

Terry Ranch Water Project

Water & Sewer Board Update

October 21, 2020



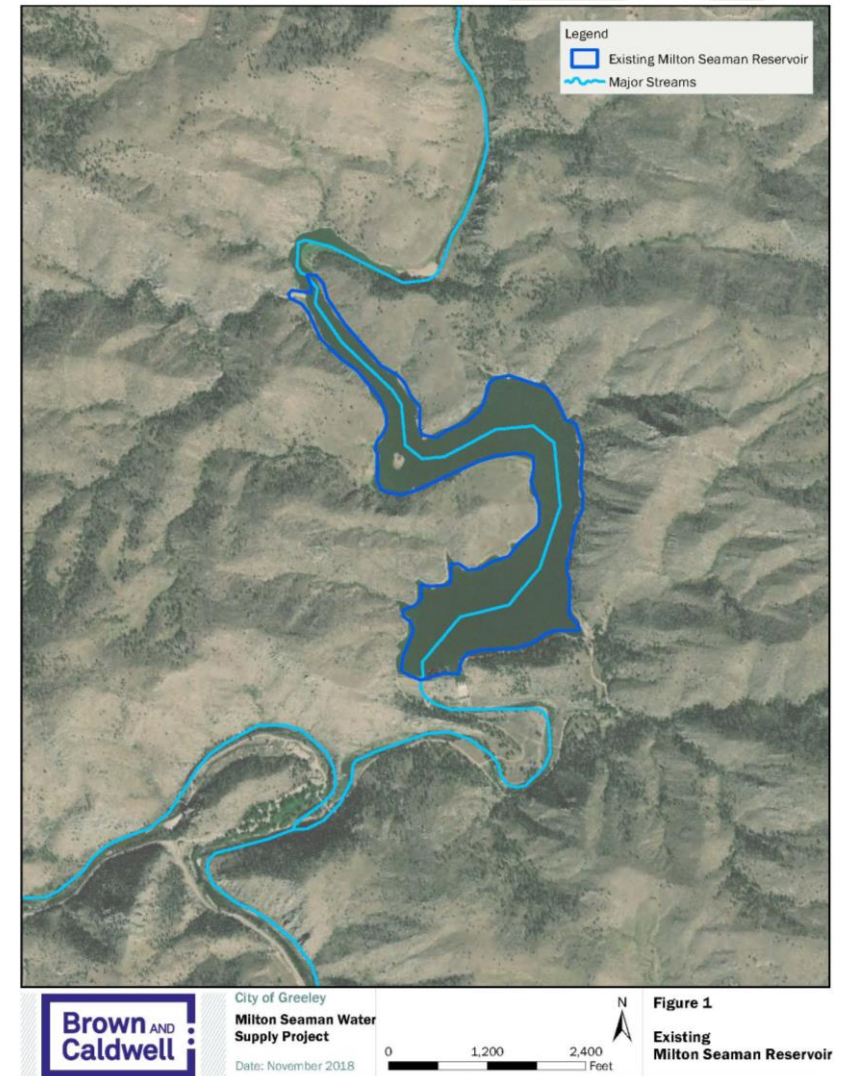
Agenda

1. Recap of Water Supply Alternatives
2. Diligence Update
3. Communication
4. Next Steps



Storage

- ✓ 2003 – Milton Seaman Reservoir enlargement identified in planning
- ✓ 2006 – Began permitting
 - ✓ Numerous federal, state, & county permits required
 - ✓ Identify, quantify and mitigate environmental impacts
 - ✓ Evaluate alternative projects that would also meet Greeley's future need



Milton Seaman Project



- ✓ Permitting complications
 - ✓ Length and cost
 - ✓ Impacts to wetlands, stream channel, and critical habitat
 - ✓ Potential inundation of U.S. Forest Service, Larimer County, and City of Fort Collins properties
- ✓ Uncertain that Greeley would receive necessary permits

Milton Seaman Project

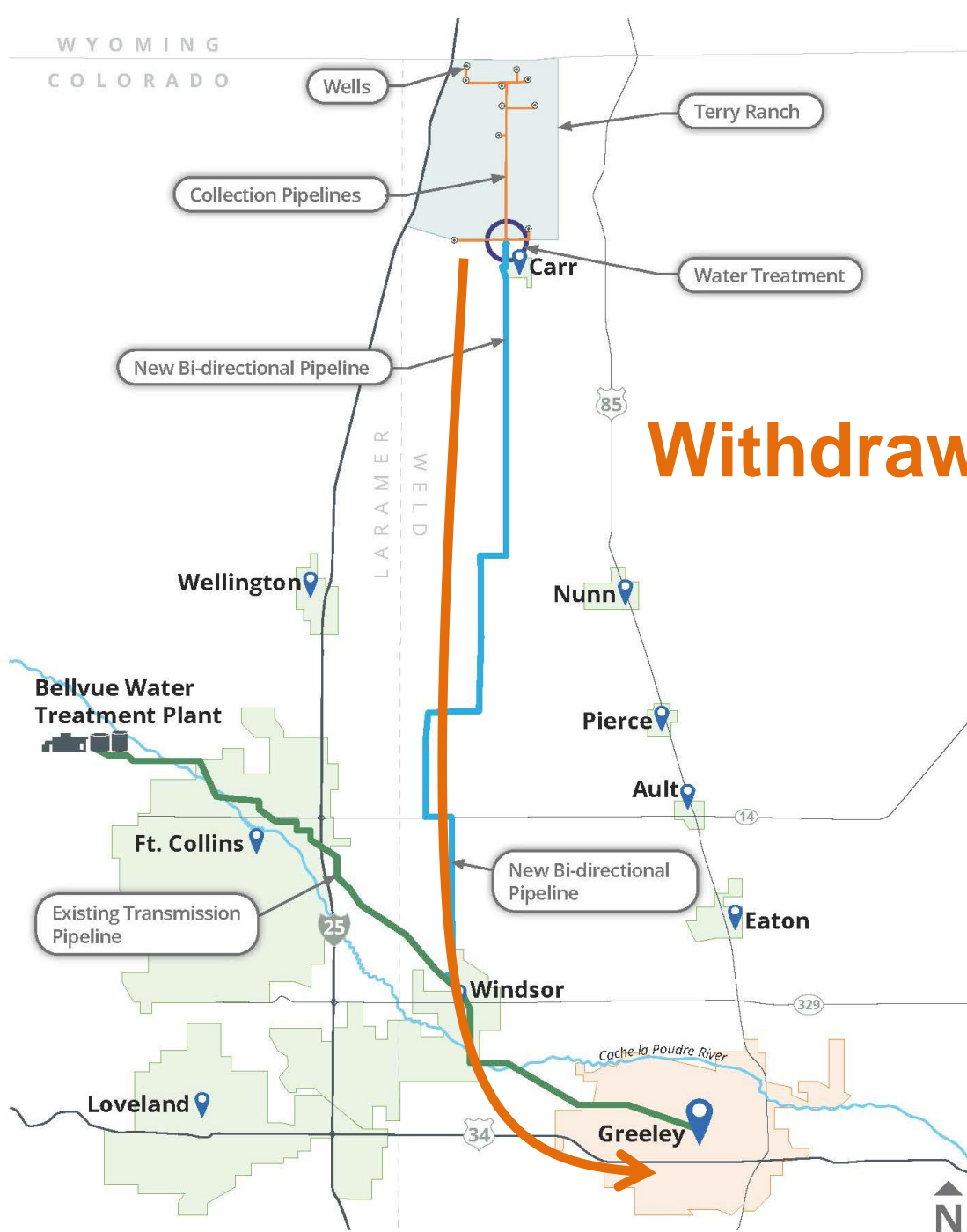
- ✓ Construction cost escalation
 - ✓ Originally estimated at roughly \$100M (2003)
 - ✓ After more detailed engineering, rose to between \$500M and \$1B (2019)
- ✓ Escalation similar to other regional water storage projects
- ✓ Increased water rates



