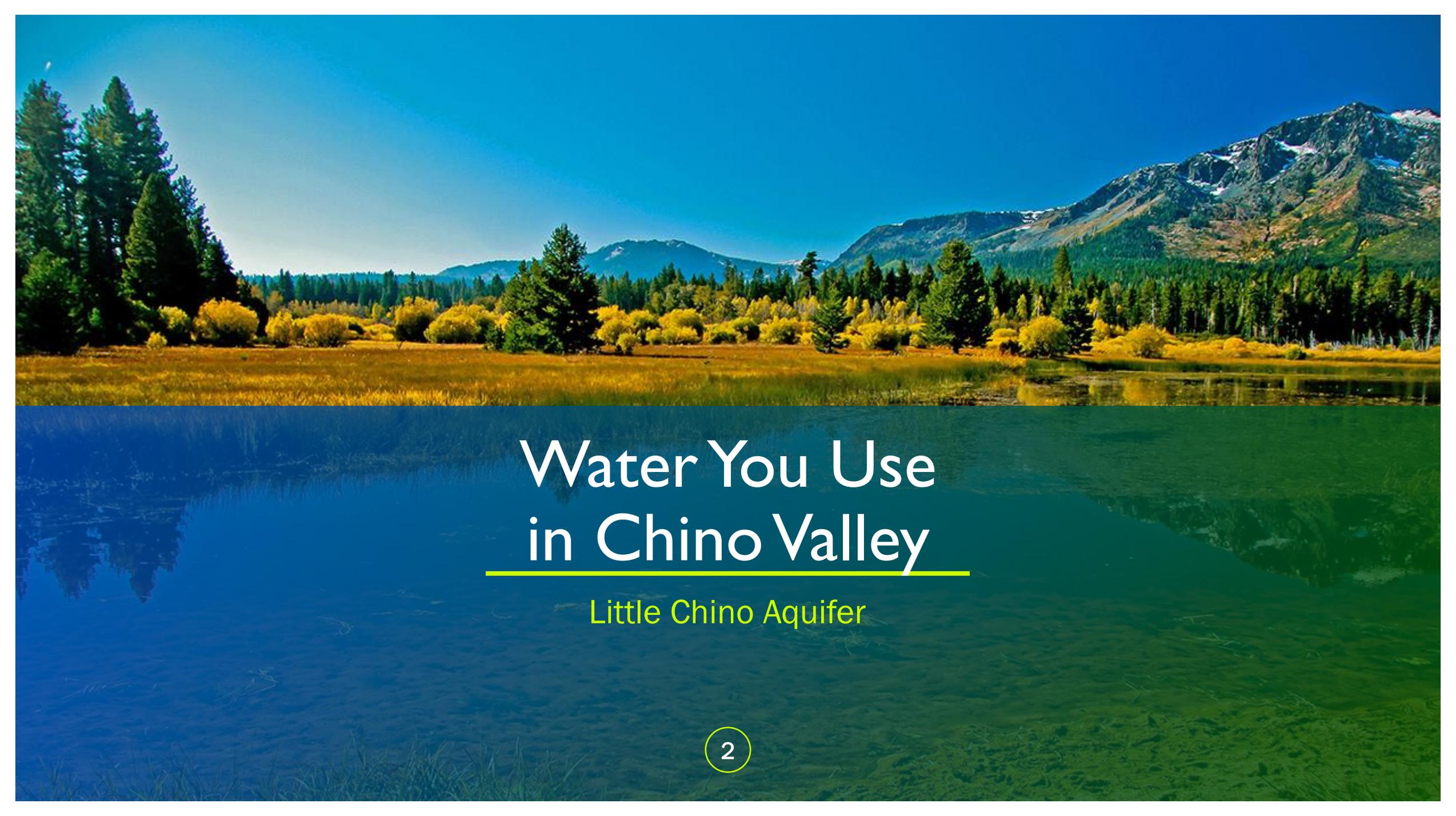


2024

Understanding Water

Citizen's Academy
Town of Chino Valley



A scenic landscape of a valley with mountains, trees, and a lake. The foreground shows a calm lake reflecting the sky and surrounding greenery. The middle ground features a dense forest of evergreen trees and yellow wildflowers. In the background, rugged mountains with patches of snow rise against a clear blue sky.

