Collaboration, Science and Advocacy: the CVCWA Methylmercury Special Project Informs Policies and Regulations

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Presentation Overview

- CVCWA MeHg Special Projects Group (SPG) Overview
- Control Study Results
- Next Steps

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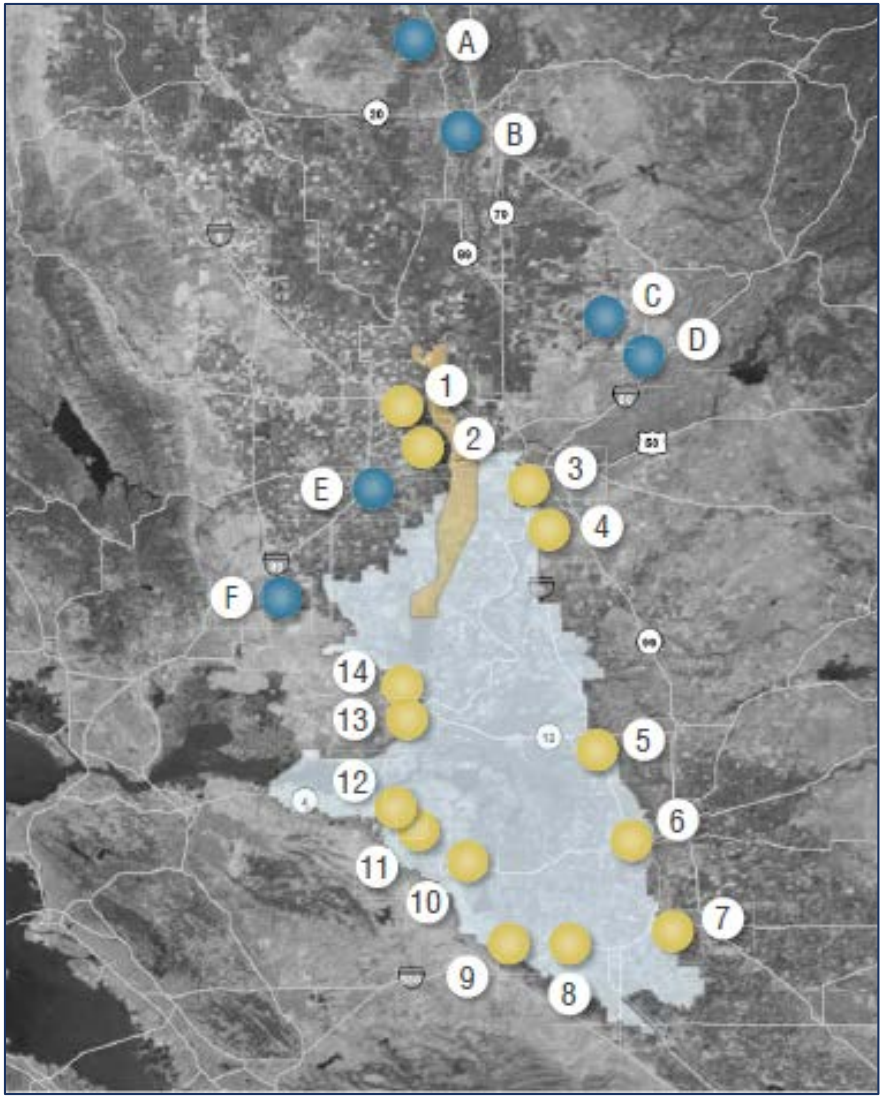
CVCWA MeHg SPG Participating Agencies



Facilities Located Within the MeHg TMDL Project Area

1. City of Woodland
2. City of Davis
3. Sacramento (Combined)
4. Sacramento Regional County Sanitation District
5. City of Lodi
6. City of Stockton
7. City of Manteca
8. City of Tracy
9. Mt. House CSD
10. Discovery Bay
11. City of Brentwood
12. Ironhouse SD
13. Rio Vista (Beach)
14. Rio Vista (Northwest)

