Combined Sewer Overflow (CSO) Treatment Technology Evaluation

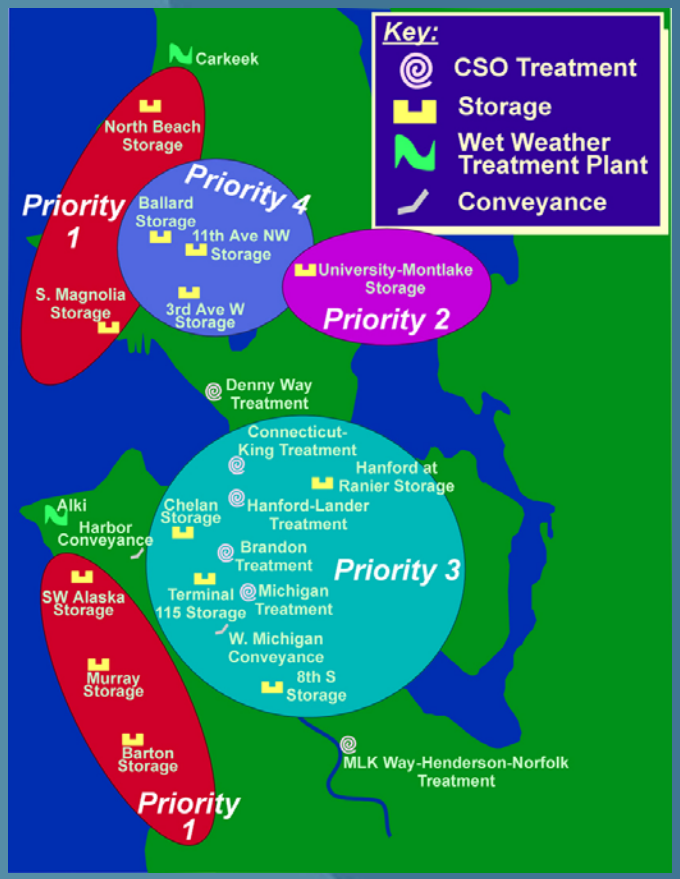
Bob Bucher
King County DNRP-WTD
Technology Assessment Program

