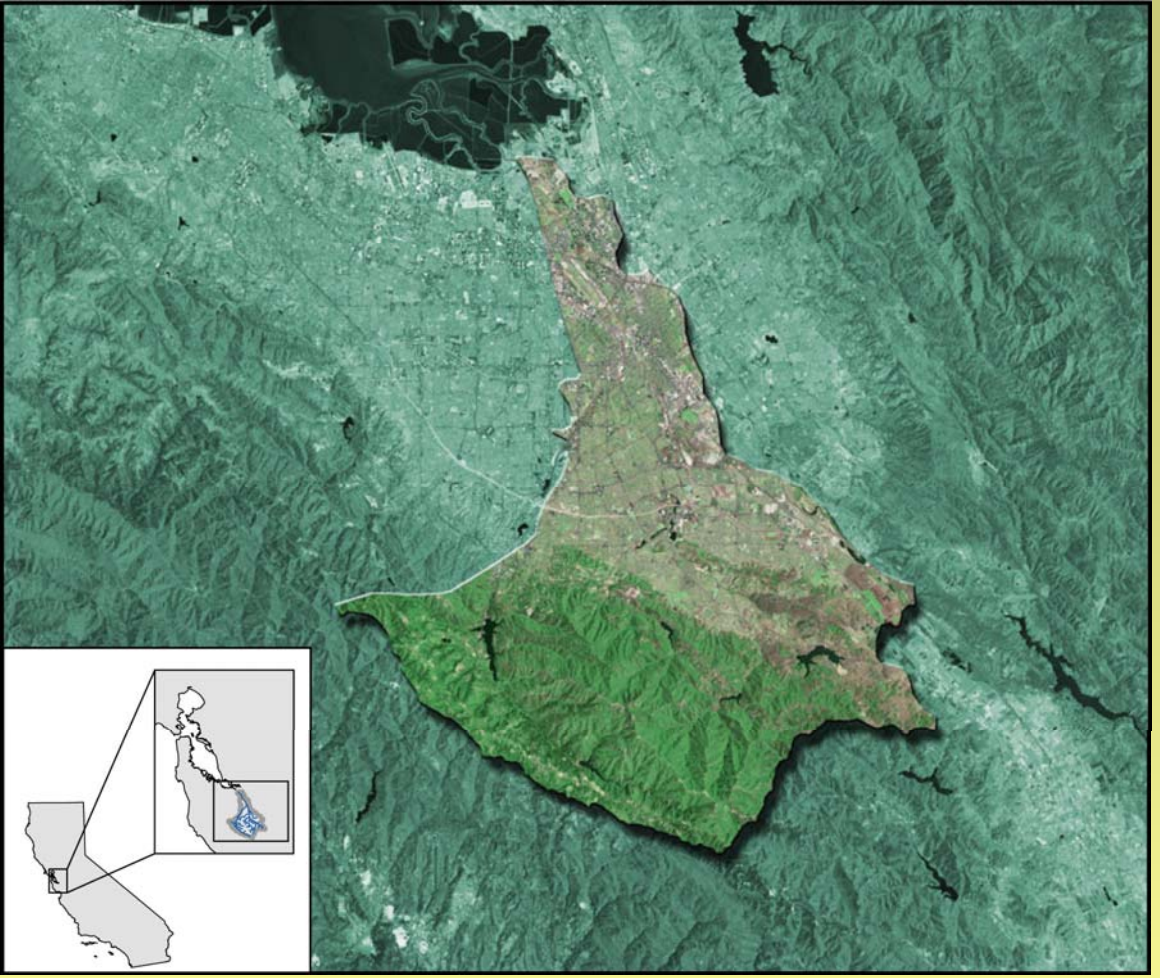

Guadalupe Watershed TMDL and Basin Plan Amendment

Michael F. Cox
New Almaden, CA
November 12, 2009

Based on materials from RWQCB Staff, 02/06, TetraTech, 3/10/2005, and USEPA National Fish Study, 2009.
Annotations and comments in red. Some text in original materials deleted or consolidated, but for brevity only.

Purpose of the TMDL and BPA Amendment

- **Protect wildlife and humans by reducing the concentration of methylmercury in fish**

Should the State Board approve the Guadalupe TMDL and the Basin Plan Amendment?

- No
  - Unfairly and arbitrarily allocates 98% load reduction to upland.
  - Drives wasteful erosion control measures that can't attain targets.
    - Total Hg target is not appropriate in upland areas.
  - Does not drive quantification of bioavailable mercury loads.
  - Voids water standard applicable to wastewater sources.
  - Advancements over the last five years find that MeHg production depends on very local biogeochemical and structural factors.
- Return the proposal to staff
  - Reconvene the Bay Mercury Council for full-court review.
  - Focus on targets and allocations that link strongly to effects on fish MeHg levels and can be demonstrated in real time.
  - Compare it to the other Hg TMDLs- they might be more direct, brief, and reasonable. Maybe no where near perfect, but better.

