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March 17, 2010

Dockets Unit
California Energy Commission
1516 Ninth Street, MS 4
Sacramento, CA 95814

RE: Marsh Landing Generating Station
Application for Certification 08-AFC-03

On behalf of Mirant Marsh Landing, LLC, the applicant for the Marsh Landing Generating Station (MLGS), we are pleased to submit the *Facility Investigation and Risk Assessment Work Plan* prepared by AMEC Geomatrix, Inc. on behalf of PG&E. This work plan was submitted to DTSC by PG&E to address investigations being conducted by PG&E to bring the MLGS site to regulatory closure through DTSC.

This document is submitted to the Dockets Unit and to the Proof of Service list electronically, and one print copy will be sent to the Docket Unit.

Please include this document in the AFC record.

URS Corporation

Anne C. Connell

Anne Connell
Project Manager

Attachment

CC: Mike Monasmith
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March 15, 2010

Mr. Tony Natera
Department of Toxic Substances Control
700 Heinz Street, Suite 200
Berkeley, California 94710

Subject: Facility Investigation and Risk Assessment Work Plan
Marsh Landing Generating Station
Mirant Contra Costa Power Plan
Contra Costa County, California

Dr. Mr. Natera:

PG&E is pleased to provide the enclosed *Facility Investigation and Risk Assessment Work Plan* for the Marsh Landing Generating Station (MLGS) at Mirant's Contra Costa Power Plant (CCPP). The work plan was prepared by AMEC Geomatrix, Inc. on our behalf.

The entire CCPP property, including the MLGS site, is owned by Mirant Delta, LLC (Mirant Delta). PG&E is conducting this work because, as the former property owner, it retained certain responsibility to remediate, as necessary, hazardous substance releases that were present at the time of sale in 1999. The enclosed *Work Plan* addresses the MLGS site where Mirant Marsh Landing, LLC, an affiliate of Mirant Delta, plans to construct and operate a new natural gas-fired power plant.

We are also looking to receive the next draft Corrective Action Consent Agreement, which we understand will serve as DTSC's administrative mechanism for oversight. We'll follow-up with you soon to schedule a meeting to discuss overall status and schedule of activities at this site. If you have any questions in the meantime, please contact our consulting project manager Ken Simas of WAU and Associates at (925) 997-6093.

Sincerely,

David Harnish
Manager, Environmental Remediation

cc: Jon Sacks, Mirant Delta, LLC
Barbara Benson, PG&E
Ken Simas, P.G, WAU & Company
Jennifer Patterson, P.E., AMEC Geomatrix, Inc.

Enclosure: Facility Investigation and Risk Assessment Work Plan

FACILITY INVESTIGATION AND RISK ASSESSMENT WORK PLAN

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Submitted to:

Pacific Gas and Electric Company
San Francisco, California

Submitted by:

AMEC Geomatrix, Inc.
Oakland, California

March 2010

Project 15317.000.0\4.0

March 15, 2010

Project 15317.000/4

Mr. David Harnish
Pacific Gas & Electric Company
Environmental Services Department
3401 Crow Canyon Road
San Ramon, California 94583

Subject: Facility Investigation and Risk Assessment Work Plan
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Dear Mr. Harnish:

On behalf of the Pacific Gas and Electric Company (PG&E), AMEC Geomatrix, Inc. (AMEC), has prepared this Facility Investigation and Risk Assessment Work Plan for the Marsh Landing Generating Station (the site; MLGS) which is located within the Contra Costa Power Plant (CCPP) property at 3201 Wilbur Avenue, Contra Costa County, California.

The work plan presents the following:

- summary of the site background and previous environmental conditions,
- site conceptual model,
- description of site investigation objectives,
- sampling and analysis plan
- quality assurance project plan,
- proposed health risk assessment activities
- description of subsequent reporting, and
- schedule.

A site specific health and safety plan will be submitted under separate cover. Please contact either of the undersigned if you have any questions.

Sincerely yours,
AMEC Geomatrix, Inc.

Robert A. Cheung

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Enclosure

cc: Neil Ziemba, PG&E
Ken Simas, WAU & Company

TABLE OF CONTENTS

Page

TABLE OF CONTENTS
(Continued)

TABLES

TABLE OF CONTENTS
(Continued)

FIGURES

APPENDIX

FACILITY INVESTIGATION AND RISK ASSESSMENT WORK PLAN

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

1.0 INTRODUCTION

On behalf of the Pacific Gas and Electric Company (PG&E), AMEC Geomatrix, Inc. (AMEC), has prepared this Facility Investigation and Risk Assessment Work Plan (work plan) to conduct additional soil and groundwater sampling and prepare human health risk assessment at the Marsh Landing Generating Station (MLGS; the site), which is located within the Contra Costa Power Plant (CCPP) property at 3201 Wilbur Avenue, Contra Costa County, California (Figure 1).

The entire CCPP property, including the MLGS site, is currently owned by Mirant Delta, LLC (Mirant Delta). Mirant Marsh Landing, LLC (Mirant Marsh Landing), an affiliate of Mirant Delta, has submitted an Application for Certification to the California Energy Commission (CEC) to construct and operate the MLGS, a new natural gas-fired power plant. Mirant Delta intends to subdivide the MLGS site as a separate parcel, which will be transferred to Mirant Marsh Landing for the new power generating station. PG&E is conducting this work because, as the former property owner, it retained certain defined responsibility to remediate, as necessary, hazardous substance releases that were present at the time of its sale of the CCPP in 1999.

2.0 BACKGROUND

The site history, regional and local geology and hydrogeology, and previous environmental investigations performed at the site are summarized below.

2.1 SITE SETTING

The site is approximately 27 acres and is part of the 114-acre CCPP property located at 3201 Wilbur Avenue, approximately 2.5 miles east of the City of Antioch in unincorporated Contra Costa County. The outlines of the MLGS site boundary and the CCPP property are shown in Figure 2. The site is bounded by a former paperboard manufacturing facility to the west, the San Joaquin River and CCPP operational areas to the north, CCPP operational areas to the east, and a PG&E switchyard and a CCPP tank farm to the south (Figure 2). The surrounding land use is a mixture of industrial, commercial, and residential (URS, 2008).

2.2 SITE HISTORY AND USE

The CCPP property was undeveloped prior to 1952. PG&E constructed the CCPP in 1952 and 1953. The CCPP is a steam electric generation facility that currently uses natural gas to generate power. Until the mid-1970s, Number 6 fuel oil was used to fuel the power generation units.

In 1999, PG&E sold the CCPP to Mirant Delta, previously named Southern Energy Delta, LLC. Mirant Marsh Landing, an affiliate of the current owner, Mirant Delta, has proposed constructing a new power plant facility, the MLGS, on approximately 27 acres of the CCPP (referred to as the site; shown on Figure 2). Mirant Delta intends to create a separate parcel for the MLGS by subdividing the existing single parcel that constitutes the CCPP and transferring ownership to Mirant Marsh Landing.

The site layout is illustrated on Figure 2. The west portion of the site (tank farm area) contains five 120,000-barrel aboveground storage tanks (ASTs) that contained fuel oil, associated piping and equipment, and a parking area. As discussed above, the ASTs have not been in use since the mid-1970s. Only residual quantities of Number 6 fuel oil remain in the ASTs. The tanks are constructed on a base of compacted rock overlain by sand. The structural integrity of the tank bottoms is unknown. Each AST is surrounded by a berm; the areas surrounding the ASTs are unpaved (URS, 2008). The parking area currently contains recreational vehicles and boats owned by power plant employees.

The east portion of the site (construction yard area) was used for the storage of paints and paint supplies, accumulation of asbestos waste and removal equipment, and the temporary storage of hazardous waste. A previous Phase I Environmental Site Assessment (ESA) indicated that this area was known as the Insulation and Coatings Department Office and Construction Yard (Camp Dresser and McKee [CDM], 1997). This area contains several work sheds and storage trailers that currently are used for offices for power plant staff and storage for documentation, painting equipment, and asbestos removal equipment (URS, 2008). This area also contains a hazardous waste storage shed and a non-hazardous waste storage shed on raised platforms on a concrete pad, an underground septic tank, load center, storage and fabrication building, and parking areas (URS, 2008).

2.3 ADJACENT PROPERTY USE

The majority of the site is surrounded by the CCPP operational areas. The area to the north of the construction yard contains seven power generating units (five of which have been retired), a transformer bank, a fire pump house, and former diesel fuel ASTs. The area to the east of the construction yard contains a leach field and septic tank and a leach mound. The area south of the tank farm contains three 500,000-barrel bulk ASTs that contain residual amounts of Number 6 fuel oil.

A PG&E switchyard is located to the south of the site. Reportedly, two oil-filled circuit breakers (OCBs) located in the switchyard immediately south of the construction yard exploded in the late 1970's. The location of these two circuit breakers is shown in Figure 3. Dielectric fluid released in the explosions potentially contained polychlorinated biphenyls (PCBs; CDM, 1997). As presented in Section 2.6, soil and groundwater samples were collected along the boundary between the switchyard and the site during subsequent environmental investigations and analyzed for PCBs. No PCBs were detected in any of the samples.

2.4 RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) STATUS

The CCPP facility submitted a RCRA Part A notification in 1980 for two surface impoundments and an asbestos storage area and began operating under interim status. In 1986, the U.S Environmental Protection Agency (U.S. EPA) completed a RCRA Facility Assessment (RFA) of the CCPP property to identify and evaluate solid waste management units (SWMUs). A SWMU is any unit of a hazardous waste facility from which hazardous constituents might migrate. A total of nine SWMUs were identified by U.S. EPA in the 1986 RFA; however, none of the listed SWMUs are located within the MLGS site boundary.

In June 1989, the California Department of Health Services Toxic Substances Control Division issued a Hazardous Waste Facility Permit to PG&E to receive, handle, treat, and store hazardous waste at the CCPP facility. In 1993, when the Department of Toxic Substances Control (DTSC) established the tiered permitting program for hazardous waste treatment, PG&E submitted an Onsite Hazardous Waste Treatment Notification and requested DTSC to convert the existing Hazardous Waste Facility Permit to the tiered permitting program. Mirant Delta, the current owner of the CCPP, continues to operate processes under the tiered permitting program.

2.5 REGIONAL AND LOCAL GEOLOGY

The CCPP is located in the San Joaquin River delta within the Coast Range physiographic province. Approximately 10 miles southwest of the site is Mount Diablo, an upper Jurassic-Cretaceous Franciscan/Ophiolite core flanked by Cenozoic sedimentary rocks. North of the site, across the Sacramento River-San Joaquin River confluence, the Pleistocene Montezuma Formation crops out in the Montezuma Hills, a gentler uplift than Mount Diablo. The Montezuma Formation is approximately 1,200 feet thick and consists of poorly consolidated sand, clay, silt, and gravel. At the CCPP property, the top of the Montezuma Formation is approximately 125 to 140 feet below ground surface (bgs). Clayey and silty beds in the upper

Montezuma Formation are overlain by the Quaternary upper aquifer composed of alluvial/estuarine and dune sands (Fluor Daniel GTI, 1998).

The lithology beneath the CCPP property consists of sand and silty sand, with silt and clay occurring to depths of approximately 20 feet bgs in the southern part of the site. Lenses of clay and peat are also present in the northern part of the site, near the San Joaquin River. Artificial fill was encountered during previous investigations at many locations to depths of up to 2 feet bgs, and locally deeper. The fill was described in the boring logs as gravel/base rock, cobbles/coarse sand, gravel fill, and base fill. The sand, below the artificial fill to depths of approximately 10 feet bgs, is generally fine grained, poorly graded to moderately graded, with silt content varying from less than 5 percent to approximately 20 percent. With increasing depth, approximately 10 feet bgs, the sand grades coarser and is moderately to well graded (Fluor Daniel GTI, 1998).

2.6 REGIONAL AND LOCAL HYDROGEOLOGY

The CCPP is located on the south bank of the San Joaquin River, which at this location is an estuary. The water level and water quality of the San Joaquin River at the site are affected by diurnal tidal fluctuations which cause water to flow up- or down-river past the site. The water level and quality in the San Joaquin River are also affected by seasonal fluctuations in flow, which are highest during winter and spring (Fluor Daniel GTI, 1998).

The upper water-bearing zone of the CCPP property consists of Quaternary alluvial/estuarine and dune sands interbedded with lenses of intertidal clay, silt, peaty mud, and peat. This unit is 125 to 140 feet thick and locally rests on silts and clays of the upper Montezuma Formation. The vadose zone is composed of silt, sand, and fill and ranges in thickness from 0 to 6 feet and forms the upper part of the vadose zone above the aquifer. Lenses of clay, silt, and peat form local confining layers. Beneath the CCPP, the peat lenses are more common near the river, whereas the silts and clays are progressively thicker and more laterally extensive in the southern part of the site (Fluor Daniel GTI, 1998).

Depth to groundwater measured on October 20, 1997, varied from approximately 11 feet bgs in the southern part of the CCPP to approximately 6 feet bgs in some wells near the river, along the northern edge of the CCPP. The hydraulic gradient across the CCPP, measured in October and December of 1997, ranged from 0.0005 foot per foot (ft/ft) to 0.001 ft/ft with a groundwater flow direction to the north-northwest. A tidal study reportedly conducted at the CCPP in April 1985 showed that the groundwater flow direction was toward the river throughout the tidal cycle (Fluor Daniel GTI, 1998).

Mirant proposes to supply the project's process water needs by using groundwater extracted by on site wells. The proposed well system would include two wells capable of providing full demand, so that one well provides redundancy. Both wells will be approximately 120 feet deep and will be located in the southern portion of the CCPP property near Wilbur Avenue and the access road. To evaluate whether or not the aquifer could produce a sustainable water supply for the project, Mirant Marsh Landing contracted Wittman Hydro Planning Associates, Inc., of Bloominton, Indiana, to conduct a site-specific exploration and testing program to characterize the local hydrogeologic setting (URS, 2009). The field investigation included test borings, hydraulic testing, and water quality sampling. Results of the field investigation were integrated into a transient groundwater flow model of the aquifer that was used to predict yield, evaluate wellfield designs, and evaluate the potential impacts of a pumping center at the site.

The test borings confirmed the presence of a continuous zone of permeable deposits beneath the site. The permeable zone, under 10 to 15 feet of surface fill, has an average thickness of 108 feet and consists of fine sand grading coarser with depth to sand and gravel (URS, 2009). Aquifer testing confirmed that this permeable unit is capable of producing large volumes of groundwater. Based on the modeling analysis, the maximum predicted drawdown 0.5-mile from the proposed well pumping at 150 gallons per minute was estimated to be about 0.25 feet (URS, 2009). The analysis also indicated that no infiltrated water from the river would reach the pumping well within the 30-year project life based on an average pumping rate of 150 gallons per minute and a maximum extraction volume of water of 50 acre-feet per year (URS, 2009).

2.7 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

PG&E conducted a Phase I ESA and Phase II sampling prior to divestiture of the CCPP to Mirant Delta. To initially evaluate the site, PG&E contracted CDM to conduct a Phase I ESA (CDM, 1997) for the entire CCPP. Based on the results of the initial Phase I, PG&E contracted Fluor Daniel GTI to complete a Phase II environmental investigation and human health risk assessment (HHRA) in 1997 (Fluor Daniel GTI, 1998). The Phase II consisted of soil and groundwater sampling and analysis across the entire CCPP, which included the subject site. The sampling plan consisted of a biased sampling grid with approximately 150-foot spacing to assess general site conditions with a focus on specific areas or features of concern identified in the 1997 Phase I ESA.

In 2008, URS conducted a Phase I ESA on behalf of Mirant Marsh Landing in support of its Application for Certification (AFC) submitted to the CEC for construction and operation of the proposed MLGS facility. Mirant Marsh Landing subsequently received data requests from the CEC staff to provide additional information required by the CEC staff to complete its review of the AFC. CEC staff requested the following:

- Groundwater sampling and analysis directly between the river and Tanks 1 and 2 to assess potential impacts from the tanks;
- Soil and groundwater sampling and analysis along the southern MLGS boundary immediately north of the PG&E switchyard to assess the potential impacts to soil and groundwater as a result of the reported circuit breaker explosions in the late 1970s; and
- Soil sampling and analysis near the storm water drains that are located near the tank farm berms and within the construction yard to assess potential impacts from off-site run-on.
- A focused human health risk assessment using only data from the MLGS site to assess potential risks to specified receptors during and after proposed construction,

Additional investigation activities were conducted at the site by AMEC in December 2009, on behalf of PG&E in response to these data requests (as previously noted, PG&E is conducting work at the site because it retained certain defined responsibility to remediate, as necessary, hazardous substance releases that were present at the time of its sale of the CCPP in 1999). The additional investigation was primarily focused on meeting the specific requests of the CEC; however, some additional data was collected during the investigation in anticipation of potential data requirements to bring the site to regulatory closure through the DTSC.

Figure 3 presents the boring locations from the 1997 and 2009 investigations. The data from both investigations are summarized in Tables 1 through 8 and on Figures 4A through 16. A summary of the data collected from the two investigations is presented below. For each media, data collected from the tank farm area is discussed first, followed by data collected in the construction yard.

2.7.1 Soil Analytical Results

2.7.1.1 Tank Farm Area

- **Metals:** Soil samples collected from the tank farm area were not analyzed for metals during the 1997 investigation. During the 2009 investigation, six samples collected from three borings located within the tank farm area but outside the bermed area, were analyzed for metals (Table 1 and Figure 4A). Samples were collected between 0.5 and 2.0 feet bgs. The number of detections and the minimum and maximum concentrations detected for each metal are summarized in Table 2.

- **Petroleum Hydrocarbons:** Ninety-four samples collected from 32 sampling locations were analyzed for total extractable hydrocarbons (TEH; C_9 to C_{40}) during the 1997 investigation. During the 2009 investigation, seven samples collected from three locations were analyzed for total petroleum hydrocarbons quantified as diesel (TPHd; C_{10} to C_{25}) and as motor oil (TPHmo; C_{25} to C_{40}) with silica gel cleanup. Petroleum hydrocarbon data and sampling locations are presented in Table 3 and on Figures 5 through 7. Samples were collected at depths ranging from 0.5 to 17.75 feet bgs. Concentrations of TEH up to 250 milligrams per kilogram (mg/kg) were detected in samples collected from 0.5 feet bgs. TEH was not detected at concentrations greater than 87 mg/kg in samples collected deeper than 0.5 feet bgs. During the 2009 investigation, TPHmo was detected at one location (SB-7 at 1.0 feet bgs) at a concentration of 12 mg/kg. TPHd was not detected above laboratory reporting limits in any of the samples analyzed from the 2009 investigation. TPH fractionation was performed on one sample (SB-7 at 1.0 foot bgs); this data will be used in the HHRA.

- **Volatile Organic Compounds (VOCs):** Soil samples collected from the tank farm area were not analyzed for VOCs during the 1997 investigation. During the 2009 investigation, six samples collected from three locations within the tank farm area were analyzed for VOCs (Table 3 and Figure 8 and 9). Samples were collected from between 0.5 to 2.0 feet bgs. VOCs were not detected above the laboratory reporting limit in any of the soil samples analyzed.

- **Polynuclear Aromatic Hydrocarbons (PAHs):** Eighty-one samples collected from 27 sampling locations were analyzed for PAHs during the 1997 investigation. During the 2009 investigation, 11 samples collected from 8 locations were analyzed for PAHs. Samples were collected from between 0.5 and 17.75 feet bgs. PAH data and sampling locations are presented in Table 4 and on Figure 10. Benzo(a)pyrene toxicity equivalents (TEQs) were calculated for the locations where carcinogenic PAHs were detected and are presented in Table 4 and on Figure 10. PAHs were only detected at two locations within tank farm area; TEQs at these locations are 0.12 mg/kg (boring CB4-093 at 0.5 feet bgs) and 2.19 mg/kg (boring CB4-099 at 4.5 feet bgs).

- **PCBs:** Soil samples collected from the tank farm area were not analyzed for PCBs during the 1997 investigation. During the 2009 investigation, six samples collected from three sampling locations (Table 3 and Figure 11) were analyzed for PCBs. PCBs were not detected above the laboratory reporting limit in any of the samples.

2.7.1.2 Construction Yard

- **Metals:** Soil samples were analyzed for metals during both the 1997 and 2009 investigations. In 1997, 57 samples were analyzed from 26 sampling locations and in 2009, five samples were analyzed from five sampling locations. Metals data is presented in Table 1 and sampling locations are shown on Figure 4A. Samples were collected at depths ranging from 0.5 to 14.5 feet bgs. The number of detections and the minimum and maximum concentrations detected for each metal is summarized in Table 2.

- **Petroleum Hydrocarbons:** During the 1997 investigation 57 samples collected from 26 sampling locations were analyzed for TEH. During the 2009 investigation, nine samples collected from eight sampling locations were analyzed for TPHd and TPHmo. Petroleum hydrocarbon data and sampling locations are presented in Table 3 and on Figures 5 through 7. Samples were collected at depths ranging from 0.5 to 14.5 feet bgs. The highest concentration of TEH detected during the 1997 investigation was 1900 mg/kg in the sample collected at 0.5 feet bgs from sample location CB5-007 in the southeast corner of the site. Concentrations in several samples collected from 0.5 feet bgs exceeded 100 mg/kg; however only the sample collected at CB5-007 exceeded 700 mg/kg. TEH was not detected at concentrations exceeding 48 mg/kg in any samples collected deeper than

0.5 feet bgs. During the 2009 investigation, TPHmo was detected in five samples collected at a depth of 1.0 foot bgs at concentrations ranging from 24 to 120 mg/kg. TPHd was not detected above the laboratory reporting limit in any of the samples analyzed. TPH fractionation was performed on four samples (SB-11 at 1.0 foot bgs, SB-12 at 0.5 foot bgs, SB-14 at 1.0 foot bgs, and SB-15 at 0.5 foot bgs); this data will be used in the HHRA.

- **VOCs:** Fifty-three samples collected from 25 sampling locations (Table 3 and Figures 8 and 9) were analyzed for VOCs during the 1997 investigation. Soil samples were collected at depths ranging from 0.5 to 9.5 feet bgs. Soil samples from the construction yard area were not analyzed for VOCs during the 2009 investigation. With the exception of methylene chloride, VOCs were only detected in two soil samples collected at 0.5 feet bgs. In the sample collected at 0.5 feet bgs from boring CB5-004, xylenes were detected at a concentration of 0.0021 mg/kg. In the sample collected from boring CB5-051 the following VOCs were detected: p-isopropyltoluene (0.0028 mg/kg); 1,2,4-trimethylbenzene (0.0064 mg/kg); and 1,3,5-trimethylbenzene (0.0053 mg/kg). No VOCs, other than methylene chloride, were detected above laboratory reporting limits in samples collected deeper than 0.5 feet bgs. Methylene chloride was detected in several soil samples at concentrations ranging from 0.0033 to 0.019 mg/kg. Fluor Daniel GTI reported that the methylene chloride was a laboratory contaminant. AMEC reviewed the original laboratory data reports from the 1997 investigation and confirmed that methylene chloride was detected in several laboratory method blanks from multiple analytical batches at concentrations similar to those detected in the samples. Therefore, AMEC concludes that the methylene chloride detections are due to laboratory contamination and will not consider this data in the risk assessment.[1] The methylene chloride data are included in Table 3, but are not presented on Figure 8.

- **PAHs:** During the 1997 investigation PAH analysis was conducted on 57 samples collected from 26 sampling locations. During the 2009 investigation, 11 samples collected from eight sampling locations were analyzed for PAHs. PAH data is presented in Table 4 and sampling locations are shown on Figure 10. Samples were collected at depths ranging from 0.5 to 14.5 feet bgs. PAHs were detected in 12 samples collected from 12 locations at depths up to 4.5 feet bgs. Four of these samples had only non-carcinogenic PAHs detected. Benzo(a)pyrene TEQs were calculated for the locations where carcinogenic PAHs were detected and are presented in Table 4 and on Figure 10. TEQs ranged from 0.066 mg/kg to 73.75 mg/kg. The samples containing the highest TEQs were collected from SB-10 at 3.0 feet bgs (73.75 mg/kg) and CB5-006 at 0.5 feet bgs (4.1 mg/kg). Both of these borings are located along the southern property boundary. TEQs in the remaining samples were below 1 mg/kg.

- **PCBs:** During the 1997 investigation, 16 samples collected from 7 sampling locations were analyzed for PCBs. During the 2009 investigation, nine samples collected from eight sampling locations (Table 3 and Figure 11) were analyzed for PCBs. Samples were collected from depths ranging from 0.5 to 14.5 feet bgs.

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[1] Methylene chloride was conservatively identified as a chemical of potential concern in the risk assessment conducted for the CEC because, when the risk assessment was prepared, AMEC did not have access to the original laboratory data reports to confirm if methylene chloride was a laboratory contaminant.

PCBs were not detected above laboratory reporting limits in any of the soil samples analyzed.

- **Asbestos:** 44 samples collected from 22 sampling locations (Table 5) were analyzed for asbestos during the 1997 investigation. Asbestos was not detected in any of the soil samples.

2.7.2 Groundwater Analytical Results

Groundwater samples were collected from temporary well points (i.e., grab groundwater samples) during both the 1997 and 2009 investigations.

2.7.2.1 Tank Farm Area

- **Metals:** Groundwater samples from the tank farm area were not analyzed for metals during the 1997 investigation. During the 2009 investigation, groundwater samples from four borings located outside the bermed areas (Table 6 and Figure 12) were analyzed for metals. The number of detections and the minimum and maximum concentrations detected for each metal is summarized in Table 7. The results suggest that there does not appear to be a significant impact to groundwater quality from metals in soil.

- **Petroleum Hydrocarbons:** During the 1997 investigation, groundwater samples from nine sampling locations were analyzed for TEH. During the 2009 investigation, groundwater samples from five sampling locations were analyzed for TPHd and TPHmo. Petroleum hydrocarbon data and sampling locations are shown in Table 8 and on Figure 13. In 1997, TEH was detected above the laboratory reporting limit in only the sample collected from boring CB4-076, located along the upgradient property boundary, at a concentration of 220 micrograms per liter (µg/L). Boring SB-7 was advanced in the vicinity of boring CB4-076 during the 2009 investigation; TPHd and TPHmo were not detected above the laboratory reporting limits in the groundwater sample collected from SB-7. During the 2009 investigation, TPHd and TPHmo were also not detected in groundwater samples collected from four borings located at the downgradient boundary of the tank farm.

- **VOCs:** Groundwater samples from the tank farm area were not analyzed for VOCs during the 1997 investigation. VOCs analyses were performed on samples collected from five borings located outside the bermed area (Table 8 and Figure 14) during the 2009 investigation. VOCs were not detected above the laboratory reporting limit in any of the samples.

- **PAHs:** Samples collected from nine sampling locations (Table 8 and Figure 15) were analyzed for PAHs during the 1997 investigation. Groundwater samples were not analyzed for PAHs during the 2009 investigation. No PAHs were detected above laboratory reporting limits in any of the 1997 groundwater samples.

- **PCBs:** Groundwater samples from the tank farm area were not analyzed for PCBs during the 1997 investigation. One groundwater sample from the tank farm area was analyzed for PCBs during the 2009 investigation (Table 8 and Figure 16). PCBs were not detected above the laboratory reporting limit in this sample.

2.7.2.2 Construction Yard

The groundwater data presented below for the construction yard area was generated during the 1997 investigation. Groundwater samples were not collected from the construction yard during the 2009 investigation.

- **Metals:** Groundwater samples collected from six sampling locations (Table 6 and Figure 12) were analyzed for metals in 1997; a second sample was collected from location CB5-006 and analyzed for metals in 1998. The number of detections and the minimum and maximum concentration detected for each metal is summarized in Table 7. The results suggest that there does not appear to be a significant impact to groundwater quality from metals in soil.

- **Petroleum Hydrocarbons:** Groundwater samples from six sampling locations (Table 8 and Figure 13) were analyzed for TEH. TEH was not detected above the reporting limit in any of the six samples.

- **VOCs:** Groundwater samples from five sampling locations (Table 8 and Figure 14) were analyzed for VOCs. VOCs were not detected in any of the samples with one exception; methylene chloride was detected at a concentration below the reporting limit (2.6 µg/L) in one sample. As discussed above, AMEC reviewed original laboratory data reports from the 1997 investigation and concluded that methylene chloride was a laboratory contaminant, based on the detection of methylene chloride in several laboratory method blanks in multiple analytical batches. Therefore, this data will not be considered in the risk assessment.[2] The methylene chloride data are included in Table 8 but are not presented on Figure 14.

- **PAHs:** Groundwater samples from six sampling locations (Table 8 and Figure 15) were analyzed for PAHs. No PAHs were detected above laboratory reporting limits in any of the groundwater samples.

- **PCBs:** Groundwater samples collected from three sampling locations (Table 8 and Figure 16) were analyzed for PCBs. PCBs were not detected above laboratory reporting limits in any of the groundwater samples.

2.7.3 Focused Human Health Risk Assessment

In response to the CEC data request, a focused human health risk assessment (HHRA) was conducted to evaluate whether the chemicals detected at the site warrant further consideration in terms of mitigating potential threats to human health through active remedial and/or risk management measures. The focused HHRA was prepared in accordance with the U.S. EPA and the California Environmental Protection Agency (Cal/EPA) guidelines.

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[2] Methylene chloride was conservatively identified as a chemical of potential concern in the risk assessment conducted for the CEC because, when the risk assessment was prepared, AMEC did not have access to the original laboratory data reports to confirm if methylene chloride was a laboratory contaminant.

Potential noncarcinogenic hazard indices and theoretical excess lifetime cancer risks were estimated quantitatively for hypothetical construction/utility workers and hypothetical off-site residents during construction, and hypothetical future on-site workers and hypothetical future off-site residents during plant operations. Because the risks to hypothetical off-site residents during construction and during plant operations are below the *de minimis* risk levels (less than one-in-one-million (1×10^{-6}) theoretical excess cancer risk and less than a noncarcinogenic hazard index of 1), potential risks and hazards to off-site workers were not quantitatively evaluated.

The results of the focused HHRA indicate that the estimated noncarcinogenic hazards for each receptor are below a hazard index of 1. The estimated hypothetical lifetime excess cancer risk are below the 1×10^{-6} *de minimis* risk level for all receptors evaluated except the future hypothetical on-site worker. Under a hypothetical scenario including conservative assumptions that soil is left exposed following the completion of construction activities and no risk management measures are implemented, and further assuming that incidental ingestion and dermal contact with soil occur, the estimated theoretical lifetime excess cancer risk for a hypothetical future on-site worker is 4×10^{-6}. This estimate is above the *de minimis* risk but within the acceptable regulatory risk range and below the cumulative cancer risk of 1×10^{-5}; a level deemed appropriate for the site, which is planned for redevelopment as an industrial power generation facility. The primary chemicals contributing to the theoretical cumulative health risk estimate are carcinogenic PAHs in soil, particularly from samples collected near the southeast site boundary.

3.0 SITE CONCEPTUAL MODEL

As described in the U.S. EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (U.S. EPA, 1988), a site conceptual model (SCM) integrates information related to the site setting and the environmental hydrogeologic system, identifies the primary source of constituents in the environment, shows how constituents at the original point of release might move in the environment, and identifies the hypothetical exposure pathways that are applicable to human health or the environment. A preliminary SCM for the site has been developed based on existing data and the planned future use of the site to support a new power plant facility (Figure 17). The SCM serves as the foundation for investigation and risk assessment strategies to address potential environmental issues at the site.

Based on existing sampling data, constituents are present in soil as a result of historical operations at the site. Constituents that have been detected in soil are classified as volatile (e.g., low levels of 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene), semi-volatile (e.g., PAHs), and non-volatile (e.g., petroleum hydrocarbons and metals). Although results suggest that groundwater has not been significantly impacted, petroleum hydrocarbons (based on historical sampling data collected in 1997) and metals are the primary constituents that have been detected in groundwater. As discussed previously, historical depth to groundwater measurements have varied from approximately 11 feet bgs in the southern part of the site to approximately 6 feet bgs in some wells near the river, along the northern edge of the site. Groundwater flow direction is generally to the north-northwest towards the San Joaquin River.

Volatile constituents can potentially migrate from soil to indoor or ambient air. Semi-volatile and non-volatile compounds can potentially be resuspended with soil particulates and potentially be present in ambient air and be transported to on- or off-site locations.

Potential human receptors are populations potentially exposed to these constituents, either on site or as a result of chemical migration to off-site areas. Given the future use of the property as a power plant, the primary potential human receptors are construction workers involved in building the power plant and industrial workers after the plant is built. Construction workers are typically involved in trenching, excavating, and earth moving activities. Nearby off-site residents and workers are potential receptors if constituents are migrating off site as a result of construction activities or from wind erosion from unpaved areas once the power plant is constructed and complete.

