CONTRA COSTA
CLEAN WATER
PROGRAM

April 2, 2024

Eileen White, Executive Officer
California Regional Water Quality Control Board, San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

SUBJECT: Submittal of the revised Old Industrial Area Control Measure Plan in accordance with MRP Provision C.11.c.iii.(1) and C.12.c.iii.(1)

Dear Ms. White,

Please find attached the Old Industrial Area Control Measure Plan (Revised Version 1.1) submitted on behalf of the Contra Costa Clean Water Program (CCCWP) member agency Permittees. This plan is required by Provisions C.11.c.iii.(1) and C.12.c.iii.(1) of the Municipal Regional Permit (MRP) NPDES Permit Order No. R2-2022-0018. These provisions require a report providing the plans and schedules for implementing control measures in old industrial areas to address the mercury and PCBs load reduction requirements. CCCWP revised the March 2023 Control Measure Plan to address San Francisco Bay Regional Water Quality Control Board comments received in August 2023.

With approval and direction from duly authorized representatives of each CCCWP Permittee, I am authorized to submit and certify under penalty of law that this document and all attachments were prepared under my direction of supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Regards,

Rinta Perkins
Interim Program Manager
Contra Costa Clean Water Program

cc: Richard Looker, SFBRWQCB
Tom Mumley, SFBRWQCB
Keith Lichten, SFBRWQCB
Imtiaz-Ali Kaylan, SFBRWQCB
Contra Costa Clean Water Program (CCCWP) Permittees

CONTRA COSTA CLEAN WATER PROGRAM

CONTRA COSTA COUNTY

OLD INDUSTRIAL AREA CONTROL MEASURE PLAN

Submitted in Compliance with Provision C.11.c.iii.(1) and C.12.c.iii.(1)

Municipal Regional Stormwater Permit
NPDES Permit No. CAS612008
Order No. R2-2022-0018

March 31, 2024

Revised Version 1.1

The Contra Costa Clean Water Program – A Municipal Stormwater Program consisting of Contra Costa County, its 19 Incorporated Cities/Towns, and the Contra Costa County Flood & Water Conservation District

This report is submitted by the agencies of the

Program Participants:

- Cities of: Antioch, Brentwood, Clayton, Concord, Danville (Town), El Cerrito, Hercules, Lafayette, Martinez, Moraga (Town), Oakley, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon and Walnut Creek
- Contra Costa County
- Contra Costa County Flood Control & Water Conservation District

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on behalf of the
Contra Costa Clean Water Program

LIST OF ACRONYMS

BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practices
CCCWP	Contra Costa Clean Water Program
g	gram
GIS	Geographic Information System
GSI	Green Stormwater Infrastructure
kg	kilogram
kg/yr	kilogram per year
µg	microgram
µg/kg	microgram per kilogram
mg	milligram
mgd	million gallons per day
mg/kg	milligram per kilogram
MPC	Monitoring and Pollutants of Concern Committee
MRP	Municipal Regional Permit
MS4	Municipal Separate Storm Sewer System
ng	nanogram
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
PCBs	Polychlorinated Biphenyls
POTW	Publicly Owned Treatment Works
ROW	Right-of-Way
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SFEI	San Francisco Estuary Institute
TMDL	Total Maximum Daily Load
WLA	Wasteload Allocation
WY	Water Year
YR	Year

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EXECUTIVE SUMMARY

This report presents the old industrial area implementation plan for the Contra Costa Clean Water Program (CCCWP or Program) Permittees to meet mercury and polychlorinated biphenyls (PCBs) load reduction requirements. The plan is required by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) through the Municipal Regional Stormwater NPDES Permit (MRP). MRP Provisions C.11.c.iii.(1) and C.12.c.iii.(1) require a report providing plans and schedules for implementing control measures in old industrial areas within the SFBRWQCB's geographic jurisdiction (Region 2) to address mercury and PCBs load reduction requirements included in MRP Provisions C.11.c and C.12.c. This report includes maps of the areas where control measures will be implemented, the size of the treated catchments, and a description of design and sizing features for the selected control measures.

MRP Provisions C.11.c and C.12.c require the Region 2 Permittees, within the permit term, to implement or cause to be implemented control measures (i.e. treatment controls, diversion to wastewater treatment plants, green stormwater infrastructure implemented in compliance with Provision C.3.b, enhanced operation and maintenance controls, or other controls) to achieve mercury and PCBs load reductions. The Contra Costa County Permittees within Region 2 must implement control measures on 664 acres of old industrial land use areas that have not been redeveloped or treated with GSI or other treatment controls, or alternatively reduce loads of mercury by 28 grams per year (g/yr) and PCBs by 121 g/yr, by June 30, 2027.

The CCCWP submitted an Old Industrial Area Control Measure Plan as required on March 31, 2023. The plan addressed the requirements of MRP Provisions C.11.c.iii.(1) and C.12.c.iii.(1) for providing a plan and schedule for focused implementation of control measures in old industrial areas to address mercury and PCBs load reduction requirements. The CCCWP has revised the March 2023 Control Measure Plan to address Water Board comments received in August 2023.

This revised plan includes maps identifying focus areas with known moderate PCBs concentrations and lays out the process by which specific treatment control measures will be assessed and implemented for these focus areas.

1 INTRODUCTION

1.1 Purpose

This *Old Industrial Area Control Measure Plan* was prepared by the Contra Costa Clean Water Program (CCCWP) per the Municipal Regional Permit (MRP) for urban stormwater issued by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB or Water Board; Order No. R2-2022-0018). This report fulfills the requirements of MRP Provisions C.11.c.iii.(1) and C.12.c.iii.(1) for providing a plan and schedule for implementing control measures in old industrial areas to address mercury and polychlorinated biphenyls (PCBs) load reduction requirements.[1]

The following MRP reporting requirements are addressed within this report:

- By March 31, 2023, Permittees shall submit plans and schedules for implementing control measures and stormwater diversion to wastewater treatment facilities in old industrial areas to address mercury and PCBs load reduction requirements during this permit term (i.e., by June 30, 2027).
- This reporting shall include maps of the areas where control measures are to be implemented; the size of these catchments; and a description of design and sizing features for all control measures, treatment devices, and stormwater diversion facilities implemented for each treated catchment.

The CCCWP submitted an Old Industrial Area Control Measure Plan (CMP) as required on March 31, 2023. The plan addressed the requirements of MRP Provisions C.11.c.iii.(1) and C.12.c.iii.(1) for providing a plan and schedule for focused implementation of control measures in old industrial areas to address mercury and PCBs load reduction requirements. The CCCWP has revised the March 2023 CMP to address Water Board comments received in August 2023.

[1] MRP Provisions C.11 and C.12 apply to the Permittees with San Francisco Bay Regional Water Quality Control Board's geographic jurisdiction (Region 2). The cities of Antioch, Brentwood, and Oakley, unincorporated Contra Costa County, and the Contra Costa County Flood Control and Water Conservation District (collectively, East County Permittees), located in the Central Valley Regional Water Quality Control Board's geographic jurisdiction must comply with the requirements of Provision C.19, which incorporates requirements from the Central Valley Water Board's methylmercury TMDL and control programs applicable to the East County Permittees.

1.2 Background

1.2.1 PCBs and Mercury Total Maximum Daily Loads

Fish tissue monitoring in San Francisco Bay (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 "Section 303(d) list" due to PCBs, mercury, and other pollutants. In response, the SFBRWQCB 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.

Municipal separate storm sewer systems (MS4s) are one of the PCBs and mercury sources/pathways identified in the TMDL plans. Local public agencies (i.e., Permittees) subject to requirements via National Pollutant Discharge Elimination System (NPDES) permits are required to implement control measures to reduce PCBs and mercury from entering stormwater runoff and the Bay. These control measures, also referred to as best management practices (BMPs), are the tools that Permittees can use to assist in restoring water quality in the Bay.

PCBs TMDL

The PCBs TMDL was developed based on a fish tissue target of ten nanograms (ng) of PCBs per gram (g) of fish tissue. This target is based on a cancer risk of one case per an exposed population of 100,000 for the 95th percentile San Francisco Bay Area sport and subsistence fisher consumer (32 grams (g) of fish per day) (SFBRWQCB, 2008). A food web model was developed by San Francisco Estuary Institute (SFEI) to identify the sediment target concentration that would yield the fish tissue target; this sediment target was found to be one microgram (µg) of PCBs per kilogram (kg) of sediment. This is equivalent to reducing the total mass of PCBs in the sediment active layer of the San Francisco Bay to 160 kg. The San Francisco Estuary Institute (Davis, 2003; SFEI, 2007a) developed a mass budget model that identified the total external load of PCBs to the Bay that would attain a long-term (i.e., equilibrated) PCBs mass in the bay of 160 kg within approximately 30 years. The mass budget model estimated that reduction of the external load to 10 kg of PCBs per year would achieve this goal, assuming a starting Bay-wide PCBs concentration

in surface sediment of 4.65 micrograms per kilogram (µg/kg)[2] (SFEI, 2007b). Twenty percent of the estimated allowable external load was allocated to urban stormwater runoff.

The wasteload allocation (WLA) for PCBs for all urban stormwater discharges to the Bay is two kilograms per year (kg/yr) by 2030. This load allocation was developed by applying the required sediment concentration (1 µg/kg) to the estimated annual sediment load discharged from local tributaries. The PCBs WLA for Contra Costa County jurisdictions is 0.3 kg/yr.

Mercury TMDL

The mercury TMDL addresses two water quality objectives. The first objective, established to protect people who consume Bay fish, applies to fish large enough to be consumed by humans. This objective is 0.2 milligrams (mg) of mercury per kg of fish tissue (average wet weight concentration measured in the muscle tissue of fish large enough to be consumed by humans). The second objective, established to protect aquatic organisms and wildlife, applies to small fish (3-5 centimeters in length) commonly consumed by the California least tern, an endangered species. This objective is 0.03 mg mercury per kg fish (average wet weight concentration). To achieve the human health and wildlife fish tissue and bird egg monitoring targets and to attain water quality standards, the Bay-wide suspended sediment mercury concentration target is 0.2 mg mercury per kg dry sediment.

A roughly 50% decrease in sediment, fish tissue, and bird egg mercury concentrations is necessary for the Bay to meet water quality standards. Reductions in sediment mercury concentrations are assumed to result in a proportional reduction in the total amount of mercury in the system, which will result in the achievement of target fish tissue and bird egg concentrations (SFBRWQCB, 2004).

The urban stormwater runoff load to the San Francisco Bay is estimated to be equivalent to 116 kg/yr, as reported in the San Francisco Bay Regional Monitoring Program for Water Quality's Sources, Pathways, and Loadings Report (McKee et al., 2015), which is less than the Mercury

[2] Bay-wide PCBs concentration in surface sediment estimated based on Regional Monitoring Program 2004 – 2006 data (SFEI, 2007a).

TMDL Staff Report reported load of 160 kg/yr[3] (corresponding to "baseline year" of 2003). The WLA for mercury for urban stormwater is 82 kg/yr (SFBRWQCB, 2006). Based on the TMDL reported load of 160 kg/yr, this results in an estimated total required load reduction of 78 kg/yr, required to be achieved by 2028. The WLA for Contra Costa County jurisdictions for mercury is 11 kg/yr (SFBRWQCB, 2006).

Mercury TMDL compliance can be demonstrated through the following three approaches[4]:

1. Show mercury concentrations are below 0.2 milligrams per kilogram (mg/kg) on a countywide level (i.e., monitoring-based compliance demonstration);
2. Meet the WLA (i.e., monitoring and/or modeling-based compliance demonstration);[5] and
3. Demonstrate the required load reductions can be achieved (i.e., modeling-based compliance demonstration).

1.2.2 Municipal Regional Permit

NPDES permit requirements associated with Phase I municipal stormwater programs and Permittees in the Bay area are included in the MRP, which was issued to the cities, counties, and flood control districts within Water Board Region 2 in 2009 and revised in 2015 and 2019[6]. The current MRP 3.0 permit was issued on May 11, 2022 and became effective on July 1, 2022. MRP 3.0 was amended in October 2023 (Order No. R2-2023-0019); this amendment did not affect Provisions C.11 and C.12.

[3] This loading assumes an annual sediment load of 410,000,000 kg/yr of sediment with a concentration of 0.38 mg/kg (ppm) (SFBRWQCB, 2006). Although the estimates were based on monitoring data collected in previous years, the TMDL states the baseline year as 2003.

[4] Detailed documentation requirements for demonstration of these approaches are summarized in the Mercury TMDL Staff Report (SFBRWQCB, 2006).

[5] Modeling-based compliance demonstration requires monitoring-based empirical inputs to conduct the analyses.

[6] The MRP was amended on February 13, 2019, to add the cities of Antioch, Brentwood, Oakley, and the eastern portions of unincorporated Contra Costa County and the Contra Costa County Flood Control & Water Conservation District.

MRP Provisions C.11.c and C.12.c require the Permittees, within the permit term, to implement or cause to be implemented control measures (i.e. treatment controls, diversion to wastewater treatment plants, green stormwater infrastructure (GSI) implemented in compliance with Provision C.3.b, enhanced operation and maintenance controls, or other controls) to achieve mercury and PCBs load reductions. The Contra Costa County Permittees must implement control measures on 664 acres of old industrial land use areas that have not been previously redeveloped or treated with GSI or other treatment controls during the current permit term (i.e., by June 30, 2027).

Implementation of treatment control measures on 664 acres would result in a total estimated load reduction of about 28 grams per year (g/yr) of mercury and 121 g/yr of PCBs (assuming a 70% pollutant removal efficiency). Implementation of control measures with a lower efficiency than 70 percent will result in reduced area credited (for those lower efficiency control measures) toward fulfillment of the total treatment area requirement. Permittees may comply with this provision either by implementing control measures on old industrial land use areas or by accounting for the load reduction of mercury and PCBs (28 g/yr and 121 g/yr, respectively). The area credited will be proportional to the ratio of the implemented control measure efficiency relative to the efficiency of treatment controls.

Implementation of control measures in PCBs-contaminated catchments not designated as old industrial may count toward fulfillment of the required treatment area. In choosing locations for control measures, this plan focuses on catchments containing known or suspected source areas or evidence of moderate to high mercury or PCBs soil concentrations (soil/sediment concentrations greater than 0.3 mg mercury/kg or 0.2 mg PCBs/kg).

Treatment control systems must be designed and sized consistent with MRP Provision C.3.d (Numeric Sizing Criteria for Stormwater Treatment Systems). The Water Board will consider the use of conditionally-approved treatment control system sizing criteria, per MRP Provision C.3.j(3)(b), provided an analysis of the effectiveness of the facility sized according to these alternative criteria is acceptable to the Water Board Executive Officer.

Permittees may choose to implement diversions to publicly owned treatment plants (POTWs) to address this requirement. Because of the higher removal efficiency of wastewater treatment, each acre addressed by routing stormwater to a POTW will be credited as 1.3 acres toward satisfying the old industrial area treatment requirement, provided that the diversion facilities are

sized and operated consistent with the sizing requirements used for non-diversion treatment facilities.

2 OLD INDUSTRIAL AREA BASELINE CONDITION

Figures A-1 through A-20 (provided in Appendix A) illustrate the old industrial area baseline condition. These maps show PCBs and mercury sample concentrations in existing monitoring data, untreated old industrial land use areas, and old industrial areas that were treated prior to Fiscal Year (FY) 2020-21. These maps also show the locations and drainage catchments of old industrial area treatment measures installed in FY 2020-21 and FY 2021-22 and treatment control measures planned for implementation during this permit term (i.e., FY 2022-23 through FY 2026-27). The old industrial area indicated on these maps is based on mapping conducted over the previous two permit terms. The maps will be updated throughout the permit term to improve the accuracy of the maps at the parcel scale and to add new monitoring data.

3 OLD INDUSTRIAL AREA TREATMENT CONTROL MEASURES

This section describes the treatment control measures that will be implemented by the Permittees during this permit term to control mercury and PCBs in urban runoff from areas containing known or suspected sources or areas with evidence of moderate to high mercury or PCBs soil concentrations. Potential treatment control measures include retrofit with GSI or non-GSI treatment control, enhanced operation and maintenance (O&M) practices, redevelopment with GSI, full trash capture devices, and diversion to POTW. The process for selecting treatment control measures is described below.

A summary of the area available to be addressed by each of the treatment control measure categories is provided in Table 1 below. Note that these areas are not exclusive (i.e., enhanced O&M practices may be selected for implementation in specific focus areas). As stated above, Provisions C.11 c and C.12.c require treatment of 664 acres; the total available area shown in Table 1 exceeds 664 acres. The CCCWP permittees are committed to meeting or exceeding the 664 acre treatment area requirement.

Table 1: Old Industrial Area Available for Treatment Control

Treatment Measure	Available Area (Acres)
Retrofit with Treatment Controls in Focus Areas	150 acres
Enhanced O&M Storm Drain Cleaning in Richmond	53 to 161 acres[1]
Applicable Redevelopment Projects	548 acres

1 Converted from mass of PCBs removed; see Appendix D for details.

3.1 Focus Areas

CCCWP analyzed the existing monitoring data and other sources of information to identify known or suspected areas with moderate or high concentrations of mercury or PCBs. These areas are located in the cities of Pittsburg, Richmond, and San Pablo and in Unincorporated Contra Costa County. Maps identifying the known moderate PCBs areas (hereafter referred to as "focus areas") are provided in Figures 1 through 4. There are 150 acres within parcels and in the right-of-way (ROW) in the selected high priority focus areas. An initial analysis of the high priority focus areas is provided in Appendix B.

In compliance with MRP Provisions C.11.b/C.12.b, the Permittees will continue to monitor old industrial areas to identify new source properties and pursue abatement of the source properties that were previously referred. The Lauritzen Channel and Parr Channel watersheds are known areas of concern (BASMAA, 2017a) and will be prioritized for pollutants of concern monitoring. Additional focus areas will be assessed for specific treatment control measures as monitoring conducted for C.11.b/C.12.b identifies additional moderate areas.

3.2 Process for Selecting and Implementing Specific Treatment Control Measures

The process used to select and implement specific control measures for each focus area is illustrated in Figure 5. In general, the process of selecting and implementing specific control measures consists of the following:

1. The CCCWP has compiled a map of focus areas using existing data (Figures 1 through 4). Focus areas group existing moderate or high data points (soil/sediment concentrations greater than 0.2 mg PCBs/kg) into smaller management areas. The old industrial areas within the pilot investigation watersheds identified in the Clean Watersheds for a Clean Bay report (BASMAA, 2017a), the Lauritzen Channel and Parr Channel watersheds, are also included as focus areas.