Bay Mercury Loads and Allocations – from Staff Presentation

SOURCE CATEGORY	EXISTING LOAD (kg/yr)	ALLOCATION (kg/yr)
Bed Erosion	460	220
Central Valley Watershed	440	330
Urban Runoff	160	82
Guadalupe River Mining Legacy	92	2
Atmospheric Deposition	27	27
Rural Runoff	25	25
Wastewater	20	20 → 14?
Dredging and Disposal	net loss	0 ≤ ambient concentration
TOTAL	1,220	706 → 700?

Why the disproportionate reduction goal for the Guadalupe River? Modern data suggests other sources are just as capable of causing "unsafe" fish. There is also the problem of the strong NATURAL gradient of sediment total mercury concentrations.

Avoid Driving Unnecessary Erosion Control

- **"Mining waste is the most significant source of the mercury bioaccumulation problem."**

- **The majority of known significant waste is either downstream (75%) or already covered and contained.**
- **Mine waste downstream is issue- about 1,350,000,000 Kg of waste discharged before 1935, 3,840,000 Kg of mercury**
  - **Can we really clean it up, or should MeHg controls be focus?**
- **Interpretation makes "mine waste" sediment in upland areas the dominant issue. Targets drive unnecessary erosion control.**
  - **Sediment is significant in reservoirs, but MeHg controls exist.**
- **There is no driver of effective monitoring of real-time conditions before and after restoration work.**
  - **Plan does not adequately account for daily load reduction.**

Achievable Targets – RWQCB Staff

- Should the TMDL goal be to restore to pre-mining conditions?
- Soil in New Almaden is naturally enriched in mercury, but very little cinnabar was distributed in creeks. [Based on what data?]
- Small areas of wetlands surely existed pre-mining, but there were no deep lakes.
- We affectionately refer to the reservoirs as “MeHg” factories, but we hypothesize much, much lower MeHg production pre-mining, and much lower bioaccumulation.
- Therefore, we calculated the targets.

Hypothesis:

low mercury bioaccumulation pre-mining

Because no impoundments! Like the Sulfur Creek and Walker Creek TMDLs, recognize higher total mercury background levels in upland areas at or near locations of natural mineralization. Test for natural background gradient! Recognize significant change after 1936.

Numeric Targets = "Fishable"

Table 5.3 Fish Targets (ppm methylmercury, wet weight)		
Protection of Wildlife		Protection of Human Health
TL3 Fish 50 – 150 mm	TL3 Fish 150 – 350 mm	Typical Size and Species of Fish Consumed
0.05 ppm	0.10 ppm	0.3 ppm
USFWS calculation		USEPA MeHg criterion

We defined "clean" by using established USFWS methods & USEPA MeHg criterion; we used the standard approach of estimating how much fish is consumed by the population [and then] calculating a safe MeHg dose for sensitive population; Division yields the safe fish mercury concentration

Is Lexington "fishable?"

Staff recalculated targets and found Lexington area is “safe,” so why isn’t this the target??

From Staff presentation:

Fishable:

- 40-cm Largemouth bass:
  0.6 ppm < 0.66 ppm TL4 human health target
- Age-1 Largemouth bass:
  0.09 ppm @ 89 mm length,
  equals 0.045 in TL3 < 0.05 ppm wildlife target
- Fish concentrations are highest near New Almaden, and lowest in…Los Gatos Creek and Lexington Reservoir.
- Conclusion: Mining Waste is the most significant source of the mercury bioaccumulation problem.” So use conditions in Lexington to establish allocations.

RWQCB Staff: **"**Because Lexington is "fishable", and therefore its median sediment [Hg] of 0.1 ppm is "safe" 0.1 ppm is the Mining Waste Allocation

