REPLENISH

Big Bear

May 22, 2024

Replenish Big Bear: Background, Alternatives and Path Forward

AGENDA

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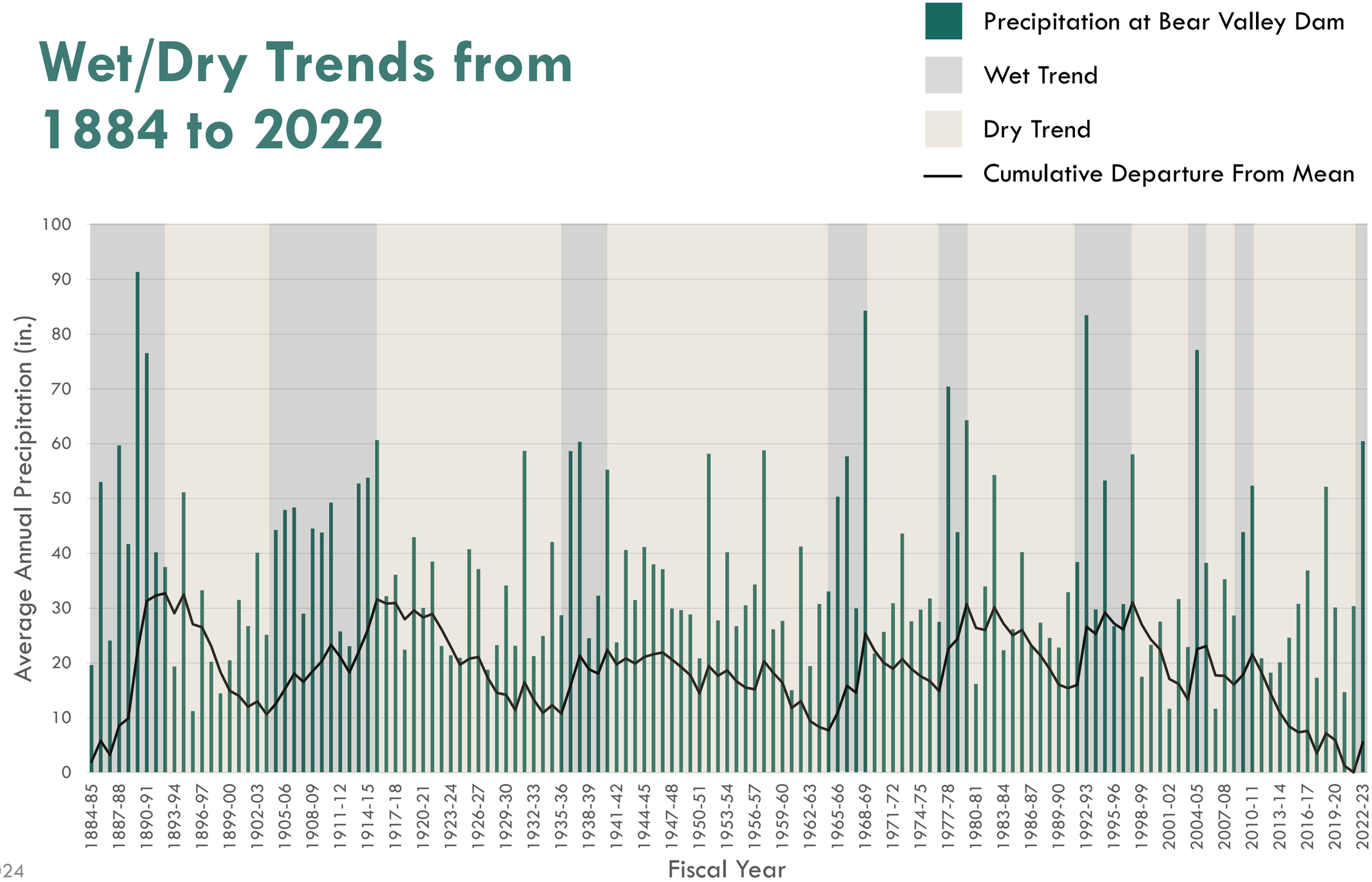
- Background and Purpose
- Alternatives Considered
- Replenish Big Bear Overview
- Milestones to Date
- Path Forward

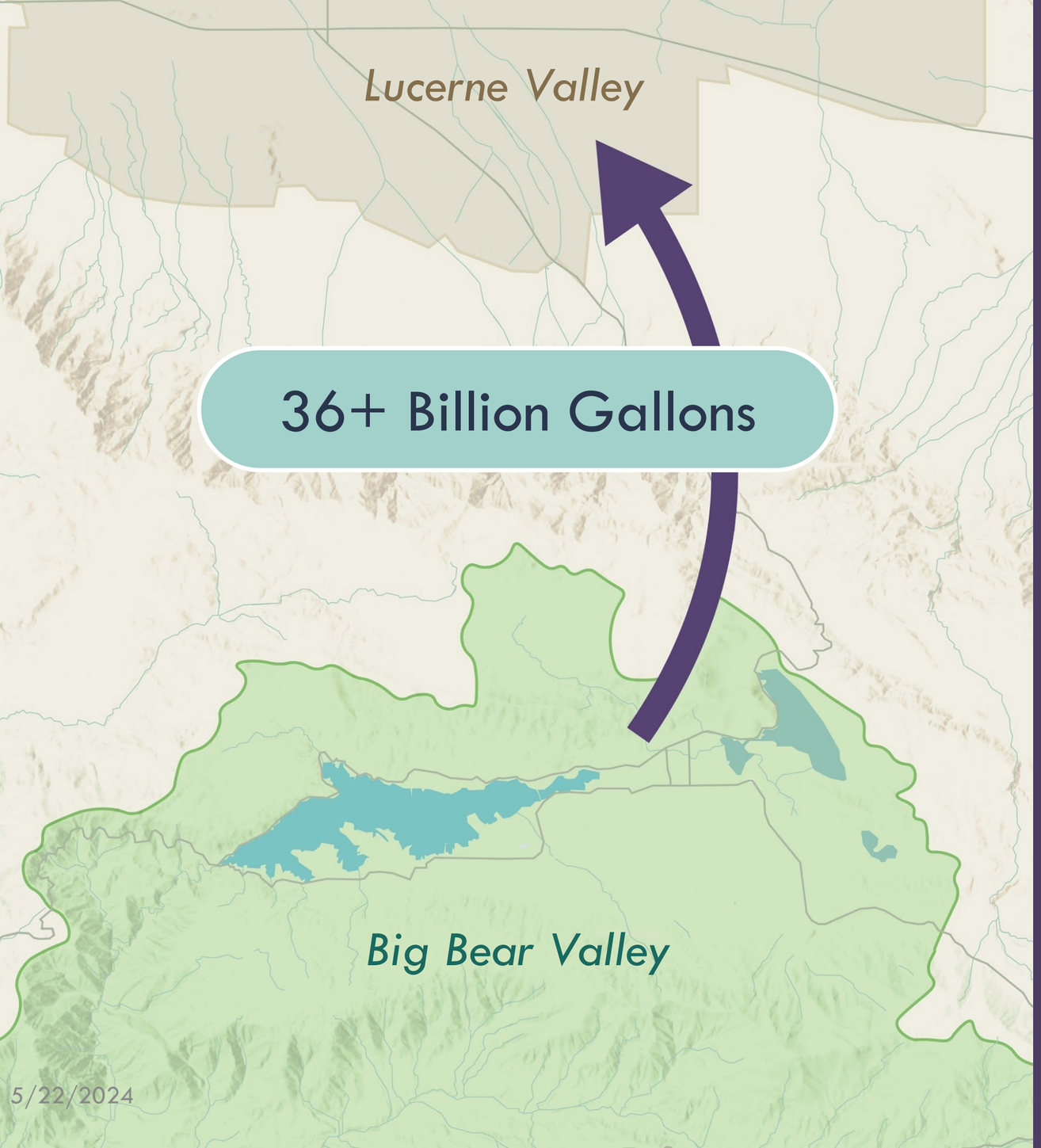
Presentation Objectives

- Review the drivers for water reuse in the Big Bear Valley and the historical efforts and barriers encountered
- Review more recent regulatory and funding developments that make water reuse more achievable now than in the past
- Review the different water reuse alternatives for Big Bear Valley that have been considered in the past 20 years
- Compare the costs of benefits of the alternatives and why Replenish Big Bear was originally selected as the preferred option
- Provide an overview of Replenish Big Bear and status to date
- Discuss potential path forward

Background and Purpose

Wet/Dry Trends from 1884 to 2022





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Over

36 Billion

gallons of water exported since 1980

Exploration of Big Bear Water Solutions Through the Years

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1964 — Investigated feasibility of creating **stickleback ponds in Baldwin Lake**

1974 — Report recommends valley-wide treatment and reuse, with **discharge to Baldwin Lake**

1975 — Facility Plan recommended **temporary effluent disposal in Lucerne Valley** until other uses could be pursued

1977 — Big Bear Lake Judgement Allows for reclaimed water to be used as **supplemental inflow to the Lake**

1986 — Evaluated cost for reuse of effluent within **Baldwin Lake**

1991 — Explored **groundwater recharge at Sand Canyon** in anticipation of updated regulations

1995 — Evaluated cost for treatment and discharge to **Shay Creek**

1996 — Mojave Basin Adjudication **BBARWA retains the right to use its water in the Big Bear Valley in the future**

1998 — Developed a plan to discharge to Baldwin Lake and **Stanfield Marsh for habitat benefits**

2000 — Regulations allow **first-ever reuse** within the Valley. A **permit is issued for discharge to Stanfield Marsh and Baldwin Lake and irrigation**

2004 — Evaluated **groundwater recharge at Greenspot, Van Dusen, Shay Meadow and Sand Canyon**

2005 — BBARWA certifies EIR for **groundwater recharge at Greenspot**

Decades of Work to Evaluate Possibilities for the Future

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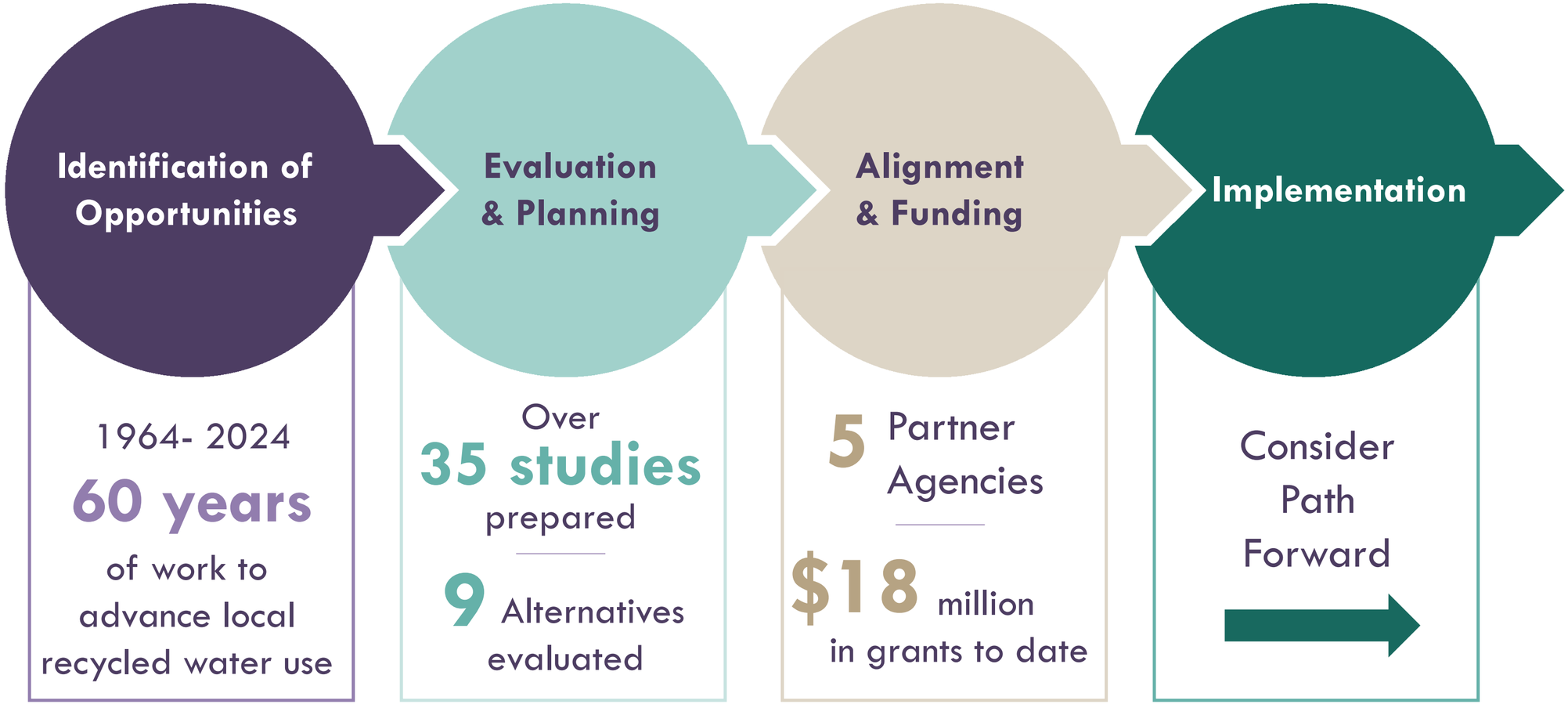

Why Now?

Why Now?

Regulations

After decades of planning, the regulatory landscape is favorable to reuse within Big Bear Valley.

Funding

State and Federal funding programs are prioritizing water reuse and groundwater recharge projects, softening the impact to rate payers.

Evidence

Potable reuse projects have been in existence for decades and have proven to be safe and reliable.

Alternatives Evaluated

Many alternatives have been evaluated, providing clarity on the feasibility, regulatory and treatment requirements, and relative costs and benefits.

Treatment Advances

Advances in wastewater treatment technology and water quality monitoring demonstrate high levels of removal of constituents of concern.

