

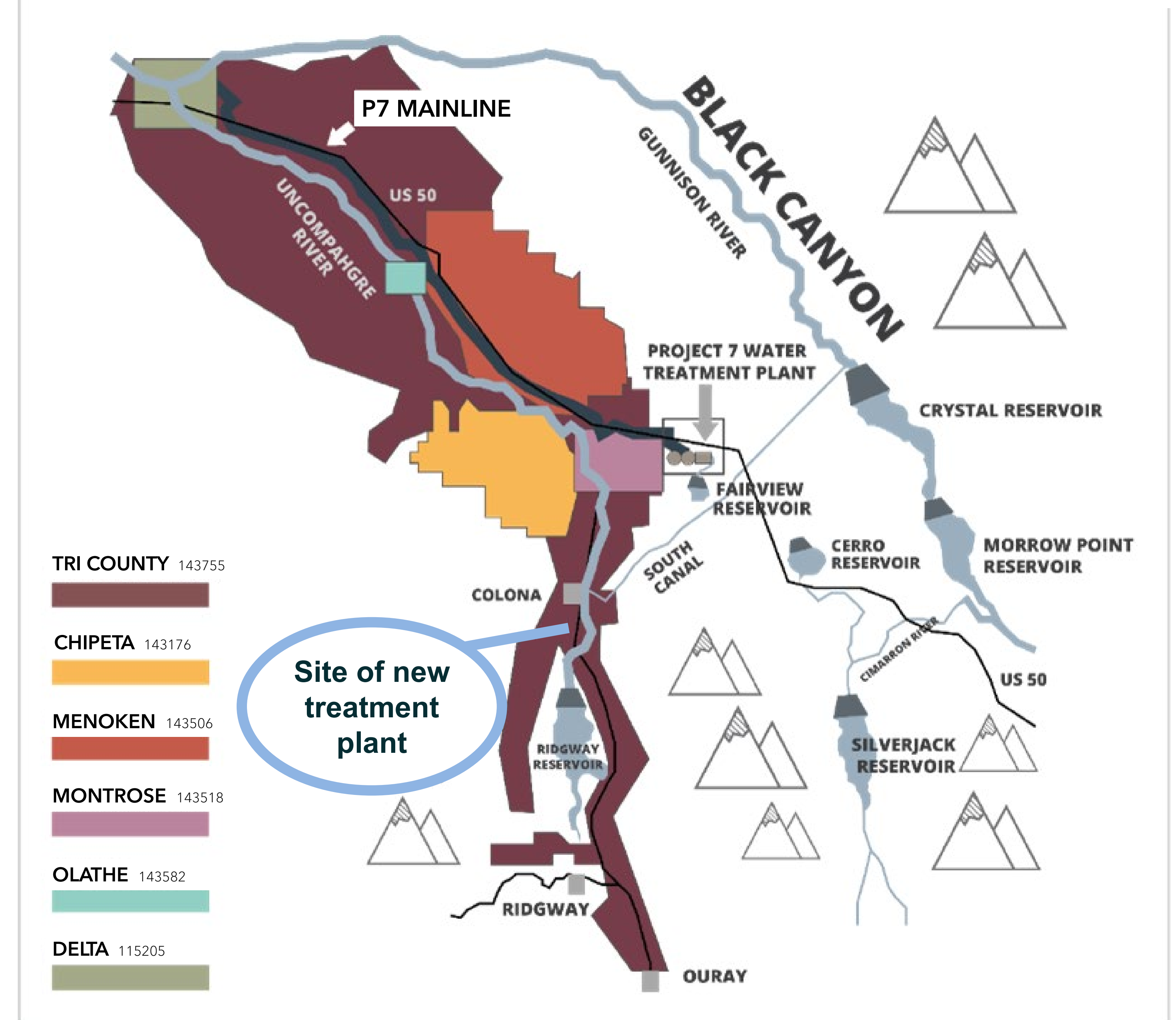
WHO WE ARE

Project 7 Water Authority is a **unique cooperative effort among seven water entities** to provide high-quality potable water to the municipalities and rural areas of the Uncompahgre River Valley.

The six entities that represent Project 7 Water Authority (P7WA) are:

- City of Montrose
- City of Delta
- Town of Olathe
- Tri-County Water Conservancy District
- Chipeta Water District
- Menoken Water District