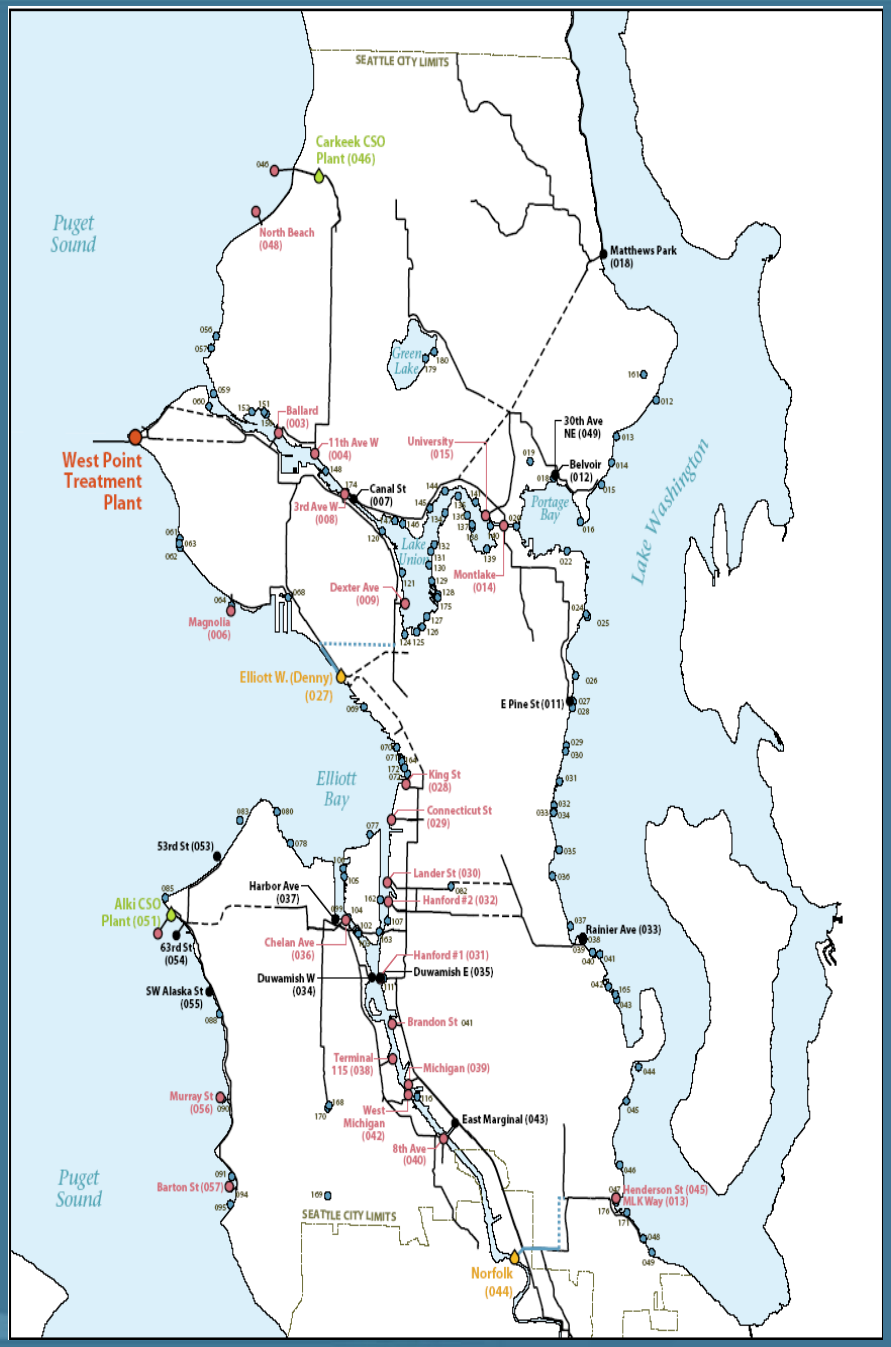
Fall Science Seminar

October 27, 2009

King County

Project Background

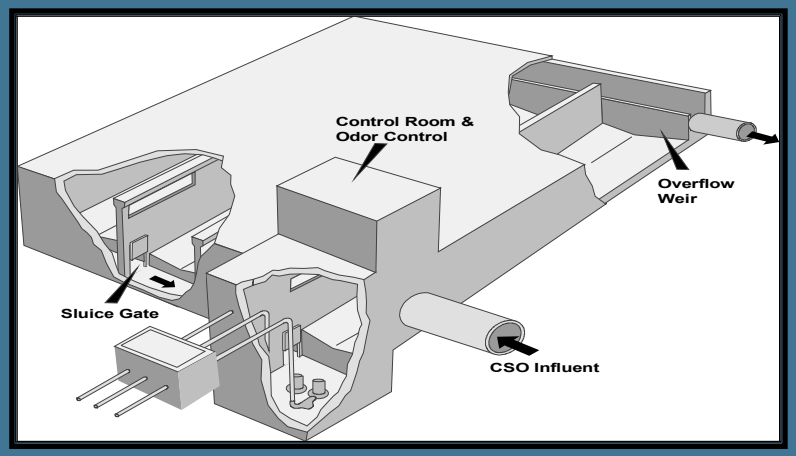




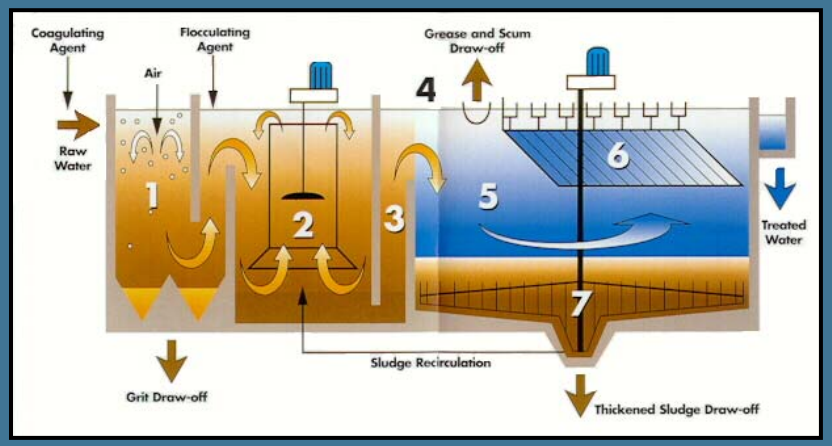
King County CSO Program Planning

Recommendations from CSO Control Plan Review

- Conventional Primary *still* remains first choice for treatment



- *Pilot* High Rate Sedimentation processes



Primary Treatment Hydraulics

<u>Surface Overflow Rate (SOR)</u>
Volume of wastewater treated per square foot of treatment liquid surface area (gallons per day per square foot, or gpd/sf)

