Regional Wastewater Services Plan and Conveyance System Improvement Program Planning Assumptions

PRESENTED TO:

ENGINEERING AND PLANNING SUBCOMMITTEE OF THE METROPOLITAN WATER POLLUTION ABATEMENT ADVISORY COMMITTEE

SEPTEMBER 5, 2013

King County
Department of Natural Resources and Parks
Wastewater Treatment Division

Schedule for Briefings with E&P

Date	Planned Topic
May 2, 2013 COMPLETED	Overview of process to update planning assumptions
June 6, 2013 COMPLETED	Future population, planning horizon, and water conservation assumptions
August 1, 2013 COMPLETED	Sewered area growth rate and average wet-weather I/I degradation rate
September 5, 2013	Follow-up from June 6 and August 1 discussions
October 3, 2013	Peak I/I and new system I/I degradation rate
November 7, 2013	Follow-up from October 3 and other meetings as needed

Today's Presentation

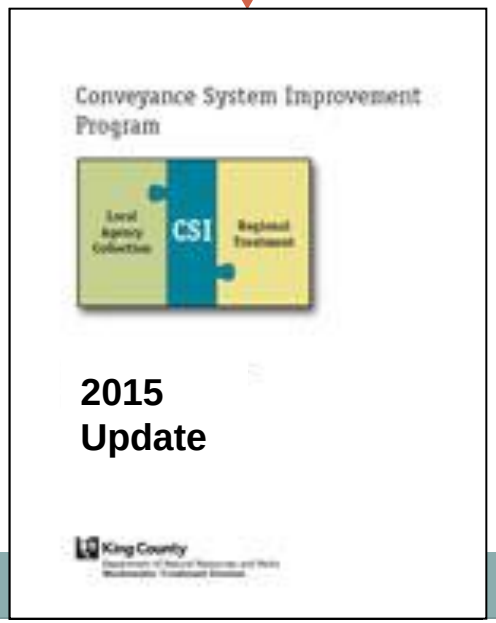
- Planning Assumption Background
- Present assumptions for use in CSI Update and RWSP Comprehensive Review
  - Future Population
  - Planning Horizon
  - Water Use/Conservation
  - Sewered Area Growth rate and Average Wet Weather I/I Degradation Rate
- Summary of E&P Discussions on Planning Assumptions Discussed in June and August
- Next Steps

Update of Planning Assumptions

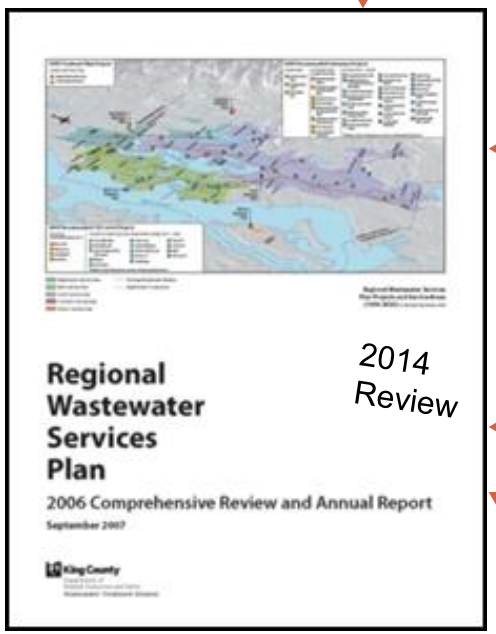
Regional Conveyance System Needs Assessment

