DATE: April 29, 2019

TO: Clean Water Services Advisory Commission (CWAC) Members and Interested Parties

FROM: Mark Jockers, Government & Public Affairs Manager

SUBJECT: **REMINDER OF AND INFORMATION FOR MAY 8, 2019 CWAC MEETING**

This is a reminder of the Clean Water Services Advisory Commission (CWAC) meeting scheduled for **Wednesday, May 8, 2019** at the District's main office, 2550 SW Hillsboro Highway. The CWAC meeting packet will be mailed to Commission members on May 1 and posted to Clean Water Services' website at CWAC section of our website.

Dinner will be served for CWAC members at 5:30 p.m. **Please call or send an email to Mark Jockers (JockersM@cleanwaterservices.org; 503.681.4450) if you are unable to attend** so food is not ordered for you.

Enclosures in this packet include:

- May 8 Meeting Agenda
- March 13 Meeting Notes

Clean Water Services Advisory Commission

May 8, 2019

AGENDA

6:30 p.m. **Welcome & Introductions**

6:35 p.m. **Review/Approval of Meeting Notes of March 13, 2019**

6:40 p.m. **Budget Committee Report**

The Budget Committee, comprised of the Board of Directors and five CWAC members, met on May 3, 2019 to review CWS' proposed budget. Staff and committee members will provide a report on the meeting and its outcome.

6:55 p.m. **Design and Construction Standards Update Fall 2019**

At the April 2, 2019 meeting, the Board of Directors adopted revised Design and Construction Standards regarding hydromodification. The Board also directed staff to present a plan for evaluating potential further revisions. At the April 16, 2019 Work Session, the Board renewed CWAC's charge to act as a sounding board and provide input to staff regarding revisions to the Design and Construction Standards that are expected to come before the Board in Fall 2019. Staff will provide CWAC with an update on the Board's charge and the scope and schedule for the Fall 2019 Standards Amendments.

- Nora Curtis, Managing Director, Utility Operations & Services
- Damon Reische, Development Services and Systems Planning Division Manager

Requested action: R*eview and input*

7:40 p.m. **Leaf Program Report to the Board**

On April 23, 2019, staff briefing the Board of Directors on CWAC review and recommendations for the Leaf Program. Staff will provide a report on the Board discussion.

- Nora Curtis, Managing Director, Utility Operations & Services

Requested action: *Informational item*

7:50 p.m. **Announcements**

8:00 p.m. **Adjourn**

Next Meeting: June 12, 2019

Clean Water Services
Clean Water Advisory Commission

Meeting Notes

March 13, 2019

Attendance

Attending the meeting from CWAC:

- Commission Chair Tony Weller (Homebuilder-Developer)
- Nafisa Fai (District 1/Schouten)
- Molly Brown (District 2/Treece)
- Commission Vice Chair Mike McKillip (District 3/Rogers)
- Andy Duyck (District 4/Willey)
- John Jackson (Agriculture)
- Judy Olsen (Agriculture)
- Stu Peterson (Business)
- Kris Balliet (Environmental)
- Matt Wellner (Homebuilder-Developer)
- Diane Taniguchi-Dennis
  (Clean Water Services Chief Executive Officer (non-voting)
- David Waffle (Cities/non-voting)

Absent:

- Art Larrance (At-Large/Harrington)
- Lori Hennings (Environmental)
- Kevin Wolfe (Business)

Attending the meeting from Clean Water Services:

- Mark Jockers, Government and Public Affairs Manager
- Nora Curtis, Conveyance Systems Department Director
- Damon Reische, Planning and Development Services Division Manager
- Raj Kapur, Water Resources Program Manager
- Tom VanderPlaat, Water Supply Project Manager
- Ken Williamson, Director of Regulatory Affairs
- Bob Baumgartner, Regulatory Affairs Department Assistant Director
- Gerald Linder, General Counsel
- Shannon Huggins, Public Involvement Coordinator
- Stephanie Morrison, Executive Assistant
- Anne MacDonald, Senior Water Resources Program Manager

1. Call to Order
Mr. Weller called the meeting to order at 6:30 pm in the Tualatin Room at the Clean Water Services (CWS) Administration Building Complex in Hillsboro, Oregon.

2. Previous Meeting Notes
There were no comments regarding the notes from the last meeting, February 13, 2019.

3. Design and Construction Standards Update
Mr. Reische discussed the update to the Design and Construction Standards (Standards), which is a requirement of the CWS 2016 Watershed Based Permit **(presentation attached)** and needs to be adopted by April 22, 2019. The final element of the updated standards addresses new, post-development stormwater management requirements. Mr. Reische provided an update on stakeholder outreach and input gathered since the February CWAC meeting and outlined the proposed adoption schedule.

Questions and comments related to the Standards update are in Appendix A.

Mr. Reische reviewed the publication dates of sections of the Standards shown on Slide 4. On March 14, 2019, CWS will publish the latest changes to chapters 1, 2 and 4 to address hydromodification. Those are the only parts of the Standards that CWS is proposing to change at this time.

Chapter 1 has new and modified definitions relating to stormwater management and hydromodification. Chapter 2 adds submittal requirements relating to the new standards for hydromodification. The bulk of changes are in Chapter 4. The chapter has been reorganized and hydromodification requirements have been added. There are no changes to requirements for water quality, conveyance capacity, or what qualifies as a public verses private facility.

CWS has been busy with outreach since the CWAC meeting on February 13. Ms. Curtis attended the Westside Economic Alliance meeting on February 20. Ms. Curtis and Mr. Reische met with the Homebuilders Association on February 22 and received feedback on the February 14 release of the Standards. A variety of stakeholders including interested ratepayers, members of the development community, environmental advocates and representatives from co-implementing jurisdictions attended a general stakeholder meeting in Hillsboro on February 22. CWS updated the Washington County Board at a work session on February 26 and a public hearing is scheduled for March 26, 2019.

CWS has received more than 250 comments since the first release of the base strategy on January 4 from 15 to 20 entities and individuals.

Many comments were received regarding the facility sizing methodology using the TRUST tool to size ponds when the initial base strategy was released in January. In response, CWS changed the pond sizing methodology to use peak matching, an approach that's common in the Portland metropolitan area for the February 14 draft. More recent, there have been comments expressing a desire to have allowances that minimize the footprint of BMPs.

Fee-in-lieu (FIL) generated a lot of questions: How broadly will it be allowed? How much is it? How will the money collected through FIL be used? There were also comments about the thresholds between small, medium and large projects.

CWS made several changes in response to the feedback:

- Allow reduction of treatment surface area when increasing the depth of planting media from 18 inches to 30 inches. Increasing the depth of planting media provides additional storage volume and detention that allows the footprint of the LIDA facility to be reduced.
- Allow the co-location of quality and quantity approaches. Co-location hasn't been prohibited, but there was confusion about the extent it has been allowed. Applicants can incorporate water quality in facilities that also have detention. It's happening in North Bethany and River Terrace.
- Further simplify the sizing method for redevelopment and hydromodification. CWS set a runoff curve number of 75 for the calculation.
- Increase threshold for using actual impervious area for sizing individual residential lots to 2,500 square feet.
- Update the mapping tool to address some gaps in risk levels.

Mr. Reische reviewed the process to determine stormwater management categories. There are three things an applicant must know to determine what category a project falls into and therefore what stormwater management approaches are available for use on that project— site size, risk level and development class.

Category 1 applies for all small projects. Applicants can choose FIL or LIDA, or applicants can bypass the simplified sizing method in favor of an engineered sizing method.

Category 2 requires the use of engineering sizing methodology for LIDA facilities and other facilities (e.g., ponds). The post-development, two-year storm peak flow must match 50 percent of the pre-development two-year storm peak flow. Five- and 10-year post-development storm peak flows must match pre-development 5- and 10-year peak flows.

The flows are determined by an engineering calculation. Applicants calculate the rainfall and volume of runoff that's created by a site before development, then do the calculation for the site after development. Applicants must then provide stormwater management approaches to manage the difference in volume and rate of runoff between the pre-development and post-development conditions.

The challenging part of this requirement is matching the post-development two-year storm peak flow to 50% of the pre-development two-year storm peak flow.

Category 3 adds a requirement to have at least 30 percent impervious area of site managed with LIDA facilities (above ground, vegetated facilities).

Mr. Reische discussed project size thresholds (slide 9 of the presentation). Data for five years from Hillsboro and unincorporated Washington County was used in the analysis. Large projects, 80,000 square feet and greater, account for approximately 65 percent of all impervious area created from the data set. Medium sized development, 12,000 to 80,000 square feet, in combination with the large development category, accounts for approximately 93 percent of all impervious area created. That leaves 7 percent of impervious area created by projects in the small project category.

Comments from the development community reflect concern about the middle category, especially infill projects and the challenge of providing onsite mitigation for hydromodification. CWS has received requests to change thresholds on both sides. The development community would like to raise the project size threshold where FIL is allowed at the developer's option to allow more developments to have that choice. The environmental community would like to lower the threshold so that more developments would have to provide onsite mitigation. Rather

than changing the thresholds, CWS tried to create language to allow potential use of FIL where an analysis can show that the risk to the receiving stream is low.

FIL as an amount is not listed in the Standards; it's listed in Rates and Charges, which will go to the Board in June.

As a starting point for determining the FIL rate, CWS analyzed cost estimates for a wide range of stormwater management approaches, from a planter to a large detention pond to stream restoration. CWS tried to pick something in the middle. The current draft FIL rate proposal is $1.50 per square foot to address both water quality and hydromodification requirements. There's a discount of a third off, from $1.50 to $1, if a project provides either water quality or hydromodification (but not both) onsite.

Mr. Reische said that although CWS will continue to take comments up until the public hearing on March 26 staff preference is to receive and work through comments in advance rather than waiting until the hearing. Ms. Curtis said CWS does not anticipate asking CWAC to moderate or mediate.

The version of the Standards that will go to the Washington County Board will be posted to the website on Thursday, March 14.

4. Water Quality Standards: Focus on Mercury

Mr. Kapur offered an overview of water quality standards related to mercury, sources of mercury and actions that Clean Water Services is taking to reduce mercury levels in the Tualatin River basin **(presentation attached)**.

Questions and comments related to mercury standards update are in Appendix B.

CWS's approach to mercury is a bit different than traditional water quality standards.

Mercury is a naturally occurring element found in the earth's crust and in coal deposits. It exists in liquid and gas states. There are two primary forms: organic (fish) and inorganic or elemental (air and water). The organic form found in fish tissue is of most concern because it's a neurotoxin with a number of health effects. The build-up, or bioaccumulation, of mercury affects the nervous system. It impairs hearing, speech and vision and causes a number of other health effects. Inorganic mercury is toxic at very high doses; methyl mercury, the organic form in fish tissue, is toxic at very low doses.

Methyl mercury bioaccumulates with the highest levels in organisms at the top of the food chain. The primary pathway for methyl mercury to accumulate in humans is through the consumption of fish.

In 2011 DEQ updated water quality standards for mercury. The mercury criteria is 0.04 mg/kg of methyl mercury in fish tissue. The criteria is expressed as fish tissue criteria, based on a fish consumption rate of six ounces a day over a lifetime.

There are varying levels of mercury in fish tissue; the level is based on the trophic level. The northern pike minnow is the highest trophic level resident fish in the Willamette River basin and has the highest concentrations of methyl mercury. Mercury levels in anadromous fish are much lower than resident fish.

To meet the fish tissue criteria of 0.04 mg/kg in northern pike minnow, DEQ has determined that the target in-stream concentration of mercury is 0.14 ng/L.

