Commissioning a New WTP with a Ruptured Reservoir

Danielle Philbrick, Stantec

Agenda

- Background Information and System Overview
- Original Start-up and Commissioning Plan
- Reservoir Failure
- Revised Start-up and Commissioning Plan
- Reservoir Repair
- Project Closeout

Project Overview

- City of Lewiston, ID
- Serves 6,000 residential and commercial metered customers
- 100-year-old existing conventional WTP
- Upgrade to 10 MGD Membrane Filtration WTP with build out potential of 15 MGD

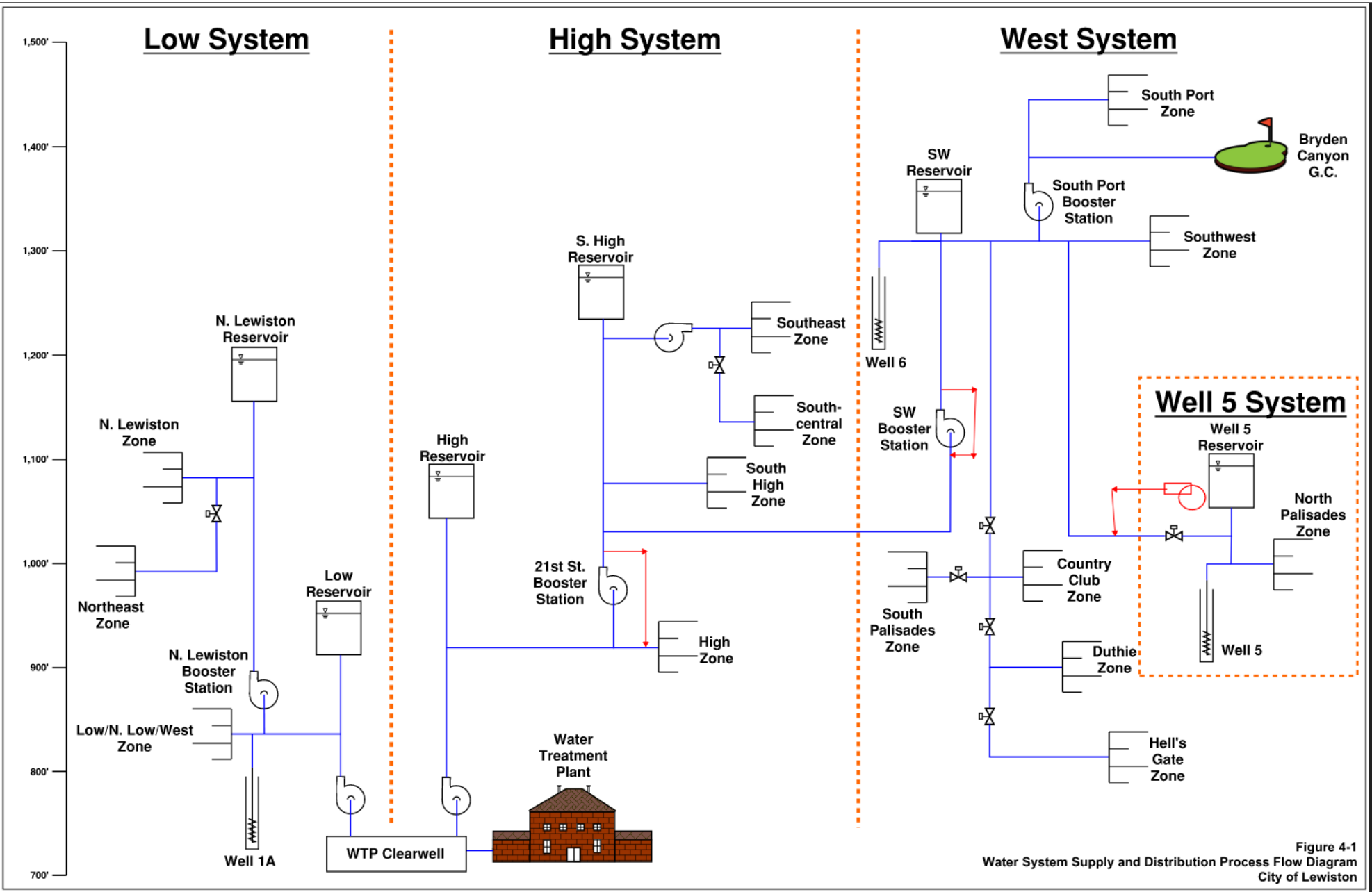

Figure 4-1
Water System Supply and Distribution Process Flow Diagram
City of Lewiston

System Overview

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.

Initial Start-up and Commissioning Plan

- Preconditions for Start-up and Commissioning
  - Completion of all inspections and tests required during construction
  - Disinfection
  - Punchlist Items
  - Submission of O&M and As-builts
- Start-up
  - Control System Testing
  - Confirmation of Proper Installation
  - Dry Testing
- Commissioning – February 2023
  - Wet/Load Testing

Initial Acceptance Testing

- Goal: Meet Hydraulic Performance, Finished Water Quality, and complete Component Testing
- 30-day period, anticipated in mid-February through March

Project Components or Systems	Acceptance Testing Required For
Membrane Filtration System	• Functional testing for at least 2 hours. • Factory testing if applicable. • Startup and shutdown operations testing. • The membrane system shall verify that all daily rack MIT's have passed and all LRVs are greater than or equal to 4.0 • The control system, including alarms and interlocks, function properly
Ultraviolet (UV) Light Disinfection System	• Delivery of design dose for flow rates up to 10 MGD • Operation between duty and standby reactors • Dose Pacing • Start-up and Shutdown sequences • Mechanical cleaning system • Trending of information

High Reservoir Failure

Two-Step Process for Acceptance Testing

- Loop System for Testing Hydraulic Capacity of WTP Components
- 2, 15-day acceptance periods
  - Low-Flow Test Period – May 30th – June 13th
  - High Flow Test Period following High Reservoir Repair
- Low Flow Period was run based on demand from the Low Reservoir System
- High Flow Period to Test Plant Capacity

Reservoir Repair

- Stantec and IMCO to complete design and construction
- Demolish roof structure, repair earthen berm, repair reservoir sloped floor
- Install new overflow and outfall
- Install Reinforced Polypyrene (RPP) liner and underlaid geofabric
- Install RPP Floating cover

Reservoir Completion

Acceptance Test Report

Condition	Flow Rate (mgd)	Points of Compliance	Demonstrated Compliance
Treated Water Production	10	Finished water	Achieved on August 9 and 15 described above, Refer to Appendix D
Treated Water Production at Turndown	3	Finished water	Achieved during low flow test, Refer to Appendix D
Hydraulic Capacity of Conveyance	15.6	MF Feed Tank and CT Tank Piping	MF Feed Tank – Calculated for minimum submergence of MF Feed Pumps, refer Appendix A CT Tank - Refer Section 6.1
Freeboard	Minimum 2 ft at 15.6 mgd	MF Feed Tank and CT Tank	Overflow in tanks at 24” above operating level. Refer drawings

Project Closeout

Questions

Thank you!!

Danielle Philbrick
Danielle.Philbrick@stantec.com
503-207-4349