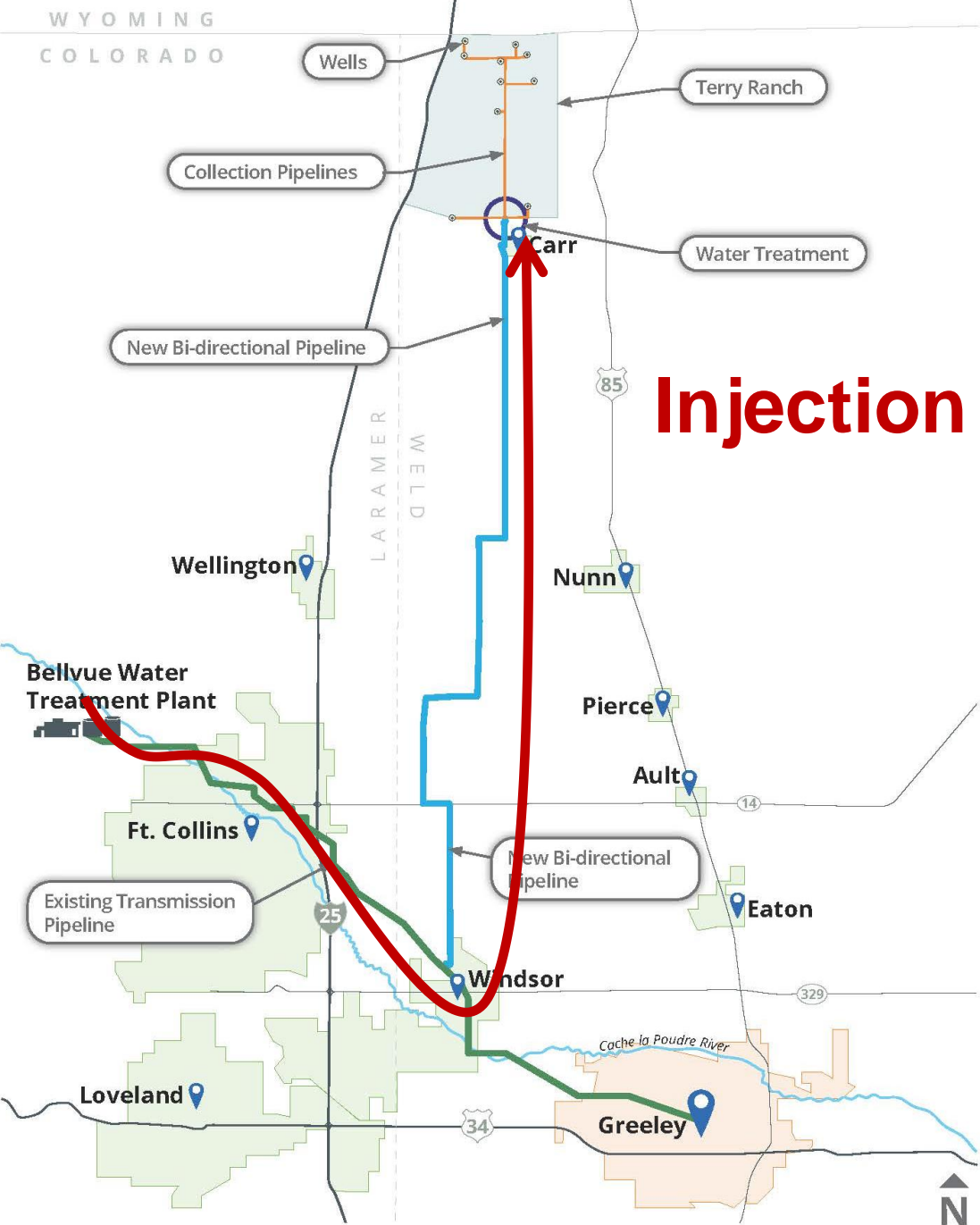
Storage Alternatives

- ✓ Well over 100 alternatives evaluated during federal permitting
- ✓ Army Corps mandated Greeley look harder at other less impactful alternatives (2018)
- ✓ W&S Board asked for “deep dive” in late 2018
 - ✓ Apart from federal permitting
 - ✓ Evaluated alternatives with fewer permitting challenges
- ✓ Identified Terry Ranch Project

Terry Ranch Overview



- ✓ Pump from wells
- ✓ Water treatment at ranch
- ✓ Connect to existing pipeline
- ✓ Potential for hydropower generation

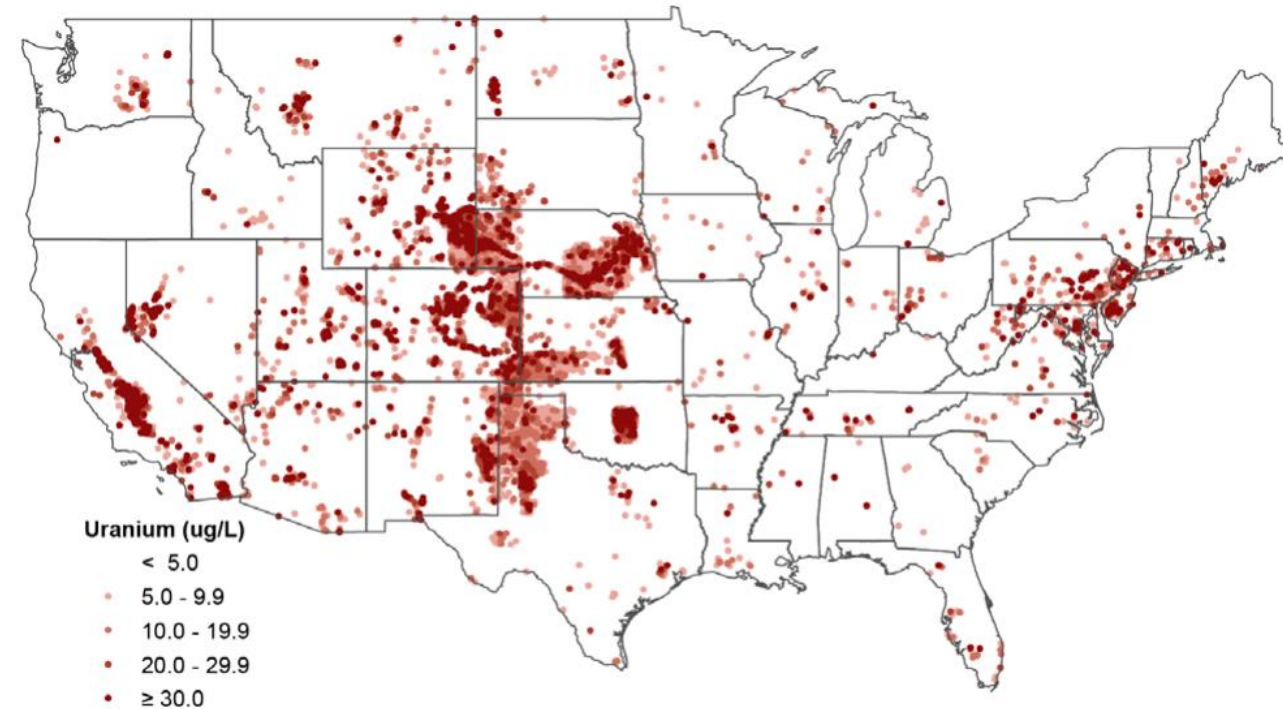


Terry Ranch Overview

- ✓ Treat at Bellvue Water Treatment Plant
- ✓ Use existing 60" pipeline
- ✓ Pump to treated water north to the ranch
- ✓ Inject
- ✓ Store for future use

Water Quality

- ✓ Preliminary testing
 - Overall, excellent water quality
 - Minimal treatment, but
 - Detection of uranium
- ✓ Uranium is a widespread, naturally occurring constituent
- ✓ Water quality and treatment are focus of inspection activities



Project Costs

- ✓ Construction cost: \$250M
- ✓ Seller financing: \$125M
- ✓ Project buildout and costs can be phased

- ✓ *All costs are preliminary, approximate and subject to change*
- ✓ Refined cost estimates in process with consultants

Operational Costs

Treatment*	Cost per kgal	Cost per AF
Boyd (2014-2019 Avg)	\$0.86	\$281
Bellvue (2014-2019 Avg)	\$0.27	\$87
Terry Ranch Withdrawal**	\$0.32	\$104
Terry Ranch Injection + Withdrawal*	\$0.73	\$237

*Includes pumping, treatment, and all overhead.

