitric acid and alcohol. The former mercury fulminate facility was located in the southeastern portion of the property. Other former facilities associated with the Cap Company included the shell manufacturing area, the blasting cap manufacturing area, an explosives test pit area, and an explosives storage area. The entire Cap Company facility covered approximately 30 acres, with an additional 30 acres of trees surrounding the facility. In addition, the southeast corner of the RFS property contained the U.S. Briquette Company, which was noted as "not in operation" on a June 1916 Sanborn map (URS, 1999).

At this time, the southern extent of the upland area was defined by a "seawall" constructed of large wooden timbers to prevent storm waves from coming into the Cap Co. facility. The area immediately south of the seawall was intertidal. Sometime prior to 1946 a breakwater consisting of large concrete rubble was placed on the bay side of, and at a low angle to, the sea wall from Meeker Creek on the west to the South 46th street private roadway.

A wooden pier extended from the northern edge of the marsh just west of South 46th Street out into the mud flats and open water. The date of origin of this structure is unknown, but may date to the late 1800's and conceivably could precede the Cap Company's ownership. Although only a severely dilapidated portion of the pier remains today on the Bay side of the embankment, it was originally reported to have been used for unloading barges in its early years. Following purchase of the property by UC Berkeley, the pier was used by the Seawater Conversion Laboratory and the Hydraulics Engineering Laboratory as an access to a Bay water pumping station located at its southern end. From examination of old aerial photographs, especially the aerial photo dated May 3, 1957, the pier appears to have been treated as an informal property boundary in the mudflats. At some point, wooden barriers were placed along the pier pilings forming a makeshift north-south barrier along the pier.

On RFS property adjacent to the former Zeneca cinder landfill, pyrite cinders were deposited or migrated into the southern and southeastern areas of the RFS property. These locations include the following:

- Adjacent to the east side of the former pier;
- Between the former seawall and the concrete breakwater on the west side of the pier (what is now the southeastern portion of the upland property); and
- South of the breakwater.

In October 1950, the Cap Company property was purchased by UC Berkeley with the agreement that the Cap Company would remove all hazardous materials from the property. The Cap Company reportedly complied with the purchase agreement, though subsequent site testing and on-site observations revealed potential hazardous material problems remaining onsite (pc, Larry Bell). For example, several explosions of unknown magnitudes occurred between 1950 and 1953 when UC Berkeley attempted to clear vegetation at the RFS by using a controlled burn. The explosions were thought to be associated with residual chemicals used by the California Cap Company.

In 1951, the University acquired the adjacent undeveloped property to the west. During the 1950s, a number of new buildings were constructed in the northeastern portion of the RFS to accommodate research programs sponsored by UC Berkeley's College of Engineering. Some of the new buildings included administration buildings and the Forest Products Laboratory (circa 1955). The first studies conducted at the Forest Products Laboratory involved the treatment of wood with pentachlorophenol in liquefied petroleum and gas, mixed with a small percentage of isopropyl ether cosolvent (approximately 4%). After approximately five to six years, the facility converted to a waterborne preservative formulation process, including the use of chromated copper arsenate and ammoniacal copper arsenate.

In the 1950's fill material was placed in the area south of the seawall and west of South 46th street in order to build a "hydrate pond" and, later, an adjacent round pond for sewage treatment research being done by Professor Oswald in the Sanitary Engineering Department. In 1990, the round pond was deepened and the excavated soil was placed on the outer berm. In 1992, the round pond was lined.

Around 1959 the Southern Pacific Railroad placed fill material along the coastline in the marsh to build a rail spur. A small linear area of fill parallel to the rail spur appeared about the same time and was probably due to the construction of the spur. Also, about this time, the University filled a two-acre area in the northwest corner of the RFS's Marsh adjacent to Meeker Creek. This area is currently referred to as the "Bulb".

In 1976, the RFS demolished the inner marsh portion of the pier and replaced it with a road using fill material that had been deposited against the pier supports over the years. This fill, which contains pyrite cinders, appears to have originated from the cinder landfill area located adjacent to the pier. In the late 1970s to early 1980s, the San Francisco Bay Conservation and Development Commission (BCDC) required that the RFS move the road, which was relocated eastward closer to the property boundary directly adjacent to the western edge of Zeneca's former cinder landfill. The road was constructed of the original cinder-laden fill, which was excavated from the old road and vicinity creating additional marsh. The "orange" pond (colored orange from the oxidation of iron) was formerly located in this area. This access road, the orange pond, and the cinder fill were excavated and removed during Phase 1 Remediation in 2002. A trail constructed on clean Bay Mud backfill is now used to access the East Bay Regional Parks District trail (Bay Trail) built on the old railroad embankment.

Current academic teaching and research activities include the following: the Forest Products Laboratory and the Northern Regional Library Facility, the Earthquake Engineering Research Center, the Fire Test Laboratory, Engineering geosciences units, the Hydraulics Basin Model Laboratory, the Soil Mechanics Laboratory, the Structural Research Laboratory, the Sanitary Engineering, the Environmental Health Research Laboratory, and the Asphalt Pavement Research Center. In addition to UC Berkeley's research facilities on-Site, the United States Environmental Protection Agency began operating its Region IX Laboratory on the southwestern portion of the RFS property in 1993. The RFS has had, and still has, a number of tenants leasing workspace over the years. Additional historical information is provided in Appendix A.

2. PCB Investigations

2.1 Soil and Sediment Sampling

Since 1999, a total of 422 soil and sediment samples have been analyzed for PCB Aroclors. A summary of PCB Aroclor analytical results for soil and sediment samples is presented in Table 1. In addition, seven soil and sediment samples have been analyzed for congeners by Columbia Analytical Services in Kelso, Washington. The congener analyses were performed because, if a source of the PCBs could be tentatively identified in the future, the congener data could be used to "fingerprint" and verify the source. Congener data may also be used to evaluate ecological risk because some congeners are more toxic than others. The congener analytical results are shown in Table 2. The sampling locations are shown on Figure 2.

The results of environmental investigations prior to 2000 are summarized in the Field Sampling and Analysis Plan (FSAP) (URS, 1999). Soil and/or sediment samples were collected by Jonas and Associates in 1990 and 1991, ECI in 1998, and Pacific Ecorisk and the RWQCB in 1999. Data tables collected from reports that were reviewed in RWQCB files indicate that PCBs were not recognized as a chemical of potential concern (COPCs) because there are no analytical results listed.

During an investigation by URS in spring 2000, 47 soil and sediment samples were collected and analyzed for PCBs. Forty-one of the samples were sediment from the marsh with six samples collected from soil adjacent to the southern extent of the eastern or WSD system. These results, presented in the Field Sampling and Analysis Results (FSAR) (URS, 2000), indicated a PCB hotspot at the WSD outfall. Based on these results, a sample of sediment within a WSD manhole was analyzed with an elevated PCB result indicating that the pipe is a potential PCB source.

The next PCB investigation was performed in fall 2001 in the vicinity of the WSD outfall to evaluate the extent of the hotspot. Twenty sediment samples were analyzed with results reported in Workplan for Additional Sediment and Surface Water Sampling, Marsh Portion of Subunit 2B (URS, 2002a). Three sediment samples were analyzed for PCB congenors.

In fall 2002, URS collected 80 sediment samples from the western portion of the marsh to evaluate the extent of PCBs beyond the WSD outfall. The results of this investigation, discussed in the Conceptual Remedial Action Plan, Marsh Portion of Subunit 2B (C-RAP) (URS, 2002e), showed that elevated PCBs are relatively widespread both horizontally and vertically in the western portion of the marsh. In addition, 12 soil samples were collected in upland areas to evaluate the RFS as a possible PCB source. The results indicated an area with elevated PCBs in the southwestern portion of the Site just south of Building 128. In late 2002 and early 2003, 36 soil samples were collected to delineate PCBs in this area that would become AOC U6. The soil sampling results are reported in the Phase 3 Remedial Action Plan (RAP) (BBL, 2004a).

Also in early 2003, 31 sediment samples were collected from within Meeker Slough and the west bank to address a datagap in the marsh. These results were consistant with other western marsh PCB samples and are reported in the draft Conceptual Remedial Action Plan (C-RAP) – Addendum (BBL, 2005).

In October 2003 during Phase 2 excavations in Area 4, subsection B5 (see excavation plan in Phase 2 Remedial Design Details [URS, 2002c]) of the upland portion of Subunit 2A, soil with a strong volatile

organic compound (VOC) odor was encountered adjacent to the then existing sanitary sewer pipe. A soil sample was collected and analyzed for Aroclors and congeners.

From mid 2003 to mid 2004, 49 soil samples were collected for Aroclor analysis and one sample for congener analysis in the central portion of the upland area in ditches and manholes to further evaluate whether the RFS may be a source for PCBs. Results were only elevated in ditches relatively close to a manhole along the central portion of the WSD in the vicinity of Building 277. This area would become AOC U8 which was addressed during Phase 3 of the remediation. Just prior to beginning Phase 3 remediation, PCBs were detected in waste characterization samples from AOC U1. Therefore, at the request of the RWQCB, BBL collected 35 soil samples for Aroclor analysis to delineate the extent of PCBs in AOC U1. In addition, one sample was collected for congener analysis. Results showed that elevated concentrations of PCBs were within the planned perimeter of the excavation. The AOC U1 and U8 results are presented in the Phase 3 RAP. During Phase 3 remediation, six soil samples were collected for Aroclor analysis and one soil sample for congener analysis from beneath the northern section of WSD pipe that was abandoned by grouting in place.

During fall 2004, BBL collected 76 sediment samples from the western marsh to further address datagaps and define the extent of PCB hotspots in the marsh. The results of this investigation are presented in the C-RAP Addendum.

In March 2005, 16 surface sediment samples were collected from the eastern portion of the marsh to evaluate potential health risks to volunteers planting vegetation as part of marsh restoration. Another purpose of this sampling was to evaluate whether contaminated sediment might be migrating into the area from the western marsh. Also in March, two sediment samples were collected in West Area 4 from beneath the fill overburden. The ND results for these samples suggest that the PCB contamination may have occurred after the 1950's because the tidal flat that was exposed in this area at that time is not contaminated.

2.2 Groundwater, Surface Water, and Storm Water Sampling

During the spring 2000 investigation, eight grab groundwater samples, six surface water samples from the inner marsh, and three surface water samples from the outer marsh (south of the Bay Trail) were collected and analyzed for PCBs. These results are reported in the FSAR. In fall 2002, 12 surface water samples were collected from the western portion of the marsh, analyzed for PCBs, and reported in the C-RAP.

In fall 2004, BBL collected four storm water samples (at the eastern and WSD outfalls, the northern extent of Meeker Slough, and the concrete-lined ditch that flows into northern Meeker Slough). These samples were collected under the draft Groundwater, Surface Water, and Sediment Monitoring Plan, Subunit 2, Meade Street Operable Unit (BBL, 2004c).

A summary of PCB analytical results for water samples is presented in Table 3. The sampling locations are shown on Figure 3.

3. Nature and Extent

The objective of this section is to provide an overview of the nature and extent of the PCB contamination assessed to date at the RFS. Results of the sampling activities outlined in Section 2 are provided below in terms of contamination remaining after three phases of remediation.

3.1 Total PCBs

3.1.1 Upland Results

During Phase 3 remediation in 2004, the human health site-specific target level (H-SSTL) of 10 mg/kg total PCBs proposed in the risk assessment prepared for the RFS was used as one of the screening levels to evaluate areas of concern (AOCs). In addition, in areas that posed a risk of erosion to the marsh a cleanup level of 3 mg/kg total PCBs was developed in consultation with URS and BBL toxicologist and risk assessors. Figure 4 shows the location of samples exceeding 10 mg/kg total PCBs in the upland area and that those locations occur with AOCs that were remediated between 2002 and 2004.

Following Phase 3, the highest known concentrations remaining in the upland areas exceeding 1 mg/kg are 1.29 mg/kg in AOC U1; 1.56 mg/kg (below 4 feet below ground surface [bgs]) in AOC U8; 3.05 mg/kg at SD2-13 in the central drainage area north of Building 277; and 1.6 mg/kg and 1.1 mg/kg in AOC U5 (planned to be removed during Phase 4). These results are shown in Table 4 that summarizes the total PCB results for samples of soil that remain in each of the sampled areas. The results are sorted in decreasing order so that the higher concentrations are evident. In addition, Table 5 presents the maximum and minimum concentration in each of the areas.

3.1.2 Marsh Results

During Phase 1 and 2 remediation, the Subunit 2A portion of the marsh and a relatively small portion of the Subunit 2B portion of the marsh (M1a and M3) were excavated and backfilled with clean Bay Mud. As shown on Table 4, 195 sediment samples have been collected in the remaining portions of the inner western marsh ranging from 0.059 mg/kg to 96.5 mg/kg total PCBs.

The future cleanup level for PCBs is unknown and must be negotiated with DTSC and RWQCB. A threshold of 0.3 mg/kg was selected as within a range of possible cleanup values for marsh samples on Figure 4 which shows numerous locations exceeding 0.3 mg/kg in the eastern marsh. Some of these locations were removed during Phase 1 and 2 remediation. However, as shown on Tables 1 and 4, some of these locations (Watershed-1 through 16) post-date remediation and indicate more recent contamination in the eastern marsh. Figure 4 also shows many locations exceeding 0.3 mg/kg total PCBs throughout the western marsh and Meeker Slough.

The draft Conceptual Remedial Action Plan – Addendum (BBL, 2005) contains additional discussion regarding the nature and extent of PCBs in the marsh including concentration contour maps for two depths; surface to 1 foot bgs and > 1 foot bgs.

3.2 Aroclors

The occurrence of individual Aroclors are shown on Figures 5 through 8. Table 5 indicates the number and frequency of occurrence of each of the Aroclors in each of the upland and marsh areas.

Figure 5 shows locations of Aroclor 1242 detections. This Aroclor only occurred in the marsh in seven samples and 2% of all samples as shown in Table 5.

Figure 6 shows locations of Aroclor 1248 detections. This Aroclor occurred in 43% of all samples and in the following areas:

- throughout the inner marsh;
- at scattered locations in the outer marsh and Eastern Stege Marsh;
- in the WSD to the north side of the RFS property;
- in areas such as ditches near catch basins (AOC U8) or a manhole in the WSD north of Building 277; and
- in the sample of soil from along the sanitary sewer extending westward from the Zeneca site.

Figure 7 shows locations of Aroclor 1254 detections. This Aroclor occurred in 33% of all samples and in the following areas:

- throughout the inner marsh although not as widespread as Aroclor 1248;
- at fewer locations than Aroclor 1248 along the WSD and only as far north as the manhole north of Building 277; and
- at multiple locations in AOC U1, U3, U6, and U8.

Figure 8 shows locations of Aroclor 1260 detections. This Aroclor occurred in 23% of all samples and in the following areas:

- throughout the inner marsh although not as widespread as Aroclor 1248 or at as high concentrations as Aroclor 1254;
- at only one location along the south end of the WSD; and
- at fewer locations in AOC U1 and U8 than Aroclor 1254.

4. Potential PCB Sources

4.1 Richmond Field Station

The WSD is believed to be the migration route for much of the PCBs in the marsh due to the occurrence of very high concentrations (up to 61,000 mg/kg) found at the outfall and in the pipe (44 mg/kg) at Manhole #11 (east of the Northern Regional Library Facility). Although the WSD currently conveys only storm water from the RFS to the marsh, this system conveyed storm water, waste water and sewage directly to the marsh prior to the 1950's and sanitary sewer overflows until 2004. A significant number of PCB detections, including the highest concentrations of PCBs in the upland areas of the RFS, have been detected in drainage ditches near Lark Drive and Building 277 in AOC U8 close to a WSD catch basin. These detections, as well as those adjacent to the WSD manhole north of Building 277, may be related to the migration of PCBs through the WSD from off-site sources. Appendix A contains the known historical information regarding the WSD and a short discussion regarding possible sources on the RFS site.

While there are no records of PCB oil spills, leaks, or known uses of PCBs on the RFS site, there are a significant number of PCB detections of Aroclors 1254 and 1260 in areas of the RFS site that are remote from the WSD such as in AOC U1 and possibly U6 as shown on Figures 7 and 8. While the occurrence of PCBs in these areas may suggest that the RFS might be a source of PCBs in the marsh, the following should be noted:

- Of the Aroclors, 1248 is most abundant with an average concentration of 18.97 mg/kg. Aroclor 1248 was not detected in AOC U1 and occurs in upland areas that may be related to the WSD as well as in the northern extent of the WSD, as shown on Figure 6, suggesting that the source of this Aroclor is off-site and

- Aroclors 1254 and 1260 are much less abundant with average concentrations of 0.98 mg/kg and 0.36 mg/kg, respectively. These Aroclors do occur within upland areas but their presence in the marsh is relatively minor.

4.2 Former PG&E Site

Legacy Partners owns property to the north of the RFS at the intersection of Regatta Boulevard (running east/west) and South 43rd Street and eastward to Regatta Boulevard (running north/south). This area is currently undergoing redevelopment. Until recently, a California Department of Transportation (CalTrans) facility occupied this site. Between the Legacy Partners property and UC Berkeley property (the RFS), is City of Richmond property, including Regatta Boulevard just south of I-580 and Meeker Avenue, and a Southern Pacific Railroad right-of-way. This area including the former location of CalTrans was the former location of a PG&E facility as shown on Figure 1. Figure 9 shows an aerial photo of the PG&E facility from 1983 that shows equipment and material stored on the site, including electrical transformers (interview with Larry Bell, former superintendent, physical plant, RFS). The photo shows that the eastern portion of the property, directly north and west of the RFS, was a dirt area with a large, black, stain. Figure 9 also shows the location of the WSD which, prior to the 1950's, conveyed storm water, waste water, and sewage directly to the marsh and San Francisco Bay. The configuration of the drainage and sewer systems on the eastern side of the former PG&E site is unknown

following demolition during the construction of I-540 and the Regatta Boulevard interchange in the 1990s.

While it is currently unknown if the former PG&E site is a source of PCBs in the marsh, it should be noted that PCBs have been widely used in transformers since 1929. Waste water, storm water, and sewage flowed directly to the marsh through the WSD until the late 1940's or early 1950's. As shown on Figure 9, a sanitary sewer line currently extends northward from the manhole at the northern end of the WSD. This pipe likely existed prior to the 1950's carrying water from the eastern side of the PG&E site (assuming this was a PG&E site at that time) to the marsh.

4.3 Zeneca/CSV Site

Aerial photos dating from the 1940's show a line of manholes on the tidal flat south of the Zeneca and RFS sites indicating a sanitary sewer system running approximately east/west. This system is believed to have flowed directly to the Bay prior to the construction of the City of Richmond wastewater treatment plant in the early 1950's. During Phase 2 remediation, the pipe was exposed in Area 4 of Subunit 2A and removed. On October 3, 2003 a hotspot of volatile organic compounds was encountered in soil that apparently leaked from the pipe. This soil was analyzed and contained 63 mg/kg total PCBs. This result suggests that the Zeneca site or another site upstream along this pipe may be a source of PCBs in the marsh.

5. Recommendations

Based on the results of PCB sampling and analysis performed to date at the RFS, BBL recommends the following:

- Collect and analyze soil samples from borings along the northern property boundary near the intersection of Meede Street and Regatta Blvd;

- If PCBs are detected in the northern property boundary area, the samples should be "fingerprinted" to evaluate whether the PCBs in this area are similar enough to PCBs in the marsh to identify this area as the source. "Fingerprinting" PCBs is done by comparing assemblages of chemicals in a residue, such as marsh sediment, with assemblages of similar chemicals in suspected source soil. There are several methods such as:

    - An interpretive process using gas chromatography from the analysis of Aroclors with calibration standards and sample chromatograms. BBL believes that most if not all of the RFS forensic questions can be addressed using this approach which is the least expensive of the fingerprinting methods;

    - A mathematical process using multivariate models requiring congener data;

    - A combination of both is the most robust approach;

    - Fingerprinting of carrier oils; and

    - Petroleum fingerprinting beyond TPH including alkylated PAHs, geochemical biomarkers, or stable isotopes.

- In 2000, Erin Brockovich, the Silicon Valley Toxics Coalition, and the RWQCB asked PG&E for a list of sites in the Bay Area where PCBs were used (see http://www.gascape.org/Brockovich_01.html). UC Berkeley should examine this list and request that DTSC request additional information from PG&E regarding the use of PCBs at the Legacy Partners site in particular.