Conveyance System Improvement Project Identification

Prioritize Projects and Update Cost Estimates



Treatment Plant Flow Projections

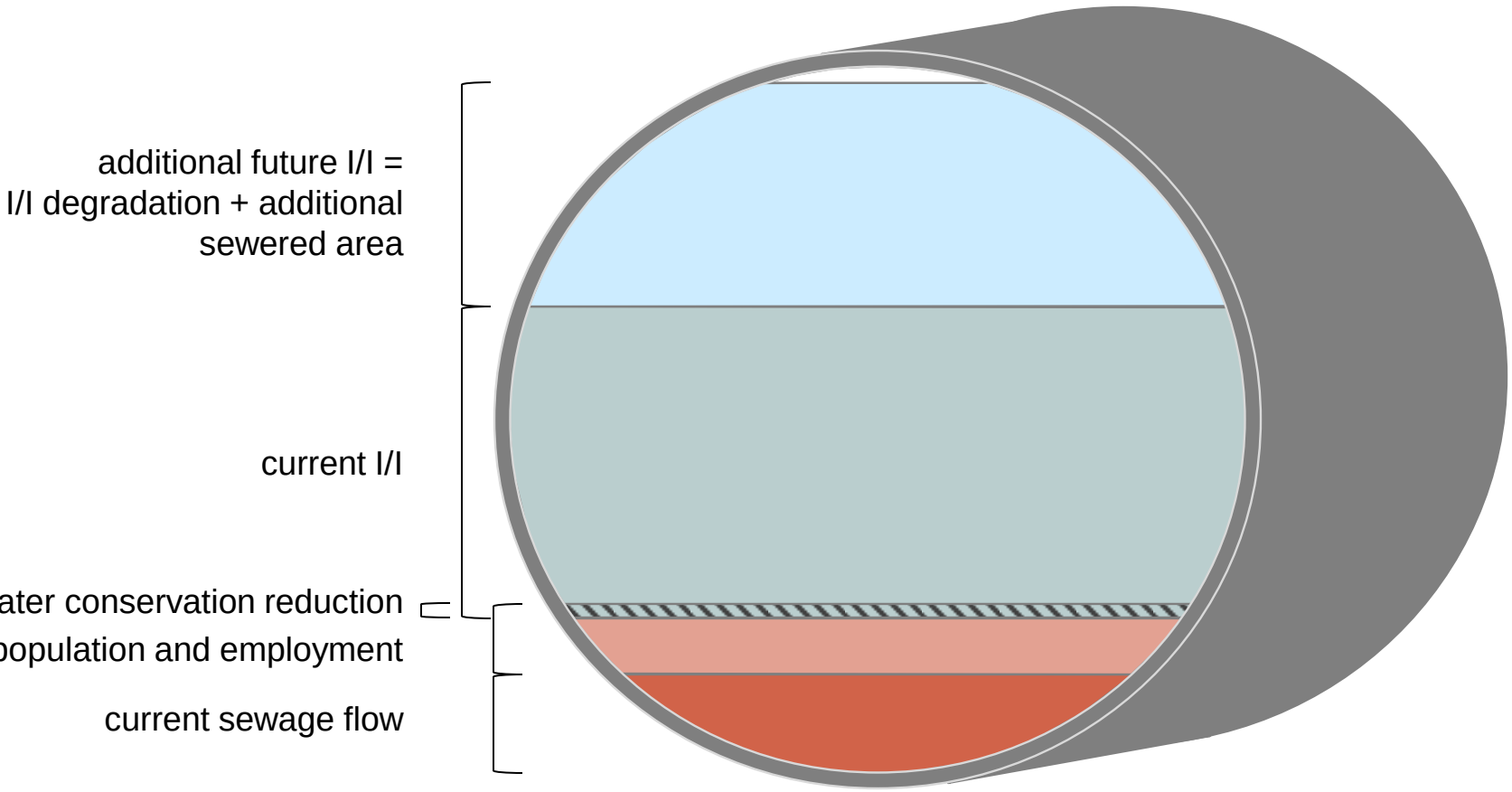


Review of RWSP Programs & Policies

Review of Asset Management Assumptions

Review of Technology & Regulatory Trends