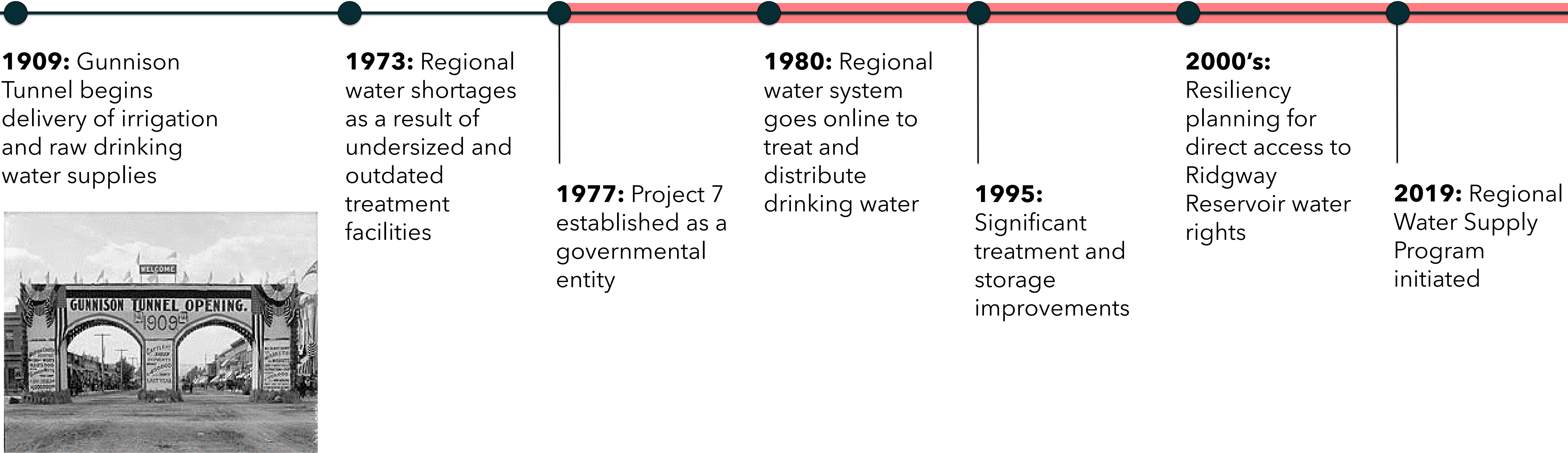
PROJECT 7 WATER AUTHORITY SOURCE & TRANSMISSION LINES



OUR HISTORY

Project 7 Water Authority was formed in 1977 in response to regional water shortages and infrastructure challenges.

40 Years of Cooperation



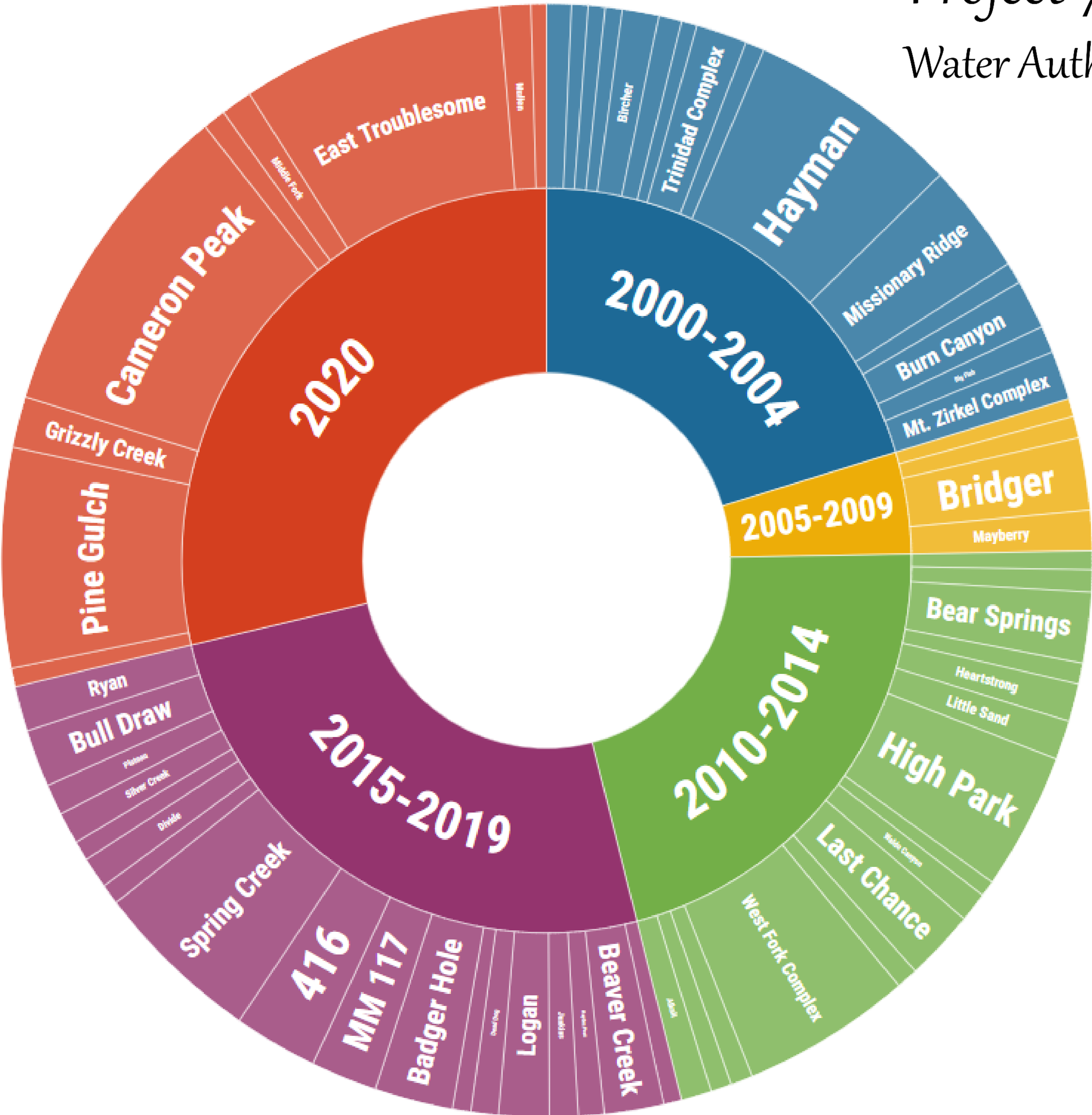
PURPOSE & NEED

The P7WA Water Supply Resiliency Program will:

Mitigate the risk of being dependent on a single drinking water source and treatment facility

MAJOR RISK FACTORS:

A wildfire, pipeline, tunnel failure, or treatment plant outage could impact drinking water that over 50,000 people depend on.



