The Clackamas County MS4 Permit: Addressing Toxics in Permit Implementation

May 8, 2018 meeting of the Willamette River Toxics Reduction Partnership Steering Committee

Andrew Swanson
ACWA/Clackamas County's WES

Water Environment Services

Private Non-Profit

Formed 1987

Members: 95+ wastewater treatment & storm water management agencies. Many associate members too.

Mission: Protect & enhance Oregon's water quality

www.oracwa.org "Oregon ACWA"

oregon association of CLEAN WATER agencies

Committees:

Biosolids & Recycled Water
Education
Energy
Groundwater
Legal
Legislative
Pretreatment
Stormwater
Water Quality
Utility Management

Water Environment Services

Clackamas County WES

<u>Wastewater treatment services:</u>

We clean over 6 billion gallons of wastewater every year for a variety of businesses and more than 165,000 people. We maintain 21 pump stations and more than 340 miles of pipes.

<u>Storm sewer systems:</u> We jointly operate storm sewer systems in partnership w/CC-DTD, and the Cities of Rivergrove and Happy Valley.

WES™

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Clackamas County MS4 Permit has these 13 co-permittees

- Clackamas County (represented by DTD)
- The Cities of Gladstone, Happy Valley, Johnson City, Lake Oswego, Milwaukie, Oregon City, Rivergrove, West Linn & Wilsonville
- Oak Lodge Water Services District
- Clackamas County Service District No. 1 (WES)
- The Surface Water Management Agency of Clackamas County (WES)
- Note: The permit generally regulates lands inside the Portland metro area's Urban Growth Boundary (UGB)

Clackamas County MS4 Permit

- **Municipal Separate Storm Sewer System = A publicly owned system of conveyances used for collecting and conveying stormwater. Is not a combined sewer. A MS4's outfall discharges into a public surface water body.**
- **This NPDES MS4 Permit was originally issued in 1995.**
- **Regulates an area with ~300,000 people. Note: Some of these people don't live or work on land which is served by any MS4…examples include lands which drain: I) to drywells, or II) directly to a creek through a privately owned storm sewer system.**
- **Note: ODOT has its own MS4 permit.**

Clackamas County MS4 Permit

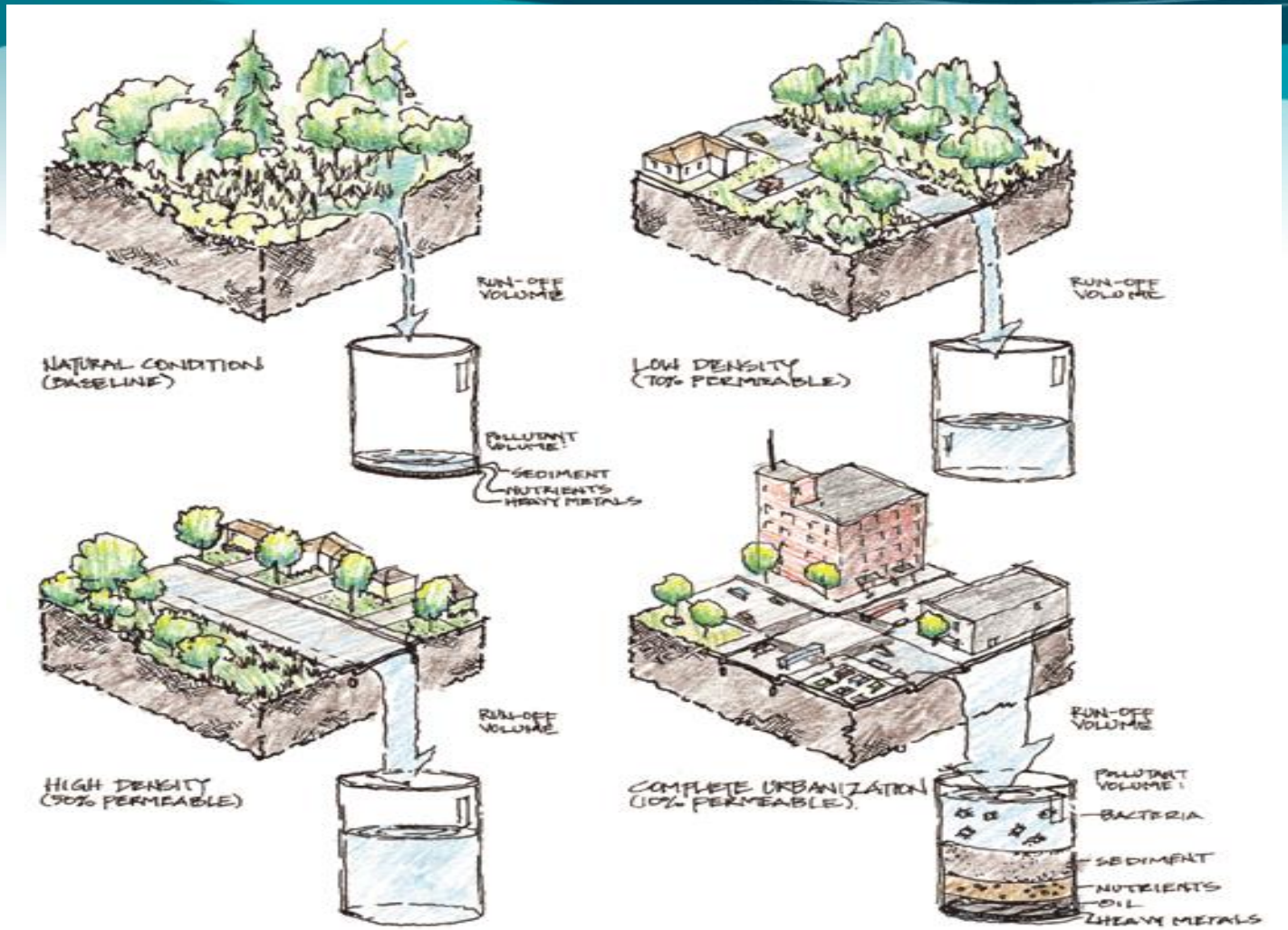
The current MS4 Permit was renewed most recently in 2012. A key requirement is implementation of a Stormwater Management Plan (SWMP) which includes BMPs for these programs:

