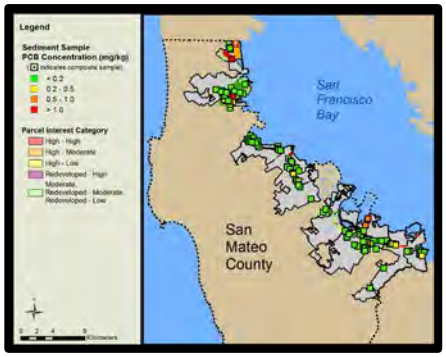
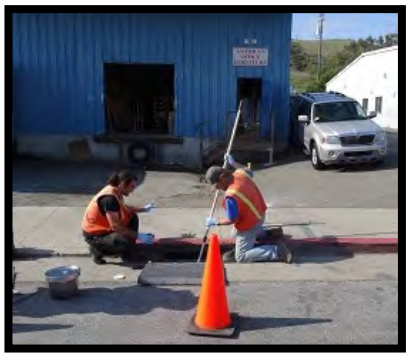
SAN MATEO COUNTYWIDE
Water Pollution
Prevention Program

PCBs and Mercury Source Area Identification

WATER YEAR 2015 POC MONITORING REPORT





Submitted in Compliance with
NPDES Permit No. CAS612008, Provision C.8.e.i
Pollutants of Concern Loads Monitoring

EOA inc.

September 2015

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Appendix A. Sampling Locations and Results

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LIST OF ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
BMPs	Best Management Practices
COC	Chain of Custody
CW4CB	Clean Watersheds for a Clean Bay
CWA	Clean Water Act
DTSC	California Department of Toxic Substances
FD	Field Duplicate
LCS	Laboratory Control Samples
MQO	Measurement Quality Objective
MRP	Municipal Regional Permit
MS	Matrix Spike
MS4	Municipal Separate Storm Sewer System
MSD	Matrix Spike Duplicate
NPDES	National Pollution Discharge Elimination System
PCBs	Polychlorinated Biphenyls
PCJPB	Peninsula Corridor Joint Powers Board
POC	Pollutant of Concern
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
SAP	Sampling and Analysis Plan
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
STLS	Small Tributaries Loading Study
USEPA	United States Environmental Protection Agency
TMDL	Total Maximum Daily Load
WY	Water Year

EXECUTIVE SUMMARY

In Water Year 2015 the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) conducted a targeted reconnaissance sediment sampling program on behalf of its Permittees in compliance with Provision C.8.e.i (Pollutants of Concern Loads Monitoring) of the Municipal Regional Stormwater National Pollutant Discharge Elimination system Program (NPDES) Permit (MRP; Order R2-2009-0074). Over one hundred bedded sediment samples were collected for polychlorinated biphenyls (PCBs) and mercury analysis (these pollutants are often found bound to sediments in the environment) to screen for areas in the urban environment with elevated pollutant concentrations. The general goal was to continue identifying potential source areas for further study. These areas are potential opportunity areas for implementing controls to reduce stormwater discharges of PCBs and mercury.

Samples were distributed among the nine municipalities that collectively encompass 93% of the old industrial land use in San Mateo County that drains to San Francisco Bay. Sample stations were sited in locations considered most likely to contain PCBs based on nearby current and historical land use (e.g., PCB-related activities, presence of heavy or electrical equipment, recycling operations) and housekeeping (e.g., pavement in poor condition, evidence of sediment track out) conditions. Areas with already confirmed PCBs contamination were specifically excluded from the program. Bedded sediment samples from the urban storm drainage system (e.g., beneath manholes, storm drain inlets) and public right-of-way surfaces (e.g., street gutters) were collected using methods detailed in the Sampling and Analysis Plan (SAP) for PCBs and Mercury Opportunity Area Analysis and Implementation Planning (SMCWPPP 2015).

Total PCBs (i.e., sum of 40 PCB congeners) concentrations ranged from less than 0.01 mg/kg to 1.46mg/kg with an average of 0.11 mg/kg and a median of 0.04 mg/kg. A total of five samples exceeded the 0.5 mg/kg threshold that was selected by the Bay Area Stormwater Management Agencies Association (BASMAA) Monitoring and Pollutants of Concern Committee as an approximate benchmark for identifying areas that should be considered for future investigation (e.g., additional sampling, records review). Total mercury concentrations ranged from 0.03 mg/kg to 3.59 mg/kg with an average of 0.22 mg/kg and a median of 0.10 mg/kg. There is currently no comparable BASMAA benchmark for mercury; however, two samples exceeded 1.0 mg/kg. The primary objective of this project was not to identify specific source properties, but to identify areas where further investigation is warranted. SMCWPPP anticipates further investigation of the five areas with elevated PCB concentrations during the next term of the MRP.

The sampling design specifically targeted sample stations within the old industrial landscape that are influenced by parcels that were classified and prioritized as having relatively higher potential to be sources of PCBs. However, a strong correlation between the land use analysis and sampling results was lacking, and only five percent of the samples had total PCBs concentrations exceeding the 0.5 mg/kg threshold. This suggests that continuing to identify additional source areas and properties in San Mateo County may be challenging. The remainder of the PCB load appears to be coming from sources that are less elevated and more diffuse and will likely be more challenging to control. Thus data collected to-date suggests that the diffuse nature of PCB contamination within the urban landscape may require a rethinking of the approach and timeline needed to meet TMDL load reduction goals.

SMCWPPP plans to continue working with other Bay Area countywide stormwater programs (through the BASMAA MPC Committee) to evaluate the results of the ongoing efforts in the Bay Area to identify PCBs and mercury source areas and plan next steps in San Mateo County. Follow-up monitoring will be

conducted in coordination with compliance with Provision C.8.f (Pollutants of Concern Monitoring) of the reissued MRP. Monitoring under Provision C.8.f is intended to address a number of management questions related to priority pollutants such as mercury and PCBs, including helping to identify pollutant source areas. The overall objectives of follow-up efforts to address PCBs and mercury under Provisions C.11, C.12 and C.8.f of the reissued MRP will include continuing to identify which pollutant source areas in San Mateo County provide the greatest opportunities for implementing controls to reduce discharges of these pollutants.

1.0 INTRODUCTION

Pollutants of Concern (POC) loads monitoring is required by Provision C.8.e.i of the Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (Order R2-2009-0074, NPDES Permit No. CAS612008), referred to as MRP 1.0. In Water Year 2015, the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP or Program) and its Regional Monitoring Coalition (RMC) partners implemented a revised alternative approach to POC loads monitoring. This alternative monitoring approach was approved by members of the Regional Monitoring Program (RMP) Small Tributaries Loading Strategy (STLS) Team, including San Francisco Bay Area Regional Water Quality Control Board (Regional Water Board) staff, as the best approach to addressing near-term high priority information needs regarding polychlorinated biphenyls (PCBs) and mercury sources, trends, and loadings.

This report describes the results from the targeted reconnaissance sediment sampling conducted in San Mateo County by SMCWPP on behalf of its Permittees in compliance with Provision C.8.e.i of MRP 1.0. The sampling design and methodologies are presented in detail in the Sampling and Analysis Plan (SAP) for PCBs and Mercury Opportunity Area Analysis and Implementation Planning (SMCWPPP 2015). The overall project is attempting to characterize polychlorinated biphenyls (PCBs) and mercury concentrations throughout San Mateo County with the goal of identifying areas of high interest for further study and possible implementation of pollutant controls, such as referral of source properties to regulatory agencies for remediation. Therefore, a reconnaissance approach was implemented to maximize the area characterized by the sampling program within existing budget and schedule constraints. Approximately 100 sediment samples were collected and analyzed in Water Year 2015 through this sampling program. PCBs and mercury are often found bound to sediments in the environment.

Methods used to select sample stations and collect and analyze the samples are summarized in Section 2.0 of this report. Section 3.0 describes the sampling results. Recommendations for next steps in the PCBs and Mercury Opportunity Area Analysis are included in Section 4.0. Cited references are listed in Section 5.0.

1.1. Background

Fish tissue monitoring in San Francisco Bay has revealed bioaccumulation of PCBs, mercury, and other pollutants. The levels found are thought to pose a health risk to people consuming fish caught in the Bay. As a result of these findings, California has issued an interim advisory on the consumption of fish from the Bay. The advisory led to the Bay being designated as an impaired water body on the Clean Water Act (CWA) "Section 303(d) list" due to PCBs, mercury, and other pollutants. In response, the Regional Water Board has developed Total Maximum Daily Load (TMDL) water quality restoration programs targeting PCBs and mercury in the Bay. The general goals of the TMDLs are to identify sources of PCBs and mercury to the Bay and implement actions to control the sources and restore water quality.

The PCBs and mercury TMDLs indicate that a 90% reduction in PCBs and 50% reduction in mercury in discharges from urban stormwater runoff to the Bay are needed to achieve water quality standards and restore beneficial uses. Provisions C.11 and C.12 of MRP 1.0 required Permittees to implement pilot-scale control measures during the permit term to reduce PCBs and mercury discharges from Municipal Separate Storm Sewer Systems (MS4s). These pilot studies were intended to enhance our collective knowledge about the costs and benefits of different Best Management Practices (BMPs) to control PCBs and mercury. The reissued NPDES permit (i.e., MRP 2.0) was released as a Tentative Order on May 11,

2015 and is anticipated to be adopted in late 2015 following a series of public workshop hearings and a written comment period. The MRP 2.0 Tentative Order requires municipal agencies to move from pilot-scale work to focused implementation and defined load reduction goals (e.g., 3 kg/year region wide for PCBs). The strategies and BMPs that will be applied to meet the load reduction goals are anticipated to include:

- Source property identification and referral for investigation and abatement;
- Green infrastructure/treatment controls; and
- Management of PCBs in building materials during demolition.

In preparation for reissuance of the MRP, SMCWPPP and Permittee staff participated in dialogue with Regional Water Board staff through the MRP 2.0 Steering Committee and its workgroups. One outcome was a preliminary framework for focused implementation requirements addressing PCBs and mercury during the MRP 2.0 timeframe. The framework assumes that all areas in the urban landscape that drain to the Bay fall within one of three PCBs/mercury source area types that will eventually be categorized as load reduction opportunity area types.

PCBs/mercury source area types have the following characteristics:

1. **High Source Areas** – Areas mainly within old industrial land uses with known PCBs/mercury sources (e.g., where PCBs/mercury were used, transported or recycled). High source areas have relatively high concentrations of PCBs/mercury in street dirt and sediment removed from the MS4 (e.g., ≥ 0.5 mg/kg PCBs), or in stormwater runoff.
2. **Moderate Source Areas** – Land uses in the moderate source area category include old urban land uses and old industrial areas that do not fall into the high source area category and have not been redeveloped into other land use types. Moderate source areas have moderate concentrations of PCBs/mercury in street dirt and sediment removed from the MS4 (e.g., 0.2-0.5 mg/kg PCBs), or in stormwater runoff.
3. **Low/No Source Areas** – Land uses in the low/no source category include newly urbanized areas, redeveloped areas, open spaces, and parks where it is unlikely that PCBs/mercury were used, transported or recycled. PCBs/mercury concentrations in street dirt and sediment removed from the MS4, or in stormwater runoff from these areas are less than about 0.2 mg/kg PCBs.

PCBs/mercury load reduction opportunity areas consider the likelihood that load reductions could eventually be achieved. Opportunity area types have the following characteristics:

1. **High Opportunity Areas** – These areas (located primarily within old industrial land uses) have relatively high or moderate PCBs/mercury yields and provide relatively high opportunity for cost effective controls such as referrals to the Regional Water Board or other agencies for subsequent remediation.
2. **Moderate Opportunity Areas** - These are areas (located primarily within old urban and old industrial land uses) that have relatively moderate PCBs/mercury yields and provide relatively moderate opportunity for cost effective controls. These include areas where additional PCBs/mercury load reductions could be achieved as the urban landscape is potentially redeveloped and/or retrofitted with Green Infrastructure, providing the opportunity for integration of PCBs/mercury load reductions with other drivers and funding sources such as transportation projects.

3. **Low Opportunity Areas** - These areas have relatively low PCB/mercury yields and provide low or no opportunity for cost-effective controls.

The data presented in this this report will be used to better delineate *High* and *Moderate* source areas where opportunity analyses could be conducted to assess the feasibility of implementing control measures in the future.

2.0 METHODS

This section provides a brief overview of the sampling design and field methods. A detailed discussion is included in the SAP for this project (SMCWPPP 2015).

2.1. Potential PCBs and Mercury Source Area Maps and Data Spreadsheets

PCBs and mercury source and opportunity areas are being identified and classified using a map-based GIS platform through an informal iterative framework developed by the Bay Area Stormwater Management Agencies Association (BASMAA) Monitoring and Pollutants of Concern Committee. This iterative process includes the steps listed in Table 1 to identify high interest PCBs or mercury **source** areas. **Opportunity** analyses for the confirmed likely *High* source areas is a likely future step that will be based on factors such as property ownership, cost of oversight, regulatory authority, and likelihood of rapid benefit.

Table 1. Iterative framework to identify high interest PCB or mercury source areas.

Step	Description[1]	Status
Step 1	Identify parcels that were industrial in or prior to 1980 (i.e., old industrial parcels), or have other land uses associated with PCBs or mercury. See Appendix A of the SAP (SMCWPPP 2015) for a full description of these areas. These parcels are referred to as potential *High* interest source areas.	*Completed* in collaboration with Permittees using County Assessor's Parcel GIS datalayer.
Step 2	Classify potential *High* interest source areas into *High*, *Moderate* and *Low* interest source areas based on the evaluation of existing information on current land uses and practices (e.g., extent and quality of pavement, redevelopment status, level of current housekeeping, presence of heavy equipment).	*Completed* in collaboration with Permittees using local institutional knowledge combined with windshield/Google Street View/aerial photo surveys.
Step 3	Conduct sediment and/or water sampling in the public right-of-way (i.e., streets or stormwater conveyance system) near or downstream of *High* interest source areas and analyze samples for PCBs and mercury.	*Ongoing*. The sediment sampling results documented in this report add to a growing database in development since 2000.
Step 4	Reclassify *High* interest source areas based on sampling results and existing information on current and historical land uses and PCB/mercury sources.	*Ongoing*. As knowledge about land uses and the presence of PCBs and mercury grows, the maps and data spreadsheets are updated.

[1] See the Opportunity Area Analysis SAP (SMCWPPP 2015) for a complete description of the process.

Results of Step 1 and Step 2 are summarized in Table 2 which lists the number of parcels and/or acreage for each source area category. The nine SMCWPPP Permittees that collectively encompass 93% of the old industrial land use in San Mateo County that drains to San Francisco Bay are shown in Table 2.

Moderate and *No/Low* interest source areas include primarily old urban, open space, and new urban land uses. *High* interest source areas are those with old industrial land uses that have not been redeveloped into a different land use category since 1980 (i.e., roughly when PCBs were banned) that also have one or more of the following characteristics:

- Unpaved areas;
- Pavement in poor condition or sediment is seen or suspected to move off site;
- A lack of "good housekeeping" in its outdoors areas;
- A history of PCB-related activities (e.g., identified in the United States Environmental Protection Agency (USEPA) PCB Transformer Registration Database, Envirostor, or Geotracker);
- A current or past last use associated with possible PCB use (e.g., metals manufacturing, transportation/shipping, recycling, electrical, port, railroad);
- Heavy or electrical equipment observed on-site;
- Hazardous waste storage;
- Recent stormwater violations; or
- Monitoring results from adjacent areas that have elevated PCB concentrations (≥ 0.5 mg/kg).

Table 2. Source area interest classification for SMCWPPP Permittees.

Permittee	High Interest Source Areas		Moderate and No/Low Interest Source Areas (Acres)					Total Area (Acres)
	Parcels	Area (Acres)	Old Industrial	Old Urban	Open Space	New Urban	Other	
Brisbane	76	605	205	399	540	68	0	1,817
Burlingame	125	181	165	2,223	109	103	0	2,781
East Palo Alto	125	92	23	1,170	98	13	0	1,397
Menlo Park	94	271	155	3,283	478	169	0	4,355
Redwood City	192	299	183	4,528	799	1,211	1	7,022
San Carlos	169	191	216	2,501	376	61	85	3,430
San Mateo	167	173	91	6,497	558	314	0	7,633
South San Francisco	287	580	886	3,555	390	228	187	5,824
Unincorporated San Mateo County	225	494	89	4,251	10,312	143	1,884	17,173
Other[1]	133	186	152	20,435	6,391	1,392	26	28,582
TOTAL	**1,593**	**3,072**	**2,165**	**48,842**	**20,051**	**3,702**	**2,183**	**80,014**

[1] Other includes Atherton, Belmont, Colma, Daly City, Foster City, Hillsborough, Millbrae, Portola Valley, San Bruno, and Woodside. These Permittees were not asked to participate in the classification process because of the small amount of old industrial land use in their jurisdictions.

2.1.1. Priority Ranking

A system was developed by Program staff to rank the 1,593 *High* interest source area parcels. The priority ranking scheme utilized parcel information collated to-date in collaboration with Permittees, and included in the source area database. The scheme scores a number of parcel characteristics related to the potential for contributions of PCBs or mercury from a parcel to the MS4. A total score was developed for each parcel by summing the scores of each characteristic.

Of the 1,460 *High* interest source area parcels in the nine targeted municipalities, 246 were identified as the highest priority (i.e., *High - High*), 464 as moderate priority (i.e., *High - Moderate*), 667 as low priority (i.e., *High - Low*), and 83 as *Redeveloped - High*. *Redeveloped - High* parcels are those that have been partially or fully redeveloped since 1980 but still meet the criteria associated with high interest source areas.

2.2. Sampling Stations

The primary goal of the sampling program was to characterize sediment chemistry (i.e., PCBs and mercury concentrations) in areas screened as *High* interest source areas of PCBs to MS4s. Therefore, a targeted reconnaissance approach was implemented to maximize the area characterized by the sampling program within existing budget and schedule constraints. A total of 101 samples were collected during this Water Year 2015 investigation.

A total of 1,460 parcels (2,885 acres) in San Mateo County were screened as *High* Interest Source Areas of PCBs to MS4s according to the criteria listed in Section 2.1. Because the number of *High* interest source parcels (1,460) far exceeded the number samples that could be collected within the available budget, not all parcels were targeted for sediment/soil sampling in Water Year 2015. Therefore, tentative locations for sampling stations were identified based on the priority ranking (e.g., *High - High*) process described in Section 2.1.1 above. Furthermore, the number of samples targeted for each of the nine Permittees included in the mapping and data spreadsheet development was based on their relative contribution to the total number of *High* interest source area parcels and acreage.

Prior to initiating the field effort, Program staff identified tentative sampling stations using the *High* interest source area maps and available geographic information on the location of the stormwater conveyance system and its access points. Field reconnaissance maps and worksheets were developed for each potential sampling location. These maps and worksheets allowed field crews to identify the optimal locations to sample given the area that the sample was intended to represent. Field crews then used discretion to alter locations based on actual site conditions (e.g., accessibility, incorrectly mapped storm drain inlets, presence of sufficient sediment for sample collection). If a planned location could not be sampled due to a lack of sediment, safety concerns, or the inability to locate sediment associated with a high interest source area, alternative *High* interest source areas were sampled.

When possible, sample stations were selected that characterized multiple *High* interest source area parcels by capturing sediment at a point in the MS4 that drained multiple *High* interest parcels (e.g., from a line beneath a manhole). In areas where sediment from stormwater drainage lines could not be obtained, sample stations were located in storm drain inlets or on street surfaces receiving drainage from or directly adjacent to *High* interest source areas. To increase the area characterized by inlet or street surface samples, multiple nearby samples were composited.

2.2.1. Known Pollution Sources

Significant effort has already been devoted to the identification of *High* source areas and high opportunity areas in San Mateo County and the larger San Francisco Bay region. These efforts include (but are not limited to) sampling of bedded sediments collected from urban storm drains in 2000 and 2001 (KLI & EOA 2002), wet weather water quality characterization of 17 watersheds (McKee et al. 2012), and the ongoing Clean Watersheds for a Clean Bay (CW4CB) project (unpublished to date) funded by a grant from the U. S. Environmental Protection Agency (USEPA).

Certain areas within San Mateo County had previously been identified as having elevated concentrations of PCBs (e.g., the Pulgas Creek Pump Station watershed and the Delta Star facility area). These areas were explicitly excluded from this sampling project, as the goal of this project was to discover additional source areas and broadly characterize PCB and mercury concentrations in *High* interest source areas.

2.3. Sample Collection Methods

Sediment/soil sample collection methods, equipment decontamination procedures, sample handling and shipping procedures, disposal of residual materials, sample documentation, quality control, and field health and safety procedures followed the Sample and Analysis Plan and Quality Assurance Project Plan developed for Task 3 of the Clean Watersheds for a Clean Bay (CW4CB) – Implementing the San Francisco Bay's PCBs and Mercury TMDLs with a Focus on Urban Runoff program (AMS 2012 and AMS 2013). These procedures are summarized in the sections below.

Kinetic Laboratories Incorporated (KLI) conducted the sample collection for this project with guidance from Program staff. General sampling locations were identified via the process described in the project's SAP. Consistent with CW4CB procedures, exact soil/sediment sampling locations were determined in the field based on sediment availability, site accessibility, signs of sediment accumulation/wash off, visible signs of potential contamination (e.g., stained soils), and topographical features. Soil sample locations and coordinates were recorded on field datasheets as sampling was completed.

Sediment samples were collected using methods that minimize contamination, losses, and changes to the chemical form of the analytes of interest. Samples were collected in the field using pre-cleaned equipment (e.g., brushes, large spoons, extension poles) into pre-cleaned sample containers (provided by the analytical laboratory). Sampling technique varied at the discretion of the field crew depending on the location and sample type. Samples with field duplicates were collected into a pre-cleaned compositing bucket, where they were thoroughly homogenized in the field, and then aliquoted into separate jars for chemical analysis.