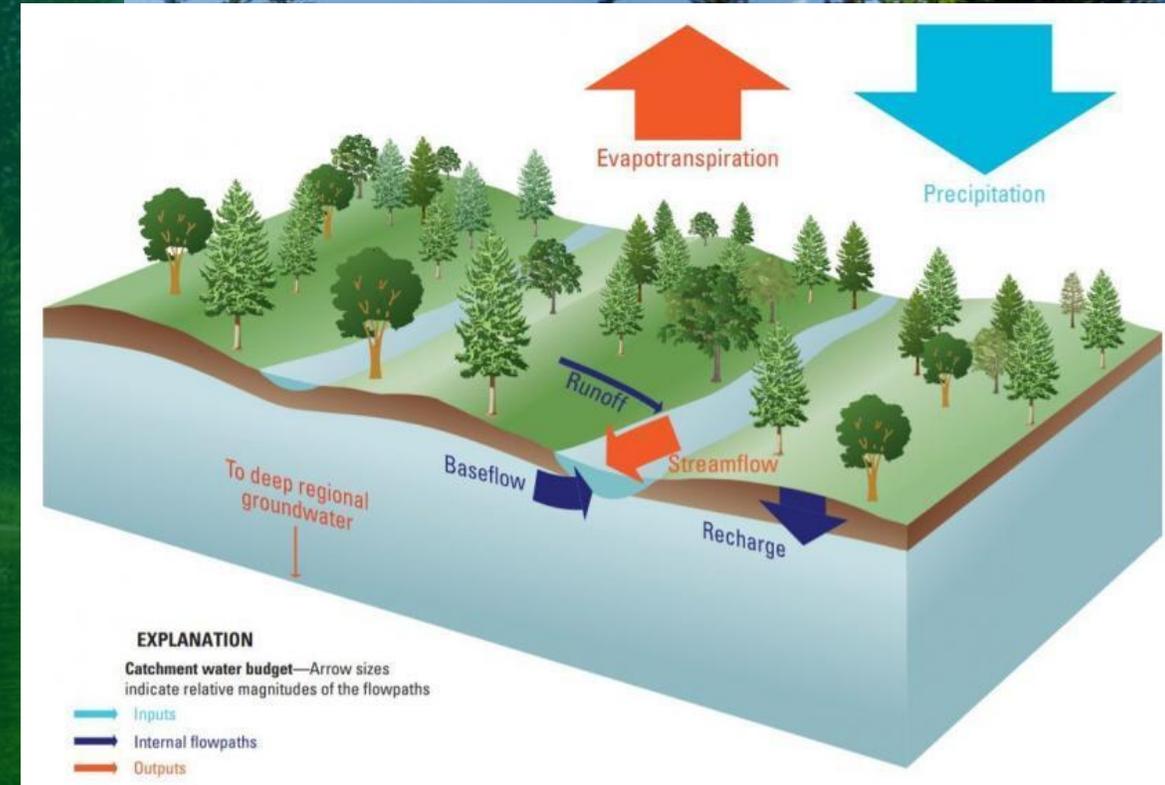
Water You Use in Chino Valley

Little Chino Aquifer

Hydrologic Cycle

Origin of Groundwater / Surface Water

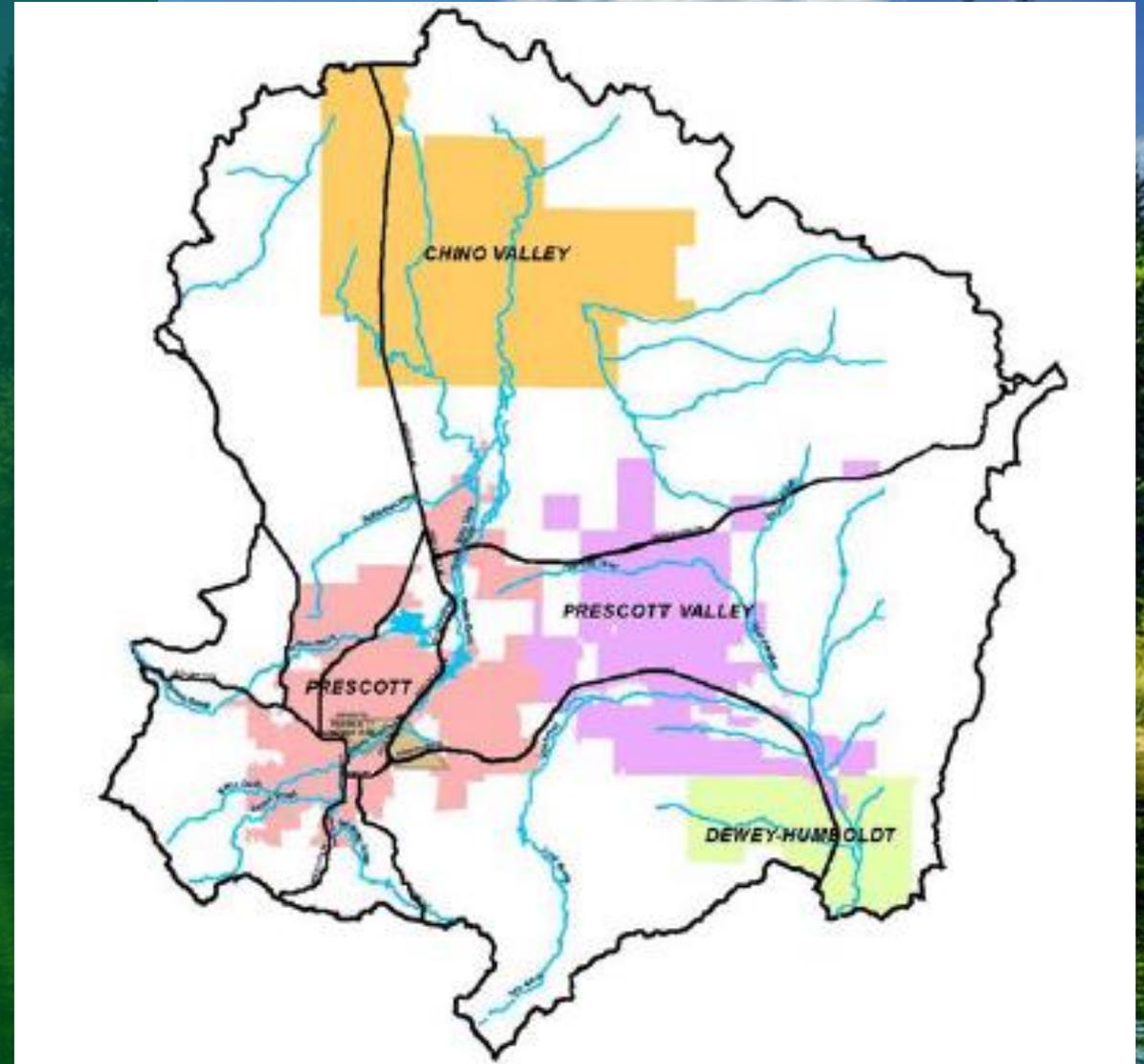
- Precipitation as rain or snow falls within the basin.
- 2% on average percolates into the ground and becomes groundwater and primarily occurs within the winter months at the mountain front areas.
- 98% is lost through flood flows and consumed by evaporation and transpiration.



Prescott AMA

Highest Regulatory Requirements

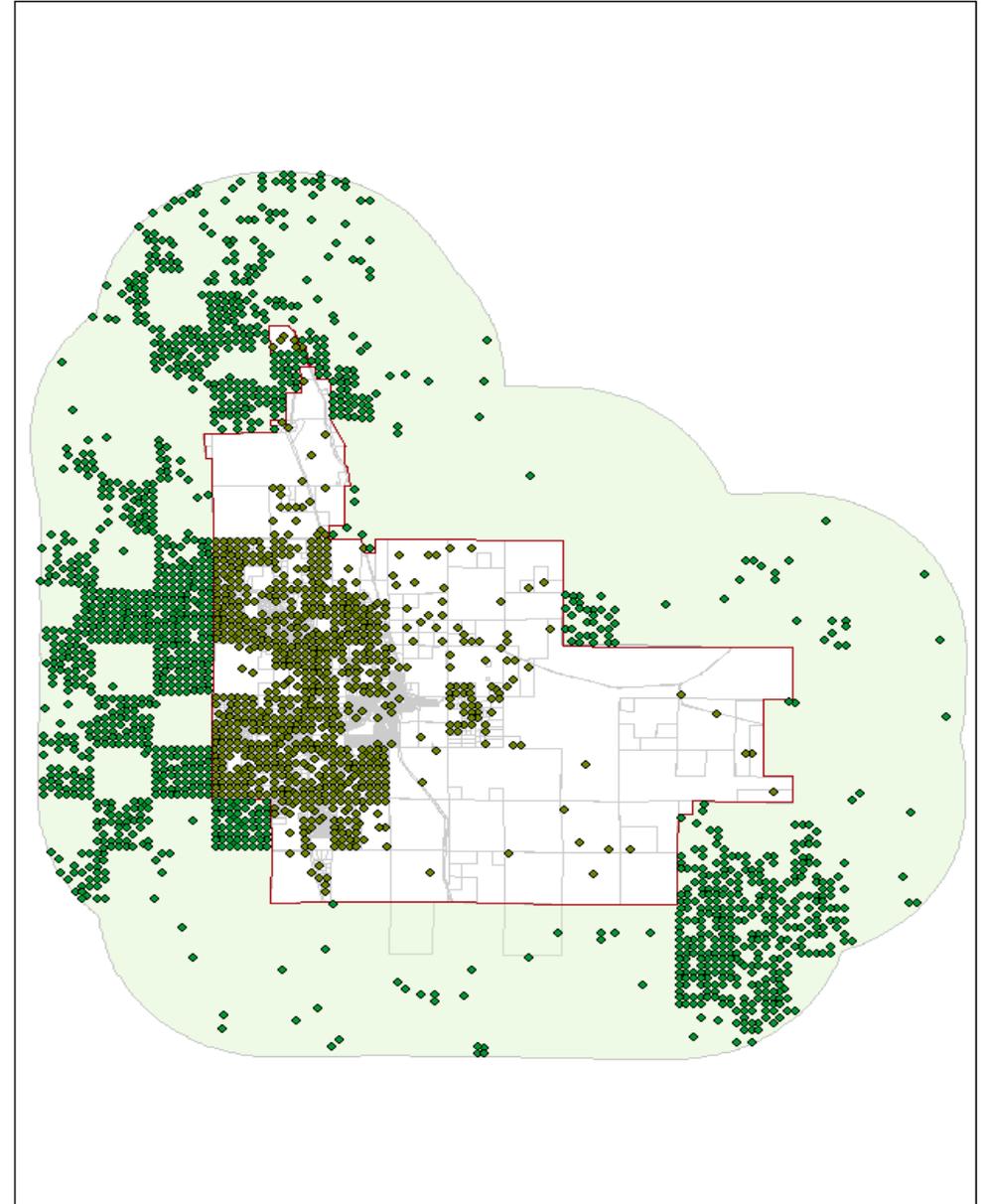
- No new groundwater used.
- All subdivisions must meet 100-year assured water requirements.
 - Meet the goal of safe-yield and conservation plan requirements
- Exempt wells are exempt from these requirements
 - Exempt wells are now the third largest water user in aggregate.
- Even with the safe-yield and plan requirements the Prescott AMA is still mining groundwater.