1. **IDDE (illicit discharge detection and elimination)**
2. **Industrial/commercial stormwater quality**
3. **Construction site runoff control**
4. **Public education and outreach**
5. **Public involvement and participation**
6. **Post-construction site runoff (for new & re-development)**
7. **Pollution prevention for municipal operations**
8. **O & M at stormwater mgt facilities (privately & publicly owned)**

Add'l CC MS4 Permit Reqs

- OVERALL: Reduce discharge of pollutants to the Maximum Extent Practicable (MEP). MS4 permits don't have numeric end-of-pipe limits for pollutants.
- Hydromodification Assessment (due July 2015)
- Stormwater Retrofit Strategy (due July 2015)
- Water quality monitoring at MS4 outfalls and in streams
- Reduce TMDL pollutants & 303(d)-listed pollutants to MEP
- Estimates of total annual stormwater pollutant loads (in pounds/year per community)
- Annual reports to DEQ

Stormwater Management 101



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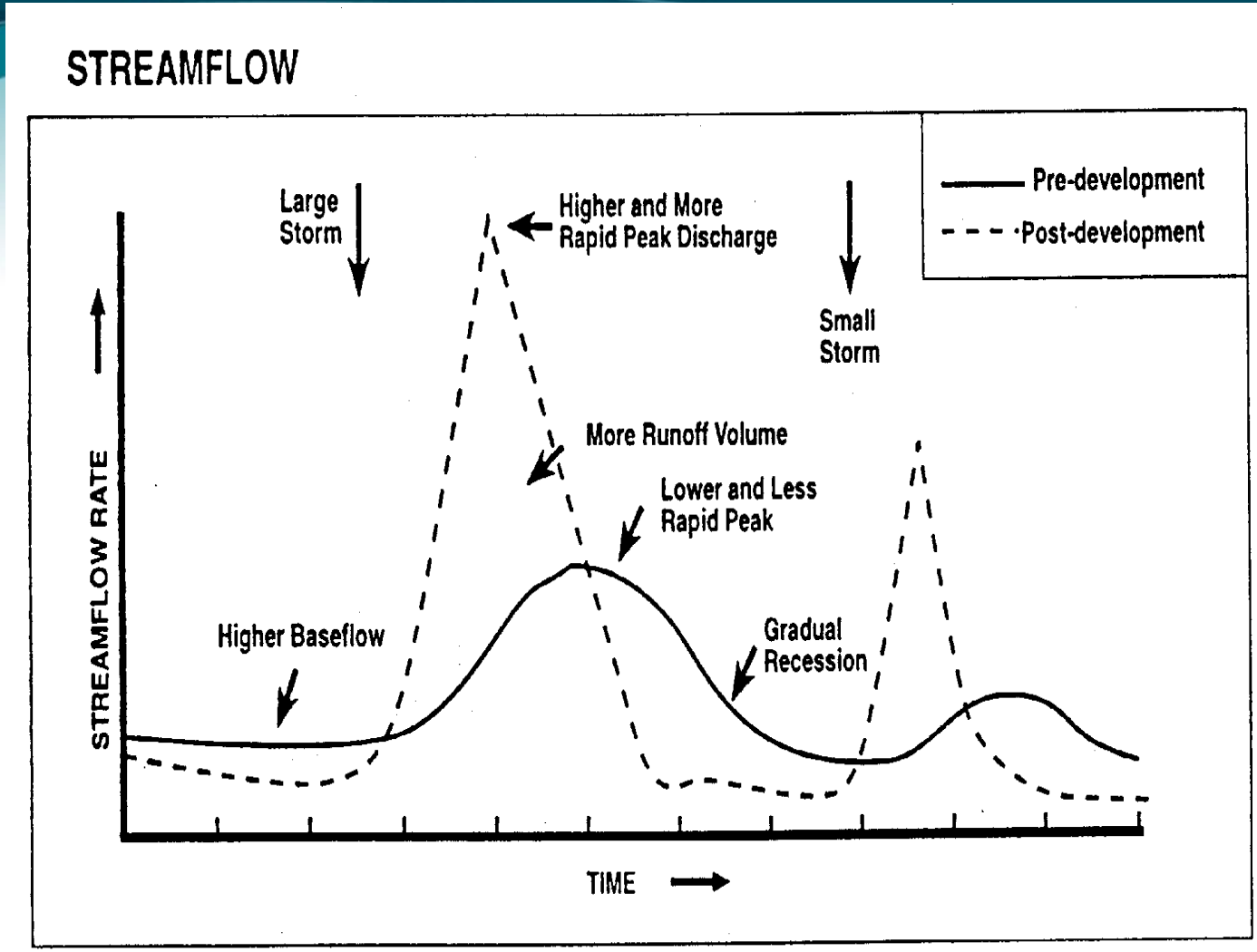
Stormwater Management 101



