

# **Public Hearing:** **Proposed Revisions to Total Dissolved Gas Criteria in the Snake and Columbia Rivers and Other Minor Changes**

**Water Quality Program  
Washington Department of Ecology**

**WA State School for the Blind, Vancouver  
September 16, 2019 1:30 PM**



# What We will Cover in Today's Hearing

- **Timeline** of this proposed rule and next steps
- Proposed **minor changes** to the water quality standards
- Proposed changes to **Total Dissolved Gas**
- **Q & A** on the proposed changes
- Formal **Public Hearing** on proposed changes
  - Verbal **Testimony** recorded



# Public Hearing: Ground Rules

Water Quality Program  
Washington Department of Ecology



# Welcoming Remarks

Heather Bartlett

Water Quality Program Manager



# Rule Timeline

- Announced Intent of Rulemaking: **CR-101** (May 8, 2019) ✓
  - Issues preproposal statement of inquiry
- **Opened** scoping comment period (May 8, 2019) ✓
  - Issued a determination of significance in the state SEPA register
  - Requested comments on the scope of the Environmental Impact Statement
- **Closed** scoping comment period (May 29, 2019) ✓
  - Received 9 comment submissions
  - The comments helped us develop the draft EIS
- **Announced the Proposed Rule: CR-102** (July 31, 2019) ✓
  - Distributed the draft rule language
  - Distributed the draft Environmental Impact Statement
  - Distributed the draft implementation plan



# Next Steps

- **Scheduled Public Hearings**

- *September 16, 2019* (in-person in Vancouver, WA)
- *September 19, 2019* (statewide online webinar)

- Proposed rule comment period closes: September 26, 2019

- Review and respond to comments: October-December, 2019

- Adopt Rule: **CR-103** December 2019

- EPA approval after adoption (prior to 2020 spring spill season)





# Significant Change Proposed: Total Dissolved Gas

- *Modification of the total dissolved gas (TDG) criteria in the Snake and Columbia rivers during spill season*

**Reason for Modifications:** Allow increased spill water over the dams that will in turn lead to increased fish passage



# Minor Changes Proposed

- We are also proposing the following minor changes to the water quality standards:
  1. *Removal of the provisions for allowing an incremental temperature increase in fresh and marine waters from nonpoint sources*
  2. *Clarifying that an adjustment of metals criteria (also called Water Effects Ratio) requires EPA approval*
  3. *Clarifying language added to the descriptions of aquatic life uses for marine waters*





# Minor Change Proposed: Incremental temperature allowances

- *Removal of the provisions for allowing an incremental temperature increase in fresh and marine waters from nonpoint sources:*
  - “Incremental temperature increases resulting from the combined effect of all nonpoint source activities in the water body must not, at any time, exceed 2.8°C (5.04°F)”

**Reason for Removal:** To meet legal obligations made in a 2018 U.S. District Court Stipulated Order of Dismissal between NWEA, EPA, and Ecology. These provisions have never been used or implemented, therefore is viewed as a minor change.



# Minor Change Proposed: Amending footnote in Toxics section

- *Amendment to footnote ‘dd’ in WAC 173-201A-240(5), Table 240 to clarify that an adjustment of metals criteria (Water Effects Ratio) requires EPA approval:*

“The adjusted site specific criteria are not in effect until they have been incorporated into this chapter and approved by EPA”

- Development of a water effects ratio is considered a site-specific criteria and requires a rule change and EPA approval

**Reason for adding clarifying sentence:** Meet legal obligations made in a 2018 U.S. District Court Stipulated Order of Dismissal between NWEA, EPA, and Ecology



