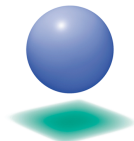


Examples of Using MBR's to Decentralize Wastewater System

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Today's Presentation

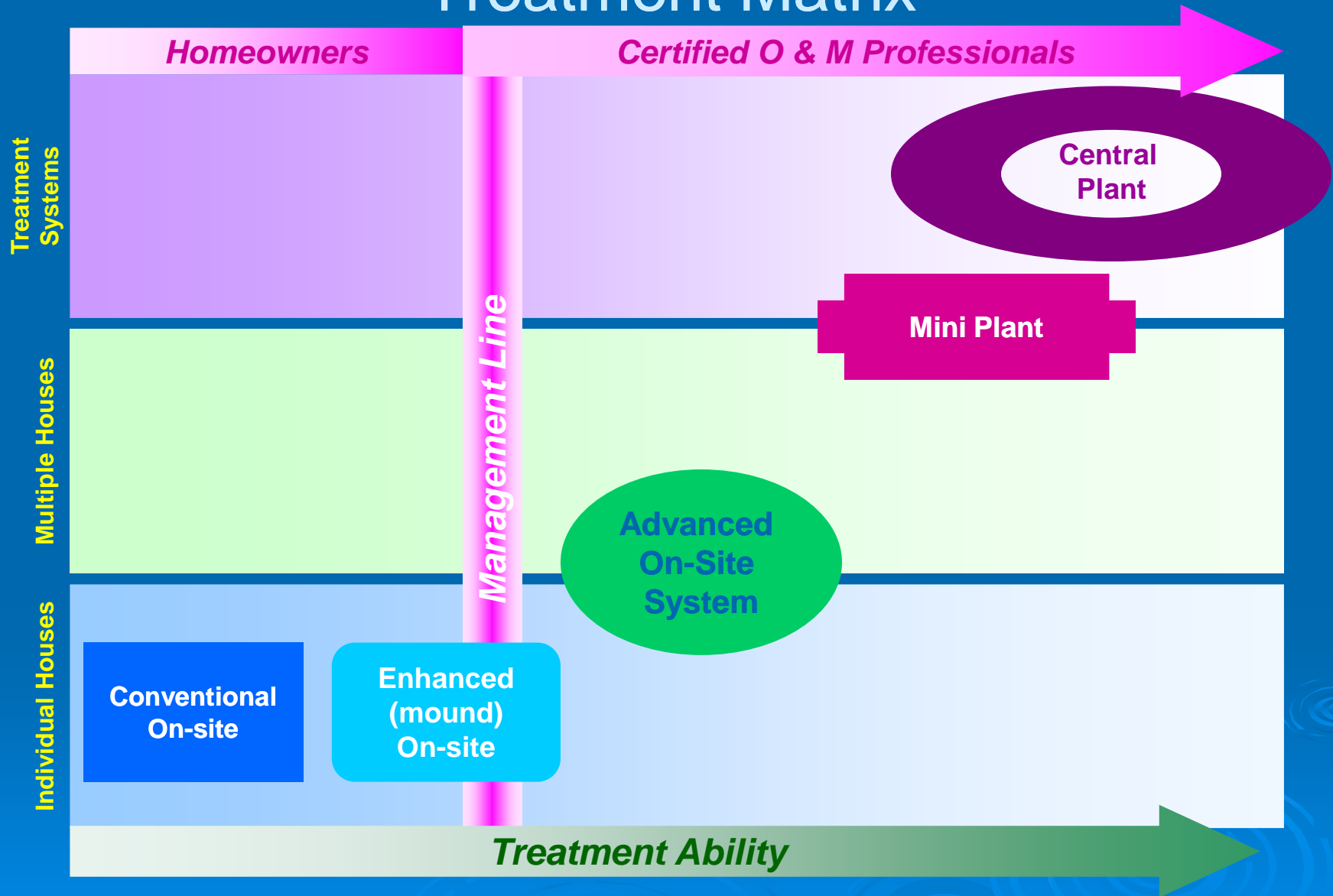
- Why decentralize?
- What treatment “tools” do we have?
- Case Studies
 - Mason County
 - Pierce County



Why Decentralization?

