Greeley Water’s Terry Ranch Conjunctive Use Project

CSU Subsurface Water Storage Symposium

February 23, 2024
Legacy of Resource Planning

**Greeley Water: Legacy of Responsible Planning, Innovation & Service**

- **June 1870**: First water delivered to Union Colony through No. 3 Ditch
- **1905**: Voters approve bonds to build Belleview Treatment Plant, Platte River, and Pipeline
- **1945**: Seminole Dam and Reservoir construction completed
- **1947**: Greeley Council approves purchase of seven high mountain reservoirs
- **1960**: Greeley population = 24,111
- **1964**: By 1964, Treatment Plant Big Thompson River, begins operations
- **1967**: Greeley Water Conservation Board starts work
- **1971**: Greeley Water District created
- **1977**: Greeley Water District completes first major development project
- **1981**: Greeley Water District establishes first water rate
- **2000**: Greeley Water District completes last major development project
- **2020**: Greeley population = 96,332
- **2020**: Greeley becomes 1.5 million federal grant for advanced metering

**March 2021**: Greeley Council approves Terry Ranch purchase for future drought supply/livestock storage

**2021**: City Baby Holter Reservoir construction begins, increasing Windy Gap supplies and available water storage

**2021**: Greeley's water infrastructure efforts rewarded with 2021 Drought System Award from Colorado Water Forum
Terry Ranch is a non-tributary aquifer decreed with 1,200,000 acre-feet of native water.
How can Greeley use the Terry Ranch Project?

When available, treated surface water is injected into the aquifer.

During droughts, water is extracted from the aquifer, treated, and delivered to Greeley.

Aquifer levels will vary depending on drought conditions – the goal is to keep sufficient water in the aquifer long-term.
Water Quality Inspection

- Extensive evaluation and analysis:
  - Over 7,000 sampling data points
  - 575 compounds from 7 municipal grade wells

- Overall water quality is excellent

- Natural Uranium is present
  - Uranium can be removed cost effectively

<table>
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<th>Fluid 1</th>
<th>Fluid 2</th>
<th>Ratio</th>
<th>pH</th>
<th>Color</th>
<th>Clarity</th>
<th>Precipitates</th>
<th>Reactivity</th>
<th>Emulsion</th>
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<tbody>
<tr>
<td>Terry Ranch Groundwater</td>
<td>90% : 10%</td>
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| Bellvue Treatment Plant | no reaction between fluids |
| Bellvue Treatment Plant | no reaction between fluids |
| Bellvue Treatment Plant | no reaction between fluids |

| 42% Bellvue 58% Terry Ranch 30% Bellvue 70% Terry Ranch | 30% Bellvue 70% Terry Ranch |
Uranium Removal

- Ion Exchange Treatment - common and proven
- **30-day pilot test** at Terry Ranch confirmed treatment results
- City will treat to non-detection
Planning for Terry Ranch- Integrated Water Resources Plan

Present

Potential Futures of Greeley’s Water Supply System

Accounts for the uncertain future conditions

Uncertain Future
How climate change impact water supplies

Warmer climates are likely to reduce yields.

Reservoir evaporation will likely increase.

Warmer climates will likely increase outdoor water needs.

Hydrograph shifts could require changes in water rights administration.

Agricultural users with senior priority could change how they use water.
Integrated Water Resource Plan: Planning Scenarios

**Planning Scenario**
- No Climate Change
- Optimistic
- Continuing Trends
- Stressed
- Unbearable
Water Demand Projections
What will Terry Ranch implementation look like?

1. Continue completing high-priority pipeline
2. Construct treatment facility and remaining pipeline
3. Install initial wells with extraction capabilities
4. Upgrade existing wells with injection capabilities
5. Install additional wells as needed

Terry Ranch Integration
Construction Segment No. 1 and Bellvue 60” Potable Tie-in Vault
What are the triggers for needing Terry Ranch?

- Terry Ranch is eventually required in all future conditions as a drought supply
- Triggering Terry Ranch will be influenced by demand growth and yield impacts

Terry Ranch Needed for Drought Supply

Factors that could trigger Terry Ranch earlier
- High demand growth
- Significant yield impacts

Factors that could trigger Terry Ranch later
- Lower demand growth
What is water supply system strategy?

Build Robust Water Portfolio
- Change agricultural water rights
- Continue strategic acquisitions
- Continue developing storage projects

Responsibly Develop Terry Ranch
- Complete priority Terry Ranch infrastructure
- Balance phasing Terry Ranch with other needs
- Study IWRP-recommended projects

Ensure Sustainable and Affordable Water
- Continue implementing demand management
- Monitor demand growth and supply conditions
- Implement Adaptive Planning
What is Greeley’s near-term Terry Ranch plan?

• Balance Terry Ranch investment with other needs

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<th>Terry Ranch Implementation</th>
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<th>2030</th>
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<td>High-Priority Pipeline Installation</td>
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<th>Water Supply</th>
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<td>Water Rights Acquisition and Changing</td>
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<td>Implement Conservation Efforts</td>
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How will Greeley move forward?

- Adaptive Plan defines actions for Greeley to take each year

Complete Adaptive Plan Actions Each Year

- Monitor Demand Growth and Water Supply Conditions
- Evaluate Terry Ranch Triggers
- Update Terry Ranch Implementation Plan
- Assess Water Rights Changes and Acquisitions
- Review Other Water Supply Opportunities
Questions?