**Cost at buildout (2065+). Near terms costs may be higher. Based on Jan. 2020 preliminary design. Concept design will refine

Water Rights



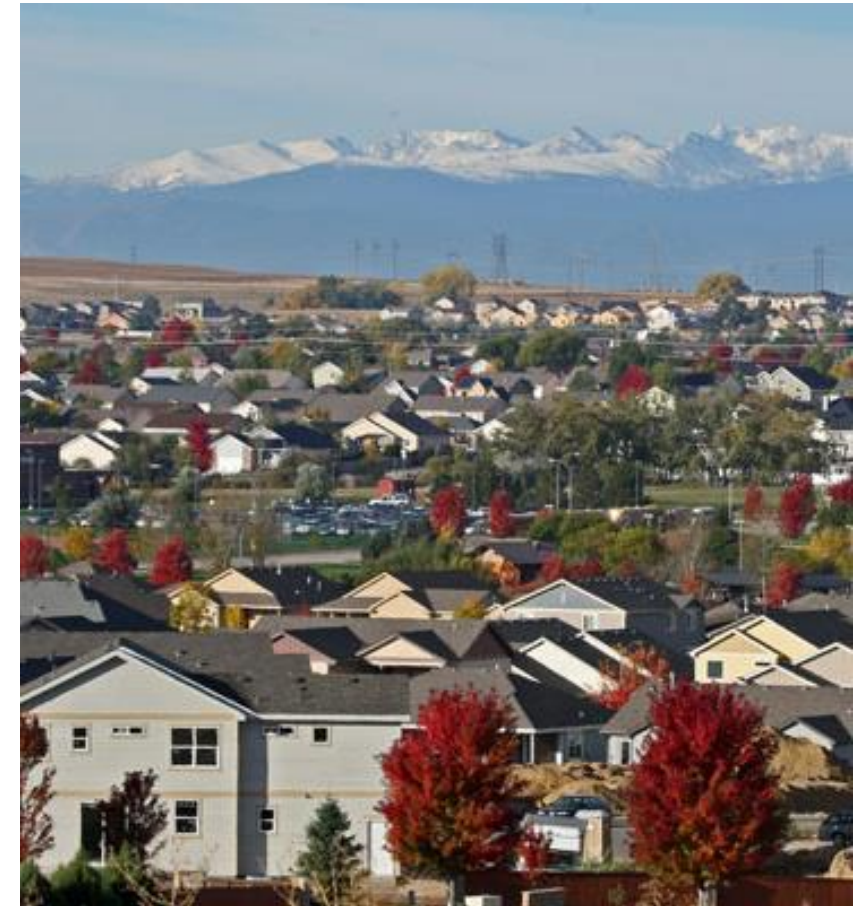
- ✓ Greeley is not abandoning any water rights
- ✓ May transfer junior conditional rights for Milton Seaman enlargement to alternative location



Contract Status

Unique Transaction

- ✓ Purchase with raw water “credits” rather than cash
 - ✓ Credits redeemable to meet Greeley’s water dedication requirements
 - ✓ Credit = 1 acre-foot of dedication
 - ✓ Greeley foregoes future water dedication (cash-in-lieu) revenue
- ✓ Shares financial risks with seller (Wingfoot)
 - ✓ Seller is making an investment in Greeley



Transaction Overview

Wingfoot Receives:

1. 12,121 Credits
2. Revenue sharing for water sold outside Greeley
3. Put Option to sell Credits back to Greeley

Greeley Receives:

1. Decree
2. Access easement
3. State Land Board lease
4. Five existing wells
5. \$125M towards infrastructure
6. Call Option to buy-back Credits

Restrictions

- ✓ Wingfoot's revenue depends on selling Credits
- ✓ City policies on raw water dedication greatly affect the Credit market
- ✓ Greeley defaults if it enacts policy changes that disadvantage credits
- ✓ Agreement does not prohibit additional acquisition of water



Ownership and Control

- ✓ Ownership transferred through tenancy in common (10-years)
- ✓ Greeley will solely and perpetually control and operate
- ✓ Greeley will solely own after credits are issued or 10-years



Purchase Timeline

Execute
Master
Agreement
(Jun 2020)

Conduct
Diligence
(Jun-Jan)

Present
Findings &
Public
Feedback
(Q1 2021)

Close
Purchase
(Q1 2021)



Diligence Update



Diligence Plan

1. Environmental
2. Hydrogeology
3. Water Quality
4. Design & Cost Estimate
5. Title, Permitting, Legal, Etc.



Environmental



- ✓ Inspections:
 - ✓ Endangered species
 - ✓ Wetlands & water
 - ✓ Hazardous materials
 - ✓ Cultural resources
- ✓ No significant issues found thus far

Hydrogeology

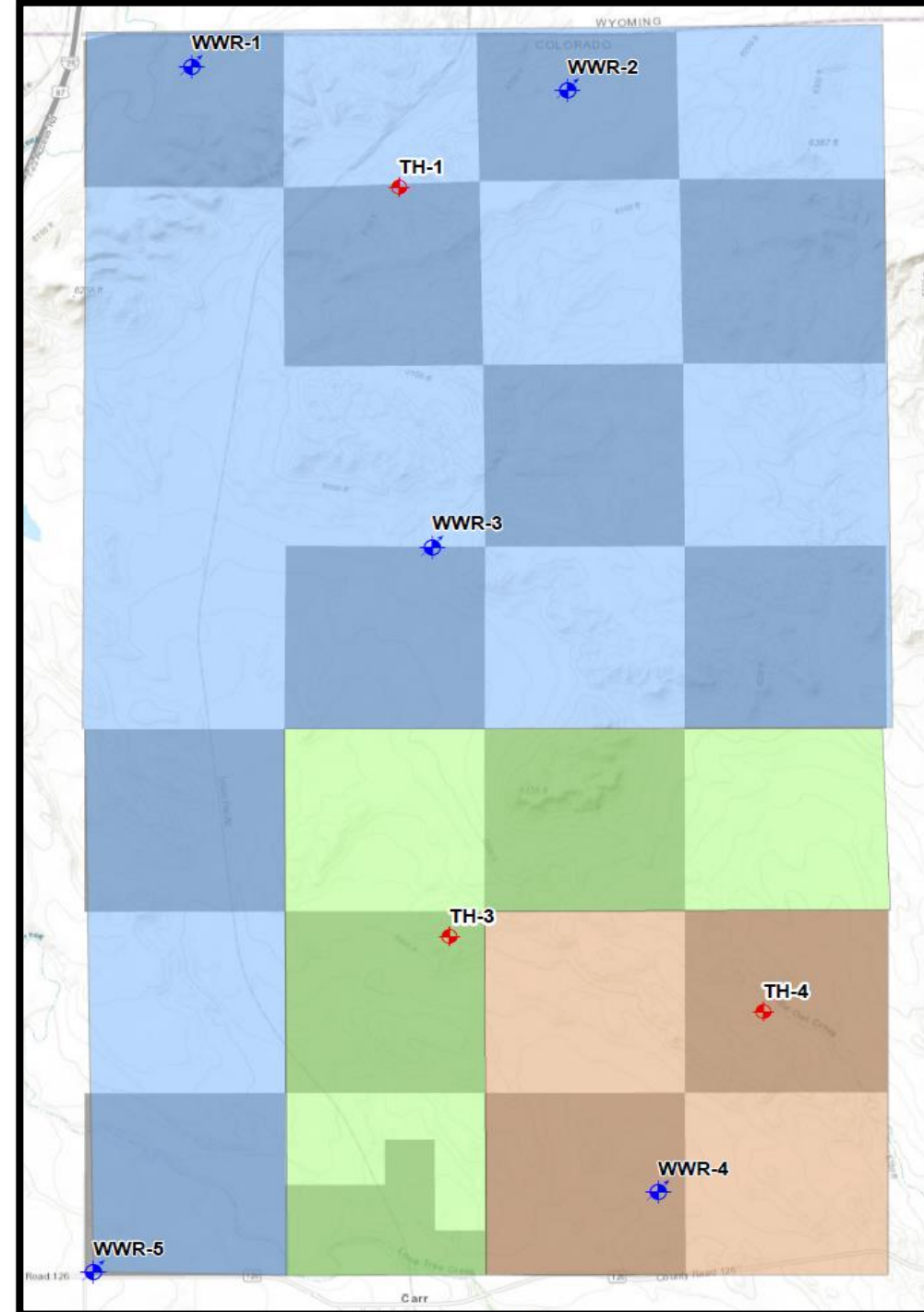
- ✓ Two exploratory wells drilled (in addition to 5 existing wells & 6 previous bores)
- ✓ Aquifer can be used for ASR
- ✓ Aquifer has sufficient storage capacity
- ✓ Well yields range from 750 gpm/well in north to 200 gpm/well in south



