

# NPDES Compliance Overview

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Portland Water Bureau  
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Slide Credit and huge thanks to Mac Gifford



# What is NPDES?

Clean Water Act

US Environmental Protection Agency

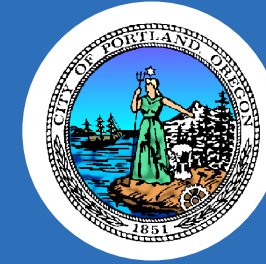
Oregon Department of Environmental Quality

National Pollutant Discharge Elimination System

# Multiple NPDES permits cover PWB work



PWB Supply System - Individual  
Industrial Wastewater Permit



PWB Distribution System -  
BES Municipal Separated Storm Sewer  
System (MS4) Permit

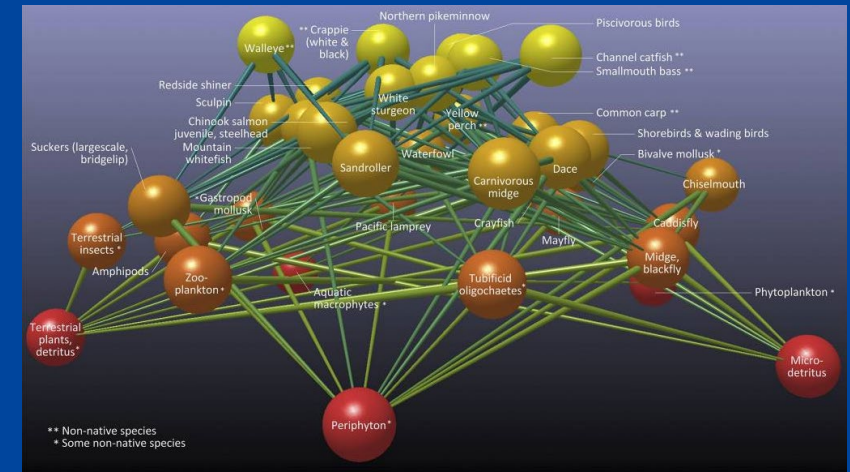


The same basic approach to managing discharges applies across the board, the main difference is in the paper work!



# Um, safe drinking water is also “industrial wastewater” ?

- Low levels of chlorine are toxic to aquatic life
- Great for the glass, bad for the brook





# When does NPDES apply?



Tank Draining

Pipe Draining

Disinfection of Facilities

Flushing

Main Breaks

# We can be fined how much?!?

- DEQ, EPA, and/or third parties can bring action for non-compliance

2. **Penalties for Water Pollution and Permit Condition Violations**  
ORS 468.140 allows the Department to impose civil penalties up to **\$10,000** per day for violation of a term, condition, or requirement of a permit. Additionally 40 CFR 122.41 (A) provides that any person who violates any permit condition, term, or requirement may be subject to a federal civil penalty not to exceed **\$25,000** per day for each violation.

Under ORS 468.943 and 40 CFR 122.41(a), **unlawful water pollution**, if committed by a person with criminal negligence, is punishable by a fine of up to **\$25,000** **imprisonment** for not more than one year, or both. Each day on which a violation occurs or continues is a separately punishable offense.

Under ORS 468.946, a person who knowingly discharges, places, or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state is subject to a Class B felony punishable by a fine not to exceed **\$200,000** and up to **10 years in prison**. Additionally, under 40 CFR 122.41(a) any person who knowingly discharges, places, or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state is subject to a federal civil penalty not to exceed **\$100,000**, and up to **6 years in prison**.

- Exceeding chlorine or pH limits
  - Not monitoring or reporting
  - Negatively impacting streams
- Bureau Administrator (and delegated signatory) face potential individual liability

# PWB Supply System permit requirements

- Applies numeric limits at conduit & groundwater blow-offs
- Total Chlorine < 0.1 mg/L
- 6.0 < pH < 9.0
- Columbia Slough: Total Phosphorus < 0.026 mg/L
- Prohibits erosion or flooding (aka hydromodification)
- **Daily monitoring – record results**
- **Monthly reporting to DEQ/EPA**
- Staff training
- *Johnson Creek: Flow < 10% of creek flow at outfall per City Code*