Field crews collected the surface soil/sediment samples using the general procedures described in the RMC SOP FS-6 *Collection of Bedded Sediment Samples for Chemical Analysis & Toxicity* (BASMAA 2014). Additional details are described in the CW4CB Quality Assurance Project Plan (QAPP) (AMS 2013). Additional detail regarding the field methods can be found in the SAP (SMCWPPP 2015).

2.3.1. Laboratory Analytical Methods

Each soil/sediment sample was analyzed for PCB congeners and mercury by ALS Environmental in Kelso, WA. Ancillary methods include sieving to 2 mm and measuring bulk density. PCB and mercury analyses are conducted on the 2 mm fraction. Bulk density measurements were applied to calculate concentrations as mg/kg. Measurement Quality Objectives (MQOs) for laboratory analyses were based on the CW4CB QAPP (AMS 2013) but modified for differing laboratory analytical methods. ALS is involved with the CW4CB program and was asked to conform to those MQOs for this study.

Although USEPA analytical method 1668A for PCBs (as congeners) has been used for previous sediment sampling, loads monitoring and analyses of Bay water and sediments, USEPA method 8082M for PCBs (as congeners) was selected as the method of choice for this study. Method 8082M was identified as the optimal method for this effort based on a thorough review of analytical detection limits. It allows for the collection of screening-level PCB data at a much greater number of sampling sites due to lower analytical laboratory costs. Consistent with the recommendations in *PCBs in San Francisco Bay: Assessment of the Current State of Knowledge and Priority Information Gaps* (Davis et al. 2014), a subset of 40 PCB congeners were analyzed. These are referred to as the Regional Monitoring Program (RMP) 40. A more thorough discussion of the reasons for selecting method 8082M can be found in the SAP (SMCWPPP 2015).

2.3.2. Quality Assurance and Quality Control

Field personnel adhered to Section 11 of the CW4CB QAPP (AMS 2013) to ensure the collection of representative, uncontaminated samples.

- **Field Blanks**. No field blanks were analyzed as part of this project as they are considered to be of limited value to the quality control process.

- **Field Duplicates**. Consistent with the CW4CB SAP (AMS 2012), field duplicate samples were collected at a rate of ten percent of sample locations or once per day, whichever was less frequent. Field crews had the discretion to select duplicate stations based upon schedule or site conditions. A separate sample number was assigned to each duplicate, and a total of ten duplicate samples were submitted blind to the laboratory. The purpose of the field duplicates was to better understand the degree of heterogeneity associated with the sediment/soil samples collected for this project and therefore variability within analytical results. Field duplicate samples assist with the interpretation of analytical results by providing an indication of this variability.

- **Method Comparison**. A total of ten samples were submitted for analysis of PCB congeners (i.e., RMP 40) using USEPA analytical method 1668A. Both methods (8082M and 1668A) quantify PCB congeners, however, method 1668A has a higher resolution and lower detection limits. The results of the two methods were compared to verify the accuracy of the 8082M results.

3.0 SAMPLING RESULTS

In January and February, 2015, 101 sediment samples were collected from high interest source areas throughout San Mateo County. The results of the sampling and related quality assurance and quality control (QA/QC) are presented in this section.

Countywide PCB sample analysis results are first presented followed by Permittee-specific results including a detailed examination of samples yielding a total PCB concentration of over 0.5 mg/kg. Mercury sampling results are briefly presented in this section, but are not the focus of this report. An evaluation of QA/QC results from field duplicates, laboratory blanks, matrix spikes, and alternative lab methods are included at the end of this section.

3.1. PCB Sampling Results

A total of 101 sediment samples were collected in San Mateo County during this Water Year 2015 investigation, all within the nine jurisdictions listed in Table 2. The samples consisted of sediments that were collected from the storm drainage system (e.g., beneath manholes, storm drain inlets, pump stations) or from locations where they could potentially reach the storm drainage system (e.g., sediment in street gutters, driveways and other surface sediments). Fifty-five (55) of the samples were composites of more than one location. The sum of the RMP 40 PCB congeners (i.e., total PCBs) concentrations ranged from 0.003 mg/kg to a maximum of 1.46 mg/kg. Two samples had total PCBs concentrations higher than 1.0 mg/kg, three samples had concentrations between 0.5 and 1.0 mg/kg, nine samples ranged from 0.2 to 0.5 mg/kg, and the remaining 87 samples had concentrations below 0.2 mg/kg. All of the nine sampled jurisdictions except for Burlingame and San Carlos had at least one sample over 0.2 mg/kg, and each of the five samples over 0.5 mg/kg fell within a different jurisdiction. Appendix A contains detailed documentation for each sample including location coordinates, sample location type (i.e., inlet, street dirt, manhole, pump station), and total PCBs and mercury concentrations measured.

3.1.1. Bay Area Sampling Comparison

Over the past 15 years over 950 sediment samples from the Bay Area have been analyzed for total PCBs. When compared to prior PCB sampling conducted in the Bay Area, a smaller percent of samples from this project had elevated PCB concentrations (i.e., above 0.5 mg/kg). Two samples from this study (2.0%) had concentrations over 1.0 mg/kg compared with 10.2% for the full Bay Area dataset, and three samples (3.0%) had concentrations between 0.5 and 1.0 mg/kg compared with 6.4% for the full Bay Area dataset. The percentage of samples with concentrations between 0.2 and 0.5 mg/kg from this study was similar to the full Bay Area dataset at roughly 9%. The higher rate of elevated samples in prior sampling may partly be attributed to past sampling efforts including further characterization of areas of known PCBs pollution. Such areas include the Pulgas Creek pump station catchment in San Carlos, the Ettie Street pump station catchment in Oakland, the Leo Avenue catchment in San Jose, and the Lauritzen and Parr Channel catchments in Richmond. A disproportionate number of samples with PCB concentrations over 1.0 mg/kg are located in Oakland, with 43% of the total.

The results of the samples in this project relative to the full Bay Area dataset is illustrated in Table 3 and Figure 1. The median total PCBs concentration for both datasets is 0.04 mg/kg, indicating that while there is a higher proportion of samples over 0.5 mg/kg in the full Bay Area dataset, there is also a higher proportion of samples that fall below 0.01 mg/kg. Seventy-four of the samples from this project (73%) have concentrations between 0.01 and 0.1 mg/kg. This group of samples is relatively uniformly distributed on a logarithmic scale which is characteristic of skewed environmental contaminant data

with elevated samples among relatively widespread low level background concentrations (i.e., of PCBs in the study area).

Table 3. PCB Results by City and Concentration Category

Permittee	Total PCBs (mg/kg)					Number of Samples				
	Max	Mean	Percentile			> 1 (mg/kg)	0.5 - 1.0 (mg/kg)	0.2 - 0.5 (mg/kg)	< 0.2 (mg/kg)	Total
			50th	75th	90th					
Brisbane	1.22	0.03	0.04			1			4	5
Burlingame	0.15	0.17	0.05						11	11
East Palo Alto	0.34	0.06	0.05					2	5	7
Menlo Park	0.57	0.17	0.03				1*	2	6	9
Redwood City	0.57	0.09	0.04				1	1	15	17
San Carlos	0.1	0.06	0.04						5	5
San Mateo	0.23	0.06	0.05					1	9	10
South San Francisco	1.46	0.15	0.04			1		3	21	25
Unincorporated San Mateo County	0.93	0.11	0.04				1		11	12
Total	1.46	0.11	0.04	0.09	0.29	2	3	9	87	101
Full Bay Area dataset	193	0.77	0.04	0.19	0.93	101	65	98	804	1068

*The sediment in this sample appeared to at least partially originate from within Redwood City.

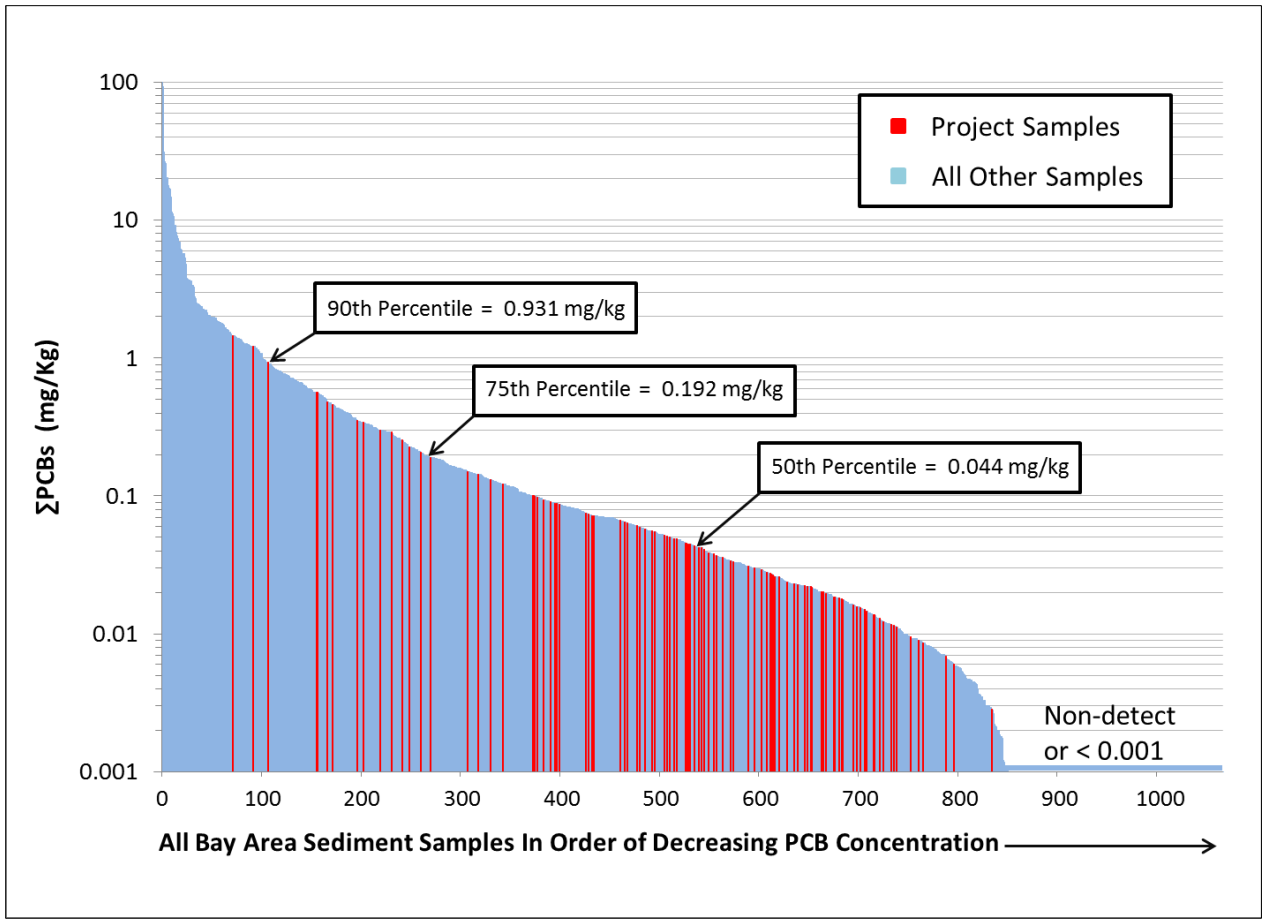

Figure 1. PCB results of the 101 samples from this project compared to the full Bay Area dataset.

3.1.2. Sample Catchment Area Mapping

The contributing area for each individual sample station was approximately delineated using GIS. These catchment areas represent the potential source area for sediment at the sample stations and range from 0.5 to 181 acres with a median size of 11 acres. For the majority of samples, the catchment area was delineated using GIS storm drain data in conjunction with field notes. If the sample was collected from a driveway, the catchment area of that station was assumed to be all or a portion of the parcel from which the sediment could have been tracked.

Of the 5,237 acres of old industrial parcels in San Mateo County that drain to the Bay, approximately 1,560 acres were characterized through sediment sampling as part of this project. The five samples from this study with total PCB concentrations greater than 0.5 mg/kg mostly drain areas characterized as *High - Low*, *Moderate*, and *Redeveloped - High* interest. Table 4 contains the sampling results cross-referenced to the parcel interest category.

There did not appear to be a trend toward parcels of higher interest contributing runoff to sediment sample stations with higher concentrations of PCBs. Possible explanations for this somewhat unexpected finding include:

- There are many uncertainties and areas of subjectivity in the process to screen for higher interest areas before sampling, including the limited amount and quality of historical land use

data available, and challenges related to aerial photograph and field reconnaissance results interpretation.

- One characteristic that may result in export of PCBs from a parcel, but was not screened for, was the potential contribution associated with sealants, caulks and other materials that may contain PCBs found in certain types of buildings primarily constructed in the 1950s through the 1970s.

- Parcels that potentially contribute a large quantity of sediment to the storm drainage system were targeted because of their potential to contribute a relatively large mass of pollutants that bind to sediments such as PCBs and mercury. However, the classification and priority ranking processes may have placed too much weight on unpaved parcels. For example, many parcels are of a higher interest category simply because of the presence of unpaved areas or vehicle tracking, regardless of other factors that would contribute to a higher PCB concentration on the parcel.

- For some catchments, the majority of a sample catchment area may exhibit background levels of PCB concentration, with a relatively small area within the catchment having elevated concentrations. Therefore, PCB concentrations may be diluted at the sample station, especially for sample locations draining larger catchments. Thus it may be necessary to characterize smaller catchments with each sample, which would increase the ratio of the number of samples collected to the area characterized, resulting in a higher cost per unit area characterized. However, it should be noted that a relatively clear signal has been found from some relatively large catchments in the past, including the Pulgas Creek pump station watershed, which has an area of approximately 250 acres.

Table 4. Acres of PCB concentration category by parcel interest category

Parcel Interest Category	Approximate Area Draining to Sample Location (acres)					Not Sampled	Total Area
	> 1.0 mg/kg	0.5 - 1.0 mg/kg	0.2 - 0.5 mg/kg	< 0.2 mg/kg	Total		
High - High	0.0	1.0	65.8	160.2	227.0	913.6	1,140.6
High - Moderate	2.5	4.8	22.4	131.0	160.8	766.4	927.2
High - Low	12.6	5.5	39.9	251.8	309.8	395.4	705.2
Moderate	36.1	15.1	43.2	397.4	491.8	798.6	1,290.4
Redeveloped - High	0.0	22.4	1.3	40.6	64.3	235.0	299.4
Redeveloped - Moderate	0.0	1.0	7.5	42.3	50.8	102.2	153.0
Redeveloped - Low	8.0	4.0	5.1	238.4	255.4	465.7	721.1
Total	59.2	53.7	185.2	1,261.8	1,559.9	3,676.9	5,236.8

3.2. PCB Sampling Results by Permittee

This section describes the PCBs sampling results for each of the nine Permittees where samples were collected. A map of sample locations is included for each Permittee along with a general description of land uses. The five samples with total PCBs concentrations over 0.5 mg/kg are shown in **bold** font and examined in detail. These sample locations and their corresponding catchment areas could potentially be targeted by future source investigations. Additional investigation would involve taking additional samples, collecting field data, interviewing property managers, and researching historical data.

3.2.1. Brisbane

A total of 810 acres of old industrial parcels[1] was mapped in the City of Brisbane. Of these, 605 acres were classified as *High* interest potential source areas and 254 acres were prioritized as *High - High*. Since 1980, 39 acres of old industrial were redeveloped; four of those acres were prioritized as Redeveloped-High.

The City of Brisbane contains what is known as the Brisbane Baylands[2], an area of approximately 660 acres between Bayshore Boulevard and Highway 101 that was prioritized mostly as *High - High* or *High - Moderate* interest. Approximately 140 acres of the Brisbane Baylands contains a former large railroad yard and the current Caltrain (Peninsula Corridor Joint Powers Board or PCJPB) right-of-way. On the east side of the railroad and to the west of Highway 101, are several large parcels including a soil processing facility that imports and exports large quantities of recycled soil and is located on top of an old landfill[3]. This facility has stormwater treatment and is required to test the soil for PCBs and many other pollutants. Most of the area is not publically accessible and does not appear to have many suitable locations for sampling. Moreover, the former railyard area and surroundings are currently being remediated for various pollutants not including PCBs, and the entire Brisbane Baylands is expected to eventually be redeveloped into a mix of commercial development, parkland, and open space (CDM, 2005). Given the scale of the planned redevelopment, no sampling from the Brisbane Baylands area was recommended for this study.

Five samples were collected in Brisbane, with three located along Industrial Way. These sample locations drain a total area of approximately 80 acres. PCB sampling results for sediments collected in the City of Brisbane are mapped in Figure 2.

- Sample **SM-BRI-02-A**, collected from a manhole near the intersection of Valley Drive and Park Lane (Figure 3), was the only elevated (greater than 0.5 mg/kg) sample from Brisbane and had a total PCBs concentration of 1.22 mg/kg (0.51 mg/kg with USEPA method 1668A). This manhole accesses a large storm drainage pipe approximately 10 feet in diameter along the north side of Valley Drive that closely parallels a second pipe of equal diameter on the south side of Valley Drive. From where the sample was taken, these pipes do not appear to be connected, but may be connected upstream such that they would share a large portion of their drainage area. Together these two pipes drain a very large area including approximately 190 acres of light industrial land uses, two relatively new residential subdivisions, a large quarry, and over 700 acres of open space (Figure 3). The City of Brisbane does not have GIS or CAD data available for their storm drain network, making delineation of the sample catchment area relatively

[1] In this discussion and in descriptions for other Permittees, "old industrial" includes other land uses associated with PCBs or mercury (e.g., recycling, railroads, military) that were compiled as part of Step 1 of the iterative process described in Section 2.1.
[2] Additional information can be found at: http://www.ci.brisbane.ca.us/baylands-information
[3] Additional information can be found at: http://thebaylands.com/

challenging. The storm drain lines shown in Figure 3 were obtained from the GIS data files available for download that were created by the Oakland Museum of California and appear in the Creek & Watershed Map of Daly City & Vicinity (Givler et al. 2006). These GIS data files only include storm drain lines greater than 24 inches in diameter and are not drawn at a resolution to determine the catchment area for this sample. Therefore, a first step in further investigation of elevated PCB concentrations in this area should be working with City staff to better understand the storm drain network and to improve the catchment area delineation.

The area of old industrial land use in the catchment area consists of large light industrial lots developed in the 1960s and 1970s, as well as a network of old railroad right-of-ways that have mostly been converted to multi-use recreational trails and remain unpaved. The catchment is primarily composed of parcels classified as *Moderate* interest, with the old railroad parcels and three others classified and prioritized as *High - Moderate* or *High - Low*. The sample itself had the smell of both petroleum and sulfides and was black in color.

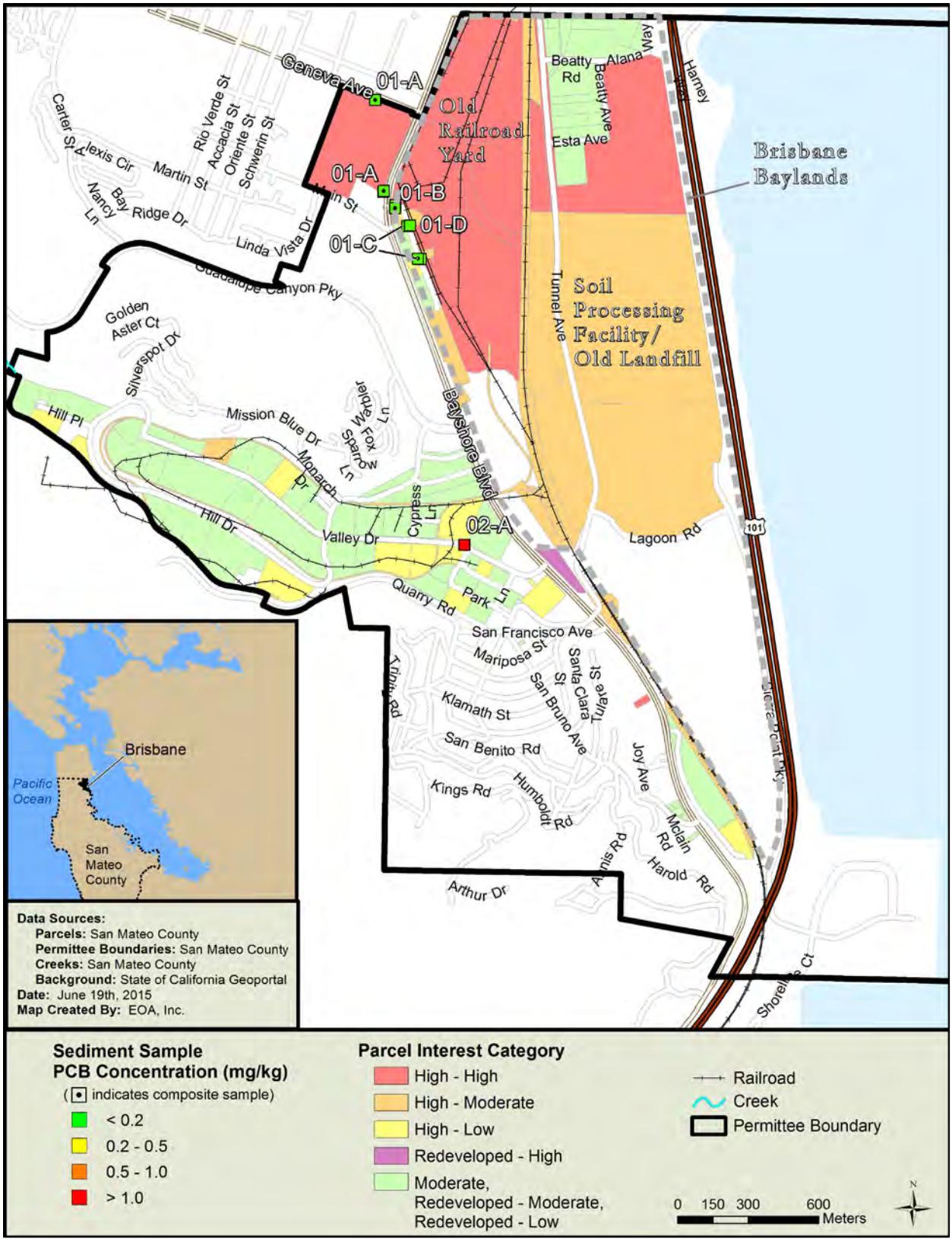

Figure 2. Map of PCB sampling results for the City of Brisbane.