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Tables

BBL
ENVIRONMENTAL SERVICES, INC.
Remedial Management & Construction

TABLE 1
ANALYTICAL RESULTS FOR PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

Location	Depth (Feet)	Date Collected	Total PCBs (Max DL) (mg/kg)	Total PCBs (NDs at 1/2 DL) (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)	Aroclor-1262 (mg/kg)
UPLAND AREAS												
AOC U1												
ES3-13	0 - 0.5	7/13/2004	0.92	0.95	< 0.01	< 0.02	< 0.01	< 0.01	< 0.01	0.81	0.11	NA
ES3-14	0 - 0.5	7/13/2004	15	15.3	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	13	2	NA
ES3-14	3 - 3.5	7/29/2004	0.016	0.068	< 0.015	< 0.029	< 0.015	< 0.015	< 0.015	0.016	< 0.015	NA
ES3-15	0 - 0.5	7/13/2004	2.91	3.06	< 0.05	< 0.099	< 0.05	< 0.05	< 0.05	2.4	0.51	NA
ES3-16	0 - 0.5	7/13/2004	25.2	25.8	< 0.2	< 0.39	< 0.2	< 0.2	< 0.2	22	3.2	NA
ES3-16	0 - 0.5	8/27/2004	0.14	0.174	< 0.0096	< 0.019	< 0.0096	< 0.0096	< 0.0096	0.14	< 0.0096	NA
ES3-16	1 - 1.5	7/29/2004	0.017	0.066	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	0.017	< 0.014	NA
ES3-16 -PCBA	0 - 0.5	9/17/2004	0.31	0.34	< 0.0098	< 0.02	< 0.0098	< 0.0098	< 0.0098	0.27	0.04	NA
ES3-16 -PCBB	0 - 0.5	9/17/2004	0.277	0.306	< 0.0097	< 0.019	< 0.0097	< 0.0097	< 0.0097	0.24	0.037	NA
ES3-16 -PCBC	0 - 0.5	9/17/2004	0.301	0.331	< 0.0098	< 0.02	< 0.0098	< 0.0098	< 0.0098	0.26	0.041	NA
ES3-16 -PCBD	0 - 0.5	9/17/2004	0.418	0.448	< 0.0098	< 0.02	< 0.0098	< 0.0098	< 0.0098	0.36	0.058	NA
ES3-17	0 - 0.5	7/29/2004	0.1	0.146	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	0.1	< 0.013	NA
ES3-18	0 - 0.5	7/29/2004	0.05	0.092	< 0.012	< 0.024	< 0.012	< 0.012	< 0.012	0.05	< 0.012	NA
ES3-19	0 - 0.5	7/29/2004	< 0.025	0.0485	< 0.012	< 0.025	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	NA
ES3-19	1 - 1.5	7/29/2004	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
ES3-20	1 - 1.5	7/29/2004	0.015	0.0605	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	0.015	NA
ES3-21	0 - 0.5	7/29/2004	0.78	0.975	< 0.065	< 0.13	< 0.065	< 0.065	< 0.065	0.67	0.11	NA
ES3-22	1 - 1.5	7/29/2004	0.105	0.147	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	0.09	0.015	NA
ES3-23	0 - 0.5	7/29/2004	1.1	1.29	< 0.063	< 0.13	< 0.063	< 0.063	< 0.063	0.95	0.15	NA
ES3-23	1 - 1.5	7/29/2004	0.207	0.249	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	0.17	0.037	NA
ES3-24	0 - 0.5	7/29/2004	0.65	0.689	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	0.48	0.17	NA
ES3-25	0 - 0.5	7/29/2004	0.128	0.167	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	0.091	0.037	NA
ES3-25	1 - 1.5	7/29/2004	< 0.028	0.056	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
ES3-26	0 - 0.5	7/29/2004	0.045	0.09	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	0.045	< 0.013	NA
ES3-27	0 - 0.5	7/29/2004	0.065	0.11	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	0.065	< 0.013	NA
ES3-27	1 - 1.5	7/29/2004	< 0.027	0.0525	< 0.013	< 0.027	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
ES3-28	0 - 0.5	7/29/2004	0.02	0.0625	< 0.012	< 0.025	< 0.012	< 0.012	< 0.012	0.02	< 0.012	NA
ES3-28	1 - 1.5	7/29/2004	< 0.027	0.0555	< 0.014	< 0.027	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
ES3-29	0 - 0.5	7/29/2004	0.024	0.0695	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	0.024	< 0.013	NA
ES3-30	0 - 0.5	7/29/2004	0.038	0.0835	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	0.038	< 0.013	NA
ES3-31	1 - 1.5	7/29/2004	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
ES3-31	0 - 0.5	7/29/2004	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
ES3-32	1 - 1.5	7/29/2004	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
ES3-32	0 - 0.5	7/29/2004	0.047	0.0925	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	0.047	< 0.013	NA
ES3-33	0 - 0.5	7/29/2004	0.02	0.0625	< 0.012	< 0.025	< 0.012	< 0.012	< 0.012	0.02	< 0.012	NA
AOC U3												
FP2-1	0 - 0.5	9/9/2002	0.15 J	0.196 J	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	0.15 J	< 0.013	NA
AOC U4												
SM2-1	0 - 0.5	9/9/2002	< 0.025	0.0515	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
SM2-4	0 - 0.5	9/9/2002	0.047	0.0835	< 0.012	< 0.025	< 0.012	< 0.012	< 0.012	0.028	0.019	NA
AOC U6												
HD2-1	0 - 0.5	9/9/2002	8.2	8.95	< 0.25	< 0.5	< 0.25	< 0.25	< 0.25	7.1	1.1	NA
HD2-1	4 - 4.5	9/9/2002	4.6 J	4.6 J	R	R	R	R	4.6 J	R	R	NA
HD2-2	0 - 0.5	9/9/2002	0.208	0.247	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	0.15	0.058	NA
HD2-2	2 - 2.5	5/6/2004	< 0.029	0.0595	< 0.015	< 0.029	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA

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Location	Depth (Feet)	Date Collected	Total PCBs (Max DL) (mg/kg)	Total PCBs (NDs at 1/2 DL) (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)	Aroclor-1262 (mg/kg)
HD2-2	4 - 4.5	5/6/2004	< 0.028	0.056	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
HD2-2	6 - 6.5	5/6/2004	< 0.028	0.056	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
HD2-3	2 - 2.5	5/6/2004	< 0.028	0.056	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
HD2-3	4 - 4.5	5/6/2004	< 0.03	0.06	< 0.015	< 0.03	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
HD2-3	6 - 6.5	5/6/2004	< 0.027	0.0555	< 0.014	< 0.027	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
HD2-4	0 - 0.5	12/11/2002	< 0.13	0.254	< 0.063	< 0.13	< 0.063	< 0.063	< 0.063	< 0.063	< 0.063	NA
HD2-4	1.5 - 2	12/11/2002	< 0.025	0.0485	< 0.012	< 0.025	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	NA
HD2-4	3 - 3.5	12/11/2002	0.1	0.15	< 0.014	< 0.029	< 0.014	< 0.014	< 0.014	0.1	< 0.014	NA
HD2-5	0 - 0.5	12/11/2002	0.2	0.433	< 0.067	< 0.13	< 0.067	< 0.067	< 0.067	0.2	< 0.067	NA
HD2-5	1.5 - 2	12/11/2002	< 0.03	0.06	< 0.015	< 0.03	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
HD2-5	3 - 3.5	12/11/2002	0.123	0.165	< 0.014	< 0.027	< 0.014	< 0.014	< 0.014	0.082	0.041	NA
HD2-6	0 - 0.5	12/11/2002	< 0.03	0.06	< 0.015	< 0.03	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
HD2-6	1.5 - 2	12/11/2002	< 0.032	0.064	< 0.016	< 0.032	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	NA
HD2-6	3 - 3.5	12/11/2002	< 0.027	0.0555	< 0.014	< 0.027	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
HD2-7	0 - 0.5	12/11/2002	0.02	0.0825	< 0.018	< 0.035	< 0.018	< 0.018	< 0.018	0.02	< 0.018	NA
HD2-7	1.5 - 2	12/11/2002	< 0.027	0.0525	< 0.013	< 0.027	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
HD2-7	3 - 3.5	12/11/2002	< 0.028	0.056	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
HD2-8	0 - 0.5	12/11/2002	0.11	0.162	< 0.015	< 0.029	< 0.015	< 0.015	< 0.015	0.11	< 0.015	NA
HD2-8	1.5 - 2	12/11/2002	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
HD2-8	3 - 3.5	12/11/2002	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
HD2-9	0 - 0.5	12/11/2002	0.69	0.74	< 0.014	< 0.029	< 0.014	< 0.014	< 0.014	0.69	< 0.014	NA
HD2-9	1.5 - 2	12/11/2002	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
HD2-9	3 - 3.5	12/11/2002	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
HD2-10	0 - 0.5	1/17/2003	0.367	0.418	< 0.017	< 0.034	< 0.017	< 0.017	< 0.017	0.28	0.087	NA
HD2-10	2 - 2.5	1/17/2003	< 0.029	0.0595	< 0.015	< 0.029	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
HD2-10	4.5 - 5	1/17/2003	< 0.029	0.0595	< 0.015	< 0.029	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
HD2-11	6 - 6.5	1/17/2003	< 0.024	0.048	< 0.012	< 0.024	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	NA
HD2-11	7.5 - 8	1/17/2003	< 0.024	0.048	< 0.012	< 0.024	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	NA
HD2-12	2 - 2.5	1/31/2003	< 0.03	0.06	< 0.015	< 0.03	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
HD2-12	0 - 0.5	1/31/2003	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
HD2-12	3.5 - 4	1/31/2003	< 0.027	0.0525	< 0.013	< 0.027	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
AOC U7												
MF2-2	0 - 0.5	9/9/2002	0.057	0.0955	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	0.033	0.024	NA
MF2-3	0 - 0.5	9/9/2002	0.149	0.188	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	0.1	0.049	NA
MF2-7	0 - 0.5	9/9/2002	0.018	0.0625	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	< 0.012	0.018	NA
AOC U8 and Central Storm Drains												
SD2-1	0.5 - 1	3/13/2003	< 0.24	0.48	< 0.12	< 0.24	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	NA
SD2-2	0.5 - 1	3/13/2003	< 0.24	0.48	< 0.12	< 0.24	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	NA
SD2-3	0 - 0.5	6/17/2004	0.725	0.751	< 0.01	< 0.021	< 0.01	< 0.01	0.3	0.35	0.075	NA
SD2-3	0.5 - 1	3/13/2003	2.12	2.48	< 0.12	< 0.24	< 0.12	< 0.12	< 0.12	1.8	0.32	NA
SD2-3	2 - 2.5	6/17/2004	< 0.021	0.0435	< 0.011	< 0.021	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	NA
SD2-4	0.5 - 1	3/13/2003	< 0.24	0.48	< 0.12	< 0.24	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	NA
SD2-5	0.5 - 1	4/10/2003	7.2	8.81	< 0.46	< 0.91	< 0.46	< 0.46	7.2	< 0.46	< 0.46	NA
SD2-6	0.5 - 1	4/10/2003	11	12.5	< 0.42	< 0.84	< 0.42	< 0.42	11	< 0.42	< 0.42	NA
SD2-6	4 - 4.5	4/23/2004	1.46	1.56	< 0.031	< 0.062	< 0.031	< 0.031	1.4	< 0.031	0.063	NA
SD2-6	5.5 - 6	5/11/2004	< 0.027	0.0525	< 0.013	< 0.027	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
SD2-7	0.5 - 1	5/12/2003	3.51	3.56	< 0.015	< 0.03	< 0.015	< 0.015	3.3	< 0.015	0.21	NA

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SD2-8	0.5 - 1	5/12/2003	0.51	0.566	< 0.016	< 0.032	< 0.016	< 0.016	0.51	< 0.016	< 0.016	NA
SD2-9	0.5 - 1	5/12/2003	10.3	10.4	< 0.024	< 0.049	< 0.024	< 0.024	10	< 0.024	0.33	NA
SD2-10	0.5 - 1	5/12/2003	445	468	< 7.7	< 15	< 7.7	< 7.7	430	< 7.7	15	NA
SD2-11	0.5 - 1	5/12/2003	2.91	2.96	< 0.017	< 0.034	< 0.017	< 0.017	2.7	< 0.017	0.21	NA
SD2-12	0 - 0.5	5/23/2003	1.2	1.27	< 0.019	< 0.037	< 0.019	< 0.019	1.2	< 0.019	< 0.019	NA
SD2-13	0.5 - 1	5/23/2003	2.8	3.05	< 0.07	< 0.14	< 0.07	< 0.07	2.8	< 0.07	< 0.07	NA
SD2-14	0 - 0.5	5/23/2003	0.23	0.275	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	< 0.013	0.23	NA
SD2-15	0 - 0.5	6/6/2003	5.52	5.56	< 0.014	< 0.027	< 0.014	< 0.014	5.2	< 0.014	0.32	NA
SD2-16	0.6 - 1.1	6/6/2003	6.9	6.95	< 0.013	< 0.027	< 0.013	< 0.013	6.9	< 0.013	< 0.013	NA
SD2-17	0.6 - 1.1	6/6/2003	0.4	0.44	< 0.013	< 0.027	< 0.013	< 0.013	0.32	< 0.013	0.08	NA
SD2-18	1.5 - 2	6/6/2003	6.15	6.19	< 0.014	< 0.027	< 0.014	< 0.014	5.8	< 0.014	0.35	NA
SD2-19	0 - 1.5	7/18/2003	3.8	4.33	< 0.15	< 0.3	< 0.15	< 0.15	3.8	< 0.15	< 0.15	NA
SD2-20	0 - 1.3	7/18/2003	< 0.03	0.06	< 0.015	< 0.03	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
SD2-21	0 - 0.3	7/18/2003	6.2	6.76	< 0.16	< 0.31	< 0.16	< 0.16	6.2	< 0.16	< 0.16	NA
SD3-1	0 - 0.5	4/23/2004	0.031	0.0805	< 0.014	< 0.029	< 0.014	< 0.014	< 0.014	0.031	< 0.014	NA
SD3-1	2 - 2.5	4/23/2004	< 0.03	0.06	< 0.015	< 0.03	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
SD3-1	4 - 4.5	4/23/2004	< 0.029	0.0595	< 0.015	< 0.029	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
SD3-2	0 - 0.5	5/11/2004	< 0.03	0.06	< 0.015	< 0.03	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
SD3-2	2 - 2.5	5/11/2004	< 0.03	0.06	< 0.015	< 0.03	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
SD3-2	4 - 4.5	5/11/2004	< 0.027	0.0555	< 0.014	< 0.027	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
SD3-2	5.5 - 6	5/11/2004	< 0.028	0.056	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
SD3-3	2 - 2.5	5/11/2004	< 0.031	0.0635	< 0.016	< 0.031	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	NA
SD3-3	4 - 4.5	5/11/2004	< 0.027	0.0555	< 0.014	< 0.027	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
SD3-3	6 - 6.5	5/11/2004	< 0.028	0.056	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
SD3-4	0 - 0.5	6/17/2004	0.621	0.649	< 0.011	< 0.022	< 0.011	< 0.011	0.28	0.25	0.091	NA
SD3-4	2 - 2.5	6/17/2004	< 0.022	0.044	< 0.011	< 0.022	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	NA
SD3-5	0 - 0.5	6/17/2004	4.53	4.56	< 0.011	< 0.022	< 0.011	< 0.011	2	2.1	0.43	NA
SD3-5	2 - 2.5	6/17/2004	< 0.023	0.0475	< 0.012	< 0.023	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	NA
SD3-6	0 - 0.5	6/17/2004	0.061	0.094	< 0.011	< 0.022	< 0.011	< 0.011	0.036	0.025	< 0.011	NA
SD3-7	0 - 0.5	6/17/2004	0.012	0.05	< 0.011	< 0.021	< 0.011	< 0.011	< 0.011	0.012	< 0.011	NA
SD3-7	2 - 2.5	6/17/2004	< 0.023	0.0445	< 0.011	< 0.023	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	NA
SD3-8	0 - 0.5	6/17/2004	0.023	0.0585	< 0.01	< 0.021	< 0.01	< 0.01	< 0.01	0.023	< 0.01	NA
SD3-8	2 - 2.5	6/17/2004	< 0.022	0.044	< 0.011	< 0.022	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	NA
SD3-9	0 - 0.5	6/17/2004	0.038	0.0765	< 0.011	< 0.022	< 0.011	< 0.011	< 0.011	0.038	< 0.011	NA
SD3-9	2 - 2.5	6/17/2004	< 0.024	0.048	< 0.012	< 0.024	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	NA
SD3-12	0 - 0.5	6/17/2004	0.61	0.785	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	0.61	< 0.05	NA
SD3-13	0 - 0.5	6/17/2004	0.117	0.148	< 0.01	< 0.021	< 0.01	< 0.01	0.056	0.061	< 0.01	NA
SD3-14	0 - 0.5	6/17/2004	0.018	0.0535	< 0.01	< 0.021	< 0.01	< 0.01	< 0.01	0.018	< 0.01	NA
Western Storm Drain (from north to south)												
SDMH-9	11 - 11.5	5/6/2004	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
NSD-1		9/23/2004	0.39	0.429	< 0.011	< 0.022	< 0.011	< 0.011	0.39	< 0.011	< 0.011	NA
NSD-2		9/23/2004	0.18	0.219	< 0.011	< 0.022	< 0.011	< 0.011	0.18	< 0.011	< 0.011	NA
NSD-3		9/23/2004	0.78	0.819	< 0.011	< 0.022	< 0.011	< 0.011	0.78	< 0.011	< 0.011	NA
NSD-4		9/23/2004	< 0.022	0.044	< 0.011	< 0.022	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	NA
SSD-1	13 - 13.5	9/23/2004	7.3	7.86	< 0.16	< 0.32	< 0.16	< 0.16	7.3	< 0.16	< 0.16	NA
SSD-2	13 - 13.5	9/23/2004	< 0.033	0.0675	< 0.017	< 0.033	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	NA
MH11	in pipe	5/1/2000	42	42	NA	NA	NA	NA	42	NA	NA	NA

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Location	Depth (Feet)	Date Collected	Total PCBs (Max DL) (mg/kg)	Total PCBs (NDs at 1/2 DL) (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)	Aroclor-1262 (mg/kg)
SDMH-11	10 - 10.5	5/6/2004	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
SDMH-11	7 - 7.5	5/6/2004	< 0.027	0.0555	< 0.014	< 0.027	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	NA
SD-101	0 - 0.5	2/25/2000	0.89 J	1.14 J	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	0.89 J	< 0.07	< 0.07
SD-101	3 - 3.5	2/25/2000	0.086	0.128	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	0.086	< 0.014	NA
SD-101	8 - 9.5	2/25/2000	< 0.015	0.0525	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
SD-102	0 - 0.5	2/25/2000	0.078 J	0.123 J	< 0.015 J	< 0.015 J	< 0.015 J	< 0.015 J	< 0.015 J	0.078 J	< 0.015 J	NA
SD-102	3 - 3.5	2/25/2000	1.55	1.62	< 0.029	< 0.029	< 0.029	< 0.029	0.88	< 0.029	0.67	NA
SD-102	8 - 9.5	2/25/2000	< 0.016	0.056	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	NA
EMI Trailer site (north of Building 277)												
EMI-1	0 - 0.5	3/30/2005	0.034	0.067	< 0.011	< 0.022	< 0.011	< 0.011	< 0.011	0.021	0.013	NA
EMI-2	0 - 0.5	3/30/2005	0.018	0.0535	< 0.01	< 0.021	< 0.01	< 0.01	< 0.01	0.018	< 0.01	NA
EMI-3	0 - 0.5	3/30/2005	0.025	0.0585	< 0.011	< 0.023	< 0.011	< 0.011	< 0.011	0.013	0.012	NA
EMI-4	0 - 0.5	3/30/2005	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
EMI-5	0 - 0.5	3/30/2005	< 0.024	0.048	< 0.012	< 0.024	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	NA
EMI-6	0 - 0.5	3/30/2005	< 0.024	0.048	< 0.012	< 0.024	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	NA
New Treatment Pond Area (northwest side of property)												
NP1	0.5 - 1	9/10/2002	< 0.025	0.0515	< 0.013	< 0.025	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
Owl Way												
OW2-1	0 - 0.5	9/9/2002	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
OW2-1	8 - 9.5	9/9/2002	< 0.026	0.052	< 0.013 J	< 0.026 J	< 0.013 J	< 0.013 J	< 0.013 J	< 0.013 J	< 0.013 J	NA
West Area 4												
CD-20	7 - 7.5	3/18/2005	< 0.033	0.0645	< 0.016	< 0.033	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	NA
CD-25	7.8 - 8.3	3/18/2005	< 0.026	0.052	< 0.013	< 0.026	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013	NA
Sanitary Sewer line from Zeneca (Area 4, Subunit 2A)												
B5-100303-Composite		10/3/2003	57	62.7	< 1.6	< 3.3	< 1.6	< 1.6	57	< 1.6	< 1.6	NA
Bulb												
BLB-8 (fill)	2.5 - 3	12/12/2002	R	R	R	R	R	R	R	R	R	NA
BLB5 (sediment)	7.5 - 8	12/11/2002	R	R	R	R	R	R	R	R	R	NA
BLB6 (sediment)	3.5 - 4	12/11/2002	0.659 J	0.659 J	R	R	R	R	0.38 J	0.25 J	0.029 J	NA
BLB7 (sediment)	6 - 6.5	12/12/2002	R	R	R	R	R	R	R	R	R	NA
MARSH												
Eastern Marsh (removed Phase 1 or 2)												
SM108	0 - 0.5	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM108	2 - 2.5	3/23/2000	< 0.25	1	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
SM108	4.5 - 5	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM109	0 - 0.5	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM110	0 - 0.5	3/17/2000	< 0.014 R	R	< 0.014 R	< 0.028 R	< 0.014 R	< 0.014 R	< 0.014 R	< 0.014 R	< 0.014 R	< 0.014 R
SM110	14 - 14.5	3/17/2000	< 0.03	0.0675	< 0.015	< 0.03	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
SM110	4 - 4.5	3/17/2000	0.54 J	0.82 J	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	0.54 J	< 0.08	< 0.08
SM110	9 - 9.5	3/17/2000	< 0.033	0.072	< 0.016	< 0.033	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016
SM123	0 - 0.5	3/17/2000	0.5	0.548	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	0.5	< 0.016	NA
SM123	3 - 3.5	3/17/2000	0.089	0.14	< 0.017 b	< 0.017	< 0.017	0.089	< 0.017	< 0.017	< 0.017 b	NA
SM123	8.5 - 9	3/17/2000	< 0.015	0.0525	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
SM124	3.5 - 4	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SMAB-6	0 - 0.5	3/18/2002	< 0.14	0.286	< 0.072	< 0.14	< 0.072	< 0.072	< 0.072	< 0.072	< 0.072	NA
Eastern Marsh - post remediation												
WATERSHED-1	0 - 0.2	3/1/2005	< 0.037	0.0755	< 0.019	< 0.037	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	NA