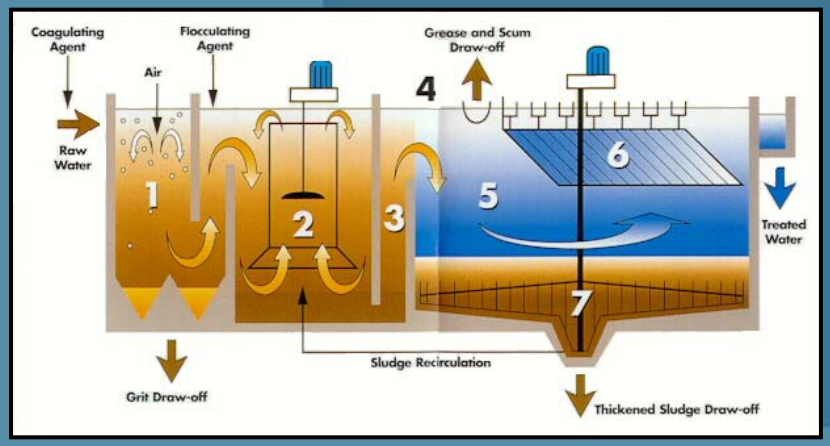
Treatment Process Performance

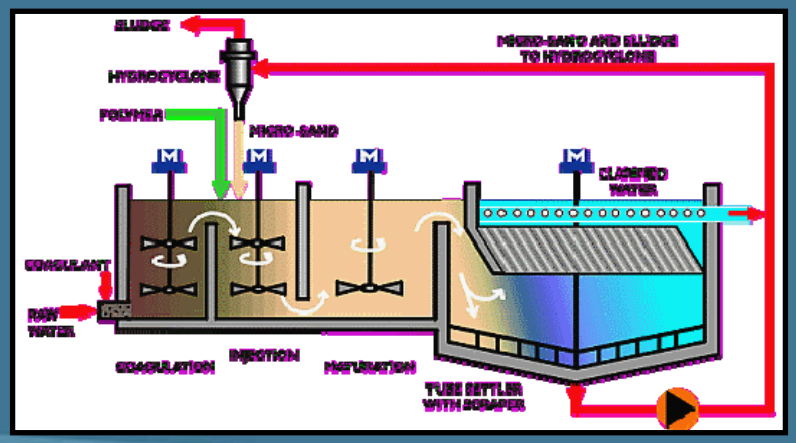
- CSO Treatment Standards
  - *TSS*
  - *Fecal Coliform*
  - *Settleable Solids*
- Water Quality-Based Permit Limits
  - *Metals*
  - *Ammonia*
  - *Chlorine*
- Sediment-Based Permit Limits

Pilot Testing of CSO Treatment Alternatives (Previous King County Experience)

