



Trailer to Tap: Maintaining a City's Water Supply While Replacing it's 100-Year-Old WTP

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Meet the Team

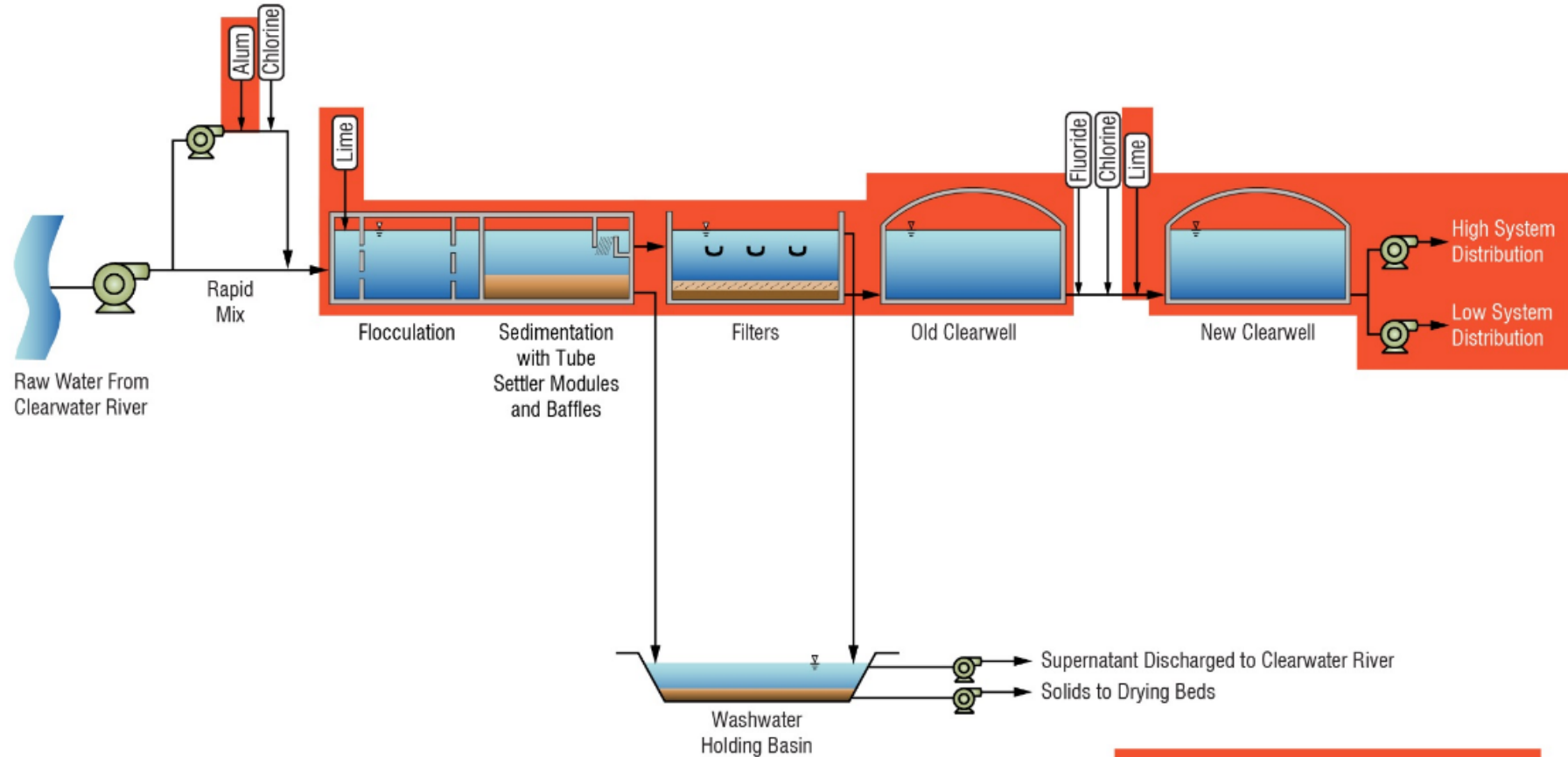
- City of Lewiston and owner's advisor, Brown and Caldwell
- Progressive design build project with IMCO Construction
- Partnered with Pall Corporation, and Control Systems Technology (CST)





Background Information

- Lewiston, ID
- Serves 6,000 residential and commercial metered customers
- Drinking water sources:
 - 7 wells
 - 100-year-old WTP treating Clearwater River



Units highlighted in red have "fatal" or "severe" criticality with no remaining useful life or "unsatisfactory" condition.

