Clean Water Plan

Making the Right Investments at the Right Time

Regional Water Quality Committee

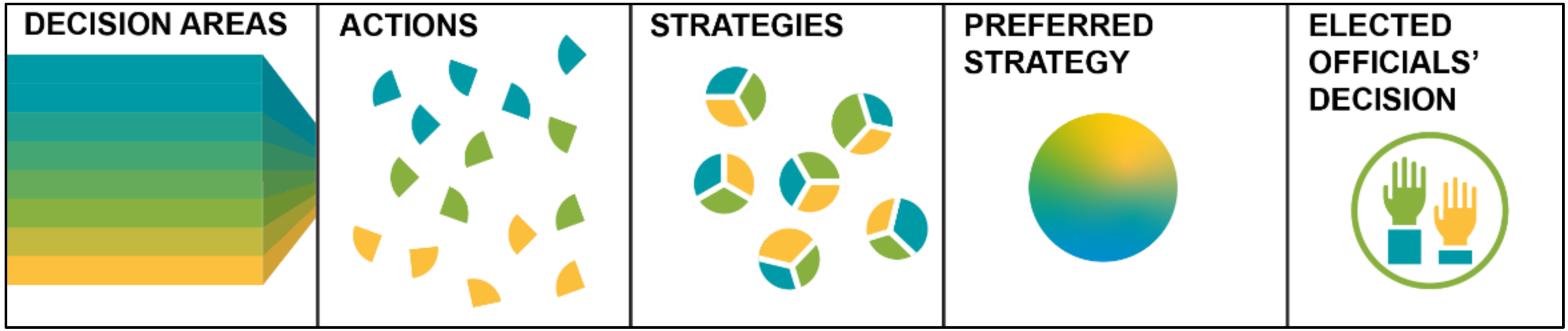
May 5, 2021

Presenters:
Tiffany Knapp, King County Wastewater Treatment Division
Steve Tolzman, King County Wastewater Treatment Division
Ian McKelvey, Brown and Caldwell

Clean Water Plan
Making the right investments at the right time

King County
Department of Natural Resources and Parks
Wastewater Treatment Division

Clean Water Plan Planning Process Overview



Action: A specific program or set of projects that addresses one of the Decision Areas.

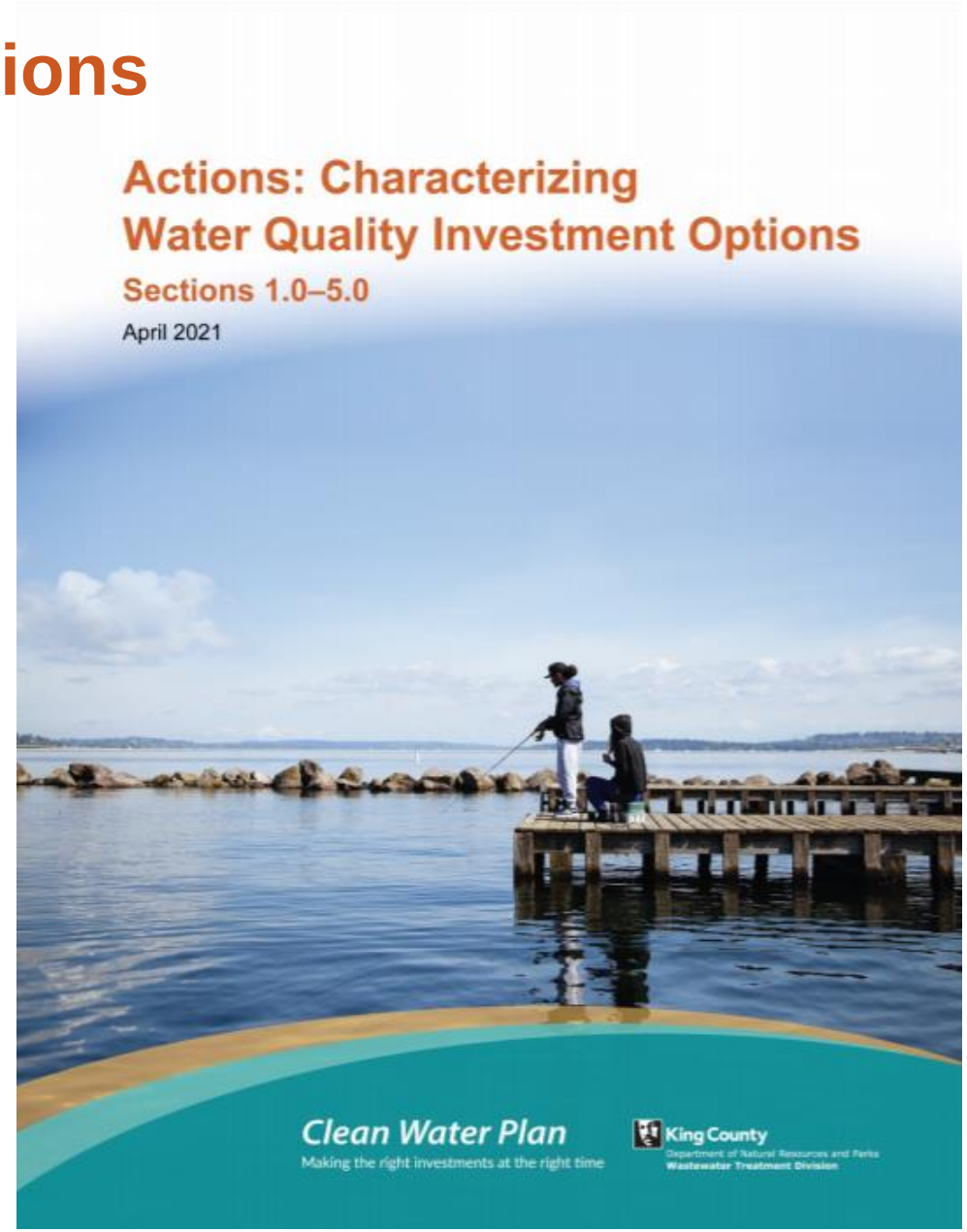
Actions are not standalone solutions, but building blocks that will be shaped and combined in different ways to form Strategies.