Densadeg – 2001

Actiflo – 2001



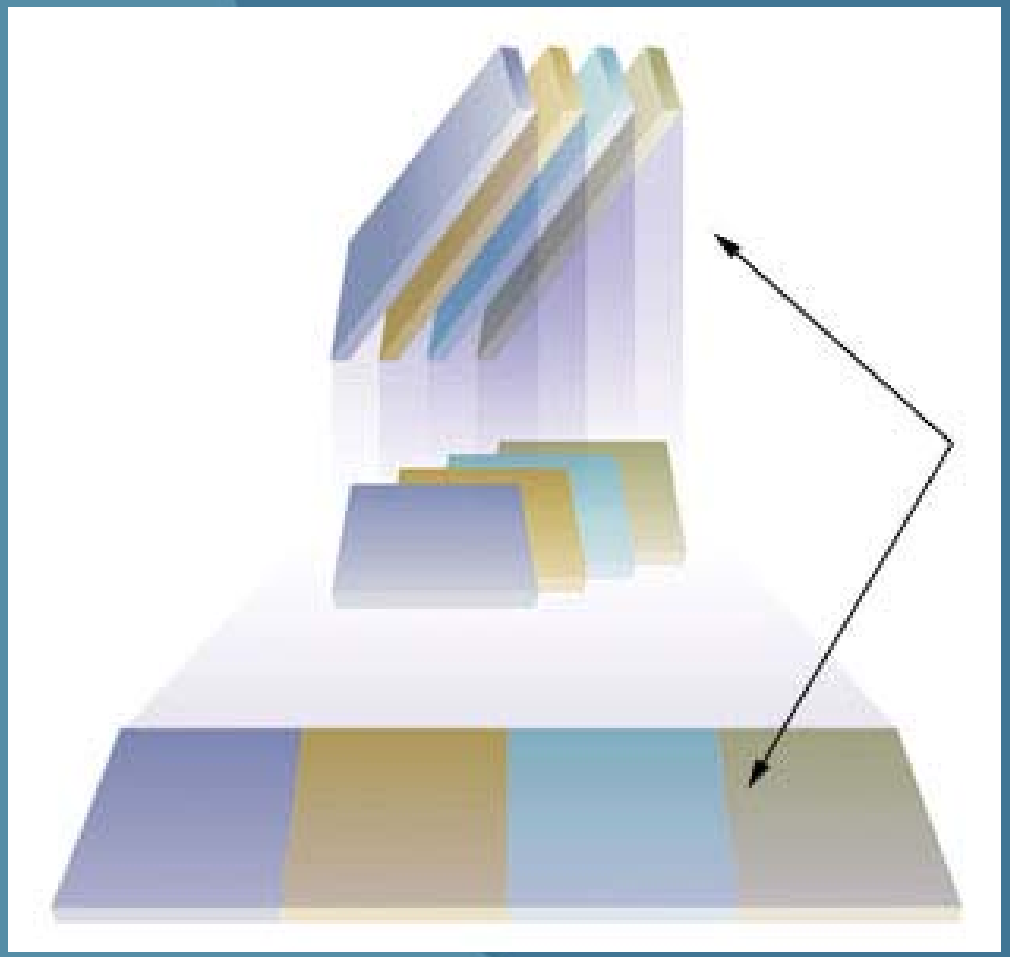


Pilot Testing of CSO Treatment Alternatives (Current Test Program – West Point)

Pilot Testing of CSO Treatment Alternatives (Current Test Program – West Point)

Chemical Enhanced – addition of coagulant (PAX 18) and polymer (anionic)

Pilot Testing of CSO Treatment Alternatives (What are Lamella Plates?)

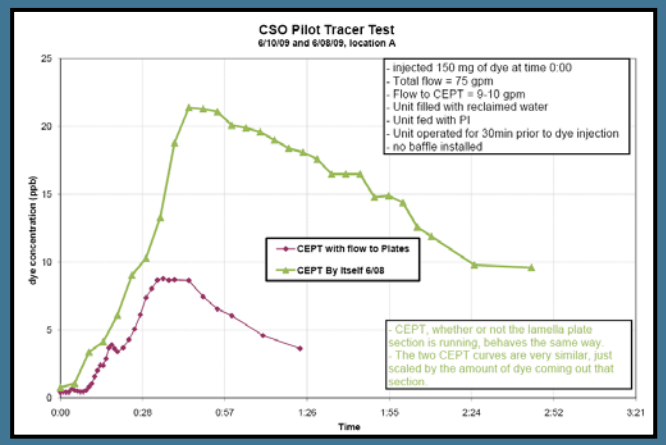


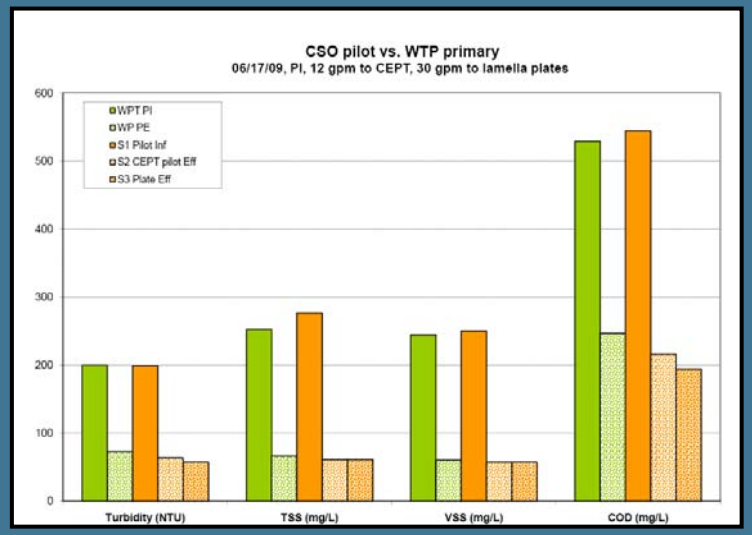
Lamella plates increase a basin's effective settling area. Each lamella plate settler provides an effective settling area equal to that of its horizontal projection.