# Minor Change Proposed: Clarifying marine use descriptions

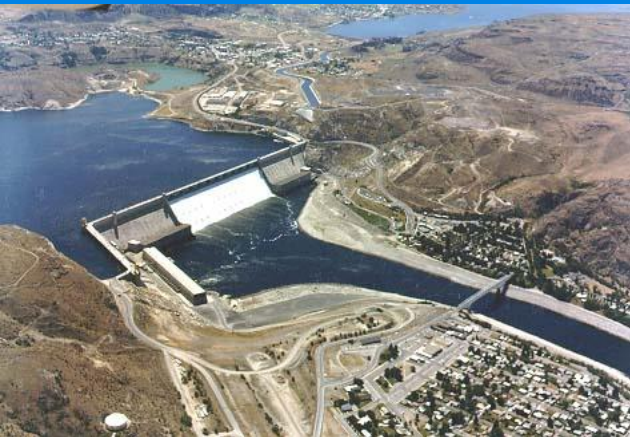
- *Clarification of the aquatic life use descriptions for marine waters*

1997 Water Quality Standards	Language inadvertently dropped in 2003 rulemaking
Class AA: extraordinary	Water quality of this class shall <u>markedly and uniformly exceed the requirement</u> for all or substantially all uses
Class A: excellent	Waters shall <u>meet or exceed the requirements for all or substantially all uses</u>
Class B: good	Waters shall <u>meet or exceed the requirements for most uses</u>
Class C: fair	Waters shall <u>meet or exceed the requirements for selected and essential uses</u>

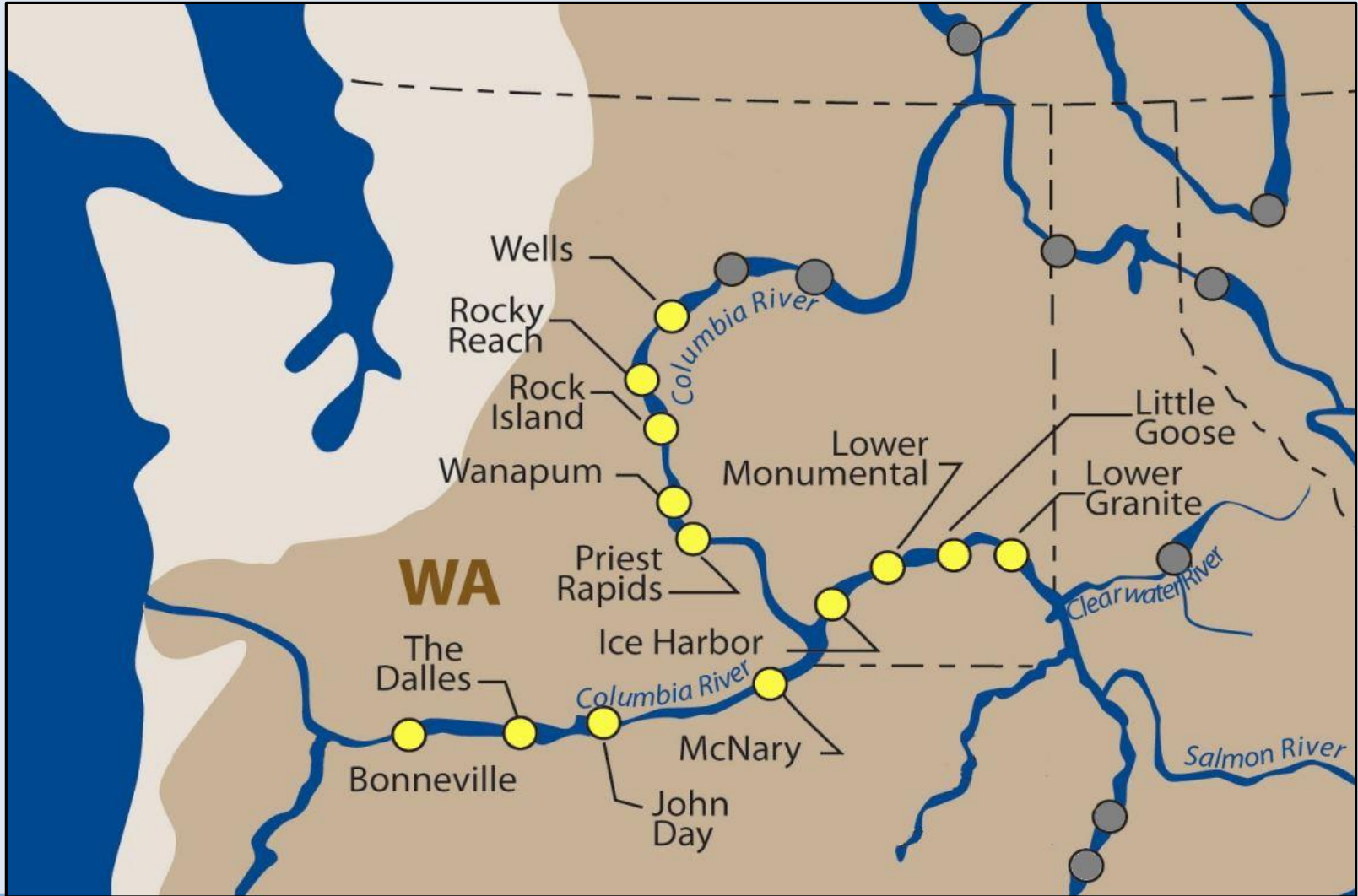
**Reason for Clarification:** Petition from the City of Everett pointed out discrepancies in language that needed clarification.



