

Columbus Collection and Treatment System Real Time Wet Weather Operational Implementation

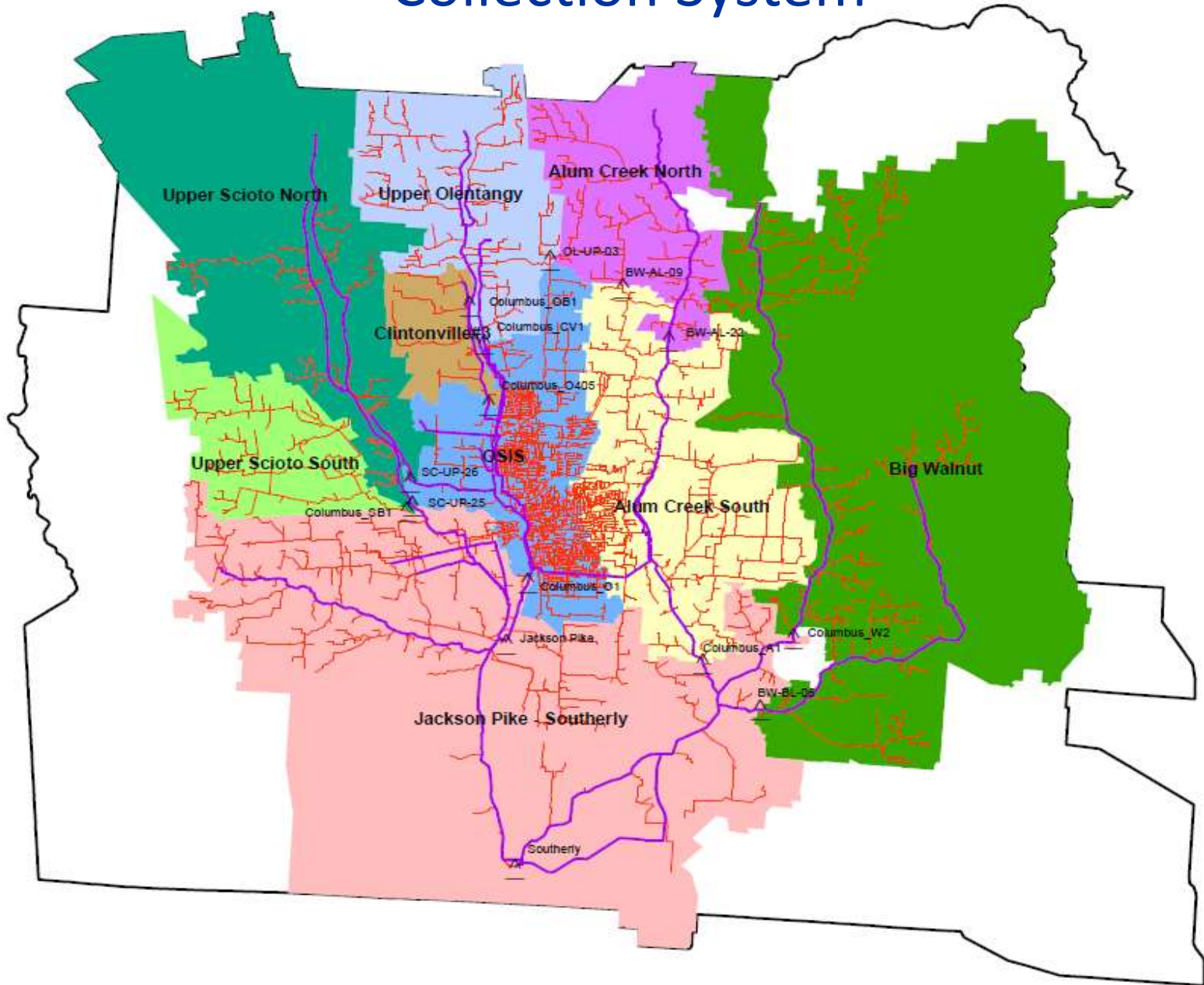
Presenters

Gary Hickman, JPWWTP Plant Manager

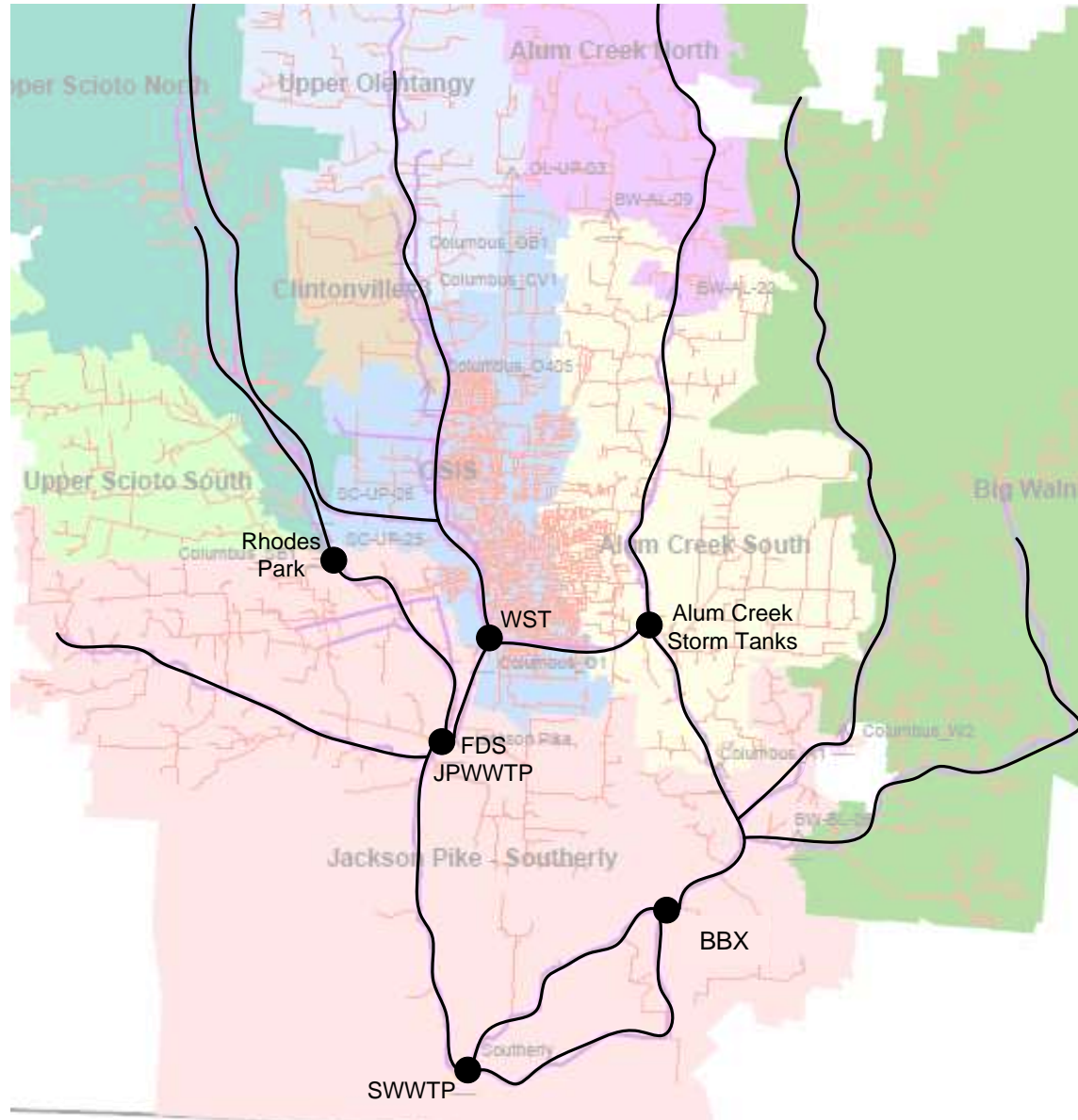
Ed Heyob, CDM Smith Automation Engineer



Collection System

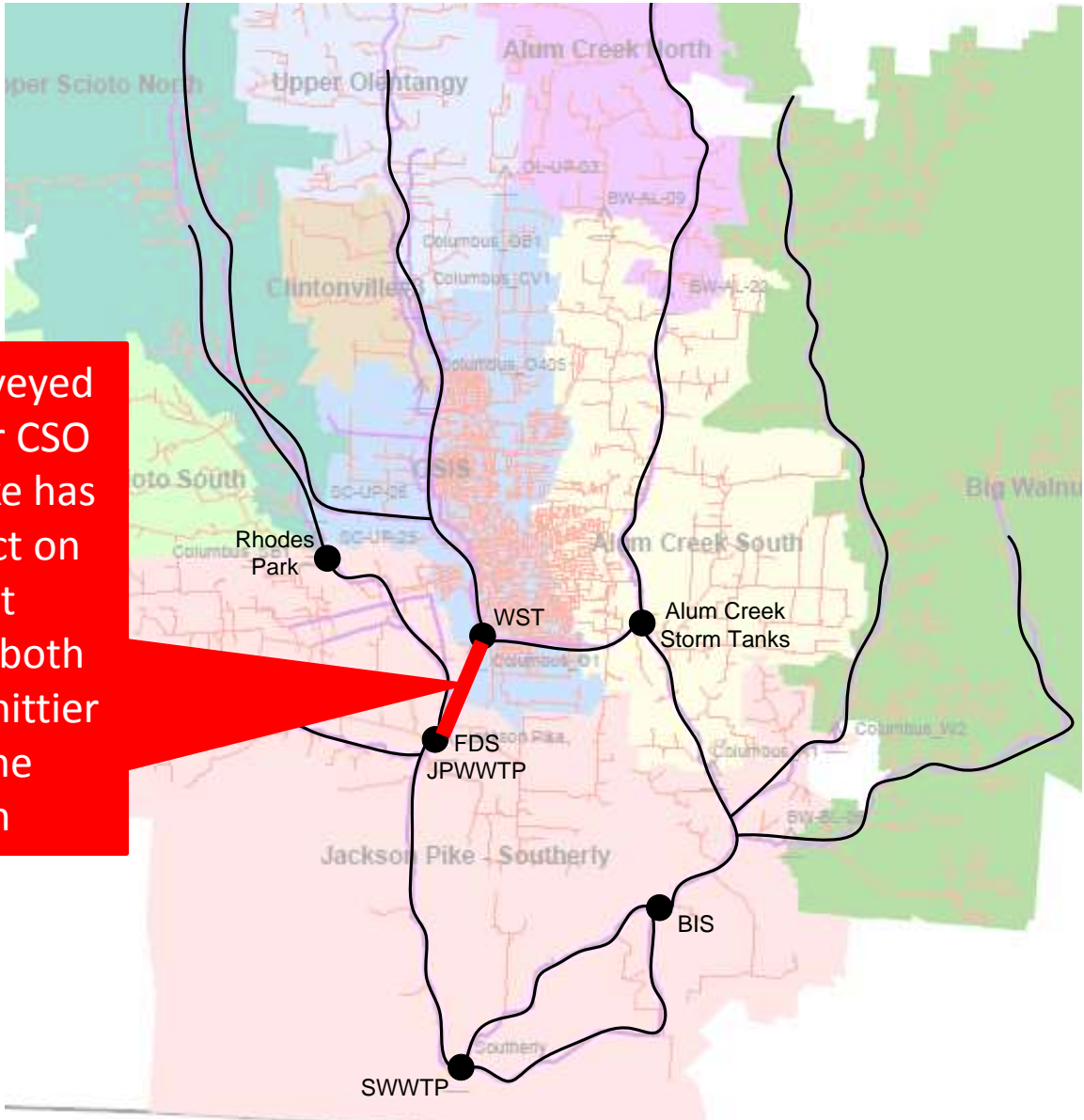


Control Locations on Trunk Sewers

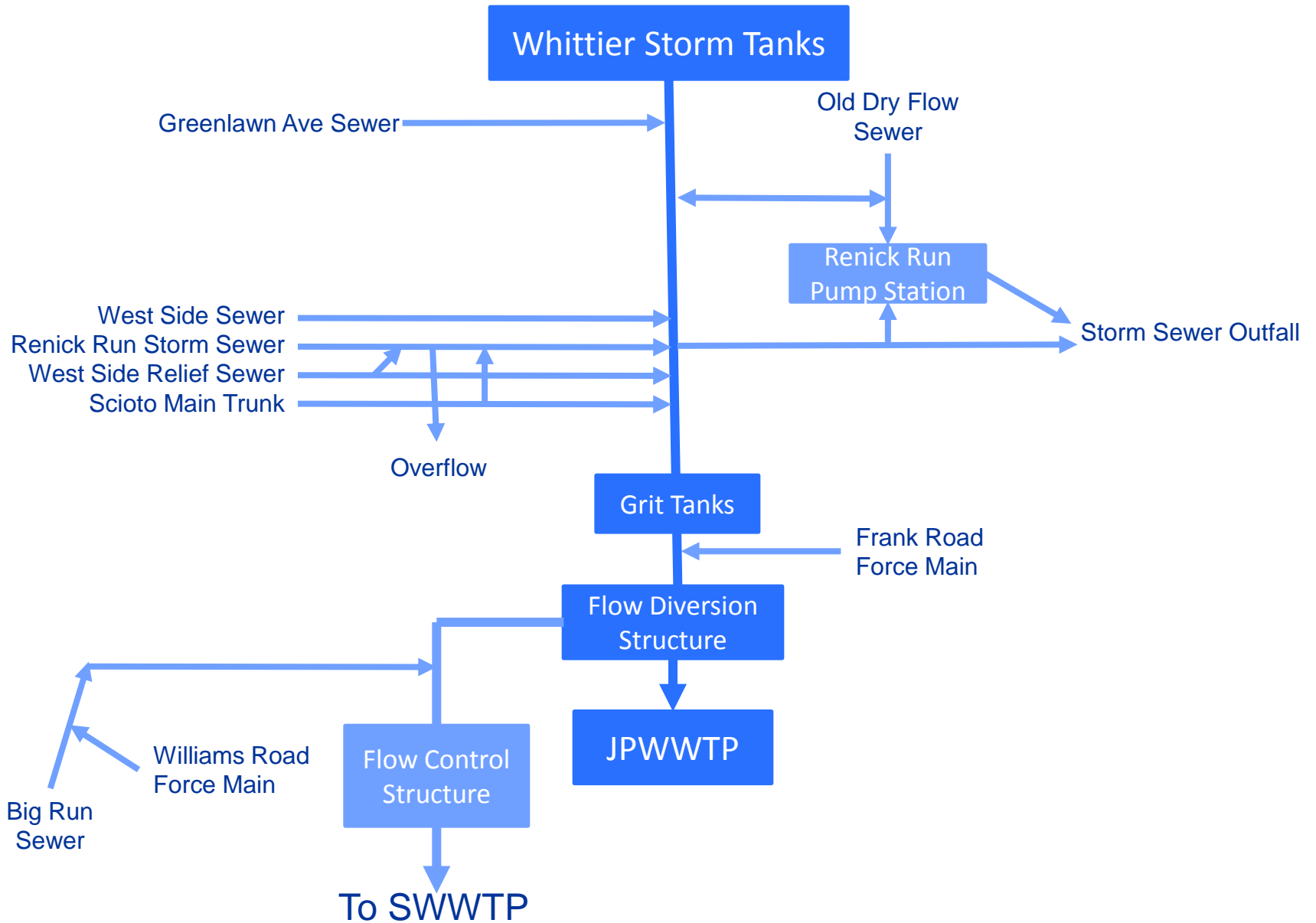


Key Conveyance Section of OSIS

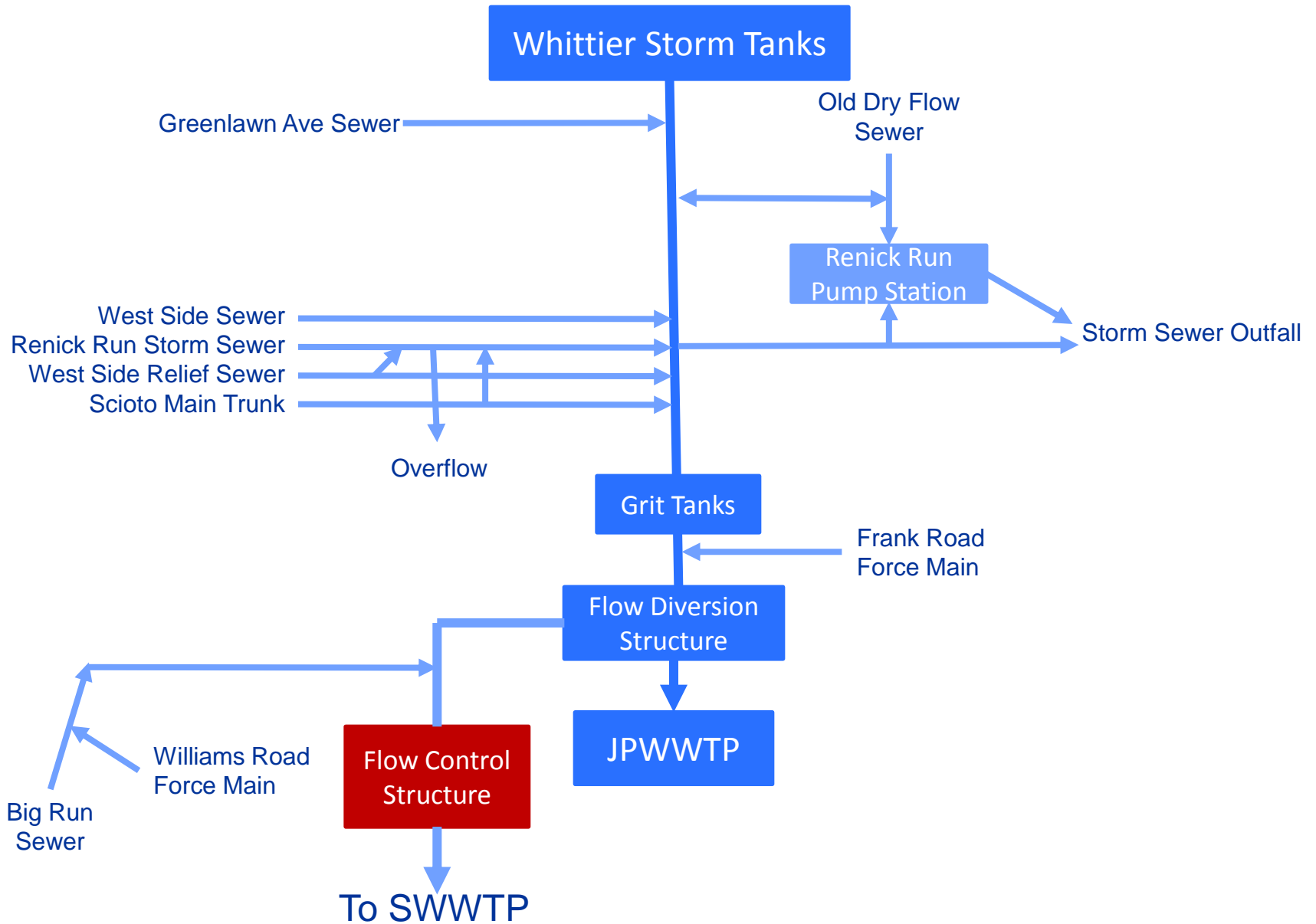
The flow conveyed from Whittier CSO to Jackson Pike has a large impact on treatment utilization at both plants and Whittier CSO volume reduction