Hypothetical exposure pathways must first be evaluated to determine if they might be "complete" (receptors can come into contact with site-related compounds), "incomplete" (no exposure is possible), or "potentially complete" (exposure may occur if site conditions change). Identification of complete or potentially complete exposure is defined by four elements:

- A source and mechanism of constituent release to the environment.
- An environmental receiving or transport medium (e.g., air, soil) for the released constituent.
- A point of potential contact with the medium of concern.
- An exposure route (e.g., ingestion) at the contact point.
- A hypothetical exposure pathway is considered "complete" if all elements are present. Only complete hypothetical exposure pathways will be evaluated in the risk assessment. Although complete exposure pathways have been identified for constituents in soil and groundwater as further discussed in Section 7.0, additional soil data near features within the tank farm and other selected locations within the site and current groundwater data are warranted to assess potential exposures. These identified data gaps are addressed below in Section 4.0.

4.0 INVESTIGATION OBJECTIVES

Based on information presented in the two Phase I reports (CDM, 1997 and URS, 2008) and the data collected during the 1997 and 2009 soil and groundwater investigations (Fluor Daniel GTI, 1998 and AMEC, 2010), it appears that the previous investigations generally provided adequate coverage to address possible impacts from site operations and features. However, AMEC has identified several data gaps that will be addressed in the proposed investigation in order to support the health risk assessment and subsequent preparation of a Corrective Measures Proposal to evaluate and recommend any necessary corrective action for the site. As such, the objectives of the proposed investigation are to:

- assess the presence of lead in shallow soil adjacent to each AST within the tank farm area;
- collect soil and groundwater TPH data to obtain information regarding the aromatic and aliphatic fractions of the petroleum for use in a HHRA;
- collect groundwater samples at the southern, upgradient boundary of the site to assess whether off-site, upgradient sources are migrating onto the site; and
- conduct additional soil sampling in certain areas where PAHs were detected during previous investigations to support removal activities.

The objectives of the proposed investigation are discussed in more detail below.

4.1 ASSESS LEAD AND PCBS ADJACENT TO ASTS

During the previous investigations, soil and groundwater samples collected from within the tank berms were not analyzed for metals. The ASTs have been present at the site since 1953. It is likely that the ASTs are or have been coated with lead-based paint, which may have chipped or been sandblasted in the past. Therefore, AMEC proposes to collect shallow soil samples adjacent to each AST to evaluate the possible presence of lead in surface soil.[3] In addition, PCBs have not been detected during previous investigations at the CCPP site, but they have reportedly been found to be present in paints used at other power plant sites. Therefore, in order to be conservative and definitely rule out the presence of PCB impacts, AMEC proposes to include PCB analyses of the shallow soil samples collected adjacent to the ASTs.

4.2 FRACTIONATED PETROLEUM HYDROCARBON DATA

The 1997 investigation conducted at the site generated a significant amount of petroleum hydrocarbon data for soil and groundwater. During that investigation, petroleum hydrocarbons

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[3] Due to Mirant's tank decommissioning schedule, these samples were collected on March 11, 2010.

were reported as TEH, which included the carbon range C_9 to C_{40}. Historically, aggregated petroleum hydrocarbon data have not been specifically evaluated in risk assessments because the results represent mixtures of chemicals that do not have descriptive health criteria. However, DTSC has recently provided interim guidance which provides a methodology to quantitatively include TPH measurements in a risk evaluation (DTSC, 2009a). This interim guidance will be followed in the HHRA to assess potential health effects associated with TPH. As such, fractionated TPH soil and groundwater data along with aggregate TPH data are needed to assess petroleum hydrocarbons that may be present at the site. In addition, consistent with the DTSC guidance, hexane, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene data will also be collected for use in evaluating the fractionated TPH data in the HHRA. This data will be used directly in the risk assessment and will be used to evaluate historical TPH data. Some fractionated data were collected during the 2009, investigation, however, additional data are needed to be representative of site conditions.

Soil samples for fractionated TPH analysis will be collected at targeted and non-targeted locations across the site. The targeted locations are near the aboveground valves and piping at each AST in the tank farm area, as these are areas where evidence of potential releases have been observed.[4] Several additional non-targeted locations will be sampled to provide general coverage of both the tank farm and construction yard area. Groundwater samples will be collected at seven locations to provide general coverage of the site.

4.3 UPGRADIENT GROUNDWATER

AMEC proposes to collect groundwater data along the upgradient MLGS site boundary to assess the possible presence of upgradient sources migrating onto the MLGS site. Additional ASTs associated with the CCPP and a PG&E switchyard are located immediately upgradient of the site.

Within the tank farm area upgradient of the MLGS site, relatively low concentrations of TEH (120 to 230 ug/L) were previously detected at two locations during the 1997 Phase II ESA. Within the switchyard, two reported OCB explosions during the 1970s may have been associated with potential releases of dielectric fluid. However, numerous soil and groundwater samples were collected along the switchyard boundary and analyzed for PCBs during both the 1997 and 2009 site investigations; no PCBs were detected in any of the samples collected.

AMEC proposes to collect grab groundwater samples from three locations near the upgradient boundary of the site to supplement the previous groundwater data collected in nearby areas.

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[4] Due to Mirant's tank decommissioning schedule, targeted shallow soil samples near the ASTs were collected on March 11, 2010.

4.4 FURTHER ASSESS PRESENCE OF PAHS

As discussed in Section 2.8.3, carcinogenic PAHs were the primary constituents contributing to the theoretical risks calculated in the focused HHRA for hypothetical future onsite workers. PAH concentrations in soil samples collected from three locations (CB4-099, CB5-006, and SB-10) were significantly higher than those collected from other locations at the site. CB4-099 is located in the northeast corner of the site and contained PAHs with a TEQ of 2.19 mg/kg at 4.5 feet bgs. AMEC will advance two borings in this area; one at the approximate location of previous boring CB4-099 to confirm the PAH detections, and a second south of this location between previous boring location CB4-099 and previous boring location CB4-090, where PAHs were not detected during the 1997 investigation. Soil samples from the boring south of CB4-099 will only be analyzed if carcinogenic PAHs are detected in the initial boring.

The samples containing the highest TEQs were collected from SB-10 at 3.0 feet bgs (73.75 mg/kg) and CB5-006 at 0.5 feet bgs (4.1 mg/kg). Both of these borings are located along the southern property boundary suggesting a localized area where carcinogenic PAHs are present in shallow soil. Although the theoretical risks to hypothetical future workers calculated in the Focused HHRA were generally within the range of acceptable risk for industrial site workers, PG&E is planning to perform soil removal activities in this area to remove PAH-affected soil, thereby reducing the potential risk to human health associated with hypothetical exposure to the soil. Proposed soil removal activities will be further described in the Corrective Measures Proposal. Seventeen additional borings will be advanced in the vicinity of previous borings SB-10 and CB5-006 to delineate the general extent of PAHs in this area. These borings will be advanced at an approximate 30-foot grid spacing. Some samples collected from this area will be held pending results of initial analyses. The objective of this soil sampling is to generally delineate the area of PAH-affected soil to support scoping of the planned removal action.

5.0 FIELD SAMPLING AND ANALYSIS PLAN

To accomplish the investigation objectives outlined above, AMEC proposes to collect soil and groundwater samples at 44 locations. The proposed investigation locations are shown on Figure 18 and the proposed sampling and analysis plan is outlined in Table 9. Table 9 also states the data objective for each boring. Additional soil or groundwater samples may be collected during field activities or additional sample analyses conducted based on field observations.

5.1 PRE-FIELD ACTIVITIES

Prior to conducting field activities, AMEC will obtain a boring permit from Contra Costa County Environmental Health Department (CCEHD), mark proposed drilling locations, contact

Underground Service Alert (USA), and retain a private utility location contractor to clear the boring locations for utilities. All proposed locations will also be cleared with plant operations. Additionally, AMEC has prepared a site-specific health and safety plan.

5.2 FIELD ACTIVITIES

AMEC will retain a California-licensed driller to perform drilling activities. All boreholes will be initially advanced using a hand auger to a depth of 5 feet bgs to clear for utilities. Borings for the sampling of groundwater will be further advanced using a direct-push drill rig equipped with a dual-tube direct-push sampling system. Soil will be continuously cored for lithologic logging. A lithologic log will be prepared for each boring by a trained field geologist under the supervision of a California Professional Geologist using visual-manual procedures of the American Society for Testing and Materials (ASTM) Standard D2488-90 for guidance, which is based on the Unified Soil Classification System (USCS). Non-dedicated downhole sampling equipment will be steam cleaned or triple-washed between each soil boring location and prior to reuse. Field screening of soil samples for organic vapors will be performed using a portable photoionization detector (PID) and any detections will be logged.

Soil samples will be collected for laboratory analysis at depth intervals shown in Table 9 using a slide hammer. Soil samples to be analyzed for semivolatile constituents will be collected in new, clean brass sleeves and sealed at each end with Teflon sheets, plastic end caps, and silicone tape. Soil samples to be analyzed for non-volatile constituents will be collected in either new, clean brass sleeves and sealed as described above or in new, clean glass jars. Samples will be labeled, sealed in plastic bags, placed in an ice-chilled cooler, and transported to a state-certified analytical laboratory under AMEC chain-of-custody procedures.

AMEC will collect grab groundwater samples from first-encountered groundwater at the seven borings indicated on Table 9. The exact depth intervals to be sampled will be determined in the field, based on the depth to groundwater and lithologic observations. Once the sampling interval has been determined, a pre-packed well screen, attached to polyvinyl chloride riser, will be installed through the outer drive casing. The lower drive casing will then be lifted approximately 5 feet to allow groundwater to flow into the borehole. The groundwater sample will be collected through the pre-pack well screen which will help filter out excess fines from the groundwater sample. If adequate groundwater recharge occurs, AMEC will purge at a low-flow rate to reduce turbidity prior to collecting a groundwater sample at each location. Prior to sampling, the dissolved oxygen, pH, and oxidation/reduction potential (ORP) of the groundwater will be measured and recorded in the field logs. These measurements will provide geochemical data, which may be used in evaluating groundwater results. If groundwater recharge is insufficient to allow for purging prior to sampling, a sample will be collected without purging.

Groundwater samples will be collected in appropriate new, laboratory-supplied containers, labeled, placed in an ice-chilled cooler, and transported to a state-certified analytical laboratory under AMEC chain-of-custody procedures.

Following completion of sampling activities, the drilling contractor will fill the borings with grout using a tremie pipe, according to CCEHD requirements. AMEC will use a global positioning system (GPS) unit to collect location information for all boring locations. The GPS unit to be used has an accuracy of approximately +/– 1 foot in the horizontal plane, and approximately +/– 3 feet in elevation.

5.3 ANALYTICAL METHODS

Samples will be analyzed by Creek Environmental Laboratories, Inc. (Creek), of San Luis Obispo, California. Soil and groundwater samples will be analyzed for the constituents indicated on Table 9 using the following methods:

- TPHd and TPHmo using U.S. EPA Method 8015M with silica gel preparation prior to analysis;
- VOCs using U.S. EPA Method 8260B;
- PCBs using U.S. EPA Method 8082;
- PAHs using U.S. EPA Method 8270C with selective ion monitoring;
- lead using EPA Method 6010B; and
- Title 22 metals using EPA Method 200.8/7470. Groundwater samples will be filtered in the field with a 0.45-micron filter prior to metals analysis.

If TPHd and/or TPHmo is detected in a sample, the following analyses will also be conducted:

- TPH Fractionation based on the DTSC's *Interim Guidance on Evaluating Human Health Risks from TPH* (DTSC, 2009a);
- Naphthalene, 1-methylnaphthalene, and 2-methylnaphtalene using U.S. EPA Method 8270C; and
- Hexane using EPA Method 8260.

5.4 INVESTIGATION-DERIVED WASTE MANAGEMENT

Soil cuttings, purge water, and rinse water generated during drilling will be temporarily stored at the CCPP in labeled, Department of Transportation (DOT)–approved 55-gallon drums, pending profiling, transportation, and off-site disposal or recycling at an appropriate facility. All waste containers will be clearly labeled with generator contact and phone number, drilling location(s), and date of generation. PG&E will be responsible for arranging for waste profiling and disposal.

Any disposable personal protection equipment (e.g., gloves, Tyvek® clothing, etc.) will be disposed as non-hazardous waste in the municipal trash.

6.0 QUALITY ASSURANCE PROJECT PLAN

The following sections comprise the quality assurance project plan (QAPP). The objective of the QAPP is to describe the quality assurance/quality control (QA/QC) procedures that AMEC will follow during investigative activities at the site and to assure production of data that are scientifically valid and are representative of field conditions.

Key project personnel and general responsibilities for each position are summarized below:

Principal-in-Charge (Susan Gallardo) – The Principal-in-Charge is responsible for reviewing all technical and policy decisions regarding the project.

Technical Reviewer (Robert Cheung) – The Technical Reviewer is responsible for reviewing technical aspects of the work including strategies, methods to be used, and key reports.

Project Manager (Jennifer Patterson)– The Project Manager is responsible for the scope, cost, and technical considerations related to the project; staff and project coordination; and implementation of review of overall project quality related to the collection, completeness, and presentation of data. The project manager is also responsible for interaction and coordination with PG&E, the regulatory agencies, and AMEC Geomatrix personnel.

Project Quality Assurance Officer (Jonathan Skaggs) – The Project Quality Assurance (QA) Officer is responsible for reviewing the project QA program as it relates to the collection and completeness of data from field and laboratory operations, including the training of personnel to follow established protocols and procedures. The QA Officer also monitors the maintenance and use of equipment necessary to conduct site field work.

6.1 SAMPLE COLLECTION, HANDLING, AND ANALYTICAL METHODS

The sample collection procedures and analytical method to be used during these investigative activities are presented in Section 5 of this report. Departures from these procedures and methods will be documented and discussed in the report of work findings. A summary of the required sample containers, preservation, and holding times for each anticipated analytical method is included in Table 10. Upon receipt of the samples, the analytical laboratory will document the condition of the samples, confirm the chain-of-custody record corresponds to that on the sample labels, and log in the samples.

6.2 QUALITY CONTROL SAMPLES

To evaluate the precision and accuracy of analytical data, field and laboratory quality control samples will be collected and analyzed. The minimum project requirements for collection and analysis of these samples are described below. It is anticipated that analyses will be performed by Creek, a California-certified analytical laboratory. Creek's laboratory quality manual dated August 31, 2009, is available upon request.

6.2.1 Equipment Blanks

An equipment field blank is prepared by pouring deionized water through the soil or groundwater sample collection device into sample bottles at the time of sample collection to check cleaning procedures. The deionized water should be obtained from the laboratory or from a clean, unopened, commercial container. Equipment blanks are preserved in the same manner as the groundwater samples and are transported with the project samples. Equipment blanks will not be identified as blanks to the laboratory. The sample identification number and time of sampling will be recorded. A minimum of one equipment blank will be obtained from each non-dedicated and reusable sampling device per day and analyzed using the U.S. EPA methods that will be used on soil or water samples collected that day.

6.2.2 Trip Blanks

A trip blank consists of deionized water that is added to the sample bottle by the subcontracted laboratory. It accompanies the other sample containers throughout the trip from the laboratory to the field and back to the laboratory. The purpose of a trip blank is to check for possible bottle, preservative, laboratory, or environmental contributions to the sample analytical results. If volatile compounds are to be analyzed for, a minimum of one travel blank per sample cooler containing groundwater samples will be collected and analyzed for volatile compounds.

6.2.3 Field Duplicate Samples

A field duplicate is an additional water sample that is collected from the same water source in an identical container and given a different sample identification number so that the laboratory will not know it is a duplicate. Duplicate samples will be submitted blind to the laboratory for identical analyses to check for analytical precision. Duplicate samples will be collected at the rate of at least one duplicate for every 20 project water samples collected for analysis by a given method.

6.2.4 Matrix Spikes and Matrix-Spike Duplicates

A matrix spike is an aliquot of a project sample, either soil or water, to which the laboratory adds a known quantity of a compound prior to sample extraction/digestion and analysis. The reported percent recovery of the known compound in the sample indicates the presence or absence of any effects of the matrix on the sample analyses. A matrix-spike duplicate is an aliquot of the matrix-spike sample that is analyzed separately; the results indicate the precision of the analytical method. A matrix-spike and matrix-spike duplicate analysis will be performed at least once with each analytical batch of soil or water samples, with a minimum of one for every 20 samples. The sample to be used for matrix-spike/matrix-spike duplicate analyses will be specified on the chain-of-custody form.

6.2.5 Laboratory Blanks

Laboratory blanks consist of laboratory-prepared samples of deionized and/or organic-free water that are analyzed prior to each batch of samples. The purpose of these samples is to check for laboratory contamination during preparation and analysis of soil or water samples. Laboratory blanks will be prepared and analyzed at least once for each analytical batch, with a minimum of one for every 20 samples.

6.2.6 Laboratory Control Standard

A laboratory control standard (LCS) or check sample is a sample prepared by the laboratory or commercial source, which contains known concentrations of the analytes of concern. It is subjected to the same preparation/extraction procedures as a soil or water sample, and is prepared independently of calibration standards. The LCS recovery checks the accuracy of the analytical methods and equipment, and will be prepared and analyzed at least once with each analytical batch, with a minimum of one for every 20 samples. LCS recoveries should fall within the limits set by the laboratory. Laboratory limits are based on a statistical analysis of all samples analyzed at the laboratory and are generally more stringent than the limits set by the U.S. EPA in SW-846.[5]

6.2.7 Laboratory Surrogate Compounds

A surrogate spike is an addition to the soil or water sample of a known concentration of an organic compound that is not expected to be a compound of concern in the sample. Every blank, quality control (QC) sample, and project sample will be spiked with surrogate compounds if specified by SW-846 for the particular analytical method (they are not required for metals analyses). The recovery of the surrogate evaluates the possible presence of systematic extraction problems. It should fall within the limits set by the laboratory in accordance with procedures specified by the method.

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[5] http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm

6.3 LABORATORY REPORTING LIMITS

The laboratory reporting limits for constituents of concern during these investigative activities are presented in Appendix A. Actual reporting limits cannot be guaranteed due to sample matrix properties, interference from other compounds present, and analytical instrument calibration variability. Because the analytical data will be used in a risk assessment, these reporting limits for soil and groundwater have been evaluated and selected so that they are below applicable regulatory screening levels for the media being analyzed.

6.4 DATA ASSESSMENT

The validity of data will be measured in terms of precision, accuracy, and completeness. The ways in which these three parameters will be evaluated for project data are described below.

6.4.1 Precision

For data generated by the laboratory, data precision will be estimated by comparing analytical results from duplicate samples and from matrix spikes and matrix spike duplicates. The comparison will be made by calculating the relative percent difference (RPD) given by:

$$RPD = \frac{2(S_1 - S_2)}{S_1 + S_2} x\ 100 \text{ percent}$$

Where: S_1 = sample
S_2 = duplicate

The goals for data precision for duplicate samples are summarized in Creek’s August 31, 2009 quality manual, which is available upon request. RPD goals are not applicable when the sample results are less than two times (organics) or five times (inorganics) the reporting limit. In those cases, duplicate results are acceptable when the absolute difference between the results is less than the reporting limit. When a compound is detected in one duplicate sample but is not detected at or above the laboratory reporting limit in the other sample, then the results are acceptable when the absolute difference between the detected result and the reporting limit is less than the reporting limit.

6.4.2 Accuracy

Data accuracy will be assessed for laboratory data only and is based on recoveries (R), expressed as the percentage of the true (known) concentration, from laboratory-spiked samples and QA/QC samples generated by the analytical laboratory. The equation for calculating recoveries is:

$$R = \frac{(A - B)}{T} x100 \text{ percent}$$

Where: A = measured concentration after spiking
B = background concentration
T = known true value of spike

This information will be reviewed periodically by the Project Manager or Project QA Officer.

6.4.3 Completeness

Data generated during the soil and groundwater sampling program will be evaluated for completeness, that is, the amount of data meeting project QA/QC goals. If data generated during field operations or via analytical procedures appear to deviate significantly from observed trends, the Project Manager or Project QA Officer will review field or laboratory procedures with the appropriate personnel to evaluate the cause of such deviations. Where data anomalies cannot be explained, resampling may be necessary.

6.5 DATA VALIDATION AND USABILITY

This section describes the QA/QC activities that will occur after the data collection phase of the project is completed. Implementation of this section will determine whether or not the data conform to the specified criteria, thus satisfying the project objectives.

Data validation is the process of reviewing data and accepting, qualifying, or rejecting data on the basis of sound criteria. Project personnel will validate field data by reviewing it to identify inconsistencies or anomalous values. The data validation approach for laboratory data will consist of a systematic review of the primary and QC sample analytical results. Data will be validated according to applicable guidelines set forth in the following sources, as appropriate:

- U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (OSWER 9240.1-48, EPA-540-R-08-01), June 2008; and

- U.S. EPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (OSWER 9240.1-45, EPA-540-R-04-004), October 2004.

Best professional judgment will be utilized, as necessary, in any area not specifically addressed by the U.S. EPA guidelines listed above.

Data validation will include a data completeness check of each data package and a thorough review of laboratory reporting forms. Specifically, this review will include:

- review of data package completeness;

- review of sample holding times;
- review of duplicate, blank, surrogate, and spike sample results;
- review of laboratory analytical reporting limits relative to the site monitoring program reporting limits;
- calculation and review of field duplicate relative percent differences;
- review of the laboratory reporting forms to evaluate whether the laboratory QC requirements were met and to determine the effect of exceeded QC requirements on the precision, accuracy, and sensitivity of the data; and
- application of standard data quality qualifiers to the data.

7.0 DEVELOPMENT OF PAH CLEANUP GOAL

The results of the focused HHRA concluded that under a hypothetical scenario in which surface and subsurface soil at the site is left exposed and no risk management measures are implemented once the power plant is constructed, such conditions may result in a calculated theoretical risk to hypothetical future on-site workers that is below the target cancer risk level typically used by regulatory agencies in assessing commercial scenarios (1×10^{-5}), but exceeds the *de minimis* level of 1×10^{-6} for unrestricted property use. Under this assumed scenario, carcinogenic PAHs in soil are the primary risk-driving COPCs. Reducing the concentrations and mass of affected soil would reduce the potential health risk and will be considered a remediation action objective. In support of the remediation action objective, remediation cleanup goals for carcinogenic PAHs will be developed to help define the extent of impacts in soil and target areas for remediation to protect human health. Following the completion of remediation activities, the concentrations of carcinogenic PAHs remaining in soil will be evaluated using statistical tools to confirm that the average concentrations are below the proposed cleanup levels.

8.0 HEALTH RISK ASSESSMENT

As indicated in the Site Conceptual Model above, the data collection and investigation procedures described herein are designed to obtain additional data to conduct a site-specific HHRA consistent with U.S. EPA and Cal/EPA guidelines. The additional data collected will be incorporated into the focused HHRA previously prepared for the CEC and a new updated HHRA will be prepared. Because the elevated concentrations of carcinogenic PAHs reported in soil near the southeast corner of the site will be removed as part of the Corrective Measures

Proposal, the updated HHRA will only assess data that will remain at the site. The purpose of the HHRA is to provide an assessment on the potential for adverse human health as a result of hypothetical exposure to chemicals detected in soil and/or groundwater at the site assuming no remedial action were to take place.

The updated HHRA will follow standard and customary practice as specified by Cal/EPA, DTSC, Human and Ecological Risk Division (HERD); and the U.S. EPA. Cal/EPA guidance will be used where different from U.S. EPA guidance. The primary guidance documents that will be used in the preparation of the HHRA include the following:

- DTSC's, Supplemental Guidance for Human Health Multimedia Risk Assessment of Hazardous Waste Sites and Permitted Facilities (DTSC, 1996);

- DTSC's, Preliminary Endangerment Assessment Guidance Manual (DTSC, 1999);

- U.S. EPA's Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, Part A (U.S. EPA, 1989); and

Additional guidance that addresses site-specific issues and chemical constituents will also be consulted. In addition, information gathered from the latest scientific literature may be consulted and incorporated with the prior approval of Cal/EPA, DTSC, HERD toxicologists.

The updated HHRA will be organized into sections that are consistent with the risk assessment steps outlined by the U.S EPA and Cal/EPA: data evaluation, exposure assessment, toxicity assessment, risk characterization, and uncertainties. If warranted based on the results, the updated risk assessment also will provide the basis for developing remediation cleanup goals and strategies consistent with the intended use of the property as part of the Corrective Measures Proposal.

8.1 DATA EVALUATION

As part of data evaluation, site characteristics and analytical data will be evaluated to identify the constituents that are potentially related to the site and for which there are data of sufficient quality to be used in a quantitative risk assessment (U.S. EPA, 1989). Site investigations have documented the presence of TPH, VOCs, PAHs, and metals in soil and TPH and metals in groundwater.

The methods for evaluating data usability for the updated HHRA will be in general accordance with the procedures outlined in the U.S. EPA publication *Guidance for Data Usability in Risk Assessment – Parts A and B* (U.S. EPA, 1992a). AMEC will evaluate the usability of the data based on: 1) documentation; 2) data sources; 3) analytical methods; 4) data review; and 5) data quality indicators (precision, accuracy, completeness, representativeness, and comparability). Data judged to be of sufficient quality will be tabulated. A summary of data for constituents detected at the site, including frequency of detection, range of detection limits, and range of detected values, will be presented in the updated HHRA. The detected constituents will then be evaluated to identify chemicals of potential concern (COPCs) following a thorough review of data, including frequency of detection, magnitude of detected concentrations, and spatial distribution of detected concentrations (i.e., potential hot spots). Except for metals and essential nutrients (e.g., iron, potassium, and sodium), constituents detected in at least one sample in each medium will be identified as COPCs.

Because metals occur naturally in soil, metal concentrations in soil will be statistically compared to site-specific background using the Wilcoxon-Mann-Whitney (WMW) test or the Gehan test, a similar methodology to the Wilcoxon Rank Sum Test presented in Cal-EPA guidance (DTSC, 1997), to identify site-related COPCs. The Mann-Whitney test examines whether measurements from one population are the same as measurements from another population. This test is non-parametric (i.e., not sensitive to the underlying distribution of the data) and can be used with censored data (i.e., non-detect values).

The site-specific background data set considered appropriate and representative for comparison with site data for the selection of COPCs is based on data previously collected by Fluor Daniel GTI (1988). Soil samples were collected and analyzed for metals at depths ranging from 0.5 to 24.5 feet bgs from 25 borings in an area located along the eastern boundary of the CCCP (Figure 4B). The samples were selected by Fluor Daniel GTI based on their locations away from the main plant operational areas. A summary of the site-specific data is presented in Table 11.

For metals in groundwater, all metals detected in groundwater will conservatively be retained as COPCs due to the lack of a site-specific background dataset.

As previously discussed, elevated concentrations of carcinogenic PAHs reported in soil near the southeast corner of the site will be removed as part of the Corrective Measures Proposal. As such, these data will not be considered in the updated HHRA.

8.2 EXPOSURE ASSESSMENT

As discussed in Section 3, potential future receptors include a hypothetical construction worker (e.g., trench/excavation) and hypothetical off-site residents/workers during construction, hypothetical on-site outdoor/indoor workers, and hypothetical off-site residents/workers during operations. It should be noted that any potential impacts to receptors will be managed under a risk-management plan which will incorporate all necessary protective measures. The exposure assessment hypothetically assumes that no protective measures will be employed.

For hypothetical future construction workers, if no protective measures were employed, several complete exposure pathways have been identified, including inhalation of ambient air (particulates and volatiles) and dermal contact with and ingestion of surface and subsurface soil during construction. In addition, construction workers may enter vaults or work in utility trenches that do not have mechanical ventilation making the exposure potentially different than outdoor air (and more similar to an indoor scenario). Potential significant exposures to groundwater are unlikely because future intrusive activities to the water table likely would require dewatering of trenches or excavations, thereby limiting dermal contact with groundwater by a hypothetical future construction worker. As an additional measure, any potential impacts associated with dermal contact with groundwater by future construction workers will be managed under a risk management plan. However, for the purpose of the risk assessment, potential hypothetical exposure from dermal contact with shallow groundwater will be quantitatively evaluated. The HHRA will conservatively assume that hypothetical future construction workers would be hypothetically exposed to constituents in groundwater via dermal contact and inhalation of volatiles when a trench is filled with shallow groundwater.

Nearby off-site residents could potentially be exposed to volatile constituents or dust particulates during construction of the power plant. The exposure pathway considered potentially complete for off-site residents includes inhalation of VOCs and particulates potentially released during construction activities. If needed, a risk management plan will be implemented to ensure that off-site receptors are fully protected.

Following the completion of construction activities (i.e., during plant operations), off-site residents also could potentially be exposed to volatile COPCs or dust particulates in ambient air. However, potential exposures to volatile COPCs by off-site residents are not expected to be significant because intrusive construction-related activities would have been completed and the lack of residual sources given that detected concentrations of volatile constituents are extremely low. Once the power plant is constructed, a majority of the site will be covered by power blocks and associated infrastructure, buildings, tanks, pavement, gravel, and compacted soil. Therefore, potential exposures from inhalation of particulates at an off-site location also are expected to be insignificant. However, to account for the possibility that some of the areas within the site may be exposed, inhalation of airborne particulates as dust will be quantitatively evaluated.

Off-site commercial/industrial workers could potentially be exposed to COPCs during both construction and subsequent plant operations similar to off-site residents. The potential exposure of off-site commercial/industrial workers, however, would be expected to be less than off-site residents due to shorter exposure frequencies and duration. Therefore, only the potential exposure of off-site residents will be evaluated quantitatively.

During plant operations, future hypothetical outdoor industrial worker exposure pathways are incomplete because a majority of the site will be covered by power plant buildings, associated infrastructure and equipment, and paved hardscape (e.g., asphalt concrete parking). Thus, potential direct pathways from inhalation of particulates in ambient air, dermal contact with soil, and incidental ingestion of soil are incomplete for a hypothetical future worker. However, these pathways will conservatively be evaluated for the hypothetical outdoor worker. For the hypothetical indoor industrial worker, the primary pathway is the potential migration of volatile constituents in soil into indoor air of enclosed structures.

Use of groundwater as a drinking water source is considered an incomplete exposure pathway because groundwater beneath the site is not considered a viable drinking water source and municipal drinking water is readily available.

The overall approach of the updated HHRA will be consistent with the Reasonable Maximum Exposure (RME) approach as defined by U.S. EPA (1989). The RME approach is defined as the “highest exposure that is reasonably expected to occur at the site.” Hypothetical exposure point concentrations (EPCs) for each COPC in each media will be estimated based on the 95 percent upper confidence limit (95% UCL) or maximum concentration detected, whichever was lower (U.S. EPA, 1992b and 2002a). For the HHRA, U.S. EPA’s ProUCL software version 4.0 (U.S. EPA, 2007) will be used to develop 95% UCLs. Given that groundwater is present between 6 and 11 feet bgs and subsurface soils could be redistributed at the land surface during excavation and grading, only soil data collected from the top 10 feet will be considered for the HHRA.

The “Annual Average Daily Dose” (AADD) or “Lifetime Average Daily Dose” (LADD) will be used to quantify hypothetical potential exposure in the HHRA. The AADD is used as a standard measure for characterizing long-term noncarcinogenic effects. The LADD, which addresses hypothetical exposures that may occur over varying durations from a single event to an average 70-year human lifetime, is used to estimate potential carcinogenic risk. Equations for calculating AADD and LADD published by the U.S. EPA will be used (U.S. EPA, 1989).

Hypothetical potential exposure assumptions used in the daily intake calculations will be based on information contained in U.S. EPA and Cal/EPA DTSC risk guidance, site-specific information, and professional judgment, and will represent upper-bound conservative values under a RME scenario. Tables 12 through 16 present the proposed hypothetical potential exposure parameters and values for each receptor for which quantitative risk calculations will be performed.

8.3 TOXICITY ASSESSMENT

Toxicity criteria to be used in the updated HHRA will be presented in tabular summaries and will be selected according to the following hierarchy:

1. Office of Environmental Health Hazard Assessment (OEHHA), 2009a, Cal/EPA Toxicity Criteria Database, OEHHA, on-line database;
2. U.S. EPA, 2009a Integrated Risk Information System (IRIS) on-line database;
3. U.S. EPA, 2009b, Regional Screening Levels; and
4. U.S. EPA, 2004, Region 9 Preliminary Remediation Goals (PRGs).

