



**King County**

**Barton, Murray, Magnolia, and North Beach**



**Murray Public Meeting  
March 29, 2010**

**CSO Facilities**

**carollo**  
Engineers...Working Wonders With Water™



**TETRA TECH**

*And Associated Firms*

# Meeting Purpose

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- To present three alternative means for CSO control in the Murray basin
- To present how these alternatives were developed
- To explain why the three alternatives are being considered for further evaluation
- Hear from the community about the alternatives

# Meeting Agenda

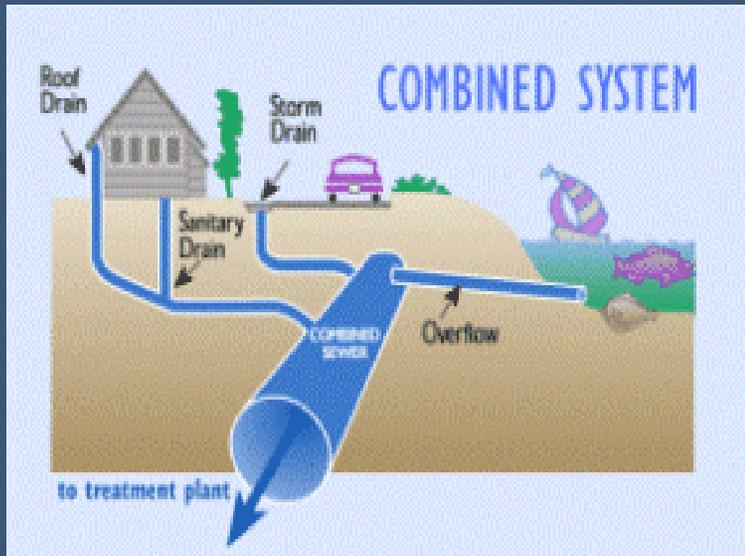
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- CSO Control Program Overview
- CSO Beaches Projects Objectives
- CSO Control Approaches
- Murray Basin Requirements
- Murray Basin Alternatives
- Next Steps

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# CSO Control Program Overview

# The Combined Sewer System



- Conveys wastewater & stormwater to treatment plants
- Pipelines & pump stations were sized to capture most of the flow
- Relief points – CSOs – were built to discharge when flows exceed capacity
- Newer systems manage sewage and stormwater separately

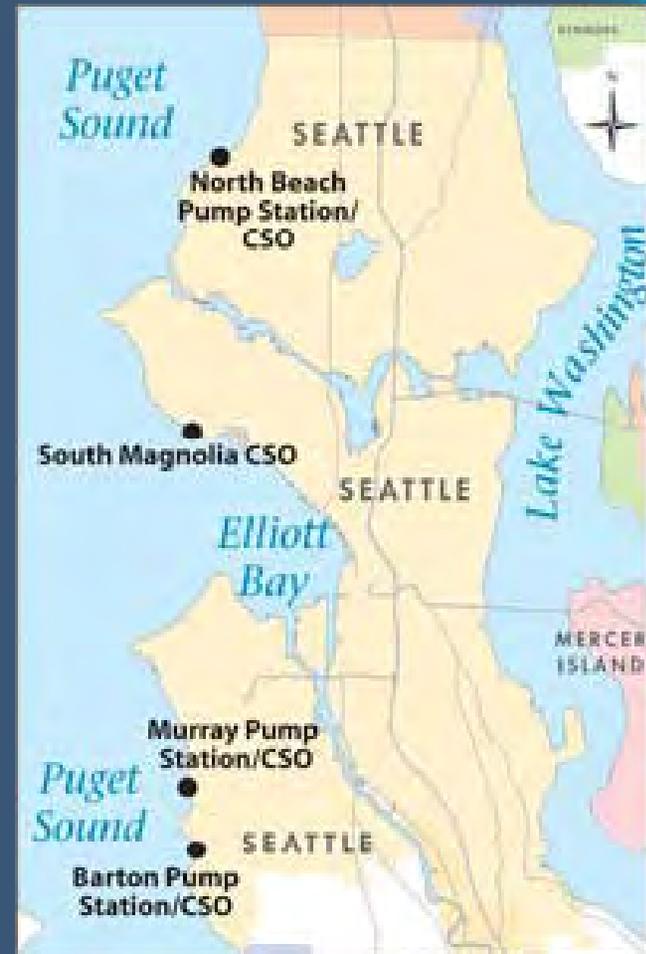
# What is the CSO Control Requirement?