# BES MS4 Permit requirements

- Narrative criteria applicable to distribution system discharges
- Prohibits non-stormwater discharges into storm system
  - “Uncontaminated water line flushing” and “Potable water sources” are provisionally allowed
- Provisionally allowed discharges may be prohibited if they “are or become a significant source of pollutants”
  - BES Batch Discharge Authorizations document BMPs and help protect PWB’s ability to conduct these activities
  - Chlorine & Sediment are pollutants: turbid water discharges are prohibited
- Control pollution from municipal operations
- No erosion or flooding (aka hydromodification)
- Staff training



# SOP for PWB permit

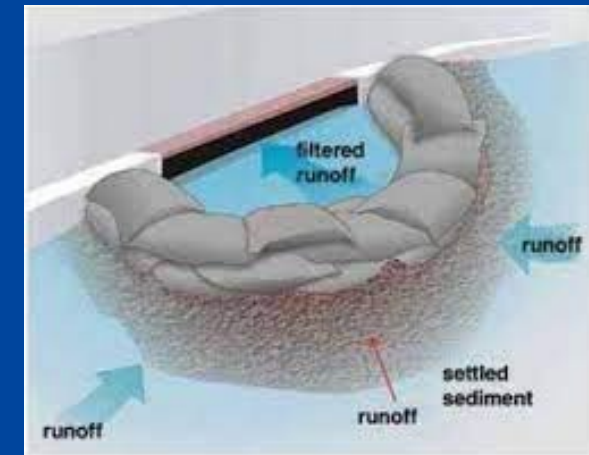
- Defines discharge limits
- Estimate number of tablets and the flow rate needed
- Field measurement instructions
- Records and reporting
- What to do if something goes wrong
- Training

Procedure Name <b>Water Quality Monitoring &amp; Control at NPDES Outfalls</b>			Revision <b>0</b>	 PORTLAND WATER BUREAU FROM FOREST TO FAUCET
			Effective Date 5/01/2018	
Name of Approver	Title	Signature	Date	Author
Danny Allison	Water Operations Manager			<i>Eloise Eccles and Mac Gifford x3-1507</i>
Doug Wise	Water Resources Program Manager			
Chris Wanner	Director of Water Operations			
Michael Stuhr	Portland Water Bureau Administrator			

# BMPs for BES permit

- Obtain Discharge Authorization
  - BES: Bret Davison (3-7588)
- Follow applicable management practices
  - Sweep or remove debris from gutter before discharge
  - Ensure chlorine is  $<0.1$  mg/l
  - Control discharge rate to prevent traffic hazards & inlet backup
  - One or more sediment control mechanisms adapted to location:
    - Infiltrate where practical (take care on slopes)
    - Inlet protection/filtering devices
    - Temporary impoundment(s) to slow flow and settle sediment
    - Use a container like a baker tank to settle fine sediment
    - **Stop discharge if sediment is entering an inlet/stream!!**

Potable Water Discharge Request Form	
<i>(For batch discharges of potable water to the city of Portland sewerage system)</i>	
..... Section I (to be completed by Water Bureau personnel prior to discharge)	
Site Name and Address:	Mt Calvary Tank - DRAIN 5425 W Burnside Rd
Contact Person and Phone No.:	Brian Robison 503.849.1730 Tim Kading 503.823.6315 DMR
Receiving Discharge Facility:	Surface > Ravine > Balch Creek
Estimated Duration:	2 days
Maximum Volume:	300,000 Gallons
Maximum Flow Rate:	200 GPM
Start Date and Time:	Monday, September 19, 2016



# Planning and Preparation

- Equipment (hoses, meters, diffuser, signage)
- Vita-D-Chlor tablets
- Calibrated field pH and chlorine analyzer
- Erosion control supplies
- NPDES Discharge Record
- Coordinate with lab for P analysis, if needed



Portland Water Bureau Discharge Record **Appendix**

Discharge Location: \_\_\_\_\_ Date: \_\_\_\_\_

Discharge to - A.  NPDES outfall B.  BES facility C.  Other (land application or sedimentation)

For B. or C.  BES permit obtained  Not applicable

Planning & Preparation Tasks

Bottle for reactive phosphorus sample (For 001 Series Outfall to Columbia Slough)  Not applicable

pH meter calibrated (Do this daily)

Secondary standard check for chlorine colorimeter completed within last 3 months

Expected Discharge Volume: \_\_\_\_\_ gal Expected chlorine concentration: \_\_\_\_\_ ppm