Facilities Located Outside of the MeHg TMDL Project Area

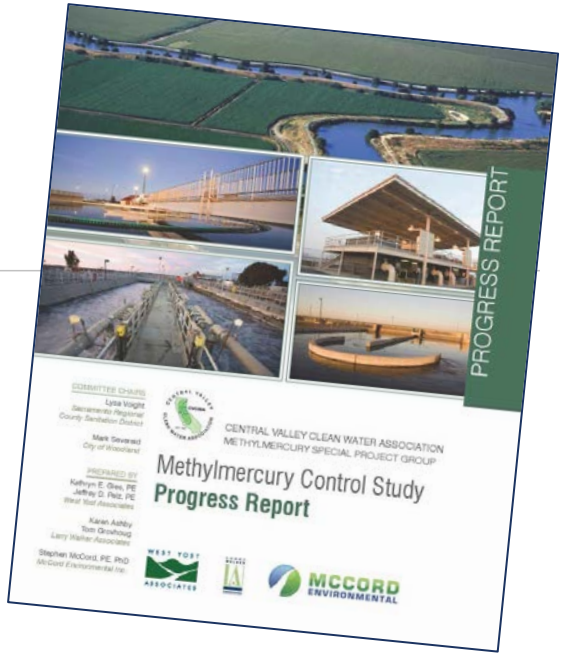
A. City of Live Oak
B. City of Yuba City
C. City of Roseville (Pleasant Grove)
D. City of Roseville (Dry Creek)
E. UC Davis
F. City of Vacaville

Primary Goals of the CVCWA MeHg SPG

2. Provide information for the Statewide Mercury Provisions and Reservoirs TMDL

1. Meet the Delta MeHg TMDL Phase I Requirements

Delta MeHg TMDL Timeline



Control Study

TAC Comments

TAC Comments

MeHg SPG

Work Plan

Progress Report

Final Report

Statewide Mercury Provisions ???

Recommendations

2010 2012 2014 2016 **2018** 2020 2022 2024 2026 2028 2030

Phase I

Review

Phase II

Final Attainment

MeHg TMDL

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Methylmercury Control Mechanisms in POTWs

