

**BIG BEAR AREA REGIONAL WASTEWATER AGENCY  
BIG BEAR CITY COMMUNITY SERVICES DISTRICT  
CITY OF BIG BEAR LAKE DEPARTMENT OF WATER AND POWER  
BIG BEAR MUNICIPAL WATER DISTRICT**

Special Meeting Replenish Big Bear Workshop Agenda  
June 23, 2021 from 1:00 p.m. to 4:00 p.m.  
121 Palomino Drive, Big Bear City, California

The public may participate in this meeting either in person or by joining via Zoom or teleconference:

Join Zoom Meeting:

<https://zoom.us/j/98325405314?pwd=aUMxSjQ0djM2Rm1xbjRubjNETnM0Zz09>

Meeting ID: 983 2540 5314

Passcode: 797749

Dial by your location:

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*Due to the number of attendees, there may not be 6' of separation. All attendees are requested to adhere to current COVID guidelines. In an effort to protect public health, BBARWA encourages the public to listen to this meeting via Zoom or the conference call number above.*

**1. CALL TO ORDER**

**2. PLEDGE OF ALLEGIANCE**

**3. PUBLIC FORUM**

Public testimony is permitted at this time only on matters listed on the posted agenda. State law prohibits the Agency from taking action on any items not listed on the posted agenda. Please note that comments shall not exceed five (5) minutes.

*If you would like to make an in-person public comment during the meeting, please fill out a comment card and the BBARWA Chair will call your name during the Public Forum. If you would like to make a public comment via Zoom, please indicate your name and request in the chat box. BBARWA staff will fill out a comment card and the BBARWA Chair will call your name during the Public Forum. If you would like to make a public comment via the teleconference number, please wait until the BBARWA Chair calls for public comment from teleconference participants during the Public Forum.*

4. **PRESENTATION AND INTRODUCTION**

4.A. Replenish Big Bear Project update, costs, and funding.

5. **ADJOURNMENT**

In compliance with the Americans with Disabilities Act and Government Code Section 54954.2, if you need special assistance to participate in an Agency meeting or other services offered by the Agency, please contact the Agency at (909) 584-4018. Notification at least 48 hours prior to the meeting or time when services are needed will assist Agency staff in assuring that reasonable arrangements can be made to provide accessibility to the meeting or service.

Copies of staff reports or other written documentation relating to each item of business referred to on this agenda are on file in the office of the Big Bear Area Regional Wastewater Agency and are available for public inspection during normal business hours.

Visit [www.bbarwa.org](http://www.bbarwa.org) to view and/or print the agenda.



# Replenish Big Bear Project

Securing our Future



REPLENISH  
— *Big Bear* —

# Treated Water Discharged to Lucerne Valley

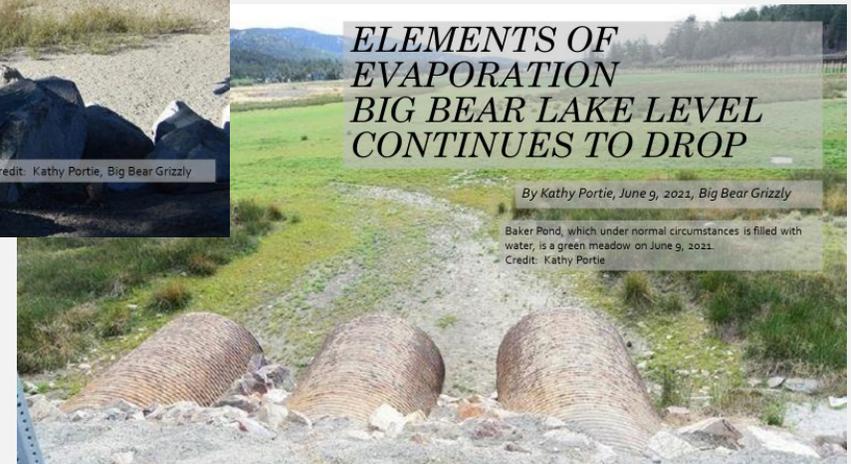
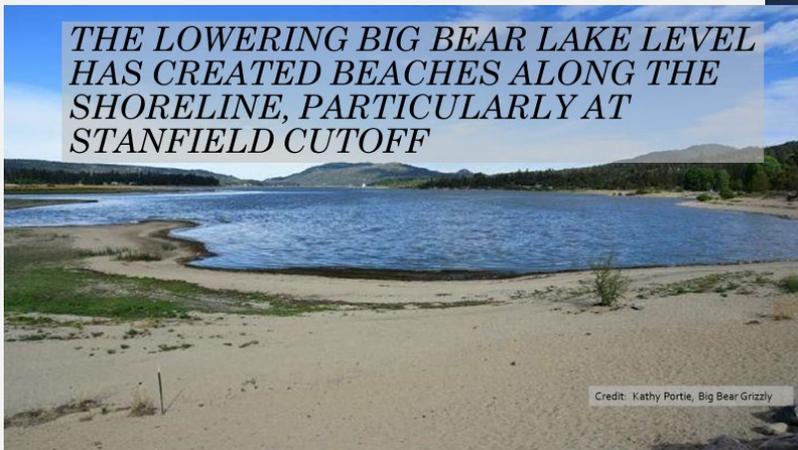
**34** billion gallons exported since 1980

- No benefit to our community
- No benefit to our economy
- No benefit to our environment



# Planning Ahead

- We have seen the headlines - weather patterns are changing
  - Increasing possibility of less precipitation and a long-term drought
  - Increasing wildfire threat

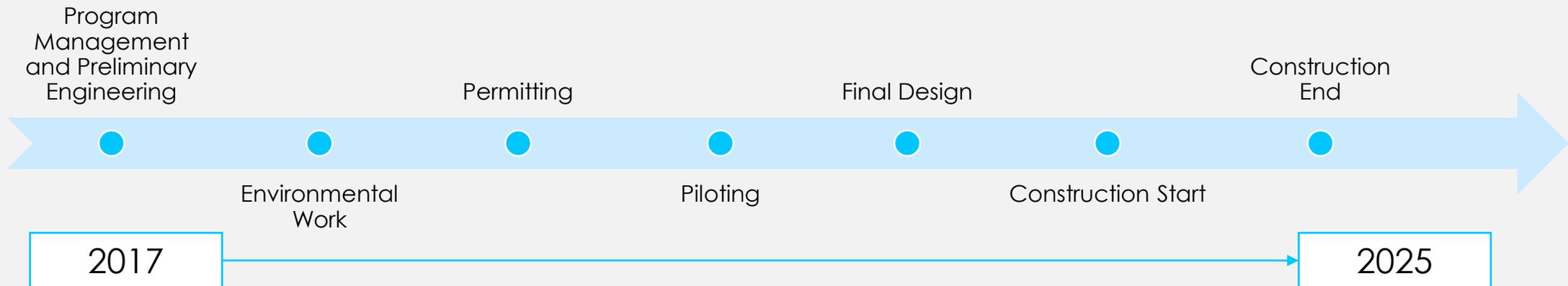


# Timing is Everything

- Water supply could be more important than ever

Exporting our wastewater to Lucerne is our least expensive option, but could be our most expensive mistake

- The cost and value of water will only increase as the effects from the drought continues
- Keeping water in Big Bear is a long, multi-year process:



