



Nutrient Management Update

MWPAAC Briefing
April 26, 2023

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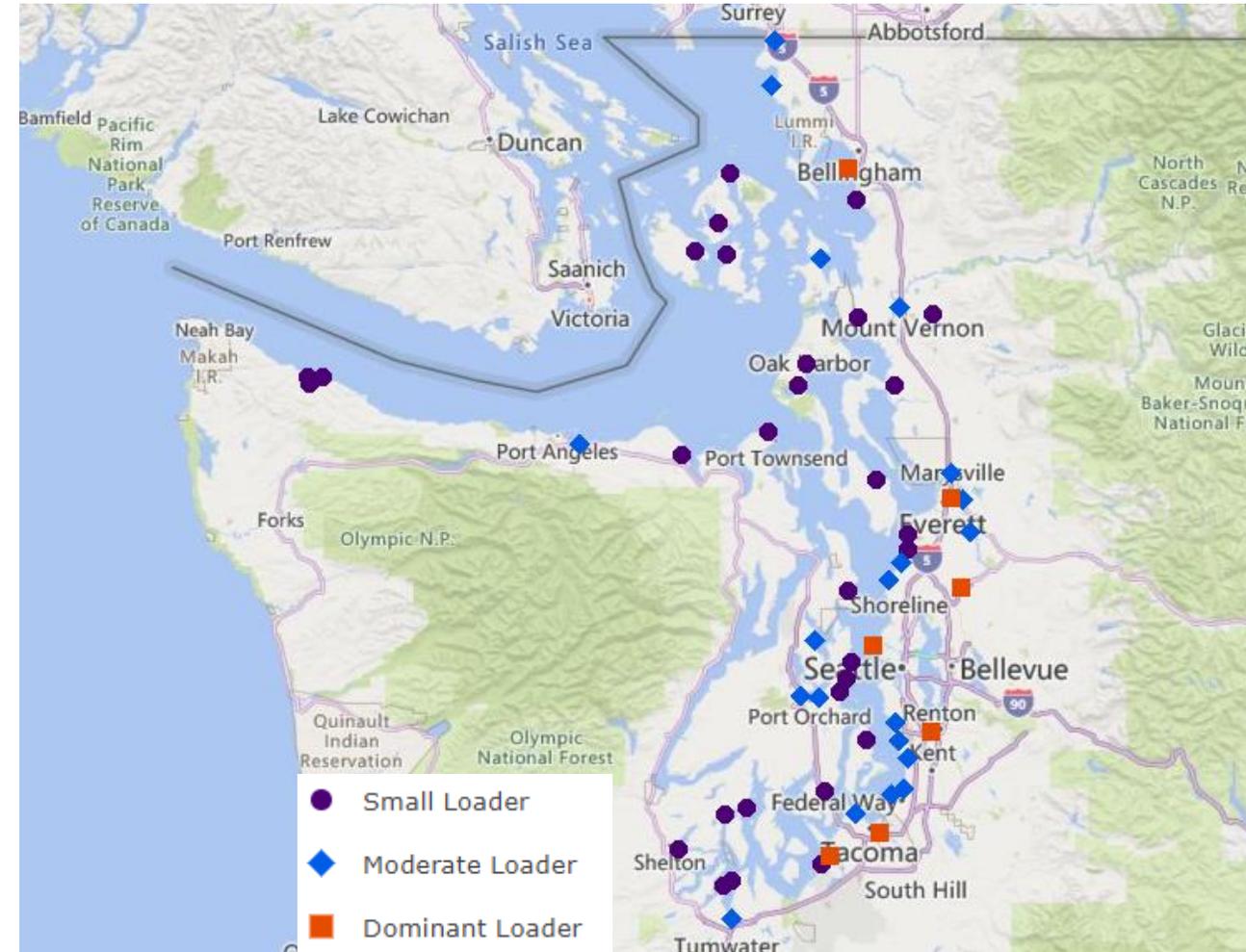
Presentation Overview

1. Puget Sound Nutrient General Permit 2022 Performance
2. Optimization Planning for 2023
3. Nutrient Reduction Evaluation
4. Other Nutrient Regulatory Actions We're Tracking



Puget Sound Nutrient General Permit (PSNGP)

- Covers the 58 WWTPs discharging to Puget Sound
- Effective: January 1, 2022 – December 31, 2026
- Plants are categorized by discharge size, with different permit provisions
- Key permit features:
 - **Action Levels** - Hold nitrogen (total inorganic nitrogen) loadings steady
 - **Optimization** – minor changes to plant operations to reduce nitrogen
 - **Monitoring & Reporting** – monitor & report nitrogen in influent and effluent
 - **Nutrient Reduction Evaluation** - Planning to meet future nitrogen limits
- Large utilities can operate under a “bubbled” discharge. WTD’s West Point, Brightwater, South Plant operate under a bubbled action level. Vashon operates under a separate small discharge action level.

