

Water Quality Standards and Assessments

Highest Attainable Condition Process

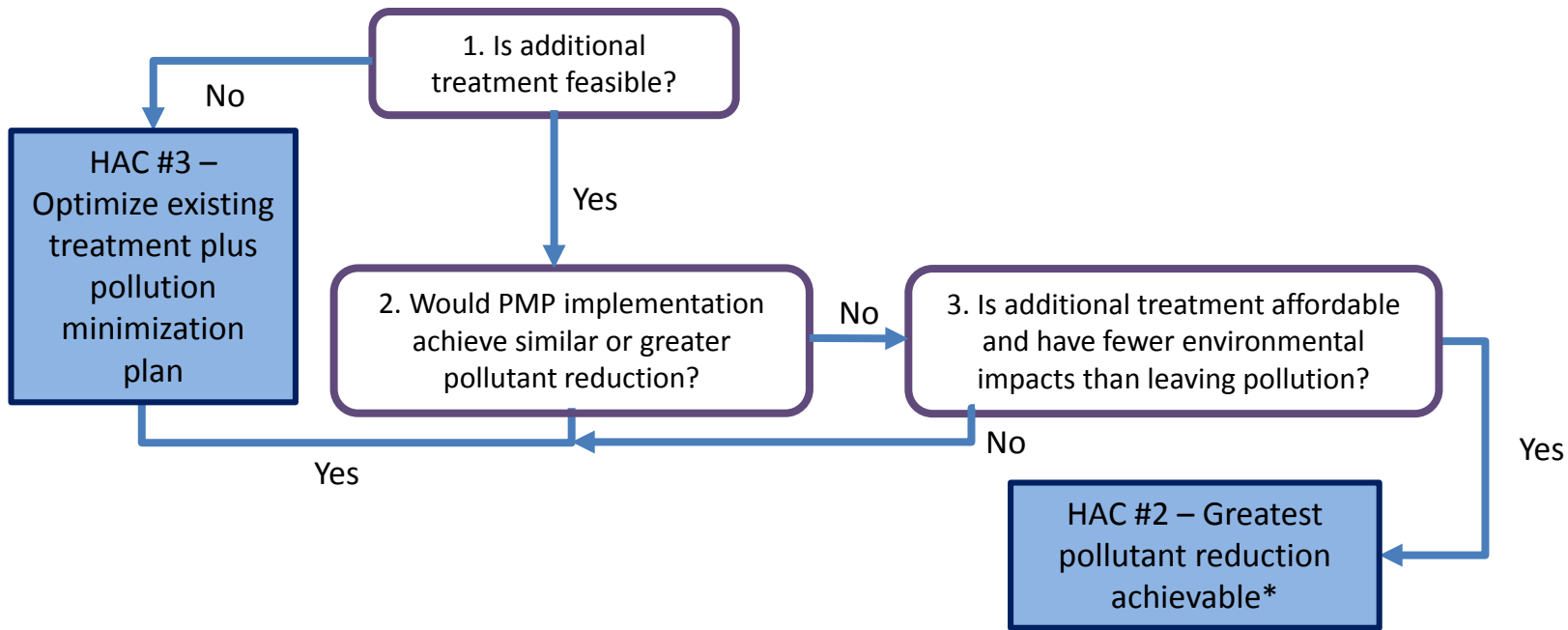
December 10, 2018
Willow Lake Pollution Control
Facility • Keizer, OR

Why is the HAC process necessary?