Evolving Regulations

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1918 — CALIFORNIA
State Board of Health published first recycled water regulations

1952 — CALIFORNIA
was the location of 107 sites using recycled water for agriculture or irrigation

1969 — PORTER-COLOGNE WATER QUALITY CONTROL ACT
formed Regional Water Quality Control Boards with regulatory authority over water quality

1972 — CLEAN WATER ACT
passage gave EPA authority to set wastewater standards for the industry

1975 — OCWD'S WATER FACTORY 21
became California's first groundwater recharge project

1991 — CALIFORNIA WATER RECYCLING ACT
passage set water recycling goals for the state

2011

2014 — SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA)

2014 — FINAL GROUNDWATER RECHARGE REGULATIONS

2018 — FINAL SURFACE WATER AUGMENTATION REGULATIONS

2023 — FINAL DIRECT POTABLE REUSE REGULATIONS

Drought (2011–2018)

Expanded Funding Opportunities for Water Reuse

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2014

Water Infrastructure Finance and Innovation Act (WIFIA) provides low interest **loan funding** for up to **80%** of the project costs for small communities.

California Prop 1 Water Bond Water Quality, Supply, and Infrastructure Improvement Act Authorizes **$510 million** for Integrated Regional Water Management Plan projects.

2016

Water Infrastructure Improvements for the Nation (WIIN) Act makes US Bureau of Reclamation Water Recycling Funding more accessible for new projects to receive up to **25% grants.**

2020

House of Representatives Community Project Funding process **reinstates ability to make funding requests for specific projects** (formerly referred to as “earmarks”).

Multi-benefit projects align with federal and state funding program goals

State priorities according to the California Water Action Plan and SRF Intended Use Plan

1

Protect and restore important ecosystems

2

Increase regional self-reliance and integrated water management across all levels of government

3

Manage and prepare for dry periods

4

Increase flood protection

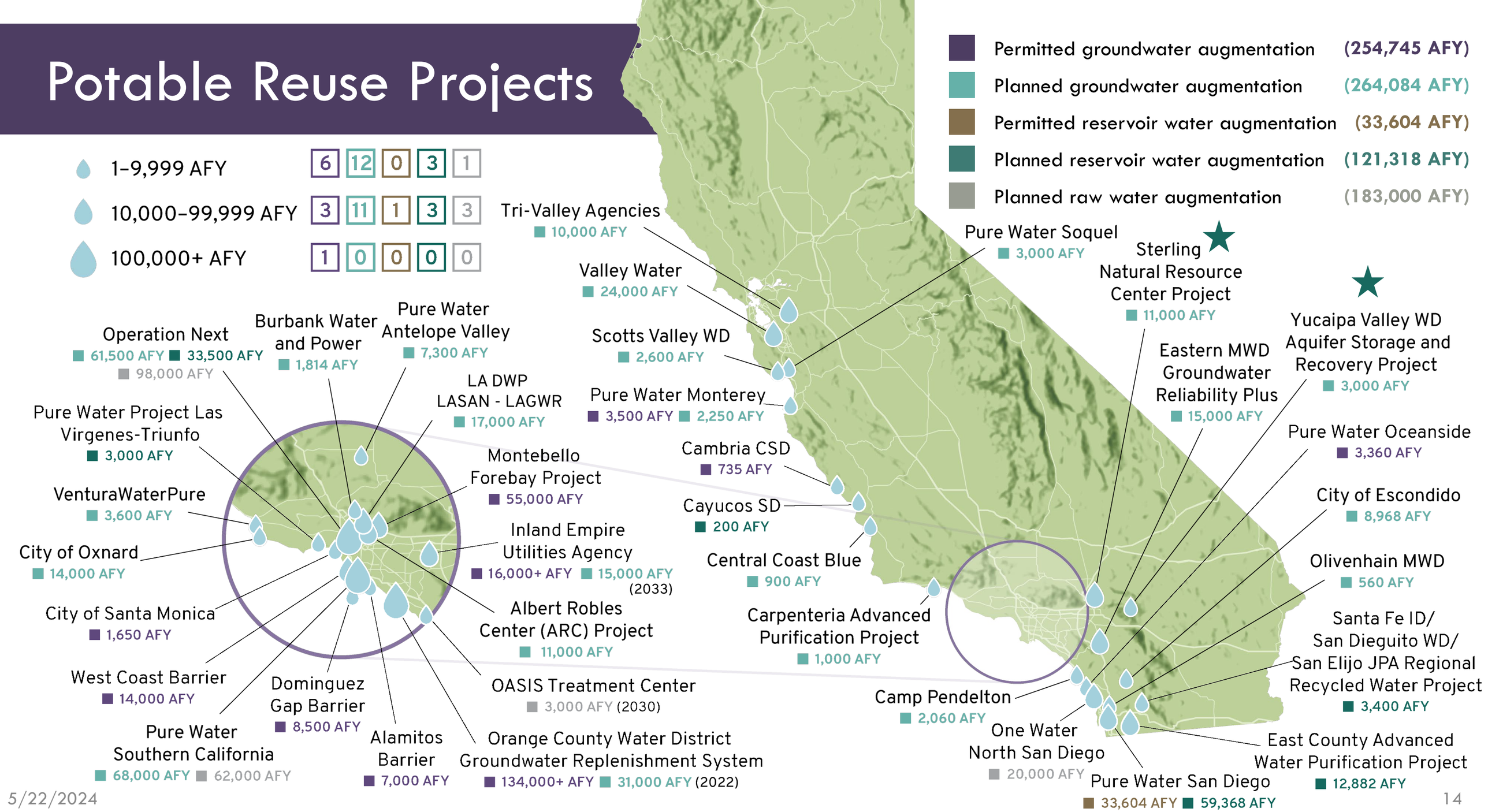
5 6 7

Continue to fund: Disadvantaged communities, water recycling, and green projects

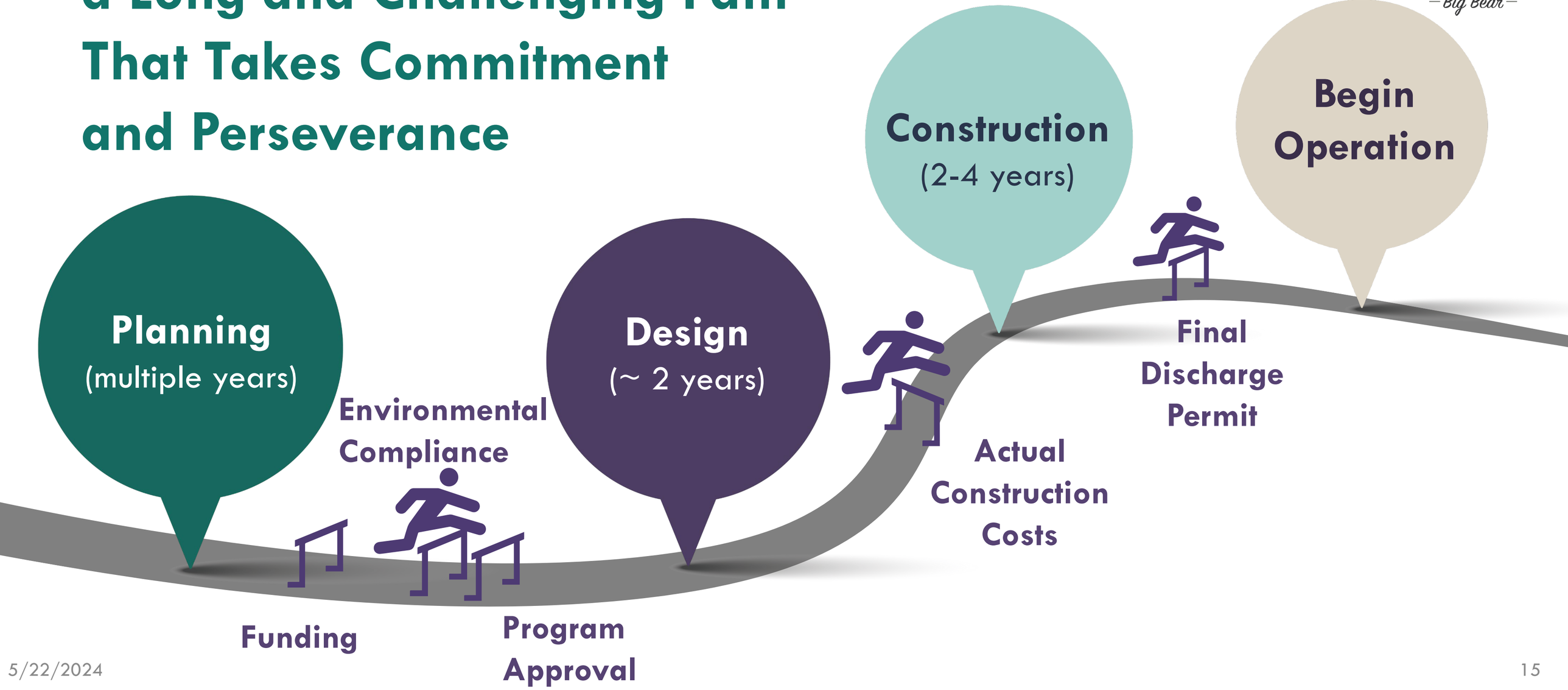
Potable Reuse Projects

	Permitted groundwater augmentation	Planned groundwater augmentation	Permitted reservoir water augmentation	Planned reservoir water augmentation	Planned raw water augmentation
1–9,999 AFY	6	12	0	3	1
10,000–99,999 AFY	3	11	1	3	3
100,000+ AFY	1	0	0	0	0

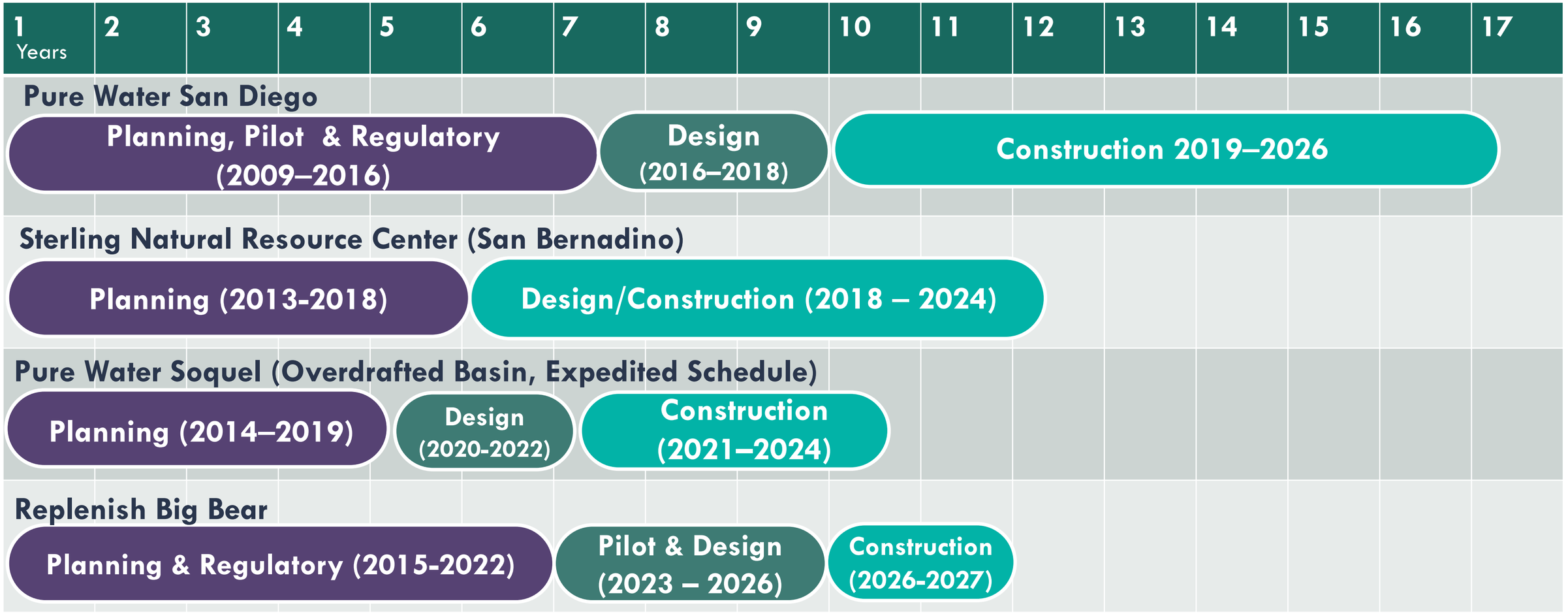
Permitted groundwater augmentation (254,745 AFY)
Planned groundwater augmentation (264,084 AFY)
Permitted reservoir water augmentation (33,604 AFY)
Planned reservoir water augmentation (121,318 AFY)
Planned raw water augmentation (183,000 AFY)



Implementing Reuse Projects is a Long and Challenging Path That Takes Commitment and Perseverance



Timeline for Similar Projects



Recycled Water Alternatives Evaluated

Recycled Water Alternatives Evaluated Since 2004

Van Dusen Canyon Recharge	Imported Water	Greenspot Recharge	Sand Canyon Recharge
2004–2005	2006	2004–2005, 2016	2004, 2016

Greenspot & Sand Canyon Recharge	Irrigation	Marsh/Lake Discharge + Sand Canyon Recharge + Shay Pond Discharge
2016	2005, 2016	2018

Imported Water

- **Yield: 1,000** AFY of imported water
- $8,420/AF
- Requires new supply contracts with State Water Contractors, may not be possible
- Supply is limited or unavailable during drought
- Requires new surface water treatment plant to use as potable water source
- For comparison: not sufficient water quality to put in the Lake (although this is not proposed)