An analysis of the Willamette Basin conducted by EPA and DEQ suggests that 98 percent of mercury contributions in the Willamette Basin are from air deposition from global sources. The mercury from air deposition is then conveyed into streams from surface runoff, sediment erosion and groundwater. Most of the mercury deposited in Oregon is from Asia.

Mercury is released into the environment mostly through the burning of coal, and artisanal and small scale gold mining. It can have a long atmospheric lifetime (six months - two years), resulting in widespread global dispersion. Mercury gets transported, deposited and transformed into methyl mercury, which then bioaccumulates in fish tissue. Humans are exposed to mercury primarily through the consumption of fish.

CWS has a watershed-based NPDES permit issued under the Clean Water Act. The permit includes requirements to implement a mercury minimization plan and to conduct monitoring for mercury at the treatment plants and in the Tualatin River.

About one percent of the mercury found in the Willamette River Basin comes from municipal wastewater treatment facilities. Where does it come from? A 2008 EPA report estimated that 50 percent of the nation's mercury in municipal wastewater comes from the dental sector. (That's 50 percent of the one percent.) In 2011, Oregon adopted a statute requiring amalgam separators to reduce the amount of mercury entering the treatment facilities. More recently, EPA developed national standards requiring the use of amalgam separators at dental offices.

Other sources of mercury are hospitals, labs, human waste, laundry graywater and household products such as toothpaste, shaving cream, toilet tissue and condiments. Certain industrial processes, such as the chlor-alkali process for the production of chlorine, use or generate mercury

CWS developed and is implementing a comprehensive mercury minimization plan. The key elements are dental surveys and inspections; industrial assessments; targeted outreach to schools, healthcare facilities and commercial laboratories; and education and outreach to the general community. CWS also monitors for mercury in the influent, effluent and biosolids at the treatment facilities. The strategies are effective. Treatment facilities regularly remove more than 95 percent of mercury. The influent concentrations at each treatment facility range from 65 ng/L to about 100 ng/L, likely reflecting source contributions. Effluent concentrations at all treatment facilities are consistently 2-3 ng/L. Influent mercury concentrations at the CWS treatment facilities have decreased significantly as a result of the mercury minimization activities. Mercury concentrations in biosolids produced at the Durham and Rock Creek treatment facilities have declined as well.

As with most municipalities in Oregon, CWS land applies its biosolids for beneficial use and takes a number of precautions to ensure land application does not result in environmental impacts. Precautions include land application at agronomic rates, avoiding areas with high slopes and adhering to setback requirements from sensitive areas.

CWS conducts a robust monitoring program in the Tualatin River. There is no change in mercury levels in the river, suggesting the source is fairly diffuse and uniform throughout the watershed. There is no change in river concentrations below the treatment facilities, which suggest treatment plants have little effect on mercury levels in the river.

Mercury is complicated to analyze and part of the challenge is measuring at the nanogram per liter range – parts per trillion. Those are very low levels.

CWS treatment plans are very good at removing mercury, reaching levels of 2-3 ng/L. DEQ's target mercury level in the Willamette River Basin is much lower — about 0.14/ng/L. CWS

conducted a literature review to find technology capable of reaching the DEQ target. CWS evaluated chemical precipitation, membrane filtration and reverse osmosis and found there is no viable treatment technology that is mature and being used at a scale of a municipal treatment facility that would meet the target mercury concentrations.

The existing biological treatment already in use at CWS is as good as emerging technologies, particularly given the low influent concentrations at municipal treatment facilities. Any resulting reduction in a facility's mercury discharges would have no effect on the mercury concentration in the river because municipal treatment facilities contribute a very small percent of the overall mercury load to the Willamette River Basin.

CWS believes and DEQ agrees that CWS is doing all that can be done to reduce mercury levels into the environment. CWS is looking for an appropriate permitting pathway under the Clean Water Act and has applied for a variance.

NPDES permits issued under the Clean Water Act must assure compliance with water quality standards. In the case of mercury, the water quality standard cannot be met. A variance is a tool — a temporary waiver — that allows an agency to issue a permit in circumstances where the water quality standard cannot be met. It is granted by DEQ and requires EPA approval.

When DEQ adopted human health standards based on a high fish consumption rate, it was aware that municipal facilities would not be able to meet the water quality standard for some pollutants and anticipated there would be variance applications. DEQ and EPA agree a variance is appropriate approach for mercury.

CWS applied for a variance to the water quality standard for mercury for each of its four treatment facilities. It noted in the applications that mercury is a naturally occurring pollutant concentration and human-caused conditions that cannot be remedied prevent attainment of the standard. DEQ is using the CWS application as a model for other facilities in the Willamette River Basin.

DEQ and EPA are reviewing them the applications; CWS expects a variance later this year.

5. Tualatin Basin Dam Safety & Water Supply Joint Project

Mr. VanderPlaat provided an overview of the Joint Project status, schedule and upcoming milestones including project options, environmental review work, fish passage waiver request and schedule for the selection of an engineering preferred alternative **(presentation attached)**.

Questions and comments related to the Dam Safety and Water Supply Joint Project are in Appendix C.

Hagg Lake holds about 60,000 acre/feet of water. Tualatin Valley Irrigation District controls half the water and CWS owns about 25 percent, about 12,000 AF.

CWS and the Bureau of Reclamation have shared goals on the project — protect public safety, secure the basin's primary water source and meet future water needs for the region.

CWS used all its water allocation in 2015 and came close in 2018. Historically, the need to release water begins around July 1. The past several years, water has been released in mid to late May and with releases continuing into November.

After becoming aware of the threat of the Cascadia Subduction Zone earthquake in 2008, Reclamation began studying how to modify Scoggins Dam to withstand a 9.2 earthquake for 200 seconds. Although safe and operating as designed, Scoggins Dam—like much of the infrastructure in the Pacific NW—was not constructed to withstand a major earthquake.

The Joint Project is examining three conceptual options for dam safety modifications at two location:

Option 1: Modify the existing dam

Option 2: Modify and raise the existing dam to provide additional 21,000 AF of storage

Option 3: Construct a new roller compacted concrete dam downstream of the existing facility to provide an additional 50,000 AF of storage.

Building a new dam downstream may be more cost effective than repairing the existing facility. The existing dam is 2700 feet across; a new dam would be about 1,000 feet across. A new downstream facility would provide greater storage capacity.

One of the challenges in the project is the need to relocate the Stimson Lumber Mill and 24 residential properties that would be inundated by a new downstream dam. CWS is working with Stimson Lumber who has been very collaborative. Mr. VanderPlaat and Ms. Huggins have visited about 80 percent of the homeowners and will continue outreach to stakeholders.

A 2016 Omnibus Appropriations bill reauthorized the Bureau of Reclamation's Safety of Dams (SOD) program and increased the cost ceiling by $1.1 billion. It also increased the Reclamation commissioner's spending authority. Finally, it provided Joint Project Authority allowing SOD projects to be built concurrent with additional benefits such as increased storage.

Ms. Taniguchi-Dennis said CWS has been preparing for this major capital investment through savings and planning necessary bond sales to limit the impact on rates.

Reclamation is responsible for 85 percent of the dam safety modifications; Tualatin repayment partners (CWS; TVID the Cities of Beaverton, Hillsboro and Forest Grove; and the Lake Oswego Corporation) are responsible for 15 percent of the dam safety cost. CWS is responsible for 100 percent of the costs associated with the additional storage.

Looking ahead:

- Complete the feasibility design, which means the project is 30-percent designed, for all three dam options by December 2019.
- Selection of engineering preferred alternative in January 2020.
- Begin NEPA process in 2020 for completion in 2021
- Seek an ODFW fish passage waiver as part of the state permitting process for impacts of the potential downstream dam. This is separate from the NEPA process.
- Develop real estate acquisition management plan for Stimson Lumber and potentially impacted landowners.
- Complete Contributed Funds Act Agreement and determine cost allocation
- Keep stakeholders informed.

CWS/Washington County Chair Kathryn Harrington, Mr. VanderPlaat, Mr. Jockers, Ms. Taniguchi-Dennis will traveling to Washington DC in May with regional water managers in support of the Joint Project.

6. Announcements

Mr. Jockers said the public hearing on Design & Construction Standards Update is March 26, 2019 at 6:30 pm.

The budget will be sent to Budget Committee members on April 19. It will be published to the public on April 22. The Budget Committee meeting is May 3, 2019.

The next CWAC meeting is scheduled for Wednesday, April 10, 2019, but is likely to be cancelled. The May meeting is scheduled for May 8, 2019. CWS will notify the group of a cancellation 10 days in advance.

6. Adjournment

Mr. Weller adjourned the meeting at 8:45 pm.

(Meeting notes compiled by Jody Newcomer.)

Appendix A
Clean Water Services Advisory Commission Meeting Notes
March 13, 2019

Questions and comments regarding Design and Construction Standards:

Stormwater management categories

Q: Is the detention the same as we provide today?

A: It uses similar calculations, but has different targets. Today the detention does not have the post-two-year to half pre-two-year requirement, but it does have a requirement for 25-year event. We still have a requirement for a 25-year event when there's a downstream conveyance issue, just like the current Standards.

Q: Is the pond bigger?

A: Detention ponds are definitely bigger than just water quality facilities, which are typically all that is required under the existing standards. The ponds required for hydromodification are not anticipated to be much larger than ponds required for a downstream capacity issue.

Q: Can you only do a deeper medium in LIDA facilities?

A: That deeper medium was a change to simplified LIDA. You can do something similar, if possible, at any site. You can reduce volumes with what you can accomplish with infiltration. That was included in the February draft of Standards.

Q: How much of the Tualatin Basin can accomplish infiltration?

A: All of it can do some infiltration. We do not have a lot of sandy soils that infiltrate the way places in Portland infiltrate. There may be places in Portland where you can essentially retain because you can infiltrate all the runoff. That probably isn't possible in our jurisdiction. You might be able to get some reduction in pond size.

Most of our clay soils have limited infiltration capacity.

Q: I don't understand the 30 percent. What's not a LIDA facility?

A: This primarily relates to commercial sites or regional filter vaults or infill situations. Green infrastructure would need to be incorporated. Most residential subdivisions are doing green infrastructure.

Q: I have done multi-family, assisted living, commercial building; would the 30 percent LIDA requirement apply to these projects?

A: Multi-family is considered commercial. If stormwater management for volume is done with underground detention, then there would be a requirement to treat 30 percent of the impervious area created through LIDA.

Q: It's not a redevelopment standard?

A: It is not specific to redevelopment.

Q: Do you know how many projects might qualify for the infill FIL approach?

A: No, not yet. CWS will analyze areas to answer that question. In lieu of analysis, there's a methodology that can be applied on a project basis.

Q: Is it possible the infill FIL percentages might be adjusted?

A: Yes, based on the results of the analysis.

Q: Will you watch as the Standards are implemented to see what effect they are having?

A: CWS will watch closely in first year. This is a new set of standards and adjustments will likely be necessary. An update will probably occur in 12 to 18 months.

Q: How do these hydromodification standards compare to what is required in other jurisdictions?

A: The sizing methodology is similar to what other jurisdictions require. CWS did a cross-jurisdictional comparison. The one factor that is somewhat unique to the CWS approach to hydromodification as compared to other local jurisdictions is the allowance for FIL.

Fee-in-Lieu

Q: If you were dependent on fund stream restoration projects with just the FIL coming out of small projects there won't be enough money.

A: If you made FIL a larger amount, it would be putting the enhancement of degradation that's happened to the stream channel over many years on the backs of a few developments.

Q: Could a project qualify for FIL in an area where an in-stream project has been implemented?

A: Yes. That already exists in the Standards.