TPH measurements, such as extractables (e.g., diesel [TPHd] and motor oil [TPHmo]), represent mixtures of chemicals that, because of their highly variable composition, have typically not had descriptive health criteria. Therefore, the toxicity of these mixtures has been historically described by the aggregate toxicity of key individual chemicals in the mixture, such as benzene, toluene, ethylbenzene, and xylene (collectively known as BTEX) and PAHs. Although the DTSC still recommends the use of BTEX to represent the toxicity of the C_6-C_8 aromatic fraction, DTSC has provided interim guidance which provides a methodology to quantitatively include TPH measurements in a risk evaluation (DTSC, 2009a). This interim guidance will be followed in the HHRA to assess potential health effects associated with TPH.

Specifically, the guidance provides recommended reference doses for TPH fractions based on the range of carbon atoms in the mixture and the structure of the carbon chain (aliphatic or aromatic). The fractions described are C_5-C_8 aliphatic, C_6-C_8 aromatic, C_9-C_{18} aliphatic, C_9-C_{16} aromatic, C_{17}-C_{32} aliphatic and aromatic. The DTSC recommends carbon ranges loosely corresponding to TPH quantified as gasoline, diesel, and motor oil. The TEH data from the 1997 investigation at the site was reported in the C_9-C_{40} carbon range. Since aliphatic and aromatic fractions are not available for the historical data, the ratio of the speciated fractionated TPH and the aggregate TPH from the proposed sampling and analysis dataset will be applied to historical data; the default assumption that 50 percent of the TPH quantified as diesel and motor oil is aliphatic and the remaining 50 percent is aromatic will not be made unless sufficient fractionated and aggregated TPH are not generated from this proposed sampling program (i.e., low to no TPH detections). In addition, consistent with the guidance, because naphthalene and methylnaphthalenes will be analyzed individually at the site as part of TPH fractionation, the less conservative oral reference dose (RfD) of 0.03 mg/kg-day will be used to quantify the health impacts from the measured aromatic fraction (C_{11}-C_{16}) that overlaps with the DTSC fraction (C_9-C_{16}).

If lead is identified as a COPC, the U.S. EPA's Adult Lead Methodology (ALM; U.S. EPA, 2005) model and Cal-EPA's model, LeadSpread, will be used (DTSC, 2009b) to evaluate hypothetical potential health concerns associated with lead exposure.

Per OEHHA (2009b), LeadSpread is currently under revision to ensure that the model is adequately protective of women of child-bearing age. Therefore, the most recent version of U.S. EPA's ALM model (U.S. EPA, 2005) will be modified with OEHHA input parameters (OEHHA, 2009b) and used to evaluate potential health risks to adults of childbearing ages. In the ALM model, exposure to lead is evaluated in two steps. The first step is designed to estimate the blood-lead concentration in adults based on a given exposure to lead in soil using a biokinetic slope factor, which relates increases in typical adult blood lead concentrations to average daily lead exposure. The second step of the model is designed to estimate the corresponding blood-lead concentration in a fetus assuming the adult is a pregnant female. The average blood-lead level in an adult is multiplied by the proportion of fetal blood-lead concentration at birth based on maternal blood-lead concentration, and an estimated value of the individual geometric standard deviation among adults.

8.4 RISK CHARACTERIZATION AND UNCERTAINTIES

Finally, the results of the COPC analysis, hypothetical exposure assessment, and toxicity evaluation will be integrated to estimate the possible likelihood of an adverse health effect for the hypothetical receptors identified for the assessment. Potential noncarcinogenic health effects will be expressed in terms of a "hazard quotient," which is equal to the estimated level of exposure (or dose) divided by the RfD. As a screening approach, hazard quotients will be conservatively summed for all COPCs to calculate a hazard index assuming they all affect the same health effect endpoint. A hazard quotient or hazard index less than or equal to one (1) indicates that the predicted potential exposure should not result in noncarcinogenic health effects. Theoretical excess lifetime cancer risks will be calculated by multiplying the estimated level of exposure (dose) over a lifetime by the chemical-specific cancer slope factor. As with the hazard index, the theoretical estimated cancer risks for each chemical and potential exposure pathway will be summed to estimate the total excess lifetime cancer risk for the hypothetically exposed individual. In discussing the results of the HHRA, theoretical carcinogenic risks will be compared with the acceptable risk range of 1×10^{-6} to 1×10^{-4}. The estimates of theoretical risk and hazard will be presented and summarized in tables.

The final component will be an assessment of the uncertainty in the estimated noncarcinogenic hazard indexes and carcinogenic risks. Uncertainty is inherent in many aspects of the risk assessment process, and generally arises from a lack of knowledge of (1) site conditions, (2) toxicity and dose-response of the COPCs, and/or (3) the extent to which an individual may be exposed (if at all) to chemicals. This lack of knowledge means that assumptions must be made based on information presented in the scientific literature or professional judgment. Although some assumptions have significant scientific basis, many do not. The assumptions that introduce the greatest amount of uncertainty and their effects on the findings of the HHRA will be discussed. The discussion of uncertainties and limitations of the risk assessment will be qualitative in nature, reflecting the difficulty in quantifying the uncertainty in specific assumptions. In general, assumptions will be selected in a manner that purposefully biases the process toward health protection.

8.5 PROPOSED REMEDIATION CLEANUP GOALS

If the results of the updated HHRA indicate that chemicals detected in soil and groundwater other than PAHs pose a potential risk to current and future populations, remediation cleanup goals will be developed to protect public health in support of the Corrective Measures Proposal.

9.0 REPORT

Following completion of field activities, sample analysis, validation of the analytical laboratory results, and analysis of the data, AMEC will prepare a report summarizing the sampling methods and results and presenting the results of the updated HHRA. The report will contain:

- a description of the MLGS background information and previous site investigations, field activities, analytical results, updated HHRA results, and conclusions;
- a site map depicting sampling locations;
- data tables summarizing the soil and groundwater data, including both historical data and data obtained during this investigation;
- analytical laboratory reports and chain-of-custody forms;
- the EPCs for all COPCs found on the MLGS site;
- a list of all potential theoretical exposure pathways and assumptions for all hypothetical receptors assessed;
- a table that provides all potential exposure input values for each hypothetical receptor assessed;

- a table that includes all physical parameters and toxicity values for all COPCs assessed;

- a table showing the results for theoretical cancer risk, acute hazard index, and chronic hazard index by COPCs and by potential exposure pathway; and

- proposed remediation cleanup goals for risk-driving COPCs in support of the Corrective Measures Proposal.

10.0 SCHEDULE

We anticipate that the field activities will begin within 2 weeks of receiving DTSC comments and/or approval of this work plan, depending on contractor availability, and will require approximately 5 days to complete. We currently anticipate field work to be conducted in April. Based on this planned schedule, we expect to submit the draft investigation report along with the HHRA to DTSC in late June/early July 2010.

11.0 REFERENCES

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TABLES

TABLE 1

SOIL ANALYTICAL RESULTS - METALS [1]
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Fluor Daniel GTI 1997 Phase II Investigation [2]																				
CB5-003	9/29/1997	0.5	<6.0	1.2	44	<0.50	<2.0	15	5.3	6.9	---	3.3	<0.050	<10	17	<1.0	<2.0	<1.0	23	21
		4.5	<6.0	1.7	28	<0.50	<2.0	14	(4.6)	4.5	---	1.7	<0.050	<10	16	<1.0	<2.0	<1.0	22	19
CB5-004	9/29/1997	0.5	<6.0	2.8	36	<0.50	<2.0	13	(4.3)	5.7	---	3.2	<0.050	<10	14	<1.0	<2.0	<1.0	20	18
		4.5	<6.0	1.3	29	<0.50	<2.0	12	(3.8)	5.0	---	1.4	<0.050	<10	17	<1.0	<2.0	<1.0	17	19
		4.5 (dup)	<6.0	1.4	27	<0.50	<2.0	14	(3.9)	5.2	---	1.3	<0.050	<10	17	<1.0	<2.0	<1.0	19	16
CB5-005	9/29/1997	0.5	<6.0	6.9	49	<0.50	<2.0	630	17	51	---	30	<0.050	<10	400	<1.0	<2.0	<1.0	39	79
		4.5	<6.0	1.5	35	<0.50	<2.0	26	(4.8)	5.9	---	2.3	<0.050	<10	22	<1.0	<2.0	<1.0	19	20
CB5-006	9/29/1997	0.5	<6.0	1.1	41	<0.50	<2.0	13	(4.8)	5.8	---	1.6	<0.050	<10	15	<1.0	<2.0	<1.0	19	17
		4.5	<6.0	0.83	37	<0.50	<2.0	13	(4.2)	5.0	---	1.3	<0.050	<10	16	<1.0	<2.0	<1.0	18	16
CB5-007	9/25/1997	0.5	<6.0	2.2	130	<0.50	<2.0	26	9.3	15	---	2.7	(0.032)	<10	41	<1.0	<2.0	<1.0	37	33
		5.5	<6.0	1.0	33	<0.50	<2.0	12	(4.3)	4.8	---	1.2	<0.050	<10	15	<1.0	<2.0	<1.0	19	17
CB5-014	9/29/1997	1.25	<6.0	2.2	72	<0.50	<2.0	20	6.0	9.0	---	2.2	<0.050	<10	20	<1.0	<2.0	<1.0	28	21
		4.5	<6.0	1.5	32	<0.50	<2.0	12	(4.3)	4.9	---	1.5	<0.050	<10	18	<1.0	<2.0	<1.0	20	17
CB5-015	9/29/1997	0.5	<6.0	1.5	52	<0.50	<2.0	16	5.2	7.2	---	1.9	<0.050	<10	19	<1.0	<2.0	<1.0	24	21
		4.5	<6.0	1.6	45	<0.50	<2.0	14	(4.6)	5.8	---	1.9	<0.050	<10	17	<1.0	<2.0	<1.0	21	18
CB5-016	9/29/1997	0.5	<6.0	4.0	66	<0.50	<2.0	7.7	(3.2)	6.0	---	5.6	<0.050	<10	8.9	<1.0	<2.0	<1.0	32	16
		4.5	<6.0	0.99	44	<0.50	<2.0	10	(4.2)	5.3	---	1.4	<0.050	<10	12	<1.0	<2.0	<1.0	16	17
CB5-017	9/29/1997	0.5	<6.0	3.6	130	<0.50	<2.0	32	8.4	16	---	5.2	<0.050	<10	37	<1.0	<2.0	<1.0	33	43
		4.5	<6.0	1.5	41	<0.50	<2.0	12	(3.7)	6.2	---	2.1	<0.050	<10	12	<1.0	<2.0	<1.0	19	21
CB5-018	9/23/1997	0.5	<6.0	1.8	32	<0.50	<2.0	11	(3.8)	5.0	---	2.4	(0.011)	<10	14	<1.0	<2.0	<1.0	18	20
		5.5	<6.0	0.93	31	<0.50	<2.0	9.7	(3.5)	5.0	---	4.5	<0.050	<10	12	<1.0	<2.0	<1.0	14	23
CB5-025	9/29/1997	0.5	<6.0	1.9	84	<0.50	<2.0	31	6.4	9.7	---	2.3	<0.050	<10	26	<1.0	<2.0	<1.0	27	22
		4.5	<6.0	1.3	29	<0.50	<2.0	10	(2.5)	4.5	---	2.2	<0.050	<10	11	<1.0	<2.0	<1.0	16	20
CB5-026	9/29/1997	0.5	<6.0	5.5	170	<0.50	<2.0	36	9.6	23	---	6.5	0.072	<10	43	<1.0	<2.0	<1.0	45	50
		4.5	<6.0	1.4	47	<0.50	<2.0	15	(4.6)	5.0	---	1.8	<0.050	<10	17	<1.0	<2.0	<1.0	23	17
CB5-027	9/25/1997	0.5	<6.0	2.5	140	<0.50	<2.0	29	7.6	14	---	5.7	(0.047)	<10	33	<1.0	<2.0	<1.0	32	33
		5.5	<6.0	1.1	40	<0.50	<2.0	12	(3.6)	5.5	---	4.2	<0.050	<10	11	<1.0	<2.0	<1.0	20	<21
C85-028	9/25/1997	0.5	<6.0	2.6	83	<0.50	<2.0	22	7.2	13	---	8.0	<0.050	<10	5.6	<1.0	<2.0	<1.0	31	31
		5.5	<6.0	1.1	29	<0.50	<2.0	9.2	(3.2)	4.3	---	1.4	<0.050	<10	13	<1.0	<2.0	<1.0	14	<17
CB5-029	9/23/1997	0.5	<6.0	1.3	120	<0.50	<2.0	8.1	11	31	---	1.0	(0.02)	<10	6.6	<1.0	<2.0	<1.0	62	42
		5.5	<6.0	1.2	34	<0.50	<2.0	11	(3.5)	4.7	---	2.9	<0.050	<10	10	<1.0	<2.0	<1.0	16	19
CB5-036	9/25/1997	0.5	<6.0	3.0	120	<0.50	<2.0	32	7.2	14	---	4.7	(0.046)	<10	29	<1.0	<2.0	<1.0	34	26
		5.5	<6.0	1.3	28	<0.50	<2.0	8.8	(3.3)	4.2	---	2.0	<0.050	<10	12	<1.0	<2.0	<1.0	13	<15
CB5-037	9/25/1997	0.5	<6.0	1.7	82	<0.50	<2.0	32	7.5	21	---	20	0.13	<10	25	<1.0	<2.0	<1.0	31	46
		5.5	<6.0	1.2	27	<0.50	<2.0	11	(3.3)	4.5	---	4.3	<0.050	<10	11	<1.0	<2.0	<1.0	16	<17
CB5-038	9/25/1997	0.5	<6.0	1.2	43	<0.50	<2.0	15	(4.0)	5.6	---	2.3	<0.050	<10	16	<1.0	<2.0	<1.0	17	<17
		5.5	<6.0	1.2	36	<0.50	<2.0	12	(3.8)	5.0	---	3.0	<0.050	<10	10	<1.0	<2.0	<1.0	20	<18
CB5-039	9/25/1997	0.5	<6.0	1.3	26	<0.50	<2.0	8.9	(3.0)	3.8	---	1.7	(0.03)	<10	11	<1.0	<2.0	<1.0	12	<13
		5.5	<6.0	1.0	39	<0.50	<2.0	13	(4.4)	5.6	---	1.9	<0.050	<10	12	<1.0	<2.0	<1.0	21	<19

TABLE 1

SOIL ANALYTICAL RESULTS - METALS [1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
CB5-040	9/22/1997	0.5	<6.0	**1.1**	**34**	<0.50	<2.0	**11**	**(3.8)**	**6.4**	---	**3.4**	<0.050	<10	**15**	<1.0	<2.0	<1.0	**16**	**20**
		4.5	<6.0	**2.6**	**394**	<0.50	<2.0	**12**	**(4.6)**	**5.3**	---	**4.8**	<0.050	<10	**17**	**1.6**	<2.0	**1.5**	**16**	**19**
		9.5	<6.0	**0.92**	**36**	<0.50	<2.0	**12**	**(4.7)**	**4.7**	---	**1.4**	**(0.017)**	<10	**16**	<1.0	<2.0	<1.0	**19**	**17**
CB5-051	9/25/1997	0.5	<6.0	**3.8**	**170**	<0.50	<2.0	**37**	**9.6**	**18**	---	**5.2**	**(0.044)**	<10	**35**	<1.0	<2.0	<1.0	**34**	**32**
		4.5	<6.0	**1.3**	**32**	<0.50	<2.0	**11**	**(3.6)**	**5.4**	---	**1.5**	**(0.034)**	<10	**14**	<1.0	<2.0	<1.0	**17**	**16**
CB5-052	9/25/1997	1.5	<6.0	**1.7**	**82**	<0.50	<2.0	**26**	**12**	**63**	---	**3.7**	**0.14**	<10	**23**	<1.0	<2.0	<1.0	**42**	**23**
		5.5	<6.0	**1.2**	**34**	<0.50	<2.0	**14**	**(4.2)**	**6.0**	---	**1.9**	<0.050	<10	**16**	<1.0	<2.0	<1.0	**21**	**20**
CB5-053	9/25/1997	0.5	<6.0	**1.7**	**62**	<0.50	<2.0	**26**	**5.5**	**8.3**	---	**3.2**	<0.050	<10	**24**	<1.0	<2.0	<1.0	**24**	**25**
		5.5	<6.0	**1.3**	**34**	<0.50	<2.0	**10**	**(4.1)**	**4.8**	---	**1.3**	**(0.031)**	<10	**10.0**	<1.0	<2.0	<1.0	**17**	**14**
CB5-054	9/25/1997	0.5	<6.0	**1.7**	**99**	<0.50	<2.0	**28**	**10**	**26**	---	**2.6**	**0.41**	<10	**32**	<1.0	<2.0	<1.0	**43**	**36**
		5.5	<6.0	**1.2**	**43**	<0.50	<2.0	**12**	**(4.2)**	**5.2**	---	**2.0**	**0.28**	<10	**14**	<1.0	<2.0	<1.0	**16**	**18**
CB5-055	9/22/1997	0.5	<6.0	**1.3**	**39**	<0.50	<2.0	**31**	**9.7**	**17**	---	**6.4**	**(0.030)**	<10	**110**	<1.0	<2.0	<1.0	**21**	**20**
		4.5	<6.0	**1.0**	**43**	<0.50	<2.0	**14**	**5.3**	**7.7**	---	**1.7**	**(0.011)**	<10	**22**	<1.0	<2.0	<1.0	**17**	**20**
		9.5	<6.0	**0.84**	**26**	<0.50	<2.0	**14**	**(4.4)**	**4.7**	---	**1.6**	<0.050	<10	**16**	<1.0	<2.0	<1.0	**22**	**17**
CB5-066	12/3/1997	0.5	<6.0	**1.2**	**34**	<0.50	<2.0	**12**	**(4.2)**	**5.6**	**6700**	**2.6**	<0.050	<10	**15**	<1.0	<2.0	<1.0	**16**	**17**
		4.5	<6.0	**2.5**	**49**	<0.50	<2.0	**15**	**5.7**	**8.1**	**9600**	**2.0**	<0.050	<10	**23**	<1.0	<2.0	<1.0	**26**	**21**
		9.5	<6.0	**1.7**	**34**	<0.50	<2.0	**13**	**(4.5)**	**5.5**	**7100**	**1.5**	<0.050	<10	**18**	<1.0	<2.0	<1.0	**18**	**16**
		14.5	<6.0	**3.3**	**59**	<0.50	<2.0	**19**	**7.9**	**8.7**	**11000**	**2.5**	<0.050	<10	**33**	<1.0	<2.0	<1.0	**27**	**28**
AMEC Geomatrix 2009 Investigation [3]																				
SB-5	12/14/09	1.0	<0.4	**2.4**	**81**	<0.4	<0.4	**17**	**5.2**	**10**	---	**6.6**	<0.04	<0.4	**20**	<0.5	<0.4	<0.4	**26**	**36**
		2.0	<0.4	**1.7**	**59**	<0.4	<0.4	**17**	**4.9**	**8.2**	---	**3**	<0.04	<0.4	**17**	<0.5	<0.4	<0.4	**24**	**22**
SB-6	12/14/09	1.0	<0.4	**2.6**	**76**	<0.4	<0.4	**22**	**6.0**	**13**	---	**15**	<0.04	**0.4**	**23**	<0.5	<0.4	<0.4	**32**	**54**
		2.0	<0.4	**1.2**	**54**	<0.4	<0.4	**16**	**4.6**	**6.9**	---	**2.4**	<0.04	<0.4	**16**	<0.5	<0.4	<0.4	**20**	**19**
SB-7	12/15/09	1.0	<0.4	**3.2**	**59**	<0.4	<0.4	**18**	**4.9**	**10**	---	**14**	<0.04	**0.4**	**22**	<0.5	<0.4	<0.4	**26**	**56**
		2.0	<0.4	**1.3**	**45**	<0.4	<0.4	**13**	**4.2**	**6.5**	---	**2.3**	<0.04	<0.4	**15**	<0.5	<0.4	<0.4	**19**	**17**
SB-8	12/15/09	0.5	<0.4	**1.8**	**35**	<0.4	<0.4	**13**	**3.8**	**6.2**	---	**2.9**	<0.04	**0.5**	**16**	<0.5	<0.4	<0.4	**19**	**17**
SB-12	12/14/09	0.5	<0.4	**2.5**	**160**	<0.4	<0.4	**42**	**11**	**22**	---	**3.3**	**0.05**	**0.7**	**43**	<0.5	<0.4	<0.4	**40**	**30**
SB-13	12/14/09	0.5	<0.4	**2.4**	**180**	<0.4	<0.4	**41**	**9.4**	**20**	---	**4.3**	<0.04	<0.4	**36**	<0.5	<0.4	<0.4	**39**	**28**
SB-14	12/14/09	1.0	<0.4	**1.7**	**75**	<0.4	<0.4	**27**	**12**	**37**	---	**5.3**	**0.24**	<0.4	**28**	<0.5	<0.4	<0.4	**46**	**38**
SB-15	12/14/09	0.5	<0.4	**0.5**	**15**	<0.4	<0.4	**59**	**16**	**80**	---	**4**	**0.29**	**0.4**	**18**	<0.5	<0.4	<0.4	**95**	**17**

Notes

1. Detected concentrations are shown in bold.
2. Samples collected by Fluor Daniel GTI in 1997 and analyzed for metals using EPA Method 6000/7000 series. Analytical results were complied from data tables in Fluor Daniel GTI's June 1998 Phase II Environmental Site Assessment report; original laboratory data sheets were not available for review.
3. Samples collected by AMEC Geomatrix in 2009 and analyzed for Title 22 metals using EPA Method 6020/7471A.

Abbreviations

-- = not analyzed
( ) = Detected concentration is less than reporting limit
< = Constituent not detected above indicated reporting limit

bgs = below ground surface
dup = duplicate sample results
EPA = U.S. Environmental Protection Agency

TABLE 2

DETECTIONS OF METALS IN SOIL SAMPLES[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Concentrations reported in milligrams per kilogram (mg/kg)

Analyte	Number of Samples	Number of Detections	Minimum Detected Concentration	Maximum Detected Concentration
Antimony	68	0	NA	NA
Arsenic	68	60	0.5	6.9
Barium	68	60	15	394
Berryllium	68	0	NA	NA
Cadmium	68	0	NA	NA
Chromium	68	68	7.7	630
Cobalt	68	68	(2.5)	17
Copper	68	68	3.8	80
Iron	4	4	6700	11000
Lead	68	68	1.0	30
Mercury	68	20	(0.011)	0.41
Molybdenum	68	62	0.4	0.7
Nickel	68	68	5.6	400
Selenium	68	1	1.6	1.6
Silver	68	0	NA	NA
Thallium	68	1	1.5	1.5
Vanadium	68	68	12	95
Zinc	68	60	14	79

Notes

1. The metals data is a summary of both the Fluor Daniel GTI 1997 investigation and AMEC 2009 investigation.

Abbreviations

( ) = Detected concentration is less than reporting limit
NA = not applicable

TABLE 3

SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, and PCBs[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Petroleum Hydrocarbons							VOCs[2]	PCBs[2]
			TEH	TPHd	TPHmo	Aliphatic HCs (C_9-C_{18})	Aromatic HCs (C_9-C_{16})	Aliphatic HCs (C_{19}-C_{32})	Aromatic HCs (C_{17}-C_{32})		
Fluor Daniel GTI 1997 Phase II Investigation [3]											
CB4-068	10/8/1997	0.5	**37**	--	--	--	--	--	--	--	--
		4.5	**1.7**	--	--	--	--	--	--	--	--
		7.5	<1.0	--	--	--	--	--	--	--	--
CB4-069	10/8/1997	0.5	**10**	--	--	--	--	--	--	--	--
		4.5	<1.0	--	--	--	--	--	--	--	--
		7.5	<1.0	--	--	--	--	--	--	--	--
CB4-070	10/1/1997	0.5	<1.1	--	--	--	--	--	--	--	--
		4.5	<1.5	--	--	--	--	--	--	--	--
CB4-071	10/1/1997	0.5	<1.4	--	--	--	--	--	--	--	--
		4.5	<1.5	--	--	--	--	--	--	--	--
CB4-072	10/8/1997	0.5	<6.1	--	--	--	--	--	--	--	--
		4.5	<1.5	--	--	--	--	--	--	--	--
		9.5	**(0.88)**	--	--	--	--	--	--	--	--
CB4-073	10/1/1997	0.5	<1.3	--	--	--	--	--	--	--	--
		4.5	<2.2	--	--	--	--	--	--	--	--
CB4-074	10/1/1997	0.5	**20**	--	--	--	--	--	--	--	--
		4.5	<2.2	--	--	--	--	--	--	--	--
CB4-075	10/7/1997	0.5	<1.2	--	--	--	--	--	--	--	--
		0.5	**(0.96)**	--	--	--	--	--	--	--	--
	10/8/1997	3.5	**(0.79)**	--	--	--	--	--	--	--	--
CB4-076	10/8/1997	0.5	**120**	--	--	--	--	--	--	--	--
		2.5	<1.0	--	--	--	--	--	--	--	--
CB4-077	10/8/1997	0.5	**51**	--	--	--	--	--	--	--	--
		4.5	<6.4	--	--	--	--	--	--	--	--
		9.5	<1.8	--	--	--	--	--	--	--	--

TABLE 3

SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, and PCBs^1

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Petroleum Hydrocarbons							VOCs^2	PCBs^2
			TEH	TPHd	TPHmo	Aliphatic HCs (C_9-C_{18})	Aromatic HCs (C_9-C_{16})	Aliphatic HCs (C_{19}-C_{32})	Aromatic HCs (C_{17}-C_{32})		
CB4-078	9/29/1997	0.5	**68**	--	--	--	--	--	--	--	--
		4.5	**4.8**	--	--	--	--	--	--	--	--
CB4-079	10/7/1997	0.5	**110**	--	--	--	--	--	--	--	--
		3.5	<1.2	--	--	--	--	--	--	--	--
CB4-080	10/7/1997	0.5	**160**	--	--	--	--	--	--	--	--
		3.5	<1.5	--	--	--	--	--	--	--	--
CB4-081	9/30/1997	0.5	**18**	--	--	--	--	--	--	--	--
		5.5	**(0.97)**	--	--	--	--	--	--	--	--
CB4-082	10/8/1997	0.5	<30	--	--	--	--	--	--	--	--
		0.5 (dup)	<12	--	--	--	--	--	--	--	--
		4.5	<1.2	--	--	--	--	--	--	--	--
		9.5	<1.5	--	--	--	--	--	--	--	--
CB4-083	9/30/1997	0.5	**5.0**	--	--	--	--	--	--	--	--
		4.5	<2.2	--	--	--	--	--	--	--	--
CB4-084	9/30/1997	0.5	<1.8	--	--	--	--	--	--	--	--
		4.5	<2.0	--	--	--	--	--	--	--	--
CB4-085	9/30/1997	0.5	**3.8**	--	--	--	--	--	--	--	--
		4.5	**(0.68)**	--	--	--	--	--	--	--	--
CB4-086	9/30/1997	0.5	**25**	--	--	--	--	--	--	--	--
		4.5	**1.3**	--	--	--	--	--	--	--	--
CB4-087	9/30/1997	0.5	**18**	--	--	--	--	--	--	--	--
		4.5	**1.5**	--	--	--	--	--	--	--	--
CB4-088	9/30/1997	0.5	**1.7**	--	--	--	--	--	--	--	--
		4.5	**5.4**	--	--	--	--	--	--	--	--
CB4-089	10/8/1997	0.5	**250**	--	--	--	--	--	--	--	--
		4.5	**44**	--	--	--	--	--	--	--	--
		11.5	<1.8	--	--	--	--	--	--	--	--

TABLE 3

SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, and PCBs[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Petroleum Hydrocarbons							VOCs[2]	PCBs[2]
			TEH	TPHd	TPHmo	Aliphatic HCs (C_9-C_{18})	Aromatic HCs (C_9-C_{16})	Aliphatic HCs (C_{19}-C_{32})	Aromatic HCs (C_{17}-C_{32})		
CB4-090	10/13/1997	0.5	**150**	--	--	--	--	--	--	--	--
		0.5 (dup)	**260**	--	--	--	--	--	--	--	--
		4.5	**3.7**	--	--	--	--	--	--	--	--
		9.5	<2.3	--	--	--	--	--	--	--	--
		13.5	<2.0	--	--	--	--	--	--	--	--
CB4-091	9/30/1997	0.5	<2.2	--	--	--	--	--	--	--	--
		4.5	<1.5	--	--	--	--	--	--	--	--
		10.75	<1.2	--	--	--	--	--	--	--	--
		15.75	**6.2**	--	--	--	--	--	--	--	--
CB4-092	9/30/1997	0.5	**38**	--	--	--	--	--	--	--	--
		4.5	<2.8	--	--	--	--	--	--	--	--
		4.5 (dup)	**(0.66)**	--	--	--	--	--	--	--	--
		10.75	**(0.70)**	--	--	--	--	--	--	--	--
		15.75	**(0.59)**	--	--	--	--	--	--	--	--
CB4-093	10/1/1997	0.5	**120**	--	--	--	--	--	--	--	--
		4.5	**(0.89)**	--	--	--	--	--	--	--	--
		10.75	**(0.72)**	--	--	--	--	--	--	--	--
		15.75	<1.0	--	--	--	--	--	--	--	--
CB4-094	10/1/1997	0.5	**16**	--	--	--	--	--	--	--	--
		4.5	<1.7	--	--	--	--	--	--	--	--
		10.75	<1.2	--	--	--	--	--	--	--	--
		15.75	<1.0	--	--	--	--	--	--	--	--
CB4-095	9/30/1997	0.5	**72**	--	--	--	--	--	--	--	--
		4.5	<1.4	--	--	--	--	--	--	--	--
		10.75	<1.2	--	--	--	--	--	--	--	--
		15.75	<1.1	--	--	--	--	--	--	--	--

TABLE 3

SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, and PCBs[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Petroleum Hydrocarbons							VOCs[2]	PCBs[2]
			TEH	TPHd	TPHmo	Aliphatic HCs (C_9-C_{18})	Aromatic HCs (C_9-C_{16})	Aliphatic HCs (C_{19}-C_{32})	Aromatic HCs (C_{17}-C_{32})		
CB4-096	9/30/1997	0.5	**20**	--	--	--	--	--	--	--	--
		8.5	**(0.67)**	--	--	--	--	--	--	--	--
		13.75	**5.0**	--	--	--	--	--	--	--	--
		17.75	<2.6	--	--	--	--	--	--	--	--
CB4-097	10/1/1997	0.5	**24**	--	--	--	--	--	--	--	--
		4.5	**3.7**	--	--	--	--	--	--	--	--
		10.75	**(0.75)**	--	--	--	--	--	--	--	--
		15.75	**(0.87)**	--	--	--	--	--	--	--	--
CB4-098	10/1/1997	0.5	**60**	--	--	--	--	--	--	--	--
		4.5	<4.8	--	--	--	--	--	--	--	--
		10.75	<2.0	--	--	--	--	--	--	--	--
		15.75	<1.1	--	--	--	--	--	--	--	--
		15.75 (dup)	<1.1								
CB4-099	10/8/1997	0.5	**16**	--	--	--	--	--	--	--	--
	10/14/1997	0.5	**77**	--	--	--	--	--	--	--	--
		0.5 (dup)	**100**	--	--	--	--	--	--	--	--
		4.5	**87**	--	--	--	--	--	--	--	--
CB5-003	9/29/1997	0.5	**12**	--	--	--	--	--	--	All ND	All ND
		4.5	**5.1**	--	--	--	--	--	--	All ND	All ND
CB5-004	9/29/1997	0.5	**3.4**	--	--	--	--	--	--	**Xylene (Mixed Isomers) (0.0021)**	All ND
		4.5	**2.3**	--	--	--	--	--	--	All ND	All ND
		4.5 (dup)	**2.0**	--	--	--	--	--	--	All ND	All ND
CB5-005	9/29/1997	0.5	**590**	--	--	--	--	--	--	All ND	All ND
		4.5	**6.5**	--	--	--	--	--	--	All ND	All ND
CB5-006	9/29/1997	0.5	**140**	--	--	--	--	--	--	All ND	All ND
		4.5	**13**	--	--	--	--	--	--	All ND	All ND