Potential Recharge Locations within Big Bear Valley Groundwater Basin Subunits

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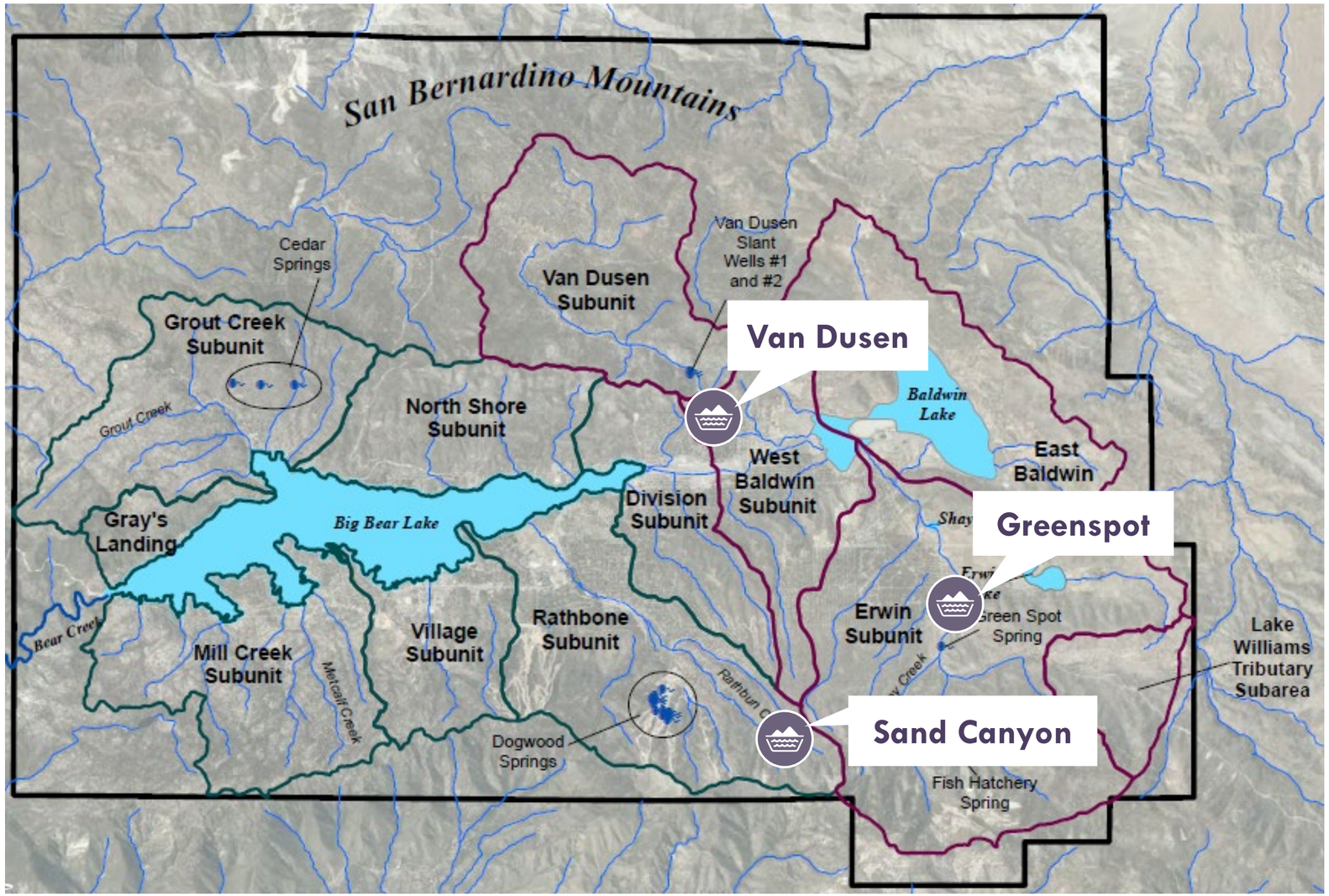


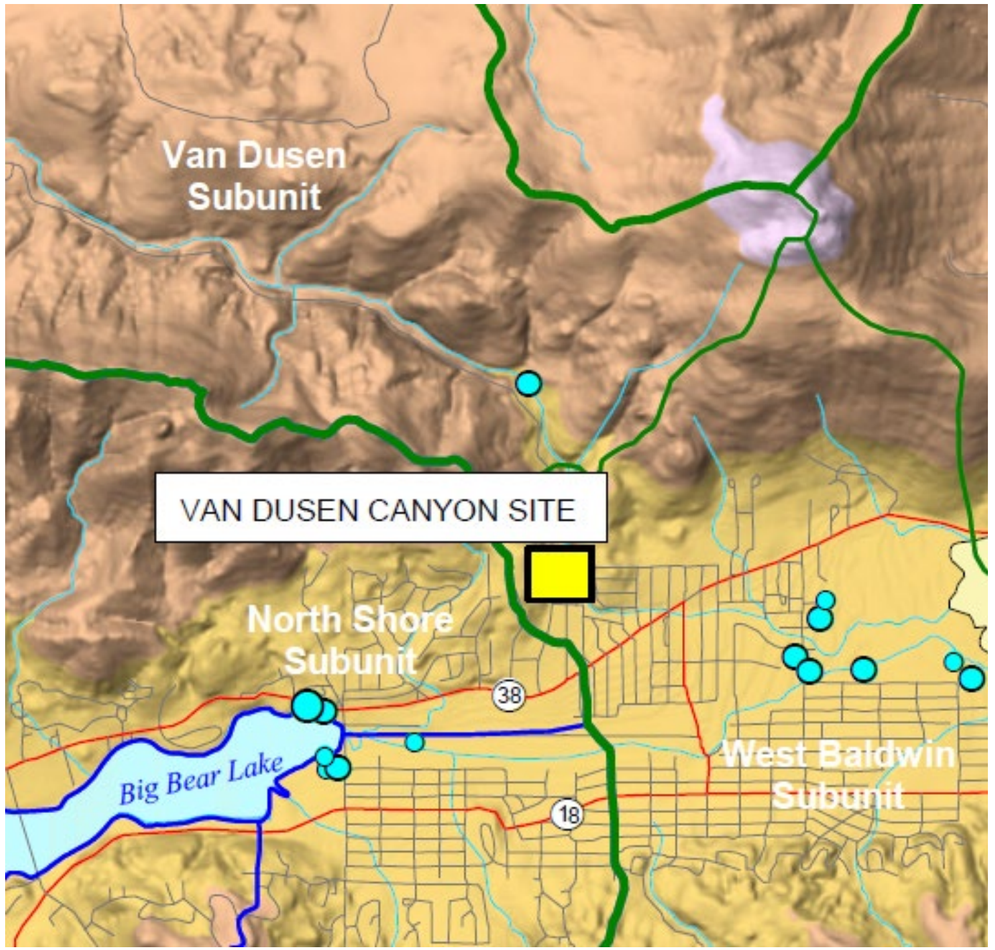
Map Features

- Spring / Slant Well
- Major Hydrologic Feature
- Drainage/Creek
- Baldwin Lake Watershed
- Big Bear Lake Watershed
- Bear Valley Basin Groundwater Sustainability Agency Boundary

ALTERNATIVE Not Evaluated in 2016

Groundwater Recharge at Van Dusen Canyon

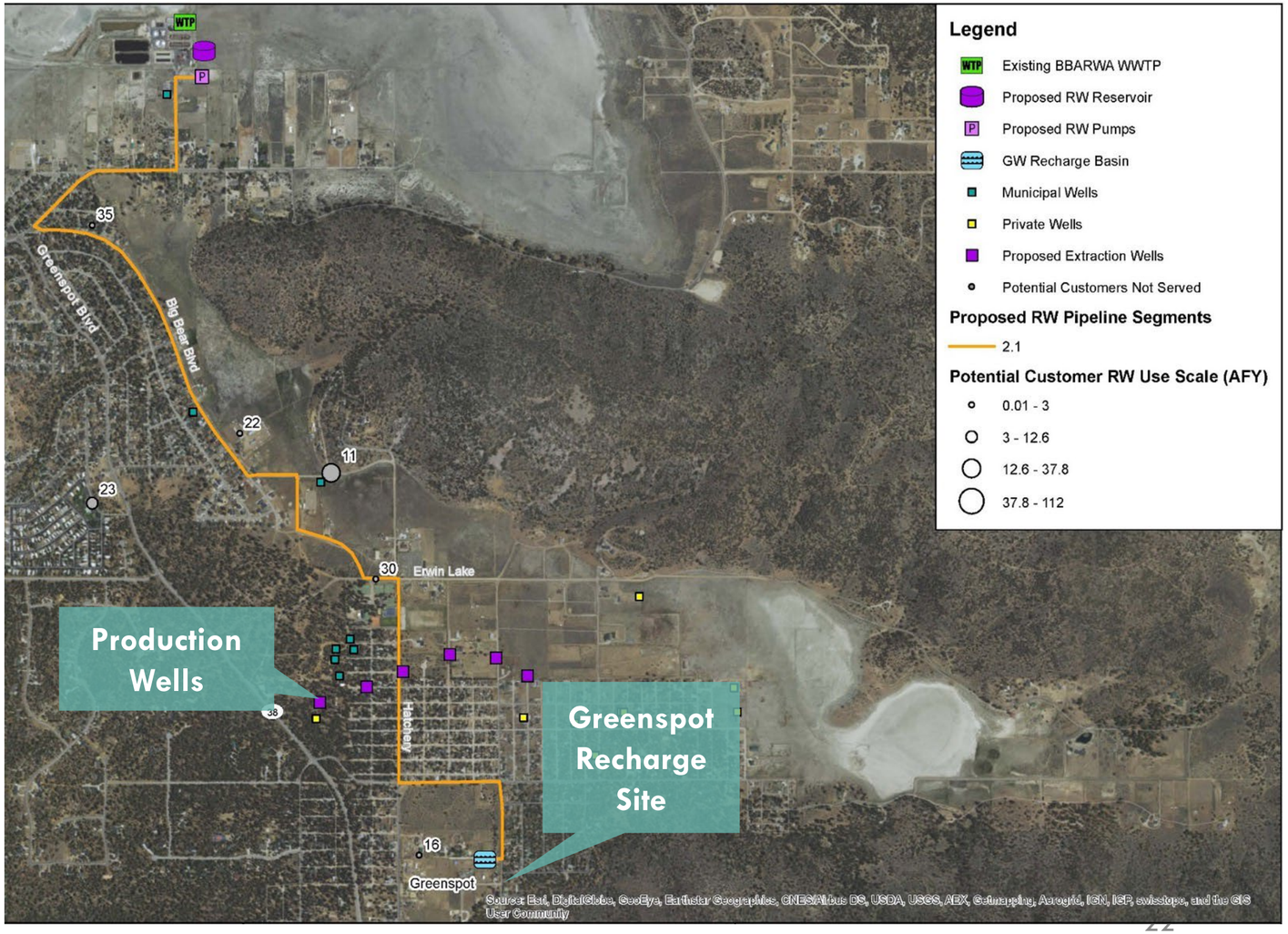
- **Yield:** Not estimated in 2004 study
- Recharge rate 1.1 – 1.6 ft/day
- Recharge water would reach the nearest well in 8-13 years. Additional wells could be added to extract the water sooner.
- Considered feasible in 2004 study, but not evaluated in 2016 because Greenspot was more favorable
- Advanced treatment upgrades and brine disposal required for all recharge locations



ALTERNATIVE

Groundwater Recharge at Greenspot

- **Yield: 1,000** AFY for groundwater sustainability.
- Recharge rate 3.1–3.7 ft/day.
- Requires six new production wells and coordinated pumping to recover recharged water



ALTERNATIVE

Groundwater Recharge at Sand Canyon

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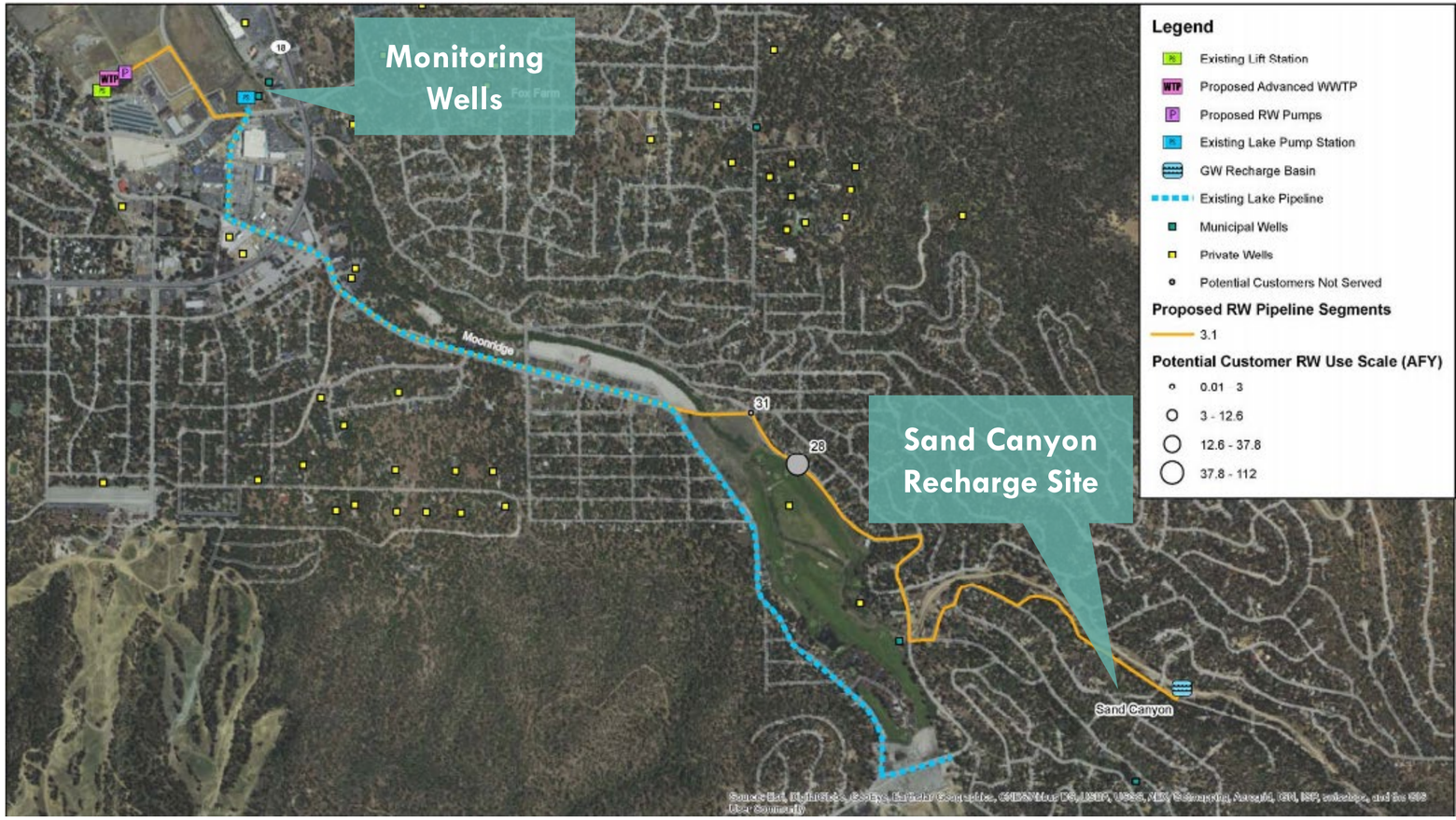
- **Yield: 500** AFY for groundwater sustainability
  - **380** AFY for Sand Canyon Recharge
  - **120** AFY for Golf Course Irrigation
- Recharge rate 2.1 ft/day
- Recharge water will reach the nearest production in about 13 months, no new production wells needed