Hydrogeology

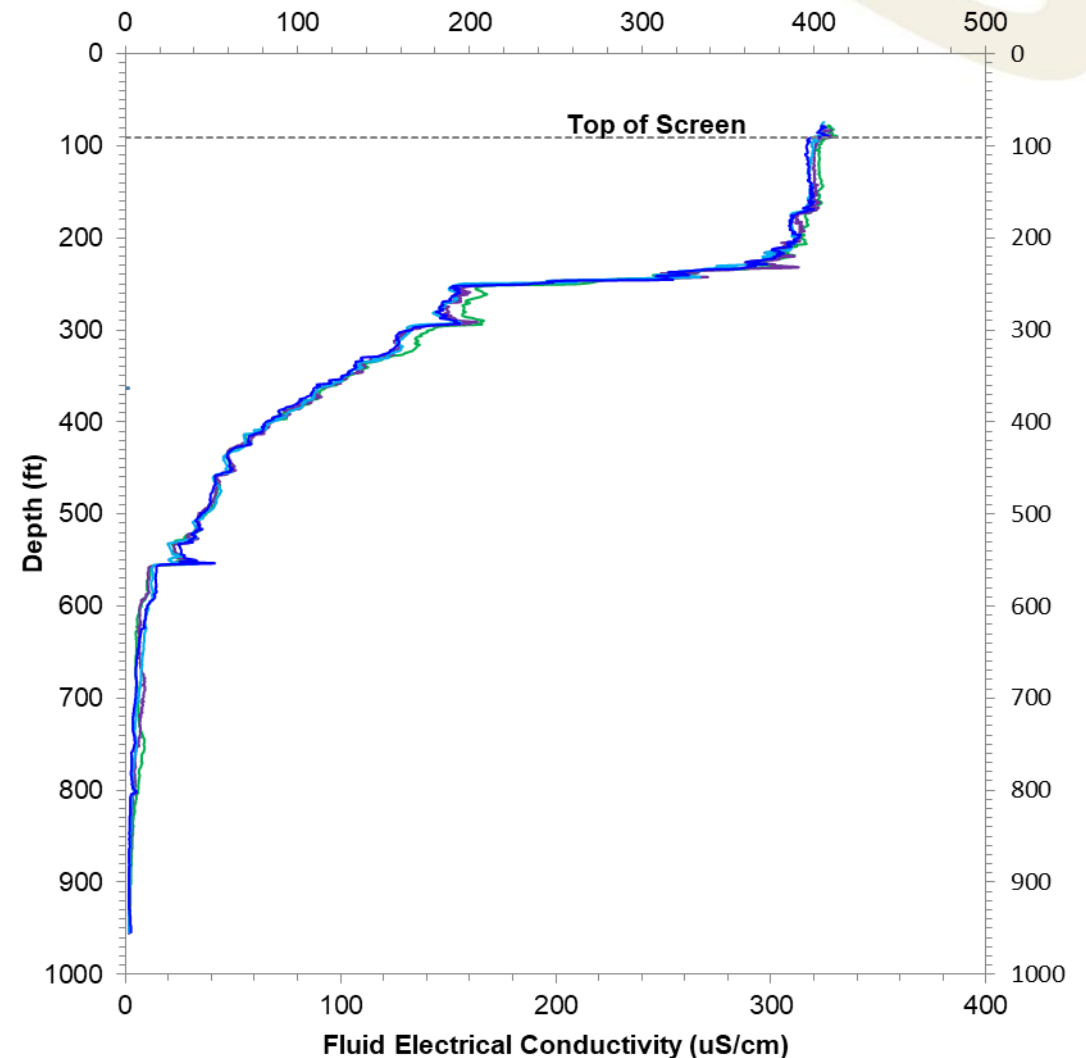
- **Blue** – suitable
- **Green** – marginal
- **Orange** –unsuitable

Modeling suggests Greeley may be able to recharge up to 14,500 AF/yr for 5 years or more in the northern area while limiting groundwater mounding to acceptable levels in the south.



Hydrogeology

- ✓ Aquifer has 2 to 3 unique producing zones
- ✓ Majority of production comes from the shallow aquifer zone(s)
- ✓ Wells can be shallower than originally anticipated



Water Quality

- ✓ Groundwater quality data have been collected from:
 - ✓ 5 existing wells, sampled in 2019 and resampled in 2020
 - ✓ Two exploratory wells
 - ✓ Composite and depth-specific samples



Water Quality

- ✓ Over 5,000 WQ data points collected with more to come
- ✓ Over 575 parameters
- ✓ There will be no “what about”s
- ✓ 2020 data align with 2019
Wingfoot data
- ✓ No surprises



Treatment

- ✓ Uranium removal requires treatment
- ✓ Uranium present in high-producing zones
- ✓ Cannot be grouted out
- ✓ Uranium can be treated to non-detect (0.2 ug/L)



Diligence Findings – Water Quality



✓ Uranium

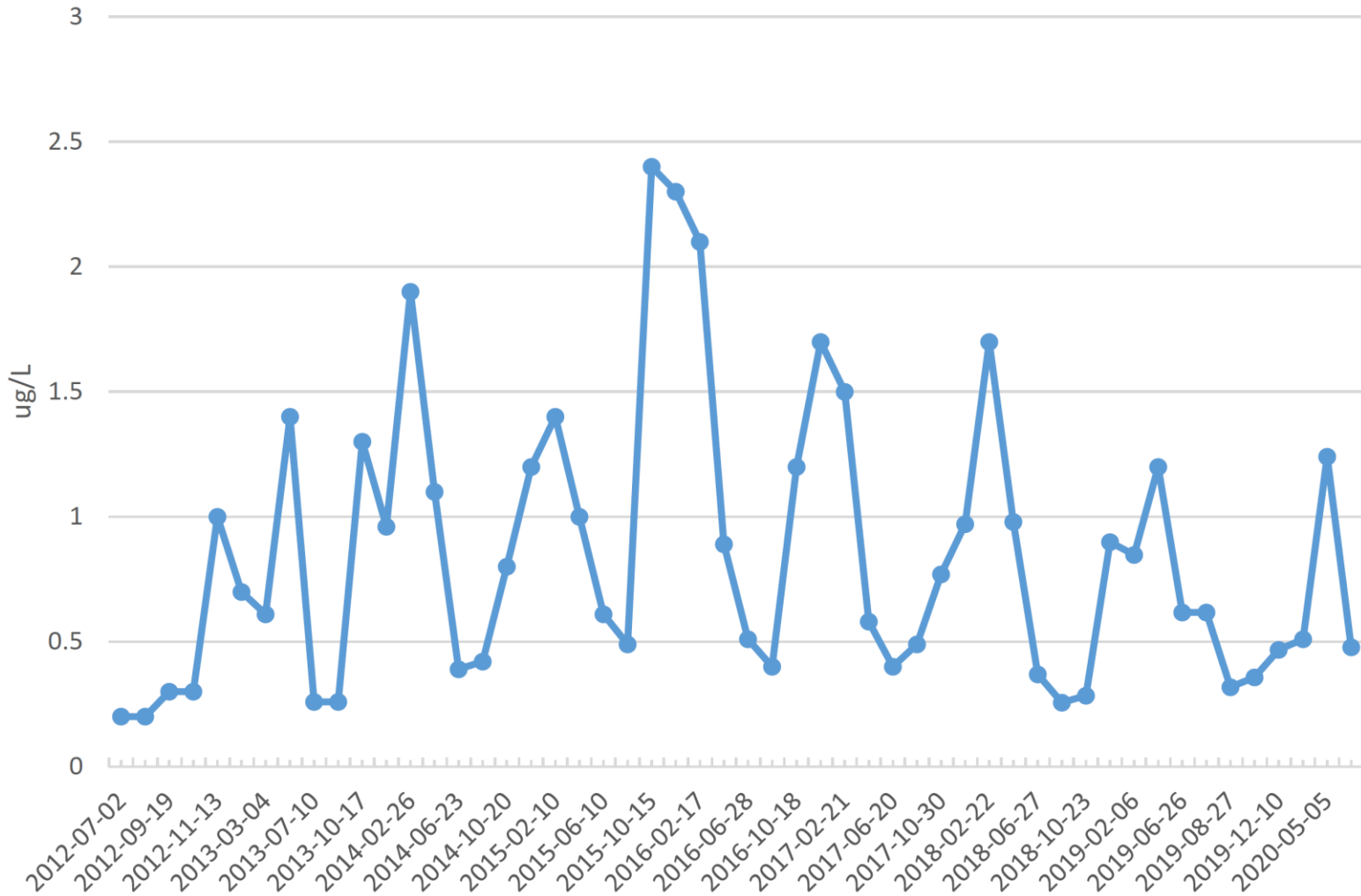
- ✓ MCL is 30 ug/L
- ✓ One test in 2019 was 43 ug/L (WWR-1)
- ✓ 2020 samples from WWR-1 at lab