CWA Beneficial Uses

Are intended to protect Clean Water Act "beneficial uses", which include but aren't limited to:

- **Habitat for fish and all other aquatic life**
- **Human health: Source water supply for a community's potable water. Also, people who come into contact with surface water in the course of doing their job (such as commercial fishermen)**
- **Water contact recreation (swimming, fishing, boating, etc.)**
- **Irrigation water for crops & water for industry**

Toxic Pollutants in the CC MS4

<u>Important Point:</u> What is the average and maximum pollutant concentration? Low levels, by definition, aren't supposed to be harmful.

<u>Categories to be addressed in this presentation include:</u>

1. ***Pesticides*: Kurt Carpenter will deliver a presentation about this in a few minutes, but I'll briefly speak about *DDT/dieldrin* in Johnson Creek**
2. ***Mercury***
3. ***Other metals, such as copper, lead and zinc***
4. ***PCBs***

Note: Other toxic pollutants, such phthalates, have probably also been discharged, but no data is available.

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DDT/dieldrin in Johnson Creek

- These insecticides were banned in the U.S. in early 1970s ("legacy pollutants").
- The 2006 Willamette TMDL includes a TMDL for DDT and dieldrin in Johnson Creek (watershed includes portions of Clackamas & Multnomah Counties)

DDT/dieldrin TMDL in Johnson Creek

- **DDT & dieldrin were not commonly detected in discharges from MS4s, so a "TSS Target" couldn't be established in the TMDL (WLA = 77% reduction). In rural and agricultural areas, the TSS Target is 15 mg/L (LA = 94% reduction).**
- **Solution: Reduction/elimination of soil erosion is the key strategy.**
- **Jan. 2017 TMDL PLRE & Benchmark report: Our MS4's DDT WLA is predicted to be achieved in 2024.**

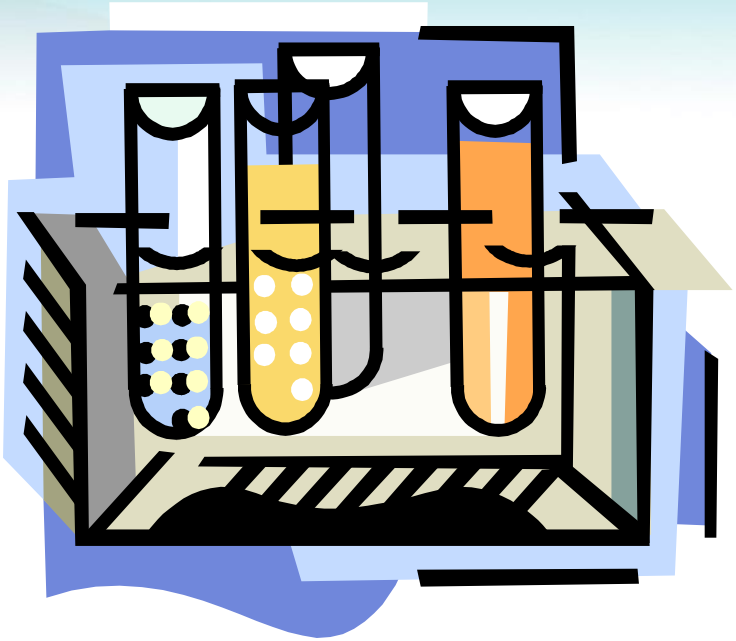
PLRE = Pollutant Load Reduction Evaluation

Mercury

- The 2006 Willamette TMDL includes a TMDL for mercury which applies to the entire WR watershed. This TMDL is being revised by DEQ at this time.
- The 2006 Willamette TMDL calculated the total amount of mercury discharged into Willamette River & tributaries in an entire year is only 284 pounds! Some is discharged into the Columbia River. Some settles into bed sediments and/or is integrated into the food chain (methylated mercury in fish tissue, etc.). Some will vaporize.
- Most of this mercury: 1) is conveyed to the river with eroded soil in stormwater runoff (mercury had been attached to soil particles), and 2) settles onto land, etc. from air deposition and is then washed in during storms.
- Remember: MS4 is a conveyance, not a source.