Appendix B
Clean Water Services Advisory Commission Meeting Notes
March 13, 2019

Questions and comments regarding water quality standards related to mercury:

Permit requirements

Q: Did DEQ use an equation to get the number 0.14/ng/L?

A: Yes. It used a series of models to figure out appropriate water column concentration.

Q: How does mercury get from inorganic to organic?

A: It's a methylation process that occurs at a higher rate in some portions of the watershed.

Fish

Q: Why is salmon steelhead not on list?

A: The list includes only resident fish. Migratory fish have lower levels of methyl mercury and were not part of this analysis.

Q: The idea is to protect the food chain. The northern pike minnow, which carries the most mercury and on which the standard is base, is not a food fish.

A: Many people have made that point to DEQ. The limit is unnecessarily conservative because people aren't eating those amounts of pike minnow.

Pike minnow is a bounty fish; it's aggressive and eats a lot of fish, which is why the numbers accumulate. The numbers are really skewed.

Q: Are fish especially vulnerable to mercury?

A: Fish eat fish; humans eat fish. The conundrum that CWS is having is humans are doing their share of minimization, but there's a permit requirement.

Mercury removal

Q: How do treatment plants remove mercury?

A: CWS employs a variety of biological processes to treat sewage and industrial wastewater. Through those processes, mercury is also removed.

Q: CWS is targeting the 1 percent of mercury that isn't airborne.

A: The 1 percent represents all the municipal treatment facilities in the Willamette River Basin. CWS is small fraction of that 1 percent.

Q: The majority of mercury pollution is coming from air, but the only things CWS can control is what's running in the water. That's a teeny tiny portion.

A: CWS undertakes a number of activities in the Tualatin River watershed to intercept mercury.

Q: Does the Willamette Basin have any big dischargers to air?

A: There are very few in Oregon. The Boardman Plant was among the last. Everything that happens globally has an impact.

Variance

Q: Is a variance for the current permit or the next permit?

A: Bob Baumgartner spoke about reconsideration at the January CWAC meeting. One challenge to the permit alleged that mercury was not handled appropriately. DEQ will reissue the permit and make necessary changes to mercury.

Dental facilities

Q: How widespread are interceptors at dental facilities?

A: CWS inspected more than 200 dental offices in the service area. Every one of them has an amalgam separator installed. Outreach was geared to best management practices.

Q: Are separators voluntary?

A: They are required now. CWS worked with the dental association to implement a law requiring separators

Appendix C
Clean Water Services Advisory Commission Meeting Notes
March 13, 2019

Questions and comments regarding the Tualatin Basin Dam Safety and Water Supply Joint Project:

Hagg Lake

Q. How much acreage does TVID irrigate?

A. 17,000 acres. It holds 27,000 acre/feet stored in the reservoir. TVID has only used the entire amount once, in 2015.

Q: How many AF are in Hagg?

A: 60,000

Q. Was the lake full when the seasons started in 2015-18?

A. Yes

Q: What is the pipe under the reservoir?

A: It serves as the intake and discharge point for the dam.

Dam options

Q. Is the structure of a downstream dam reliant on the existing dam remaining?

A. No, although keeping the existing dam in place provide valuable transportation access to around the reservoir.

Q: Could a new dam survive failure of old dam?

A: The selected option will be designed to withstand a major Cascadia Subduction Earthquake. The engineering team has reviewed the impact of the existing dam on the downstream dam following the major earthquake. Due to the distance between the two dams, it is not expected to impact the lower dam from the failure of the existing dam.

Stimson Lumber and mill

Q: Are there any potential hazardous materials remediation needed at the Mill. A: CWS has completed a Phase I site assessment and the findings are what would be expected for a mill site. A Phase 2 assessment is planned Stimson has a short period of time that they had wood treatment at the site. The mill has the expected issues for an industrial sites such as oils, greases, and transformers.

Q: Is Stimson the main landowner at the downstream dam site.
A: Yes, mostly, except for one parcel.

Financing

Q: Does a bond require a vote?

A: No. These are revenue bonds.

Q: Have there been bond sales in past?

A: Not recently. There were some significant bonds about four years ago. CWS is paying off debt and managing investments. The Joint Project is a major capital investment for CWS and is planned to serves our needs for the long term.

Partners

Q: Who are the local partners at this point?
A: The key partners are TVID, Cities of Hillsboro, Beaverton and Forest Grove, and Lake Oswego Corporation. These partners are referred to as repayment contractors and hold stored water contracts for stored water in Hagg Lake.

Q: Which federal agency is the lead organization for this Joint Project?

A: The Bureau of Reclamation owns Scoggins Dam and serves as the lead agency for this Joint Project. Several other federal, state and regional agencies will be active stakeholders for the NEPA and permitting processes.

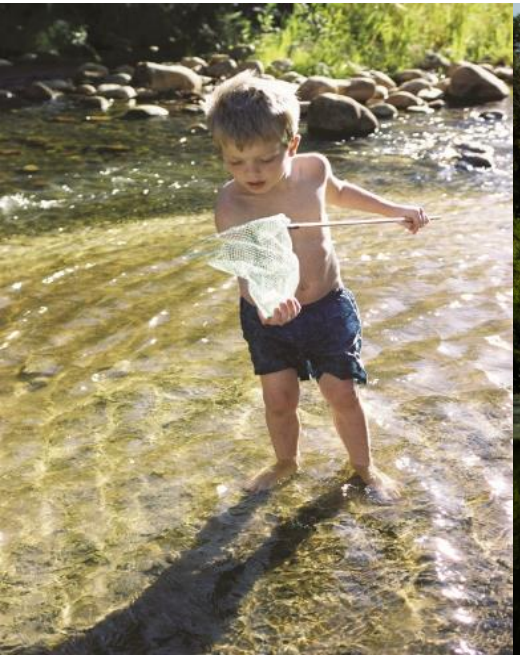
General comments

- Even if we didn't increase the water supply, we still share responsibility for dam safety. The repayment partners are obligated to pay 15 percent of the dam safety costs. The federal government has an 85 percent share. CWS is must fund all of the costs for the new stored water. CWS uses the water from releases to augment flows in the summer in the Tualatin River for fish habitat and water quality.

Design & Construction Standards Update

Clean Water Advisory Commission
March 13, 2019

Clean Water Services

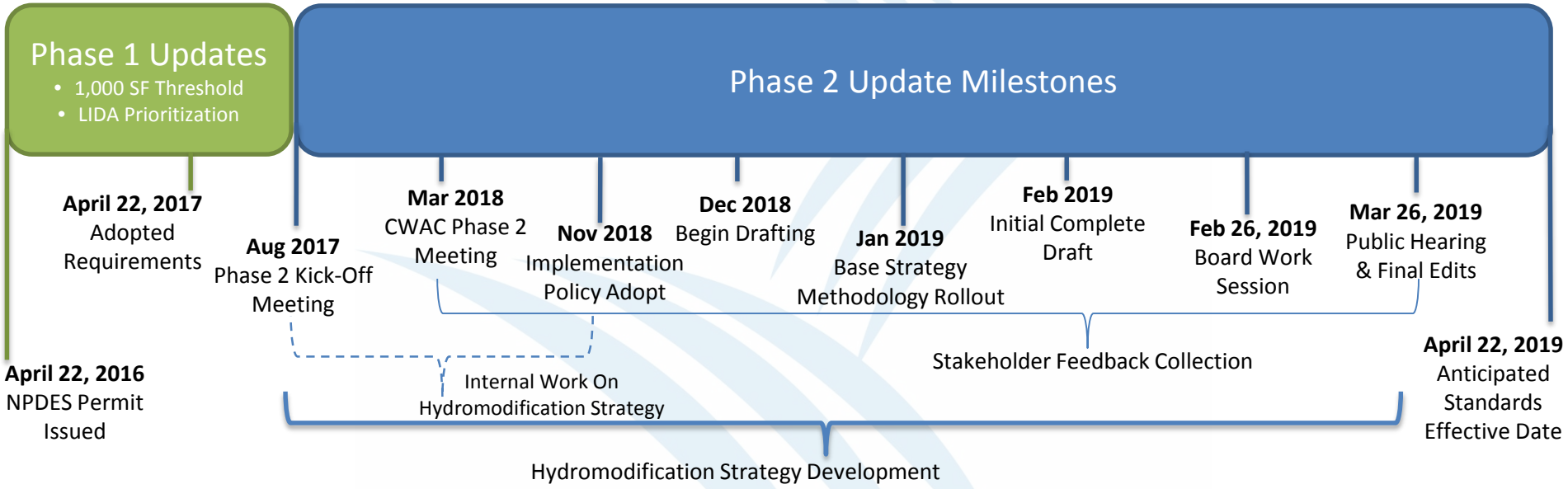


NPDES (Watershed Based) Permit Requirement

2016 NPDES permit requirement for the District to develop and implement a program to address the effects of hydromodification:

> *By April 22, 2019, the permittee must develop and implement the post-construction stormwater runoff quantity program applicable to new development and redevelopment projects.*
>
> -SCHEDULE A, Section 2.d.vi.C.4

D&C Standards Update: Timeline & Major Tasks



Stakeholder Engagement Phase 1 & 2: 8/16 – 3/26

- Public Hearings – 2
- Board Meeting – 4
- Co-Implementers Meetings – 14
- General Outreach Presentations – 8
- Clean Water Advisory Commission Meeting – 8
- Ongoing Information on CWS Website & Factsheet
- Email Notification Sent to D&C Update List – 370+ Individuals

Stakeholder Engagement Phase 2: 1/19 – 3/19

- Clean Water Advisory Commission (CWAC) - Monthly
- Tualatin Riverkeepers – January 31st
- Tualatin River Watershed Council – February 6th
- Westside Economic Alliance – February 20th
- Portland Home Builders Association – February 22nd
- General Stakeholder Meeting – February 22nd
- Public Hearing – March 26, 2019

Published Materials

January 4, 2019

- Draft Base Strategy and Methodology
- Hydromodification Web Mapping Tool

January 16, 2019

- Tualatin River Urban Stormwater Tool & Instructions
- Base Strategy and Methodology Examples

February 14, 2019

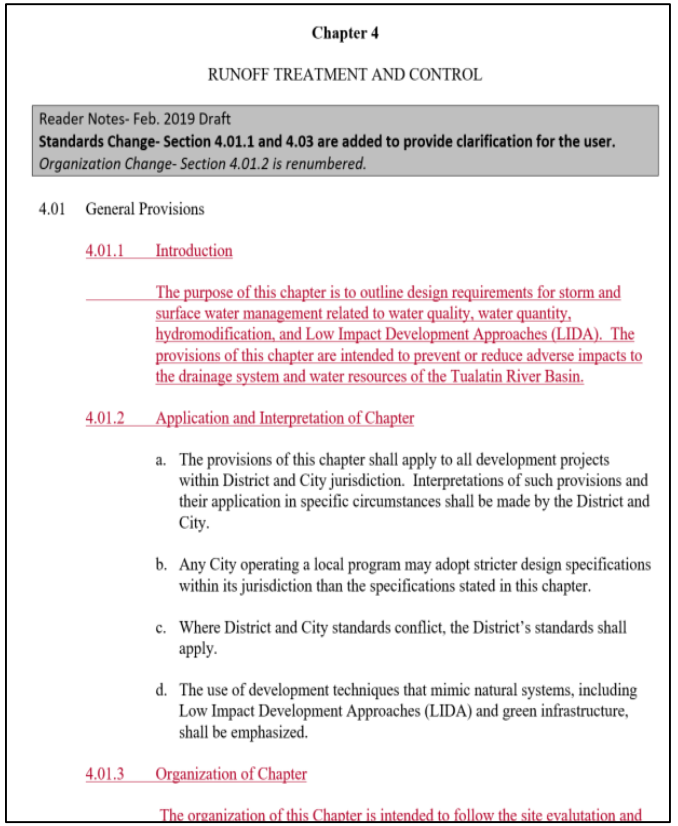
- Executive Summary of Base Strategy
- Preliminary Draft of Proposed Standards, Chapter 1 & 4
- Guide to Reading & Understanding Chapter 4 Changes
- Updated Hydromodification Web Mapping Tool

March 1, 2019

- Response to Comments: Draft Base Strategy & Methodology

March 14, 2019

- Response to Comments: Preliminary Draft Standards
- Proposed Draft for Public Hearing, Chapters 1, 2, & 4



Chapter 4

RUNOFF TREATMENT AND CONTROL

Reader Notes- Feb. 2019 Draft
Standards Change- Section 4.01.1 and 4.03 are added to provide clarification for the user.
Organization Change- Section 4.01.2 is renumbered.