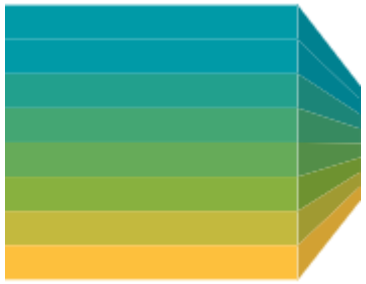
Strategy: A group of multiple Actions.

Each Strategy reflects a complete water quality investment approach the County could take for water quality and the regional wastewater system.

Engagement with the Region on Actions

- Elected Officials Workshops
  - March 31
  - May 21
- Technical Document
  - *Actions: Characterizing Water Quality Investment Options*
- Technical Workshops
  - April 20: Wastewater Treatment
  - May 13: Wastewater Systems Operations and Health
  - May 25: Wet Weather Management





Exploring a Range of Actions Within Each Decision Area

Wastewater Treatment

What treatment plant and wet weather facility investments should be made?

Pollution Source Control and Product Stewardship

Are there more efficient or effective methods to address pollutants of concern than wastewater treatment?

Wet Weather Management

What approach should be taken to address stormwater and combined sewer overflows in King County's system?

Wastewater Conveyance

What are the best investments in collections systems to ensure sufficient capacity and improve system condition?

Today's Discussion

Asset Management, Resiliency, and Redundancy

What investments should be made to care for an aging regional wastewater system and protect the investments that have been made?

Legacy Pollution

What are the opportunities to address legacy pollution?

Resource Recovery

How should King County recover resources in wastewater?

Today's Discussion

Finance

How will regional water quality investments be financed?

Resource Recovery Policy Considerations – Existing Policies

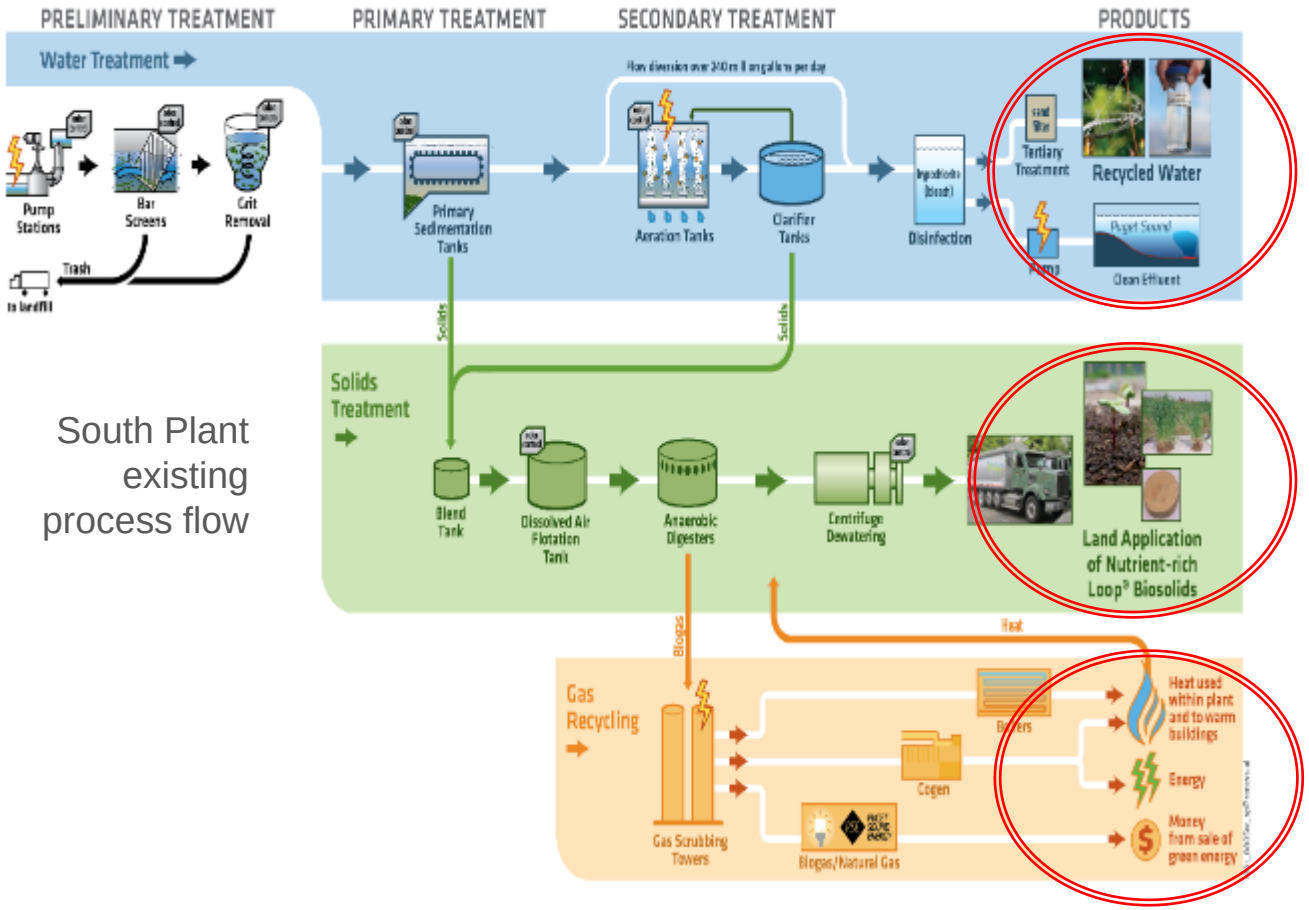
Metropolitan Functions - King County Code 28.86