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WATERSHED-2	0 - 0.2	3/1/2005	0.147	0.261	< 0.038	< 0.076	< 0.038	< 0.038	0.078	0.069	< 0.038	NA
WATERSHED-3	0 - 0.2	3/1/2005	0.237	0.295	< 0.023	< 0.046	< 0.023	< 0.023	0.1	0.1	0.037	NA
WATERSHED-4	0 - 0.2	3/1/2005	0.46	0.518	< 0.023	< 0.046	< 0.023	< 0.023	0.26	0.14	0.06	NA
WATERSHED-5	0 - 0.2	3/1/2005	0.627	0.697	< 0.028	< 0.056	< 0.028	< 0.028	0.38	0.2	0.047	NA
WATERSHED-6	0 - 0.2	3/1/2005	0.349	0.399	< 0.02	< 0.039	< 0.02	< 0.02	0.16	0.12	0.069	NA
WATERSHED-7	0 - 0.2	3/1/2005	0.348	0.408	< 0.024	< 0.048	< 0.024	< 0.024	0.15	0.12	0.078	NA
WATERSHED-8	0 - 0.2	3/1/2005	0.519	0.619	< 0.04	< 0.079	< 0.04	< 0.04	0.28	0.19	0.049	NA
WATERSHED-9	0 - 0.2	3/1/2005	0.357	0.435	< 0.031	< 0.062	< 0.031	< 0.031	0.13	0.13	0.097	NA
WATERSHED-10	0 - 0.2	3/1/2005	< 0.091	0.181	< 0.045	< 0.091	< 0.045	< 0.045	< 0.045	< 0.045	< 0.045	NA
WATERSHED-11	0 - 0.2	3/1/2005	0.956	1.06	< 0.042	< 0.085	< 0.042	< 0.042	0.47	0.39	0.096	NA
WATERSHED-12	0 - 0.2	3/1/2005	0.28	0.355	< 0.025	< 0.05	< 0.025	< 0.025	0.17	0.11	< 0.025	NA
WATERSHED-13	0 - 0.2	3/1/2005	0.462	0.559	< 0.039	< 0.077	< 0.039	< 0.039	0.24	0.17	0.052	NA
WATERSHED-14	0 - 0.2	3/1/2005	0.486	0.596	< 0.044	< 0.088	< 0.044	< 0.044	0.26	0.16	0.066	NA
WATERSHED-15	0 - 0.2	3/1/2005	0.448	0.531	< 0.033	< 0.066	< 0.033	< 0.033	0.24	0.16	0.048	NA
WATERSHED-16	0 - 0.2	3/1/2005	< 0.04	0.08	< 0.02	< 0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	NA
Western Marsh (removed Phase 2)												
SM104	2 - 2.5	3/24/2000	1600	2200	< 170	< 170	< 170	< 170	1600	< 170	< 170	< 170
SM104	4 - 4.5	3/24/2000	1200	1550	< 100	< 100	< 100	< 100	1200	< 100	< 100	< 100
SM127	0 - 0.5	8/7/2001	20	21.6	< 0.45	< 0.91	< 0.45	20	< 0.45	< 0.45	< 0.45	NA
SM127	2 - 2.5	8/7/2001	8.2	9.5	< 0.37	< 0.75	< 0.37	8.2	< 0.37	< 0.37	< 0.37	NA
SM127	3.5 - 4	8/7/2001	0.94	1.19	< 0.072	< 0.14	< 0.072	0.94	< 0.072	< 0.072	< 0.072	NA
SM128	0 - 0.5	8/7/2001	370	398	< 7.8	< 16	< 7.8	370	< 7.8	< 7.8	< 7.8	NA
SM128	2 - 2.5	8/7/2001	61000	68,400	< 2100	< 4300	< 2100	61,000	< 2100	< 2100	< 2100	NA
SM128	4 - 4.5	8/7/2001	1600	1,730	< 36	< 73	< 36	1,600	< 36	< 36	< 36	NA
SM129	0 - 0.5	8/7/2001	8.9	9.67	< 0.22	< 0.44	< 0.22	8.9	< 0.22	< 0.22	< 0.22	NA
SM129	2.5 - 3	8/7/2001	1.3	1.56	< 0.074	< 0.15	< 0.074	1.3	< 0.074	< 0.074	< 0.074	NA
SM129	3.5 - 4	8/7/2001	1.2	1.46	< 0.074	< 0.15	< 0.074	1.2	< 0.074	< 0.074	< 0.074	NA
SM130	0 - 0.5	8/7/2001	4.5	5.13	< 0.18	< 0.36	< 0.18	4.5	< 0.18	< 0.18	< 0.18	NA
SM130	2 - 2.5	8/7/2001	6000	6,420	< 120	< 240	< 120	6,000	< 120	< 120	< 120	NA
SM130	4 - 4.5	8/7/2001	770	822	< 15	< 29	< 15	770	< 15	< 15	< 15	NA
SM131	0 - 0.5	8/7/2001	47	51.2	< 1.2	< 2.4	< 1.2	47	< 1.2	< 1.2	< 1.2	NA
SM131	2 - 2.5	8/7/2001	0.14	0.193	< 0.015	< 0.03	< 0.015	0.14	< 0.015	< 0.015	< 0.015	NA
SM132	0 - 0.5	8/7/2001	96	103	< 1.9	< 3.8	< 1.9	96	< 1.9	< 1.9	< 1.9	NA
SM132	2 - 2.5	8/7/2001	14	17.2	< 0.9	< 1.8	< 0.9	14	< 0.9	< 0.9	< 0.9	NA
SM132	3 - 3.5	8/7/2001	0.96	1.22	< 0.074	< 0.15	< 0.074	0.96	< 0.074	< 0.074	< 0.074	NA
SM133	0 - 0.5	8/7/2001	45	47.9	< 0.82	< 1.6	< 0.82	45	< 0.82	< 0.82	< 0.82	NA
SM133	0.5 - 1	8/7/2001	0.14	0.193	< 0.015	< 0.03	< 0.015	0.14	< 0.015	< 0.015	< 0.015	NA
SM133	2 - 2.5	8/7/2001	0.17	0.22	< 0.014	< 0.029	< 0.014	0.17	< 0.014	< 0.014	< 0.014	NA
SM135	0 - 0.5	10/1/2002	1.4	1.53	< 0.038	< 0.076	< 0.038	< 0.038	1.4	< 0.038	< 0.038	NA
SM135	2 - 2.5	10/1/2002	0.5	0.567	< 0.019	< 0.038	< 0.019	< 0.019	0.5	< 0.019	< 0.019	NA
SM135	2.5 - 3	10/1/2002	0.238	0.286	< 0.016	< 0.032	< 0.016	< 0.016	0.21	< 0.016	0.028	NA
Western Marsh												
MS1	0 - 0.5	1/9/2003	1.35	1.39	< 0.017	< 0.034	< 0.017	< 0.017	0.98	0.32	0.051	NA
MS1	3 - 3.5	1/9/2003	0.97	1.02	< 0.016	< 0.032	< 0.016	0.56	0.41	< 0.016	< 0.016	NA
MS1-BIO	0 - 0.5	11/23/2004	1.02	1.32	< 0.099	< 0.2	< 0.099	< 0.099	0.68 D	0.34 D	< 0.099	NA
MS2	0 - 0.5	1/9/2003	2.97	3.03	< 0.022	< 0.045	< 0.022	< 0.022	1.4	1.3	0.27	NA
MS2	3.5 - 4	1/9/2003	0.393	0.433	< 0.016	< 0.032	< 0.016	< 0.016	0.18	0.14	0.073	NA

TABLE 1
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	Location	Depth (Feet)	Date Collected	Total PCBs (Max DL) (mg/kg)	Total PCBs (NDs at 1/2 DL) (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)	Aroclor-1262 (mg/kg)
	MS3	0 - 0.5	1/9/2003	1.44	1.48	< 0.016	< 0.031	< 0.016	< 0.016	1.4	< 0.016	0.037	NA
	MS4	0 - 0.5	1/9/2003	2.75	2.82	< 0.029	< 0.057	< 0.029	< 0.029	1.9	0.65	0.2	NA
	MS4	1 - 1.5	12/8/2004	0.388	0.445	< 0.019	< 0.037	< 0.019	< 0.019	0.3	0.088	< 0.019	NA
	MS4	2 - 2.5	12/21/2004	0.083	0.128	< 0.015	< 0.029	< 0.015	< 0.015	< 0.015	0.033	0.05	NA
	MS4	4 - 4.5	1/9/2003	0.139	0.205	< 0.022	< 0.044	< 0.022	< 0.022	0.1	0.039	< 0.022	NA
	MS5	0 - 0.5	1/9/2003	7.57	7.64	< 0.024	< 0.049	< 0.024	< 0.024	7.3	< 0.024	0.27	NA
	MS5	4.5 - 5	1/9/2003	0.45	0.541	< 0.026	< 0.052	< 0.026	< 0.026	0.45	< 0.026	< 0.026	NA
	MS6	0 - 0.5	1/9/2003	0.582	0.663	< 0.027	< 0.054	< 0.027	< 0.027	0.53	< 0.027	0.052	NA
	MS6	2 - 2.5	1/9/2003	3.77	3.83	< 0.021	< 0.043	< 0.021	< 0.021	3.6	< 0.021	0.17	NA
	MS7	0 - 0.5	1/9/2003	2.81	2.86	< 0.018	< 0.036	< 0.018	< 0.018	2.7	< 0.018	0.11	NA
	MS7-BIO	0 - 0.5	11/22/2004	2.09	2.42	< 0.11	< 0.21	< 0.11	< 0.11	1.5 D	0.59 D	< 0.11	NA
	MS8	0 - 0.5	1/9/2003	0.773	0.864	< 0.03	< 0.061	< 0.03	< 0.03	0.71	< 0.03	0.063	NA
	MS8	4.5 - 5	1/9/2003	0.056	0.151	< 0.027	< 0.055	< 0.027	< 0.027	< 0.027	0.056	< 0.027	NA
	MS9	0 - 0.5	1/9/2003	16.5	16.5	< 0.026	< 0.052	< 0.026	< 0.026	16	< 0.026	0.45	NA
	MS9	1 - 1.5	1/9/2003	0.35	0.41	< 0.017	< 0.034	< 0.017	< 0.017	0.35	< 0.017	< 0.017	NA
	MS10	0 - 0.5	1/10/2003	0.629	0.716	< 0.035	< 0.069	< 0.035	< 0.035	0.35	0.23	0.049	NA
	MS10	4 - 4.5	1/10/2003	0.086	0.18	< 0.027	< 0.053	< 0.027	< 0.027	< 0.027	< 0.027	0.086	NA
	MS10	7 - 7.5	1/10/2003	0.06	0.12	< 0.02	< 0.039	< 0.02	< 0.02	0.025	< 0.02	0.035	NA
	MS11	0 - 0.5	1/10/2003	0.616	0.672	< 0.022	< 0.045	< 0.022	< 0.022	0.38	0.19	0.046	NA
	MS11	4 - 4.5	1/10/2003	0.571	0.639	< 0.027	< 0.055	< 0.027	< 0.027	0.28	0.2	0.091	NA
	MS11-BIO	0 - 0.5	11/24/2004	1.63	1.96	< 0.11	< 0.21	< 0.11	< 0.11	1 D	0.63 D	< 0.11	NA
	MS12	0 - 0.5	1/10/2003	0.619	0.699	< 0.032	< 0.064	< 0.032	< 0.032	0.3	0.26	0.059	NA
	MS12	1.5 - 2	1/10/2003	0.717	0.76	< 0.017	< 0.035	< 0.017	< 0.017	0.47	0.21	0.037	NA
	MS13	0 - 0.5	1/10/2003	0.283	0.316	< 0.013	< 0.027	< 0.013	< 0.013	0.17	0.094	0.019	NA
	MS13	4 - 4.5	1/10/2003	2.78	2.85	< 0.031	< 0.063	< 0.031	< 0.031	1.9	0.78	0.095	NA
	MS13	7 - 7.5	1/10/2003	< 0.037	0.0725	< 0.018	< 0.037	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	NA
	MS13-BIO	0 - 0.5	11/24/2004	0.697	0.737	< 0.016	< 0.032	< 0.016	< 0.016	0.37	0.25	0.077	NA
	MS14	0 - 0.5	1/10/2003	0.113	0.153	< 0.013	< 0.027	< 0.013	< 0.013	0.079	0.034	< 0.013	NA
	MS14	1.5 - 2	1/10/2003	0.258	0.324	< 0.026	< 0.053	< 0.026	< 0.026	0.12	0.096	0.042	NA
	MS15	0 - 0.5	12/8/2004	< 0.032	0.064	< 0.016	< 0.032	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	NA
	MS15	0.5 - 1	1/10/2003	0.767	0.82	< 0.021	< 0.043	< 0.021	< 0.021	0.4	0.3	0.067	NA
	MS15	1 - 1.5	12/8/2004	< 0.26	0.52	< 0.13	< 0.26	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	NA
	MS16	0 - 0.5	1/10/2003	0.159	0.197	< 0.015	< 0.03	< 0.015	< 0.015	0.052	0.078	0.029	NA
	MS16	2 - 2.5	1/10/2003	0.162	0.252	< 0.03	< 0.06	< 0.03	< 0.03	0.089	0.073	< 0.03	NA
	MS16	2.7 - 3.2	12/20/2004	0.411 J	0.465 J	< 0.018	< 0.035	< 0.018	0.35 J	< 0.018	0.061 J	< 0.018	NA
	MS17	0 - 0.5	11/19/2004	0.59	0.647	< 0.019	< 0.037	< 0.019	< 0.019	0.41	0.18	< 0.019	NA
	MS18	0 - 0.5	11/19/2004	1.05	1.14	< 0.029	< 0.058	< 0.029	< 0.029	0.69	0.36	< 0.029	NA
	MS19	0 - 0.5	11/19/2004	< 0.061	0.124	< 0.031	< 0.061	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	NA
	MS20	0 - 0.5	11/19/2004	< 0.07	0.14	< 0.035	< 0.07	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	NA
	MS21	0 - 0.5	11/19/2004	0.72	0.771	< 0.017	< 0.034	< 0.017	< 0.017	0.5	0.22	< 0.017	NA
	MS22	0 - 0.5	12/8/2004	14.6	15	< 0.18	< 0.36	< 0.18	< 0.18	9.8	4.1	0.69	NA
	MS22	1 - 1.5	12/8/2004	93.5	96.5	< 1.2	< 2.4	< 1.2	< 1.2	65	25	3.5	NA
	MS22	2 - 2.5	12/8/2004	17.2	18.1	< 0.37	< 0.74	< 0.37	< 0.37	12	4.7	0.48	NA
	MS23	0 - 0.5	12/8/2004	2.08	2.56	< 0.16	< 0.32	< 0.16	< 0.16	1.5	0.58	< 0.16	NA
	MS24	0 - 0.5	11/19/2004	2.07	2.15	< 0.028	< 0.055	< 0.028	< 0.028	1.6	0.47	< 0.028	NA
	MS25	0 - 0.5	11/19/2004	2.43	2.68	< 0.084	< 0.17	< 0.084	< 0.084	1.6	0.83	< 0.084	NA
	MS26	0 - 0.5	12/8/2004	0.5	0.567	< 0.022	< 0.045	< 0.022	< 0.022	0.35	0.15	< 0.022	NA

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Location	Depth (Feet)	Date Collected	Total PCBs (Max DL) (mg/kg)	Total PCBs (NDs at 1/2 DL) (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)	Aroclor-1262 (mg/kg)
MS27	0 - 0.5	11/19/2004	0.96	1.09	< 0.045	< 0.089	< 0.045	< 0.045	0.7	0.26	< 0.045	NA
MS28	0 - 0.5	12/8/2004	0.52	0.586	< 0.022	< 0.043	< 0.022	< 0.022	0.37	0.15	< 0.022	NA
MS30	0 - 0.5	11/22/2004	4.68	4.94	< 0.085	< 0.17	< 0.085	< 0.085	3.7	0.98	< 0.085	NA
MS31	0 - 0.5	11/19/2004	0.55	0.629	< 0.026	< 0.053	< 0.026	< 0.026	0.36	0.19	< 0.026	NA
MS32	0 - 0.5	11/22/2004	5.19	5.5	< 0.1	< 0.21	< 0.1	< 0.1	4.2	0.99	< 0.1	NA
MS33	0 - 0.5	11/19/2004	1.4	1.48	< 0.028	< 0.056	< 0.028	< 0.028	0.94	0.46	< 0.028	NA
MS33	2 - 2.5	12/20/2004	0.129 J	0.196 J	< 0.027 b	< 0.053 b	< 0.027 b	0.042 J	< 0.027 b	0.053 J	0.034 J	NA
MS33	3 - 3.5	12/20/2004	0.129 J	0.207 J	< 0.026 b	< 0.051 b	< 0.026 b	0.061 J	< 0.026 b	0.068 J	< 0.026 b	NA
MS34	0 - 0.5	11/22/2004	10.7	11.3	< 0.19	< 0.39	< 0.19	< 0.19	5.8	4.9	< 0.19	NA
MS35	0 - 0.5	11/22/2004	38	40.6	< 0.74	< 1.5	< 0.74	< 0.74	38	< 0.74	< 0.74	NA
SM102	0 - 0.5	3/24/2000	0.5	0.675	< 0.05	< 0.05	< 0.05	< 0.05	0.5	< 0.05	< 0.05	< 0.05
SM102	2 - 2.5	3/24/2000	0.6	0.775	< 0.05	< 0.05	< 0.05	< 0.05	0.6	< 0.05	< 0.05	< 0.05
SM102	5 - 5.5	3/24/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM103	1.5 - 2	3/24/2000	0.65	0.825	< 0.05	< 0.05	< 0.05	< 0.05	0.65	< 0.05	< 0.05	< 0.05
SM103	0-0.5	3/24/2000	0.84	1.02	< 0.05	< 0.05	< 0.05	< 0.05	0.84	< 0.05	< 0.05	< 0.05
SM103	3 - 3.5	3/24/2000	0.27	0.459	< 0.054	< 0.054	< 0.054	< 0.054	0.27	< 0.054	< 0.054	< 0.054
SM105	1.5 - 2	3/30/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM105	0 - 0.5	3/30/2000	0.64	0.815	< 0.05	< 0.05	< 0.05	< 0.05	0.64	< 0.05	< 0.05	< 0.05
SM105	4.5 - 5	3/30/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM106	0 - 0.5	3/30/2000	< 0.05	0.2 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM106	3 - 3.5	3/30/2000	< 0.05	0.2 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM134	0 - 0.5	10/1/2002	0.59	0.706	< 0.033	< 0.066	< 0.033	< 0.033	0.59	< 0.033	< 0.033	NA
SM134	2 - 2.5	10/1/2002	1.1	1.18	< 0.025	< 0.05	< 0.025	< 0.025	1	< 0.025	0.1	NA
SM134	2.5 - 3	10/1/2002	0.017	0.0725	< 0.016	< 0.031	< 0.016	< 0.016	0.017	< 0.016	< 0.016	NA
SM136	0 - 0.5	10/1/2002	0.73	0.871	< 0.04	< 0.081	< 0.04	< 0.04	0.73	< 0.04	< 0.04	NA
SM136	2 - 2.5	10/1/2002	15.7	17	< 0.45	< 0.9	< 0.45	< 0.45	15	< 0.45	0.68	NA
SM136	6 - 6.5	10/1/2002	0.081	0.148	< 0.019	< 0.038	< 0.019	< 0.019	0.081	< 0.019	< 0.019	NA
SM137	0 - 0.5	10/7/2002	5.09	5.49	< 0.13	< 0.27	< 0.13	< 0.13	4.8	< 0.13	0.29	NA
SM137	0.5 - 1	11/5/2002	0.063	0.119	< 0.016	< 0.031	< 0.016	< 0.016	0.063	< 0.016	< 0.016	NA
SM137	0.5 - 1	10/7/2002	0.015	0.0675	< 0.015	< 0.03	< 0.015	< 0.015	0.015	< 0.015	< 0.015	NA
SM138	0 - 0.5	10/7/2002	39	44.3	< 1.5	< 3	< 1.5	< 1.5	39	< 1.5	< 1.5	NA
SM138	2 - 2.5	11/5/2002	19.7	21.5	< 0.59	< 1.2	< 0.59	< 0.59	18	< 0.59	1.7	NA
SM139	0 - 0.5	10/7/2002	0.582	0.642	< 0.02	< 0.04	< 0.02	< 0.02	0.51	< 0.02	0.072	NA
SM139-BIO	0 - 0.5	11/23/2004	0.9	0.925	< 0.0099	< 0.02	< 0.0099	< 0.0099	0.29	0.44	0.17	NA
SM140	0 - 0.5	10/1/2002	2.6	2.81	< 0.059	< 0.12	< 0.059	< 0.059	2.6	< 0.059	< 0.059	NA
SM140	2 - 2.5	10/1/2002	15	16.7	< 0.48	< 0.95	< 0.48	< 0.48	15	< 0.48	< 0.48	NA
SM140	4.5 - 5	10/1/2002	7.03	7.7	< 0.22	< 0.45	< 0.22	< 0.22	6.8	< 0.22	0.23	NA
SM140-BIO	0 - 0.5	11/22/2004	13.6	18.4	< 1.6	< 3.2	< 1.6	< 1.6	10 D	3.6 D	< 1.6	NA
SM141	0 - 0.5	10/1/2002	2.81	3.02	< 0.071	< 0.14	< 0.071	< 0.071	2.6	< 0.071	0.21	NA
SM141	2 - 2.5	10/1/2002	1.64	1.73	< 0.03	< 0.06	< 0.03	< 0.03	1.5	< 0.03	0.14	NA
SM141	6 - 6.5	10/1/2002	0.36	0.472	< 0.032	< 0.064	< 0.032	< 0.032	0.36	< 0.032	< 0.032	NA
SM142	0 - 0.5	9/30/2002	1.04	1.22	< 0.06	< 0.12	< 0.06	< 0.06	0.96	< 0.06	0.083	NA
SM142	2 - 2.5	9/30/2002	0.031	0.105	< 0.021	< 0.042	< 0.021	< 0.021	0.031	< 0.021	< 0.021	NA
SM142	2.5 - 3	9/30/2002	< 0.033	0.0675	< 0.017	< 0.033	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	NA
SM143	0 - 0.5	9/30/2002	0.527	0.623	< 0.032	< 0.064	< 0.032	< 0.032	0.47	< 0.032	0.057	NA
SM143	2 - 2.5	9/30/2002	5.28	5.7	< 0.14	< 0.28	< 0.14	< 0.14	5	< 0.14	0.28	NA
SM143	4.5 - 5	9/30/2002	27.4	29.5	< 0.71	< 1.4	< 0.71	< 0.71	26	< 0.71	1.4	NA