✓ Manganese

- ✓ SMCL – 50 ug/L (can color water and cause taste concerns)
- ✓ Greeley limits to 20 ug/L
- ✓ 2020 data: 6-44 ug/L; flow weighted: 17 ug/L

Poudre River Uranium

Cache la Poudre River Above Fort Collins-Uranium Values (2012-2020)



Diligence Findings – Water Quality

✓ Gross Alpha

- ✓ MCL is 15 pCi/L
- ✓ 2020 data: 17 - 35 pCi/L
- ✓ Decay product of uranium; removed with uranium treatment

✓ Radon

- ✓ No MCL (inhalation risk)
- ✓ Removed via aeration

✓ Manganese

- ✓ SMCL – 50 ug/L (can color water and cause taste concerns). Greeley limits to 20 ug/L
- ✓ 2020 data: 6-44 ug/L; flow weighted: 17 ug/L

✓ Arsenic

- ✓ MCL – 10 ug/L (common in groundwater)
- ✓ 2020 data: 1.4 – 3.8 ug/L

✓ Iron

- ✓ SMCL – 300 ug/L (common in groundwater and can impact ion exchange)
- ✓ 2020 data: 8 -123 ug/L

Water Quality

- ✓ Outstanding issues:
 - ✓ Water quality changes from storing Bellvue water in the aquifer
 - ✓ Water quality changes from mixing treated groundwater with Bellvue water
 - ✓ Additional lab results, especially from WWR-1



Water Quality

- ✓ Additional testing (Geochemistry)
 - ✓ Geochemical modeling
 - ✓ Bench-scale testing (mix Bellvue water with groundwater and with aquifer material)
 - ✓ **Pilot injection test**
(inject/store/recover Bellvue water)



Courtesy Southern Nevada Water Authority

Water Quality



- ✓ Additional testing (Water Quality & Treatment)
 - ✓ Additional water quality testing
 - ✓ Mixing studies of Terry Ranch water and Bellvue water
 - ✓ Distribution system water quality modeling
 - ✓ **Pilot treatment plant**

Comparable Treatment

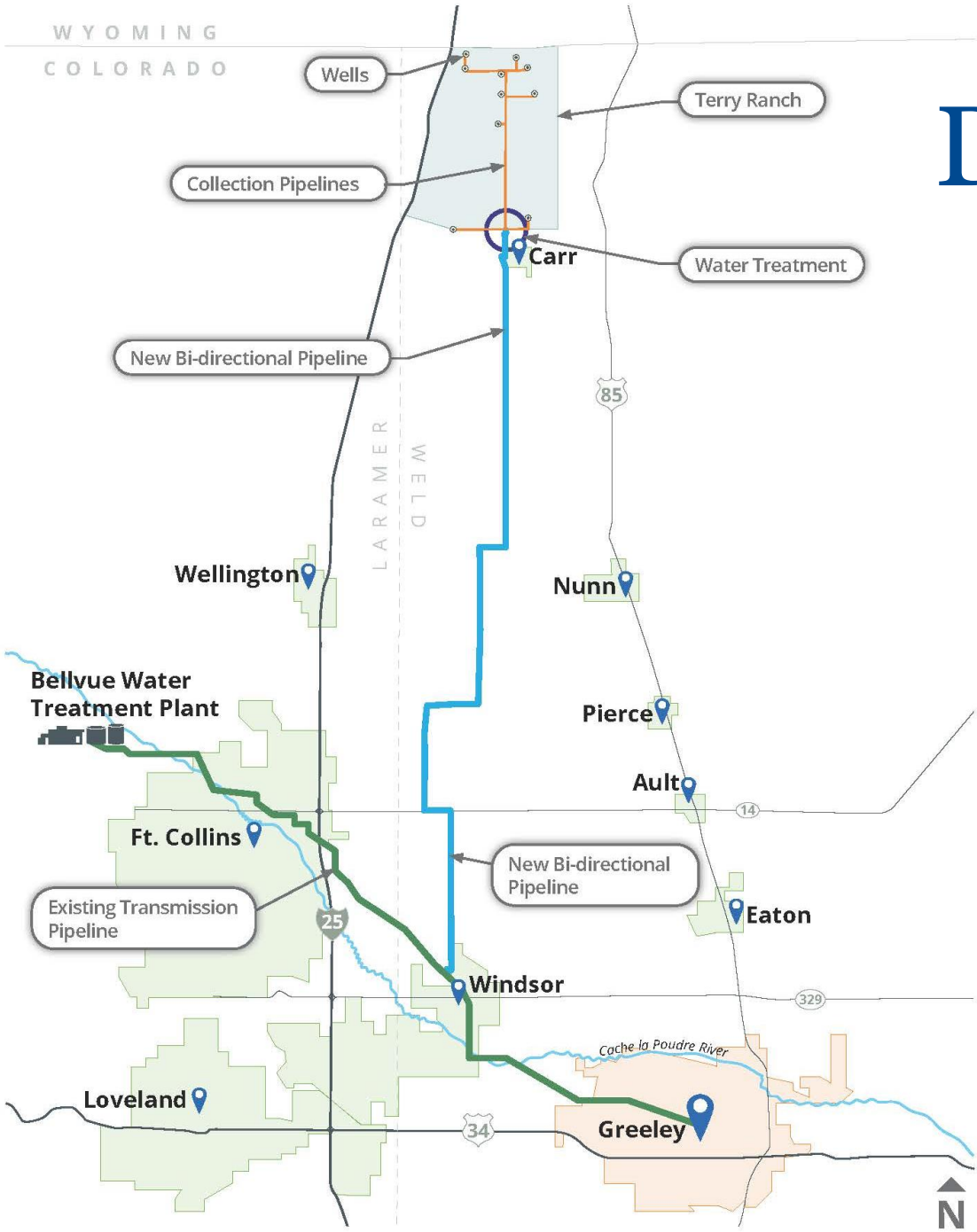
Case Study Location	State	Design Flow	Influent U (ug/L)	Treated U (ug/L)
McCook	NE	6.8 MGD	15.1 - 54.3	<25
Grand Island	NE	3500 GPM	35	<5
Bridgeport	NE	1500 GPM	78	<25
Hillview Water Company	CA	1000 GPM	Not Available	Not Available
Mission Springs Water District	CA	900 GPM	Not Available	Not Available
Golden State Water Company, Morongo Valley	CA	600 GPM	25 - 35	<5
Bass Lake Water Company	CA	125 GPM	25 - 300	<20
Gresham	WI	100 GPM	Not Available	Not Available
Dinwiddie County	VA	80 GPM	80 - 90	<5
Chesdin Manor, Aqua America	VA	80 GPM	Not Available	Not Available

*Treated Uranium levels listed as below community target level

Peer Reviews

- ✓ Peer reviews of LRE and Brown & Caldwell's work
- ✓ Will review methodology and results, but also make independent determinations
- ✓ Geochemistry
 - ✓ Chris Wolf, Daniel B. Stephens & Associates
- ✓ Water Quality & Treatment
 - ✓ Carollo Engineers
 - ✓ Long history with Greeley WTPs





Design & Cost Estimate

- ✓ Preliminary pipeline layout
- ✓ Hydraulics and instrumentation
- ✓ Power
- ✓ Treatment design
- ✓ Revised cost estimate



Communication



Community Outreach



- ✓ Website launch:
greeleygov.com/terryranch
- ✓ W&S Board editorial
- ✓ Oct. 13 City Council Work Session
- ✓ Social media responses
- ✓ Outreach to op-ed authors

Public Engagement

- ✓ Present diligence findings as available to W&S Board and City Council
- ✓ Virtual open houses
- ✓ Greeley Tribune

- ✓ Continued social media engagement
- ✓ Online videos
- ✓ Ongoing updates to website FAQs



Next Steps



- Diligence and inspection
- Present diligence findings & collect public input
- W&S Board consideration of closing and recommendation to Council
- Council consideration of closing