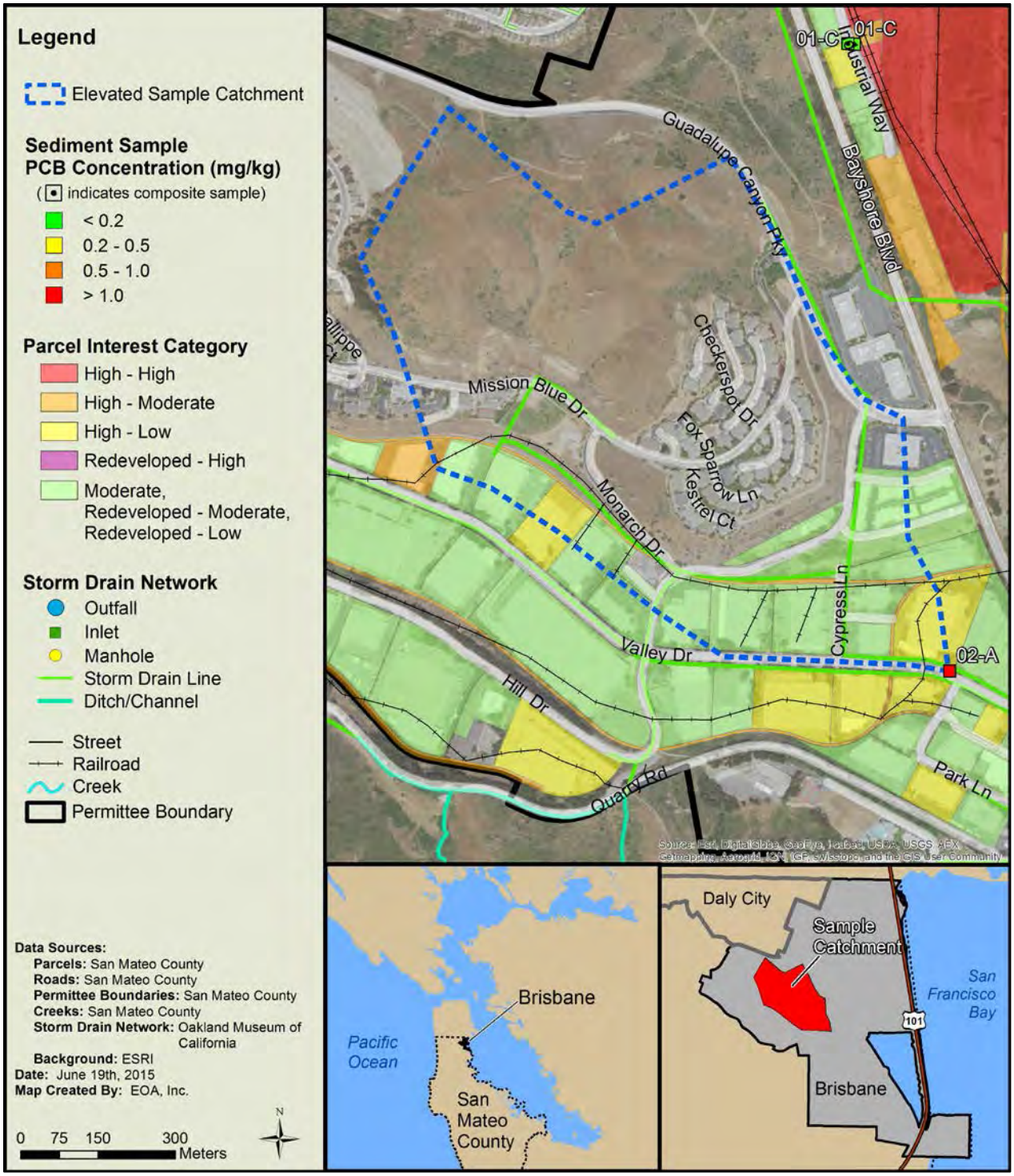

Figure 3. Map of the approximate catchment area for elevated sample SM-BRI-02-A, City of Brisbane.

3.2.2. Burlingame

A total of 346 acres of old industrial parcels were mapped in the City of Burlingame. Of these, 181 acres were classified as *High* interest potential source areas and three acres were prioritized as *High - High*. Since 1980, 34 acres of old industrial were redeveloped; three of those acres were prioritized as *Redeveloped-High*. The industries within Burlingame are primarily not heavy industrial (e.g., metal manufacturing, parts fabrication) or recycling, and therefore less likely to have a history of PCB use. Many of the industrial zoned properties contain businesses that are not normally considered industrial such as food production, office space, retail, gymnasiums, and restaurants.

Eleven samples were collected in Burlingame, at locations that drain a total of approximately 208 acres. None of the samples were elevated (i.e. greater than 0.5 mg/kg), with the highest total PCBs concentration in a sample being 0.15 mg/kg. Three of the eleven samples were collected from pump station wet wells, with the highest of these samples having a concentration of 0.06 mg/kg. PCB sampling results for sediments collected in the City of Burlingame are mapped in Figure 4.

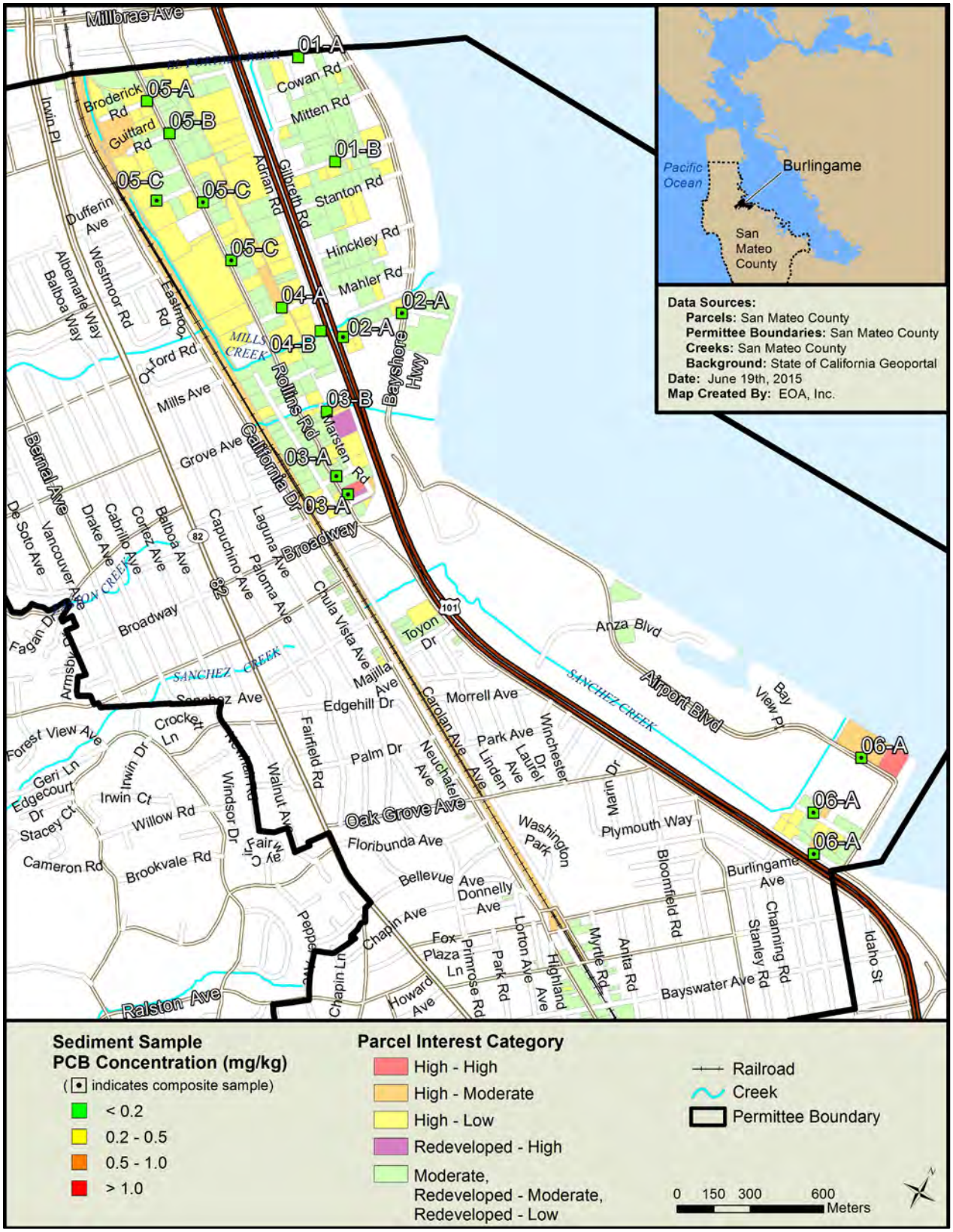

Figure 4. Map of PCB sampling results for the City of Burlingame.

3.2.3. East Palo Alto

A total of 115 acres of old industrial parcels were mapped in the City of East Palo Alto. Of these, 92 acres were classified as *High* interest potential source areas and 37 acres were prioritized as *High - High*. Since 1980, 28 acres of old industrial were redeveloped; 17 of those acres were prioritized as *Redeveloped-High*. Seven samples were collected in East Palo Alto at locations that drain a total of approximately 56 acres.

Along Bay Road in the northeast corner of the industrial area of East Palo Alto is the closed Romic Environmental Technologies Corporation site, a 12.6-acre property closed in 2007 that handled hazardous waste, and is known to contain PCB contaminated soil. The property is undergoing remediation by the USEPA in partnership with the California Department of Toxic Substances (DTSC), and is a Resource Conservation and Recovery Act (RCRA) site. Stormwater from the site is treated and released directly to the Bay without entering East Palo Alto's storm drainage system. Sample SM-EPA-01-C, which was a composite of four locations near the boundary of the site, contained low concentrations of PCBs (0.02 mg/kg).

Many of the *High – High* and *High – Moderate* parcels within East Palo Alto are currently vacant and a large area between Bay Road, Weeks Street, and Pulgas Ave will soon be redeveloped. PCB sampling results for sediments collected in the City of East Palo Alto are mapped in Figure 5.

None of the seven samples had elevated total PCBs concentrations (greater than 0.5 mg/kg) and two samples were between 0.2 and 0.5 mg/kg (Figure 5).

- Sample SM-EPA-02-D had a concentration of 0.34 mg/kg, and was collected from a manhole that drains a relatively large area along Weeks Street and to the north along Pulgas Avenue. Sample SM-EPA-02-A was collected from the manhole immediately upstream of SM-EPA-02-D along Pulgas Avenue and had a relatively low total PCBs concentration (0.05 mg/kg), suggesting that the source of PCBs could be along Weeks Street. The three large *High – Moderate* priority sites along Weeks Street have never contained industrial businesses, but are all classified as "site with open/active remediation and deed restriction" by the City suggesting existing pollution concerns (Figure 6) (DTSC 2005). Deed restrictions often will prevent a parcel from being developed into land uses such as residential, hospitals, schools, and day care centers, but will allow the development of land uses such as industrial, office, or commercial spaces.

- Sample SM-EPA-01-A had a concentration of 0.21 mg/kg (0.25 mg/kg with USEPA method 1668A), and was collected from a manhole that receives drainage from nearly all of Demeter Street. The sediment collected was black with a hydrogen sulfide smell, and the water surface had an oily sheen.

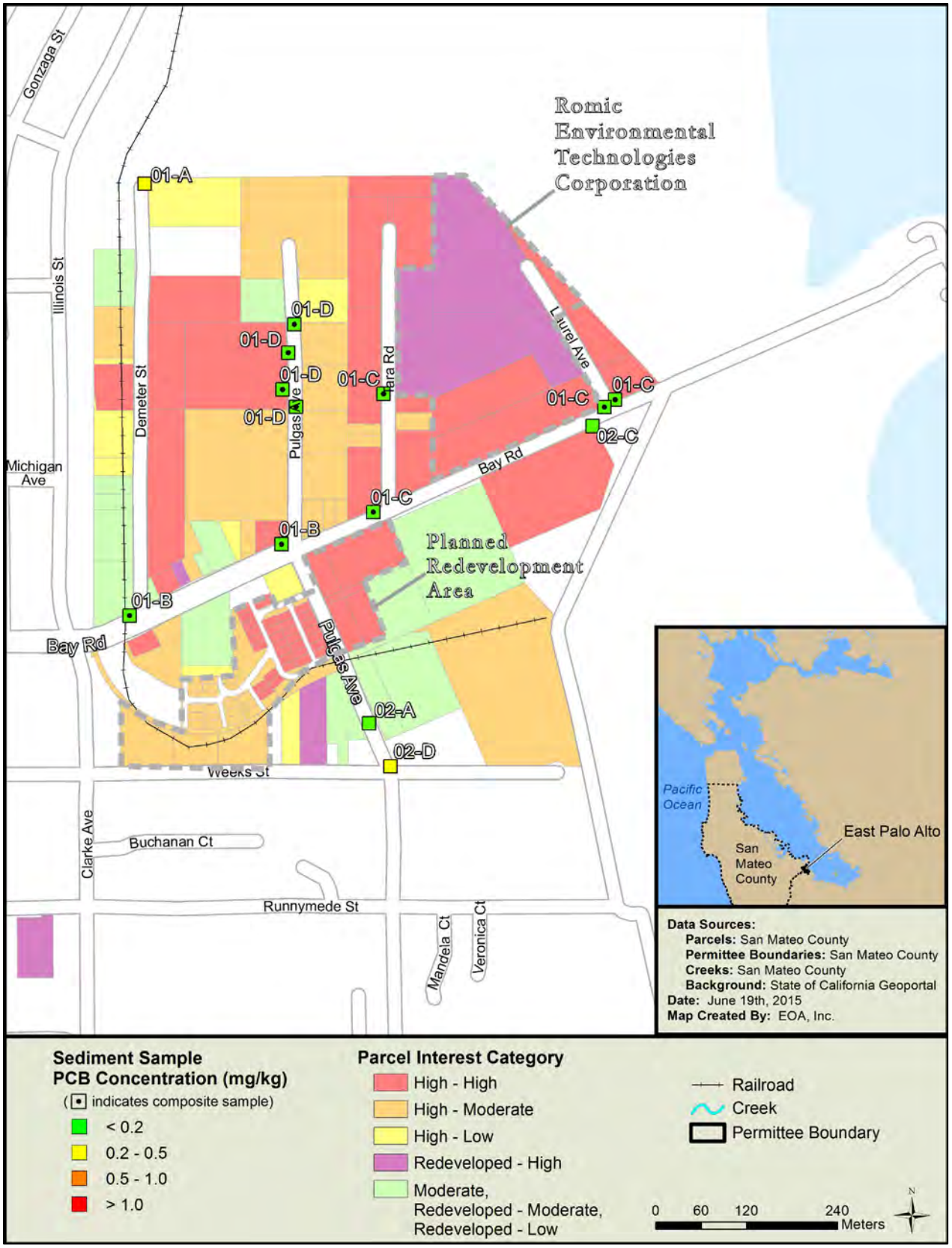

Figure 5. Map of PCB sampling results for the City of East Palo Alto

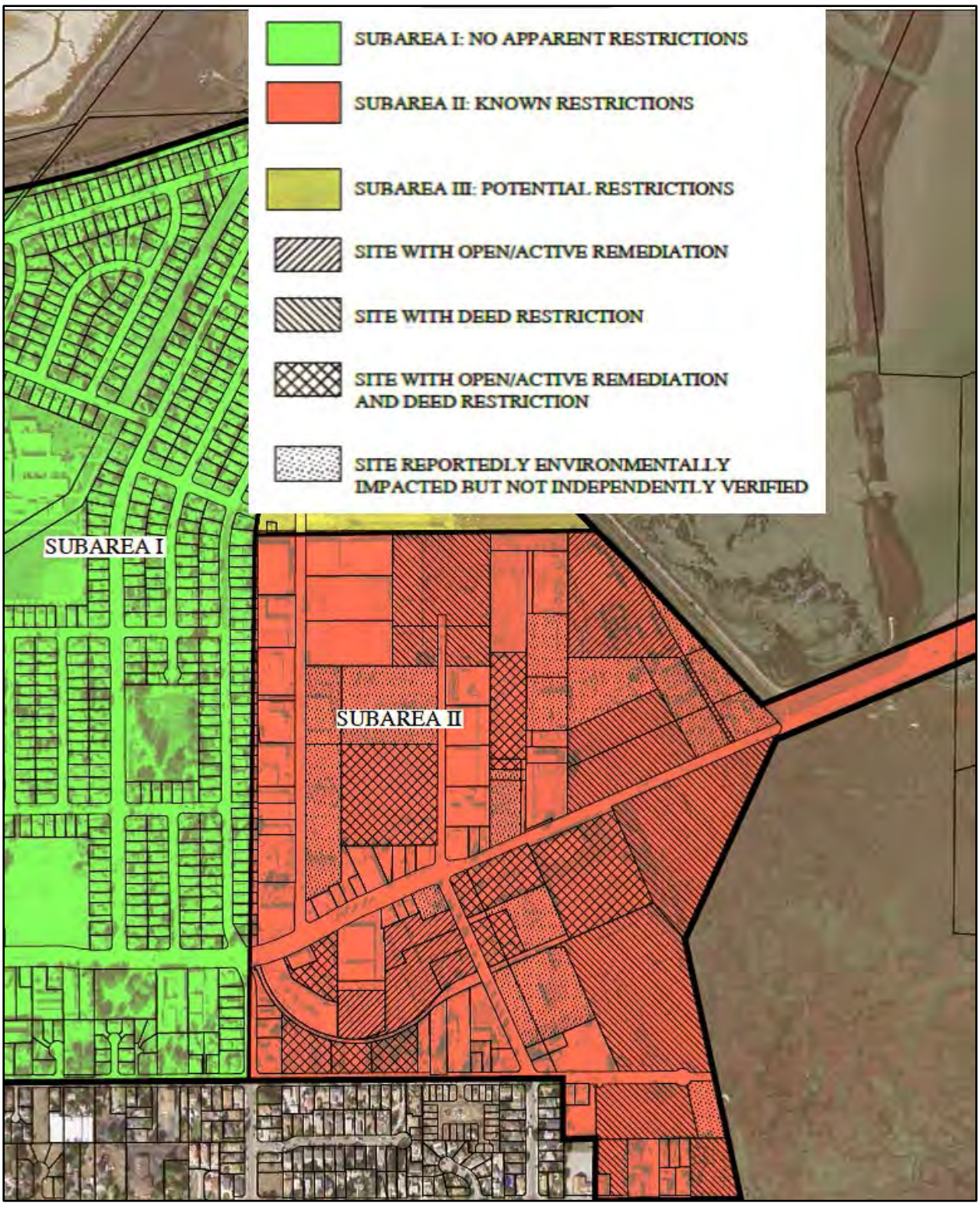

Figure 6. Building Restrictions within the City of East Palo Alto
Map Source: Michelle Daher, Environmental Coordinator, City of East Palo Alto

3.2.4. Menlo Park

A total of 426 acres of old industrial parcels were mapped in the City of Menlo Park. Of these, 271 acres were classified as *High* interest potential source areas and 126 acres were prioritized as *High - High*. Since 1980, 70 acres of old industrial were redeveloped; 35 of those acres were prioritized as *Redeveloped - High*.

Facebook is has recently finished redeveloping a large industrial property between Highway 84 and the Dumbarton railroad right-of-way formerly owned by Raychem and Tyco Electronics Corporation (Atkins 2012). The large *High - High* interest property to the west of the new Facebook campus is owned by Tyco Electronics Corporation. Both of these properties have been historically polluted with PCBs, but remediation has occurred (Atkins 2012). Portions of these properties drain to a ditch that runs along the south side of Highway 84 and eventually discharges directly to the Bay without entering the City of Menlo Park's storm drainage network. There is also a large multifamily development being built on the south side of the railroad right-of-way along Hamilton Avenue that is replacing a number of old industrial parcels of higher interest. An effort was made to sample along Hamilton Avenue, Campbell Avenue, and Scott Drive, but sediment was not found in the storm drainage system along these streets.

Nine samples were collected in the City of Menlo Park at locations that drain a total of approximately 150 acres. Two samples had total PCBs concentrations in the 0.2 – 0.5 mg/kg range and one in the elevated (0.5 – 1.0 mg/kg) range. PCB sampling results for sediments collected in the City of Menlo Park are mapped in Figure 7.

- Sample SM-MPK-04-E was a composite from two manholes located near the main entrance of Tyco Electronics Corporation and had a total PCBs concentration of 0.29 mg/kg. Half of the sample was collected from a large pipe near Highway 84 that appears to drain part of the Tyco Electronics parcel. The other half of the sample was collected at Chilco Street and Constitution Drive, a location that drains a small catchment without any parcels prioritized as High-High.

- Sample SM-MPK-04-D was collected from an inlet near 188 Constitution Drive and had a total PCBs concentration of 0.25 mg/kg. The inlet connects to a 30-inch diameter inflow and outflow pipe and drains a catchment that includes all of Constitution Drive to the east including a small portion of the Tyco Electronics Corporation property near its entrance.