2. The CCCWP will resample the focus areas to confirm the presence of moderate or elevated levels of mercury or PCBs. This monitoring will be conducted April 2024 – September 2024. If resampling finds an area to not be moderately contaminated (i.e., PCBs ≤ 0.2 mg/kg), the focus area map will be revised to indicate the result of the monitoring. The revised maps will be included in the annual report (see Section 5 below).
3. If there is a confirmed source property (i.e., PCBs ≥ 1 mg/kg), the permittee will refer the property to the Water Board and implement enhanced O&M measures at the site. Alternatively, permittees may abate or cause the property to be abated directly. Source properties will be referred as they are identified throughout the permit term unless the Permittee causes abatement of the property.
4. For target areas where elevated levels of PCBs are confirmed, the CCCWP or permittee will conduct site visits within the focus area to determine if there is a readily identifiable source. These site visits will occur April 2024 – September 2024 or when new moderate data is collected.
5. If no specific source property is identified, but a property that is a source of moderate contamination (i.e., PCBs ≥ 0.2 mg/kg) is located, the permittee will assess whether the property owner can implement actions on the property to contain or treat the source. The permittee will take action to cause the containment or treatment to be implemented by the property owner at or around the site. These actions will be conducted when a source of moderate contamination is identified beginning in October 2024.
6. If no specific property is identified as a source of moderate contamination, the CCCWP and permittee will select and implement controls for the moderate area in the ROW (i.e., treatment or enhanced operations and maintenance) based on site-specific constraints, local infrastructure, and drainage patterns. Assessment of site-specific control measure options for confirmed moderate areas will occur from June 2024 through December 2024, or as new moderate areas are confirmed thereafter.

If treatment (i.e., a capital improvement) is determined to be the best option for the area, the following outlines the steps for implementation:

3.2.1 Treatment Control Project Development (Approximately Six Months)

1. Investigate the potential treatment project location for drainage patterns and availability of storm drain systems, location of utilities, right-of-way needs, and potential environmental permitting issues.
2. Develop a 10% concept design (i.e., location, preliminary sizing, and treatment type).
3. Investigate funding and implementation agreements.
4. Conduct internal agency coordination and public outreach.

3.2.2 Engineering Phase (Approximately 12-24 Months; Assumes Typical Design-Bid-Build Process)

1. Conduct pre-design investigations:
    a. Desktop utility investigation and surveying
    b. Potholing
    c. Geotechnical analysis
    d. Groundwater/subsurface contamination conditions analysis
2. Prepare 30/60/90% Plans, Specifications, and Estimates (PS&E).
3. Prepare final (100%) PS&Es and bid documents.
4. Conduct CEQA.
5. Conduct procurement.

3.2.3 Construction (Approximately 6-12 months) and Post-Construction

1. Construction management.
2. Project acceptance.
3. Asset management/O&M.

3.3 Treatment Control Options

3.3.1 Retrofit with Treatment Controls or Green Stormwater Infrastructure

Retrofit projects provide treatment control for existing developed areas without redeveloping the tributary area. Treatment controls may include GSI or non-GSI treatment.

MRP 3.0 defines treatment as any method, technique, or process designed to remove pollutants and/or solids from polluted stormwater runoff. For example, some of the TAPE-approved[7] and NJCAT-verified[8] proprietary treatment control measures are listed in Appendix C. Appendix C also provides information on sediment removal methods and efficiency; installation and sizing; constraints; and maintenance considerations. These types of treatment controls will be considered for retrofit of confirmed focus areas.

MRP Provision C.3.j required each Permittee to develop a Green Infrastructure Plan for inclusion in the 2019 Annual Report. These Green Infrastructure Plans mapped and prioritized areas for potential and planned public and private GSI projects for implementation by 2020, 2030, and 2040. These Green Infrastructure Plans and direct input from Permittees were used to identify retrofit projects that are planned to be implemented in old industrial and moderate areas during this permit term (see Appendix A). GSI will also be considered for retrofit of confirmed focus areas.

Retrofit treatment control measures will be designed and sized consistent with MRP Provision C.3.d (Numeric Sizing Criteria for Stormwater Treatment Systems). Non-regulated retrofit projects with significantly constrained area or other substantial constraints will size treatment control measures using the *Guidance for Sizing Green Infrastructure Facilities in Streets Projects* (BASMAA, 2019) with companion analysis *Green Infrastructure Facility Sizing for Non-Regulated*

[7] The TAPE program reviews and certifies stormwater treatment technologies using the Washington State Technology Assessment Protocol - Ecology. Certified treatment technologies meet or exceed 80% removal of TSS.

[8] The New Jersey Corporation for Advanced Technology (NJCAT) is a non-profit corporation that focuses on promoting collaboration with industry, entrepreneurs, academic institutions, utilities, the New Jersey State government, and other non-profit organizations, for the development and commercialization of innovative or emerging energy and environmental technologies. A key element of the NJCAT program is verifying technology performance claims.

Street Projects (BASMAA, 2017b). These projects will comply with Water Board's conditional approval of that sizing method providing qualifiers and conditions under which alternative sizing criteria may be used for non-regulated green streets projects (SFBRWQCB, 2019). Retrofit projects that use the conditionally-approved sizing criteria in MRP Provision C.3.j(3)(b) will provide an analysis to the Water Board that determines the effectiveness of the facility sized according to these alternative criteria.

Implementation of a Regional Treatment Control Project

As part of developing this Old Industrial Area Control Measure Plan in 2023, CCCWP screened regional project opportunities from the Contra Costa Watersheds Stormwater Resource Plan (SWRP) and the Permittees' planned projects to identify a subset of potential candidate locations for a regional retrofit project within Contra Costa County.

In 2023, the CCCWP was awarded a United States Environmental Protection Agency (USEPA) Water Quality Improvement Fund (WQIF) grant. The *Clean Watersheds for All* (CW4A) project, which began in November 2023 and is scheduled to be complete by June 2027, focuses on countywide implementation of regional GSI and treatment control projects, especially in underserved communities. The CW4A project will generate a regional stormwater treatment plan and project delivery roadmap for underserved communities in Contra Costa County. Building on the list of regional project opportunities developed for this plan, the CW4A project is developing a list of proposed water quality improvement projects in underserved communities, prioritized based on the potential to reduce PCBs and mercury and other community-supported multiple benefits. The CW4A project will develop concept designs for three projects and will advance financial plans and systems needed to allow the CCCWP Permittees to collaborate and fund the plans, construction and ongoing operation and maintenance of prioritized projects. The CW4A project will conduct outreach to engage with and garner support from the affected communities.

The outcomes of the CW4A project include:

- A list of viable regional stormwater treatment projects located within or adjacent to underserved communities that have community support and can provide treatment of legacy pollutants along with other multiple benefits (March 2024).
- Concept designs for three regional stormwater treatment / GSI projects (August 2024).

- A Funding and Delivery Roadmap with tangible next steps and a schedule for securing funding to construct the prioritized regional stormwater capture projects (January 2025).
- A mechanism (such as a Community Facilities District) to charge fees for and fund ongoing operations and maintenance for regional stormwater treatment projects (2024 – 2025).
- Design and bid documents or an RFP for alternative delivery (i.e., design plus construction) for one regional stormwater capture project (2025).
- Community outreach to garner support for the top prioritized projects and the overall CW4A Regional Project Plan and Funding and Delivery Roadmap (2024 – 2025).
- Fish Risk Reduction materials for underserved communities in Contra Costa County (2024).

3.3.2 Enhanced Operation and Maintenance

Enhanced MS4 O&M activities include street sweeping; drain inlet cleaning; and storm drain, culvert, and channel desilting to remove excessive quantities of accumulated sediment. Each of these O&M activities removes PCBs and mercury that are present in the sediment that is removed.

If the Focus Area investigations find accumulated sediments that are moderately contaminated in inlets, storm drains, or along the ROW, enhanced O&M will be conducted to remove the contaminated sediment. The method selected to remove moderately contaminated sediment will be a function of the site conditions (e.g., the presence/absence of curb and gutter, inlets, and storm drains).

The City of Richmond cleans its entire storm drain network every four years. An estimate of the PCBs and mercury load reductions as a result of this storm drain line cleaning within old industrial areas in the Parr and Lauritzen Channel watersheds is provided in Appendix D.

3.3.3 Redevelopment with Green Stormwater Infrastructure

GSI is treatment control that uses vegetation, soils, and natural processes to manage water and create healthier urban environments. GSI is used to reduce runoff volumes, disperse runoff to vegetated areas, harvest and use runoff where feasible, promote infiltration and evapotranspiration, and use bioretention and other natural treatment control systems to detain

and treat runoff before it reaches tributary creeks and, ultimately, San Francisco Bay. GSI treatment control measures include, for example, pervious pavement, infiltration basins, bioretention facilities, green roofs, and rainwater harvesting systems. Infiltration-based GSI treatment control measures are not recommended in areas with contaminated soils or groundwater.

Regulated redevelopment projects in old industrial and moderate areas are required to implement GSI by MRP Provision C.3. Redevelopment projects reduce mercury and PCBs loads both through the redevelopment activity (e.g., soil removal, capping, and addition or replacement of impervious surfaces) and the implementation of GSI treatment.

MRP Provision C.3.d includes numeric sizing criteria for GSI treatment measures for regulated redevelopment projects. The current 8th Edition of the *Stormwater C.3 Guidebook*, published in December 2022, provides guidance on the selection, sizing, and design of GSI treatment measures for redevelopment projects in Contra Costa County. MRP 3.0 includes several significant changes to Provision C.3, including changes to the types and sizes of projects regulated. Most of these changes go into effect on July 1, 2023. The 8th Edition of the *Stormwater C.3 Guidebook* reflects the new requirements. The redevelopment projects in old industrial and moderate areas listed in this plan will be sized and designed in accordance with this guidance.

Figure 6 shows redevelopment projects that are associated with known or suspected areas with moderate or high concentrations of mercury or PCBs. An estimated 530.9 acres of known or suspected areas with moderate or high concentrations of mercury or PCBs are in the processes of redeveloping. Appendix D provides fact sheets for these redevelopment projects.

3.3.4 Full Trash Capture Treatment Control Measures

MRP Provision C.10 requires Permittees to implement trash prevention and control actions, including full trash capture systems, to reduce trash generation. Full trash capture systems capture sediment along with trash that may be contaminated with PCBs and mercury. Permittees have installed both large and inlet-based full trash capture devices in response to Provision C.10. Large full trash capture devices, including hydrodynamic separators (HDS), gross solids removal devices (GSRDs), and baffle boxes, capture and treat urban runoff from large drainage areas, ranging from tens to hundreds of acres. Inlet-based devices in roadways enhance the capture of sediments that may be contaminated with PCBs and mercury from smaller, localized drainage areas. In addition, these inlets are typically cleaned more frequently as a result of the installation

of the full trash capture device. Trash capture device implementation is described in each Permittee's Trash Load Reduction Plan. Full trash capture devices are sized and designed in compliance with MRP Provision C.10. Installation of full trash capture devices will consider old industrial areas to reduce loads of PCBs and mercury.

3.3.5 Diversion to POTW

This control measure consists of diverting stormwater runoff from MS4s to POTWs as a method to reduce loads of PCBs and mercury in urban runoff. Diversion to POTW is not planned for implementation in Contra Costa County as a result of the pilot project described below, which found that diversion to POTW is not a cost-effective option.

North Richmond Pump Station Pilot Project

The CCCWP facilitated implementation of a stormwater diversion pilot project to divert urban runoff from the North Richmond Stormwater Pump Station (North Richmond Station) to the West County Wastewater District (WCWD) in compliance with MRP 1.0 (BASMAA, 2014; Amec Foster Wheeler, 2016). The North Richmond Station is jointly owned by Contra Costa County (61 percent) and the City of Richmond (39 percent) through a Joint Powers Authority (JPA) based on a 1974 agreement. The WCWD is currently under a separate contract with the JPA to maintain and operate the North Richmond Station.

The North Richmond Station is designed to control stormwater flooding conditions for the unincorporated area of North Richmond. The station receives water from a network of stormwater collection sewers which drain into the wet well of the pump station. Stormwater is then pumped into the discharge channel of the pump station that drains by gravity into a 78-inch discharge pipeline.

The area draining to the station consists of industrial and residential land uses in the unincorporated area adjacent to the north boundary of the City of Richmond. The storm drainage system delivers stormwater to the North Richmond Station located on the southwest corner of Gertrude Avenue and Richmond Parkway. The station's 78-inch discharge pipeline runs westward from the pump station along an easement on the Chevron Chemical Company's property just south of Gertrude Avenue. At about 950 feet downstream of the pump station, the pipeline enters an 8-foot by 4-foot box culvert which crosses Gertrude Avenue and runs into a trapezoidal earth channel that drains to Wildcat Creek.

Objectives for the North Richmond Station pilot diversion project included:

1. Evaluating PCBs and mercury loads avoided through pump station maintenance conducted in conjunction with diversion to the POTW;
2. Designing a diversion pilot project that could be permitted for discharge to West County Wastewater District; and
3. Evaluating operating techniques that could treat first flush without adversely impacting POTW capacity.

The pilot project was led by Contra Costa County (the County). The County sought and obtained grant funding administered by the San Francisco Estuary Project through a USEPA WQIF grant. The grant provided $496,649 in USEPA funds, matched by $165,550 from the County to plan, design, construct, and monitor an engineered diversion into WCWD.

The San Francisco Estuary Institute (SFEI) monitored the North Richmond Station Pump Station to characterize loads of PCBs and mercury from 2010 to 2013; SFEI's work was initially funded by the EPA WQIF grant, and later by BASMAA. Negotiation with WCWD to gain their acceptance of the pilot project took place between 2011 and 2013, including two meetings with the WCWD Board of Directors. The design of the project was completed in 2014, and construction was completed in 2015. Dry and wet weather diversion were monitored in the fall of 2015, concurrent with completion of the diversion infrastructure.

Monitoring conducted for the pilot study showed that the estimated watershed PCBs load is approximately ten grams per year (BASMAA, 2014; Hunt et al., 2012). The study conclusions were:

- The wet weather and dry weather diversion pilot tests captured about 1 mg of PCBs.
- Conveyance limitations of the sanitary sewage system prohibit substantial scale-up of the pilot to larger diversion flows. The installed diversion pump diverts 200 to 250 gallons per minute into the WCWD collection system. Larger flow rates risk sanitary sewer overflows. The design of the pump station provides 135,000 gallons per minute of stormwater pumping capacity, about six hundred times more volume than the diversion.
- Even if all of the stormwater from the 339 acre catchment served by the pump station could be captured and treated – which would require a substantial capital project - the total PCBs load reduction possible is on the order of one to ten grams.

- The total project cost was over $1.4 million which included some necessary upgrades to the existing pump station infrastructure. The cost for a "stand-alone" stormwater diversion project would be approximately $1 million.

4 COSTS AND FUNDING

MRP Provisions C.11.c and C.12.c require the permittees to treat 664 acres during the current permit term. The cost for implementing treatment is significant. A cost study prepared for the CCCWP (Geosyntec, 2023) found that the mean cost of treatment with GSI ranges from $50,000 to $558,000 per acre treated (in 2023 dollars), depending on the scale and whether the facility incorporates infiltration[9]. The unit treatment cost for regional facilities is less expensive (although the total cost will be greater) than green street or parcel-based treatment. The cost of treatment using proprietary devices (e.g., high rate media filters) may be greater. The Clean Watersheds for a Clean Bay project (BASMAA, 2017a) conducted a pilot study of a Contech catch basin StormFilter unit in a new storm drain inlet located at the driveway of a PG&E substation. Although the total planning, design, and construction cost was approximately $120,000 (in 2015 dollars), the cost per acre treated was approximately $900,000 (in 2015 dollars; in 2023 dollars this would be approximately $1.1M) due to the small tributary area treated (0.13 acres). Thus, the cost to treat 664 acres during this permit term is estimated to range from $33.2M to $730M[10]. This plan assumes that a portion of the 664 acres will be treated with enhanced O&M, redevelopment, and full trash capture devices, which will reduce the cost of compliance.

The Focus Areas are located in the cities of Pittsburg, Richmond, and San Pablo and in Unincorporated Contra Costa County. The CCCWP is considering pooling funds to assist with implementation of treatment control measures in the Focus Areas.

5 REPORTING

In each Annual Report, the CCCWP will submit an account of control measure implementation consistent with this CMP. Reporting will include maps of the areas treated, te confirmed PCBs

[9] Infiltration devices are not likely to be feasible in old industrial areas, which may have contaminated soils, low infiltration rates, and high groundwater or tidal influence.

[10] Given that regional treatment would not be able to treat the entire 664 acres and would not rely on infiltration, the cost is likely to be on the high end of this range.

and mercury concentrations, the acreage of catchments addressed, and a description of the control measures, installed treatment devices, and routing facilities for each treated catchment. In the 2026 Annual Report, the CCCWP will provide the total area treated and an estimate of the resultant total mercury and PCBs loads reduced. Load reductions will be calculated in accordance with the approved *Source Control Load Reduction Accounting for Reasonable Assurance Analysis* report (BASMAA, 2022).

6 SCHEDULE

Table 2 below provides a schedule for implementing the process for selecting and implementing specific treatment control measures in the Focus Areas.