Source: [Rocky Mountain Area Coordination Center](#)
Acreage totals for 2020 fires are current as of Oct. 19. This chart includes the more than 20,000 acres that the Mullen Fire, which started in Wyoming, has burned so far in Colorado.



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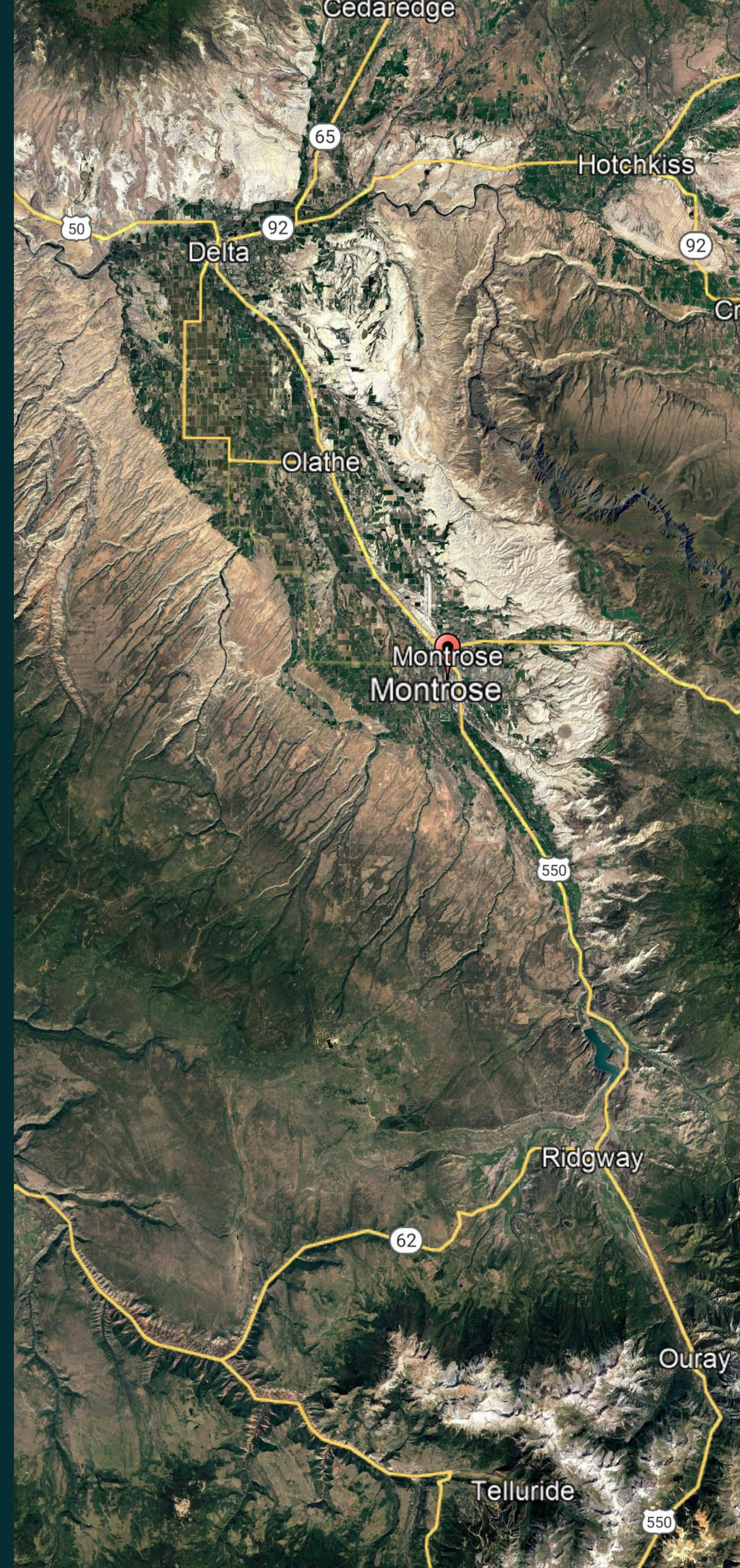


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Project 7 
Water Authority

- **50,000+ individuals** served safe drinking water by Project 7 Water Authority
- **2 Cities, 1 Town, 3 Districts**
- Only **one water treatment plant** and only **one drinking water transmission line** running the length of the valley

PROJECT BENEFITS



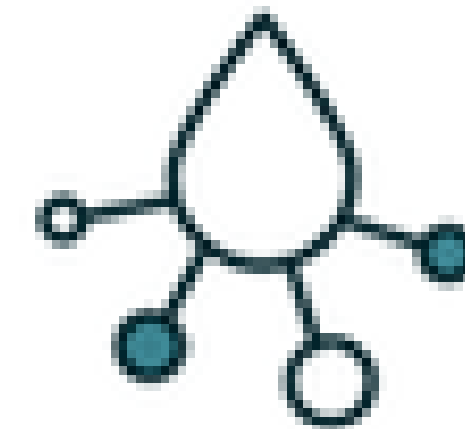
Investing in the Future:

Realize P7's founding vision of a resilient and reliable water supply for more than 50,000 people in the Uncompahgre and Gunnison Valleys.