Mercury Monitoring in MS4

The CC MS4 permit contains a stormwater quality monitoring requirement for mercury. Two MS4 outfalls were monitored by WES in 2014 and 2015. Each outfall was monitored during 3 storms. Total mercury was detected at each outfall during each storm. Total mercury concentrations were all within this range: 0.002 ug/L to 0.011 ug/L.



- **Note: 1.0 ug/L = 1 part per billion**
- **Note: 0.002 ug/L = 2 nanograms/liter = 2 parts per trillion**

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Mercury, Solutions

WES and our partners implement BMPs which reduce the discharge of mercury from the MS4 to the MEP, including:

- **Control erosion (at construction sites, for example)**
- **Retain stormwater on site on private property through our post-construction stormwater program, which applies to new/re-development.**
- **Infiltrate the public's stormwater with our drywells (over 275 inside UGB) and with vegetated swales and dry ponds.**
- **Provide education and/or technical assistance to residents and businesses…goal is *pollution prevention.***

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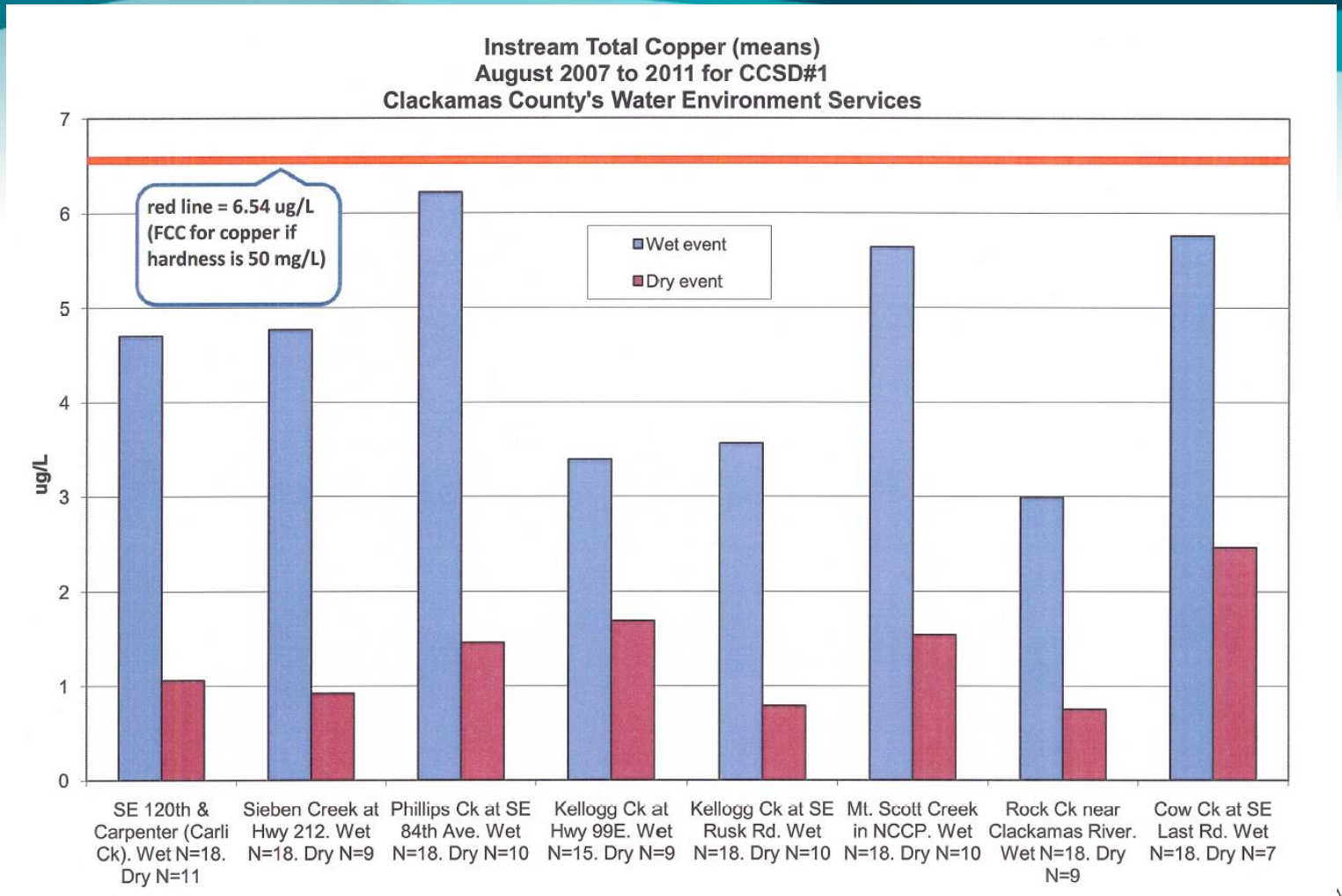
Other metals, such as copper

Other metals, such as copper, lead and zinc, are discharged by the MS4 which is jointly owned/operated by Clackamas County, WES-CCSD#1-SWMACC, and the Cities of Rivergrove and Happy Valley (this MS4 serves ~90,000 people).