TABLE 3

SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, and PCBs^1

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Petroleum Hydrocarbons							VOCs^2	PCBs^2
			TEH	TPHd	TPHmo	Aliphatic HCs (C_9-C_{18})	Aromatic HCs (C_9-C_{16})	Aliphatic HCs (C_{19}-C_{32})	Aromatic HCs (C_{17}-C_{32})		
CB5-007	9/25/1997	0.5	**1900^4**	--	--	--	--	--	--	All ND	All ND
		5.5	**(0.76)**	--	--	--	--	--	--	All ND	All ND
CB5-014	9/29/1997	1.25	**14**	--	--	--	--	--	--	**Methylene Chloride 0.015**	--
		4.5	**2.4**	--	--	--	--	--	--	**Methylene Chloride 0.018**	--
CB5-015	9/29/1997	0.5	<1.3	--	--	--	--	--	--	**Methylene Chloride (0.0058)**	--
		4.5	<1.7	--	--	--	--	--	--	**Methylene Chloride (0.0067)**	--
CB5-016	9/29/1997	0.5	**180**	--	--	--	--	--	--	All ND	--
		4.5	**3.5**	--	--	--	--	--	--	All ND	--
CB5-017	9/29/1997	0.5	**700**	--	--	--	--	--	--	All ND	--
		4.5	**6.6**	--	--	--	--	--	--	All ND	All ND
CB5-018	9/23/1997	0.5	<2.1	--	--	--	--	--	--	All ND	--
		5.5	**10**	--	--	--	--	--	--	**Methylene Chloride (0.0033)**	--
CB5-025	9/29/1997	0.5	**33**	--	--	--	--	--	--	**Methylene Chloride 0.013**	--
		4.5	**5.3**	--	--	--	--	--	--	**Methylene Chloride 0.013**	--
CB5-026	9/29/1997	0.5	**370**	--	--	--	--	--	--	**Methylene Chloride 0.019**	--
		4.5	**2.1**	--	--	--	--	--	--	**Methylene Chloride 0.012**	--
CB5-027	9/25/1997	0.5	**420^4**	--	--	--	--	--	--	All ND	--
		5.5	<1.2	--	--	--	--	--	--	All ND	--

TABLE 3

SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, and PCBs[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Petroleum Hydrocarbons							VOCs[2]	PCBs[2]
			TEH	**TPHd**	**TPHmo**	**Aliphatic HCs (C_9-C_{18})**	**Aromatic HCs (C_9-C_{16})**	**Aliphatic HCs (C_{19}-C_{32})**	**Aromatic HCs (C_{17}-C_{32})**		
CB5-028	9/25/1997	0.5	**140**[4]	--	--	--	--	--	--	All ND	--
		5.5	<2.8	--	--	--	--	--	--	**Methylene Chloride (0.0054)**	--
CB5-029	9/23/1997	0.5	**45**	--	--	--	--	--	--	All ND	--
		5.5	**7.1**	--	--	--	--	--	--	All ND	--
CB5-036	9/25/1997	0.5	**110**[4]	--	--	--	--	--	--	All ND	--
		5.5	<2.3	--	--	--	--	--	--	All ND	--
CB5-037	9/25/1997	0.5	**110**[4]	--	--	--	--	--	--	All ND	--
		5.5	<1.9	--	--	--	--	--	--	All ND	--
CB5-038	9/25/1997	0.5	**81**[4]	--	--	--	--	--	--	All ND	--
		5.5	<1.3	--	--	--	--	--	--	All ND	--
CB5-039	9/25/1997	0.5	<2.2	--	--	--	--	--	--	All ND	--
		5.5	**8.2**[4]	--	--	--	--	--	--	All ND	--
CB5-040	9/22/1997	0.5	**4.4**	--	--	--	--	--	--	**Methylene Chloride (0.0071)**	--
		4.5	**1.4**	--	--	--	--	--	--	**Methylene Chloride (0.0095)**	--
		9.5	<1.0	--	--	--	--	--	--	**Methylene Chloride (0.0087)**	--

TABLE 3

SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, and PCBs[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Petroleum Hydrocarbons							VOCs[2]	PCBs[2]
			TEH	**TPHd**	**TPHmo**	**Aliphatic HCs (C_9-C_{18})**	**Aromatic HCs (C_9-C_{16})**	**Aliphatic HCs (C_{19}-C_{32})**	**Aromatic HCs (C_{17}-C_{32})**		
CB5-051	9/25/1997	0.5	**140**	--	--	--	--	--	--	**Methylene Chloride 0.016 1,2,4-Trimethylbenzene 0.0064 p-Isopropyltoluene (0.0028) 1,3,5-Trimethylbenzene 0.0053**	--
		4.5	**8.9**	--	--	--	--	--	--	**Methylene Chloride 0.011**	--
CB5-052	9/25/1997	1.5	<1.7	--	--	--	--	--	--	**Methylene Chloride (0.0096)**	--
		5.5	**4.7**	--	--	--	--	--	--	**Methylene Chloride (0.0094)**	--
CB5-053	9/25/1997	0.5	**150**	--	--	--	--	--	--	**Methylene Chloride (0.0096)**	--
		5.5	<1.9	--	--	--	--	--	--	All ND	--
CB5-054	9/25/1997	0.5	**180[4]**	--	--	--	--	--	--	All ND	--
		5.5	**(0.69)**	--	--	--	--	--	--	All ND	--
CB5-055	9/22/1997	0.5	**280**	--	--	--	--	--	--	**Methylene Chloride 0.012**	--
		4.5	**38**	--	--	--	--	--	--	**Methylene Chloride (0.0043)**	--
		9.5	**7.8**	--	--	--	--	--	--	**Methylene Chloride (0.0096)**	--

TABLE 3

SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, and PCBs[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

			Petroleum Hydrocarbons								
Sample Location	**Date**	**Sample Depth (feet bgs)**	**TEH**	**TPHd**	**TPHmo**	**Aliphatic HCs (C_9-C_{18})**	**Aromatic HCs (C_9-C_{16})**	**Aliphatic HCs (C_{19}-C_{32})**	**Aromatic HCs (C_{17}-C_{32})**	**VOCs[2]**	**PCBs[2]**
CB5-066	12/3/1997	0.5	**25**	--	--	--	--	--	--	--	All ND
		4.5	<1.0	--	--	--	--	--	--	--	All ND
		9.5	<1.0	--	--	--	--	--	--	--	All ND
		14.5	<1.0	--	--	--	--	--	--	--	All ND
AMEC Geomatrix 2009 Investigation [5]											
SB-5	12/14/2009	1.0	--	<10	<10	--	--	--	--	All ND	All ND
		2.0	--	<10	<10	--	--	--	--	All ND	All ND
SB-6	12/14/2009	1.0	--	<10	<10	--	--	--	--	All ND	All ND
		2.0	--	<10	<10	--	--	--	--	All ND	All ND
SB-7	12/15/2009	1.0	--	<10	**12**	<10	<10	**22**	**34**	All ND [6]	All ND
		2.0	--	<10	<10	--	--	--	--	All ND	All ND
		3.5	--	<10	<10	--	--	--	--	--	--
SB-8	12/15/2009	0.5	--	<10	<10	--	--	--	--	--	All ND
		1.0	--	<10	<10	--	--	--	--	--	All ND
SB-9	12/14/2009	1.0	--	<10	<10	--	--	--	--	--	All ND
		3.0	--	--	--	--	--	--	--	--	All ND
SB-10	12/14/2009	1.0	--	<10	**24**	--	--	--	--	--	All ND
		3.0	--	--	--	--	--	--	--	--	All ND
SB-11	12/15/2009	1.0	--	<10	**25**	<10	<10	<10	<10	--	All ND
SB-12	12/14/2009	0.5	--	<10	**36**	<10	<10	<10	<10	--	All ND
SB-13	12/14/2009	0.5	--	<10	<10	--	--	--	--	--	All ND
SB-14	12/14/2009	1.0	--	<10	**48**	**160**	**71**	**480**	**540**	--	All ND
SB-15	12/14/2009	0.5	--	<10	**120**	<10	<10	**16**	**20**	--	All ND

TABLE 3

SOIL ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, and PCBs[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Notes

1. Detected concentrations are shown in **bold.**
2. Full list of VOC and PCB analytes are included in Fluor Daniel 1997 Phase II Investigation Report and AMEC 2010 Focused Site Investigation Report and Human Health Risk Assessment. Based on information in Fluor Daniel's 1997 report, methylene chloride was determined to be a laboratory contaminant.
3. Samples collected by Fluor Daniel GTI in 1997 and analyzed for TEH in the range of C_9 to C_{40} using Modified U.S. EPA Method 8015; TPH fractionation by ultrasonic extraction (EPA 3550B), silica gel fractionation (EPA 3630C/TNRCC1006), and GC/MS Method (EPA Method 8270C modified for TEPH) with the aromatic and aliphatic fractions analyzed separately; VOCs using U.S. EPA Method 8260; and PCBs using EPA Method 8081. Analytical results were complied from data tables in Fluor Daniel GTI's June 1998 Phase II Environmental Site Assessment report; original laboratory data sheets were not available for review.
4. Note on Fluor Daniel GTI data table indicates "Duplicate records found; data review required."
5. Samples collected by AMEC Geomatrix in 2009 and analyzed for TPHd (carbon range C_{10} through C_{25}) and TPHmo (carbon range C_{25} through C_{40}) using EPA Method 8015 with silica gel cleanup, VOCs using EPA Method 8260, and PCBs using EPA Method 8081. PCB concentrations were reported on a dry weight basis.
6. Methylene chloride was detected at 0.051mg/kg in the sample; however, the laboratory indicated this is likely due to laboratory contamination. Therefore, methylene chloride is considered to be not detected above 0.051 mg/kg.

Abbreviations

( ) = detected concentration is less than reporting limit
< = constituent not detected above indicated reporting limit
-- = not analyzed
All ND = none of the constituents listed in either the VOC or PCB lists were detected
bgs = below ground surface
dup = duplicate sample result
EPA = U.S. Environmental Protection Agency
HCs = hydrocarbons
PCBs = polychlorinated biphenyls
TEH = total extractable hydrocarbons
TPHd = total petroleum hydrocarbons quantified as diesel
TPHmo = total petroleum hydrocarbons quantified as motor oil
U = The compond analyzed for was not detected above the reported sample quantitation limit
VOCs = volatile organic compounds

TABLE 4

SOIL ANALYTICAL RESULTS - PAHs [1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo-(ghi)-perylene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoran-thene	Benzo(k)-fluoran-thene	Chrysene	Dibenz-(a,h)an-thracene	Fluoran-thene	Fluorene	Indeno-(1,2,3-cd)-pyrene	1-Methylnaph-thalene	2-Methylnaph-thalene	Naphtha-lene	Phenan-threne	Pyrene	B(a)p TEQ[2]
Fluor Daniel GTI 1997 Phase II Investigation [3]																					
CB4-073	10/1/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-074	10/1/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-075	10/7/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		0.5 (dup)	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		3.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-076	10/8/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		2.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-077	10/8/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		9.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-078	9/29/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-079	10/7/1997	0.5	<0.50	<10	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.30	--	--	<0.50	<0.50	<0.50	NC
		3.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-080	10/7/1997	0.5	<0.50	<10	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.30	--	--	<0.50	<0.50	<0.50	NC
		3.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-081	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-082	10/08/1997	0.5	<0.50	<10	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.50	<0.050	<0.50	<0.50	<0.30	--	--	<0.50	<0.50	<0.50	NC
		0.5 (dup)	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<010	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		9.5	<010	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-083	09/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-084	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-085	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-086	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-087	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC

TABLE 4

SOIL ANALYTICAL RESULTS - PAHs[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo-(ghi)-perylene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoran-thene	Benzo(k)-fluoran-thene	Chrysene	Dibenz-(a,h)an-thracene	Fluoran-thene	Fluorene	Indeno-(1,2,3-cd)-pyrene	1-Methylnaph-thalene	2-Methylnaph-thalene	Naphtha-lene	Phenan-threne	Pyrene	B(a)p TEQ[2]
CB4-088	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-089	10/8/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		4.5	<0.50	<10	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.30	--	--	<0.50	<0.50	<0.50	NC
		11.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-090	10/13/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		0.5 (dup)	<5.0	<100	<5.0	<5.0	<5.0	<2.5	<5.0	<5.0	<5,0	<2.5	<5.0	<5.0	<3.0	--	--	<5.0	<5.0	<5.0	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		9.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		13.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-091	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		10.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		15.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-092	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5 (dup)	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		10.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		15.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-093	10/1/1997	0.5	<0.20	<4.0	<0.20	**(0.12)**	<0.20	<0.10	<0.20	<0.20	<0.20	**0.11**	<0.20	<0.20	<0.12	--	--	<0.20	<0.20	<0.20	**0.12**
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		10.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		15.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-094	10/1/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		10.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		15.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-095	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<010	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		10.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0:10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		15.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-096	9/30/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		8.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		13.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		17.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC

TABLE 4

SOIL ANALYTICAL RESULTS - PAHs[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Acenaphthene	Acenaphthylene	Anthracene	Benzo-(ghi)-perylene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Chrysene	Dibenz-(a,h)an-thracene	Fluoranthene	Fluorene	Indeno-(1,2,3-cd)-pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene	B(a)p TEQ[2]
CB4-097	10/1/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		10.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		15.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-098	10/1/1997	0.5	<0.20	<4.0	<0.20	<0.20	<0.20	<0.10	<0.20	<0.20	<0.20	<0.10	<0.20	<0.20	<0.12	--	--	<0.20	<0.20	<0.20	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		10.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		15.75	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		15.75 (dup)	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB4-099	10/8/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
	10/14/1997	0.5	<0.50	<10	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.30	--	--	<0.50	<0.50	<0.50	NC
		0.5 (dup)	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.060	--	--	<1.0	<1.0	<1.0	NC
		4.5	<1.0	<20	<1.0	**(0.59)**	**1.1**	**0.71**	**2.3**	**(0.85)**	**3.0**	**2.9**	<1.0	<1.0	**0.74**	**--**	**--**	<1.0	<1.0	<1.0	**2.19**
CB5-003	9/29/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-004	9/29/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5 (dup)	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-005	9/29/1997	0.5	**(9.0)**	<200	<10	<10	<10	**(3.6)**	<10	<10	<10	<5.0	**14**	<10	<6.0	--	--	**(7.0)**	**13**	**(9.5)**	**0.13**
		4.5	<0.10	<2.0	<0.10	<0.10	**(0.072)**	**0.093**	**(0.094)**	<0.10	**(0.089)**	**0.051**	**0.15**	<0.10	**(0.044)**	**--**	**--**	<0.10	<0.10	**0.15**	NC
CB5-006	9/29/1997	0.5	**(1.6)**	<50	<2.5	**(2.3)**	**2.7**	**3.2**	**(1.7)**	<2.5	**(2.4)**	<1.2	**7.5**	<2.5	**2.1**	**--**	**--**	<2.5	**9.0**	**7.6**	**4.1**
		4.5	<0.10	<2.0	<0.10	**0.17**	**(0.061)**	**0.19**	**0.10**	**0.11**	**(0.081)**	<0.050	**(0.094)**	<0.10	<0.060	--	--	<0.10	<0.10	**0.17**	**0.23**
CB5-007	9/25/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-014	9/29/1997	1.25	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-015	9/29/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-016	9/29/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-017	9/29/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.050	<1.0	<1.0	<1.0	**(0.28)**	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-018	9/23/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	**(0.052)**	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-025	9/29/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.050	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC

TABLE 4

SOIL ANALYTICAL RESULTS - PAHs [1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(ghi)perylene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene	B(a)p TEQ[2]
CB5-026	9/29/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	**(0.26)**	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-027	9/25/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	**(0.70)**	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-028	9/25/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-029	9/23/1997	0.5	<0.20	<4.0	<0.20	<0.20	<0.20	<0.10	<0.20	<0.20	<0.20	<0.10	<0.20	<0.20	<0.12	--	--	<0.20	<0.20	<0.20	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.1	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-036	9/25/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-037	9/25/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-038	9/25/1997	0.5	<0.50	<10	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.50	<0.25	<0.50	<0.50	<0.30	--	--	<0.50	<0.50	<0.50	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-039	9/25/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-040	9/22/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		9.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-051	09125/97	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-052	9/25/1997	1.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-053	9/25/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	**(0.45)**	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<010	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-054	9/25/1997	0.5	<1.0	<20	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.60	--	--	<1.0	<1.0	<1.0	NC
		5.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-055	9/22/1997	0.5	<2.0	<40	<2.0	<2.0	<2.0	<1.0	<2.0	<2.0	<2.0	<1.0	<2.0	<2.0	<1.2	--	--	<2.0	<2.0	<2.0	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		9.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
CB5-066	12/3/1997	0.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		4.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		9.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC
		14.5	<0.10	<2.0	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.050	<0.10	<0.10	<0.060	--	--	<0.10	<0.10	<0.10	NC

TABLE 4

SOIL ANALYTICAL RESULTS - PAHs [1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

Sample Location	Date	Sample Depth (feet bgs)	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo-(ghi)-perylene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoran-thene	Benzo(k)-fluoran-thene	Chrysene	Dibenz-(a,h)an-thracene	Fluoran-thene	Fluorene	Indeno-(1,2,3-cd)-pyrene	1-Methylnaph-thalene	2-Methylnaph-thalene	Naphtha-lene	Phenan-threne	Pyrene	B(a)p TEQ[2]
AMEC Geomatrix 2009 Investigation [4]																					
SB-7	12/15/2009	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.2 J**	**0.2 J**	--	--	--	**--**
SB-8	12/15/2009	0.5	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.023	0.016	**0.024**	<0.010	<0.010	<0.010	<0.010	--	--	<0.010	<0.010	<0.010	**0.099**
SB-9	12/14/2009	1.0	<0.010	<0.010	<0.010	**0.018**	**0.023**	**0.022**	**0.015**	**0.019**	**0.026**	<0.010	**0.033**	<0.010	**0.014**	--	--	<0.010	**0.014**	**0.062**	**0.124**
		3.0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	<0.010	<0.010	<0.010	NC
SB-10	12/14/2009	1.0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	<0.010	<0.010	<0.010	NC
		3.0	<0.500	**4.9**	**2.5**	**2.5**	**27**	**8.6**	**2.5**	**2.3**	**32**	**1.1**	**29**	**0.5**	<0.500	--	--	**0.65**	**5.3**	**62**	**73.75**
SB-11	12/15/2009	1.0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.1	<0.1	<0.010	**<0.010**	**<0.010**	NC
		3.0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	<0.010	<0.010	**0.01**	NC
SB-12	12/14/2009	0.5	<0.010	<0.010	<0.010	**0.051**	**0.017**	**0.035**	**0.026**	**0.031**	**0.029**	<0.010	**0.021**	<0.010	**0.038**	<0.1	<0.1	<0.010	<0.010	**0.036**	**0.181**
SB-13	12/14/2009	0.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	--	<0.010	<0.010	<0.010	NC
SB-14	12/14/2009	1.0	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	**0.8 J**	**0.5 J**	<0.030	<0.030	**0.031**	NC
SB-15	12/14/2009	0.5	<0.010	<0.010	<0.010	<0.010	<0.010	**0.018**	**0.011**	<0.010	**0.017**	<0.010	**0.012**	<0.010	<0.010	<0.1	<0.1	<0.010	<0.010	**0.014**	**0.066**

Notes

1. Detected concentrations are shown in **bold.**
2. Benzo(a)pyrene TEQs were calculated for each sample that had at least one carcinogenic PAH detection above laboratory reporting limit. All results for non-detected carcinogenic PAHs were set at half of the detection limit. The equivalent is calculated using TEFs, adjusting the toxicity of the carcinogenic PAHs to the TEQ of benzo(a)pyrene.
3. Samples collected by Fluor Daniel GTI in 1997 and analyzed for PAHs using Modified EPA Method 8310. Analytical results were complied from data tables in Fluor Daniel GTI's June 1998 Phase II Environmental Site Assessment report; original laboratory data sheets were not available for review.
4. Samples collected by AMEC Geomatrix in 2009 and analyzed for PAHs using EPA Method 8270C with selective ion monitoring.

Abbreviations

( ) = detected concentration is less than reporting limit
< = constituent not detected above indicated reporting limit
-- = not analyzed
B(a)p TEQ = benzo(a)pyrene toxic equivalency
bgs = below ground surface
dup = duplicate sample results
EPA = U.S. Environmental Protection Agency
J = the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
NC = not calculated; none of the carcinogenic PAHs were detected above laboratory reporting limits
PAHs = polynuclear aromatic hydrocarbons
TEF = toxic equivalency factor

TABLE 5

SOIL ANALYTICAL RESULTS - ASBESTOS

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Units reported in fiber

Sample Location	Date	Sample Depth (feet bgs)	Asbestos
Fluor Daniel GTI 1997 Phase II Investigation [1]			
CB5-005	9/29/1997	4.5	0
CB5-006	9/29/1997	0.5	0
		4.5	0
CB5-014	9/29/1997	1.25	0
		4.5	0
CB5-015	9/29/1997	0.5	0
		4.5	0
CB5-016	9/29/1997	0.5	0
		4.5	0
CB5-017	9/29/1997	0.5	0
CB5-018	9/23/1997	0.5	0
		5.5	0
CB5-025	9/29/1997	0.5	0
		4.5	0
CB5-026	9/29/1997	0.5	0
		4.5	0
CB5-027	9/25/1997	0.5	0
		5.5	0
CB5-028	9/25/1997	0.5	0
		5.5	0
CB5-029	9/23/1997	0.5	0
		5.5	0
CB5-036	9/25/1997	0.5	0
		5.5	0
CB5-037	9/25/1997	0.5	0
		5.5	0
CB5-038	9/25/1997	0.5	0
		5.5	0
CB5-039	9/25/1997	0.5	0
		5.5	0
CB5-040	9/22/1997	0.5	0
		4.5	0
		9.5	0
CB5-051	9/25/1997	0.5	0
		4.5	0
CB5-052	9/25/1997	1.5	0
		5.5	0

TABLE 5

SOIL ANALYTICAL RESULTS - ASBESTOS

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Units reported in fiber

Sample Location	Date	Sample Depth (feet bgs)	Asbestos
CB5-053	9/25/1997	0.5	0
		5.5	0
CB5-054	9/25/1997	0.5	0
		5.5	0
CB5-055	9/22/1997	0.5	0
		4.5	0
		9.5	0

Note

1. Samples collected by Fluor Daniel GTI in 1997 and analyzed for asbestos using NIOSH Method 7400. Analytical results were complied from data tables in Fluor Daniel GTI's June 1998 Phase II Environmental Site Assessment report; original laboratory data sheets were not available for review.

Abbreviations

bgs = below ground surface
NIOSH = National Institute of Occupational Safety and Health

TABLE 6

GROUNDWATER ANALYTICAL RESULTS - METALS[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in micrograms per liter (µg/L)

Sample Location	Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium
Fluor Daniel GTI 1997 Phase II Investigation [2]													
CB5-004	9/29/1997	<60	<10	<200	<5.0	<20	---	<30	<50	<25	---	<4.0	---
CB5-007	9/25/1997	<60	<10	<200	<5.0	<20	---	<30	<50	<25	---	<5.0	---
CB5-027	9/29/1997	<60	**44**	<200	<5.0	<20	---	<30	<50	**(13)**	---	<4.0	---
CB5-051	9/29/1997	<60	**23**	<200	<5.0	<20	---	<30	<50	<25	---	<4.0	---
CB5-053	9/25/1997	<60	**64**	<200	<5.0	<20	---	<30	<50	**34**	---	<5.0	---
CB5-066	12/9/1997	<60 *[<60]* [3]	**37** ***[42]***	<200 ***[(120)]***	<5.0 *[<5.0]*	<20 *[<20]*	--- ***[30000]***	<30 *[<30]*	<50 *[<50]*	<25 *[<25]*	**71** ***[3500]***	**(2.7) [<4.0]**	--- ***[16000]***
	2/17/1998	---	**57**	---	---	---	---	---	---	---	---	---	---
AMEC Geomatrix 2009 Investigation [4]													
SB-1	12/15/2009	<8	<8	**74**	<8/<1	<8/<1	---	**13**	<8/<2	<8/**5**	---	<8/**3**	---
SB-2	12/15/2009	<8	<8	**86**	<8/<1	<8/<1	---	<8	<8/**1**	<8/<1	---	<8/<1	---
SB-2 DUP [5]	12/15/2009	<8	<8	**74**	<8/<1	<8/<1	---	**8**	<8/**1**	<8/<1	---	<8/<1	---
SB-3	12/15/2009	<8	**65**	**55**	<8/<1	<8/<1	---	**46**	<8/**3**	<8/**6**	---	<8/**2**	---
SB-4	12/14/2009	<8	**21**	**15**	<8/<1	<8/1	---	**26**	<8/<2	<8/**2**	---	<8/<1	---
SB-7	12/15/2009	<8	<8	**51**	<8/<1	<8/<1	---	**21**	<8/<2	<8/**2**	---	<8/**1**	---

Sample Location	Date	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Fluor Daniel GTI 1997 Phase II Investigation												
CB5-004	9/29/1997	---	<0.50	<100	<40	---	<50	<20	---	<10	<50	<110
CB5-007	9/25/1997	---	<0.50	<100	<40	---	<50	<20	---	<10	<50	<49
CB5-027	9/29/1997	---	<0.50	<100	<40	---	<50	<20	---	<10	**70**	<58
CB5-051	9/29/1997	---	<0.50	<100	<40	---	<50	<20	---	<10	**(37)**	<32
CB5-053	9/25/1997	---	<0.50	<100	**41**	---	**(14)**	<20	---	<10	**210**	**150**
CB5-066	12/9/1997	**---** ***[1100]***	<0.50 *[<0.50]*	**(66)** ***[<100]***	<40 *[<40]*	--- ***[4100]***	<50 *[<50]*	<20 *[<20]*	**---** ***[590000]***	<10 *[<10]*	**87** ***[100]***	<45 *[<68]*
	2/17/1998	---	---	---	---	---	---	---	---	---	---	---
AMEC Geomatrix 2009 Investigation												
SB-1	12/15/2009	---	<0.5<0.2	<8	<8	---	<8/<1	<8/<1	---	<8/<1	<10	<80
SB-2	12/15/2009	---	<0.5<0.2	<8	<8	---	<8/<1	<8/<1	---	<8/<1	<8	<80
SB-2 DUP [5]	12/15/2009	---	<0.5<0.2	**16**	**9**	---	<8/<1	<8/<1	---	<8/<1	<8	<80
SB-3	12/15/2009	---	<0.5<0.2	**14**	**16**	---	<8/<1	<8/<1	---	<8/<1	**180**	<80
SB-4	12/14/2009	---	<0.5/<0.2	**17**	<8	---	<8/<1	<8/<1U[6]	---	<8/<1	**68**	<80
SB-7	12/15/2009	---	<0.5<0.2	<8	**8**	---	<8/**3**	<8/<1	---	<8/<1	**19**	<80

TABLE 6

GROUNDWATER ANALYTICAL RESULTS - METALS[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Notes
1. Detected concentrations are shown in **bold.**
2. Samples collected by Fluor Daniel GTI in 1997 and analyzed for metals using EPA Method 6000/7000 series. Analytical results were complied from data tables in Fluor Daniel GTI's June 1998 Phase II Environmental Site Assessment report; original laboratory data sheets were not available for review.
3. Results shown in brackets and italics are for unfiltered samples.
4. Samples collected by AMEC Geomatrix in 2009 and analyzed for Title 22 metals using EPA Method 6020/7471A. Select metals (beryllium, cadmium, cobalt, copper, lead, mercury, selenium, silver, and thallium) were also analyzed using EPA Method 200.8/7470 to achieve lower reporting limits; results of these metal analyses are shown after the "/".
5. Blind duplicate sample was labeled as SB-20.
6. Silver was detected in sample SB-4-GW and the laboratory blank at the method detection limit of 0.1 µg/L. This result was flagged with a "U" to indicate that silver is considered not detected above the laboratory reporting limit.

Abbreviations

--- = Not analyzed
( ) = Detected concentration is less than reporting limit
< = Constituent not detected above indicated reporting limit
EPA = U.S. Environmental Protection Agency
U = The analyte was analyzed for, but was not detected above the reported sample quantitaion limit.

TABLE 7

DECTIONS OF METALS IN GROUDNWATER SAMPLES[1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in micrograms per liter (µg/L)

Analyte	Number of Samples	Number of Detections	Minimum Detected Concentration	Maximum Detected Concentration
Antimony	12	0	NA	NA
Arsenic	13	7	21	65
Barium	12	7	15	86
Berryllium	12	0	NA	NA
Cadmium	12	0	NA	NA
Chromium	12	5	8	46
Cobalt	12	3	1	3
Copper	12	5	2	34
Iron	1	1	71	71
Lead	1	4	1.0	3
Mercury	12	0	NA	NA
Molybdenum	12	4	14	(66)
Nickel	12	4	8	41
Selenium	12	2	3	(14)
Silver	12	0	NA	NA
Thallium	12	0	NA	NA
Vanadium	12	7	19	210
Zinc	12	1	150	150

Note

1. The metals data is a summary of both the Fluor Daniel GTI 1997 investigation and AMEC 2009 investigation. Data includes filtered samples only.