- **Wastewater Treatment**
  - Treatment plant policies (TPP).
  - Conveyance policies (CP).
  - I/I policies (I/IP).
  - Combined sewer overflow control policies (CSOCP).
  - Biosolids policies (BP).
  - Water reuse policies (WRP).
  - Wastewater services policies (WWSP).
  - Water quality protection policies (WQPP).
  - Wastewater planning policies (WWPP).
  - Environmental mitigation policies (EMP).
  - Public involvement policies (PIP).
  - Financial policies (FP).
  - Reporting policies.

Resource Recovery Policy Examples

- **BP- 1**: "King County shall strive to achieve beneficial use of wastewater solids. A beneficial use can be any use that proves to be environmentally safe, economically sound and utilizes the advantageous qualities of the material."
- **BP-10**: "Where cost-effective, King County shall beneficially use methane produced at the treatment plants for energy and other purposes."

Resource Recovery Actions



South Plant existing process flow

- Existing resource recovery program
- Expanded resource recovery program
- Recycled water discussed as part of Wastewater Treatment Decision Area

Existing resource recovery program

- **Why explore**
  - Describes continuation of current biosolids and energy programs
- **Conceptual components**
  - Continue existing biosolids management practices (Class B biosolids applied to agricultural land in Eastern Washington and forests in eastern King County)
  - Continue working towards SCAP* targets (energy efficiency improvements, carbon neutrality)
  - Maintain existing systems (investments in capacity increases and replacements only)

* SCAP = King County Strategic Climate Action Plan

Existing resource recovery program

- **Water quality**
  - Potential increase in effluent nitrogen levels, if nitrogen removal is not included at West Point
- **Long-term conceptual program planning estimate (order of magnitude) over a 40-year period**
  - $0.4B to $1.1B for capital costs
  - $1.9B to $4.8B in ongoing annual costs
  - $0.4B to $0.9B in additional revenues
- **Other**
  - With only 2 biosolids end use markets, King County is at risk of market disruptions
  - Increased service levels could put energy efficiency and carbon neutrality goals at risk

Expanded resource recovery program

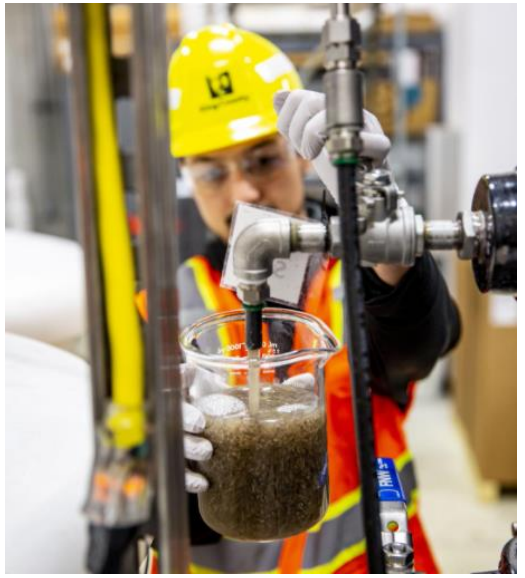
- **Why explore**
  - Considers what additional investment in resource recovery could look like and result in
- **Conceptual components**
  - Convert biosolids program to Class A (suitable for use by the general public; would include compost and topsoil amendments)
  - Codigestion of food waste at wastewater treatment plants and phosphorus recovery
  - Achieve energy and carbon neutrality through increased energy efficiency, renewable energy generation, and use of renewable energy sources