# The Project



REPLENISH  
— *Big Bear* —

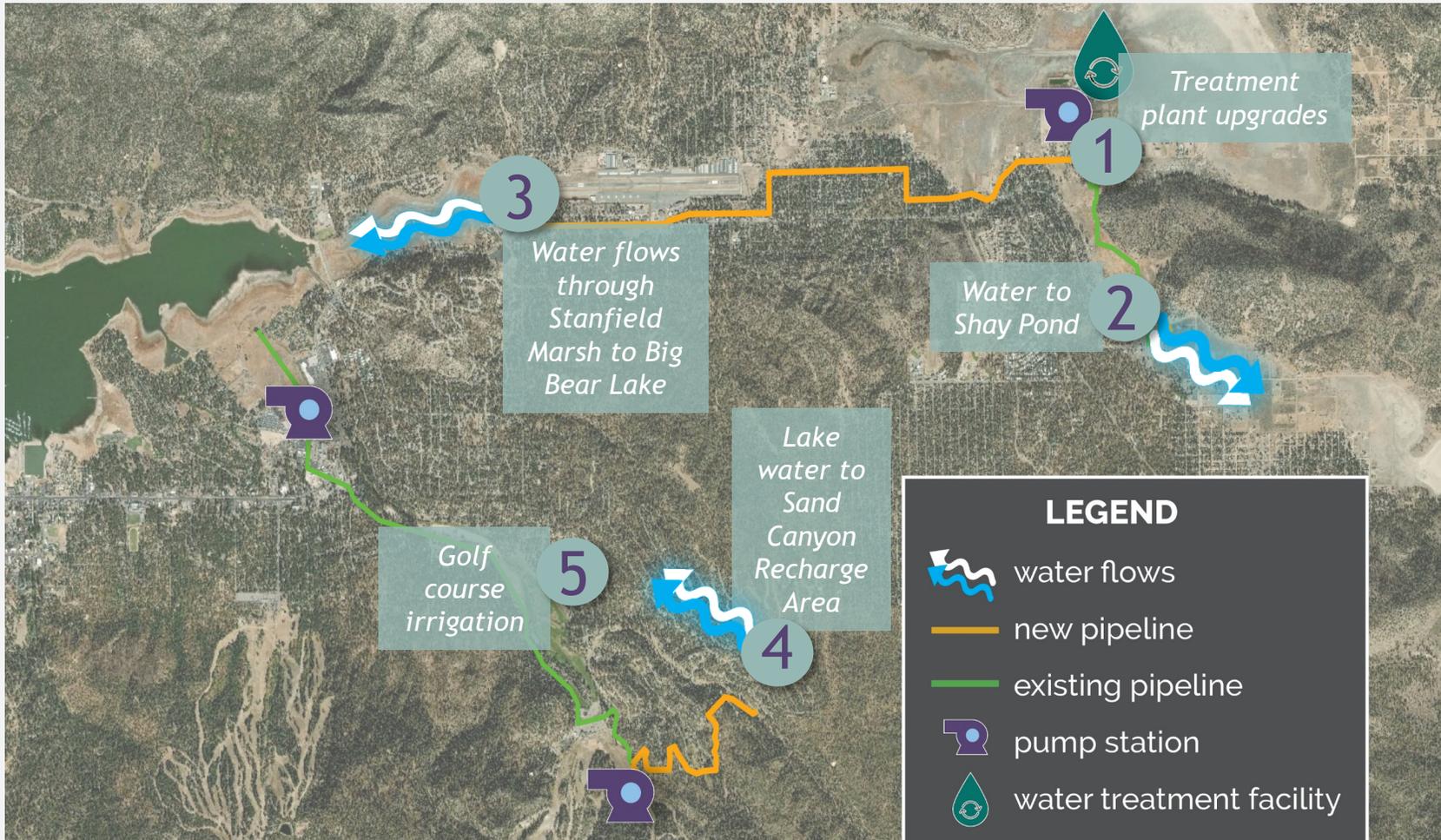


# Project Goals

- Keep this Valuable Resource (treated water) in Big Bear Valley
  - Increase Lake levels
  - Improve water sustainability
- An affordable project that benefits community, economy and environment



# Overview



## 1 Treatment plant upgrades

### Water Treatment

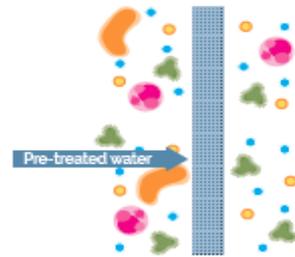
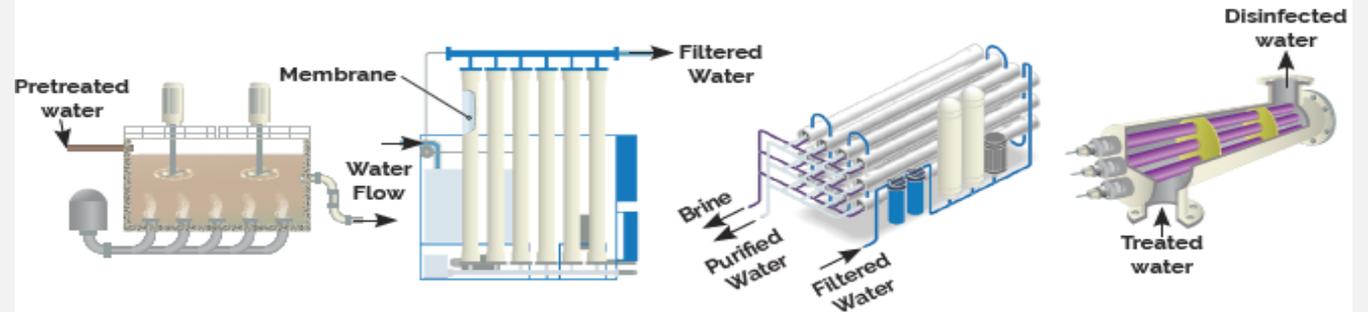
- 2,000 AF (650 million gallons)
- Plant Upgrades
  - Ox Ditch Retrofits
  - Denitrification Filter
  - Ultrafiltration
  - 100 % Reverse Osmosis
  - UV Disinfection
  - Pellet Reactor
  - Evaporation Ponds
- Piloting
  - Denitrification Filter, Ultrafiltration, Reverse Osmosis, Pellet Reactor

# Treatment Process

- Exceeds Drinking Water Standards – It's SAFE
- Permitting Requires 100% Reverse Osmosis

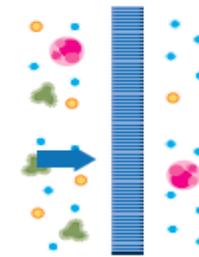
## A Proven Water Treatment Process

Several additional treatment steps to Big Bear's existing treatment process will use proven technology to achieve safe, high quality water that exceeds drinking water quality standards.



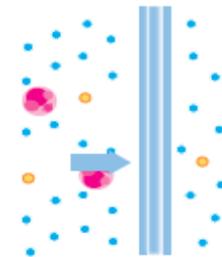
### Nutrient Removal

Specialized biological processes and chemical treatment remove most of the organics, nitrogen, and phosphorous from the water.



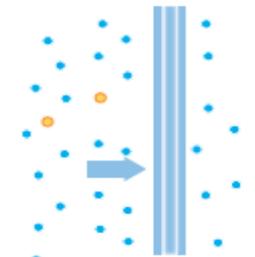
### Filtration

A filtration process uses either permeable membranes or granular media to remove suspended solids and bacteria from the treated water as it passes through the filter.



### Reverse Osmosis

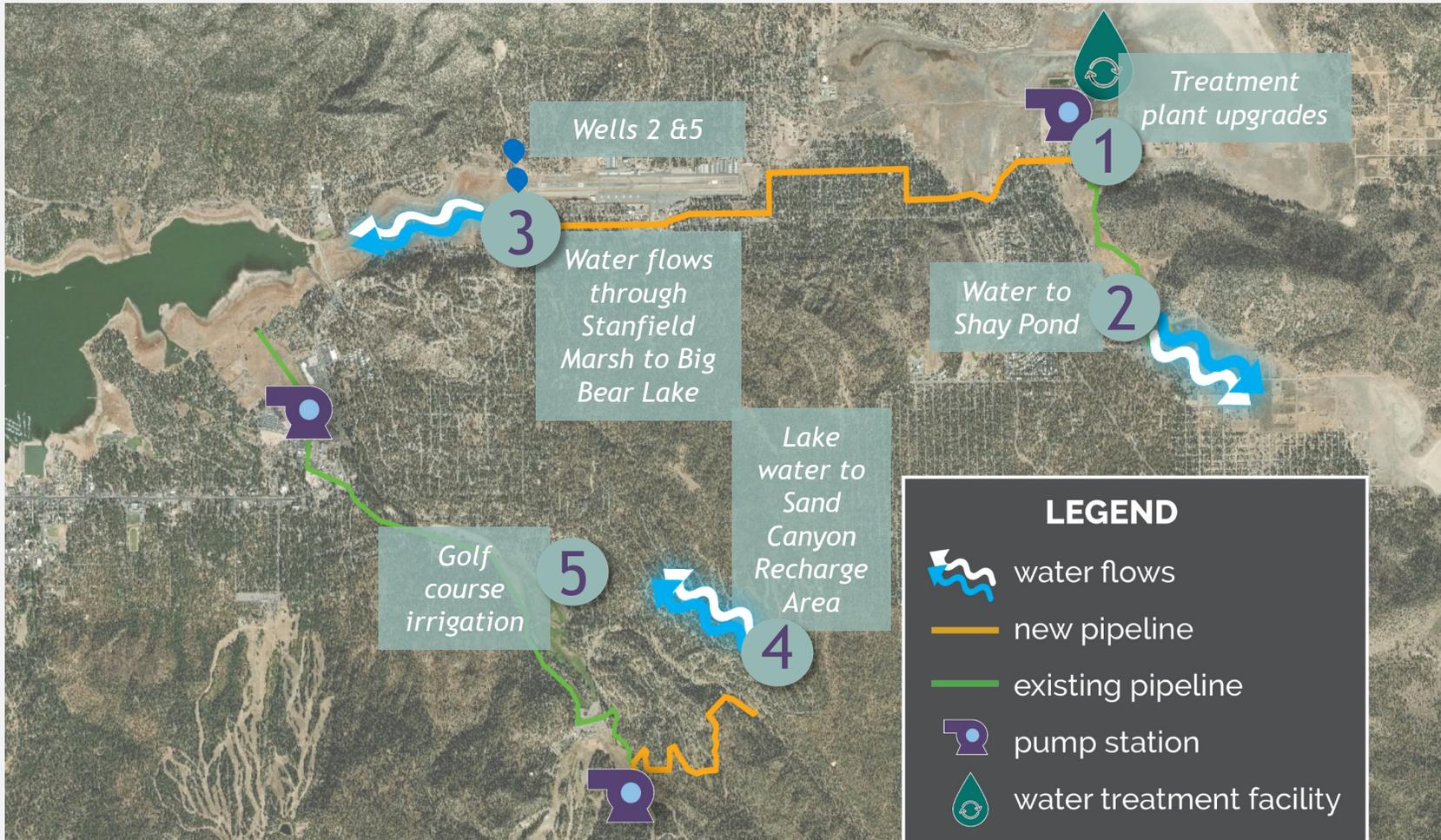
Water is forced under high pressure through reverse osmosis membranes to remove impurities, including salts, bacteria, viruses, pharmaceuticals, and personal care products.