Abbreviations

( ) = Detected concentration is less than reporting limit
NA = not applicable

TABLE 8

GROUNDWATER ANALYTICAL RESULTS - PETROLEUM HYDROCARBONS, VOCs, PAHs, and PCBs [1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in micrograms per liter (µg/L)

Sample Location	Date	Petroleum Hydrocarbons			VOCs [2]	PAHs [2]	PCBs [2]
		TEH	TPHd	TPHmo			
Fluor Daniel GTI 1997 Phase II Investigation [3]							
CB4-068	10/8/1997	**(43)**	--	--	--	All ND	--
CB4-074	10/8/1997	<82	--	--	--	All ND	--
CB4-076	10/13/1997	**220**	--	--	--	All ND	--
CB4-077	10/8/1997	**(40)**	--	--	--	All ND	--
CB4-078	10/1/1997	<50	--	--	--	All ND	--
CB4-081	10/1/1997	<54	--	--	--	All ND	--
CB4-090	10/20/1997	<50	--	--	--	All ND	--
CB4-096	10/1/1997	**(35)**	--	--	--	All ND	--
CB4-097	10/1/1997	**(26)**	--	--	--	All ND	--
CB5-004	9/29/1997	**(34)**	--	--	All ND	All ND	All ND
CB5-007	9/25/1997	**(47)**	--	--	All ND	All ND	All ND
CB5-027	9/29/1997	**(33)**	--	--	All ND	All ND	--
CB5-051	9/29/1997	**(39)**	--	--	All ND	All ND	--
CB5-053	9/25/1997	**(37)**	--	--	**Methylene Chloride (2.6)**	All ND	--
CB5-066	12/9/1997	**(30)**	--	--	--	All ND	All ND
AMEC Geomatrix 2009 Investigation [4]							
SB-1	12/15/2009	--	<50	<100	All ND	--	--
SB-2	12/15/2009	--	<50	<100	All ND	--	--
SB-2 DUP [5]	12/15/2009	--	<50	<100	All ND	--	--
SB-3	12/15/2009	--	**460**	**1,200**	All ND	--	--
SB-4	12/14/2009	--	<50	<100	All ND	--	--
SB-7	12/15/2009	--	<50 UJ	<100 UJ	All ND	--	All ND

Notes

1. Detected concentrations are shown in **bold.**
2. Full list of VOCs, PAHs, and PCBs analytes are included in Fluor Daniel 1998 Phase II Investigation Report and AMEC 2010 Focused Site Investigation Report and Human Health Risk Assessment
3. Samples collected by Fluor Daniel GTI in 1997 and analyzed for TEH in the range of C_9 to C_{40} using Modified EPA Method 8015. Analytical results were complied from data tables in Fluor Daniel GTI's June 1998 Phase II Environmental Site Assessment report; original laboratory data sheets were not available for review.
4. Samples collected by AMEC Geomatrix in 2009 and analyzed for TPHd (carbon range C_{10} through C_{25}) and TPHmo (carbon range C_{25} through C_{40}) using EPA Method 8015 with silica gel cleanup, VOCs using EPA Method 8260, and PCBs using EPA Method 8081.
5. Blind duplicate sample was labeled as SB-20

Abbreviations

( ) = Detected concentration is less than reporting limit
< = Constituent not detected above indicated reporting limit
--- = not analyzed
All ND = none of the constituents included in the VOC, PAH, or PCB analytical suites were detected
EPA = U.S. Environmental Protection Agency
PAHs = polynuclear aromatic hydrocarbons
PCBs = polychlorinated biphenyls
TEH = total extractable hydrocarbons
TPHd = total petroleum hydrocarbons quantified as diese
TPHmo = total petroleum hydrocarbons quantified as motor oi
UJ = the analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate.
VOCs = volatile organic compounds

TABLE 9

SAMPLING AND ANALYSIS PLAN

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Sampling Location [1]	Objective	Media	Sample Depths to be Analyzed (ft bgs)	TPHd with Silica Gel Cleanup	TPHmo with Silica Gel Cleanup	TPH Fractionation	Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene	Hexane	VOCs	Lead	PCBs	Title 22 Metals	PAHs
Tank Farm Area													
SB-16	Assess TPH fractionation	Soil	0.5	**X**	**X**	*	*	*					
			1.5	**X**	**X**	*	*	*					
			2.5	(X)	(X)	*	*	*					
SB-17	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							**X**	**X**		
			1.5							**X**	**X**		
SB-18	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							**X**	**X**		
			1.5							**X**	**X**		
SB-19	Assess TPH fractionation	Soil	0.5	**X**	**X**	*	*	*					
			1.5	**X**	**X**	*	*	*					
			2.5	(X)	(X)	*	*	*					
SB-20	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							**X**	**X**		
			1.5							**X**	**X**		
SB-21	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							**X**	**X**		
			1.5							**X**	**X**		
SB-22	Assess TPH fractionation	Soil	0.5	**X**	**X**	*	*	*					
			1.5	**X**	**X**	*	*	*					
SB-23 [2]	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							**X**	**X**		
			1.5							**X**	**X**		
	Assess TPH fractionation	GW	Water Table [3]	**X**	**X**	*	*	*					
SB-24	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							**X**	**X**		
			1.5							**X**	**X**		
SB-25	Assess TPH fractionation	Soil	0.5	**X**	**X**	*	*	*					
			1.5	**X**	**X**	*	*	*					
			2.5	(X)	(X)	*	*	*					
SB-26	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							**X**	**X**		
			1.5							**X**	**X**		
	Assess TPH fractionation	GW	Water Table [3]	**X**	**X**	*	*	*					
SB-27	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							**X**	**X**		
			1.5							**X**	**X**		
SB-28	Assess TPH fractionation	Soil	0.5	**X**	**X**	*	*	*					
			1.5	**X**	**X**	*	*	*					
			2.5	(X)	(X)	*	*	*					
SB-29	Assess TPH fractionation	Soil	0.5	**X**	**X**	*	*	*					
			1.5	**X**	**X**	*	*	*					

TABLE 9

SAMPLING AND ANALYSIS PLAN
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Sampling Location [1]	Objective	Media	Sample Depths to be Analyzed (ft bgs)	TPHd with Silica Gel Cleanup	TPHmo with Silica Gel Cleanup	TPH Fractionation	Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene	Hexane	VOCs	Lead	PCBs	Title 22 Metals	PAHs
SB-30	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							X	X		
			1.5							X	X		
SB-31	Assess TPH fractionation	Soil	0.5	X	X	*	*	*					
			1.5	X	X	*	*	*					
			2.5	(X)	(X)	*	*	*					
SB-32	Assess the presence of lead and PCBs adjacent to the ASTs	Soil	0.5							X	X		
			1.5							X	X		
SB-33	Assess groundwater conditions at upgradient boundary	GW	Water Table	X	X	*	*	*	X			X	
SB-34	Assess groundwater conditions at upgradient boundary	GW	Water Table	X	X	*	*	*	X			X	
SB-35	Assess the presence of PAHs	Soil	1.0										X
			3.0										X
			4.5										X
			6.0										X
			8.0										(X)
			10.0										(X)
SB-36	Assess the presence of PAHs	Soil	1.0										X
			3.0										X
			4.5										X
			6.0										X
			8.0										(X)
			10.0										(X)
Construction Yard Area													
SB-37	Assess TPH fractionation	Soil	0.5	X	X	*	*	*					
			1.5	X	X	*	*	*					
SB-38	Assess TPH fractionation	Soil	0.5	X	X	*	*	*					
			1.5	X	X	*	*	*					
SB-39	Assess TPH fractionation	Soil	0.5	X	X	*	*	*					
			1.5	X	X	*	*	*					
	Assess TPH fractionation	GW	Water Table	X	X	*	*	*					
SB-40	Assess TPH fractionation	Soil	0.5	X	X	*	*	*					
			1.5	X	X	*	*	*					

TABLE 9

SAMPLING AND ANALYSIS PLAN

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Sampling Location [1]	Objective	Media	Sample Depths to be Analyzed (ft bgs)	TPHd with Silica Gel Cleanup	TPHmo with Silica Gel Cleanup	TPH Fractionation	Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene	Hexane	VOCs	Lead	PCBs	Title 22 Metals	PAHs
SB-41	Assess TPH fractionation	Soil	0.5	**X**	**X**	*	*	*					
			1.5	**X**	**X**	*	*	*					
	Assess TPH fractionation	GW	Water Table	**X**	**X**	*	*	*					
SB-42	Assess TPH fractionation	Soil	0.5	**X**	**X**	*	*	*					
			1.5	**X**	**X**	*	*	*					
SB-43	Assess TPH fractionation; delineate PAHs in southeast area	Soil	0.5	**X**	**X**	*	*	*					**X**
			1.5	**X**	**X**	*	*	*					**X**
	Delineate PAHs in southeast area		3,0										**X**
			4.5										**X**
			6.0										(X)
			8.0										(X)
			10.0										(X)
	Assess groundwater conditions at upgradient boundary	GW	Water Table	**X**	**X**	*	*	*	**X**			**X**	
SB-44	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)
SB-45	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)
SB-46	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)

TABLE 9

SAMPLING AND ANALYSIS PLAN
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Sampling Location [1]	Objective	Media	Sample Depths to be Analyzed (ft bgs)	TPHd with Silica Gel Cleanup	TPHmo with Silica Gel Cleanup	TPH Fractionation	Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene	Hexane	VOCs	Lead	PCBs	Title 22 Metals	PAHs
SB-47	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)
SB-48	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)
SB-49	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)
SB-50	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)
SB-51	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)
SB-52	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)

TABLE 9

SAMPLING AND ANALYSIS PLAN
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Sampling Location [1]	Objective	Media	Sample Depths to be Analyzed (ft bgs)	TPHd with Silica Gel Cleanup	TPHmo with Silica Gel Cleanup	TPH Fractionation	Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene	Hexane	VOCs	Lead	PCBs	Title 22 Metals	PAHs
SB-53	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)
SB-54	Delineate PAHs in southeast area	Soil	0.5										**X**
			3.0										**X**
			4.5										**X**
			6.0										**X**
			8.0										(X)
			10.0										(X)
SB-55	Delineate PAHs in southeast area	Soil	0.5										(X)
			3.0										(X)
			4.5										(X)
			6.0										(X)
			8.0										(X)
			10.0										(X)
SB-56	Delineate PAHs in southeast area	Soil	0.5										(X)
			3.0										(X)
			4.5										(X)
			6.0										(X)
			8.0										(X)
			10.0										(X)
SB-57	Delineate PAHs in southeast area	Soil	0.5										(X)
			3.0										(X)
			4.5										(X)
			6.0										(X)
			8.0										(X)
			10.0										(X)
SB-58	Delineate PAHs in southeast area	Soil	0.5										(X)
			3.0										(X)
			4.5										(X)
			6.0										(X)
			8.0										(X)
			10.0										(X)

TABLE 9

SAMPLING AND ANALYSIS PLAN

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Sampling Location [1]	Objective	Media	Sample Depths to be Analyzed (ft bgs)	TPHd with Silica Gel Cleanup	TPHmo with Silica Gel Cleanup	TPH Fractionation	Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene	Hexane	VOCs	Lead	PCBs	Title 22 Metals	PAHs
SB-59	Delineate PAHs in southeast area	Soil	0.5										(X)
			3.0										(X)
			4.5										(X)
			6.0										(X)
			8.0										(X)
			10.0										(X)

Analysis

Samples to be analyzed for: TPHd and TPHmo using EPA Method 8015M with silica gel preparation; TPH Fractionation based on the DTSC Interim Guidance on Evaluating Human Health Risks from TPH; naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene using EPA Method 8270C; hexane and VOCs using EPA Method 8260B; lead using EPA Method 6010B; PCBs using EPA Method 8082; Title 22 metals using EPA Methods 200.8/7470; and PAHs using EPA Method 8270C with selective ion monitoring.

Notes

1. Sample locations are shown on Figure 18.
2. A blind duplicate groundwater sample will be collected at the SB-23 location.
3. Sampling interval will be from water table (anticipated to be at approximately 10 to 15 feet bgs) to 5 feet below.

Abbreviations

* = indicates sample will be analyzed for indicated constituents only if TPHd and/or TPHmo are detected in the sample.
( ) = indicates that sample will be held and analyzed based on results of shallower or nearby samples.
DTSC = Department of Toxic Substances Control
EPA = U. S. Environmental Protection Agency
ft bgs = feet below ground surface
PAHs = polynuclear aromatic hydrocarbons
PCBs = polychlorinated biphenyls
TPHd = total petroleum hydrocarbons quantified as diesel
TPHmo = total petroleum hydrocarbons quantified as motor oil
VOCs = volatile organic compounds

TABLE 10

REQUIRED SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Analyses	EPA Method	Sample Matrix	Container	Qty.	Preservative	Holding Time[1]
Total petroleum hydrocarbons quantified as diesel (TPHd) and motor oil (TPHmo) with silica gel cleanup	8015M/ TPH Fractionation	W	1-L amber glass	2	Cool, 4°C	7/40 days
		S	250-mL glass jar/brass, butyrate, or steel tube	1	Cool, 4°C	14/40 days
Volatile organic compounds (VOCs)	8260	W	40-mL VOA vials	3	Cool, 4°C, HCl to pH <2	14 days
Select polynuclear aromatic hydrocarbons (PAHs)	8270C	W	1-L amber glass	2	Cool, 4°C	7/40 days
		S	Brass, butyrate, or steel tube/glass jar	1	Cool, 4°C	14/40 days
Title 22 Metals or selected individual metals	200.8/7470	W	500-mL polyethylene or glass	1	HNO_3, pH <2; Cool, 4°C (field filter)	6 months 28 days (Hg)
	6010B/7471A	S	Brass, butyrate, or steel tube/glass jar	1	Cool, 4°C	6 months 28 days (Hg)

Note

1. "7/40" indicates a hold time of 7 days for extraction and 40 days for analysis after extraction.

Abbreviations

S = soil sample
W = water sample
M = modified
mL = milliliters
L = liter

VOA = volatile organic analysis
HCl = hydrochloric acid
HNO_3 = nitric acid
Hg = mercury

TABLE 11

SOIL ANALYTICAL RESULTS - BACKGROUND METALS [1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

SITE	DATE	DEPTH (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
CB6-025	9/30/1997	0.5	< 6	2.2	45	< 0.5	< 2	16	2.5	6.5	5.3	< 0.025	< 10	19	< 1	< 2	< 1	19	23
		4.5	< 6	1.8	67	< 0.5	< 2	19	6	8.6	2.5	< 0.025	< 10	23	< 1	< 2	< 1	23	25
		9.5	< 6	2	46	< 0.5	< 2	23	6.1	9.4	2.7	< 0.025	< 10	30	< 1	< 2	< 1	22	26
CB6-026	9/30/1997	0.5	< 6	2.1	70	< 0.5	< 2	20	8	10	3.9	< 0.025	< 10	24	< 1	< 2	< 1	25	30
		4.5	< 6	1.5	54	< 0.5	< 2	17	6	7.9	2.2	< 0.025	< 10	22	< 1	< 2	< 1	22	25
		9.5	< 6	4	39	< 0.5	< 2	12	5.6	7	3.1	< 0.025	< 10	20	< 1	< 2	< 1	23	25
CB6-027	9/29/1997	0.5	< 6	1.7	48	< 0.5	< 2	12	2.5	6.8	5.2	< 0.025	< 10	15	< 1	< 2	< 1	16	24
		4.5	< 6	3.9	100	< 0.5	< 2	54	16	38	5.3	< 0.025	< 10	94	< 1	< 2	< 1	57	70
		9.5	< 6	4.6	55	< 0.5	< 2	14	6	9.7	3.7	0.025	< 10	19	< 1	< 2	< 1	25	28
CB6-028	10/6/1997	0.5	< 6	3.4	57	< 0.5	< 2	32	9.9	7.4	2.2	< 0.025	< 10	43	< 1	< 2	< 1	33	35
		4.5	< 6	1.4	38	< 0.5	< 2	16	2.5	7.1	2.3	< 0.025	< 10	18	< 1	< 2	< 1	26	25
		9.5	< 6	4.2	41	< 0.5	< 2	34	8.6	5.6	2.1	< 0.025	< 10	40	< 1	< 2	< 1	32	30
		16.5	< 6	1.6	90	< 0.5	< 2	20	5.6	8.3	2.1	0.025	< 10	24	< 1	< 2	< 1	30	28
CB6-029	9/30/1997	0.5	< 6	2.1	58	< 0.5	< 2	19	6.8	10	5.1	< 0.025	< 10	22	< 1	< 2	< 1	24	30
		4.5	< 6	1.8	67	< 0.5	< 2	25	7.2	12	3	0.37	< 10	30	< 1	< 2	< 1	30	31
		9.5	< 6	3.6	72	< 0.5	< 2	62	17	38	3.7	0.15	< 10	110	< 1	< 2	< 1	71	62
CB6-030	9/29/1997	0.5	< 6	1.6	50	< 0.5	< 2	12	2.5	6.5	4.8	< 0.025	< 10	15	< 1	< 2	< 1	16	24
		4.5	< 6	1.9	65	< 0.5	< 2	18	5.2	8.1	2.9	< 0.025	< 10	22	< 1	< 2	< 1	20	21
		7.5	< 6	2	130	< 0.5	< 2	47	12	19	5.5	< 0.025	< 10	64	< 1	< 2	< 1	32	47
		14.5	< 6	4.2	100	< 0.5	< 2	53	16	34	6	0.025	< 10	88	< 1	< 2	< 1	53	63
CB6-031	10/6/1997	0.5	< 6	1.2	43	< 0.5	< 2	20	7.1	9.8	2	< 0.025	< 10	22	< 1	< 2	< 1	36	27
		4.5	< 6	1.9	40	< 0.5	< 2	19	5.4	6.1	1.9	< 0.025	< 10	23	< 1	< 2	< 1	29	21
		9.5	< 6	3.2	43	< 0.5	< 2	38	9.8	6.7	1.9	< 0.025	< 10	46	< 1	< 2	< 1	32	34
		16.5	< 6	1.4	58	< 0.5	< 2	16	5.3	7.2	1.6	< 0.025	< 10	22	< 1	< 2	< 1	22	20
CB6-032	10/6/1997	0.5	< 6	1.2	56	< 0.5	< 2	18	5.3	8.2	2.4	< 0.025	< 10	21	< 1	< 2	< 1	27	28
		4.5	< 6	1.6	41	< 0.5	< 2	18	2.5	6.9	2.2	< 0.025	< 10	20	< 1	< 2	< 1	25	23
		9.5	< 6	3	50	< 0.5	< 2	37	10	8.5	2.3	< 0.025	< 10	44	< 1	< 2	< 1	36	35
		16.5	< 6	2.7	100	< 0.5	< 2	29	9.6	13	2.7	< 0.025	< 10	41	< 1	< 2	< 1	40	35
CB6-033	9/29/1997	0.5	< 6	1.5	47	< 0.5	< 2	13	2.5	6.4	2.7	< 0.025	< 10	16	< 1	< 2	< 1	16	21
		4.5	< 6	1.7	64	< 0.5	< 2	14	5.3	7	2.4	< 0.025	< 10	18	< 1	< 2	< 1	18	19
		7.5	< 6	3	30	< 0.5	< 2	13	2.5	5	2.6	< 0.025	< 10	17	< 1	< 2	< 1	19	16
CB6-034	10/6/1997	0.5	< 6	1.9	33	< 0.5	< 2	11	2.5	5.2	2	< 0.025	< 10	16	< 1	< 2	< 1	16	16
		4.5	< 6	1.5	53	< 0.5	< 2	15	5.8	7.6	2.3	< 0.025	< 10	22	< 1	< 2	< 1	18	20
		9.5	< 6	5.1	31	< 0.5	< 2	28	7.8	5.2	2.7	< 0.025	< 10	35	< 1	< 2	< 1	26	29
		16.5	< 6	1	28	< 0.5	< 2	10	2.5	4.7	1.5	0.025	< 10	9.8	< 1	< 2	< 1	13	15
CB6-035	10/6/1997	0.5	< 6	1.3	61	< 0.5	< 2	24	8.4	12	2.2	< 0.025	< 10	23	< 1	< 2	< 1	40	34
		4.5	< 6	1.7	41	< 0.5	< 2	18	5.5	6.5	1.9	< 0.025	< 10	21	< 1	< 2	< 1	29	22
		9.5	< 6	1.3	45	< 0.5	< 2	19	2.5	6.7	3.1	< 0.025	< 10	19	< 1	< 2	< 1	25	25
		16.5	< 6	3.2	66	< 0.5	< 2	37	12	8.1	2.7	< 0.025	< 10	48	< 1	< 2	< 1	37	40
CB6-036	9/29/1997	0.5	< 6	1.6	44	< 0.5	< 2	13	2.5	6.2	3.4	< 0.025	< 10	17	< 1	< 2	< 1	17	21
		4.5	< 6	1.5	42	< 0.5	< 2	12	2.5	5.7	2.5	< 0.025	< 10	14	< 1	< 2	< 1	19	< 10
		7.5	< 6	0.59	37	< 0.5	< 2	13	2.5	6.1	0.84	< 0.025	< 10	17	< 1	< 2	< 1	21	17
CB6-037	10/6/1997	0.5	< 6	1.4	48	< 0.5	< 2	13	2.5	6	2	< 0.025	< 10	20	< 1	< 2	< 1	17	19
		4.5	< 6	1.3	29	< 0.5	< 2	13	2.5	4.7	1.5	< 0.025	< 10	17	< 1	< 2	< 1	18	16
		9.5	< 6	3.6	44	< 0.5	< 2	26	8.3	5.8	2.4	< 0.025	< 10	38	< 1	< 2	< 1	25	33
		16.5	< 6	3.6	23	< 0.5	< 2	21	5.8	3.8	2.4	< 0.025	< 10	25	< 1	< 2	< 1	19	20

TABLE 11

SOIL ANALYTICAL RESULTS - BACKGROUND METALS [1]

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Results reported in milligrams per kilogram (mg/kg)

SITE	DATE	DEPTH (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
CB6-038	10/6/1997	0.5	< 6	2.1	51	< 0.5	< 2	16	2.5	7.3	4	< 0.025	< 10	20	< 1	< 2	< 1	28	24
		4.5	< 6	1.6	37	< 0.5	< 2	17	5.2	6	1.9	< 0.025	< 10	21	< 1	< 2	< 1	26	21
		9.5	< 6	4.6	78	< 1	< 4	36	14	9.5	2.9	< 0.025	< 20	52	< 1	< 4	< 1	42	46
		16.5	< 6	5.6	67	< 0.5	< 2	40	13	8.5	2.4	< 0.025	< 10	55	< 1	< 2	< 1	36	38
CB6-039	9/29/1997	0.5	< 6	1.2	37	< 0.5	< 2	11	2.5	5.6	3.2	< 0.025	< 10	14	< 1	< 2	< 1	18	< 9
		4.5	< 6	1.2	42	< 0.5	< 2	12	2.5	5.6	3.2	< 0.025	< 10	13	< 1	< 2	< 1	18	22
		7.5	< 6	1	47	< 0.5	< 2	16	5.9	23	86	< 0.025	< 10	73	< 1	< 2	< 1	110	53
CB6-040	9/29/1997	0.5	< 6	1.2	30	< 0.5	< 2	8.2	2.5	4.4	2.2	< 0.025	< 10	12	< 1	< 2	< 1	12	23
		4.5	< 6	1.5	50	< 0.5	< 2	12	2.5	21	20	0.025	< 10	38	< 1	< 2	< 1	94	40
		7.5	< 6	1.4	43	< 0.5	< 2	16	5	6.2	1.8	< 0.025	< 10	18	< 1	< 2	< 1	17	< 10
CB6-041	10/6/1997	0.5	< 6	1.7	36	< 0.5	< 2	13	2.5	5.2	2.1	< 0.025	< 10	19	< 1	< 2	< 1	17	18
		4.5	< 6	2.2	34	< 0.5	< 2	17	5.6	5.4	3.8	< 0.025	< 10	24	< 1	< 2	< 1	18	22
		9.5	< 6	4.1	34	< 0.5	< 2	23	7.5	5.1	2.3	< 0.025	< 10	35	< 1	< 2	< 1	21	25
		16.5	< 6	5.3	32	< 0.5	< 2	21	6.8	4.2	2.4	< 0.025	< 10	29	< 1	< 2	< 1	20	21
CB6-042	10/2/1997	0.5	< 6	2	170	< 0.5	< 2	22	6.2	10	2.3	0.24	< 10	25	< 1	< 2	< 1	28	25
		5.5	< 6	3.9	70	< 0.5	< 2	32	9.4	8	2.6	< 0.025	< 10	42	< 1	< 2	< 1	34	38
		10.25	< 6	2.7	68	< 0.5	< 2	30	7.1	12	4.5	< 0.025	< 10	32	< 1	< 2	< 1	39	36
		16.75	< 6	5.3	82	< 0.5	< 2	32	15	10	2.6	< 0.025	< 10	48	< 1	< 2	< 1	42	44
CB6-043	9/29/1997	0.5	< 6	1.1	49	< 0.5	< 2	11	2.5	6.1	4.5	< 0.025	< 10	13	< 1	< 2	< 1	14	21
		4.5	< 6	1.3	45	< 0.5	< 2	12	2.5	6.1	2.8	< 0.025	< 10	15	< 1	< 2	< 1	16	20
		7.5	< 6	1.5	41	< 0.5	< 2	16	2.5	6.3	1.6	< 0.025	< 10	17	< 1	< 2	< 1	22	22
CB6-044	10/6/1997	0.5	< 6	4.3	98	< 0.5	< 2	19	7.4	5.5	3.1	0.025	< 10	33	< 1	< 2	< 1	21	22
		4.5	< 6	3.2	32	< 0.5	< 2	13	5.3	4.3	2.7	< 0.025	< 10	21	< 1	< 2	< 1	15	20
		9.5	< 6	1.6	48	< 0.5	< 2	8.9	2.5	5.3	6.2	< 0.025	< 10	13	< 1	< 2	< 1	13	20
		16.5	< 6	0.91	21	< 0.5	< 2	8.1	2.5	3.1	1.4	< 0.025	< 10	13	< 1	< 2	< 1	13	11
CB6-045	9/29/1997	0.5	< 6	4.1	120	< 0.5	< 2	22	7.8	8.5	4	0.025	< 10	32	< 1	< 2	< 1	25	30
		4.5	< 6	1.4	40	< 0.5	< 2	11	2.5	5.3	2.5	< 0.025	< 10	15	< 1	< 2	< 1	18	< 8.5
		9.5	< 6	1.9	37	< 0.5	< 2	17	2.5	5.7	2.6	< 0.025	< 10	18	< 1	< 2	< 1	18	< 9.5
		14.5	< 6	1.9	26	< 0.5	< 2	15	2.5	4.3	1.9	< 0.025	< 10	14	< 1	< 2	< 1	18	< 7.5
		19.5	< 6	2.2	34	< 0.5	< 2	9.7	2.5	4.7	2.3	< 0.025	< 10	14	< 1	< 2	< 1	15	18
		24.5	< 6	1.3	33	< 0.5	< 2	12	2.5	5.2	1.2	< 0.025	< 10	16	< 1	< 2	< 1	15	16
CB6-046	9/29/1997	0.5	< 6	1.6	33	< 0.5	< 2	15	2.5	5.2	1.7	< 0.025	< 10	17	< 1	< 2	< 1	23	17
		4.5	< 6	1.1	29	< 0.5	< 2	8.6	2.5	4.5	1.3	< 0.025	< 10	15	< 1	< 2	< 1	15	15
		9.5	< 6	1.6	38	< 0.5	< 2	14	2.5	6.4	1.7	< 0.025	< 10	17	< 1	< 2	< 1	21	21
CB6-047	10/9/1997	0.5	< 6	1.3	34	< 0.5	< 2	11	2.5	5.7	1.8	< 0.025	< 10	13	< 1	< 2	< 1	15	17
		5.5	< 6	1.3	29	< 0.5	< 2	11	2.5	4.2	1.7	< 0.025	< 10	13	< 1	< 2	< 1	17	16
CB6-048	10/9/1997	0.5	< 6	3	46	< 0.5	< 2	20	5.8	7.2	3.3	< 0.025	< 10	24	< 1	< 2	< 1	23	23
		5.5	< 6	1.2	25	< 0.5	< 2	9	2.5	4.6	1.4	< 0.025	< 10	14	< 1	< 2	< 1	14	14
CB6-049	9/29/1997	0.5	< 6	1.6	33	< 0.5	< 2	15	5.5	7.4	2	0.025	< 10	18	< 1	< 2	< 1	24	22
		4.5	< 6	1.9	24	< 0.5	< 2	10	2.5	5.1	1.6	< 0.025	< 10	16	< 1	< 2	< 1	14	17
		9.5	< 6	1.8	26	< 0.5	< 2	12	2.5	4.5	1.8	< 0.025	< 10	16	< 1	< 2	< 1	13	< 8.5

Note

1. Samples collected by Fluor Daniel GTI, Inc., as part of the Phase II Environmental Site Assessment for soil and groundwater at the Contra Costa Power Plant (CCPP) and analyzed in accordance with U.S. EPA Methods 6000 and 7000 series.

Abbreviation

< = analytical result less than the detection limit indicated

TABLE 12

HYPOTHETICAL EXPOSURE PARAMETERS FOR CONSTRUCTION (TRENCH EXCAVATION) WORKER

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Exposure Parameter	Units	Reasonable Maximum Exposure
GENERAL EXPOSURE PARAMETERS		
Exposure Frequency (EF)	days/year	Value: 250 Rationale: U.S. EPA, 2002
Exposure Duration (ED)	years	Value: 1 Rationale: U.S. EPA, 2002
Body Weight (BW)	kg	Value: 70 Rationale: DTSC, 1996; U.S. EPA, 1991; U.S. EPA, 2002
Averaging Time (AT)	days	Value: 25,550 (carcinogens) 365 (noncarcinogens) Rationale: DTSC, 1996; U.S. EPA, 1991; U.S. EPA, 2002
PATHWAY-SPECIFIC PARAMETERS		
Incidental Soil Ingestion		
Soil Ingestion Rate (IR_s)	mg/day	Value: 480 Rationale: U.S. EPA 2002
Dermal Contact with Soil		
Exposed Skin Surface Area (SA_s)	cm^2/day	Value: 5,800 Rationale: U.S. EPA 2002
Soil-to-Skin Adherence Factor (SAF)	mg/cm^2	Value: 0.51 Rationale: U.S. EPA 2002
Absorption Fraction (ABS)	unitless	Value: Chemical-specific Rationale: U.S. EPA, 2004
Inhalation of Vapors in Ambient Air		
Inhalation Rate (IHR_a)	m^3/hr	Value: 2.5 Rationale: U.S. EPA, 2002b; U.S. EPA 1997a
Exposure Time (ET)	hours/day	Value: 8 Rationale: DTSC, 1996; U.S. EPA, 1991; Standard work day

TABLE 12

HYPOTHETICAL EXPOSURE PARAMETERS FOR CONSTRUCTION (TRENCH EXCAVATION) WORKER

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Exposure Parameter	Units	Reasonable Maximum Exposure
Inhalation of Suspended Soil Particulates		
Particulate Emission Factor (PEF)	m^3/kg	Value: 2.0×10^7 Rationale: DTSC, 1999; corresponds to the PM10 Ambient Air Quality Standard of 50 $\mu g/m^3$; also consistent with U.S. EPA, 2002, recommended PEF for construction activities other than unpaved road traffic (3.6×10^7 m^3/kg)
Inhalation Rate (IHR_a)	m^3/hr	Value: 2.5 Rationale: U.S. EPA, 2002, U.S. EPA, 1997
Exposure Time (ET)	hours	Value: 8 Rationale: DTSC, 1996; U.S. EPA, 1991; Standard work day
Inhalation of Volatiles in Trench Ambient Air		
Exposure Time (ET)	hours/day	Value: 2 Rationale: Professional judgment
Event Frequency (EV)	event/day	Value: 1 Rationale: Professional judgment
Exposure Frequency (EF)	days/year	Value: 20 Rationale: Professional judgment
Inhalation Rate (IHRa)	m^3/hr	Value: 2.5 Rationale: DTSC, 1996; U.S. EPA, 1991; Standard work day
Dermal Contact with Groundwater		
Event Time (ET)	hours/day	Value: 0.5 Rationale: Professional judgment; based on incidental contact
Event Frequency (EV)	event/day	Value: 1 Rationale: Professional judgment
Exposure Frequency (EF)	days/year	Value: 20 Rationale: Professional judgment

TABLE 12

HYPOTHETICAL EXPOSURE PARAMETERS FOR CONSTRUCTION (TRENCH EXCAVATION) WORKER

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Exposure Parameter	Units	Reasonable Maximum Exposure
Exposed Skin Surface Area (SA_s)	cm^2	Value: 7,000 Rationale: U.S. EPA, 1997. Assuming that workers stand in ~2 feet of water; thus, forearms, hands, lower legs, and feet (30.6% of total body area, 23,000 cm^3) are exposed.

Abbreviations

cm^2 = squared centimeters
kg = kilogram
mg/cm^2 = milligrams per squared centimeters
mg/day = milligrams per day
m^3/hr = cubic meters per hour
m^3/kg = cubic meters per kilogram

References

Department of Toxic Substances Control (DTSC), 1996, Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities (corrected and reprinted): Office of the Scientific Advisor, California Environmental Protection Agency (Cal/EPA), Sacramento, California.

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TABLE 13

HYPOTHETICAL EXPOSURE PARAMETERS FOR OFF-SITE RESIDENTS DURING CONSTRUCTION AND OPERATIONS

Marsh Landing Generating Station
Mirant Contra Cost Power Plant
Contra Costa County, California

Exposure Parameter	Units	Reasonable Maximum Exposure
General Exposure Parameters		
Exposure Frequency (EF)	days/year	Value: 350 Rationale: DTSC, 1996; U.S. EPA, 1991
Exposure Duration (ED)	years	Value: 6 (child) 24 (adult)
Body Weight (BW)	kg	Rationale: DTSC, 1996; U.S. EPA, 1991 Value: 15 (child) 70 (adult)
Averaging Time (AT)	days	Rationale: DTSC, 1996; U.S. EPA, 1991 Value: 25,550 (carcinogens) 2,190 (child—noncarcinogens) 8,760 (adult—noncarcinogens)
Pathway Specific Parameters		
Inhalation of Vapors in Ambient Air		
Inhalation Rate (IHR_a)	m^3/hr	Value: 0.42 (child) 0.83 (adult) Rationale: U.S. EPA, 1997 (child); DTSC, 1996 (adult)
Exposure Time (ET)	hours	Value: 24 Rationale: DTSC, 1996; U.S. EPA, 1991
Inhalation of Suspended Soil Particulates		
Inhalation Rate (IHR_a)	m^3/hr	Value: 0.42 (child) 0.83 (adult) Rationale: U.S. EPA, 1997 (child); DTSC, 1996 (adult)
Particulate Emission Factor (PEF)	m^3/kg	Value: 4.4 x 10^8 Rationale: U.S. EPA, 2002
Exposure Time (ET)	hours	Value: 24 Rationale: DTSC, 1996; U.S. EPA, 1991

Abbreviations
kg = kilograms
m^3/hr = cubic meters per hour
m^3/kg = cubic meters per kilogram

TABLE 13

HYPOTHETICAL EXPOSURE PARAMETERS FOR OFF-SITE RESIDENTS DURING CONSTRUCTION AND OPERATIONS

Marsh Landing Generating Station
Mirant Contra Cost Power Plant
Contra Costa County, California

References

Department of Toxic Substances Control (DTSC), 1996, Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities (corrected and reprinted): Office of the Scientific Advisor, California Environmental Protection Agency (Cal/EPA), Sacramento, California.

U.S. Environmental Protection Agency (U.S. EPA), 1991, Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors: Office of Emergency and Remedial Response, Washington, D.C.

U.S. EPA, 1997, Exposure Factors Handbook, Volume 1: Office of Research and Development, Washington, D.C.

U.S. EPA, 2002, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites: Office of Solid Waste and Emergency Response, December.