Table 2: Old Industrial Area Control Measure Plan Schedule

Task	Start Date	End Date
Submit revised CMP to Water Board		3/31/2024
Resample Focus Areas	Q2 2024	Q3 2024
Conduct site visits and inspections	Q2 2024	Q3 2024
Assess control measure options	Q3 2024	Q4 2024
Implement enhanced O&M options	2025	6/30/2027
Implement treatment options	2025	6/30/2027

7 REFERENCES

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FIGURES

City Limits
Focus Areas
Lauritzen Channel Watershed
Parr Channel Watershed

Baseline Category
Old Commercial & Old Transportation
Old Residential
New Urban & Open Space

Old Industrial Baseline (OIB)
Source Properties (Referred)
Untreated Old Industrial
Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB
GSI Projects FY20-22 (7/1/2020-6/30/2022)
Redevelopment
Retrofit
Planned Projects (After 6/30/2022)
Redevelopment
Retrofit
Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]
FY20-22 (7/1/2020-6/30/2022)
Planned Projects (After 6/30/2022)
Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]
FTC Install Date
FY20-22 (7/1/2020-6/30/2022)
Planned Projects (After 6/30/2022)

Sediment Sample Concentrations
<0.2 mg/kg PCBs & <0.3 mg/kg Hg
<0.2 mg/kg PCBs & >0.3 mg/kg Hg
0.2 - 1.0 mg/kg PCBs
>1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 2,500 5,000 Feet

City of Pittsburg
Moderate PCBs Focus Areas

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure 1

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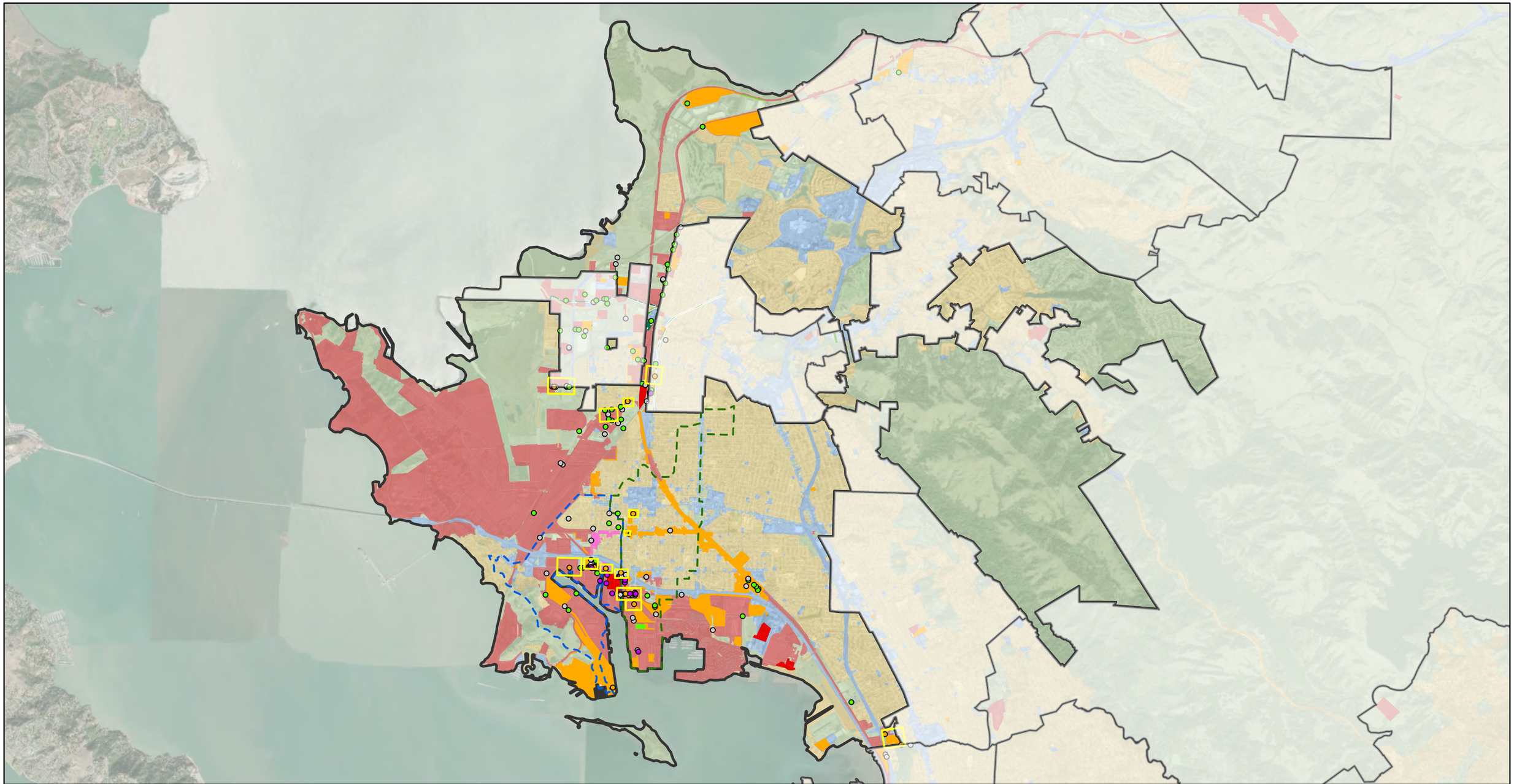

City Limits
Focus Areas
Lauritzen Channel Watershed
Parr Channel Watershed

Baseline Category
Old Commercial & Old Transportation
Old Residential
New Urban & Open Space

Old Industrial Baseline (OIB)
Source Properties (Referred)
Untreated Old Industrial
Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB
GSI Projects FY20-22 (7/1/2020-6/30/2022)
Redevelopment
Retrofit
Planned Projects (After 6/30/2022)
Redevelopment
Retrofit
Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]
FY20-22 (7/1/2020-6/30/2022)
Planned Projects (After 6/30/2022)
Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]
FTC Install Date
FY20-22 (7/1/2020-6/30/2022)
Planned Projects (After 6/30/2022)

Sediment Sample Concentrations
<0.2 mg/kg PCBs & <0.3 mg/kg Hg
<0.2 mg/kg PCBs & >0.3 mg/kg Hg
0.2 - 1.0 mg/kg PCBs
>1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 4,000 8,000 Feet

City of Richmond
Moderate PCBs Focus Areas

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure 2

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City Limits
Focus Areas
Lauritzen Channel Watershed
Parr Channel Watershed

Baseline Category

Old Commercial & Old Transportation
Old Residential
New Urban & Open Space

Old Industrial Baseline (OIB)

Source Properties (Referred)
Untreated Old Industrial
Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)
Redevelopment
Retrofit
Planned Projects (After 6/30/2022)
Redevelopment
Retrofit
Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

FY20-22 (7/1/2020-6/30/2022)
Planned Projects (After 6/30/2022)
Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date
FY20-22 (7/1/2020-6/30/2022)
Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

<0.2 mg/kg PCBs & <0.3 mg/kg Hg
<0.2 mg/kg PCBs & >0.3 mg/kg Hg
0.2 - 1.0 mg/kg PCBs
>1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 1,000 2,000 Feet

City of San Pablo

Moderate PCBs Focus Areas

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure 3

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City Limits
Focus Areas
Lauritzen Channel Watershed
Parr Channel Watershed

Baseline Category

Old Commercial & Old Transportation
Old Residential
New Urban & Open Space

Old Industrial Baseline (OIB)

Source Properties (Referred)
Untreated Old Industrial
Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)
Redevelopment
Retrofit

Planned Projects (After 6/30/2022)
Redevelopment
Retrofit
Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

FY20-22 (7/1/2020-6/30/2022)
Planned Projects (After 6/30/2022)
Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date
FY20-22 (7/1/2020-6/30/2022)
Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

<0.2 mg/kg PCBs & <0.3 mg/kg Hg
<0.2 mg/kg PCBs & >0.3 mg/kg Hg
0.2 - 1.0 mg/kg PCBs
>1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 10,000 20,000 Feet

Unincorporated County
Moderate PCBs Focus Areas

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure 4

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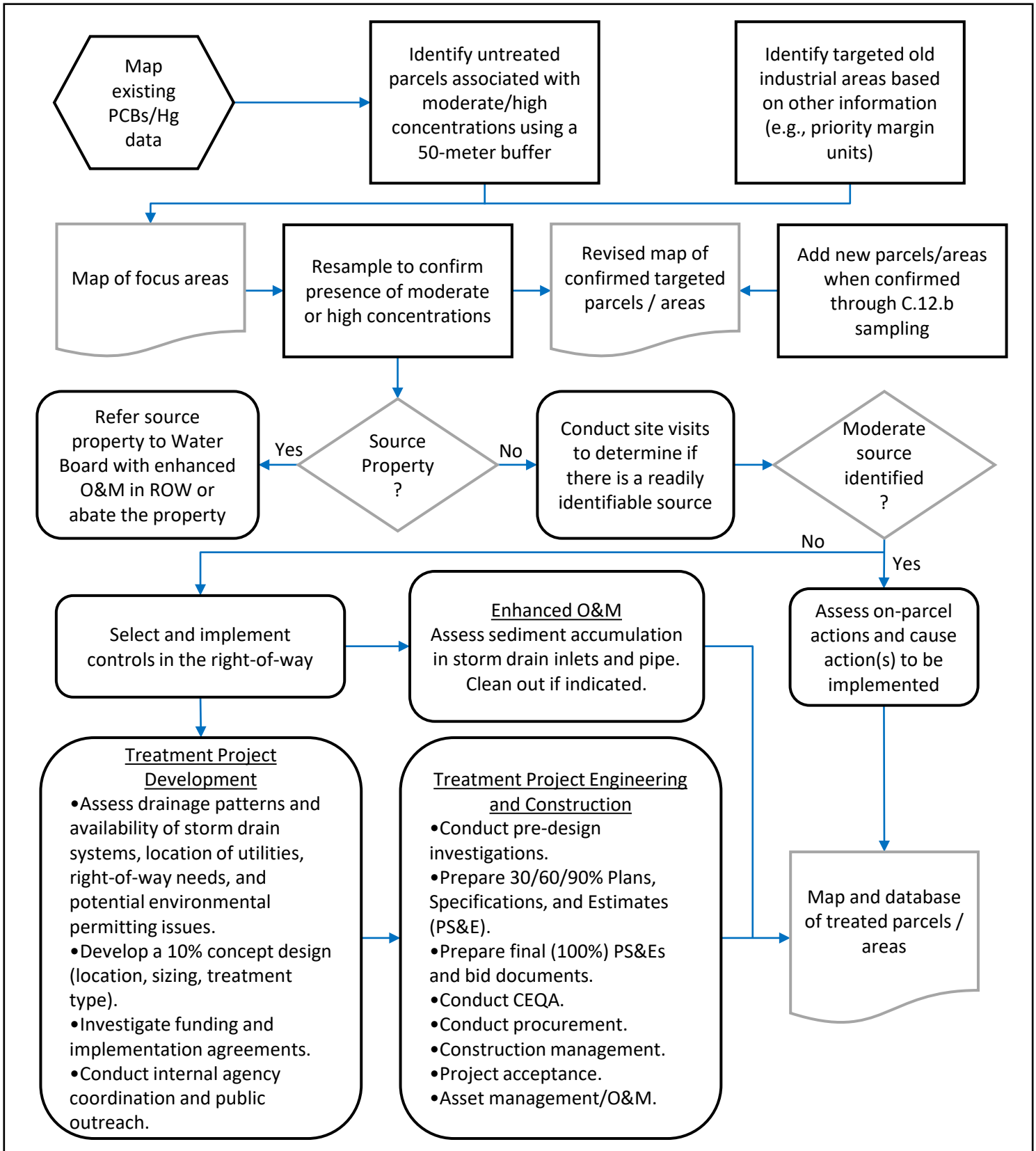


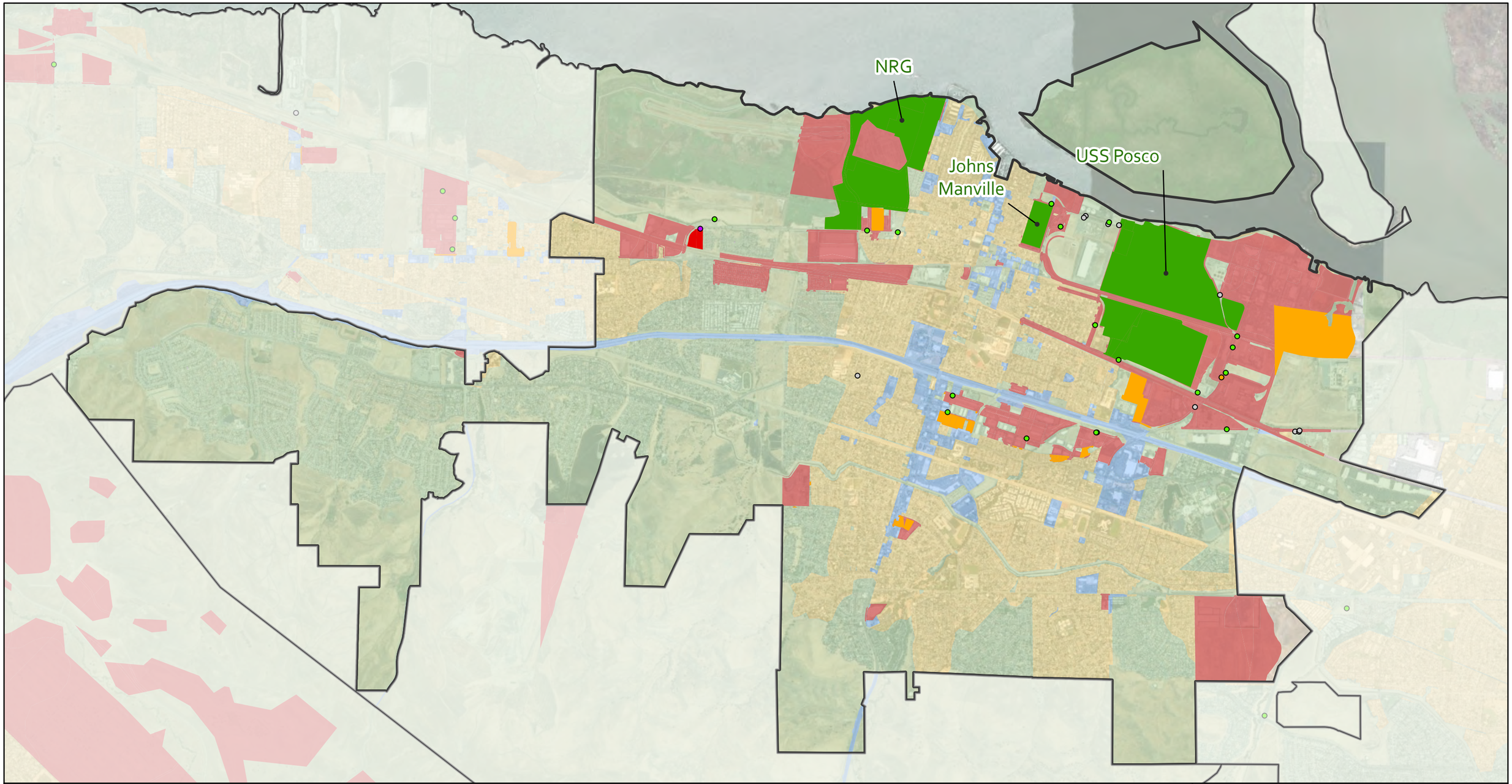
Notes:

PROCESS OF SELECTING AND IMPLEMENTING SPECIFIC CONTROL MEASURES

Geosyntec consultants

Figure 5

CWR0847/CWR0857 | March 2024



City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

Applicable Planned Projects within OIB

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Applicable Planned FTC within OIB

- Large FTC[a]
- Large FTC Drainage Area Not OIB
- Small FTC[b]

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 2,500 5,000 Feet

City of Pittsburg

Applicable Planned Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure 6

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APPENDIX A
Baseline Condition Maps

City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 1,000 2,000 Feet

City of Clayton

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-1

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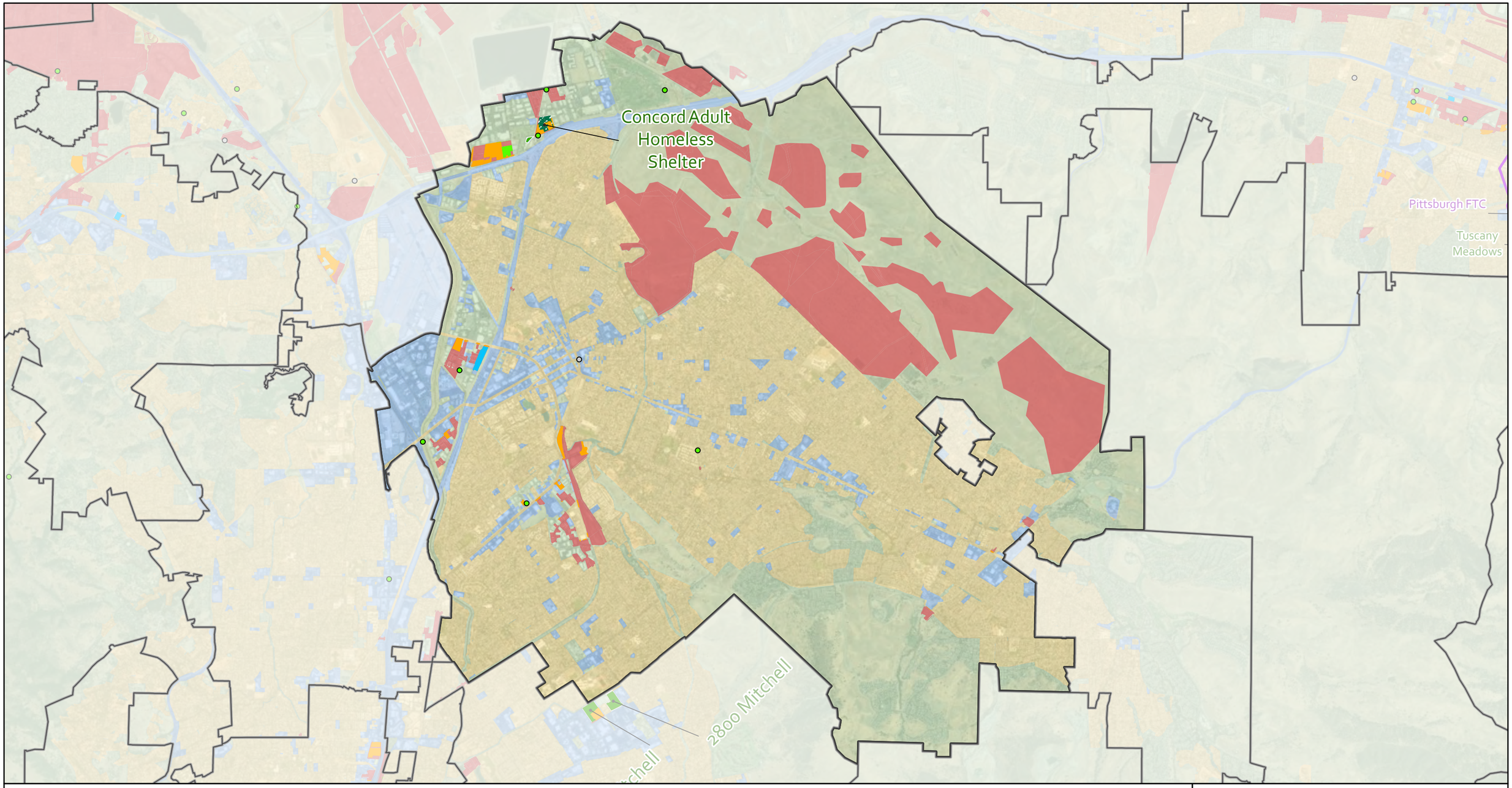

City Limits

Baseline Category
- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)
- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)
- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)
- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations
- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 4,000 8,000 Feet

City of Concord
Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-2

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City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 2,500 5,000 Feet

Town of Danville

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-3

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City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 1,000 2,000 Feet