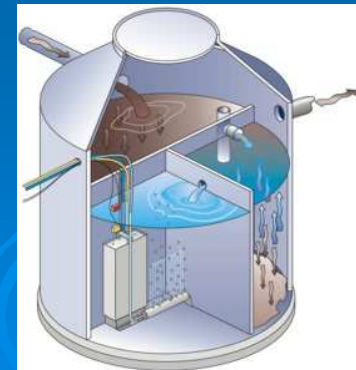
- Treat wastewater where reclaimed water is needed
 - Minimize conveyance
 - Minimize energy
 - Maximize water resources
- Need to bring better treatment to non-urban areas
 - Alternatives to sewer systems

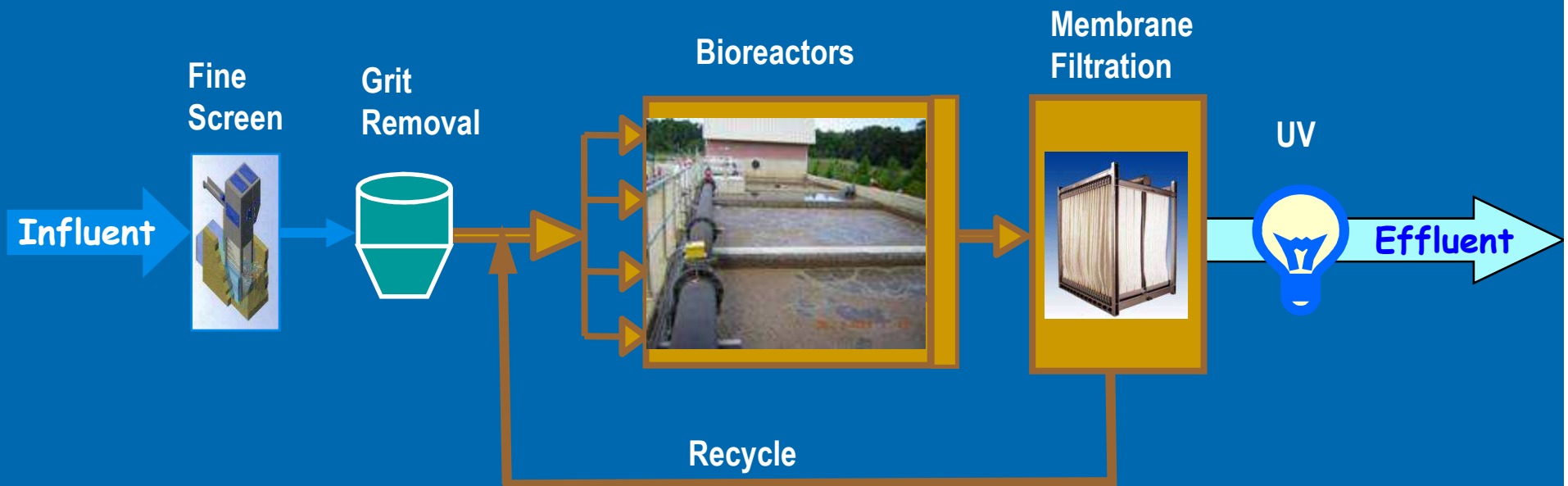
Treatment Matrix



MBR

- Membrane Bioreactor
- Applications span wide flow range
 - Centralized – Brightwater 39 MGD
 - Small Plant – Cascadia and Belfair .5 MGD
 - On site – European use imported to US
- Reclaimed water
- Fits decentralized model