# Water Quality Standards: Total Dissolved Gas



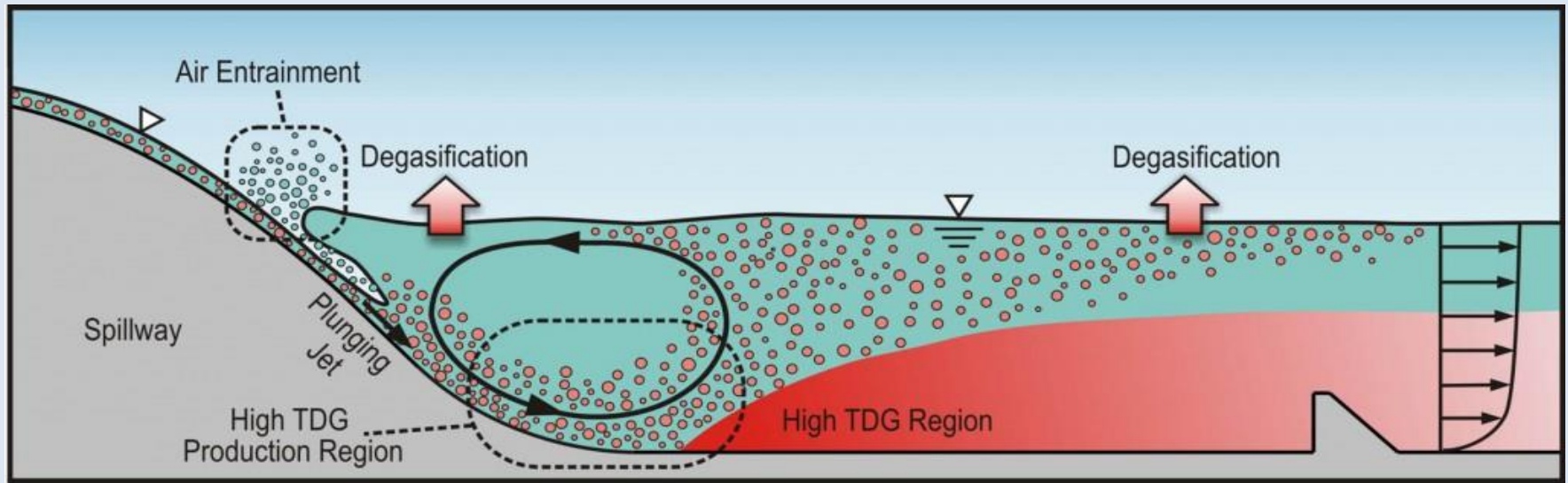
# Geographical Scope





# What is TDG?

- Plunging water “entrains” or traps air in the river.
- The entrained gases (mostly nitrogen and oxygen) produce pressure.
- Pressure is recorded as a percentage. 100% is normal or “in equilibrium” with the atmosphere. Anything above this is considered “supersaturation”
  - **Example: 110% TDG is creating 10% more pressure in the water column than than what is considered normal or in equilibrium**



\* Used with permission, from University of Iowa IIHR Hydroscience and Engineering, IIHR TDG home page: <https://www.iihr.uiowa.edu/totaldissolvedgas/>



# Why do we limit TDG?

- High TDG can result in the formation of gas bubbles in tissues and harm aquatic life
- Depth compensation may protect some aquatic life from high TDG levels



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## So why increase spill at dams?