Exempt wells

~9,000 exempt wells in the Town and within 3 miles of Chino Valley

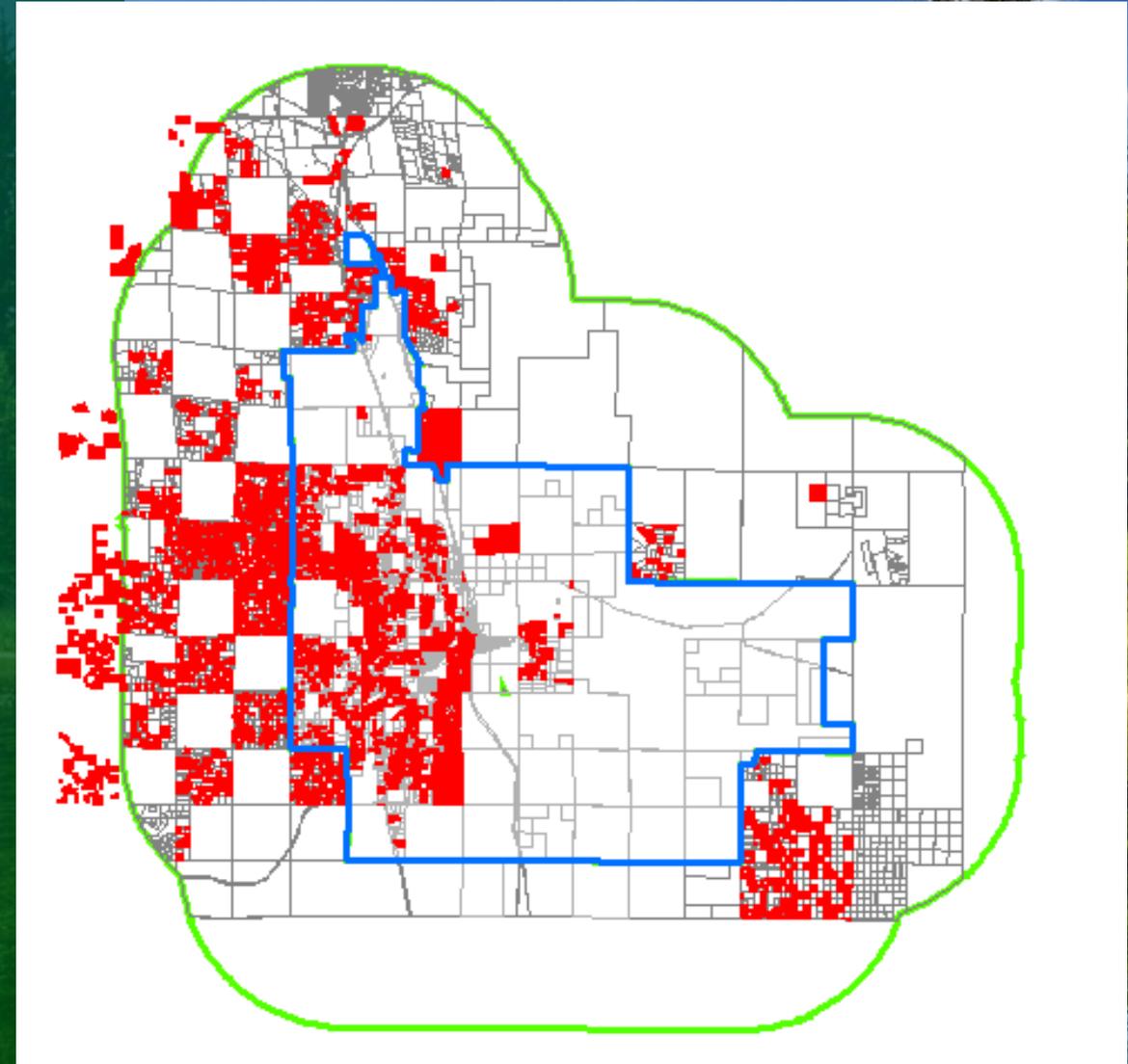
- Wells are competing for the same water supply.
- No harm provisions for someone to drill a new well adjacent to you and impact your well.
- Water providers are not allowed to impact adjacent wells and must prove new wells create no impacts



Private Septic Systems

Not designed to contribute water to the groundwater system

- Designed to have water percolate into the soils and be consumed by evaporation and transpiration.
- When the density of septic systems create flows to the aquifer system contamination occurs and is a violation of the US Clean Water Act.
 - These sites will be required to hook up to a sewer system and abandon their septic systems
 - This occurred within the Chino Meadows development



General Plan

Vision for Water

- Goal LU-2 - Use Development Agreements to guide master planned and larger developments.
- Policy LU 2.1 - Provisions for public infrastructure improvements necessary for the development and in conformance with Facility, Transportation, Water, and Wastewater Master Plans.



General Plan

Vision for Water

- Goal LU-7 - Develop growth areas in a manner that promotes efficient use of resources and infrastructure and maintains or improves the rural character and quality of life for residents.
- Policy LU-7.2 - Encourage new development to be located adjacent to or near existing development, streets, and infrastructure to limit impacts to open space and natural areas.



General Plan

Vision for Water

- Promote sustainable planning and efficient use of water resources through water conservation and drought planning programs.
- PRN-7.1 - Balance development and growth with the town's resource capacity. Consider the social, economic, and environmental impacts of development and growth on the town's existing and future resource capacity.
- PRN-7.2 - Review development proposals to ensure that they will not result in potential adverse impacts to the Town's water resources portfolio or to the physically available water supplies within the aquifer.
- PRN-7.3 - Participate in regional and local strategies, programs, and efforts to ensure sustainable water supplies in the area.
- limit impacts to open space and natural areas.