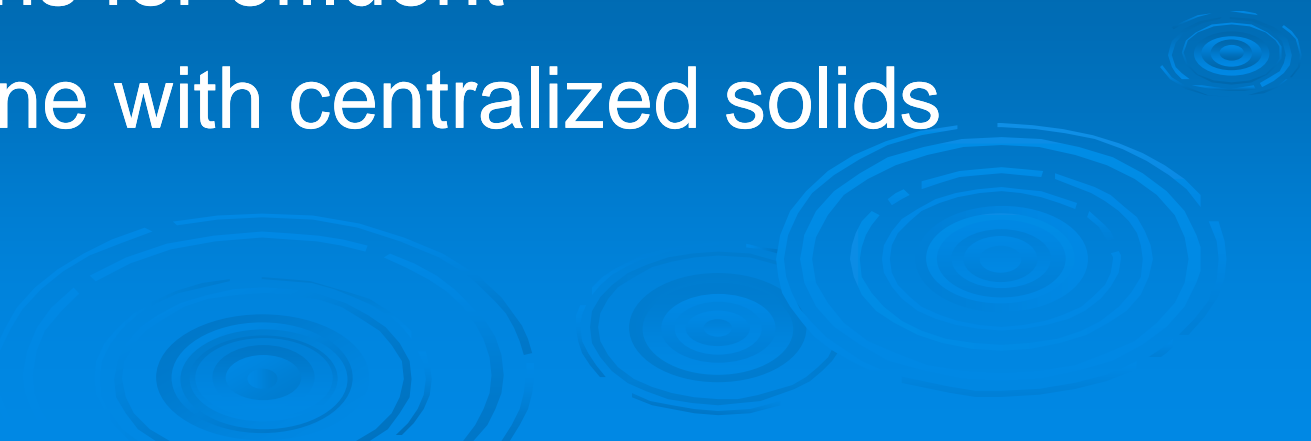


Effluent

Bioreactor

Influent

MBR and Advanced On-site applied to decentralized approach?

- MBR very scalable to small sizes
 - Advance on-site can decrease loading in sensitive areas
 - Small size can limit sewer systems and urban growth
 - More options for effluent
 - Can combine with centralized solids approach
- 

Approach in Mason County

- Continuation of small plants serving pockets of urban growth
- Introduction of MBR technology
 - Greater ability to remove N
 - Easier to operate
 - Reuse opportunities
- Address areas outside urban pockets
 - Advance on-site system

The map displays the Humber and Great Ouse river systems. The Humber is shown flowing from the north towards the south, with the Great Ouse joining it from the east. The map is divided into a grid with labels such as R3WT23N, R2WT23N, R1WT23N, R4WT23N, R3WT23N, R2WT23N, R1WT23N, R4WT23N, R3WT21N, R2WT21N, and R1WT21N. The locations of the four sampling stations are marked with red dots and labeled D1, D2, D3, and D4. D1 is located on the Humber river, D2 is on the Great Ouse river, D3 is on the Humber river, and D4 is on the Great Ouse river. The map also shows various geographical features like rivers, canals, and wetlands.