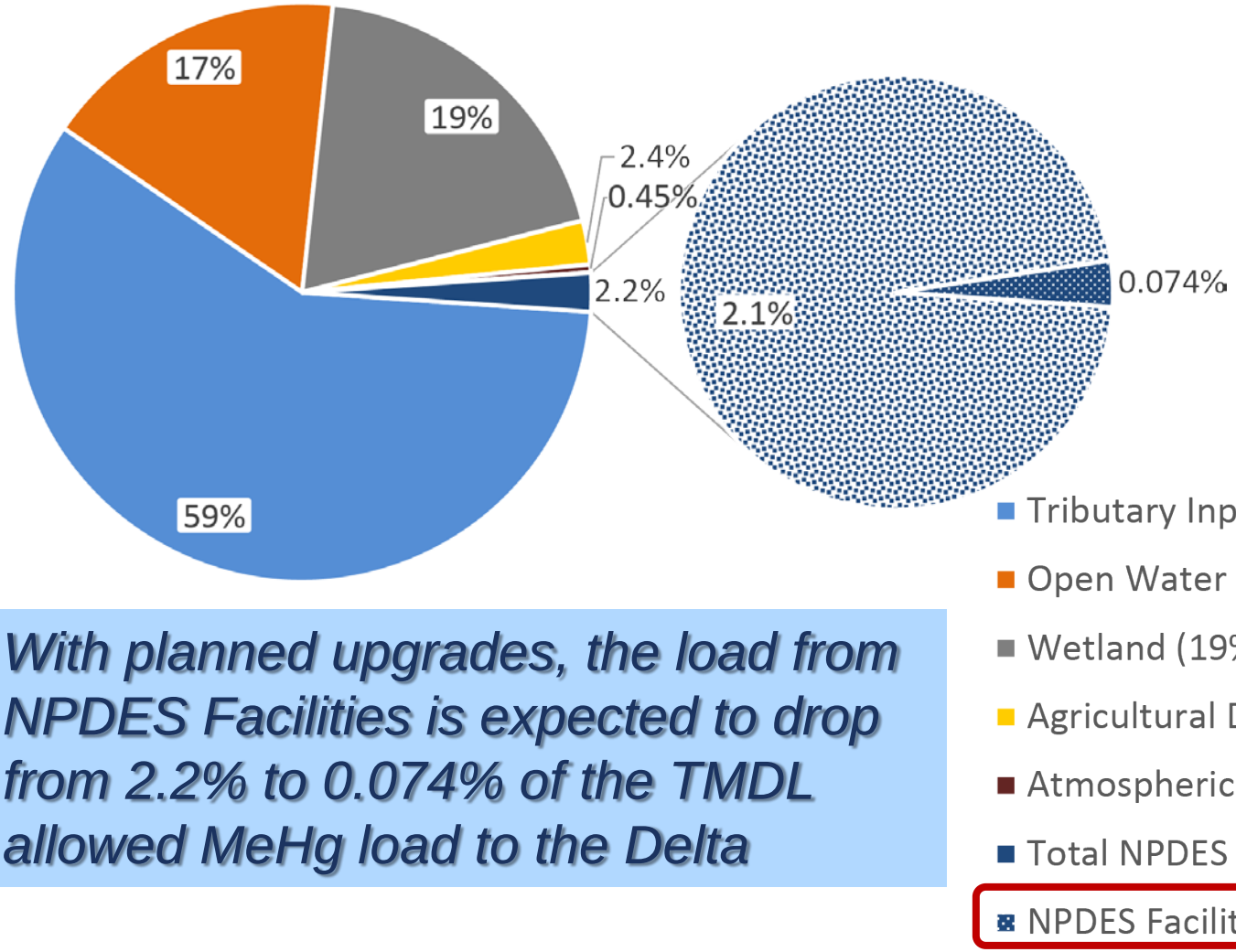
- Oxidation through Extended Aeration (Nitrification)
- Minimize Reducing Conditions (Nitrate Present)
- Solids Removal

Methylmercury Control Mechanisms in POTWs

- Oxidation through Extended Aeration (Nitrification)
- Minimize Reducing Conditions (Nitrate Present)
- Solids Removal
- *Denitrification?*

Treatment Level	Calculated Average Effluent Concentration[a,b], ng/L	Number of SPG Facilities	Data Points	
			Total Number	Percent ND
Secondary Only	0.27	2	120	1
Secondary plus N	0.05	6	137	23
Secondary plus NDN	0.02	9	147	67
Tertiary plus N	0.05	3	120	23
Tertiary plus NDN	0.01	10	448	85

Comparison of 2030 Planned NPDES Facility Loads to the TMDL Waste Load Allocations



With planned upgrades, the load from NPDES Facilities is expected to drop from 2.2% to 0.074% of the TMDL allowed MeHg load to the Delta

Note: Urban Runoff Point Sources represent 0.017% of the total WLA and are not shown on this figure.

Mercury Control Mechanisms in POTWs

- Solids Removal

Mercury Control Mechanisms in POTWs

- Solids Removal
- *Oxidation through Extended Aeration?*

Treatment Level	Calculated Average Effluent Concentration[(a)], ng/L	Number of SPG Facilities	Data Points	
			Total Number	Percent ND
Secondary Only	4.2	2	342	0
Secondary plus N	2.7	6	134	0
Secondary plus NDN	2.1	9	147	2
Tertiary plus N	1.2	3	139	4
Tertiary plus NDN	1.1	10	568	12