- Studies demonstrate that the spillways are safer routes for fish migrating downstream
- Fish that pass over the dam have higher survival rates than those that pass through the turbines





# Current Total Dissolved Gas Criteria

## State-wide

Magnitude	Duration/Averaging Period	Frequency
110%	Instantaneous	Not to be exceeded

## Snake and Columbia Rivers

- Seasonal TDG criteria allowable during spill season
- TDG criteria is adjusted to aid in fish passage

Magnitude	Duration / Averaging Period	Short-term modification removed 115% for up to 3 yrs Not to be exceeded
<del>115% forebay</del>	<del>Highest consecutive 12 hour avg. in a day</del>	
120% tailrace	Highest consecutive 12 hour avg. in a day	
125% maximum	1 hour average	



# Total Dissolved Gas Criteria for Snake & Columbia Rivers

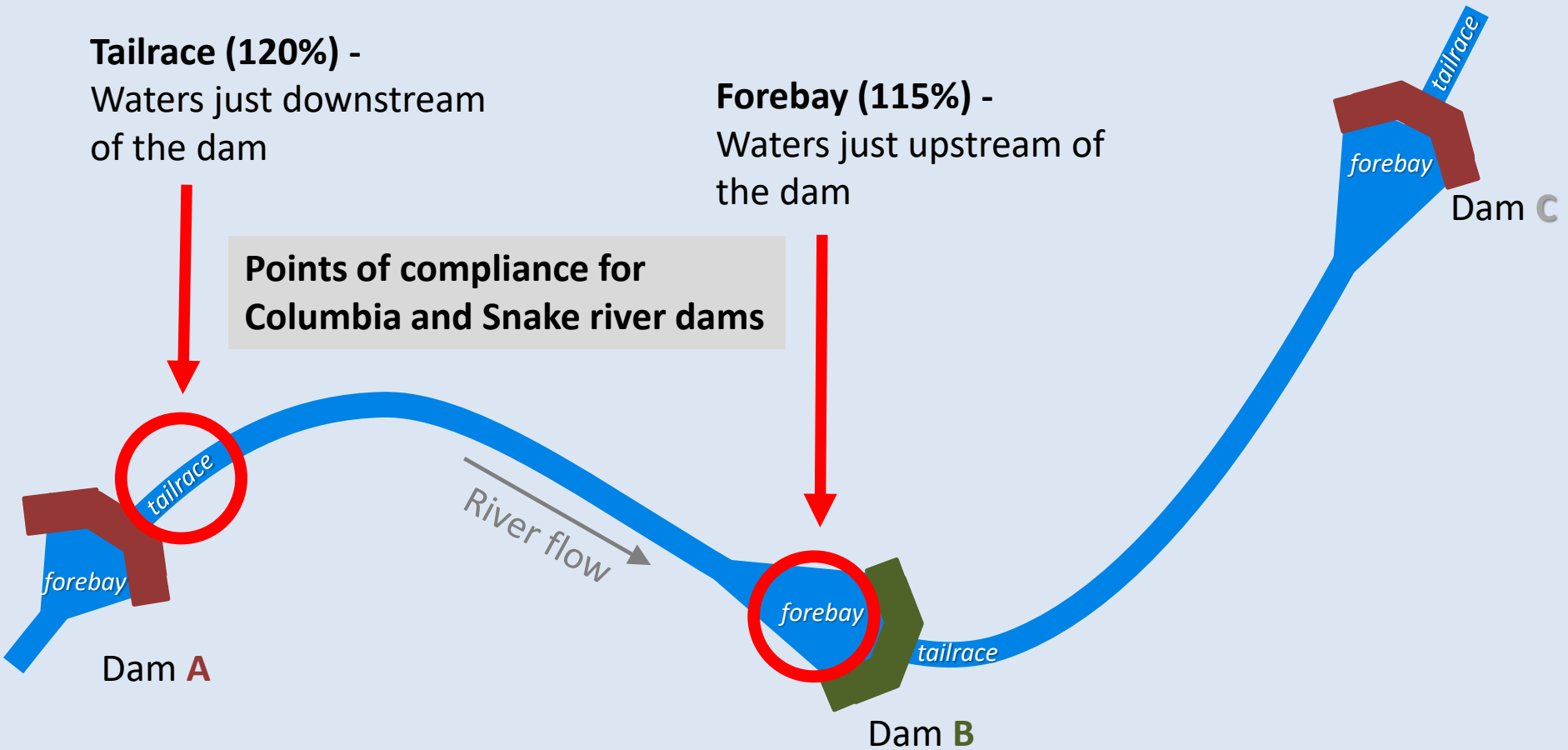
## Tailrace (120%) -

Waters just downstream  
of the dam

## Forebay (115%) -

Waters just upstream of  
the dam

Points of compliance for  
Columbia and Snake river dams



# Current Requirements for the Adjusted TDG Criteria

- Gas abatement plan (approved by Ecology)
  - Long-term strategy to incorporate structural and operational measures to continue to reduce TDG during spill
  
- Fisheries management plan
  - Approach for reducing and eliminating negative impacts to salmon and steelhead
  
- Physical and biological monitoring plans
  - Plans that outline monitoring program for water quality and the biological health of aquatic life





# Why Modify TDG Criteria on the Snake and Columbia Rivers?

# Why Modify TDG Criteria?

## On the Snake and Columbia Rivers

- **Falling Short of Salmon Recovery Goals**
  - Northwest Power and Conservation Council
    - Goal: return of 5 million adult salmonids
    - 2019 Forecast: 1.1 million salmonids