General Plan

Vision for Water

- Community Supported Facilities
- CSF-2.2 - Ensure that infrastructure extensions and expanded public services needed to support new development are mutually beneficial for the Town and the developer.
- CSF-6.1 - Develop an integrated utility master plan to identify near-, mid-, and long-term related capital improvements for water and wastewater infrastructure and facilities to support the future population contemplated by this General Plan.
- CSF-8.5 - Require new development to be responsible for the installation of any infrastructure extensions, beyond what the Town is required to cover, that is necessary to connect to existing Town water lines and any other infrastructure required to support the delivery of adequate water supply to the proposed development.



“ONE WATER”

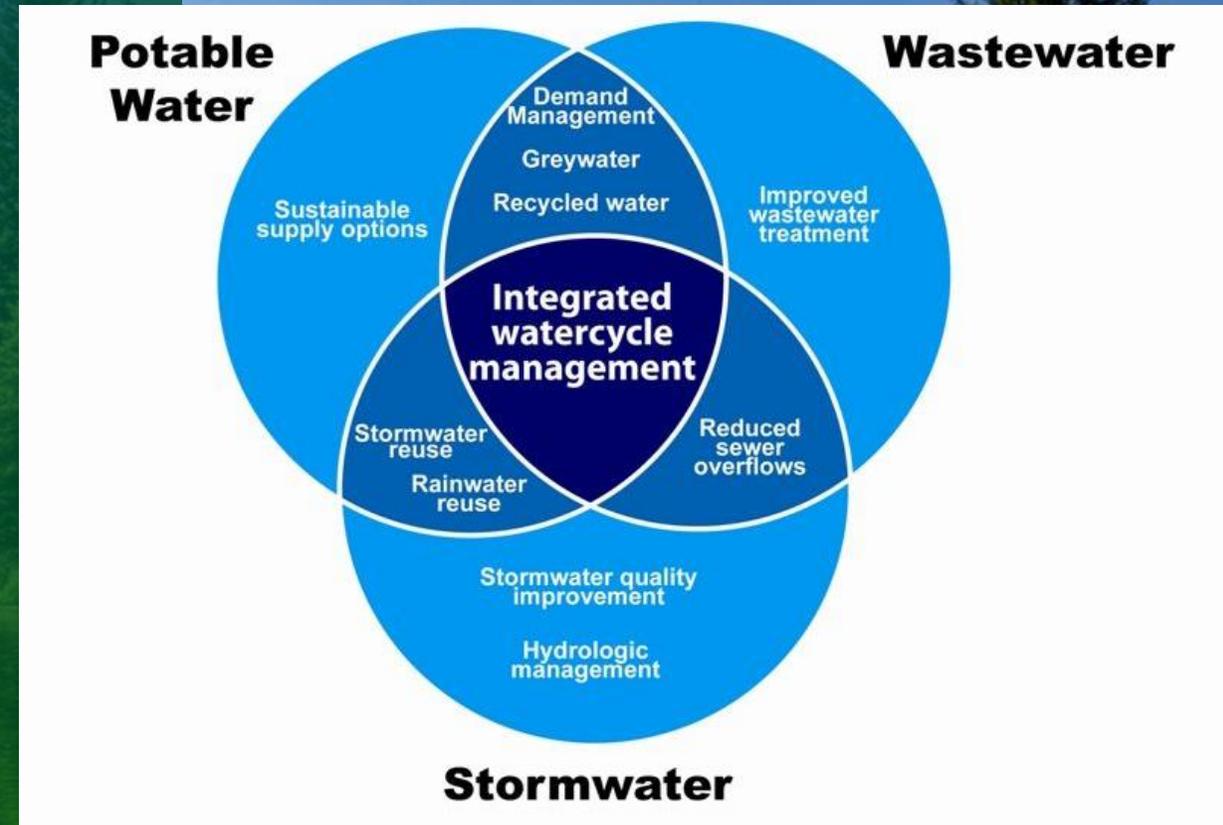
Encourage sustainable water resource management and protect water quality.

Potable Water

Wastewater / Recycled / Effluent

Stormwater

Poor Quality Water



What does sustainable water use mean?

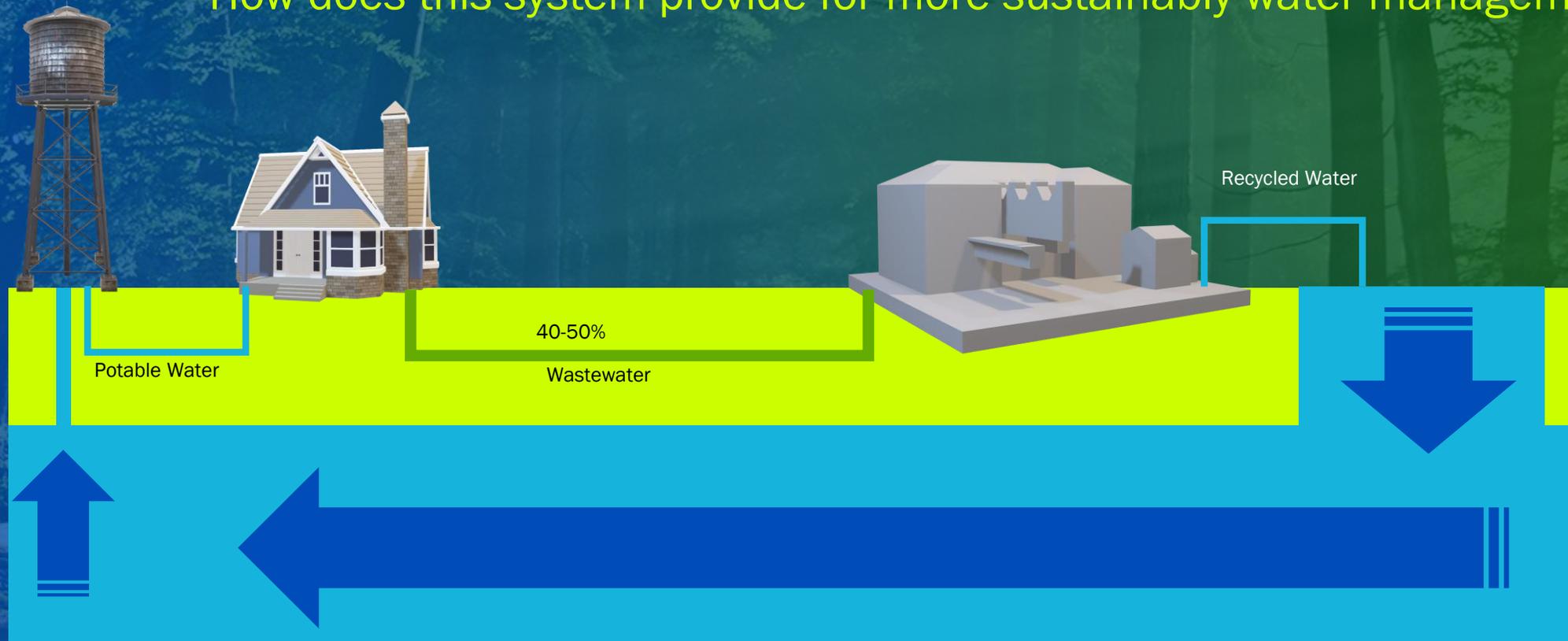
Water Conservation – indoor / outdoor water uses

Expansion of the Town's water and sewer utilities

Better use of stormwater for regions watershed management and outdoor water needs

Expanding the Town's Utilities

How does this system provide for more sustainably water management?