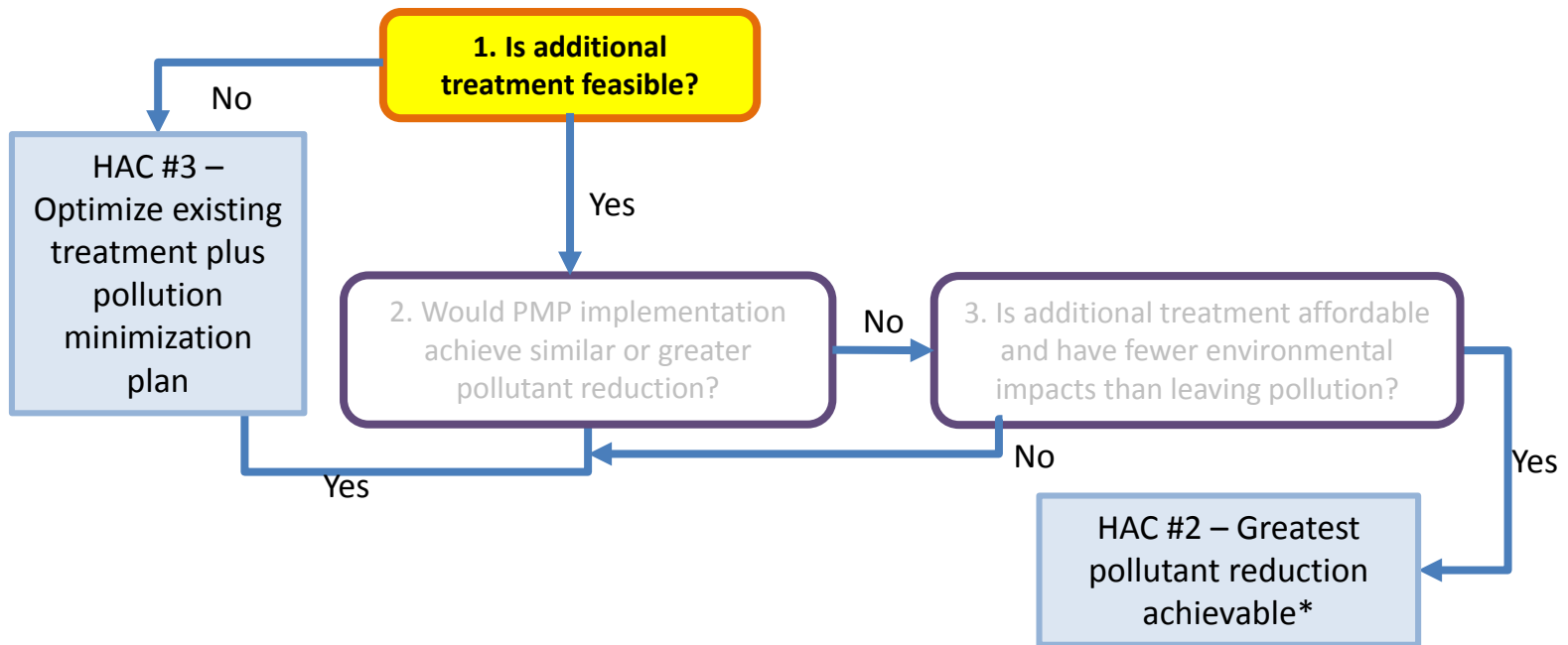
- Deliberate process to show that dischargers are removing as much Hg as feasibly process.
- Meet EPA requirements.
- Ensure predictability and accountability.

Overview

- MDV rule sets out process with procedures for determining HAC.
 - Determining how much detail goes in rule vs. companion guidance.
- DEQ determines HAC for each discharger based on treatment capability, history of MMP implementation, financial and environmental factors, etc.