Components of Future Flows

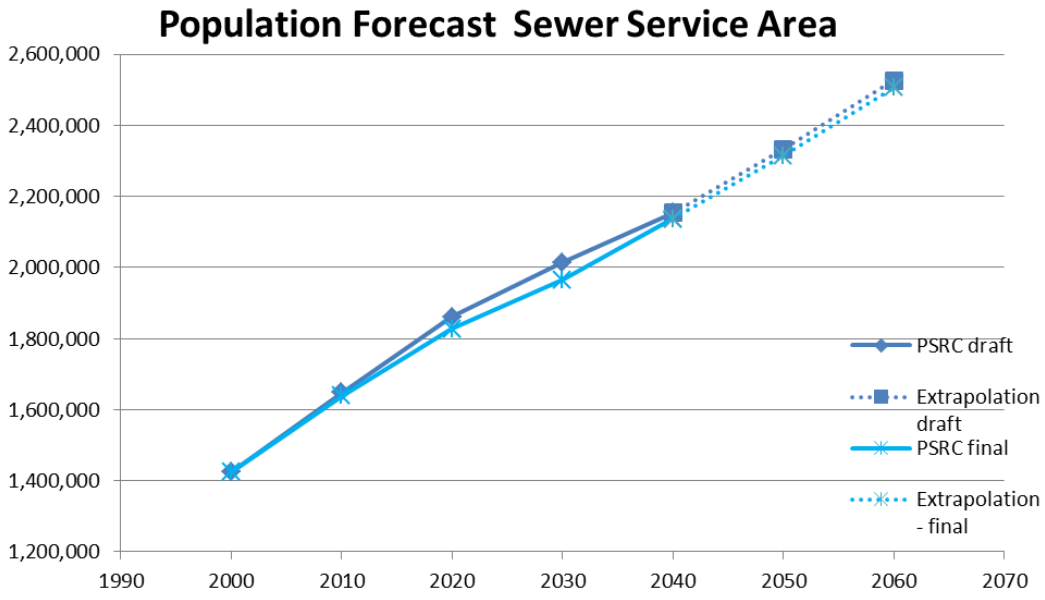


Assumption: Future Population

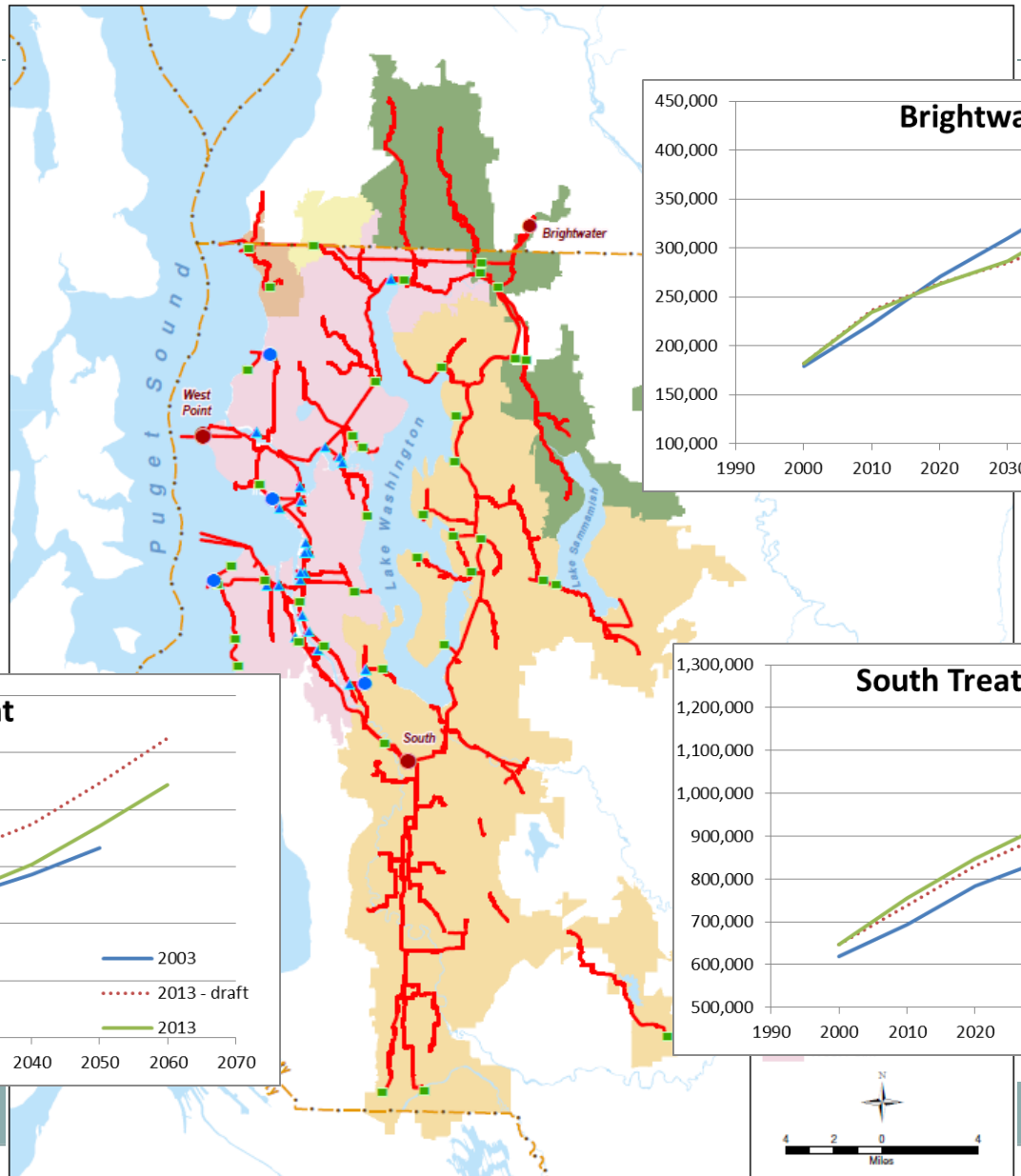
Analysis: Apply 2013 PSRC Land Use Forecast data to WTD sewer model basins. Review options for extrapolating the data beyond the forecast horizon of 2040.