City of El Cerrito

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-4

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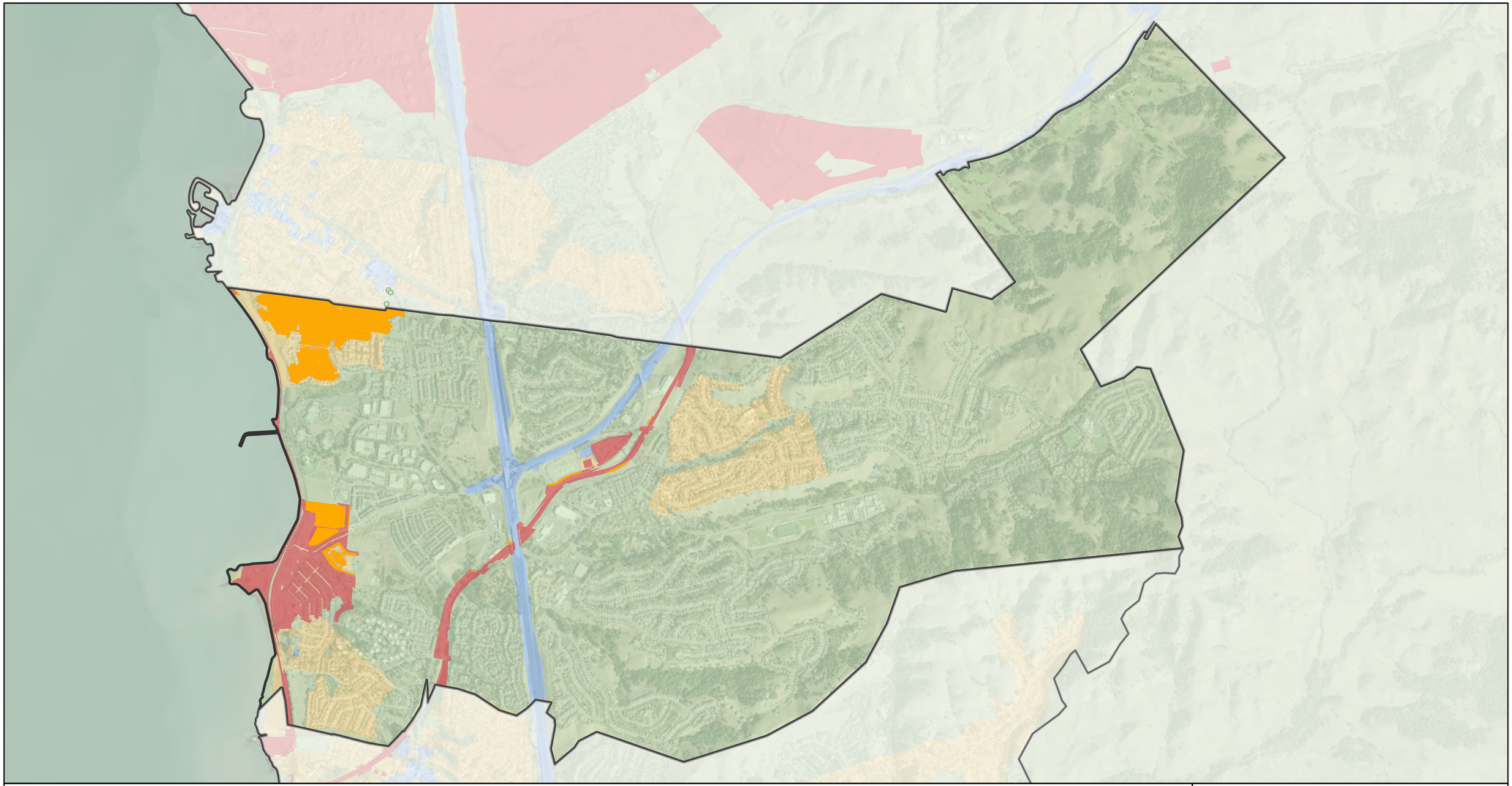

City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 1,000 2,000 Feet

City of Hercules

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-5

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City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 2,500 5,000 Feet

City of Lafayette

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-6

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City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 2,500 5,000 Feet

City of Martinez

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-7

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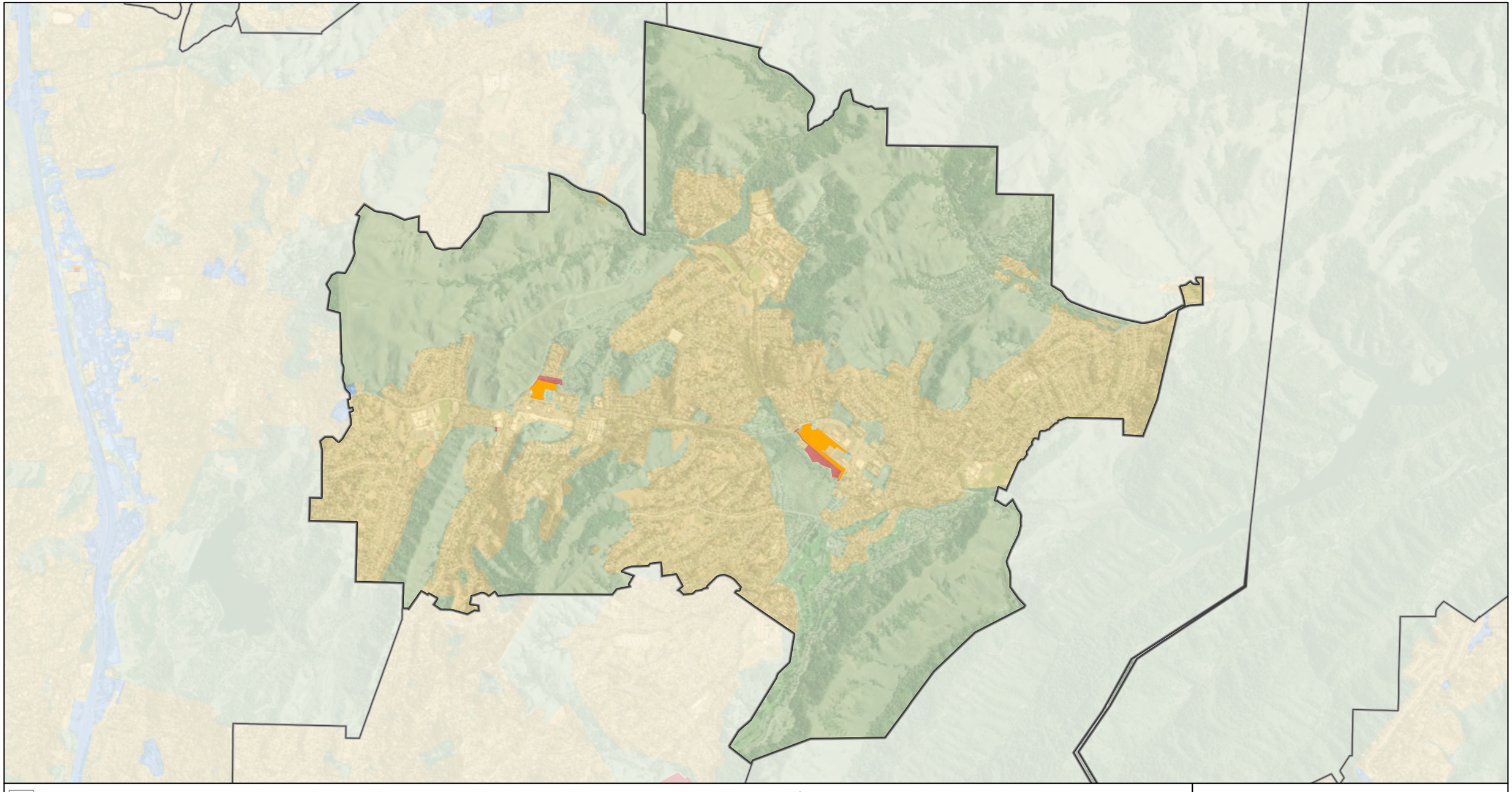

City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 2,000 4,000 Feet

Town of Moraga

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-8

P:\GIS\CCCWP\Project\c12c\C12C_MRPMapping2 - Copy for OI CMP 2024.aprx 1/12/2024 3:09 PM

City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

0 2,000 4,000 Feet

City of Orinda

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-9

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City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 1,000 2,000 Feet

City of Pinole

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-10

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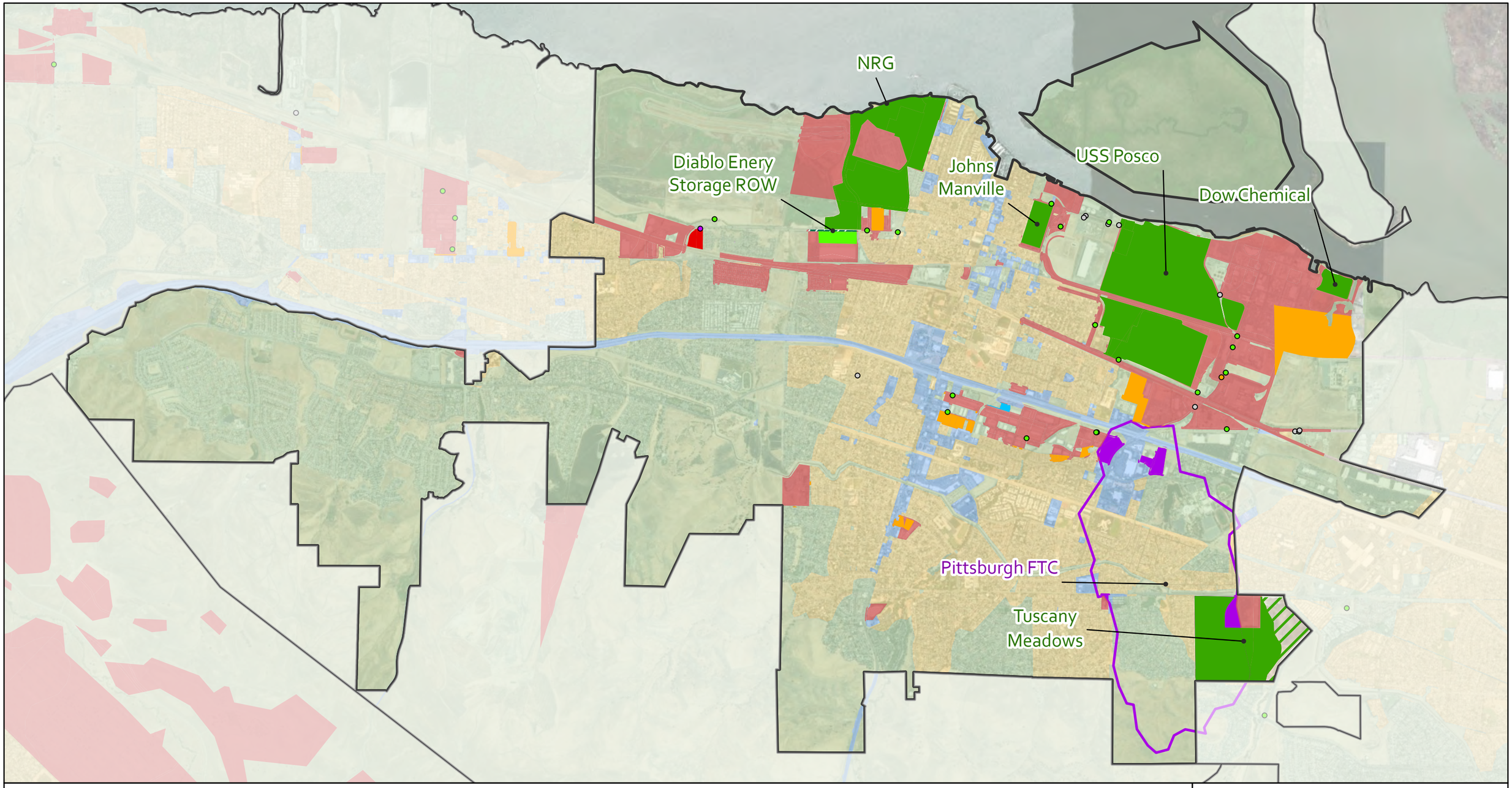


City Limits

Baseline Category
- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)
- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)
- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)
- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations
- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 2,500 5,000 Feet

City of Pittsburg
Baseline Condition and Projects

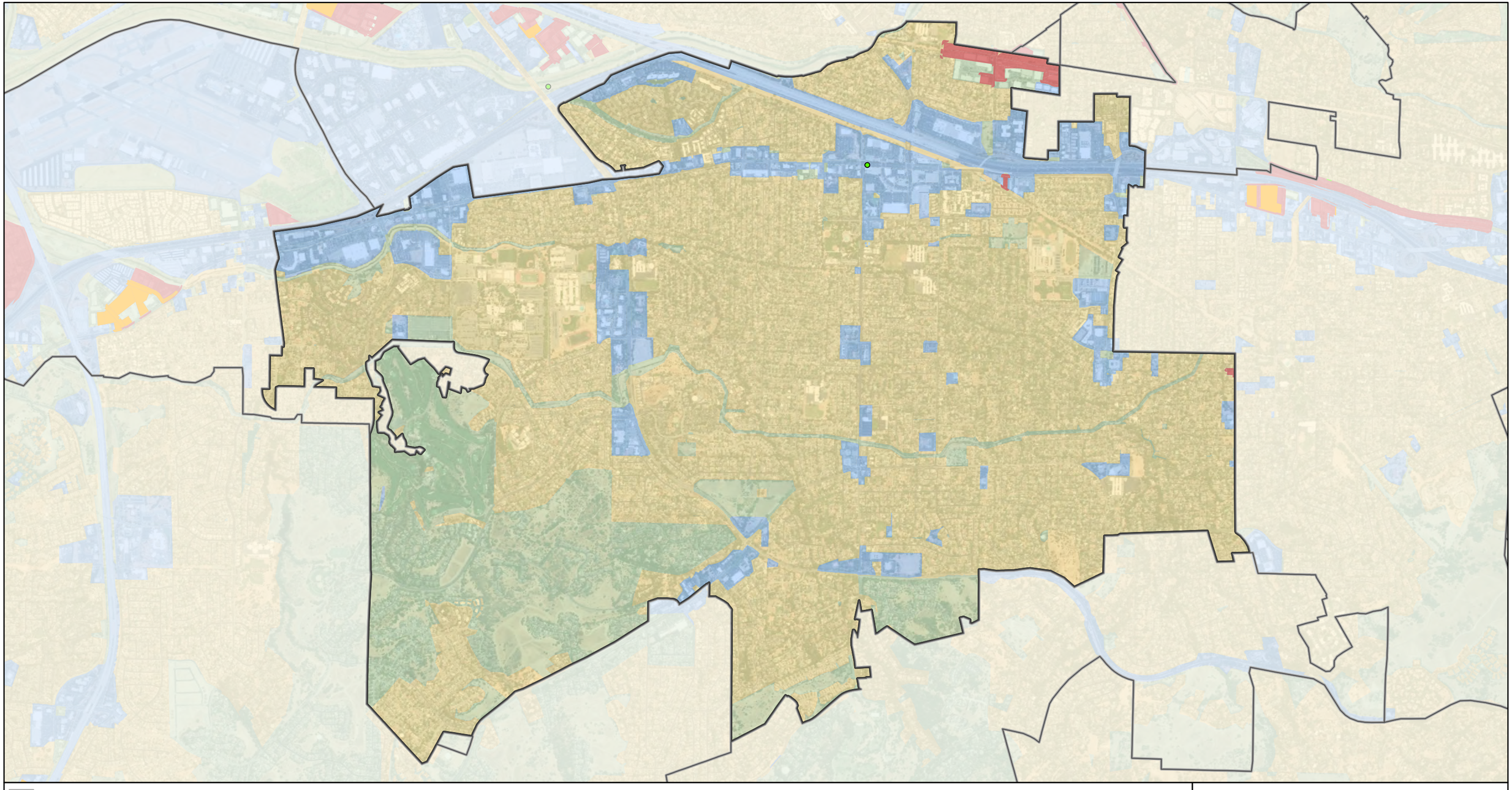
CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-11

P:\GIS\CCCWP\Project\c12c\C12C_MRPMapping2 - Copy for OI CMP 2024.aprx 1/12/2024 3:09 PM



City Limits

Baseline Category
- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)
- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)
- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)
- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations
- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 1,000 2,000 Feet

City of Pleasant Hill
Baseline Condition and Projects

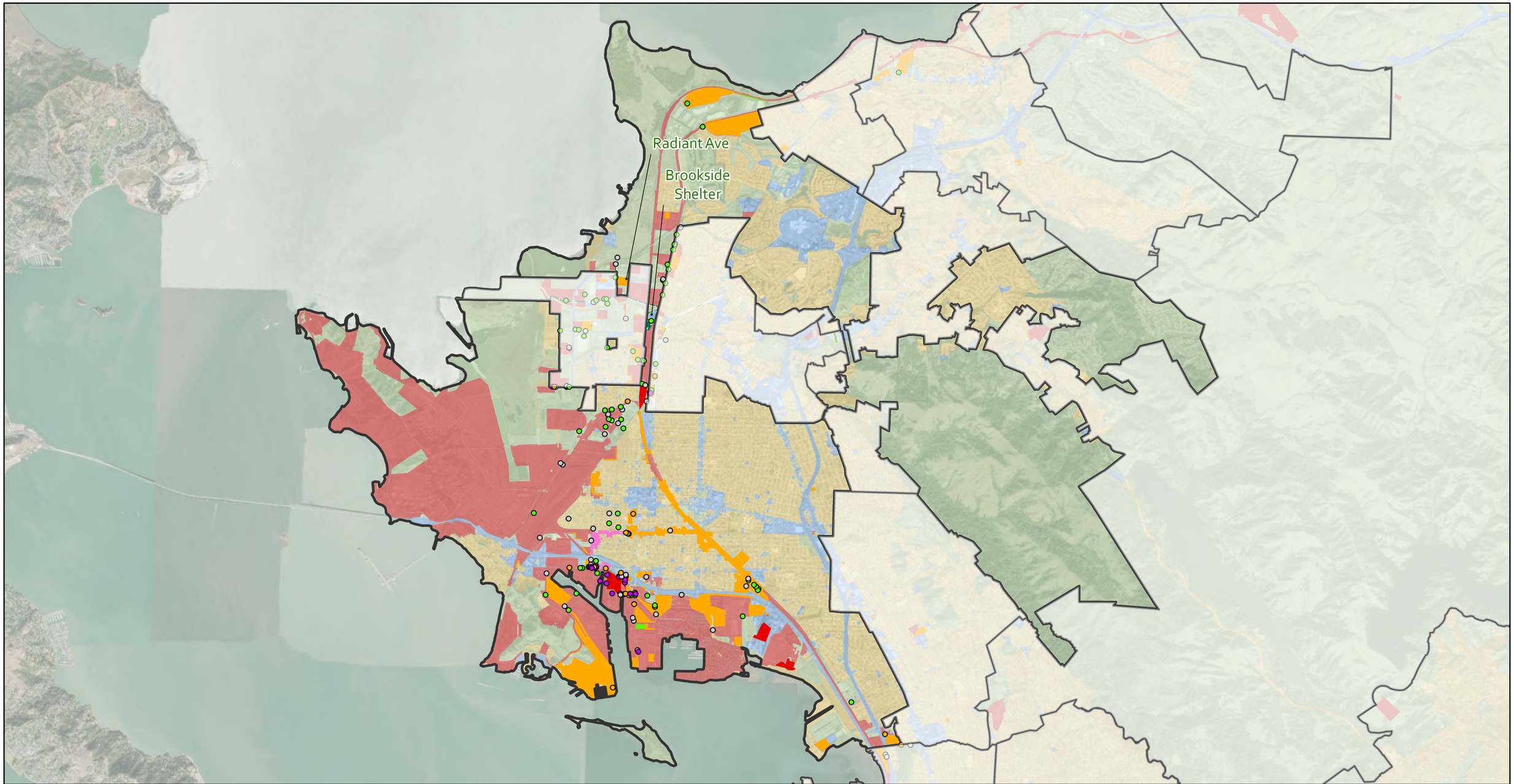
CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-12

P:\GIS\CCCWP\Project\c12c\C12C_MRPMapping2 - Copy for OI CMP 2024.aprx 1/12/2024 3:09 PM