* - may need compliance schedule

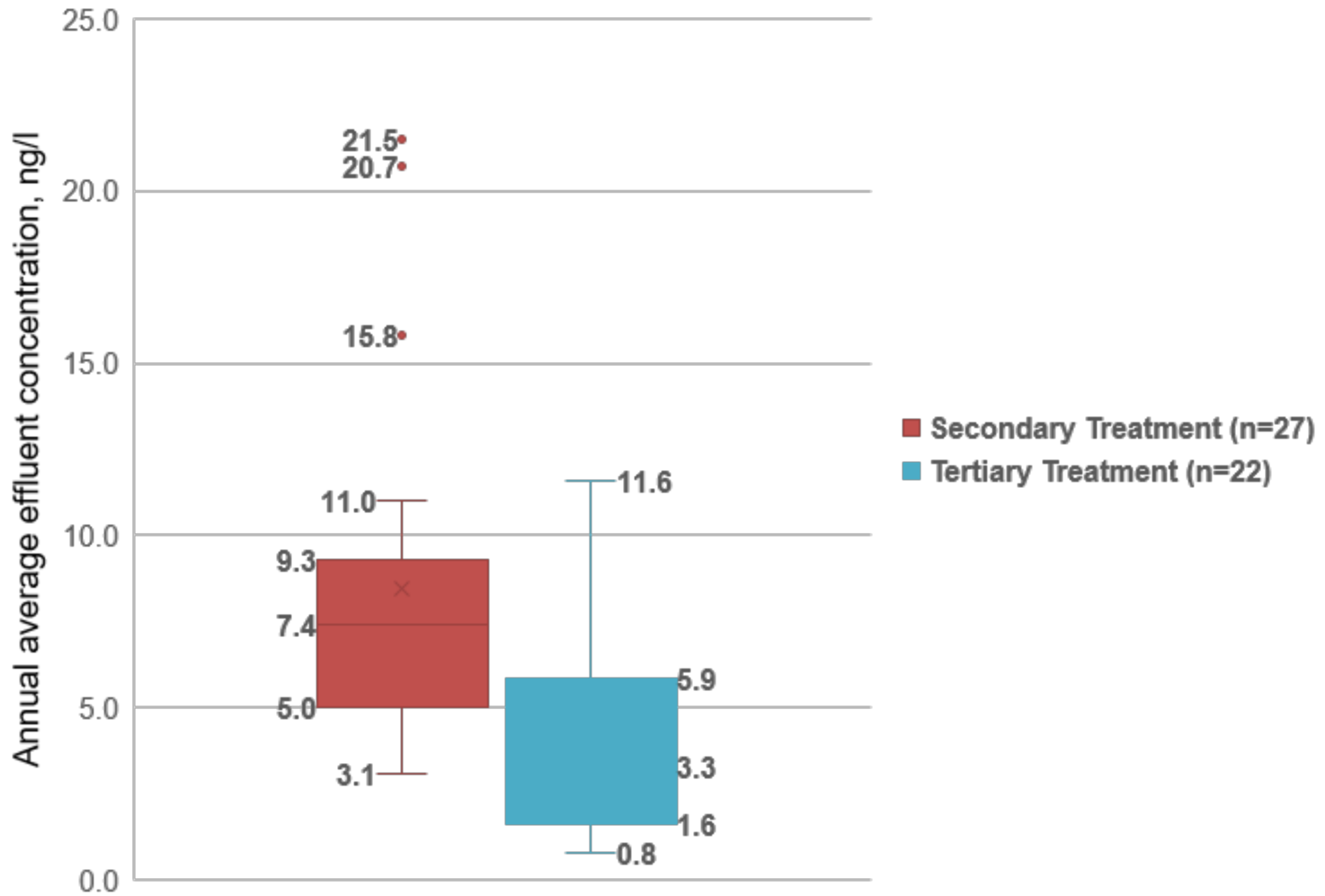


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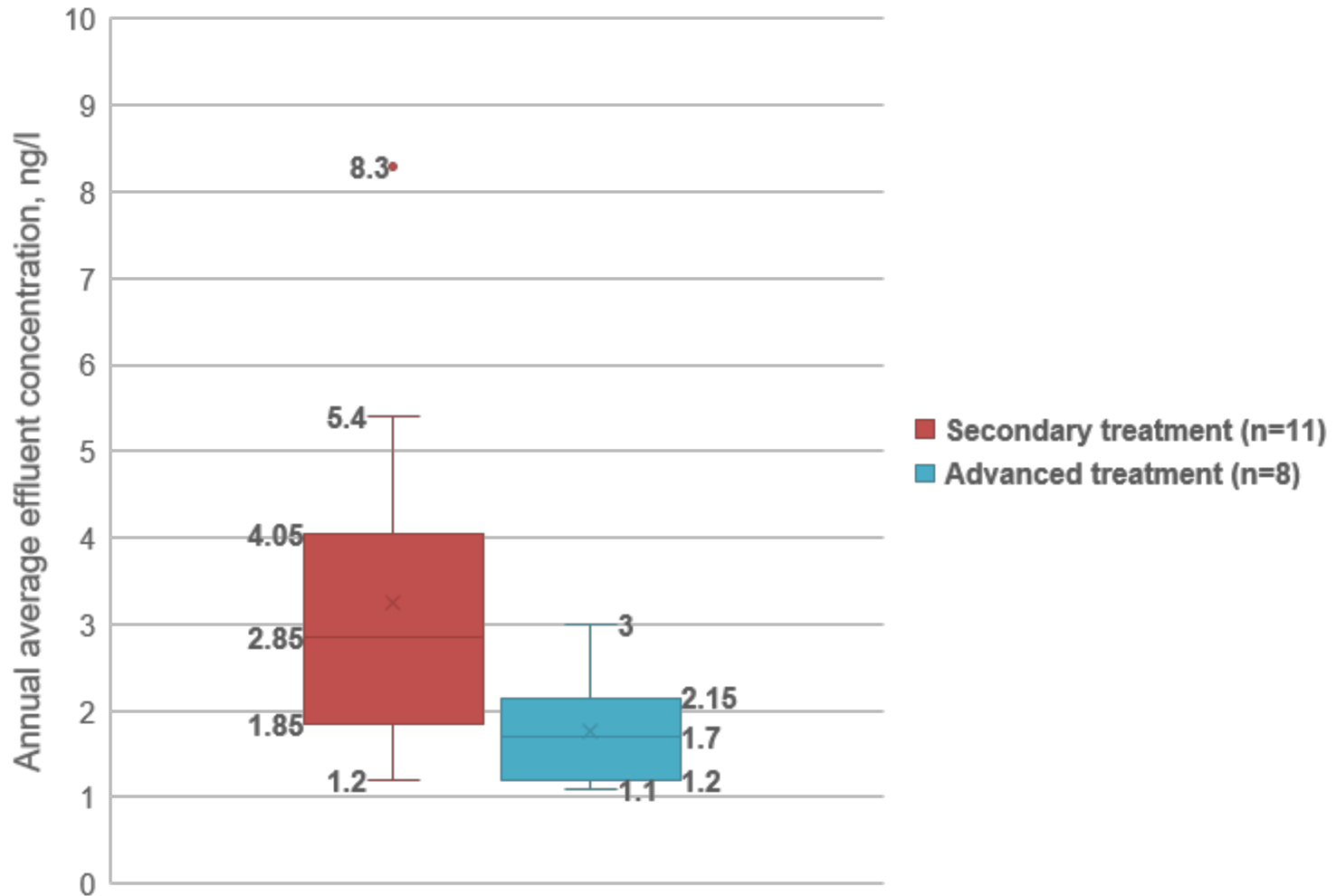
What treatment is technologically feasible?

- Conventional wastewater treatment
 - Secondary treatment
 - Advanced secondary treatment
 - Tertiary treatment
- Let's see what they can achieve...

Avg. Tot. Hg Effluent Conc., Sacramento Delta WWTPs, 2004-5



Avg. Tot. Hg Effluent Conc., Oregon Pretreatment WWTPs, 2016



Is other treatment feasible?