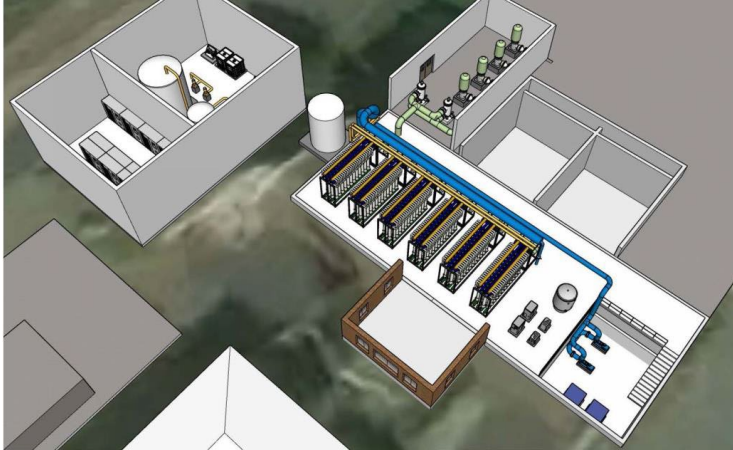


Initial Challenges

- 100-year-old plant
- Catastrophic plant failure concerns
- High summer demand
- Constrained site
- Historical capital expenditure
- Expected completion 2025



Alternatives Considered



Alternative 1

Interior Retrofit



Alternative 2

Exterior Retrofit



Alternative 3

New Plant Site Along Raw Water Pipeline Alignment



Alternative 4

New Plant at Existing Sludge Lagoon Site



Alternative 5



FALL 2021 DEMOLITION AND FWPS RELIABILITY

Demolish the existing sedimentation and filtration area along with the old administration building, relying on groundwater during Winter conditions.

Install new pumps, motors, electrical, and backup power generator at the clearwell to improve reliability of the City's intertie to distribute groundwater between pressure zones.



APRIL 2022 MOBILE TREATMENT TRAILERS SUPPLEMENT CITY WELL WATER

Install raw water tank with Pall mobile water treatment plant trailers to augment City groundwater supply throughout the peak Summer irrigation season.

Complete buried utilities, slab, and building.



SUMMER 2022 CONSTRUCTION

Construct the new membrane plant.



DECEMBER 2022 FINAL COMPLETION

Final completion of the new membrane plant.





New Plant on Existing Plant Footprint

Benefits:

- Meets City's Budget of \$27.5 million
- New Plant on City-Owned Property
- Future expansion integrated within New Building
- Control Integration with the Entire Water System
- Supply water to City throughout Construction
- Ease of construction with an unobstructed site

Risks/Fatal Flaws:

- City Groundwater is inadequate
- DEQ does not approve the mobile treatment trailers
- Clearwell disinfection is inadequate
- Geotechnical issues
- Trailer Delays