- **Creeks in this area have a low average concentration of copper, lead and zinc on days when it isn't raining.**
- **On rainy days, concentrations of these pollutants typically go up. Some of the metals in the water in these creeks on rainy days are discharged from MS4-permitted outfalls. And some isn't.**

Copper (total)

Note: Aquatic Life Criteria is now BLM (biotic ligand model), which is expressed as dissolved copper concentration



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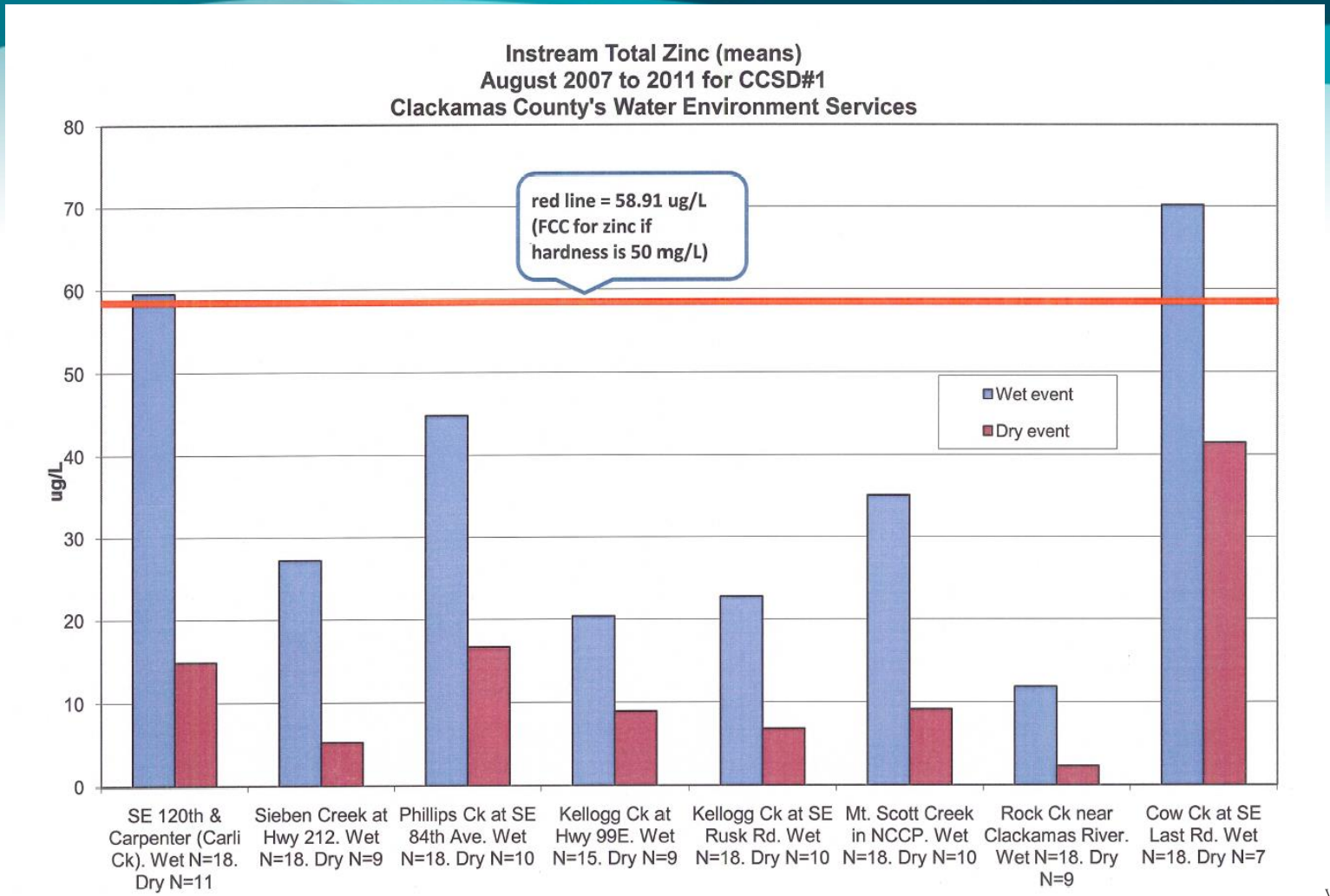
Zinc (total)