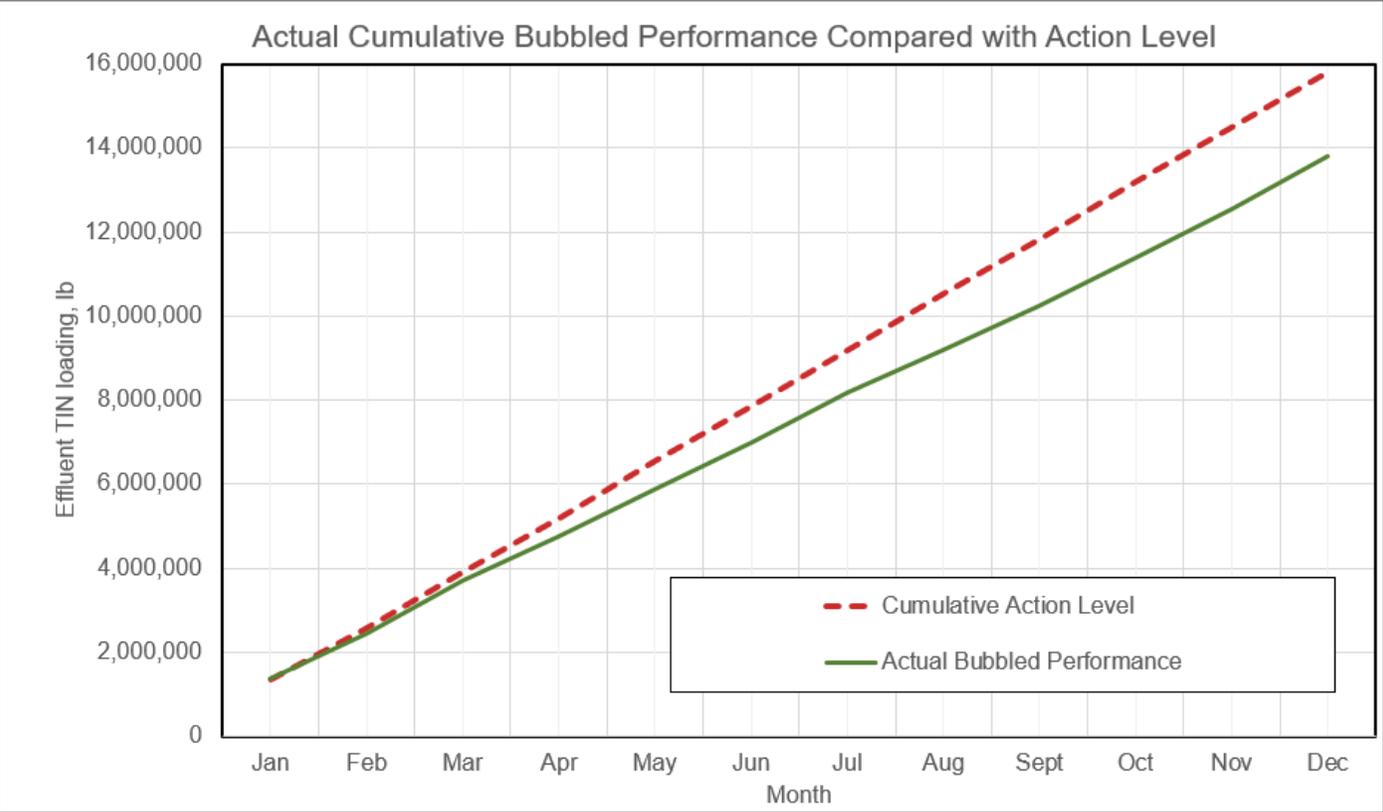
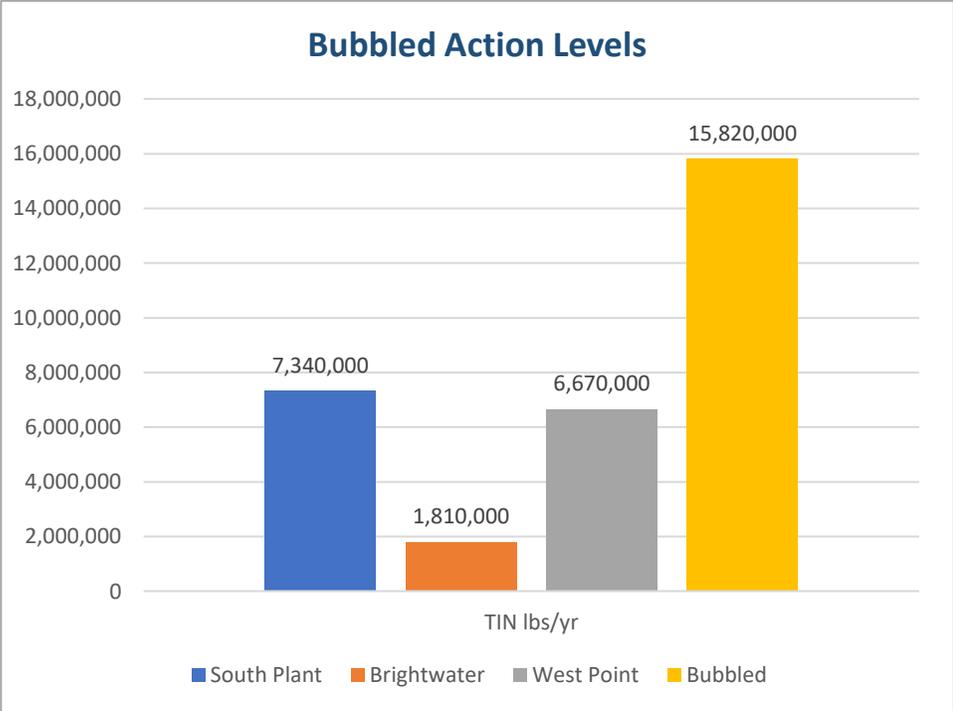