Better Managed Water

Integrated Water Management



Better Managed Water

Integrated Water Management



Town Water Supplies

| Prescott AMA Type Right | Right # | AF | Notes |
|------------------------------------|----------------|--|--|
| Extinguished Credits | 58-101753.0010 | 5,889.14 | Old Home Manor |
| Extinguished Credits | 58-101753.0007 | 561.00 | |
| Extinguished Credits | 58-114293.0002 | 915.20 | |
| Extinguished Credits | 58-120016.0003 | 172.20 | |
| Extinguished Credits | 58-100851.0015 | 350.10 | Recent Purchase |
| Extinguished Credits | 58-105220.0015 | 375.00 | Recent Purchase |
| | | TOTAL | 8,262.64 |
| | | TOTAL | |
| Type 1 GFR | 58-101602 | 15.82 | Land at the Ball Fields OHM |
| Type 2 | 58-108364 | 15.2 ¹ | |
| Type 2 | 58-120028 | 11.2 ⁶ | |
| Type 2 | 58-111958 | 6.4 | |
| | | TOTAL | 48.62 |
| | | AF/YR | |
| Service Area Right ADD A FOOTER | 56-003022 | unlimited ¹ ⁶ | |
| HIA Water Supplies | | 645.75 | AF/YR |
| Reclaimed LTSC | | 300 | AF/YR |
| | | -45.3 | AF/Yr |
| | | -56.53 | AF/Yr |
| | | | Bright Star Agreement Highlands Ranch |

What can be done with this water?

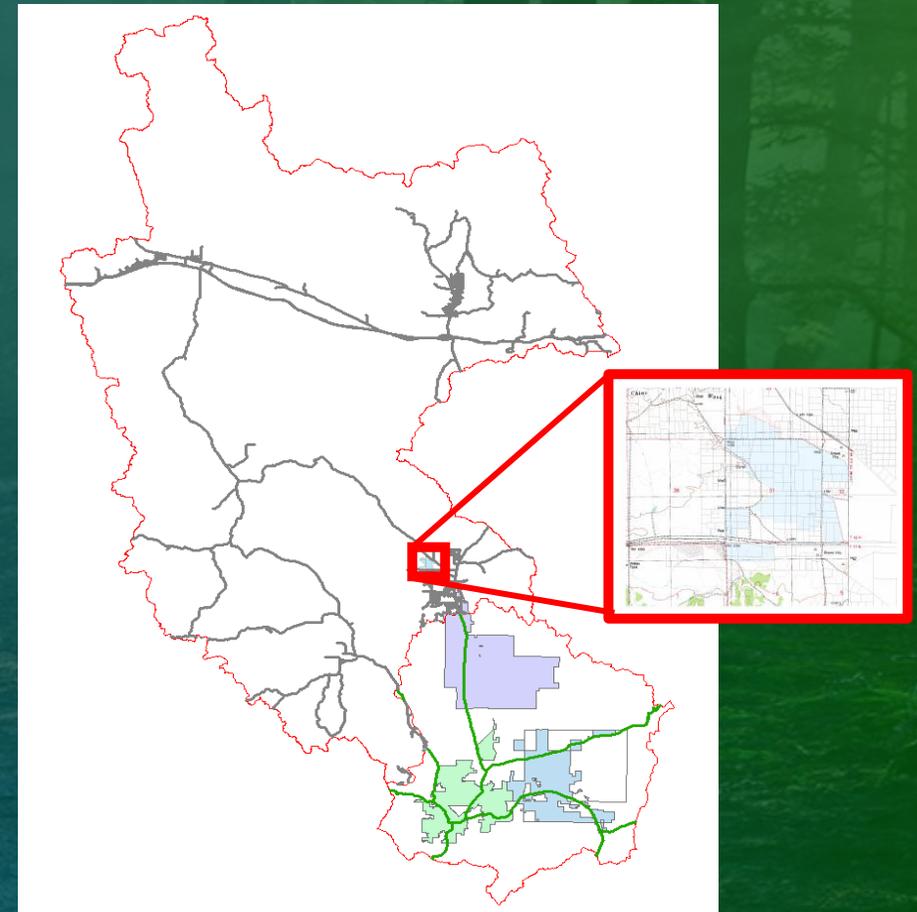
100-Year Assured Water Supplies

- 82.63 AF AWS (Groundwater Rights)
- 198.17 AF AWS (Reclaimed Water Rights)
- Total = 197.8 AF (AWS)
- Build 1,965 new homes
- Provide water for commercial or industrial subdivisions.

Imported - Augmented Water

This will be required for the Town to provide community supported development

- The Town has invested ~3 Million in the purchase of historically irrigated acres (HIA) within the Big Chino at the Wine Glass Ranch and has access to 645.75 AF (AWS)
- These water rights have a value of \$45,000 per AF
- This is in essence a return of investment of \$26.1 Million



Capabilities of HIA water

What could this water supply provide for the community?

- Provide 4,520 new residential dwelling units.
- Provide significant community supported commercial and industrial complexes.

Water Quality Issues



Per- and Polyfluoroalkyl Substances (PFAS)

| Chemical | Maximum Contaminant Level Goal (MCLG) | Maximum Contaminant Level (MCL) |
|--|---------------------------------------|---------------------------------|
| PFOA | 0 | 4.0 ppt |
| PFOS | 0 | 4.0 ppt |
| PFNA | 10 ppt | 10 ppt |
| PFHxS | 10 ppt | 10 ppt |
| HFPO-DA (GenX chemicals) | 10 ppt | 10 ppt |
| Mixture of two or more: PFNA, PFHxS, HFPO-DA, and PFBS | Hazard Index of 1 | Hazard Index of 1 |

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.

PFAS Assessment – Carollo Engineers

| Alternative | Total Capital Cost (\$) ⁽¹⁾ |
|---|--|
| Alternative 1 - PFAS Treatment at Bright Star Facility | \$5,112,000 |
| Alternative 2a - Direct Connection of New Well Source | \$2,558,000 |
| Alternative 2b - New Well Source Delivery to Well #24 Site | \$4,494,000 |
| Alternative 2c - New Well Source with Distribution Facilities | \$10,221,000 |

Notes:

(1) Cost opinions correspond to 2023 dollars. (Handy-Whitman Index, Plateau Region Index July 2023 = 1228.)

PFAS Next Steps

1

Sampling and Analysis of Water Quality Parameters (WQPs)

To determine PFAS speciation and interferences.