Note: As of 2014, Aquatic Life Criteria are based on dissolved zinc



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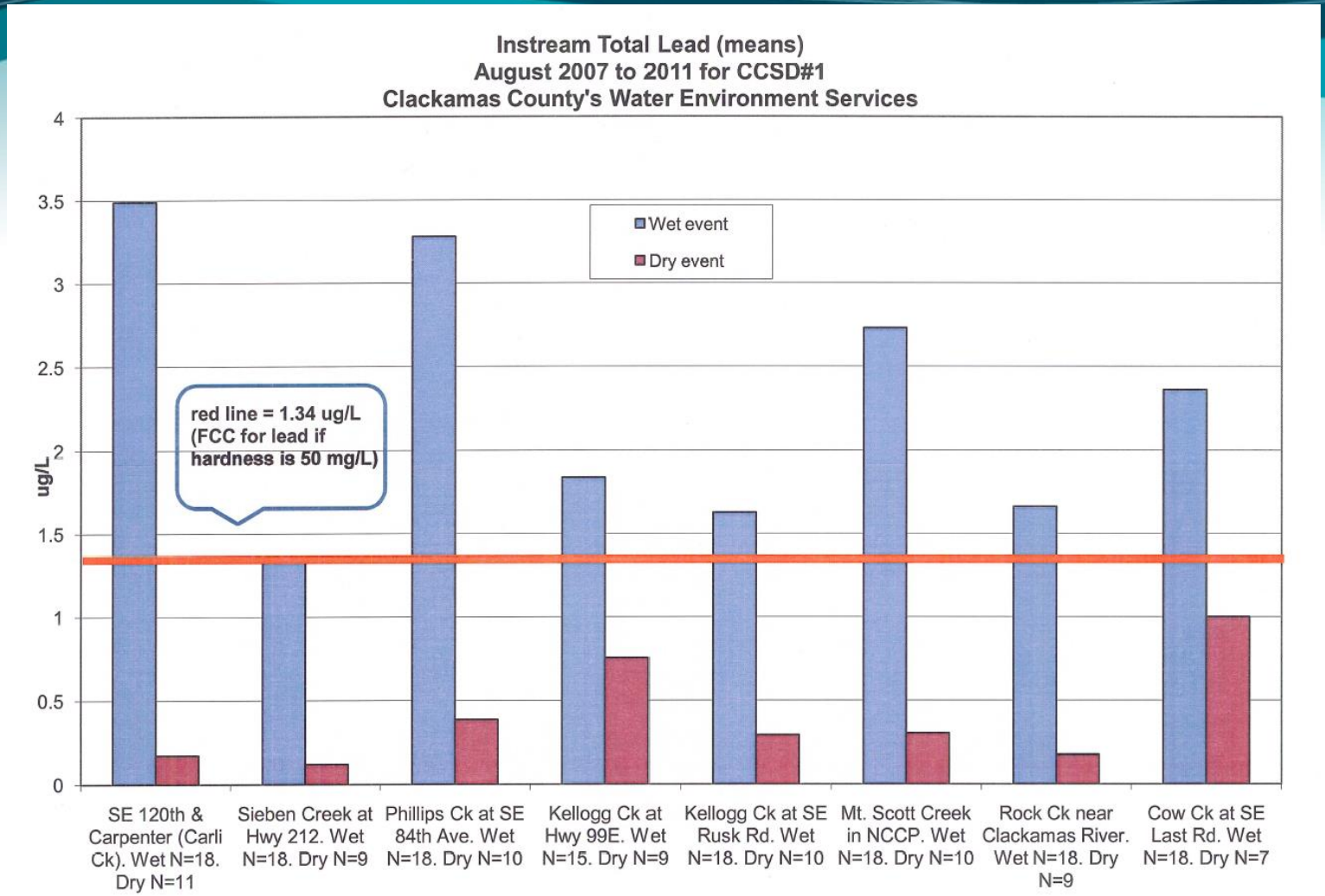
Lead (total)