IDEQ Coordination

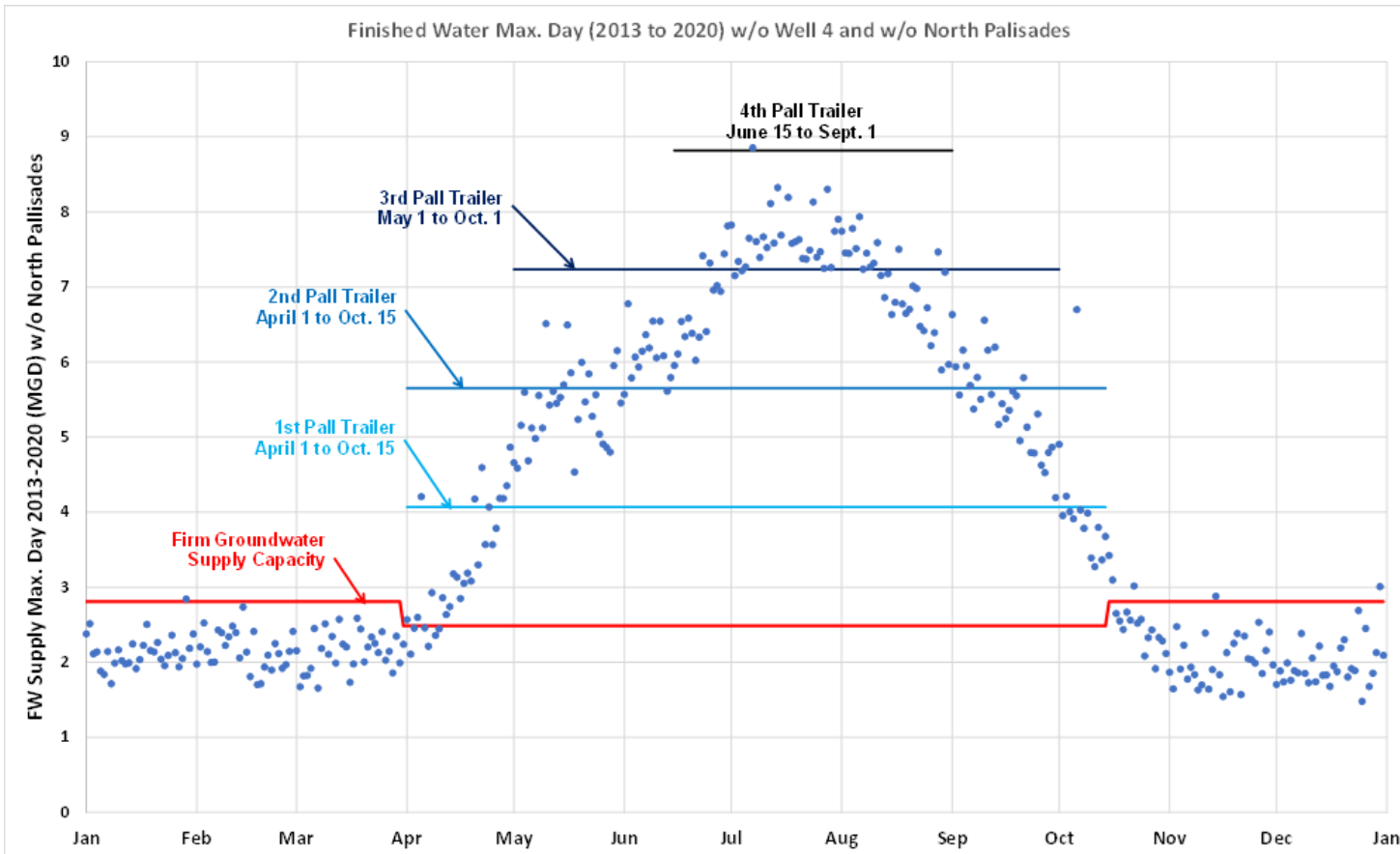
- DEQ requirements are the same for a “temporary” facility and a “permanent” facility
- Preliminary engineering report, plans, and specification
- Conditional Approval of PER:
 - Corrosion control plan
 - Tracer study
 - Start-up disposal water
- Continued coordination throughout temporary operation