2

Preliminary Design

To select technology type most suitable for system need and technical managerial and financial (TMF) capacity.

3

Testing

To select optimal media and operational parameters.

4

Approval to Construct (ATC)

To permit final design and start installation.

5

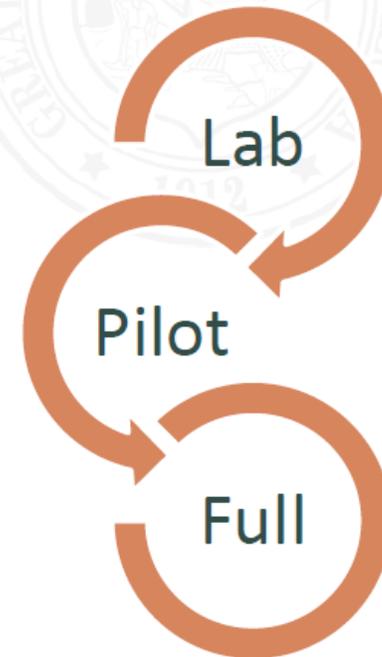
Start-up

To confirm treatment suitability in regards to approved design.

6

Approval of Construction (AOC)

To start serving PFAS treated water.



Bright Star Water Production Facility

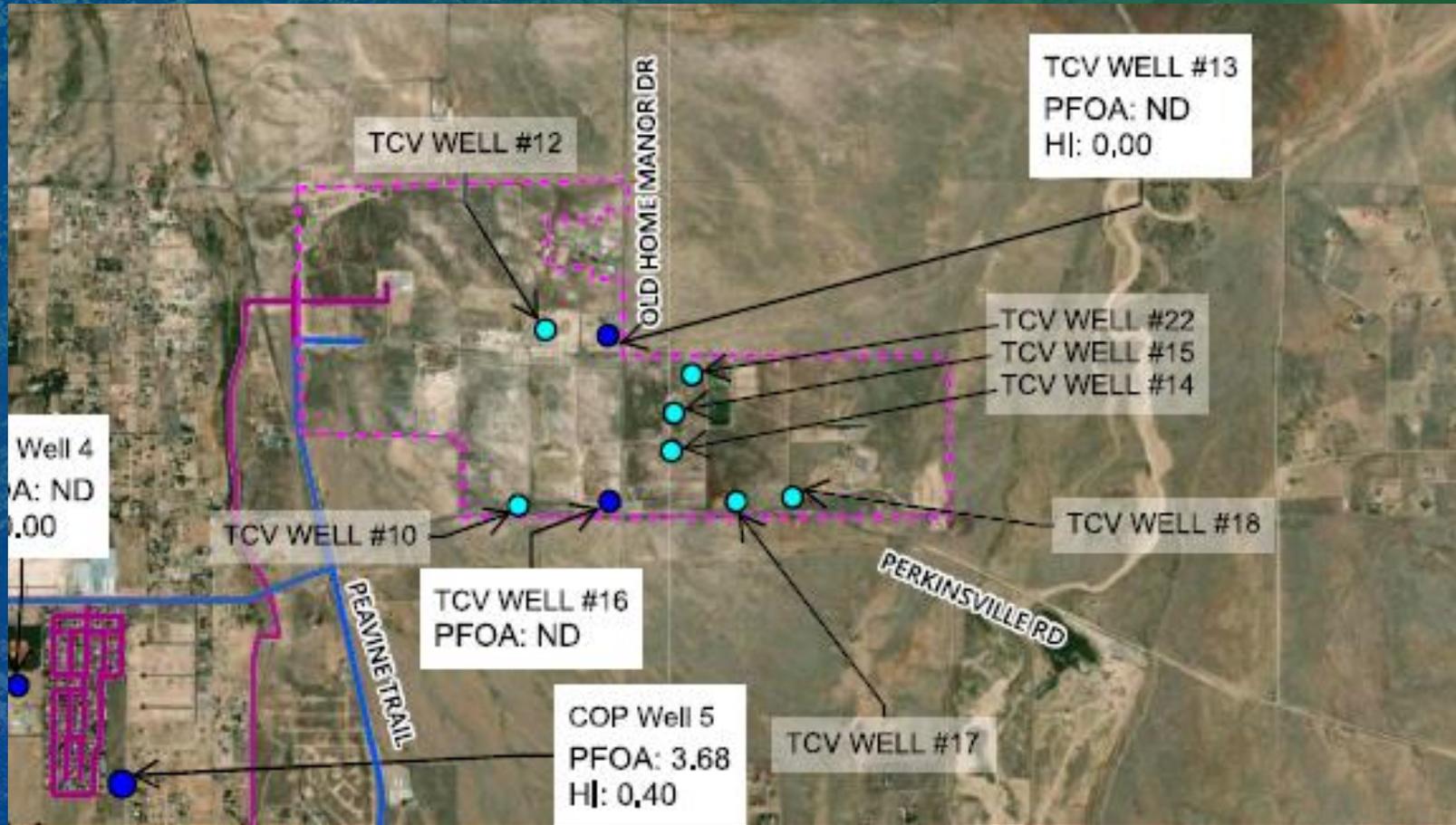
1. The Town is currently working with ADEQ and its consultant right now on the design of a pilot system to evaluate PFAS treatment.
2. ADEQ is partnered with the Town and they are paying for the entire work including the treatment system via federal funding.