### UV Disinfection

High-intensity UV light disinfects the water by deactivating any bacteria, viruses, and other microorganisms so they are rendered harmless.

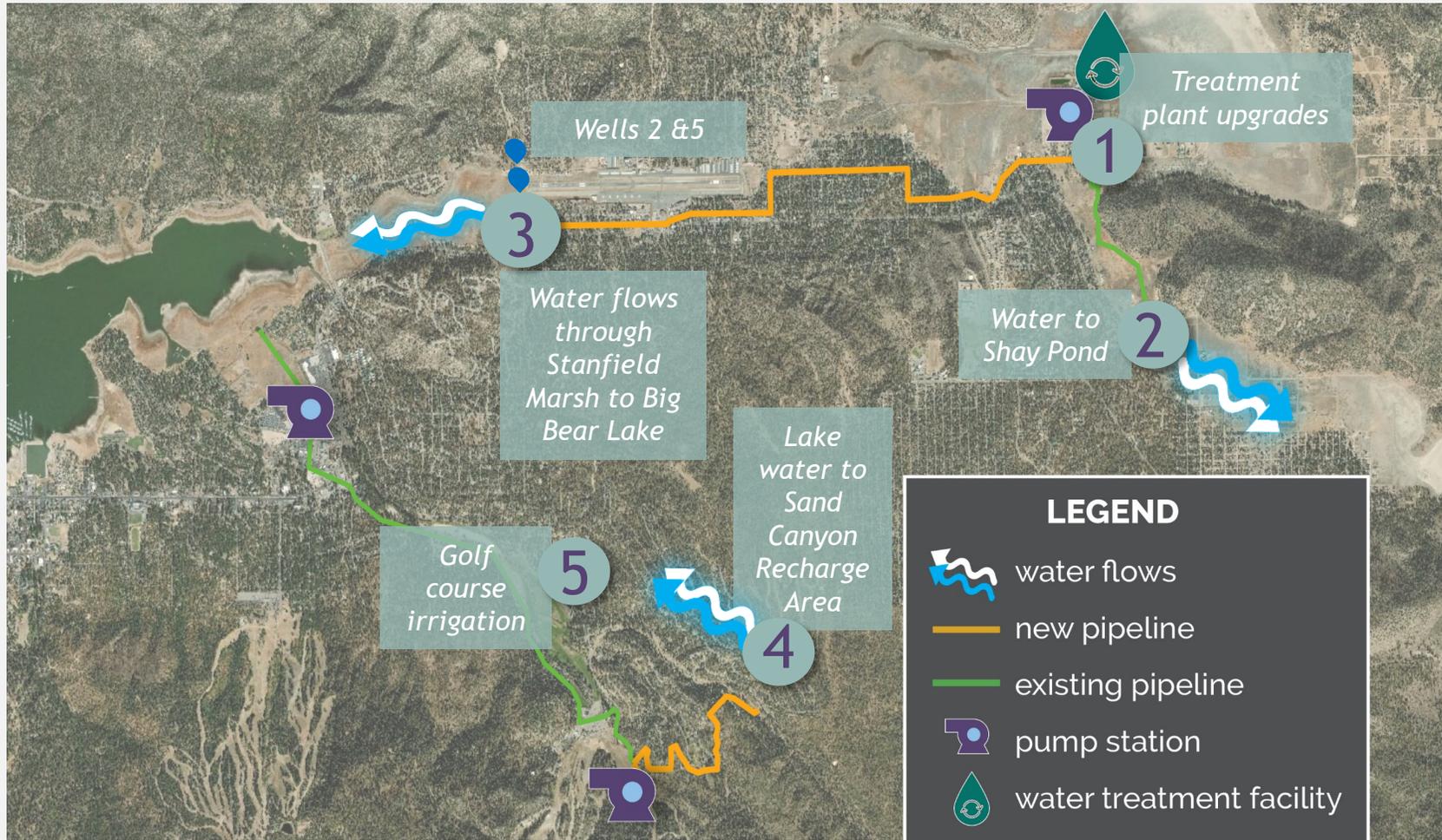
# Overview



## 2 Water to Shay Pond

- Up to 80 AF annual requirement to replenish Shay Pond to protect endangered Stickleback fish
- CSD pumps groundwater to meet requirement
- Pipeline to Shay Pond – 4", 710 LF

# Overview



## 3

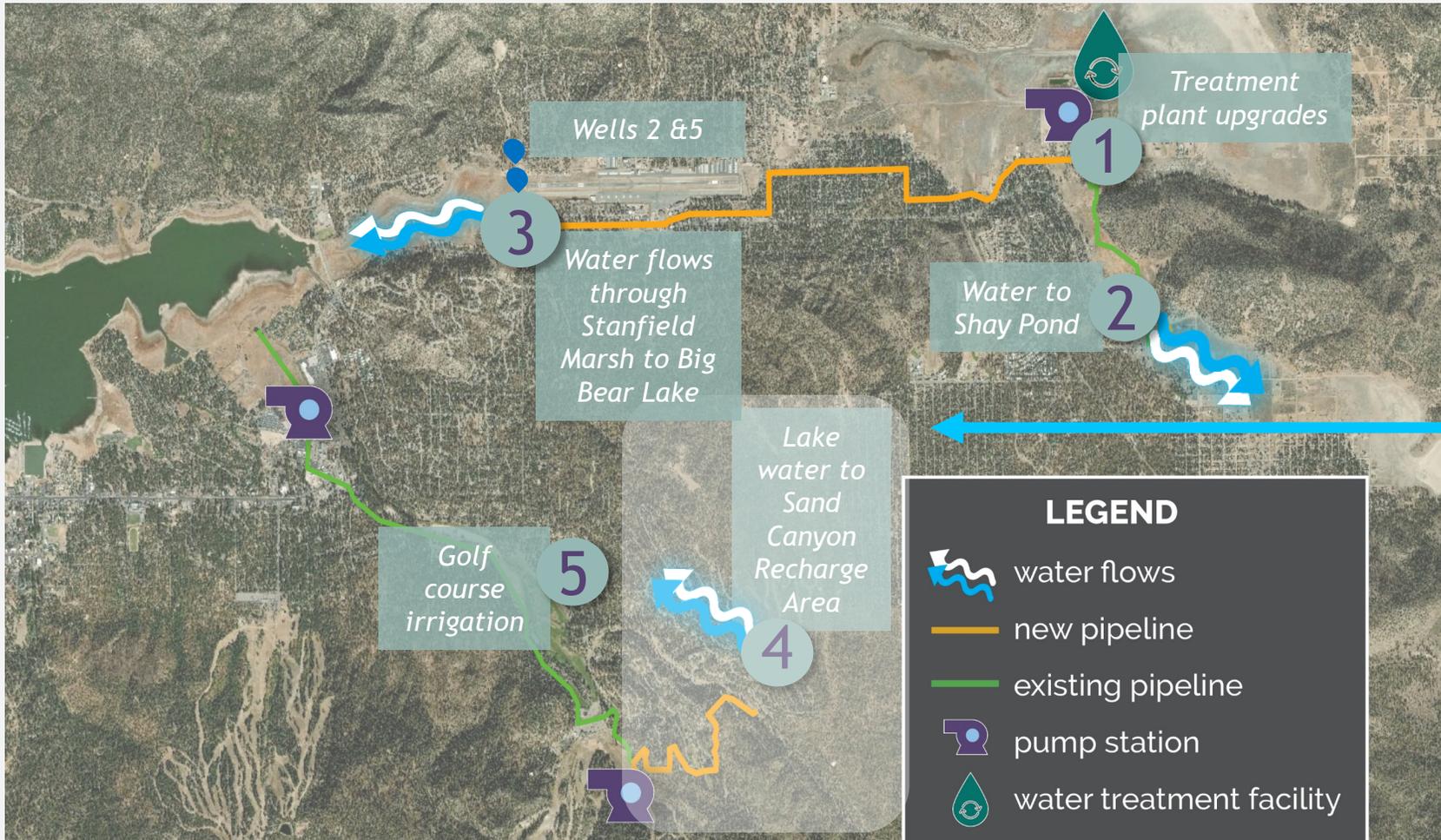
### Offsite Improvements

#### Transport of Treated Water

- Pipeline
  - to Lake – 12", 19,940 LF
- Well abandonment\*
  - Due to proximity to lake
  - Abandon DWP Wells 2 and 5
  - DWP Replacement Well 9

\*DWP costs, not included in project costs.