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SM143-BIO	0 - 0.5	11/22/2004	1.79	2.12	< 0.11	< 0.21	< 0.11	< 0.11	1.1 D	0.69 D	< 0.11	NA
SM144	0 - 0.5	9/30/2002	0.38	0.506	< 0.036	< 0.072	< 0.036	< 0.036	0.38	< 0.036	< 0.036	NA
SM144	2 - 2.5	9/30/2002	2.75	2.9	< 0.05	< 0.1	< 0.05	< 0.05	2.6	< 0.05	0.15	NA
SM144	3 - 3.5	9/30/2002	< 0.035	0.0685	< 0.017	< 0.035	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	NA
SM145	0 - 0.5	9/30/2002	0.899	1.06	< 0.053	< 0.11	< 0.053	< 0.053	0.8	< 0.053	0.099	NA
SM145	2 - 2.5	9/30/2002	0.254	0.345	< 0.03	< 0.061	< 0.03	< 0.03	0.22	< 0.03	0.034	NA
SM145	3 - 3.5	9/30/2002	< 0.033	0.0675	< 0.017	< 0.033	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	NA
SM145-BIO	0 - 0.5	11/23/2004	0.84	0.95	< 0.022	< 0.044	< 0.022	< 0.022	0.55	0.29	< 0.11 I	NA
SM146	0 - 0.5	10/7/2002	6.04	6.88	< 0.28	< 0.55	< 0.28	< 0.28	5.7	< 0.28	0.34	NA
SM146	2 - 2.5	11/4/2002	7.7	8.4	< 0.2	< 0.39	< 0.2	< 0.2	7.7	< 0.2	< 0.2	NA
SM147	0 - 0.5	9/26/2002	0.627	0.762	< 0.045	< 0.09	< 0.045	< 0.045	0.55	< 0.045	0.077	NA
SM147	2 - 2.5	9/26/2002	0.173	0.23	< 0.019	< 0.038	< 0.019	< 0.019	0.14	< 0.019	0.033	NA
SM147	4 - 4.5	9/26/2002	0.02	0.069	< 0.014	< 0.028	< 0.014	< 0.014	0.02	< 0.014	< 0.014	NA
SM148	0 - 0.5	9/26/2002	0.42	0.571	< 0.043	< 0.087	< 0.043	< 0.043	0.42	< 0.043	< 0.043	NA
SM148	1 - 1.5	9/27/2002	0.11	0.187	< 0.022	< 0.044	< 0.022	< 0.022	0.11	< 0.022	< 0.022	NA
SM148	2.5 - 3	9/27/2002	< 0.029	0.0595	< 0.015	< 0.029	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA
SM149	0 - 0.5	9/26/2002	0.15	0.297	< 0.042	< 0.084	< 0.042	< 0.042	0.15	< 0.042	< 0.042	NA
SM149	2 - 2.5	9/26/2002	< 0.041	0.0835	< 0.021	< 0.041	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021	NA
SM149	3 - 3.5	9/27/2002	< 0.031	0.0635	< 0.016	< 0.031	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	NA
SM150	0 - 0.5	9/26/2002	0.22	0.408	< 0.053	< 0.11	< 0.053	< 0.053	0.22	< 0.053	< 0.053	NA
SM150	2 - 2.5	9/26/2002	0.333	0.481	< 0.049	< 0.099	< 0.049	< 0.049	0.25	< 0.049	0.083	NA
SM150	4 - 4.5	9/26/2002	0.025	0.0845	< 0.017	< 0.034	< 0.017	< 0.017	0.025	< 0.017	< 0.017	NA
SM151	0 - 0.5	9/27/2002	0.614	0.74	< 0.042	< 0.083	< 0.042	< 0.042	0.56	< 0.042	0.054	NA
SM151	1.5 - 2	9/27/2002	< 0.038	0.076	< 0.019	< 0.038	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	NA
SM151	2.5 - 3	9/27/2002	< 0.034	0.068	< 0.017	< 0.034	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	NA
SM152	0 - 0.5	9/27/2002	0.45	0.66	< 0.06	< 0.12	< 0.06	< 0.06	0.45	< 0.06	< 0.06	NA
SM152	2 - 2.5	9/27/2002	0.914	1.01	< 0.031	< 0.063	< 0.031	< 0.031	0.85	< 0.031	0.064	NA
SM152	2.5 - 3	9/27/2002	< 0.035	0.0715	< 0.018	< 0.035	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	NA
SM153	0 - 0.5	9/27/2002	0.28	0.396	< 0.033	< 0.067	< 0.033	< 0.033	0.28	< 0.033	< 0.033	NA
SM153	2 - 2.5	9/27/2002	2.29	2.47	< 0.062	< 0.12	< 0.062	< 0.062	2.1	< 0.062	0.19	NA
SM153	4 - 4.5	9/27/2002	< 0.035	0.0715	< 0.018	< 0.035	< 0.018	< 0.018	< 0.018	< 0.018	< 0.018	NA
SM153-BIO	0 - 0.5	11/24/2004	0.544	0.574	< 0.012	< 0.023	< 0.012	< 0.012	0.27	0.2	0.074	NA
SM154	0 - 0.5	9/30/2002	0.704	0.8	< 0.032	< 0.064	< 0.032	< 0.032	0.62	< 0.032	0.084	NA
SM154	1.5 - 2	9/30/2002	0.023	0.0895	< 0.019	< 0.038	< 0.019	< 0.019	0.023	< 0.019	< 0.019	NA
SM154	2 - 2.5	9/30/2002	< 0.034	0.068	< 0.017	< 0.034	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	NA
SM155	0 - 0.5	9/30/2002	0.586	0.694	< 0.036	< 0.071	< 0.036	< 0.036	0.5	< 0.036	0.086	NA
SM155	1.5 - 2	9/30/2002	0.11	0.184	< 0.021	< 0.042	< 0.021	< 0.021	0.11	< 0.021	< 0.021	NA
SM155	2 - 2.5	9/30/2002	< 0.033	0.0675	< 0.017	< 0.033	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	NA
SM156	0 - 0.5	9/30/2002	0.573	0.618	< 0.015	< 0.029	< 0.015	< 0.015	0.52	< 0.015	0.053	NA
SM156	2 - 2.5	9/30/2002	< 0.04	0.08	< 0.02	< 0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	NA
SM156	2.5 - 3	9/30/2002	< 0.038	0.076	< 0.019	< 0.038	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019	NA
SM156-BIO	0 - 0.5	11/23/2004	1.94	2.24	< 0.1	< 0.2	< 0.1	< 0.1	1.3 D	0.64 D	< 0.1	NA
SM157	0 - 0.5	9/30/2002	11 - 11.5	13.1	< 0.59	< 1.2	< 0.59	< 0.59	11	< 0.59	< 0.59	NA
SM157	2 - 2.5	9/30/2002	0.092	0.155	< 0.021	< 0.041	< 0.021	< 0.021	0.071	< 0.021	0.021	NA
SM157	3 - 3.5	9/30/2002	< 0.034	0.068	< 0.017	< 0.034	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	NA
SM158	0 - 0.5	11/6/2002	5.33	5.66	< 0.11	< 0.22	< 0.11	< 0.11	5.1	< 0.11	0.23	NA
SM158-BIO	0 - 0.5	11/22/2004	4.2	4.53	< 0.11	< 0.21	< 0.11	< 0.11	3 D	1.2 D	< 0.11	NA

TABLE 1
ANALYTICAL RESULTS FOR PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

Location	Depth (Feet)	Date Collected	Total PCBs (Max DL) (mg/kg)	Total PCBs (NDs at 1/2 DL) (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)	Aroclor-1262 (mg/kg)
SM159	0 - 0.5	9/27/2002	0.28	0.427	< 0.042	< 0.084	< 0.042	< 0.042	0.28	< 0.042	< 0.042	NA
SM159	2 - 2.5	9/27/2002	0.3	0.399	< 0.028	< 0.057	< 0.028	< 0.028	< 0.028	0.3	< 0.028	NA
SM159	4 - 4.5	9/27/2002	< 0.033	0.0645	< 0.016	< 0.033	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	NA
SM160	0 - 0.5	9/27/2002	0.3	0.51	< 0.06	< 0.12	< 0.06	< 0.06	0.3	< 0.06	< 0.06	NA
SM160	2 - 2.5	9/27/2002	< 0.048	0.096	< 0.024	< 0.048	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	NA
SM160	3 - 3.5	9/27/2002	0.017	0.059	< 0.012	< 0.024	< 0.012	< 0.012	0.017	< 0.012	< 0.012	NA
SM161	0 - 0.5	9/27/2002	0.356	0.431	< 0.025	< 0.05	< 0.025	< 0.025	0.28	< 0.025	0.076	NA
SM161	2 - 2.5	9/27/2002	0.12	0.208	< 0.025	< 0.051	< 0.025	< 0.025	0.12	< 0.025	< 0.025	NA
SM161	4 - 4.5	9/27/2002	< 0.034	0.068	< 0.017	< 0.034	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	NA
SM162	0 - 0.5	11/6/2002	1.15	1.22	< 0.022	< 0.044	< 0.022	< 0.022	1.1	< 0.022	0.054	NA
SM162	1.5 - 2	11/6/2002	0.26	0.341	< 0.023	< 0.047	< 0.023	< 0.023	0.26	< 0.023	< 0.023	NA
SM163	0 - 0.5	11/19/2004	5.8	6.04	< 0.082	< 0.16	< 0.082	< 0.082	4.1	1.7	< 0.082	NA
SM164	0 - 0.5	11/19/2004	29.7	31	< 0.45	< 0.89	< 0.45	< 0.45	25	4.7	< 0.45	NA
SM165	0 - 0.5	11/19/2004	5.2	5.68	< 0.16	< 0.32	< 0.16	< 0.16	3.9	1.3	< 0.16	NA
SM165	2 - 2.5	12/9/2004	3.75	4.17	< 0.17	< 0.33	< 0.17	< 0.17	2.8	0.68	0.27	NA
SM165	4 - 4.5	12/9/2004	11.9	12.4	< 0.2	< 0.39	< 0.2	< 0.2	7.9	3.5	0.48	NA
SM166	0 - 0.5	11/19/2004	4.4	4.7	< 0.1	< 0.2	< 0.1	< 0.1	3	1.4	< 0.1	NA
SM166	2 - 2.5	12/9/2004	< 0.04	0.08	< 0.02	< 0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	NA
SM166	2.7 - 3.2	12/20/2004	0.037	0.0855	< 0.016	< 0.033	< 0.016	0.02 b	< 0.016	0.017	< 0.016	NA
SM167	0 - 0.5	11/19/2004	1.01	1.13	< 0.039	< 0.078	< 0.039	< 0.039	0.58	0.43	< 0.039	NA
SM168	0 - 0.5	11/19/2004	0.86	0.983	< 0.041	< 0.082	< 0.041	< 0.041	0.56	0.3	< 0.041	NA
SM169	0 - 0.5	11/19/2004	1.24	1.35	< 0.035	< 0.07	< 0.035	< 0.035	0.79	0.45	< 0.035	NA
SM170	0 - 0.5	11/22/2004	0.84	0.919	< 0.026	< 0.053	< 0.026	< 0.026	0.5	0.34	< 0.026	NA
SM171	0 - 0.5	11/19/2004	1.17	1.28	< 0.038	< 0.075	< 0.038	< 0.038	0.73	0.44	< 0.038	NA
SM172	0 - 0.5	11/19/2004	0.91	1.06	< 0.051	< 0.1	< 0.051	< 0.051	0.64	0.27	< 0.051	NA
SM173	0 - 0.5	11/19/2004	0.67	0.754	< 0.028	< 0.056	< 0.028	< 0.028	0.38	0.29	< 0.028	NA
SM174	0 - 0.5	11/19/2004	1.47	1.59	< 0.041	< 0.081	< 0.041	< 0.041	1	0.47	< 0.041	NA
SM175	0 - 0.5	11/19/2004	6.2	6.39	< 0.064	< 0.13	< 0.064	< 0.064	4	2.2	< 0.064	NA
SM176	0 - 0.5	11/19/2004	2.07	2.16	< 0.03	< 0.061	< 0.03	< 0.03	1.2	0.87	< 0.03	NA
SM177	0 - 0.5	11/19/2004	1.31	1.4	< 0.031	< 0.062	< 0.031	< 0.031	0.88	0.43	< 0.031	NA
SM178	0 - 0.5	11/19/2004	0.83	0.974	< 0.048	< 0.096	< 0.048	< 0.048	0.35	0.48	< 0.048	NA
SM179	0 - 0.5	11/19/2004	0.56	0.704	< 0.048	< 0.096	< 0.048	< 0.048	0.28	0.28	< 0.048	NA
SM180	0 - 0.5	11/19/2004	1.47	1.56	< 0.031	< 0.062	< 0.031	< 0.031	0.86	0.61	< 0.031	NA
SM180	2 - 2.5	12/20/2004	28.4	28.9	< 0.18	< 0.37	< 0.18	< 0.18	22	5.5	0.92	NA
SM180	4 - 4.5	12/20/2004	2.18	2.23	< 0.02	< 0.04	< 0.02	< 0.02	1.6	0.5	0.082	NA
SM181	0 - 0.5	11/19/2004	0.65	0.743	< 0.031	< 0.062	< 0.031	< 0.031	0.43	0.22	< 0.031	NA
SM181	2 - 2.5	12/20/2004	0.508	0.546	< 0.015	< 0.03	< 0.015	0.38 b	< 0.015	0.1	0.028	NA
SM181	3.8 - 4.3	12/20/2004	0.418	0.461	< 0.017	< 0.035	< 0.017	< 0.017	0.23	0.15	0.038	NA
SM182	0 - 0.5	11/19/2004	1.15	1.25	< 0.034	< 0.069	< 0.034	< 0.034	0.8	0.35	< 0.034	NA
SM182	2 - 2.5	12/20/2004	13.1	13.6	< 0.2	< 0.4	< 0.2	11 b	< 0.2	1.8	0.32	NA
SM182	4 - 4.5	12/20/2004	0.834 J	0.886 J	< 0.021	< 0.041	< 0.021	0.55 J	< 0.021	0.19 J	0.094 J	NA
SM183	0 - 0.5	12/20/2004	0.663	0.728	< 0.026	< 0.051	< 0.026	< 0.026	0.4	0.22	0.043	NA
SM183	1.9 - 2.4	12/20/2004	0.27 J	0.31 J	< 0.016	< 0.031	< 0.016	< 0.016	0.16 J	0.083 J	0.027 J	NA
SM183	3.5 - 4	12/20/2004	0.092	0.135	< 0.014	< 0.029	< 0.014	< 0.014	0.068	0.024	< 0.014	NA
B4MA	0 - 0.5	12/20/2004	0.136	0.232	< 0.032	< 0.063	< 0.032	< 0.032	0.074	0.062	< 0.032	NA
B4MA	2 - 2.5	12/20/2004	0.3 J	0.527 J	< 0.076	< 0.15	< 0.076	< 0.076	0.16 J	0.14 J	< 0.076	NA
B4MA	3 - 3.5	12/20/2004	0.026	0.0965	< 0.02 b	< 0.041 b	< 0.02 b	< 0.02 b	< 0.02 b	0.026 b	< 0.02 b	NA

TABLE 1
ANALYTICAL RESULTS FOR PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

Location	Depth (Feet)	Date Collected	Total PCBs (Max DL) (mg/kg)	Total PCBs (NDs at 1/2 DL) (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)	Aroclor-1262 (mg/kg)
OLD OUTFALL 1	0 - 0.5	11/19/2004	0.67	0.721	< 0.017	< 0.034	< 0.017	< 0.017	0.38	0.29	< 0.017	NA
OLD OUTFALL 2	0 - 0.5	11/19/2004	27.7	28.8	< 0.37	< 0.74	< 0.37	< 0.37	20	7.7	< 0.37	NA
EBRPD Bay Trail												
SM121	0 - 0.5	3/2/2000	< 0.06	0.24	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
SM121	4 - 4.5	3/2/2000	< 0.06	0.24	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
SM122	0 - 0.5	3/2/2000	< 0.06	0.24	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
SM122	16 - 16.5	3/2/2000	< 0.07	0.28	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07
Outer Marsh												
SM107	0 - 0.5	3/30/2000	0.19	0.365	< 0.05	< 0.05	< 0.05	< 0.05	0.19	< 0.05	< 0.05	< 0.05
SM107	2 - 2.5	3/30/2000	0.45	0.625	< 0.05	< 0.05	< 0.05	< 0.05	0.45	< 0.05	< 0.05	< 0.05
SM107	4.5 - 5	3/30/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM114	0 - 0.5	3/23/2000	0.52	0.695	< 0.05	< 0.05	< 0.05	< 0.05	0.52	< 0.05	< 0.05	< 0.05
SM114	2 - 2.5	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM114	5 - 5.5	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM119	0 - 0.5	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM119	2.5 - 3	3/23/2000	0.37	0.545	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM119	5 - 5.5	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	0.37	< 0.05	< 0.05	< 0.05
SM120	0 - 0.5	3/23/2000	0.24	0.415	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
SM120	2 - 2.5	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	0.24	< 0.05	< 0.05	< 0.05
SM120	5 - 5.5	3/23/2000	< 0.05	0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Soil excavated during previous rounds of remediation

Soil planned for excavation during Phase 4 remediation

Total PCBs (Max DL) = the total of reported Aroclor concentrations or, if all results are ND, the maximum detection limit.
Total PCBs (NDs at 1/2 DL) = the total of reported Aroclor concentrations plus 1/2 of the detection limit for Aroclors reported at concentrations below the detection limit.

TABLE 2
ANALYTICAL RESULTS FOR PCB CONGENORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION

Location	Marsh	Marsh	Marsh	Sanitary Sewer from Zeneca	AOC U8, Lark Dr.	North WSD	AOC U1
Sample ID	SM-128-2	SM-132-0	SM-133-0	B5-100303	SD3-5-0	SSD-1	ES3-16-0-PCBD
Sample Date	8/7/2001	8/7/2001	8/7/2001	10/3/2003	6/17/2004	9/23/2004	9/17/2004
Depth Interval	2 - 2.5'	0 - 0.5'	0 - 0.5'	pipe	0 - 0.5'	pipe	0 - 0.5'
Matrix	Sediment	Sediment	Sediment	Soil	Soil	Soil	Soil
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution	2000	10	10	10000	1	50	1
PCB 8	**940,000**	**12,000**	**1,100**	**2,600**	**3.8**	ND	**0.7**
PCB 18	**5,700,000**	**46,000**	**5,300**	**5,400**	**2.2**	**750**	**2.9**
PCB 28	**8,900,000**	**44,000**	**2,200**	**6,800**	**8.4**	**1,000**	**5.6**
PCB 44	**9,100,000**	**21,000**	**1,500**	ND	**45**	**1,700**	**14**
PCB 52	**10,000,000**	**60,000**	**5,800**	**6,900**	**66**	**1,500**	**18**
PCB 66	**9,000,000**	**14,000**	**1,600**	**5,500**	**210**	**560**	**19**
PCB 87	**1,500,000**	ND	ND	**1,100**	**91**		
PCB 101	**2,700,000**	**5,200**	**760**	**4,900**	**110**	**370**	**19**
PCB 114	ND	ND	ND	ND	ND		
PCB 123	ND	ND	ND	ND	ND		
PCB 138	**520,000**	ND	ND	ND	**72**	**40**	**24**
PCB 156	ND	ND	ND	ND	**11**	**5**	**4.4**
PCB 167	ND	ND	ND	ND	ND		
PCB 180	ND	ND	ND	710	**35**	**21**	**6**
PCB 183	ND	ND	ND	ND	**9.1**		
PCB 184	ND	ND	ND	ND	ND		
PCB 187	ND	ND	ND	ND	**20**	**17**	**2.8**
PCB 189	ND	ND	ND	ND	**0.86**		
PCB 195	ND	ND	ND	ND	**3.6**	ND	**1.4**
PCB 206	ND	ND	ND	ND	**3.3**	ND	**0.4**
PCB 209	ND	ND	ND	ND	**0.92**	ND	ND
PCB 60	ND	ND	ND	ND	ND		
PCB 77	ND	ND	ND	ND	ND		
PCB 81	ND	ND	ND	ND	ND		
PCB 90	ND	ND	ND	ND	ND		
PCB 105	**1,300,000**	ND	ND	ND	**100**	**74**	**16**
PCB 118	**2,600,000**	**5,500**	**800**	**3,500**	**140**	**150**	**23**
PCB 126	ND	ND	ND	ND	ND		
PCB 128	ND	ND	ND	ND	**15**	ND	**5.5**
PCB 153	**490,000**	**1,800**	ND	ND	**54**	**47**	**16**
PCB 157	ND	ND	ND	ND	ND		
PCB 158	ND	ND	ND	ND	ND		
PCB 166	ND	ND	ND	ND	ND		
PCB 169	ND	ND	ND	ND	ND		
PCB 170	ND	ND	ND	ND	**17**	ND	**3.4**
PCB 99						**190**	**12**
PCB 194						ND	ND
PCB 31						**650**	**4.4**
PCB 49						**960**	**10**
PCB 95						**590**	**15**
PCB 149						ND	**9.5**

TABLE 3
ANALYTICAL RESULTS FOR PCB AROCLORS
GROUNDWATER, SURFACE WATER AND STORM WATER
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

Sample ID	Date Collected	Total PCBs (Max DL) (ug/L)	Total PCBs (NDs at 1/2 DL) (ug/L)	Aroclor-1016 (ug/L)	Aroclor-1221 (ug/L)	Aroclor-1232 (ug/L)	Aroclor-1242 (ug/L)	Aroclor-1248 (ug/L)	Aroclor-1254 (ug/L)	Aroclor-1260 (ug/L)	Aroclor-1262 (ug/L)
Groundwater											
Western Storm Drain											
SD101	2/25/2000	0.88	NA	NA	NA	NA	NA	0.88	NA	NA	NA
SD102	2/25/2000	< 0.51	NA	NA	NA	NA	NA	NA	NA	NA	NA
Eastern Sanitary Sewer											
SL101	2/25/2000	< 0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
SL102	2/25/2000	< 0.47 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
SL103	2/25/2000	1.3	NA	NA	NA	NA	NA	NA	NA	1.3	NA
SL104	2/25/2000	< 0.47	NA	NA	NA	NA	NA	NA	NA	NA	NA
Eastern Marsh (upland)											
SM123	3/17/2000	< 0.53	NA	NA	NA	NA	NA	NA	NA	NA	NA
EBRPD Bay Trail											
SM121	3/2/2000	< 0.96	1.92	< 0.48	< 0.96	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	NA
Surface Water											
Eastern Marsh - (removed Phase 1 or 2)											
SM108	3/23/2000	< 5	20	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
SM109	3/23/2000	< 1	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
SM126	6/28/2000	< 0.49	1.72	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	NA
SM131	6/28/2000	< 0.48	1.68	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	NA
Western Marsh											
SM103	3/24/2000	< 1	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
SM127	6/28/2000	< 0.5	1.75	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
SM124-SW	10/7/2002	< 0.96	1.92	< 0.48	< 0.96	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	NA
SM125-SW	10/7/2002	23.8	25.3	< 0.48	< 0.95	< 0.48	< 0.48	23	< 0.48	0.82	NA
SM126-SW	10/1/2002	1.2	2.85	< 0.47	< 0.94	< 0.47	< 0.47	1.2	< 0.47	< 0.47	NA
SM127-SW	9/27/2002	0.62	2.27	< 0.47	< 0.94	< 0.47	< 0.47	0.62	< 0.47	< 0.47	NA
SM128-SW	9/26/2002	< 0.99	2	< 0.5	< 0.99	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
SM129-SW	9/27/2002	< 0.94	1.88	< 0.47	< 0.94	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	NA
SM130-SW	9/27/2002	< 0.94	1.88	< 0.47	< 0.94	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	NA
SM131-SW	9/27/2002	< 0.94	1.88	< 0.47	< 0.94	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	NA
SM132-SW	9/27/2002	< 0.96	1.92	< 0.48	< 0.96	< 0.48	< 0.48	< 0.48	< 0.48	< 0.48	NA
SM133-SW	9/27/2002	< 0.94	1.88	< 0.47	< 0.94	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	NA
SM134-SW	9/27/2002	< 0.94	1.88	< 0.47	< 0.94	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	NA
SM135-SW	10/1/2002	1.4	3.05	< 0.47	< 0.94	< 0.47	< 0.47	1.4	< 0.47	< 0.47	NA
Outer Marsh											
SM128	6/28/2000	< 0.49	1.72	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	NA
SM129	6/28/2000	< 0.77	2.7	< 0.77	< 0.77	< 0.77	< 0.77	< 0.77	< 0.77	< 0.77	NA
SM130	6/28/2000	< 0.56	1.96	< 0.56	< 0.56	< 0.56	< 0.56	< 0.56	< 0.56	< 0.56	NA
Storm Water											
Eastern Storm Drain											
SW105	10/19/2004	< 1	2	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
Western Storm Drain											
SW106	10/19/2004	< 0.94	1.88	< 0.47	< 0.94	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	NA
Concrete Ditch Outfall											
SW107	10/19/2004	< 0.94	1.88	< 0.47	< 0.94	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	NA
North end of Meeker Slough											
SW108	10/19/2004	< 0.94	1.88	< 0.47	< 0.94	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	NA

All water samples were filtered in lab

TABLE 4
REMAINING TOTAL PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

Note: Concentrations sorted in decreasing order in each area.