Source: http://www.meurerresearch.com/plate_theory.html

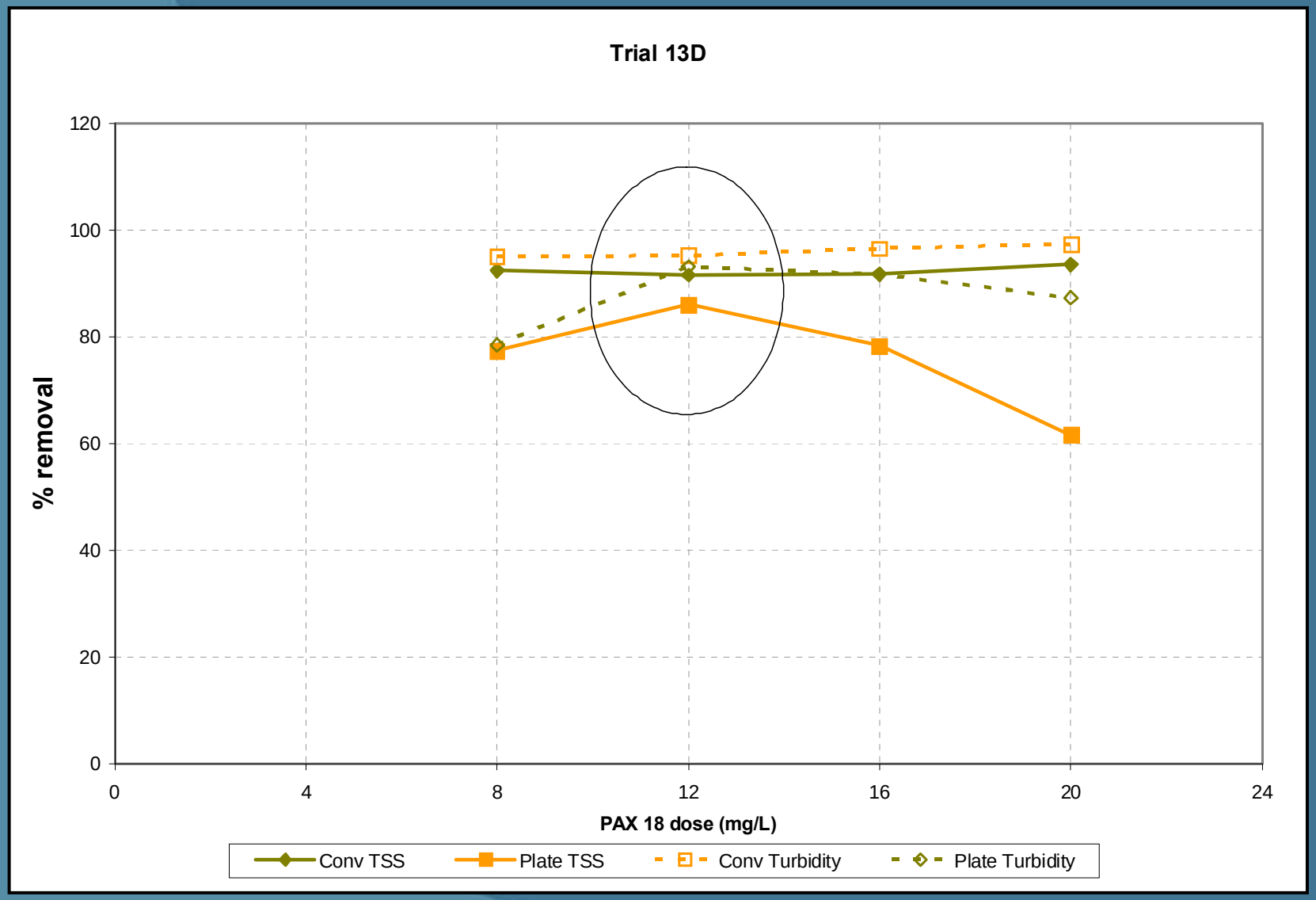
West Point Pilot - Test Trials

- Dye Testing
- West Point Primary Comparison
- Chemical Optimization
- Capacity Testing
- Dilution Testing
- Performance Testing
- Hydrograph Testing