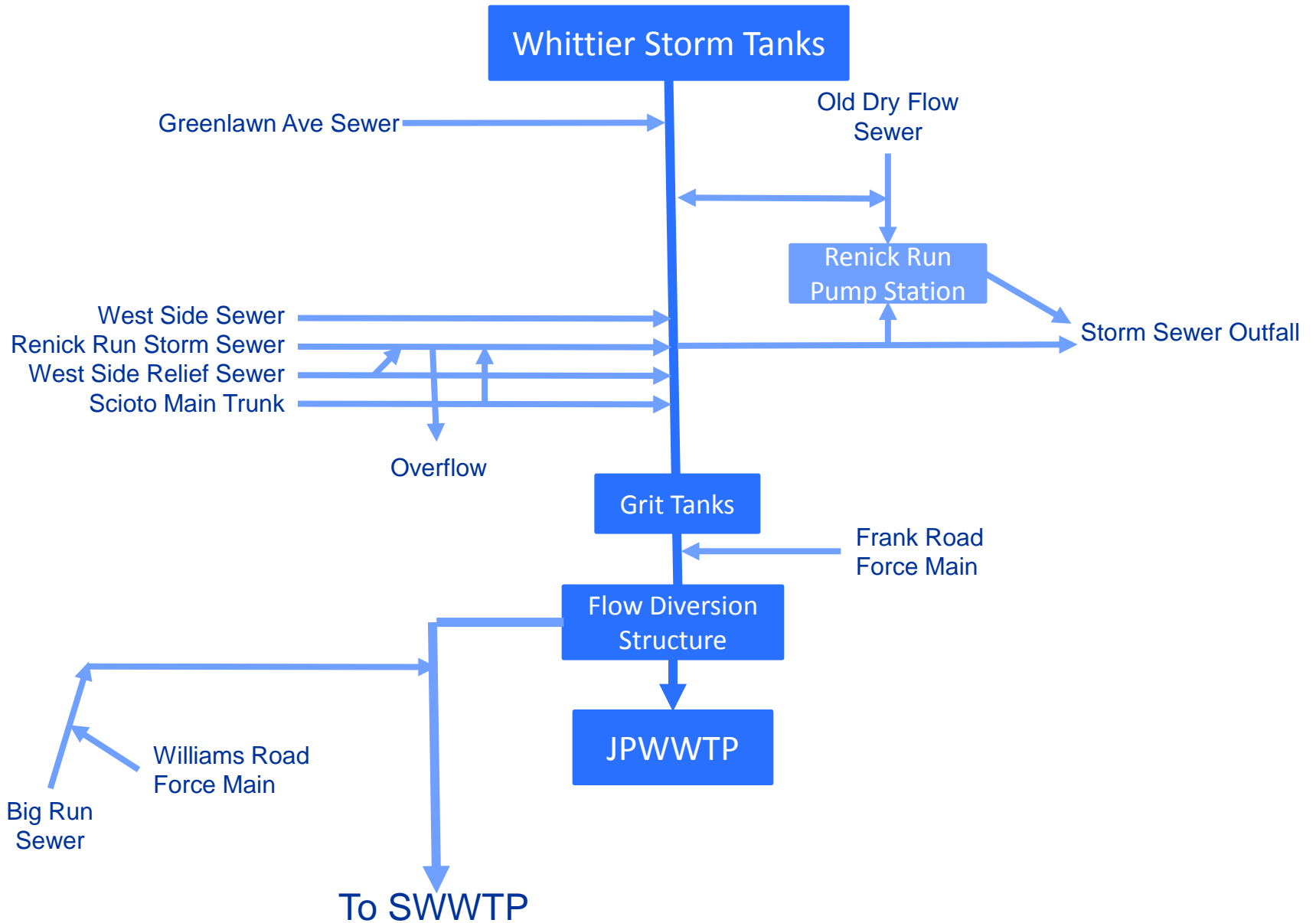
OSIS Evolution



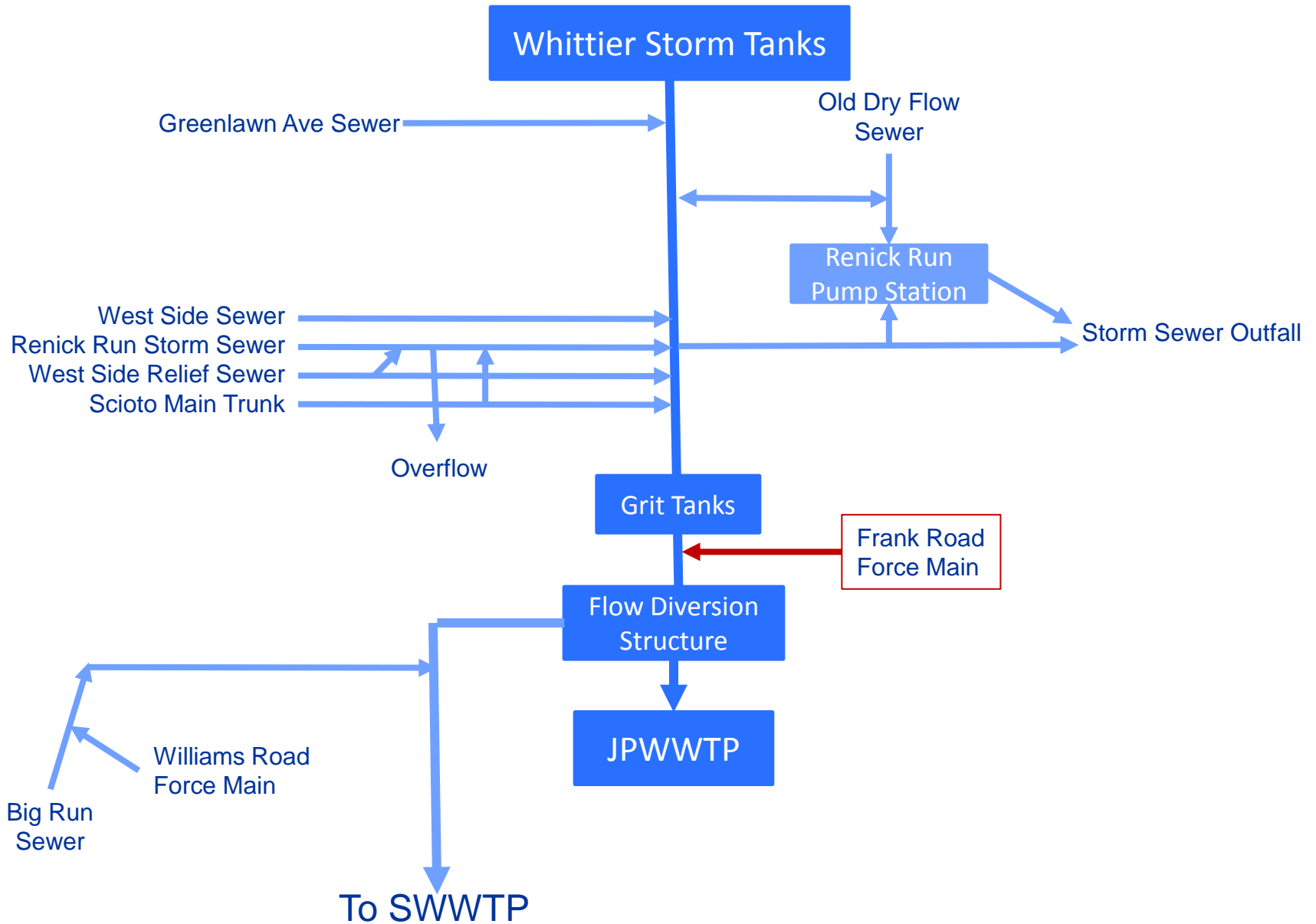
OSIS Evolution



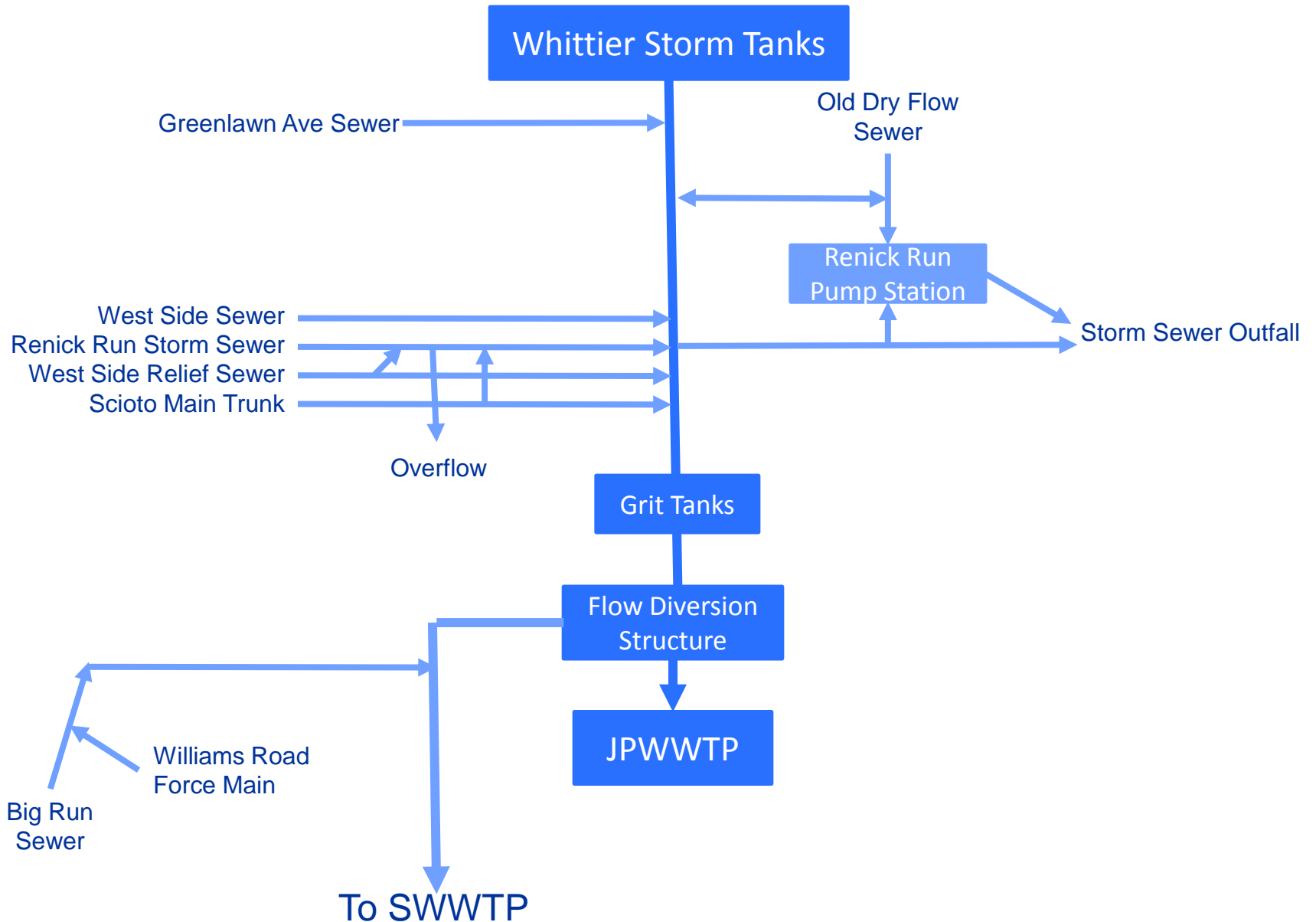
OSIS Evolution



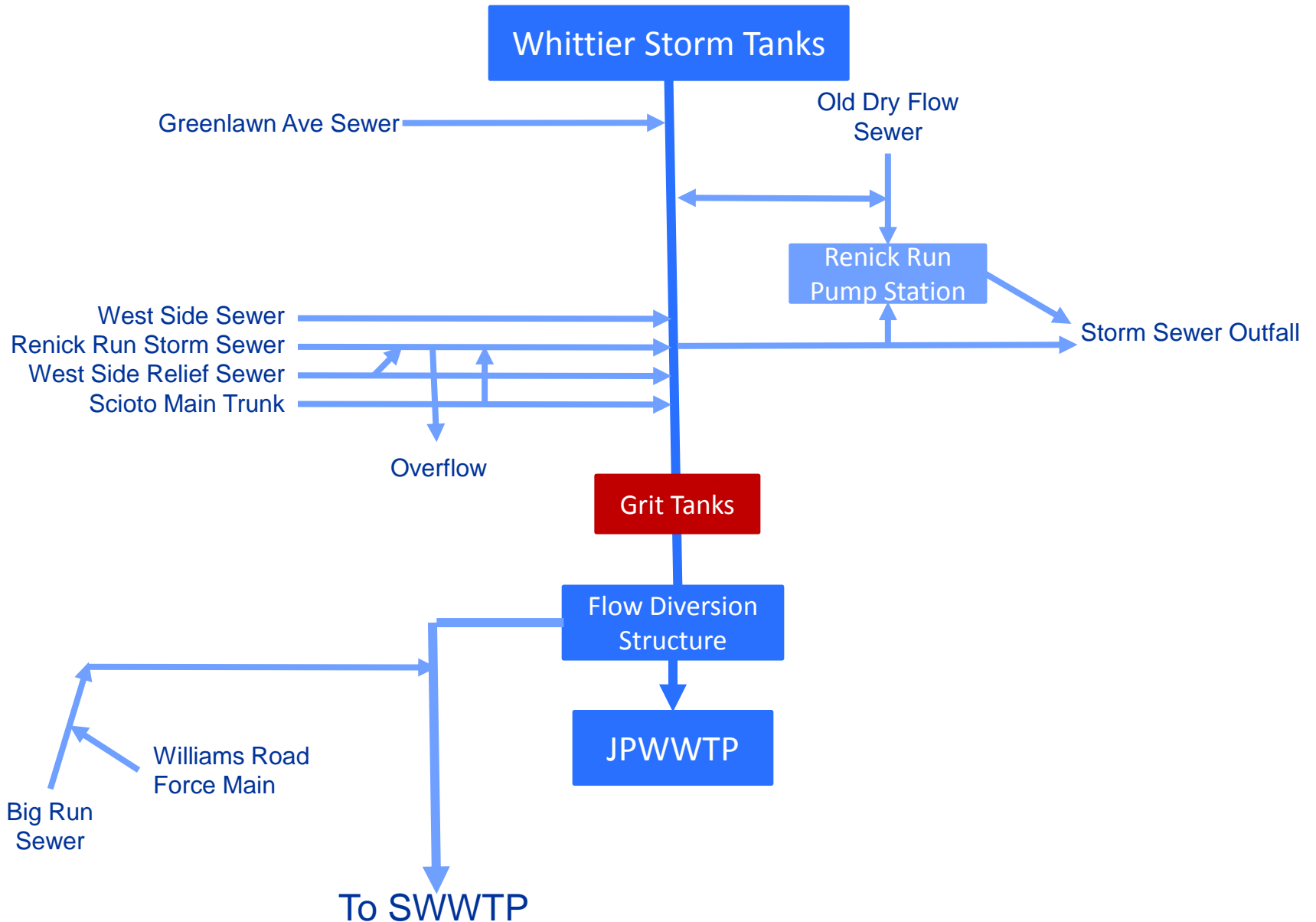
OSIS Evolution



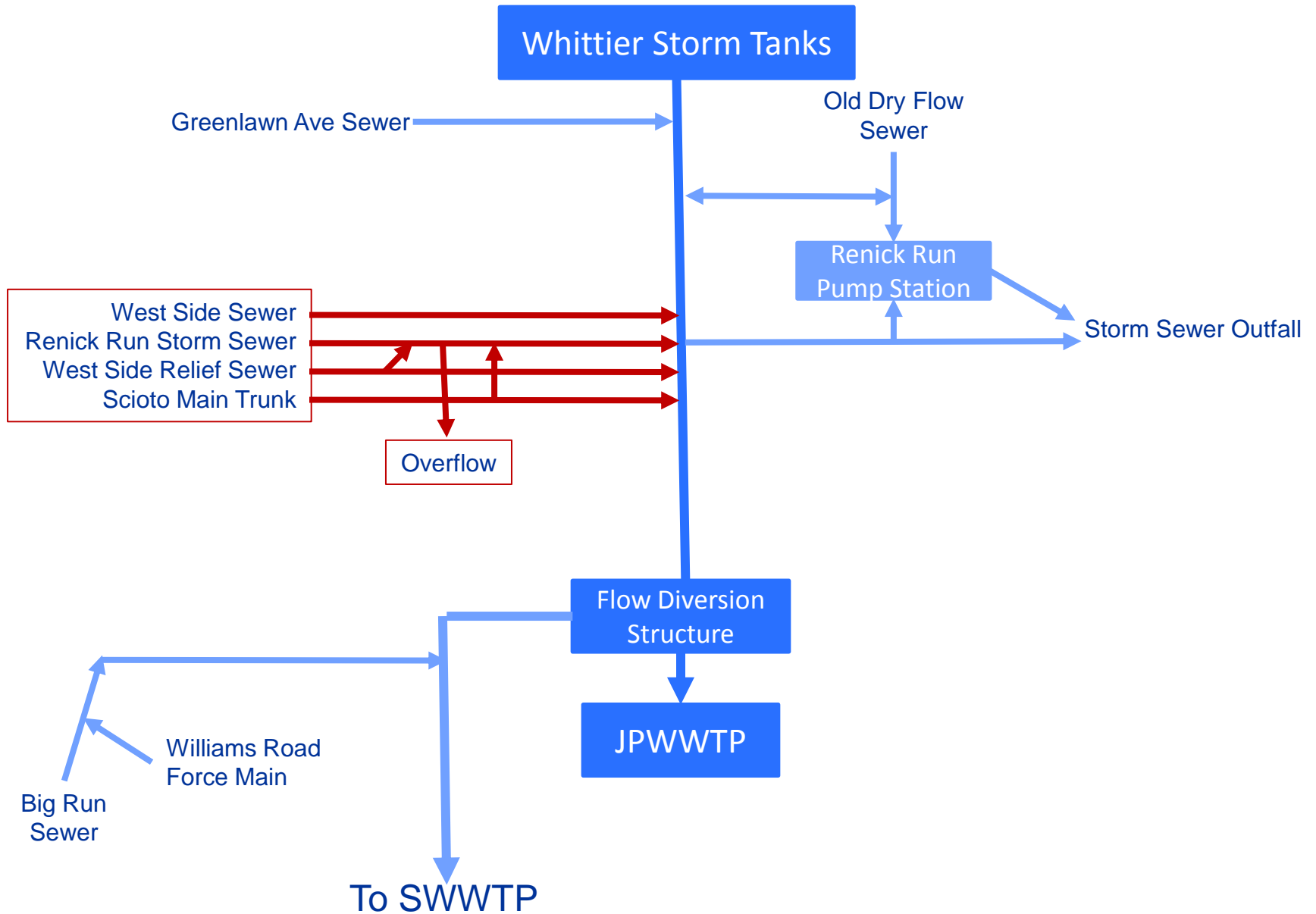
OSIS Evolution



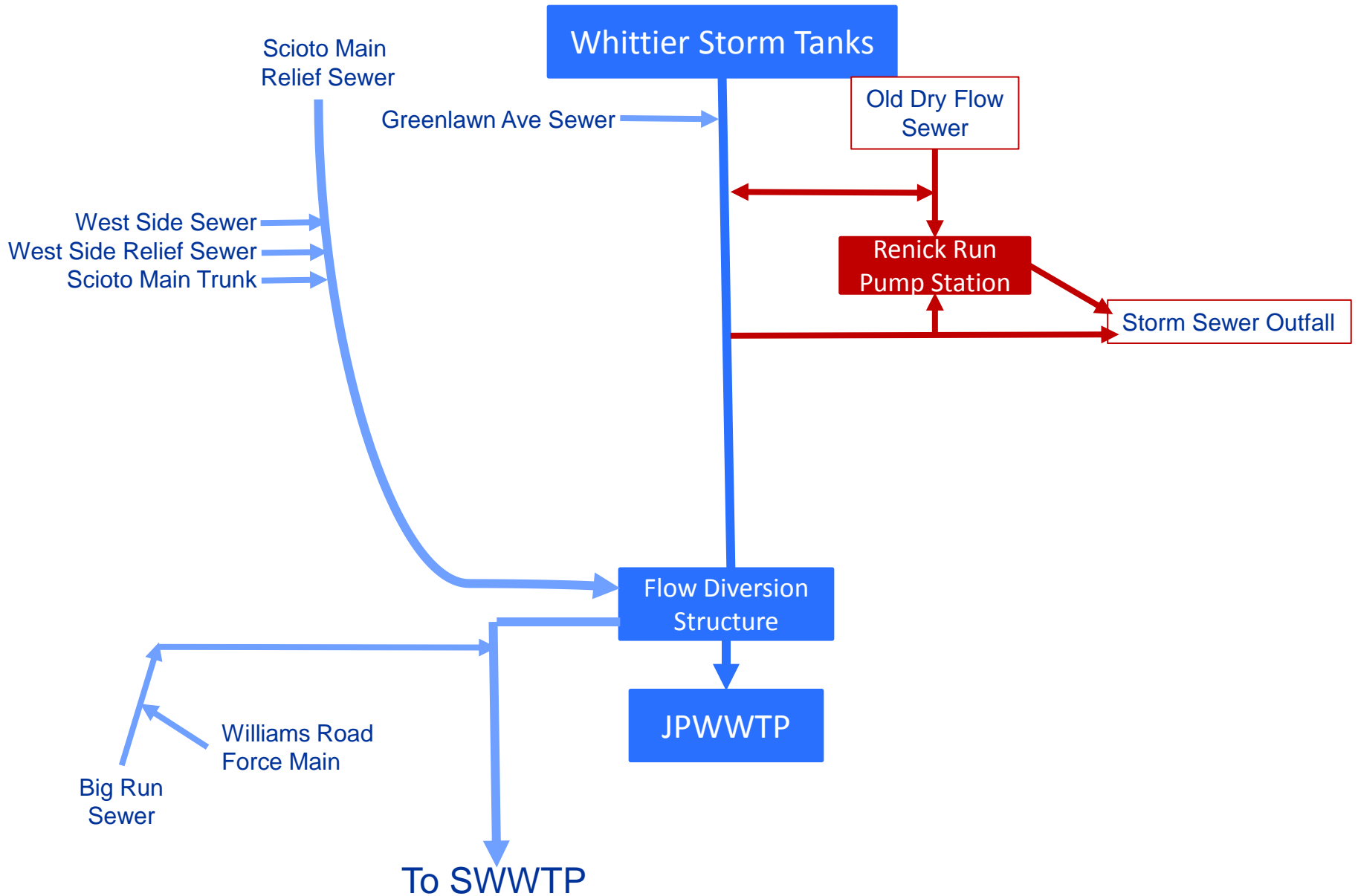
OSIS Evolution