PFAS Impacts at the Water Reclamation Facility

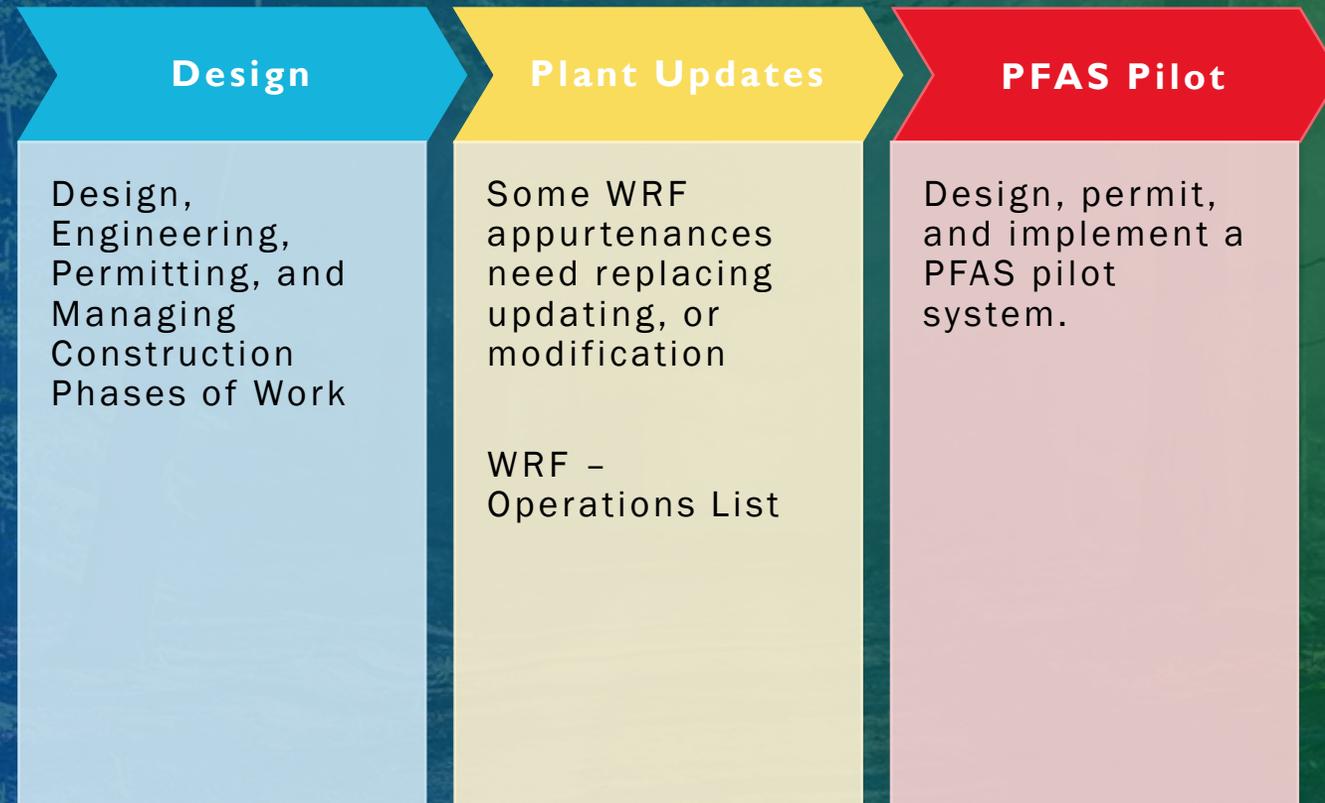
| Parameter | Result (ng/L) |
|-----------|---------------|
| PFBS | 28 |
| PFBA | 3.4 |
| PFHpA | <2.9 |
| PFHxA | 14 |
| PFHxS | 3.7 |
| PFNA | <2.9 |
| PFOA | 6.7 |
| PFOS | <2.9 |

PFBA - Perfluorobutanesulfonic acid

PFAS Impacts at the Water Reclamation Facility



PFAS Impacts at the Water Reclamation Facility



Circle K – Fuel Release



- 86,000 gallon release of fuel into the subsurface Dec 2023 and Jan 2024.
- Circle-K and its consultants are working with the Arizona Department of Environmental Quality (ADEQ) towards a remediation plan.
- Installing wells for monitoring and testing nearby wells ensuring health and safety.

Chino Valley Preparing for a Study Session

1. The Town is coordinating with Circle-K, its consultants, and ADEQ for a Council Study Session.
2. Providing the goals and plan elements for the site.
3. Learn about the ADEQ UST Program.

Circle K Reports 86,000 Gallon Fuel Release in the Town of Chino Valley

Initial private well tests in the area show no impacts; Circle K environmental investigation underway

PHOENIX (March 1, 2024) – Arizona Department of Environmental Quality (ADEQ) officials announced today that Circle K (Facility 0-009194) reported the release of an estimated 86,000 gallons of unleaded gasoline into the environment from its location at 1910 N State Route 89, Chino Valley, AZ 86323. Initial tests of private drinking water wells in the immediate area show no impacts from the release.

ADEQ and Circle K are aware that residents in the immediate vicinity of the Circle K release get their drinking water from private wells; the nearest public water supply well is part of the Town of Chino Valley's public water system and is located more than a mile away. ADEQ has advised Yavapai County Health Department officials about the situation and also is coordinating with officials from the Town of Chino Valley. As additional information becomes available, ADEQ will continue to provide updates.

"ADEQ takes any release of fuel into the environment seriously," said ADEQ Waste Programs Division Director Julie Riemenschneider. "ADEQ is committed to working with Circle K to ensure swift and appropriate actions are taken to protect public health and clean up the release."

Planning and Regional Issues



What Does the Future Look Like “Regionalism”

25-Year Paradigm Same Old Journey – Competition for Water

- Local planning
- Local water management
- Local governance

- Increased groundwater mining
- Increased water quality issues
- Upper Verde River baseflow decreasing

- Competition for water and development
- Two Sets of Laws, Rules, and Policies
- We cannot conserve or educate our way to overcoming these challenges



2019 Water Budget Prescott AMA

- Water Demands

Municipal 19,342 AF/Year (2019)

- Large Providers – 14,632 AF
- Small Providers – 1,966 AF
- Exempt Wells – 2,744 AF

Industrial Demands 2,992 AF/Year (2019)

Agriculture Demands 2,444 AF/Year (2019)

Groundwater Outflows 4,579 AF/Year (2019)

Del Rio Springs

Big Chino & Upper Agua Fria

Total – 29,357 AF/Year Demands

- Water Supplies

Natural Recharge - 2,929 AF/Year (2019)

Artificial Recharge - 4,492 AF/Year (2019)

Incidental Recharge - 1,000 AF/Year (2019)

Surface Water – 900 AF/Year (2019)

Total – 9,321 AF/Year

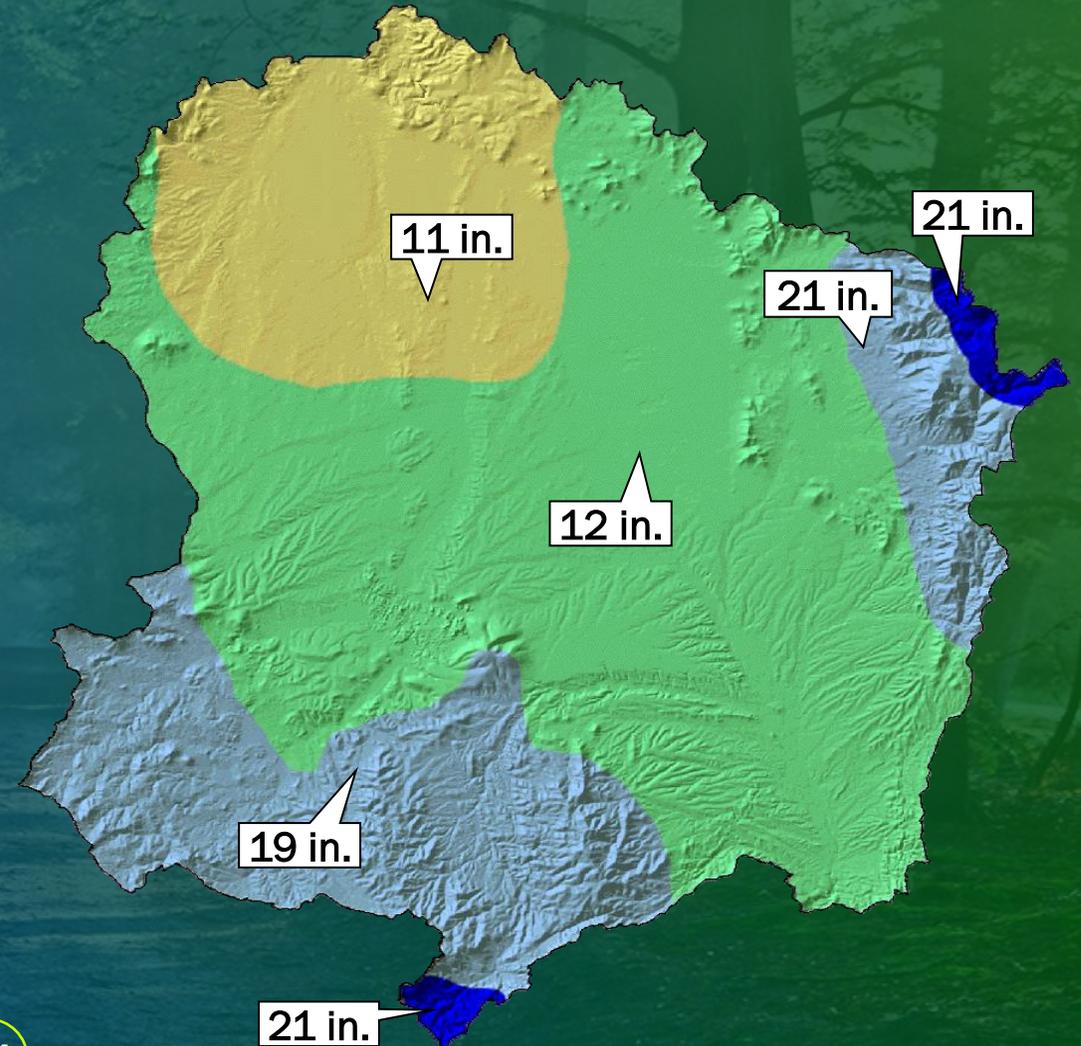
Groundwater Over Drafting – 20,036 AF/Year (2.2x)

