WATER RESOURCES

Expansion of the Town's Water Portfolio

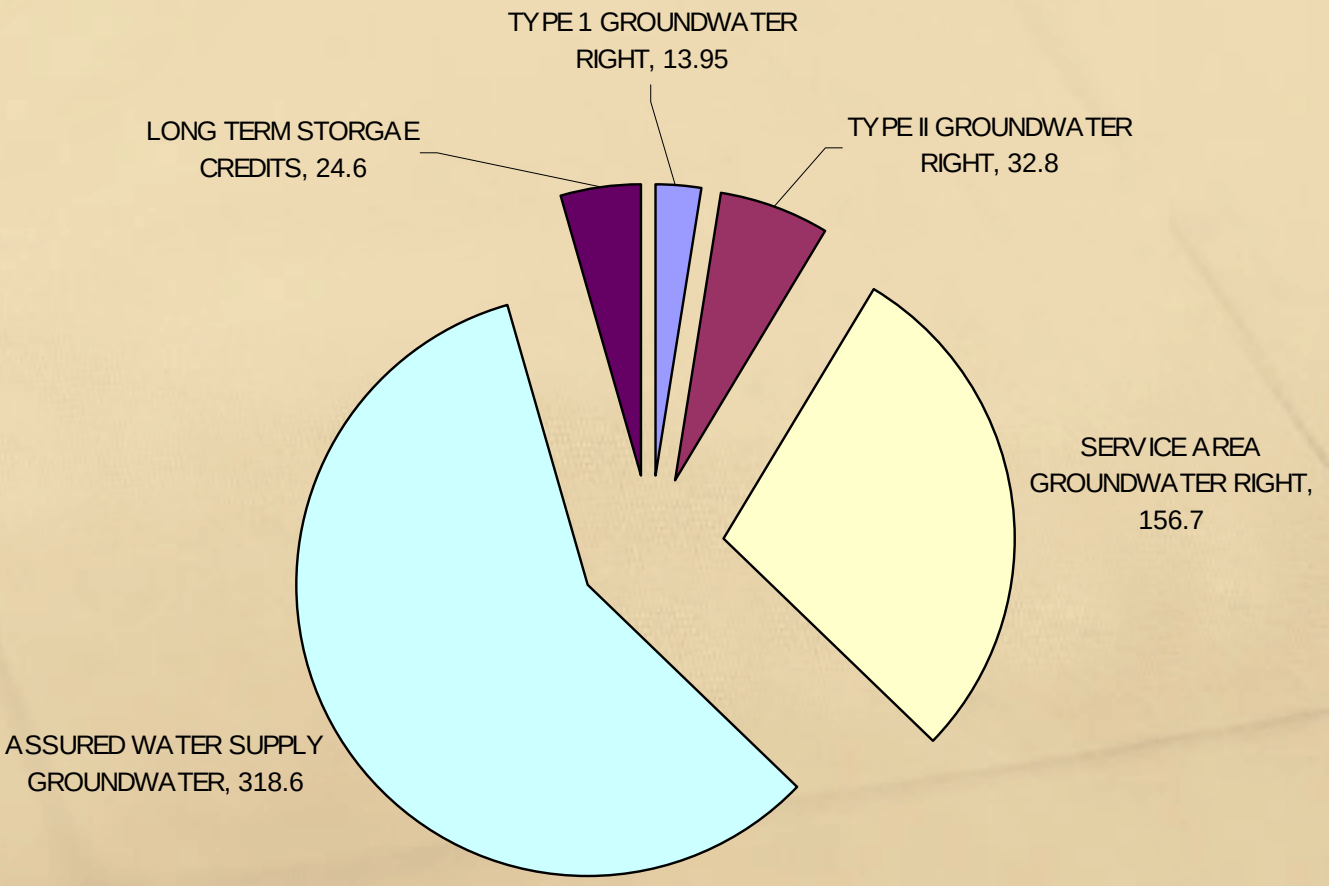
DISCUSSION ITEMS

1. Expansion of Chino Valley's water portfolio
2. Chino Valley's safe-yield efforts
3. Increased capture of effluent for aquifer replenishment and water quality assurances
4. Improve water services by becoming the sole water provider in Chino Valley
5. Create water conservation and water use ordinances that exceed all existing standards

DEFINITIONS

- **Acre-Foot (AF)** - 325851 gallons of water or equivalent of 1 foot of water over 1 acre
- **ADWR** – Arizona Department of Water Resources
- **HIA** – Historically Irrigated Acres, qualifying acres that were/are irrigated in Big Chino Sub-Basin
- **Assured Water Supply Credit** – equivalent of 1 AF of water served annually for 100 years or the sum total of 100 AF
- **Long Term Storage** – Effluent that has been treated and recharged back into the aquifer and ADWR has recognized that quantity of water
- **GPCD** – Gallons Per Capita per Day, the amount of water used by a person in a single day
- **Natural Recharge** – water that falls to the ground as rain or snow and percolates through the ground to reach the water table