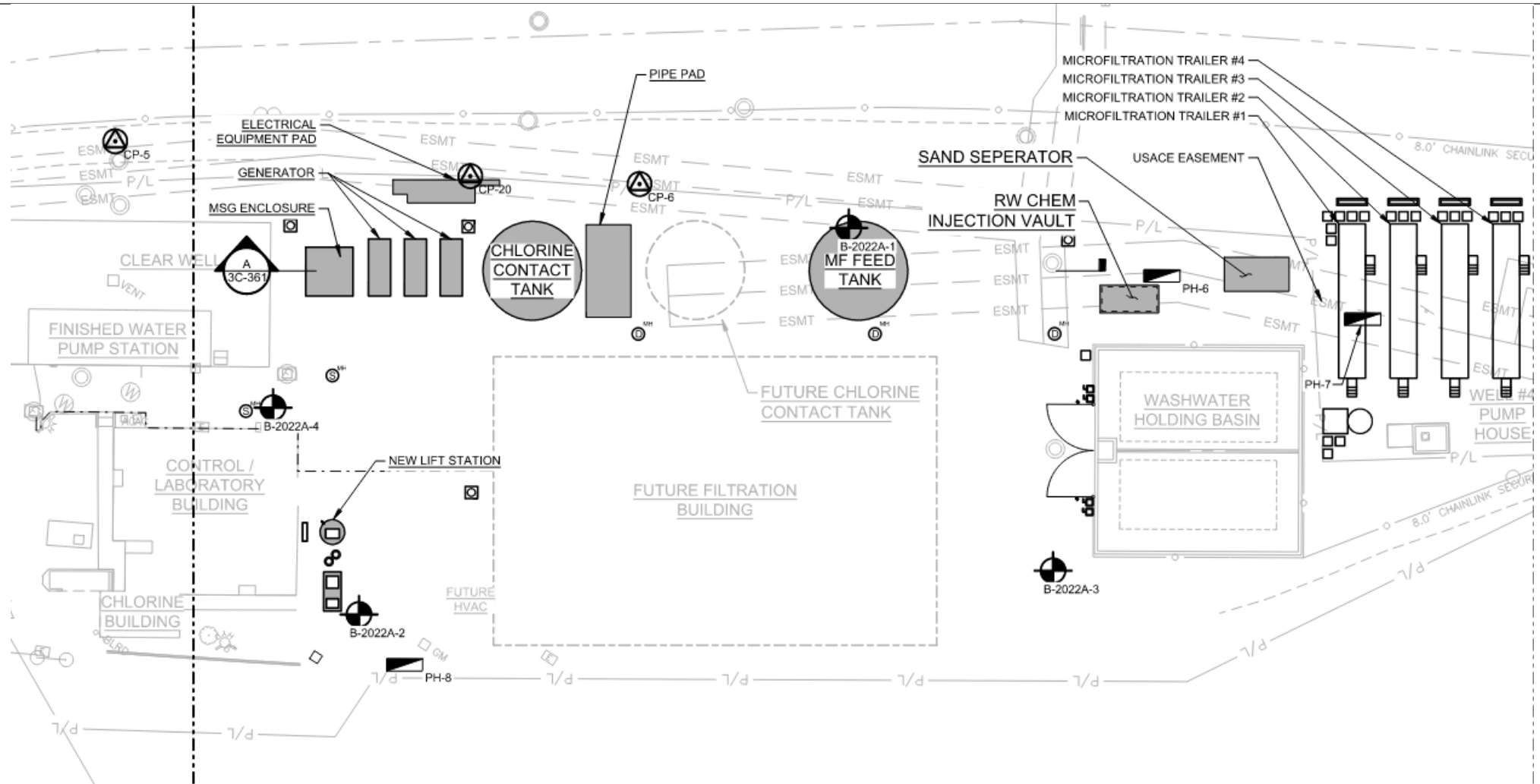
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