Vita-D-Chlor Tablets needed (calculated): \_\_\_\_\_ (see formula on back of this sheet)

**Field Data**

**Water quality limits for pH and chlorine: pH of 6 – 9 Total chlorine of 0.1 mg/L max**

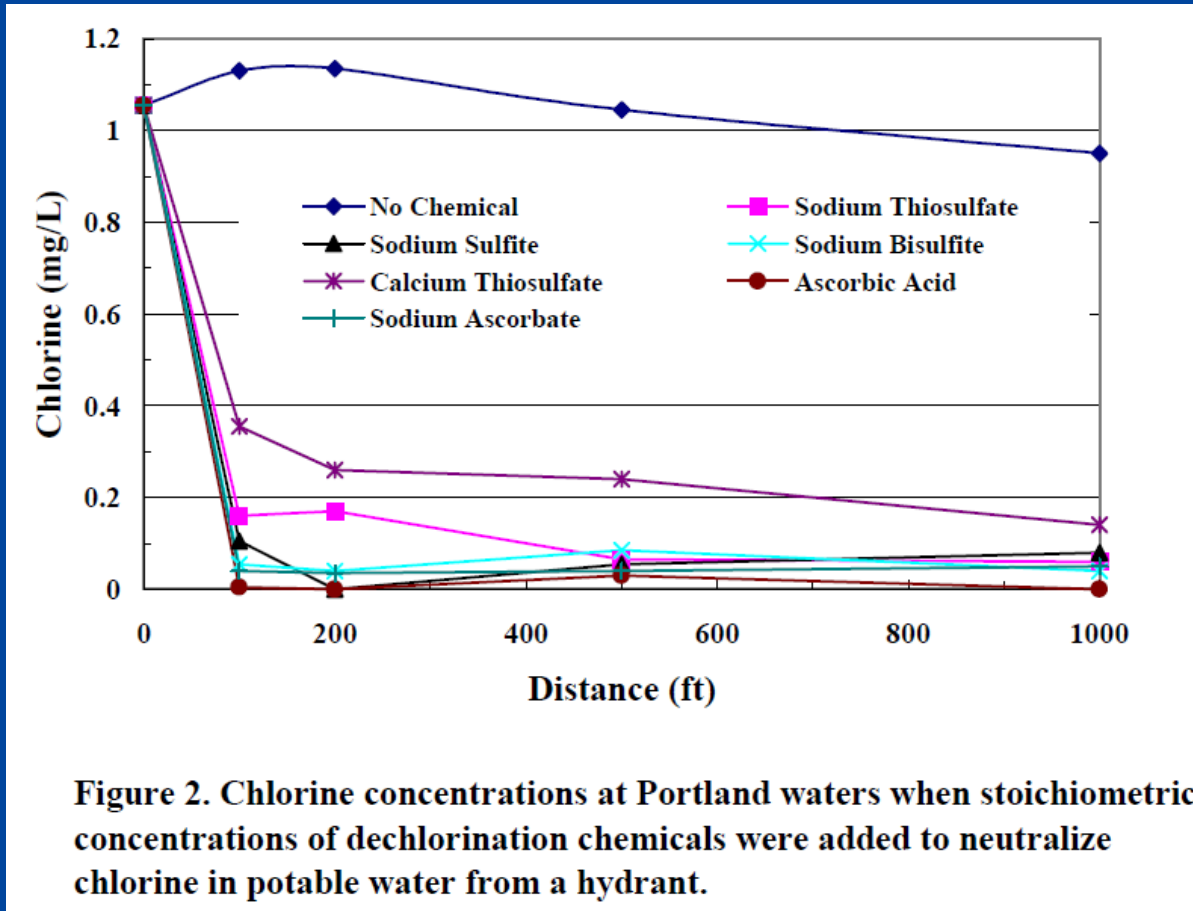
Time	Flow Rate, gpm	pH	Total Chlorine Residual, mg/L	Comments (Required when any measurements are out of compliance)
				Start of discharge





# Why Do We Use Ascorbic Acid?

aka Vitamin C



← Pavement does not dissipate chloramine

← Other chemicals work, but not as quickly or completely.

← Ascorbic acid neutralized the chlorine residual within 100' (24 seconds).

Ascorbic acid is also safer than sulfur compounds for aquatic life.