ALTERNATIVE

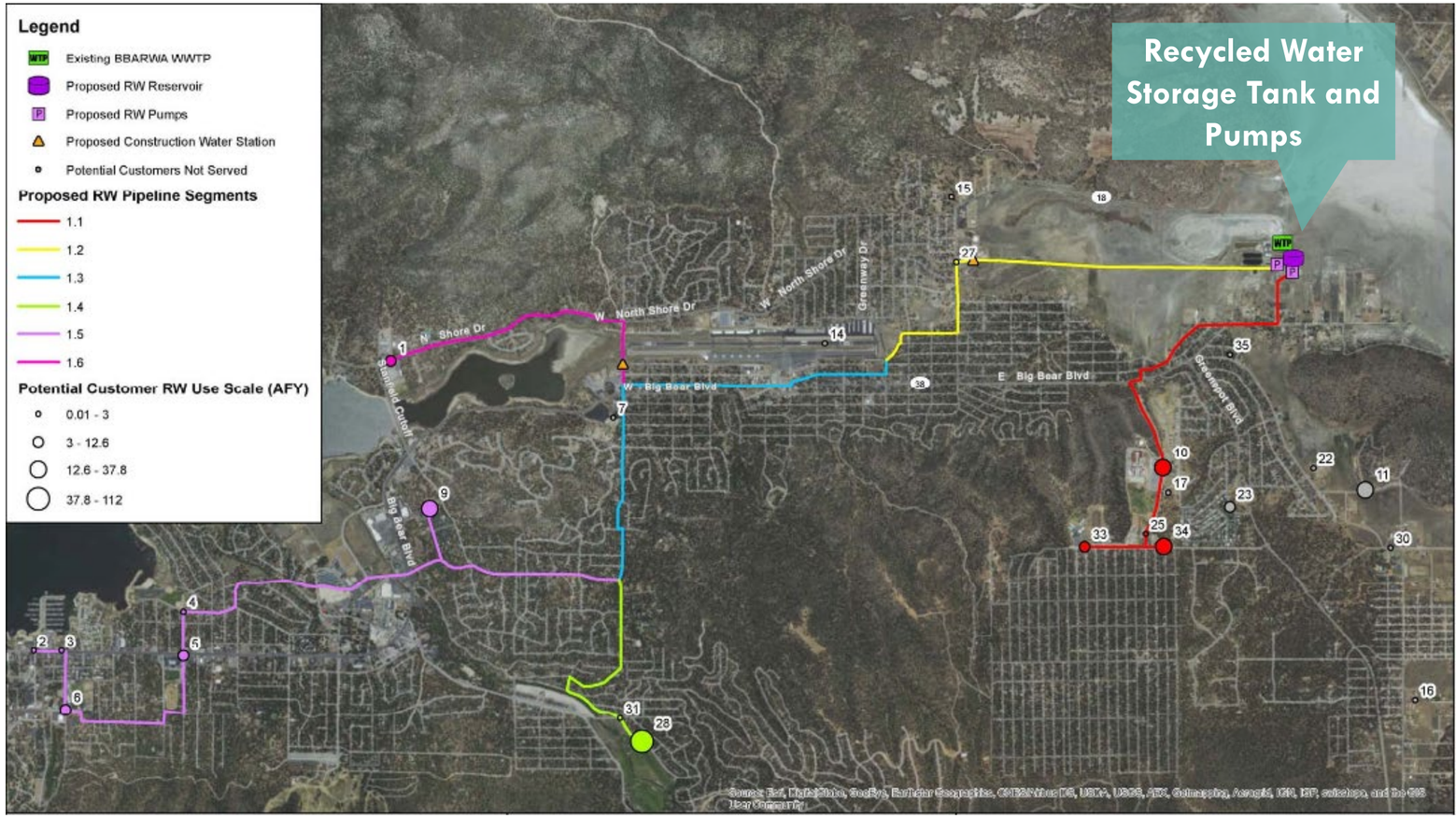
Groundwater Recharge at Greenspot and Sand Canyon

- **Yield: 1,500** AFY for groundwater sustainability.
- Requires six new production wells and coordinated pumping to recover recharge water at Greenspot

ALTERNATIVE

Irrigation

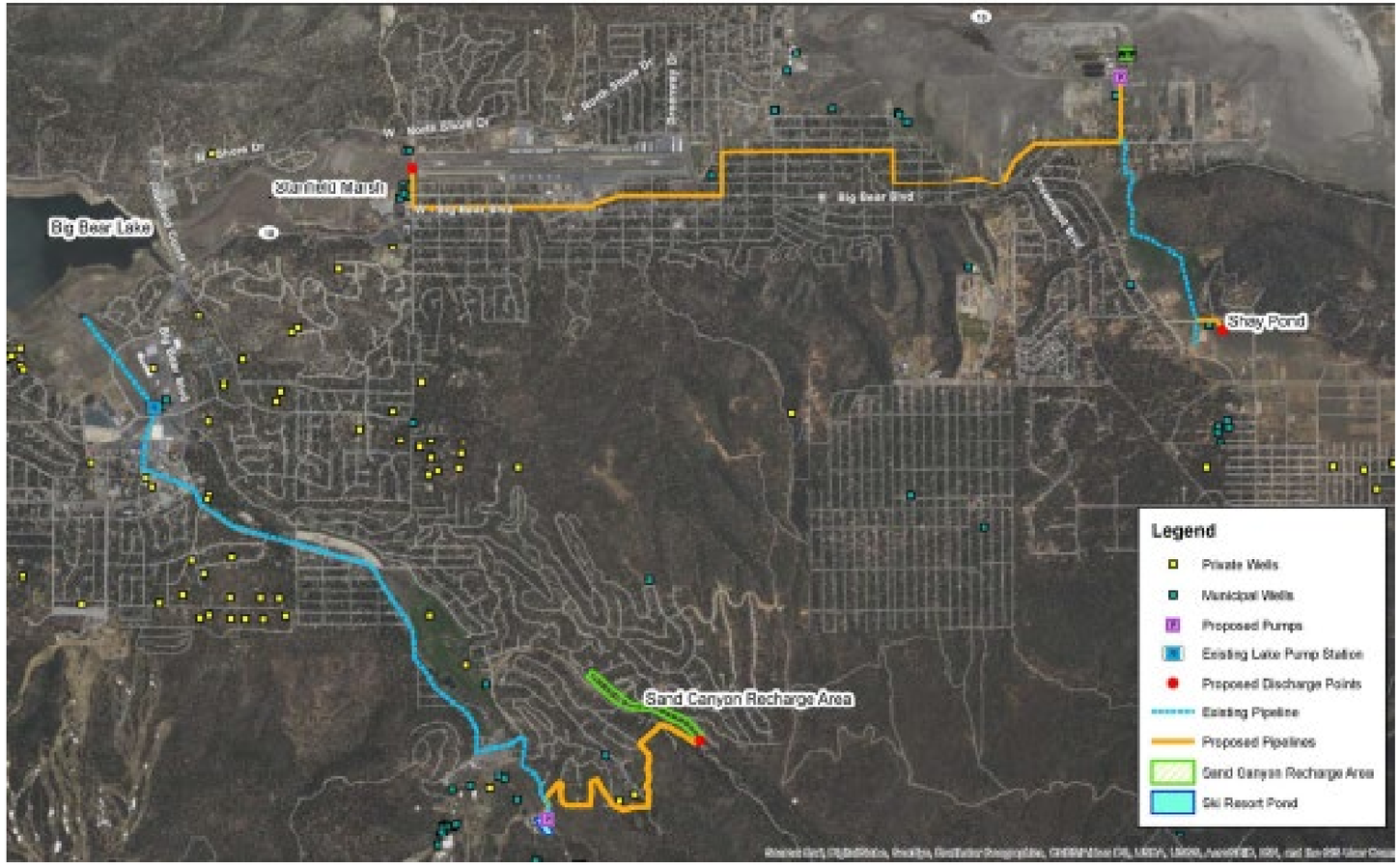
- **Yield: 54** AFY for irrigation (red segment only)
- Up to 231 AFY total for all segments, but unit cost increases
- Tertiary treatment upgrades required



ALTERNATIVE

Lake Alternative (renamed Replenish Big Bear)

- **Yield: 2,200** AFY for multiple beneficial uses
- Marsh/Lake Discharge, Groundwater Recharge at Sand Canyon, Golf Course Irrigation
- Provides water supply, Lake and habitat benefits



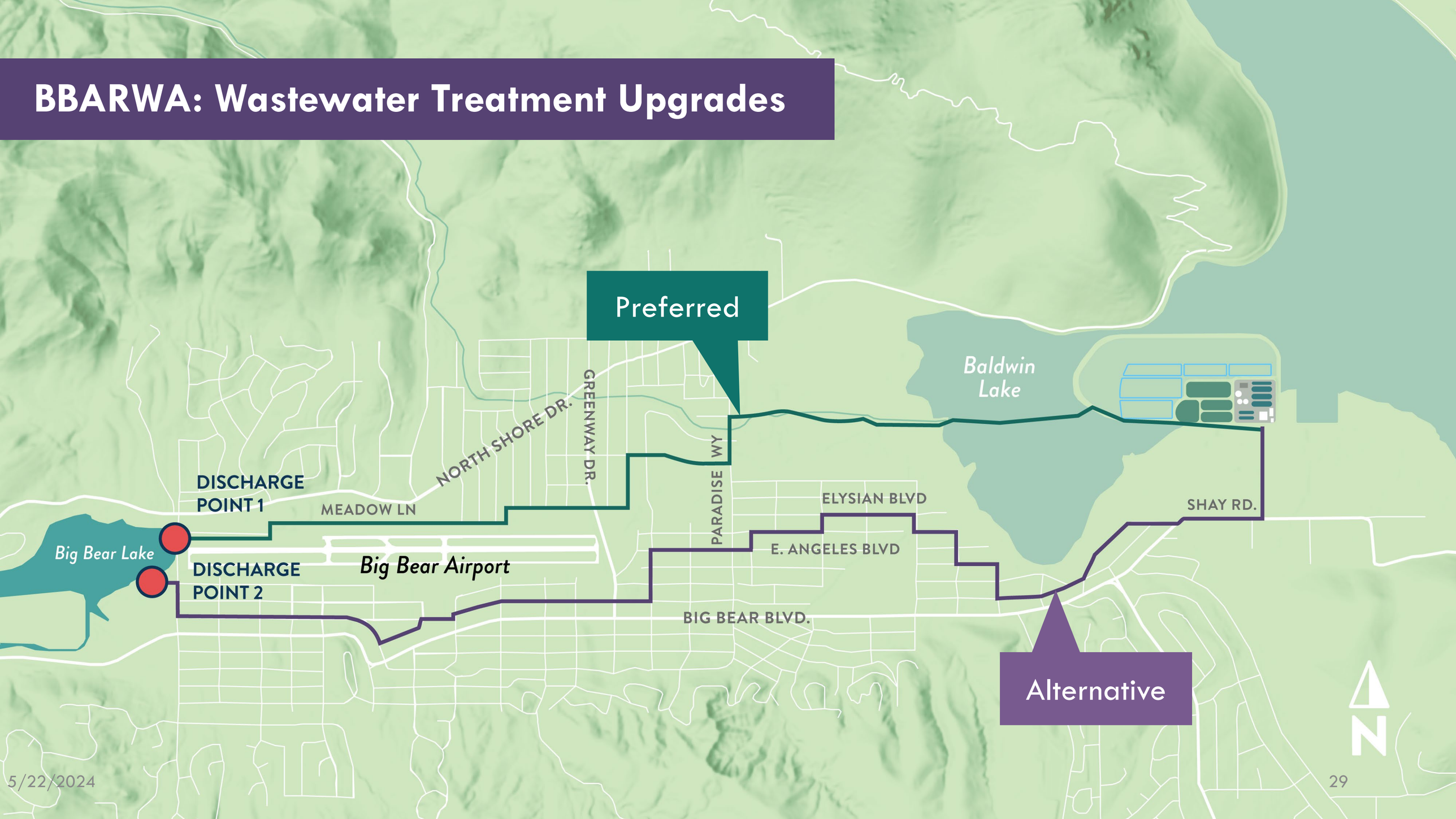
Comparing Water Solutions for Big Bear Valley

	REPLENISH BIG BEAR	RECHARGE GREENSPOT & SAND CANYON	RECHARGE GREENSPOT	RECHARGE SAND CANYON	IRRIGATION
RECYLED WATER RECOVERED *Percentage of total BBARWA Flow*	2,200 AFY* 93%	1,500 AFY 63%	1,000 AFY 42%	500AFY 21%	54 AFY 2%
BENEFITS *Water Supply* *Habitat* *Recreation*					
UNIT COST *($/Acre Foot)*	$3,400	$6,500	$6,500	$7,900	$5,700
TOTAL CAPITAL COST	$86.7 MILLION BBARWA WASTEWATER TREATMENT UPGRADES + $3.5 MILLION SAND CANYON RECHARGE	$125 MILLION	$86 MILLION	$45 MILLION	$5 MILLION