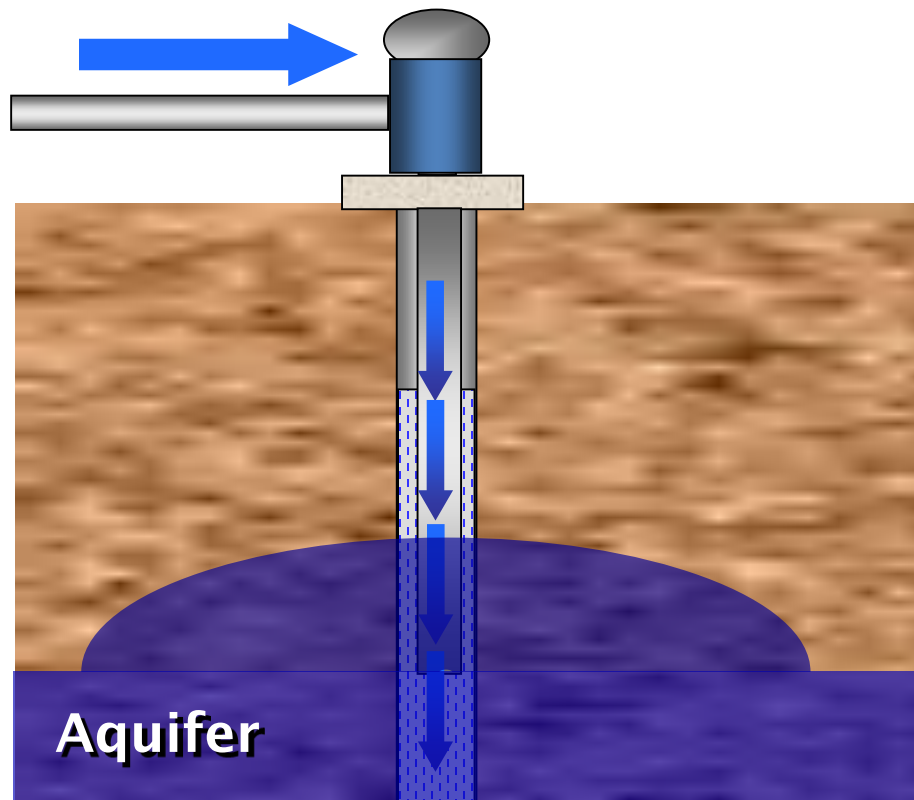


Thank you.