# Overview



4

## Sand Canyon Recharge

- New pipeline, pump station **not in construction costs**
- alternative, less expensive recharge options are also being explored
- Future permitting and infrastructure

5

## Golf Course Irrigation

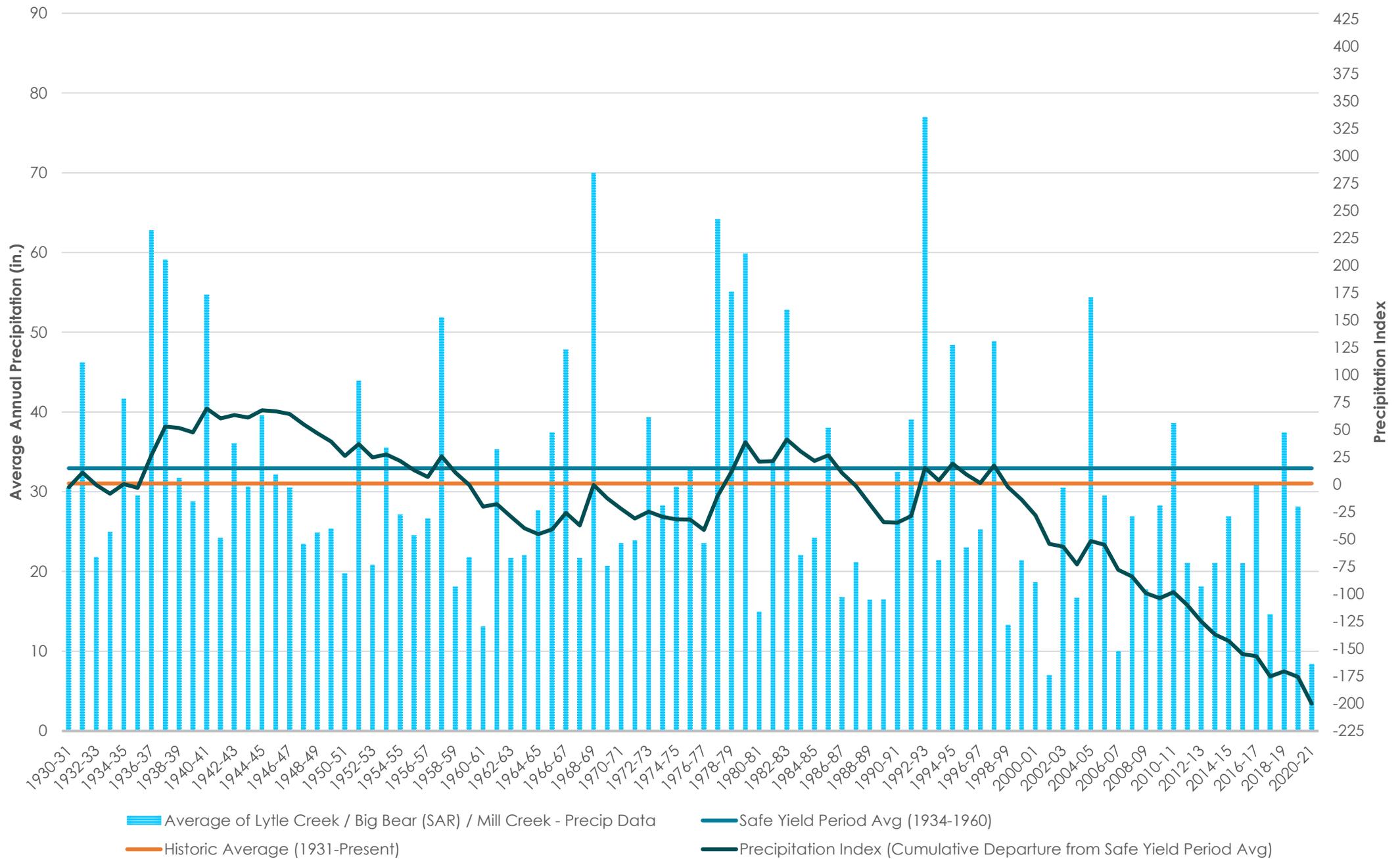
- 120 AF Recharge
- Irrigation water from lake instead of well

# Improve Water Sustainability – Increase Water Supply

- In-lieu Groundwater recharge
  - 120 AF Golf Course water
  - 80 AF Shay Pond / Stickleback water
- Future opportunities
  - 380 AF Sand Canyon Recharge
  - DWP can access Lake to pump water to Sand Canyon (pipeline not included in current Project costs)
    - Delivered water will soak into groundwater basin
    - DWP can share this benefit with CSD through existing pipeline interconnect
  - Treating the water and keeping it in Big Bear creates opportunities for future beneficial reuse