Dependability:

Reduce the need to pump water around the valley which lowers maintenance costs and benefits the environment.



System Strength:

Develop a new water supply and reduce the risk of supply interruptions due to wildfire or drought in the Gunnison watershed, or transmission failures in the Gunnison Tunnel.



Direct Access:

Provide direct access to member entities' existing water rights in Ridgway Reservoir, currently accessed by trades and exchanges.

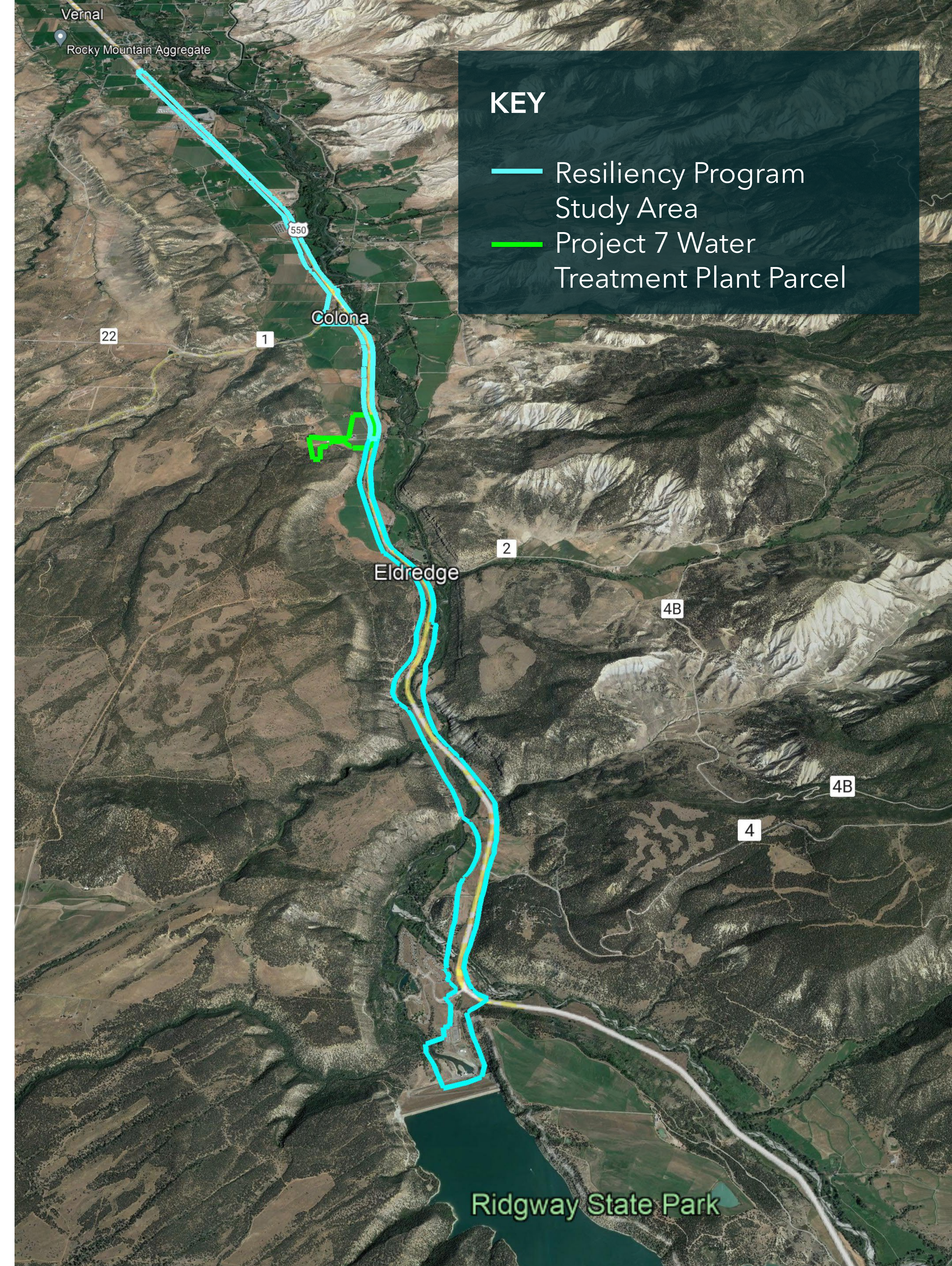
PROJECT ELEMENTS

A new **raw water transmission line** installed between Ridgway Reservoir and the new facility (5.5 miles of pipe)

A new **drinking water transmission line** from the WTP site to serve all members via an adequately sized tie in point within Tri-County WCD (3.25 miles of pipe)