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- Set by State Ecology Regulations (WAC 173-245)
- No more than one untreated event per year on a 20 year average
- CSO control schedule to protect public health, environment, and aquatic life by 2030.
- Department of Ecology set deadlines for project milestones in the West Point NPDES permit.
  - CSOs must be controlled to the state regulation
  - Ecology & EPA can use various means of enforcement, including fines and court issued compliance orders
  - EPA is tracking King County's compliance schedule

# CSO Control Projects

- King County has 38 CSOs
- Over half are controlled
- CSO Beach projects are a priority due to location near popular beaches.
- CSO Beach projects under construction 2013



# Public Input Opportunities To Date

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- 2007 – 2009
  - Community groups and service organizations
  - Community meetings
  - Newsletters and website
- October 2009 – Public Open Houses on CSO control approaches
- March 2010 – Public meetings on alternative means for CSO control

# Project Timeline – 2010 - 2011

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- Spring 2010 –
  - Public meetings for 3 alternatives
  - Refinement of alternatives
- Early Summer 2010 –
  - Define proposal for further review
- Summer to Fall 2010 -
  - Report back to public
  - Facility Plan preparation
- December 31, 2010 – Draft Facility Plan to Ecology
- Early 2011 – Public comment on SEPA

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# CSO Control Approaches

# CSO Control Approaches

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- Approaches Considered
  - Storage
  - On-site Treatment
  - Conveyance & Treatment
  - Peak Flow Reduction (Demand Management)
- Combination of Approaches

*All approaches evaluated for each basin*

# Storage Approach

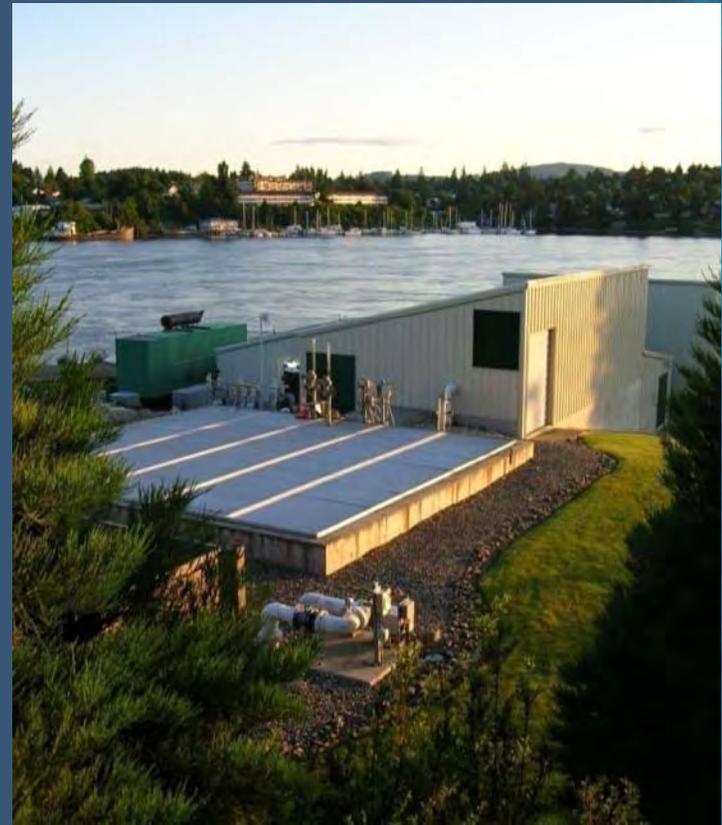
- May be “centralized” at bottom of basin, centralized higher in basin, or distributed within basin
- Majority of facility is typically underground
  - Associated facilities located above ground
- Peak flows diverted into storage during wet weather
- Stored flow drained back to collection system following wet weather



# On-site Treatment Approach

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- Treatment facilities located near the CSO point
- Peak flows are treated and discharged
- Facilities operate only during wet weather events



# Conveyance & Treatment Approach

- Increase pump station and pipeline capacity to convey flow downstream for treatment
- Dry weather flow treated at West Point treatment plant
- Peak flows treated at “Wet Weather” facility, in this case Alki treatment plant