Biosolids Composting Facility (Arlington, WA)

Electric Semi-Trailer Truck
(courtesy of Daimler Trucks North America)

Expanded resource recovery program

- **Water quality**
  - Potential increase in effluent nitrogen levels, if nitrogen removal is not included at West Point
- **Long-term conceptual program planning estimate (order of magnitude) over a 40-year period**
  - $1.0B to $2.5B for capital costs
  - $1.9B to $4.8B in ongoing annual costs
  - $0.7B to $1.7B in additional revenues
- **Other**
  - Requires siting a new composting/soil blending facility
  - Aggressive energy neutrality goals require advances in technology and would be put at risk by increased service levels such as meeting nutrient regulations



Resource Recovery Actions – Questions and Discussion

Wastewater Conveyance Policy Considerations – Existing Policies

Metropolitan Functions - King County Code 28.86

- **Wastewater Treatment**
  - Treatment plant policies (TPP).
  - Conveyance policies (CP).
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  - Combined sewer overflow control policies (CSOCP).
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  - Water reuse policies (WRP).
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  - Environmental mitigation policies (EMP).
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  - Financial policies (FP).
  - Reporting policies.

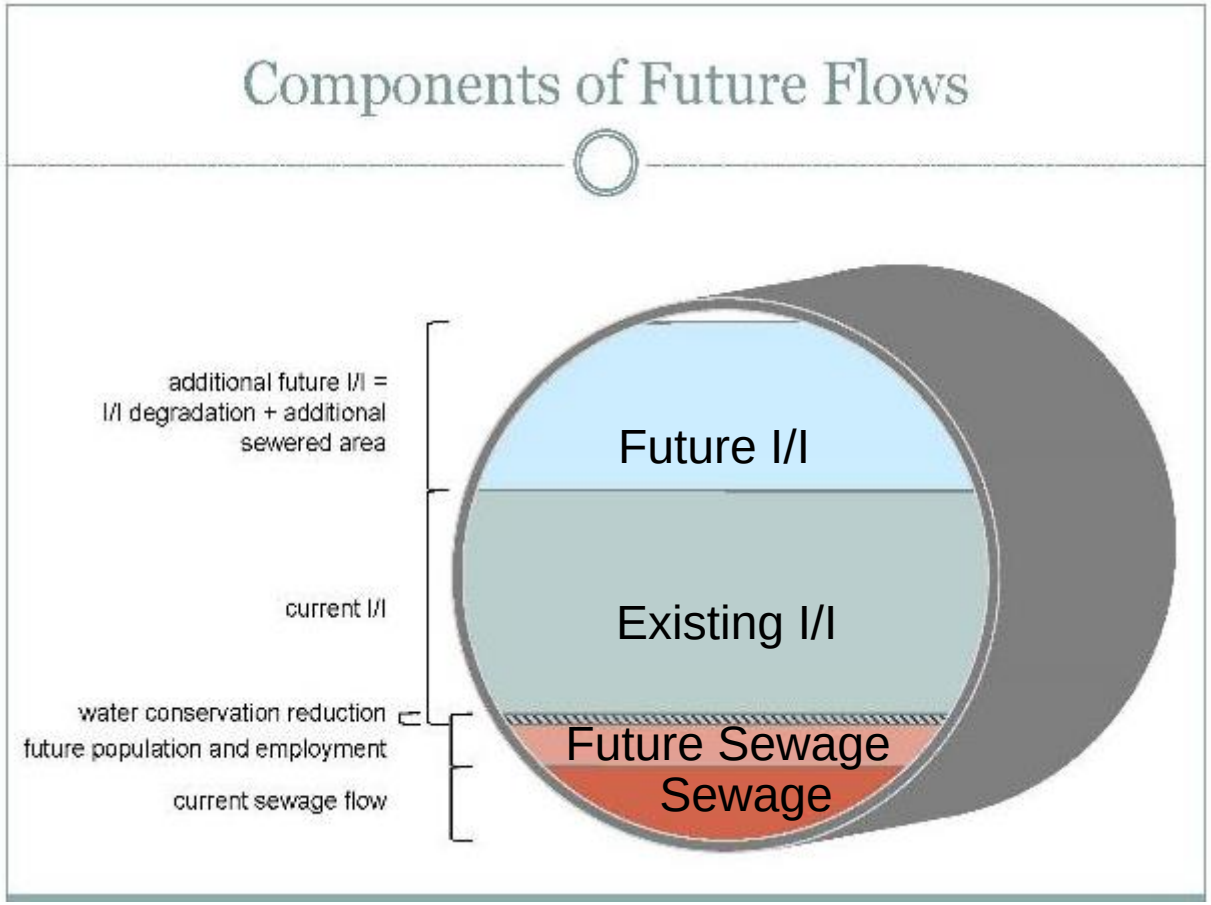
Resource Recovery Policy Examples

- **CP-1**: "…the twenty-year peak flow storm shall be used as the design standard for the county's separated wastewater system..."
- **I/IP-2:** "King County shall work cooperatively with component agencies to reduce I/I in local conveyance systems utilizing and evaluating I/I pilot rehabilitation projects…."
- **I/IP-3:** "King County shall consider an I/I surcharge…."