A new **water treatment facility**

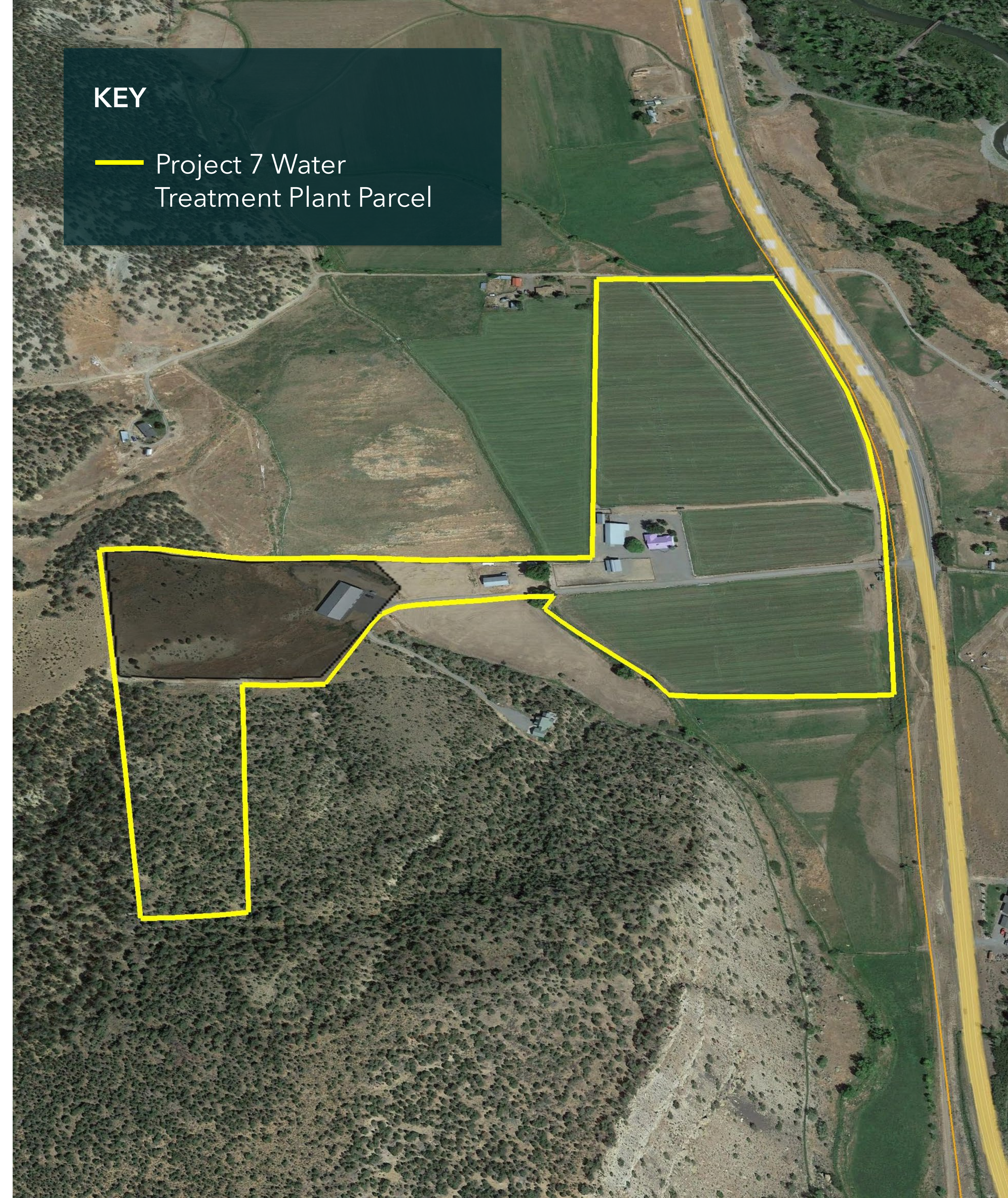
- Surface water treatment (filtration) and softening
- Hydroelectric generation from raw water line
- Envisioned as a Design-Build project



PROPOSED LOCATION

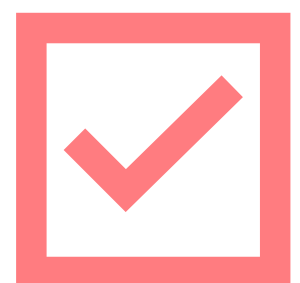
35679 US-550, Montrose, CO 81403

- 50 Acre site
- Proposed building site located off the HWY-550 corridor but with dedicated access
- Fractured sandstone at back of property allows a firm foundation and is excavatable
- Topography offers the ability to reduce costs associated with pumping



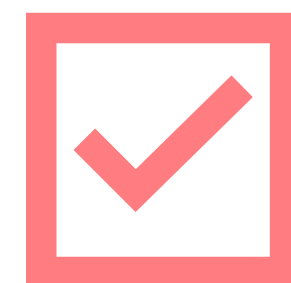
DEFINING SUCCESS

In 2019 and 2021, program leadership met with all Project 7 voting members to identify and confirm definitions of program success:



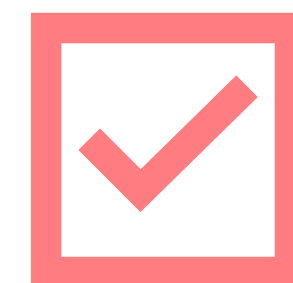
System Strength:

"We are part of the whole and we want the whole system to be strong."