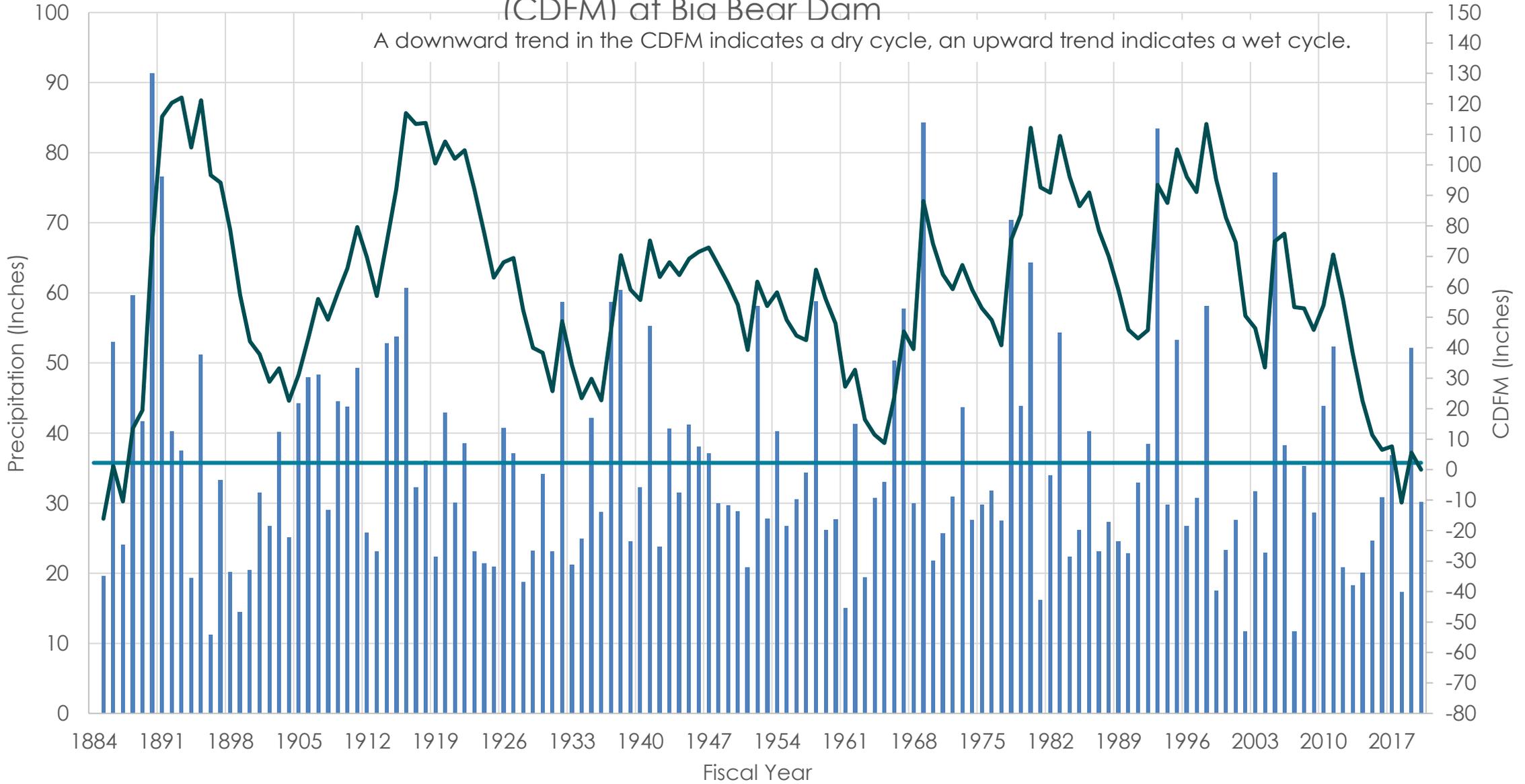


# SAN BERNARDINO BASIN PRECIPITATION INDEX

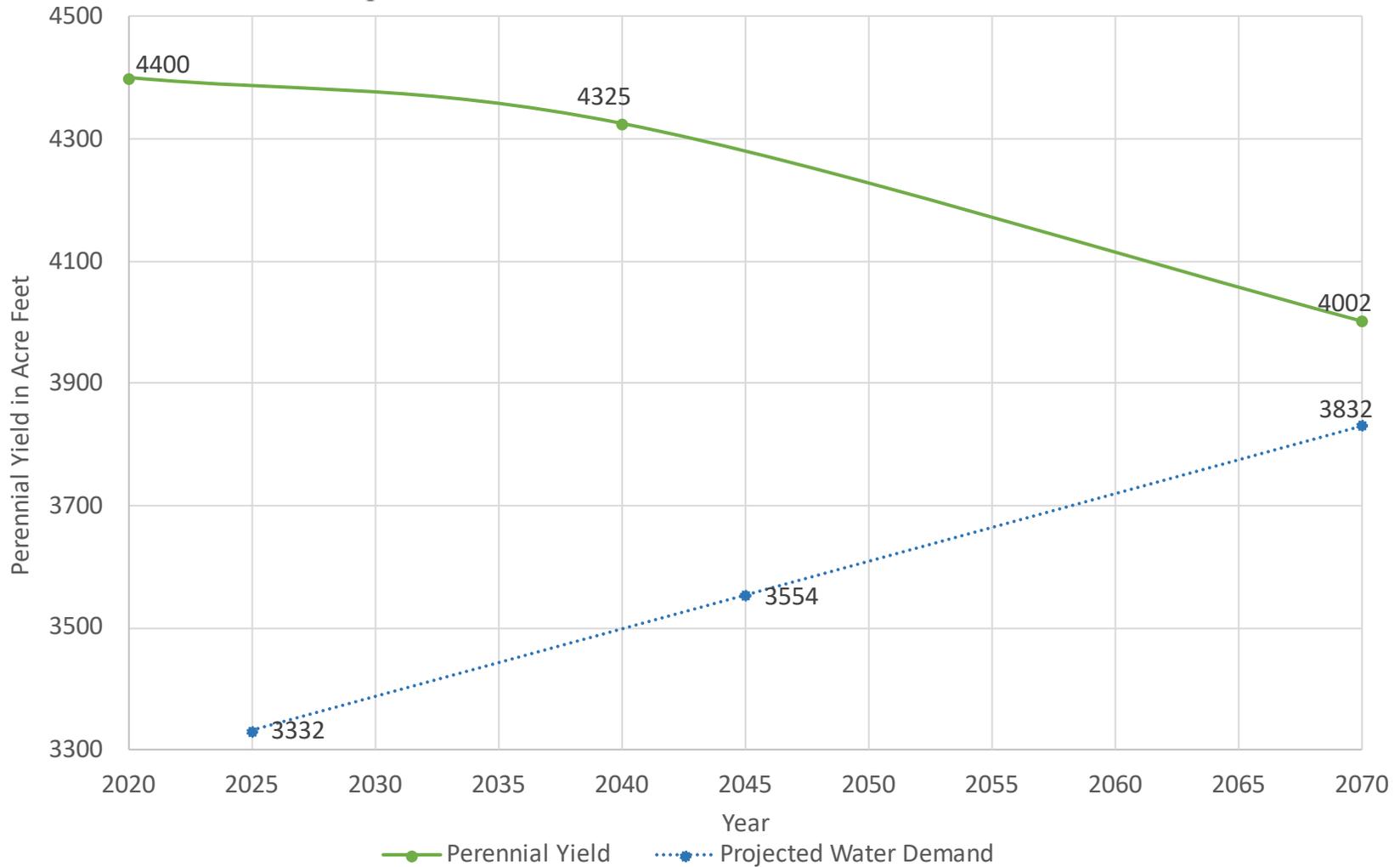


# Annual Precipitation and Cumulative Departure from Mean Precipitation (CDFM) at Bia Bear Dam

A downward trend in the CDFM indicates a dry cycle, an upward trend indicates a wet cycle.



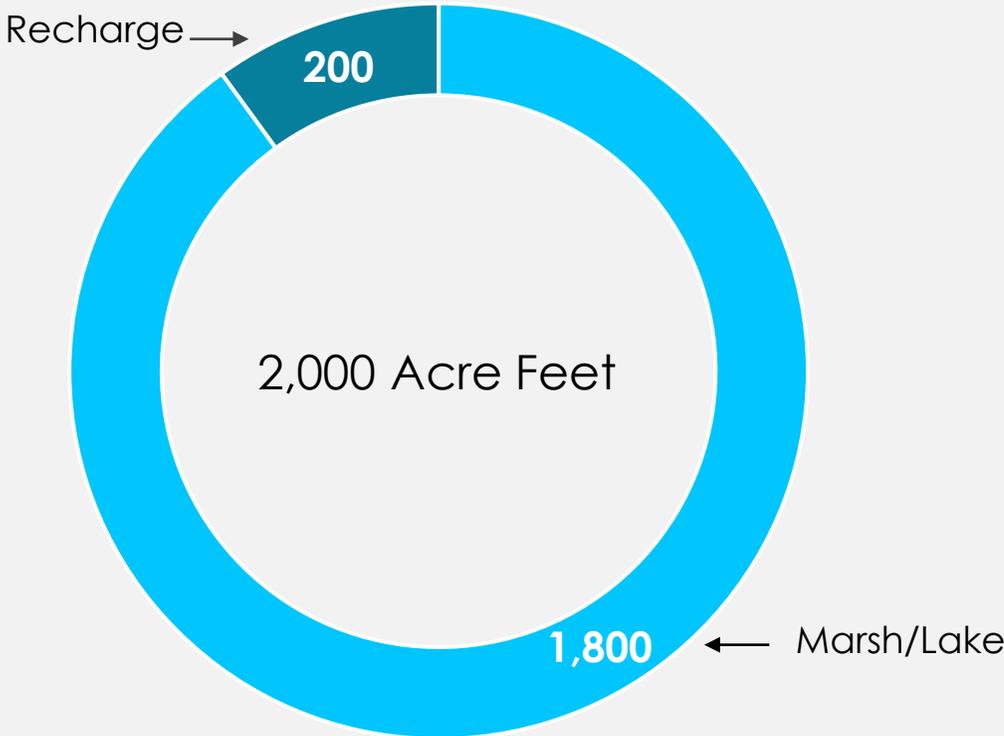
## Bear Valley Perennial Yield vs. Water Demand