Wastewater Conveyance Actions

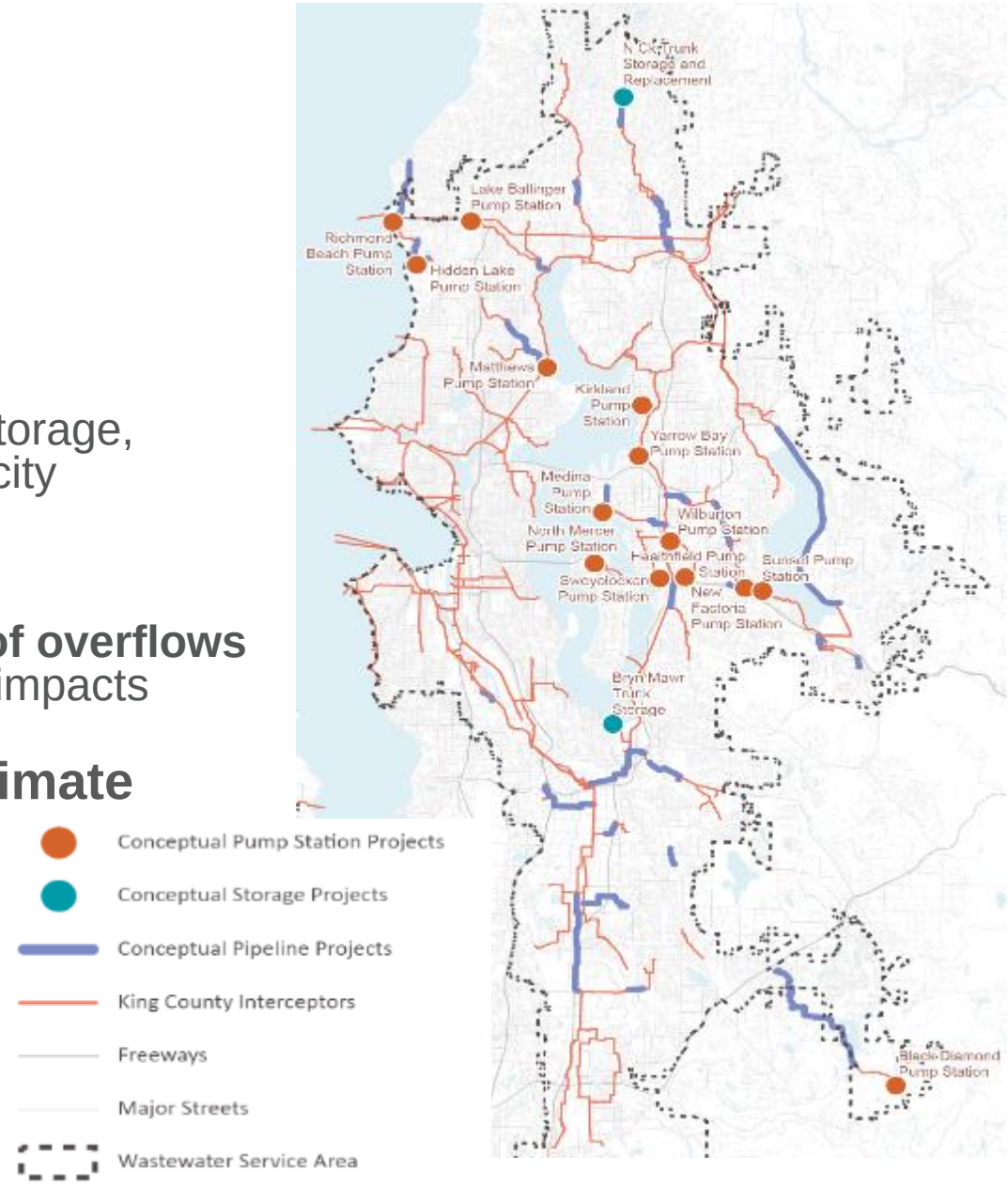
- **Wastewater conveyance – 20-year peak flow design standard**
- **Wastewater conveyance – 5-year peak flow design standard**
- **Infiltration and inflow (I/I) reduction – peak flow limitation program**
- **Infiltration and Inflow reduction – point-of-sale side sewer inspection program**
- **Wastewater conveyance – control system capacity optimization**
- **Urban Growth Area on-site septic system conversion**

Sanitary Sewer Systems: Collect and transport wastewater, limited stormwater, and infiltrated groundwater to treatment facilities