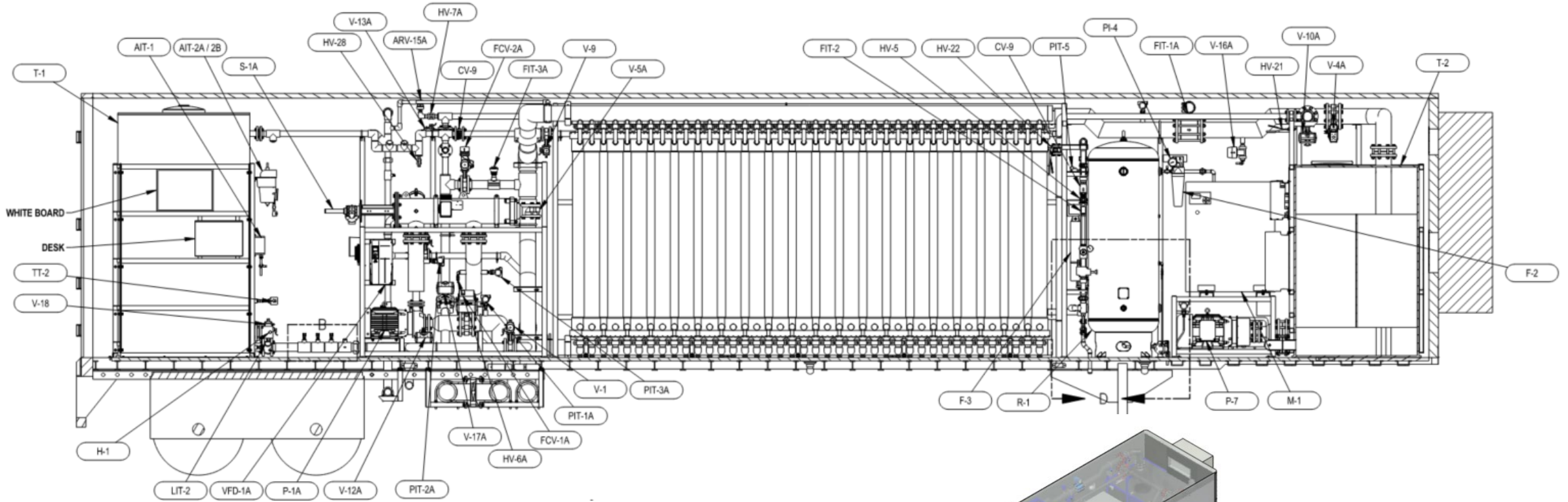
Water Demand and Supply



