APPENDIX G

CCCWP Memo on Scenarios for Attaining PCBs Loads by GSI

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Memorandum

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Subject:	CCCWP Reasonable Assurance Analysis – 2030 Scenario Geosyntec Project Number: LA0540

1. BACKGROUND

This memorandum presents the results of an analysis of scenarios that investigate the level of implementation needed to result in polychlorinated biphenyls (PCBs) load reductions sufficient to attain the PCBs total maximum daily load (TMDL) wasteload allocation for Contra Costa County by 2030.

Municipal Regional Permit (MRP) (SFBRWQCB; Order No. R2-2015-0049; as amended by Order No. R2-2019-0004) Provisions C.11.d and C.12.d require that a reasonable assurance analysis (RAA) be conducted for the PCBs and mercury control measures described in the countywide PCBs Control Measure Plan and Mercury Control Measure Plan. The RAA methodologies and estimated load reductions for the control measures plans are provided in the RAA Report (Appendix A of the *Contra Costa PCBs and Mercury TMDL Control Measure Plan and Reasonable Assurance Analysis* report (CCCWP, 2020)). The load reduction results are summarized in Table 1 below.

Table 1: Summary of Estimated PCBs Load Reductions Achieved through Control Measure Implementation

Control Measure	PCBs Load Reduction by 2030 (kg/yr)
PCBs in Building Materials Management	0.37
Source Property Identification and Abatement	0.54
PCBs in Electrical Utilities Management	0.12
PCBs in Infrastructure	0.01
Green Stormwater Infrastructure	0.18
Full Trash Capture Treatment Control Measures	0.05
Enhanced Operations and Maintenance	0.004
Total Load Reduced	**1.27**
Load Reduction Goal	**1.51**
Remaining Load to be Reduced	**0.24**

As shown in Table 1, the control measures described in the RAA Report are not estimated to provide the required load reduction (i.e., the load reduction goal of 1.51 kg/yr) to achieve the TMDL wasteload allocation by the TMDL compliance date of 2030 (although it is estimated to be achieved by 2050 or later in the RAA Report). The RAA estimates a deficit of 0.24 kg/yr of PCBs load reduction by 2030. The discussion below assesses the level of effort or change of assumptions that would result in compliance with the wasteload allocation by 2030.

An analysis of mercury is not included in this memorandum, because the RAA model estimates that the existing baseline mercury load may have achieved the TMDL wasteload allocation already. This is a nuance related to calculating baseline and accounting for lands above reservoirs. The RAA supports the TMDL assumption that certain control measures (i.e., GSI and enhanced operations and maintenance) implemented to achieve PCB reductions will achieve target mercury reductions. Therefore, this scenario analysis focuses on PCBs for simplicity.

2. PCBS LOAD REDUCTION GOAL

The RAA baseline pollutant loading model represents the loading of PCBs across the County during the TMDL baseline period (i.e., 2003 – 2005). The baseline load used to establish the PCBs TMDL load reduction goal for the Contra Costa MRP Permittees is the load for the MRP area (i.e., within Water Board Region 2) below dams, after deducting the estimated baseline load for the other NPDES-permitted stormwater dischargers within this area (i.e., NPDES major and minor permittees and Phase II permittees).

In contrast, the TMDL population-based wasteload allocation for Contra Costa County MRP Permittees was calculated by distributing the countywide urban stormwater wasteload allocation between the MRP Permittees and other NPDES-permitted stormwater dischargers. Using the calculated MRP Permittee portion of both the wasteload allocation and the RAA-calculated baseline load, the load reduction goal is estimated to be 1.51 kg/yr. (For further detail, see the

RAA Report (Appendix A of the *Contra Costa PCBs and Mercury TMDL Control Measure Plan and Reasonable Assurance Analysis* report).

If additional non-MRP Permittee areas are accounted for, this load reduction goal would be reduced, as described in the sections below.

2.1 Adjustment for Caltrans Right-of-Way Area

An additional non-jurisdictional area within Contra Costa County is located in the right-of-way (ROW) area owned and operated by Caltrans, whose urban stormwater discharges are regulated under a separate NPDES permit. An analysis was conducted to estimate the difference in the MRP Permittees' TMDL load reduction goal if the Caltrans area is removed from the MRP Permittee portion of the RAA-calculated baseline load (Table 2).

Table 2: Contra Costa County Estimated PCBs Baseline Loads without Caltrans ROW

RWQCB Region	Above/Below Dam	Permit	Baseline Load PCBs (kg/yr)
Region 2	Below Dam	**MRP[1]**	**1.61**
		NPDES[2]	0.62
		Caltrans	0.12
		Phase 2[3]	0.01
	TMDL Baseline[4]		2.36

[1] Municipal Regional Permit permitted areas, along with IGP facilities and facilities with individual NPDES Stormwater Industrial permits.