City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 4,000 8,000 Feet

City of Richmond

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-13

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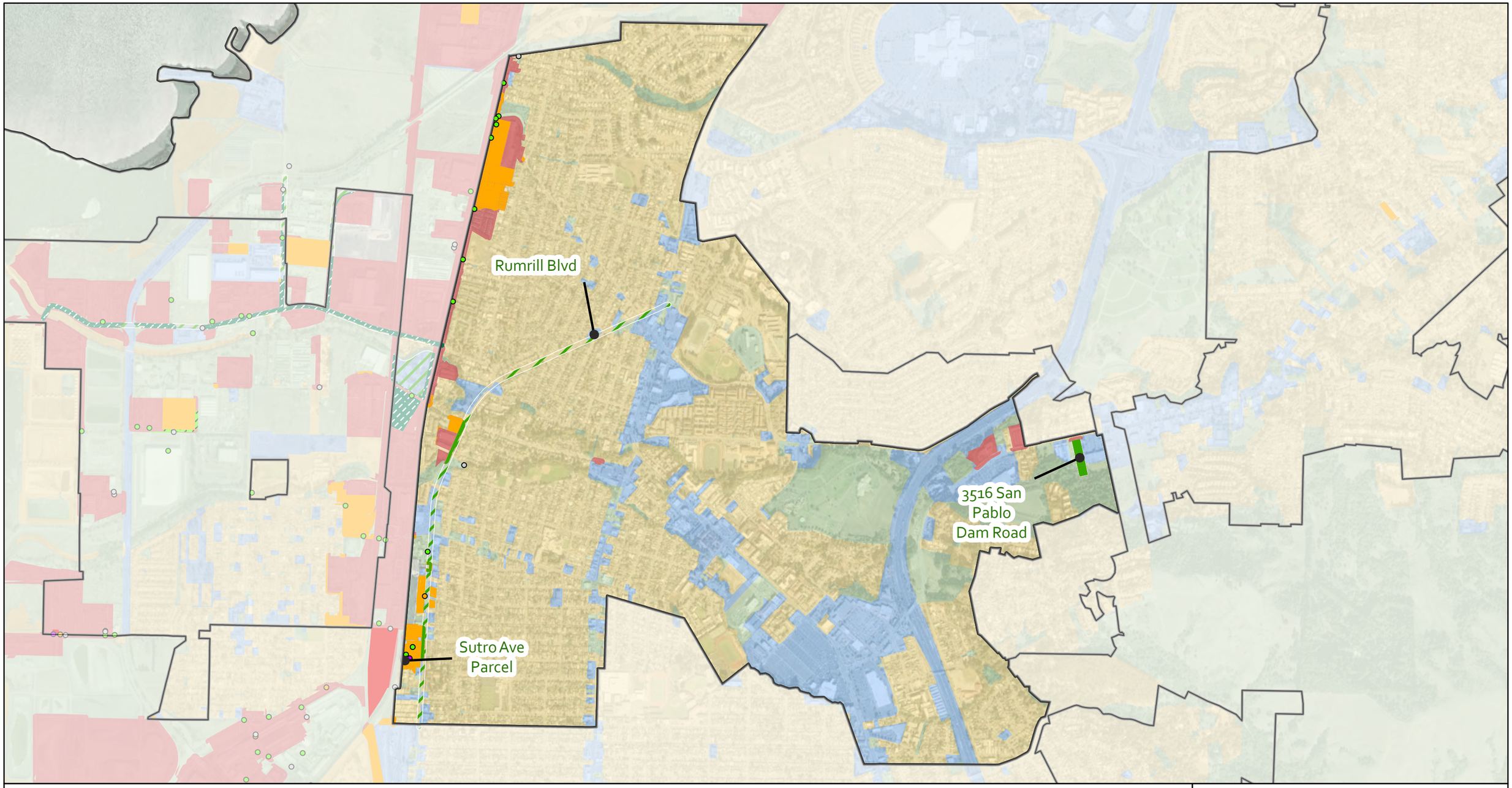

City Limits

Baseline Category
- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)
- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)
- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)
- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations
- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 1,000 2,000 Feet

City of San Pablo
Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-14

P:\GIS\CCCWP\Project\c12c\C12C_MRPMapping2 - Copy for OI CMP 2024.aprx 1/12/2024 3:09 PM

City Limits

Baseline Category

- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)

- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)

- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)

- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date

- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations

- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 2,500 5,000 Feet

City of San Ramon

Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-15

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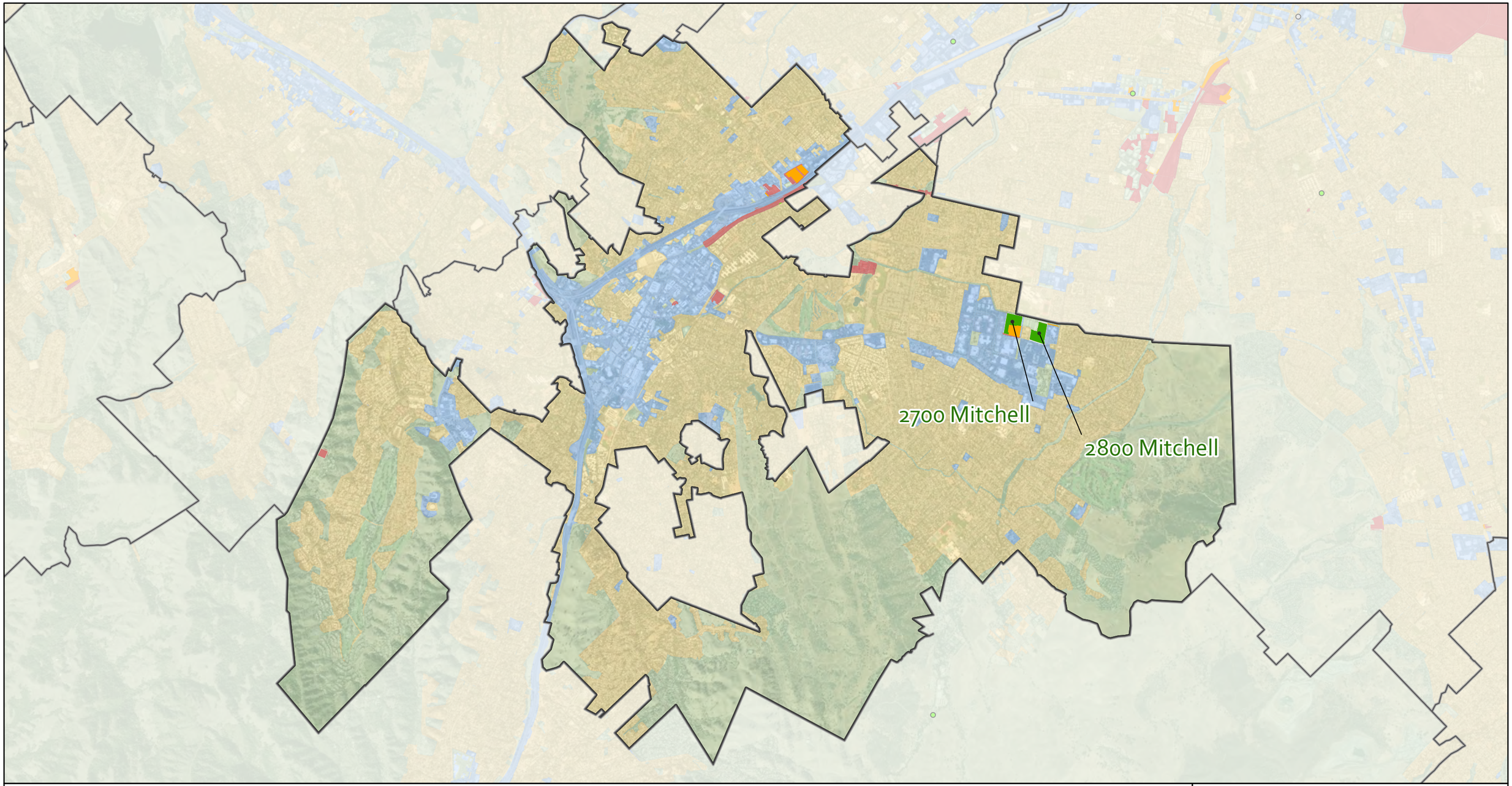


City Limits

Baseline Category
- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)
- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)
- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)
- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations
- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 3,000 6,000 Feet

City of Walnut Creek
Baseline Condition and Projects

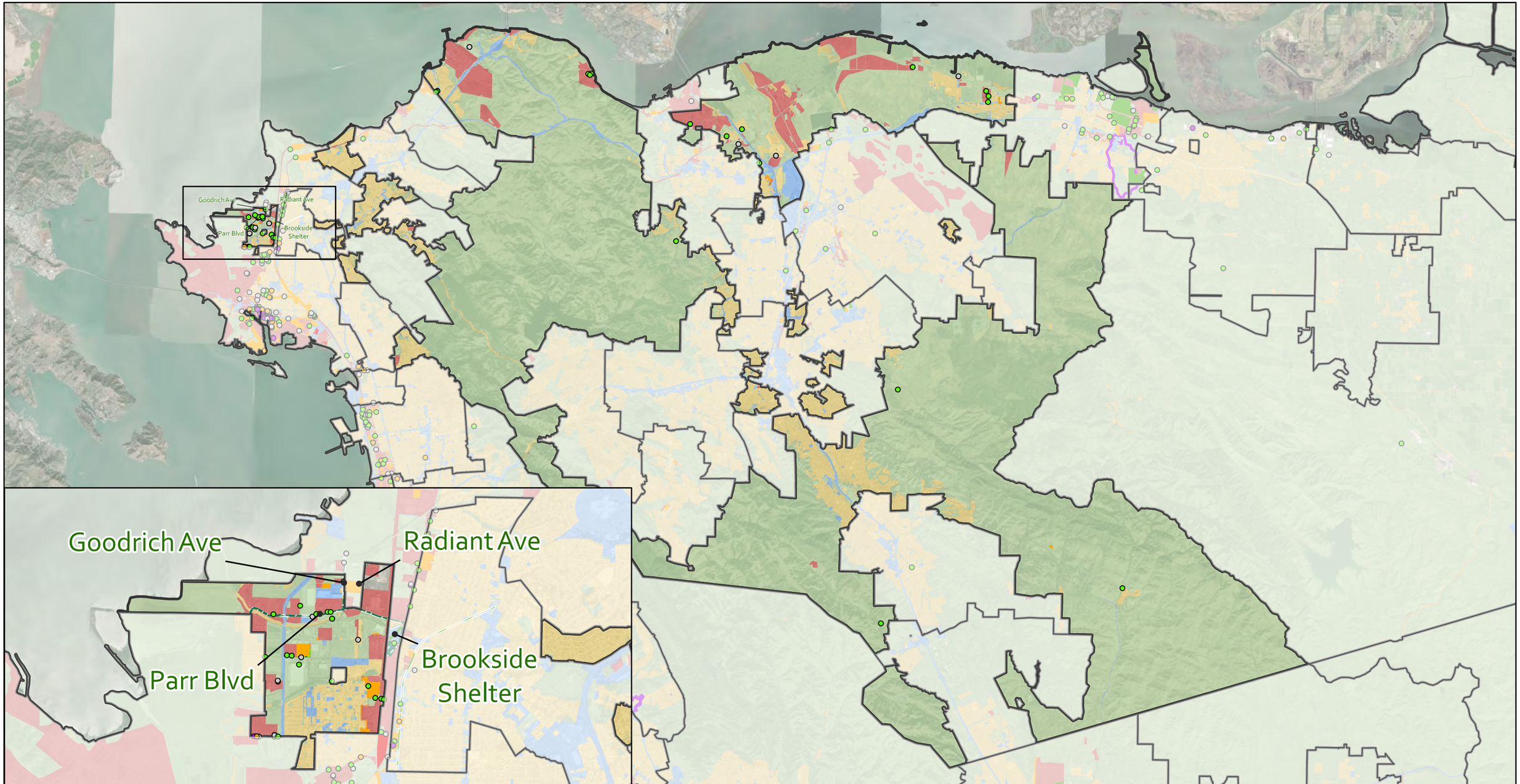
CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-16

P:\GIS\CCCWP\Project\c12c\C12C_MRPMapping2 - Copy for OI CMP 2024.aprx 1/12/2024 3:09 PM



City Limits

Baseline Category
- Old Commercial & Old Transportation
- Old Residential
- New Urban & Open Space

Old Industrial Baseline (OIB)
- Source Properties (Referred)
- Untreated Old Industrial
- Treated by GSI Or FTC Through 6/30/2020

GSI Projects within OIB

GSI Projects FY20-22 (7/1/2020-6/30/2022)
- Redevelopment
- Retrofit

Planned Projects (After 6/30/2022)
- Redevelopment
- Retrofit
- Planned GSI Drainage Area Not OIB

Large FTC within OIB[a]
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)
- Planned Project Drainage Area Not OIB

Small FTC Projects within OIB[b]

FTC Install Date
- FY20-22 (7/1/2020-6/30/2022)
- Planned Projects (After 6/30/2022)

Sediment Sample Concentrations
- <0.2 mg/kg PCBs & <0.3 mg/kg Hg
- <0.2 mg/kg PCBs & >0.3 mg/kg Hg
- 0.2 - 1.0 mg/kg PCBs
- >1.0 mg/kg PCBs

Notes:
a: Includes HDS and GSRD
b: Includes Basket, CPS, Inlet Filter

N

0 10,000 20,000 Feet

Unincorporated County
Baseline Condition and Projects

CONTRA COSTA CLEAN WATER PROGRAM

Geosyntec consultants

March 2024

Figure A-17

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APPENDIX B

Focus Area Fact Sheets

PCBs/Hg Focus Area Fact Sheet Summary

Fact sheets were developed for high-priority focus areas for follow-up investigation and confirmation sampling. These priority focus area locations and associated PCBs and mercury sediment data are summarized in Table B-1.

Table B-1. Summary of Priority Focus Area Locations

Focus Area Name	Jurisdiction	Sample ID	PCBs Sampling Years	PCBs Sampling Results (mg/kg)	Mercury Sampling Results (mg/kg)	Total Approx. Area (acres)
Loveridge Rd	Pittsburg	CC-PTZ-201A-R	2015	0.339	0.287	73.2
9th St & Bissell Ave	Richmond	RMD17	2007	0.371	0.291	5.0
Cherry St & Sanford Ave	Richmond	CCC-CHR-100-P1	2017	0.36	0.103	3.5
Harbour Way S & Wright Ave	Richmond	Site L Site K CCC039 Site J RMD30 Harbour and Wright PAR-07 CCC031 CCC032 - Composite (2001)	2007 2007 2007 2007 2007 2007 2012 2002 2001	0.423 0.433 0.482 0.639 0.673 0.858 0.932 1.153 1.877	0.497 1.37 0.41	6.6
S 1st St & Cutting Blvd	Richmond	Site G Site C CCC037 (FR) LAU-04 LAU-03 CCC035 (2005) 2nd & Cutting Site E Site D Site B 1st & Cutting CCC036 CCC035 (2002) CCC031 - Composite (2001) RMD25 CCC034 (2005) CCC032 CCC034 (2002)	2007 2007 2007 2012 2012 2005 2007 2007 2007 2007 2007 2007 2002 2001 2007 2005 2002 2002	0.211 0.262 0.272 0.326 0.367 0.532 0.568 0.641 0.661 0.68 0.7 0.879 0.976 1.118 1.242 1.397 1.945 2.052	0.38 0.61 1.119 0.95	5.8
S 4th St & Cutting Blvd	Richmond	RMD26	2007	0.567	0.642	12.9
S 7th St & Hoffman Blvd	Richmond	SanFeCh5 PAR-08 Site M RMD28	2021 2012 2007 2007	0.359 1.37 1.843 1.982	0.527 1.92 1.385	3.8
W Cutting Blvd	Richmond	RMD24	2007	0.821	0.783	27.1
Richmond Pkwy & W Gertrude Ave	Unincorporated Contra Costa County	RMD02a RMD01c CC-RCH-401-R	2007 2007 2015	0.226 0.521 6.383	0.275 0.651 20.6	12.1
Total Area Treated						150.0

PITTSBURG — LOVERIDGE RD

Sample Location

○ Sample Locations ■ Storm Drain Inlets

Site Location	City of Pittsburg
Address	1300 Loveridge Rd, Pittsburg, CA
PCBs Concentration	0.3387 mg/kg
Mercury Concentration	0.287 mg/kg
Sample Names, Dates Collected, and Type	CC-PTZ-201A-R 2015 Local Area Composite
Site Constraints	No existing curb and gutter
Approximate Area	Parcel Area: 69.1 acres ROW Area: 4.1 acres
Potential Treatment	Enhanced O&M, GSI as part of required storm drain facility improvements through a Developer Agreement

Parcel #1 (view along Loveridge Rd)

Parcel #1 (073200015, 073200014, 073200027) Total Area = 27.1 acres

Contra Costa Waste Services, Inc. is currently undergoing upgrades to reorganize and expand their physical and operational services. The expanded facility consists of the Mt. Diablo Recycling Facility, Transfer / Processing Facility, Mixed Construction and Demolition processing facility, Organics Processing, Truck Maintenance Facility and Biomass Gasification Unit.

Parcel #2 (view along Loveridge Rd)

Parcel #2 (073230032, 073230033) Total Area = 42.0 acres

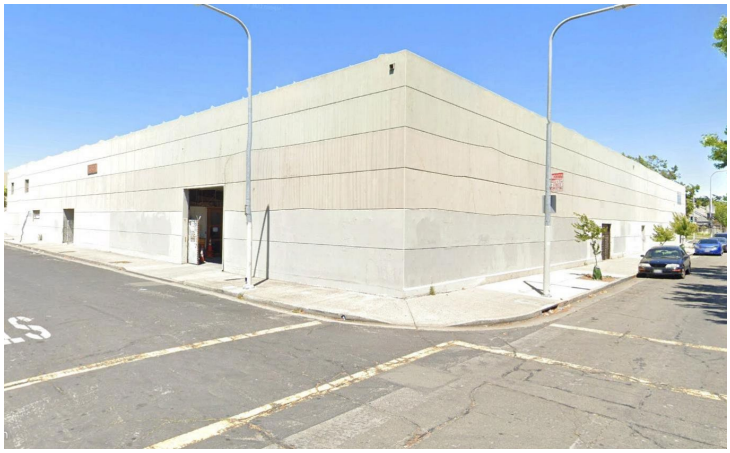
Contra Costa Industrial Park. Parcel was used as mixed industrial uses throughout the years. The US government used to manufacture heavy armor during World War II at this site. Envirostor # 07550006

RICHMOND — 9TH ST & BISSELL AVE

Sample Location

Site Location	City of Richmond
Address	180 9th St, Richmond, CA
PCBs Concentration	0.371 mg/kg
Mercury Concentration	0.291 mg/kg
Sample Names, Dates Collected, and Type	RMD17 2007 Catch Basin
Site Constraints	Existing utilities
Approximate Area	Parcel Area: 4.1 acres ROW Area: 0.9 acres
Potential Treatment	Enhanced O&M, inlet-based device

Parcel #1 (view at intersection)



Parcel #1 (538260013) Total Area = 1.2 acres	Catholic Charities East Bay Richmond Service Center. Old Transportation/Old Commercial Land Use.
Parcel #2 (538282001) Total Area = 2.7 acres	Leadership Public Schools. UST leak on northeast corner of parcel in 2011 that has since been remediated. Geotracker #T10000003499, Envirostor #60001527
Parcel #3 (538270005) Total Area = 0.2 acres	St. Mark's Catholic Church. Old Transportation/Old Commercial Land Use.