Impacts of Advanced Nitrogen Removal Treatment

Collected data from four Tampa Bay Florida facilities with more stringent nitrogen and phosphorus limits

Name[a]	Secondary Treatment Process Description	Rated Treatment Capacity, million gallons per day	Total Nitrogen Effluent Limit,[b] mg/L			
			Annual Average	Monthly Average	Weekly Average	Single Sample
Dale Mabry AWWTP	Anaerobic conditioning tank, oxidation ditch with SND, and denitrification filters	6.0	3.0	3.75	4.5	6.0
William E. Dunn WRF	5-stage Bardenpho aeration basins	9.0				
Northwest Regional WRF	5-stage Bardenpho aeration basins	10.0				
South Cross Bayou WRF	MLE process followed by denitrification filters	33.0				

Impacts of Advanced Nitrogen Removal Treatment

Methylmercury: All Florida facilities had Non-Detect Methylmercury data – similar to SPG Tertiary plus NDN facilities

Mercury: Florida effluent mercury concentrations also similar to SPG Tertiary plus NDN (did not expect a difference)

Conclusions

- Cannot conclusively determine that lower nitrogen levels will not result in higher effluent MeHg concentrations.
- Additional evaluation efforts are not needed at this time.
- Additional studies recommended if nitrogen objectives are adopted that are even lower than those applied to the Tampa Bay facilities.

Impacts of Changing Climatic Conditions

The analysis compared the following data sets:

- Normal Year to Wet Year
- Normal Year to Dry Year
- Wet Year to Dry Year

Conclusions

- MeHg wet year data appears to be more variable for NDN Facilities
- Differences with influent variability does not appear to be associated with climatic conditions

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- **SPG Recommendations**

Primary Goals of the CVCWA MeHg SPG

2. Provide information for the Statewide Mercury Provisions and Reservoirs TMDL

1. Meet the Delta MeHg TMDL Phase I Requirements

Delta MeHg TMDL Phase 1 Review

- Re-evaluate and/or modify the TMDL:
  - Goals;
  - Fish tissue objectives;
  - Linkage analysis;
  - Allocations and their attainability; and/or
  - Final attainment date.
- Modify implementation plan

CVCWA MeHg SPG Recommendations to Regional Board

- General
  - Reconvene a representative stakeholder group
- Linkage Analysis/Attainability
  - Establish a process to conduct a use attainability analysis
  - Utilize a mercury cycling model
- Waste Load Allocations
  - Maintain current facility-based WLAs, but allow for Delta-aggregate NPDES facility WLA

CVCWA MeHg SPG Recommendations to Regional Board

- Modify Implementation Plan
  - Reduce monitoring to annually
  - 5-year trend analysis once per permit term to confirm *de minimis*/insignificant source
  - NPDES Discharges will support (not lead):
    - Mercury-related public education outreach efforts
    - Goals and intent of the mercury exposure reduction program (MERP)
    - Delta Regional Monitoring Program
    - Development of a mercury offsets program