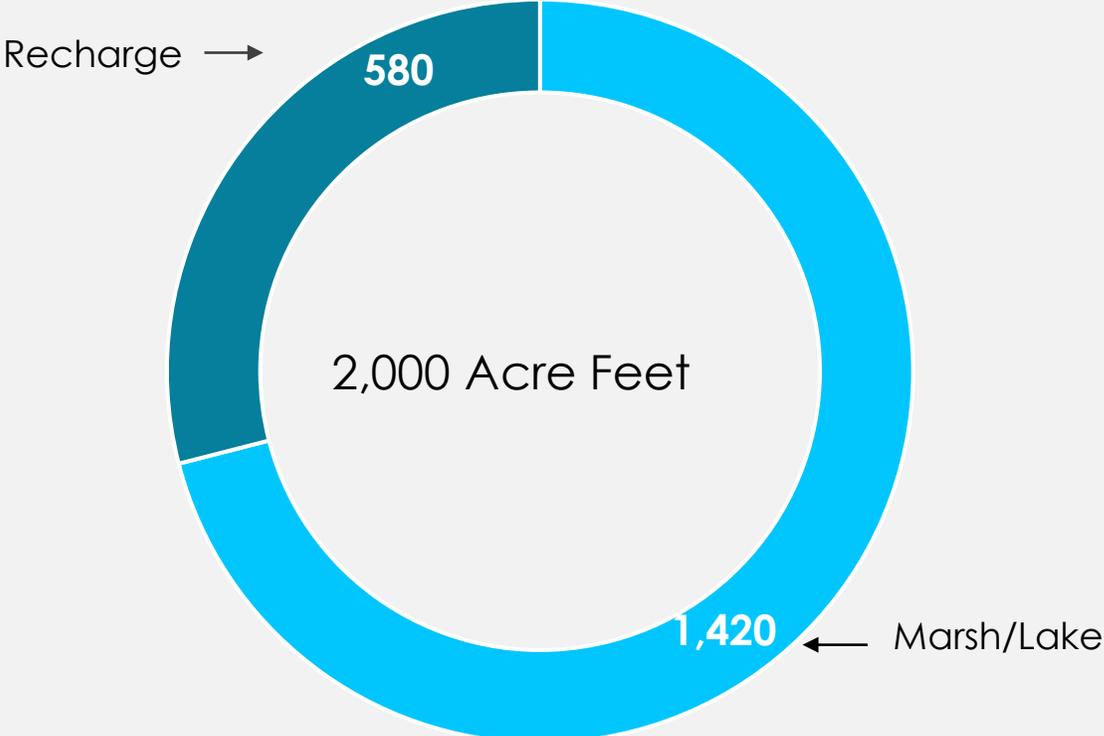
# Overview

Annual Production of 2,000 Acre Feet or 650 million gallons of treated water

**Current – Annual Recharge 7% of Water Demand**



**Future – Annual Recharge 20% of Water Demand**

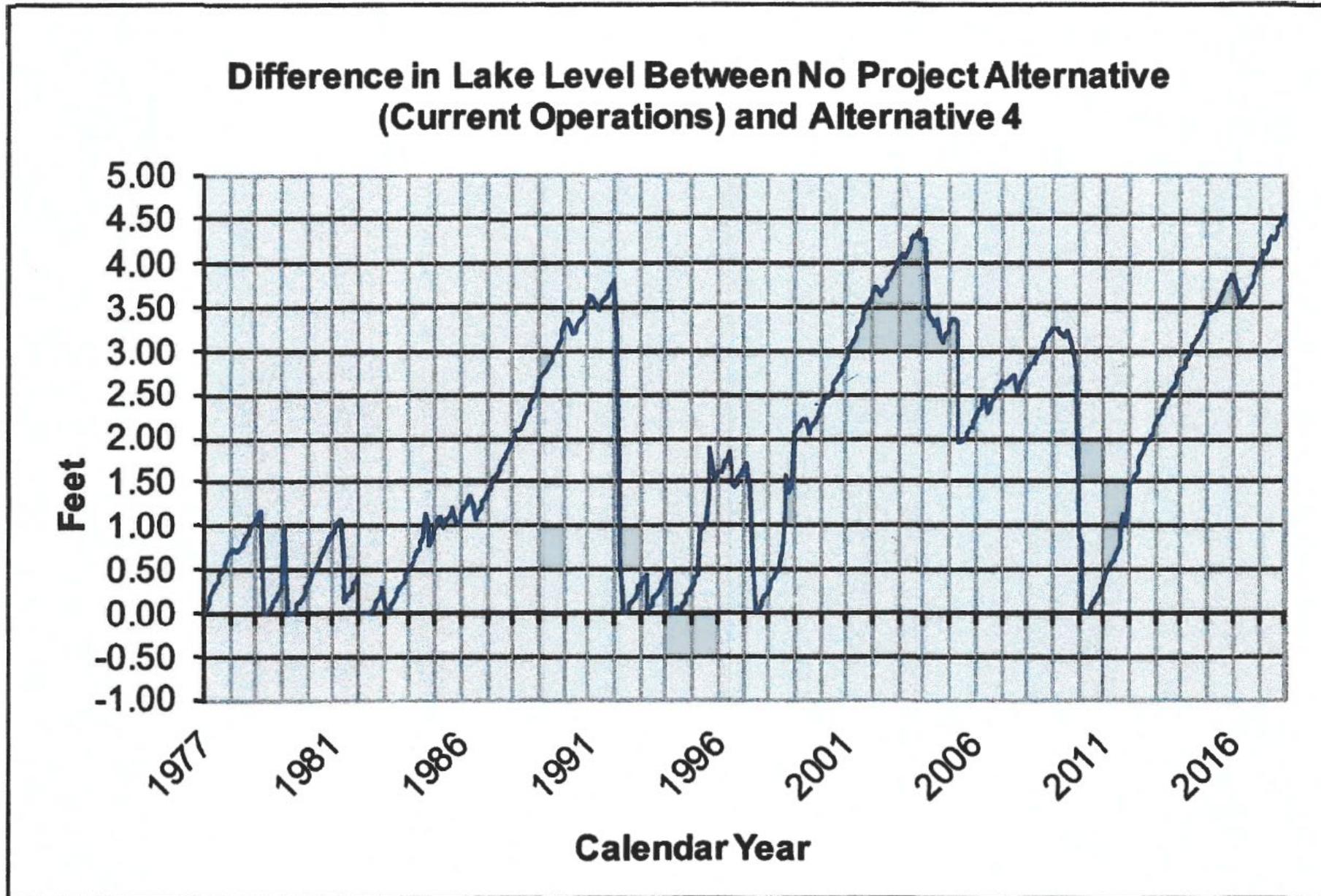


# Increase Lake Levels – Lake Impact

- Lake Impact modeled based on 1,788 AF annual inflow applied to historical lake levels from 1977 - 2018
- The expected impact is
  - More stable lake levels with a long-term, average annual increase of 1.7 feet, and up to 4.5 feet during drought years.
  - Increase in lake usability – the lake is full more frequently