Precipitation

- Annual Precipitation – 450,000 AF in the Prescott AMA.
However, only 4,000 – 8,000 AF naturally recharge the aquifer system annually or < 2%.

Why?

- Evaporation
- Transpiration
- Runoff
- Interception
- Drought Conditions / Climate Change



What Does the Future Look Like

Water Users

- + Recognition that **everyone** is using the same limited water supplies.
- + **Everyone** must participate towards bona fide and substantial solutions.

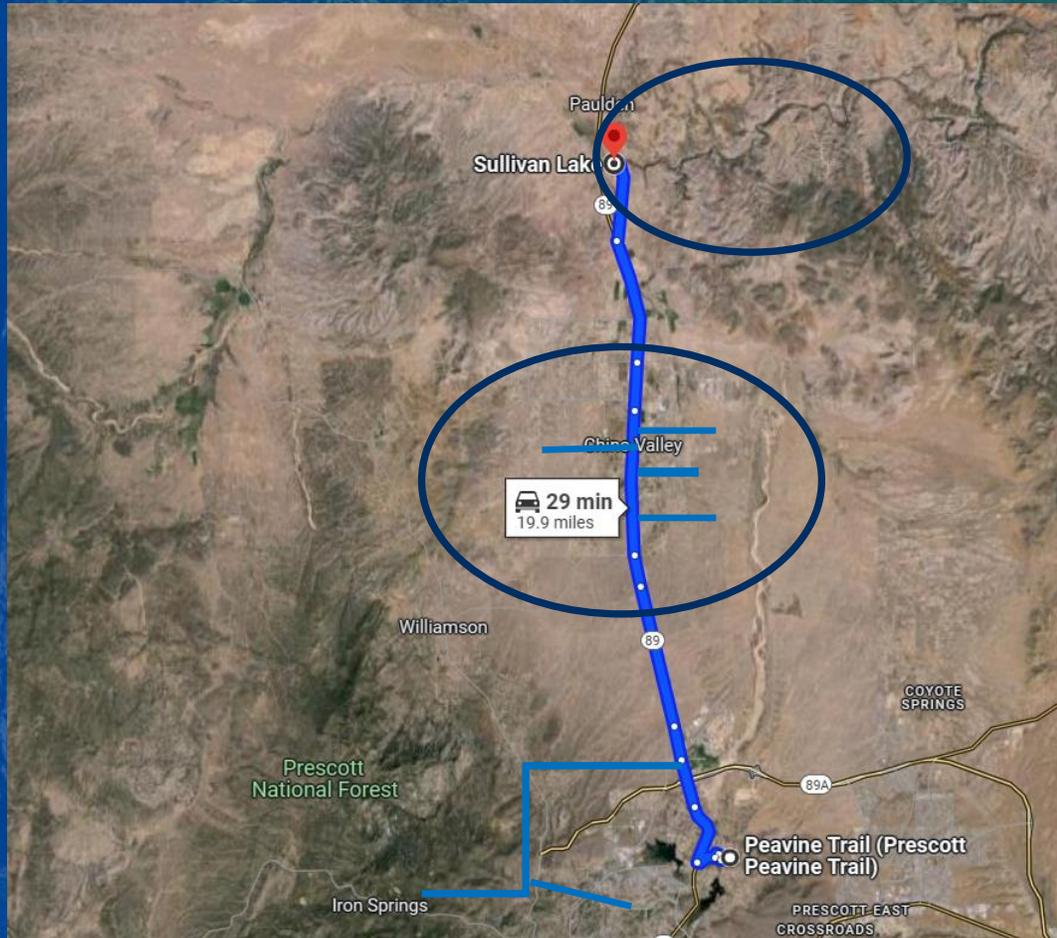
Regional Planning

- + Water needs to be regionally managed with an understanding of localized and regional impacts.
- + All jurisdictions are in the water, sewer, and stormwater planning business if they govern growth.

New Authority

- + Regional planning will lead to regional capital solutions.
- + Significant capital investments will be needed for bona fide, science-based significant solutions that will succeed in solving safe-yield and preserving the Upper Verde baseflows.

Opportunities for Regional Planning



1. 20-mile rail to trail that could be utilized as a public utility easement.
2. Build a Effluent / stormwater interceptor from Prescott to Sullivan Lake area.
3. Plug in effluent / flood stormwater generated from large-scale development rooftops and streets.
4. Recharge water in the Little Chino Aquifer and part of it near the Upper Verde River.
5. Create an authority like CAP that owns all the water, sewer and stormwater systems of the region.
6. Regional authority would db e needed to manage this project.

What Does the Future Look Like

The Northern Arizona Municipal Water Users Association (NAMWUA) is reviewing a proposal and opportunity for a northern Arizona Regional Water Master Plan.



**Northern Arizona
Municipal Water Users
Association**



THANK YOU!

Mark Holmes

Phone

928-277-5253

Email

mark.holmes.llc@gmail.com

A scenic landscape featuring a river flowing through a rocky area. The background shows a range of mountains under a clear blue sky. The foreground is dominated by large, dark rocks on the left and a dense forest of evergreen trees on the right. The water in the river is calm, reflecting the surrounding environment. A small, simple wooden cabin is visible in the distance, nestled among the trees. The overall atmosphere is peaceful and natural.

Questions or
Comments?