Hillsboro OREGON

WEST YOST
Water. Engineered.

Unlocking the Flow: SCADA-Powered Knowledge Retention for Efficient Flow Management

Thursday, May 2, 2024

Agenda

- Team Introductions
- System Layout
- The Challenge and Solution
- Control Strategy Walk-through
- Results
- Next Steps
- Question and Answer

Team Introductions

Jamie Davis

Water Distribution Coordinator

Sophia Hobet

Water Operations Manager / PM

Alex Zabarenko

IS Systems Analyst

Jeff Hesse

Project Manager / Technical Lead

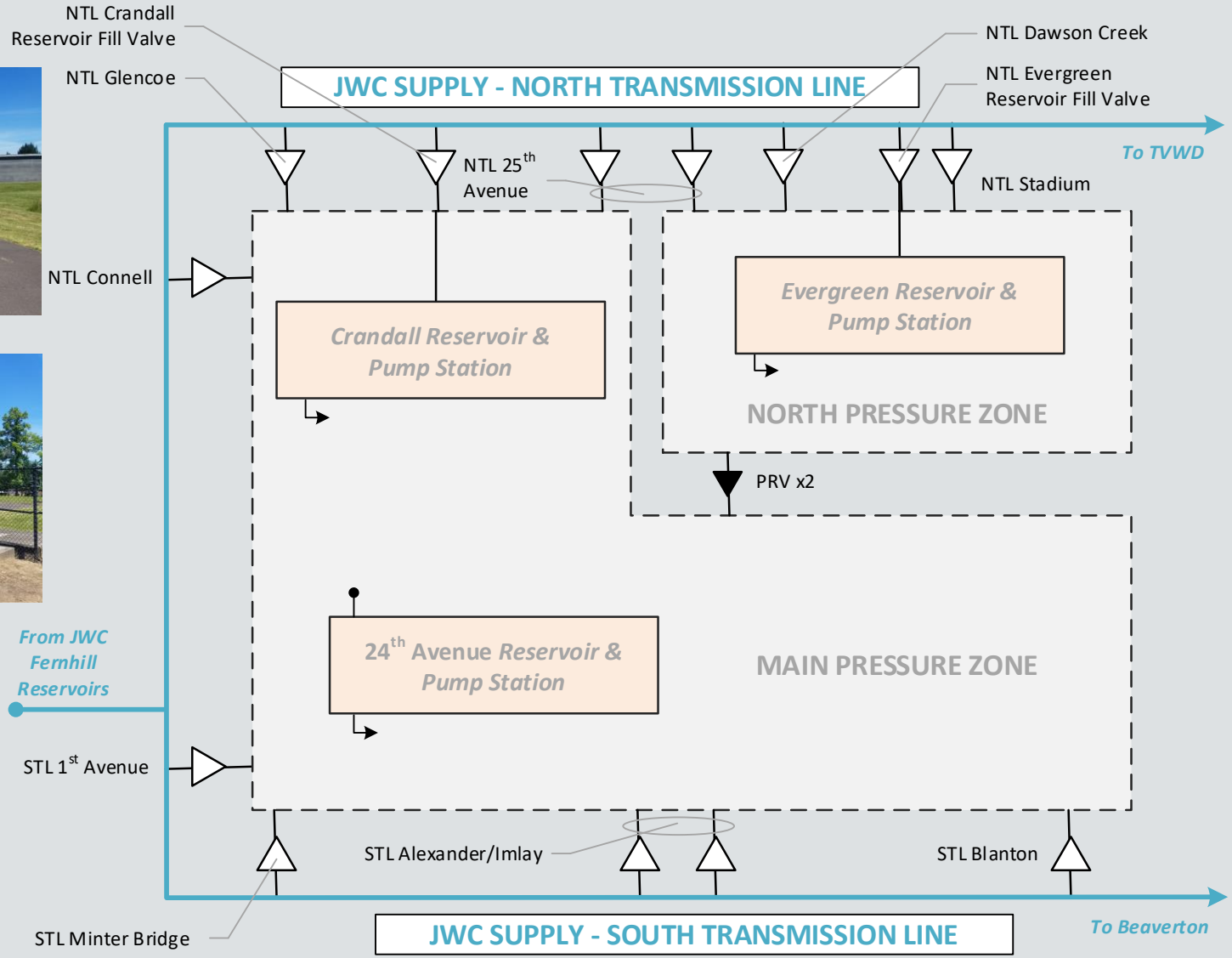
Dan Groves

Technical Advisor / QA/QC

System Layout

City of Hillsboro - Water Supply and Distribution System

Hillsboro Water Supply and Distribution System



LEGEND

Turnout

JWC – Joint Water Commission