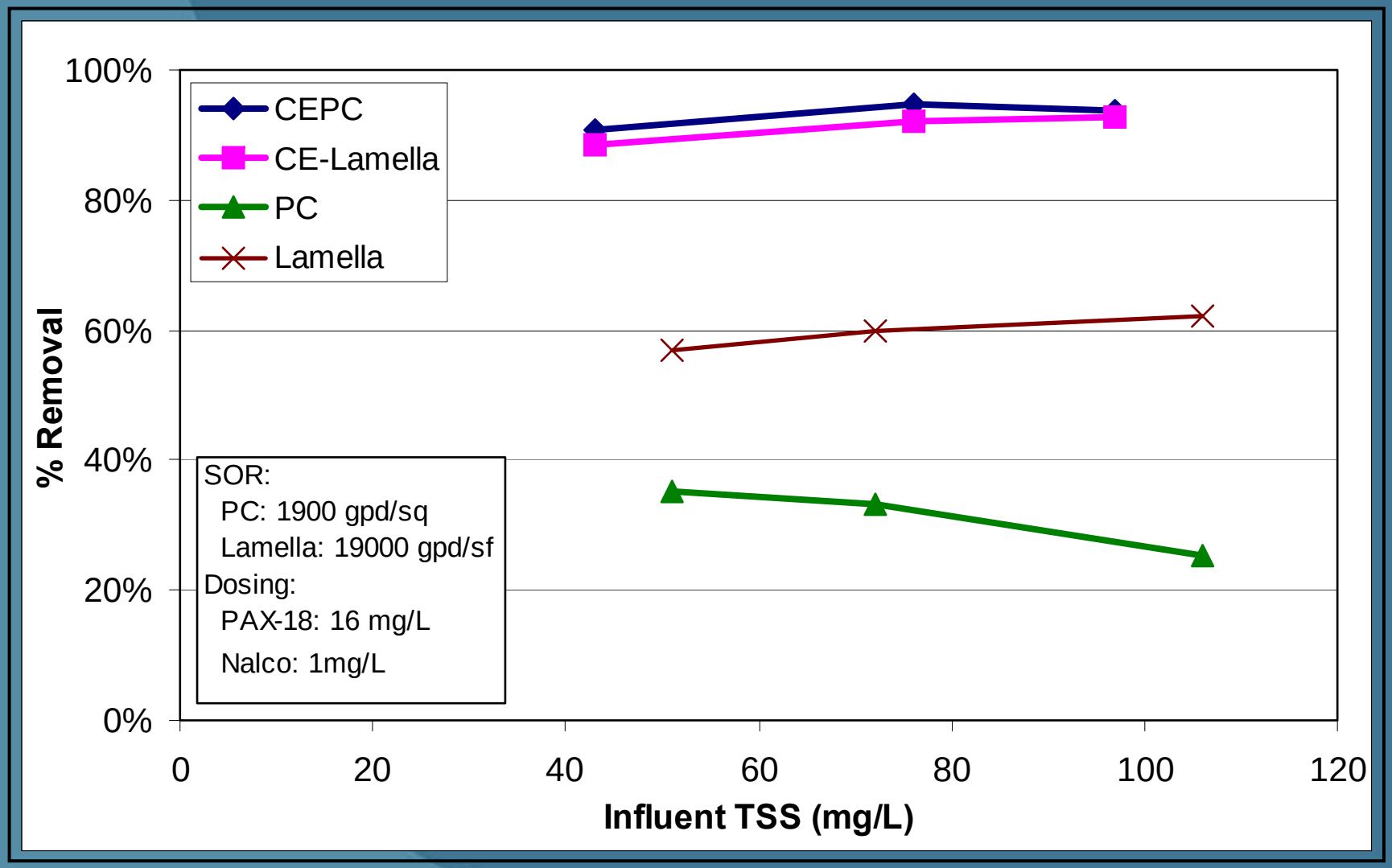




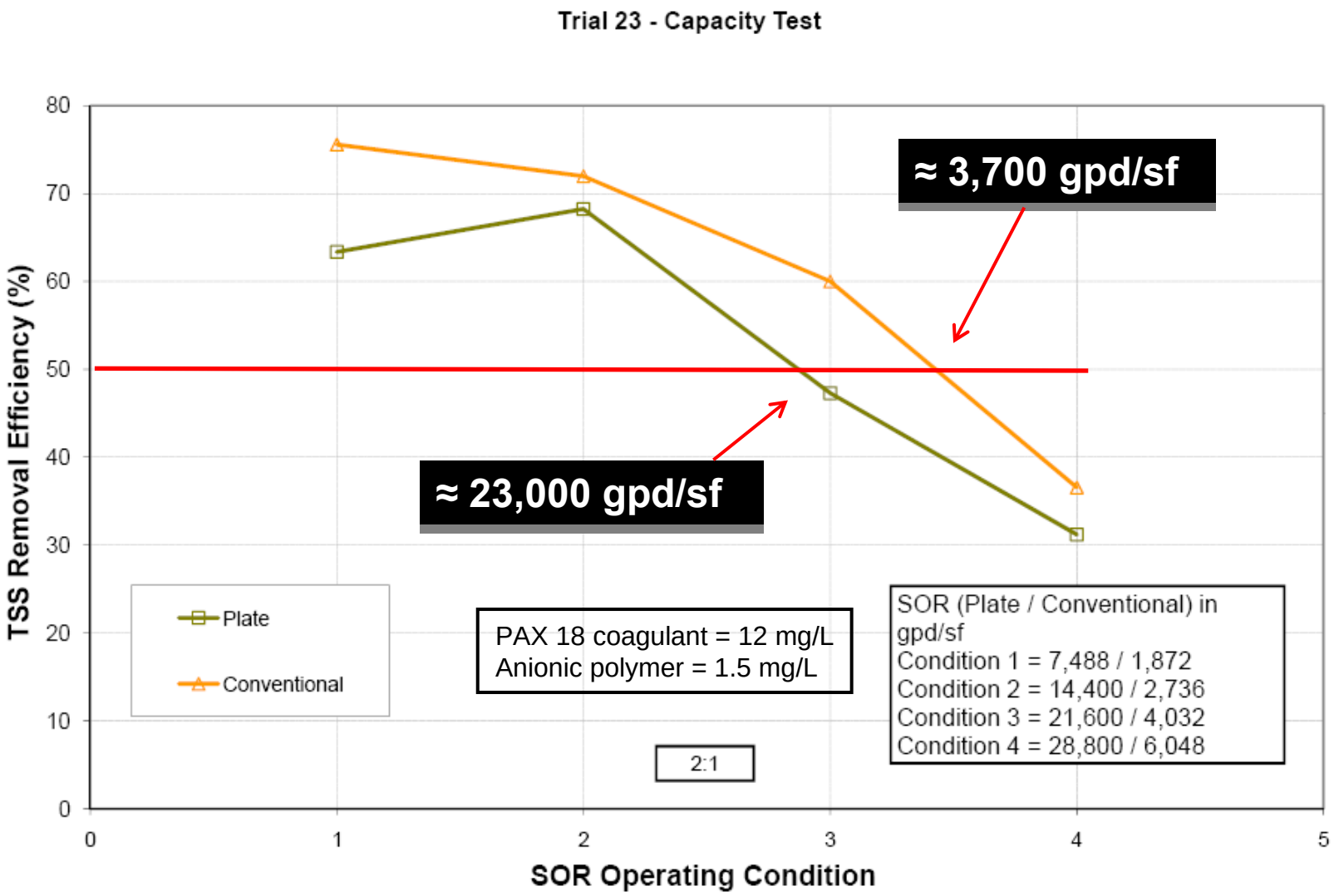
Chemical Optimization Test Trial



Dilution Test Trial