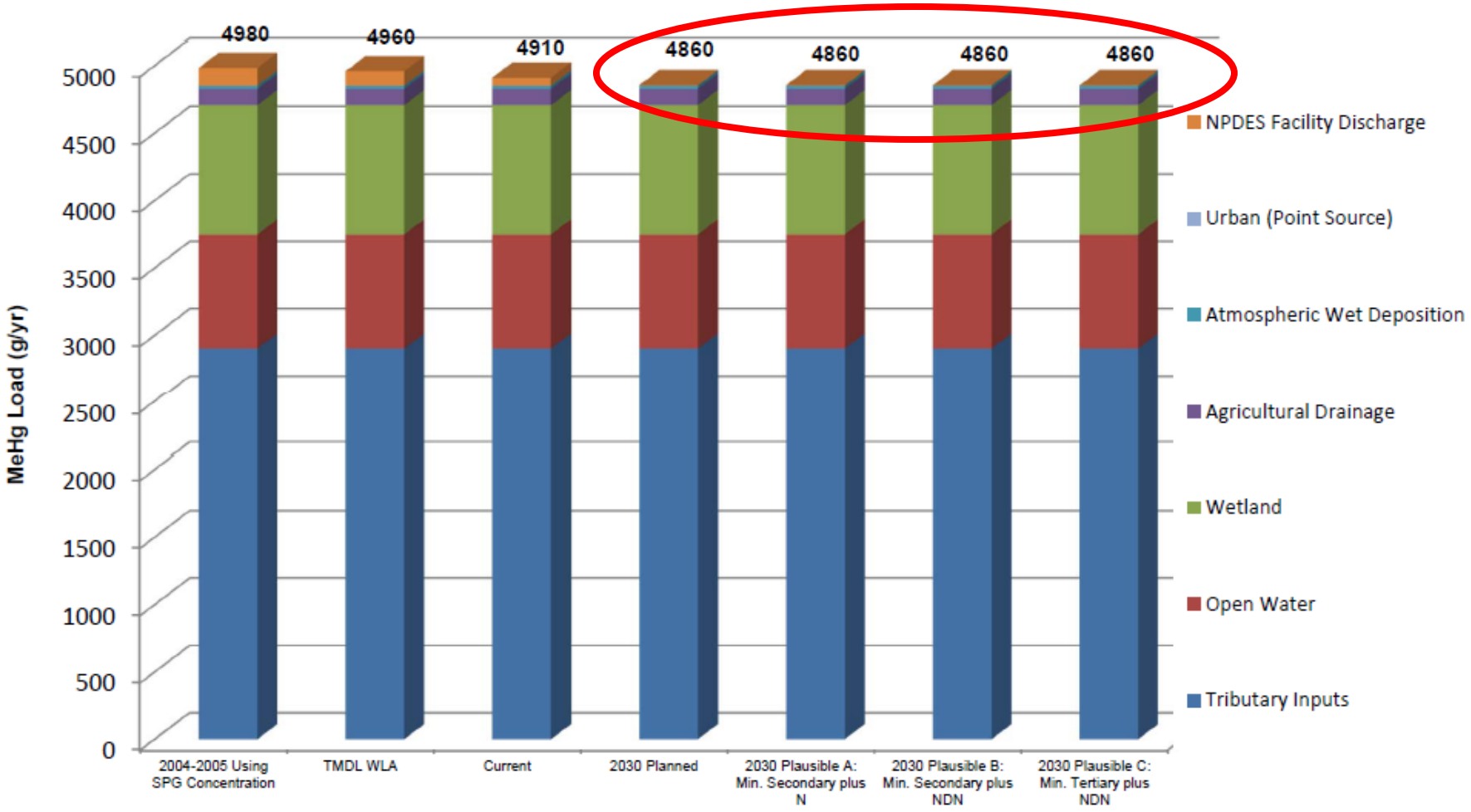
Recommendations – Preparing for the Future

	Delta Me Hg TMDL	Statewide Mercury Provisions
Geographic Coverage	Sacramento-San Joaquin River Delta Estuary	Statewide
New Beneficial Use(s)	COMM	CUL, T-SUB, SUB*
Tissue Objectives 150-500 mm	0.08 – 0.24 mg MeHg/kg	0.04 - 0.2 mg MeHg/Kg
< 50 mm (and 50 – 150 mm)	0.03 mg MeHg/kg	0.05 – 0.03 mg MeHg/Kg
POTW Limits	Annual load MeHg - g/yr Performance-based	Water column concentration Total Hg - 12 ng/L, 4 ng/L, 1 ng/L
Existing TMDLs	---	Recognition of existing mercury TMDLs

* - Narrative fish tissue objective

Questions?

Comparison of MeHg TMDL Project Area MeHg Loads at Varying SPG Facility Scenarios



Note: includes all NPDES Facilities within MeHg TMDL Project Area