Note: As of 2014, Aquatic Life Criteria are based on dissolved lead



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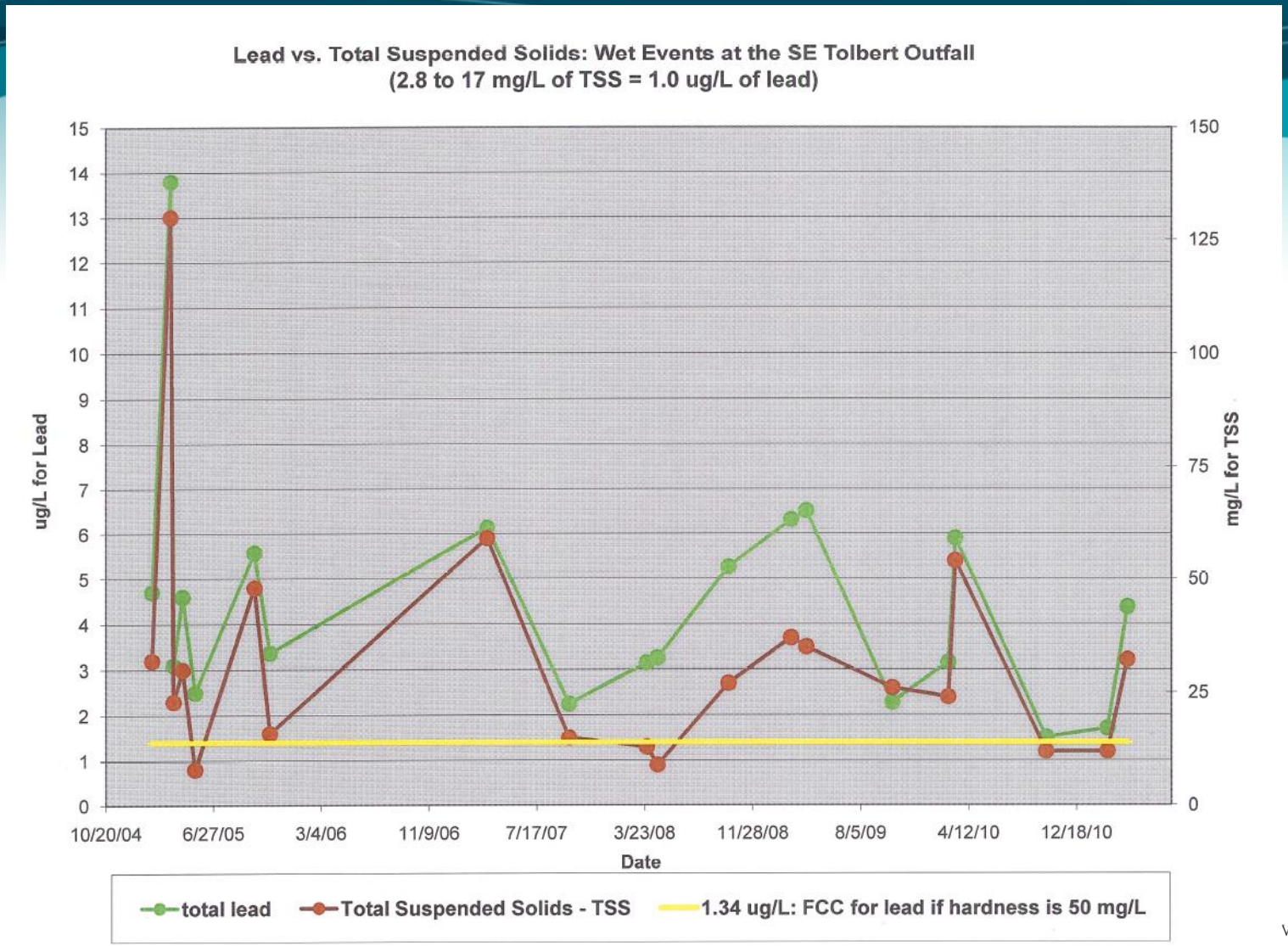
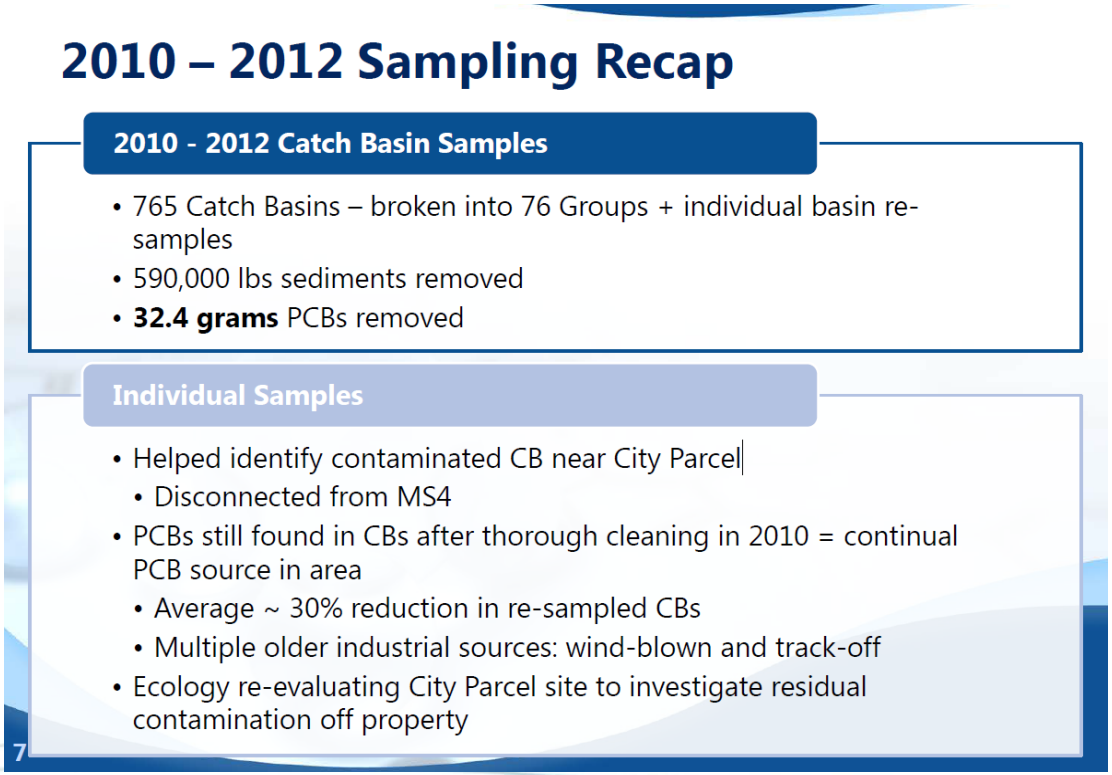
Lead (total) & relation to TSS