[2] Major and Non-Major dischargers with individual NPDES permits.

[3] Phase II General Permit permittees.

[4] See Table 3-1 in the *Contra Costa Clean Water Program Reasonable Assurance Analysis report* (Appendix A to the *Contra Costa Contra Costa PCBs and Mercury TMDL Control Measure Plan and Reasonable Assurance Analysis report*.)

Table 3 below presents the wasteload allocation for the MRP Permittees after adjusting for the Caltrans portion of the baseline.

Table 3: TMDL Wasteload Allocations for Contra Costa County with Caltrans

Stormwater Discharger within TMDL Baseline Area[1]	Percentage of Baseline Load (%)	PCBs Wasteload Allocation (kg/yr)
MRP Permittees	68%	0.205
NPDES Permittees	26%	0.079
Caltrans	5%	0.015
Phase 2 Permittees	0.6%	0.002
Contra Costa County	100%	0.3

[1] All Water Board Region 2, above dams.

Using the calculated MRP Permittee portion of the wasteload allocation and RAA-calculated baseline load after removing the Caltrans portion, the adjusted load reduction goal would be 1.40 kg/yr (i.e., 1.61 kg/yr – 0.21 kg/yr), in contrast to 1.51 kg/yr with Caltrans included (see Table 1), which is 0.11 kg/yr less. If Caltrans was removed from the baseline and the wasteload allocation, the 2030 PCBs load reduction deficit would be decreased by 46%, from 0.24 kg/yr (see Table 1) to 0.13 kg/yr (i.e., 1.40 kg/yr - 1.27 kg/yr predicted load reduction by 2030 (see Table 1) = 0.13 kg/yr).

Including the Caltrans ROW area in the MRP Permittee baseline assumption is conservative (i.e., generates a greater overall load reduction goal), but allows the Permittees to take full credit for the loads reduced by control measures implemented by Caltrans within Contra Costa County. Leaving Caltrans baseline loads and wasteload allocations as part of the MRP Permittees load reduction goal calculations may also foster collaboration with Caltrans in implementing PCBs control measures going forward.

2.2 Adjustment for Non-Urban Open Space Area

A portion of Contra Costa County within Region 2 is comprised of open space located outside of the urban boundary as defined by the U.S Census. The estimated RAA baseline load for this area is 0.007 kg/yr. This load constitutes a very small fraction of the overall Permittee baseline load (0.4%). Although no control measures would be applied to this area and thus it could be removed from the Permittee baseline load estimate, it is such a small portion of the baseline load for PCBs that it would not affect the PCBs load reduction goal, so has not been removed.

3. APPLICATION OF ADDITIONAL CONTROL MEASURES BY 2030

3.1 Green Stormwater Infrastructure

The RAA model was used to estimate the total potential PCBs load reduction through application of GSI treatment to areas within the County, within Water Board Region 2, and below dams, that is not already treated or projected to be treated by 2030 (i.e., the public and private GSI Plan project areas projected to be implemented between 2030 and 2040 are still "available" for treatment through GSI). The results of this analysis are provided in Table 4 below. Table 5 lists the approximate area that would be needed for private parcels, public parcels, or right-of-way (ROW) to reduced PCBs loads by an additional 0.24 kg/yr by 2030 using the average load reduction from the RAA model for the projects constructed by 2020 or projected for 2030.

Table 4: PCBs Load Available for GSI Treatment by 2030

	Private Parcels	Public Parcels	Right-of-Way	Total
Available Area[1] (Acres)	159,817	99,498	22,465	281,780
Potential PCBs Load Reduction via GSI Treatment (kg/yr)[2]	1.12	0.20	0.21	1.58

[1] Results are for the areas within Contra Costa County that are within Water Board Region 2, below dams, and not already treated or projected to be treated by 2030.

[2] Excludes loads for area within the Concord Naval Weapons Station.

Table 5: PCBs Load Available for GSI Treatment by 2030

Contra Costa County Parameter	RAA Model Result
Average Modeled Load Reduction Potential – Available Private Parcels (g/yr/acre)	0.027
Available Private Parcel Area Needed to Reduce 0.24 kg/yr[1] (acres)	9,042
Average Modeled Load Reduction Potential – Available Public Parcels (g/yr/acre)	0.004
Available Public Parcel Area Needed to Reduce 0.24 kg/yr[1] (acres)	57,483
Average Modeled Load Reduction Potential – Available Public ROW (g/yr/acre)	0.030
Available ROW Area Needed to Reduce 0.24 kg/yr[1] (acres)	8,030

[1] Assumes average modeled load reduction for area category to calculate area needed to be redeveloped and/or treated.