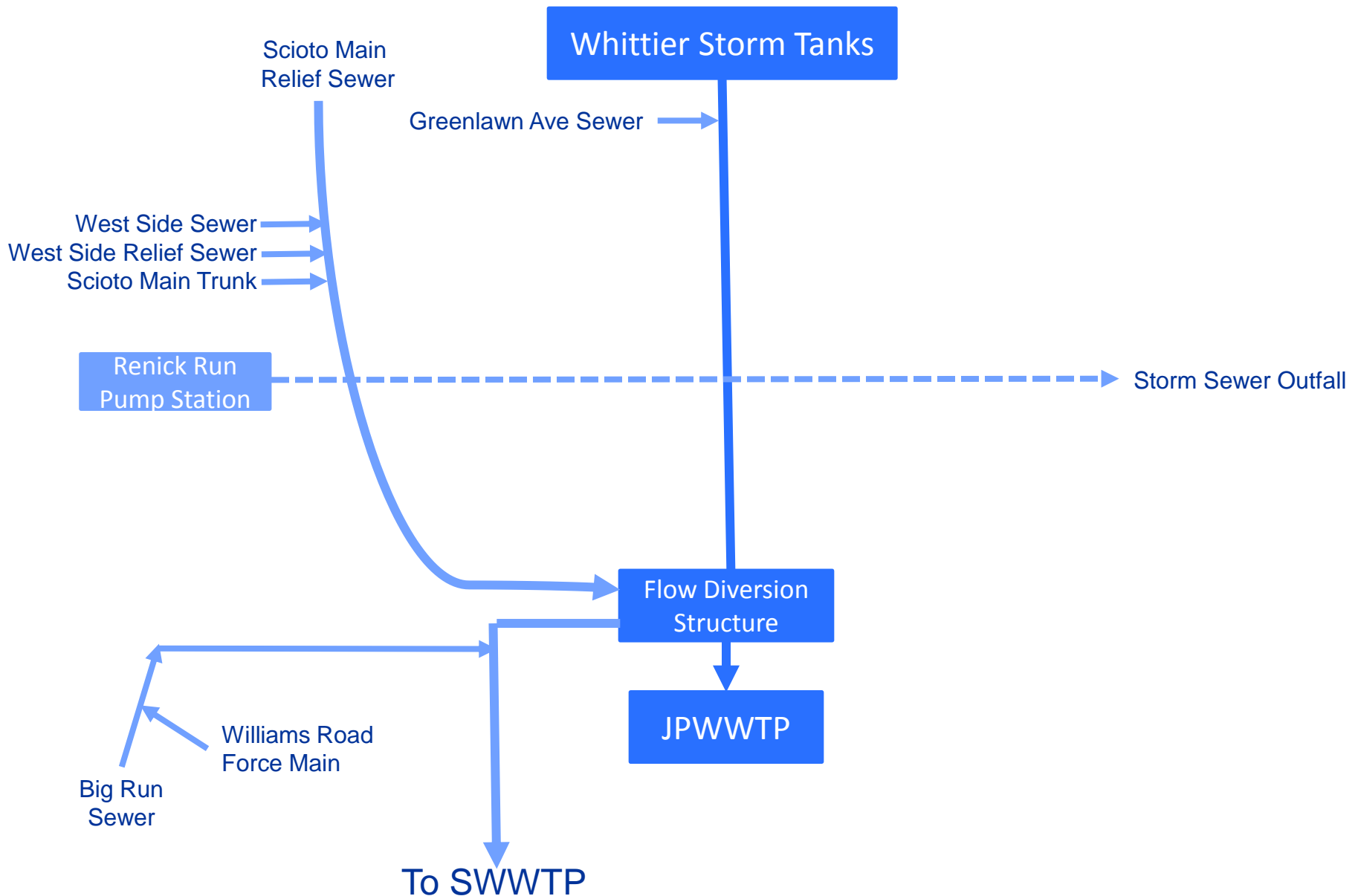
OSIS Evolution



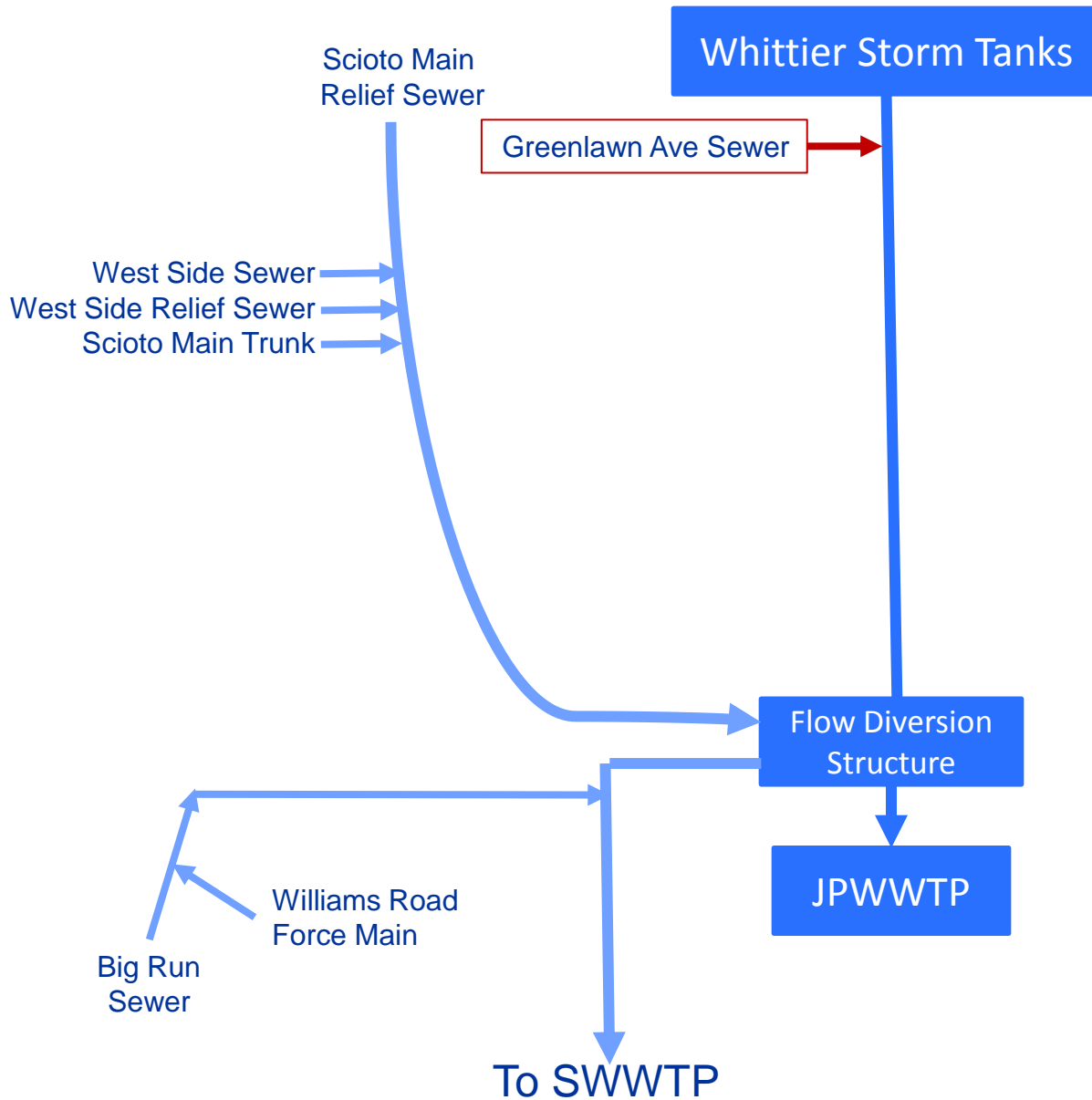
OSIS Evolution



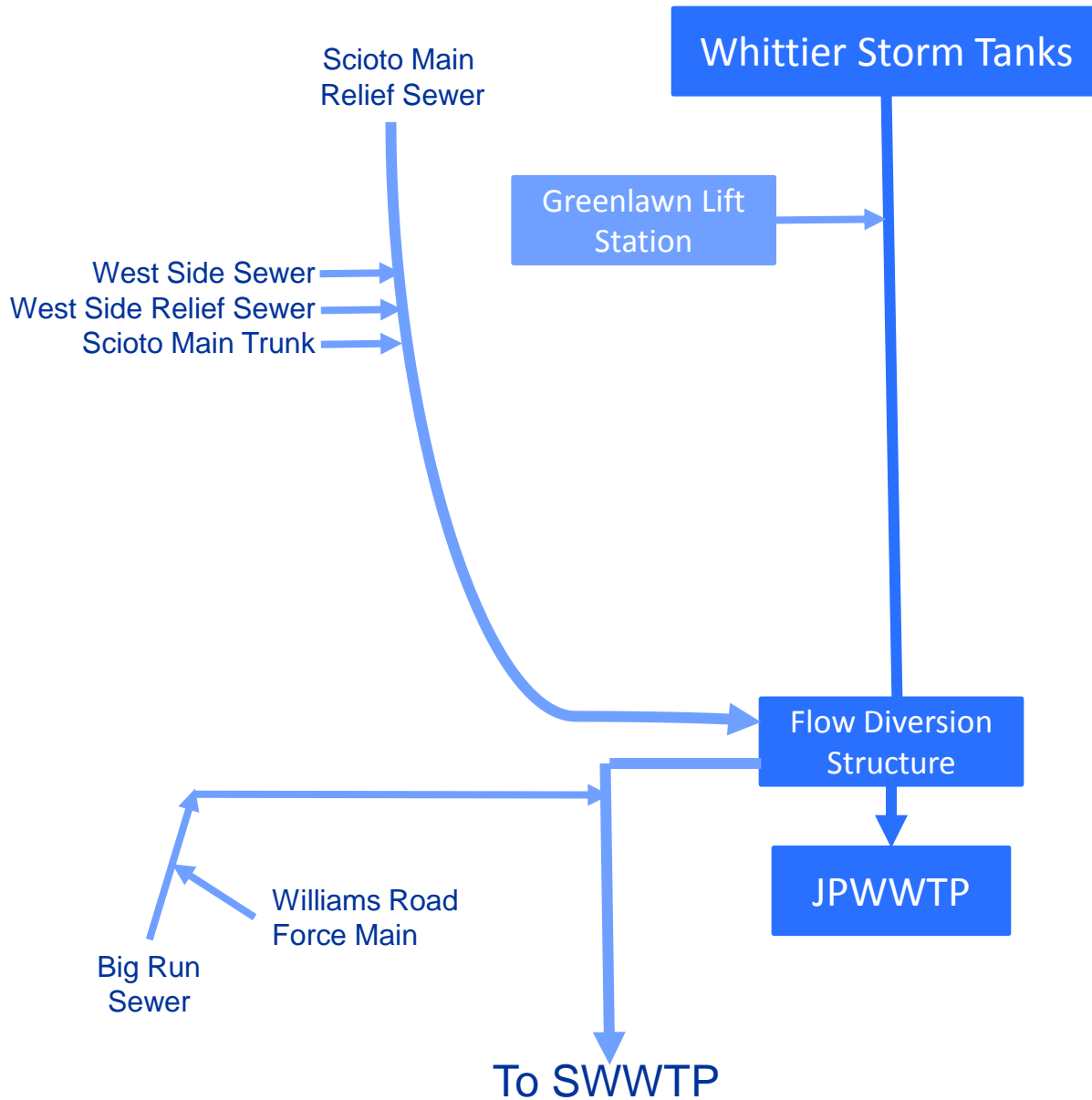
OSIS Evolution



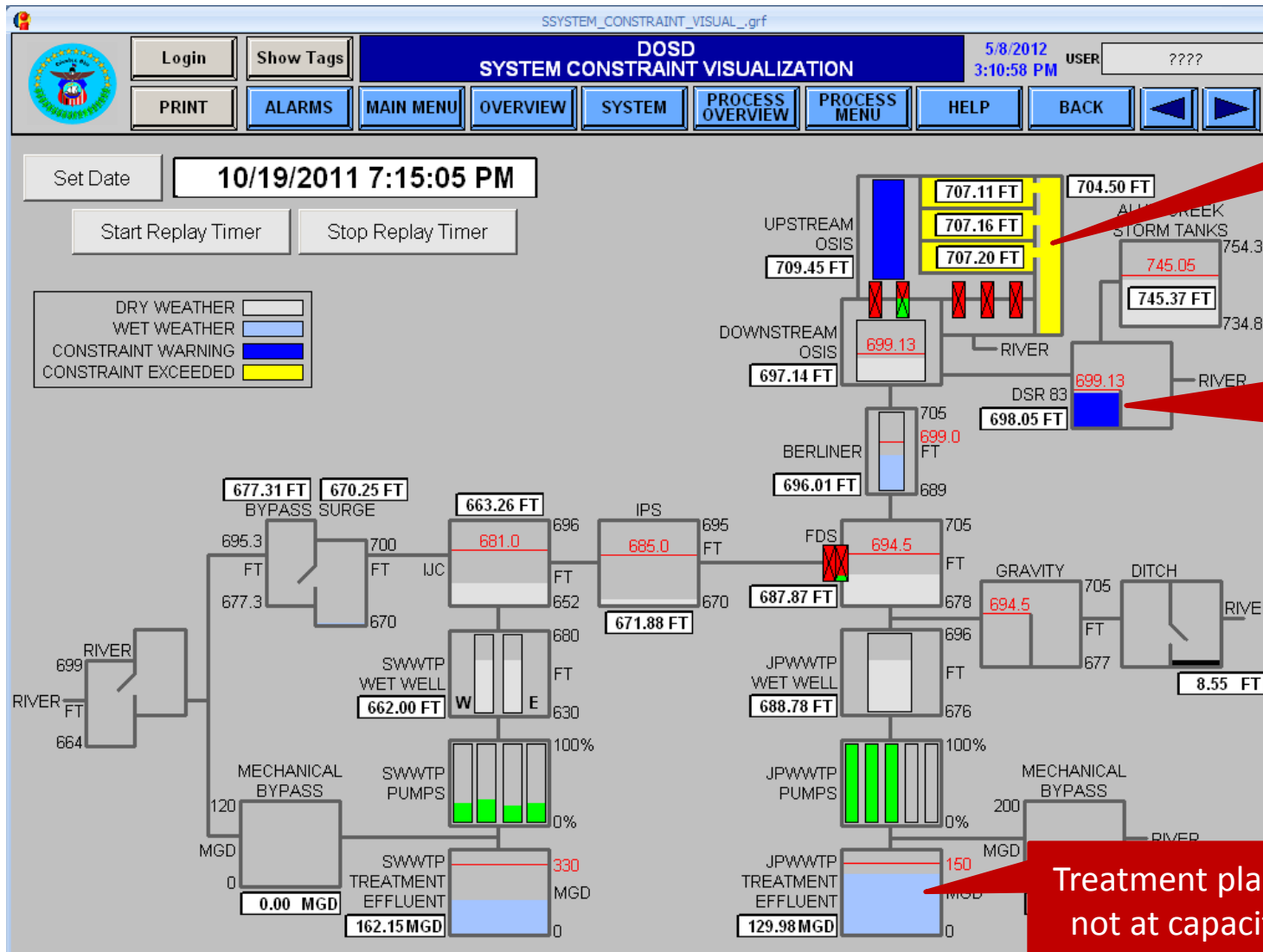
OSIS Evolution



OSIS Evolution

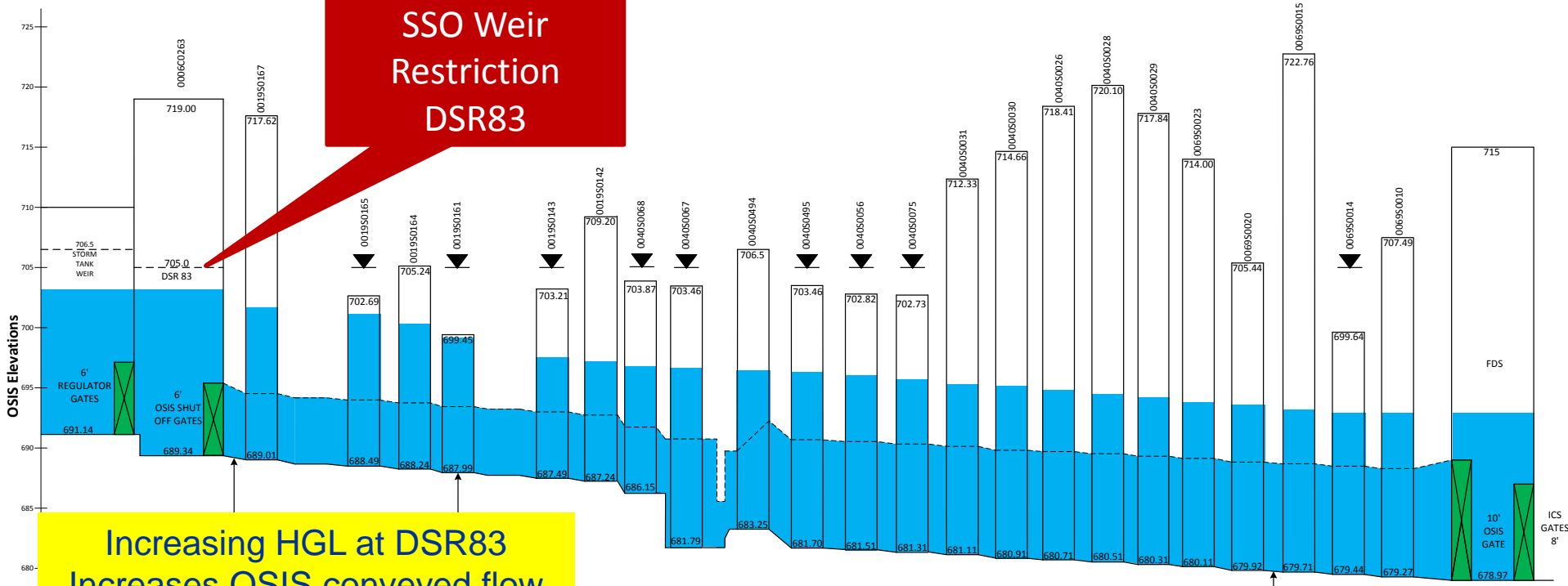


OSIS Conveyance Limitation



OSIS - Maximizing Conveyance

SSO Weir Restriction
DSR83



OSIS - Maximizing Conveyance Challenges

- Increase conveyance to JP WWTP is desired
- Overcome constraints in the system between Whittier Street and JPWWTP
 - DSR83 weir elevation
 - Structural capacity of manholes along OSIS
 - Greenlawn Avenue Water-In-Basement potential
 - Franklin Main and Scioto Main Water-In-Basement potential
 - Regulator Gate Actuators