4.01 General Provisions

4.01.1 Introduction

The purpose of this chapter is to outline design requirements for storm and surface water management related to water quality, water quantity, hydromodification, and Low Impact Development Approaches (LIDA). The provisions of this chapter are intended to prevent or reduce adverse impacts to the drainage system and water resources of the Tualatin River Basin.

4.01.2 Application and Interpretation of Chapter

a. The provisions of this chapter shall apply to all development projects within District and City jurisdiction. Interpretations of such provisions and their application in specific circumstances shall be made by the District and City.

b. Any City operating a local program may adopt stricter design specifications within its jurisdiction than the specifications stated in this chapter.

c. Where District and City standards conflict, the District's standards shall apply.

d. The use of development techniques that mimic natural systems, including Low Impact Development Approaches (LIDA) and green infrastructure, shall be emphasized.

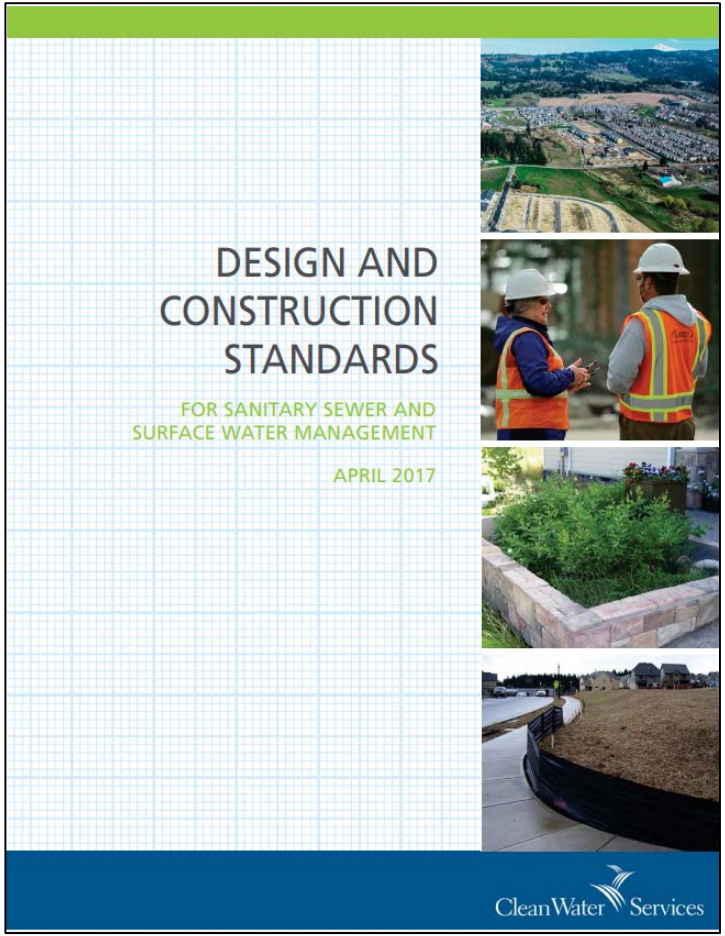
4.01.3 Organization of Chapter

The organization of this Chapter is intended to follow the site evalutation and

Stakeholder Engagement

Base Strategy Development and Implementation Policy

- Clean Water Advisory Commission (CWAC) – Monthly since fall 2018
- Westside Economic Alliance – September 19, 2018
- Tualatin Riverkeepers – January 31st
- Tualatin River Watershed Council – February 6th
- Westside Economic Alliance – February 20th
- Portland Home Builders Association – February 22nd
- General Stakeholder Meeting – February 22nd
- Board Work Session – February 26th
- Public Hearing – March 26, 2019



Stakeholder Comments

- Facility sizing methodology
  - Desire for a relatively simple and familiar method that is consistent with other jurisdictions in the Metropolitan Portland area – Flow Duration vs. Peak Matching
  - Desire for design details/specifications that can reduce impact to development projects
- Fee-In-Lieu
  - How broadly should Fee-In-Lieu be allowed as an approach?
  - How much will it be?
  - Where and how will the collected fee be spent to offset impacts of hydomodification?
- Thresholds for increasingly greater levels of protection: Lower thresholds for greater protection vs. fewer requirements on small/medium sized project that will be financially impacted

Changes Resulting from Stakeholder Feedback

- Reduction of treatment surface area when increasing depth of planting media
- Co-location of quality & quantity approaches
- Simplified sizing method for Redevelopment
- Increased threshold for using actual impervious area for sizing for residential lots
- Update of Hydromodification Mapping Tool to address “gaps” between High Risk segments

Summary Table of Stormwater Management Categories

<table>
<tr><th>Development Class/ Hydromodification Risk Level</th><th>Small Project
1,000 – 12,000 SF</th><th>Medium Project
12,000 – 80,000 SF</th><th>Large Project
> 80,000 SF</th></tr>
<tr><td>Expansion/High</td><td rowspan="6">Category 1</td><td rowspan="2">Category 3</td><td rowspan="3">Category 3</td></tr>
<tr><td>Expansion/ Moderate</td></tr>
<tr><td>Expansion/ Low</td><td>Category 2</td></tr>
<tr><td>Developed/ High</td><td>Category 3</td></tr>
<tr><td>Developed/ Moderate</td><td rowspan="2">Category 2</td><td rowspan="2">Category 2</td></tr>
<tr><td>Developed/ Low</td></tr>
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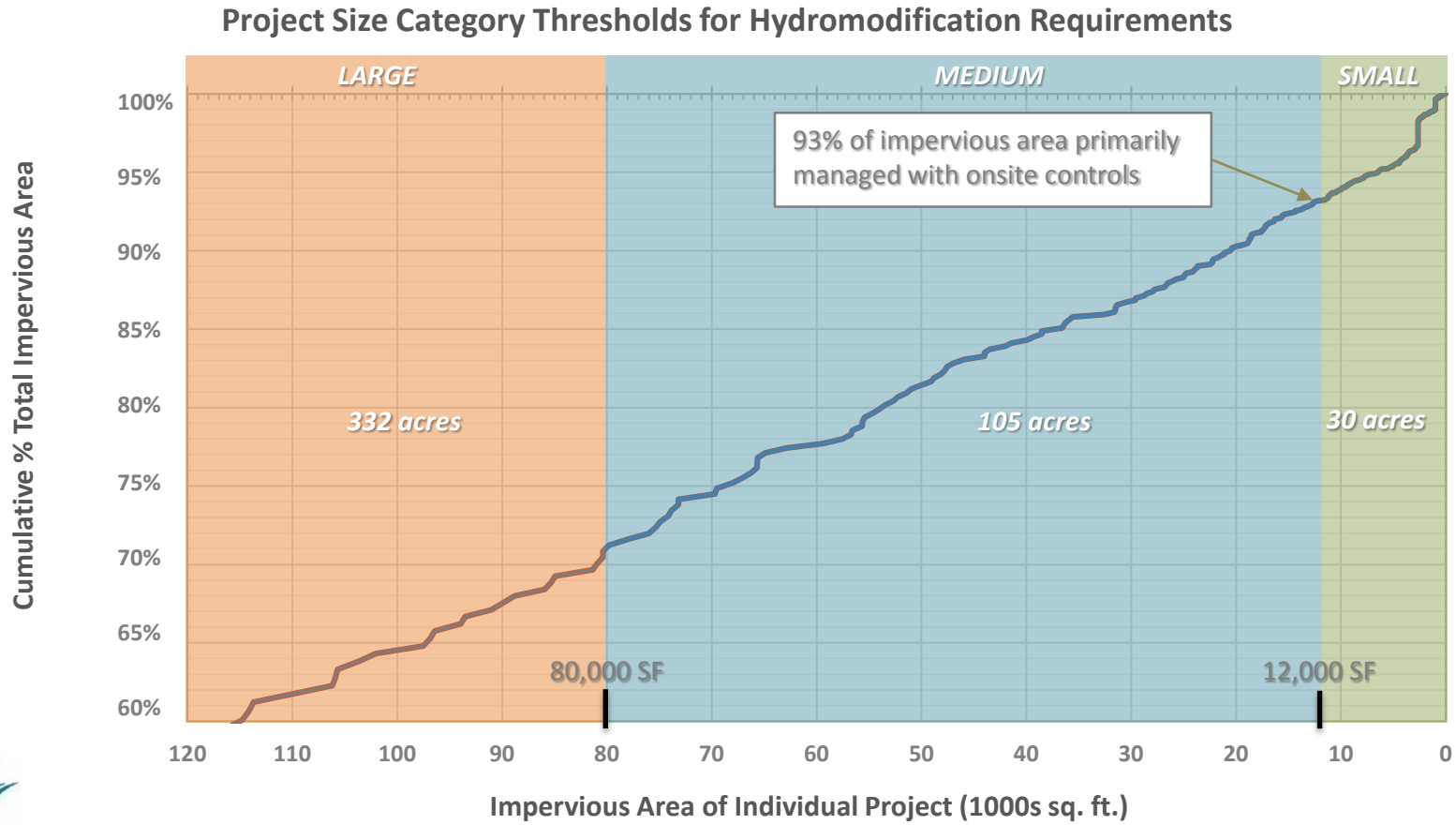
Project Size Thresholds



Fee-In-Lieu for Infill Projects

Proposed development is likely to have a negligible impact and on-site implementation of a hydromodification approach will result in little or no benefit to the Receiving Reach,

Demonstrate all of the following:

- The Risk Level is Low or Moderate.
- The discharge from the project is small compared with the total tributary drainage flow in the receiving stream (less than 10% of the total tributary drainage flow at the Point of Discharge).
- The project is located in a drainage basin with a high level of existing development tributary to the downstream end of the Receiving Reach (drainage basins with less than 10% of remaining area is developable).