Location	Depth (Feet)	Total PCBs (NDs at 1/2 DL) (mg/kg)
UPLAND AREAS		
AOC U1		
ES3-23	0 - 0.5	1.29
ES3-21	0 - 0.5	0.975
ES3-24	0 - 0.5	0.689
ES3-23	1 - 1.5	0.249
ES3-25	0 - 0.5	0.167
ES3-17	0 - 0.5	0.146
ES3-27	0 - 0.5	0.11
ES3-32	0 - 0.5	0.0925
ES3-18	0 - 0.5	0.092
ES3-26	0 - 0.5	0.09
ES3-30	0 - 0.5	0.0835
ES3-29	0 - 0.5	0.0695
ES3-14	3 - 3.5	0.068
ES3-28	0 - 0.5	0.0625
ES3-33	0 - 0.5	0.0625
ES3-20	1 - 1.5	0.0605
ES3-25	1 - 1.5	0.056
ES3-28	1 - 1.5	0.0555
ES3-27	1 - 1.5	0.0525
ES3-19	1 - 1.5	0.052
ES3-31	1 - 1.5	0.052
ES3-31	0 - 0.5	0.052
ES3-32	1 - 1.5	0.052
ES3-19	0 - 0.5	0.0485
AOC U4		
SM2-1	0 - 0.5	0.0515
AOC U6		
HD2-9	0 - 0.5	0.74
HD2-5	0 - 0.5	0.433
HD2-10	0 - 0.5	0.418
HD2-4	0 - 0.5	0.254
HD2-5	3 - 3.5	0.165
HD2-8	0 - 0.5	0.162
HD2-4	3 - 3.5	0.15
HD2-7	0 - 0.5	0.0825
HD2-6	1.5 - 2	0.064
HD2-12	2 - 2.5	0.06
HD2-3	4 - 4.5	0.06
HD2-5	1.5 - 2	0.06
HD2-6	0 - 0.5	0.06
HD2-10	2 - 2.5	0.0595
HD2-10	4.5 - 5	0.0595
HD2-2	2 - 2.5	0.0595
HD2-2	4 - 4.5	0.056
HD2-2	6 - 6.5	0.056
HD2-7	3 - 3.5	0.056
HD2-3	6 - 6.5	0.0555
HD2-6	3 - 3.5	0.0555
HD2-12	3.5 - 4	0.0525
HD2-7	1.5 - 2	0.0525
HD2-12	0 - 0.5	0.052
HD2-8	1.5 - 2	0.052
HD2-8	3 - 3.5	0.052
HD2-9	1.5 - 2	0.052
HD2-9	3 - 3.5	0.052
HD2-4	1.5 - 2	0.0485
HD2-11	6 - 6.5	0.048
HD2-11	7.5 - 8	0.048

TABLE 4
REMAINING TOTAL PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

Location	Depth (Feet)	Total PCBs (NDs at 1/2 DL) (mg/kg)
AOC U7		
MF2-3	0 - 0.5	0.188
MF2-2	0 - 0.5	0.0955
MF2-7	0 - 0.5	0.0625
AOC U8 and Central Storm Drains		
SD2-13	0.5 - 1	3.05
SD2-6	4 - 4.5	1.56
SD2-8	0.5 - 1	0.566
SD2-1	0.5 - 1	0.48
SD2-2	0.5 - 1	0.48
SD2-4	0.5 - 1	0.48
SD2-17	0.6 - 1.1	0.44
SD2-14	0 - 0.5	0.275
SD3-13	0 - 0.5	0.148
SD3-1	0 - 0.5	0.0805
SD3-3	2 - 2.5	0.0635
SD2-20	0 - 1.3	0.06
SD3-1	2 - 2.5	0.06
SD3-2	2 - 2.5	0.06
SD3-1	4 - 4.5	0.0595
SD3-8	0 - 0.5	0.0585
SD3-2	5.5 - 6	0.056
SD3-3	6 - 6.5	0.056
SD3-2	4 - 4.5	0.0555
SD3-3	4 - 4.5	0.0555
SD3-14	0 - 0.5	0.0535
SD2-6	5.5 - 6	0.0525
SD3-7	0 - 0.5	0.05
SD3-9	2 - 2.5	0.048
SD3-5	2 - 2.5	0.0475
SD3-7	2 - 2.5	0.0445
SD3-4	2 - 2.5	0.044
SD3-8	2 - 2.5	0.044
SD2-3	2 - 2.5	0.0435
Western Storm Drain (from north to south)		
SD-102	3 - 3.5	1.62
SD-101	0 - 0.5	1.14
SD-101	3 - 3.5	0.128
SD-102	0 - 0.5	0.123
SD-102	8 - 9.5	0.056
SDMH-11	7 - 7.5	0.0555
SD-101	8 - 9.5	0.0525
SDMH-11	10 - 10.5	0.052
EMI Trailer site (north of Building 277)		
EMI-1	0 - 0.5	0.067
EMI-3	0 - 0.5	0.0585
EMI-2	0 - 0.5	0.0535
EMI-4	0 - 0.5	0.052
EMI-5	0 - 0.5	0.048
EMI-6	0 - 0.5	0.048
New Treatment Pond Area (northwest side of property)		
NP1	0.5 - 1	0.0515
Owl Way		
OW2-1	0 - 0.5	0.052
OW2-1	8 - 9.5	0.052
West Area 4		
CD-20	7 - 7.5	0.0645
CD-25	7.8 - 8.3	0.052
Bulb		
BLB6 (sediment)	3.5 - 4	0.659

TABLE 4
REMAINING TOTAL PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

	Location	Depth (Feet)	Total PCBs (NDs at 1/2 DL) (mg/kg)
MARSH			
	Eastern Marsh - post remediation		
	WATERSHED-11	0 - 0.2	1.06
	WATERSHED-5	0 - 0.2	0.697
	WATERSHED-8	0 - 0.2	0.619
	WATERSHED-14	0 - 0.2	0.596
	WATERSHED-13	0 - 0.2	0.559
	WATERSHED-15	0 - 0.2	0.531
	WATERSHED-4	0 - 0.2	0.518
	WATERSHED-9	0 - 0.2	0.435
	WATERSHED-7	0 - 0.2	0.408
	WATERSHED-6	0 - 0.2	0.399
	WATERSHED-12	0 - 0.2	0.355
	WATERSHED-3	0 - 0.2	0.295
	WATERSHED-2	0 - 0.2	0.261
	WATERSHED-10	0 - 0.2	0.181
	WATERSHED-16	0 - 0.2	0.08
	WATERSHED-1	0 - 0.2	0.0755
	Western Marsh		
	MS22	1 - 1.5	96.5
	SM138	0 - 0.5	44.3
	MS35	0 - 0.5	40.6
	SM164	0 - 0.5	31
	SM143	4.5 - 5	29.5
	SM180	2 - 2.5	28.9
	OLD OUTFALL 2	0 - 0.5	28.8
	SM138	2 - 2.5	21.5
	SM140-BIO	0 - 0.5	18.4
	MS22	2 - 2.5	18.1
	SM136	2 - 2.5	17
	SM140	2 - 2.5	16.7
	MS9	0 - 0.5	16.5
	MS22	0 - 0.5	15
	SM182	2 - 2.5	13.6
	SM157	0 - 0.5	13.1
	SM165	4 - 4.5	12.4
	MS34	0 - 0.5	11.3
	SM146	2 - 2.5	8.4
	SM140	4.5 - 5	7.7
	MS5	0 - 0.5	7.64
	SM146	0 - 0.5	6.88
	SM175	0 - 0.5	6.39
	SM163	0 - 0.5	6.04
	SM143	2 - 2.5	5.7
	SM165	0 - 0.5	5.68
	SM158	0 - 0.5	5.66
	MS32	0 - 0.5	5.5
	SM137	0 - 0.5	5.49
	MS30	0 - 0.5	4.94
	SM166	0 - 0.5	4.7
	SM158-BIO	0 - 0.5	4.53
	SM165	2 - 2.5	4.17
	MS6	2 - 2.5	3.83
	MS2	0 - 0.5	3.03
	SM141	0 - 0.5	3.02
	SM144	2 - 2.5	2.9
	MS7	0 - 0.5	2.86
	MS13	4 - 4.5	2.85
	MS4	0 - 0.5	2.82
	SM140	0 - 0.5	2.81
	MS25	0 - 0.5	2.68

TABLE 4
REMAINING TOTAL PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

	Location	Depth (Feet)	Total PCBs (NDs at 1/2 DL) (mg/kg)
	MS23	0 - 0.5	2.56
	SM153	2 - 2.5	2.47
	MS7-BIO	0 - 0.5	2.42
	SM156-BIO	0 - 0.5	2.24
	SM180	4 - 4.5	2.23
	SM176	0 - 0.5	2.16
	MS24	0 - 0.5	2.15
	SM143-BIO	0 - 0.5	2.12
	MS11-BIO	0 - 0.5	1.96
	SM141	2 - 2.5	1.73
	SM174	0 - 0.5	1.59
	SM180	0 - 0.5	1.56
	MS3	0 - 0.5	1.48
	MS33	0 - 0.5	1.48
	SM177	0 - 0.5	1.4
	MS1	0 - 0.5	1.39
	SM169	0 - 0.5	1.35
	MS1-BIO	0 - 0.5	1.32
	SM171	0 - 0.5	1.28
	SM182	0 - 0.5	1.25
	SM142	0 - 0.5	1.22
	SM162	0 - 0.5	1.22
	SM134	2 - 2.5	1.18
	MS18	0 - 0.5	1.14
	SM167	0 - 0.5	1.13
	MS27	0 - 0.5	1.09
	SM145	0 - 0.5	1.06
	SM172	0 - 0.5	1.06
	MS1	3 - 3.5	1.02
	SM103	0-0.5	1.02
	SM152	2 - 2.5	1.01
	SM168	0 - 0.5	0.983
	SM178	0 - 0.5	0.974
	SM145-BIO	0 - 0.5	0.95
	SM139-BIO	0 - 0.5	0.925
	SM170	0 - 0.5	0.919
	SM182	4 - 4.5	0.886
	SM136	0 - 0.5	0.871
	MS8	0 - 0.5	0.864
	SM103	1.5 - 2	0.825
	MS15	0.5 - 1	0.82
	SM105	0 - 0.5	0.815
	SM154	0 - 0.5	0.8
	SM102	2 - 2.5	0.775
	MS21	0 - 0.5	0.771
	SM147	0 - 0.5	0.762
	MS12	1.5 - 2	0.76
	SM173	0 - 0.5	0.754
	SM181	0 - 0.5	0.743
	SM151	0 - 0.5	0.74
	MS13-BIO	0 - 0.5	0.737
	SM183	0 - 0.5	0.728
	OLD OUTFALL 1	0 - 0.5	0.721
	MS10	0 - 0.5	0.716
	SM134	0 - 0.5	0.706
	SM179	0 - 0.5	0.704
	MS12	0 - 0.5	0.699
	SM155	0 - 0.5	0.694
	SM102	0 - 0.5	0.675
	MS11	0 - 0.5	0.672
	MS6	0 - 0.5	0.663

TABLE 4
REMAINING TOTAL PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

	Location	Depth (Feet)	Total PCBs (NDs at 1/2 DL) (mg/kg)
	SM152	0 - 0.5	0.66
	MS17	0 - 0.5	0.647
	SM139	0 - 0.5	0.642
	MS11	4 - 4.5	0.639
	MS31	0 - 0.5	0.629
	SM143	0 - 0.5	0.623
	SM156	0 - 0.5	0.618
	MS28	0 - 0.5	0.586
	SM153-BIO	0 - 0.5	0.574
	SM148	0 - 0.5	0.571
	MS26	0 - 0.5	0.567
	SM181	2 - 2.5	0.546
	MS5	4.5 - 5	0.541
	B4MA	2 - 2.5	0.527
	MS15	1 - 1.5	0.52
	SM160	0 - 0.5	0.51
	SM144	0 - 0.5	0.506
	SM150	2 - 2.5	0.481
	SM141	6 - 6.5	0.472
	MS16	2.7 - 3.2	0.465
	SM181	3.8 - 4.3	0.461
	SM103	3 - 3.5	0.459
	MS4	1 - 1.5	0.445
	MS2	3.5 - 4	0.433
	SM161	0 - 0.5	0.431
	SM159	0 - 0.5	0.427
	MS9	1 - 1.5	0.41
	SM150	0 - 0.5	0.408
	SM159	2 - 2.5	0.399
	SM153	0 - 0.5	0.396
	SM145	2 - 2.5	0.345
	SM162	1.5 - 2	0.341
	MS14	1.5 - 2	0.324
	MS13	0 - 0.5	0.316
	SM183	1.9 - 2.4	0.31
	SM149	0 - 0.5	0.297
	MS16	2 - 2.5	0.252
	B4MA	0 - 0.5	0.232
	SM147	2 - 2.5	0.23
	SM161	2 - 2.5	0.208
	MS33	3 - 3.5	0.207
	MS4	4 - 4.5	0.205
	SM102	5 - 5.5	0.2
	SM105	1.5 - 2	0.2
	SM105	4.5 - 5	0.2
	SM106	0 - 0.5	0.2
	SM106	3 - 3.5	0.2
	MS16	0 - 0.5	0.197
	MS33	2 - 2.5	0.196
	SM148	1 - 1.5	0.187
	SM155	1.5 - 2	0.184
	MS10	4 - 4.5	0.18
	SM157	2 - 2.5	0.155
	MS14	0 - 0.5	0.153
	MS8	4.5 - 5	0.151
	SM136	6 - 6.5	0.148
	MS20	0 - 0.5	0.14
	SM183	3.5 - 4	0.135
	MS4	2 - 2.5	0.128
	MS19	0 - 0.5	0.124
	MS10	7 - 7.5	0.12

TABLE 4
REMAINING TOTAL PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

	Location	Depth (Feet)	Total PCBs (NDs at 1/2 DL) (mg/kg)
	SM137	0.5 - 1	0.119
	SM142	2 - 2.5	0.105
	B4MA	3 - 3.5	0.0965
	SM160	2 - 2.5	0.096
	SM154	1.5 - 2	0.0895
	SM166	2.7 - 3.2	0.0855
	SM150	4 - 4.5	0.0845
	SM149	2 - 2.5	0.0835
	SM156	2 - 2.5	0.08
	SM166	2 - 2.5	0.08
	SM151	1.5 - 2	0.076
	SM156	2.5 - 3	0.076
	MS13	7 - 7.5	0.0725
	SM134	2.5 - 3	0.0725
	SM152	2.5 - 3	0.0715
	SM153	4 - 4.5	0.0715
	SM147	4 - 4.5	0.069
	SM144	3 - 3.5	0.0685
	SM151	2.5 - 3	0.068
	SM154	2 - 2.5	0.068
	SM157	3 - 3.5	0.068
	SM161	4 - 4.5	0.068
	SM137	0.5 - 1	0.0675
	SM142	2.5 - 3	0.0675
	SM145	3 - 3.5	0.0675
	SM155	2 - 2.5	0.0675
	SM159	4 - 4.5	0.0645
	MS15	0 - 0.5	0.064
	SM149	3 - 3.5	0.0635
	SM148	2.5 - 3	0.0595
	SM160	3 - 3.5	0.059
	EBRPD Bay Trail		
	SM122	16 - 16.5	0.28
	SM121	0 - 0.5	0.24
	SM121	4 - 4.5	0.24
	SM122	0 - 0.5	0.24
	Outer Marsh		
	SM114	0 - 0.5	0.695
	SM107	2 - 2.5	0.625
	SM119	2.5 - 3	0.545
	SM120	0 - 0.5	0.415
	SM107	0 - 0.5	0.365
	SM107	4.5 - 5	0.2
	SM114	2 - 2.5	0.2
	SM114	5 - 5.5	0.2
	SM119	0 - 0.5	0.2
	SM119	5 - 5.5	0.2
	SM120	2 - 2.5	0.2
	SM120	5 - 5.5	0.2

Total PCBs (NDs at 1/2 DL) = the total of reported Aroclor concentrations plus 1/2 of the detection limit for Aroclors reported at concentrations below the detection limit.

= planned for removal in Phase 4 remediation.

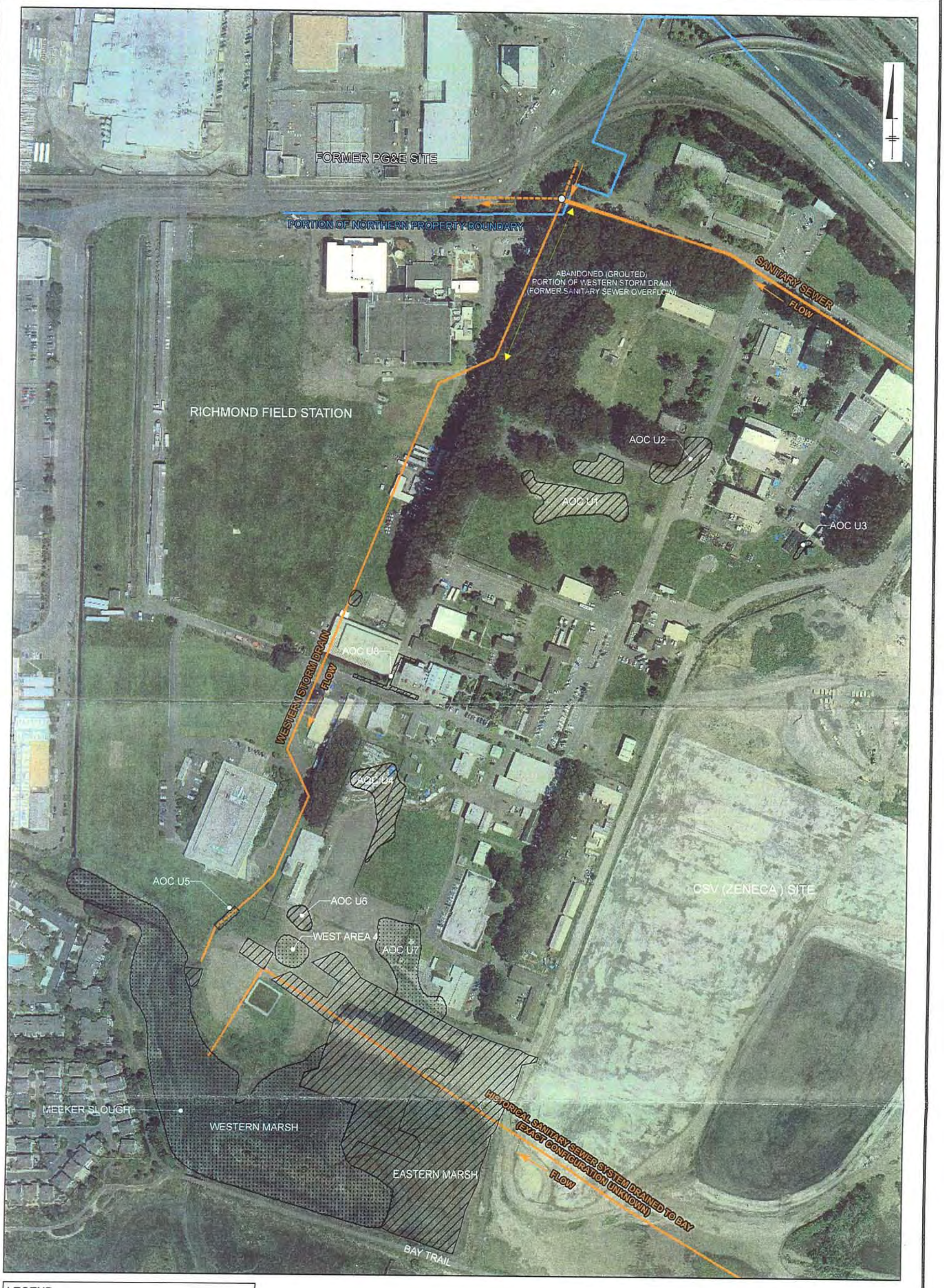
TABLE 5
SUMMARY OF STATISTICS FOR PCB AROCLORS
UPLAND SOIL AND MARSH SEDIMENT
RICHMOND FIELD STATION
UNIVERSITY OF CALIFORNIA BERKELEY