Future Facilities

Belfair WRF

Hoodspport WRF

Potlatch WRF

Skokomish



Belfair

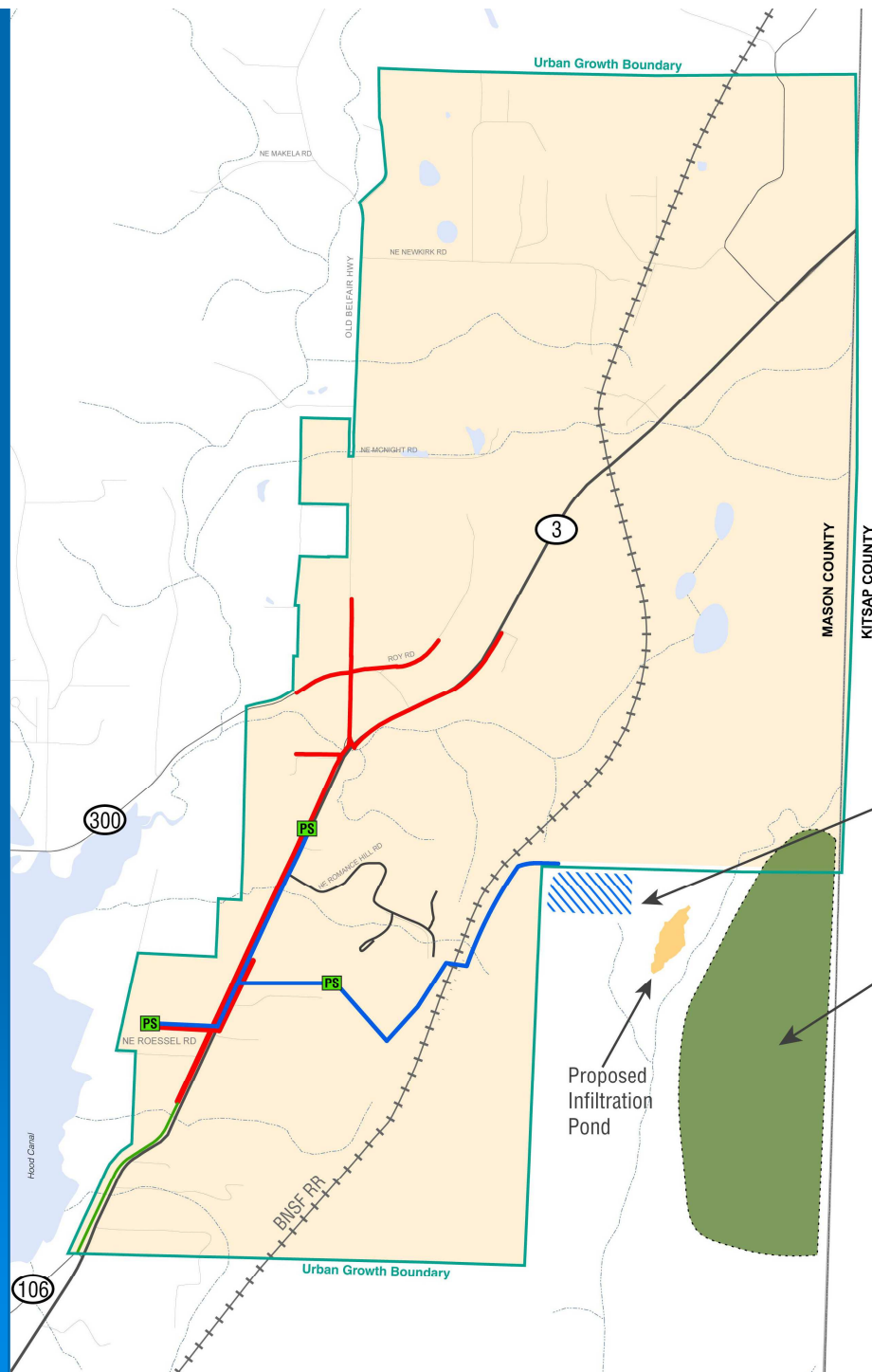


➤ Why sewers in Belfair?

- Healthy Hood Canal
- Economic Growth in Belfair
- Compliance with Growth Management Act

➤ Why MBR?

- Nitrogen removal
- Reclaimed water potential
- Remote monitoring and operation

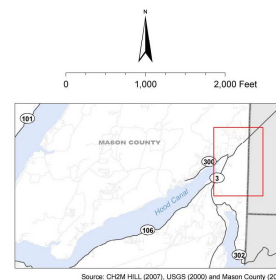


- Proposed Force Main
- Proposed Gravity Sewer
- Proposed Low Pressure Sewer
- PS Approximate Location of Proposed Pump Station
- Reclamation Facility Site
- Reuse Area
- Water