Puget Sound Nutrient General Permit

2022 Performance

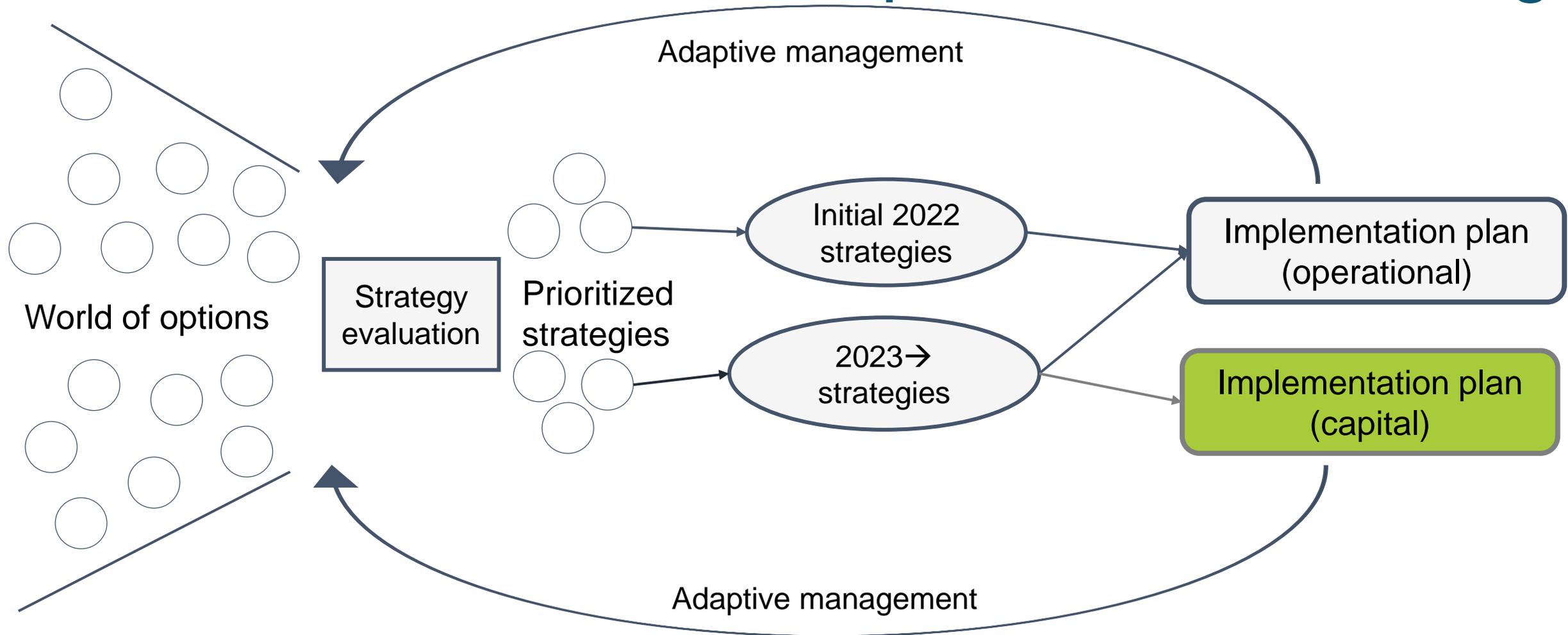


Effluent Action Levels



2022 Performance

Puget Sound Nutrient General Permit Optimization Planning



Initial Selected Optimization Strategies

- **South Plant:** Operating South Plant in full-plant Ludzack-Ettinger mode to partially nitrify and denitrify wastewater during dry-season (generally April-October).
- **Brightwater:** Implement the Brightwater Aeration Basin Optimization project (including trialing of low-dissolved oxygen control).