Parcel #2 (view at intersection)

Parcel #3 (view at intersection)

RICHMOND — CHERRY ST & SANFORD AVE

Sample Location

○ **Sample Locations**

Site Location	City of Richmond
Address	625 Sanford Ave, Richmond, CA
PCBs Concentration	0.36 mg/kg
Mercury Concentration	0.103 mg/kg
Sample Names, Dates Collected, and Type	CCC-CHR-100-P1 2017 Railroad track out
Site Constraints	No curb/gutter
Approximate Area	Parcel Area: 3.2 acres ROW Area: 0.3 acres
Potential Treatment	Enhanced O&M, inlet-based device, GSI

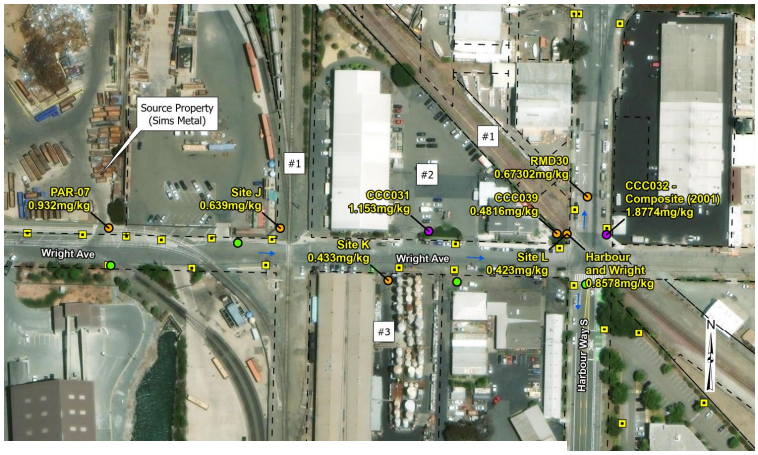
Parcel #1 (view at intersection)

Parcel #1 (None) Total Area = 2.5 acres	Non-jurisdictional railroad property.
Parcel #2 (561270003) Total area = 0.7 acres	Vacant land. H&H Oil Recycling Company owns this parcel, which is a closed site on GeoTracker (T0601391554).

Parcel #2 (aerial)

RICHMOND — HARBOUR WAY S & WRIGHT AVE

Sample Location



○ **Sample Locations** ■ **Storm Drain Inlets**

Site Location	City of Richmond
Address	803 Wright Ave, Richmond, CA
PCBs Concentration	0.423, 0.433, 0.482, 0.639, 0.673, 0.858, 0.932 mg/kg
Mercury Concentration	0.497, 1.37 mg/kg
Sample Names, Dates Collected, and Type	Site L, Site K, CCC039, Site J, RMD30, Harbour and Wright, PAR-07 2007, 2012 Catch Basin, Street/Curb Dirt
Site Constraints	No curb/gutter, tidally influenced storm drain
Approximate Area	Parcel Area: 5.8 acres ROW Area: 0.8 acres
Potential Treatment	Enhanced O&M, inlet-based device

Parcel #1 (view along Wright Ave)

Parcel #1 (560260029) Total Area = 1.2 acres	Amtecol, Inc. Old Industrial land use. The former Sunoco Plant is an oil product blending, packaging and distribution plant that has been in operation since 1965. Geotracker #SL372261173
Parcel #2 (560231016) Total Area = 2.5 acres	Golden Gate Meat Co. This site was a shipyard then was developed for other industrial operations (chemical manufacturing, metal casting, and truck fueling and repair). Geotracker #T10000003501
Parcel #3 (None) Total Area = 2.1 acres	Non-jurisdictional railroad.

Parcel #2 (view along Wright Ave)

Parcel #3 (view at Wright Ave & Harbour Way S intersection)

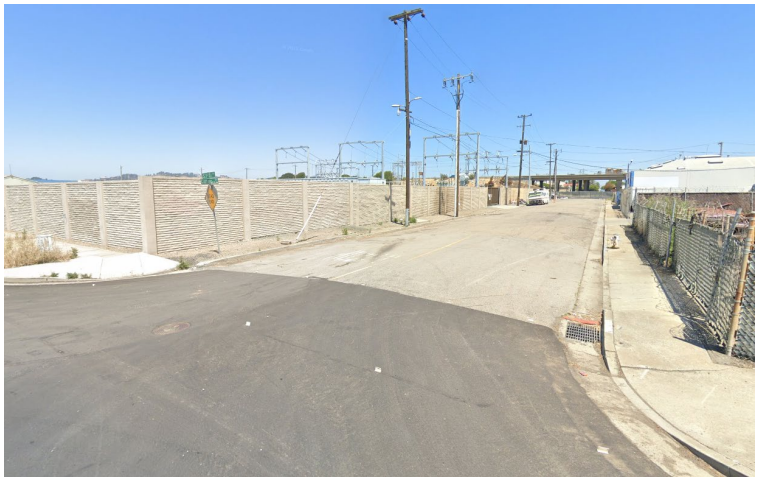
RICHMOND — S 1ST ST & CUTTING BLVD

Sample Location

○ Sample Locations ■ Storm Drain Inlets

Site Location	City of Richmond
Address	135 Cutting Blvd, Richmond, CA
PCBs Concentration	0.211, 0.326, 0.367, 1.397, 0.641, 0.661 mg/kg
Mercury Concentration	0.38, 0.61 mg/kg
Sample Names, Dates Collected, and Type	Site G, LAU-04, LAU03, CCC034, Site E, Site D 2007, 2005, 2012 Street/Gutter, Dirt
Site Constraints	Tidally influenced storm drain, utilities
Approximate Area	Parcel Area: 3.4 acres ROW Area: 2.4 acres
Potential Treatment	Enhanced O&M, inlet-based device, existing CW4CB bioretention retrofit at 1st St & Cutting Blvd

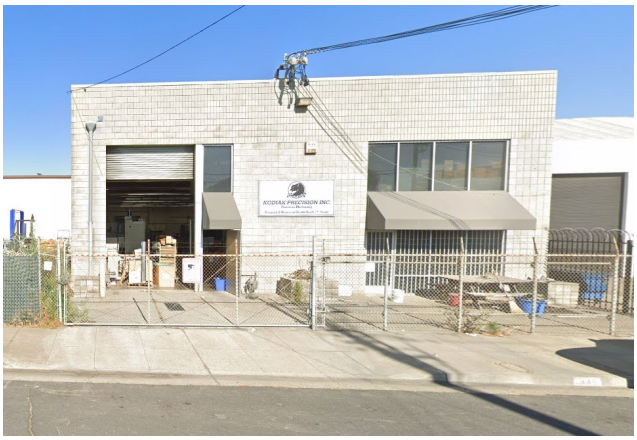
Parcel #1 (view along S 1st St)



Parcel #1 (550040006) Total Area = 2.8 acres	Pacific Gas and Electric Co. This parcel is old industrial land use. The existing bioretention facility along Cutting Blvd may treat PCBs from this parcel.
Parcel #2 (550090024) Total Area = 0.5 acres	Ritco Forklift Repair and Rentals. This parcel is old industrial land use.
Parcel #3 (550090017) Total Area = 0.1 acres	Kodiak Precision Inc. This location is a precision machining and fabrication shop with an attached receiving and shipping facility. The parcel is old commercial land use.

Parcel #2 (view along S 2nd St)

Parcel #3 (view along S 2nd St)



RICHMOND — S 4TH ST & CUTTING BLVD

Sample Location

○ Sample Locations ■ Storm Drain Inlets

Site Location	City of Richmond
Address	424 Cutting Blvd, Richmond, CA
PCBs Concentration	0.567 mg/kg
Mercury Concentration	0.642 mg/kg
Sample Names, Dates Collected, and Type	RMD26 2007 Catch Basin
Site Constraints	No curb/gutter
Approximate Area	Parcel Area: 11.6 acres ROW Area: 1.3 acres
Potential Treatment	Enhanced O&M, inlet-based device, GSI

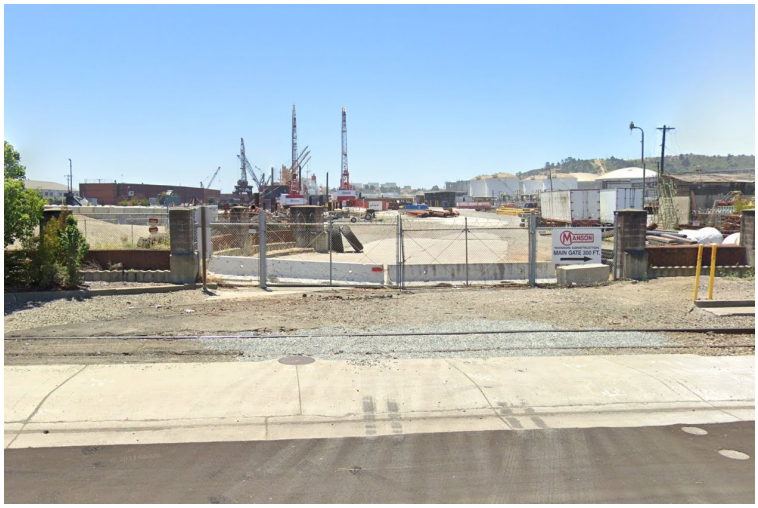
Parcel #1 (view facing southeast at intersection)

Parcel #1 (None) Total Area = 0.8 acres	Non-jurisdictional railroad property.
Parcel #2 (560240040) Total Area = 6.2 acres	Sims Metal. This parcel is an identified source property. Envirostor #60003002, Geotracker #T10000012052.
Parcel #3 (560380002) Total Area = 0.5 acres	Owned by Levins Metal Corporation. This parcel is old industrial land use.
Parcel #4 (560380005) Total Area = 4.1 acres	IMTT. This parcel is old industrial land use. This location is owned by the adjacent chemical plant and may operate as storage for the plant. Geotracker #T0601300233

Parcel #2 (view along S 4th St)

Parcel #3 (view along S 4th St)

Parcel #4 (view along Cutting Blvd)



RICHMOND — S 7TH ST & HOFFMAN BLVD

Sample Location

○ Sample Locations ■ Storm Drain Inlets

Site Location	City of Richmond
Address	543 S 8th St, Richmond, CA
PCBs Concentration	0.359, 1.37, 1.843, 1.982 mg/kg
Mercury Concentration	0.527, 1.92, 1.385 mg/kg
Sample Names, Dates Collected, and Type	SanFeCh5, PAR-08, Site M, RMD28 2021, 2012, 2007 Gutter
Site Constraints	Curb/gutter in poor condition or missing towards end of S 7th St, which appears closed to traffic.
Approximate Area	Parcel Area: 1.8 acres ROW Area: 2.0 acres
Potential Treatment	Enhanced O&M, inlet-based device, GSI

Parcel #1 (view along S 7th St)

Parcel #1 (550261019, 550261017, 550261003, 550261021, 550261015, 550261018) Total Area = 0.7 acres	Bay Machinery Corporation. Baseline land use category wis open space. Current parcel use codes are for vacant land, although land is not vacant.
Parcel #2 (560240038, 560240037) Total Area = 1.1 acres	Vacant Land. These two parcels make up a site that was operated as a gas station until 1983. There are groundwater wells on this site. Geotracker #T0601394027.

Parcel #2 (view at Hoffman Blvd & S 7th St intersection)

RICHMOND — W CUTTING BLVD

Sample Location

Site Location	City of Richmond
Address	530 W Cutting Blvd, Richmond, CA
PCBs Concentration	0.821 mg/kg
Mercury Concentration	0.783 mg/kg
Sample Names, Dates Collected, and Type	RMD24 2007 Street/Curb Dirt
Site Constraints	Existing utilities, tidally influenced storm drain
Approximate Area	Parcel Area: 24.4 acres ROW Area: 2.7 acres
Potential Treatment	Enhanced O&M, inlet-based device, GSI

Parcel #1 (view along W Cutting Blvd)

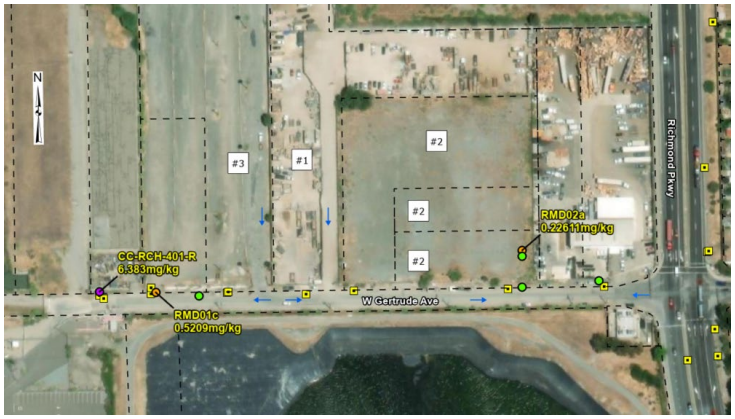
Parcel #1 (560300003, 560300004, 560300005) Total Area = 7.0 acres	Svendsen's Bay Marine. These parcels operate as a boat yard. The site is within old industrial area. Envirostor # 60000341
Parcel #2 (560300002) Total Area = 4.8 acres	Various boat yards. Currently this parcel is light industrial land use and is within old industrial area.
Parcel #3 (550030008) Total Area = 12.6 acres	Richmond Distribution Center – structural steel and ornamental iron fabricator and a health food supplier are operating onsite. This parcel is within old industrial area. Geotracker #T0601300196

Parcel #2 (view along W Cutting Blvd)

Parcel #3 (view along W Cutting Blvd)

UNINCORPORATED/RICHMOND — RICHMOND PKWY & W GERTRUDE AVE

Sample Location



○ Sample Locations ■ Storm Drain Inlets

Site Location	Unincorporated County/City of Richmond
Address	560 W Gertrude Ave, Richmond, CA
PCBs Concentration	0.226, 0.521 mg/kg
Mercury Concentration	0.275, 0.651 mg/kg
Sample Names, Dates Collected, and Type	RMD02a, RMD01c 2007 Catch Basin, Street/Curb
Site Constraints	Tidally influenced storm drain
Approximate Area	Parcel Area: 11.3 acres ROW Area: 0.8 acres
Potential Treatment	Enhanced O&M, inlet-based device

Parcel #1 (view along W Gertrude Ave)

Parcel #1 (408160019) Total Area = 3.8 acres	Duenas Pallets. In 1997 there was overwhelming circumstantial evidence of hazardous substance release where PCBs were a suspected hazardous substance onsite. Envirostor ID # 07750022
Parcel #2 (408160007 408160028 408160029) Total Area = 3.3 acres	Vacant old industrial land. These three parcels were an automobile dismantling and parts storage facility for 45 years. Envirostor ID # 07750024
Parcel #3 (408160009) Total Area = 4.2 acres	Kids Playland Flea Market Parking Lot. Historically the property was the site of automobile dismantling and junkyard operations. GeoTracker #SL0601306354

Parcel #2 (view along W Gertrude Ave)

Parcel #3 (view along W Gertrude Ave)