NTL – North Transmission Line

STL – South Transmission Line

TVWD – Tualatin Valley Water District

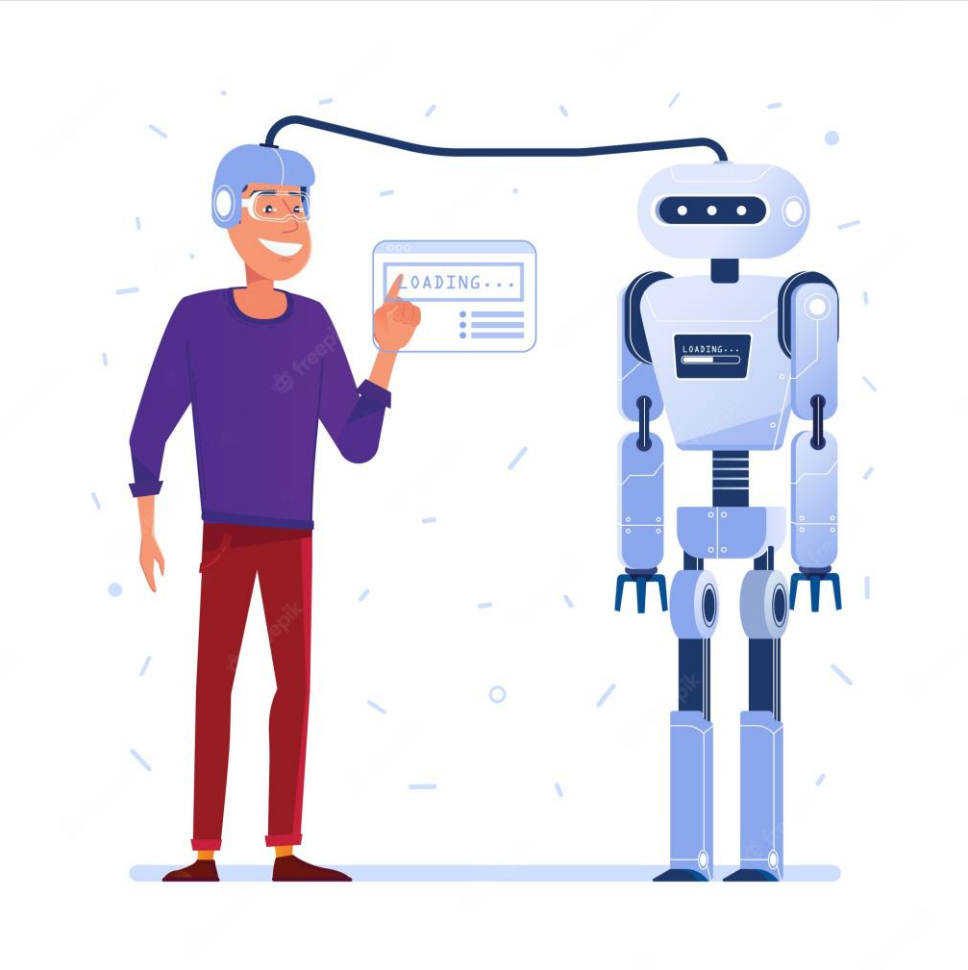
Operational Challenge

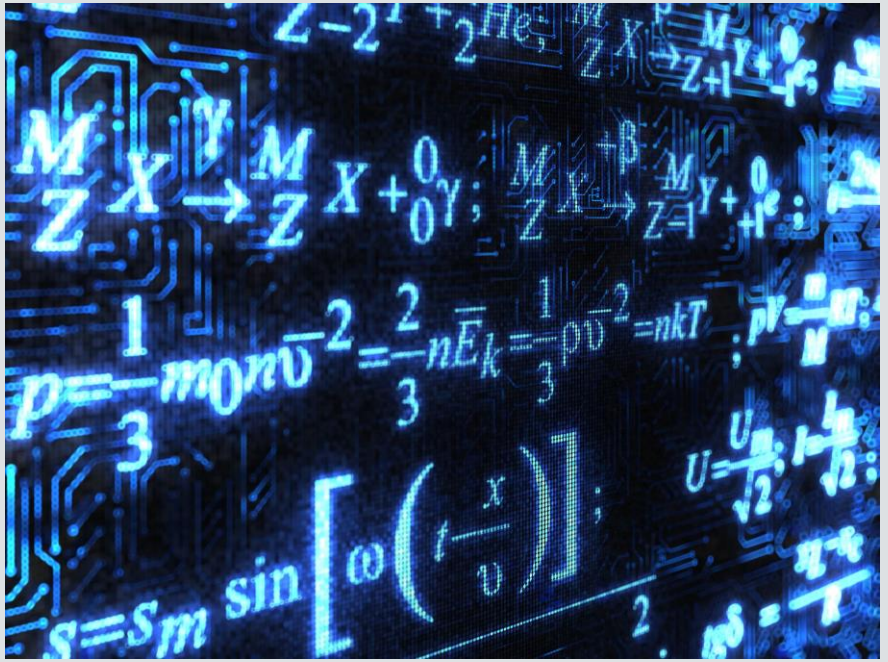
- Hillsboro aims to be a good partner of Joint Water Commission (JWC).
- JWC desires all partners to draw water consistently throughout 24-hour period from JWC system.
- Hillsboro distribution system is not designed for a consistent flatline flow rate from the transmission mains.

Objective

- Draw water consistently throughout 24-hour period from JWC system and create a “Flatline” system.
- Maintain water quality (i.e., water age/chlorine residual).
- Avoid excessive strain on equipment (i.e., pump starts and stops).