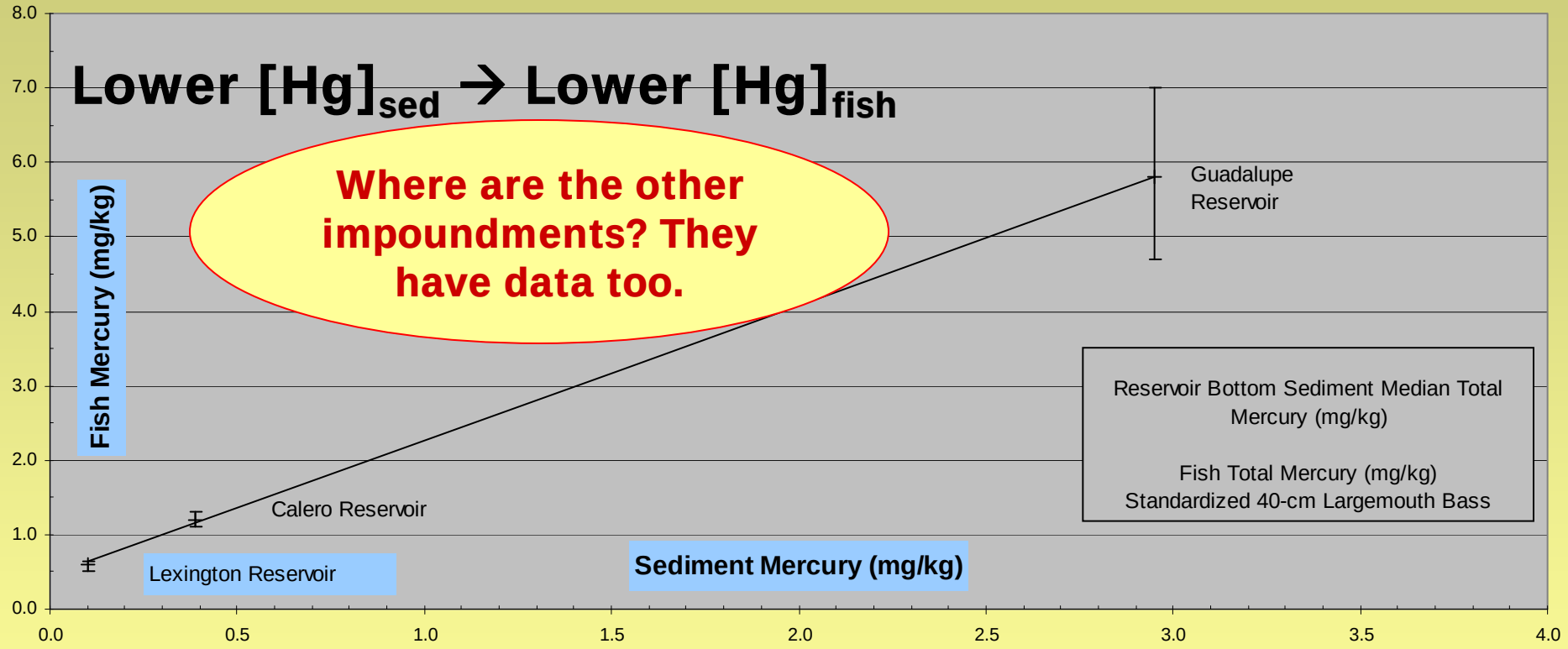

Chart not an adequate basis for 0.1 mg/Kg target. Could be "more impounded waste = more fish MeHg." California can make up its own rules, so Board has annotated the BPA and TMDL to declare that the proposed limits do not apply to "Los Gatos Creek and its tributaries upstream of Vasona Dam, Lake Elsman, Lexington Reservoir, and Vasona Lake."

USEPA National Lake Fish Tissue Study results relative to TMDL target?