    - Goal: Smolt-to-adult return of 2-6% or 4% average
    - Goal not met most years
- **Comparative Survival Study**
  - Predicts increased spill will benefit fish
  - Largest fish benefit will come from spill up to 125% TDG



# Why Modify TDG Criteria?

## On the Snake and Columbia Rivers

### ■ Flexible Spill Agreement

- Fish benefits: Increases total spill over next 2-3 years to improve smolt-to-adult ratio and salmon returns
- Power benefits: Decreasing spill during short daily periods of high energy demand
- Timeline:
  - 2019: ~16 hours of spill to 120% TDG for fish with ~8 hours of lower spill (2014 BiOp) for power generation
  - 2020-2021: ~16 hours of spill to 125% TDG for fish with ~8 hours of lower spill (2014 BiOp) for power generation



# Why Modify TDG Criteria?

## On the Snake and Columbia Rivers

### ■ Orca Task Force Recommendation #8:

- *Increase spill to benefit Chinook for Southern Residents by adjusting TDG allowances at the Snake and Columbia River dams*
  - Direct Ecology to increase TDG allowances from 115% to 125% to benefit Chinook and other salmonids
  - Align standards with the State of Oregon
  - Maintain rigorous monitoring of salmonids and resident fish
  - Work with stakeholders to minimize revenue losses and impacts to fish and wildlife funds







# Proposed Rule Changes

# TDG Numeric Criteria

## on the Snake and Columbia River

- **Proposed Decision:**
  - **Remove** the 115% forebay criterion
  - **Remove** the 120% tailrace criterion
  - Maintain the 125% tailrace criterion
- Expand on the required monitoring for gas bubble trauma with a focus on resident fish species



# Duration

## Options:

1. Up to 24 hours per day (performance spill period not included)
2. As prescribed in flexible spill operations (~16 hrs of spill for fish and ~8 hrs of performance spill)