- Groundwater Supply Analysis
 - GW supply is sufficient to meet winter demands
 - Analyze the number of mobile trailers are needed to meet summer demand



Maintaining Water Supply: Mobile Membrane Trailers





Pall Mobile Membrane Trailers

Each trailer consists of:

- 2 trains of Pall Microza Hollow fiber membrane racks
- PC, PLC, and Instrumentation
- Air compressor for valve actuation and process air
- 1 Feed Pump with VFD per train
- Automated self-backwashing strainer
- Reverse Filtration pump with VFD
- Filtrate transfer pump with VFD



Capacity and Timing

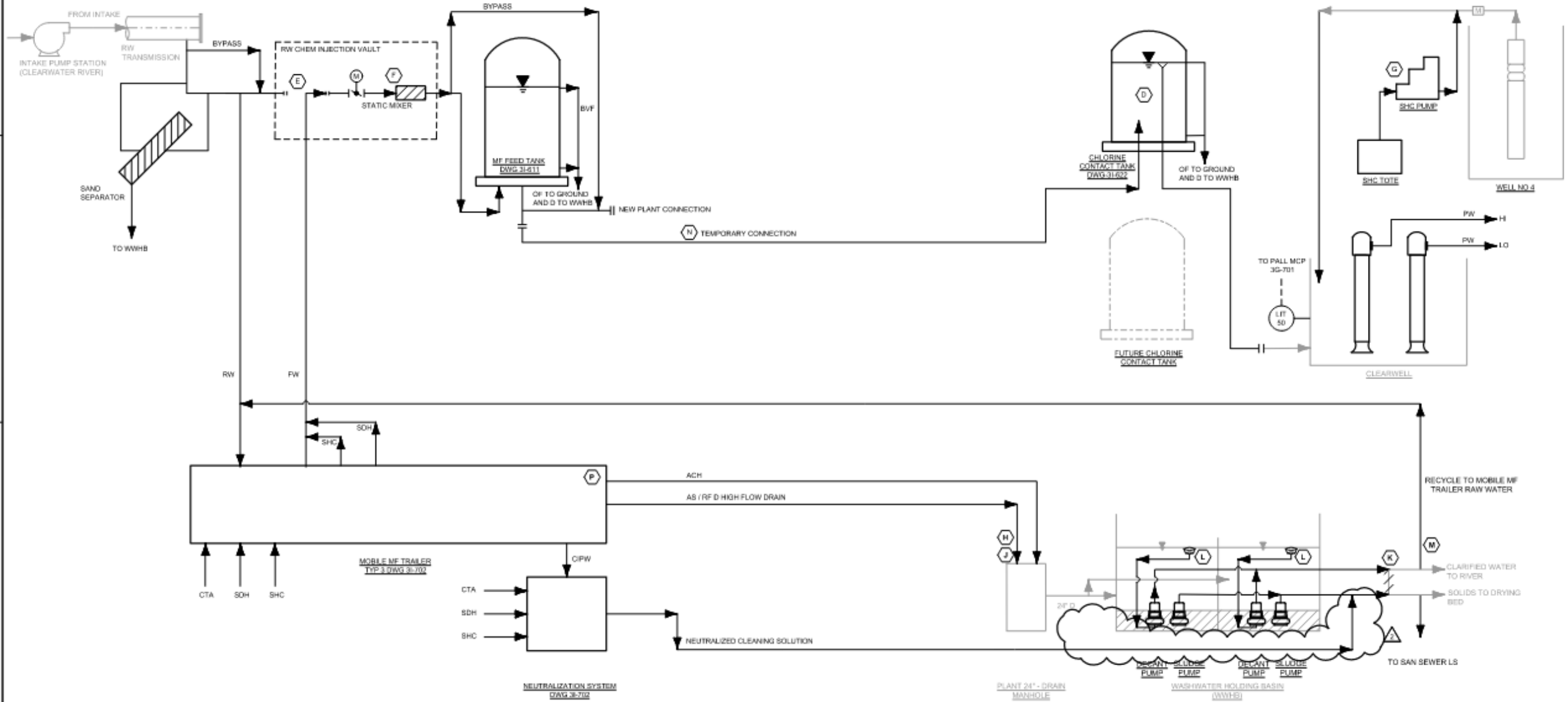
- 4 total Mobile trailers
- Each with capacity over 1 MGD
- Commissioning and start-up of the trailers
 - First 3 trailers – End of March
 - 4th trailer – Beginning of June
- Trailers Decommissioned in a phased approach





Supporting Infrastructure for Mobile Membrane Trailer

- Temporary Piping
- Chemicals
 - Chlorine
 - ACH
 - Sodium Hydroxide
 - Citric Acid
- Membrane Feed Tank and Chlorine Contact Tank*
- Existing Clearwell
- Existing Washwater Holding Basin and Temporary Neutralization Tank





Continued Challenges

- Coronavirus, Inflation, and Supply Chain Issues!
- Membrane Feed tank and Chlorine Contact Tank Delivery and Installation delays
 - Used for Chlorine Contact time
- Pall Mobile Trailer Supply
 - Only 3 available trailers