TABLE 14

HYPOTHETICAL EXPOSURE PARAMETERS FOR ON-SITE OUTDOOR WORKER

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Exposure Parameter	Units	Reasonable Maximum Exposure
General Exposure Parameters		
Exposure Frequency (EF)	days/year	Value: 250 Rationale: DTSC, 1996; U.S. EPA, 1991
Exposure Duration (ED)	years	Value: 25 Rationale: DTSC, 1996; U.S. EPA, 1991
Body Weight (BW)	kg	Value: 70 Rationale: DTSC, 1996; U.S. EPA, 1991
Averaging Time (AT)	days	Value: 25,550 (carcinogens) 9125 (noncarcinogens) Rationale: DTSC, 1996; U.S. EPA, 1991
Pathway-Specific Parameters		
Incidental Soil Ingestion		
Soil Ingestion Rate (IR_s)	mg/day	Value: 100 Rationale: DTSC, 1996; U.S. EPA, 1991; U.S. EPA, 2002
Dermal Contact with Soil		
Exposed Skin Surface Area (SA_s)	cm^2/day	Value: 3,300 Rationale: U.S. EPA, 2002; U.S. EPA, 2004
Soil-to-Skin Adherence Factor (SAF)	mg/cm^2	Value: 0.2 Rationale: U.S. EPA, 2002; U.S. EPA, 2004
Absorption Fraction (ABS)	unitless	Value: Chemical-specific Rationale: U.S. EPA, 2004
Inhalation of Vapors in Ambient Air		
Inhalation Rate (IHR_a)	m^3/hr	Value: 0.83 Rationale: DTSC, 1996
Exposure Time (ET)	hrs/day	Value: 8 Rationale: DTSC, 1996; U.S. EPA, 1991; Standard work day

TABLE 14

HYPOTHETICAL EXPOSURE PARAMETERS FOR ON-SITE OUTDOOR WORKER

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Exposure Parameter	Units	Reasonable Maximum Exposure
Inhalation of Suspended Soil Particulates		
Particulate Emission Factor (PEF)	m^3/kg	Value: 1.32×10^9 Rationale: Estimated
Inhalation Rate (IHR_a)	m^3/hr	Value: 0.83 Rationale: DTSC, 1996
Exposure Time (ET)	hrs/day	Value: 8 Rationale: DTSC, 1996; U.S. EPA, 1991; Standard work day

Abbreviations

cm^2/day = square centimeters per day
hrs/day = hours per day
kg = kilograms
m^3/hr = cubic meters per hour
m^3/kg = cubic meters per kilogram
mg/cm^2 = milligrams per square centimeters
mg/day = milligrams per day

References

Department of Toxic Substances Control (DTSC), 1996, Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities (corrected and reprinted), Office of the Scientific Advisor, Department of Toxic Substances Control, Sacramento, California.

U.S. Environmental Protection Agency (U.S. EPA), 1991, Interoffice Memorandum Regarding the Human Health Evaluation Manual, Supplemental Guidance: “Standard Default Exposure Factors,” Office of Emergency and Remedial Response, Washington, D.C.

U.S. EPA, 2002, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, Office of Solid Waste and Emergency Response, December.

U.S. EPA, 2004, Risk Assessment Guidance for Superfund (RAGS): Volume 1 – Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), Final, Office of Superfund Remediation and Technology Innovation, July.

TABLE 15

HYPOTHETICAL EXPOSURE PARAMETERS FOR ON-SITE INDOOR WORKER

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Exposure Parameter	Units	Reasonable Maximum Exposure	
GENERAL EXPOSURE PARAMETERS			
Exposure Frequency (EF)	days/year	Value:	250
		Rationale:	DTSC, 1996; U.S. EPA, 1991
Exposure Duration (ED)	years	Value:	25
		Rationale:	DTSC, 1996; U.S. EPA, 1991
Body Weight (BW)	kg	Value:	70
		Rationale:	DTSC, 1996; U.S. EPA, 1991
Averaging Time (AT)	days	Value:	25,550 (carcinogens) 9,125 (noncarcinogens)
		Rationale:	DTSC, 1996; U.S. EPA, 1991
PATHWAY-SPECIFIC PARAMETERS			
Inhalation of Vapors in Indoor Air			
Inhalation Rate (IHRa)	m^3/hr	Value:	2.5
		Rationale:	DTSC, 1996
Exposure Time (ET)	hours/day	Value:	8
		Rationale:	DTSC, 1996; U.S. EPA, 1991

Abbreviations

kg = kilograms
m^3/hr = cubic meters per hour

References

Department of Toxic Substances Control (DTSC), 1996, Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities (corrected and reprinted), Office of the Scientific Advisor, California Environmental Protection Agency (Cal/EPA), Sacramento, California.

U.S. Environmental Protection Agency (U.S. EPA), 1991, Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors: Office of Emergency and Remedial Response, Washington, D.C.

TABLE 16

HYPOTHETICAL EXPOSURE PARAMETERS FOR OFF-SITE WORKER

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

Exposure Parameter	Units	Reasonable Maximum Exposure
General Exposure Parameters		
Exposure Frequency (EF)	days/year	Value: 250 Rationale: DTSC, 1996; U.S. EPA, 1991
Exposure Duration (ED)	years	Value: 25
Body Weight (BW)	kg	Rationale: DTSC, 1996; U.S. EPA, 1991 Value: 70
Averaging Time (AT)	days	Rationale: DTSC, 1996; U.S. EPA, 1991 Value: 25,550 (carcinogens) 9125 (noncarcinogens)
Pathway Specific Parameters		
Inhalation of Vapors in Ambient Air		
Inhalation Rate (IHR_a)	m^3/hr	Value: 0.83 Rationale: DTSC, 1996
Exposure Time (ET)	hrs/day	Value: 8 Rationale: DTSC, 1996; U.S. EPA, 1991; Standard work day
Inhalation of Suspended Soil Particulates		
Inhalation Rate (IHR_a)	m^3/hr	Value: 0.83 Rationale: DTSC, 1996
Particulate Emission Factor (PEF)	m^3/kg	Value: 4.4×10^8 Rationale: U.S. EPA, 2002
Exposure Time (ET)	hrs/day	Value: 8 Rationale: DTSC, 1996; U.S. EPA, 1991; Standard work day

Abbreviations
kg = kilograms
m^3/hr = cubic meters per hour
m^3/kg = cubic meters per kilogram

TABLE 16

HYPOTHETICAL EXPOSURE PARAMETERS FOR OFF-SITE WORKER

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

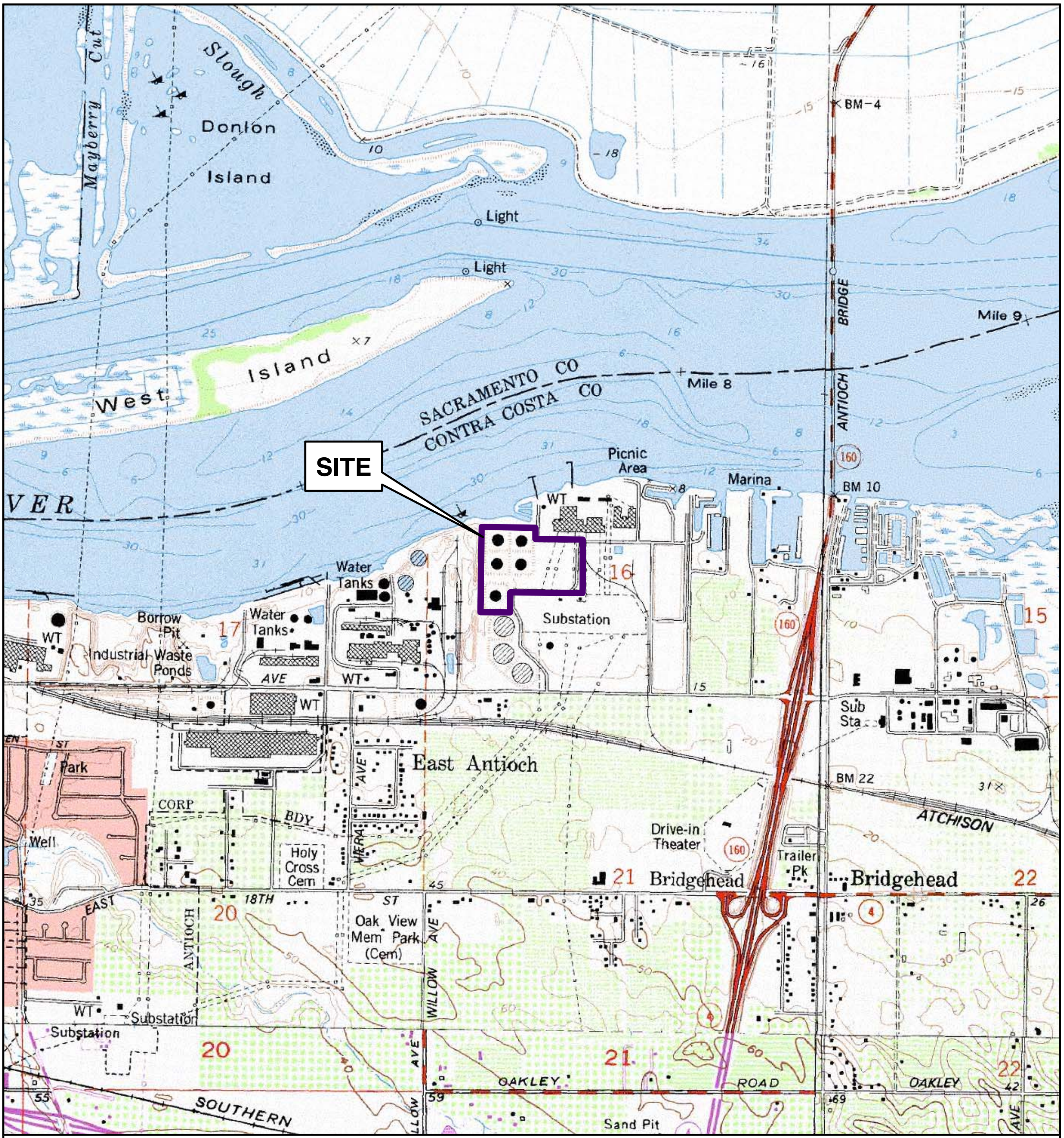
References

Department of Toxic Substances Control (DTSC), 1996, Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities (corrected and reprinted): Office of the Scientific Advisor, California Environmental Protection Agency (Cal/EPA), Sacramento, California.

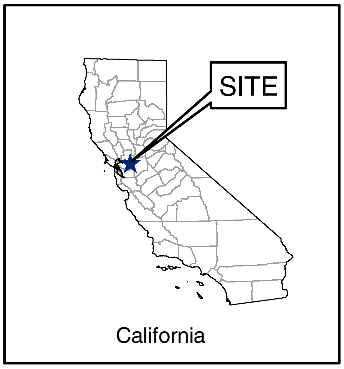
U.S. Environmental Protection Agency (U.S. EP), 1991, Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors: Office of Emergency and Remedial Response, Washington, D.C.

U.S. EPA, 2002, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites: Office of Solid Waste and Emergency Response, December.

FIGURES



Base map from USGS 7.5' Antioch North, Antioch South, Brentwood and Jersey Island, California topographic quadrangles.



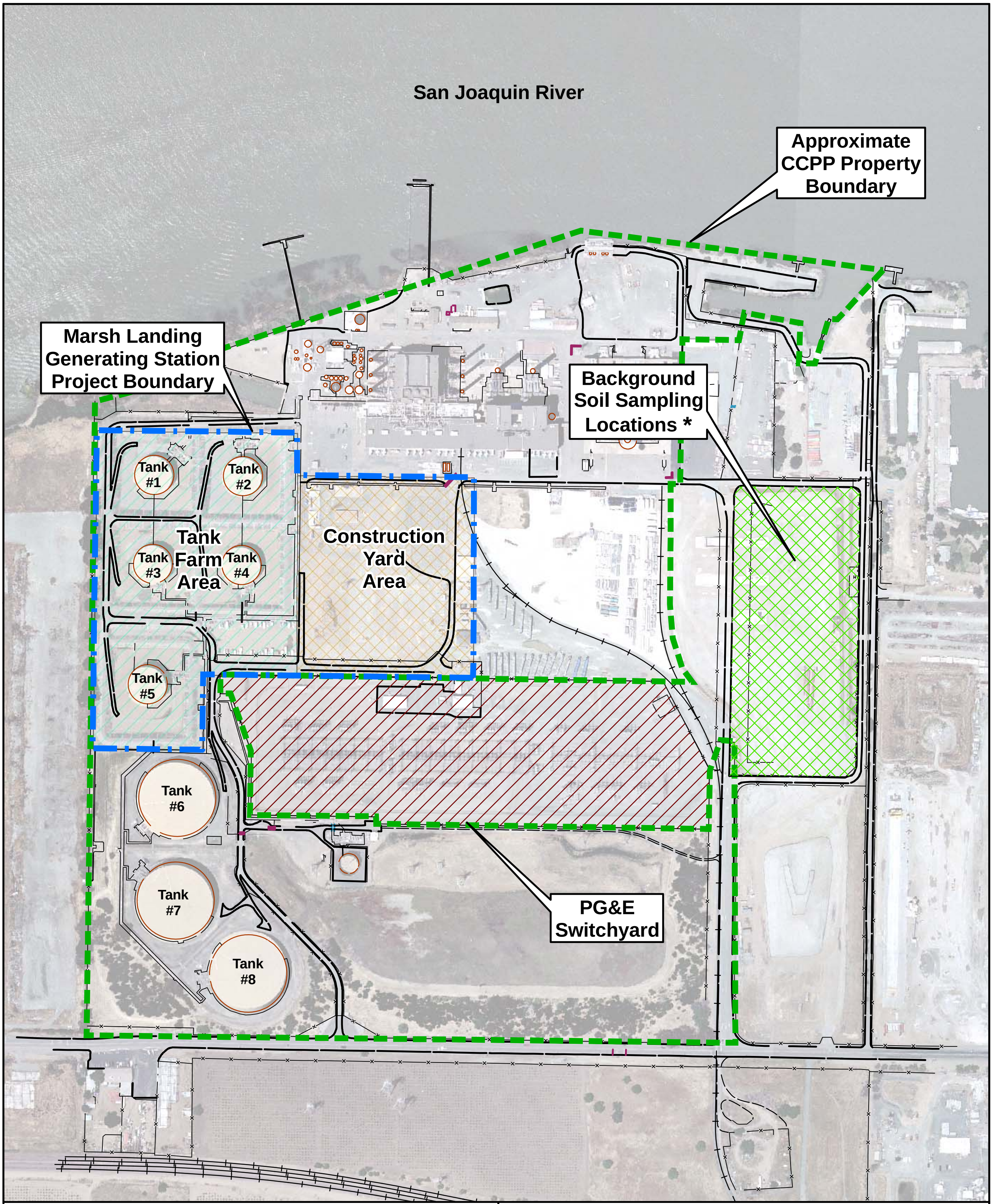
SITE LOCATION MAP
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/23/2009	Project No. 15317.000

AMEC Geomatrix

Figure 1

File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_01.mxd



Aerial image from USGS digital orthophoto dated May 23, 2002.

*Location of background metals sampling conducted by Fluor Daniel GTI in 1997 (Fluor Daniel GTI, 1998).

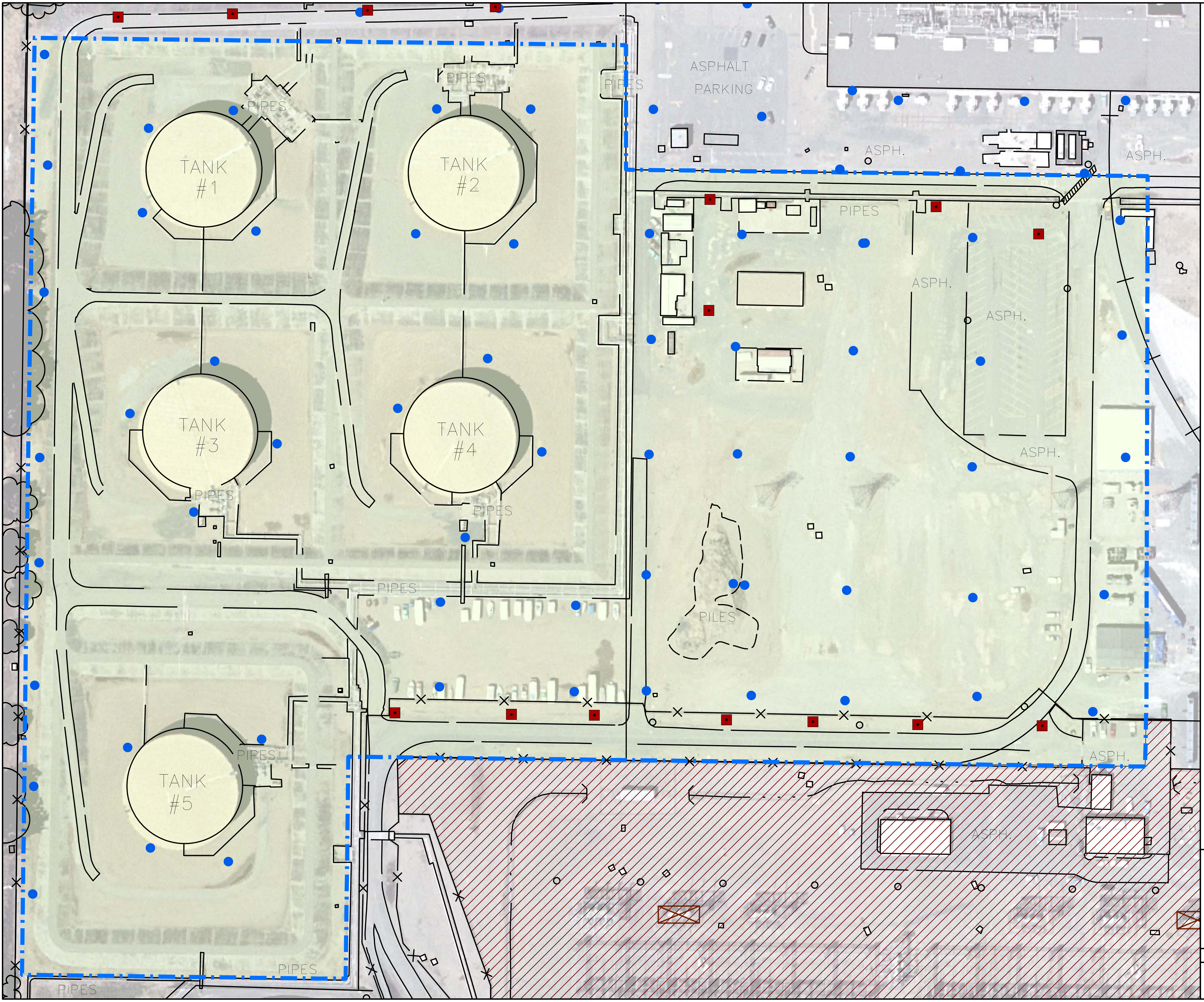
SITE PLAN AND FACILITY LAYOUT
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 3/11/2010	Project No. 15317.000

AMEC Geomatrix

Figure 2

File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_02.mxd



Explanation

🟥 2009 sampling location

● 1997 sampling location

▨ PG&E switchyard

▭ Marsh Landing Generating Station project boundary (the site)

☒ Reported oil-filled circuit breaker explosion site

N

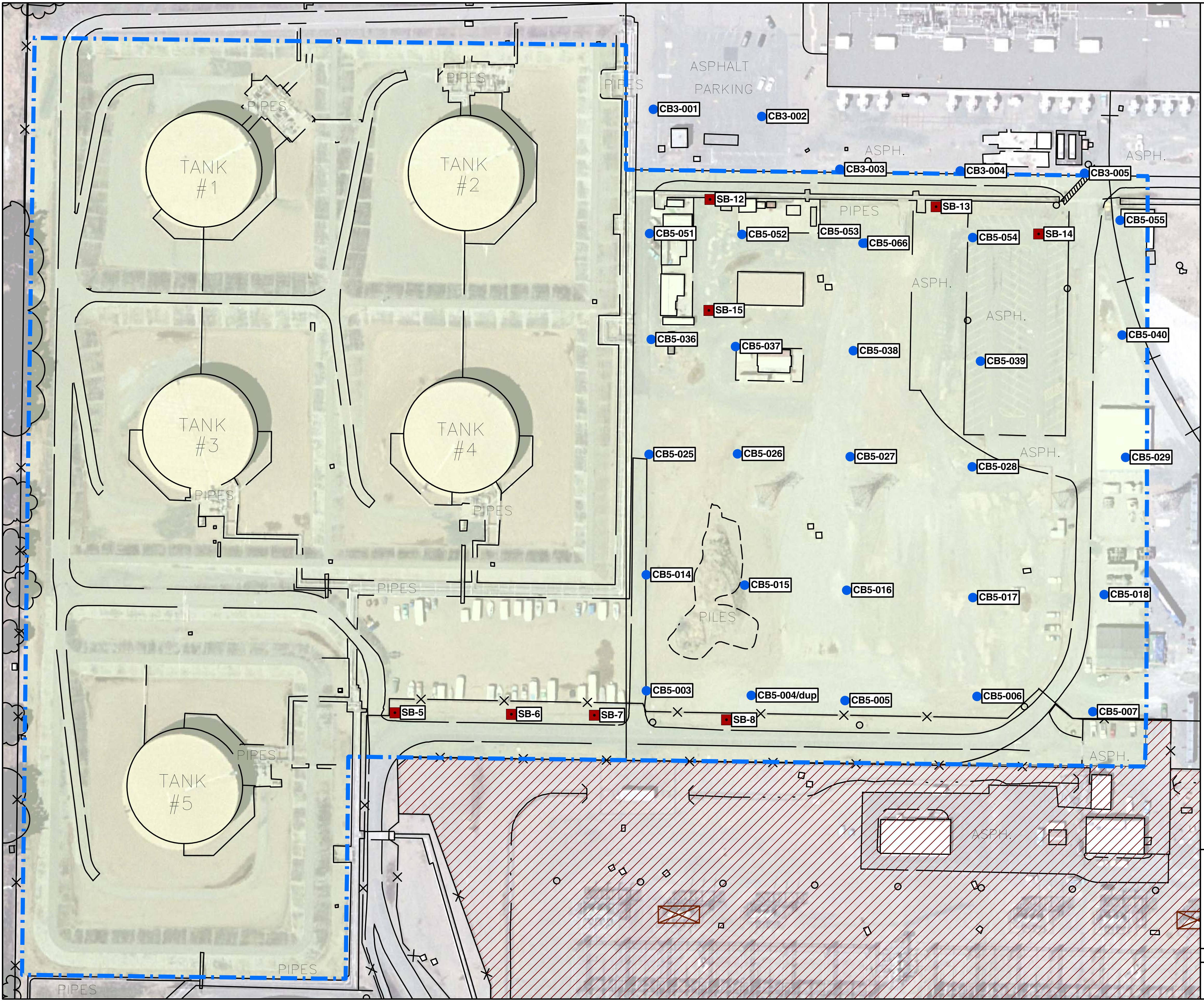
0 120 240
Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

PREVIOUS SAMPLING LOCATIONS
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 3

File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_03.mxd



Explanation

■	2009 sampling location
●	1997 sampling location
▨	PG&E switchyard
▭	Marsh Landing Generating Station project boundary (the site)
☒	Reported oil-filled circuit breaker explosion site

N

0 120 240 Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

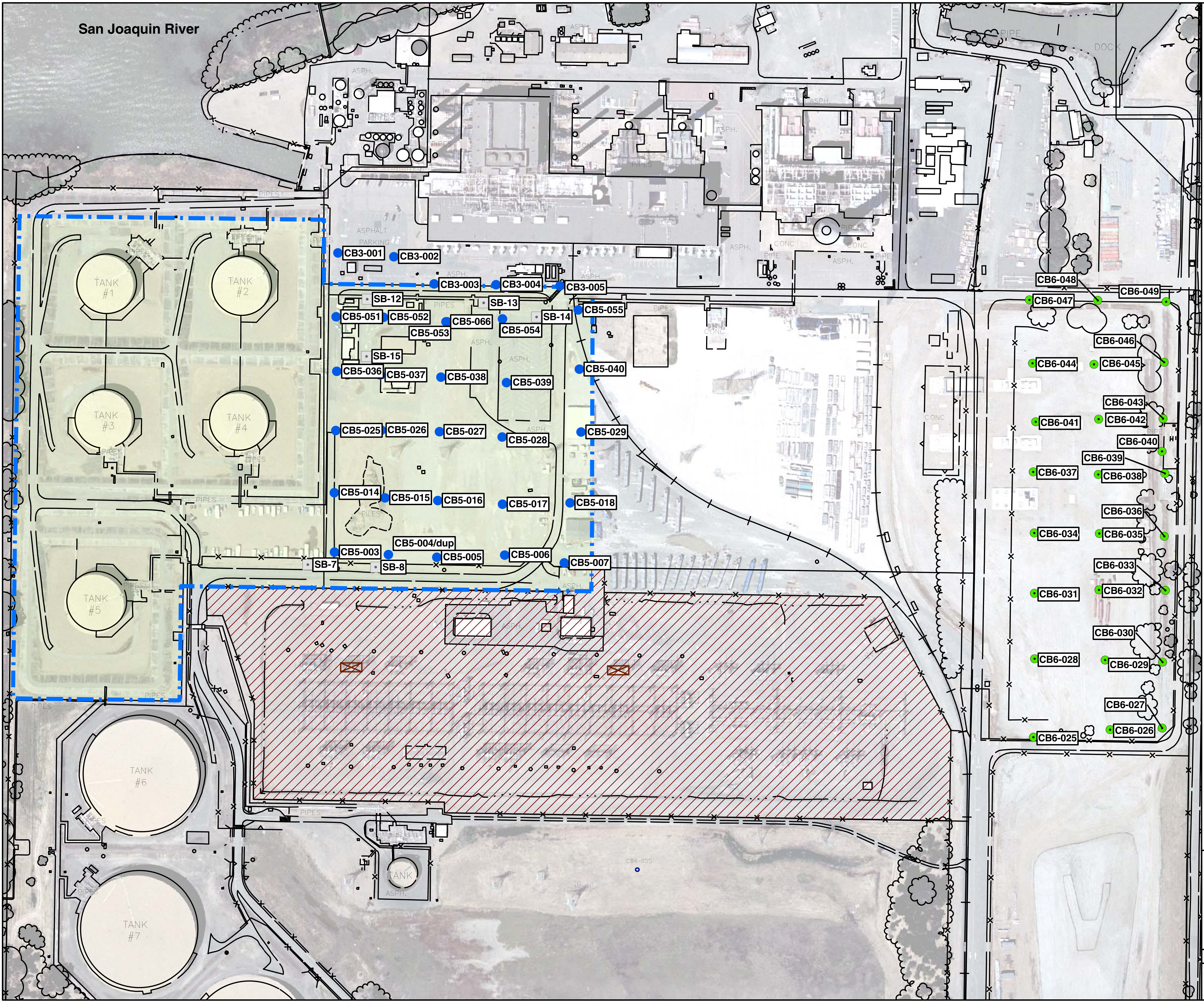
LOCATIONS WHERE METALS WERE ANALYZED IN SOIL

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG | Date: 2/15/2010 | Project No. 15317.000

AMEC Geomatrix | Figure **4A**

File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_04a.mxd



Explanation

- ▪ 2009 sampling location
- ● 1997 sampling location
- ● 1997 background soil sampling location
- ▨ PG&E switchyard
- ▭ Marsh Landing Generating Station project boundary (the site)
- ⊠ Reported oil-filled circuit breaker explosion site

N

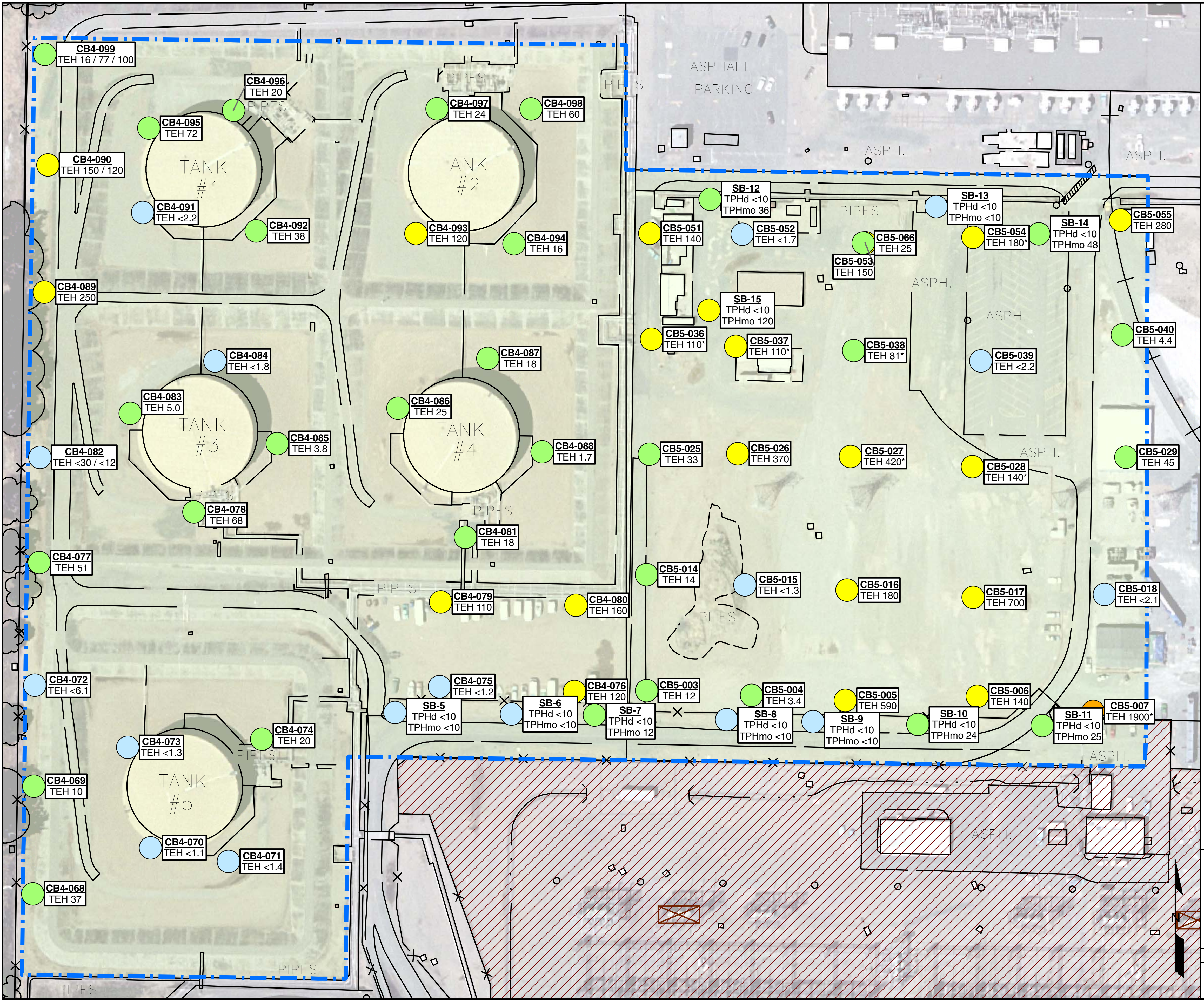
0 200 400 Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

BACKGROUND SAMPLING LOCATIONS IN SOIL
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 2/16/2010	Project No. 15317.000
AMEC Geomatrix		Figure **4B**

File path: S:\15300\15317.000\task_04\09_1223_fi\fig_04b.mxd



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Explanation

- ▨ PG&E switchyard
- ▭ Marsh Landing Generating Station project boundary (the site)
- ☒ Reported oil-filled circuit breaker explosion site
- ● Not detected
- ● Up to 100 mg/kg
- ● 101 - 1000 mg/kg
- ● >1000 mg/kg

CB5-028 ← Sample I.D.
TEH 140 ← Concentration in mg/kg

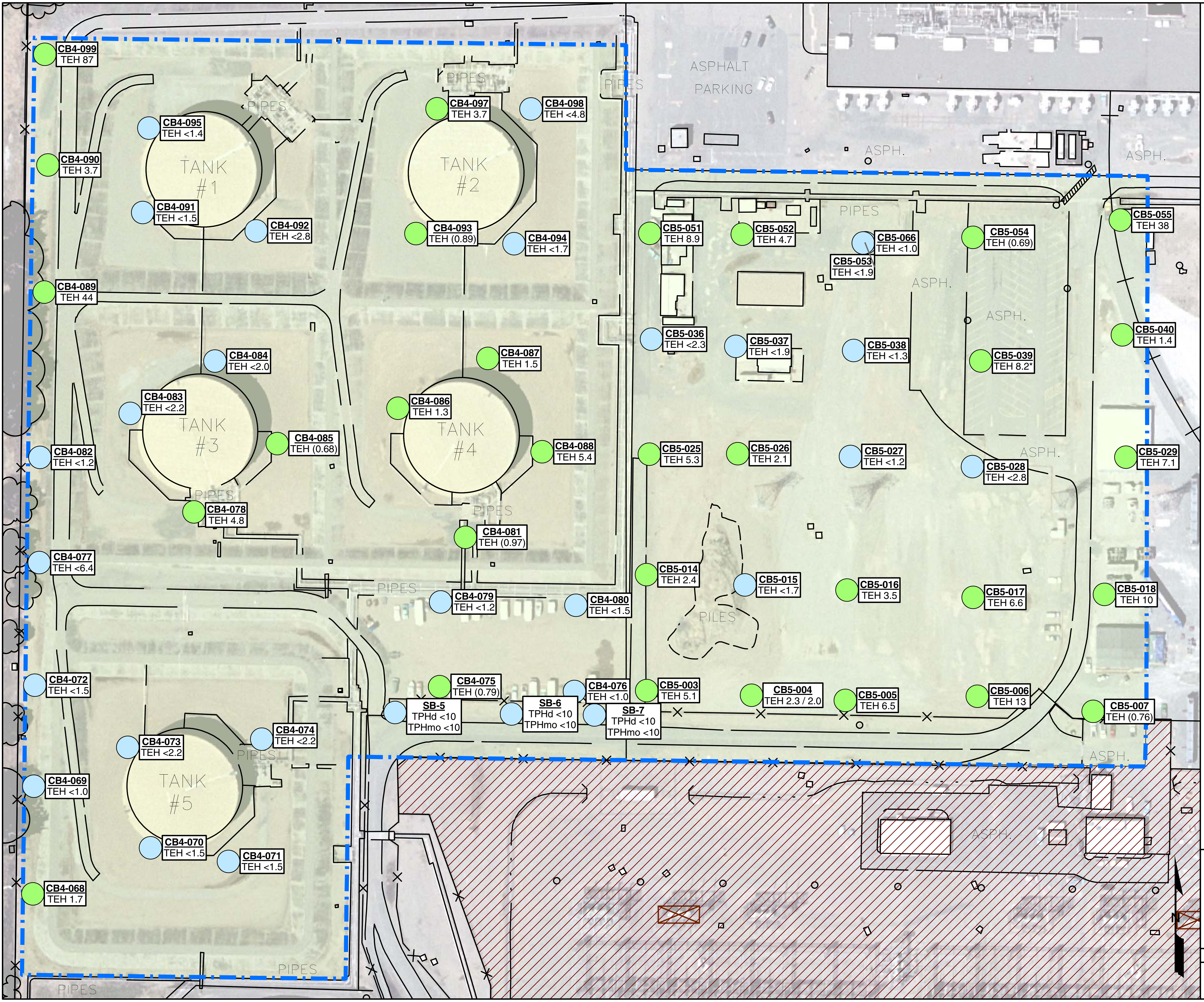
Notes:
TEH = total extractable hydrocarbons
TPHd = total petroleum hydrocarbons quantified as diesel
TPHmo = total petroleum hydrocarbons quantified as motor oil
BGS = below ground surface
mg/kg = milligrams per kilogram
/ = duplicate sample results
* note on original data tables indicates "Duplicate records found, data review required"

Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

Aerial image from USGS digital orthophoto dated May 23, 2002.