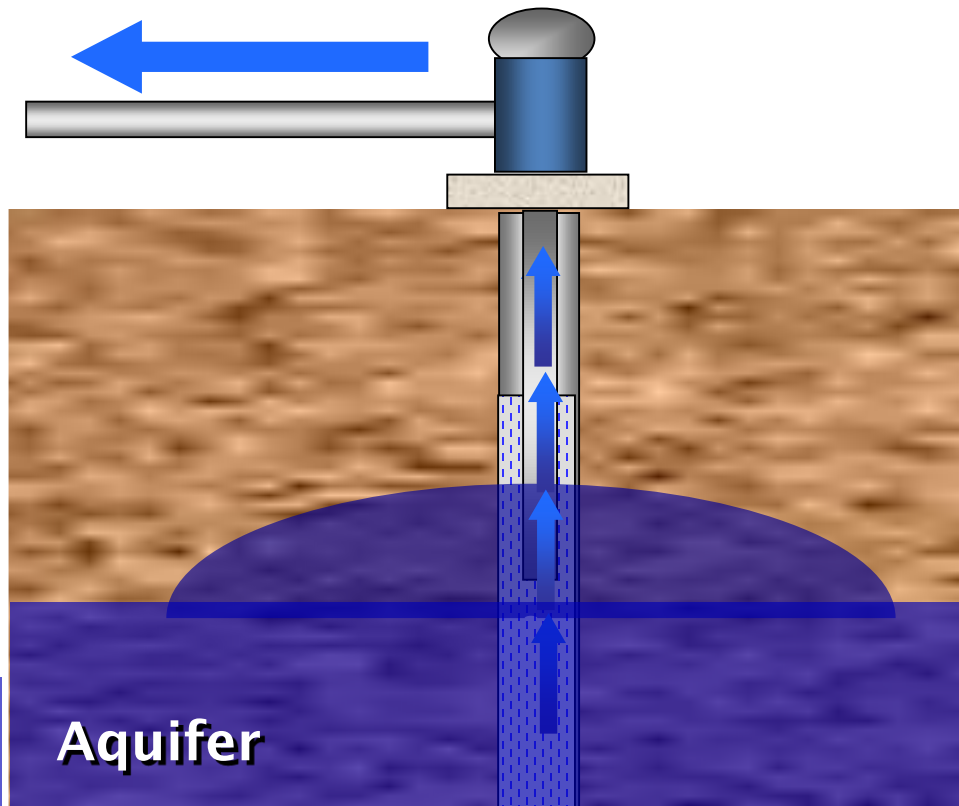


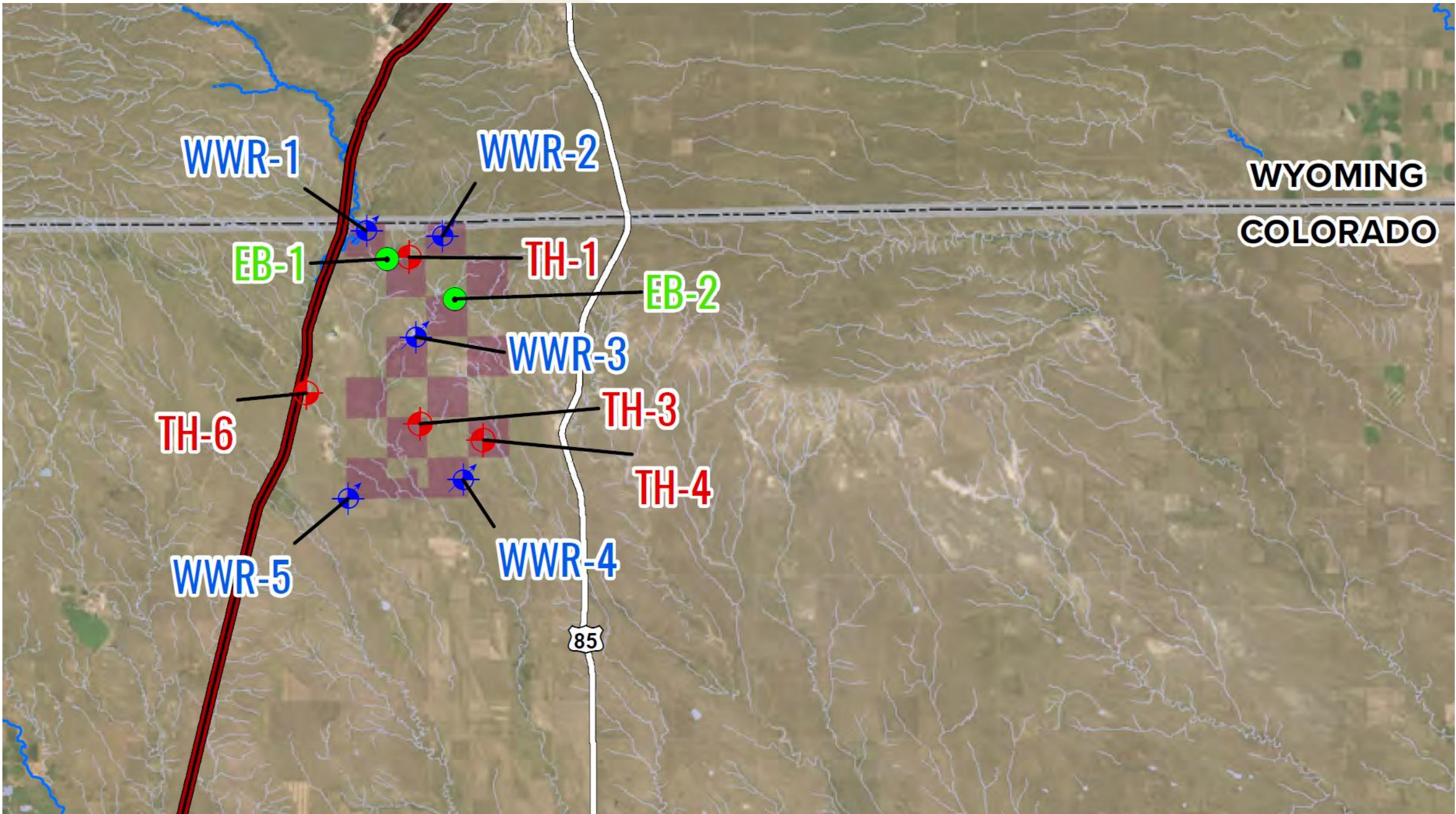
Aquifer Storage & Recovery

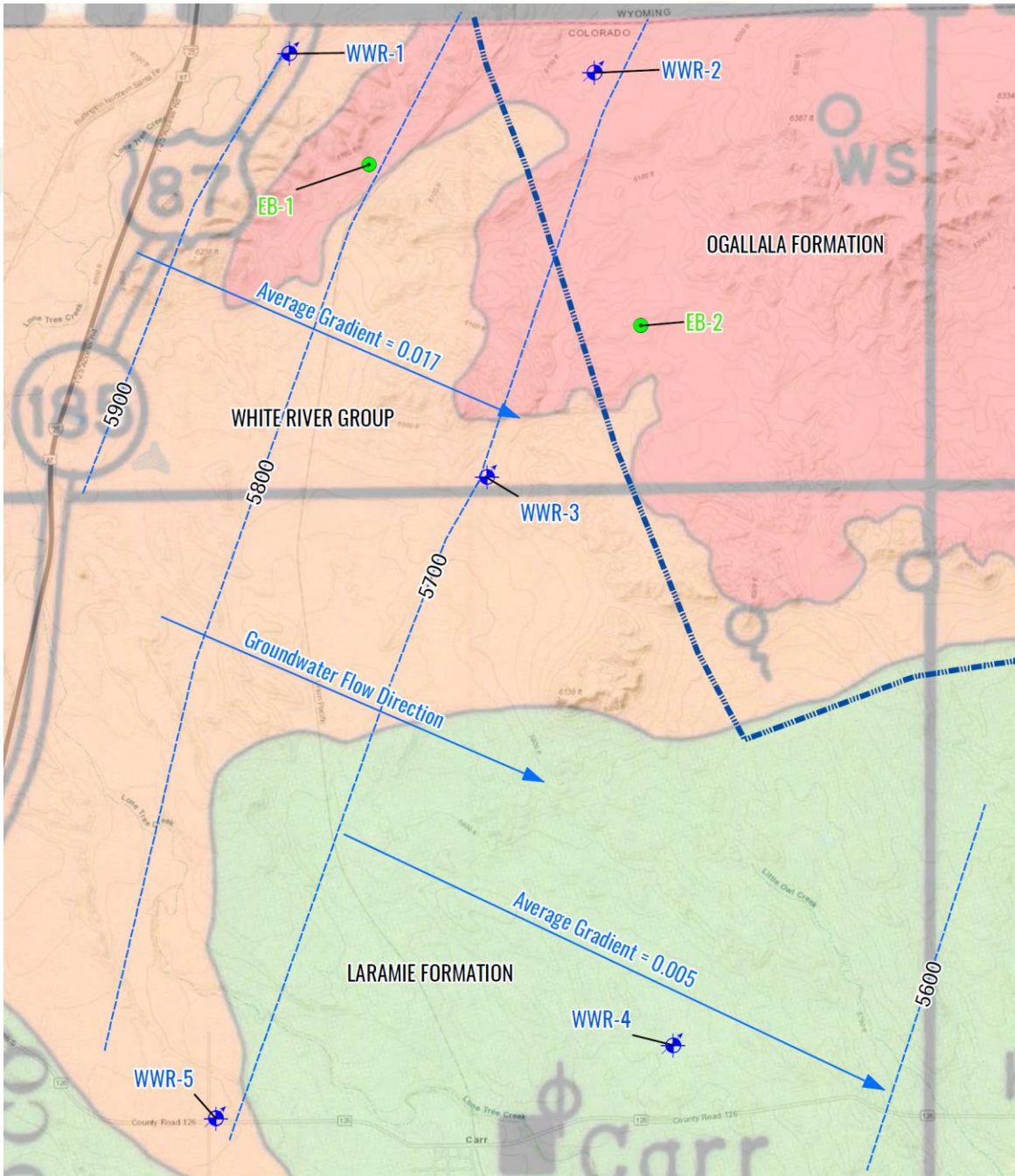
**Inject/Store Treated
Water When Surplus is
Available**



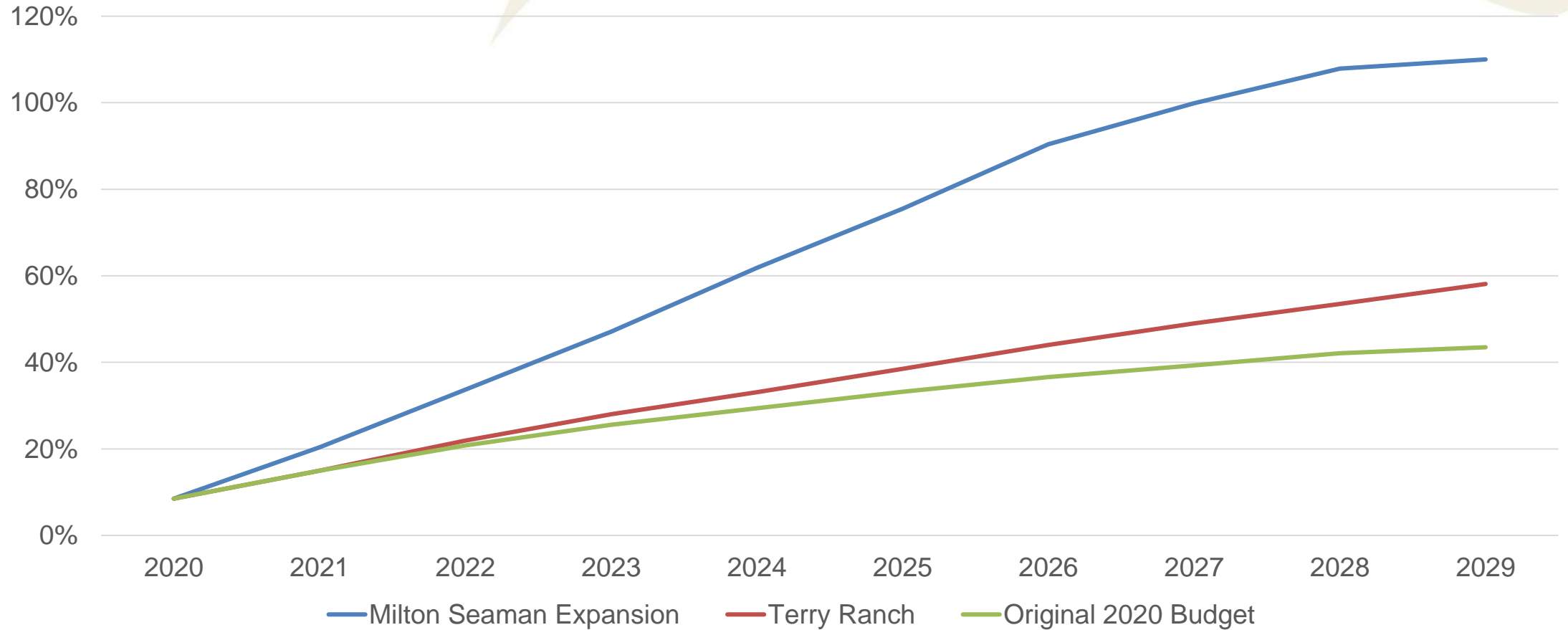
**Withdraw/Recover
Stored Water When
Needed**