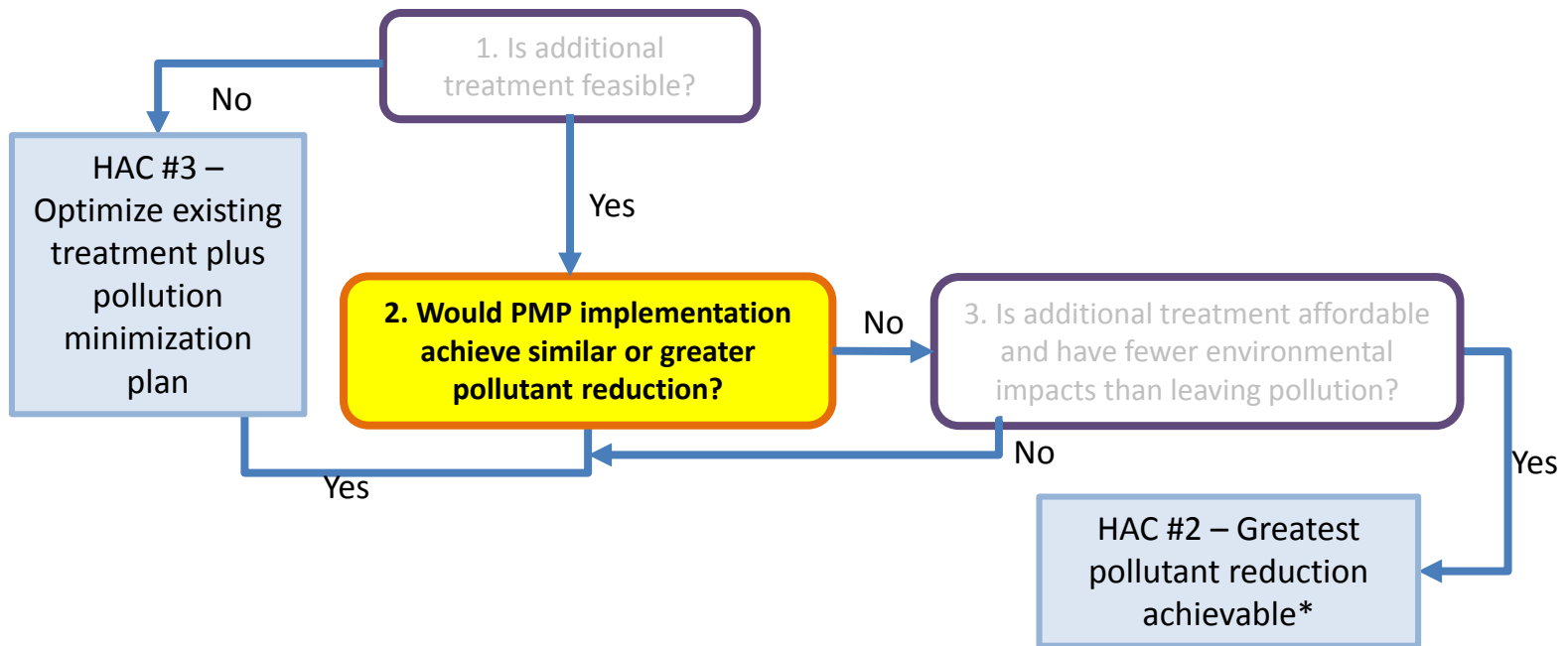
Study	Type of treatment facility	Tot. Influent conc. (ng/l)	Tot. Hg conc. (ng/l)	Notes
Ohio EPA	Precipitation (Chelator)	9,600,000	35	Not demonstrated at WWTP scale
Ohio EPA	Adsorption (Granular Activated Carbon)	44,000	300	Not demonstrated at WWTP scale
HDR	Tertiary Filtration/ Reverse Osmosis		0.12-1.2 hypothetically	Not demonstrated
HDR	Tertiary Filtration/GAC		0.12-1.2 hypothetically	Not demonstrated

^[1] Ohio Environmental Protection Agency – Division of Surface Water; Foster Wheeler Environmental Corporation; DRI/MdCraw-Hill. Assessing the Economic Impacts of the Proposed Ohio EPA Water Rules on the Ohio Economy. 1997

^[2] Treatment Technology Review and Assessment, Association of Washington Businesses, HDR, Dec. 2013.

Conclusions

- Advanced secondary treatment and tertiary treatment result in lowest Hg concentrations.
- Systems using advanced treatment will fit into HAC option 3.
- Systems with conventional secondary treatment or primary treatment will need additional analysis.
- Technology re-evaluation when re-evaluating variance.