Proposed Stormwater Fee-In-Lieu

- Based on analysis of a range of projects
- Total Stormater Management Fee-In-Lieu (quality and hydromodification) = $1.50 per SF of unmanaged impervious area
- Fee-In-Lieu credit for construction of an on-site water quality or hydromodification approach = 1/3 of Total Fee-In-Lieu ($0.50 per SF of unmanaged impervious area)

Website

http://cleanwaterservices.org/dncupdate

Questions or Comments

dncupdate@cleanwaterservices.org

Damon W. Reische
Systems Planning and Development Services Division Manager
reisched@cleanwaterservices.org

Implementation Policy

Proposed Effective Date of Standards – April 22, 2019

Projects *requiring* Land Use (LU)

- LU application *before* April 22nd – Current Standards
- LU application *after* April 22nd – New Standards

Projects *not requiring* Land Use

- Up to 180 days after April 22nd – Current Standards
- Greater than 180 days after April 22nd – New Standards

WATER QUALITY STANDARDS: MERCURY

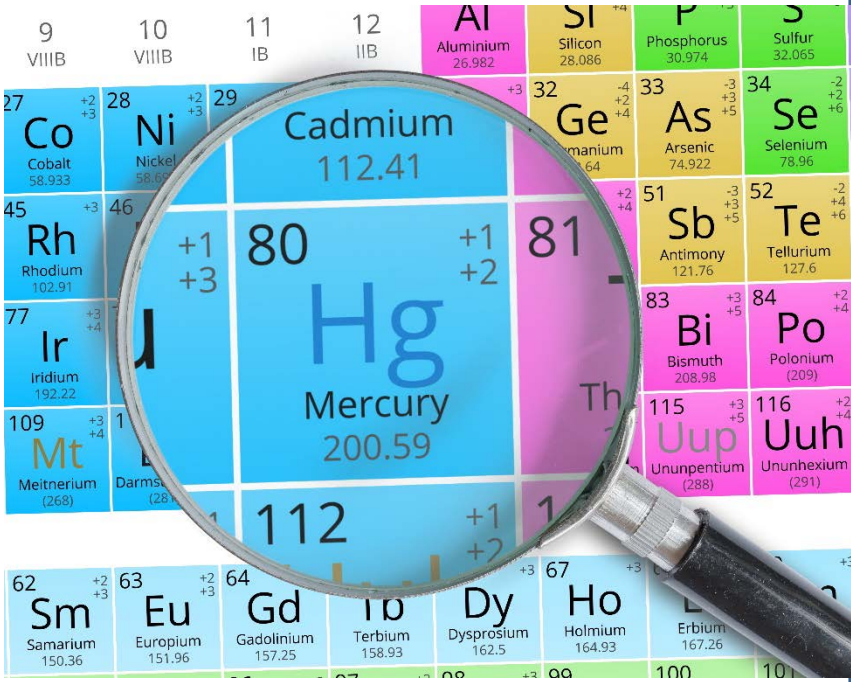
March 13, 2019

Raj Kapur
Water Resources Program Manager

Clean Water Services

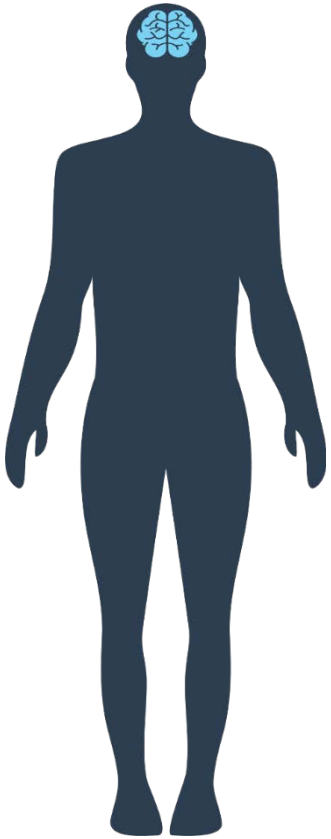
MERCURY IN THE ENVIRONMENT

- Naturally occurring substance
- Unique properties
- Uses
- Forms
  - Inorganic (Hg^0, Hg^{++})
  - Organic (methyl mercury)
- Most prevalent forms:
  - Air: inorganic (Hg^0)
  - Water: inorganic (Hg^{++})
  - Fish: organic (methyl mercury)



ENVIRONMENTAL RELEVANCE

- Mercury is a neurotoxin
- Effects related to form of mercury
  - inorganic mercury toxic at high levels
  - Methyl mercury toxic at low levels
- Primary pathway to humans as methyl mercury
- Highest levels at the top of the food chain



- Deteriorates nervous system
- Impairs hearing, speech, vision and gait
- Causes involuntary muscle movements
- Corrodes skin and mucous membranes
- Causes chewing and swallowing to become difficult

WATER QUALITY STANDARD FOR MERCURY

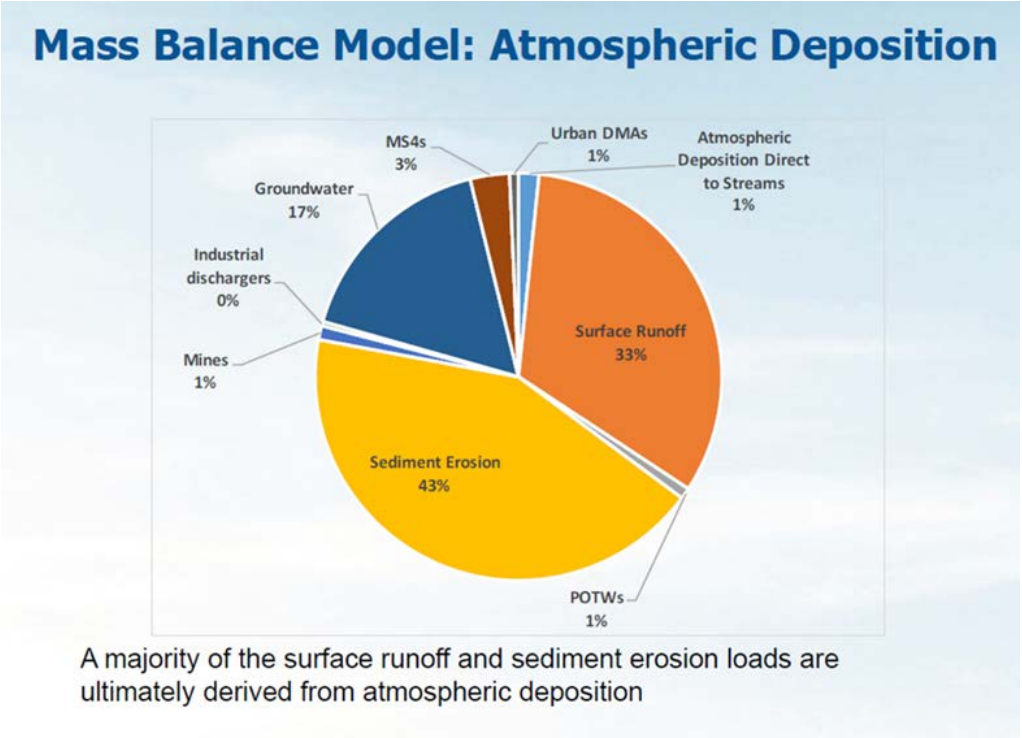
- DEQ updated human health criteria for mercury in 2011
- Criteria based on long-term exposure and a fish consumption rate of
  175 grams per day
- Mercury: 0.04 mg/kg of methyl mercury in fish tissue
- Northern Pike minnow as top of food chain
- Target in-stream concentration:
  0.14 ng/L (parts per trillion)

Mercury Concentrations in Fish Tissue

Fish Species	Median (mg/kg)
Bluegill	0.17
Common Carp	0.14
Cutthroat Trout	0.07
Largemouth Bass	0.34
Largescale Sucker	0.14
Northern Pikeminnow	0.44
Rainbow Trout	0.10
Smallmouth Bass	0.14

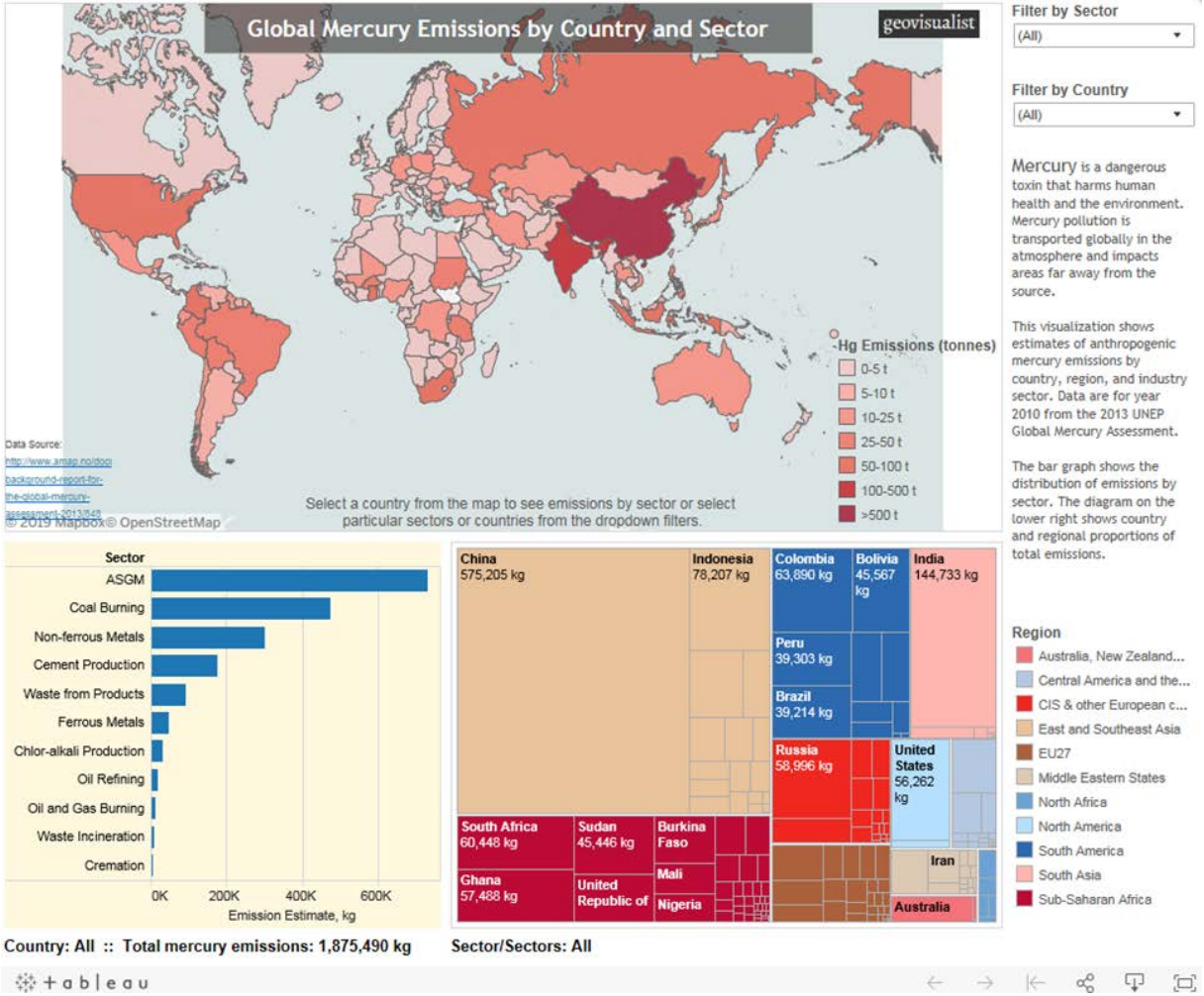
WILLAMETTE BASIN MERCURY EVALUATION

- Sources of mercury:
  - 98% of mercury from air deposition –global sources
  - Mercury in sediment & groundwater from historic deposition
  - Small quantity from others
    - Wastewater treatment facilities
    - Abandoned mines
    - Industrial sources