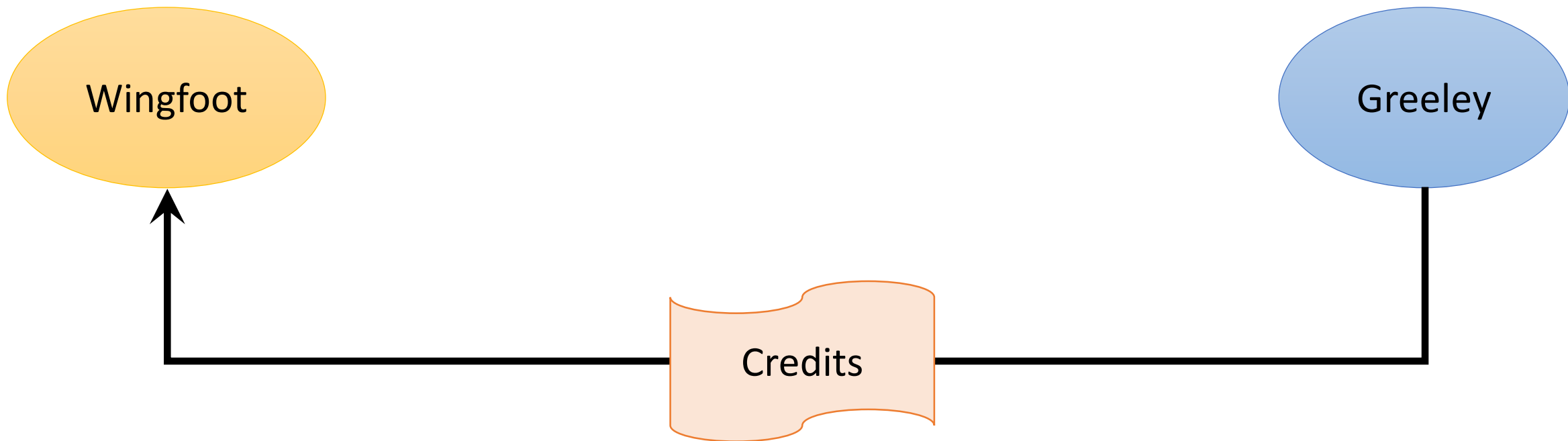




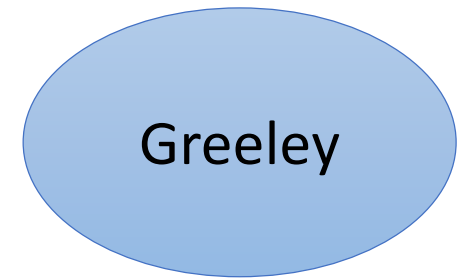
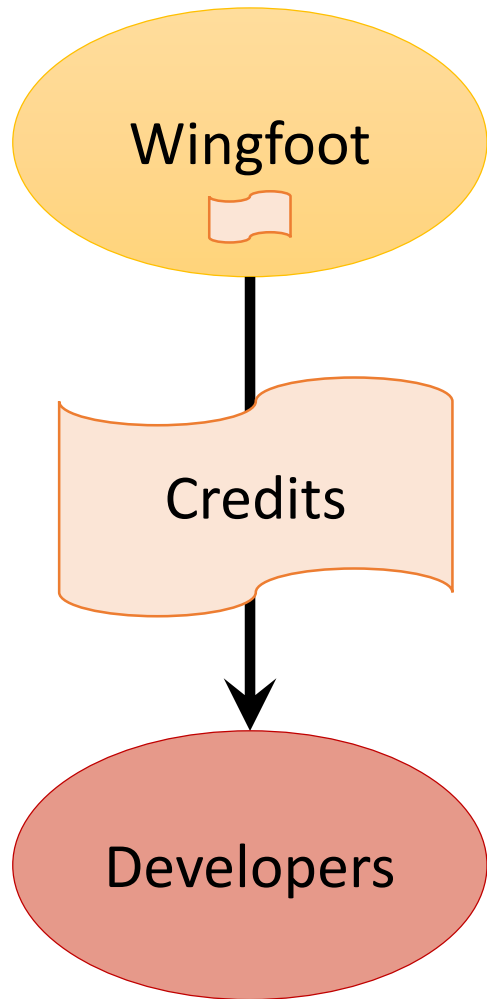


Cumulative Rate Impacts

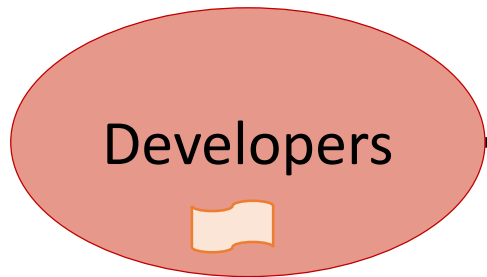
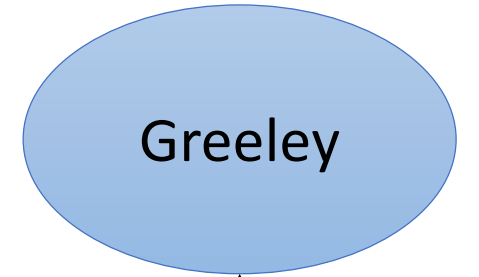




Credit Issuance

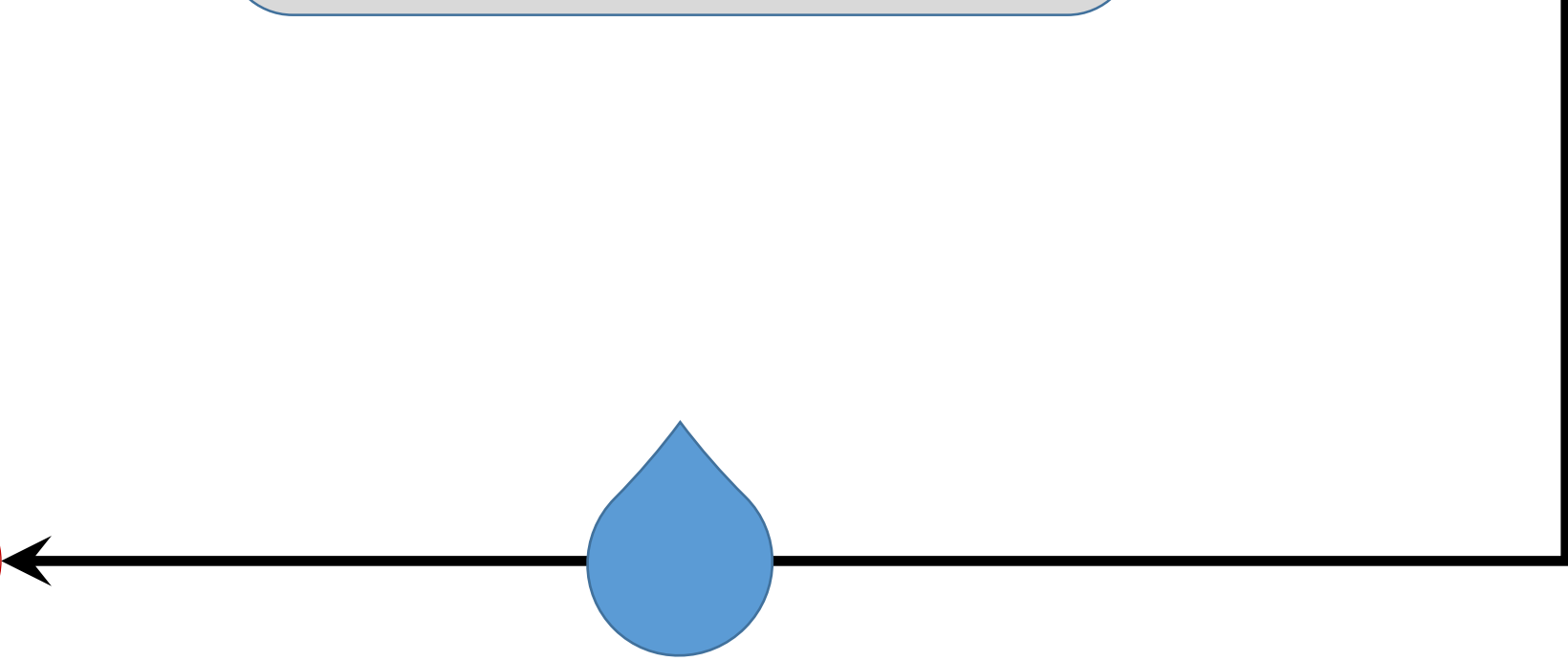
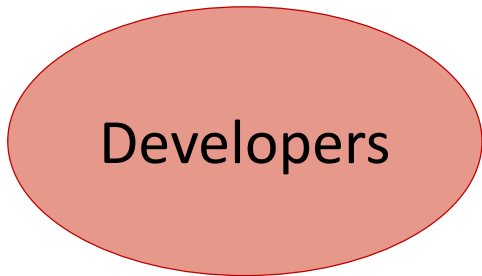
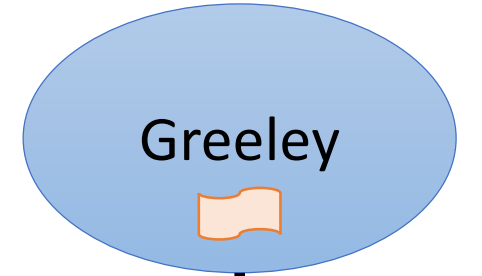
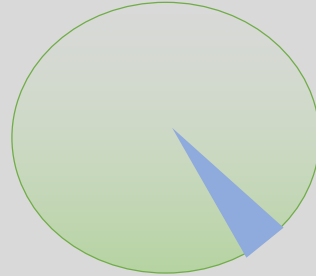


Credit Redemption



Credit Redemption

Tenancy In Common Agreement



Credit Redemption