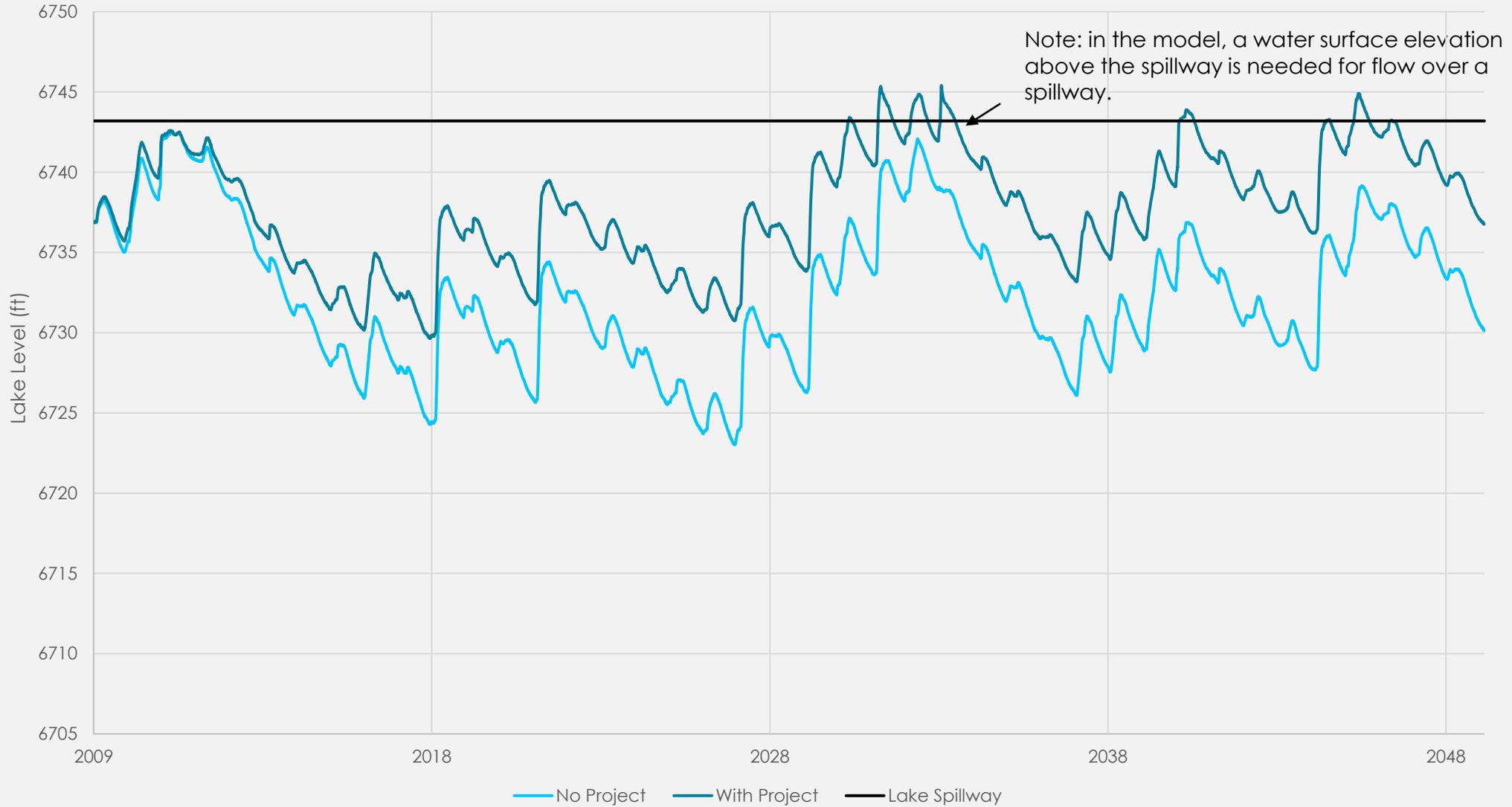


# Lake Levels

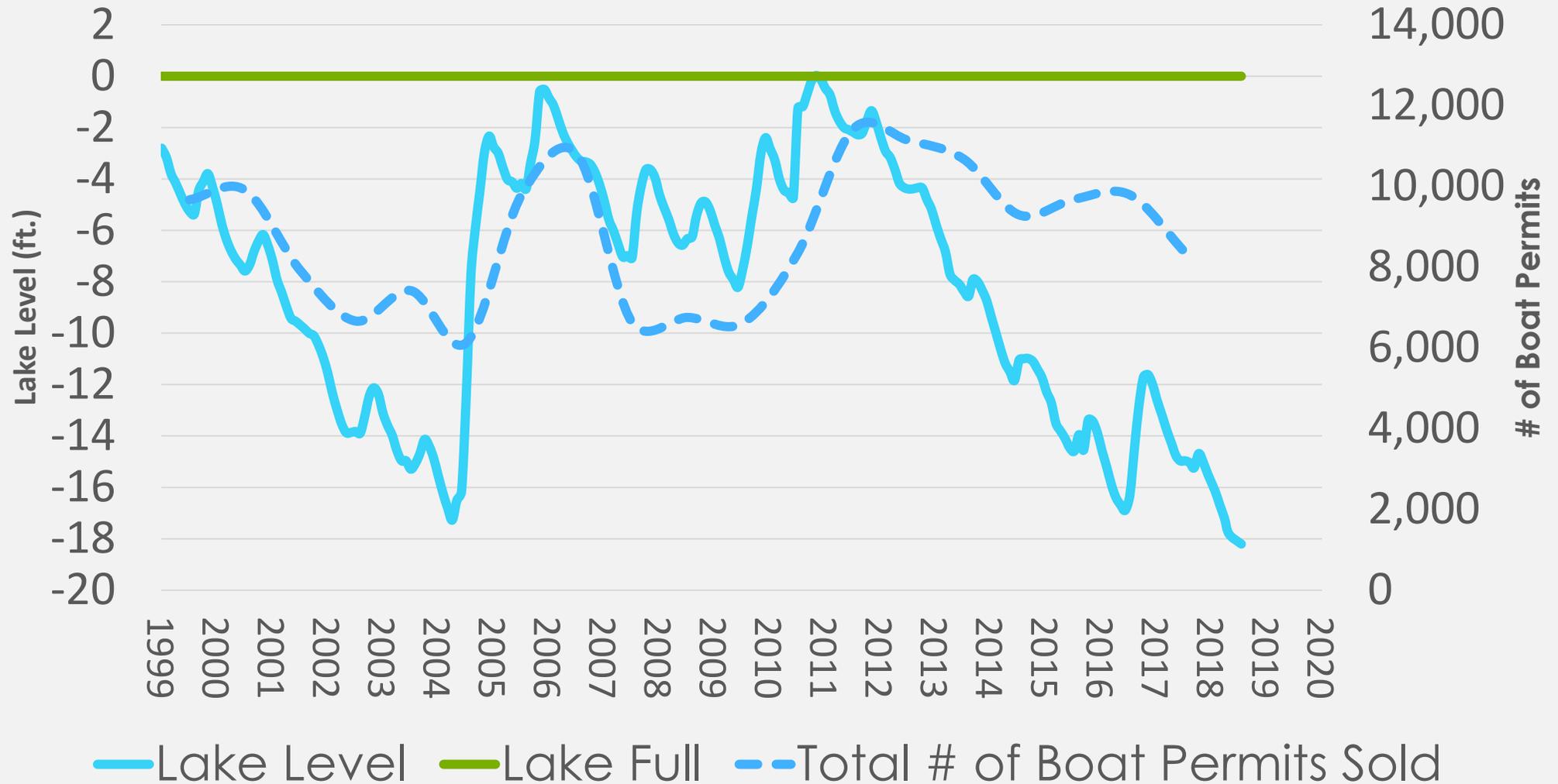


# Lake Levels

Lake Model - Simulated Lake Level Under Average Scenario



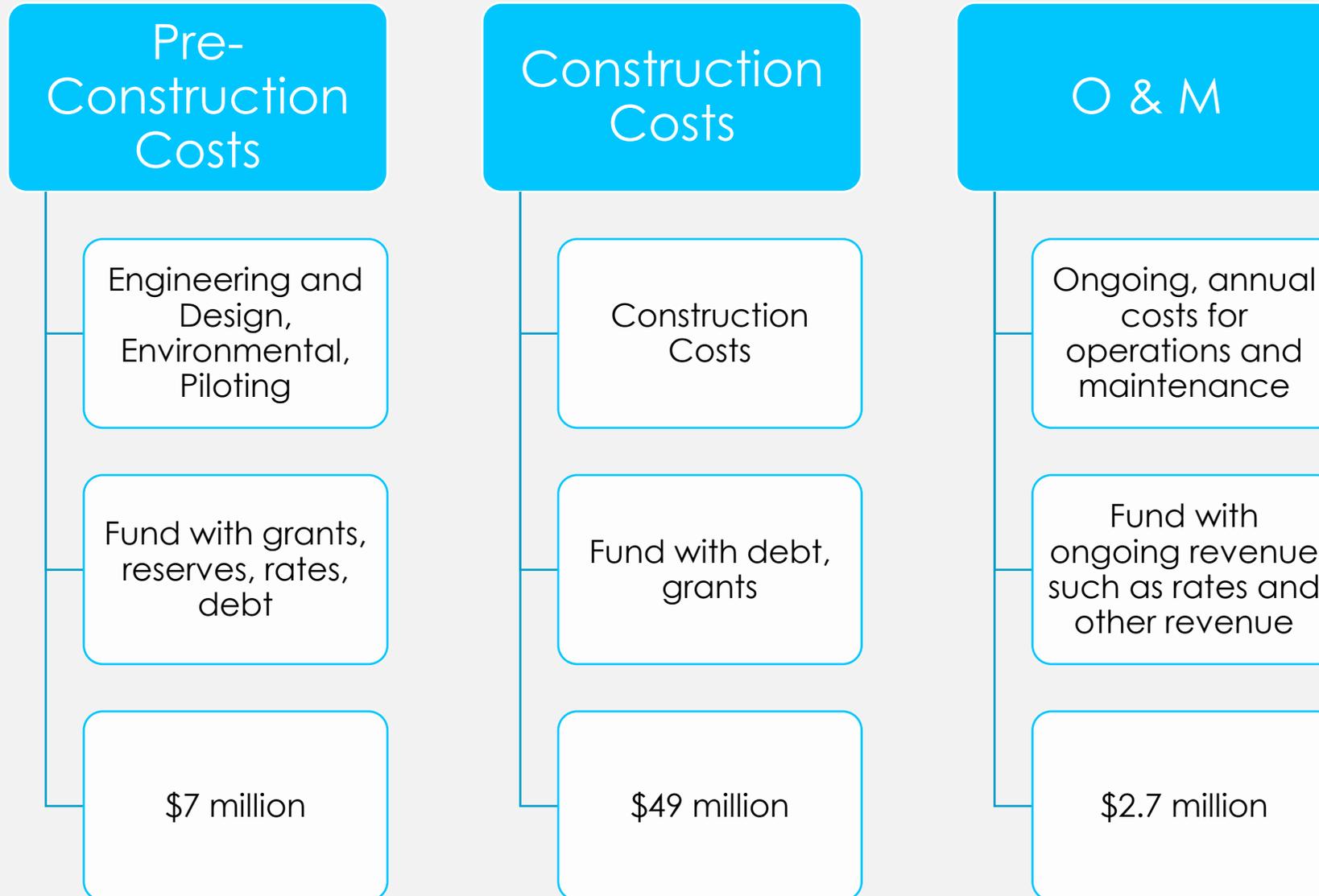
# Lake Level Impacts Recreation and Economic Activity





# Project Costs and Funding

# Project Cost Estimate



# Project Costs and Funding

Costs	\$
Preconstruction Costs	\$ 7,005,646
Construction Costs	48,711,354
Total Costs	\$55,717,000
Grant Funding	(5,063,338)
Net Costs after Grants	\$50,653,662
Debt Service 2.2%, 30 Years	\$2,315,440

Annual Revenue Requirements	\$
O&M	\$2,737,001
Debt Service	2,315,440
Total Annual Requirements	\$5,052,441

# Rates and Funding

- **Balance of Funding – Equitable Allocation of Costs**

- Project represents
  - more expensive, alternative treatment and disposal option
  - creates specific and general benefits across our community, economy and environment
- BBARWA's funding goals are to:
  - pass through the costs of specific benefits to those beneficiaries
  - pass through the remaining costs to BBARWA's ratepayers
    - results in a lower, more equitable rate for BBARWA's ratepayers