Proposed Reclamation Facility Site

Proposed Water Reuse Area


Proposed Infiltration Pond



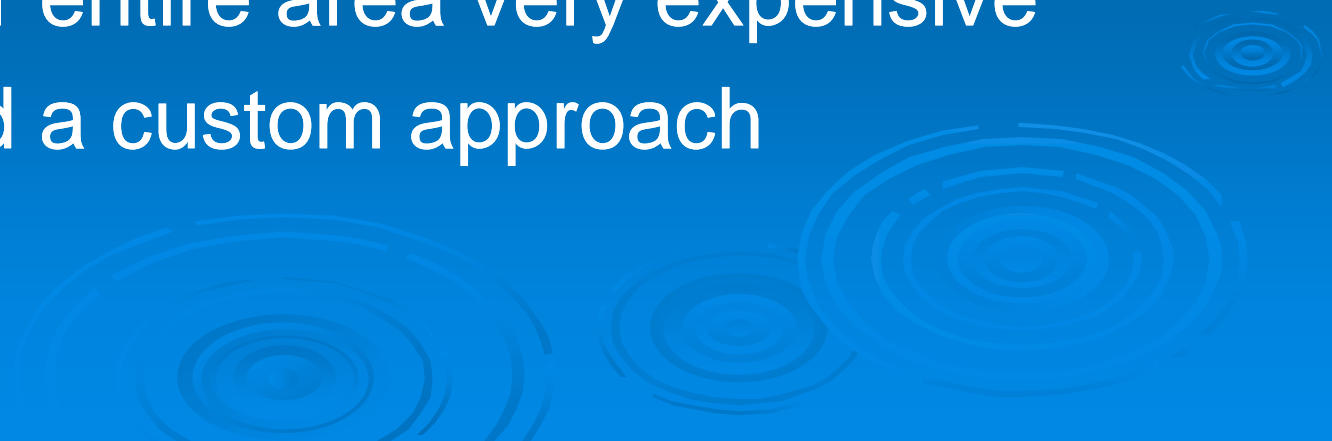


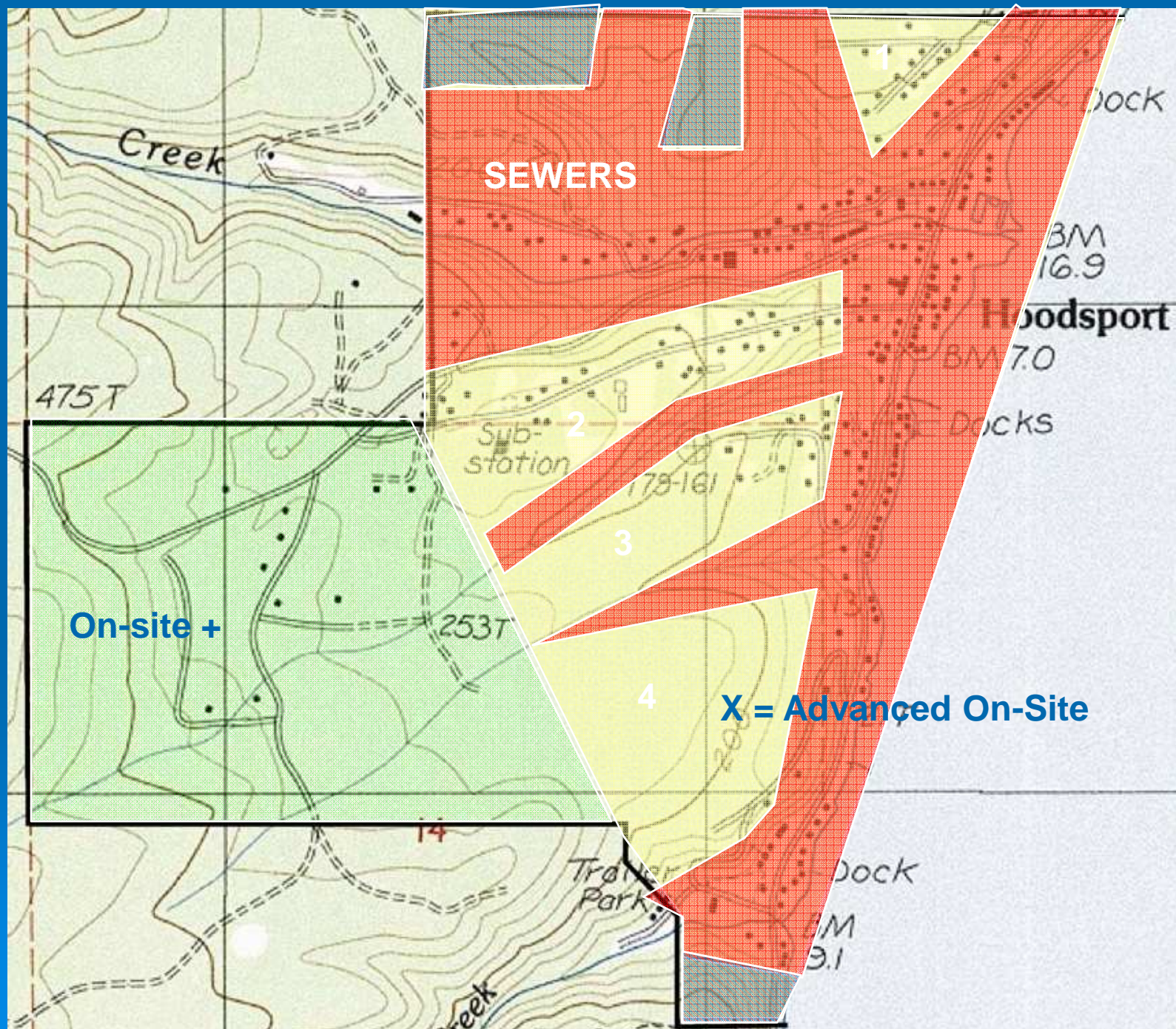
Belfair Water Reclamation Facility

Belfair System

- Solids to be treated at centralized site
 - Reclaimed water has multiple applications
 - Forest irrigation
 - Infiltration
 - Future industrial use
 - Initial capacity = .7 MGD
 - Ultimate capacity = 1.4 MGD
- 

Hoodsport

- Small “urban center”
 - Steep slopes
 - Poor Soils
 - Density varies with distance from Hood Canal
 - Sewers for entire area very expensive
 - Developed a custom approach
- 