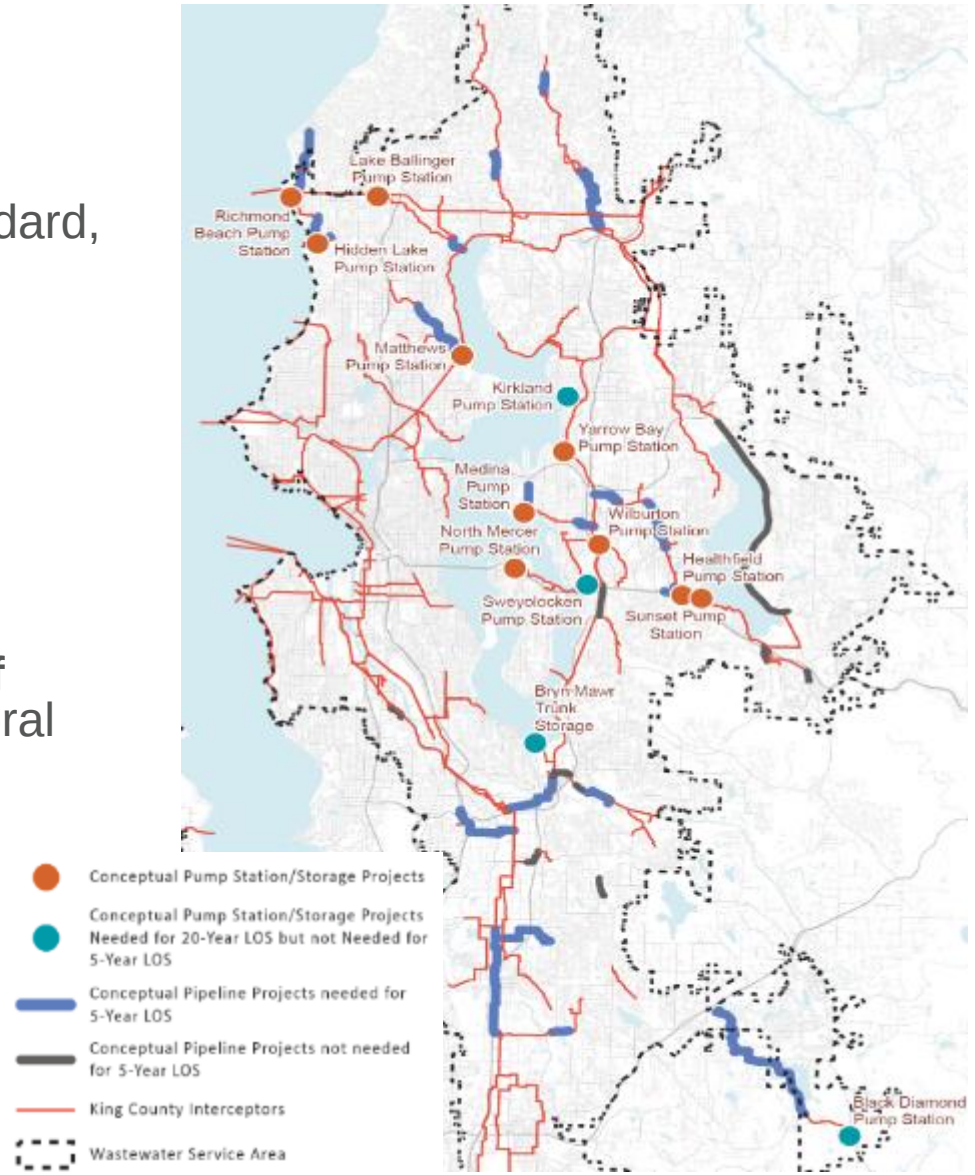
20-year peak flow design standard

- **Why explore**
  - Address capacity for population growth
  - Limit the number of overflows
- **Conceptual components**
  - **26 projects** to increase pipelines, add wastewater storage, upgrade pump station to increase conveyance capacity
- **Water quality**
  - Conservative level of service results in **lowest risk of overflows** and associated geographically limited and temporal impacts
- **Long-term conceptual program planning estimate (order of magnitude) over a 40-year period**
  - $2B to $5B for capital improvements
  - $1B to $2B for operations and maintenance