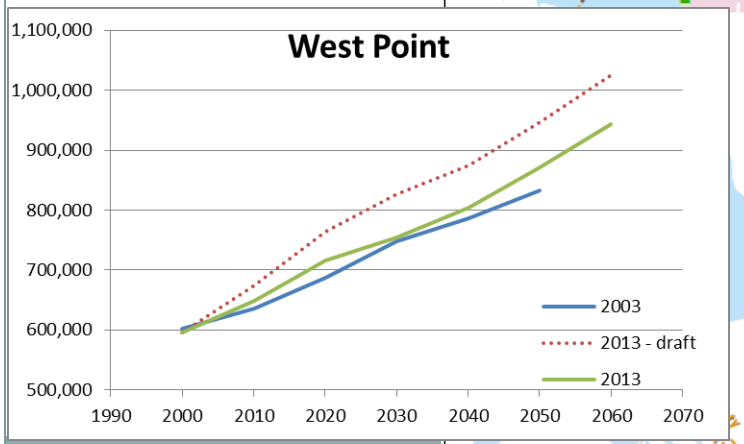
E&P Discussion: How much capacity for growth there is in the region was discussed. While capacity of some types of zoning, for example, single family may saturate it does not seem realistic to run out of capacity for growth.

Updated Assumption: Allocate PSRC 2013 forecast for 2020, 2030, and 2040 to sewer model basins. Apply straight line extrapolation of the growth rate out to 2060.

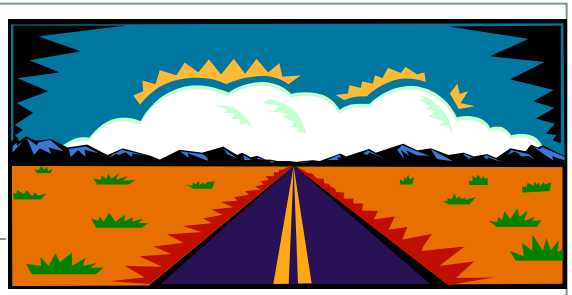


Population Estimates





Assumption: Planning Horizon



Analysis:

- Previous assumption was that the regional wastewater service area would be fully built out and sewered by 2050. Determined that building would be expected beyond 2050. Based on that selected a 50-year planning horizon as the reasonable horizon for modeling future wastewater flows.

Updated Assumption: Use a 50-year planning horizon; estimate capacity needs in 2060, based on population, employment, and results of sewered area growth rate analysis.