OSIS - Maximizing Conveyance Challenges

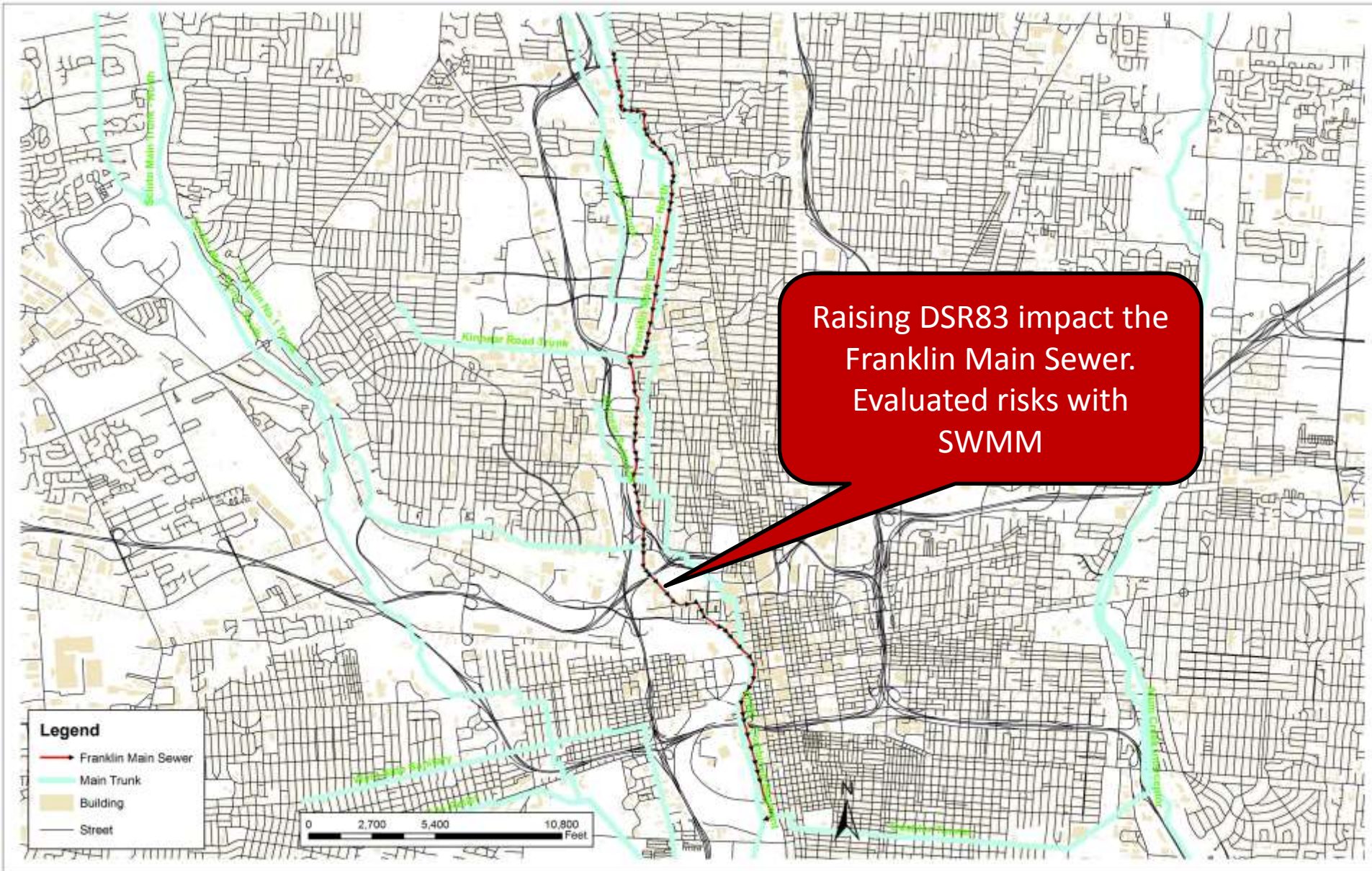


Regulator Gates installed in 1932

1960's vintage actuators recently upgraded to support automatic controls

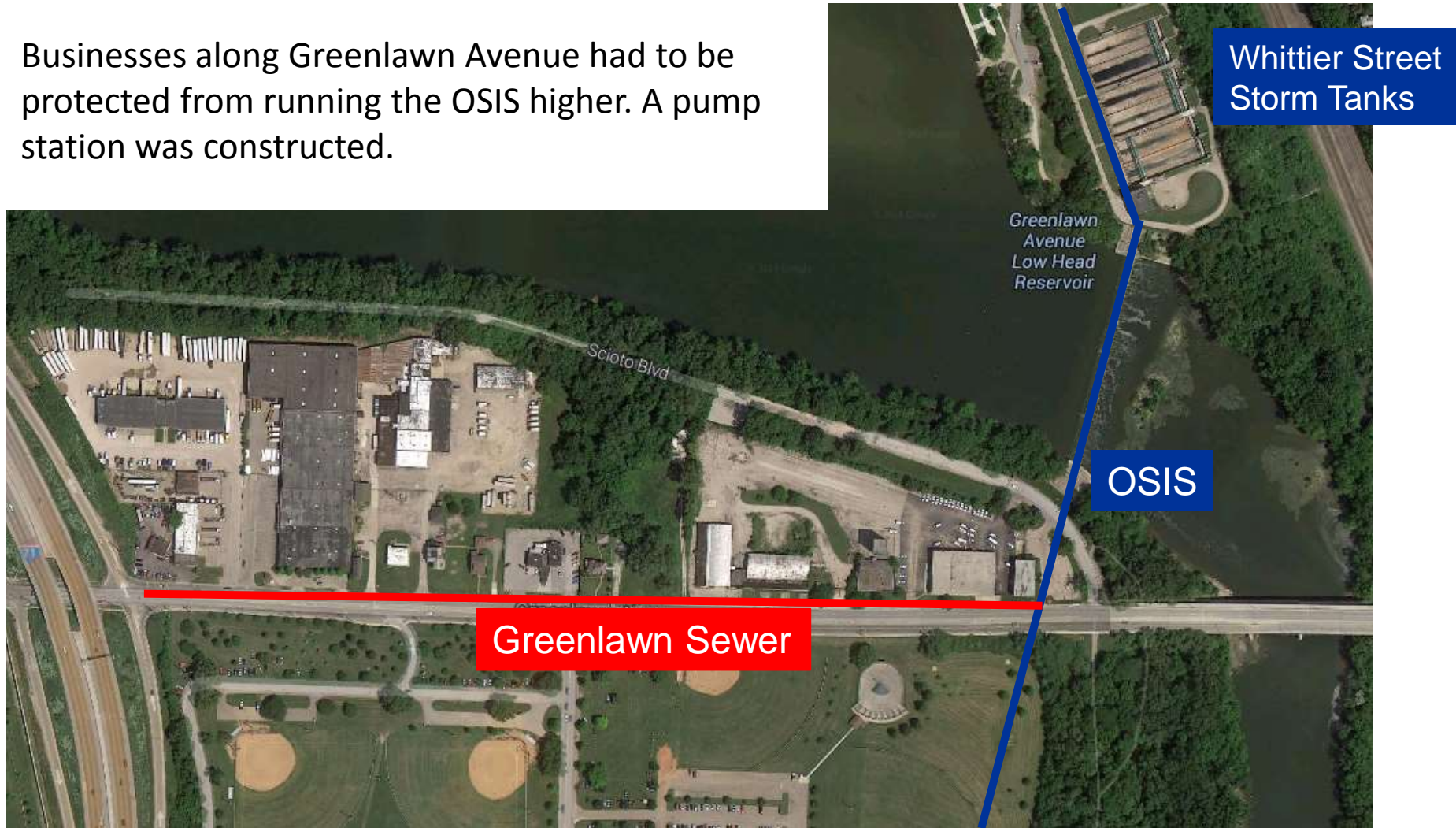
Range of gate movement increased from 3 feet to 6 feet open.

OSIS - Maximizing Conveyance Challenges



OSIS - Maximizing Conveyance Challenges

Businesses along Greenlawn Avenue had to be protected from running the OSIS higher. A pump station was constructed.



OSIS 705 – Field Testing

DSR83 at 699 before recent improvements during wet weather event



DSR83 raised to 705 for increased conveyance



DSR83 level at 704 during testing

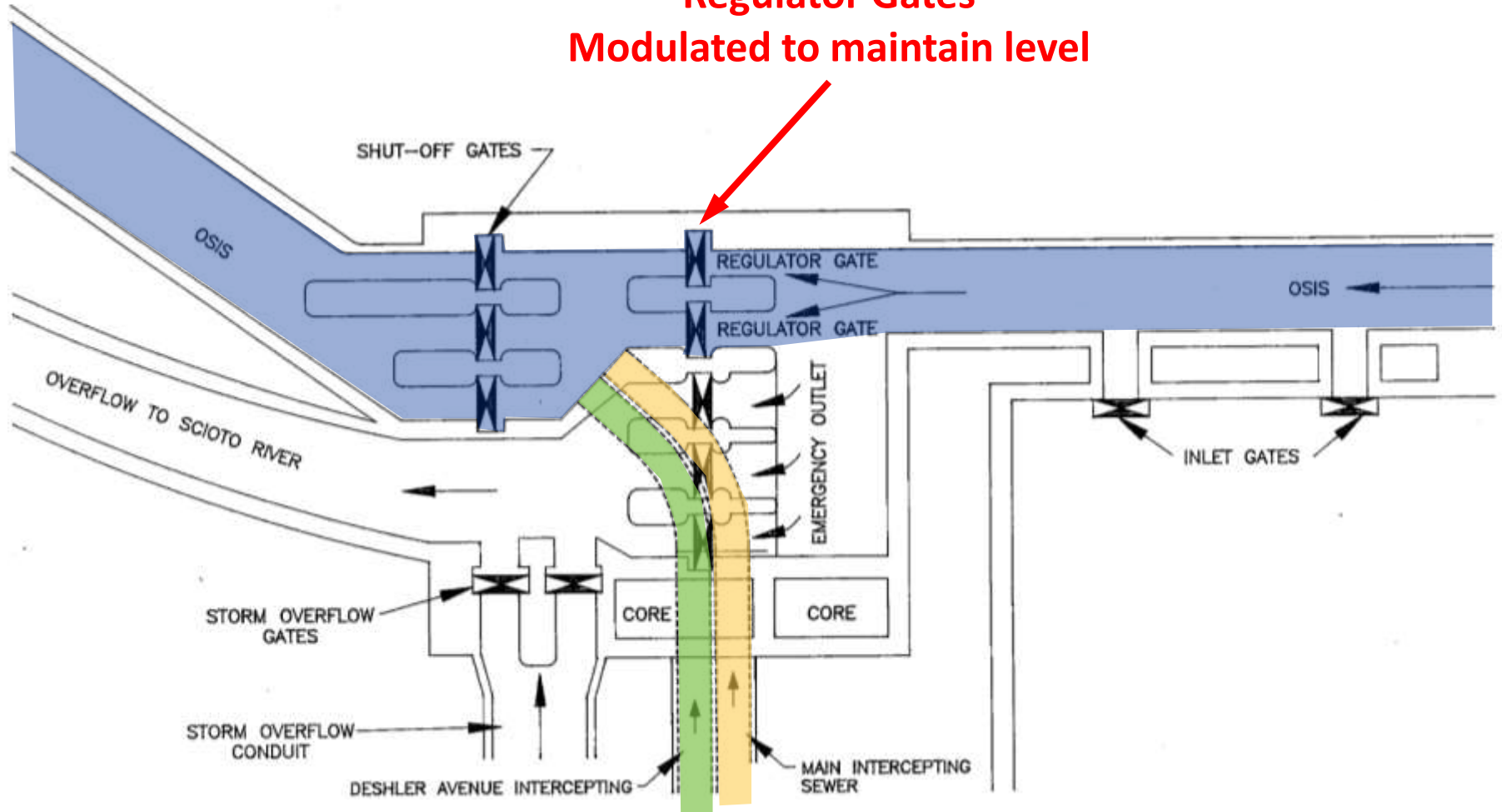


Manhole during testing of OSIS 704 is about 5 foot above grade

Whittier Street Regulator Gates

To Berliner Park

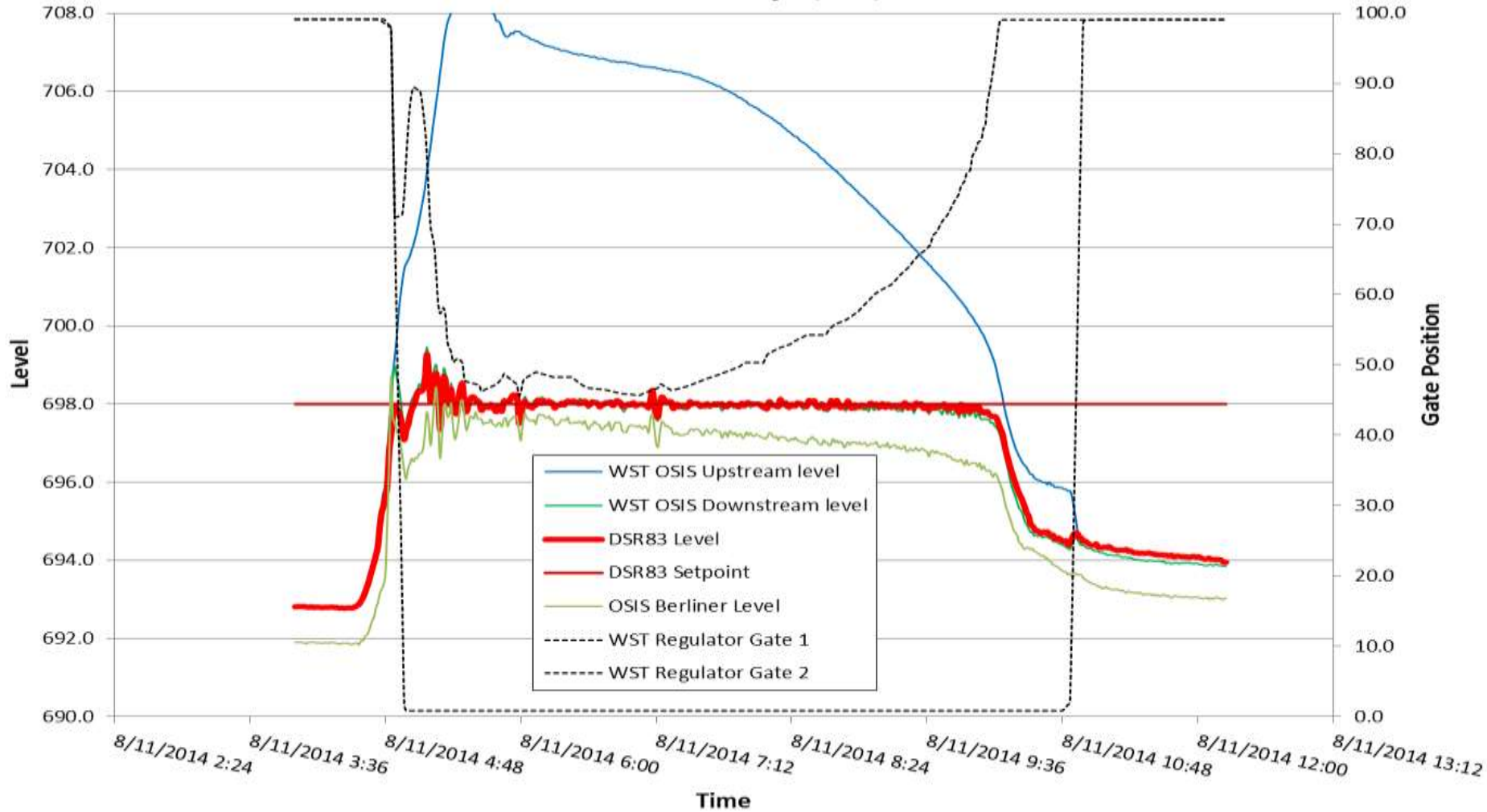
Regulator Gates
Modulated to maintain level



From/to DSR83

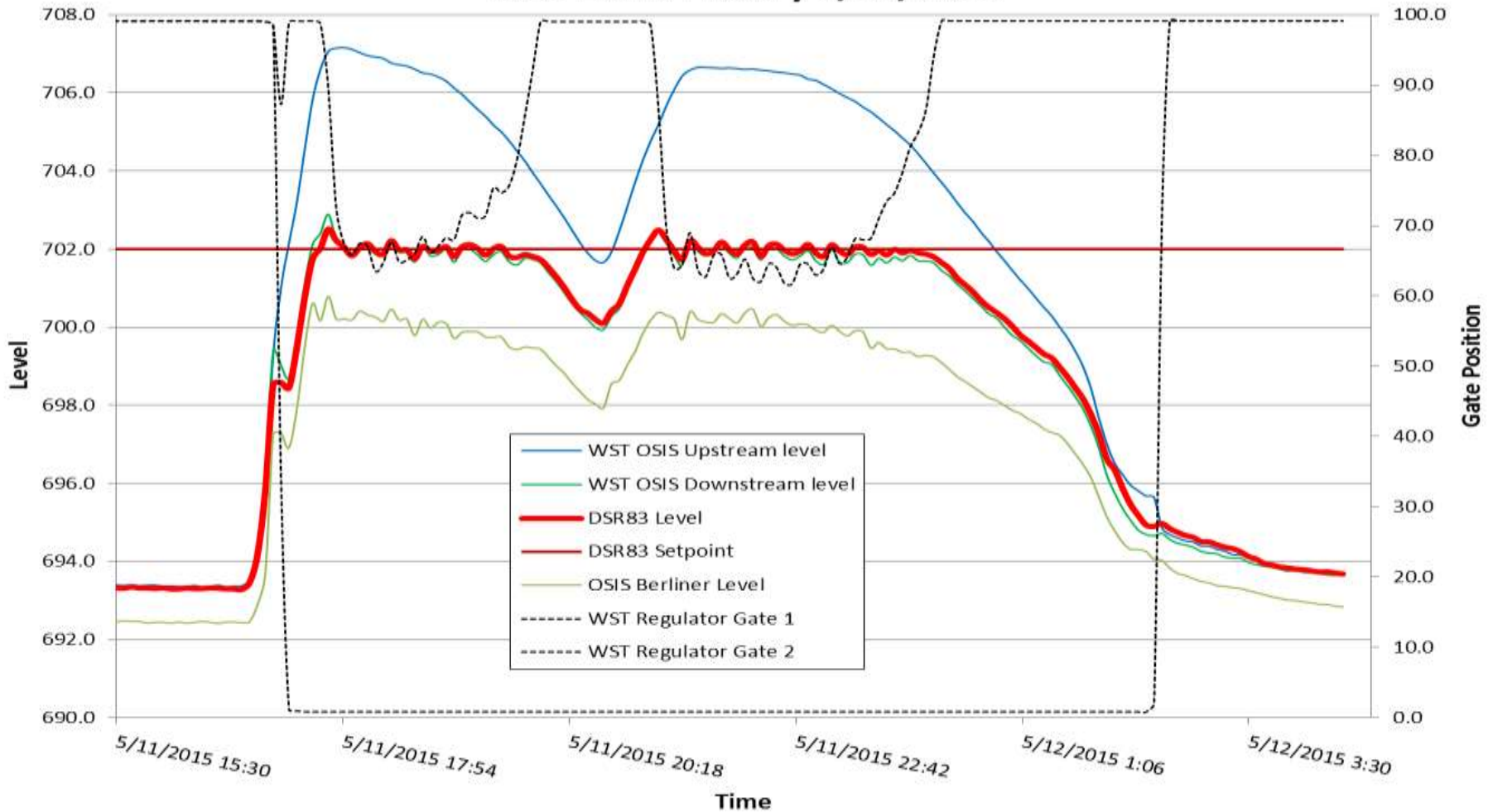
OSIS Conveyance Limitation Real Time Controls Level Control at 698 ft.