The Solution

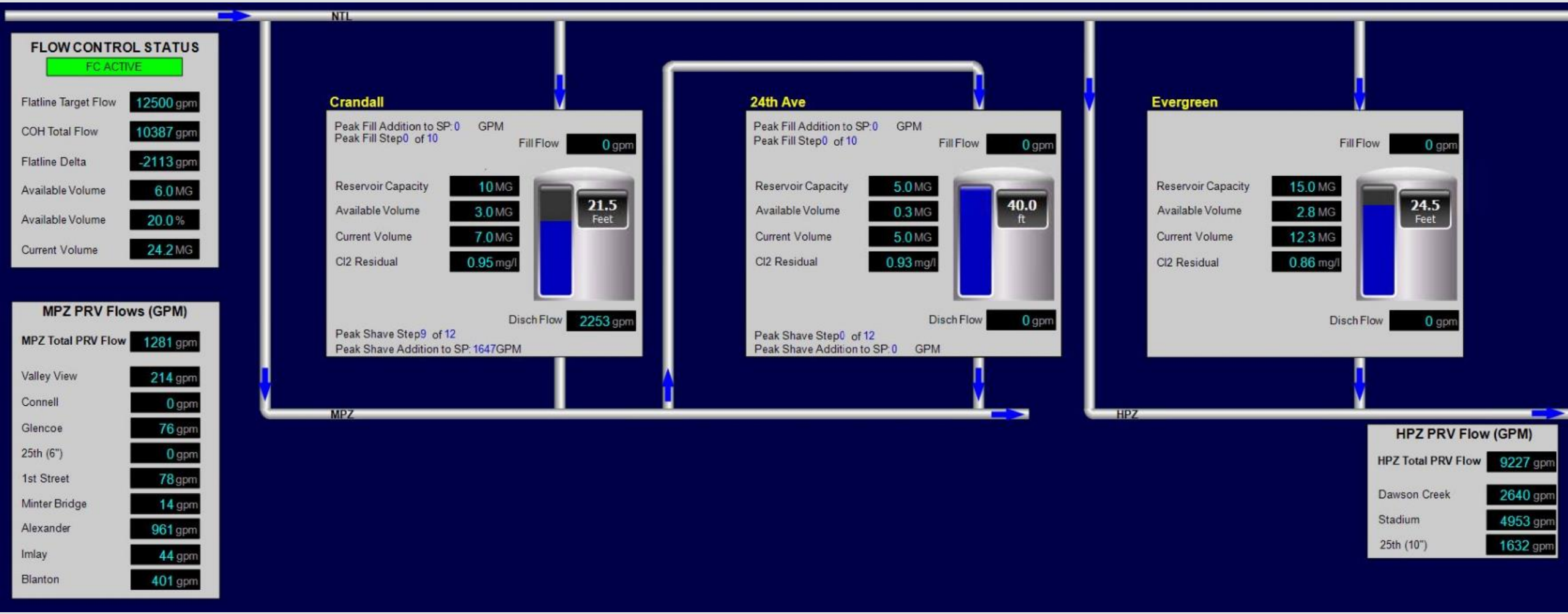




Control Strategy Walk-through

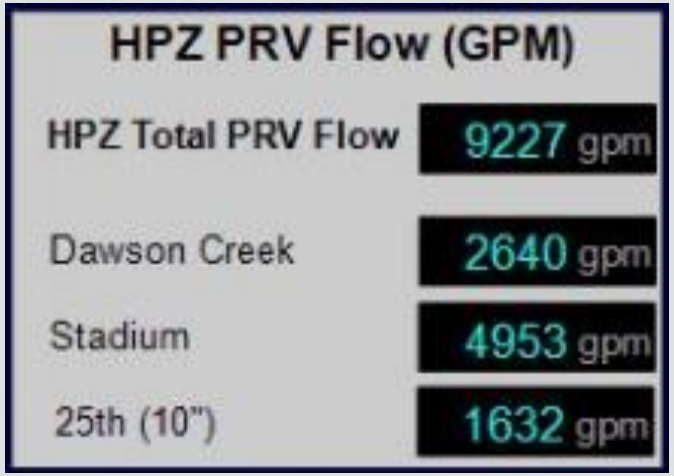
More detail on the control approach.