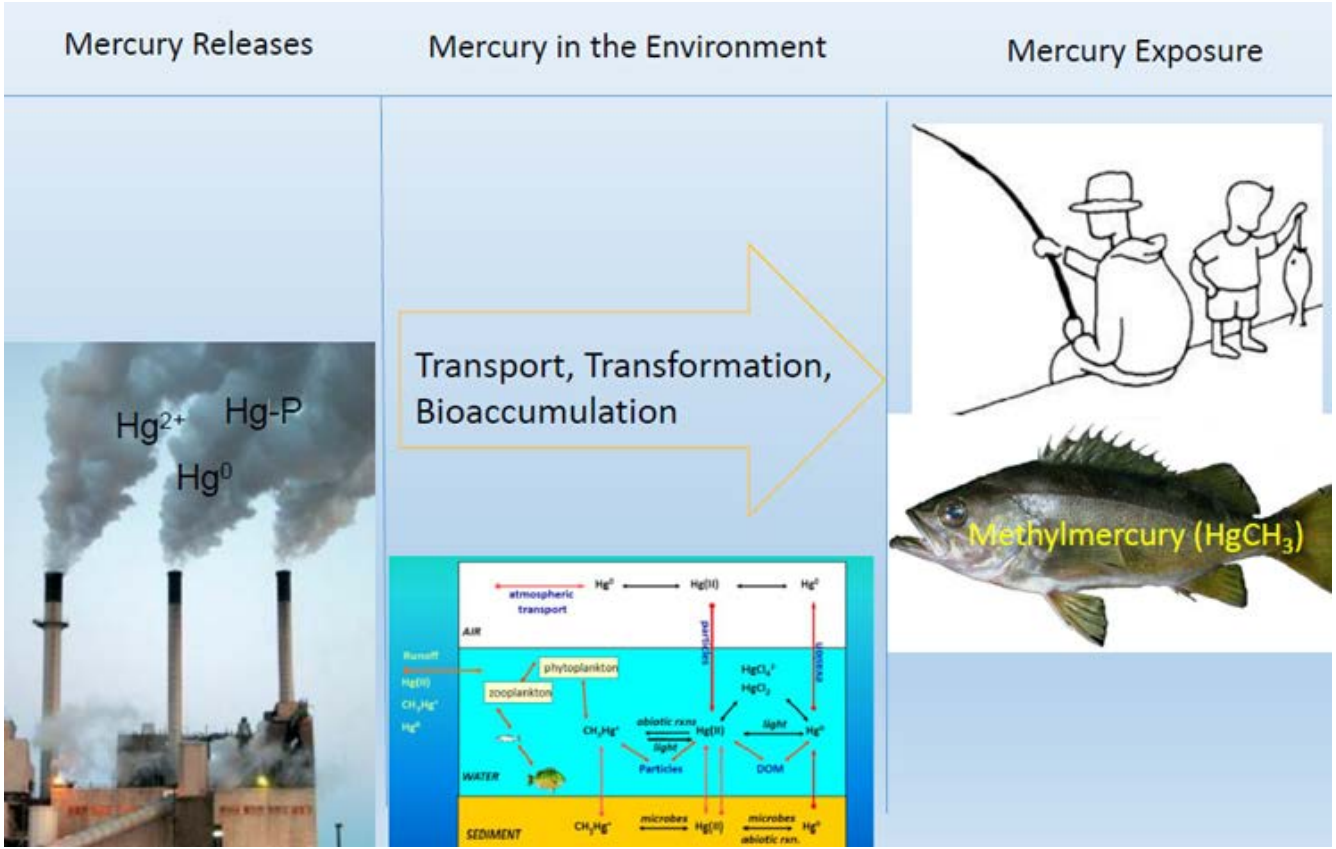


Global Mercury Emissions by Country & Sector

[Global Mercury Emissions]

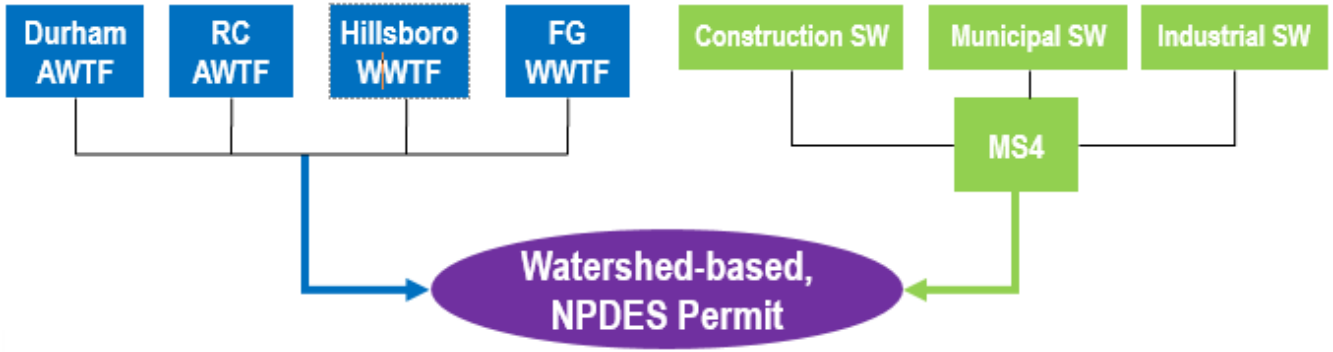


THE MERCURY CYCLE



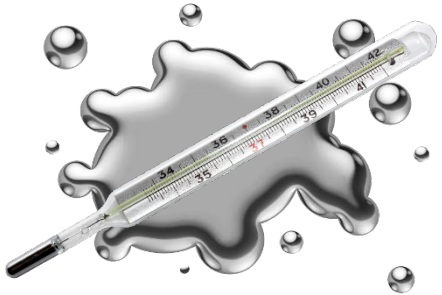
CLEAN WATER SERVICES PERMIT

- Watershed-based National Pollutant Discharge Elimination System (NPDES) Permit



  - Mercury Minimization Plan
  - Mercury Monitoring

MERCURY SOURCES IN WASTEWATER

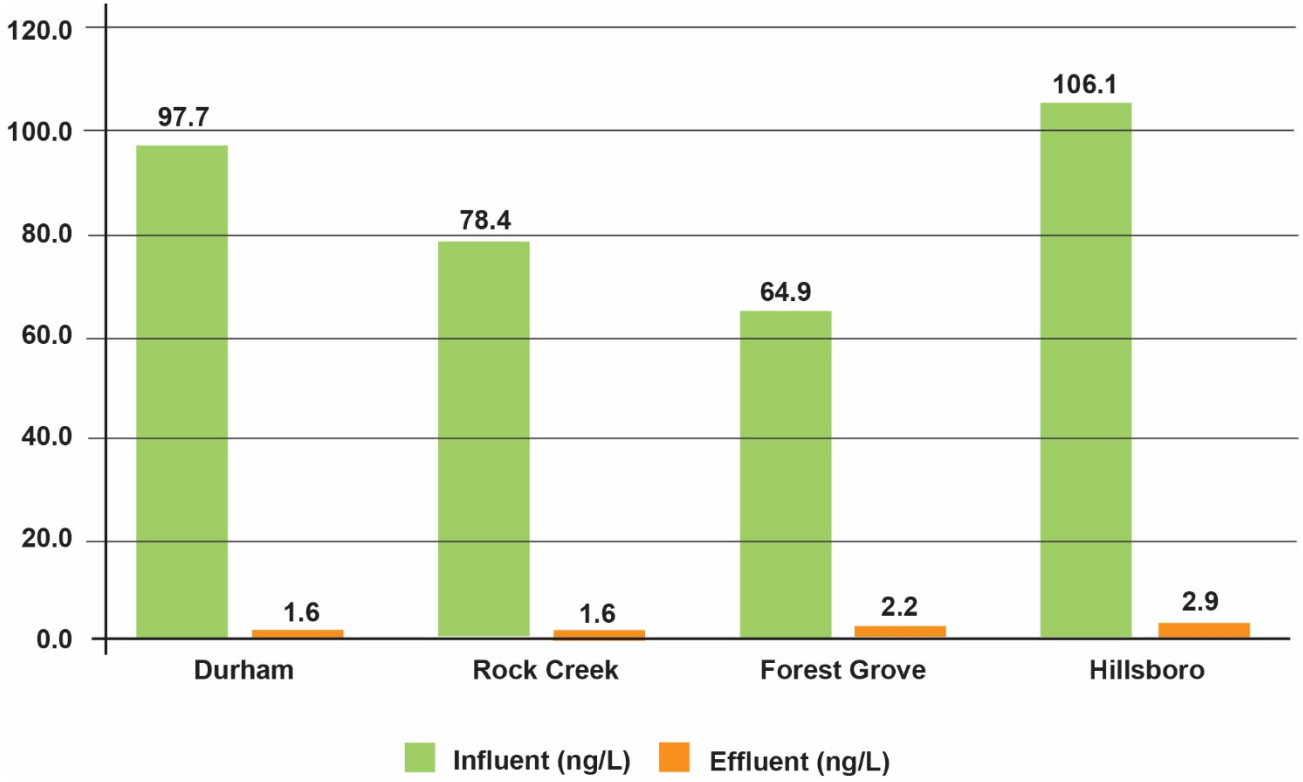


Commercial	Residential	Industrial
• Dental offices • Hospitals • Laboratories • Universities/schools • Medical clinics • Vehicle service facilities • Industrial activities	• Human waste (amalgam) • Human waste (dietary) • Laundry graywater • Household products • Improper disposal of mercury thermometers	• Chlorine production • Portland cement • Mining – i.e. gold mining • Caustic soda • Sulfuric acid

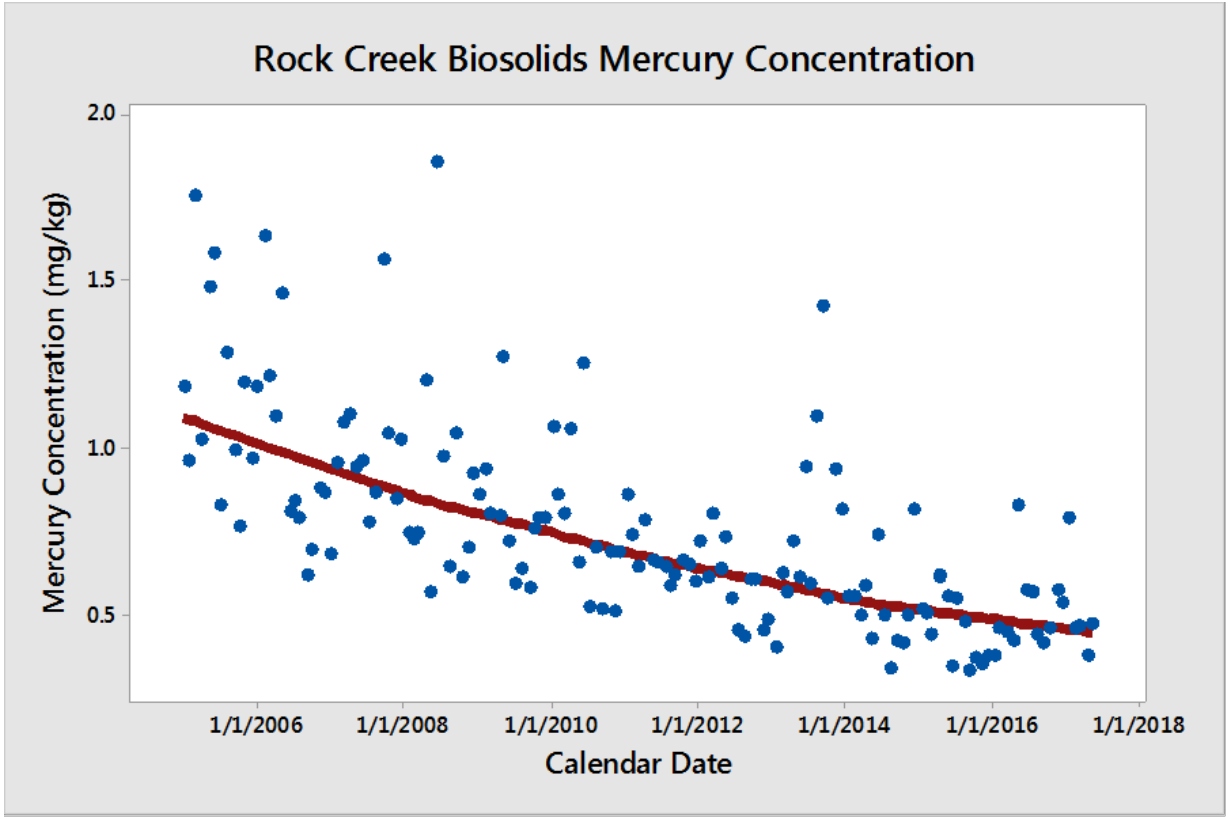
MERCURY MINIMIZATION PLAN

- Key Elements:
  - Survey/inspect dental offices
  - Assess industrial contributions
  - Targeted outreach:
    - Schools
    - Healthcare facilities
    - Laboratories
  - Commercial/residential outreach