# Peak Flow Reduction (Demand Management)

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- Separate stormwater from combined system
  - Disconnect catch basins, roof drains, down spouts
- Re-route stormwater to new or existing storm drainage system
- Green Stormwater Infrastructure (GSI)
  - Roadside rain gardens
  - Green Roofs
  - Street Trees
  - Pervious Pavement

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# Murray Basin Requirements

# Basin Description and Requirements

- 992 acres
- Murray CSOs
  - Average 5 events per year
  - Average 5 million gallons per year
- Control requirements
  - 1,000,000 gallons of storage, **or**
  - 28.5 mgd treatment capacity, **or**
  - 28.5 mgd additional conveyance capacity



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# Murray Basin Alternatives

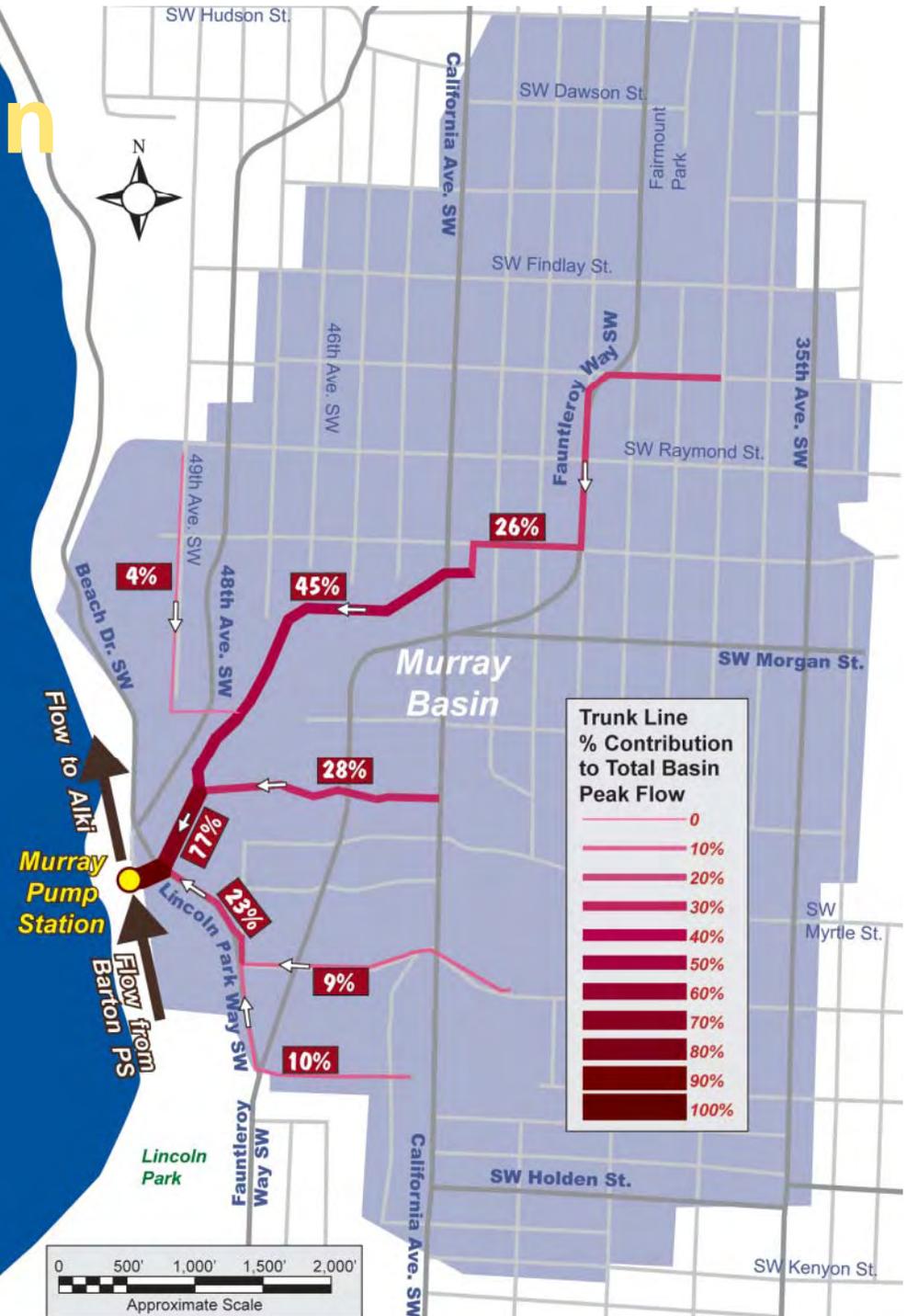
# How were Alternatives Developed?