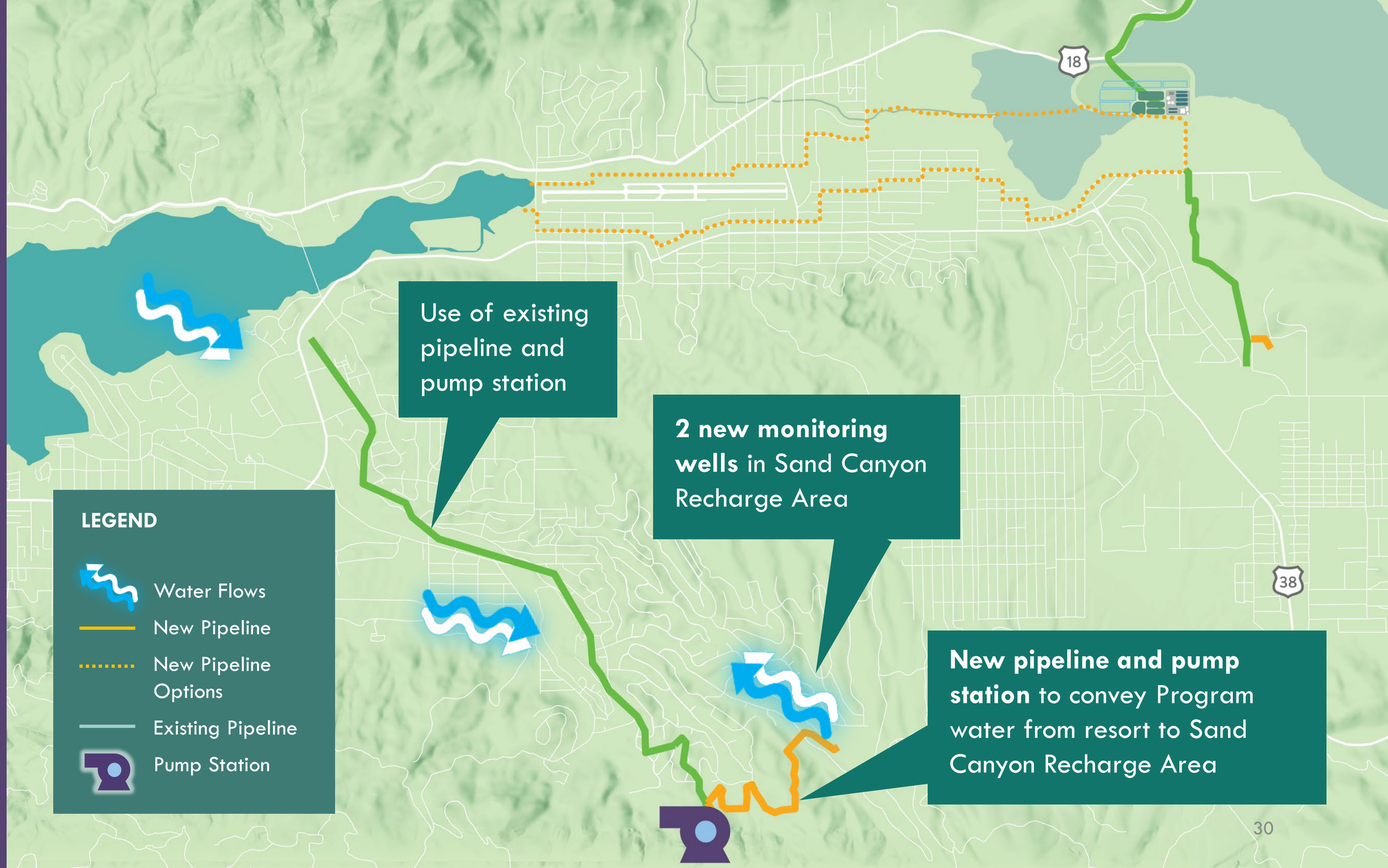
*AFY - Acre Feet Per Year

Replenish Big Bear Program Overview

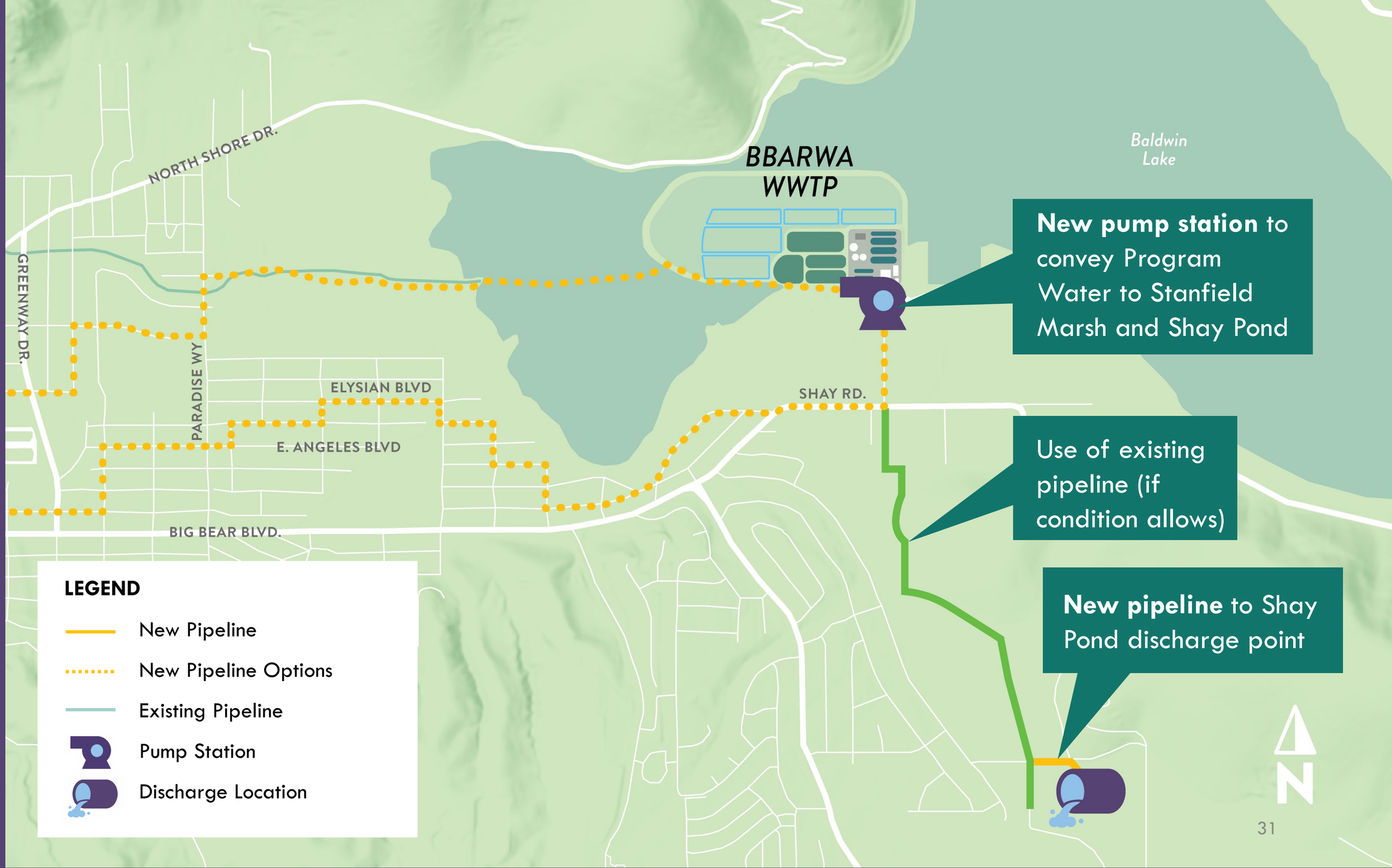
BBARWA: Wastewater Treatment Upgrades



BBLDWP/BBCCSD: Sand Canyon Recharge Project



BBARWA/BBCCSD: Shay Pond Discharge Project Future Option



Replenish Big Bear Benefits

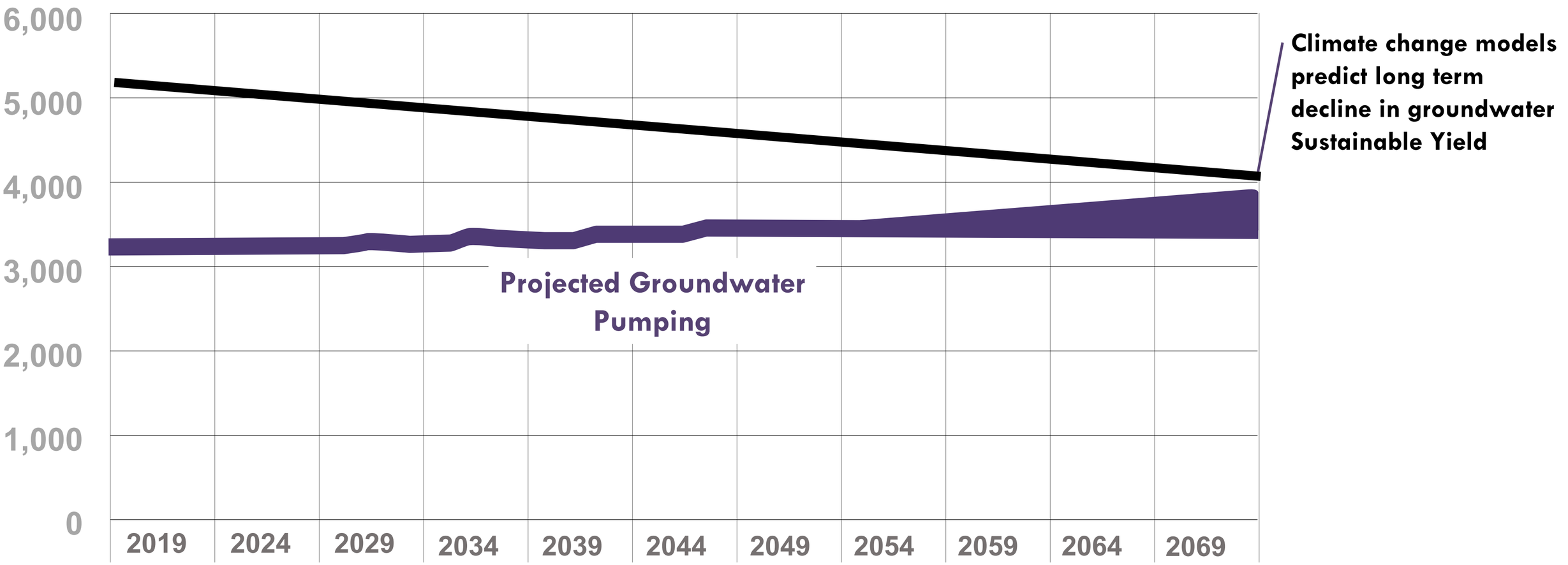
Recover local water for beneficial use in the Big Bear Valley

Recharge the groundwater basin to enhance long term sustainability

Increase Big Bear Lake levels to support recreation and habitat

Provide a constant source of water to Stanfield Marsh to restore marsh/ meadow habitat