	Pre-Remediation		Post-Remediation		Pre-Remediation											
	Maximum*	Minimum*	Maximum*	Minimum*	Aroclor-1242		Aroclor-1248		Aroclor-1254		Aroclor-1260		Aroclor-1262		Total Number of Detections	Total Number of Samples
Area	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	Number	Frequency	Number	Frequency	Number	Frequency	Number	Frequency	Number	Frequency		
UPLAND																
AOC U1	25.8	0.0485	1.29	0.0485	0	0%	0	0%	15	100%	5	33%	0	0%	15	
AOC U3	0.196	0.196	na	na												
AOC U4	0.0835	0.0515	0.0515	0.0515	0		0		0		0		0		0	
AOC U6	8.95	0.0485	0.74	0.0485	0	0%	0	0%	7	100%	2	29%	0	0%	7	
AOC U7	0.188	0.0625	0.188	0.0625	0	0%	0	0%	2	67%	3	100%	0	0%	3	
AOC U8 and Central Storm Drains	468	0.0435	3.05	0.0435	0	0%	6	60%	5	50%	0	0%	0	0%	10	
Western Storm Drain	42	0.044	1.14	0.044	0	0%	1	25%	3	75%	1	25%	0	0%	4	
EMI Trailer site (north of Building 277)	0.067	0.048	0.067	0.048	0	0%	0	0%	3	100%	2	67%	0	0%	3	
New Treatment Pond Area (northwest side of property)	0.0515	0.0515	0.0515	0.0515	0	0%	0	0%	0	0%	0	0%	0	0%	1	
Owl Way	0.052	0.052	0.052	0.052	0	0%	0	0%	0	0%	0	0%	0	0%	2	
West Area 4	0.0645	0.052	0.0645	0.052	0	0%	0	0%	0	0%	0	0%	0	0%	2	
Bulb	0.659	0.659	0.659	0.659	0	0%	0	0%	0	0%	0	0%	0	0%	1	
MARSH																
Eastern Marsh	1	0.0525	1.06	0.0755	0	0%	13	100%	13	100%	11	85%	0	0%	13	
Western Marsh	68,400	0.193	96.5	0.059	7	4%	154	93%	89	54%	70	42%	0	0%	166	
EBRPD Bay Trail	0.28	0.24	0.28	0.24	0		0		0		0		0		0	
Outer Marsh	0.695	0.2	0.695	0.2	0	0%	5	100%	0	0%	0	0%	0	0%	5	
					7	2%	179	43%	137	33%	94	23%	0	0%		416

*Value includes Total PCBs (NDs at 1/2 DL)

Figures

BBL
ENVIRONMENTAL SERVICES, INC.
Remedial Management & Construction



LEGEND:

REMEDIATED AREAS 2002-2004

AREAS TO BE REMEDIATED 2005/2006

0 250 500 Feet

GRAPHIC SCALE

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION

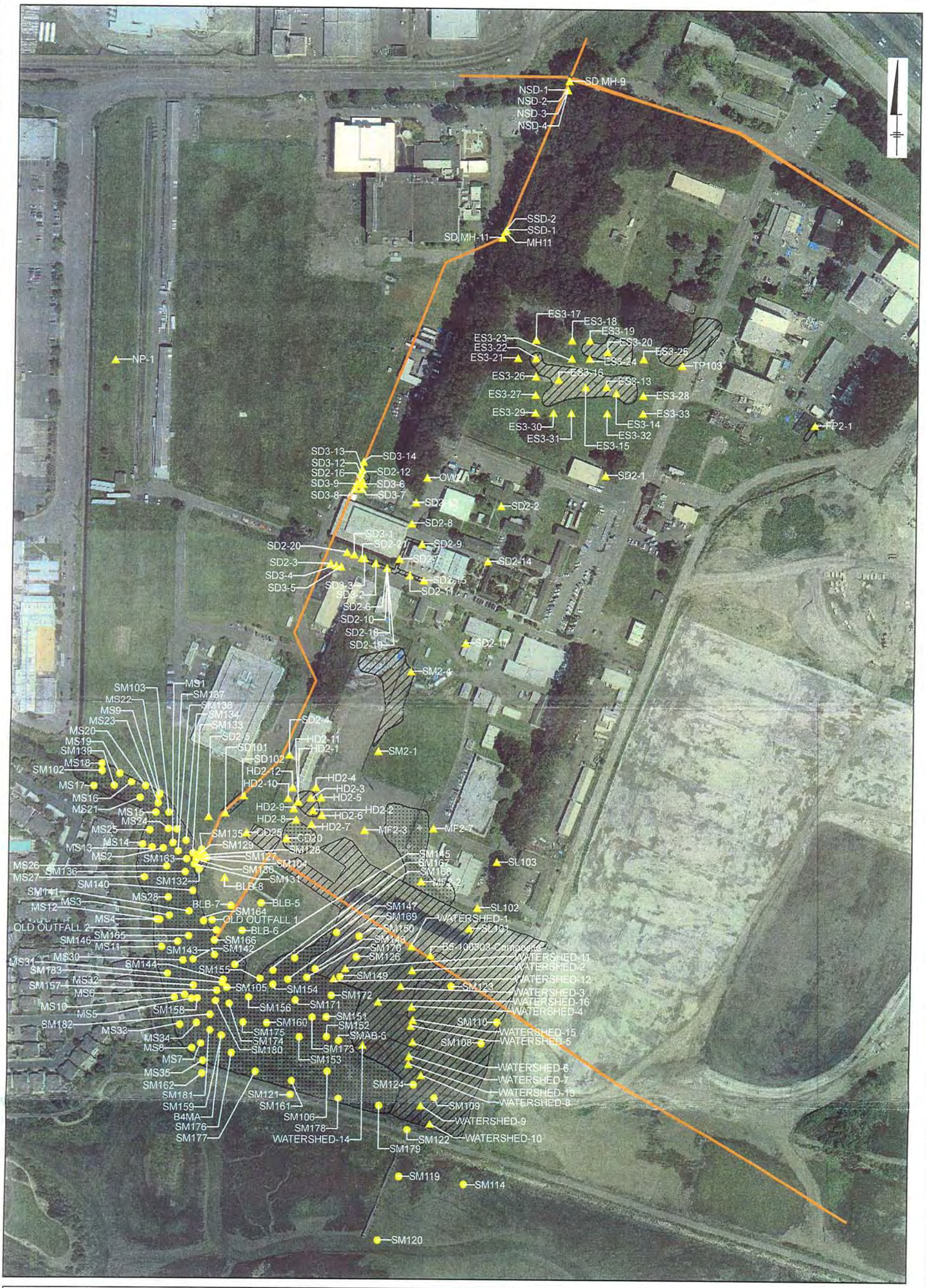
SUMMARY OF PCB RESULTS

FACILITIES LAYOUT

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

FIGURE 1

7/08/05 SYR-85 KEW
UC Berkeley
Q:\UC_Berkeley\RichmondFieldStation\SummaryPCBResults\mxd\FacilitiesLayout.mxd



LEGEND:

- PCB SEDIMENT SAMPLE LOCATION
- PCB SURFACE WATER SAMPLE LOCTION
- WESTERN STORM DRAIN
- REMEDIATED AREAS 2002-2004
- AREAS TO BE REMEDIATED 2005/2006

0 250 500 Feet

GRAPHIC SCALE

7/08/05 SYR-85 KEW
UC Berkeley
Q:\UC_Berkeley\RichmondFieldStation\SummaryPCBResults\mxd\PCBSoilSedSampLocs.mxd

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION

SUMMARY OF PCB RESULTS

PCB SOIL AND SEDIMENT SAMPLE LOCATIONS

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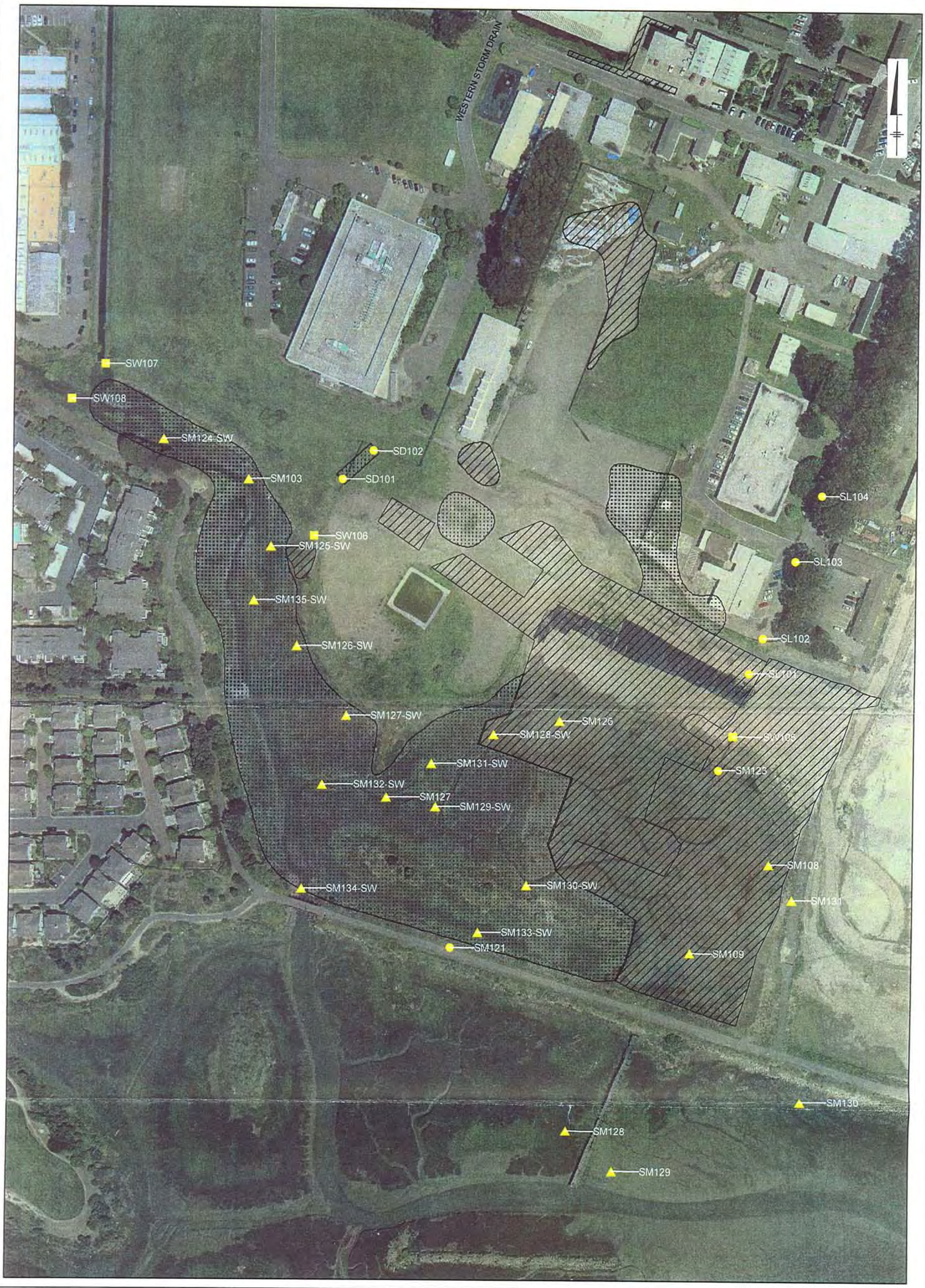
FIGURE 2



LEGEND:

- PCB GROUNDWATER SAMPLE LOCATION
- PCB STORM WATER SAMPLE LOCATION
- PCB SURFACE WATER SAMPLE LOCTION
- REMEDIATED AREAS 2002-2004
- AREAS TO BE REMEDIATED 2005/2006

0 150 300 Feet

GRAPHIC SCALE

7/08/05 SYR-85 KEW
UC Berkeley
Q:\UC_Berkeley\RichmondFieldStation\SummaryPCBResults\mxd\PCBWaterSampLocs.mxd

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
SUMMARY OF PCB RESULTS

PCB WATER SAMPLE LOCATIONS

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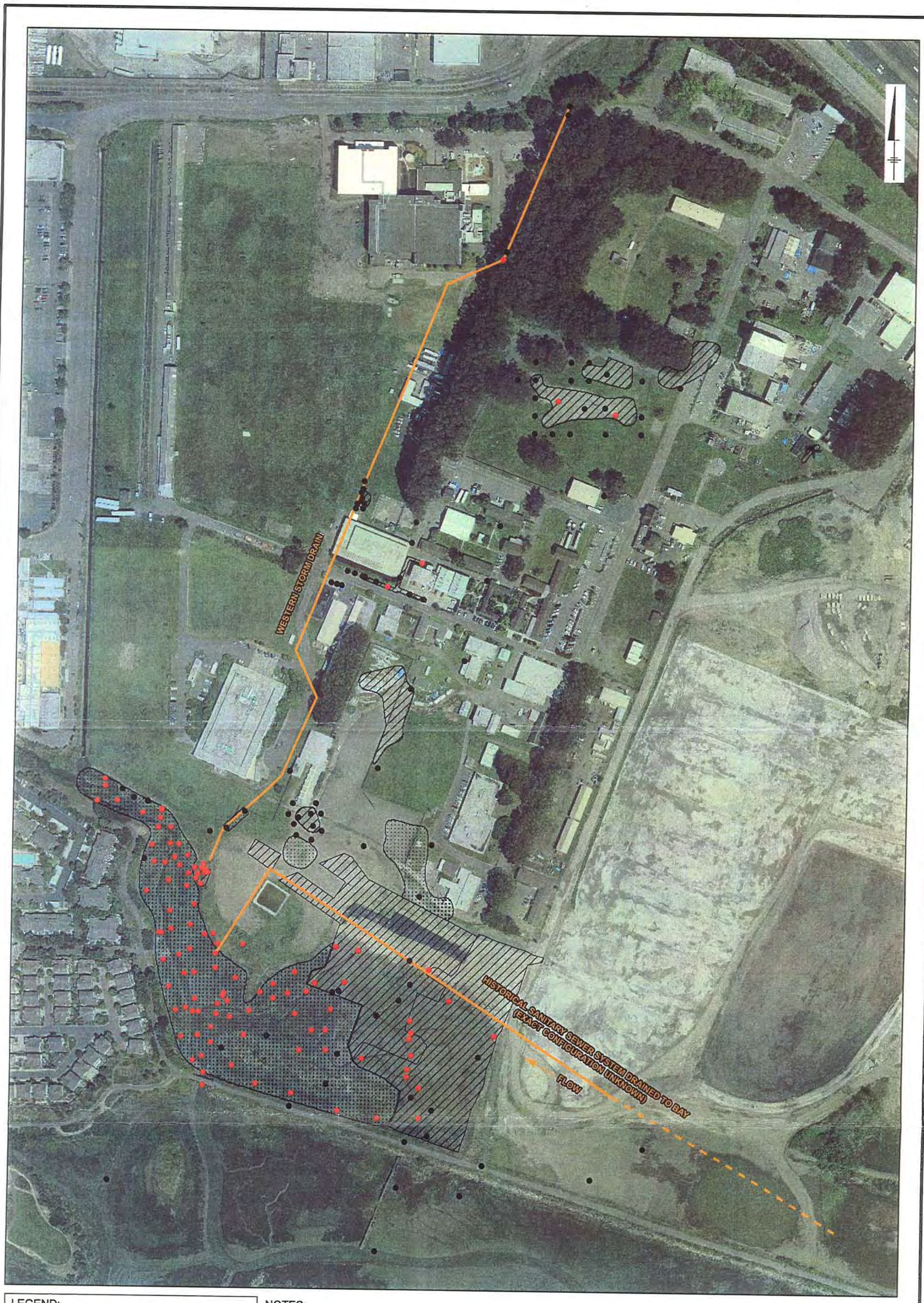
FIGURE 3



LEGEND:

- TOTAL PCBs > 10 mg/kg (UPLAND) OR > 0.3 mg/kg (MARSH)
- TOTAL PCBs < 10 mg/kg (UPLAND) OR < 0.3 mg/kg (MARSH)
- REMEDIATED AREAS 2002-2004
- AREAS TO BE REMEDIATED 2005/2006

NOTES:

1. 10 mg/kg PCBs IS THE HUMAN HEALTH SITE-SPECIFIC TARGET LEVEL DEVELOPED IN THE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT FOR THE COMMERCIAL/INDUSTRIAL WORKER.
2. 0.3 mg/kg PCBs IS A CLEANUP LEVEL THAT MAY BE REQUIRED BY THE REGIONAL WATER QUALITY CONTROL BOARD.

0 250 500 Feet

GRAPHIC SCALE

7/08/05 SYR-85 KEW
UC Berkeley
Q:\UC_Berkeley\RichmondFieldStation\SummaryPCBResults\mxd\TotalPCB.mxd

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION

SUMMARY OF PCB RESULTS

TOTAL PCBs CONCENTRATION

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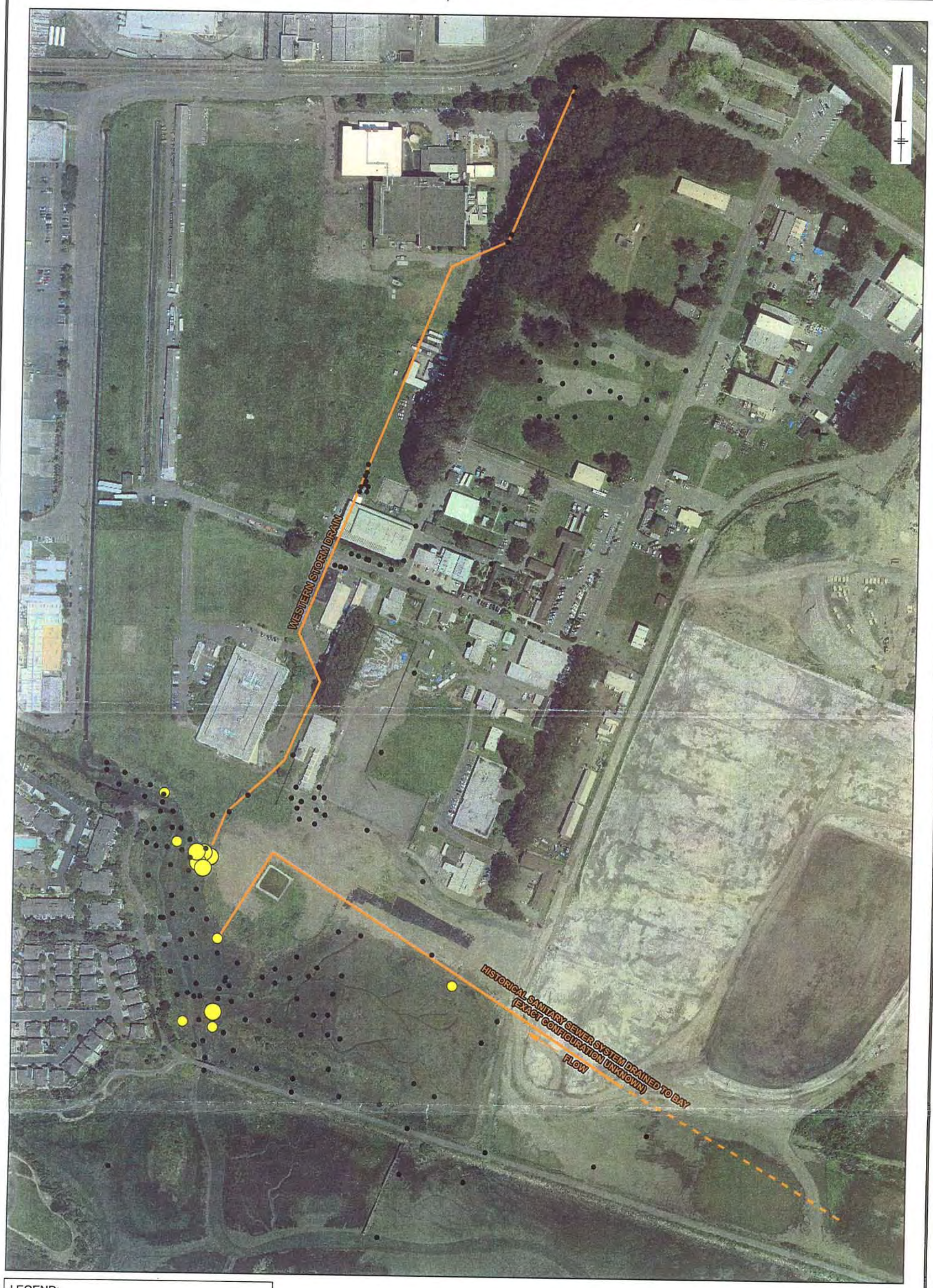
FIGURE
4



LEGEND:

- AROCLOR CONCENTRATION = ND
- AROCLOR CONCENTRATION <1 mg/kg
- AROCLOR CONCENTRATION 1-100 mg/kg

0 250 500 Feet

GRAPHIC SCALE

7/08/05 SYR-85 KEW
UC Berkeley
Q:\UC_Berkeley\RichmondFieldStation\SummaryPCBResults\mxd\Aroclor1242-revised.mxd