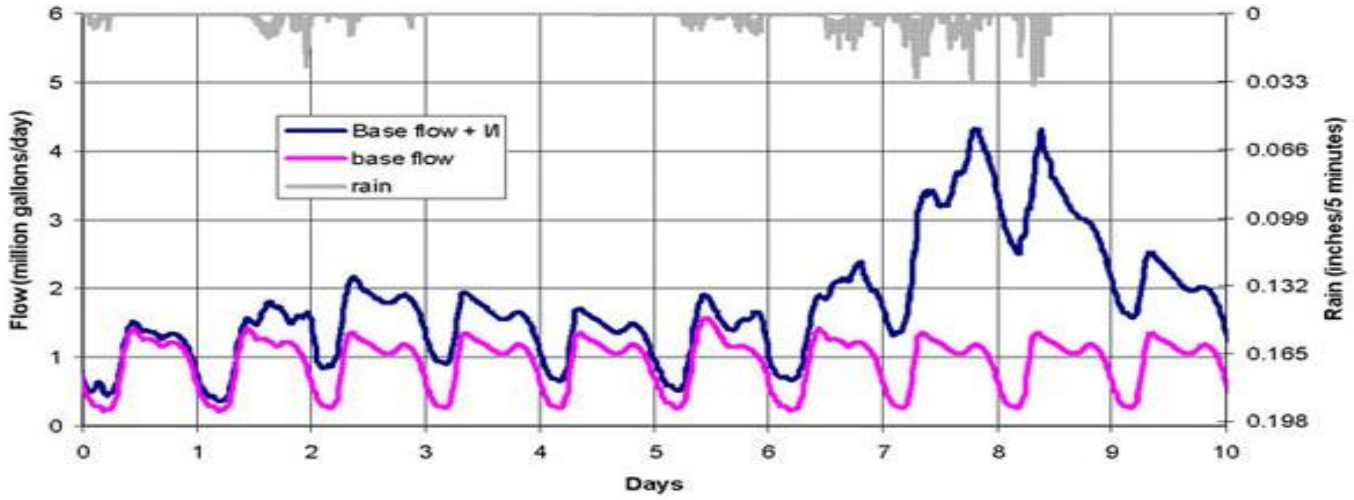
5-year peak flow design standard

- **Why explore**
  - Address capacity for population growth
  - Test lower level of service, the 5-year peak flow design standard, for the conveyance program
- **Conceptual components**
  - **20 projects** to increase pipelines, add wastewater storage, upgrade pump stations to increase conveyance capacity
- **Water quality**
  - Updated level of service results in **some increase in risk of overflows** and associated geographically limited and temporal impacts
- **Long-term conceptual program planning estimate (order of magnitude) over a 40-year period**
  - $1B to $3B for capital improvements (about 35% less than 20-year peak flow design standard)
  - $0.3B to $0.8B for operations and maintenance



I/I – peak flow limitation program

- **Why explore**
  - During winter, up to 75% of peak flow is from rain-derived I/I
  - Portion of I/I comes from defective local agency sewer mains and laterals, largely due to aging infrastructure



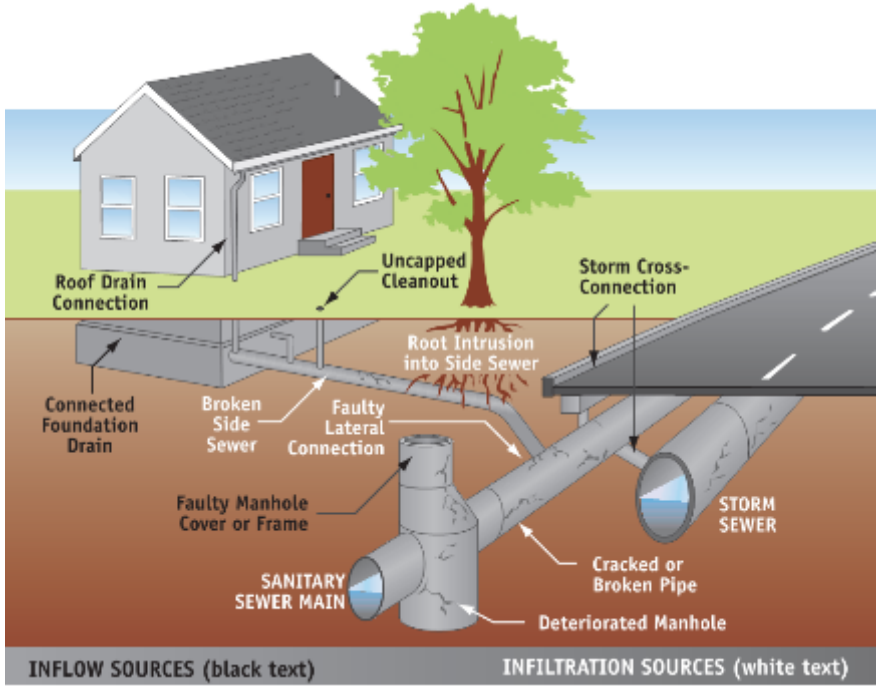
- **Conceptual components**
  - Targeted I/I reduction by enforcing peak flow standards from local agencies tributary to the WTD separated sewer system

- **Water quality**
  - Implications are direct for homeowners: basement back-ups
  - Capacity-related overflows are infrequent; impacts on regional water bodies are small

- **Long-term conceptual program planning estimate (order of magnitude) over a 40-year period**
  - Additional $70M to $180M in O&M and administrative costs
  - $150M to $380M in avoided/deferred capacity upgrades in the regional system
  - $0.5B to $1.3B borne by others for repair of component agency mains and laterals

I/I – point-of-sale side sewer inspections

- **Why explore?**
  - During winter, up to 75% of peak flows is from rain-derived I/I
  - Much of I/I is from private side sewers connecting homes and businesses to local agency sewer systems
- **Conceptual components**
  - Targeted I/I reduction by expanding repair of private side sewers
- **Water quality**
  - Implications are direct for homeowners: basement back-ups
  - Capacity-related overflows are infrequent; impacts on regional water bodies are small
- **Long-term conceptual program planning estimate (order of magnitude) over 40 years**
  - Additional $330M to $830M in administrative costs
  - $190M to $480M in additional revenue
  - $4B to $11B borne by others for mandatory private side sewer inspection and repair