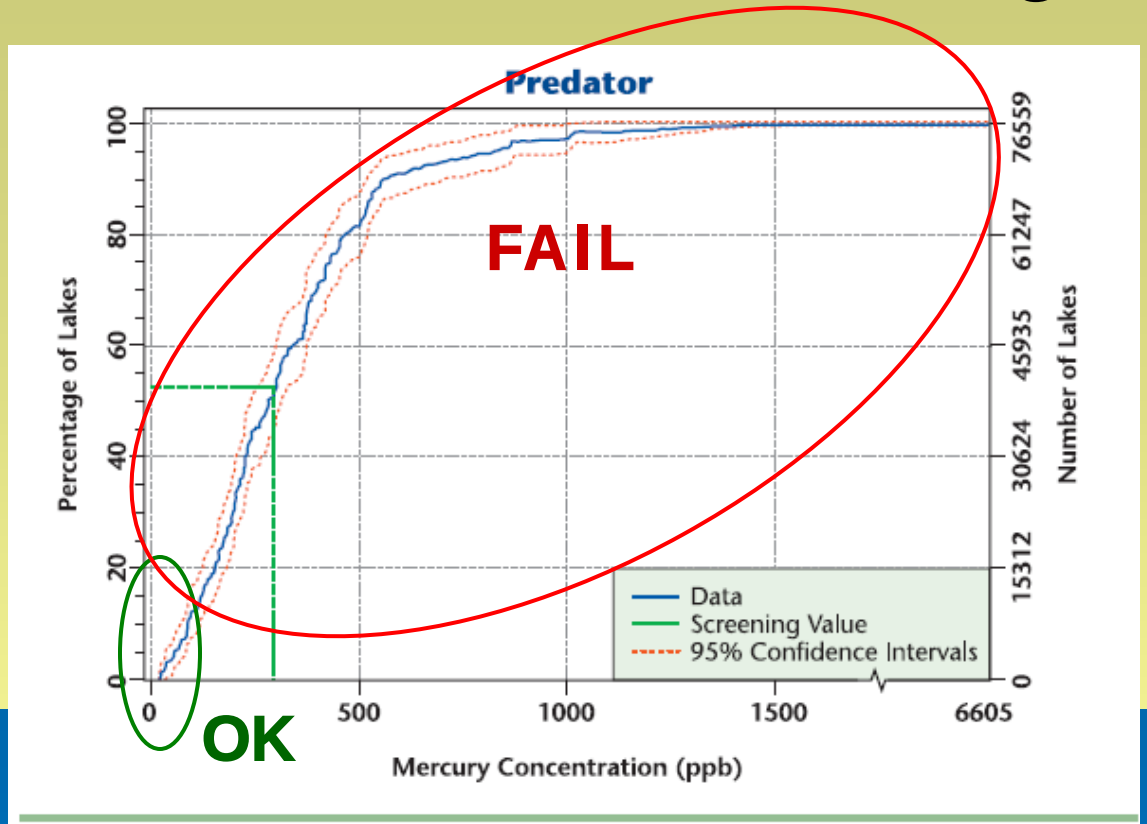

Figure 5. Cumulative distribution function of mercury concentrations in predator samples.

"48.8% of the sampled population of lakes exceed.. the 300 ppb (0.3 ppm) human health SV for mercury, ...a total of 36,422 lakes." At 100 ppb, 90% of the lakes out of 76559 sampled fail. Why? At 200ppb, it appears about 75% of the lakes exceed the goal (~57400 lakes).

Summary from Staff

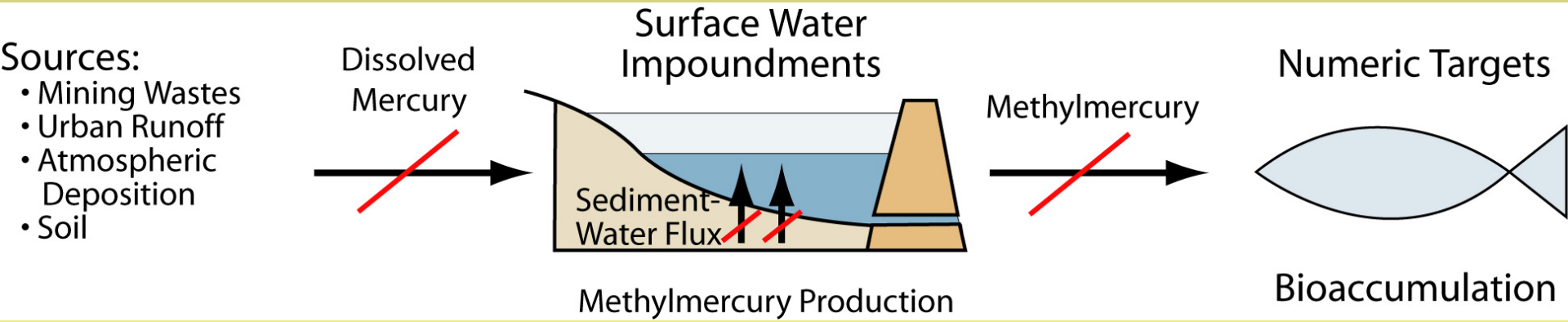

Figure S-1 Solving the Mercury Problem

Citation: figure prepared by Tetra Tech

"Stringent and Hopeful" according to Staff. "Unrealistic and Wasteful" is just as likely. MeHg exhibits significant variations depending on the source and local conditions. Singular targets and associated allocations based on weak extrapolations is too simplistic.

From Staff Presentation:

- **STRINGENT**
- **0.1 ppm mercury concentration [Now 0.2] from Lexington**
  - **This may be lower than natural mercury concentrations**
- **For this and other practicality issues, compliance evaluated by installation and maintenance of BMPs for erosion control**
- **BMPs are needed everywhere in New Almaden,**
  - **We've got an oversize figure in the Background section of the report which shows surface soil Hg concentrations**
- **And erosion control is also needed for mining waste downstream**
- **We need your input – how do we achieve downstream erosion control?**
  - **Ranges from flood control projects along Guadalupe River to private homeowners**
- **That was STRINGENT, now let's look at HOPEFUL - implementation**

CONCLUSION: "HOPEFUL" implementation is no substitute for an overly stringent and poorly supported set of targets and allocations. Why punish homeowners??