WST Event History 8/11/2014

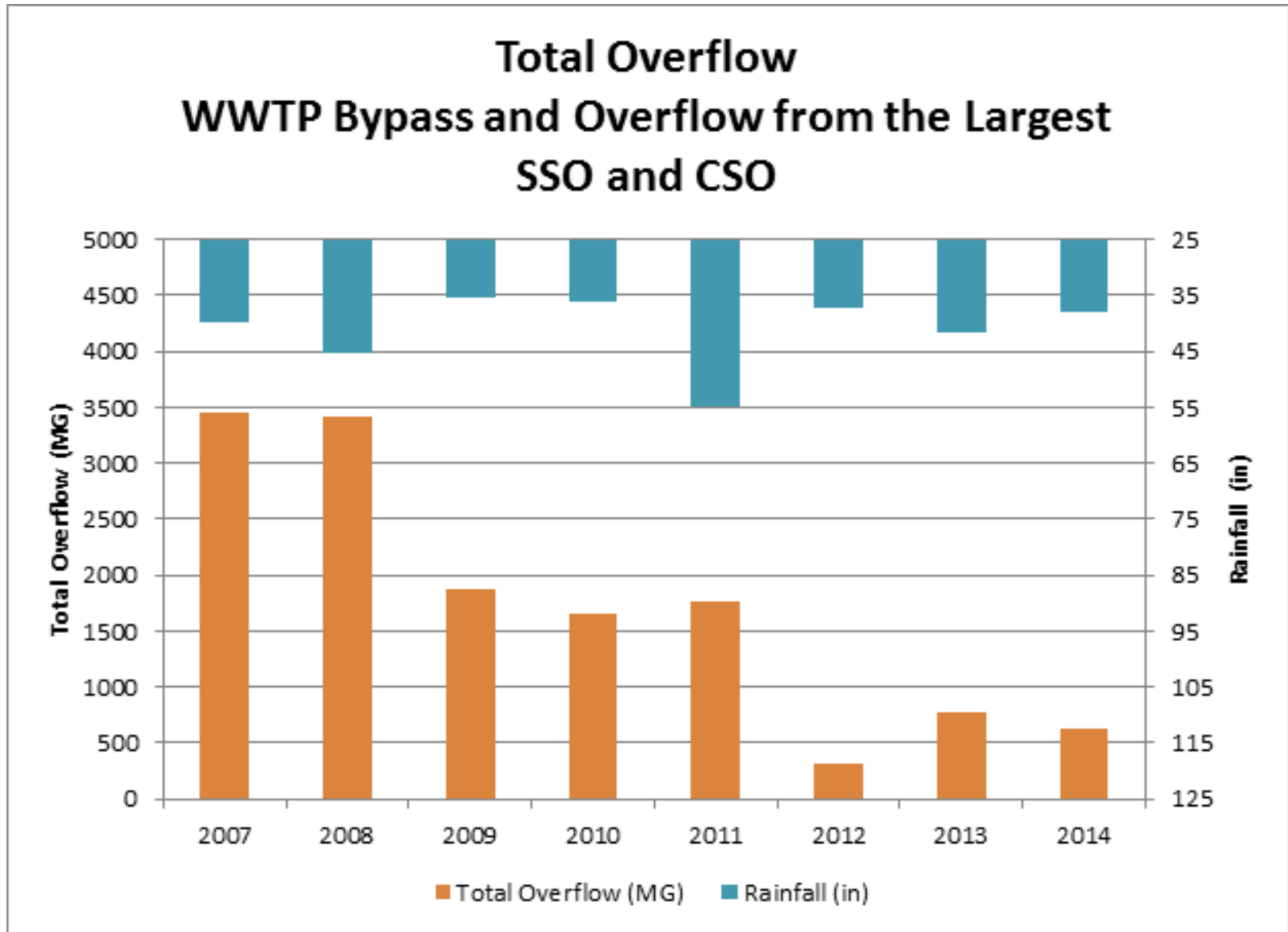


OSIS Conveyance Limitation Real Time Controls Level Control at 702 ft.