New Water Source Enhances Groundwater Sustainability



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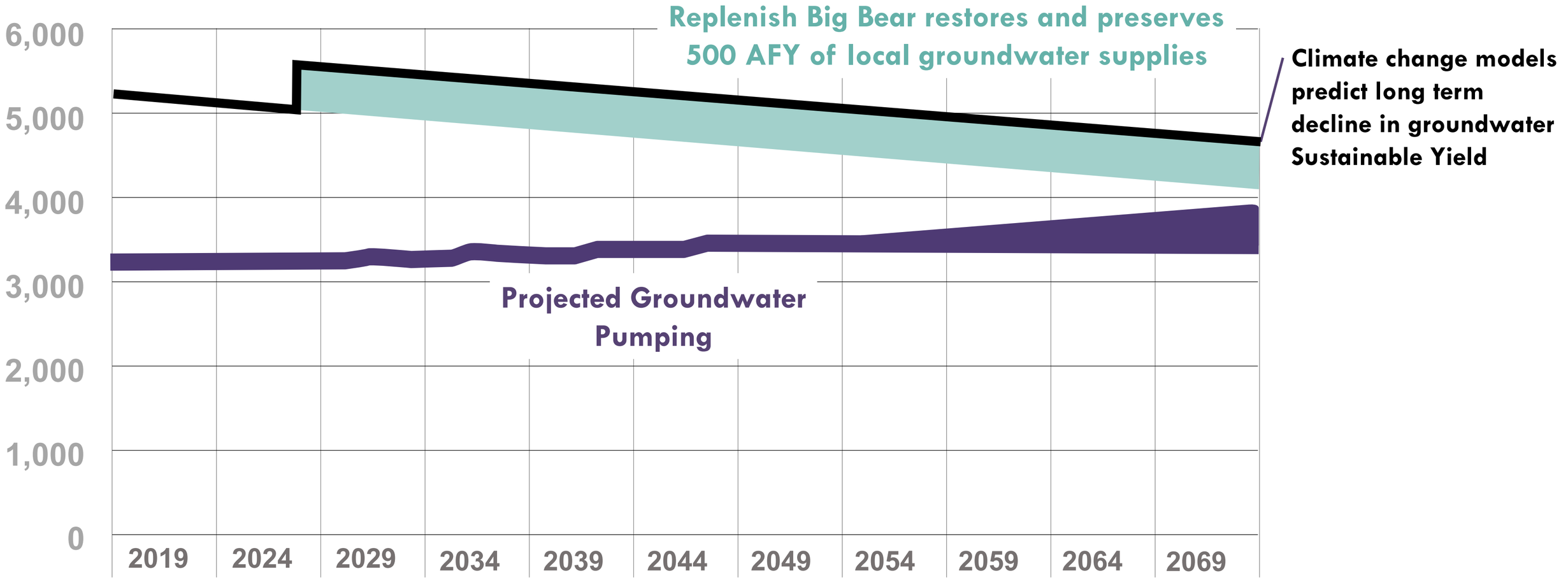
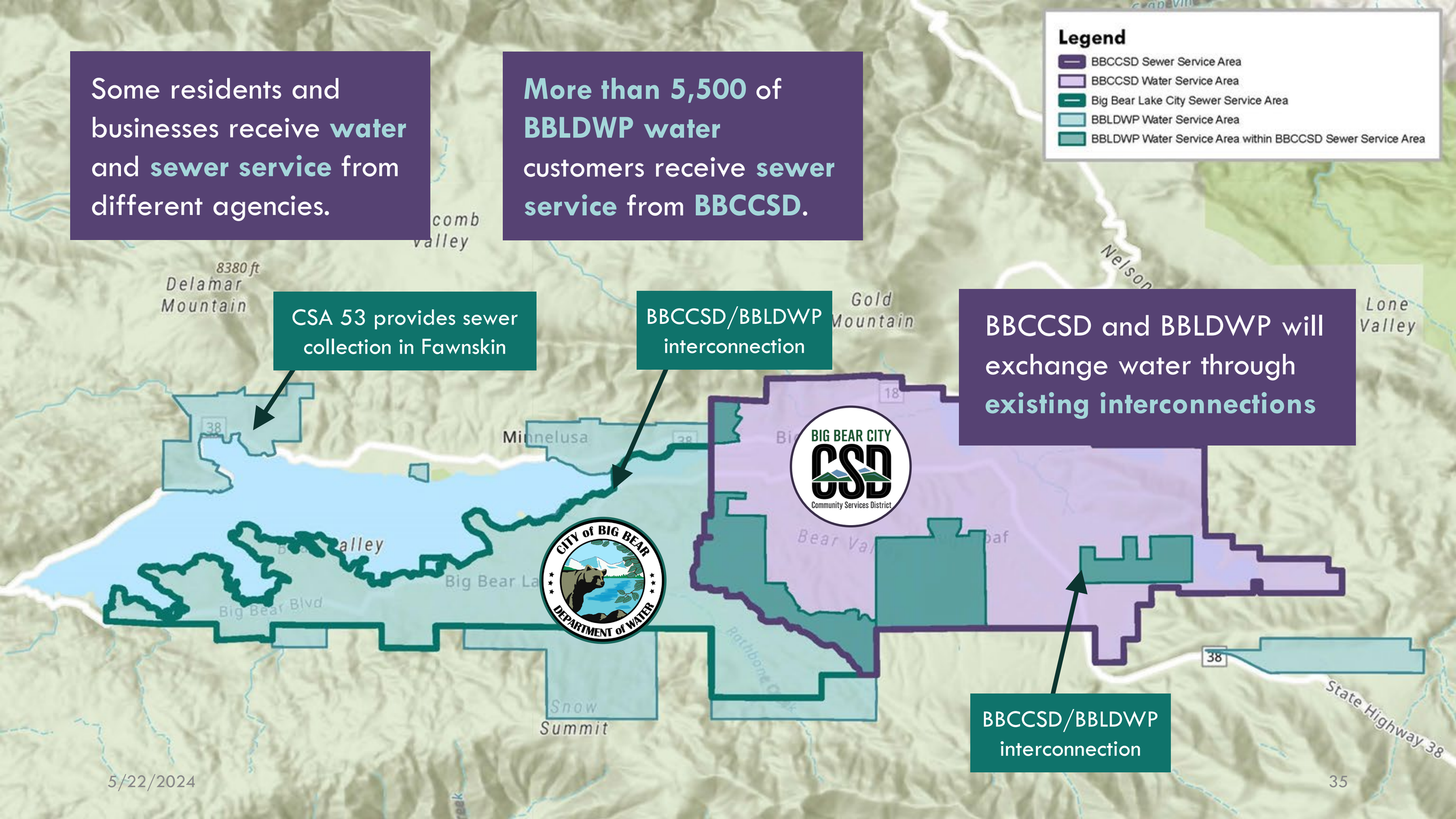
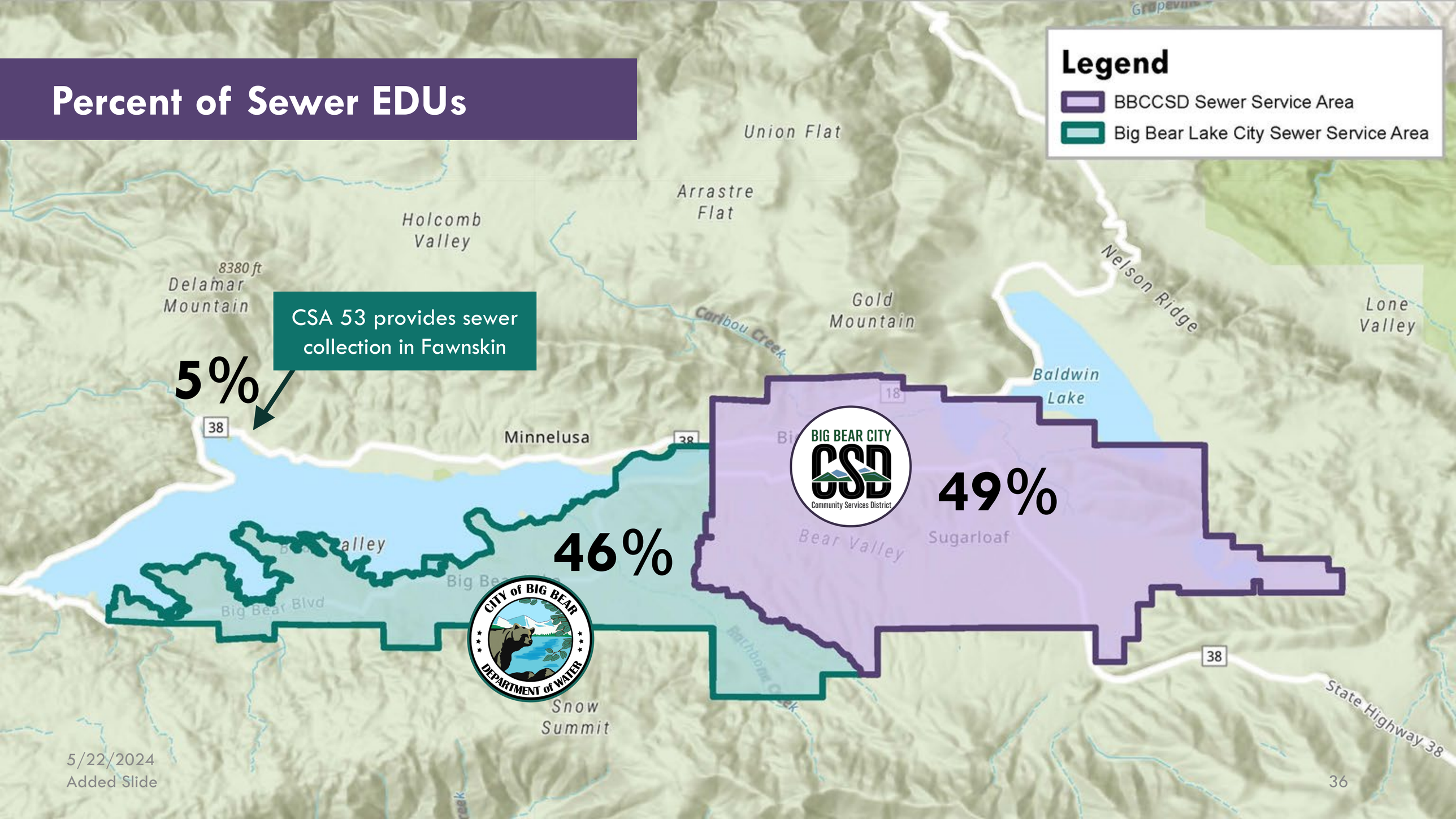


Some residents and businesses receive **water** and **sewer service** from different agencies.

More than 5,500 of **BBLDWP water** customers receive **sewer service** from **BBCCSD**.



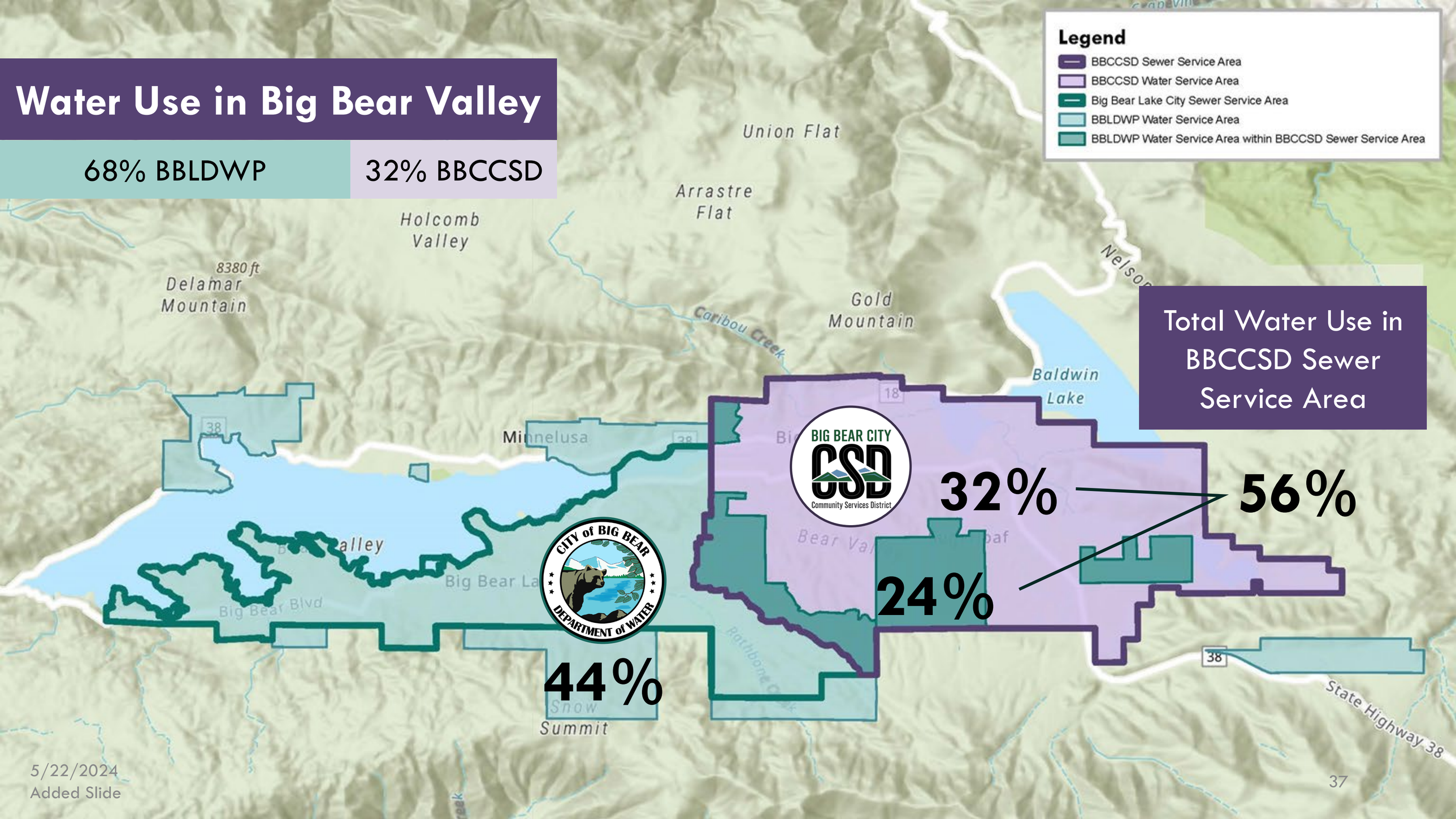
Percent of Sewer EDUs



5/22/2024
Added Slide

Water Use in Big Bear Valley

68% BBLDWP	32% BBCCSD



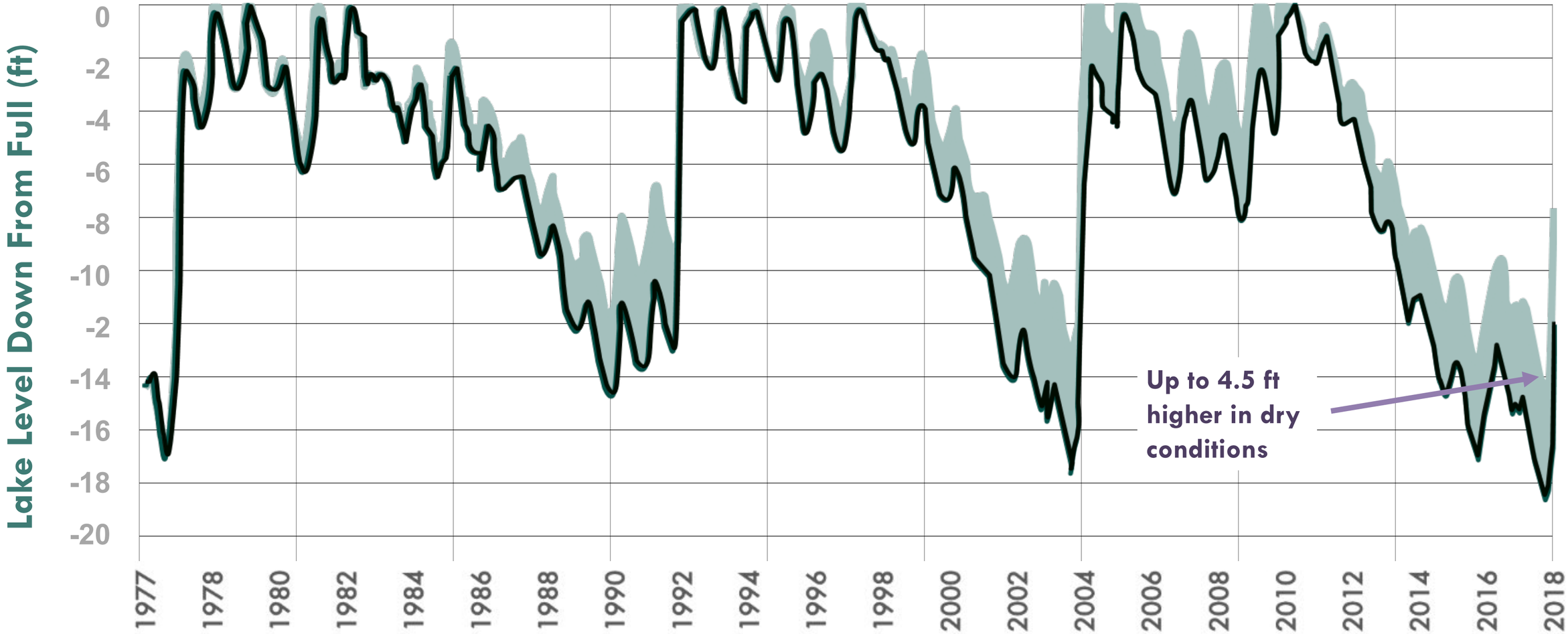
Total Water Use in BBCCSD Sewer Service Area

