

Resilience Planning and Adaptation Training for Water and Wastewater Utilities

Adaptation Planning Exercise Instructions

Objective

The purpose of this exercise is to identify potential adaptive measures that can help protect critical assets from specific threats. In addition, we will be designing adaptation plans for the Washington County Water Conservancy District (WCWCD) drinking water system. The total cost to implement the adaptation plan can be compared to the monetized risk reduction achieved by implementing the plan in the next CREAT module.

Background

Review WCWCD's existing adaptive measures to protect the Virgin River basin water supplies from drought events:

- Community Outreach
- Demonstration Gardens
- Education Program
- Metering of Secondary Irrigation Water
- Municipal Partners Plans
- Rebates
- Reduced Impact Fees
- Water Audits

WCWCD now needs to identify potential adaptive measures that can be implemented to provide greater protection from future climate conditions, increasing their overall resilience. Potential adaptive measures under consideration are listed in the table on the following page.

Small Group Discussion Instructions

Break into groups of 4 to 5 people. On your name tent, you will find a colored dot, which will indicate your small group placement. Review the potential adaptive measures in the table on the following page that WCWCD might want to consider implementing with your group.

- 1) Choose **five** potential measures that your group thinks should be considered based on the risk reduction achieved by implementing the measure.
- 2) Rank each of your selected measures from 1 to 5, with 1 being the highest priority for implementation. Discuss with your group members the reasoning or justification for prioritizing each measure and record any notes on the flip chart provided. Draw on your own experience and think about constraints or other factors you would consider in making planning decisions (e.g., financial, political, regulatory).
- 3) During the report out, nominate someone from your group to explain your results and reasoning.
- 4) As a larger group, we will discuss prioritization and pick **five** measures that we all agree should be considered for future implementation.
- 5) In CREAT, we will select from the list of Potential Measures those measures that were agreed upon by the larger group.

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Potential Adaptive Measures for Washington County Water Conservancy District Virgin River Basin Water Supplies

Adaptive Measure	Description	Estimated Cost Over Time
Ash Creek Project	17 miles of pipeline to convey water from Ash Creek Reservoir and tributaries to new Toquer Reservoir; up to 4,000 acre-feet of additional water per year that will offset demand for culinary-quality Toquerville Springs water (cost includes bond financing).	\$40,000,000
Expand Reuse of Treated Wastewater	Expand treatment of wastewater to be used for secondary irrigation throughout county.	\$1,500,000 to \$100,000,000
Groundwater Development (including recharge projects)	Development of up to 12 new groundwater wells; new regional pipeline; 3 MGD groundwater treatment plant to remove manganese and arsenic.	\$45,000,000
Increase Secondary Water Supply Storage (Warner Valley Reservoir Project)	Additional storage for secondary water, including wastewater reuse and agricultural water; Warner Valley Reservoir and/or smaller reservoirs; up to 55,000 acre-feet of storage.	\$100,000,000
Lake Powell Pipeline Project	Bring 84,249 acre-feet of water per year to Washington County from Lake Powell; 130-mile pipeline, 5 pump stations and 5 hydro power plants.	\$1,378,000,000
Agricultural and irrigation water demand models	Develop methods to forecast and plan for future water supply needs for agricultural partners, particularly in drought-prone areas. Models will inform the potential need for new water conservation and resource protection practices. These models can be developed in collaboration with agricultural partners and related stakeholders.	\$400,000
Drought Contingency Plan	Develop or update plans for drought to prepare for possible reductions in water supply. Plans could include the use of alternative water supplies and the adoption of water use restrictions for households, businesses and other water users. These plans should be updated regularly to remain consistent with current operations and assets.	\$150,000
Monitor/Maintain Existing Infrastructure	Continue and strengthen facility condition assessments and inspections; look at vulnerabilities; would be over years to do vulnerability assessments and drought management plans; anticipated to increase cost with changing conditions.	\$50,000,000
Purchase Agricultural Water Rights and Convert to Municipal Use	Convert agricultural water to municipal use as agricultural lands are developed; re-purpose for secondary water systems; most water is brackish and not suitable for culinary use	\$40,000,000
Water Loss Reduction	Install additional meters, determine meter inaccuracy, and replace water lines known to have water loss.	\$10,000,000
Emergency Response Plan - Water Supply	Develop emergency response treatment plan for residential supply, including drought response plan and alternate (temporary) drinking water supply, such as bottled water. These plans should focus on service interruption and rationing events that may become more frequent under projected future climate conditions, especially those that the community has limited experience dealing with. Plans should be coupled with other measures to limit consequences when possible.	\$200,000