- **West Point:** Sustaining current operations, monitoring, and asset and reliability capital project implementation.
- **System-wide:** WTD will continue to serve existing reclaimed water customer connections at Brightwater and South Plant and add new users where feasible.

Puget Sound Nutrient General Permit

2023 Implementation



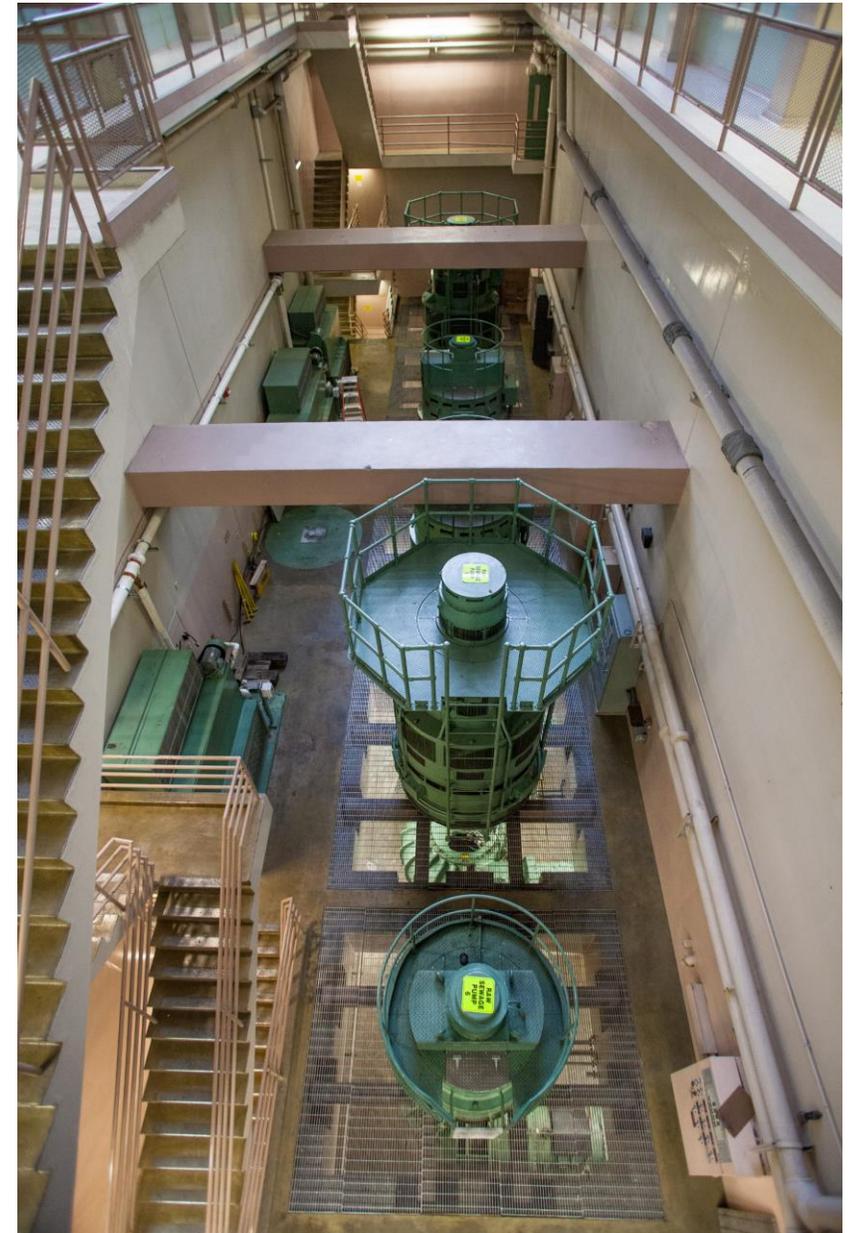
Nitrogen Removal Optimization Capital Program