Assumption: Current Water Use

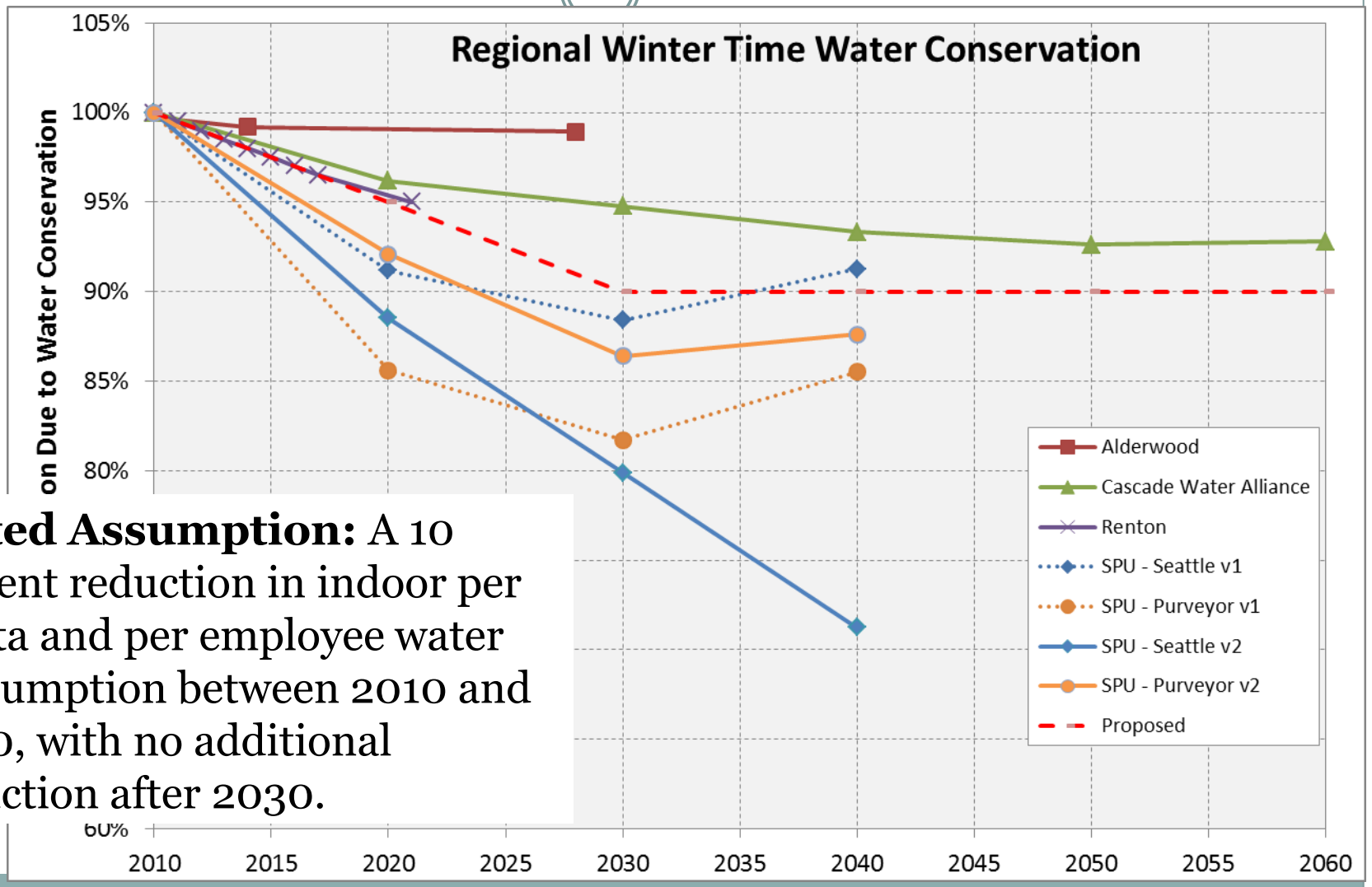
Analysis: Reviewed water use data from Seattle Public Utilities, Cascade Water Alliance, and local water districts.