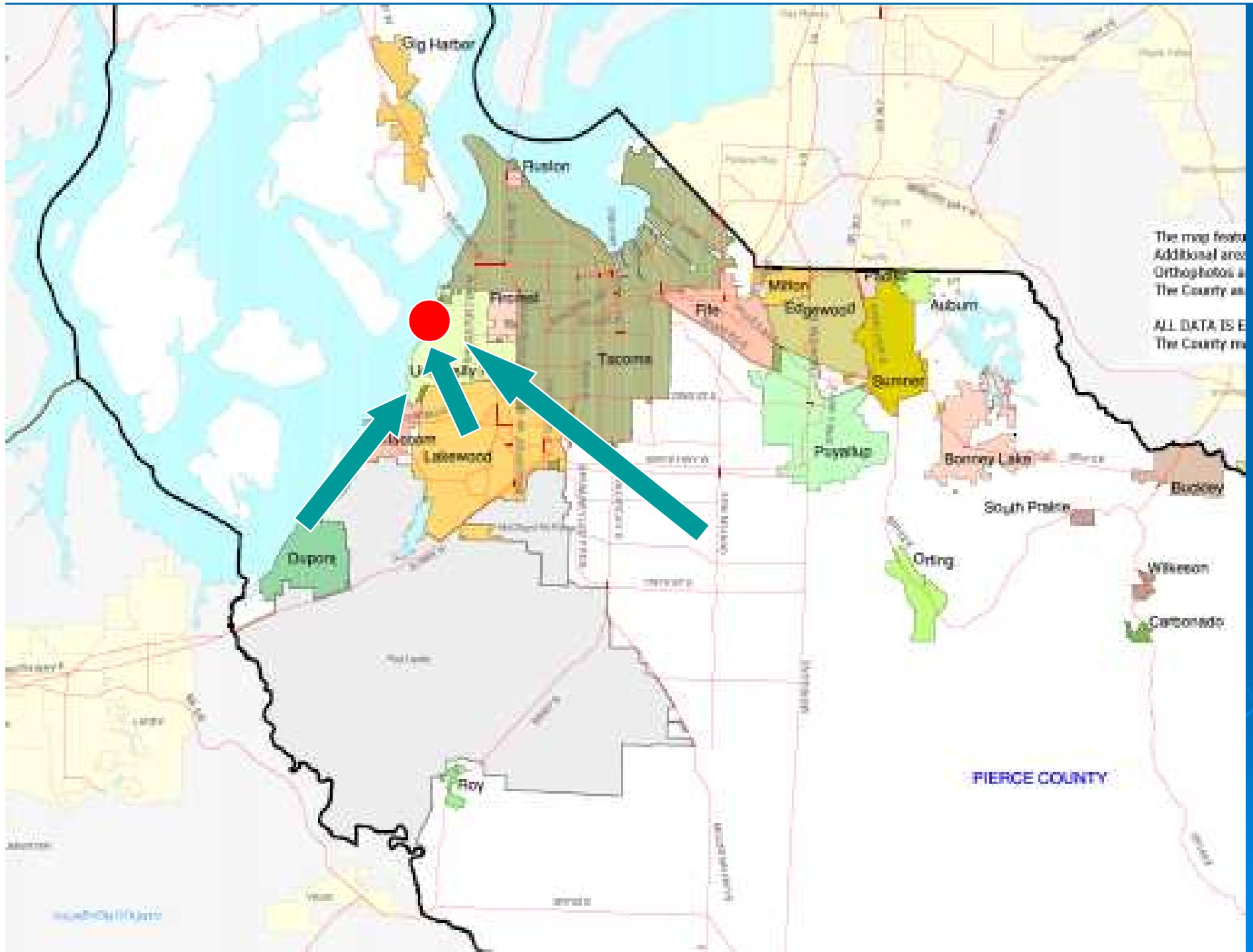
Future applications

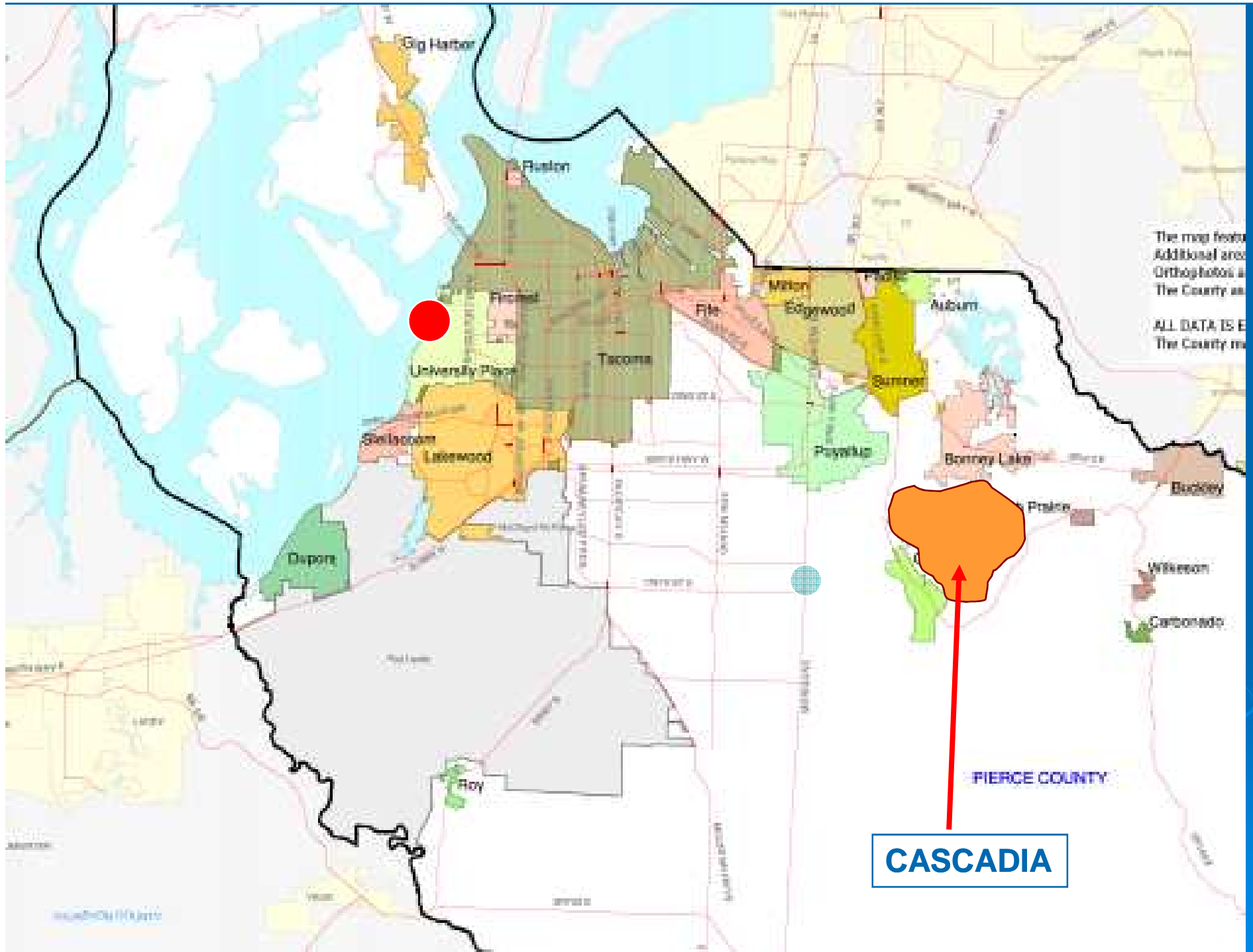
Hood Canal area

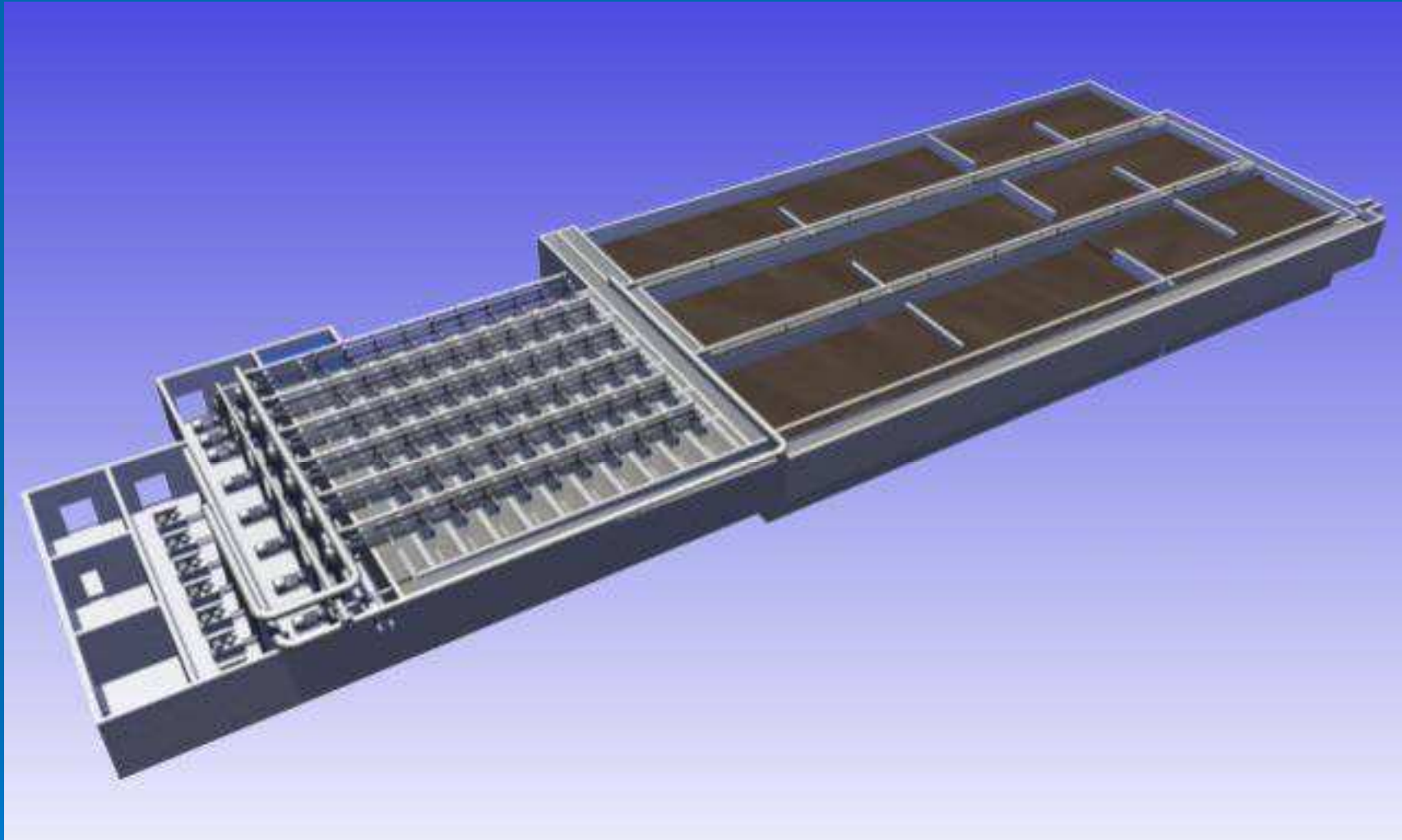
Increased use of small MBR and advanced on-site systems

Pierce County

- Centralized plant at Chambers Creek
 - Initial design focused on outfall discharge
 - Construction of Chambers Bay Golf Course has changed focus
- Cascadia Development
 - 16,000 equivalent population
 - 2 Major Golf Courses
 - Need for treatment and irrigation







Cascadia MBR

.5 MGD Phase I - 1 MGD Phase II – 1 MGD Modular Increments

Cascadia

➤ Before MBR

- .1 MGD LOSS
- Permit requires MBR at flows above .1 MGD

➤ Phase I MBR

- Discharge to drainfield
- Groundwater monitoring

➤ Future phases

- Infiltration, irrigation, other?
- Reclaimed Water District

Advantages to decentralized approach

- Technology has allowed small treatment systems to achieve high quality
- Remote monitoring and control
- Centralized solids treatment
- Ease of operation
- Ability to potentially reuse water
 - Reduce potable water demand
- Can apply the approach to fit the need

Disadvantages to decentralized approach

- Cost
- Poor soils can limit applications
- Access to on site systems
- Solids handling
- Retrofit of existing homes/businesses
- Public perception
 - *“There is nothing wrong with my septic tank!”*
- Regulatory framework

Where are we going?

- To address issues like Hood Canal, must embrace decentralized approach
- Regulations and regulators need to revise their approach to adapt to changes in decentralized approach
- More interest in advanced on-site will spur more research and technology
- Water demand will push need for decentralized systems



Thank you!



Questions?