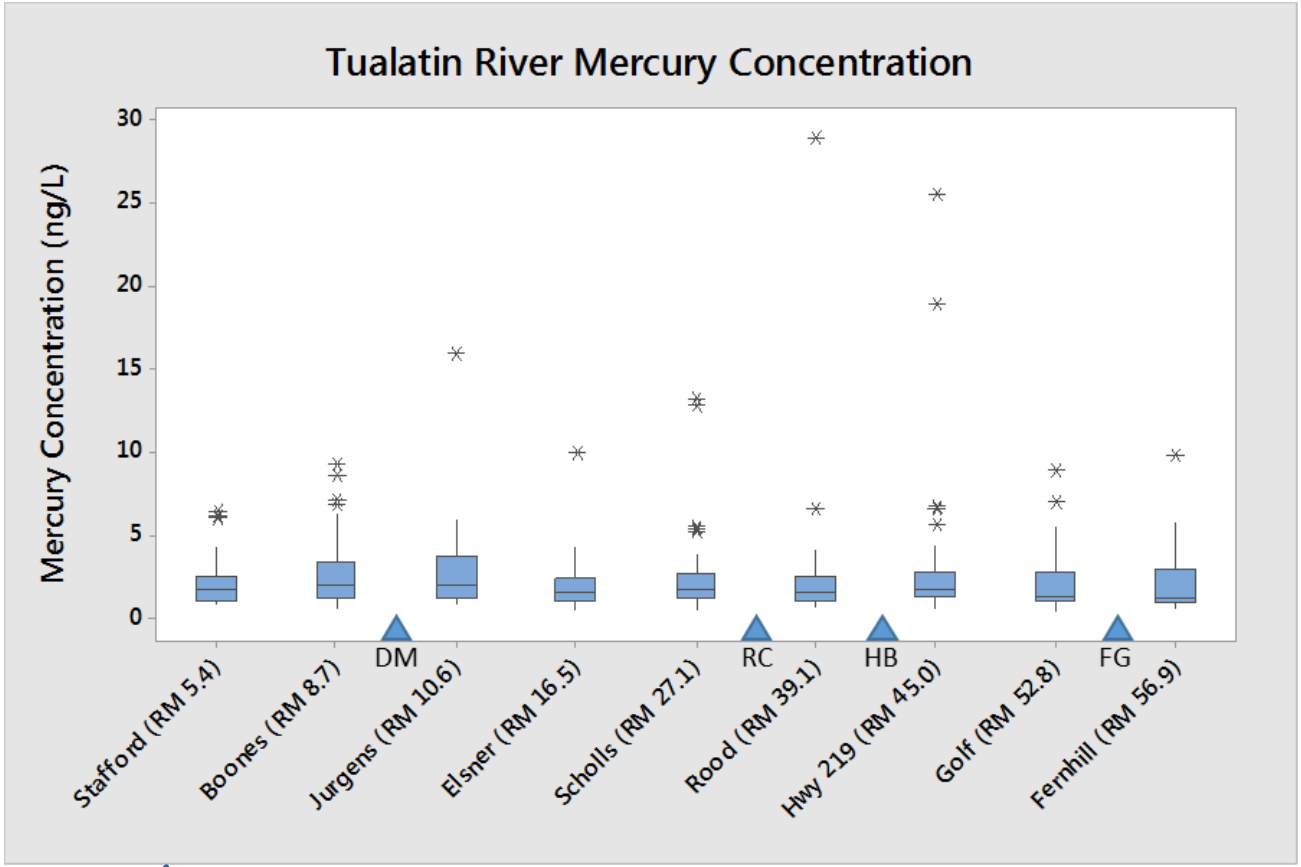
INFLUENT AND EFFLUENT TOTAL MERCURY LEVELS



BIOSOLIDS


Rock Creek Biosolids Mercury Concentration
Mercury Concentration (mg/kg)
2.0
1.5
1.0
0.5
1/1/2006
1/1/2008
1/1/2010
1/1/2012
1/1/2014
1/1/2016
1/1/2018
Calendar Date

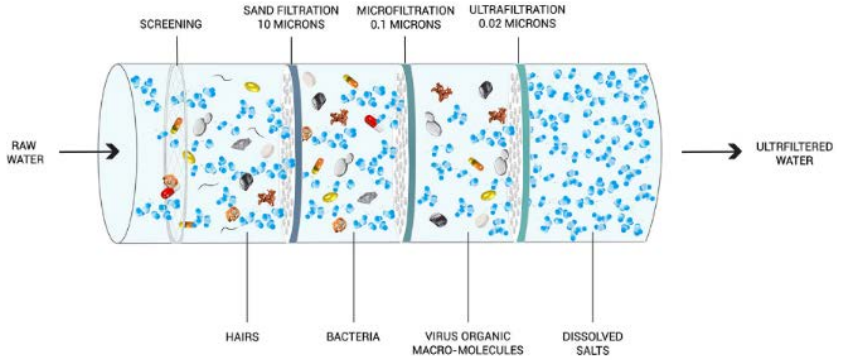
AMBIENT DATA



Downstream Upstream

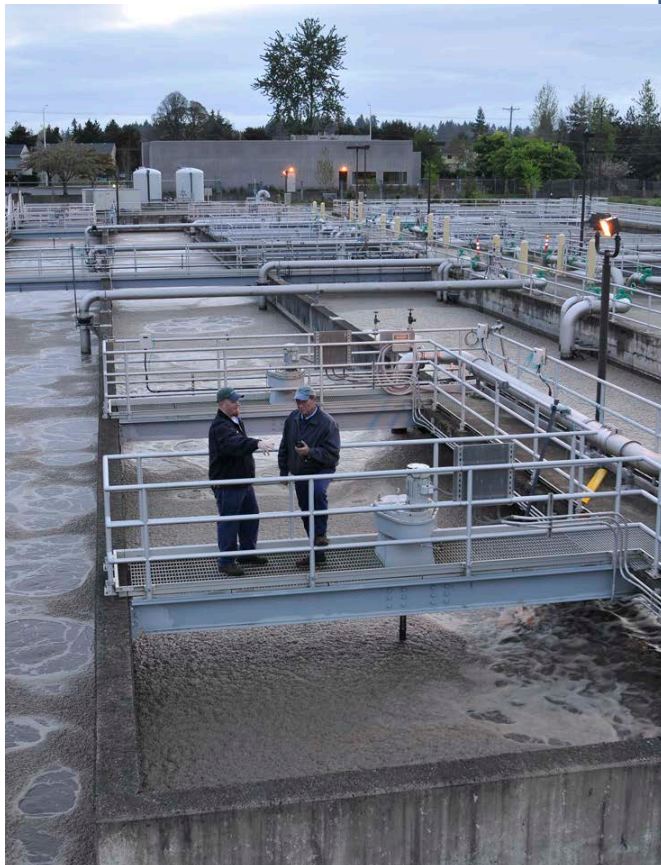
TECHNOLOGY REVIEW

- Typical Hg levels: 2 – 5 ng/L; Target Hg conc: ~0.14 ng/L
- Technologies: precipitation, membrane filtration, ion exchange, reverse osmosis
- Energy intensive, cost prohibitive
- Concentrated brine waste disposal
- No pilot or full-scale systems that meet mercury targets



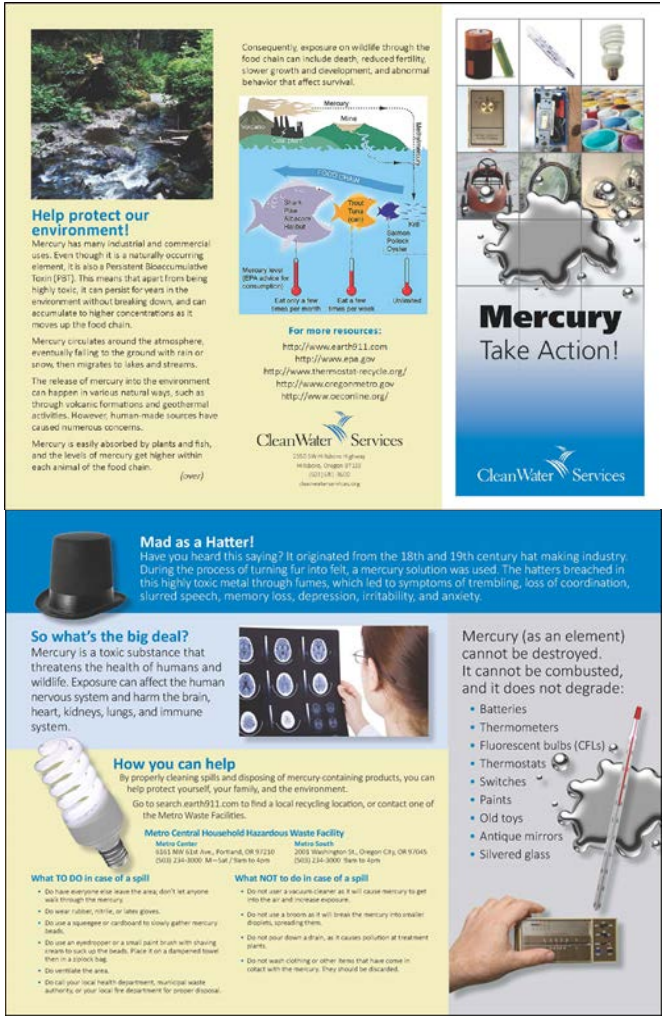
CWS WASTEWATER TREATMENT FACILITIES

- Wastewater sources: residential/commercial/industrial
- Remove conventional pollutants (solids, bacteria)
- Produce high quality effluent that exceeds federal standards
- Also very effective at removing Hg (>97%)
- Primary source of mercury in wastewater: dental facilities; remaining sources are diffuse
- Technology solutions not available
- Mercury minimization plan is the most effective approach
- Mercury loading from ALL municipal treatment facilities
  - About 1% of total mercury load to Willamette Basin
- Workable pathway is needed for permitting municipal facilities



MERCURY VARIANCE

- NPDES permits must assure compliance with water quality standards
- Variance is a Clean Water Act tool when water quality based effluent limits cannot be met
  - Waiver of the water quality standard; however, underlying standard remaining in effect
  - Granted by DEQ and requires EPA approval
- Encouraged by EPA when progress can be made
- CWS has applied for a variance for its facilities
- Criteria for variance in CWS application:
  - Naturally occurring pollutant concentrations prevent attainment
  - Human-caused conditions prevent attainment



WHAT DOES A VARIANCE ACCOMPLISH?