- Sample **SM-MPK-02-B** is a composite sample from two locations in Menlo Park on the Redwood City border (Figure 8). The sample had a total PCBs concentration of 0.57 mg/kg (1.14 mg/kg with USEPA method 1668A). A field duplicate of this sample had a total PCBs concentration of 0.76 mg/kg (method 8082M). Half of the sample came from an inlet in front of a large 394-unit housing development that is currently being built and will reportedly be finished by the spring of 2016[4]. The inlet has three pipes flowing into it, the largest of which is a 24-inch diameter pipe originating across the street in Redwood City. The current construction site appears to be a source of sediment to the storm drainage system, although most of the sediment collected was inside of the Redwood City pipe, and did not appear to come from the construction site. The sediment in the sample was black and there was a sheen observed on the water when the sediments were disturbed. The other half of the sample was collected from a manhole at the entrance to Haven Court just before the storm drain line empties into a vault and then into Atherton Channel. The catchment for this half of the sample is only what flows into two inlets

[4] Additional information can be found at: http://menlopark.org/892/St-Anton

located at the same intersection including two *High-High* interest parcels on the north side of Haven Avenue.

- Sample SM-RCY-10-A was collected from an inlet in front of 3562 Haven Avenue in Redwood City that drains an area that is a subset of the catchment area of sample **SM-MPK-02-B**. Sample SM-RCY-10-A had a total PCBs concentration of 0.04 mg/kg. Therefore, it is unlikely that the elevated concentrations measured in sample **SM-MPK-02-B** originate in this portion of the catchment area, which is shown in crosshatching on the map in Figure 8.

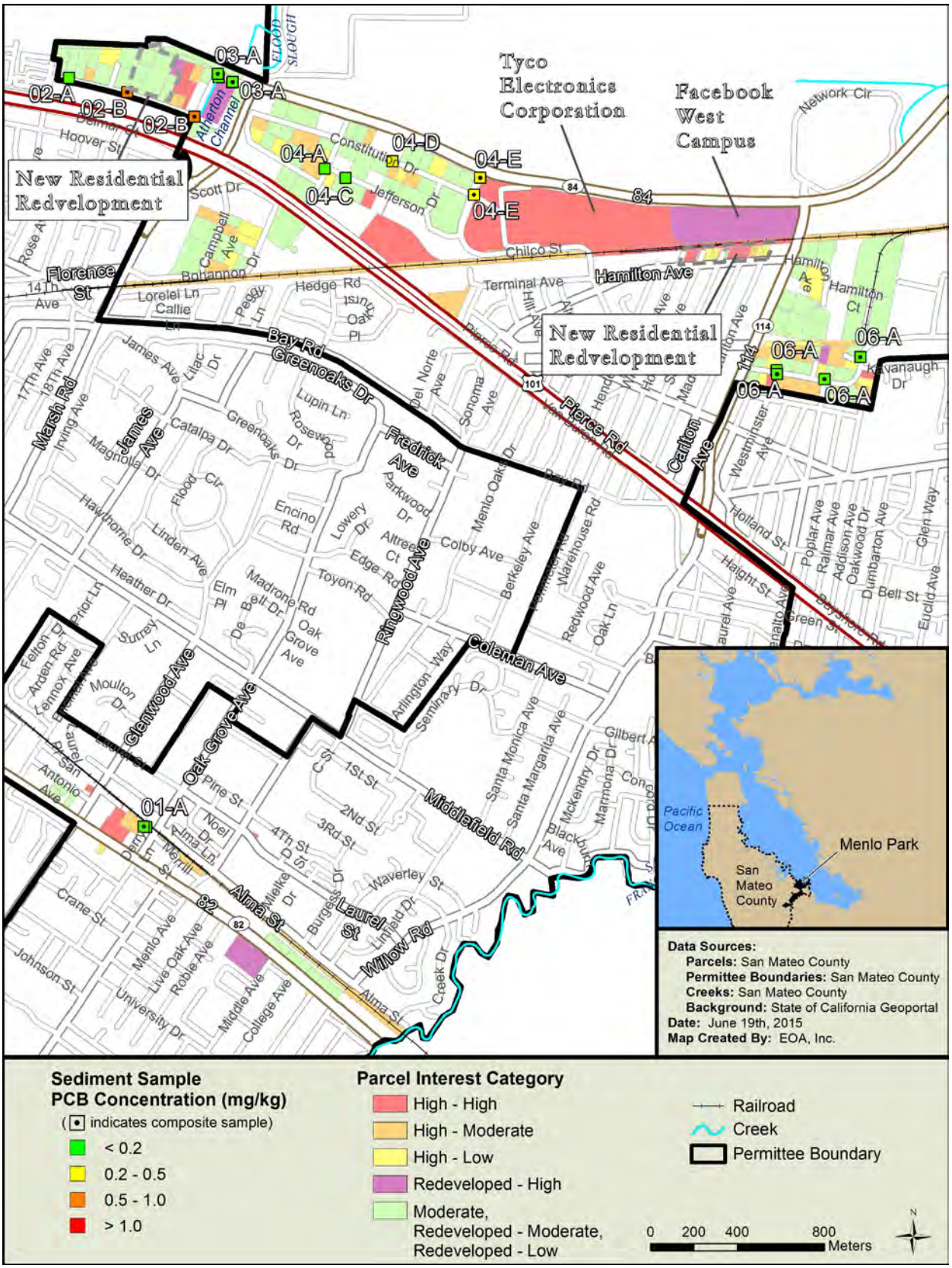

Figure 7. Map of PCB sampling results for the City of Menlo Park.

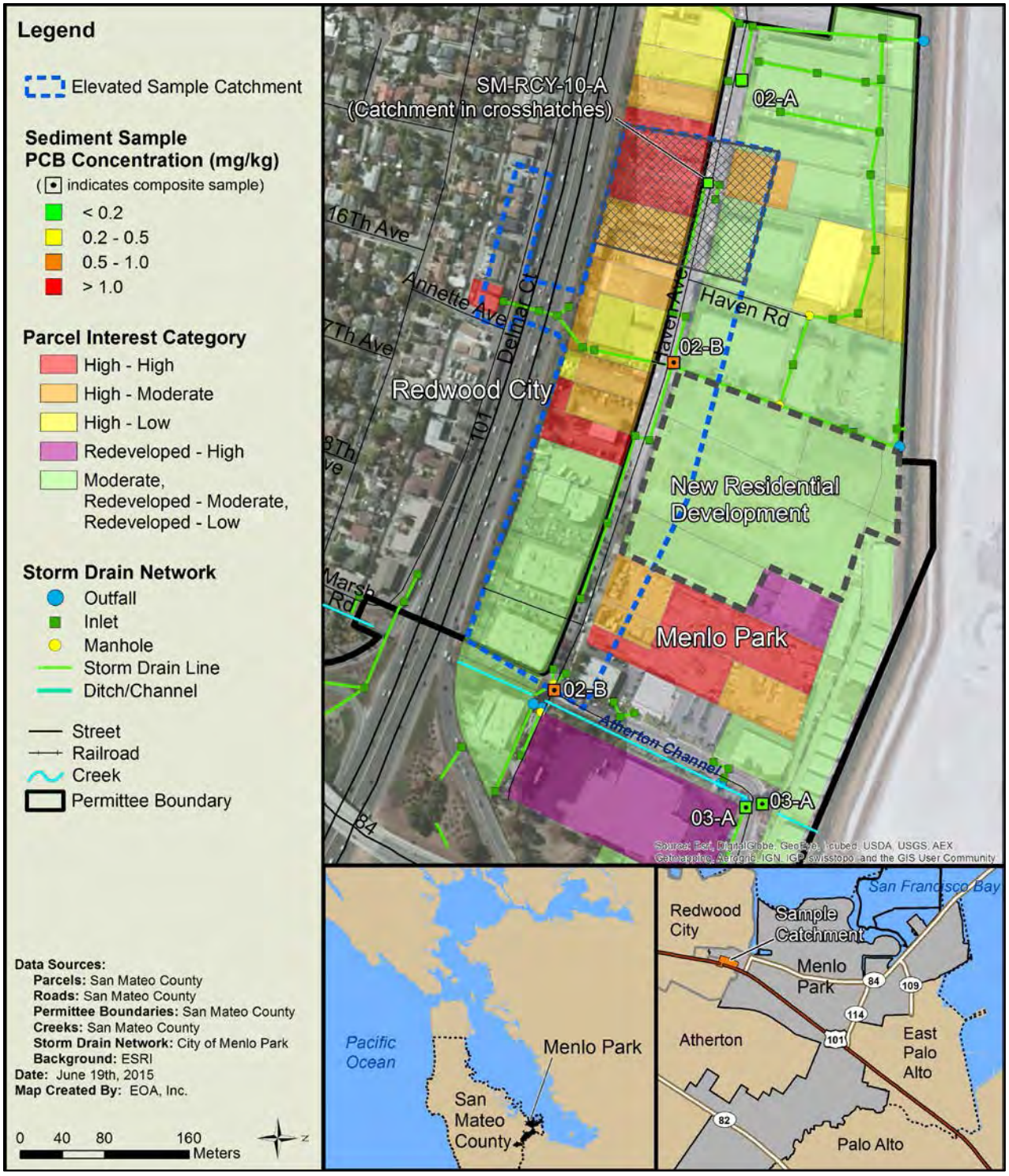

Figure 8. Map of the catchment for sample SM-MPK-02-B, City of Menlo Park.

3.2.5. Redwood City

A total of 482 acres of old industrial parcels were mapped in the City of Redwood City. Of these, 299 acres were classified as *High* interest potential source areas and 106 acres were prioritized as *High - High*. Since 1980, 203 acres of old industrial were redeveloped; 114 of those acres were prioritized as *Redeveloped-High*.

Seventeen samples were collected in Redwood City at locations that drain a total of approximately 129 acres. One of these samples had an elevated PCBs concentration (greater than 0.5 mg/kg) and one sample had a total PCBs concentration in the 0.2 – 0.5 mg/kg range. PCB sampling results for sediments collected in the City of Redwood City are mapped in Figure 9.

- Sample SM-RCY-07-B was collected from a manhole along Douglas Avenue near the intersection of Broadway Street, and had a total PCBs concentration of 0.25 mg/kg. This manhole accessed a large 36-inch pipe that drains a catchment area of approximately 117 acres including the 22-acre catchment area for sample **SM-SMC-06-C** which is located in the unincorporated community of North Fair Oaks. **SM-SMC-06-C** had a total PCBs concentration of 0.93 mg/kg and is discussed is more detail in Section 3.2.8, which describes sampling results from unincorporated San Mateo County.

- Sample **SM-RCY-05-A** was a composite of three locations in a drainage ditch that parallels most of the Port of Redwood City between Frontage Road and the industries along the Port (Figure 10). The sample had a total PCBs concentration of 0.57 mg/kg (1.26 mg/kg with USEPA method 1668A). The most northerly third of the sample was collected near a small substation, another third was collected outside of Sims Metal Management, and the final third of the sample was collected from a ditch adjacent to a large lot that has been vacant for at least a year. The ditch drains both north though the large sand and gravel business near the end of the Port and south to the Sequoia Yacht Club.

  Sims Metal Management is a large international metal recycling company that also has locations in Hayward, Richmond, San Francisco, and San Jose. On August 25, 2011 USEPA inspectors took eight samples on the Sims Metal Management property, including the ditch along the eastern border of the property where sample **SM-RCY-05-A** was taken (Garcia-Bakarich and Nagle 2011)[5]. The resulting total PCBs concentrations ranged from 0.09 mg/kg to 35.83 mg/kg, with all but the one in the ditch being over 1.0 mg/kg. High levels of mercury, lead, copper, and zinc were also reported. Since then, the USEPA has required the cleanup of some of the polluted areas, and has required measures to prevent future pollution. All stormwater from the property is treated onsite before it is discharged directly into the bay. The Sims Metal Management property does not currently drain to the ditch.

A recently released environmental report investigating PCBs pollution around the former Pentair Thermal Management site in Redwood City (2201 Bay Road) suggests there may be at least two additional sources of PCBs in Redwood City: one along Bay Road at the now vacant Pentair Thermal Management site and one along Spring Street just north of Highway 84 (AMEC 2015). Concentrations of total PCBs in two sediment samples collected from storm drain inlets in these locations were both over 1.0 mg/kg. However, a sample from the pump station downstream of these sites had a concentration of 0.07 mg/kg, indicating that average concentration of total PCBs from this storm drain line may be near Bay Area background levels.

[5] Additional information can be found at: http://www.epa.gov/region9/mediacenter/sims-metal/

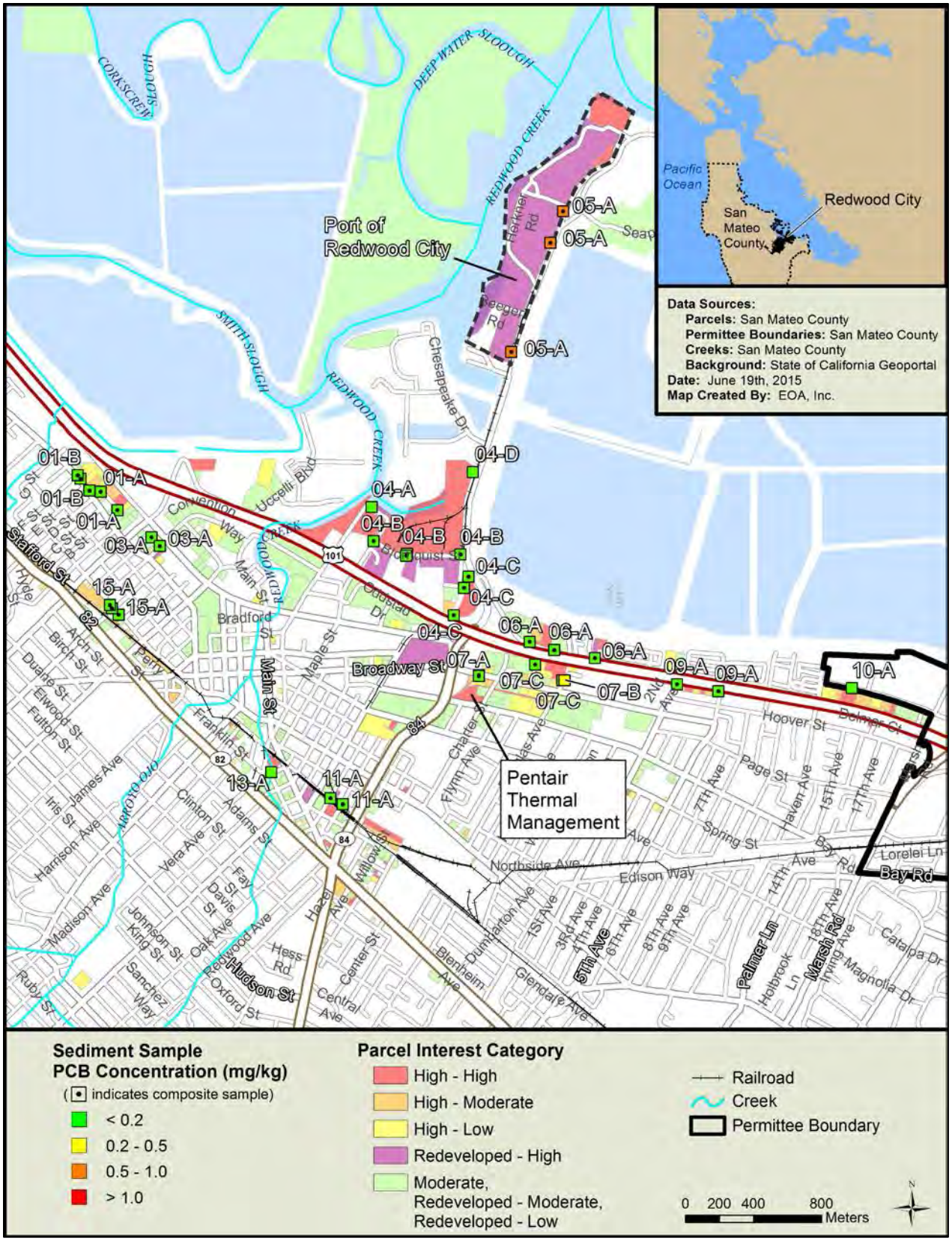

Figure 9. Map of PCB sampling results for the City of Redwood City.

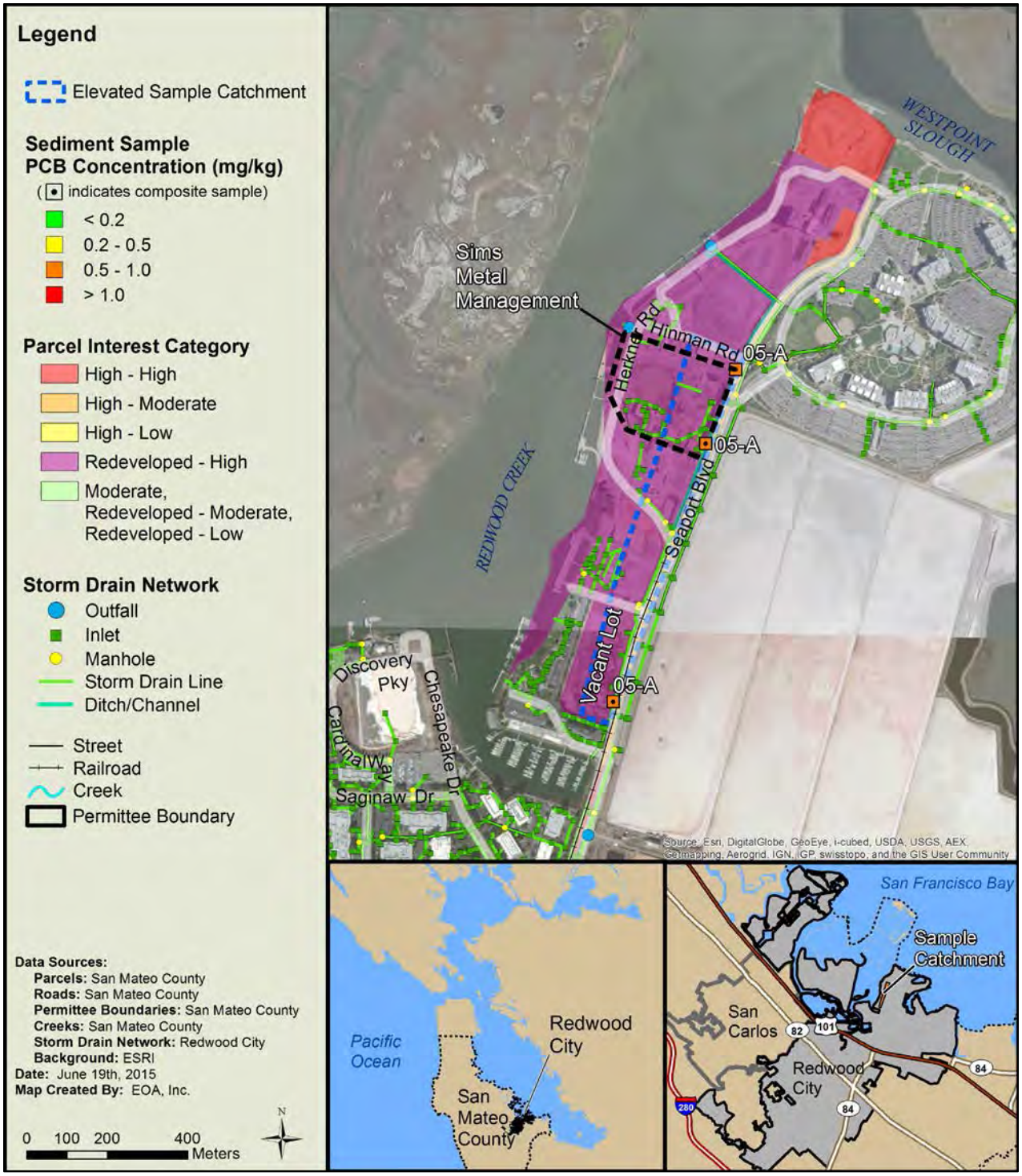

Figure 10. Map of the catchment for sample SM-RCY-05-A, City of Redwood City.

3.2.6. San Carlos

A total of 407 acres of old industrial parcels were mapped in the City of San Carlos. Of these, 191 acres were classified as *High* interest potential source areas and 44 acres were prioritized as *High - High*. Since 1980, 141 acres of old industrial were redeveloped; 32 of those acres were prioritized as *Redeveloped - High*.

There were five samples collected in San Carlos in locations that drain a total of approximately 62 acres. The highest total PCBs concentration was 0.10 mg/kg. PCB sampling results for sediments collected in the City of San Carlos are mapped in Figure 11.

A little more than half of the old industrial area of San Carlos is within the Pulgas Creek pump station catchment, which is known to contain multiple areas of elevated PCB concentration. This catchment has been the subject of a separate investigation, and therefore was not included in this project. North of the Pulgas Creek pump station catchment area along Industrial Road is a PG&E facility and Delta Star Incorporated, a property where transformers that contained PCBs were formerly manufactured. Remediation for PCBs and other pollutants at this site occurred from June 1989 to January 1991 (DTSC, 2003). Eight hundred cubic yards of contaminated soil were removed, clean soil was brought in, and the site was capped. Subsequent testing in 1998 found that the adjacent property, Tiegel Manufacturing Company (495 Bragato Road), was also contaminated with PCBs among other pollutants along its shared border with Delta Star. The Regional Water Board adopted site cleanup requirements (Order No. 99-062) for the site, and additional remediation occurred from October 2001 to February 2002 involving the removal of 1,283 tons of soil. Storm drain sampling conducted in 2001 found very elevated levels of PCBs (20 mg/kg) in a sample collected in piping beneath a manhole along Industrial Road next to the Tiegel property (KLI and EOA, 2002). As a result of that sample, in 2003 SMCWPPP referred the Delta Star site to the Regional Water Board for further investigation and cleanup.

