Analysis of the Central Water Project's Future Water Demand

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INTRODUCTION

- Water demand in northern Utah County is expected to increase 270% by 2060 due to population growth.

How are we planning on providing water to future Utahns?

- The Central Water Project (CWP) delivers local groundwater and treated water to northern Utah County cities. It was built and is maintained by the Central Utah Water Conservancy District (CUWCD).
- The CWP is adequately providing for the current northern Utah population, but how do we ensure that it can provide for the larger populations of the future?

Customer Peak Demand

Customer	2020 Annual Supply af/yr	2035 Annual Supply af/yr	2060 Annual Supply af/yr	2020 Peak Month Demand gpm	2035 Peak Month Demand gpm	2060 Peak Month Demand gpm
RMP	2840	2840	2840	3732	3732	3732
Vineyard City	1036	6000	6000	1361	7884	7884
Lehi	2500	5500	5500	3285	7227	7227
Saratoga Springs	480	6180	10300	631	8120	13533
Eagle Mountain	1200	10691	16992	1577	14047	22326
JVWCD	11680	11680	11680	15347	15347	15347
Total	**19736**	**42891**	**53312**	**25932**	**56355**	**70048**

Source: (CUWCD, 2022)

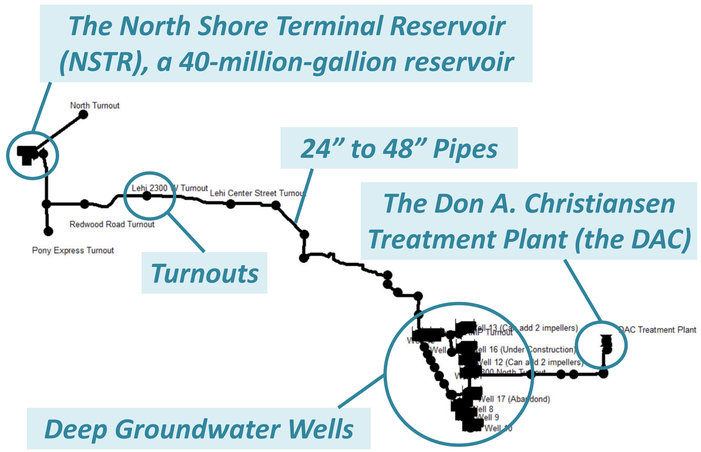
METHODS

- The CUWCD has built a model of the CWP within the Environmental Protection Agencies water modeling software EPANET.
- This model can be used to predict conditions within the CWP transmission system when pressured with higher flowrates.
- The CUWCD can use model output to determine when and where upgrades are needed. This helps inform its Capital Improvement Program (CIP), which helps inform cites and the public of costs and upgrades to the system.

ANALYSIS

The Central Water Project

The CWP pipeline is made up of:



Variables to Consider

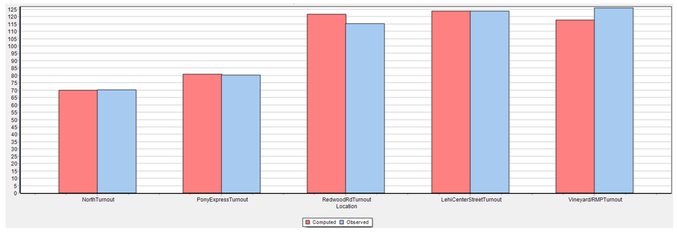
The CWP is large and complex with many variables, including:

- Miles of pipeline
- Pipe roughness
- Elevation changes
- Aquifer draw down,
- Varying flow demands at turnouts
- Multiple pumps with different capabilities
- *And much more*

The CWP EPANET model allows us to take all these variables and accurately model pressures at turnouts.

Accuracy and Calibration of the CWP EPANET model

- **Real-world data was compared against model output to determine the accuracy of the CWP EPANET model.**



Pressure Analysis and when the CWP Needs to be Upgraded

- **Future flowrates were input into the CWP EPANET model to determine the flowrate at which the CWP begins to not meet volume requirements at turnouts.**

CONCLUSIONS

- **The CWP EPANET model has been shown to reliably model real-world conditions at turnouts.**
  - **All model pressure outputs were within a 10% error of real-world pressures.**
  - **It is recommended the CUWCD investigate the calibration of sensors at the Redwood Road and Vineyard turnouts.**
- **It is recommended the CUWCD upgrade the CWP transmission system to allow for higher flow volumes before peak monthly demand reaches**

48,314 gpm

- **Potential flow capacity after upgrading two wells =**

55,689 gpm

- **Potential flow with all wells operational =**

62,258 gpm

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