5/22/2024
Added Slide

New water source mitigates drought impacts to the Lake

Historic Lake Level

Estimated Project Lake Level



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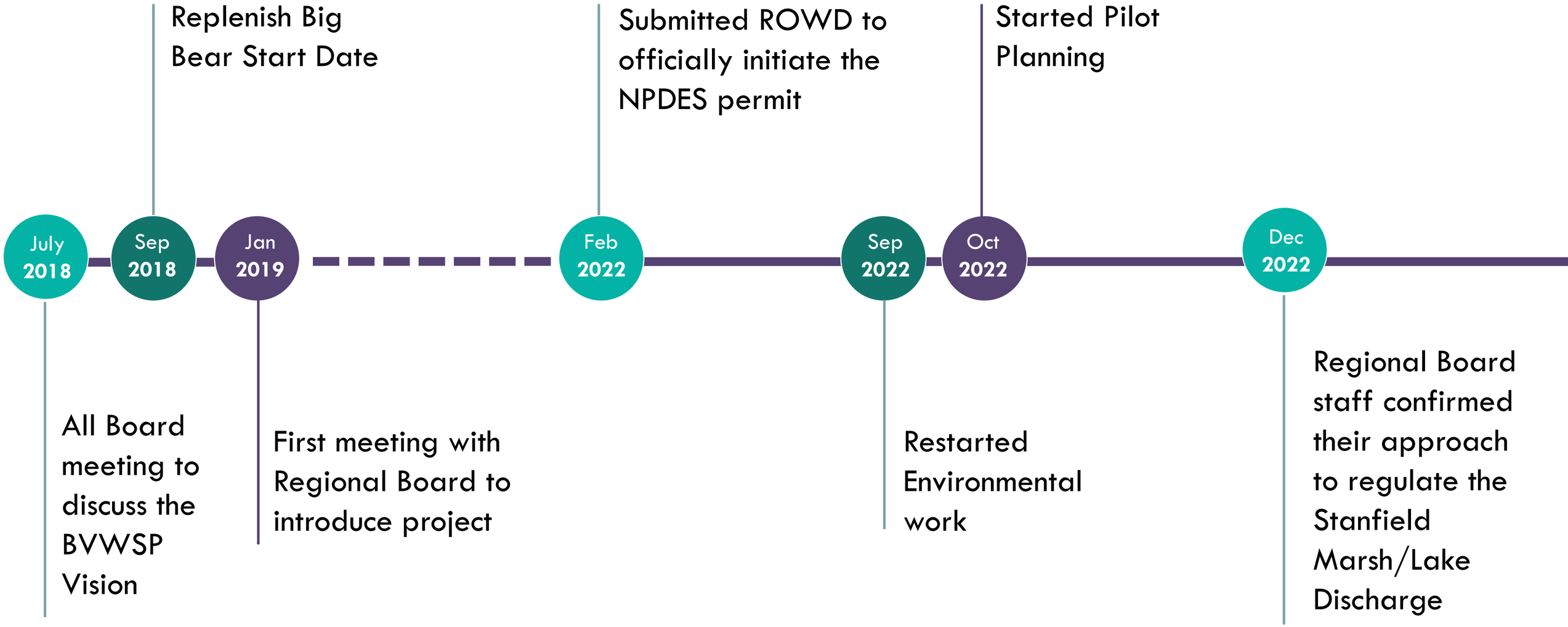
*AFY - Acre Feet Per Year

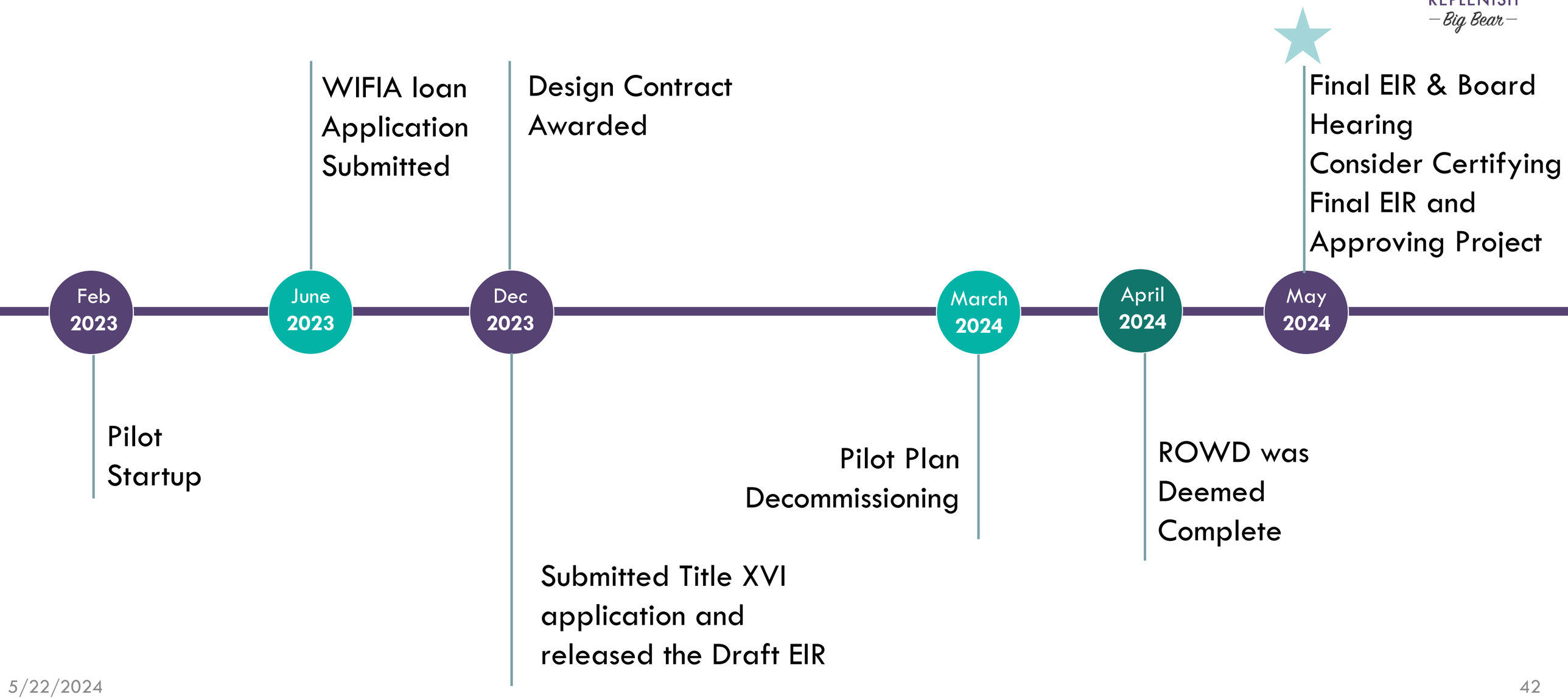
Program Kick Off - July 17, 2018

- All Boards Meeting to Kick Off the Program
- Discussed Program Goals
- Shared Understanding of Program Vision and Benefits