- **Project Affordability**

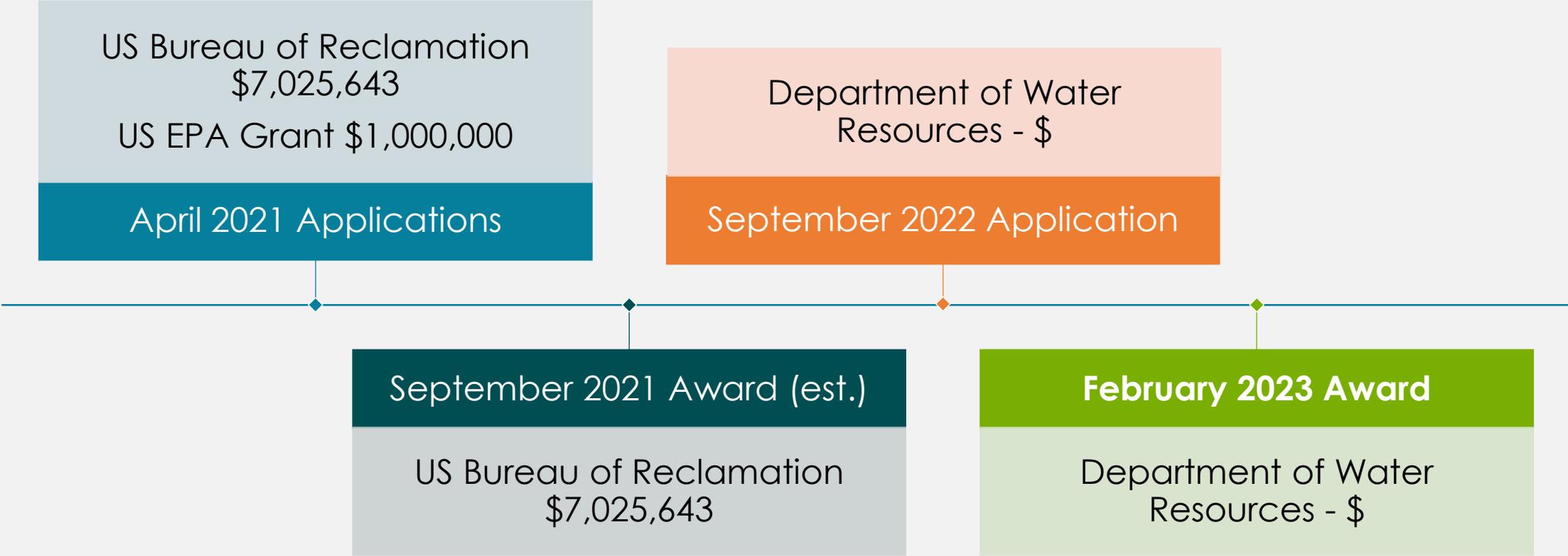
- It is BBARWA's goal to secure grant funding to offset the costs of the project and to meet the objective of "affordability"

# Contributions

<b>Shay Pond</b>		<b>AF</b>	<b>Cost Per AF</b>		
CSD		26.7	X	\$ 500.00	\$ 13,333.33
DWP		26.7	X	\$ 500.00	\$ 13,333.33
BBARWA		26.7	X	\$ 500.00	\$ 13,333.33
				Total	\$ 40,000.00
<b>Sand Canyon Recharge</b>		<b>Cost Per AF</b>			
DWP		253.3	X	\$ 500.00	\$ 126,666.54
CSD		126.7	X	\$ 500.00	\$ 63,333.27
				Total	\$ 189,999.81
<b>Lake Benefit</b>					
MWD		1540	X	\$500	\$770,000
				<b>Annual Charge</b>	<b><u>\$ 999,999.81</u></b>

# Other Funding – Grants and Low-Interest Loans

## Grant Roadmap



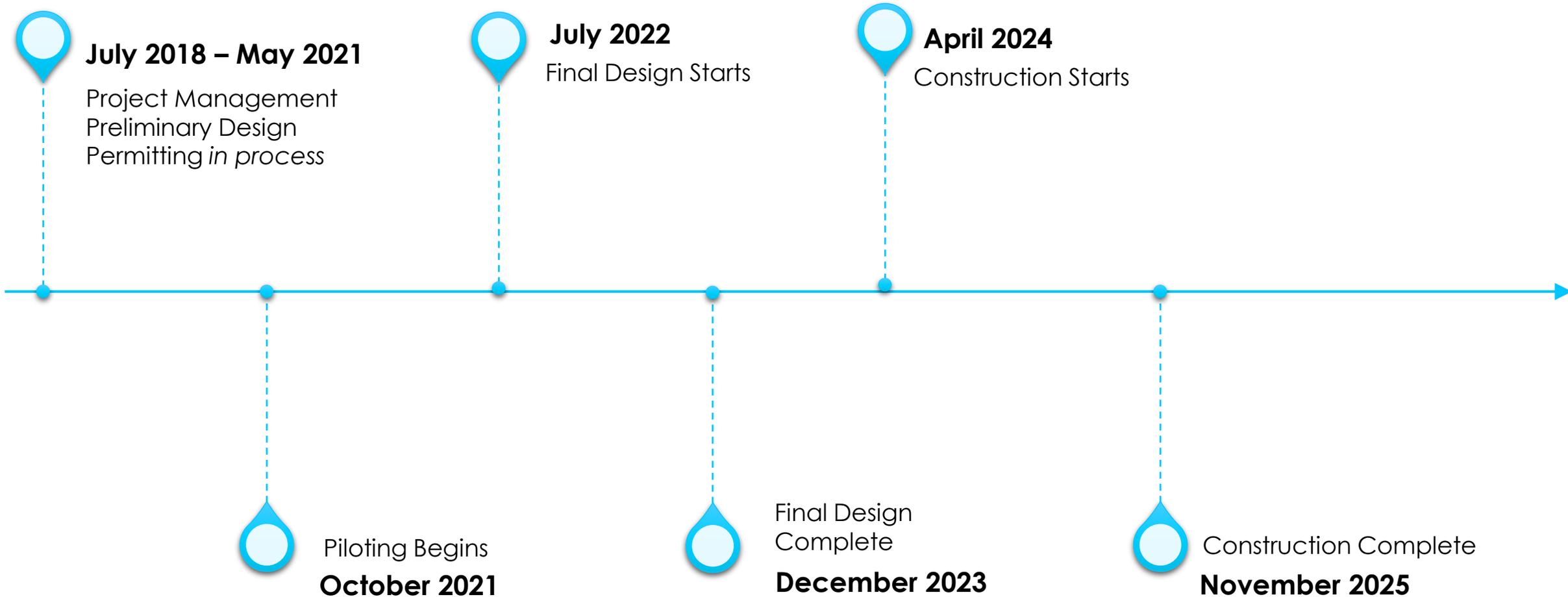
# Benefits & Beneficiaries

Project	Beneficiaries	Potential Funding Source	Environment	Community	Economy
<b>Increase Lake Levels</b>	<ul style="list-style-type: none"> <li>Fish and Wildlife</li> <li>Residents</li> <li>Visitors</li> <li>Environmental groups</li> <li>Lake front property owners</li> <li>Private Dock owners</li> <li>Boat owners</li> <li>People that fish</li> <li>Lake Recreators</li> <li>Marinas</li> <li>Commercial businesses</li> <li>Private home rentals</li> <li>Private home rental agencies</li> <li>General economy</li> <li>City of Big Bear Lake</li> <li>MWD</li> <li>Fishing Charters</li> <li>County of San Bernardino</li> <li>Fire Protection District</li> <li>DWP</li> <li>CSD</li> <li>San Bernardino Valley Water District</li> <li>Caltrans</li> <li>Sheriff's Department</li> <li>Ski Resorts</li> <li>Visitors Bureau</li> <li>Forest Service</li> <li>Big Bear Mutual Water Agency</li> </ul>	<ul style="list-style-type: none"> <li>TOT</li> <li>Property Tax</li> <li>BBARWA Rates</li> <li>Special Assessment District</li> <li>CSD Rates</li> <li>DWP Rates</li> <li>User Fees</li> <li>TBID</li> <li>Ski Resort Fee</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>Stabilized lake level reduces stress on habitat and species</li> <li>Creates opportunities for ecosystem restoration</li> <li>Allows more flushing of poor-quality water from lake</li> <li>Increased flexibility of Lake management strategies</li> </ul>	<ul style="list-style-type: none"> <li>Stabilized lake level improves access and quality for recreation</li> <li>Preserves community asset and economic resource</li> </ul>	<ul style="list-style-type: none"> <li>Supports property values</li> <li>Increases recreation and economic activity, and thus sales tax revenues and jobs</li> </ul>

# Benefits & Beneficiaries

Project	Beneficiaries	Potential Funding Source	Environment	Community	Economy
<b>Improve Water Sustainability</b>	General Public Residents Commercial businesses Fire Protection District Residents Visitors Contractors Developer Ski Resorts County of San Bernardino Fire Protection District DWP CSD	<ul style="list-style-type: none"> <li>• TOT</li> <li>• Property Tax</li> <li>• BBARWA Rates</li> <li>• Special District</li> <li>• CSD Rates</li> <li>• DWP Rates</li> <li>• User Fees</li> <li>• TBID</li> <li>• Ski Resort Fee</li> <li>•</li> </ul>		<ul style="list-style-type: none"> <li>• Helps protect our investments in our community from long-term drought and improves fire protection</li> <li>• Helps us ensure the promise of clean drinking water for a thriving community</li> </ul>	<ul style="list-style-type: none"> <li>• Improves resilience to long-term drought</li> <li>• Helps to maintain economic viability and value – property values, sales tax revenue and jobs</li> </ul>

# Current Project Timeline



# Next Steps Project Funding

1. Develop Memorandum of Understanding among Beneficiaries
  1. Lays the groundwork for co-operative funding
  2. Establishes the framework for the funding structure
2. Ongoing pursuit of grant opportunities to increase affordability