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION

SUMMARY OF PCB RESULTS

AROCLOR 1242 CONCENTRATION

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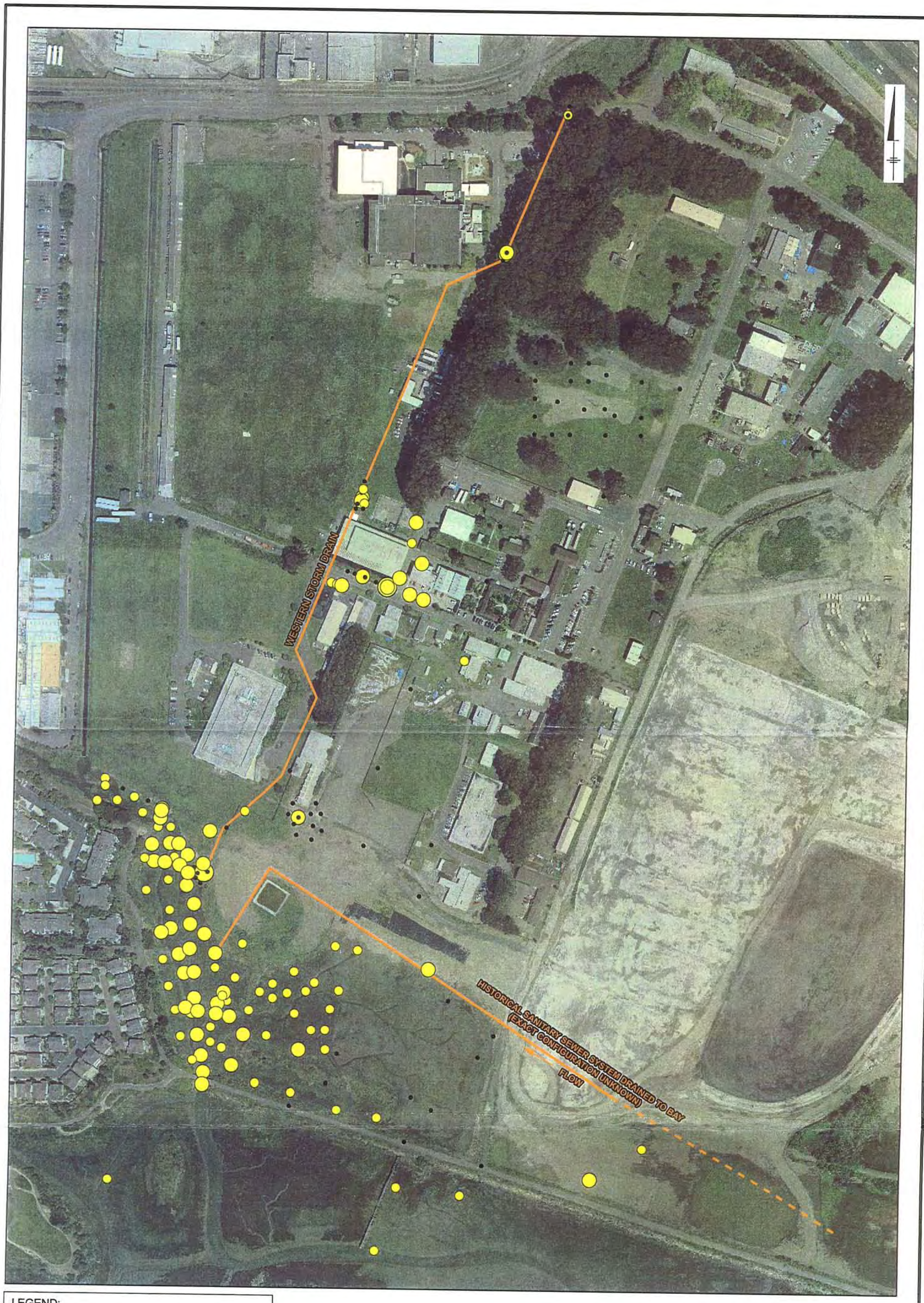
FIGURE
5



LEGEND:

- AROCLOR CONCENTRATION = ND
- AROCLOR CONCENTRATION <1 mg/kg
- AROCLOR CONCENTRATION 1-100 mg/kg
- AROCLOR CONCENTRATION >100 mg/kg

0 260 520 Feet

GRAPHIC SCALE

7/08/05 SYR-85 KEW
UC Berkeley
Q:\UC_Berkeley\RichmondFieldStation\SummaryPCBResults\mxd\Aroclor1248-revised.mxd

UNIVERSITY OF CALIFORNIA, BEREKLEY
RICHMOND FIELD STATION

SUMMARY OF PCB RESULTS

AROCLOR 1248 CONCENTRATION

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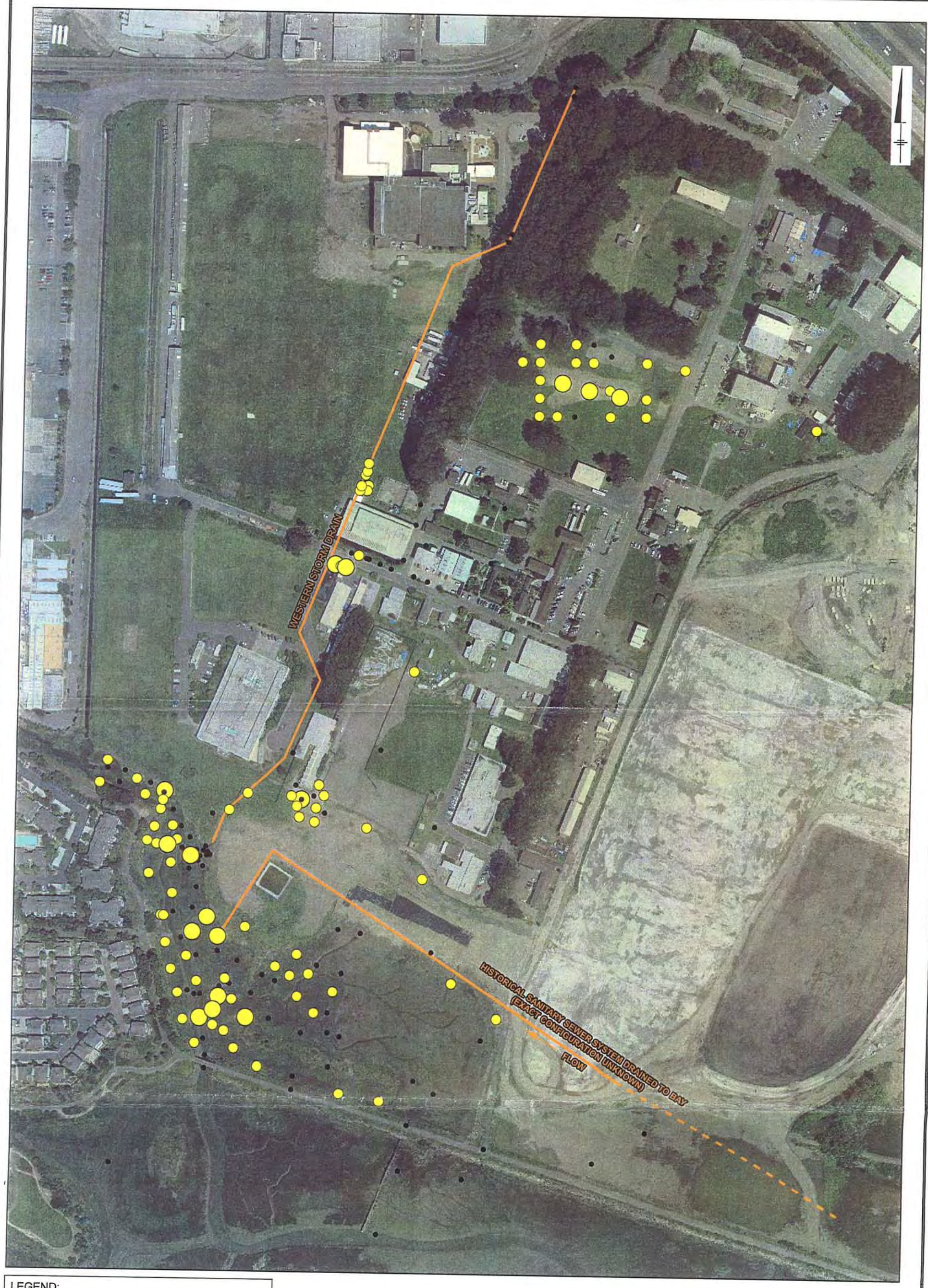
FIGURE
6



LEGEND:

- AROCLOR CONCENTRATION = ND
- AROCLOR CONCENTRATION <1 mg/kg
- AROCLOR CONCENTRATION 1-100 mg/kg

7/08/05 SYR-85 KEW
UC Berkeley
Q:\UC_Berkeley\RichmondFieldStation\SummaryPCBResults\mxd\Aroclor1254-revised.mxd

0 250 500 Feet

GRAPHIC SCALE

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION

SUMMARY OF PCB RESULTS

AROCLOR 1254 CONCENTRATION

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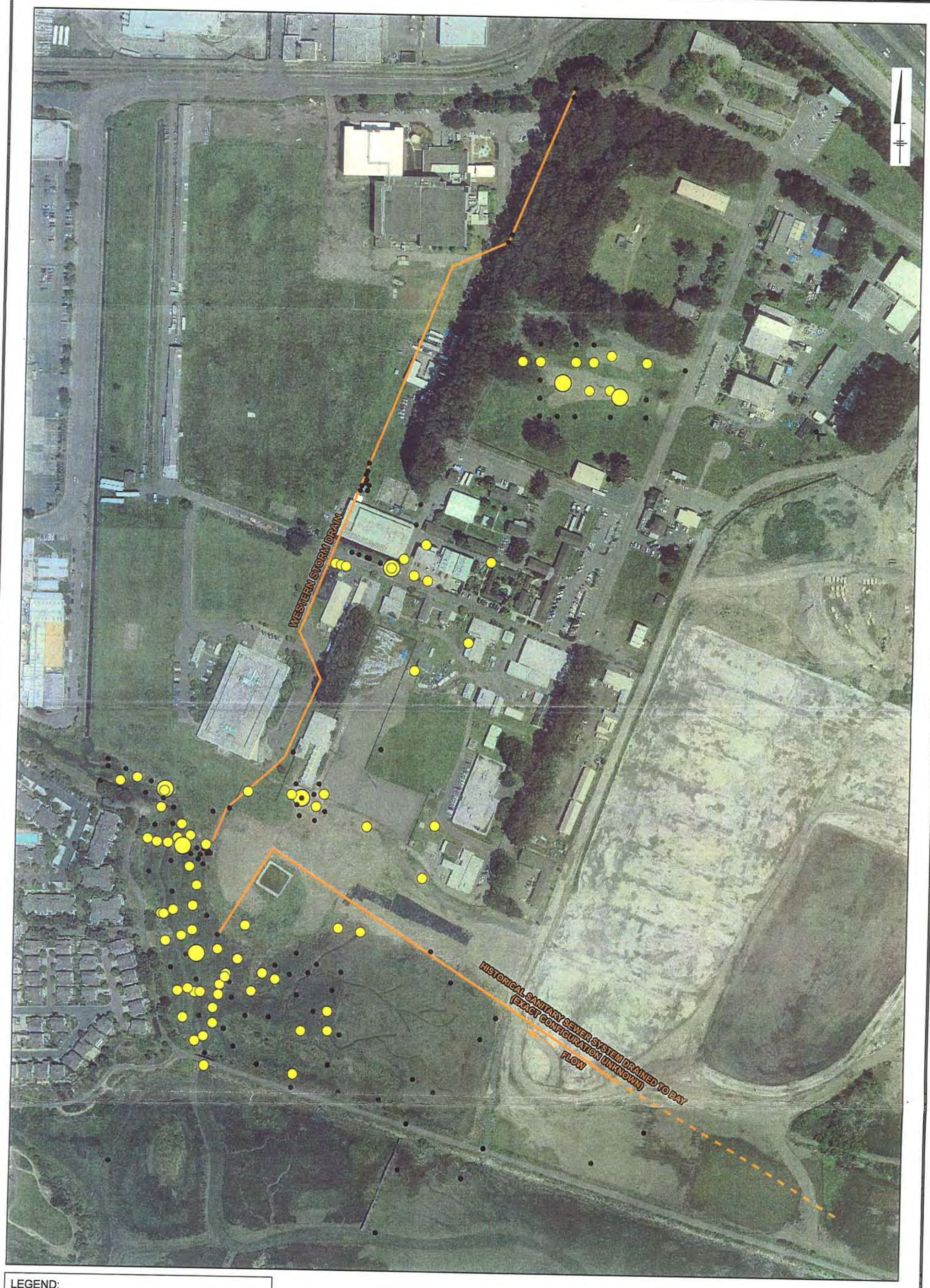
FIGURE
7



LEGEND:

- AROCLOR CONCENTRATION = ND
- AROCLOR CONCENTRATION <1 mg/kg
- AROCLOR CONCENTRATION 1-100 mg/kg

7/08/05 SYR-85 KEW
UC Berkeley
Q:\UC_Berkeley\RichmondFieldStation\SummaryPCBResults\mxd\Aroclor1260-revised.mxd

0 250 500 Feet

GRAPHIC SCALE

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION

SUMMARY OF PCB RESULTS

AROCLOR 1260 CONCENTRATION

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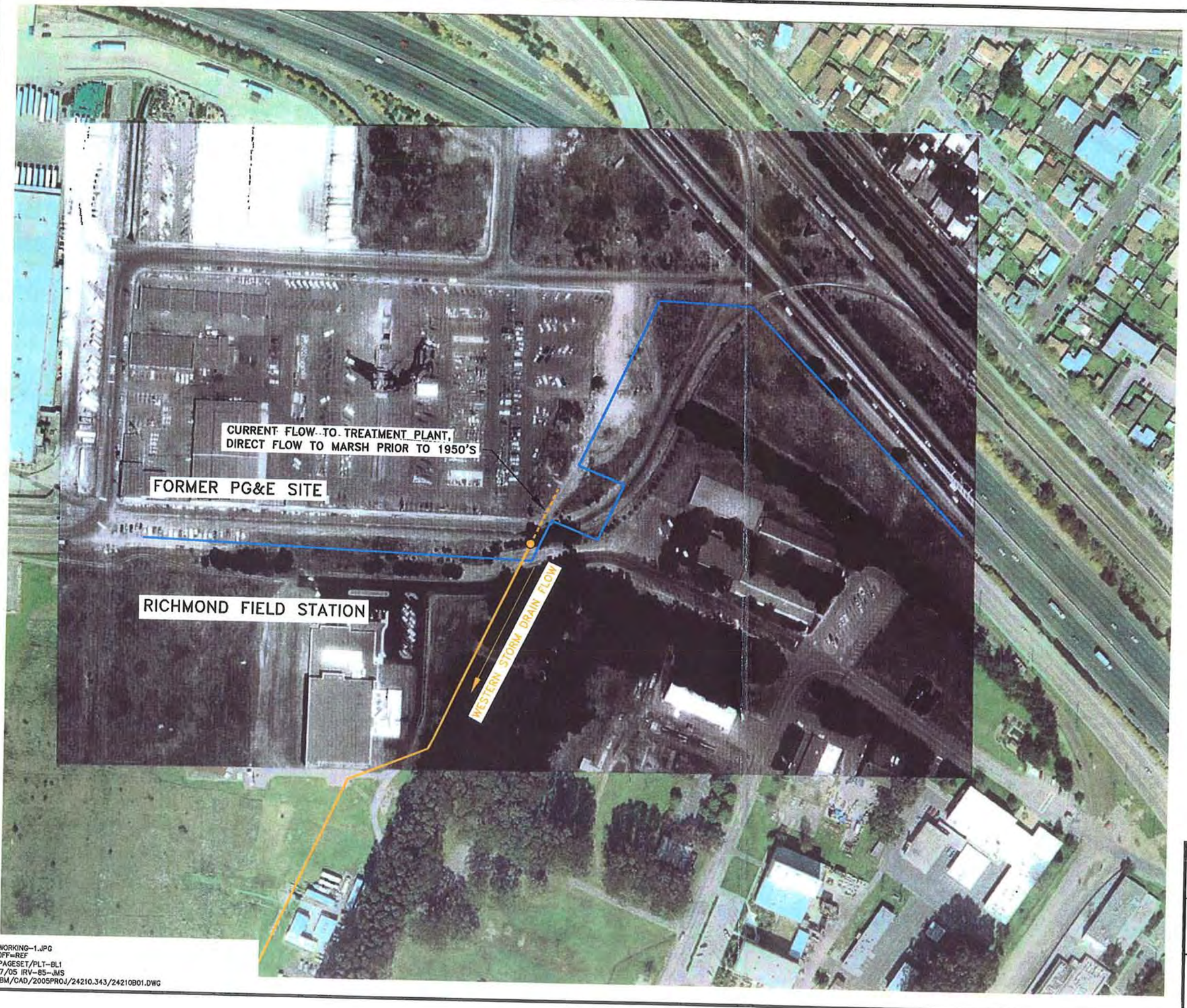
FIGURE
8



LEGEND:

NORTHERN PROPERTY BOUNDARY

WESTERN STORM DRAIN

NOTE:

HISTORICAL BLACK AND WHITE AERIAL PHOTO DATED 6/12/83.

0 200' 400'

GRAPHIC SCALE

UNIVERSITY OF CALIFORNIA, BERKELEY
RICHMOND FIELD STATION
SUMMARY OF PCB RESULTS

FORMER PG&E SITE

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

FIGURE 9

X: WORKING-1.JPG
L: OFF=REF
P: PAGESET/PLT-BL1
7/07/05 IRV-85-JMS
F: /IBM/CAD/2005PROJ/24210.343/24210B01.DWG

Appendix A

Status Report on Polychlorinated Biphenyls in the Western Storm Drain

BBL®
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Status Report on Polychlorinated Biphenyls
in the Western Storm Drain
University of California, Richmond Field Station
Richmond, California

November 22, 2004

Introduction

Beginning in 1999, the University of California, Berkeley (UC Berkeley) investigated and remediated a large area of legacy industrial wastes that had been deposited into Stege Marsh at the Richmond Field Station (RFS) by prior neighboring property owners. Investigation of sources and cleanup of contamination continues under an order issued by the San Francisco Bay Regional Water Quality Control Board in October 2001 (Order No. 01-102 Site Cleanup Requirements for Meade Street Operable Unit Subunit 2).

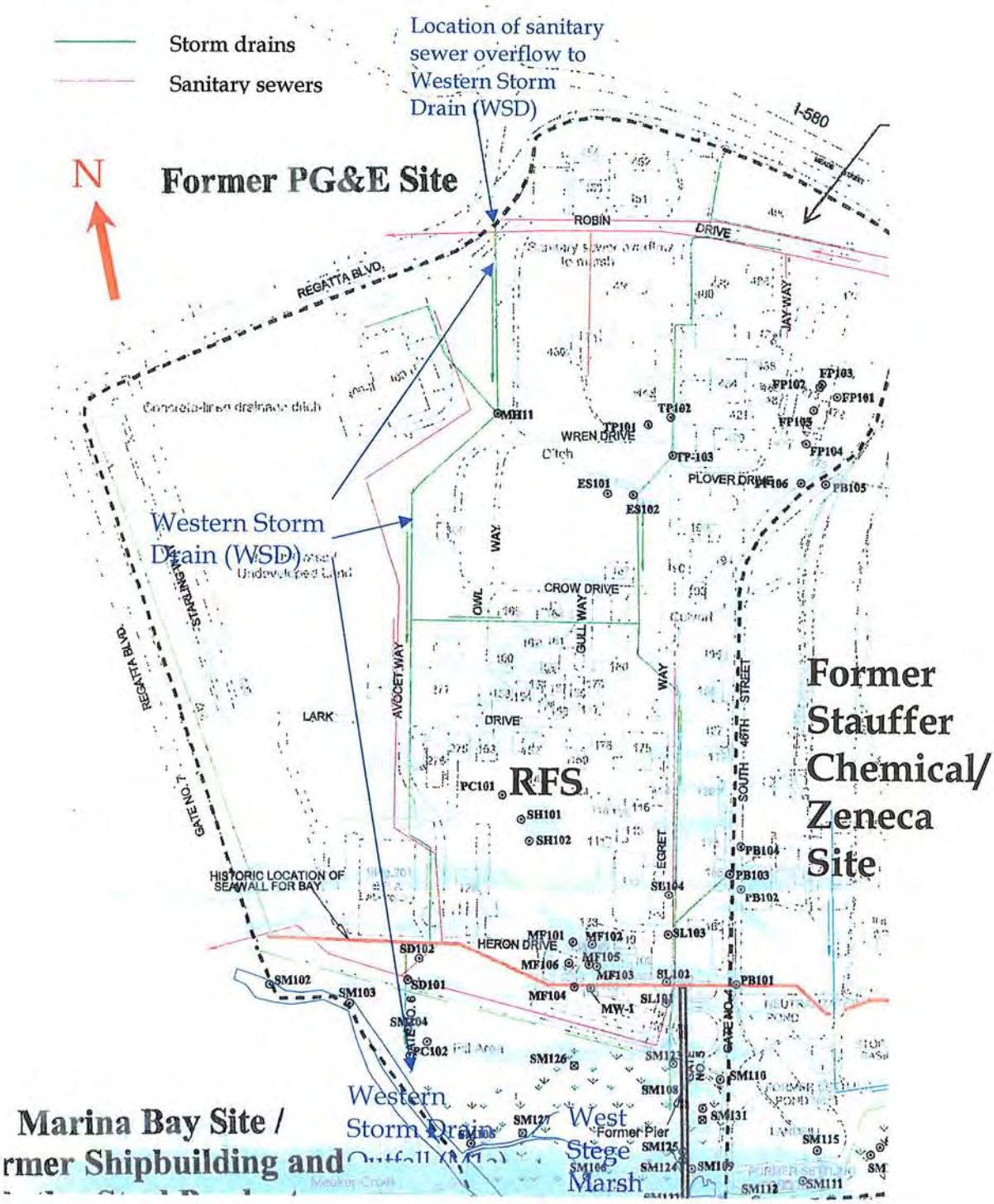
During site investigations, sediments contaminated with polychlorinated biphenyls (PCBs) were discovered at the base of the RFS Western Storm Drain outfall, a storm drain draining to Meeker Slough at the western edge of West Stege Marsh. The area with greatest PCB contamination was excavated and disposed of in 2003. Ongoing investigations continue to determine the source of PCBs. This report summarizes information collected on the Western Storm Drain and a possible source area at the former Pacific Gas & Electric Company (PG&E) yard to the north (upstream) of the RFS, currently owned by Legacy Partners.

Historical Background

The exact history of the Western Storm Drain construction and use is not known because no specific documents have been found describing the history of utilities construction in the area. Following is a general history based on interviews and available aerial photographs, maps, and documents.

Urban development of the southern Richmond shoreline dates to the 1870s. Industrial plants, including the California Cap Company (previously situated on what is now a portion of the RFS property) and Stauffer Chemical Company (current site of the Cherokee Simeon Ventures/former Zeneca remediation) were constructed in the late 1800s. The Cap Company ceased production in 1948 and the property was purchased by the University in 1950 for use as an academic teaching and research facility. Stauffer Chemical Company and subsequent owners ceased production of sulfuric acid and other chemicals in the 1990s. Other neighboring properties have included the Kaiser Shipyard, BioRad, and a PG&E and CalTrans storage yard.