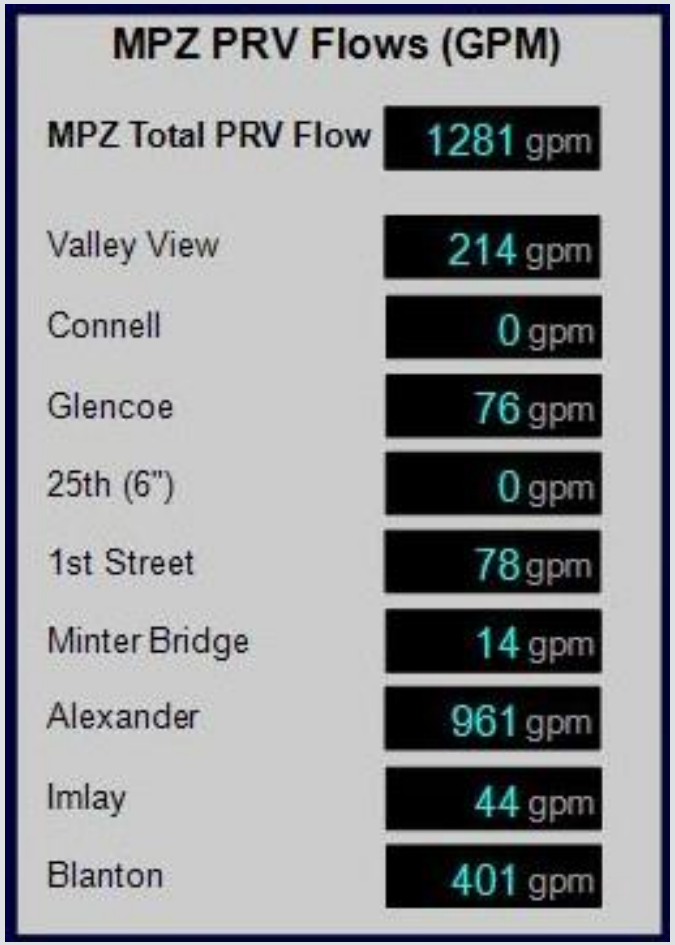
Overview


NTL
FLOW CONTROL STATUS
FC ACTIVE
Flatline Target Flow 12500 gpm
COH Total Flow 10387 gpm
Flatline Delta -2113 gpm
Available Volume 6.0 MG
Available Volume 20.0 %
Current Volume 24.2 MG
MPZ PRV Flows (GPM)
MPZ Total PRV Flow 1281 gpm
Valley View 214 gpm
Connell 0 gpm
Glencoe 76 gpm
25th (6") 0 gpm
1st Street 78 gpm
Minter Bridge 14 gpm
Alexander 961 gpm
Imlay 44 gpm
Blanton 401 gpm
Crandall
Peak Fill Addition to SP: 0 GPM
Peak Fill Step 0 of 10
Fill Flow 0 gpm
Reservoir Capacity 10 MG
Available Volume 3.0 MG
Current Volume 7.0 MG
Cl2 Residual 0.95 mg/l
21.5 Feet
Disch Flow 2253 gpm
Peak Shave Step 9 of 12
Peak Shave Addition to SP: 1647 GPM
24th Ave
Peak Fill Addition to SP: 0 GPM
Peak Fill Step 0 of 10
Fill Flow 0 gpm
Reservoir Capacity 5.0 MG
Available Volume 0.3 MG
Current Volume 5.0 MG
Cl2 Residual 0.93 mg/l
40.0 ft
Disch Flow 0 gpm
Peak Shave Step 0 of 12
Peak Shave Addition to SP: 0 GPM
Evergreen
Fill Flow 0 gpm
Reservoir Capacity 15.0 MG
Available Volume 2.8 MG
Current Volume 12.3 MG
Cl2 Residual 0.86 mg/l
24.5 Feet
Disch Flow 0 gpm
MPZ
HPZ
HPZ PRV Flow (GPM)
HPZ Total PRV Flow 9227 gpm
Dawson Creek 2640 gpm
Stadium 4953 gpm
25th (10") 1632 gpm

System Controls

Flow Control Objective: Achieve Flatline flow by maintaining Total PRV (TO) Flow to the Flatline Setpoint.