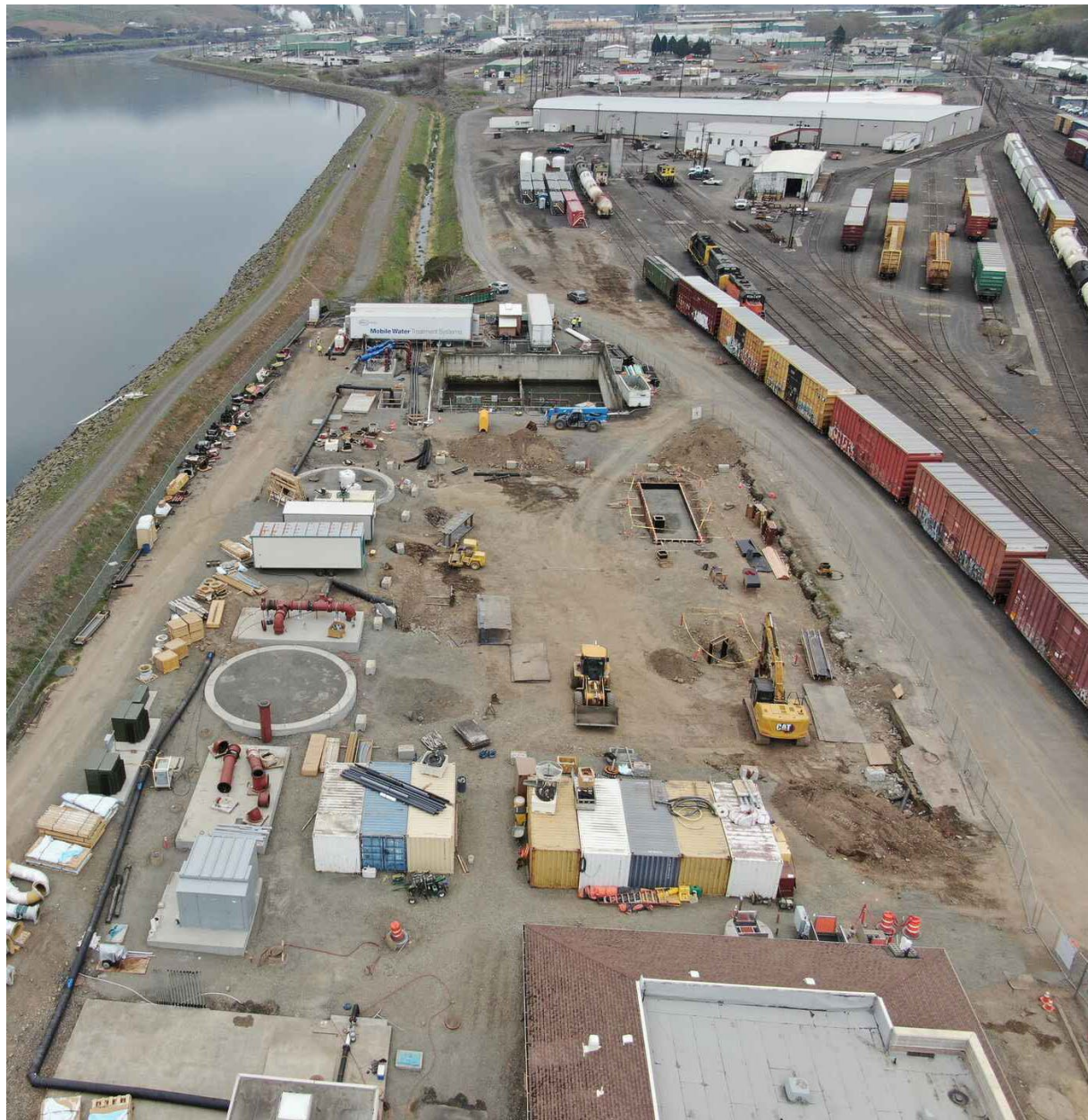




Overcoming Challenges

- Coordination with DEQ
 - Approval for modifications to the Clearwell to meet CT
 - Approval to use Suez Mobile Membrane Trailer
- Overcoming operational challenges with 2 membrane manufacturers





Benefits

- Operational exposure and experience with equipment for the permanent plant
- Proof for permanent plant
 - Ability to adequately treat the water
 - Achieving acceptable filtrate with raw water turbidity above 100 NTU
- Allowed for construction to occur while meeting the City demands



Project Status

- October 2022 – Trailers Decommissioned
- October 2022 through January 2023 – Completion of Membrane Filtration Building
- January 18th, 2023 – High Reservoir Failure
- February/March 2023 – Start-up and Commissioning
- April 2023 – Acceptance Testing and serving water to the City





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