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- Control approaches evaluated on a basin-specific basis
- Critical questions:
  - Is there sufficient room to site and construct the facility?
  - Is it feasible to construct?
  - Will the alternative capture sufficient peak flow?

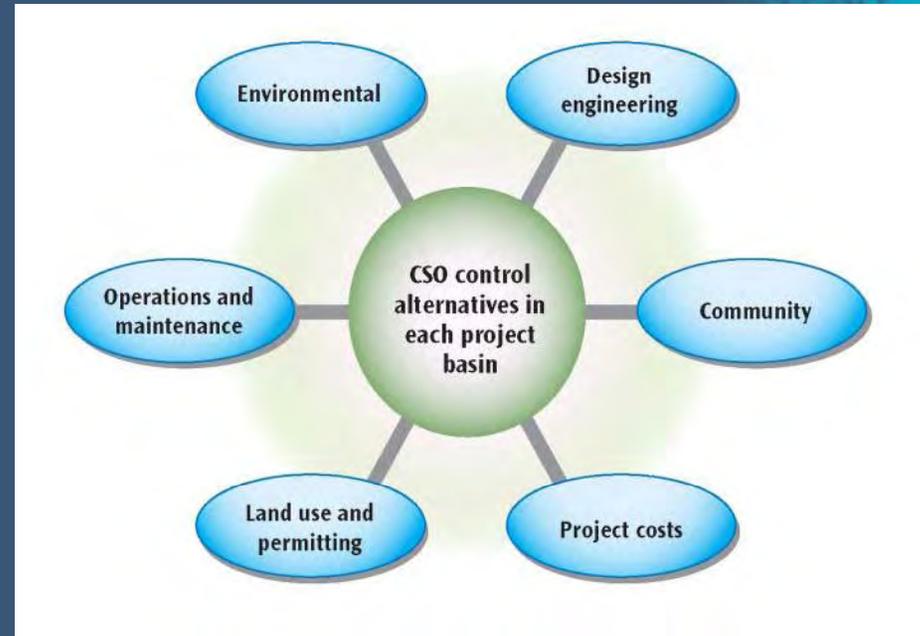
# Flow Distribution in Basin

- Flow converges at Murray Pump Station
- Murray Avenue trunk carries roughly 75% of basin flow



# How Were The Alternatives Evaluated?

- Individual alternatives were evaluated using a range of factors:
  - Land Use/Permitting
  - Environmental
  - Community
  - Costs
  - Operations & Maintenance
  - Design and engineering
- Your input used to shape and inform our work.



# Evaluation Results

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- On-site Treatment
  - Operational and maintenance requirements
  - Land use challenges
- Conveyance & Treatment
  - Downstream conveyance capacity limits
- Combine storage – Barton & Murray
  - Geotechnical/Tunneling risk
  - Major construction at both pump stations
  - Cost
- Peak Flow Reduction (Rooftop disconnection and GSI)
  - Storage not eliminated