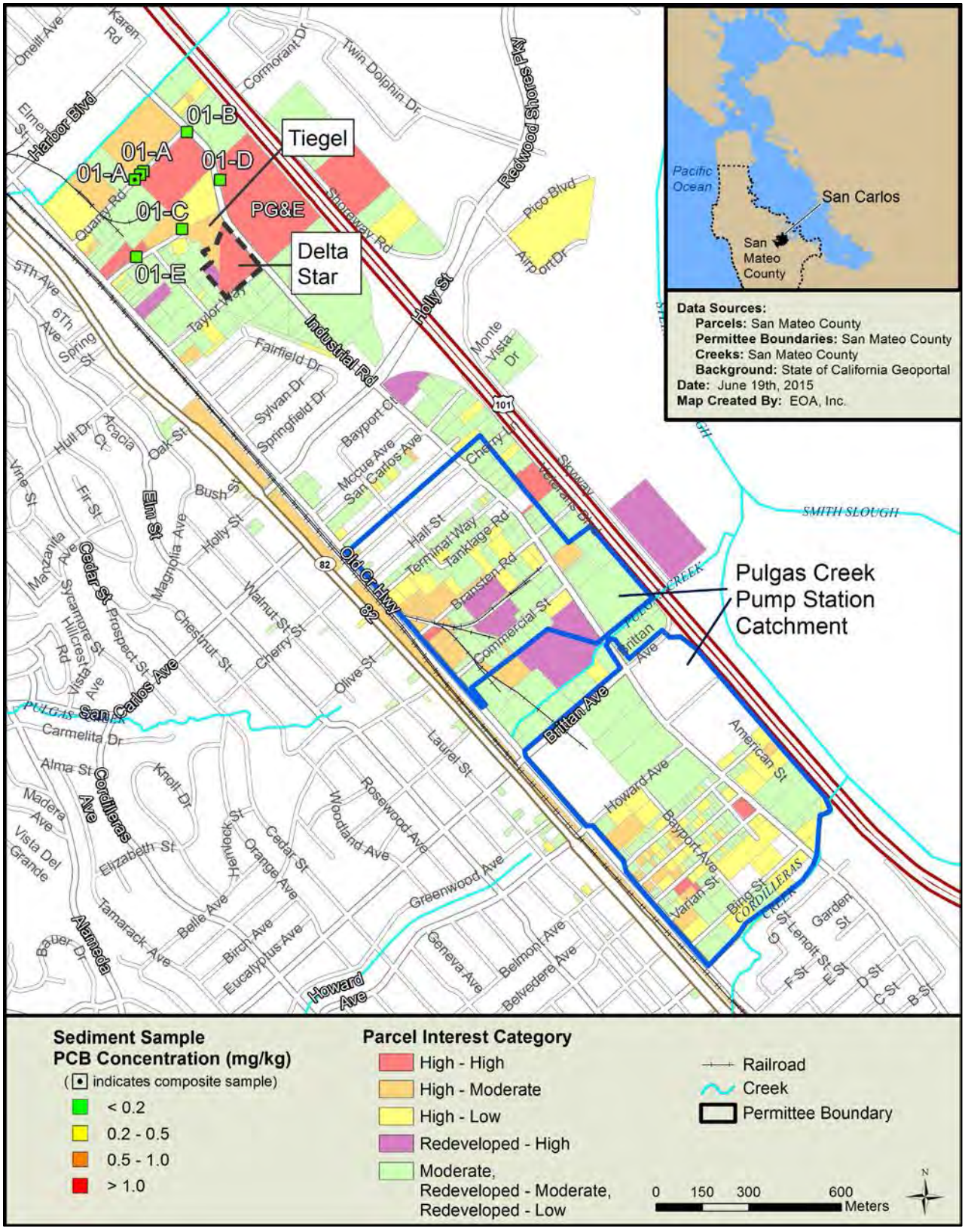

Figure 11. Map of PCB sampling results for the City of San Carlos.

3.2.7. San Mateo

A total of 264 acres of old industrial parcels were mapped in the City of San Mateo. Of these, 173 acres were classified as *High* interest potential source areas and 78 acres were prioritized as *High - High*. Since 1980, 63 acres of old industrial were redeveloped; 26 of those acres were prioritized as *Redeveloped - High*. The large *High - High* interest parcel in northern San Mateo on East Poplar Avenue near the Bay is a PG&E substation. The substation has stormwater treatment on site and drains directly to the Bay.

Ten samples were collected in the City of San Mateo at locations that drain a total of approximately 38 acres. None of these samples had an elevated total PCBs concentration (greater than 0.5 mg/kg). PCB sampling results for sediments collected in the City of San Mateo are mapped in Figure 12.

- Sample SM-SMO-06-A (0.23 mg/kg) was a composite of three locations, two inlets along Claremont Street and a ditch that drains the Caltrain (PCJPB) right-of-way. Both the ditch and one of the inlets appeared to lack an outlet, and a local resident told the field crew that the inlet floods when it rains.

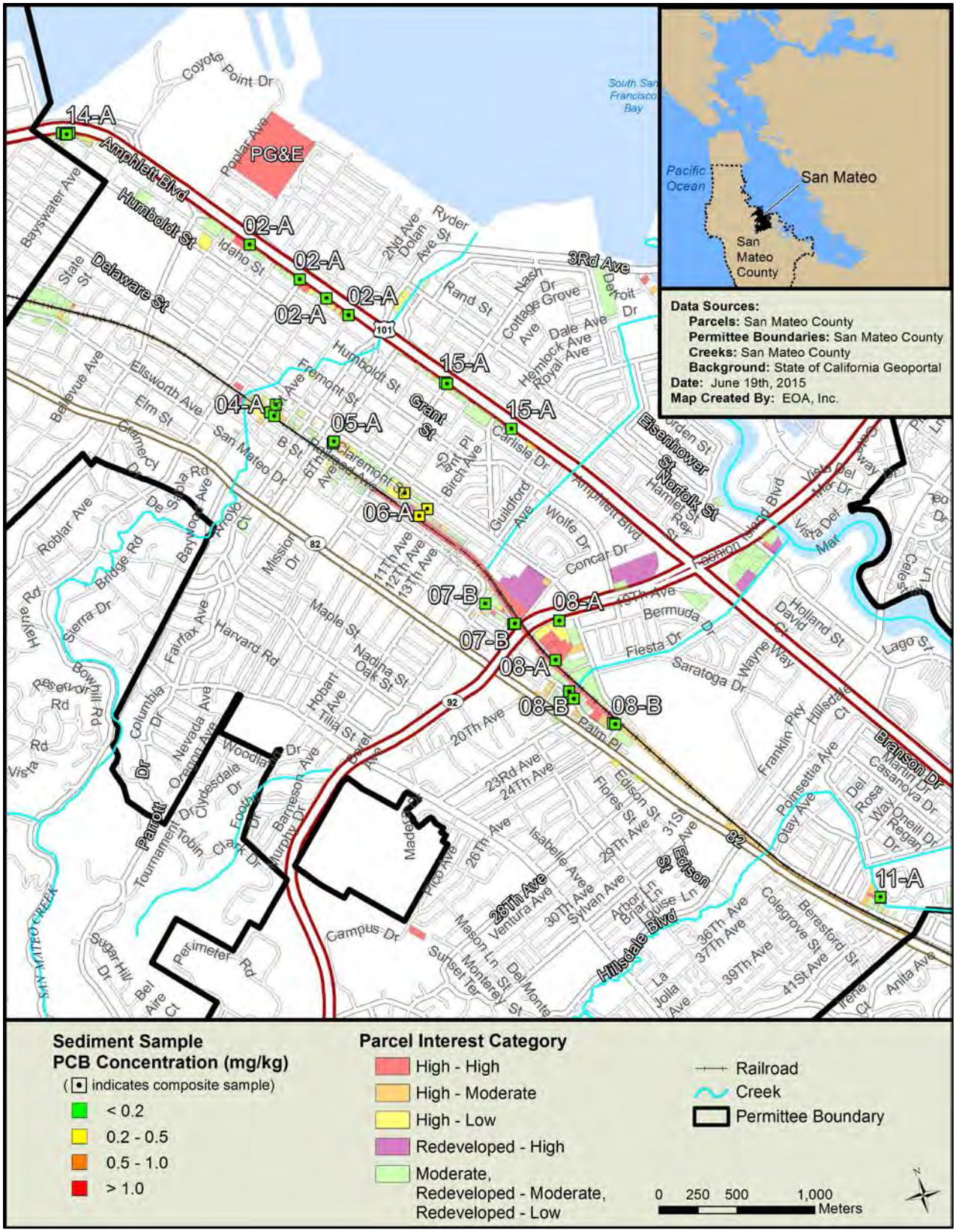

Figure 12. Map of PCB sampling results for the City of San Mateo.

3.2.8. San Mateo County Unincorporated

A total of 583 acres of old industrial parcels were mapped in unincorporated San Mateo County. Of these, 583 acres were classified as *High* interest potential source areas and 376 acres were prioritized as *High - High*. Since 1980, 17 acres of old industrial were redeveloped. None of those acres were prioritized as *Redeveloped - High*.

Twelve samples were collected in unincorporated areas of San Mateo County at locations that drain a total of approximately 66 acres. The majority of the *High* interest potential source areas are in the community of North Fair Oaks near Redwood City, and nine of the twelve samples were collected here (Figures 13 and 14). Sample **SM-SMC-06-C** on Bay Road near Douglas Ave had a total PCBs concentration of 0.93 mg/kg, and is discussed below. The remaining eleven samples had relatively low concentrations (less than 0.1 mg/kg).

- Sample **SM-SMC-06-C** was collected from a pipe beneath a manhole along Bay Road just southeast of the intersection with Douglas Ave and had a total PCBs concentration of 0.93 mg/kg (Figure 15). The catchment area for this sample station is approximately 22 acres, primarily in the unincorporated community of North Fair Oaks, and partially in Redwood City. None of the properties in the unincorporated area appeared to have private drainage infrastructure but instead appeared to drain directly out to the street. Flow into the sampled pipe originates from three inlets a block away at the intersection of Hurlingame Avenue and Bay Road. A fourth inlet in front of 2610 Bay Road also flows into this pipe at the manhole that was sampled.

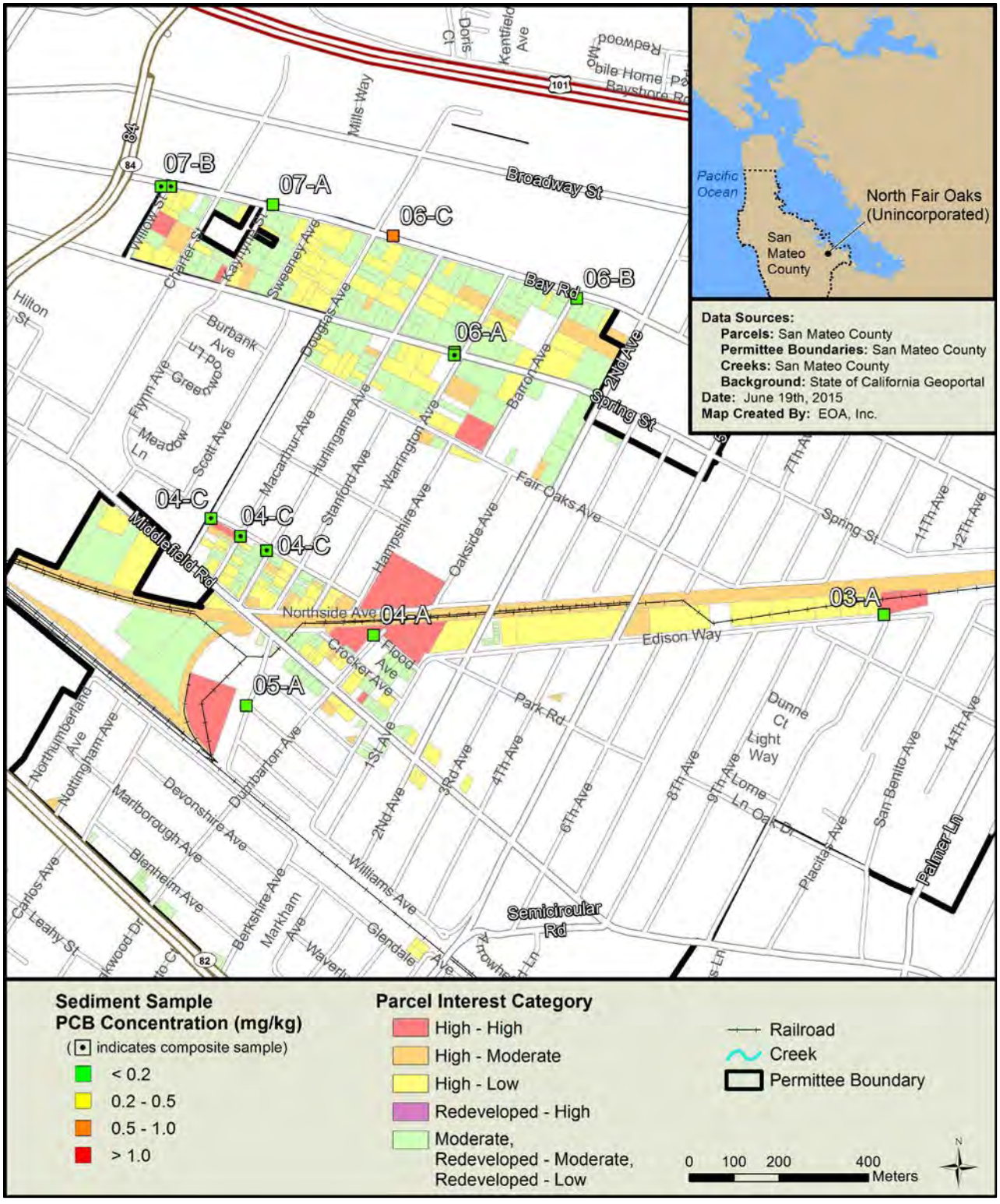

Figure 13. Map of PCB sampling results for the unincorporated community of North Fair Oaks

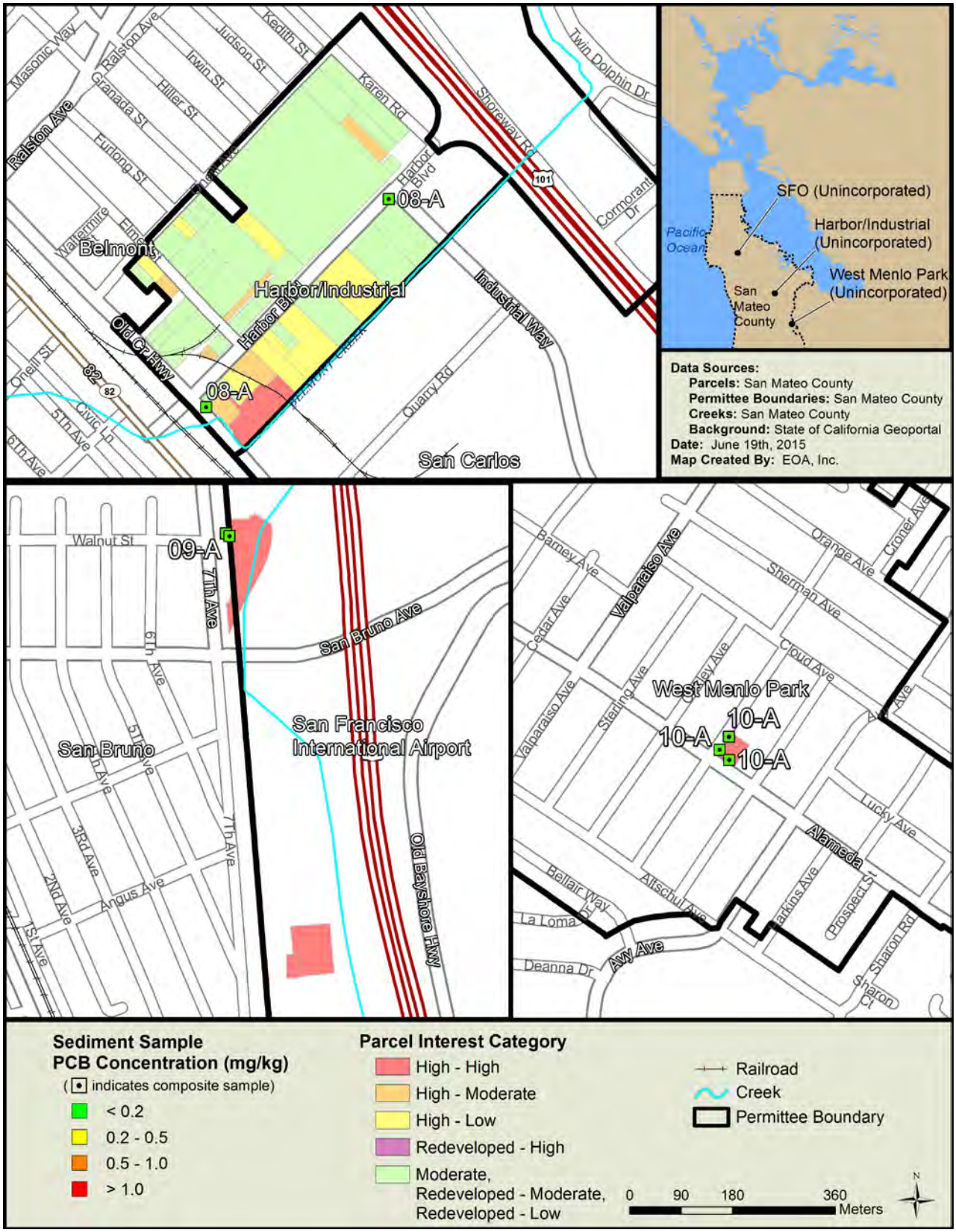

Figure 14. Map of PCB sampling results for other unincorporated communities in San Mateo County.

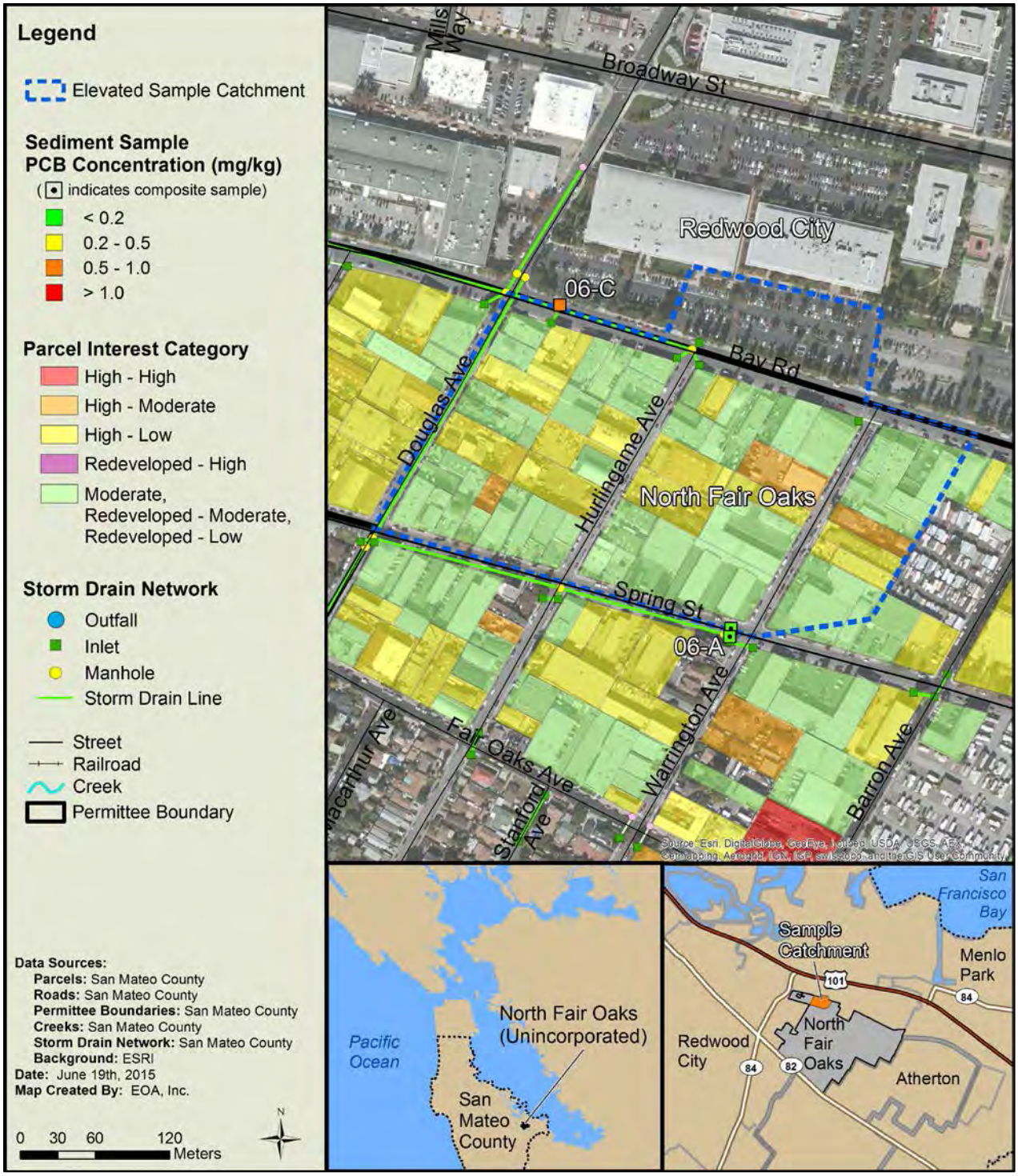

Figure 15. Map of the catchment for sample SM-SMC-06-A, unincorporated community of North Fair Oaks.

3.2.9. South San Francisco

A total of 1,466 acres of old industrial parcels were mapped in the City of South San Francisco the Permittee with the most acres of old industrial land uses in San Mateo County. Of these, 580 acres were classified as *High* interest potential source areas and 73 acres were prioritized as *High - High*. Since 1980, 551 acres of old industrial were redeveloped; 66 of those acres were prioritized as *Redeveloped - High*.

Twenty-five samples were collected in the City of South San Francisco at locations that drain a total of approximately 748 acres including 19 within the City of San Bruno. One elevated (greater than 0.5 mg/kg) sample was collected in South San Francisco which had a total PCBs concentration of 1.46 mg/kg. Three additional samples had total PCBs concentrations between 0.2 and 0.5 mg/kg. PCB sampling results for sediments collected in the City of South San Francisco are mapped in Figure 16.