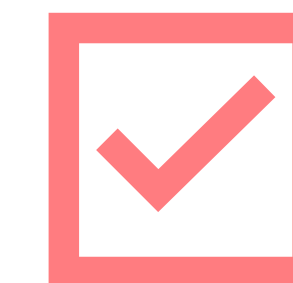
Predictable Budgeting:

Transparent cost sharing agreements must be established.
"We need real numbers and specifics on how this is going to work."



Return on Investment:

"What size is the right size to provide maximum value on day one."



Long-Term:

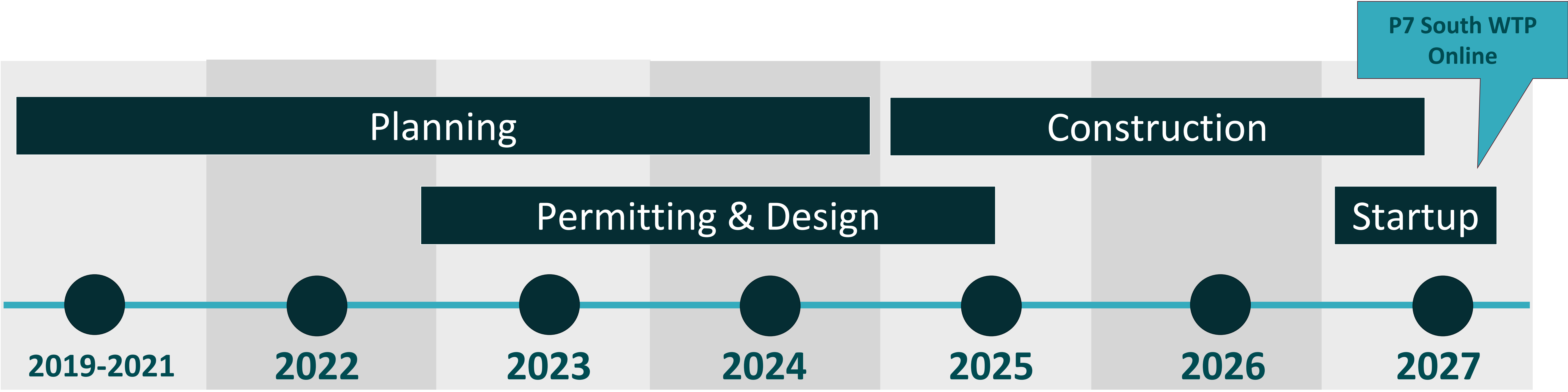
"Twenty years from now this will be a bump in the road, but a water shortage is remembered forever."



Value of Water:

"The founding investment in Project 7 yielded huge regional benefits. Now is the time to reinvest. No one wants to be the generation that drops the ball."

The Regional Water Supply Program is expected to produce water for the Uncompahgre Valley by 2027.



The new water treatment plant will be designed so additional capacity can be added in the future.





The Ridgway Water Treatment Plant would be set back from HWY 550 to protect the area's scenic and agricultural character.



The project team is currently evaluating design concepts to optimize the site layout - both to reduce construction costs and to protect the scenic skyline as seen from US-550

PILOT TREATMENT PROJECT

In spring 2022, the U.S. Bureau of Reclamation awarded **\$612,059** to Project 7 from the Desalination and Water Purification Research Program to **test different technologies for the new treatment facility.**



SOFTENING PILOT STUDY

The Project 7 Water Authority (P7WA) is testing an innovative total dissolved solids (TDS) removal treatment train for surface waters with high hardness and TDS. The concept uses pellet softening reactors (PSRs), to remove hardness *without osmotic or nano-porous membranes or generating brine streams*. The treatment concept will be compared to ultrafiltration (UF) followed by brackish water RO membranes, a process that is often applied in western states for softening and inland desalination. This USBR-funded study will (1) demonstrate compliance of the two trains with federal and state water quality standards, (2) provide insight into operational considerations for the two trains, and (3) result in peer-reviewed publications that will make data publicly available for use in water treatment projects throughout the West.

PROJECT BACKGROUND

P7WA is a wholesale potable water provider serving over 55,000 individuals in the Uncompahgre Valley of southwestern Colorado. P7WA has one water treatment plant (WTP) and one source water, Blue Mesa Reservoir on the Gunnison River. Raw water is conveyed to the P7WA WTP via the 112-year-old Gunnison Tunnel. Improving water system resiliency is critical to maintaining service to P7WA’s customers and reducing risks associated with drought, wildfire, and water supply interruption.



The P7WA Resiliency Program will add a new water source, Ridgway Reservoir, increasing the security and reliability of the P7WA system and hardening it against drought and wildfire.