APPENDIX C

Proprietary Treatment Control Devices

Product	Stormwater Management StormFilter	EcoPure BioFilter	Modular Wetlands Linear Stormwater Treatment Device	High Capacity Kraken Filter	Filterra High Capacity Bioretention System	Up-Flo Filter	Up-Flo Filter EMC	BioPod Biofilter with StormMix Media	PerkFilter System with High Flow Media
Manufacturer	Contech Engineered Solutions	Advanced Drainage Systems	Contech Engineered Solutions	Contech Engineered Solutions	Contech Engineered Solutions	Hydro International	Hydro International	Oldcastle Infrastructure	Oldcastle Infrastructure
NJCAT Verification	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TAPE Approval	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TAPE Treatment[1]	Basic Treatment	Basic Treatment for 2-Cell, Enhanced Treatment for 3-Cell	Enhanced Treatment	Basic Treatment	Enhanced Treatment	Basic Treatment	Basic Treatment	Enhanced Treatment	Basic Treatment
Device Type	Cartridge Filter	Green Infrastructure	Green Infrastructure	Cartridge Filter	Green Infrastructure	Cartridge Filter	Cartridge Filter	Green Infrastructure	Cartridge Filter
Sediment Removal Method	Energy dissipation and percolation through media-filled cartridges	Settling and screening in pretreatment cell, finer particle filtration in bioretention filter media	Settling and screening in pretreatment cell, finer particle filtration in bioretention filter media	Settling trash and heavier particles in pretreatment chamber, finer particles filtration by membrane filters	Sediment and debris captured in pretreatment mulch layer, finer particle filtration through engineered bioretention media	Settling and screening followed by filtration through engineered media bags	Settling followed by filtration through filtration media	Sediment and debris captured in pretreatment mulch layer, finer particle filtration through engineered bioretention media	Settling trash and heavier particles in pretreatment chamber, finer particles filtration by media filters
Installation Location	In precast vault or manhole downstream of a pipe, curb inlet, or grated inlet	Above-ground vegetation with sub-surface features in precast vault downstream of curb-gutter, inlet, pipe, etc.	Above-ground vegetation with sub-surface features in precast vault downstream of curb-gutter, inlet, pipe, etc.	In precast vault or manhole downstream of a pipe, curb inlet, or grated inlet	Above-ground vegetation with sub-surface features in precast vault downstream of curb-gutter, inlet, pipe, etc.	In precast vault or manhole downstream of a pipe, curb inlet, or grated inlet	In precast vault or manhole downstream of a pipe, curb inlet, or grated inlet	Above-ground vegetation with sub-surface features in precast vault downstream of curb-gutter, inlet, pipe, etc.	In precast vault or manhole downstream of a pipe, curb inlet, or grated inlet
Dimensions	Various configurations for catch basins, curb inlets or linear grates.	Between 4'x8' and 10'x19' depending on model	Custom dimensions, varies based on application	Standard cartridge height of 30.75 in. Standard vault footprint between 4'x4' and 8'x16'	Sizes vary between 4'x4' and 22'x8' depending on model and configuration.	Rectangular vault dimensions between 4'x6' and 8'x21'. Manhole dimension of 4' diameter.	Rectangular vault dimensions between 4'x4' and 8'x24'. Available cartridge heights of 18", 27", 36", 48"	Available in several standard sizes between 4'x4' and 8'x16'. Custom sizes available as well	Curb inlet PerkFilter dimensions are between 4'x4' and 8'x16'. Rectangular vault PerkFilter dimensions are between 4'x4' and 8'x18'. Manhole PerkFilters range from 48" to 96" diameters. Available cartridge heights of 12", 18", 24", 30"
Treatment Flow Rate (gpm)	Max flow rate through each cartridge is 0.26 gpm/SF to 2 gpm/SF	60 to 360 gpm depending on configuration/model	Varies based on design and configuration	Hydraulic loading rate of 0.05 gpm/SF of filter membrane surface area per NJCAT testing. 9 to 114 gpm (for standard cartridge of 30.75" height) depending on number of cartridges	Hydraulic loading rate as high as 3.12 gpm/SF or 300 in/hr (High capacity version of Filterra).	Hydraulic loading rate of 0.533 gpm/SF of filtration area and 4.81 gpm/SF of sedimentation area Maximum treatment flow rate up to 1900 gpm depending on model, number of cartidges, height of cartridge	Hydraulic loading rate of 0.96 gpm/SF of filtration area per NJCAT testing. Maximum treatment flow rate up to 1350 gpm depending on model, number of cartidges, height of cartridge	Hydraulic loading rate of 1.8 gpm/SF per NJCAT testing	Hydraulic loading rate of 1.5 to 2.5 gpm/SF of media surface
Engineering Constraints	27" cartridge: sites with at least 3.05 feet of available driving head; best for sites with footprint constraints 18" cartridge: sites with 2.3 feet of driving head Low Drop: sites with only 1.8 feet of headloss; best for sites with limited by hydraulic constraints	Estimated headloss of 36 in (increase over time with sediment loading). Recommended in little to no-slope areas. Available in multiple configurations, with curb, gutter, grated inlet, straight-in pipe inlets, etc.	Sized based on treatment and bypass flow rates, load rating requirements, and pipe depth/inlet design details. Recommended that pipe slope into system does not exceed 5% or be less than 0.5%. Comes housed in a pre-cast concrete structure.	Recommended that pipe slope into system does not exceed 10% or be less than 0.5%. Minimum driving head of 29.5 inches required.	Available in a variety of precast configuration. Can be configured with an open or closed top. Can be configured for infiltration.	Operating head of 2.5 ft	Requires smaller footprint for same flow rate when compared to standard UFF. Maximum driving head required to maintain treatment flow rate is 48 inches above the discharge pipe	Available in a variety of precast configuration (e.g. planter with open top, tree box, solid top with no vegetation). Can be configured with an open or closed top. Can be configured for infiltration.	Maximum head loss varies from 1.7 ft to 3.5 ft. Drop across the system cannot be less than 9 in.
Maintenance	At least one scheduled inspection should take place per year with maintenance following as warranted. The average maintenance lifecycle is approximately 1-5 years.	General landscaping, cover management, replacement planting for vegetation. Remove sediments and trash in pretreatment cell with vactor truck. Inspect at least bi-annually and at the start of the rainy season	Remove trash from screening device (every 6 to 12 months). Remove sediment from separation chamber (every 12 to 24 months). Periodically replace pretreatment cartridge filter media (every 12 to 24 months). Replace drain down filter media (every 12 to 24 months). Trim vegetation (every 6 to 12 months)	Estimated to be able to handle at least 18 months sediment loading with no maintenance. Recommended that inspections are performed mulitple times in the first year to assess site specific maintenance interval recommendations. To clean cartridges, remove from vault and rinse off accumulated sediment and debris with standard garden hose with low pressure nozzle. Power wash and vacuum filter chamber.	Routine maintenance visits should be scheduled once or twice a year. Maintenance interval will depend on upstream drainage area. Typical maintenance will include removal of debris, trash, and mulch, replacement of mulch, and plant pruning and replacement as necessary.	Remove oil, floatabales, sediments and debris from sump using vactor truck. Replace cartridge filters as-needed. Frequency of inspection and maintenance will be determined in field after installation and is based on upstream drainage area. Inspection and	Remove oil, floatabales, sediments and debris from sump using vactor truck. Replace cartridge filters as-needed. Frequency of inspection and maintenance will be determined in field after installation and is based on upstream drainage area. Inspection and maintenance should be conducted at least twice in the first year of operation and at least once in the years following.	Remove trash and debris from inlet and BioPod chamber manually or using vacuum truck. If erosion of filter media bed is evident, redistribute mulch with rake or replace. If sediment load is heavy, remove mulch layer and inspect engineering media. If media is clogged with sediment, remove and replace one or two inches of media prior to replacing mulch layer. Prune vegetation as appropriate.	Inspect twice a year and maintain as required. Remove trash, debris, standing water, sediment using vacuum truck (jetting may be required). Remove the top of each cartridge and vacuum spent media. Remove spent cartridges. Place fresh cartridges in each cartridge position.

Note: [1]TAPE-certified treatment technologies meet or exceed 80 percent removal of total suspended solids for an influent concentration range of 100 mg/L to 200 mg/L.

APPENDIX D

Mercury and PCBs Load Reductions from Storm Drain Inlet Cleaning

Geosyntec consultants

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Memorandum

Date:	March 4, 2024
To:	Contra Costa Clean Water Program
From:	Lisa Austin, Senior Principal; Lisa Welsh, Senior Scientist; Grace Yao, Senior Staff Engineer
Subject:	Mercury and PCBs Load Reductions from Storm Drain Inlet Cleaning Geosyntec Project Number: CWR0847

1. BACKGROUND

Municipal Regional Stormwater Permit (MRP) Provisions C.11.c and C.12.c require the Permittees to, within the permit term, implement or cause to be implemented control measures to achieve mercury and polychlorinated biphenyls (PCBs) load reductions. The Contra Costa County Permittees within San Francisco Bay Regional Water Quality Control Board Region 2 must implement control measures on 664 acres of old industrial land use area that have not been redeveloped or treated with GSI or other treatment controls, or alternatively reduce loads of mercury by 28 grams per year (g/yr) and PCBs by 121 g/yr, by June 30, 2027.

One of the mercury and PCBs treatment control measures that will be implemented by the Contra Costa County Permittees during this permit term to control urban runoff from areas containing known or suspected sources or areas with evidence of moderate to high mercury or PCBs soil concentrations is enhanced operation and maintenance (O&M) practices, and, specifically, storm drain line cleaning. This memorandum estimates mercury and PCBs loads reduced (and equivalent old industrial acres treated) resulting from the City of Richmond's storm drain line cleanout activities.

2. METHODOLOGY

Load reductions have been estimated in accordance with the approved *Source Control Load Reduction Accounting for Reasonable Assurance Analysis* report (BASMAA, 2022).

Geosyntec used the following method for estimating mercury and PCBs load reduction for storm drain line cleanout:

$$Load\ Reduced = L \cdot M \cdot Conc$$

Where:

Load Reduced	=	Estimated mercury or PCBs load reduction from storm drain line cleanouts (g/yr)
L	=	Average annual length of the storm drain line cleanout (ft/yr)
M	=	Unit mass of sediments removed per foot of storm drain line cleanout (kilograms (kg)/ft)
Conc	=	Mean concentration of mercury or PCBs in sediments within old industrial land use areas (milligrams (mg)/kg)

The following subsections summarize the inputs and assumptions used to estimate the individual components of the load reduction calculation: *L*, *M*, and *Conc*.

2.1 Storm Drain Line Cleanout Length, *L*

The City of Richmond cleans its entire storm drain network over a period of four years *(B. Harms, personal communication, January 2024).* For this estimate, Geosyntec focused on loads reduced within old industrial areas in the priority Parr and Lauritzen Channel watersheds (Attachment 1). The total length of storm drain lines within old industrial areas in the priority Parr and Lauritzen Channel watersheds is 68,770 ft, which amounts to an estimated **17,190 ft** of storm drain line cleaned annually.

2.2 Unit Mass of Sediment Removed, *M*

Three sources of input for the unit mass of sediments removed by storm drain cleanout were considered:

1. The Leo Avenue Pilot Project from the Clean Watersheds for a Clean Bay grant project conducted by the Bay Area Stormwater Management Agencies Association (BASMAA, 2017). The calculated mass of solids per linear foot of the storm drain line was 3.8 kg/ft. Due to Leo Avenue's unique location and configuration, the sediment accumulation rate was likely higher than the typical accumulation rate of a larger storm drain system.

2. The City of Richmond stated that four cubic yards of sediment are removed per 1,000 linear ft of storm drain line (*B. Harms, personal communication, February 2024*). This converts to 0.103 cubic ft of sediment per linear ft of storm drain line. Multiplying the measured dry bulk sediment density of 0.965 g per cubic centimeter (cm^3) from the Leo Avenue Storm Drain System Cleaning Pilot Project (CW4CB 2017) by the sediment volume, the estimated unit mass of sediment removed is 2.95 kg/ft.

3. Geosyntec estimated the corresponding unit mass of one-inch of sediment accumulation in an average pipe is 1.26 kg per linear foot. The calculation was

performed by first determining the length-weighted average pipe diameter, 25.2 inches, of all storm drain pipes within the priority watersheds and old industrial areas. With the one-inch sediment accumulation assumption, the unit volume of the sediment accumulated was calculated to be 0.046 cubic feet per foot length of the pipe. Using the dry bulk density of the sediment from the Leo Avenue pilot project, 0.965 g/cm^3, the unit mass of sediment in a linear foot of storm drain pipe was estimated to be 1.26 kg/ft. Following the same approach, the unit mass of sediment corresponding to a two-inch accumulation was calculated to be 3.51 kg/ft.

Table 1 below summarizes the four unit mass values of the sediment removed from one foot of storm drain pipe.

Table 1: Summary of Unit Mass of Sediment Removed Per Foot of Storm Drain Pipe

Assumption / Source	Unit Mass of Sediment Removed (kg/ft)
Leo Avenue Pilot Project	3.80
City of Richmond	2.95
One-inch Accumulation Assumption	1.26
Two-inch Accumulation Assumption	3.51

2.3 Mercury and PCBs Concentration, *Conc*

The mercury and PCBs mean sediment concentrations associated with old industrial land uses were calculated using the available sediment sampling data collected from within the combined old industrial areas of Alameda County and Contra Costa County from 2001 to 2022. A total of 187 and 241 data points were used for the analyses of mercury and PCBs, respectively. Sediment sampling results located within fifty meters of known source properties were removed to prevent overestimation of mercury and PCBs concentrations.

The data were first transformed by taking the natural logarithm of each data point, assuming that environmental data is lognormally distributed. The total number of data points and outliers are summarized in Table 2 below.The log-transformed mercury and PCBs datasets were next assessed for normality using the Shapiro-Wilk test. The test results are shown in Table 2. A p-value below 0.05 indicates that the sample did not come from a normally distributed population. The p-values of the mercury and PCBs data distributions were 0.131 and 0.288, respectively, thus indicating that both datasets follow the lognormal distribution (Figure 1).

Table 2: Data Count and Shapiro-Wilk Test Results

Pollutant of Concern	Data Count	W	p	Conclusion
Mercury	187	0.99	0.172	Lognormal distribution
PCBs	241	0.99	0.080	Lognormal distribution

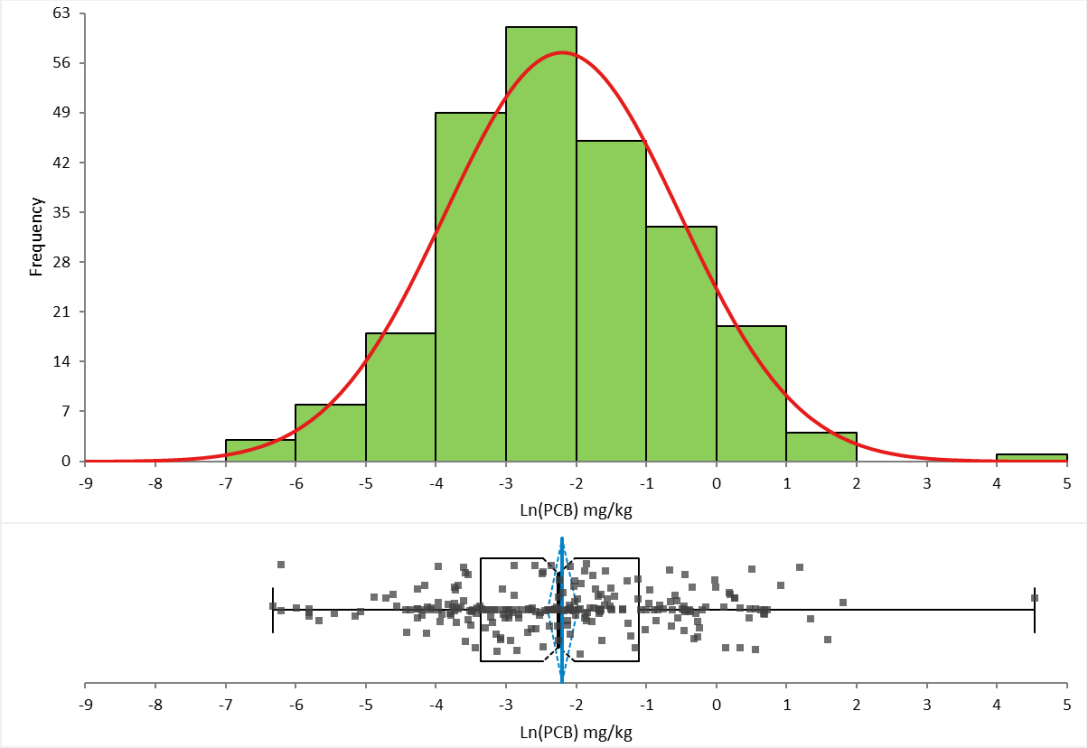


Figure 1: Distribution of sampling results for PCBs. For the box scatter plot, the median is shown as the bold line (with a 95% confidence interval shown as a notch on the box), the mean as the blue line (with 95% confidence interval shown as a dashed diamond), the 1st and 3rd quartiles as the edges of the box, and minimum/maximum as end caps.

The mean concentrations of the natural log-transformed distributions were then calculated using the natural logs of the mean and the standard deviation as shown in the equation below:

$$Mean = \exp\left(\mu_{ln} + 0.5\sigma_{ln}^2\right)$$

Where:

exp = e to the power of

μ_{ln} = the mean of the natural log-transformed distribution

σ_{ln}= the standard deviation of the natural log-transformed distribution

The back-transformed mean sediment concentrations associated with old industrial land uses for mercury and PCBs are 0.331 and 0.450 mg/kg, respectively (Table 3).

Table 3: Arithmetic Mean Mercury and PCB Concentrations (mg/kg)

Pollutant of Concern	μ	σ	Arithmetic Mean Concentration (mg/kg)
Mercury	-1.492	0.879	0.331
PCBs	-2.20	1.672	0.450

3. RESULTS

Using the equation and inputs defined in Section 2, the load reduction results for storm drain line cleanouts are shown in Table 4 below. The PCBs load reductions were estimated to range from 9.7 g/yr to 29.4 g/yr. The mercury load reductions were estimated to range from 7.1 g/yr to 21.6 g/yr.

As defined in the MRP, implementing treatment controls on 664 acres of old industrial land use is equivalent to reducing mercury by 28 g/yr and PCBs by 121 g/yr. The potential PCBs load reduction achieved by storm drain line cleanout in the City of Richmond priority watersheds of 9.7 to 29.4 g/yr is equivalent to treating 53 to 161 acres of old industrial area.

Table 4: Details of the City of Richmond Storm Drain Line Cleaning in Old Industrial Areas in the Priority Lauritzen and Parr Channel Watersheds.

Parameter Description	Results based on four different unit mass estimates				Units
	Leo Avenue	Two-Inch	City of Richmond	One-Inch	
Number of years to clean the City of Richmond storm drain line network	4				yrs
Total length of storm drain line within old industrial areas in the priority watersheds	68,770				ft
Length of storm drain line cleaned annually within old industrial areas in the priority watersheds	17,190				ft/yr
Volume of sediment removed per 1,000 linear feet of storm drain line	-	-	4	-	cubic yard
Volume of sediment removed per linear foot of storm drain line	-	0.128	0.103	0.046	ft^3/ft
Measured sediment bulk density (dry weight) from the Leo Avenue Watershed Pilot Project (BASMAA, 2017)	0.965				g/cm^3
Calculated mass of solids removed per linear foot of storm drain line	3.8	3.51	2.95	1.26	kg/ft

Parameter Description	Results based on four different unit mass estimates				Units
	Leo Avenue	Two-Inch	City of Richmond	One-Inch	
Calculated mean mercury concentration in sediment associated with old industrial land uses	0.331				mg/kg
Calculated mean PCBs concentration in sediment associated with old industrial land uses	0.450				mg/kg
Calculated annual mercury load reduced from storm drain cleanout within old industrial areas in the priority watersheds	21.6	20.0	16.8	7.1	g/yr
Calculated annual PCBs load reduced from storm drain cleanout within old industrial areas in the priority watersheds	29.4	27.1	22.8	9.7	g/yr
Acres of old industrial area treated per PCBs g/yr reduced, from the MRP (664 acres:121 g PCBs/yr)	5.5				acres
Equivalent acres of old industrial area treated based on annual PCBs load reduced	**161**	**149**	**125**	**53**	acres

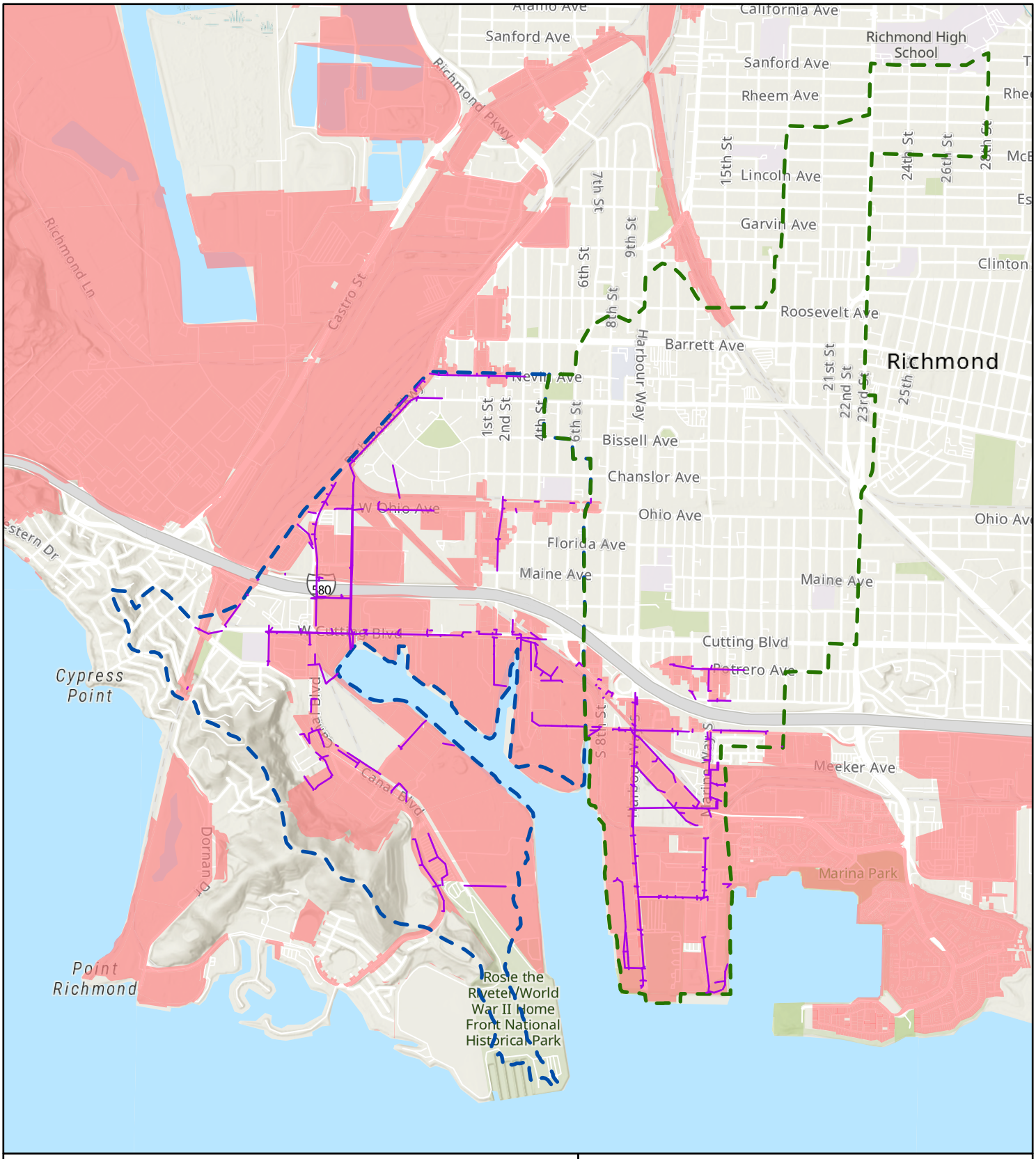
4. REFERENCES

Bay Area Stormwater Management Agencies Association (BASMAA), 2017. Storm Drain System Cleaning and Video Inspection Pilot Project – Leo Avenue Watershed, San Jose, CA, April 2017

BASMAA, 2022. Source Control Load Reduction Accounting for Reasonable Assurance Analysis. Prepared for BASMAA by Geosyntec Consultants and EOA, Inc. January 2022.