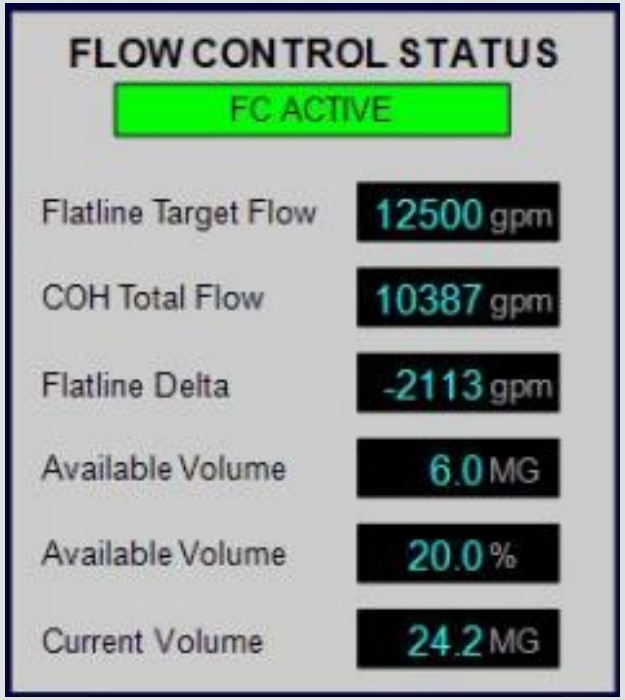




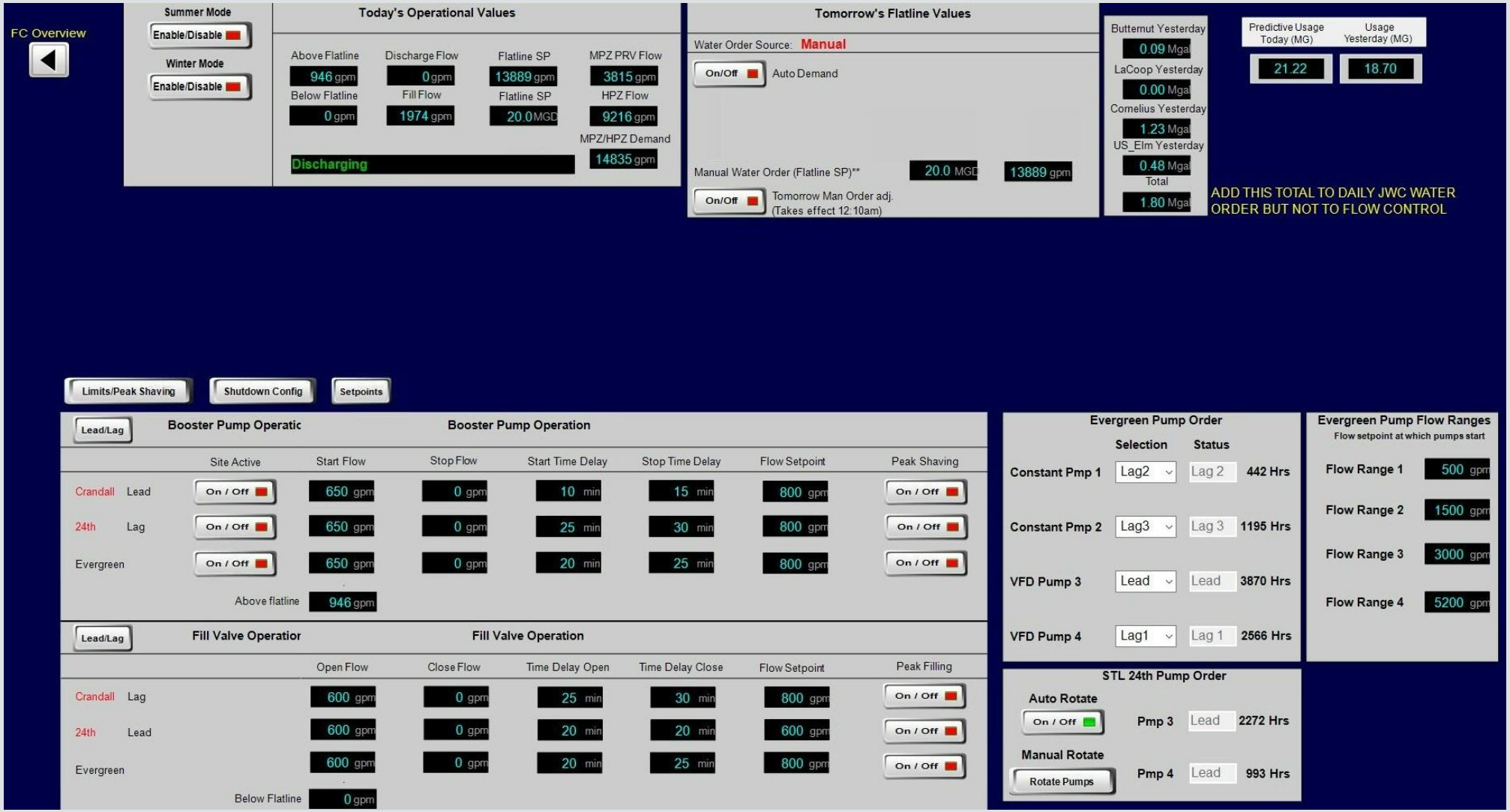
System Controls

Flatline “Target” Setpoint

- The GPM setpoint for the system to deliver the daily water order over 24 hours.
- This value is compared to the Total PRV (TO) Flow to determine what action flow control should be doing.