- Enables DEQ to issue a permit under the Clean Water Act
- Enables CWS to continue to utilize the existing technology at its treatment facilities to remove mercury
- Establishes an effluent limit for mercury based on capability of current technology
- Continue the use of a mercury minimization plan to reduce mercury into the environment
- DEQ is also looking at a variance for all municipal facilities in the Willamette River basin

QUESTIONS?

Contact information:

Raj Kapur

Clean Water Services

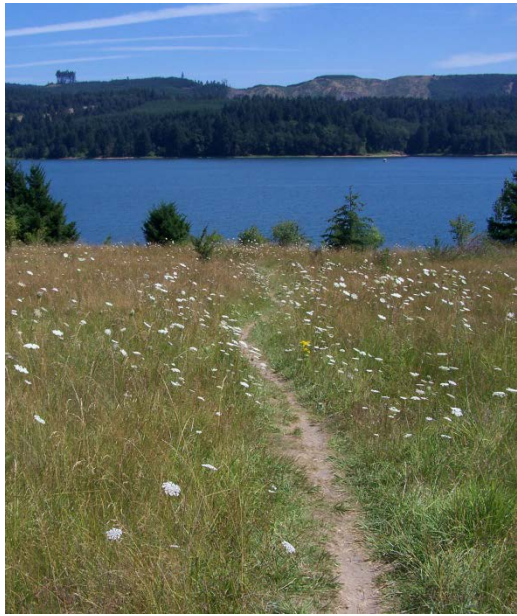
Kapurr@cleanwaterservices.org

503.681.4424

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

Tualatin Basin Dam Safety & Water Supply Joint Project

Clean Water Services Advisory Committee – March 13, 2019



Clean Water Services

- Formed in 1970
- Water resources management utility serving more than 600,000 residents
- $550 million annual budget
- 12 Partner Cities
- Washington County is the economic engine of Oregon

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

Tualatin Project: A Shared Investment

Hagg Lake Repayment Contractors

- TVID: 54.5%
- Clean Water Services: 24.9%
- City of Hillsboro: 7.4%
- City of Forest Grove: 6.6%
- City of Beaverton: 5.9%
- Lake Oswego Corporation: 0.7%

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

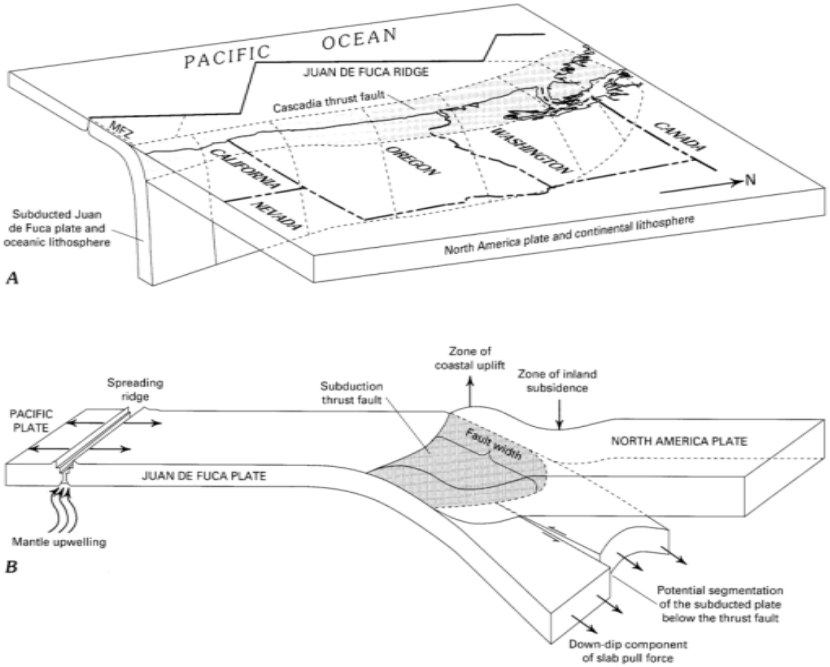
CWS and Reclamation Shared Project Goals

- Protect public safety
- Secure the basin's primary water source
- Meet the region's future water needs
- Scoggins Dam is our best option to improve the river

Future is Today! All available
stored water used in 2015 and almost all in 2018

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

CASCADIA SUBDUCTION ZONE (CSZ)

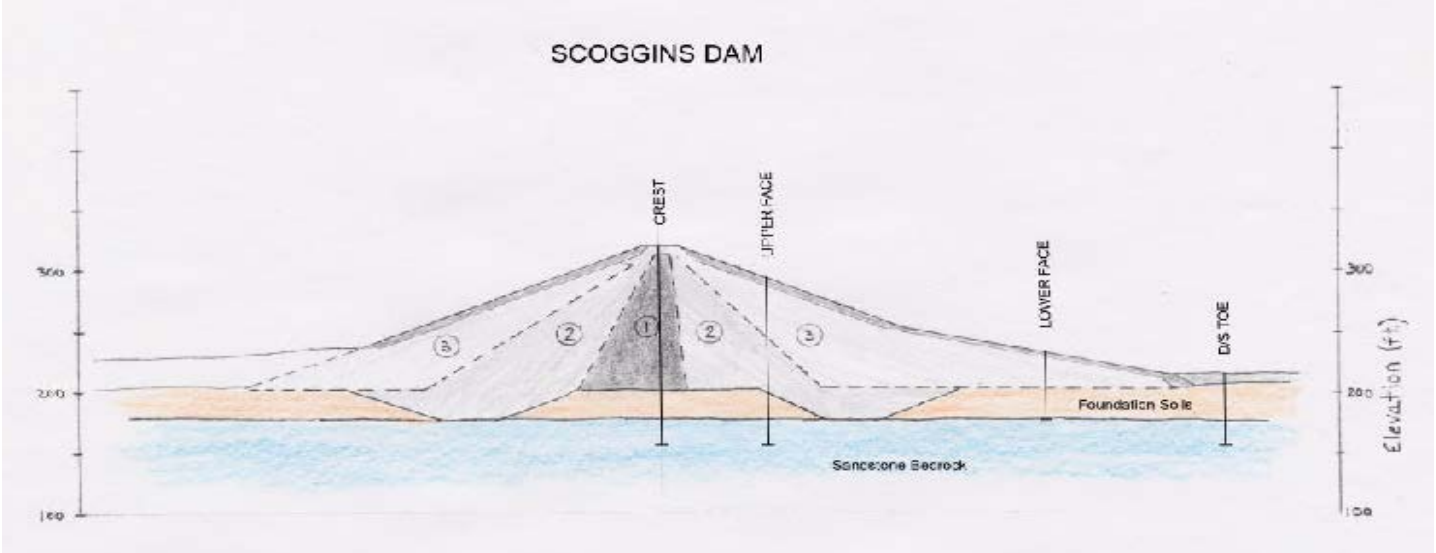


- THE BIG EARTHQUAKE
- Magnitude 9.0
- 200-second strong of shaking

(In an earthquake, damage to buildings and infrastructure is related more closely to ground motion rather than the magnitude of the earthquake itself.)

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

SCOGGINS DAM DESIGN



- U.S. Bureau of Reclamation - designed and constructed 1970s
- 151 foot high zoned earth fill embankment
- 53,316 acre-feet active storage capacity
- 2,600 acres area for lake and lands
- 1,100 acres of water at full pool

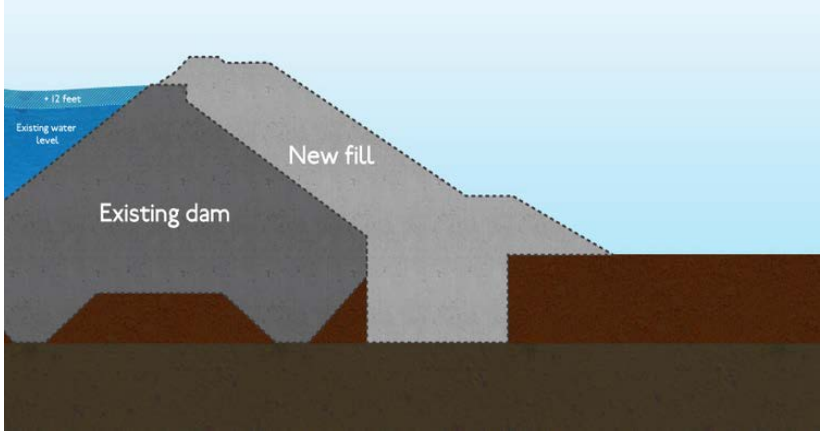
Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

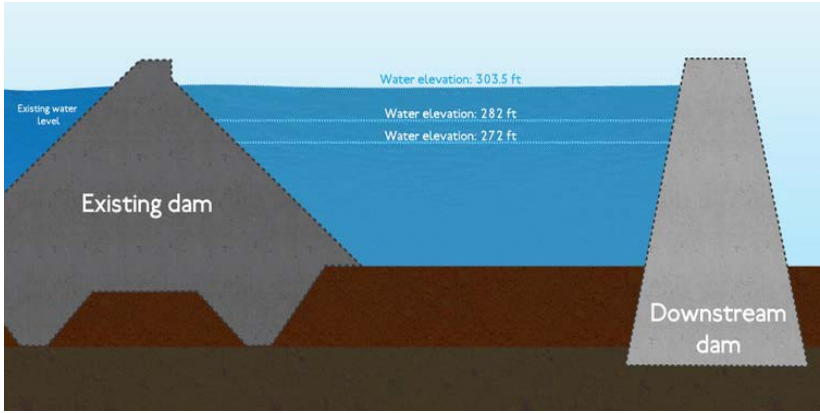
Joint Project Conceptual Options

1) Modify dam (Safety of Dams)

2) Raise existing dam (21K AF)

3) Downstream dam (50K AF)





Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

DAM SAFETY MODIFICATION - Option 1 and 2

Tualatin Basin
WATER SUPPLY PROJECT

OPTION 3 - DOWNSTREAM DAM

2016 OMNIBUS BILL

- Reauthorizes Reclamation's Safety of Dams (SOD) Program increases cost ceiling by $1.1B
- Increases Reclamation Commissioner's spending authority
- Provides Joint Project Authority allowing SOD projects to be built concurrent with additional benefits (Water Supply)

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

Joint Project - Moving Forward Together

- Reclamation
  - New Policy Process
  - Expertise and experience
  - Responsibility
  - Limited time and funding
- CWS
  - Motivation – needed storage
  - Resources - Funding
  - Commitment

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

Managing Risks: Community

Joint Project

- Communication/Coordination
  - Project stakeholders
  - Stimson Lumber & Landowners
  - Repayment contractors
  - Water delivery contracts

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

Managing Risks: Technical/Regulatory

Joint Project

- Technical and regulatory investigations
  - Feasibility design
  - Geotechnical
  - Environmental Review
  - Materials Quantities and availability
  - Cost estimates

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

Tualatin Joint Project – Looking ahead

- Feasibility Level Design for all three options
- Engineering Preferred Alternative Decision Process
- NEPA Process and Permitting
  - Environmental Enhancement (Collaborative Partnerships)
  - Fish Passage Waiver Process
- Land Acquisition and Relocation Process
  - Stimson Lumber
  - Residential Properties

Tualatin Basin Joint Project
DAM SAFETY • WATER SUPPLY

Tualatin Joint Project - Looking Ahead

- Reclamation Contributed Funds Act Agreement
  - Cost Allocation – Safety of Dams and Water Supply
- CWS NEPA Contract – Pre-NEPA work
  - 32 Resources Reports (Wetlands, Fish, Wildlife, WQ…)
- Permitting and Agency Coordination
- Land Acquisition Process (Stimson and Key Landowners)
- Public and Stakeholder Process
- Governmental Affairs

Tualatin Basin Joint Project
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