Discussion: Per capita water use continues to decline. The extent of the decline could be impacted by factors such as household income level and age of housing stock. Where the decline will stop is the subject of much discussion.

Updated Water Use Assumptions (2010):

	Previous 2000	Previous 2010	Proposed 2010
Seattle residential (gpcd)	55	50	46
other residential (gpcd)	66	60	54
commercial (gped)	33	30	23
industrial (gped)	55	50	45

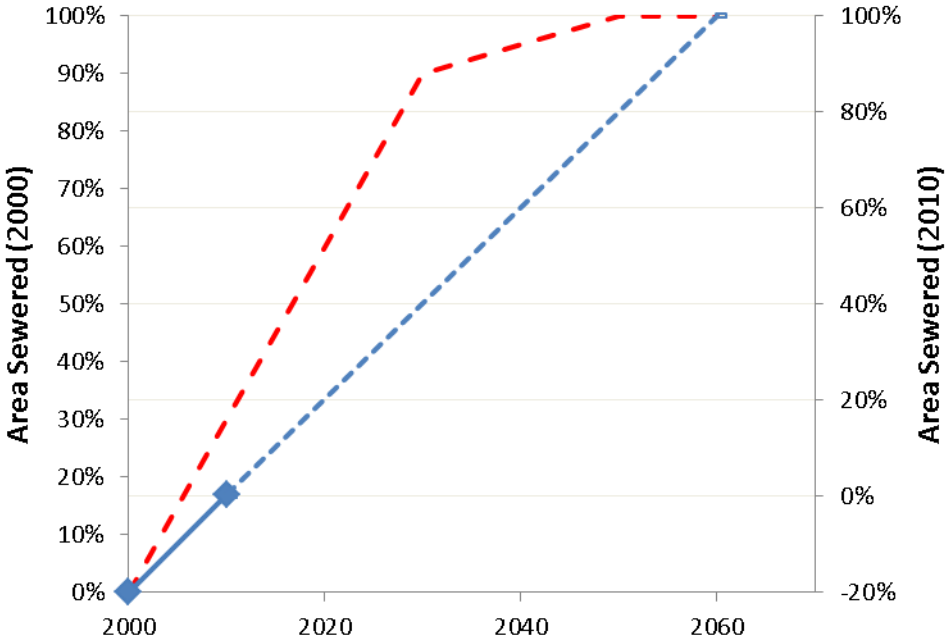
Assumption: Water Conservation



Updated Assumption: A 10 percent reduction in indoor per capita and per employee water consumption between 2010 and 2030, with no additional reduction after 2030.

Sewered Area Growth Assumption

Analysis:
Evaluated changes in sewered area between 2000 and 2010.