- Sample SM-SSF-05-A had a concentration of 0.46 mg/kg (0.48 mg/kg with USEPA method 1668A), and was a composite of three inlets along Shaw Road.
- Sample SM-SSF-06-B also had total PCBs concentration of 0.48 mg/kg (0.72 mg/kg with USEPA method 1668A). This sample was a composite from two locations: an inlet with sediment that originated from a ditch along the Caltrain railroad, and sediment from a trench drain that drains two parcels containing multiple businesses including a construction supply company, a tour bus company, an architecture firm, and a recycling facility.
- Both sample SM-SSF-05-A and SM-SSF-06-B are slightly under 0.5 mg/kg threshold for additional investigation; however, it is likely that one of the composite locations for each sample was over 0.5 mg/kg.
- Sample **SM-SSF-04-A** had a total PCBs concentration of 1.46 mg/kg (Figure 17). It was collected from an inlet on the south side of Utah Avenue close to the outfall into Colma Creek. The inlet is tidal and was filled with about eight feet of water at the time the sample was taken. It is unknown if any sediment in the sample may have originated from Colma Creek and washed up into the storm drain line during the tidal cycle. Much of the storm drainage system near the Bay in South San Francisco is tidal, making it challenging to delineate sample catchment areas for inlets which may contain water and sediment from down along a storm drainage system.
- Sample SM-SSF-04-B had a total PCBs concentration of 0.30 mg/kg. The catchment includes the southern half of Beacon Street, and drains mostly parcels of *Moderate* interest.

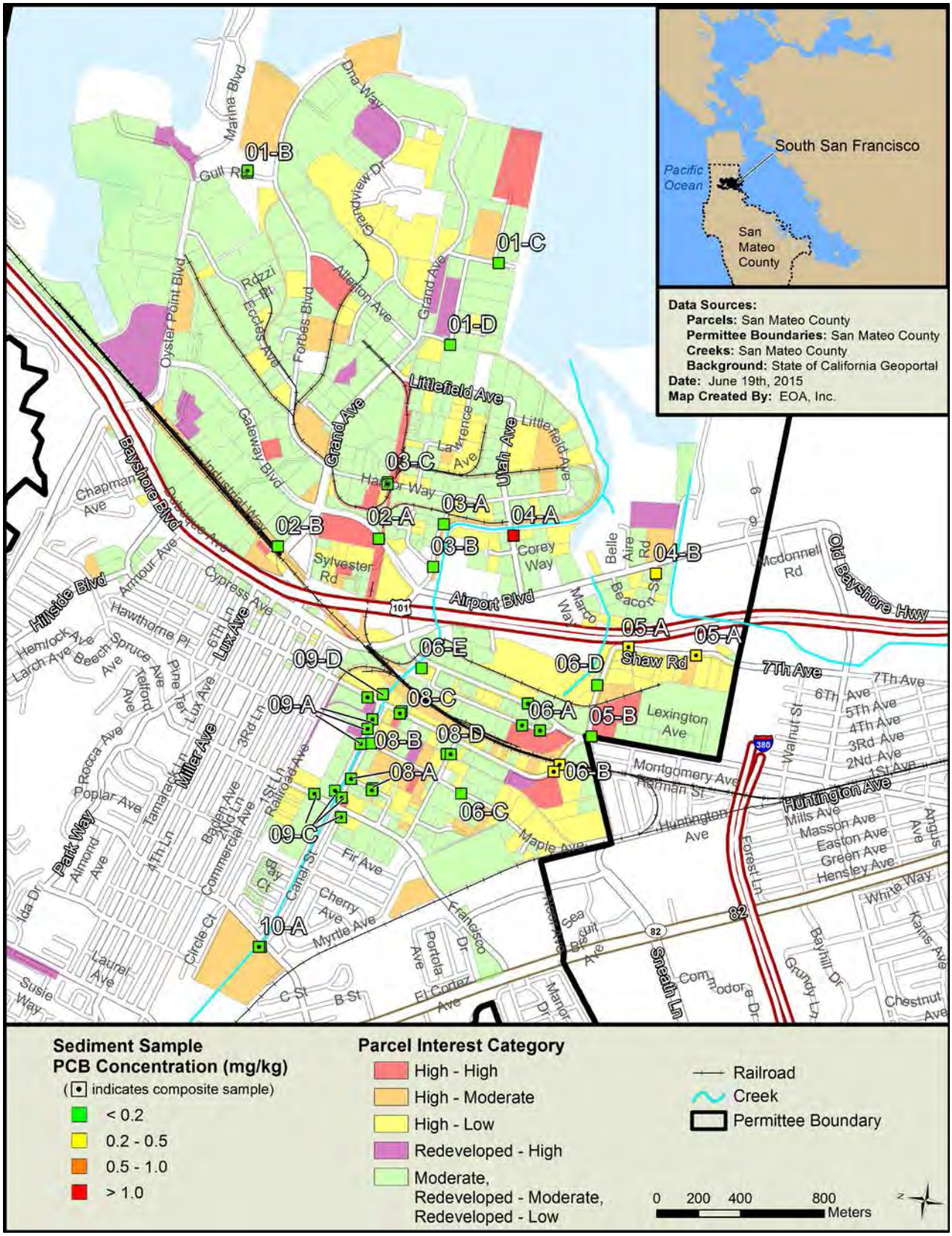

Figure 16. Map of PCB sampling results for the City of South San Francisco

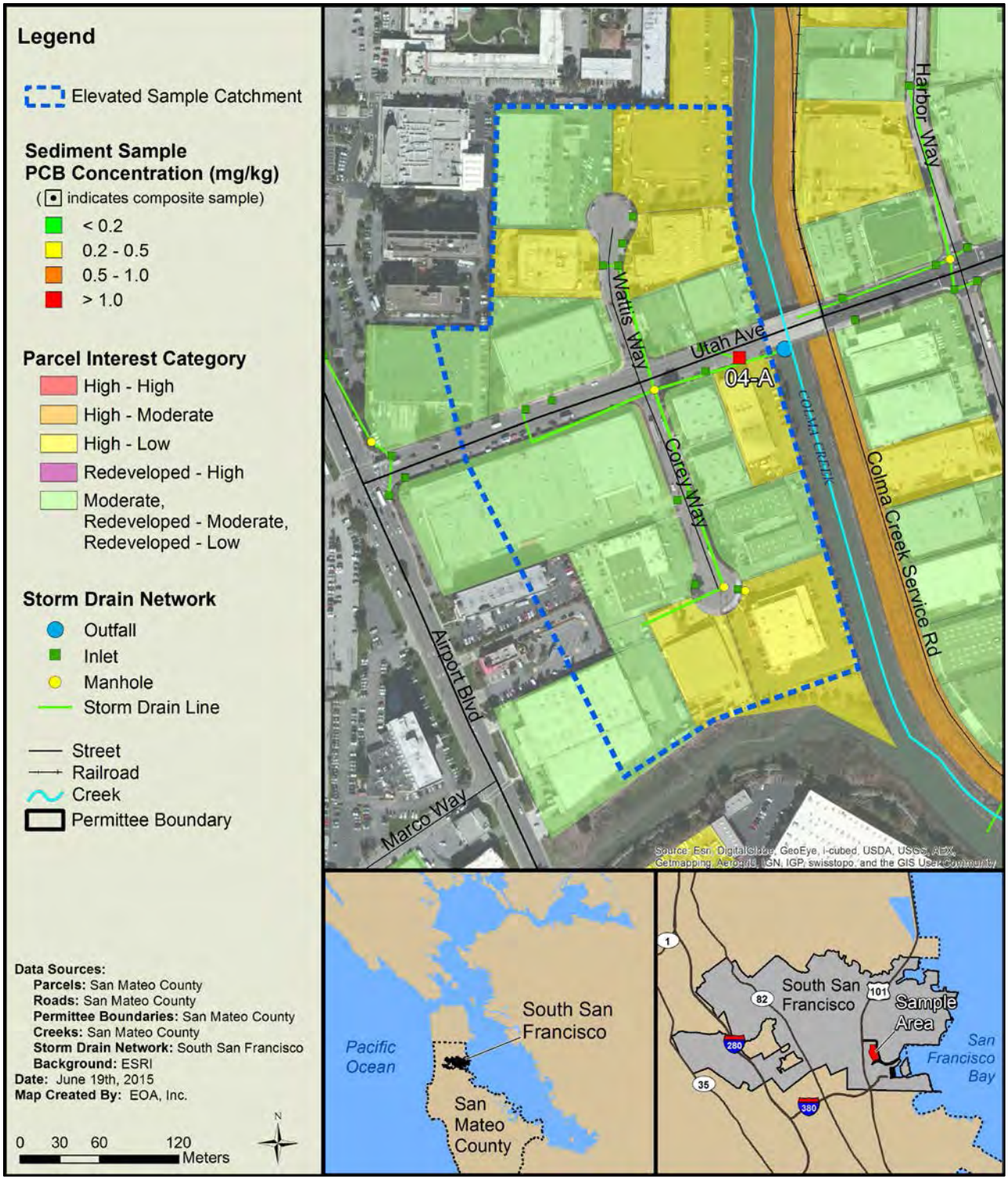

Figure 17. Map of the approximate catchment for sample SM-SSF-04-A, City of South San Francisco.

3.3. Mercury Sampling Results

Total mercury concentrations were analyzed for each of the 101 samples. Five samples had concentrations over 0.5 mg/kg of which two had concentrations over 1.0 mg/kg (Table 5). At this time there is no BASMAA threshold for further investigation comparable to the PCBs threshold discussed previously. However, the samples with mercury concentrations exceeding 1.0 mg/kg are discussed in the Section 3.3.1 below.

Median, 75th and 90th percentile mercury concentrations from this study were all lower compared to the full Bay Area dataset. For example, the median concentration for this study was 0.10 mg/kg compared to 0.16 mg/kg for the full Bay Area dataset. The analytical results from this project are compared to the full Bay Area dataset in Table 5 and Figure 18.

Table 5. Mercury results by Permittee and concentrations category

Permittee	Mercury (mg/kg)					Number of Samples				
	Max	Mean	Percentile			> 1 (mg/kg)	0.5 - 1.0 (mg/kg)	0.2 - 0.5 (mg/kg)	< 0.2 (mg/kg)	Total
			50th	75th	90th					
Brisbane	0.17	0.08	0.06						5	5
Burlingame	0.83	0.25	0.17				1	4	6	11
East Palo Alto	0.45	0.18	0.22					4	3	7
Menlo Park	0.21	0.13	0.10					1	8	9
Redwood City	0.96	0.17	0.09				1	3	13	17
San Carlos	0.17	0.08	0.08						5	5
San Mateo	0.63	0.15	0.10				1	1	8	10
South San Francisco	3.59	0.40	0.14			2*		4	19	25
Unincorporated San Mateo County	0.39	0.12	0.10					1	11	12
Total	3.59	0.22	0.10	0.18	0.33	2	3	18	78	101
Full Bay Area dataset	15.0	0.42	0.16	0.31	0.78	68	74	228	530	900

*The sediment in one sample appeared to at least partially originate from within San Bruno.

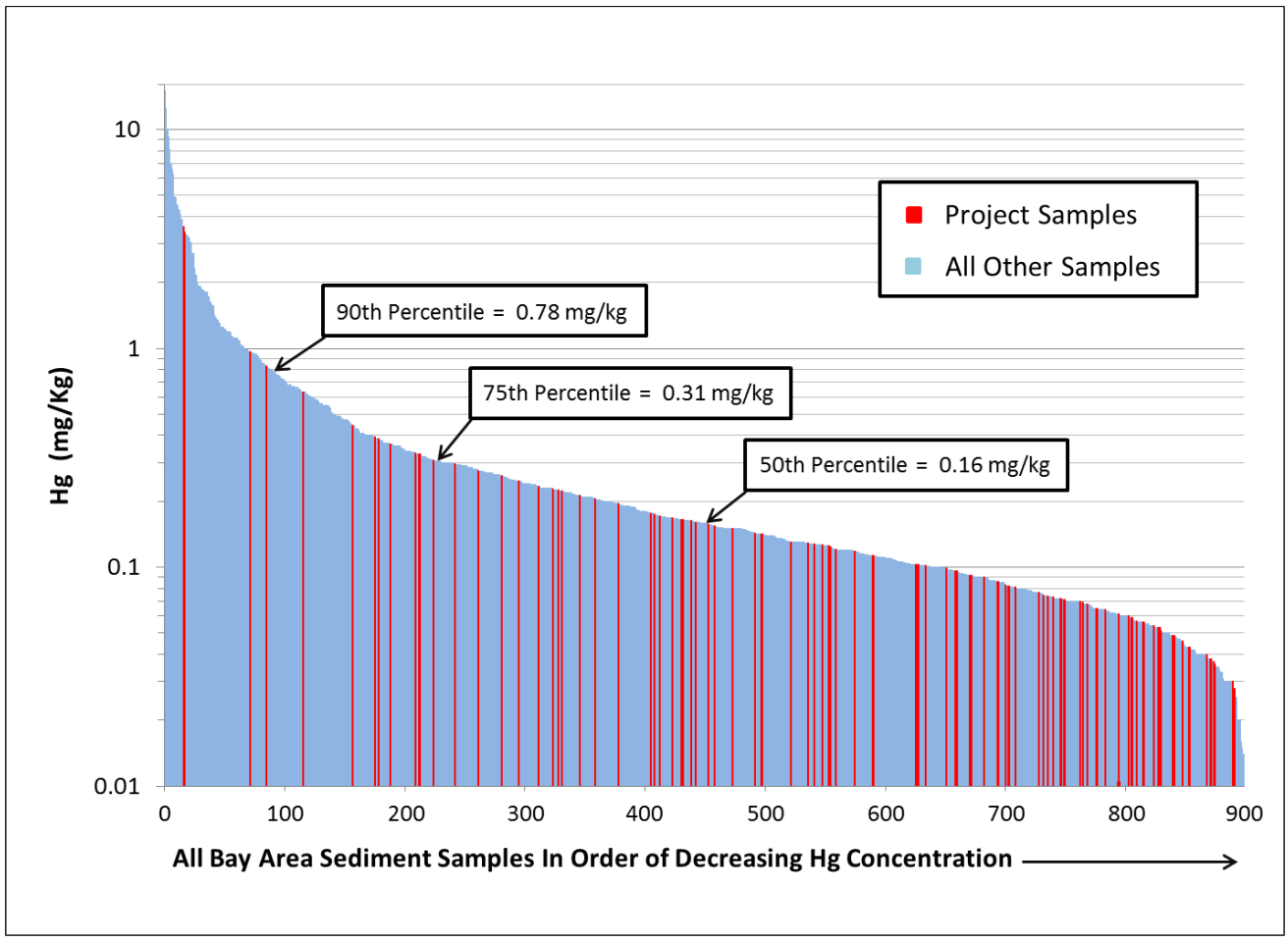

Figure 18. Mercury results of the 101 samples from this project compared to the full Bay Area dataset.

3.3.1. Elevated Mercury Results

Two mercury samples had concentrations over 1.0 mg/kg, both located relatively close to each other in the City of South San Francisco (Figure 19).

- Sample SM-SSF-06-D was collected from a manhole on the north side of Shaw Road near the outfall for the catchment into Colma Creek and had a concentration of 3.40 mg/kg. Two large pipes (at least 36 inches in diameter) enter the vault under the manhole. The inflow pipes were difficult to see because the vault was nearly full with sediment and tidal water at the time of sampling. This sample station has a relatively large catchment area that includes an industrial area of South San Francisco and a mixture of industrial, residential, and retail from the City of San Bruno. There are a number of *High - High* and *High - Moderate* interest parcels within the catchment area including the Shaw Business Center, the Caltrain (PCJPB) right-of-way, and other old railroad parcels. The catchment area for sample SM-SSF-05-B, located on the corner of Shaw Road and San Mateo Avenue, is within the catchment area for SM-SSF-06-D. The mercury

concentration for SM-SSF-05-B was relatively low (0.09 mg/kg), suggesting that the source of mercury in sample SM-SSF-06-D may be outside of the SM-SSF-06-B sub-catchment (i.e., not south along San Mateo Avenue).

- Sample SM-SSF-06-E was collected from the wet well of a small stormwater pump station near San Mateo Avenue on the south side of Colma Creek and had a mercury concentration of 3.59 mg/kg, the highest of the 101 samples taken. Although the exact catchment area is not known at this time, it is clear that this pump station drains a small portion of San Mateo Avenue. There is a storm drain flowing north along San Mateo Avenue with an outfall at the bridge over Colma Creek that does not drain to this pump station. Any future investigation into the sources of elevated mercury here would require working with the City to better delineate the catchment area.

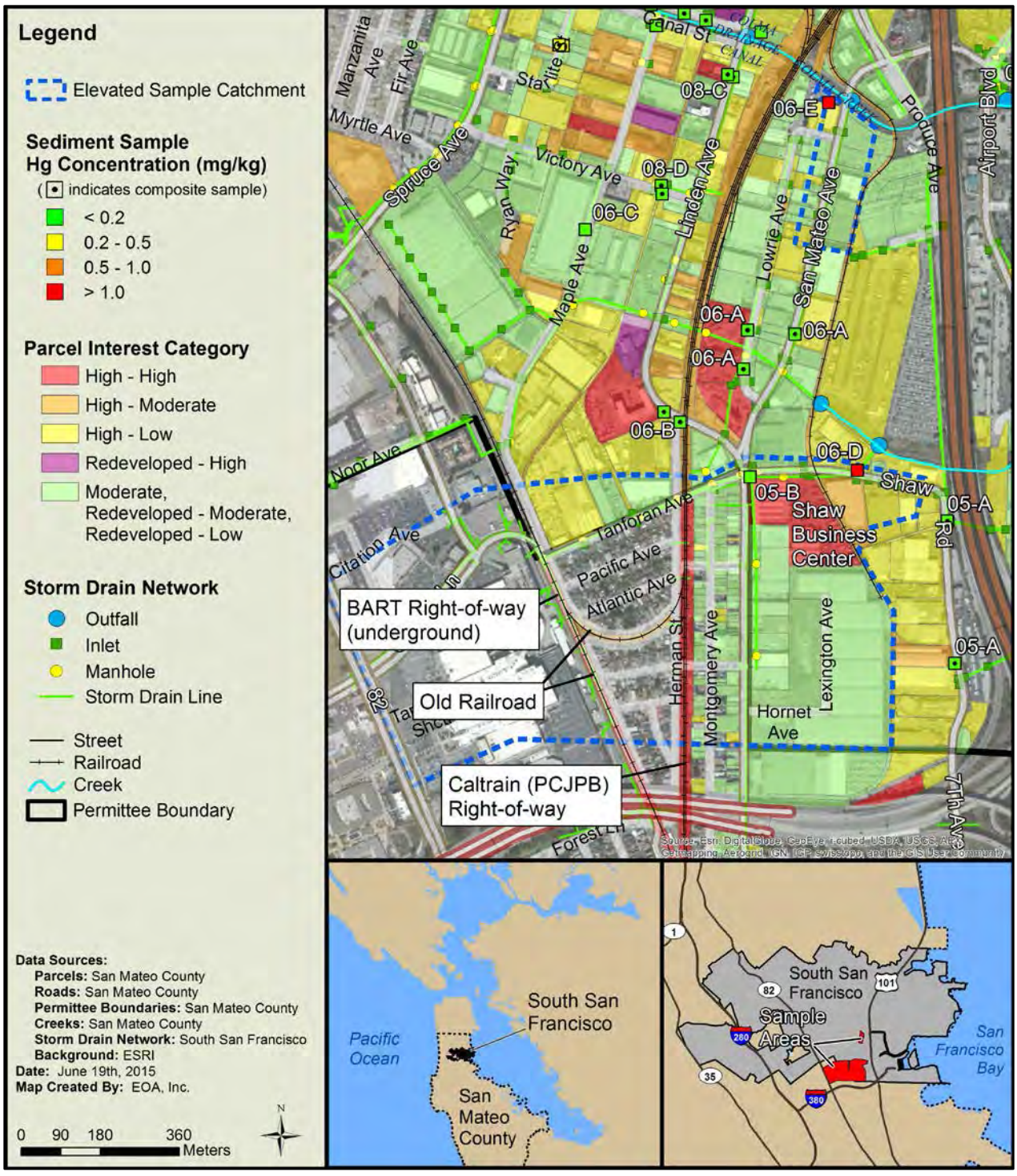

Figure 19. Map of the catchment areas for mercury samples SM-SSF-06-D and SM-SSF-06-E, City of South San Francisco.

3.4. Quality Assurance Results

This project used the CW4CB QAPP (AMS 2013) as a basis for Quality Assurance and Quality Control (QA/QC) procedures. Unlike CW4CB, this project used USEPA method 8082M instead of method 1668A for PCB congener analysis, resulting in higher reporting limits. However, the difference in methods did not impact the measurement quality objects (MQOs), which remained the same as in the CW4CB QAPP. The MQOs for PCBs and mercury are summarized in Table 6. Further details regarding the QA/QC review are provided in the remainder of this section. Overall, the results of the QA/QC review suggest that the sediment chemistry data generated during this study was of sufficient quality for the screening level purposes of the project. While some data was flagged in the project database, none of the data was rejected.

Table 6. Measurement quality objectives of the Clean Watersheds for a Clean Bay (CW4CB) Quality Assurance Project Plan

	PCBs	Mercury
Laboratory Blank	< Reporting Limit	< Reporting Limit
Reference Material (Laboratory Control Sample)	50-150% recovery (70-130% recovery if certified)	75-125% recovery
Matrix Spike	50-150% recovery	75-125% recovery
Matrix Spike Duplicate	50-150% recovery Relative Percent Difference < 25%	75-125% recovery Relative Percent Difference < 25%

3.4.1. Reporting Limits

The project SAP (SMCWPPP 2015) identified 0.5 mg/kg as an elevated total PCBs concentration threshold for sites to be considered for additional investigation. In the absence of a defined reporting limit for Method 1882 in the project QAPP, the project applied a reporting limit of 10 ppb (µg/kg) for each PCB congener for this study. This project-specific reporting limit is 2% of the elevated concentration of 0.5 mg/kg.