**Proposed decision:** Up to 24 hours per day



# Averaging Period

- 115% forebay & 120% tailrace criteria
  - Washington: highest consecutive 12-hour average
  - Oregon: average of the 12 highest hours in one day

**Proposed decision:** change 12 highest consecutive hours to the 12 highest hourly TDG measures in one day

- 125% tailrace criterion
  - Washington: one hour average
  - Oregon: two hour average

**Proposed decision:** change from 1-hour to 2-hour average



# 125% TDG Tailrace Criterion

## Conditions:

- 1) US Army Corps Engineers must be in accordance with Endangered Species Act consultation
- 2) Dam operators must have an approved biological monitoring plan focused on resident fish
- 3) Dam operators must be below biological thresholds for gas bubble trauma



# Proposed TDG Criteria for the Snake and Columbia Rivers

**By default this TDG criteria applies during the spill season**

Magnitude	Duration / Averaging Period	Frequency
115% forebay	Average of 12 highest hourly readings in a day	Not to be exceeded
120% tailrace	Average of 12 highest hourly readings in a day	
125% maximum	Average of the 2 highest hourly readings in a day	

**Conditional use of 125% tailrace criterion during spring spill season (Apr – June)**

Magnitude	Duration / Averaging Period	Frequency
125% tailrace	Average of the 2 highest hourly readings in a day	Not to be exceeded





# Implementation



# Biological Monitoring Plan

**Purpose:** evaluate the risk of elevated TDG levels to non-salmonid fish

- Salmonid monitoring will continue via the Fish Passage Center

## **Requirements of Biological Monitoring:**

- Approved by the Department of Ecology
- Required for a minimum of 5 years
- Must meet biological thresholds
- Annual reporting of gas bubble trauma incidence