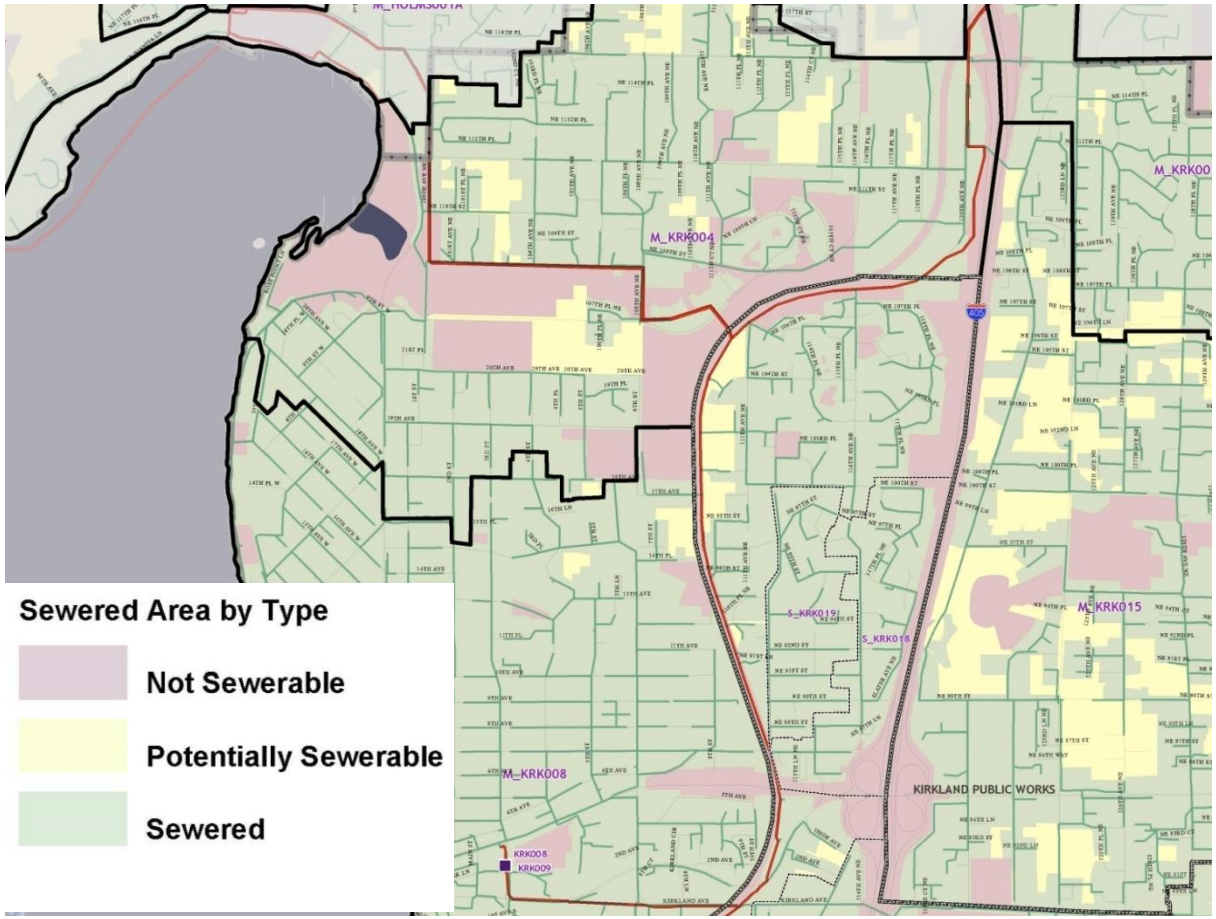


Updated Assumption: Additional sewered area will continue to increase at the 2000-2010 rate until service area is fully sewered in 2060.