A large number of congener samples (328 out of 4040) did not meet the reporting limit requirement of 10 µg/kg. However, the majority of these exceedances are explained by dilutions necessary to conduct the analysis, resulting in elevated reporting limits. Only a small minority (22, or 7%) of the samples that did not meet the reporting limit requirements were not diluted, and therefore, did not have a justification for the elevated reporting limits. Only four out of forty congeners were affected – PCBs 60, 95, 99, and 101.

The target method reporting limit for mercury, 0.30 mg/kg, was met for all but one sample, and in most cases the reporting limit was less than the target. The one sample whose reporting limit was greater than 0.3 mg/kg was diluted and its reporting limit was only marginally elevated at 0.39 mg/kg.

3.4.2. Lab Blanks

All laboratory blanks were less than the reporting limit and method detection limit for both PCBs and mercury.

3.4.3. Laboratory Control Samples (LCS)

The CW4CB MQO for Synthetic Organic Compounds in sediment (i.e., PCB congeners) specifies a 70-130% recovery for reference material if certified or 50-150% recovery otherwise. The laboratory had a much smaller acceptable range for laboratory control samples (LCS) recovery, and as a result, some of the QA samples that were qualified by the laboratory were within the QAPP MQO range. Samples associated with these QA samples were not qualified. Samples were qualified if their batch was associated with QA samples whose percent recovery exceeded the MQOs. Only 2% of all LCS samples exceeded the MQOs specified by the CW4CB QAPP.

3.4.4. Matrix Spikes and Matrix Spike Duplicates

The majority (92%) of matrix spike (MS) and matrix spike duplicates (MSD) met the MQOs specified in the CW4CB QAPP. The relative percent difference (RPD) between matrix spikes and their duplicates met MQOs for the majority of samples. Only 17% of these RPDs exceeded 25%.

3.4.5. Field Duplicates

Ten field duplicates were collected during this project. Field duplicate sampling methods included homogenization of the sediment samples in a pre-cleaned, stainless steel bucket and then separation into two sample containers. The duplicate sample was run as a blind duplicate by the laboratory. A comparison of the PCB and mercury samples and their respective duplicates is shown in Table 7.

Table 7. Total PCBs relative percent difference (RPD) for ten field duplicates.

Site ID	Site Duplicate Sample ID	Total PCBs				Mercury			
		Result (mg/kg)		RPD[6]	Meets MQO?	Result (mg/kg)		RPD	Meets MQO?
		Sample	Duplicate			Sample	Duplicate		
SM-BRI-01-C	SM-BRI-01-G	0.04	0.03	8%	Yes	0.06	0.07	9%	Yes
SM-BUR-04-A	SM-BUR-04-C	0.10	0.11	8%	Yes	0.39	0.41	6%	Yes
SM-EPA-02-D	SM-EPA-02-E	0.34	0.34	0%	Yes	0.45	0.43	5%	Yes
SM-MPK-02-B	**SM-MPK-02-C**	**0.57**	**0.76**	**30%**	**No**	**0.13**	**0.27**	**70%**	**No**
SM-RCY-04-C	SM-RCY-04-E	0.01	0.02	12%	Yes	**0.23**	**0.09**	**89%**	**No**
SM-SCS-01-C	SM-SCS-01-F	0.04	0.04	12%	Yes	0.17	0.15	9%	Yes
SM-SMC-07-A	SM-SMC-07-C	0.06	0.07	4%	Yes	**0.20**	**0.11**	**54%**	**No**
SM-SMO-08-B	**SM-SMO-08-C**	**0.01**	**0.01**	**38%**	**No**	0.07	0.06	14%	Yes
SM-SSF-01-C	**SM-SSF-01-E**	**0.01**	**0.00**	**65%**	**No**	**0.24**	**8.51**	**189%**	**No**
SM-SSF-08-B	**SM-SSF-08-E**	**0.04**	**0.02**	**55%**	**No**	**0.06**	**0.09**	**37%**	**No**

[6] RPD = ABS([X1 - X2] / [(X1 + X2) / 2]) where X1 is the first sample result and X2 is the duplicate sample result. Sites that exceeded the measurement quality objective of 25 % are bolded

The relative percent difference (RPD) for four of the ten samples and their corresponding duplicates exceeded MQOs for total PCBs. However, the concentrations of total PCBs at three of the sites were lower than QA/QC threshold of 0.1 mg/kg, and their high RPDs are attributed to concentrations being close to detection limits. Both the sample and duplicate concentrations at the fourth site, SM-MPK-02-B, exceeded the SAP's high concentration threshold of 0.5 mg/kg, and as a result, the sample was reanalyzed via the USEPA 1668A method to confirm the concentration. However, the concentration of total PCBs in both samples is within the same concentration category (0.5 to 1.0 mg/kg).

Five of the ten sites did not meet the MQO for RPD for Mercury. Three of these sites also did not meet the RPD MQO for total PCBs. SM-SSF-01-C, had an RPD of 189%, and the duplicate sample had a mercury concentration of 8.51 mg/kg, a very high result. The absolute differences between the samples and their duplicates were generally higher than expected, possibly from heterogeneity of concentrations within the sample rather than laboratory techniques. The samples and their duplicates are all well mixed in the field, and so these results are somewhat surprising.

3.4.6. 1668A Method Comparison

A total of ten samples from San Mateo County were also analyzed using USEPA method 1668A, which has higher resolution and lower detection limits for PCB congeners. Samples re-analyzed using this method were validated using the same MQOs as method 8082M. As a result of the lower detection limits, several laboratory blanks had PCB congener concentrations greater than the method detection limit[7]. Most were below the reporting limit, but 11 individual congeners and coelutions[8] were also above the reporting limit. Data were qualified accordingly with flags in the database.

In addition to resolution and detection limits differences for the two methods, there are small differences in the individual congeners analyzed. Method 8082M identifies the RMP 40 congeners individually; whereas, method 1668A identifies 22 individual congeners and 17 coelutions. Consequently, results from the two methods are not identical but are considered comparable. The sums of the PCB congeners (e.g., total PCBs) were compared and the relative percent difference was calculated for each sample (Table 8).

[7] The presence of PCBs in laboratory blanks associated with method 1668A is common and highlights the theory that PCBs are ubiquitous in the environment (City of Spokane 2015).

[8] Coelution is the process whereby two or more chemical compounds (e.g., PCB congeners) elute from the chromatographic column at the same time, making separation and identification difficult.

Table 8. Comparison of Total PCBs analyzed with both USEPA 1668A and 8082M, and their relative percent difference.

Site ID	Total PCBs Method 1668A (mg/kg)	Total PCBs Method 8082M (mg/kg)	Relative Percent Difference
SM-BRI-01-C	0.041	0.037	11%
SM-BRI-02-A	**0.513**	**1.217**	**81%**
SM-BUR-04-C	0.117	0.109	7%
SM-EPA-01-A	0.253	0.209	19%
SM-MPK-02-B	**1.140**	**0.565**	**67%**
SM-MPK-02-C	**0.421**	**0.764**	**58%**
SM-RCY-05-A	**1.260**	**0.565**	**76%**
SM-SSF-03-C	0.200	0.191	5%
SM-SSF-05-A	0.476	0.459	4%
SM-SSF-06-B	**0.721**	**0.483**	**40%**

Of the ten samples collected in San Mateo County that were analyzed using both methods, the relative percent difference (RPD) for five of the samples exceeded the MQO (greater than 25% difference). Higher RPDs were noted for samples with higher concentrations, while there was generally good agreement amongst samples with lower concentrations (i.e., less than 0.5 mg/kg), which suggests that the two methods may be more comparable at lower concentrations.

Overall, total PCB concentrations were higher for method 1668A. Only two of the ten samples had higher concentrations of total PCBs for method 8082M. These samples also exceeded the RPD measurement quality objective. No data were rejected as a result of these differences.

4.0 DISCUSSION AND NEXT STEPS

The MRP 2.0 Tentative Order requires Permittees to work toward a cumulative Bay Area goal to reduce PCBs in stormwater. To calculate reductions in PCB loads, an accounting methodology is being developed where Permittees are given reduction credits based on implementing BMP programs such as:

- Source property identification and abatement;
- Green infrastructure/treatment controls; and
- Management of PCBs in building materials during demolition.

Identifying pollutant source areas is a challenging and often a multi-year process. The 101 sediment samples analyzed during this project in combination with historical sediment and stormwater runoff samples are part of an ongoing effort to identify areas in San Mateo County of high interest for further study and the potential opportunity to implement pollutant controls. The primary objective of this project was not to identify specific source properties, but to identify areas where further investigation is warranted. It is important to note that a variety of chemical and geomorphic processes lead to high spatial and temporal variability in the concentrations of PCBs and other pollutants found in embedded sediment samples. Thus this type of monitoring is best used to screen for potential elevated areas rather than attempting to verify that any particular area is not a source of pollutants.

The sampling design specifically targeted sample stations within the old industrial landscape that are influenced by parcels that were classified and prioritized as having relatively higher potential to be sources of PCBs. However, a strong correlation between the land use analysis and sampling results was lacking, and only five percent of the samples had total PCBs concentrations exceeding the 0.5 mg/kg threshold. This suggests that continuing to identify additional source areas and properties in San Mateo County may be challenging. The remainder of the PCB load appears to be coming from sources that are less elevated and more diffuse and will likely be more challenging to control. Thus data collected to-date suggests that the diffuse nature of PCB contamination within the urban landscape may require a rethinking of the approach and timeline needed to meet TMDL load reduction goals.

SMCWPPP plans to continue working with other Bay Area countywide stormwater programs (through the BASMAA MPC Committee) to evaluate the results of the ongoing efforts in the Bay Area to identify PCBs and mercury source areas and plan next steps. Types of potential follow-up work include additional research into historical land uses and refinement of associated GIS layers, collection and analysis of additional water and sediment samples, and analysis of individual PCBs congener data in an attempt to identify pollutant “fingerprints.” Follow-up sediment and water monitoring should be conducted in coordination with compliance with Provision C.8.f (Pollutants of Concern Monitoring) of the reissued MRP. Monitoring under Provision C.8.f is intended to address a number of management questions related to priority pollutants such as mercury and PCBs, including assessing inputs to the Bay from urban runoff, assessing trends in pollutant loading, and helping to identify pollutant source areas. The requirements in C.8.f will be finalized with adoption of the reissued permit, which is anticipated in November 2015.

To help plan for compliance with Provisions C.8.f, C.11 (mercury controls), and C.12 (PCBs controls) of the reissued MRP, SMCWPPP will review water and sediment sampling results for PCBs and mercury conducted to-date in San Mateo County and associated ancillary data (e.g., historical land use research). SMCWPPP will then develop a framework for follow-up efforts to continue identifying which pollutant

source areas in San Mateo County provide the greatest opportunities for implementing controls to reduce discharges of mercury and PCBs.

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Appendix A

Sampling Locations and Results

Permittee	Sample	Map Label	Subsample	Latitude	Longitude	Date	Time	Sample Location Type	Mercury (mg/kg)	Total PCBs 8082M (mg/kg)	Total PCBs 1668A (mg/kg)
Legend (shading):					< 0.2 mg/kg (none)			0.2 - 0.5 mg/kg (yellow)	0.5 - 1.0 mg/kg (orange)		≥ 1.0 mg/kg (red)
Brisbane	SM-BRI-01-A	01-A	SM-BRI-01-A-2	37.70151	-122.40867	2/18/2015	11:38	Inlet	0.17	0.04	
			SM-BRI-01-A-3	37.70155	-122.40866	2/18/2015	11:38	Inlet			
			SM-BRI-01-A-4	37.70502	-122.40917	2/18/2015	11:38	Street Dirt			
	SM-BRI-01-B	01-B	SM-BRI-01-B-1	37.70102	-122.40810	2/18/2015	9:56	Inlet	0.04	0.01	
			SM-BRI-01-B-2	37.70090	-122.40811	2/18/2015	9:56	Inlet			
	SM-BRI-01-C	01-C	SM-BRI-01-C-1	37.69897	-122.40682	2/18/2015	10:18	Inlet	0.06	0.04	0.04
			SM-BRI-01-C-2	37.69898	-122.40696	2/18/2015	10:18	Inlet			
			SM-BRI-01-C-4	37.70023	-122.40750	2/18/2015	10:18	Inlet			
	SM-BRI-01-G (Dup of 01-C)								0.07	0.03	
	SM-BRI-01-D	01-D	SM-BRI-01-D-4	37.70024	-122.40736	2/18/2015	10:40	Inlet	0.04	0.01	
	SM-BRI-02-A	02-A	SM-BRI-02-A-5	37.68806	-122.40444	2/18/2015	9:11	Manhole	0.07	1.22	0.51
Burlingame	SM-BUR-01-A	01-A	SM-BUR-01-A-3	37.60249	-122.37588	2/12/2015	10:14	Pump Station	0.16	0.03	
	SM-BUR-01-B	01-B	SM-BUR-01-B-3	37.59990	-122.37191	2/11/2015	10:30	Inlet	0.17	0.03	
	SM-BUR-02-A	02-A	SM-BUR-02-A-1	37.59449	-122.36737	2/11/2015	11:10	Inlet	0.30	0.10	
			SM-BUR-02-A-3	37.59637	-122.36560	2/11/2015	11:10	Inlet			
	SM-BUR-03-A	03-A	SM-BUR-03-A-3	37.58995	-122.36429	2/11/2015	14:35	Manhole	0.33	0.15	
			SM-BUR-03-A-4	37.58960	-122.36340	2/11/2015	14:35	Street Dirt			
	SM-BUR-03-B	03-B	SM-BUR-03-B-4	37.59182	-122.36623	2/12/2015	9:27	Pump Station	0.09	0.06	
	SM-BUR-04-A	04-A	SM-BUR-04-A-4	37.59425	-122.37052	2/11/2015	13:55	Manhole	0.39	0.10	
	SM-BRI-01-C (Dup of 04-A)								0.41	0.11	0.12
	SM-BUR-04-B	04-B	SM-BUR-04-B-3	37.59425	-122.36840	2/12/2015	9:47	Pump Station	0.06	0.01	
	SM-BUR-05-A	05-A	SM-BUR-05-A-5	37.59821	-122.38085	2/11/2015	12:00	Inlet	0.31	0.05	
	SM-BUR-05-B	05-B	SM-BUR-05-B-5	37.59762	-122.37918	2/11/2015	12:20	Inlet	0.83	0.09	
	SM-BUR-05-C	05-C	SM-BUR-05-C-1	37.59524	-122.37808	2/11/2015	12:45	Inlet	0.10	0.04	
			SM-BUR-05-C-2	37.59608	-122.37619	2/11/2015	12:45	Inlet			
			SM-BUR-05-C-3	37.59478	-122.37367	2/11/2015	12:45	Inlet			
	SM-BUR-06-A	06-A	SM-BUR-06-A-1	37.59107	-122.33662	2/11/2015	9:30	Inlet	0.14	0.05	

Permittee	Sample	Map Label	Subsample	Latitude	Longitude	Date	Time	Sample Location Type	Mercury (mg/kg)	Total PCBs 8082M (mg/kg)	Total PCBs 1668A (mg/kg)
Legend (shading):					< 0.2 mg/kg (none)			0.2 - 0.5 mg/kg (yellow)	0.5 - 1.0 mg/kg (orange)		≥ 1.0 mg/kg (red)
			SM-BUR-06-A-3	37.58842	-122.33721	2/11/2015	9:30	Inlet			
			SM-BUR-06-A-5	37.58712	-122.33620	2/11/2015	9:30	Inlet			
East Palo Alto	SM-EPA-01-A	01-A	SM-EPA-01-A-1	37.47722	-122.13418	1/19/2015	11:20	Manhole	0.22	0.21	0.25
	SM-EPA-01-B	01-B	SM-EPA-01-B-2	37.47208	-122.13429	1/19/2015	11:50	Inlet	0.12	0.02	
			SM-EPA-01-B-3	37.47296	-122.13204	1/19/2015	11:50	Inlet			
	SM-EPA-01-C	01-C	SM-EPA-01-C-1	37.47475	-122.12710	1/19/2015	10:00	Street Dirt	0.08	0.02	
			SM-EPA-01-C-2	37.47466	-122.12726	1/19/2015	10:00	Street Dirt			
			SM-EPA-01-C-3	37.47477	-122.13056	1/19/2015	10:00	Street Dirt			
			SM-EPA-01-C-4	37.47336	-122.13068	1/19/2015	10:00	Street Dirt			
	SM-EPA-01-D	01-D	SM-EPA-01-D-2	37.47558	-122.13191	1/19/2015	10:45	Street Dirt	0.10	0.06	
			SM-EPA-01-D-3	37.47524	-122.13199	1/19/2015	10:45	Street Dirt			
			SM-EPA-01-D-4	37.47480	-122.13207	1/19/2015	10:45	Street Dirt			
			SM-EPA-01-D-5	37.47460	-122.13186	1/19/2015	10:45	Street Dirt			
	SM-EPA-02-A	02-A	SM-EPA-02-A-1	37.47085	-122.13069	1/19/2015	8:40	Manhole	0.26	0.05	
	SM-EPA-02-C	02-C	SM-EPA-02-C-1	37.47443	-122.12743	1/19/2015	9:30	Inlet	0.33	0.02	
	SM-EPA-02-D	02-D	SM-EPA-02-D-1	37.47034	-122.13036	1/19/2015	8:55	Manhole	0.45	0.34	
	SM-EPA-02-E (Dup of 02-D)								0.43	0.34	
Menlo Park	SM-MPK-01-A	01-A	SM-MPK-01-A-1	37.45565	-122.18395	1/20/2015	15:20	Inlet	0.07	0.02	
			SM-MPK-01-A-2	37.45566	-122.18408	1/20/2015	15:20	Street Dirt			
	SM-MPK-02-A	02-A	SM-MPK-02-A-2	37.48664	-122.18868	1/20/2015	2:45	Inlet	0.04	0.03	
	SM-MPK-02-B	02-B	SM-MPK-02-B-1	37.48610	-122.18564	1/20/2015	13:50	Inlet	0.13	0.57	1.14
			SM-MPK-02-B-5	37.48513	-122.18212	1/20/2015	13:50	Manhole			
	SM-MPK-02-C (Dup of 02-B)								0.27	0.76	0.42
	SM-MPK-03-A	03-A	SM-MPK-03-A-1	37.48678	-122.18090	1/22/2015	11:45	Inlet	0.04	0.02	
			SM-MPK-03-A-5	37.48658	-122.18019	1/22/2015	11:45	Manhole			
			SM-MPK-03-A-6	37.48659	-122.18016	1/22/2015	11:45	Inlet			
			SM-MPK-03-A-7	37.48692	-122.18094	1/22/2015	11:45	Creek sediment			

Permittee	Sample	Map Label	Subsample	Latitude	Longitude	Date	Time	Sample Location Type	Mercury (mg/kg)	Total PCBs 8082M (mg/kg)	Total PCBs 1668A (mg/kg)
Legend (shading):					< 0.2 mg/kg (none)		0.2 - 0.5 mg/kg (yellow)		0.5 - 1.0 mg/kg (orange)		≥ 1.0 mg/kg (red)
Menlo Park	SM-MPK-04-A	04-A	SM-MPK-04-A-3	37.48307	-122.17529	1/20/2015	10:20	Inlet	0.21	0.03	
	SM-MPK-04-C	04-C	SM-MPK-04-C-4	37.48270	-122.17420	1/20/2015	10:45	Manhole	0.12	0.01	
	SM-MPK-04-D	04-D	SM-MPK-04-D-1	37.48342	-122.17178	1/19/2015	15:20	Inlet	0.03	0.25	
	SM-MPK-04-E	04-E	SM-MPK-04-E-1	37.48281	-122.16719	1/19/2015	14:55	Manhole	0.10	0.29	
			SM-MPK-04-E-4	37.48210	-122.16749	1/19/2015	14:55	Manhole			
	SM-MPK-06-A	06-A	SM-MPK-06-A-3	37.47566	-122.14726	1/19/2015	13:15	Inlet	0.12	0.06	
			SM-MPK-06-A-5	37.47471	-122.14910	1/19/2015	13:15	Ditch			
			SM-MPK-06-A-6	37.47505	-122.15160	1/19/2015	13:15	Street Dirt			
			SM-MPK-06-A-7	37.47489	-122.15158	1/19/2015	13:15	Street Dirt			
Redwood City	SM-RCY-01-A	01-A	SM-RCY-01-A-1	37.49505	-122.23654	2/10/2015	10:30	Manhole	0.33	0.03	
			SM-RCY-01-A-2	37.49601	-122.23766	2/10/2015	10:30	Inlet			
	SM-RCY-01-B	01-B	SM-RCY-01-B-1	37.49607	-122.23841	2/10/2015	11:12	Inlet	0.09	0.05	
			SM-RCY-01-B-4	37.49668	-122.23903	2/10/2015	11:12	Manhole			
			SM-RCY-01-B-5	37.49687	-122.23921	2/10/2015	11:12	Inlet			
	SM-RCY-03-A	03-A	SM-RCY-03-A-1	37.49366	-122.23425	2/10/2015	10:00	Manhole	0.13	0.02	
			SM-RCY-03-A-2	37.49321	-122.23367	2/10/2015	10:00	Inlet			
	SM-RCY-04-A	04-A	SM-RCY-04-A-2	37.49548	-122.21968	1/22/2015	12:45	Inlet	0.07	0.02	
	SM-RCY-04-B	04-B	SM-RCY-04-B-2	37.49304	-122.21726	1/22/2015	11:30	Inlet	0.10	0.01	
			SM-RCY-04-B-4	37.49305	-122.21372	1/22/2015	11:30	Inlet			
			SM-RCY-04-B-5	37.49367	-122.21949	1/22/2015	11:30	Inlet			
			SM-RCY-04-B-6	37.49293	-122.21731	1/22/2015	11:30	Street Dirt			
	SM-RCY-04-C	04-C	SM-RCY-04-C-1	37.49129	-122.21345	1/22/2015	10:30	Inlet	0.23	0.01	
			SM-RCY-04-C-2	37.49189	-122.21315	1/22/2015	10:30	Street Dirt			
			SM-RCY-04-C-3	37.48983	-122.21408	1/22/2015	10:30	Street Dirt			
	SM-RCY-04-E (Dup of 04-C)								0.09	0.02	
	SM-RCY-04-D	04-D	SM-RCY-04-D-1	37.49742	-122.21299	1/22/2015	13:15	Street Dirt	0.07	0.02	
	SM-RCY-05-A	05-A	SM-RCY-05-A-1	37.50961	-122.20813	1/22/2015	13:35	Ditch	0.96	0.57	1.26
			SM-RCY-05-A-2	37.50380	-122.21060	1/22/2015	13:35	Ditch			
			SM-RCY-05-A-3	37.51128	-122.20732	1/22/2015	13:35	Ditch			