A few slides about PCBs

Thanks to City of Spokane's, Lynn Schmidt (Stormwater Permit Coordinator) for these slides from a 2015 presentation about Spokane River in WA & ID. Key finding: PCBs can be conveyed to the river via MS4 outfalls from sources of contamination



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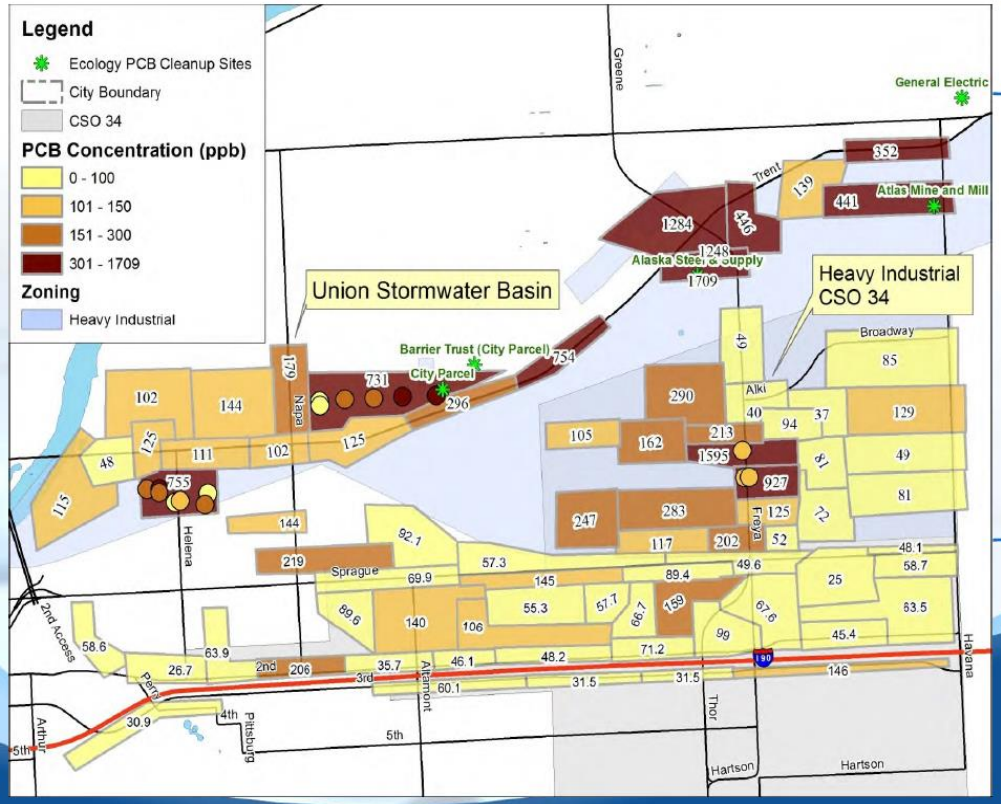
A few slides about PCBs

Thanks to City of Spokane's Lynn Schmidt

2010 and 2011 Catch Basin Sampling



Highest in Heavy Industrial Zone = Re-sample in 2012

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A few slides about PCBs

Thanks to City of Spokane's Lynn Schmidt

City Product Sampling

Results in ug/kg, ppb

Municipal products in contact with stormwater

- Road paint: Yellow and white — 0.4 - 65
  - Liquid and dried
  - Thermoplastic tape — 3 - 10
- Hydrant Paint (Aluminum)
- Utility locate paint (green) — 21
- Motor oil (new and used) — 0.8 – 2.3
- Diesel and gasoline — Gas: 1
- Lubricant
- PVC pipe — 2
- CIPP liner and Shortliner — 1 - 18
- Asphalt sealer
- Crack sealer — 8
- Asphalt release agent
- Deicer — MgCl = 1.3-2 (Great Salt Lake)
- Vehicle wash soap
- Antifreeze
- Pesticide/herbicide — 2,4-D = ND, Portfolio = 7
- Dust suppressant — MgCl = 3.5
- Hydroseed — 2,500
- Firefighting foam

16

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Solutions: Toxic pollutants in a MS4

Options include but aren't limited to:

- Provide education and/or technical assistance to residents and businesses; goal is *pollution prevention.*
- Regulation by Executive branch of govt. (for example, State of Oregon can restrict the sale of a pesticide product so that only Licensed Pesticide Applicators can purchase/use it).
- Install the appropriate stormwater treatment infrastructure, such as rain gardens, which infiltrate runoff.
- Legislation; Example #1: Eliminate phosphorus in most lawn fertilizer products in Minnesota in 2007.
- Legislation; Ex. #2: Auto brake pads (copper); WA in 2010.