[2] ROW = Right-of-Way.

The following conclusions can be drawn from the results provided in Table 4 and Table 5:

- As can be seen in Table 4, much more area and potential load reduction is available in private parcels than public parcels or rights-of-way.
- Fifty-seven percent of the available area consists of privately-owned parcels. Approximately 9,000 acres of this area (6%) would need to be treated via GSI by 2030 to achieve an additional PCBs load reduction of 0.24 kg/yr. The RAA analysis currently predicts that 1,380 acres of private parcel area will redevelop between 2020 and 2030, therefore six times as much redevelopment would need to occur to achieve the 2030 TMDL WLA solely through private parcels. This much private redevelopment is highly unlikely to occur in the next decade.
- Thirty-five percent of the available area is comprised of public parcels. Approximately 57,500 acres would need to be treated via GSI by 2030 to achieve an additional PCBs load reduction of 0.24 kg/yr. The RAA analysis currently assumes 517 acres of public parcels will be retrofitted between 2020 and 2030, therefore more than 100 times more public parcel area would need to be retrofitted than the public parcel area included in the Permittees' Green Infrastructure Plans. Using the cost estimating methodology presented in the *Contra Costa PCBs and Mercury TMDL Control Measure Plan and Reasonable Assurance Analysis* report, which assumes a

median capital cost of $121,000 per acre treated with GSI (2018 dollars), retrofitting 57,500 acres of public parcels would cost approximately seven billion dollars. In addition to the large amount of funding that would be needed, installing this much GSI on public parcels in 10 years would be technically infeasible to implement due to the time needed to site projects, conduct preliminary and final engineering design, and go through the municipal procurement process. A typical municipal GSI project would take two to five years to go through this process. Additionally, it is unlikely that the number of contractors needed to construct this much GSI in such a short period of time are available.

- Eight percent of the available area is public ROW; approximately 8,000 acres of ROW would need to be treated via GSI by 2030 to reduce PCBs load by 0.24 kg/yr. As with the discussion on public parcel area above, this is a highly unlikely scenario. The estimated capital cost for retrofitting 8,000 acres of ROW is more than one billion dollars (assuming a median cost of $137,000 per acre treated). The same technical infeasibility constraints as outlined above for retrofitting public parcels applies to retrofitting large areas of public ROW.

3.2 Enhanced Operations and Maintenance

The RAA model was used to assess the potential load reduction that could be achieved by applying enhanced operations and maintenance (O&M) measures in Old Industrial areas that are not planned to be addressed by treatment control measures (i.e., GSI or full trash capture devices) by 2030. Enhanced inlet cleaning was selected as a representative enhanced O&M measure for the purpose of this analysis. The total PCBs load produced by these areas is estimated to be 1.07 kg/yr. Table 6 below presents the potential load reduction if all of this area were addressed through enhanced storm drain inlet cleanout (i.e., increasing the frequency of cleanout from annually to biannually) with and without the use of inlet-based full trash capture devices.

Table 6: Potential Load Reduction through Enhanced Inlet Cleaning in Old Industrial Areas Not Planned for Control Measures by 2030

County/ Region	Enhanced Cleaning Frequency for Inlets with FTC Devices -- Annual to Biannual		Enhanced Cleaning Frequency for Inlets without FTC Devices -- Annual to Biannual	
	Potential Load Reduction (kg/yr)	Potential Load Reduction Rate (g/yr per acre)	Potential Load Reduction (g/yr)	Potential Load Reduction Rate (g/yr per acre)
Efficiency Factor:	**18%**		**5%**	
Contra Costa Region 2	0.33	0.0466	0.092	0.01295

FTC – Full trash capture.

To achieve the additional required PCBs load reduction of 0.24 kg/yr using enhanced street inlet cleaning without inlet-based full trash capture devices, enhanced cleaning would be needed for approximately 18,500 inlets with an average tributary area of one acre (i.e., 18,500-acre drainage area). The cost of implementing enhanced inlet cleaning without full trash capture for this scenario would be $1,850,000 per year for one additional cleanout per year (assumes $100/cleanout).

If new inlet-based full trash capture devices were implemented with biannual cleaning, then a total inlet drainage area of approximately 5,000 acres would be required. Assuming an average one-acre tributary area and a capital cost of $1,000 per acre treated, the capital cost of implementing enhanced inlet cleaning with full trash capture for this scenario would be approximately $5,000,000. The additional ongoing annual cost would be approximately $1,000,000 assuming $200 per year for biannual cleaning.

3.3 Conclusion

The analysis provided in this memorandum leads to a reasonable conclusion that it is technically and economically infeasible to achieve the PCBs TMDL wasteload allocation in Contra Costa County by 2030.

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