PETROLEUM HYDROCARBON
ANALYTICAL RESULTS IN SOIL
0.5 TO 1.5 FEET BGS
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 5



Explanation

▨ PG&E switchyard

▭ Marsh Landing Generating Station project boundary (the site)

☒ Reported oil-filled circuit breaker explosion site

🔵 Not detected

🟢 Up to 100 mg/kg

🟡 101 - 1000 mg/kg

🟠 >1000 mg/kg

CB5-028 ← Sample I.D.
TEH 140 ← Concentration in mg/kg

Notes:
TEH = total extractable hydrocarbons
TPHd = total petroleum hydrocarbons quantified as diesel
TPHmo = total petroleum hydrocarbons quantified as motor oil
BGS = below ground surface
mg/kg = milligrams per kilogram
( ) = detected concentration is less than reporting limit
/ = duplicate sample results
* note on original data tables indicates "Duplicate records found, data review required"

Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

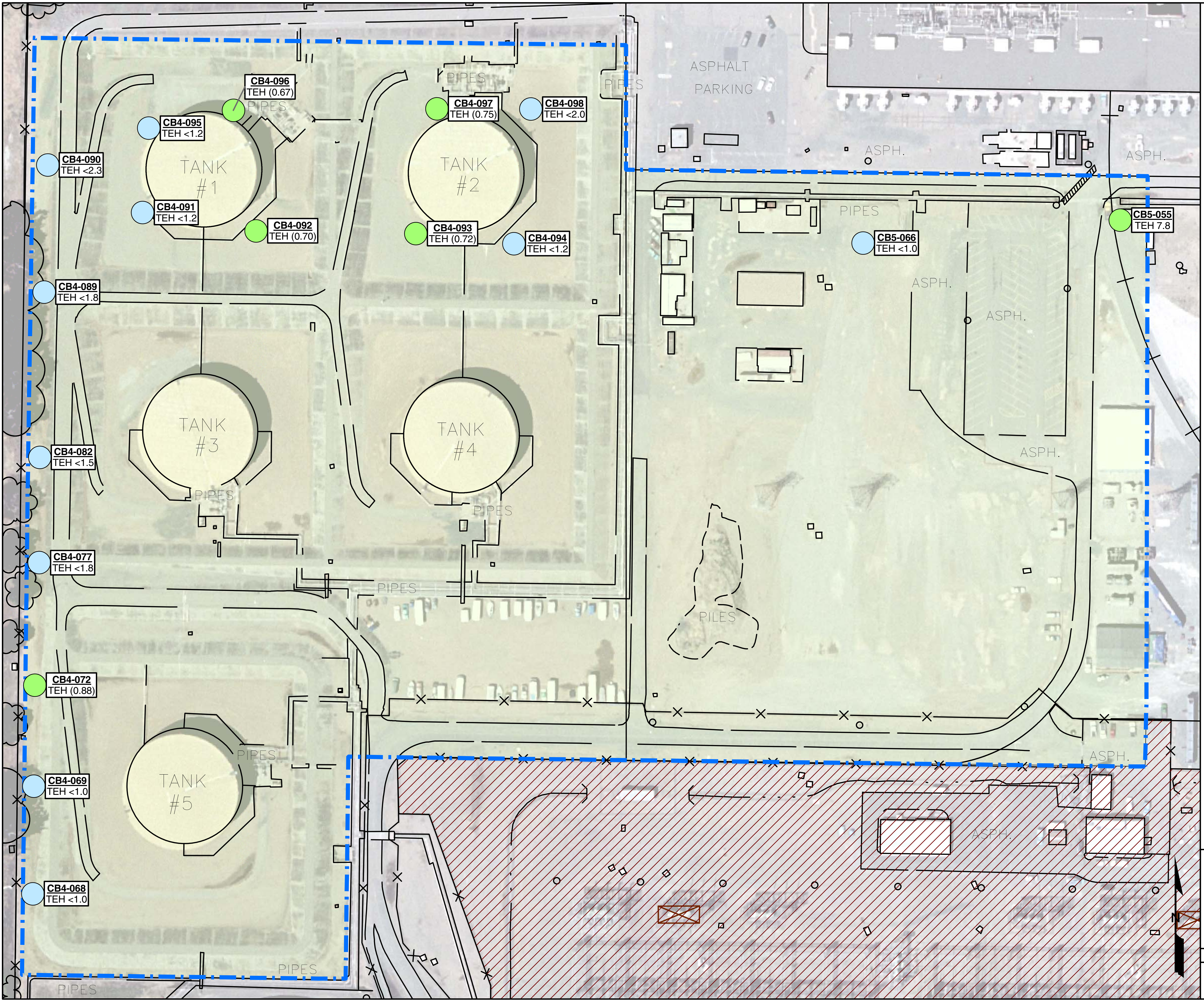
0 120 240 Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

PETROLEUM HYDROCARBON
ANALYTICAL RESULTS IN SOIL
2.0 TO 4.5 FEET BGS
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 6

File path: S:\15300\15317.000\task_04\09_1223_fi_fig_06.mxd



Explanation

- ▨ PG&E switchyard
- ▭ Marsh Landing Generating Station project boundary (the site)
- ⊠ Reported oil-filled circuit breaker explosion site
- ● Not detected
- ● Up to 100 mg/kg
- ● 101 - 1000 mg/kg
- ● >1000 mg/kg

CB5-028 ← Sample I.D.
TEH 140 ← Concentration in mg/kg

Notes:
TEH = total extractable hydrocarbons
TPHd = total petroleum hydrocarbons quantified as diesel
TPHmo = total petroleum hydrocarbons quantified as motor oil
BGS = below ground surface
mg/kg = milligrams per kilogram
( ) = detected concentration is less than reporting limit
Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

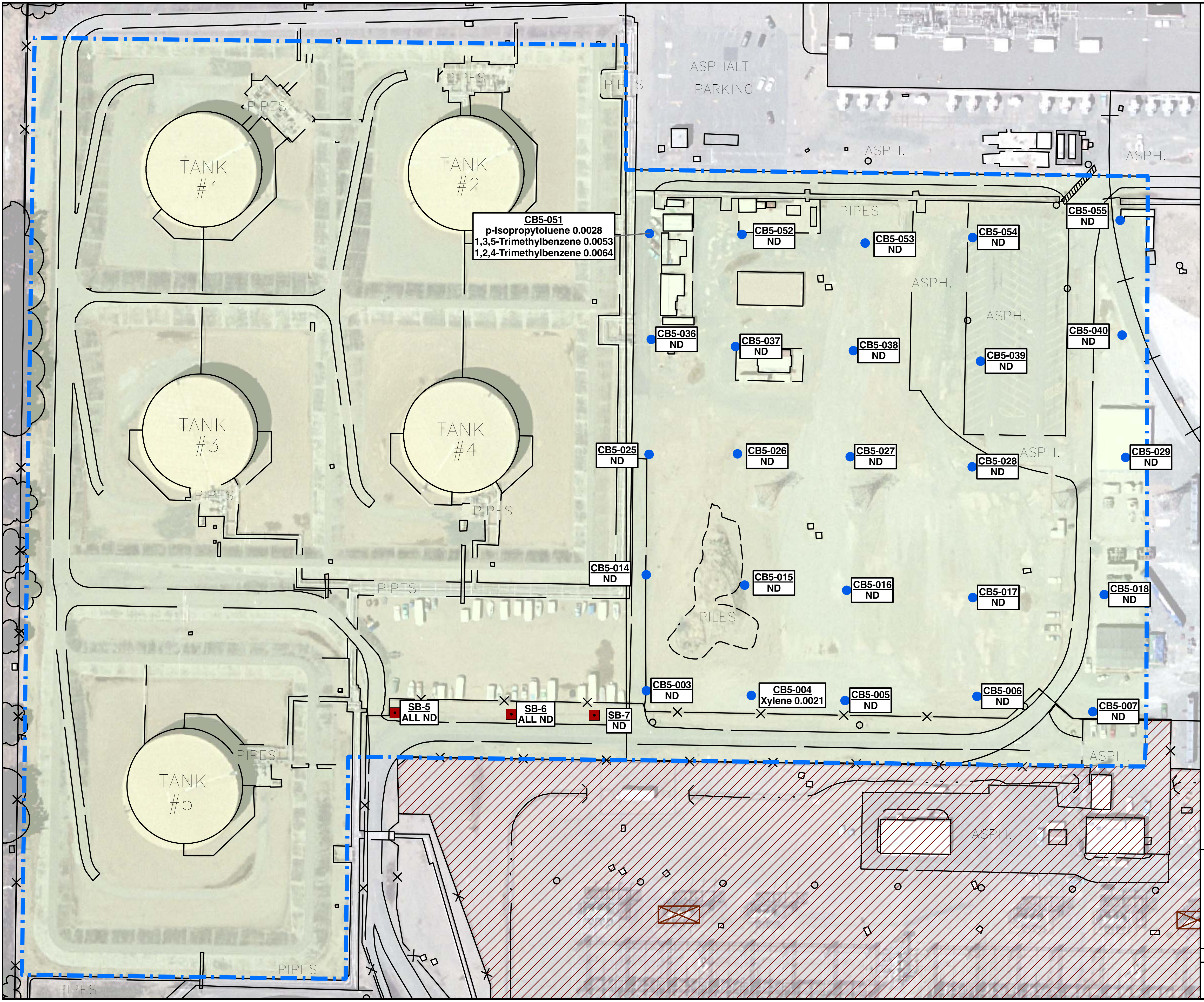
0 120 240 Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

PETROLEUM HYDROCARBON
ANALYTICAL RESULTS IN SOIL
7.5 TO 11.5 FEET BGS
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 7

File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_07.mxd



File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_08.mxd

Explanation

🟥	2009 sampling location
●	1997 sampling location
▨	PG&E switchyard
☐	Marsh Landing Generating Station project boundary (the site)
☒	Reported oil-filled circuit breaker explosion site

CB5-004 ← Sample I.D.
Xylene 0.0021 ← Concentration in mg/kg

Notes:

VOC = volatile organic compound

BGS = below ground surface

mg/kg = milligrams per kilogram

ND = no VOCs were detected

Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

Methylene chloride was detected at several locations, however, based on information in Fluor Daniel's 1998 Phase II Investigation Report, it was determined to be a laboratory contaminant.

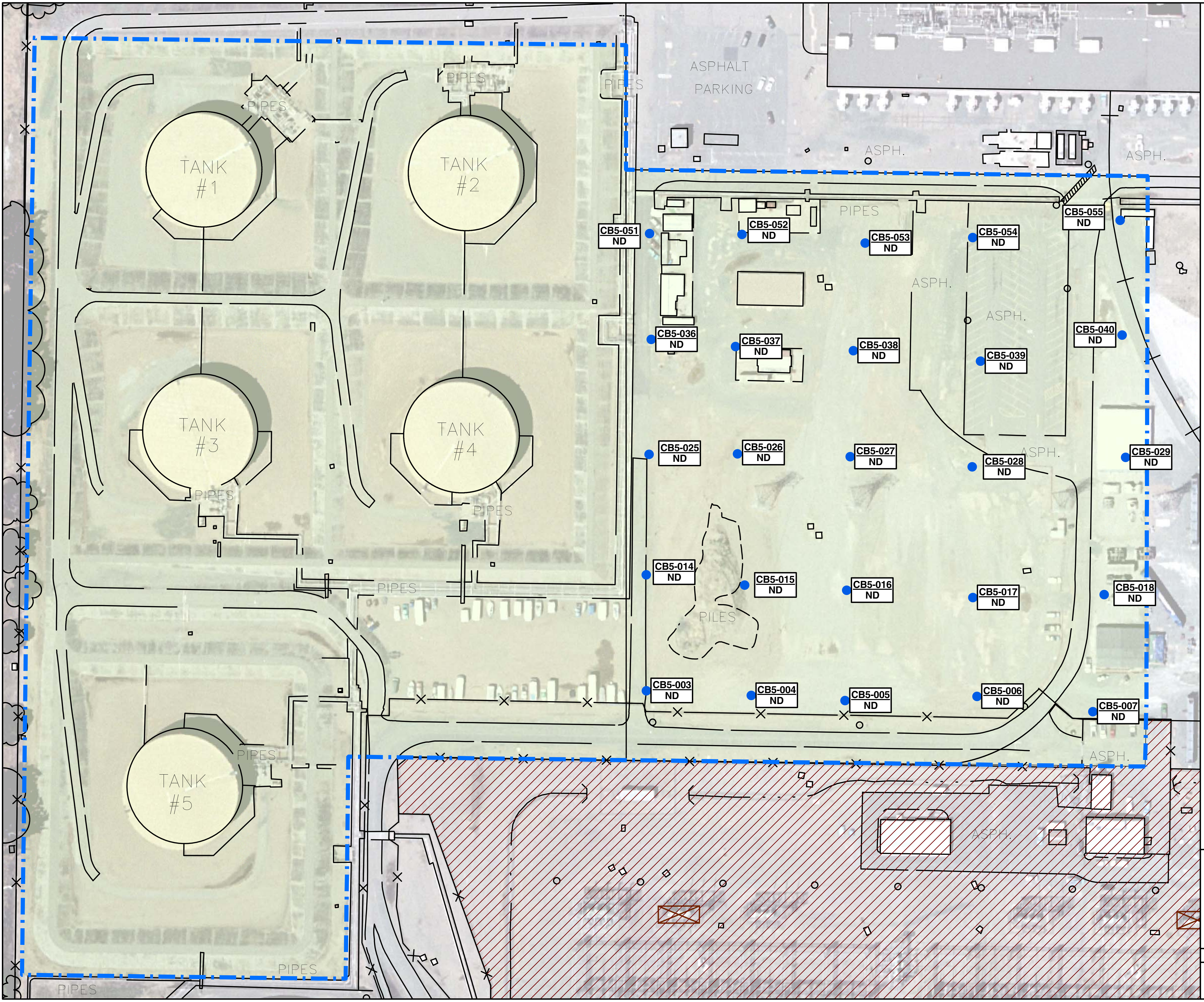
N

0 120 240
Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

VOC ANALYTICAL RESULTS IN SOIL
0.5 TO 2.0 FEET BGS
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 8



File path: S:\15300\15317.000\task_04\09_1223_fi_fig_09.mxd

Explanation

🟥 2009 sampling location

● 1997 sampling location

▨ PG&E switchyard

▭ Marsh Landing Generating Station project boundary (the site)

☒ Reported oil-filled circuit breaker explosion site

CB5-025 ND ← Sample I.D. ← Concentration in mg/kg

Notes:

VOC = volatile organic compound

BGS = below ground surface

mg/kg = milligrams per kilogram

ND = no VOCs were detected

Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

Methylene chloride was detected at several locations, however, based on information in Fluor Daniel's 1998 Phase II Investigation Report, it was determined to be a laboratory contaminant.

N

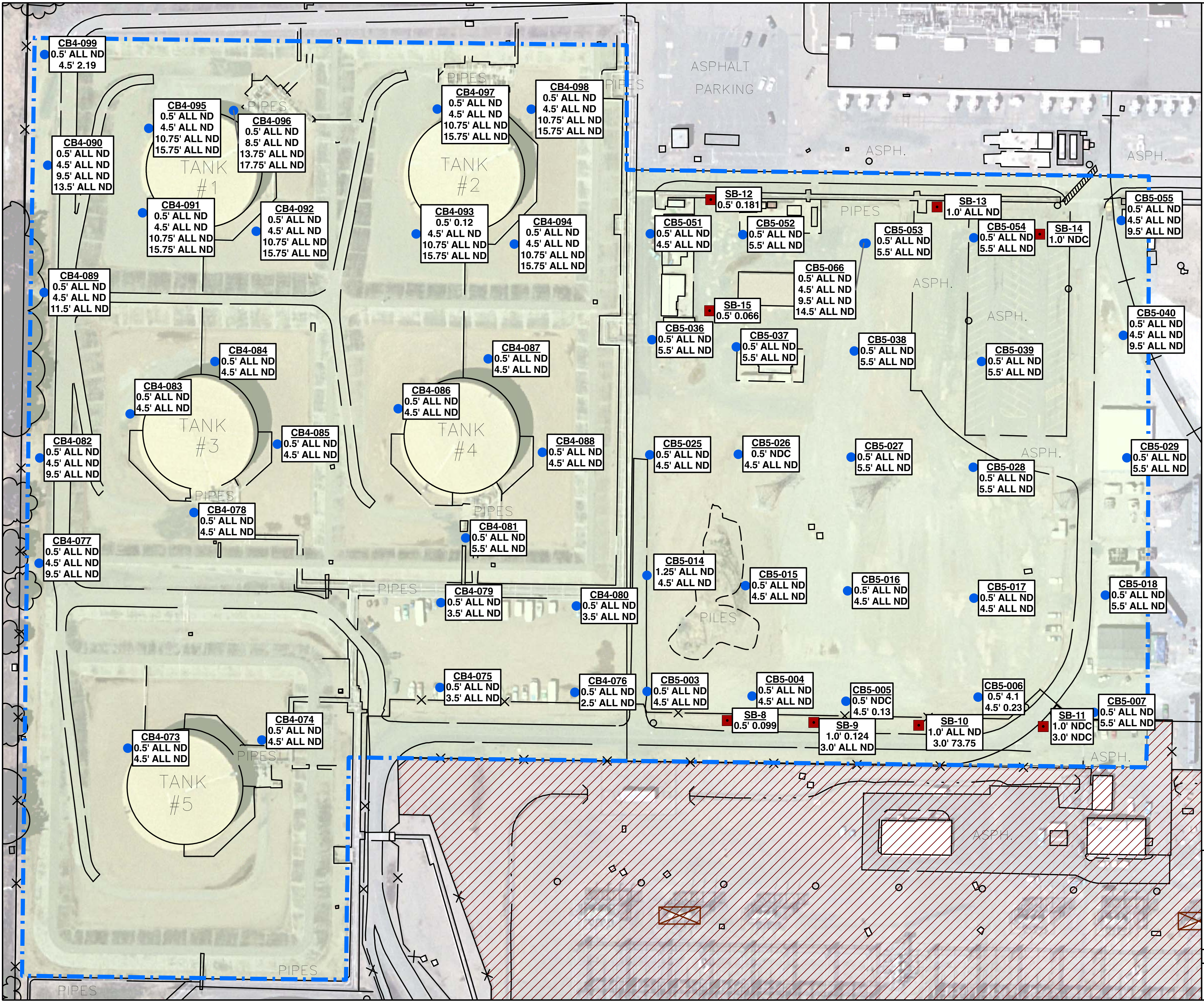
0 120 240 Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

VOC ANALYTICAL RESULTS IN SOIL
4.5 TO 5.5 FEET BGS

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 9



File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_10.mxd

Explanation

🟥 2009 sampling location

● 1997 sampling location

▨ PG&E switchyard

▭ Marsh Landing Generating Station project boundary (the site)

☒ Reported oil-filled circuit breaker explosion site

Sample Depth (feet bgs) → CB4-099 0.5' ALL ND 4.5' 2.19 ← Sample I.D. ← Benzo(a)pyrene TEQ in mg/kg

Notes:

ALL ND = no polyaromatic hydrocarbons were detected above laboratory reporting limits

NDC = no carcinogenic polyaromatic hydrocarbons were detected above laboratory reporting limits

BGS = below ground surface

mg/kg = milligrams per kilogram

TEQ = toxic equivalency factor

Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

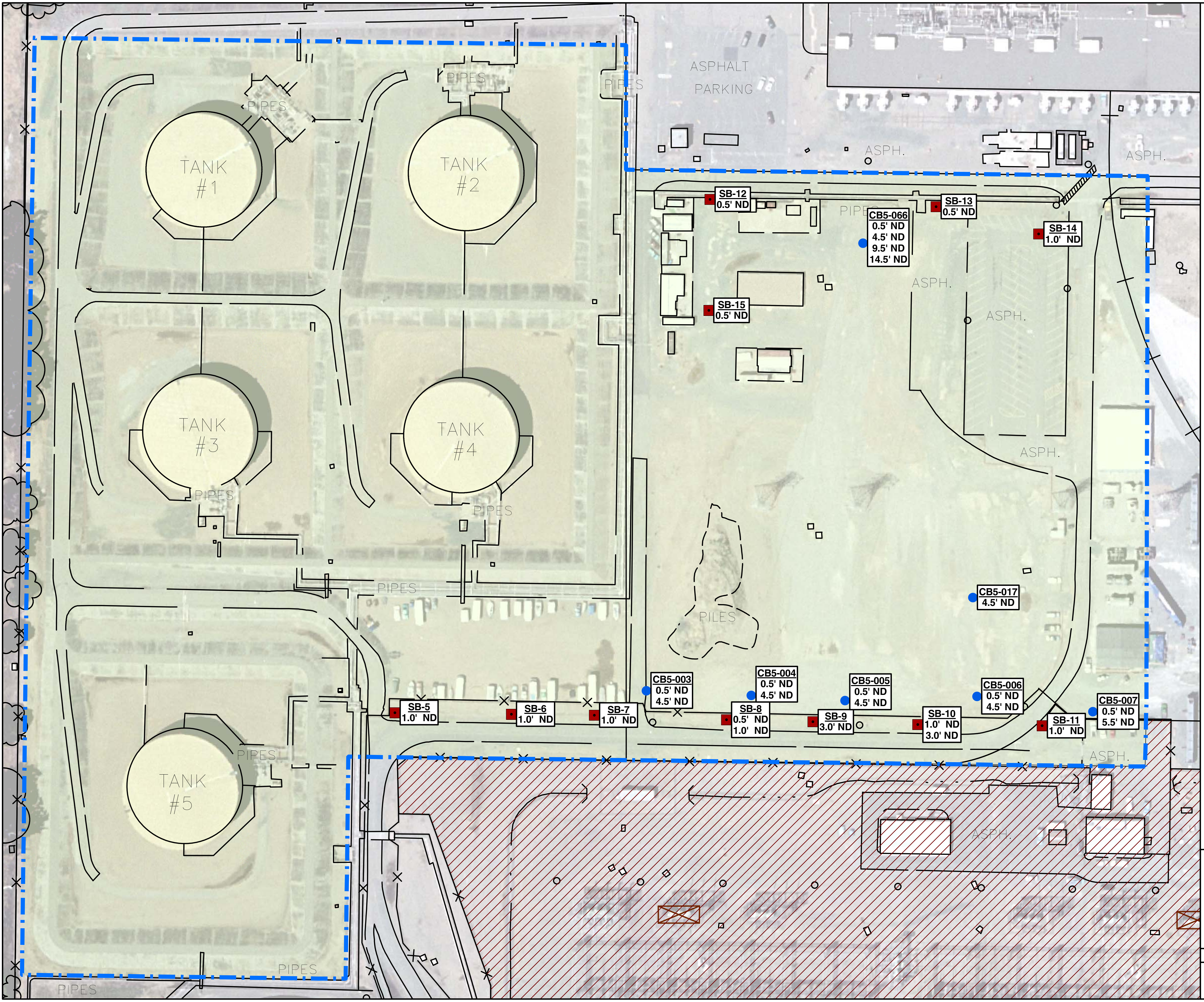
N

0 120 240 Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

BENZO(A)PYRENE TEQs IN SOIL
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 10



Explanation

🟥 2009 sampling location

● 1997 sampling location

▨ PG&E switchyard

Marsh Landing Generating Station project boundary (the site)

☒ Reported oil-filled circuit breaker explosion site

Sample Depth (feet bgs) → **CB5-004** ← Sample I.D.
0.5' ND
4.5' ND ← Concentration in mg/kg

Notes:
PCB = polychlorinated biphenyl
ND = no polychlorinated biphenyls were detected
bgs = below ground surface
mg/kg = milligrams per kilogram
Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

N

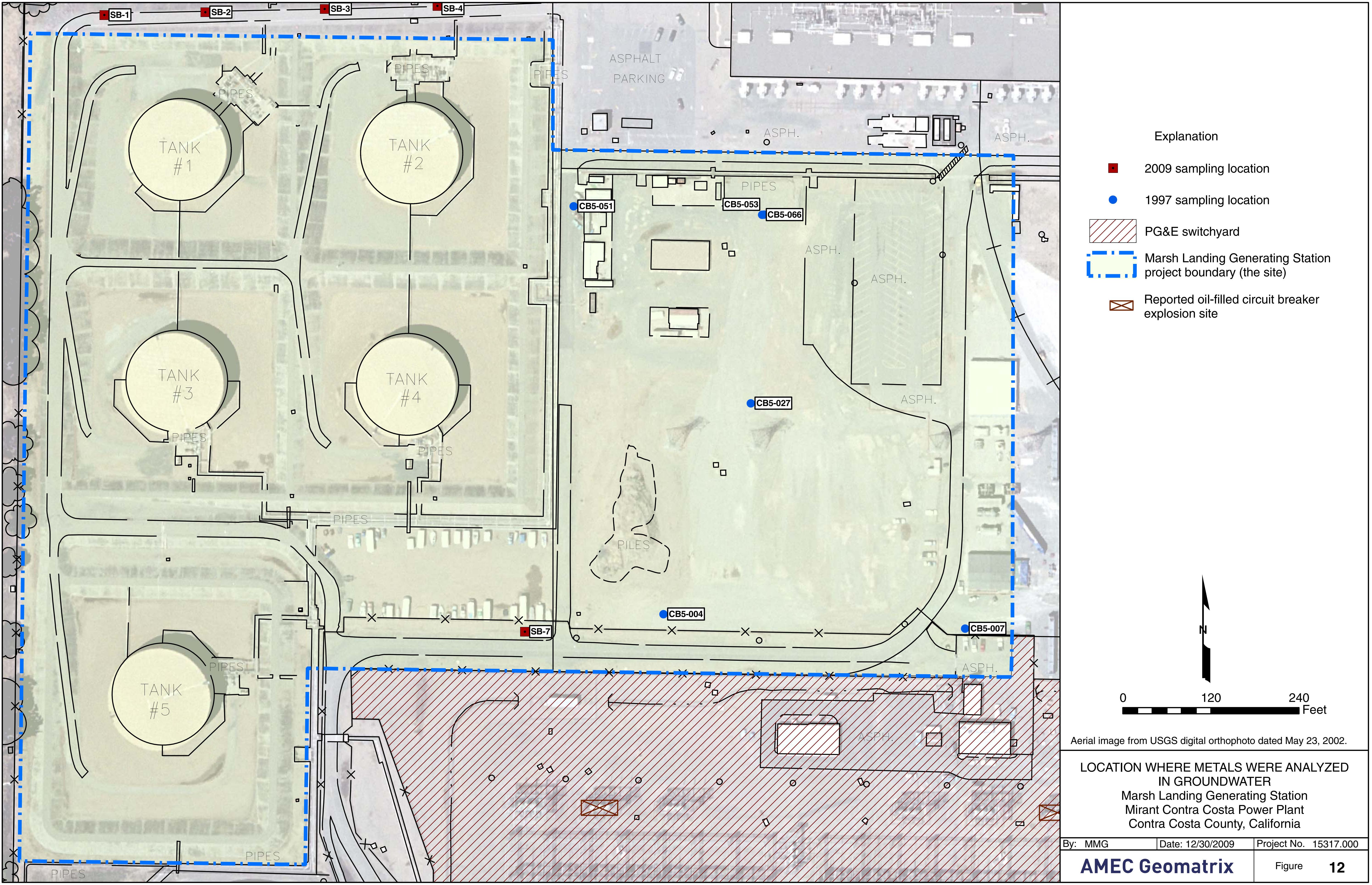
0 120 240
Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

PCB ANALYTICAL RESULTS IN SOIL
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 11

File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_11.mxd



Explanation

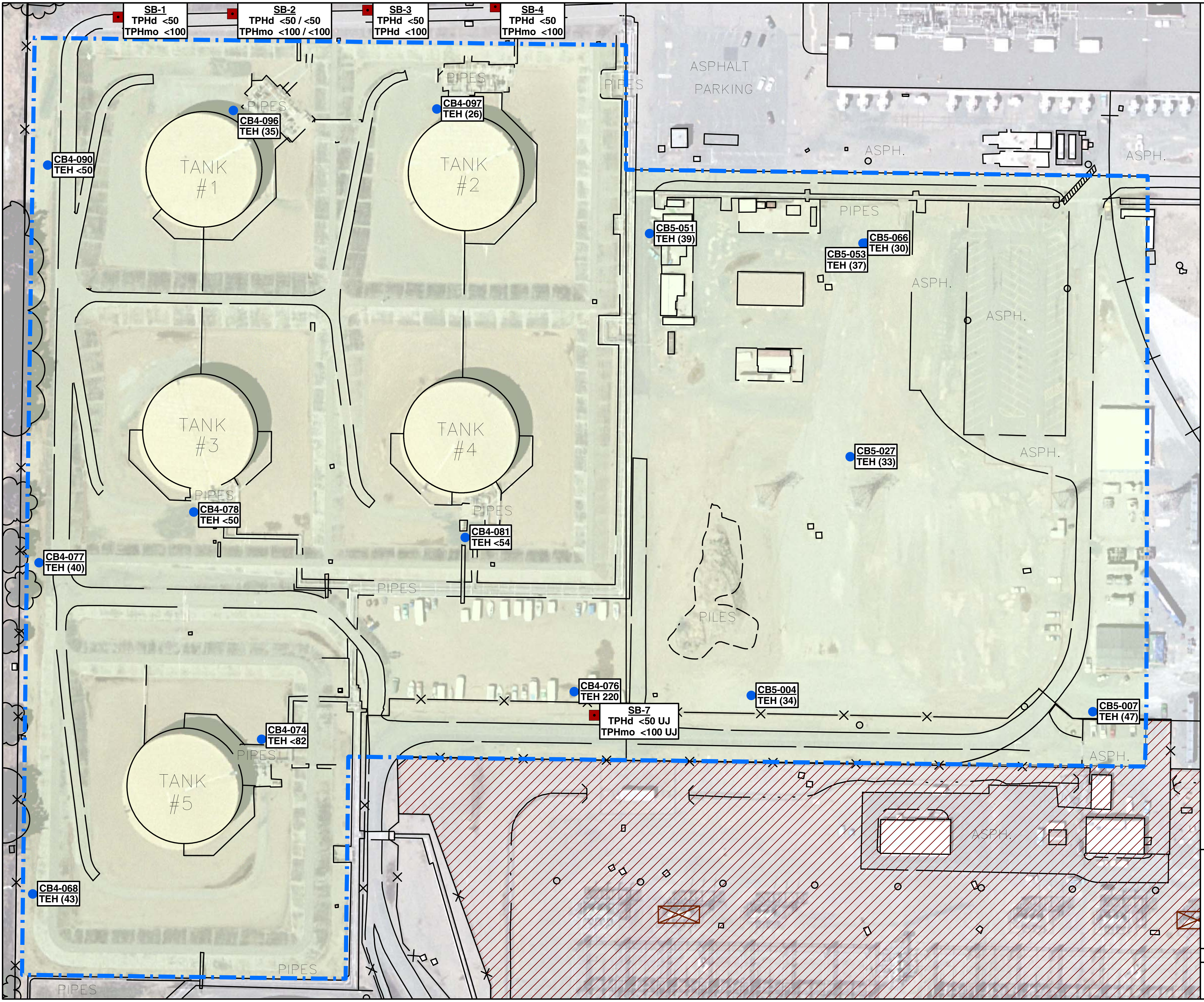
- 🟥 2009 sampling location
- ● 1997 sampling location
- ▨ PG&E switchyard
- Marsh Landing Generating Station project boundary (the site)
- ☒ Reported oil-filled circuit breaker explosion site

Aerial image from USGS digital orthophoto dated May 23, 2002.