Ridgway Reservoir water quality is show in the table below. **Technical challenges**, including minerals content, the intermittent presence of metals, and the rural, remote location of the water source, **must be overcome to develop the Ridgway Reservoir and other marginal surface waters throughout the West into reliable potable water supplies.**

Historical Ridgway Reservoir Water Quality

Parameter	Range	Average	SMCL	Units
pH	7.2 – 8.3	8.0	6.5 – 8.5	-
Alkalinity	64 – 140	101	--	mg/L as CaCO ₃
Total Organic Carbon (TOC)	1.2 – 2.0	1.5	--	mg/L as C
Total Hardness	160 – 440	291	--	mg/L as CaCO ₃
Calcium	210 – 245	225	--	mg/L as CaCO ₃
Magnesium	45 – 49	49	--	mg/L as CaCO ₃
Total Dissolved Solids (TDS)	150 – 533	350	500	mg/L
Total Iron	0.01 – 0.41	0.05	0.3	mg/L
Total Manganese	0.02 – 0.28	0.06	0.05	mg/L

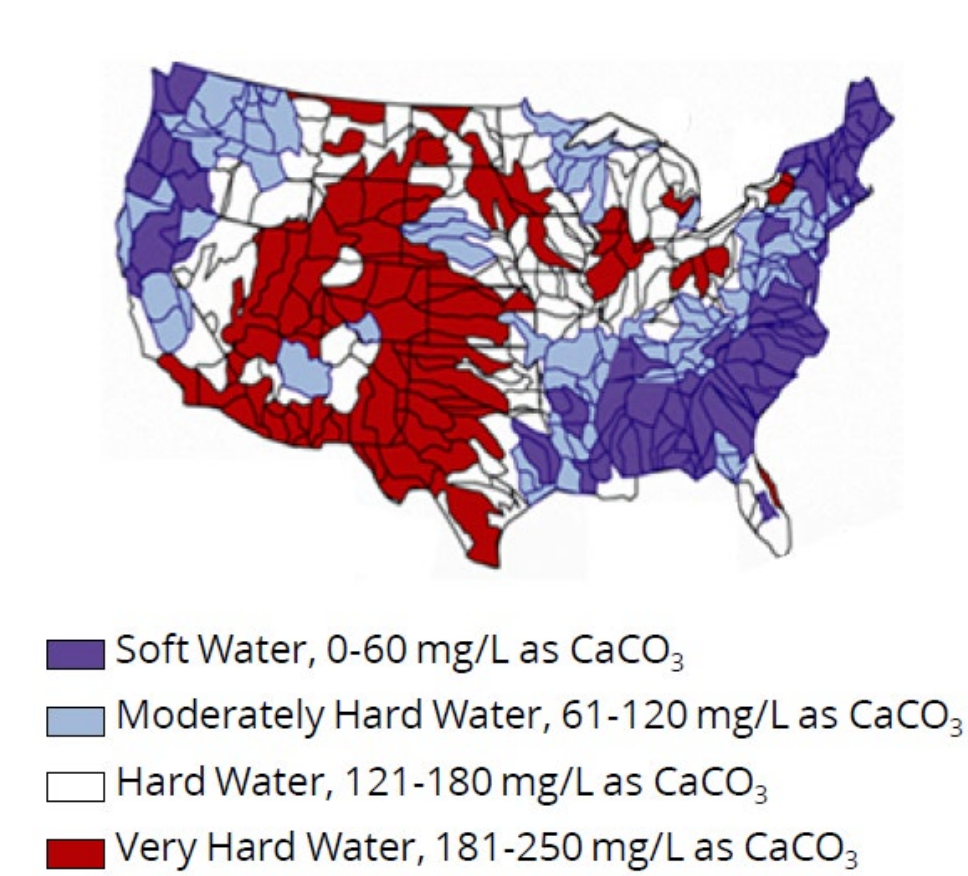
PROJECT GOALS AND PHASING

The P7WA Softening Pilot Study is being conducted in two phases to allow comparison of the PSR process train to a more traditional membrane-based softening treatment train, as shown in the figure to the right and the table below.

The process trains will be evaluated on their operability, performance for hardness/TDS removal, and ability to meet common surface water treatment goals, including:

- Disinfection byproduct (DBP) precursor removal through measurement of total and dissolved organic carbon, ultraviolet absorbance, and fluorescence excitation emission matrices throughout the treatment trains. **DBP precursor removal is expected through the PSRs and the filters - possibly without the need for flocculation and sedimentation, which would present significant construction and operational cost savings.** Selection of coagulant injection locations and doses are key parts of this pilot.
- Iron and manganese removal through sampling for dissolved metals throughout the treatment trains. These metals are expected to be removed by incorporation into pellets or through oxidation followed by filtration.

USGS Surface Water Hardness Classifications



POTENTIAL VALUES OF PSRs ACROSS THE WEST

Hardness ions are significant contributors to TDS in the Ridgway Reservoir – and many other surface waters across the West, as shown in the figure below. Hardness removal using conventional lime softening or high-pressure membranes is well-established.

However, disposal of residuals from these processes is a significant challenge for remote water systems. Hauling costs for lime sludge add up, the ability to renew permits for surface water discharge of low-strength brine is not guaranteed, and local geology may require construction, operation, and maintenance of multiple wells for disposal of high-strength brine.

PSRs use common water treatment chemicals such as caustic soda, lime, and/or soda ash to **produce residuals in the form of calcium carbonate pellets, which readily dewater to 95% solids**. The pellets are well-suited to beneficial reuse in agricultural and industrial applications. WTPs with PSRs that recycle other residuals streams (e.g., filter backwash waste) essentially become **zero-liquid-discharge facilities**.