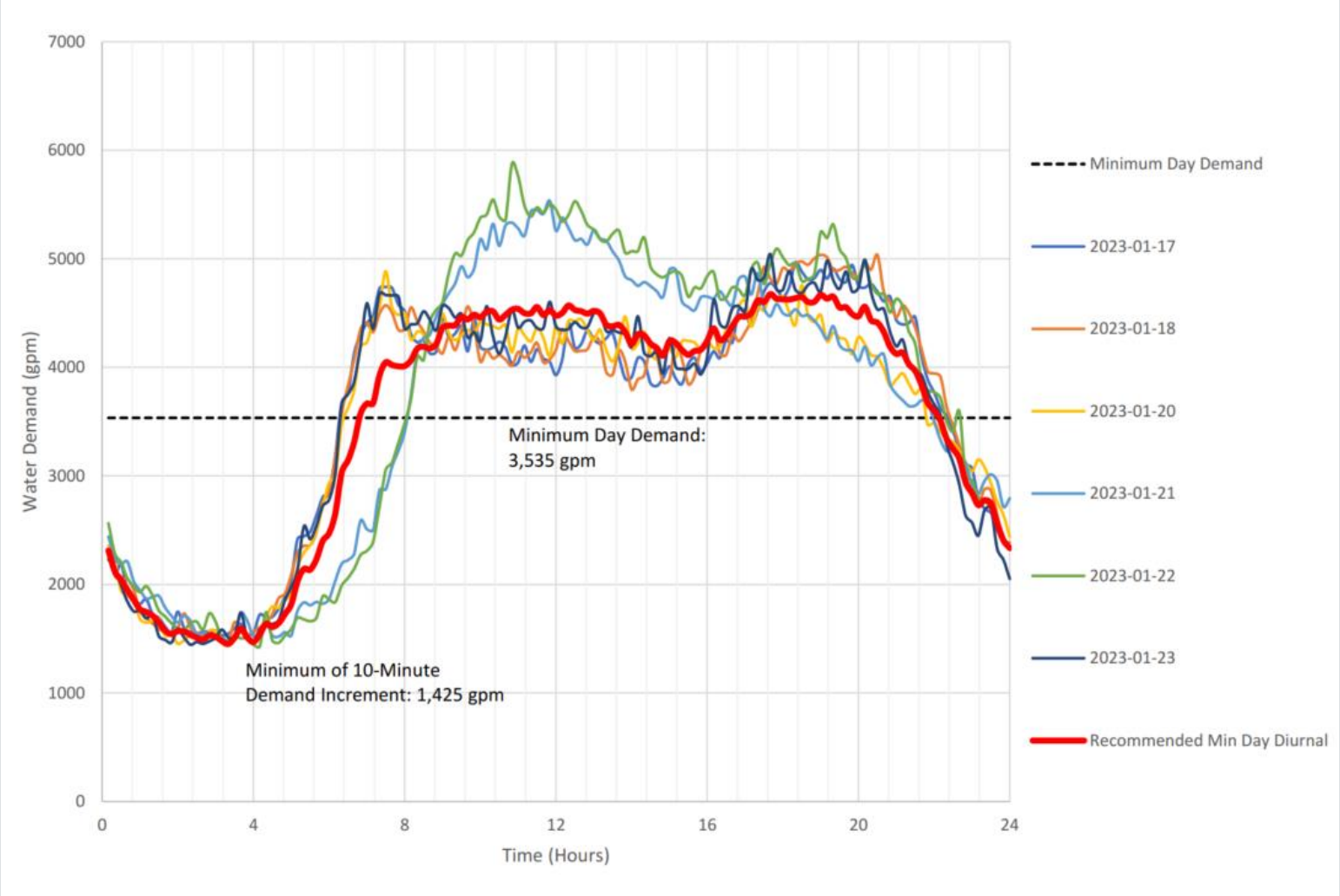
System Controls



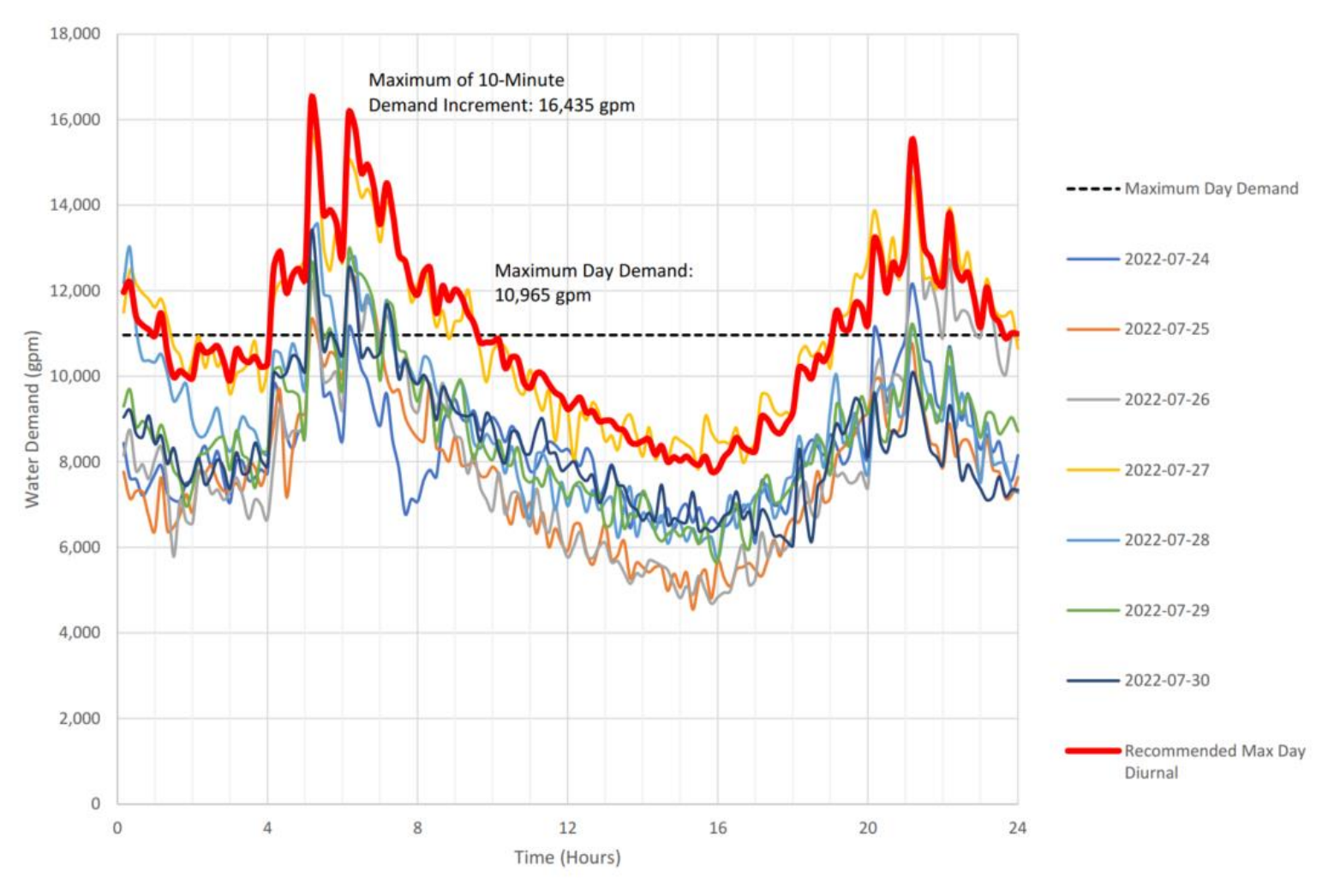
Results

Diurnal curve meets the Flatline control.