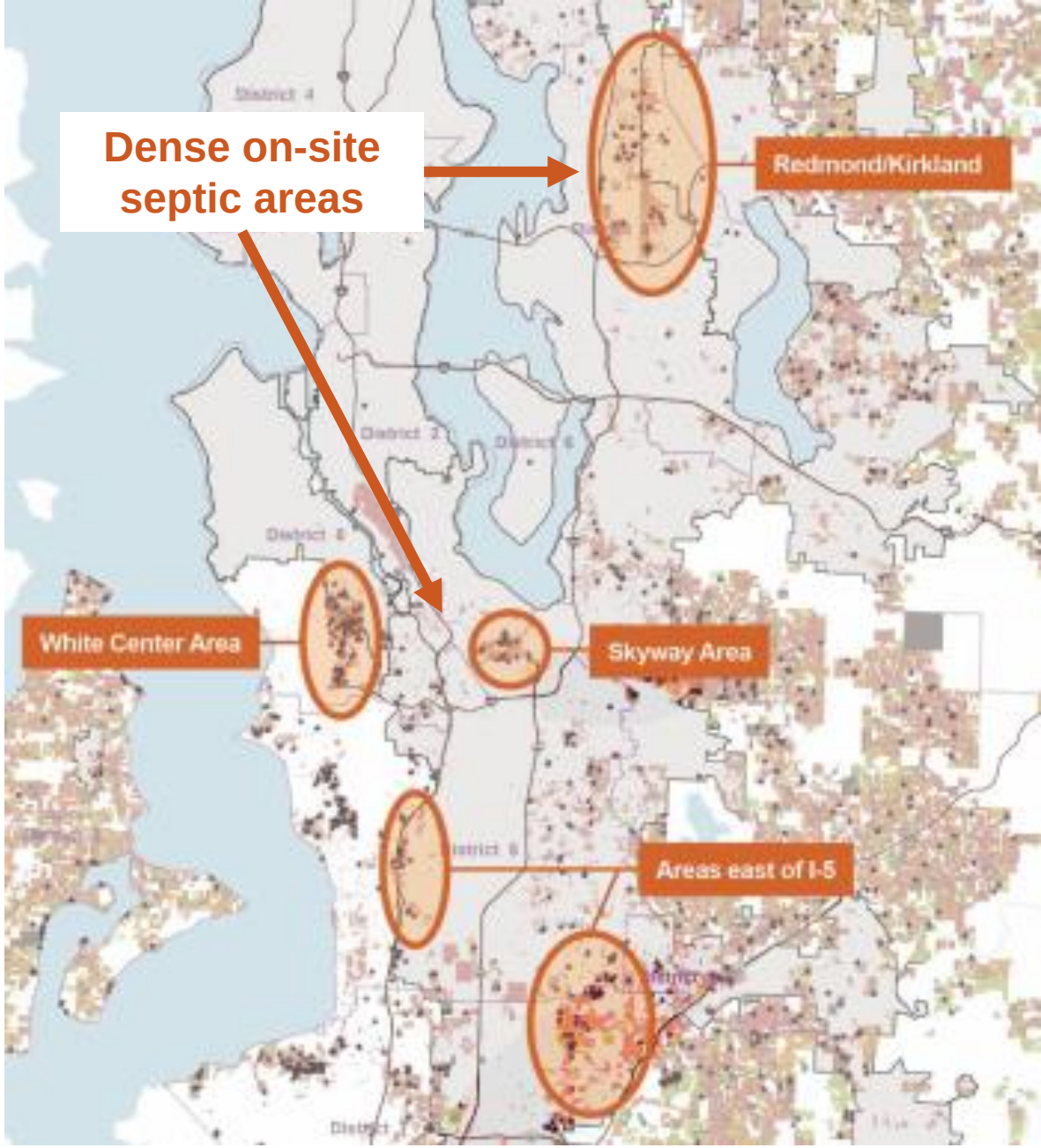


Control system capacity optimization

- **Why explore**
  - Optimize use of existing and new infrastructure
- **Conceptual components**
  - Expand existing automation and control standards to incorporate more data analytics and improve system
    optimization throughout the service area
- **Water quality**
  - Capacity-related overflows are infrequent; impacts on regional water bodies are small.
  - After program implementation, no changes to water quality outcomes
- **Long-term conceptual program planning estimate (order of magnitude) over a 40-year period**
  - $50M to $120M for capital improvements
  - $80M to $200M for operations and maintenance
  - $130M to $320M in avoided

Urban Growth Area on-site septic system conversion

- **Why explore**
  - Improperly operating or failing on-site septic (OSS) systems can cause untreated wastewater to potentially contribute viruses, bacteria, and pathogens to ground and surface water
- **Conceptual components**
  - Continue King County's Public Health 2007 OSS Management Plan
  - Expansion of sewer service within Urban Growth Area to address development densification or aging OSS
- **Water quality**
  - Currently minimal impact to pollutant load reductions in region; primarily nitrogen and phosphorus



Wastewater Conveyance Actions – Questions and Discussion

Thank you!

Plan contact:
Steve Tolzman, PMP
Comprehensive Planning
King County Wastewater Treatment Division
steve.tolzman@kingcounty.gov