CURRENT WATER PORTFOLIO



UNITS IN ACRE-FEET

CURRENT WATER PORTFOLIO

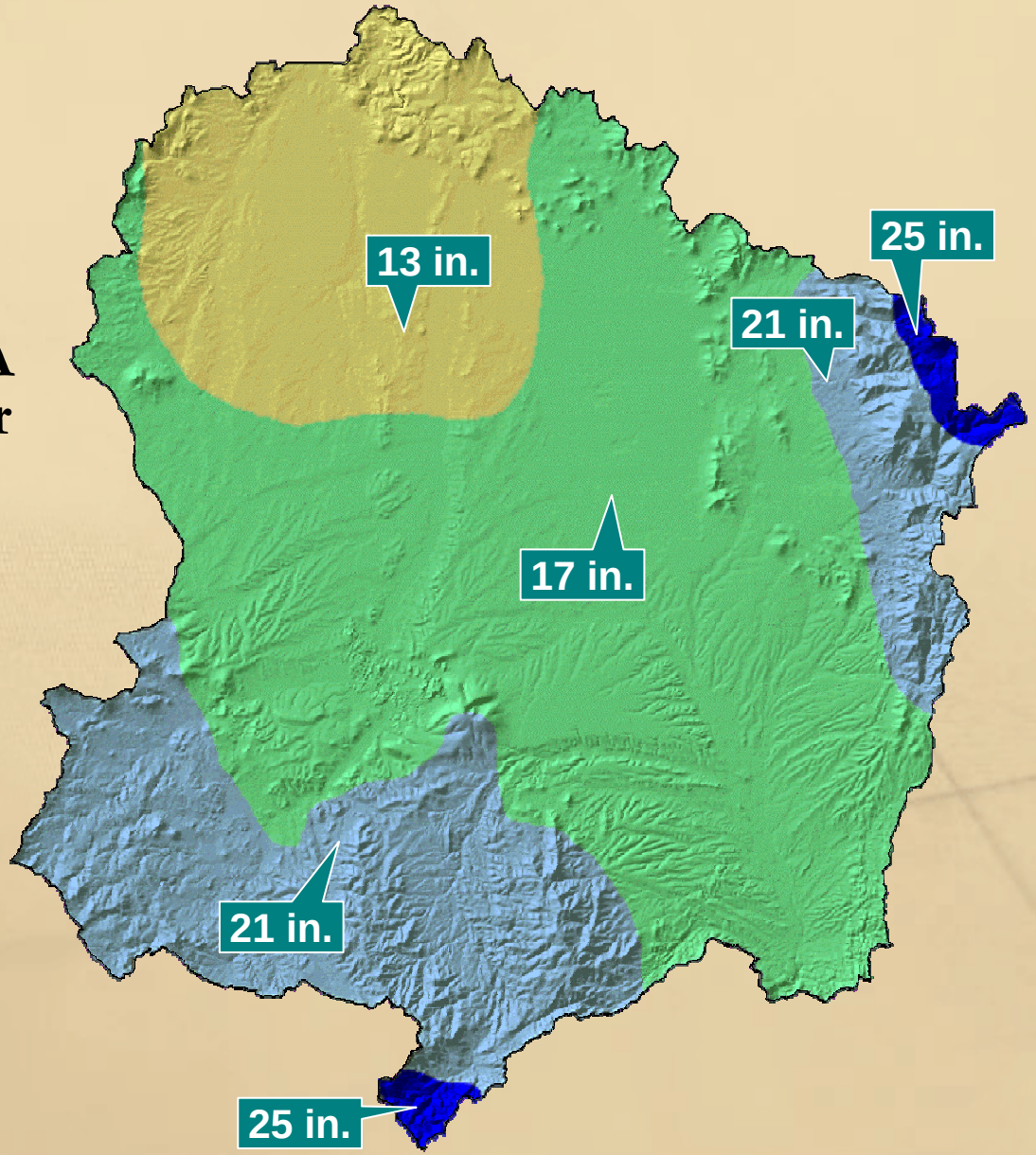
TYPE 1 GROUNDWATER RIGHT	13.95		FIXED
TYPE II GROUNDWATER RIGHT	32.8		FIXED
SERVICE AREA GROUNDWATER RIGHT	156.7		MAY EXPAND
ASSURED WATER SUPPLY GROUNDWATER	318.6		FIXED
LONG TERM STORGAE CREDITS	24.6		MAY EXPAND

TOTAL CURRENT GROUNDWATER RIGHTS 546.65

Why do we need to import water and how much do we need?