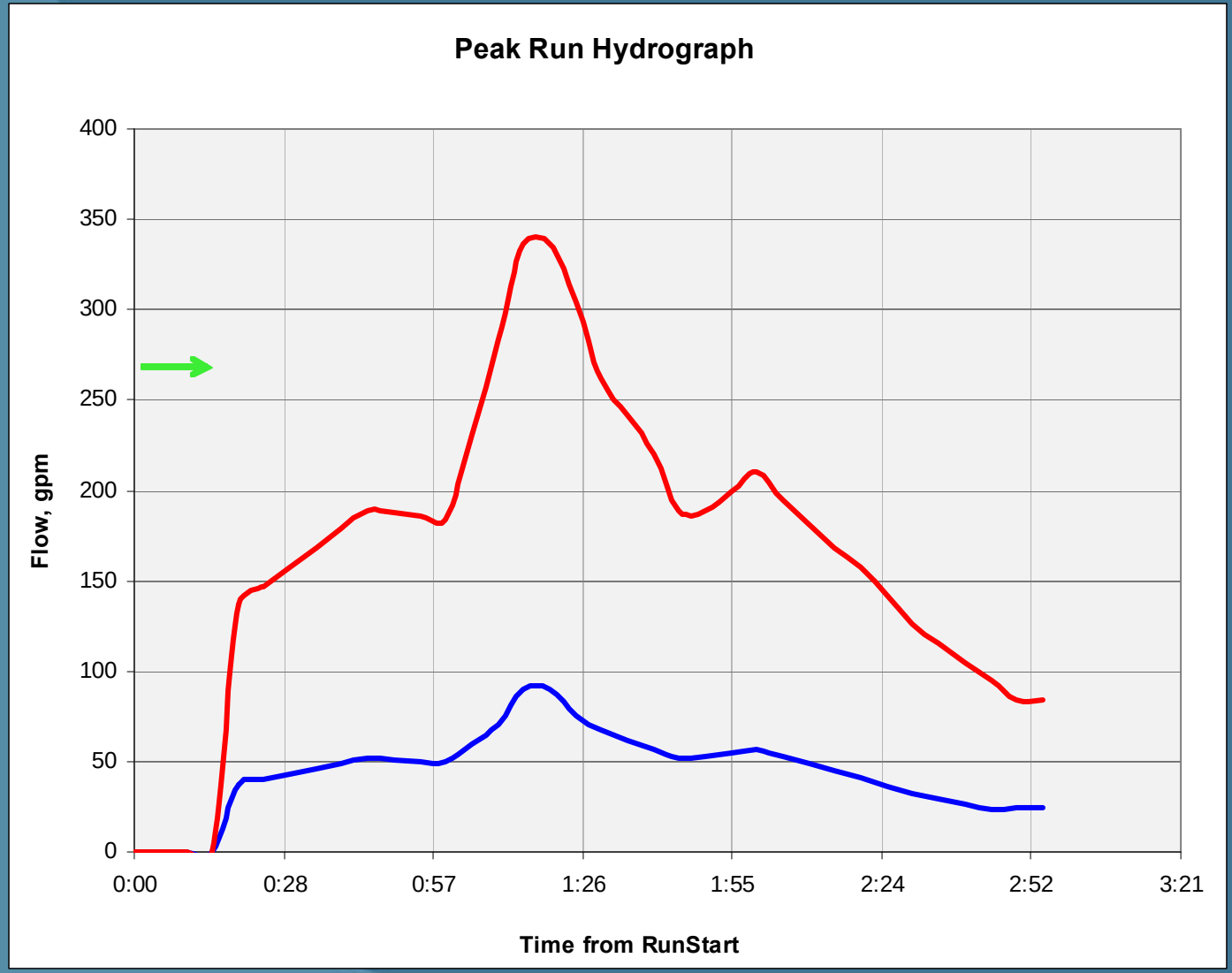
Capacity Test Trial



Performance Test Trial

Additional Sampling for metals, nutrients, and trace organics.