*****

Attachment 1
Storm Drain Line Cleanouts Location Map



Legend

- Storm Drain Lines Within Priority Watersheds and Old Industrial Areas
- Lauritzen Channel Watershed
- Parr Channel Watershed
- Old Industrial Land Use Areas

0 2,000 Feet

3

City of Richmond Storm Drain Line Cleanouts for PCB Load Reduction

Geosyntec consultants

CWR0847	March 2024

Attachment 1

P:\GIS\Alameda Countywide Clean Water Program (ACCWP)\OI CMP\SD Cleanout Enhanced OM\SD Cleanout Enhanced OM.aprx\Richmond 2/14/2024 4:51 PM (GYao)

APPENDIX E

Applicable Redevelopment Projects

PCBs/Hg Redevelopment Property Summary

This appendix compiles fact sheets for redevelopment projects that are associated with known or suspected areas with moderate or high concentrations of mercury or PCBs. The redevelopment projects names, locations, and project areas are summarized in the table below.

Jurisdiction	Name	Address	Project Area (acres)	Appendix Page Number
Pittsburg	Johns Manville	420 East 3rd St, Pittsburg, CA	20.5	2-3
Pittsburg	NRG	696 W 10th St, Pittsburg, CA	175.0	4-6
Pittsburg	USS Posco	900 Loveridge Road, Pittsburg, CA	335.4	7-8
		Total Area (acres)	530.9	

PCBs/Hg Redevelopment Property Summary
Former Johns Manville

Name of Site:	Harbor View Project (formerly Johns Manville)
Address:	420 East 3rd Street, Pittsburg, CA
APN(s):	073-050-001
Parcel Area (acres):	20.5

Site Location and Description

The project site is located at 420 East 3rd Street, southwest of the intersection of East 3rd Street and Harbor Street, approximately one mile north of State Route 4 in the City of Pittsburg, California Currently, the project site consists primarily of ruderal grasses and is absent of structures. A 3.46-acre berm area runs north-to-south along the eastern boundary of the project site. Scattered trees are located along the west and south boundaries of the project site.

Project Site History

Historically, the project site was occupied since the mid-1920s by a manufacturing plant that produced asbestos-cement products, asphalt roofing materials, and asbestos-containing pipe covering. Manufacture of asbestos-containing materials ceased in 1980 and commercial-grade roofing materials were manufactured at the plant until 2003, when operations terminated. Several environmental investigations were conducted at the former manufacturing site, beginning in 1986 and continuing through 2005, and areas of potential concern associated with asbestos-containing materials were identified.

The selected remedy for the environmental concerns at the project site was the removal of asbestos-containing materials and petroleum hydrocarbon-affected soil from the site and placement in engineered containment berms along the eastern boundary of the project site. Asbestos-impacted material and debris were placed into a trench excavated to 10 feet below ground surface (bgs) along the eastern boundary of the site, which was then capped by hydrocarbon-impacted soil. An engineered textile and two feet of clean, low-permeability soil was then added to the top of the materials to create the capped, vegetated berms. An automated irrigation system exists to maintain the vegetation. The berms consist of two distinct segments referred to below as the “northern” and “southern” berms. Drainage swales were installed adjacent to the berm and graded such that stormwater runs off toward catch basins on the eastern site boundary. All remedial actions have been completed and approved by DTSC; however, ongoing maintenance and monitoring is required. The remediation system is required to be operated and maintained as described in the Site Operation and Maintenance Plan until the DTSC authorizes its modification or discontinuation. The remediation system is also evaluated every five years to determine if human health and the environment are being adequately protected.

Site Contamination

Several environmental investigations were conducted at the former manufacturing site, beginning in 1986 and continuing through 2005, and areas of potential concern associated with asbestos-containing materials were identified.

The selected remedy for the environmental concerns at the project site was the removal of asbestos-containing materials and petroleum hydrocarbon-affected soil from the site and placement in engineered containment berms along the eastern boundary of the project site. Asbestos-containing materials (ACM) and debris were placed into a trench dug to 10 feet bgs along the eastern boundary of the site, which was then capped by hydrocarbon-impacted soil. An engineered textile and two feet of clean, low-permeability soil was then added to the top of the materials to create the capped, vegetated berms. An automated irrigation system exists to maintain the vegetation. The berms consist of two distinct segments referred to below as the “northern” and “southern” berms. Drainage swales were installed adjacent to the berm and graded such that stormwater runs off toward catch basins on the eastern site boundary. The existing drainage

PCBs/Hg Redevelopment Property Summary
Former Johns Manville

swales were installed in cooperation with DTSC-required remedial actions for the project site. The swales and other remediation systems are evaluated every five years by the DTSC. Therefore, an evaluation by the DTSC would confirm that the drainage swales are still operable. Additional remedial actions included the removal of 11 underground storage tanks (USTs), off-site disposal of approximately 10,500 CY of ACM, the off-site disposal of approximately 18,000 CY of petroleum hydrocarbon-impacted soil, and the placement of some impacted soil in the vicinity of the former evaporation pond, now referred to as the Soil Management Area (SMA). All remedial actions have been completed and approved by the DTSC; however, ongoing maintenance and monitoring is required. The remediation system is required to be operated and maintained as described in the Site Operation and Maintenance Plan until the DTSC authorizes its modification or discontinuation. The remediation system is also evaluated every five years to determine if human health and the environment are being adequately protected.

In the course of preparing the Phase I ESA, groundwater and soil vapor beneath the project site was found to be impacted with volatile organic compounds (VOCs), and petroleum hydrocarbons. The presence of such compounds on the project site is identified as a recognized environmental concern (REC). As such, a Site Investigation Report (SIR) was prepared for the project by GSI Environmental Inc. in response to the findings of the Phase I ESA (Appendix E). The SIR involved a sampling plan to assess the current subsurface conditions at the project site, the scope of which included soil vapor sampling at approximately five feet bgs in an approximate grid pattern across the site, with additional samples placed along the perimeter of the SMA; shallower vapor sampling within the SMA; groundwater sampling at the southwest boundary of the project site to assess impacts from the upgradient dry cleaner property; groundwater sampling around the perimeter of the SMA and at the downgradient property boundary to assess potential groundwater impacts resulting from previous site operations; and soil sampling to assess the quality of fill soil placed in the excavated areas and address areas where adequate sampling may not have been previously conducted.

To provide context to the analytical results, the soil, groundwater, and soil vapor data was evaluated by comparison to screening criteria recommended by DTSC. Concentrations of pollutants below the respective screening criteria are not considered to pose a significant risk. Concentrations of pollutants above the respective screening levels do not necessarily indicate a risk is present, but rather suggest that additional evaluation is warranted.

PCBs

- Notice of Preparation (NOP) page 325. 14 March 1996 incident form documents the removal of two transformers and associated PCB leak.
- Final Remedial Action Plan, June 2006 (NOP page 1636). PCBs were detected in two samples from the same boring (one at 16.6 mg/kg at 5 feet deep and 1.0 mg/kg at 6.5 feet) and from 7 feet deep in one other boring (at 5.3 mg/kg). All of the detections exceeded the PCB CHHSL. Both borings were located within the central portion of the former evaporation pond.
- Site Investigation Report, June 2021 (NOP page 4484). PCBs were only detected in one sample (SB-05-8.0); the detected concentration was below the DTSC-SL [Aroclor 1254 = 0.079 mg/kg]

PCBs/Hg Redevelopment Property Summary
NRG

Name of Site:	Bay Walk/NRG
Address:	North of Willow Pass Road and south of Honker Bay
APN(s):	096-100-015-5, 096-100-029-6, 096-100-031-2, 096-100-032-0, 096-100-033-8, 096-100-034-6, and 096-100-035-3
Parcel Area (acres):	1046.8

Site Location and Description

The approximately 1,046.8-acre project site is located north of Willow Pass Road and south of Honker Bay in the City of Pittsburg, California. The project site consists of approximately 519 acres of wetlands located in the center of the site, approximately 254 acres of land located south and east of the wetlands which was previously used by the Pittsburg Power Plant, and vacant grassland/ruderal vegetated land which is traversed by unpaved roads, an inactive buried fuel oil pipeline, and a former railroad right of way, which makes up the remaining acreage of the site. An approximately 38-acre Pacific Gas and Electric (PG&E) switching station is located in the eastern portion of the site and is not included as part of the proposed project.

The now vacant Pittsburg Power Plant site includes administrative, warehouse, and maintenance buildings, as well as former power generating units, a cooling water canal, oily water treatment and inactive ponds, an inactive buried fuel oil pipeline, and a total of 16 bulk fuel oil tanks which are located within two separate tank farms in the northeast and southeast portions of the project site. It should be noted that the southeast tank farms are currently in the process of being demolished for property management purposes not related to the project. In addition, the 38-acre switching station (APN 096-100-035-3), owned by PG&E, is located adjacent to the eastern portion of the site and is still active. The PG&E switching station delivers electricity to multiple overhead power lines throughout the project site that transmit and distribute electricity through the east bay area. The existing transmission lines and towers would remain in place following development of the proposed project.

Project Site History

The northeastern portion of the project site was purchased by PG&E in 1951 for development as the Pittsburg Power Plant. Construction between 1951 and 1954 included the development of Power Generation Units (Units) 1 to 4, the marine terminal, and six fuel oil aboveground storage tanks (ASTs) (Nos. 1 through 6). Plant operations initiated in 1954. Units 5 and 6 were constructed and operational in 1960 and 1961, respectively. PG&E continued to acquire surrounding properties for incorporation into the power plant between 1972 and 1979, and the power plant, cooling towers, and storage tanks were constructed between 1951 and 1980. In 1972, Unit 7 was added to the project site along with the cooling water canal. The cooling towers were constructed between 1974 and 1980. Ten additional fuel oil ASTs (Units 7 through 16) were constructed between 1972 and 1974. The Pittsburg Power Plant and associated open areas historically occupied over 2,000 acres.

Historical site operations involved power generation, system maintenance, and administrative activities. Cooling water for generating Units 1 to 6 was formerly drawn from Honker Bay. Unit 7 was cooled using water from the on-site canal in a closed-loop system. Wastewater was historically discharged to the on-site lined treatment ponds, which are currently closed/inactive with the exception of the oily water pond that treats storm water from the power generation areas of the project site through physical oil separation.

Southern Energy Delta, LLC, a subsidiary of Southern Company, acquired the project site from PG&E in 1999. The sale included the power generating plant, all site buildings, fuel oil tank farms, power generating equipment, the cooling water circulation canal, cooling towers, and open space/wetlands to the west of the power plant. PG&E retained the

PCBs/Hg Redevelopment Property Summary
NRG

switching station located in the northeastern portion of the site, as well as the property to the west of the project site. The area west of the site included the PG&E Shell Pond and Carbon Black Area, which are not a part of the project site.

In 2001, Southern Energy Delta, LLC, became Mirant Corporation/Mirant Delta, LLC (Mirant). RRI Energy and Mirant merged to form GenOn Energy, Inc., in 2010. In 2012, NRG Energy Inc. (NRG) merged with GenOn doing business under NRG's name. GenOn officially separated from NRG in December 2018 and was the owner of the site through March 2021. GenOn ceased operating the Pittsburg Power Plant on December 31, 2016, and the project site has not generated power since. Units 1 to 4 were decommissioned in 2004 and Units 5 to 7 were decommissioned in January 2017. The electrical switching station owned by PG&E has remained active and the project site has been connected to electrical power through the high-voltage switching station and several active transformers that have been maintained in place. In March 2021, the current owner, The Pittsburg Owner, LPV, LLC, purchased the site.

Site Contamination

The site is a closed hazardous waste facility that was permitted under the federal Resource Conservation and Recovery Act (RCRA). RCRA requires corrective action to be conducted to address any releases of hazardous wastes or constituents from a permitted hazardous waste facility. The lead regulatory agency for the RCRA corrective action is the Department of Toxic Substances Control (DTSC). DTSC and the project applicant have executed a Corrective Action Consent Agreement (Consent Agreement) to set forth the protocols for the completion of corrective action and the ultimate issuance of Corrective Action Complete Determination by DTSC.

The majority of known chemicals and hazardous materials from past site activities have been removed from the facility through completed decommissioning and or remedial actions that have previously taken place on-site. The power unit lubricant oil systems have been drained, and tanks that were emptied have been certified closed, although some contain residual liquids or sludges that could not be readily removed. Three of the fuel oil tanks have been emptied and cleaned. The other 13 fuel oil tanks and the cutter stock tank have residual oils remaining inside, which are currently being drained and sold to a recycler.

The proposed project is comprised of two components: (1) remedial activities, and (2) new development within the project site. Remedial activities would include demolition of the vacant Pittsburg Power Plant and all associated structures and other remaining structures on the project site. The project also includes remediation activities implementing a remedy for various media (i.e., soil, soil vapor and groundwater) to be detailed in a separate Corrective Measures Study for each development area reviewed and approved by the DTSC.

Because the Pittsburg Power Plant is inactive, various obsolete facility components and structures will be removed or demolished, such as certain tanks and piping, consistent with sound industrial property management practices and in compliance with applicable fire, health and safety requirements. As such, by the time project construction activities are proposed to commence in the Development Phase II Area, almost all of the above grade facility components and features (e.g., Tanks 8 through 17, and including Tanks 5 and 6 in Development Phase III) would be removed. However, most of the components and structures in the Development Phase III Area will not yet have been demolished or removed. The proposed project, therefore, includes abatement and demolition of all facility components and structures, including aboveground storage tanks, remaining at the project site at the time of the commencement of the proposed project. Because facility components are not present in the Development Phase I Area, the remaining facility components and structures requiring demolition as part of the proposed project are primarily in the Development Phase III Area, and the cooling water canal area. All lead-based paint, polychlorinated biphenyl (PCB)-containing material, and asbestos containing material (ACM) encountered at the project site would be abated, and all remaining structures and associated equipment, including ASTs, the power plant, the water intake structure, retention basins, and below grade improvements within the project boundary would be demolished or abandoned.

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NRG

PCBs

Likely, but not documented. The selected site screening level in soils is 6.3 mg/kg (Supplementation RCRA Facility Investigation Report Table 4); only exceedances are reported.

PCB analytical results can be found in the Phase II ESA (Fluor Daniel GTI, 1998).

PCBs/Hg Redevelopment Property Summary
USS POSCO

Name of Site:	USS-POSCO Industries Facility
Address:	900 Loveridge Road
APN(s):	073030007, 073030013, 073030018, 073030019, 073030020, 073030021, 073030022, 073030023, 073200021, 073200022, 073200023, 073200024, 073210008, 073210032
Parcel Area (acres):	483

Site Location and Description

The USS-POSCO Industries Facility in Pittsburg (UPI) belongs to United States Steel, Inc. (USS) and is currently operated by USS and Pohang Iron and Steel Company Ltd. (POSCO) a Korea based corporation.

Project Site History

The location has been the site of metal processing and steel manufacturing facilities since 1909. Operations currently consist of receiving coils of hot-rolled steel from off-site sources, and producing cold-rolled Steel, galvanized steel, and tin or chromium plated steel. All regulated hazardous waste treatment and storage units at the Facility have been closed since 1999.

Site Contamination

The USS-POSCO Facility holds a Hazardous Waste Facility Post-Closure Permit which it requires to operate the Unit 1 Landfill, a corrective action management unit (CAMU) containing contaminated materials removed during environmental remediation at the facility. The Facility is divided into three areas designated by UPI as “Site L-A” (149 Acres), “Site L-B” (98.7 Acres), and “Main Site” (206 Acres). There are also a number of easements cutting across the property. Site L-A used to be the location of manufacturing facilities a number of land-based waste management units and it has been remediated to industrial use standards, requiring annual land use covenant inspections. Site L-B is the location of a number of landfills, buffer zones and new research centers and facilities. The main site is the location of most of the manufacturing facilities and material storage and handling areas. DTSC currently oversees on-going RCRA Corrective Action at the Facility including investigation and remediation of a chlorinated solvent groundwater plume, an arsenic groundwater plume, and a number of Corrective Action Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) within the main site. DTSC also oversees BNSF’s investigation and future remediation of a carbon tetrachloride groundwater contamination plume that originated from railroad operations, and that stretches from south to north across Site L-B all the way to the Sacramento/San Joaquin Estuary which is the northern boundary of the Facility.

Corrective measures have been implemented in the Central Group SWMUs and SWMU 4. Remedies include MNA (Central Group), soil vapor and groundwater extraction (SWMU 4), ZVI injections (SWMU 4) and ongoing monitoring. An ISCO pilot study was completed at Northern Boundary SWMUs for arsenic remediation, but monitoring showed rebound. Currently, an air sparge pilot study workplan is being drafted for the arsenic contamination. The annual land use restriction report will be combined for Site L-A, SWMU 4 and Central Group SWMUs into one report.

PCBs

Multiple documents on EnviroStor (USS-POSCO INDUSTRIES (80001609)) where PCBs listed as a POC.

In May 2000, a letter to USEPA and DTSC stated that UPI would proceed with the RCRA corrective action process using USEPA PCB self-implementing soil cleanup levels allowed by the MEGA Rule.

PCBs/Hg Redevelopment Property Summary
USS POSCO

Those SWMUs with PCBs are addressed in a document called “Self-Implementation of On-Site Cleanup and Disposal of PCB Remediation Material/Soils (August 3, 2001). Concentrations reported: SWMU No. 17.1 = 0.68-55 mg/kg, SWMU No. 24.5 = 0.63 – 88 mg/kg. Cleanup level 1.0 mg/kg.