File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_12.mxd

LOCATION WHERE METALS WERE ANALYZED
IN GROUNDWATER
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 12



File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_13.mxd

Explanation

■	2009 sampling location
●	1997 sampling location
▨	PG&E switchyard
▭	Marsh Landing Generating Station project boundary (the site)
☒	Reported oil-filled circuit breaker explosion site

CB4-097 ← Sample I.D.
TEH (26) ← Concentration in µg/L

Notes:
TEH = total extractable hydrocarbons
TPHd = total petroleum hydrocarbons quantified as diesel
TPHmo = total petroleum hydrocarbons quantified as motor oil
µg/L = micrograms per liter
( ) = detected concentrations is less than reporting limit
/ = duplicate sample results
UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate.

Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

N

0 120 240 Feet

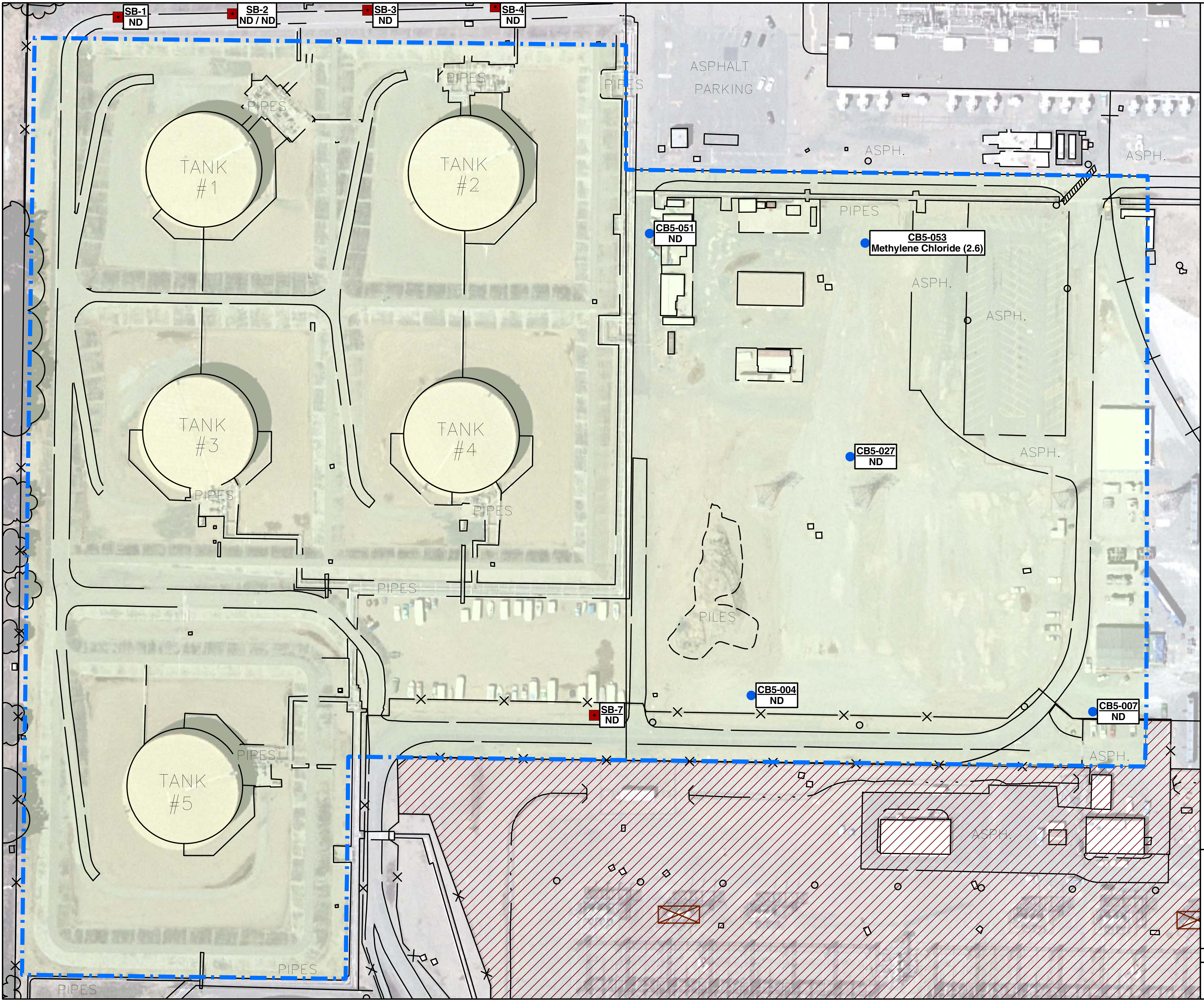
Aerial image from USGS digital orthophoto dated May 23, 2002.

PETROLEUM HYDROCARBON
ANALYTICAL RESULTS IN GROUNDWATER
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG
Date: 1/29/2010
Project No. 15317.000

AMEC Geomatrix

Figure 13



File path: S:\15300\15317\15317.000\task_04\09_1223_fi_fig_14.mxd

Explanation

■ 2009 sampling location

● 1997 sampling location

▨ PG&E switchyard

Marsh Landing Generating Station project boundary (the site)

☒ Reported oil-filled circuit breaker explosion site

CB5-053 — Sample I.D.
Methylene Chloride (2.60) — Concentration in µg/L

Notes:
VOC = volatile organic compound
ND = no VOCs were detected
µg/L = micrograms per liter
( ) = detected concentrations is less than reporting limit
/ = duplicate sample results
Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

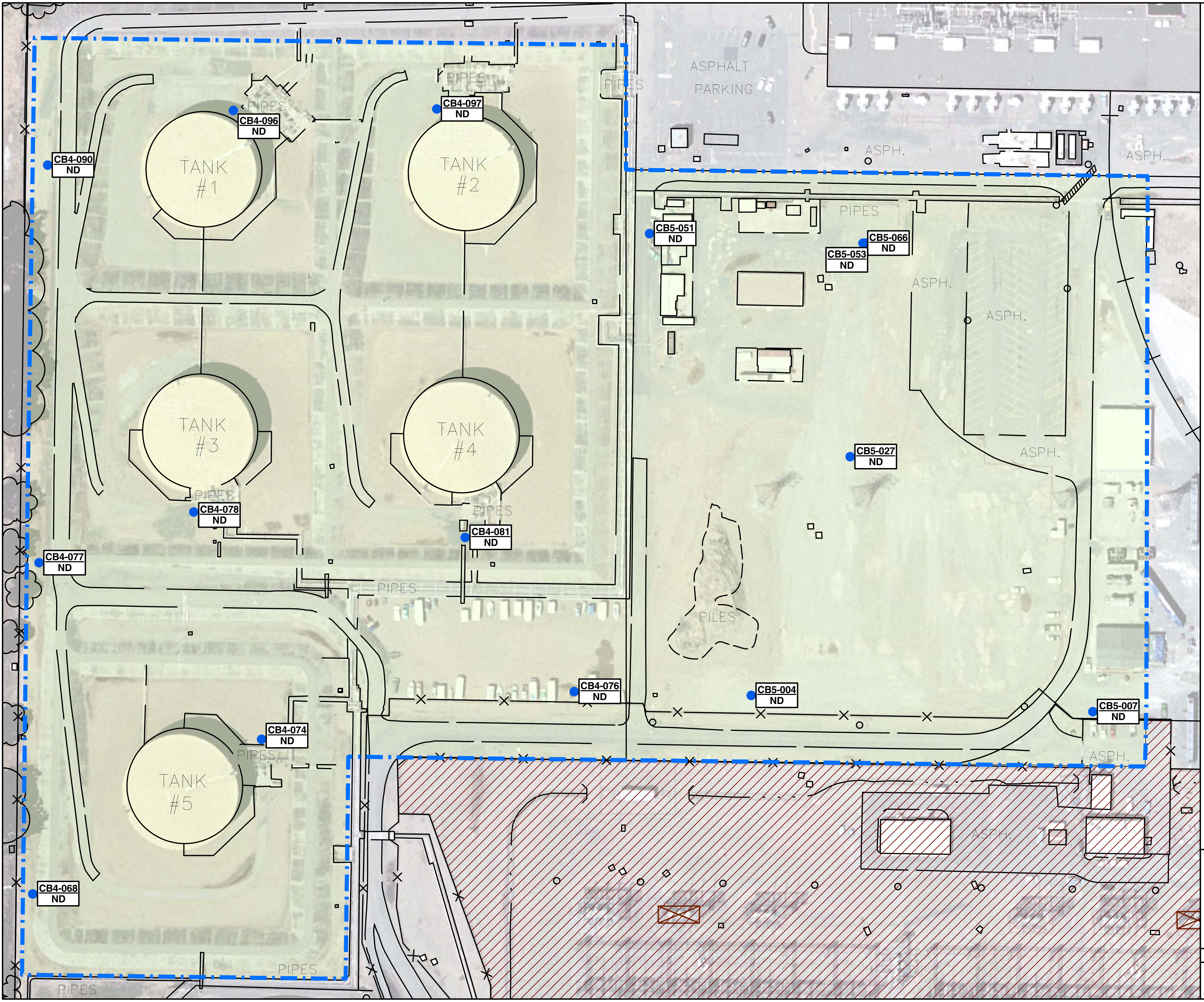
N

0 120 240
Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

VOC ANALYTICAL RESULTS IN GROUNDWATER
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 14



Explanation

- 🟥 2009 sampling location
- ● 1997 sampling location
- ▨ PG&E switchyard
- Marsh Landing Generating Station project boundary (the site)
- ☒ Reported oil-filled circuit breaker explosion site

CB5-004 — Sample I.D.
ND — Concentration in µg/L

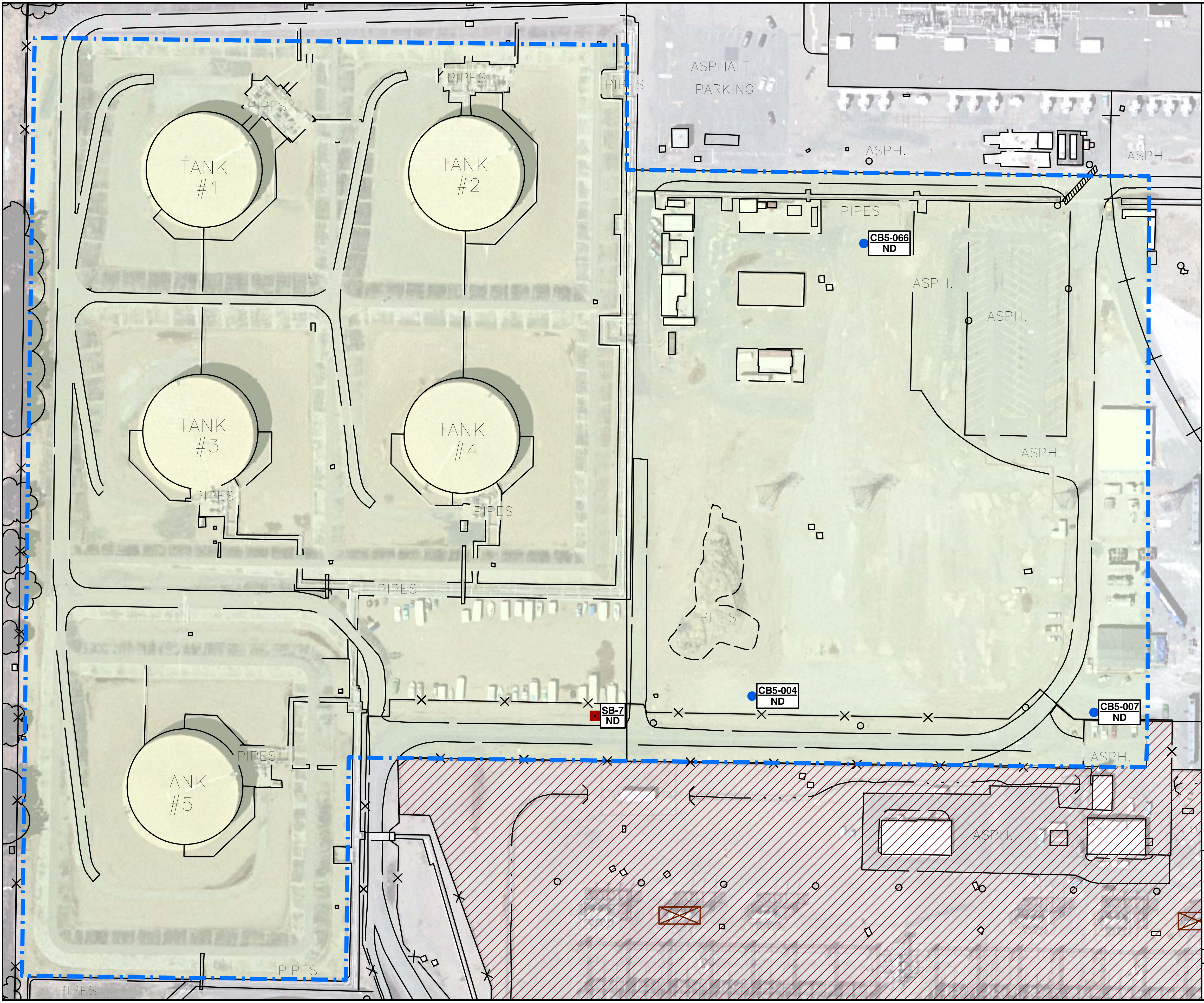
Notes:
PAH = polyaromatic hydrocarbons
ND = no PAHs were detected
µg/L = micrograms per liter
Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

Aerial image from USGS digital orthophoto dated May 23, 2002.

PAH ANALYTICAL RESULTS IN GROUNDWATER
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 15

File path: S:\15300\15317.000\task_04\09_1223_fi_fig_15.mxd



Explanation

🟥 2009 sampling location

● 1997 sampling location

▨ PG&E switchyard

▭ Marsh Landing Generating Station project boundary (the site)

☒ Reported oil-filled circuit breaker explosion site

CB5-004	◄ Sample I.D.
ND	◄ Concentration in µg/L

Notes:
PAH = polyaromatic hydrocarbons
ND = no PAHs were detected
µg/L = micrograms per liter
Analytical results from 1997 were compiled from data tables in Fluor Daniel GTI June 1998 Phase II Environmental Site Assessment report; original data sheets were not available for review.

N

0 120 240
Feet

Aerial image from USGS digital orthophoto dated May 23, 2002.

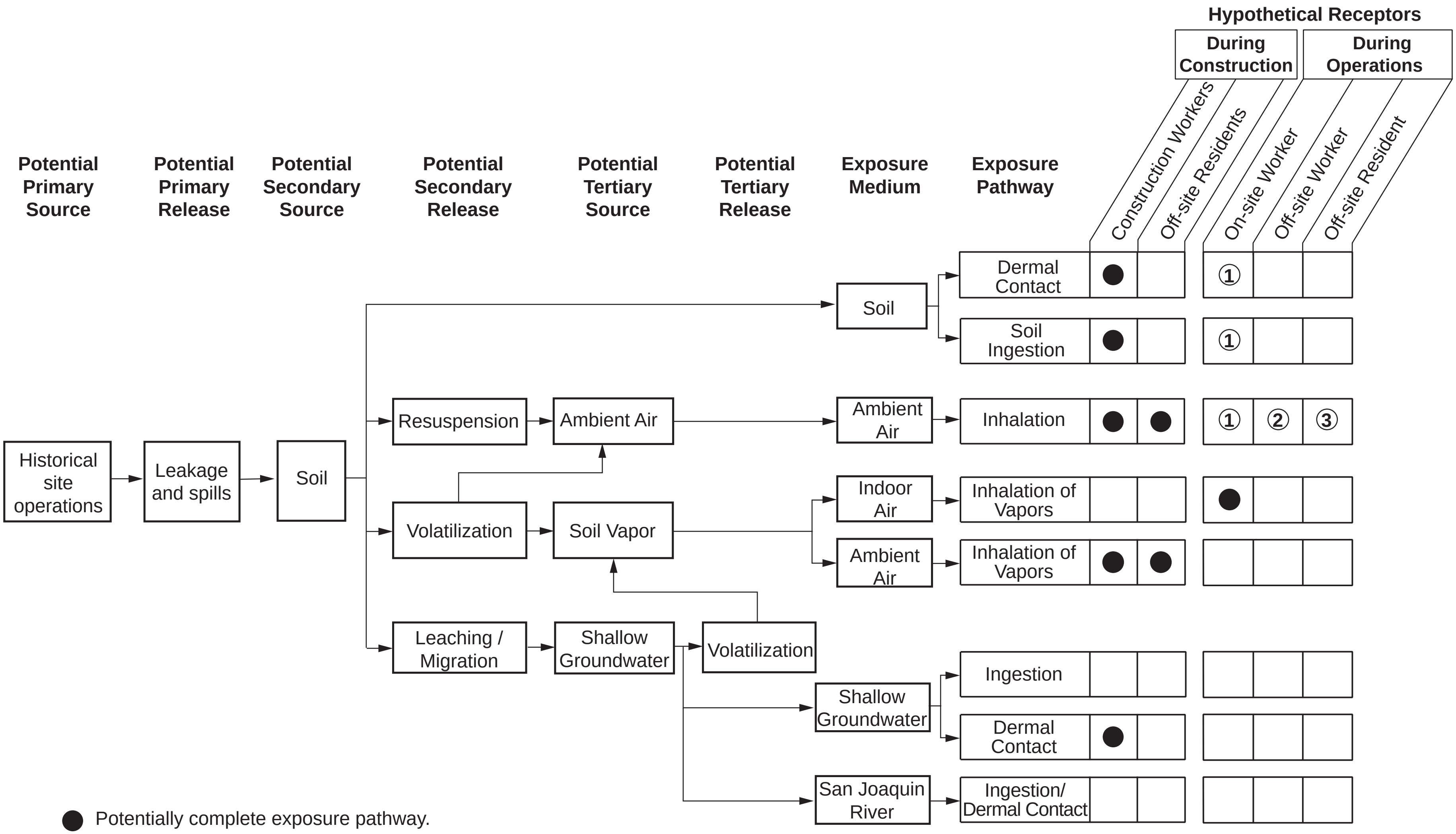
PCB ANALYTICAL RESULTS IN GROUNDWATER

Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: MMG	Date: 12/30/2009	Project No. 15317.000
AMEC Geomatrix		Figure 16

File path: S:\15300\15317.000\task_04\09_1223_fi_fig_16.mxd

S:\15300\15317\15317.000\task_04\09_1223_fi_fig_17.ai



Exposure Medium	Exposure Pathway	Construction Workers	Off-site Residents	On-site Worker	Off-site Worker	Off-site Resident
Soil	Dermal Contact	●		①		
	Soil Ingestion	●		①		
Ambient Air	Inhalation	●	●	①	②	③
Indoor Air	Inhalation of Vapors			●		
Ambient Air	Inhalation of Vapors	●	●			
Shallow Groundwater	Ingestion					
	Dermal Contact	●				
San Joaquin River	Ingestion/ Dermal Contact					

● Potentially complete exposure pathway.

① This pathway may not be complete once construction is finished because portions of the site may be paved and covered by buildings and equipment. However, potential exposure (assuming the site will not be covered) is evaluated.

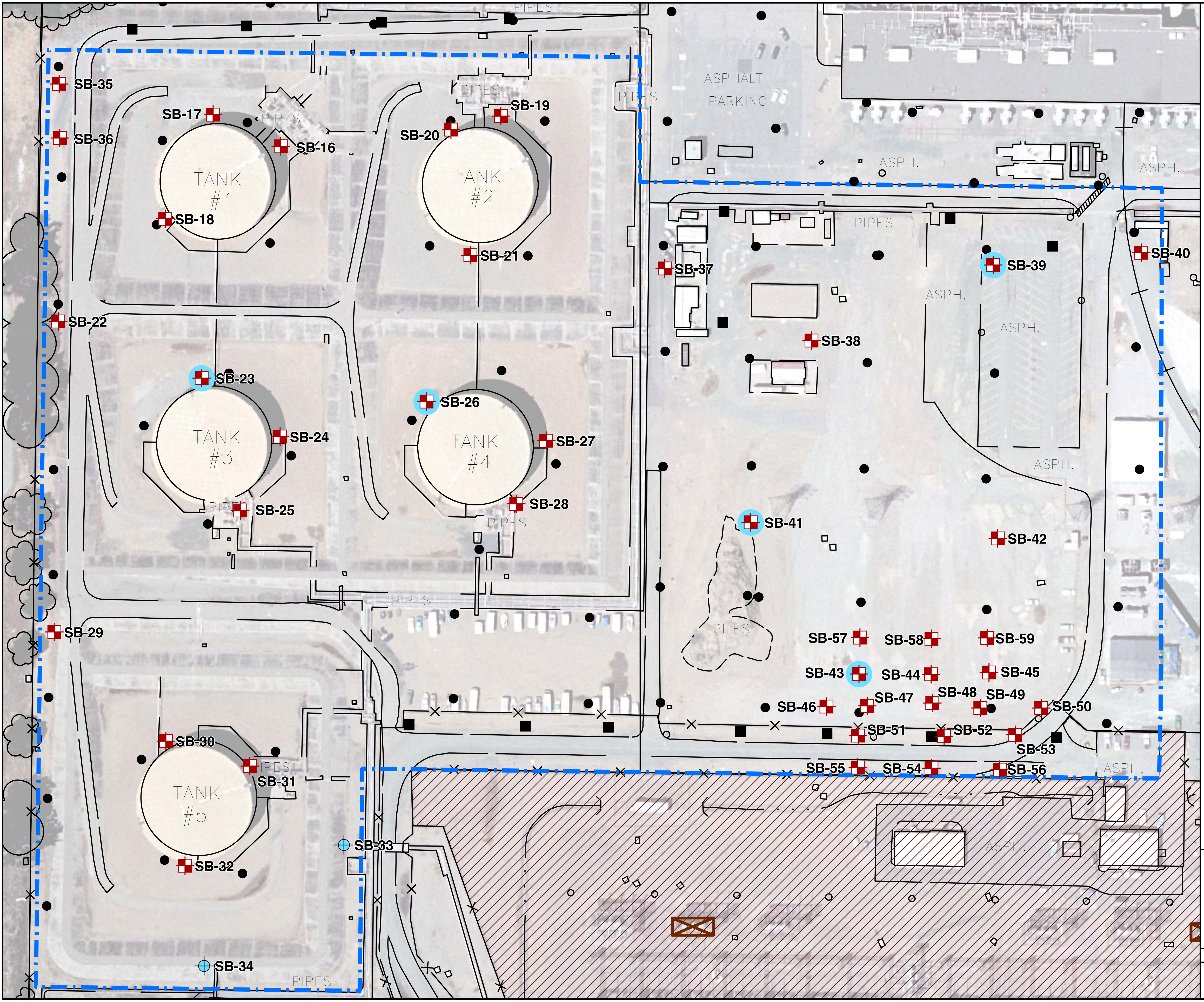
② This pathway is evaluated qualitatively because exposure during operations for off-site worker receptor is expected to be less than the on-site worker receptor for inhalation of particulates.

③ Potentially complete for the inhalation of particulates.

PRELIMINARY SITE CONCEPTUAL MODEL
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: PS | Date: 12/30/2009 | Project No. 15317.000

AMEC Geomatrix | Figure 17



Explanation

⌖	Proposed grab groundwater sampling location
◉	Proposed soil and grab groundwater sampling location
⊞	Proposed soil sampling location
■	2009 sampling location
●	1997 sampling location
▭	Marsh Landing Generating Station project boundary
▨	PG&E switchyard
⊠	Reported oil-filled circuit breaker explosion site

Aerial image from USGS digital orthophoto dated May 23, 2002.

PROPOSED SAMPLING LOCATIONS
Marsh Landing Generating Station
Mirant Contra Costa Power Plant
Contra Costa County, California

By: JLP | Date: 3/9/2010 | Project No. 15317.000

AMEC Geomatrix | Figure 18

File path: S:\15300\15317.000\task_04\09_1223_fi_fig_18.mxd

APPENDIX A

Creek Environmental Laboratories Reporting Limits

EPA 8260	SOIL		WATER	
	MDL	PQL	MDL	PQL
ANALYTE	ug/Kg	ug/Kg	ug/L	ug/L
Benzene	2.0	5	0.2	0.5
Bromobenzene	0.9	5	0.2	0.5
Bromochloromethane	2.0	5	0.2	0.5
Bromodichloromethane	1.3	5	0.2	0.5
Bromoform	1.8	5	0.3	0.5
Bromomethane	2.7	5	0.3	0.5
n-Butylbenzene	2.4	5	0.2	0.5
sec-Butyl Benzene	2.7	5	0.2	0.5
t-Butylbenzene	1.0	5	0.2	0.5
Carbon Tetrachloride	4.4	5	0.2	0.5
Chlorobenzene	1.6	5	0.2	0.5
Chloroethane	1.8	5	0.3	0.5
2-Chloroethylvinyl ether	4.7	100	10.0	20
Chloroform	2.9	5	0.2	0.5
Chloromethane	2.9	5	0.3	0.5
2-Chlorotoluene	1.3	5	0.2	0.5
4-Chlorotoluene	2.9	5	0.2	0.5
1,2-Dibromo-3-Chloropropane	1.6	5	1.0	1
Dibromochloromethane	2.1	5	0.3	0.5
Dibromomethane	1.0	5	0.3	0.5
1,2-Dibromoethane (EDB)	0.8	5	0.4	0.5
Dichlorodifluoromethane	3.0	5	0.5	0.5
1,2-Dichlorobenzene	2.0	5	0.2	0.5
1,3-Dichlorobenzene	2.4	5	0.2	0.5
1,4-Dichlorobenzene	0.8	5	0.2	0.5
1,1-Dichloroethane	2.3	5	0.2	0.5
1,2-Dichloroethane (EDC)	3.8	5	0.2	0.5
1,1-Dichloroethene	0.9	5	0.2	0.5
cis-1,2-Dichloroethene	0.9	5	0.2	0.5
trans-1,2-Dichloethene	1.1	5	0.2	0.5
1,2-Dichloropropane	0.7	5	0.2	0.5
1,3-Dichloropropane	1.4	5	0.2	0.5
2,2-Dichloropropane	1.8	5	0.2	0.5
1,1-Dichloropropene	2.1	5	0.2	0.5

EPA 8260	SOIL		WATER	
	MDL	DLR	MDL	DLR
ANALYTE	ug/Kg	ug/Kg	ug/L	ug/L
cis-1,3-Dichloropropene	1.1	5	0.2	0.5
trans-1,3-Dichloropropene	0.7	5	0.2	0.5
Ethylbenzene	1.3	5	0.2	0.5
Hexachlorobutadiene	1.1	5	0.3	0.5
Iodomethane	10.0	20	2.0	5
Isopropylbenzene	0.7	5	0.2	0.5
4-Isopropyltoluene	2.4	5	0.2	0.5
Methylene Chloride	1.4	20	2.0	5
Methyl t-Butyl Ether (MTBE)	3.0	5	0.2	0.5

Naphthalene	2.2	20	2.0	5
n-Propylbenzene	2.6	5	0.2	0.5
Styrene	0.7	5	0.2	0.5
1,1,1,2-Tetrachloroethane	2.7	5	0.2	0.5
1,1,2,2-Tetrachloroethane	2.6	5	0.2	0.5
Tetrachloroethene	2.4	5	0.2	0.5
Toluene	2.0	5	0.2	0.5
1,2,3-Trichlorobenzene	1.5	5	0.3	0.5
1,2,4-Trichlorobenzene	0.8	5	0.3	0.5
1,1,1-Trichloroethane	3.0	5	0.2	0.5
1,1,2-Trichloroethane	0.8	5	0.2	0.5
Trichloroethene	1.6	5	0.2	0.5
Trichlorofluoromethane	3.1	5	0.3	0.5
1,2,3-Trichloropropane	1.1	5	0.3	0.5
1,2,4-Trimethylbenzene	1.4	5	0.2	0.5
1,3,5-Trimethylbenzene	2.0	5	0.2	0.5
Vinyl Chloride	2.9	5	0.3	0.5
m,p-Xylene	4.0	5	0.4	0.5
o-Xylene	2.0	5	0.2	0.5
t-Butyl Alcohol (TBA)	10.0	20	1.0	2
TAME	3.0	5	0.4	0.5
DIPE	2.8	5	0.2	0.5
ETBE	3.3	5	0.2	0.5
Acetone	8.0	20	5.0	10
2-Butanone (MEK)	9.0	20	5.0	10
4-Methyl-2-pentanone (MIBK)	4.0	10	2.0	5
2-Hexanone	10.0	20	2.0	5

TPH	MDL	PQL	MDL	PQL
ANALYTE	mg/Kg	mg/Kg	ug/L	ug/L
TPH-Gasoline 8015	0.2	0.5	20	50
TPH-Diesel 8015	5	10	50	100
TPH-Motor Oil 8015	5	10	50	100
TPH Fractionation:				
Aliphatic Hydrocarbons (C5-C8)		0.5		
Aromatic Hydrocarbons (C6-C8)		0.005		
Aliphatic Hydrocarbons (C9-C18)		10		
Aromatic Hydrocarbons (C9-C16)		10		
Aliphatic Hydrocarbons (C19-C32)		20		
Aromatic Hydrocarbons (C17-C32)		10		

ICP/MS METALS ANALYTE	EPA 6020 SOIL PQL mg/Kg	EPA 6020 WATER PQL mg/L	EPA 200.8 WATER PQL mg/L
Antimony	0.4	0.008	
Arsenic	0.4	0.008	
Barium	0.4	0.008	
Beryllium	0.4	0.008	0.001
Cadmium	0.4	0.008	0.001
Chromium	0.4	0.008	
Cobalt	0.4	0.008	0.001
Copper	0.4	0.008	0.001
Lead	0.4	0.008	0.001
Molybdenum	0.4	0.008	
Nickel	0.4	0.008	
Selenium	0.5	0.008	0.001
Silver	0.4	0.008	0.001
Thallium	0.4	0.008	0.001
Vanadium	0.4	0.008	
Zinc	4	0.08	

Cold Vapor	EPA 7471 SOIL mg/Kg	EPA 7470 WATER mg/L
Mercury	0.04	0.0002

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE MARSH LANDING GENERATING STATION

DOCKET NO. 08-AFC-3

PROOF OF SERVICE

(REVISED 2/17/2010)

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DECLARATION OF SERVICE

I, Anne Connell, declare that on March 17, 2010, I served and filed copies of the attached Facility Investigation and Risk Assessment Work Plan. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[http://www.energy.ca.gov/sitingcases/marshlanding/index.html]**. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(C*heck all that Apply*)

For service to all other parties:

X sent electronically to all email addresses on the Proof of Service list;

_____ by personal delivery or by depositing in the United States mail at San Francisco, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

For filing with the Energy Commission:

X sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION

Attn: Docket No. 08-AFC-3
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.