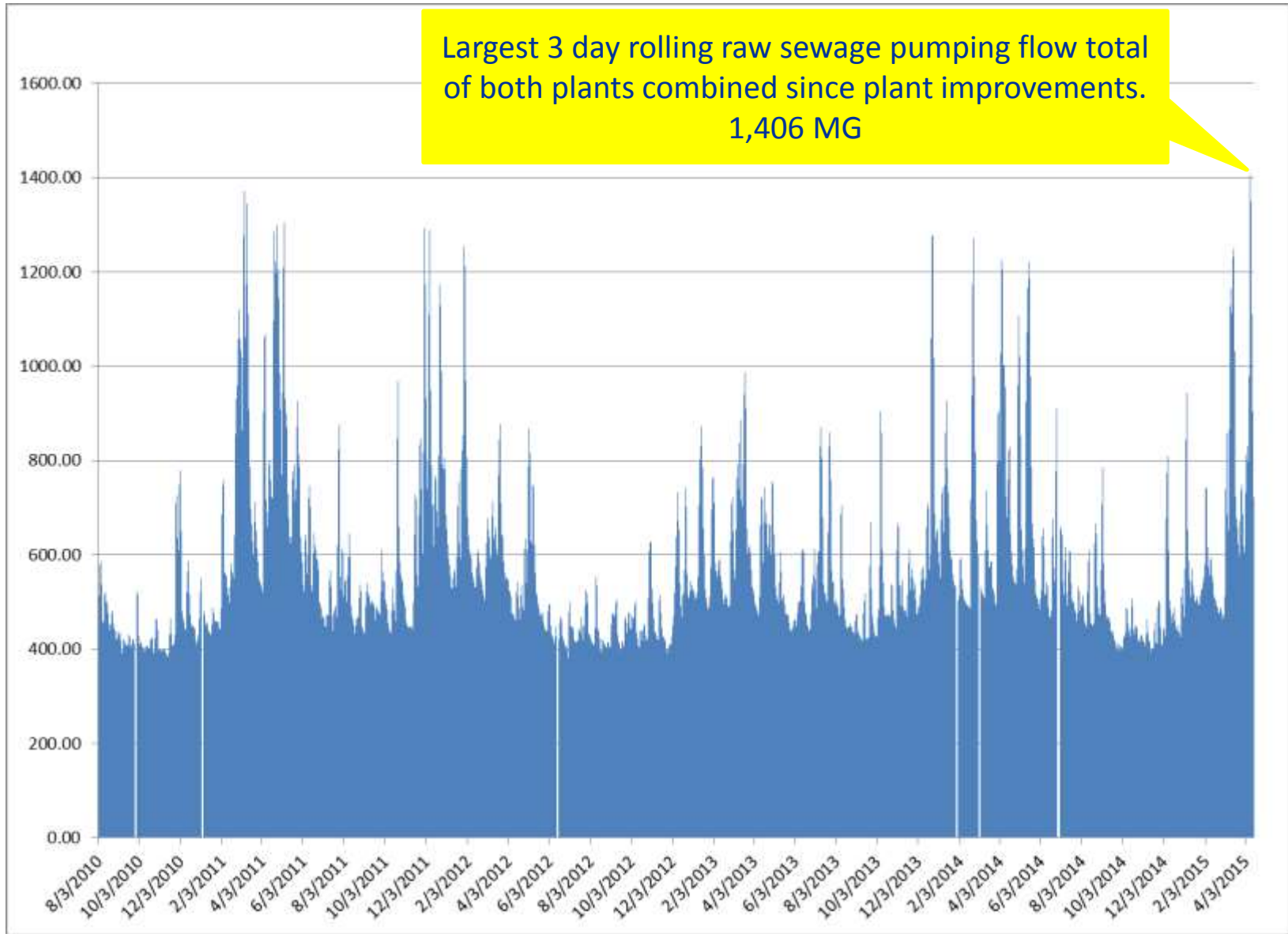
WST Event History 5/11/2015



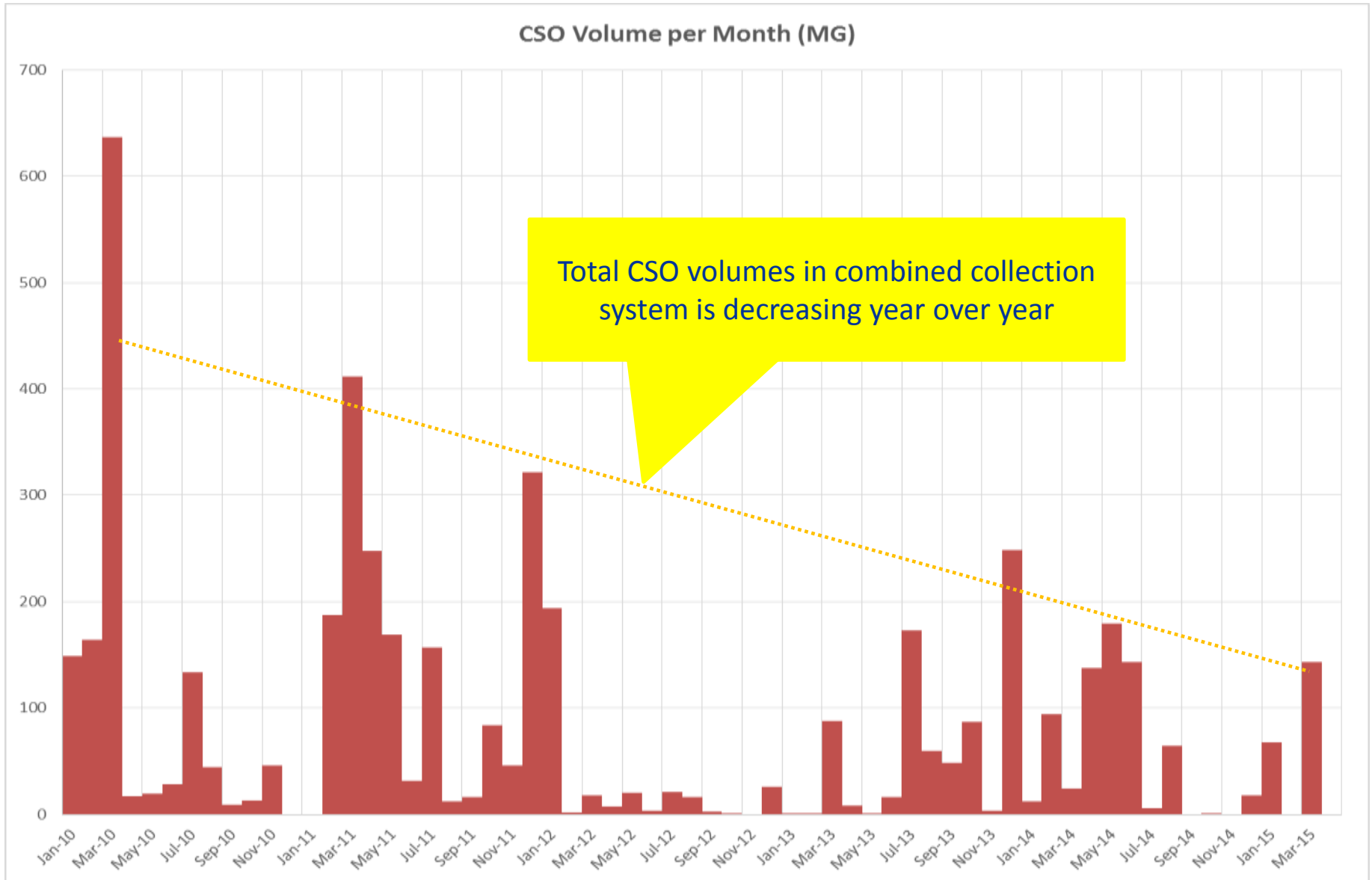
Performance Improvements Overall



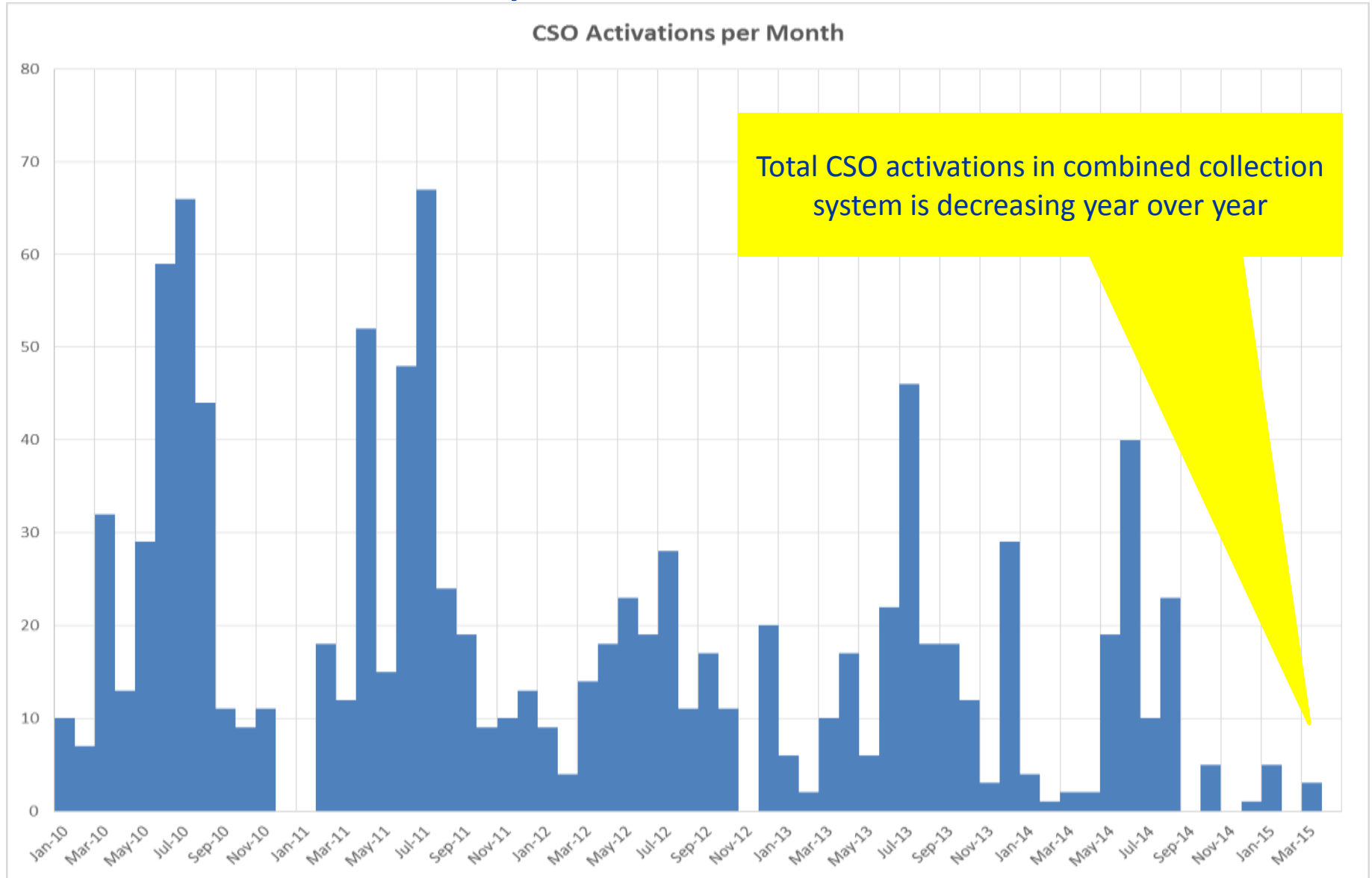
Performance Improvements – Plant Pumping



Performance Improvements – CSO Volumes

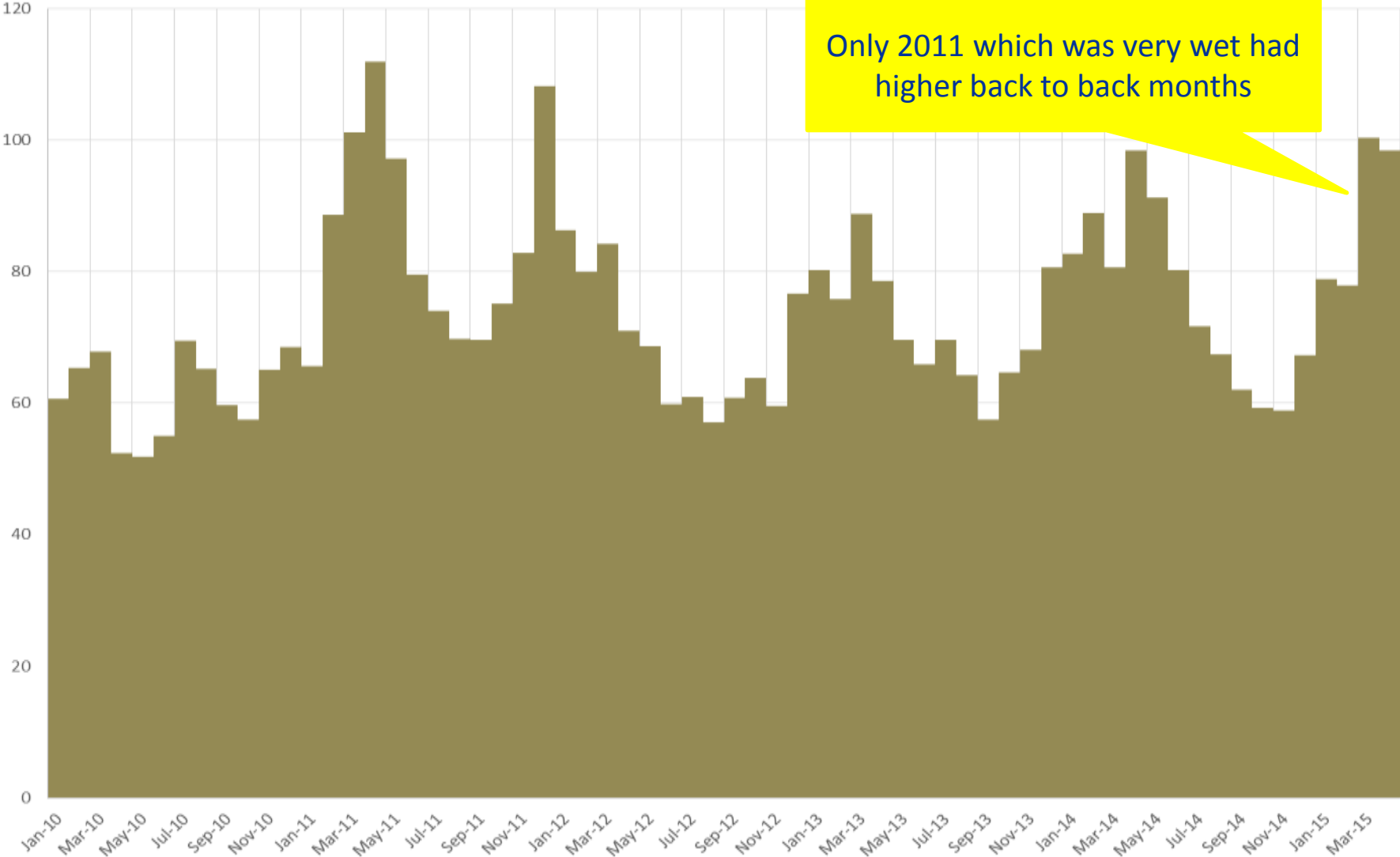


Performance Improvements – CSO Activations



Performance Improvements – JPWWP Effluent Flow

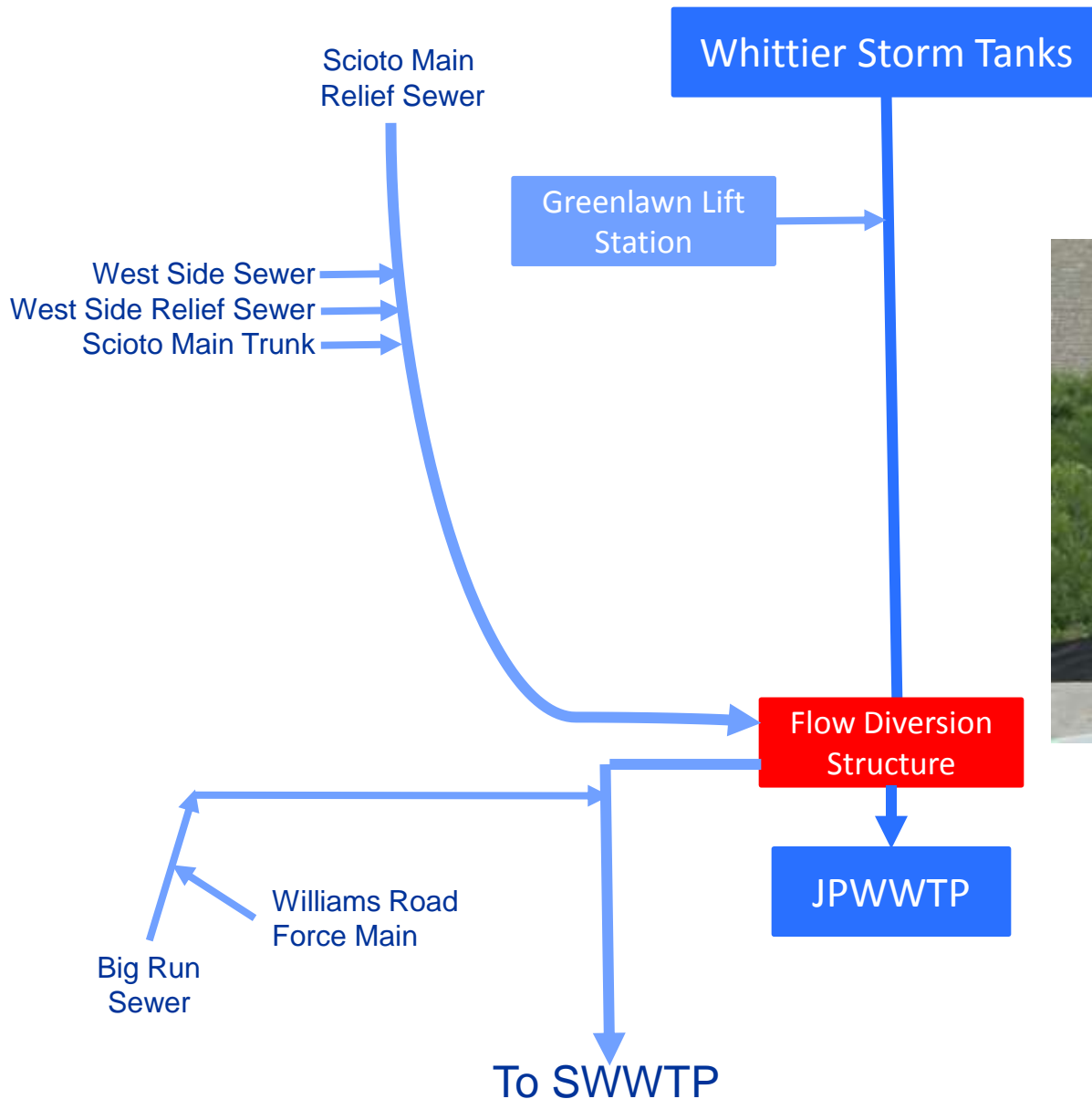
JPWWTP Average Daily Effluent Flow (MGD) per Month



OSIS Conveyance Limitation Real Time Controls Operational Adjustments

1. Raise of level control set point from 702' to 704'
2. Large wet weather events involve additional downstream constraints beyond just DSR83.
 - Treatment plants will be fully utilized and downstream storage consumed.
 - Guidance on when to restrict flow from OSIS at Whittier
3. Standard Operating Procedures based on modeling insight and refined through experience
4. Work with existing instrumentation which is sewer level based

Next Steps – Improving Storage Utilization



New Scioto Main Relief Weir Gate for flow balancing between plants and Southerly influent sewers storage utilization.

Next Steps – OARS Tunnel



OARS Dewatering Pump Station Under Construction

Special Thanks to OSIS 705 Testing Team



Manhole Patrol



JPWWTP Operations Staff
SMOC Operations Staff
Greg Barden
Hunter Kelly
Larry Lamp
Mike Foster
Rob Herr
Afaf Musa
Derek Wride
And many others!

Is there a
problem?
Where is
everyone?



Questions

Gary Hickman
JPWWTP Plant Manager

Ed Heyob
CDM Smith Automation Engineer