# Tablets Needed

$$\text{Total Tablets Needed} = \frac{(\text{Pipe Diameter (in)})^2 * (\text{Chlorine Concentration (ppm)}) * (\text{Pipe Length (ft)})}{278,075}$$

$$\text{Total Tablets Needed} = \frac{(\text{Gallons Drained}) * (\text{Chlorine Concentration (ppm)})}{11,529}$$

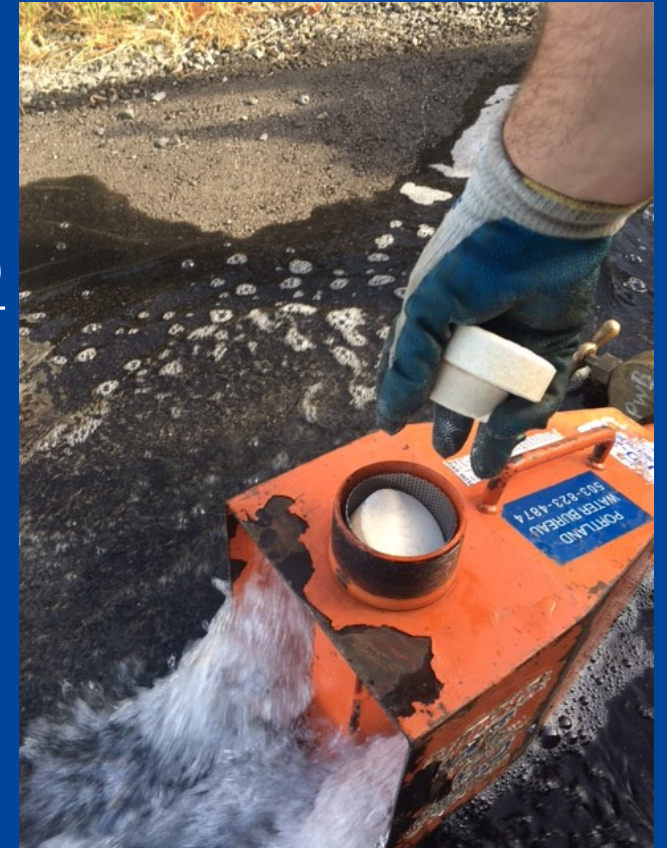


...Plus a few extra

# How fast to use tablets

$$\text{Tablets Needed Per Hour} = \frac{(\text{Flow Rate (GPM)}) * (\text{Chlorine Concentration (ppm)})}{192}$$

Or the table attached to the protocol...



**Appendix A** **Dechlorination Chemical Feed Rates for Various Discharge Flows and Chlorine Concentrations**

Cl in discharge flow, ppm	Tablets per Hour of Vita-D-Chlor Needed to Dechlorinate Drinking Water																					
	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6
Discharge flow rate, gpm																						
100	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.4
150	0.4	0.5	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0	2.0
200	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7
250	0.7	0.8	0.9	1.0	1.2	1.3	1.4	1.6	1.7	1.8	2.0	2.1	2.2	2.3	2.5	2.6	2.7	2.9	3.0	3.1	3.3	3.4



# Troubleshooting De-chlor

- Adjust flow rate.
  - Slow it down if chlorine is too high.
  - Speed it up if pH is too low.
- Managed discharges
  - Make an adjustment
  - Take a new sample
  - Call in
- Unplanned discharges
  - Control it
  - Call in

1. Make an adjustment
2. Record the adjustment
3. Take a new sample

# Analytical Instruments

- Calibrate HQ40d on day of use for pH measurement.
- Verify DR 890, DR 900, or SL1000 on day of use for total chlorine measurement.