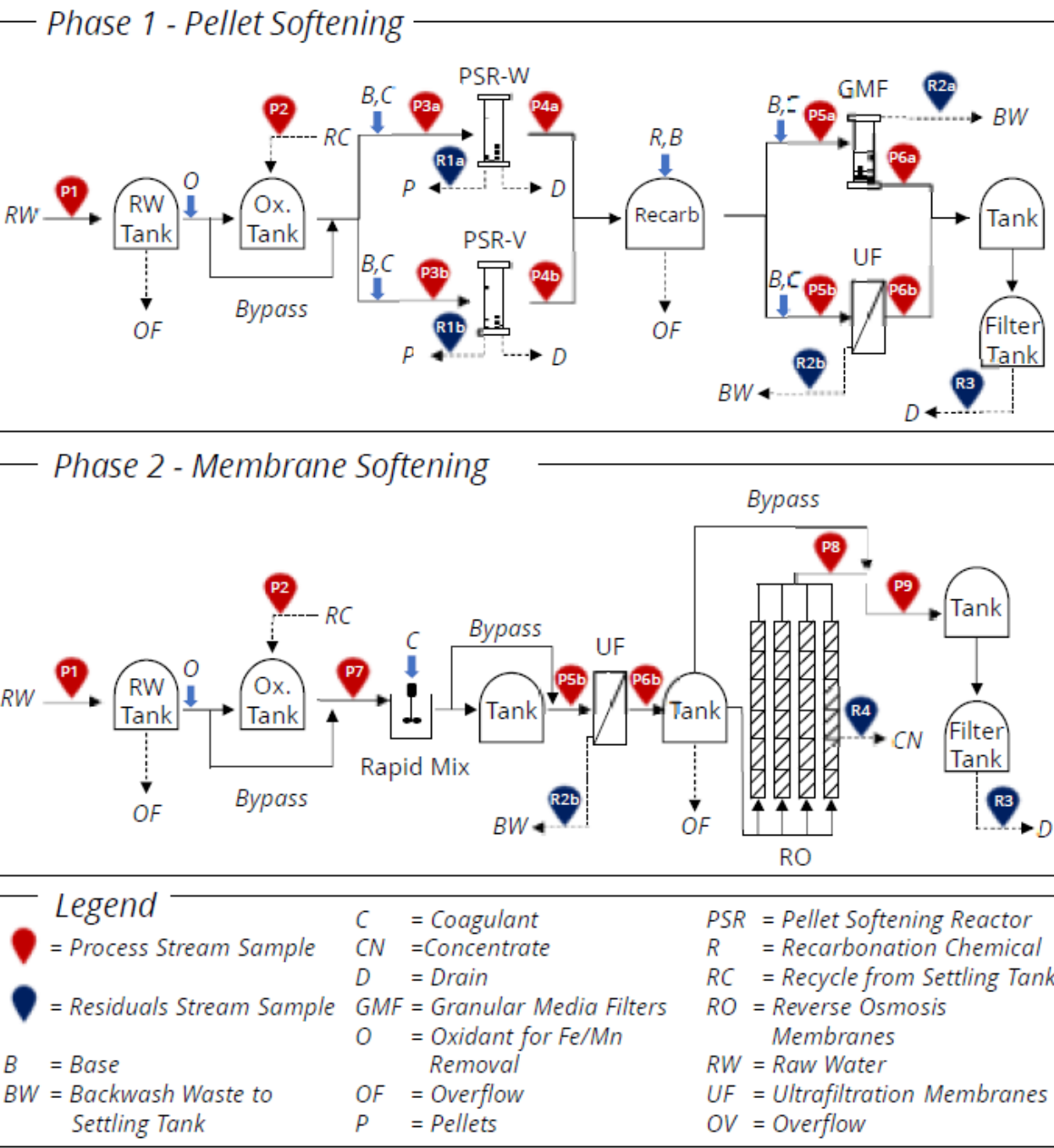
PROGRESS TO DATE

- Pilot installation was recently completed at the Ridgway Reservoir Dam!
- Testing is scheduled to begin on May 23
- PSR testing will last for 12 weeks
- UF/RO testing will last for 7 weeks



Pilot Site at Ridgway Reservoir Dam Veolia PSR Pilot Study WesTech PSR Pilot System WesTech Granular Media Filter Pilot System MEMCOR UF Pilot System

Pilot Process Flow Diagrams



ENVIRONMENTAL REVIEWS

Environmental reviews coordinated by the Colorado Dept. of Public Health and Environment (CDPHE), including cooperating agencies' input and review:

- Environmental Protection Agency
- Bureau of Reclamation
- Bureau of Land Management
- U.S. Fish and Wildlife Service
- Colorado Parks and Wildlife
- U.S. Army Corps of Engineers
- State Historic Preservation Office

Additional **environmental permitting** is obtained through:

- U.S. Fish and Wildlife Service (for potential impacts to endangered species)
- U.S. Army Corps of Engineers (for impacts to wetlands and waters)
- State Historic Preservation Office (for impacts to cultural/archaeological resources)

Draft Environmental Assessment will be provided to nearby residents, agencies, and interested parties, and is available by request by emailing:

- P7Waterline@garverusa.com