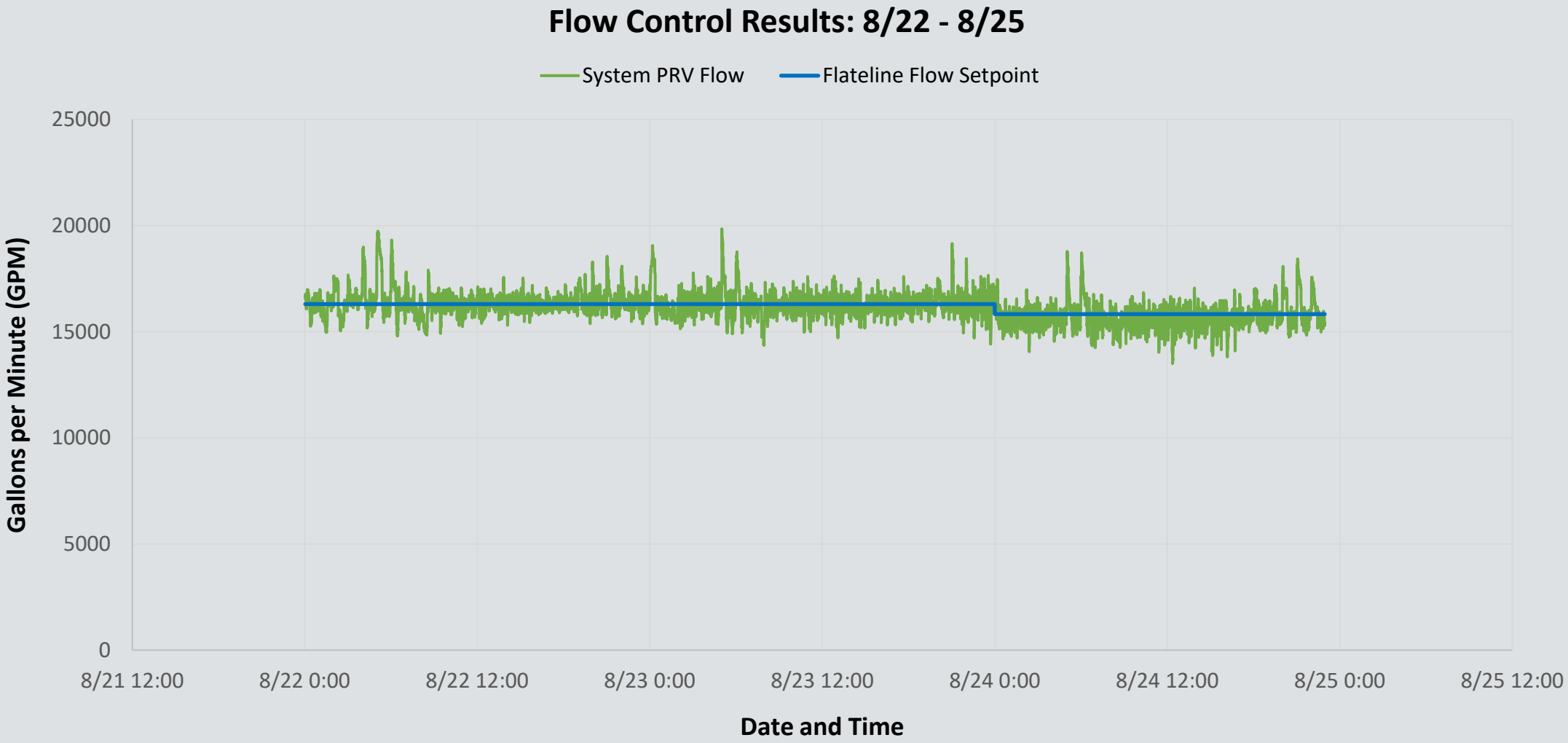
Diurnal Curve – Winter MPZ Sample Set



Diurnal Curve – Summer MPZ Sample Set



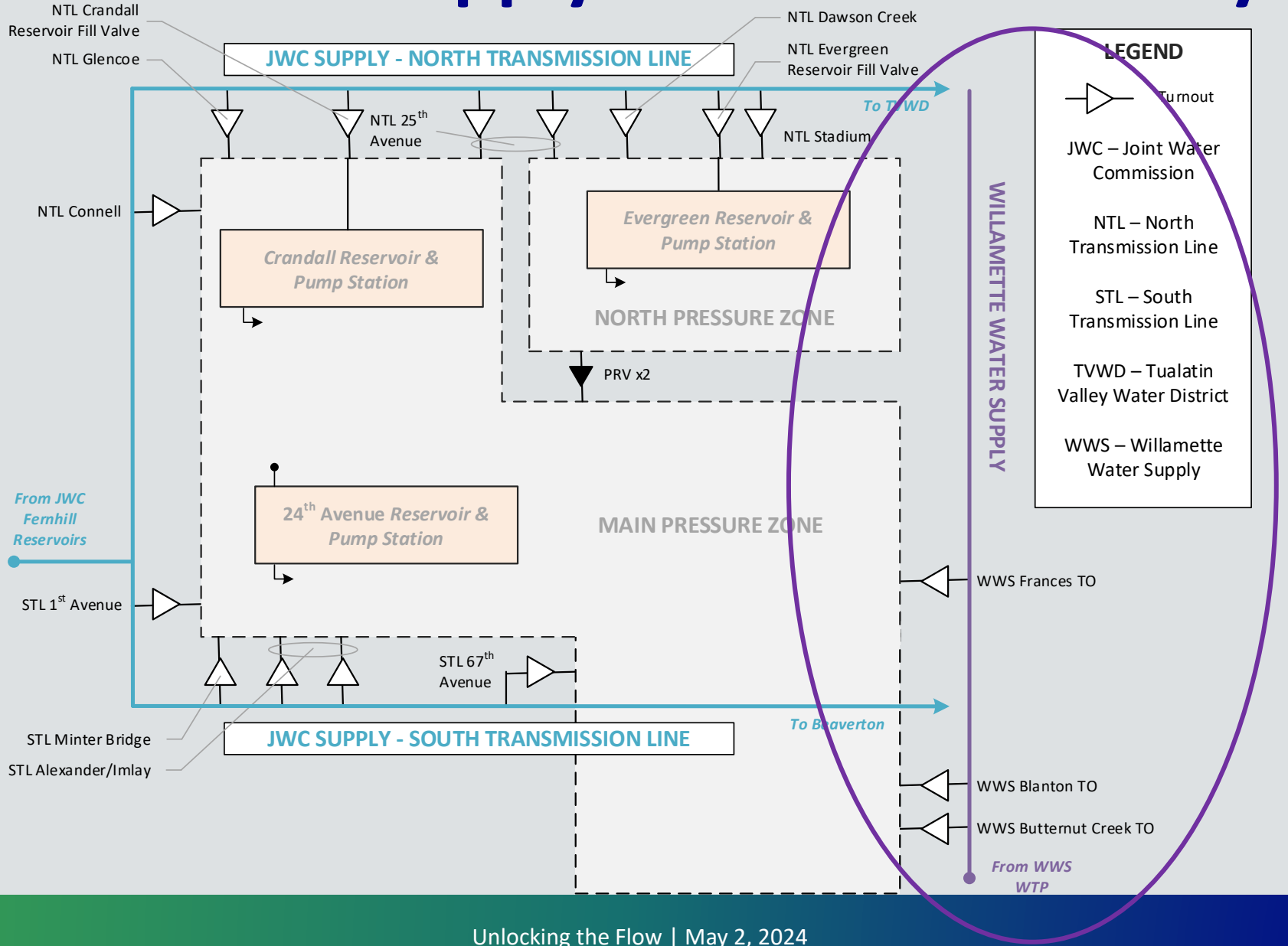
Results


Flow Control Results: 8/22 - 8/25
System PRV Flow
Flateline Flow Setpoint
Gallons per Minute (GPM)
25000
20000
15000
10000
5000
0
8/21 12:00
8/22 0:00
8/22 12:00
8/23 0:00
8/23 12:00
8/24 0:00
8/24 12:00
8/25 0:00
8/25 12:00
Date and Time

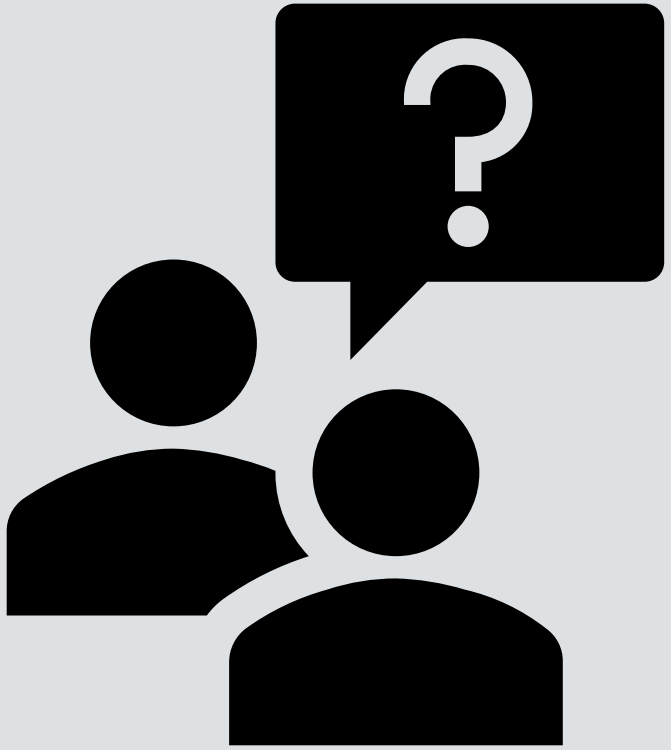
Next Steps

- Evaluation of alternatives to address increase energy costs including Distributed Energy Resources (DER).
- Enhancements to automation of water quality operations for winter season (e.g. Turnout lead/lag function, reservoir turnover prioritization).
- Expand flow control to include flatling flow from the future Willamette Water Supply (on-going).

Hillsboro Water Supply and Distribution System



Question and Answer



THANK YOU

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OREGON

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