# Field Setup

Safety from traffic



Identify sample location

Maximize discharge flow distance



Public perception



Appropriate hoses, valves, meters, diffusers



# Keep Record for Monthly Reporting

**Portland Water Bureau Discharge Record      Appendix B**

Discharge Location: \_\_\_\_\_ Date: \_\_\_\_\_

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**Planning & Preparation Tasks**

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**Field Data**

**Water quality limits for pH and chlorine: pH of 6 – 9    Total chlorine of 0.1 mg/L maximum**

Time <sup>h</sup>	Flow Rate, gpm	pH	Total Chlorine Residual, mg/L	Comments <small>(Required when any measurements are out of compliance)</small>
				Start of discharge

Measurements at regular intervals, and after every adjustment

Record as "< 0.02", the instrument detection limit



# West Side vs. East Side Geography

Streams

Streams

Streams

Streams

Streams

Streams

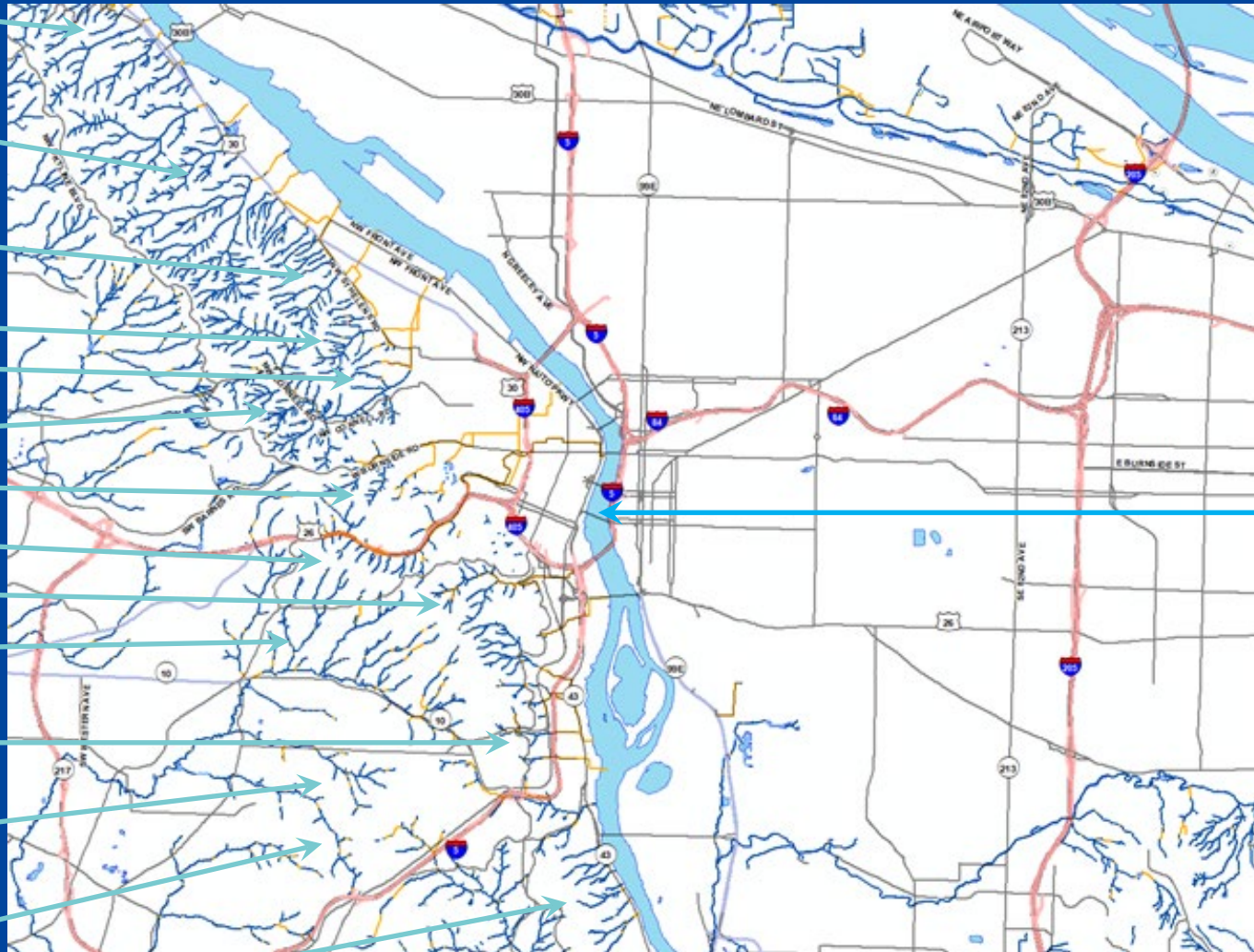
Streams

Streams

Streams

Streams

Streams



Columbia Slough

Willamette River

Johnson Creek

# Resources

- Copy of protocol
- Dechlor tablets table
- Discharge record
- Checklist