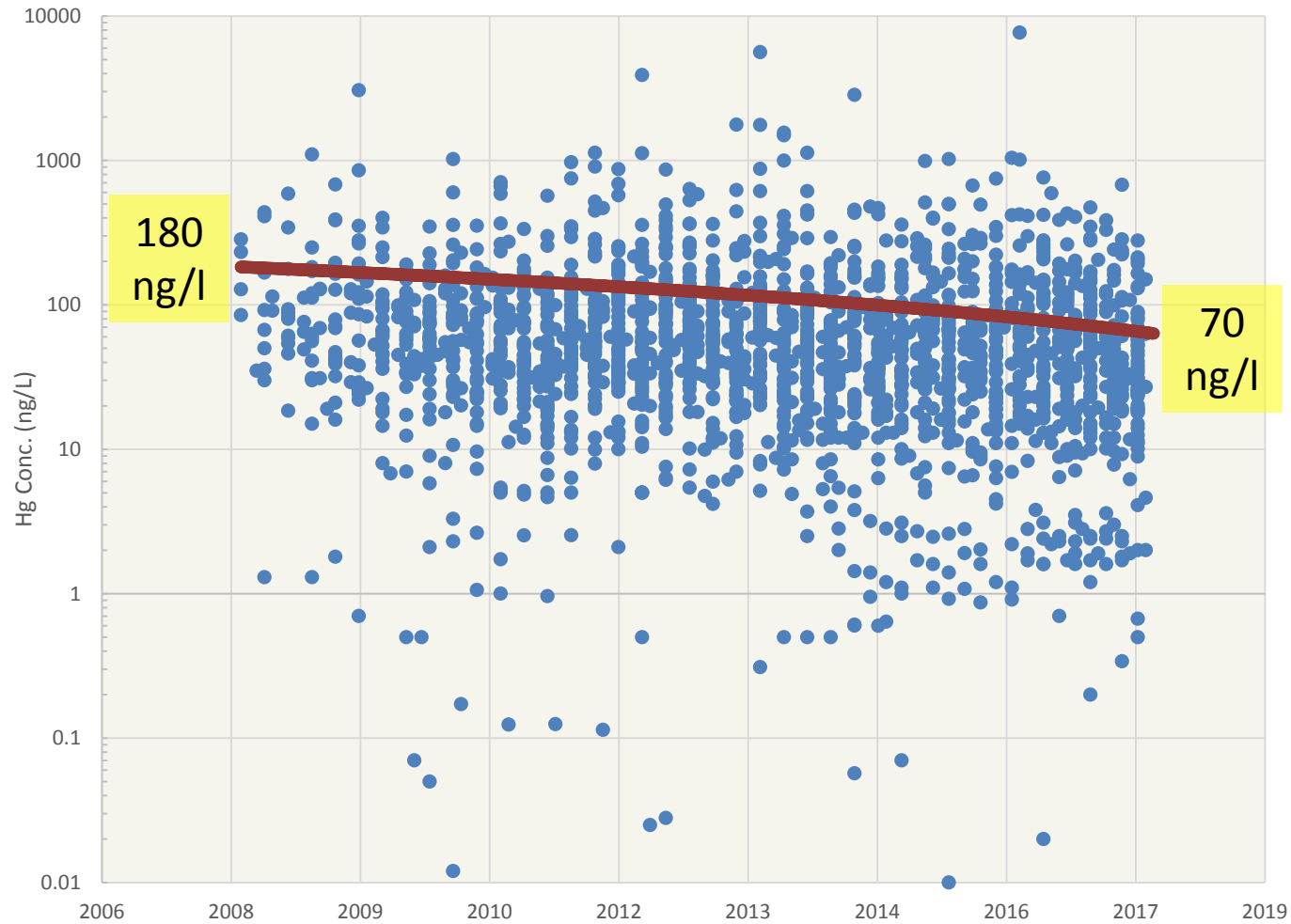


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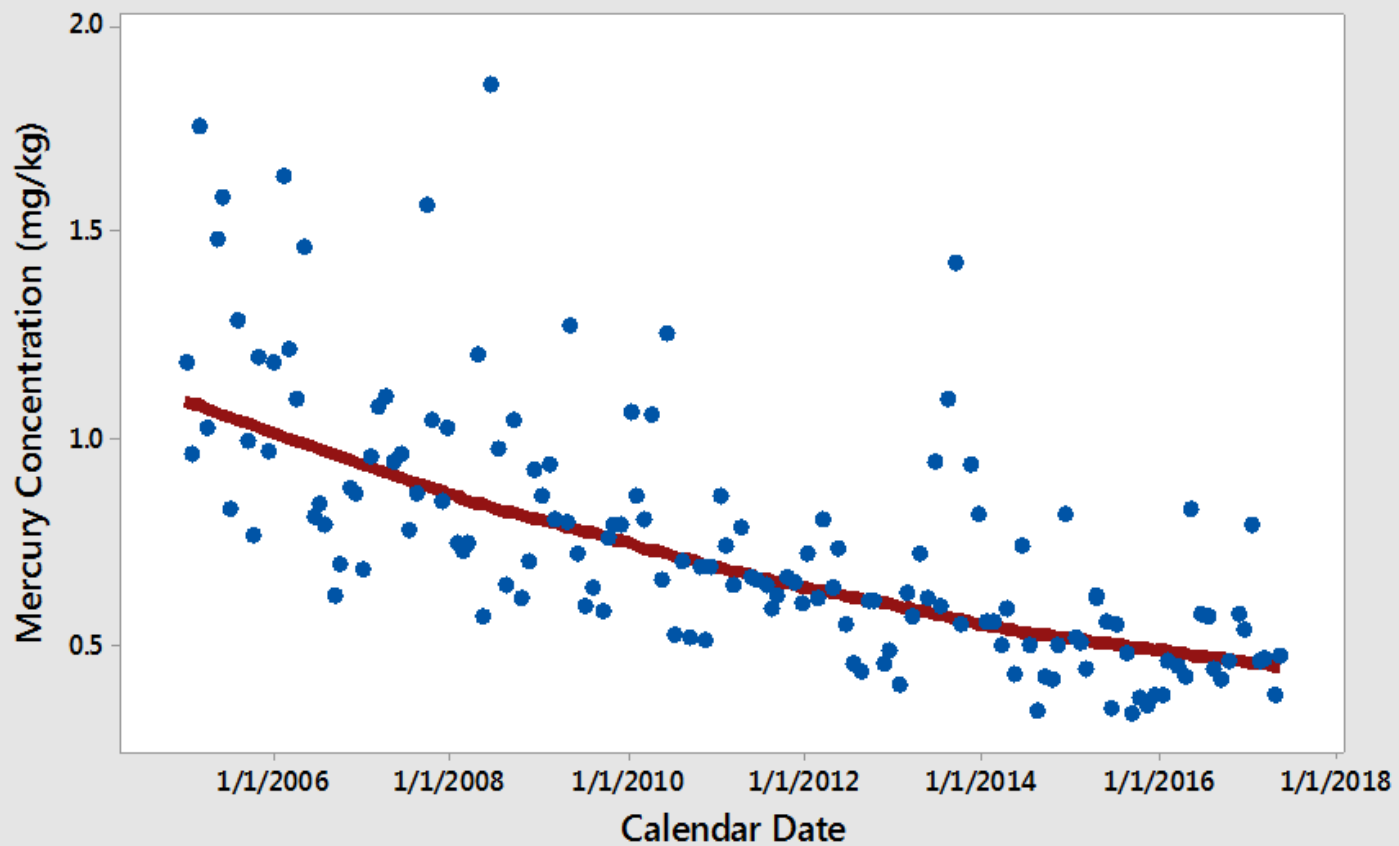
Would PMP implementation achieve greater or similar pollutant reduction than treatment upgrades?

- Some secondary systems already achieving effluent concentrations similar to advanced treatment.
- Source reduction (e.g., influent concentration) not fully correlated with effluent concentration.