Western Storm Drain Location



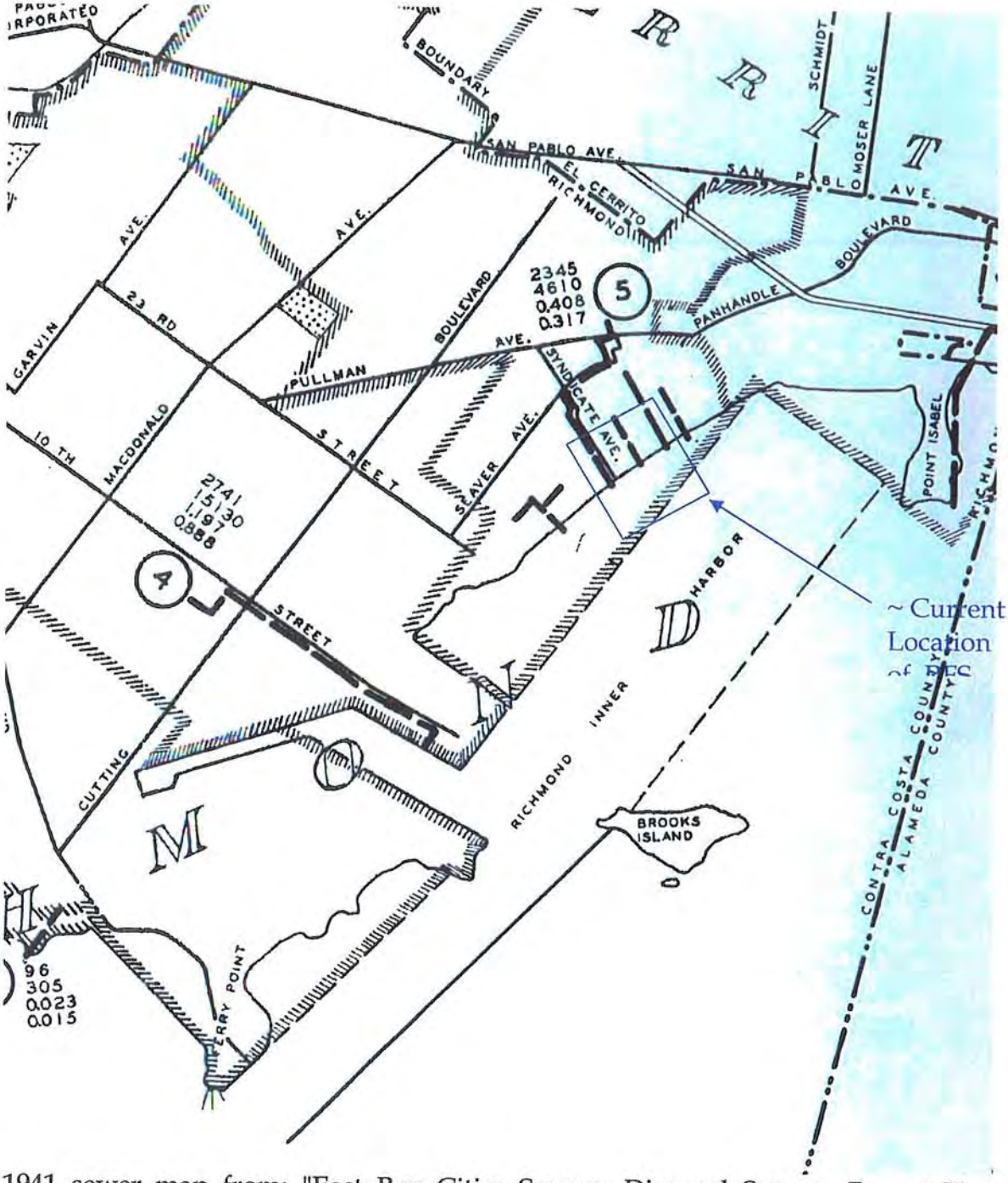
Richmond Field Station utility map showing location of storm drains (green) and sanitary sewers (pink).

Prior to the construction of the City of Richmond's publicly owned treatment works in the early 1950s, sewage and industrial wastes were discharged directly to the Bay through a system of combined sanitary sewer and storm drains. The RFS Western Storm Drain was one of a number of wastewater and stormwater conveyance pipes located on and around the RFS. The date of construction of the Western Storm Drain at the RFS is unknown. It is believed to have served as a combined sewer through the 1900s until the early 1950s, draining industrial and residential wastewater and stormwater from upstream of the California Cap Company and from portions of the property itself.

Sometime in the late 1940s or early 1950s, the City of Richmond wastewater treatment plant was constructed and historic sewers were routed to newly constructed sanitary sewer lines. Two sanitary sewer lines were constructed perpendicular to the Western Storm Drain. On the south end of the RFS, a pipe draining Stauffer Chemical Company and portions of the RFS was routed west across what is now BioRad property. On the north end, a sewer line was constructed to continue to convey wastewater from the northeast corner of the RFS and upstream areas west to the treatment plant. At that time, a manhole with an overflow bypass was placed at the intersection of the Western Storm Drain and new sewer line so that the old line functioned as a sanitary sewer overflow to Meeker Slough in addition to conveying storm water runoff.

Since 1950, the Western Storm Drain has conveyed stormwater runoff from portions of the RFS and it is believed to have conveyed stormwater runoff and storm drain discharges from properties north of the RFS, including the former PG&E yard. Due to reconfiguration of the Regatta Boulevard/I-580 interchange in the 1990s, historic drainage patterns no longer exist. UC Berkeley has connected storm drains to this line from the middle and lower areas of the RFS, including roof drains from new buildings, such as the Northern Regional Library Facility. No connections were made above the manhole directly east of the Library (Manhole #11). The northernmost manhole of the Western Storm Drain line is north of the UC property line and covered by a eucalyptus tree.

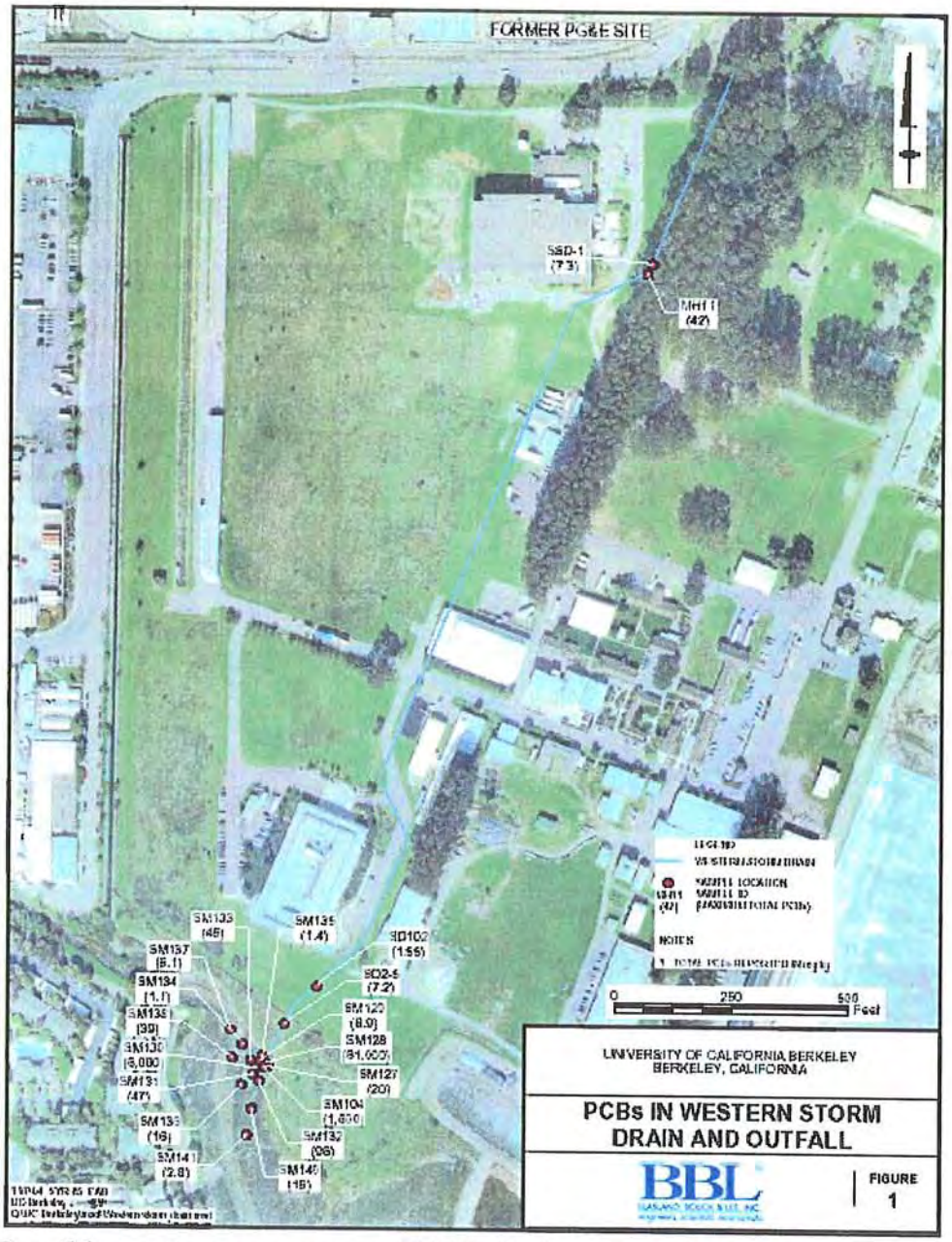
Following is a map showing the general configuration of sewers in the RFS area (then known as Stege) in the early 1940s, prior to construction of the Richmond publicly owned treatment works. The Western Storm Drain is located along the street then named Syndicate Avenue. Aerial photos from the 1940s show a pipe in Meeker Slough in the same location (parallel to what was then Syndicate Avenue).



1941 sewer map from: "East Bay Cities Sewage Disposal Survey, Report Upon the Collection, Treatment, and Disposal of Sewage and Industrial Wastes of the East Bay Cities, California" June 30, 1941, by the Board of Consulting Engineers (Charles Gilman Hyde, Harold Farnsworth Gray, A.M. Rawn) to the Mayor and Council representing the City of Berkeley as the sponsoring agent for the seven cooperating cities - Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, and Richmond.

PCB Sampling and Analysis

In 1999, the University initiated a field sampling and analysis program at the RFS and discovered PCB contaminated sediments at the outfall of the Western Storm Drain. Based on estimated sedimentation rates in West Stege Marsh, the high concentration of PCBs (up to 61,000 ppm) and depth of maximum concentration (1-2 feet) indicate the probable source of PCBs was a discharge of oil through the Western Storm Drain a few decades ago. Sampling of sediment in the Western Storm Drain found PCBs up to Manhole #11 at the northern end of the RFS. Following is a map of sampling analytical results. A complete table with Aroclor analysis appears at the end of the report.

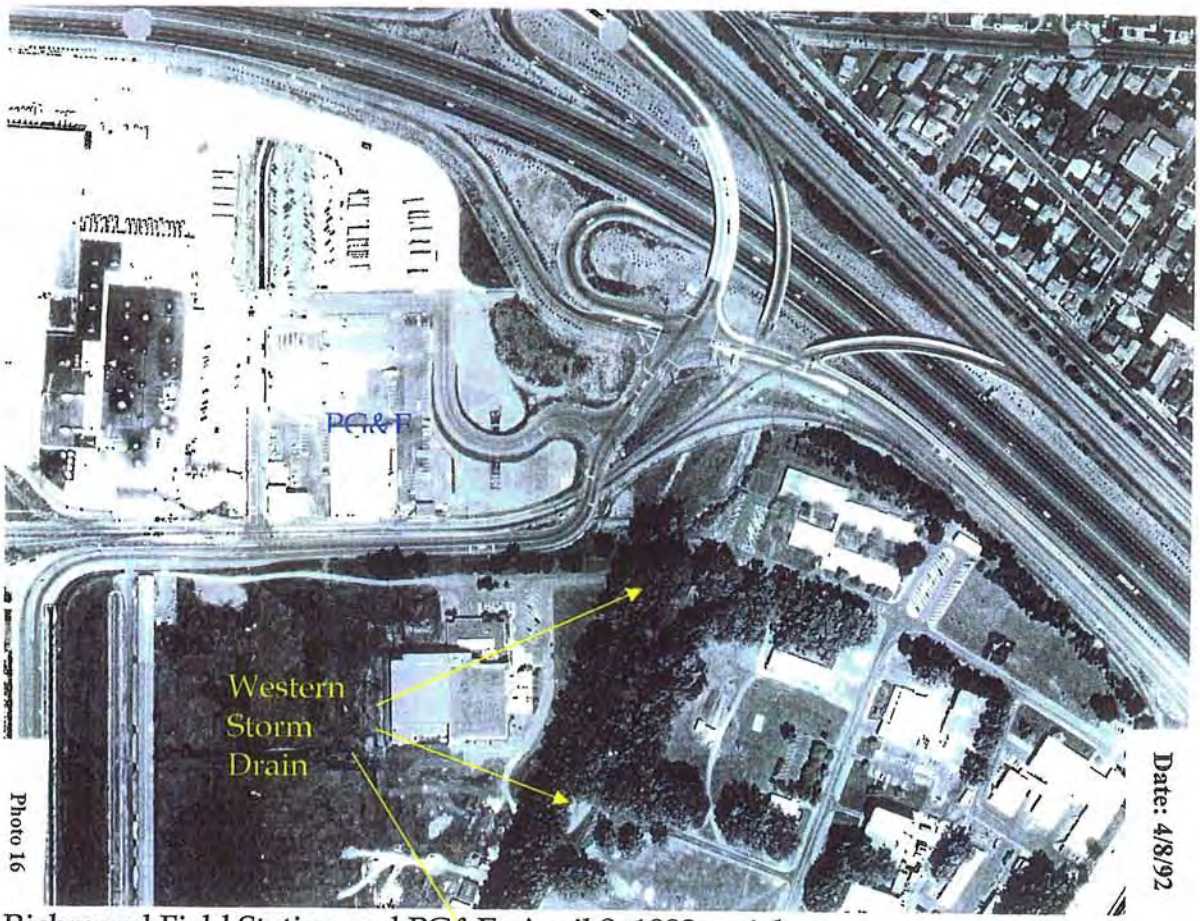


Possible upstream sources of PCB discharges include direct discharges into the storm drains connected to the Western Storm Drain and sanitary sewer overflows from oil discharged from upstream locations, including Stauffer Chemical.

A possible source for PCBs in the Western Storm Drain includes a PG&E facility built in the mid 1950s just north of the RFS. Based on historic aerial photographs, the facility appears to have been used for parking vehicles and storing equipment. The storage yard was located immediately north of the Western Storm Drain. It is unclear how the

stormwater drained from the site because historic utility maps have not been located and the drainage was reconfigured in the early 1990s during the construction of the I-580 freeway and reconfiguration of the Regatta Boulevard interchange. The following aerial photos show the PG&E yard location in 1983 and in again in 1992 after I-580 construction reconfigured overland and piped storm drainage conveyance.

Richmond Field Station and PG&E- June 21, 1983 aerial



Richmond Field Station and PG&E- April 8, 1992 aerial

Conclusion

Investigation of possible sources of PCB contamination in the Western Storm Drain and its outfall have been inconclusive, but indicate that at least one possible upstream location, the former PG&E yard, may have contributed PCBs from overland flow of spilled transformer oil or direct dumping into the storm drain.

Extensive field sampling and analysis investigations at the RFS have included reviews of records, aerial photos and environmental sampling for PCBs. There are no records indicating that any large transformer PCB oil leak or spill ever occurred. Some isolated areas with low levels of PCBs have been found in the upland soils, but PCB concentrations have been found to be low (approximately 10 ppm or less) and do not indicate the historic presence of a significant source of PCBs release. Drainage routes from all RFS subcatchment areas draining to the Western Storm Drain have been sampled and no significantly elevated areas of PCBs were found.

Other sources of PCBs and additional historical documents will continue to be investigated in efforts to identify the probable source of contaminated sediments in West Stege Marsh.

Table: Richmond Field Station Western Storm Drain polychlorinated biphenyl sampling analytical results

Sample ID	Sample Depth (Feet)	Date Collected	Total PCBs	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260
		Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MH11	in pipe	No Date	42	NA	NA	NA	NA	42	NA	NA
SSD-1	in pipe	09/23/04	7.3	0.16 U	0.32 U	0.16 U	0.16 U	7.3	0.16 U	0.16 U
SD2-5	in pipe	04/10/03	7.2	0.46 U	0.91 U	0.46 U	0.46 U	7.2	0.46 U	0.46 U
SD102	3 - 3.5	02/25/00	1.55	0.029 U	0.029 U	0.029 U	0.029 U	0.88	0.029 U	0.67
SM104	0 - 0.5	03/24/00	23	NA	NA	NA	NA	23	NA	NA
SM104	2 - 2.5	03/24/00	1600	NA	NA	NA	NA	1600	NA	NA
SM104	4 - 4.5	03/24/00	1200	NA	NA	NA	NA	1200	NA	NA
SM127	0 - 0.5	08/07/01	20	0.45 U	0.91 U	0.45 U	20	0.45 U	0.45 U	0.45 U
SM127	2 - 2.5	08/07/01	8.2	0.37 U	0.75 U	0.37 U	8.2	0.37 U	0.37 U	0.37 U
SM127	3.5 - 4	08/07/01	0.94	0.072 U	0.14 U	0.072 U	0.94	0.072 U	0.072 U	0.072 U
SM128	0 - 0.5	08/07/01	370	7.8 U	16 U	7.8 U	370	7.8 U	7.8 U	7.8 U
SM128	2 - 2.5	08/07/01	61000	2100 U	4300 U	2100 U	61000	2100 U	2100 U	2100 U
SM128	4 - 4.5	08/07/01	1600	36 U	73 U	36 U	1600	36 U	36 U	36 U
SM129	0 - 0.5	08/07/01	8.9	0.22 U	0.44 U	0.22 U	8.9	0.22 U	0.22 U	0.22 U
SM129	2.5 - 3	08/07/01	1.3	0.074 U	0.15 U	0.074 U	1.3	0.074 U	0.074 U	0.074 U
SM129	3.5 - 4	08/07/01	1.2	0.074 U	0.15 U	0.074 U	1.2	0.074 U	0.074 U	0.074 U
SM130	0 - 0.5	08/07/01	4.5	0.18 U	0.36 U	0.18 U	4.5	0.18 U	0.18 U	0.18 U
SM130	2 - 2.5	08/07/01	6000	120 U	240 U	120 U	6000	120 U	120 U	120 U
SM130	4 - 4.5	08/07/01	770	15 U	29 U	15 U	770	15 U	15 U	15 U
SM131	0 - 0.5	08/07/01	47	1.2 U	2.4 U	1.2 U	47	1.2 U	1.2 U	1.2 U
SM131	2 - 2.5	08/07/01	0.14	0.015 U	0.03 U	0.015 U	0.14	0.015 U	0.015 U	0.015 U
SM132	0 - 0.5	08/07/01	96	1.9 U	3.8 U	1.9 U	96	1.9 U	1.9 U	1.9 U
SM132	2 - 2.5	08/07/01	14	0.9 U	1.8 U	0.9 U	14	0.9 U	0.9 U	0.9 U
SM132	3 - 3.5	08/07/01	0.96	0.074 U	0.15 U	0.074 U	0.96	0.074 U	0.074 U	0.074 U
SM133	0 - 0.5	08/07/01	45	0.82 U	1.6 U	0.82 U	45	0.82 U	0.82 U	0.82 U
SM133	0.5 - 1	08/07/01	0.14	0.015 U	0.03 U	0.015 U	0.14	0.015 U	0.015 U	0.015 U
SM133	2 - 2.5	08/07/01	0.17	0.014 U	0.029 U	0.014 U	0.17	0.014 U	0.014 U	0.014 U
SM134	0 - 0.5	10/01/02	0.59	0.033 U	0.066 U	0.033 U	0.033 U	0.59	0.033 U	0.033 U
SM134	2 - 2.5	10/01/02	1.1	0.025 U	0.05 U	0.025 U	0.025 U	1	0.025 U	0.1
SM134	2.5 - 3	10/01/02	0.017	0.016 U	0.031 U	0.016 U	0.016 U	0.017	0.016 U	0.016 U
SM135	0 - 0.5	10/01/02	1.4	0.038 U	0.076 U	0.038 U	0.038 U	1.4	0.038 U	0.038 U
SM135	2 - 2.5	10/01/02	0.5	0.019 U	0.038 U	0.019 U	0.019 U	0.5	0.019 U	0.019 U
SM135	2.5 - 3	10/01/02	0.238	0.016 U	0.032 U	0.016 U	0.016 U	0.21	0.016 U	0.028
SM136	0 - 0.5	10/01/02	0.73	0.04 U	0.081 U	0.04 U	0.04 U	0.73	0.04 U	0.04 U
SM136	2 - 2.5	10/01/02	15.7	0.45 U	0.9 U	0.45 U	0.45 U	15	0.45 U	0.68

Sample ID	Sample Depth (Feet)	Date Collected	Total PCBs	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260
SM136	6 - 6.5	10/01/02	0.081	0.019 U	0.038 U	0.019 U	0.019 U	0.081	0.019 U	0.019 U
SM137	0 - 0.5	10/07/02	5.09	0.13 U	0.27 U	0.13 U	0.13 U	4.8	0.13 U	0.29
SM137	0.5 - 1	10/07/02	0.015	0.015 U	0.03 U	0.015 U	0.015 U	0.015	0.015 U	0.015 U
SM138	0 - 0.5	10/07/02	39	1.5 U	3 U	1.5 U	1.5 U	39	1.5 U	1.5 U
SM138	2 - 2.5	11/05/02	19.7	0.59 U	1.2 U	0.59 U	0.59 U	18	0.59 U	1.7
SM140	0 - 0.5	10/01/02	2.6	0.059 U	0.12 U	0.059 U	0.059 U	2.6	0.059 U	0.059 U
SM140	2 - 2.5	10/01/02	15	0.48 U	0.95 U	0.48 U	0.48 U	15	0.48 U	0.48 U
SM140	4.5 - 5	10/01/02	7.03	0.22 U	0.45 U	0.22 U	0.22 U	6.8	0.22 U	0.23
SM141	0 - 0.5	10/01/02	2.81	0.071 U	0.14 U	0.071 U	0.071 U	2.6	0.071 U	0.21
SM141	2 - 2.5	10/01/02	1.64	0.03 U	0.06 U	0.03 U	0.03 U	1.5	0.03 U	0.14
SM141	6 - 6.5	10/01/02	0.36	0.032 U	0.064 U	0.032 U	0.032 U	0.36	0.032 U	0.032 U

Note: U indicates value is below reporting limit, i.e., ND
NA = not available