Permittee	Sample	Map Label	Subsample	Latitude	Longitude	Date	Time	Sample Location Type	Mercury (mg/kg)	Total PCBs 8082M (mg/kg)	Total PCBs 1668A (mg/kg)
Legend (shading):					< 0.2 mg/kg (none)			0.2 - 0.5 mg/kg (yellow)	0.5 - 1.0 mg/kg (orange)		≥ 1.0 mg/kg (red)
Redwood City	SM-RCY-06-A	06-A	SM-RCY-06-A-1	37.48850	-122.20902	1/22/2015	9:45	Inlet	0.07	0.09	
			SM-RCY-06-A-2	37.48810	-122.20738	1/22/2015	9:45	Inlet			
			SM-RCY-06-A-3	37.48771	-122.20467	1/22/2015	9:45	Inlet			
	SM-RCY-07-A	07-A	SM-RCY-07-A-4	37.48670	-122.21235	1/21/2015	14:30	Manhole	0.08	0.10	
			SM-RCY-07-A-5	37.48666	-122.21235	1/21/2015	14:30	Street Dirt			
	SM-RCY-07-B	07-B	SM-RCY-07-B-2	37.48650	-122.20665	1/21/2015	15:20	Manhole	0.21	0.25	
	SM-RCY-07-C	07-C	SM-RCY-07-C-1	37.48651	-122.20681	1/21/2015	14:55	Inlet	0.08	0.13	
			SM-RCY-07-C-2	37.48731	-122.20862	1/21/2015	14:55	Inlet			
	SM-RCY-09-A	09-A	SM-RCY-09-A-3	37.48607	-122.19643	1/22/2015	9:00	Inlet	0.06	0.05	
			SM-RCY-09-A-4	37.48640	-122.19919	1/22/2015	9:00	Street Dirt			
	SM-RCY-10-A	10-A	SM-RCY-10-A-1	37.48637	-122.18757	1/20/2015	14:20	Inlet	0.06	0.04	
	SM-RCY-11-A	11-A	SM-RCY-11-A-1	37.48006	-122.22206	1/22/2015	14:40	Inlet	0.16	0.03	
			SM-RCY-11-A-3	37.47975	-122.22122	1/22/2015	14:40	Street Dirt			
	SM-RCY-13-A	13-A	SM-RCY-13-A-1	37.48136	-122.22602	1/22/2015	15:20	Inlet	0.10	0.01	
	SM-RCY-15-A	15-A	SM-RCY-15-A-5	37.48953	-122.23632	2/10/2015	9:30	Street Dirt	0.08	0.05	
			SM-RCY-15-A-6	37.48986	-122.23677	2/10/2015	9:30	Street Dirt			
			SM-RCY-15-A-7	37.49005	-122.23692	2/10/2015	9:30	Street Dirt			
San Carlos	SM-SCS-01-A	01-A	SM-SCS-01-A-2	37.51799	-122.26640	2/10/2015	13:45	Manhole	0.05	0.10	
			SM-SCS-01-A-3	37.51789	-122.26651	2/10/2015	13:45	Manhole			
			SM-SCS-01-A-4	37.51774	-122.26671	2/10/2015	13:45	Manhole			
	SM-SCS-01-B	01-B	SM-SCS-01-B-3	37.51915	-122.26483	2/10/2015	14:20	Inlet	0.05	0.09	
	SM-SCS-01-C	01-C	SM-SCS-01-C-1	37.51632	-122.26494	2/10/2015	12:35	Manhole	0.17	0.04	
	SM-RCY-01-F (Dup of 01-C)								0.15	0.04	
	SM-SCS-01-D	01-D	SM-SCS-01-D-4	37.51778	-122.26358	2/10/2015	15:05	Street Dirt	0.08	0.02	
	SM-SCS-01-E	01-E	SM-SCS-01-E-1	37.51548	-122.26660	2/10/2015	13:15	Inlet	0.09	0.03	
Unincorporated San Mateo County	SM-SMC-03-A	03-A	SM-SMC-03-A-3	37.47682	-122.19520	1/21/2015	9:20	Street Dirt	0.03	0.00	
	SM-SMC-04-A	04-A	SM-SMC-04-A-1	37.47622	-122.20808	1/21/2015	9:38	Inlet	0.11	0.09	
	SM-SMC-04-C	04-C	SM-SMC-04-C-4	37.47851	-122.21224	1/21/2015	10:35	Street Dirt	0.13	0.06	
			SM-SMC-04-C-5	37.47816	-122.21149	1/21/2015	10:35	Street Dirt			

Permittee	Sample	Map Label	Subsample	Latitude	Longitude	Date	Time	Sample Location Type	Mercury (mg/kg)	Total PCBs 8082M (mg/kg)	Total PCBs 1668A (mg/kg)
Legend (shading):					< 0.2 mg/kg (none)			0.2 - 0.5 mg/kg (yellow)	0.5 - 1.0 mg/kg (orange)		≥ 1.0 mg/kg (red)
Unincorporated San Mateo County			SM-SMC-04-C-6	37.47788	-122.21082	1/21/2015	10:35	Inlet			
	SM-SMC-05-A	05-A	SM-SMC-05-A-2	37.47476	-122.21126	1/21/2015	10:00	Manhole	0.10	0.03	
	SM-SMC-06-A	06-A	SM-SMC-06-A-1	37.48194	-122.20616	1/21/2015	11:10	Manhole	0.05	0.02	
			SM-SMC-06-A-5	37.48188	-122.20617	1/21/2015	11:10	Inlet			
	SM-SMC-06-B	06-B	SM-SMC-06-B-1	37.48307	-122.20310	1/21/2015	11:45	Inlet	0.06	0.02	
	SM-SMC-06-C	06-C	SM-SMC-06-C-1	37.48426	-122.20777	1/21/2015	12:55	Manhole	0.39	0.93	
	SM-SMC-07-A	07-A	SM-SMC-07-A-4	37.48484	-122.21082	1/21/2015	13:25	Manhole	0.20	0.06	
	SM-SMC-07-C (Dup of 07-A)								0.11	0.07	
	SM-SMC-07-B	07-B	SM-SMC-07-B-2	37.48517	-122.21341	1/21/2015	13:55	Inlet	0.14	0.07	
			SM-SMC-07-B-4	37.48517	-122.21365	1/21/2015	13:55	Inlet			
	SM-SMC-08-A	08-A	SM-SMC-08-A-3	37.51758	-122.27088	2/10/2015	15:30	Inlet	0.10	0.02	
			SM-SMC-08-A-4	37.52092	-122.26734	2/10/2015	15:30	Inlet			
	SM-SMC-09-A	09-A	SM-SMC-09-A-1	37.63283	-122.40533	2/17/2015	10:55	Inlet	0.05	0.01	
			SM-SMC-09-A-2	37.63279	-122.40526	2/17/2015	10:55	Street Dirt			
	SM-SMC-10-A	10-A	SM-SMC-10-A-2	37.43302	-122.20285	1/20/2015	9:20	Street Dirt	0.06	0.04	
			SM-SMC-10-A-3	37.43281	-122.20303	1/20/2015	9:20	Street Dirt			
			SM-SMC-10-A-4	37.43265	-122.20284	1/20/2015	9:20	Street Dirt			
San Mateo	SM-SMO-02-A	02-A	SM-SMO-02-A-1	37.57746	-122.32173	2/11/2015	15:20	Inlet	0.13	0.03	
			SM-SMO-02-A-2	37.57480	-122.31881	2/11/2015	15:20	Inlet			
			SM-SMO-02-A-4	37.57212	-122.31598	2/11/2015	15:20	Inlet			
			SM-SMO-02-A-5	37.57337	-122.31724	2/11/2015	15:20	Street Dirt			
	SM-SMO-04-A	04-A	SM-SMO-04-A-1	37.56775	-122.32320	2/18/2015	13:43	Inlet	0.11	0.06	
			SM-SMO-04-A-2	37.56810	-122.32269	2/18/2015	13:43	Inlet			
			SM-SMO-04-A-4	37.56748	-122.32298	2/18/2015	13:43	Inlet			
	SM-SMO-05-A	05-A	SM-SMO-05-A-1	37.56514	-122.31933	2/12/2015	11:28	Inlet	0.07	0.05	
			SM-SMO-05-A-3	37.56521	-122.31921	2/12/2015	11:28	Inlet			
	SM-SMO-06-A	06-A	SM-SMO-06-A-2	37.56134	-122.31515	2/18/2015	14:23	Inlet	0.25	0.23	
			SM-SMO-06-A-4	37.56012	-122.31382	2/18/2015	14:23	Inlet			
			SM-SMO-06-A-5	37.55986	-122.31449	2/18/2015	14:23	Ditch			

Permittee	Sample	Map Label	Subsample	Latitude	Longitude	Date	Time	Sample Location Type	Mercury (mg/kg)	Total PCBs 8082M (mg/kg)	Total PCBs 1668A (mg/kg)
Legend (shading):					< 0.2 mg/kg (none)			0.2 - 0.5 mg/kg (yellow)	0.5 - 1.0 mg/kg (orange)		≥ 1.0 mg/kg (red)
San Mateo	SM-SMO-07-B	07-B	SM-SMO-07-B-1	37.55247	-122.30973	2/12/2015	13:20	Inlet	0.04	0.04	
			SM-SMO-07-B-3	37.55401	-122.31136	2/12/2015	13:20	Inlet			
			SM-SMO-07-B-5	37.55249	-122.30963	2/12/2015	13:20	Manhole			
	SM-SMO-08-A	08-A	SM-SMO-08-A-1	37.54987	-122.30739	2/12/2015	14:53	Inlet	0.04	0.03	
			SM-SMO-08-A-3	37.55203	-122.30645	2/12/2015	14:53	Street Dirt			
	SM-SMO-08-B	08-B	SM-SMO-08-B-1	37.54553	-122.30445	2/12/2015	13:51	Inlet	0.07	0.01	
			SM-SMO-08-B-2	37.54544	-122.30430	2/12/2015	13:51	Inlet			
			SM-SMO-08-B-3	37.54792	-122.30697	2/12/2015	13:51	Street Dirt			
			SM-SMO-08-B-4	37.54744	-122.30678	2/12/2015	13:51	Street Dirt			
	SM-SMO-08-C (Dup of 08-B)								0.06	0.01	
	SM-SMO-11-A	11-A	SM-SMO-11-A-3	37.53201	-122.28861	2/18/2015	15:17	Manhole	0.13	0.08	
			SM-SMO-11-A-4	37.53204	-122.28861	2/18/2015	15:17	Street Dirt			
	SM-SMO-14-A	14-A	SM-SMO-14-A-1	37.58632	-122.33303	2/12/2015	10:55	Inlet	0.63	0.07	
			SM-SMO-14-A-2	37.58622	-122.33253	2/12/2015	10:55	Inlet			
			SM-SMO-14-A-3	37.58618	-122.33281	2/12/2015	10:55	Inlet			
			SM-SMO-14-A-4	37.58618	-122.33273	2/12/2015	10:55	Inlet			
	SM-SMO-15-A	15-A	SM-SMO-15-A-1	37.56701	-122.31035	2/12/2015	11:50	Inlet	0.08	0.02	
			SM-SMO-15-A-2	37.56690	-122.31023	2/12/2015	11:50	Inlet			
			SM-SMO-15-A-3	37.56348	-122.30647	2/12/2015	11:50	Inlet			
South San Francisco	SM-SSF-01-B	01-B	SM-SSF-01-B-5	37.66032	-122.38511	2/16/2015	12:07	Inlet	0.07	0.12	
			SM-SSF-01-B-6	37.66032	-122.38500	2/16/2015	12:07	Outfall			
	SM-SSF-01-C	01-C	SM-SSF-01-C-3	37.64896	-122.38728	2/16/2015	13:21	Manhole	0.24	0.01	
	SM-SSF-01-E (Dup of 01-C)								8.51	0.00	
	SM-SSF-01-D	01-D	SM-SSF-01-D-4	37.65032	-122.39213	2/16/2015	13:52	Manhole	0.14	0.02	
	SM-SSF-02-A	02-A	SM-SSF-02-A-3	37.65172	-122.40318	2/16/2015	10:50	Manhole	0.37	0.07	
	SM-SSF-02-B	02-B	SM-SSF-02-B-1	37.65591	-122.40464	2/16/2015	11:11	Manhole	0.07	0.01	
	SM-SSF-03-A	03-A	SM-SSF-03-A-3	37.64910	-122.40172	2/16/2015	10:06	Manhole	0.28	0.07	
	SM-SSF-03-B	03-B	SM-SSF-03-B-4	37.64919	-122.40410	2/16/2015	9:50	Inlet	0.15	0.09	

Permittee	Sample	Map Label	Subsample	Latitude	Longitude	Date	Time	Sample Location Type	Mercury (mg/kg)	Total PCBs 8082M (mg/kg)	Total PCBs 1668A (mg/kg)
Legend (shading):					< 0.2 mg/kg (none)			0.2 - 0.5 mg/kg (yellow)		0.5 - 1.0 mg/kg (orange)	≥ 1.0 mg/kg (red)
South San Francisco	SM-SSF-03-C	03-C	SM-SSF-03-C-1	37.65181	-122.40008	2/16/2015	10:26	Inlet	0.18	0.19	0.20
			SM-SSF-03-C-3	37.65181	-122.40020	2/16/2015	10:26	Inlet			
	SM-SSF-04-A	04-A	SM-SSF-04-A-3	37.64606	-122.40160	2/16/2015	9:26	Inlet	0.15	1.46	
	SM-SSF-04-B	04-B	SM-SSF-04-B-1	37.63974	-122.40212	2/16/2015	9:07	Inlet	0.09	0.30	
	SM-SSF-05-A	05-A	SM-SSF-05-A-2	37.63735	-122.40605	2/17/2015	10:10	Inlet	0.05	0.46	0.48
			SM-SSF-05-A-3	37.64028	-122.40633	2/17/2015	10:10	Inlet			
	SM-SSF-05-B	05-B	SM-SSF-05-B-1	37.64110	-122.41145	2/17/2015	9:37	Manhole	0.09	0.02	
	SM-SSF-06-A	06-A	SM-SSF-06-A-1	37.64412	-122.41159	2/16/2015	14:22	Inlet	0.06	0.02	
			SM-SSF-06-A-3	37.64406	-122.41036	2/16/2015	14:22	Inlet			
			SM-SSF-06-A-4	37.64331	-122.41168	2/16/2015	14:22	Inlet			
	SM-SSF-06-B	06-B	SM-SSF-06-B-3	37.64220	-122.41329	2/17/2015	11:35	Inlet	0.07	0.48	0.71
			SM-SSF-06-B-4	37.64240	-122.41371	2/17/2015	11:35	Street Dirt			
	SM-SSF-06-C	06-C	SM-SSF-06-C-3	37.64612	-122.41585	2/13/2015	14:55	Inlet	0.05	0.05	
	SM-SSF-06-D	06-D	SM-SSF-06-D-4	37.64128	-122.40868	2/17/2015	9:15	Manhole	3.40	0.14	
	SM-SSF-06-E	06-E	SM-SSF-06-E-1	37.64884	-122.40961	2/13/2015	9:50	Pump Station	3.59	0.03	
	SM-SSF-08-A	08-A	SM-SSF-08-A-1	37.65089	-122.41622	2/13/2015	13:50	Manhole	0.23	0.02	
			SM-SSF-08-A-3	37.64990	-122.41651	2/13/2015	13:50	Inlet			
			SM-SSF-08-A-4	37.64991	-122.41662	2/13/2015	13:50	Inlet			
	SM-SSF-08-B	08-B	SM-SSF-08-B-6	37.65035	-122.41412	2/13/2015	12:26	Manhole	0.06	0.04	
	SM-SSF-08-E (Dup of 01-B)								0.09	0.02	
	SM-SSF-08-C	08-C	SM-SSF-08-C-1	37.64932	-122.41211	2/13/2015	11:14	Inlet	0.04	0.01	
			SM-SSF-08-C-4	37.64937	-122.41224	2/13/2015	11:14	Street Dirt			
	SM-SSF-08-D	08-D	SM-SSF-08-D-3	37.64706	-122.41390	2/13/2015	14:28	Inlet	0.17	0.04	
			SM-SSF-08-D-4	37.64689	-122.41387	2/13/2015	14:28	Street Dirt			
	SM-SSF-09-A	09-A	SM-SSF-09-A-2	37.65047	-122.41284	2/17/2015	13:15	Inlet	0.18	0.02	
			SM-SSF-09-A-4	37.65087	-122.41172	2/17/2015	13:15	Inlet			
			SM-SSF-09-A-5	37.65078	-122.41426	2/17/2015	13:15	Inlet			
			SM-SSF-09-A-6	37.65061	-122.41340	2/17/2015	13:15	Inlet			
	SM-SSF-09-C	09-C	SM-SSF-09-C-3	37.65148	-122.41703	2/17/2015	14:05	Inlet	0.16	0.02	

Permittee	Sample	Map Label	Subsample	Latitude	Longitude	Date	Time	Sample Location Type	Mercury (mg/kg)	Total PCBs 8082M (mg/kg)	Total PCBs 1668A (mg/kg)
Legend (shading):					< 0.2 mg/kg (none)		0.2 - 0.5 mg/kg (yellow)		0.5 - 1.0 mg/kg (orange)		≥ 1.0 mg/kg (red)
South San Francisco			SM-SSF-09-C-5	37.65231	-122.41741	2/17/2015	14:05	Street Dirt			
			SM-SSF-09-C-6	37.65113	-122.41731	2/17/2015	14:05	Street Dirt			
			SM-SSF-09-C-7	37.65100	-122.41837	2/17/2015	14:05	Inlet			
	SM-SSF-09-D	09-D	SM-SSF-09-D-1	37.65026	-122.41140	2/13/2015	10:11	Pump Station	0.07	0.04	
	SM-SSF-10-A	10-A	SM-SSF-10-A-2	37.65329	-122.42609	2/17/2015	15:40	Inlet	0.05	0.01	
			SM-SSF-10-A-4	37.65338	-122.42612	2/17/2015	15:40	Street Dirt			

Appendix B

Blank KLI Sampling Form

PCB/Hg Sampling Form				Contractor:
City:	Date (mm/dd/yyyy): / /			Personnel:
Sample ID:	Arrival Time:	Departure Time:		*Sample Time (1st sample):
Photos (Y / N)	Photo IDs:	GPS Device:		**Address, Location, and Sketches**

Env. Conditions		WIND DIRECTION (from):		Beaufort Scale:
SKY CODE:	Clear, Partly Cloudy, Overcast, Fog, Smoky, Hazy			
SITE ODOR:	None, Sulfides, Sewage, Petroleum, Smoke, Other_____			
PRECIP:	None, Fog, Drizzle, Rain			
PRECIP (last 24 hrs):	None, Unknown, < 0.1", 0.1 - 0.25", > 0.25"			
SOIL ODOR:	None, Sulfides, Sewage, Petroleum, Mixed, Other_____			
SOIL COLOR:	Colorless, Green, Yellow, Brown			
SOIL COMPOSITION:	Silt/Clay, Sand, Gravel, Cobble, Mixed, Debris			
SOIL POSITION	Submerged, Exposed			

Samples Taken	**Field Dup at Site? YES / NO:** (create separate datasheet for FDs, with unique IDs (i.e., blind samples) **Field Dup ID:**
COLLECTION DEVICE:	Equipment type used: Scoop (SS / PC / PE), Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar), Broom (nylon, natural fiber)

SubSampleID	MH / Inlet / Street Dirt / Other	DepthCollec (cm)	Composite / Grab (C / G)	# Containers Filled	PCBs	Hg	Other	Latitude (dd.ddddd)	Longitude (ddd.ddddd)

SITE/SAMPLING DESCRIPTION AND COMMENTS:

Appendix C

Blank EOA Sampling Form

POC Sampling Form

Staff: _____ Sample ID: _____

City: _____ Date:_____ Time: _____

Photo IDs: _____

Address 1: _____ Latitude: _____

MH / CB / SED / Other: _____ Subsample ID: _____Longitude: _____

Address 2: _____ Latitude: _____

MH / CB / SED / Other: _____ Subsample ID: _____Longitude: _____

Address 3: _____ Latitude: _____

MH / CB / SED / Other: _____ Subsample ID: _____Longitude: _____

Address 4: _____ Latitude: _____

MH / CB / SED / Other: _____ Subsample ID: _____Longitude: _____

Composite: yes / no Field Duplicate: yes / no ID: _____ Time: _____

Notes: (Electrical/Heavy equipment, drums, scrap metal, oil stains, sediment transport, drainage patterns, etc.)

_____

_____

_____

_____

_____

_____

Sketch: (include north arrow, street names, inflow/outflow pipes with diameters, private inlets, flow directions, etc.)