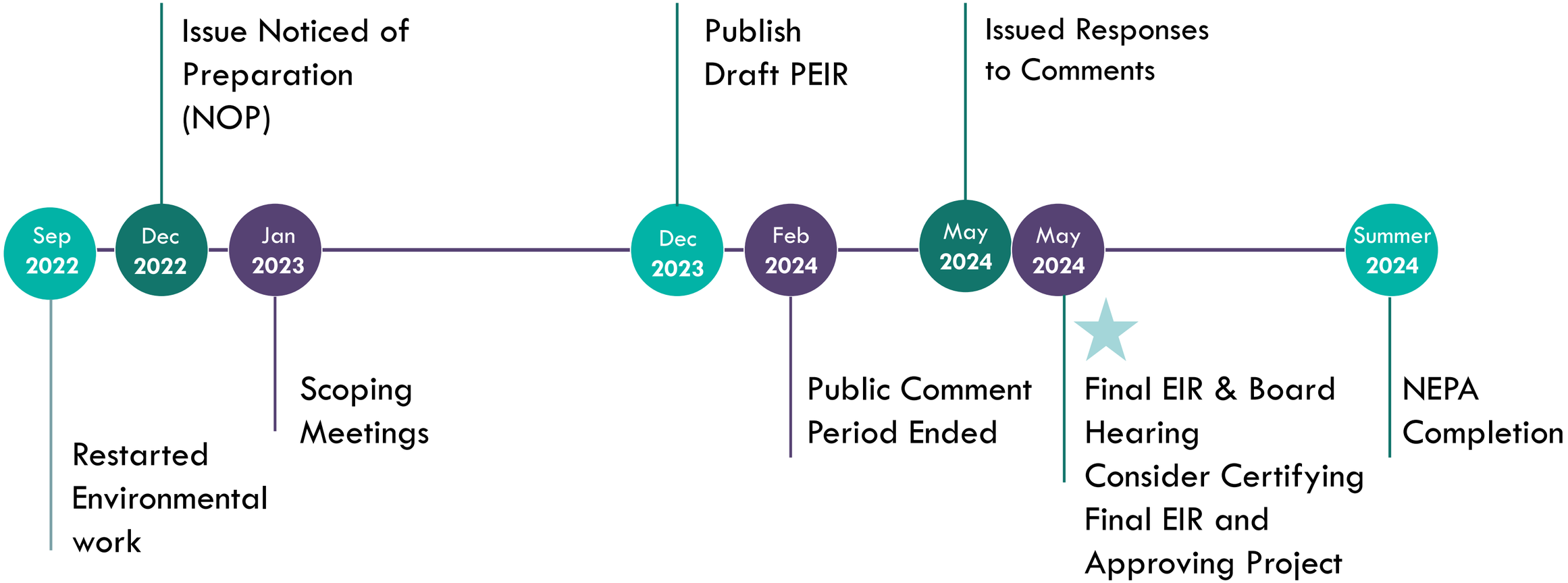
Program Milestones



Program Milestones

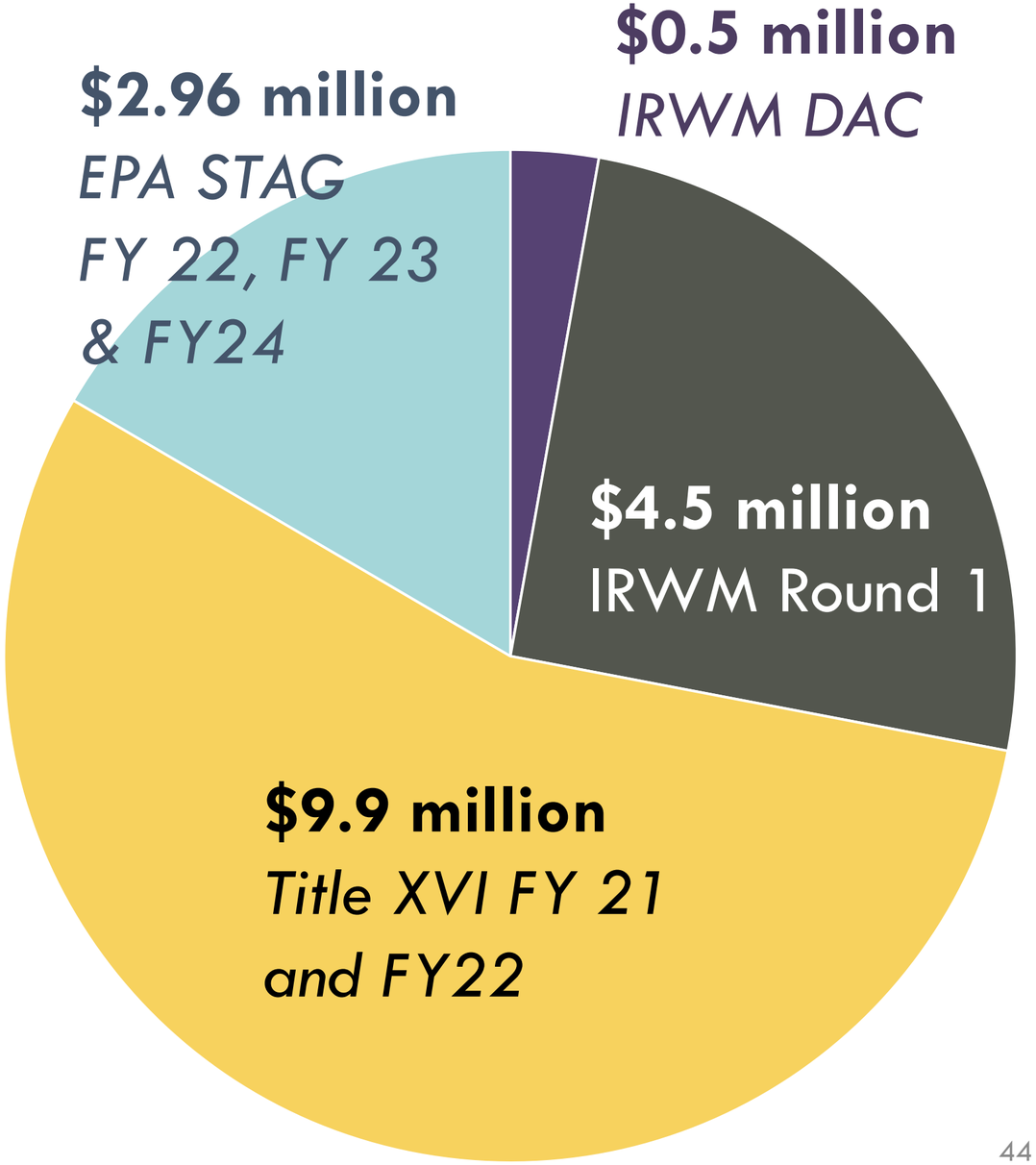


Environmental Documentation Milestones

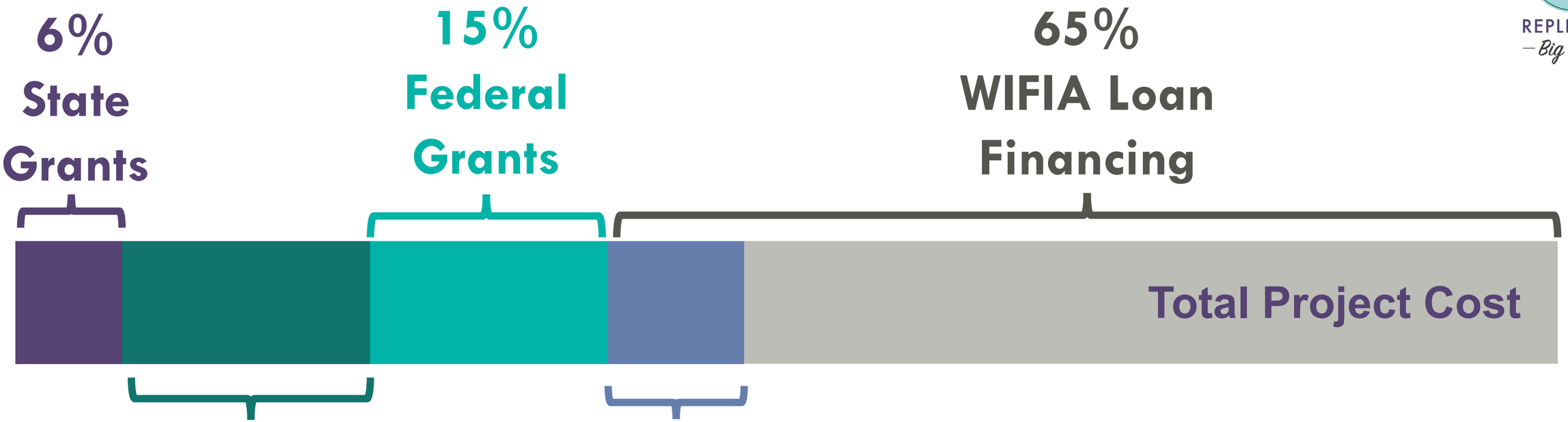


Grants to Date

Replenish Big Bear has been successful in securing about $18 million in grants!



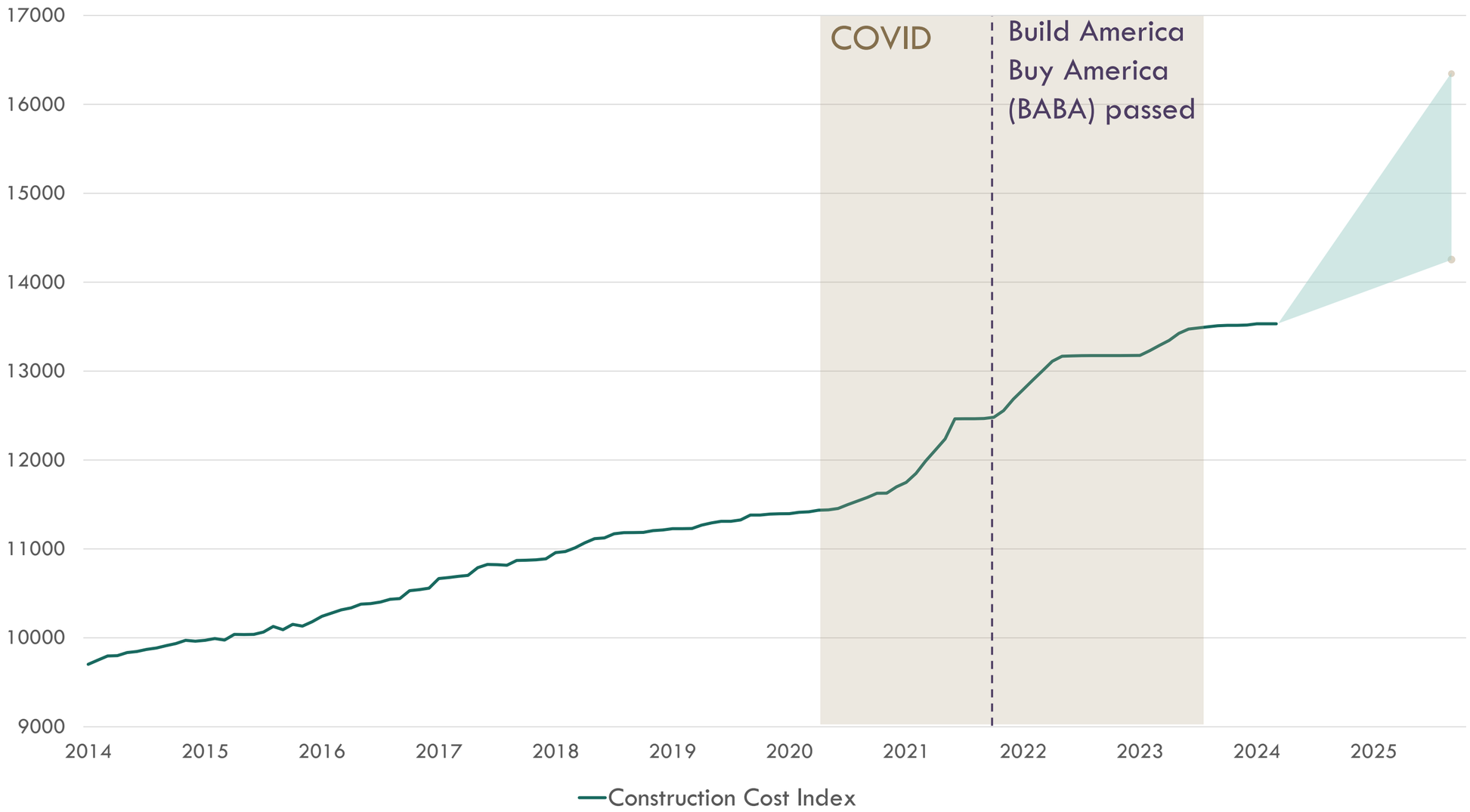
Funding and Financing



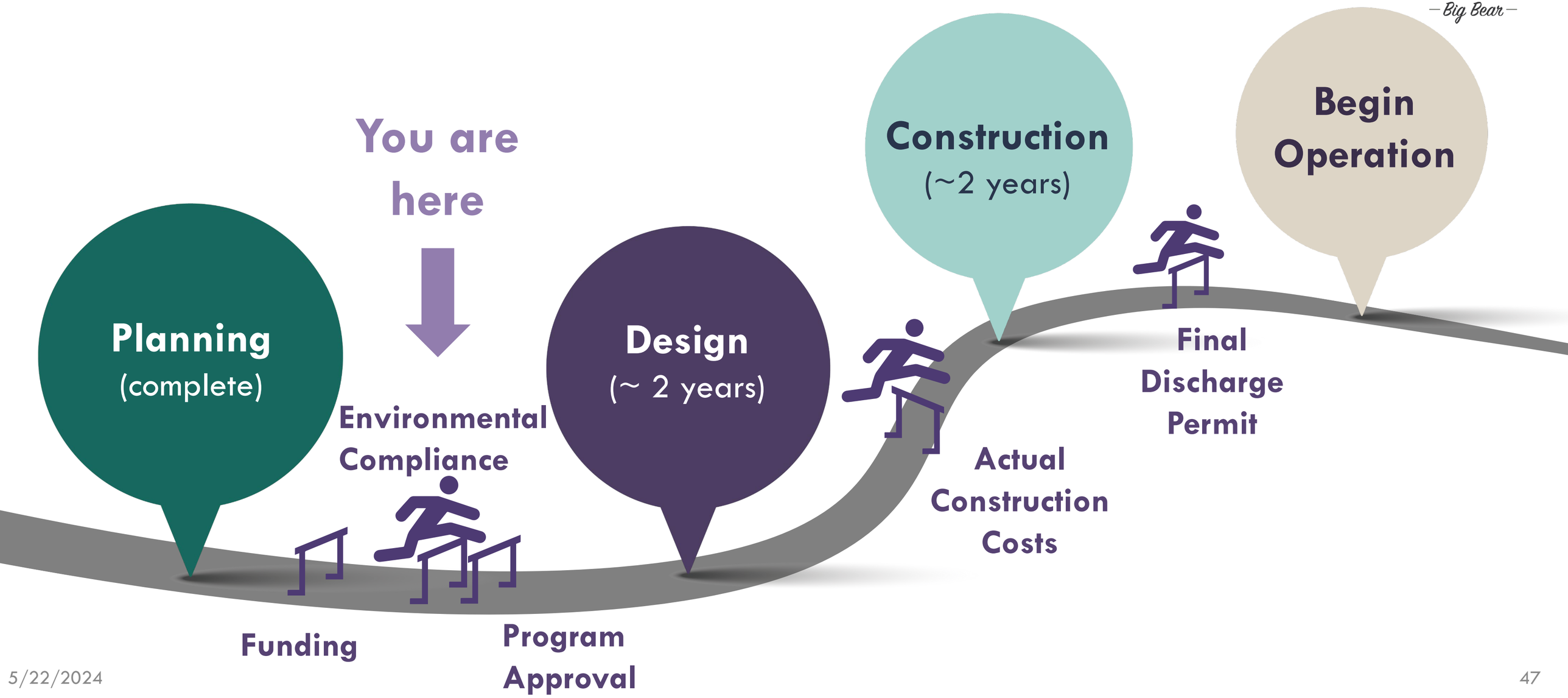
Federal funds can be used for up to 80% of the total project cost. If more federal grants are awarded, the WIFIA loan amount will be reduced to meet the 80% limit.

Program Cost Drivers

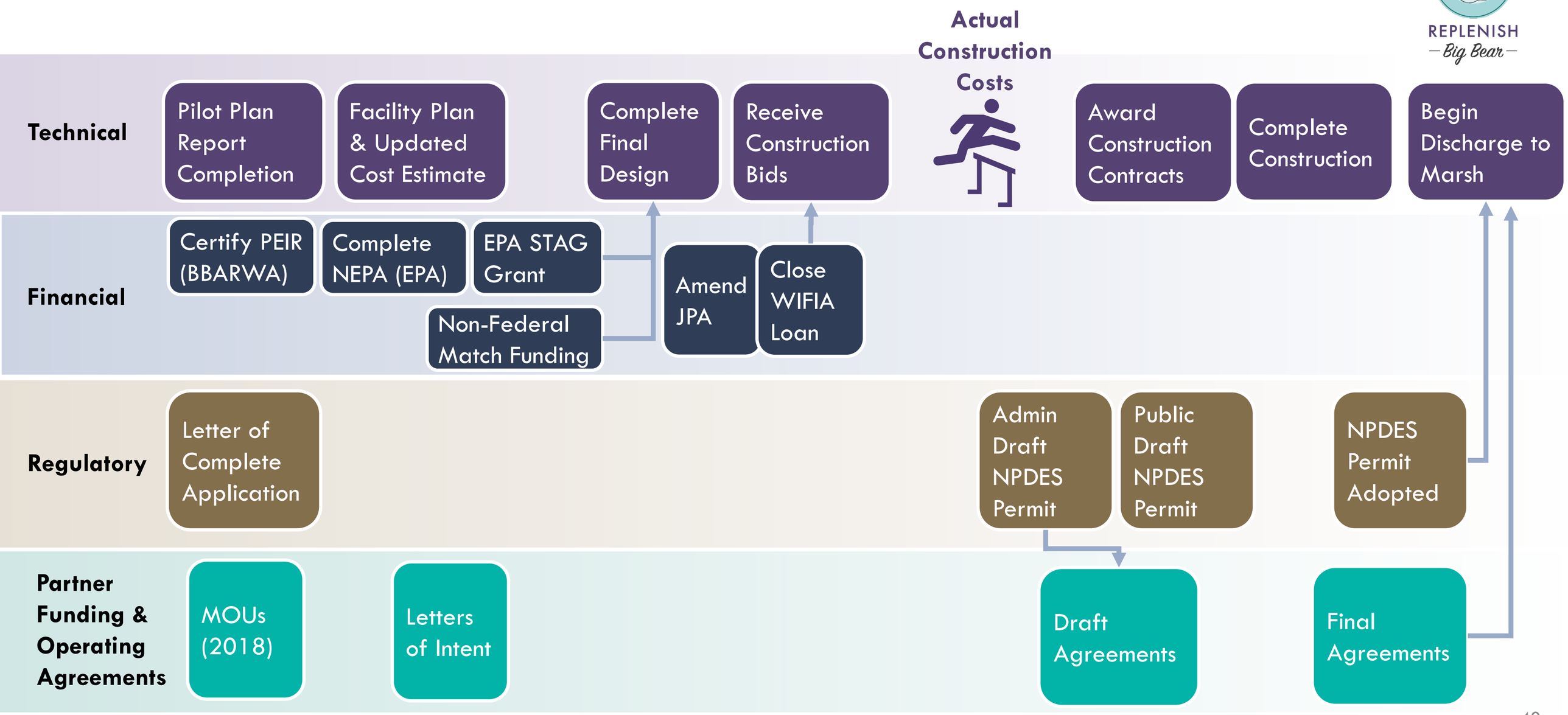
Post-COVID Construction Cost Inflation



Path Forward



Program Milestone Sequence



Questions?