Minnesota Influent Hg Concentrations 2008 - 2017

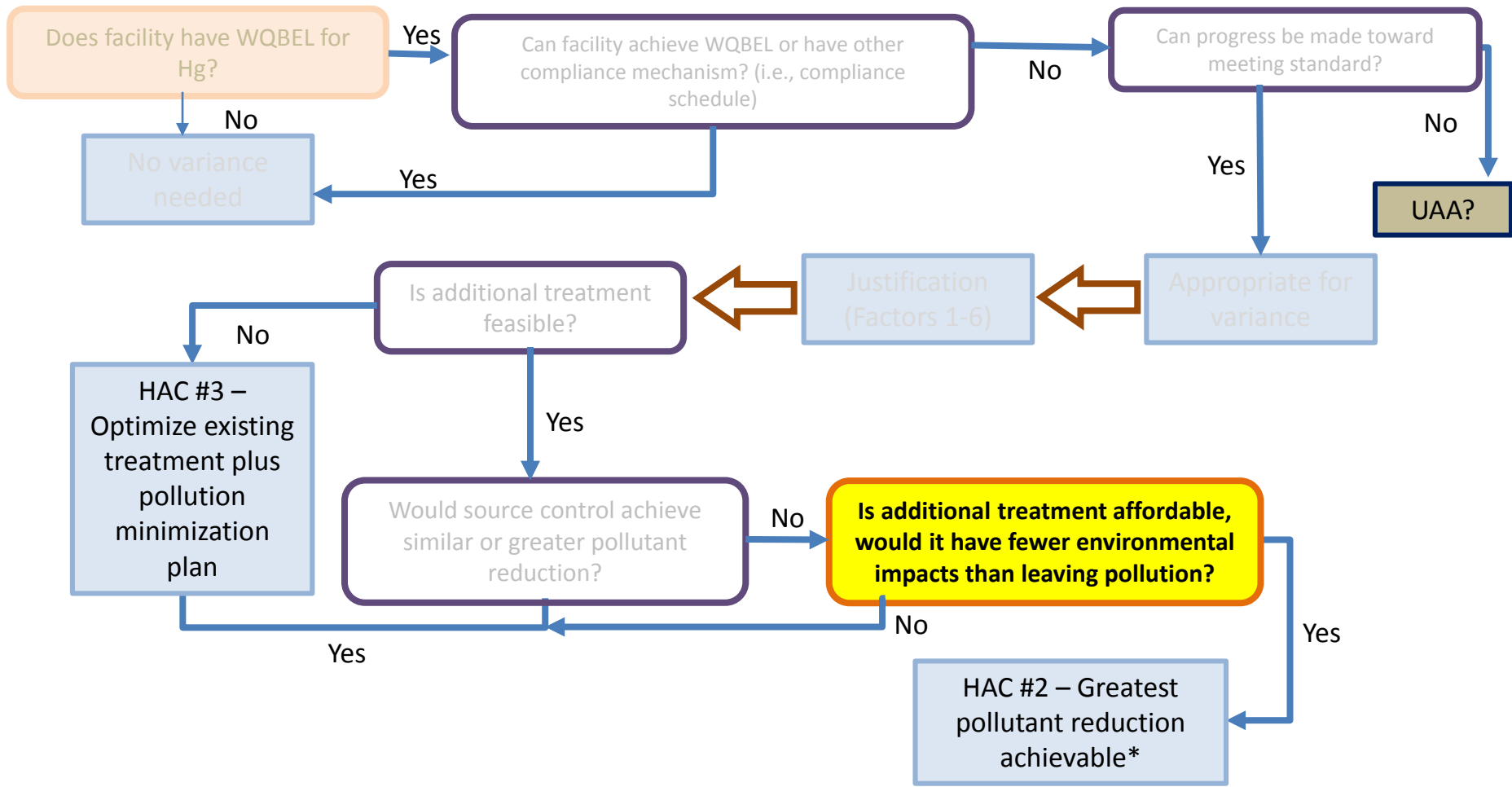


Rock Creek Biosolids Mercury Concentration



Would PMP implementation achieve greater or similar pollutant reduction than treatment upgrades?

- Extrapolate effect of source reduction based on prior data.
- Estimate effect of treatment upgrade based on similar facilities.
- Require facility to examine feasibility of upgrade as first term variance requirement.



* - may need compliance schedule

Economic feasibility

- Different test than “widespread and substantial economic impact.”
 - Treatment won’t meet standard, but make progress toward standard.
 - No EPA guidance.
- Working with EPA to determine options.

Environmental feasibility

- Variance factor: “...would cause more environmental damage to correct than leave in place.”
- Treatment upgrades result in more energy consumption
 - Secondary → Advanced/Tertiary doubles energy consumption on average
 - Upgrade to GAC or RO requires higher energy costs.
- Additional waste disposal
 - Land apply or landfill

Multiple lines of evidence

- PMP implementation often less expensive and is possibly more effective than treatment.
- Economic and environmental costs vs. marginal removal of mercury.

Questions and discussion



Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.