MEMORANDUM

TO: Sean Chambers, Water and Sewer Director

FROM: Alex Tennant, Water Resources Administrator II

DATE: November 9, 2022

RE: 2022 November Water Supply Update

ISSUE

In accordance with the Drought Emergency Plan, staff will report the water supply status to the Greeley Water and Sewer Board ("Board") in April, July and November of each year. This report is on the final numbers from water year 2022 and the forecast for water year 2023.

The Water Resources Division's goal is maximize rentals, maximize storage and minimize spill by closely monitoring drought conditions, associated hydrologic conditions, and storage levels. Previous modeling analysis has shown that the target storage level needed to provide adequate drought protection for the citizens of Greeley is approximately 21,300 acre-feet. When the target storage level is met, Board can declare an "adequate water year" with normal watering restrictions. As base use demands increase in the future, periodic reevaluation of the target storage level will be required to ensure it is adequate to supply the citizens of Greeley.

The Greeley System Storage Analysis MS excel application is used for projecting the target storage level over a 12-month period. The model performs an annual water balance to arrive at a forecasted April 1st carryover storage based on existing supplies and demands for the current year. The storage analysis model only includes standard operational practices and does not take into account other plans (additional drought restrictions, etc.) that may be available to Greeley.

BACKGROUND

In 2022, monthly temperatures were below average January through March. Beginning in April, temperatures were near average or slightly above average through November. This year's cumulative precipitation to date 9.58 inches which is 75% of the 10-year average of 12.8 inches. Monthly precipitation totals from January through July varied between above and below average and precipitation from August through November has been below average. Currently, the South Platte Basin storage is at 108% of average and the state as a whole is at 89% of average. Production through October totaled 24,817 acre-feet, which 5% higher than the 5-year average likely due to the hot, dry late summer conditions.

The Colorado drought monitor shows the majority of Colorado is abnormally dry to a moderate drought with a few areas of severe and extreme drought in the northwest and northeast. The NOAA 3-month temperature projections indicate above average temperatures throughout the state. The NOAA 3 month projection for precipitation indicates equal chance for an average precipitation year for the northernmost two thirds of the state with the southern portion being below average. Soil conditions are drier than normal for much of the state, particularly in the northeast. Snowpack levels are at 102% and 150%, for the South Platte and Colorado Basin, respectively. While storage levels are above average for the S. Platte, current conditions and projections indicate a Statewide drought that will likely persist throughout the next year with some relief in the mountains.

We are entering year three of La Nina which developed in September 2020 and La Nina is expected to be prevalent for this winter as well. For Colorado this means variable conditions across the State and from year to year, however, generally the southern portion of the state experiences warm and dry conditions and the northern part of the state sees colder temperatures, more snow and more wind.

For Water Year (WY) 2022, the High Mountain Reservoir (HMR) system yielded around 775 acre-feet of supply with the majority of that rented out to agriculture. This is significantly less than historical yield because we left Comanche and Hourglass reservoirs empty due to concerns of potential impacts from the surrounding Cameron Peak burn area. The Greeley Loveland System (GLIC) yielded 11,565 acre-feet, with 13,500 acre-feet carried over to WY 2023. Greeley rented out over 8,100 acre-feet of excess Colorado Big Thompson water (C-BT). In total, Greeley leased approximately 20,321 acre-feet in agricultural leases and high mountain reservoir water.

The Greeley System Storage Analysis table for Water Year 2023 shows the April 2024 storage level will be approximately 29,128 acre-feet. This conservatively assumes the following:

- High demands in Greeley
- No Windy Gap carryover
- No high mountain reservoir or native Seaman supplies
- 40% quota issued for the C-BT project
- Collateralizing 4,450 acre-feet of C-BT for Greeley's Windy Gap requirements
- No agricultural rentals
- Dry year yields for the GLIC system

Given GLIC cannot currently be treated and fully utilized year round, the estimated target storage volume minus the GLIC water that cannot feasibly be used is 21,728 acre-feet, which is still above Greeley's 21,300 acre-foot target.

April 1, 2023 Storage (acre-feet)	
CBT	22,112
Windy Gap	1,000
GLIC	12,500
Tunnel	1,000
Total	**36,612**
Demands (April 1, 2023-March 31, 2024) (acre-feet)	
CBT	18,965
Windy Gap	4,450
GLIC	10,405
Tunnel	1,000
Total	**34,820**
Yields through April 2024 (acre-feet)	
CBT (Nov. 2022-April 1, 2022)	11,402
Windy Gap	4,366
GLIC	10,653
Tunnel	800
Total	**27,221**
April 2024 Storage by Source	
CBT	15,728
Windy Gap	0
GLIC	13,000
Tunnel	400
April 2023 Storage	**29,128**
April 2023 Storage-minus unusable GLIC	**21,728**
Target Storage Volume	**21,300**

SUMMARY

Initial Projections show the target storage volume is greater than 21,300 acre-feet. Staff will revise the target storage volume in April after Northern declares the quota and the Board will make a determination of adequate water year at the April 2024 Board meeting.