Budget: \$25M

Objective:

- Remove nitrogen
- Lower compliance risk
- Avoid unintended plant impacts

Scope: Manage projects supporting nitrogen removal across the treatment plants as a program



Next steps for 2023

Optimization

- Optimization planning will continue
- Revision of optimization plan – consider more strategies and confirm selection of 2023 optimization strategies
- Improve accuracy of 10-year projections
- 2023 PSNGP Optimization Plan and Annual Report (due to Ecology March 31, 2024)

Nutrient Reduction Evaluation

- Will start in 2023
- Due to Ecology December 31, 2025

Nutrient Reduction Evaluation

- Evaluation of long-term alternatives to reduce nutrients, due December 31, 2025. Must include alternatives to meet final effluent concentration of:
 - **3 mg/L Total inorganic nitrogen (TIN) seasonal average** (April – October)
 - **AKART (all known, available and reasonable treatment)** ~ defined as the alternative representing the greatest total inorganic nitrogen reduction that is reasonably feasible on an annual basis
- Assessment of other nutrient reduction opportunities (e.g., alternative effluent management options, the viability of satellite treatment, sidestream treatment etc.)
- An economic assessment and environmental justice review must be included on both alternatives
- NRE must select AKART and seasonal 3 mg/L options and provide viable implementation timelines based on funding, design, and construction
- NRE will not be the final nitrogen reduction plan, further planning will be needed to incorporate the final nitrogen limits as well as other long-term treatment needs and priorities

King County Nutrient Management Strategy



Puget Sound Nutrient
General Permit



Watershed Reduction
Strategy



Nutrient Related
Regulations
(WQ Standards, TMDL)



Nitrogen Science,
Monitoring and
Modeling

Nutrient Regulatory Issues

- Washington Water Quality Standards – Natural Conditions for Dissolved Oxygen**
 - Ecology initiated rule-making in 2022 to adopt new natural conditions provisions. These are exceptions in WQ standards to recognize waterbodies may not meet numeric standards due to natural processes.
 - 0.2 mg/L provision underpins the dissolved oxygen regulations and nitrogen reductions.
- Puget Sound Nutrient Reduction Plan and Salish Sea Modeling**
 - Watershed reductions for non-point and future water quality effluent limits for WWTPs will be based on future Salish Sea modeling.
 - Year 2 Optimization Report to published by the end of 2024.
 - Ecology scheduled to provide draft sections of the nutrient reduction plan in 2023.
- Puget Sound Dissolved Oxygen Related Litigation**
 - Tracking cases relating to PSNGP and Ecology/EPA regulatory actions.

Puget Sound Nutrient Source Reduction Project		
Phase 1: Bounding Scenarios	Phase 2: Optimization Scenarios	
Volume 1: Model Updates and Bounding Scenarios Report (Ahmed et al., 2019)	Optimization Scenarios, Year 1 Technical Memorandum (2021)	Optimization Scenarios, Year 2 Volume 2 Report (expected 2022)
Model Scenarios (2006, 2008, 2014): 1. Impact of all anthropogenic sources 2. Impact of marine point sources 3. Improvement with BNR at all municipal WWTPs 4. Improvement with BNR at large WWTPs 5. Improvement with BNR at mid-size WWTPs	Year 1 Scenarios (2006, 2014): 1. Watershed reductions by region 2. WWTP reductions by region 3. Annual vs. seasonal WWTP reductions 4. Future growth scenarios 5. Watershed and WWTP reductions	Year 2 'Parking Lot' Scenarios: 1. Combination of watershed and WWTP reductions 2. Other scenarios to be determined



Thank you

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