Hydrograph Test Trial



Testing Schedule and Final Report

Performance / Hydrograph testing through early November.
Final Report in January 2010.

Acknowledgements

- King County
  - CSO Program
  - West Point Process Group
  - West Point Process Laboratory
  - West Point Maintenance Staff
  - Environmental Laboratory
- CDM

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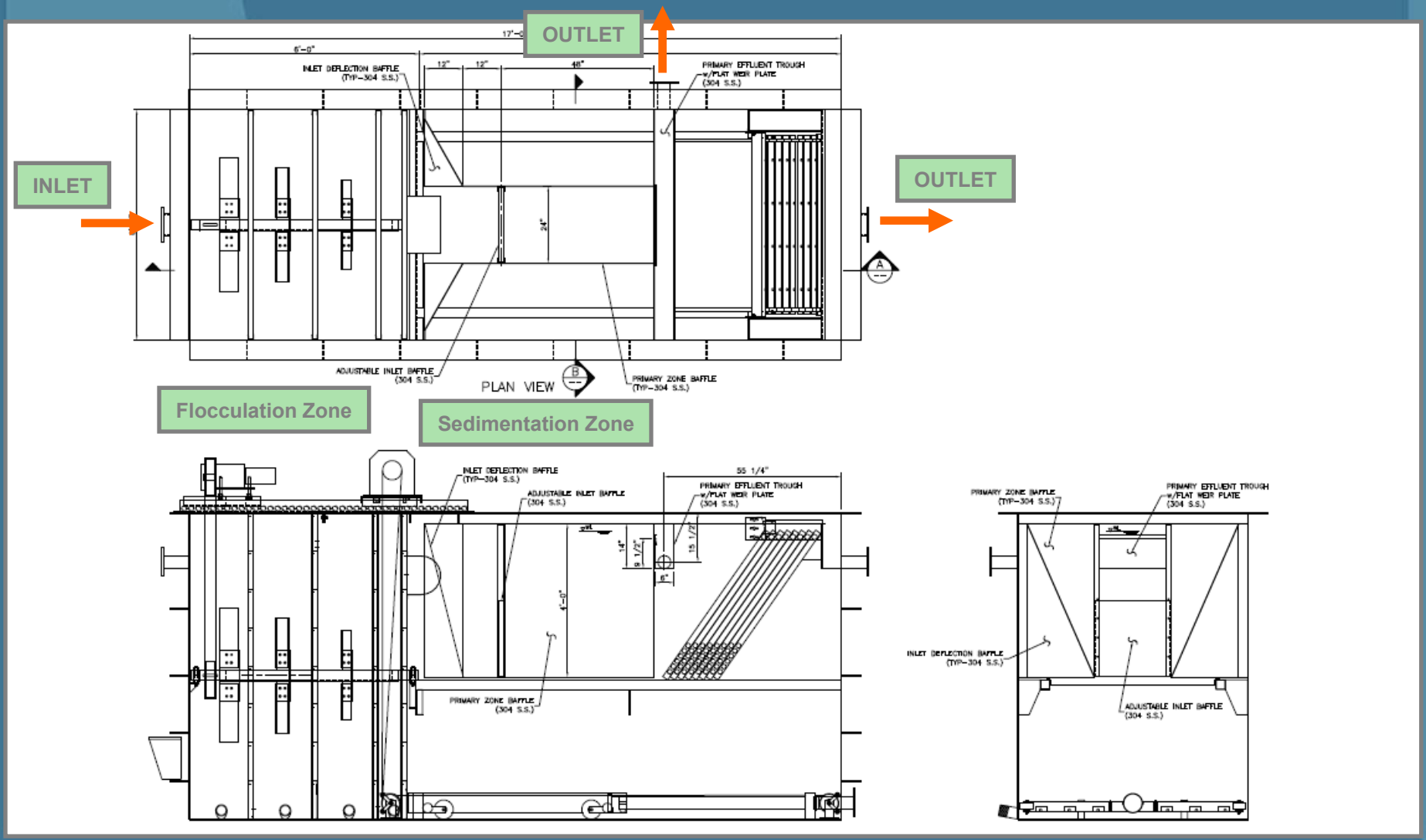
Pilot Testing of CSO Treatment Alternatives (Current Test Program – West Point)