Sewered Area Growth Assumption Applied

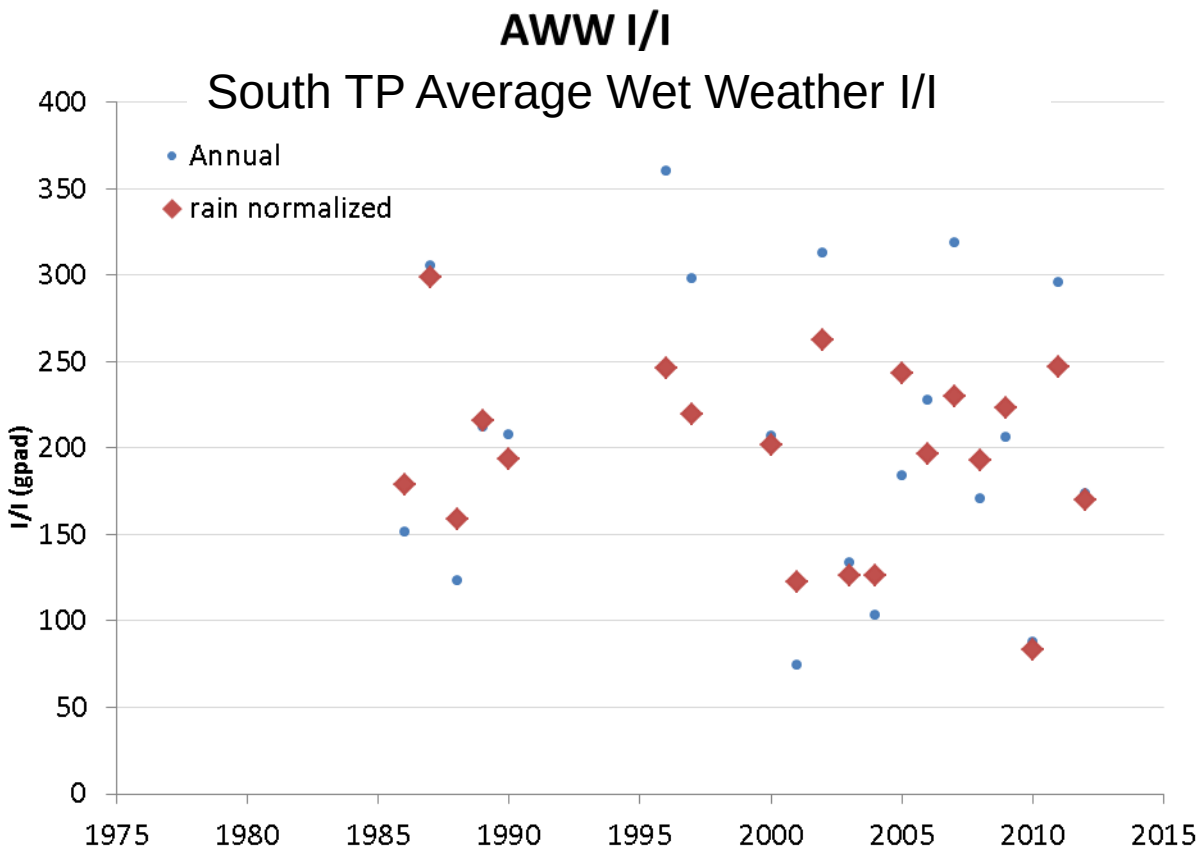
E&P Discussion:

Sewerable area assumption and population growth assumption are separate. Sewerable area assumption is needed for I/I component of flow. Population is used for base flow.



AWW I/I Degradation Assumption

Note: applies only to treatment plant flow forecasts.



- **Analysis:** Plot excludes base infiltration
- **E&P Discussion:** No discernible trend in AWW I/I rates.
- **Updated Assumption:** No AWW I/I degradation factor

* Includes Interurban + Tukwila North

What We've Heard

- Other items mentioned during May, June, August meetings:
  - Living buildings / on-site treatment systems
  - Heat/Energy recovery
  - Flushables
  - Environmental goals for the region
  - Future / changing regulations

Assumption Update Summary

Assumption	Previous	New
Extent of Service Area	Sewerable areas within UGA	Same
Design Flow	20-year peak flow	Same
Future Population	2003 PSRC Forecast	2013 PSRC Forecast
Planning Horizon	2050	2060
Water Use (gpcd or gped)	Seattle Residential: 55 Other Residential: 66 Commercial: 33 Industrial: 55	Seattle Residential: 46 Other Residential: 54 Commercial: 23 Industrial: 45
Water Conservation	A 10% reduction in per day water consumption between 2000 and 2010, with no additional reduction after 2010	A 10% reduction in indoor per capita and per employee water consumption between 2010 and 2030, with no additional reduction after 2030.

Assumption Update Summary (cont.)

Assumption	Previous	New
Sewered Area Growth Rate	90% of unsewered sewerable area sewered by 2030, 100% sewered by 2050.	Additional sewered area will continue to grow at the 2000-2010 rate until service area is fully sewered in 2060.
AWW I/I Degradation (Treatment Plants)	Increase of 7% per decade up to a maximum of 28%.	No AWW I/I degradation.
Peak I/I Degradation (Separated Conveyance)	Increase of 7% per decade up to a maximum of 28%.	TBD – October & November Discussion
New System I/I (Separated Conveyance)	Initial rate of 1500 gpad with degradation applied starting one decade after construction.	TBD – October & November Discussion

Next Meeting/Contacts

- Discussion of Peak I/I and New System I/I Degradation Rate on October 3 and November 7.
- For questions on RWSP Comprehensive Review contact:

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