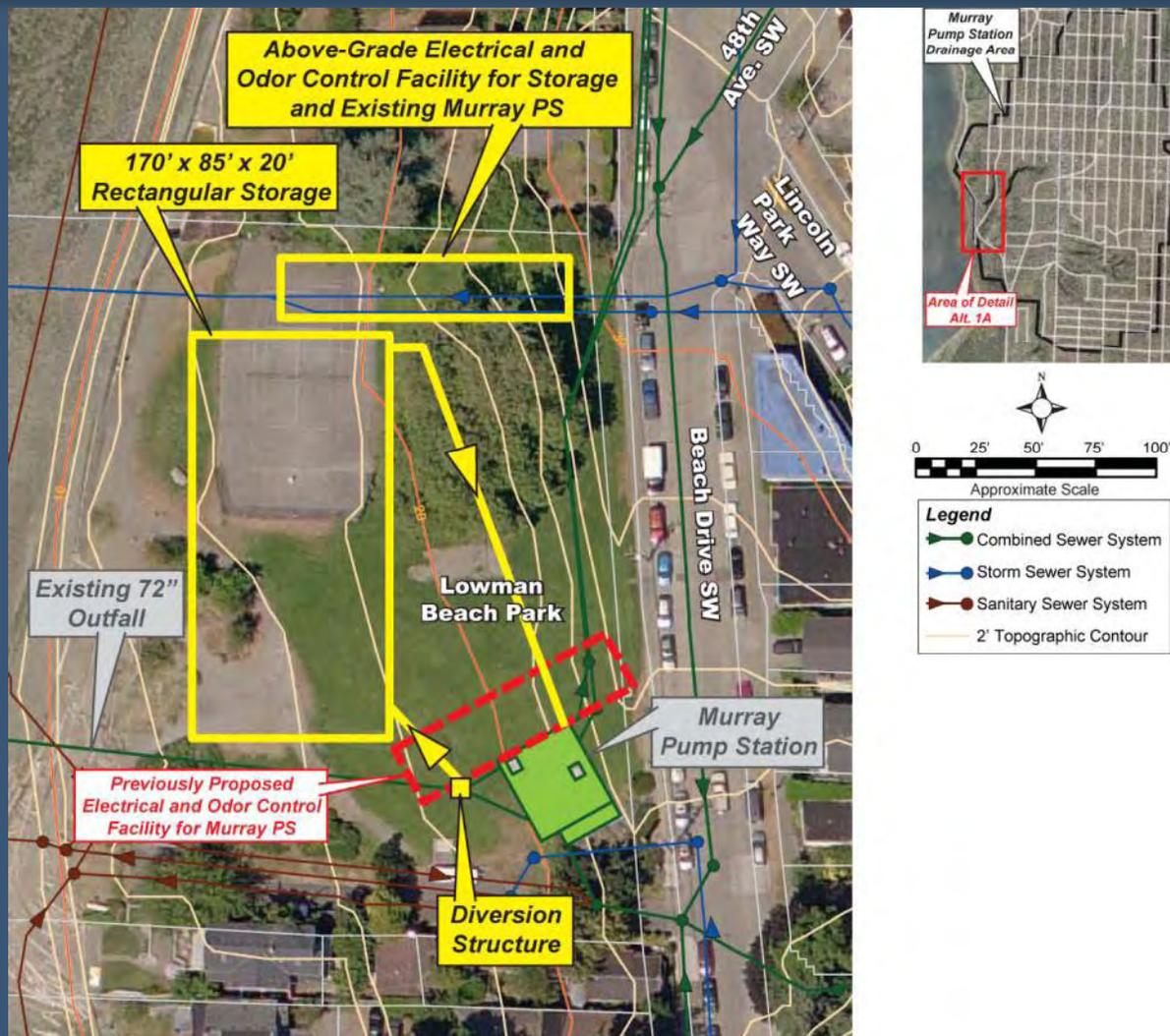


# Murray Pump Station Upgrade Project

- Installation of a generator
- Additional odor control measures
- Upgrades are independent of CSO control requirements
- Bottom of basin alternatives provide coordination opportunity



# Rectangular Storage in Lowman Beach Park



# Rectangular Storage in Lowman Beach Park

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- **Benefits**

- Single facility at bottom of basin
- Lowest level of complexity to operate and maintain
- Similar to other King County facilities

- **Challenges**

- Use of a portion of Lowman Beach Park
- Permanent above-grade facilities may limit park use
- Will disrupt park use during construction
- Shoreline location