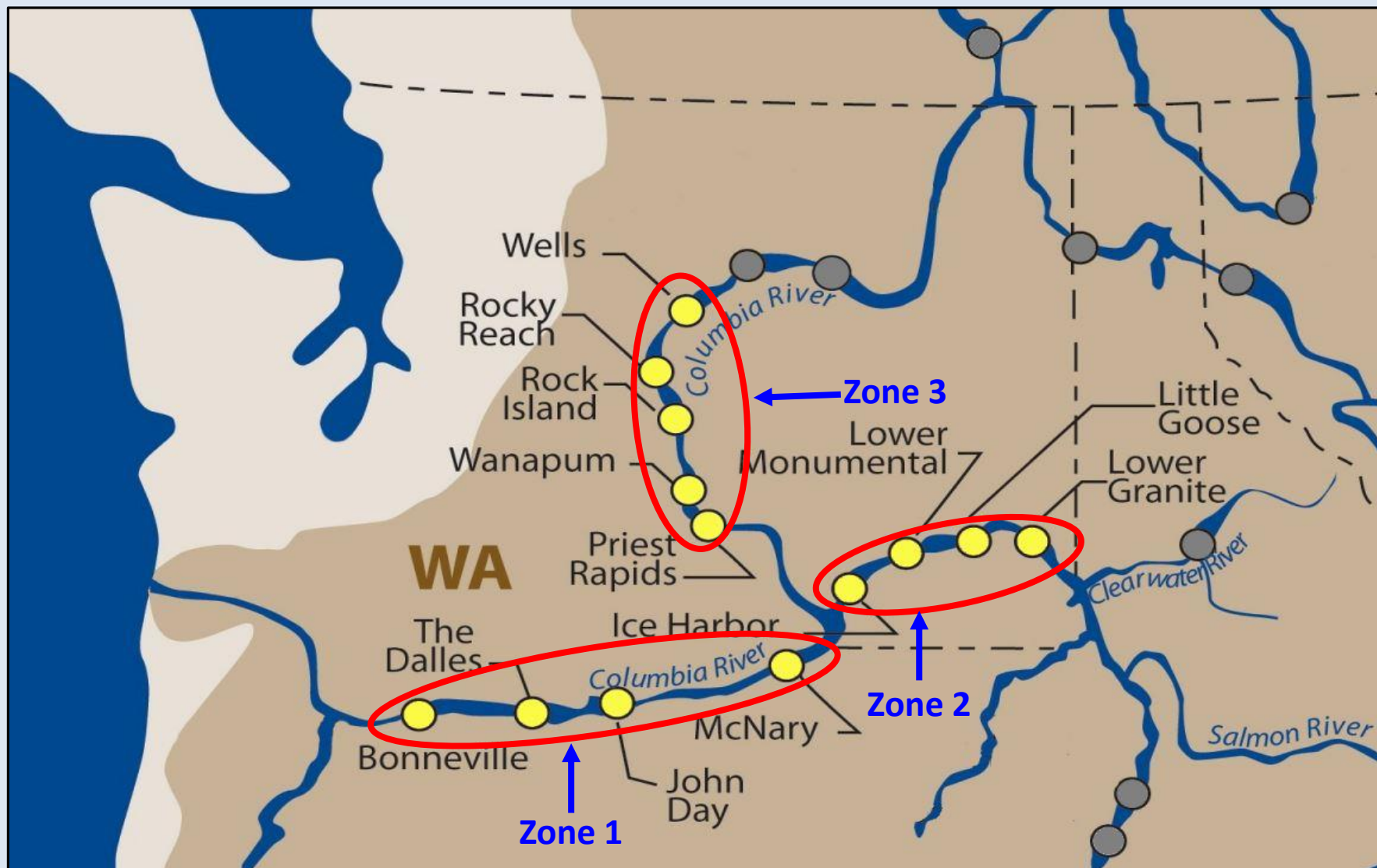


# Biological Monitoring Plan

- **Minimum sample size:**
  - 50 salmonids & 50 non-salmonid fish per week
- **Species richness:**
  - 3 native non-salmonid fish
  - Minimum sample size of 10 fish for each species
  - Non-native species as surrogates when insufficient native fish
- **Sample location:**
  - Fish bypass system
  - In-river sampling within 1 mile downstream of project



# Biological Monitoring: Compliance Locations



# Biological Thresholds

- Calculated incidence of gas bubble trauma (GBT) in salmonids or non-salmonids may not exceed:
  1. Gas bubble trauma in non-paired fins of 15 percent; or
  2. Gas bubble trauma in non-paired fins of five percent and gas bubbles occlude more than 25 percent of the surface area of the fin
  
- If an exceedance of GBT occurs:
  - Can no longer use 125% TDG adjustment until....

Gas bubble trauma is below biological thresholds over the next 7-day averaging period before the 125% TDG criterion can be reapplied



# Summary of Proposed TDG Criteria for the Snake and Columbia Rivers

Revised TDG Criteria has two parts:

## **Adjusted Criteria (automatically applied):**

- 115% forebay/120% tailrace/125% max criteria
- Spill season only (can include summer spill)
- Gas abatement plan no longer required by Ecology

## **Further Adjusted Criteria (conditional applied):**

- 125% tailrace criterion only
- Spring spill season (generally April – June)
- Requires an Ecology approved biological monitoring plan
- Must meet biological thresholds for gas bubble trauma in fish





# Questions?



# Formal Public Hearing

- We are now in the formal public hearing.
- Verbal testimony will be recorded.
- We will go in the order that requests were received at the sign-in, followed by others who want to testify.



# How to Provide Written Comments

**COMMENTS DUE BY SEPTEMBER 26, 2019**

- **In person** at today's public hearing
- **Online** through *eComments* on Ecology's rulemaking webpage
- **By mail** Susan Braley  
WA State Dept. of Ecology  
Water Quality Program  
PO Box 47600  
Olympia, WA 98504-7600





# Contact Information

- **Rule webpage:**

<https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Rulemaking/WAC173-201A-revisions>

- **Technical Lead:**

Bryson Finch

[bryson.finch@ecy.wa.gov](mailto:bryson.finch@ecy.wa.gov)

360-407-7158

- **Rulemaking Lead:**

Susan Braley

[susan.braley@ecy.wa.gov](mailto:susan.braley@ecy.wa.gov)

360-407-6414