# Distributed Storage in Beach Drive and Murray Avenue



# Distributed Storage in Beach Drive and Murray Avenue

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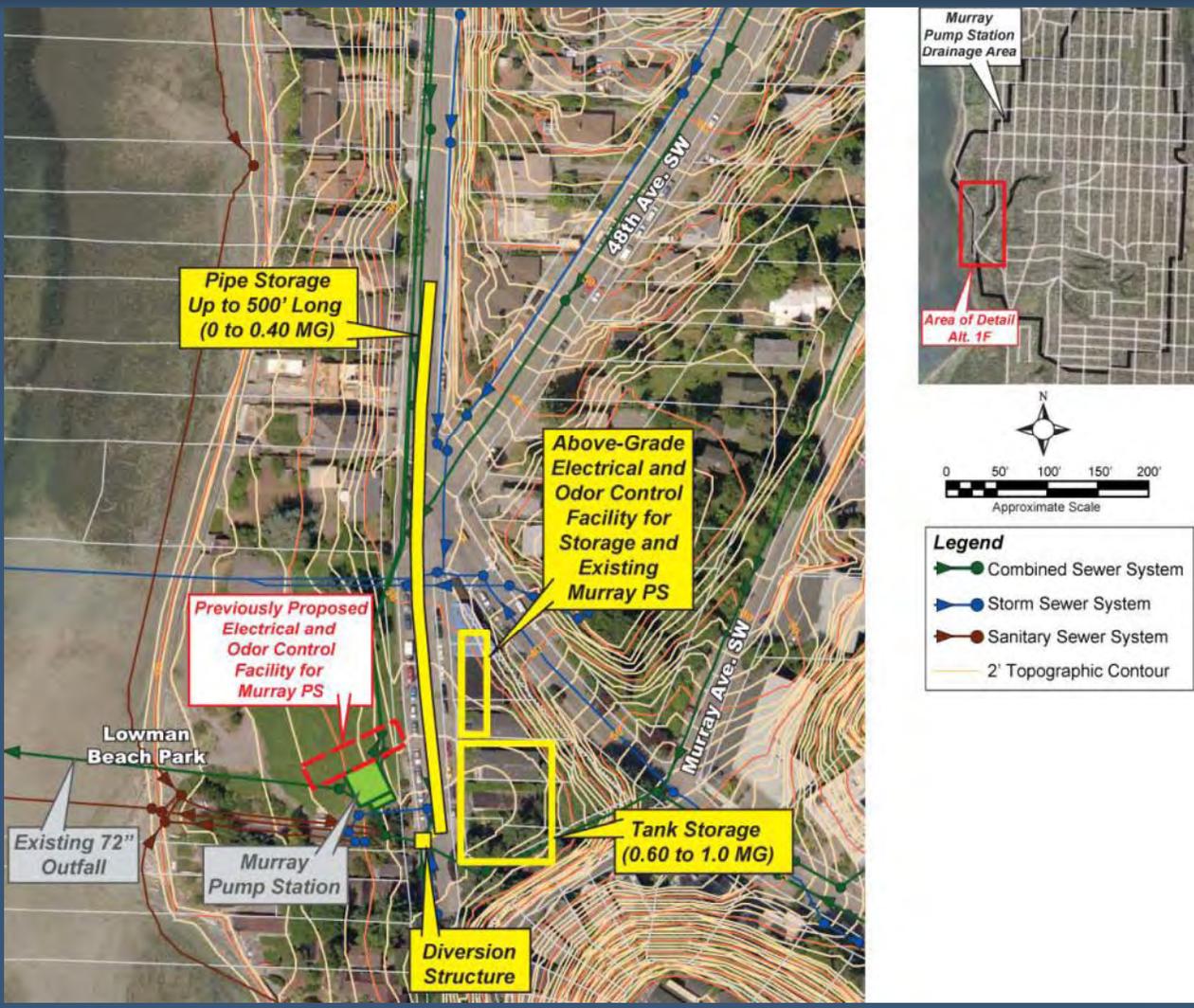
- **Benefits**

- Less private property acquisition
- Similar to other King County facilities

- **Challenges**

- Utility relocation will be required
- Locations needed for odor control and electrical facilities
- Traffic and residential access disruptions during construction
- Location is not at bottom of basin; requiring larger facility size to achieve control
- Lack of construction staging area

# Combined Pipe and Tank Storage



# Combined Pipe and Tank Storage

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- **Benefits**
  - Bottom of basin
  - Similar operational complexity to single facility
- **Challenges**
  - Street use permits may be required
  - Property acquisition required
  - Two storage facilities to operate and maintain

# Questions, Responses, and Public Input



# Contact Information to Provide Input

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- Web: [www.kingcounty.gov/csobeachprojects](http://www.kingcounty.gov/csobeachprojects)
- E-mail: [CSOBeachProjects@kingcounty.gov](mailto:CSOBeachProjects@kingcounty.gov)
- Phone: 206-263-7301
- Feedback forms
- Feedback and info received by mid-April will be considered during evaluation of the three alternatives

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