ANNUAL PRECIPITATION

- **Widely varying precipitation events in the AMA are responsible for 100% of the aquifer natural recharge**



TOTAL NATURAL RECHARGE

- **Annual Precipitation** – 450,000 AF in the Prescott AMA

  However, only 8,000 AF naturally recharge the aquifer system annually or < 2%

- **<u>Why?</u>**

  Evaporation – water is converted from a liquid to gas and lost to the atmosphere

  Transpiration – water is used by vegetation

  Runoff – water that does not percolate into the ground and is transported on top of the ground in the form of rivers and streams

  Interception – water that is physically prevented from percolating into the ground or captured by groundwater wells as it percolates into the ground

GENERAL AMA WATER BUDGET

Groundwater Inflows

Natural Recharge	8,620
Artificial Recharge:	
City of Prescott	3,480
Chino Valley	25
Prescott Valley	1,740
Total Inflows	13,865

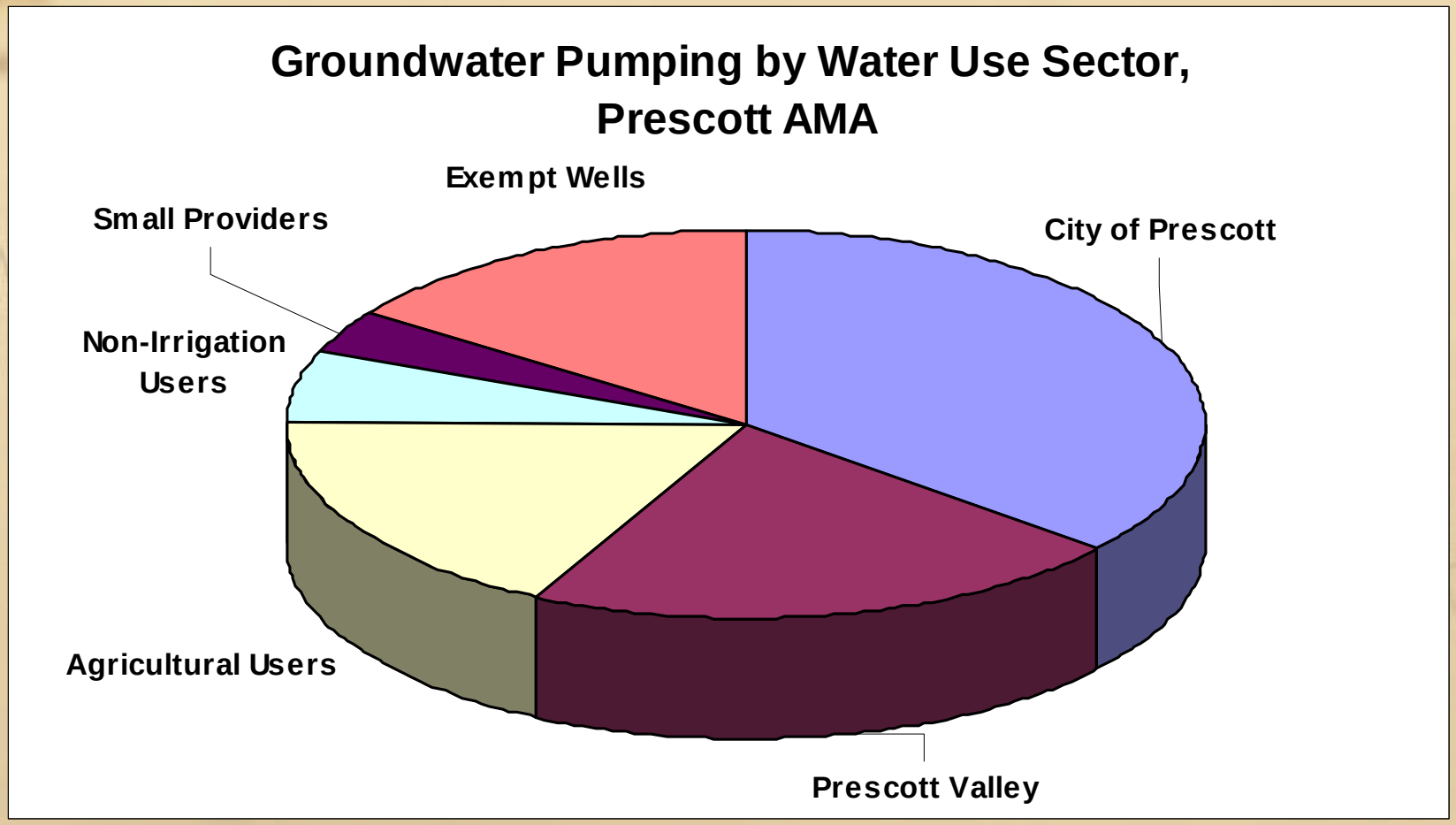
Groundwater Outflows

Groundwater Pumpage:	
Non-Exempt wells	19,160
Exempt Wells	1,830
Groundwater Discharge:	
Underflow to Big Chino	1,800
Del Rio Springs Discharge	1,050
Agua Fria Baseflow	1,300
Total Outflow	25,140

Inflow - Outflow = Change in Storage

13,840 – 25,140 = **-11,300 acre-feet (overdraft)**

GROUNDWATER PUMPING BY SECTOR

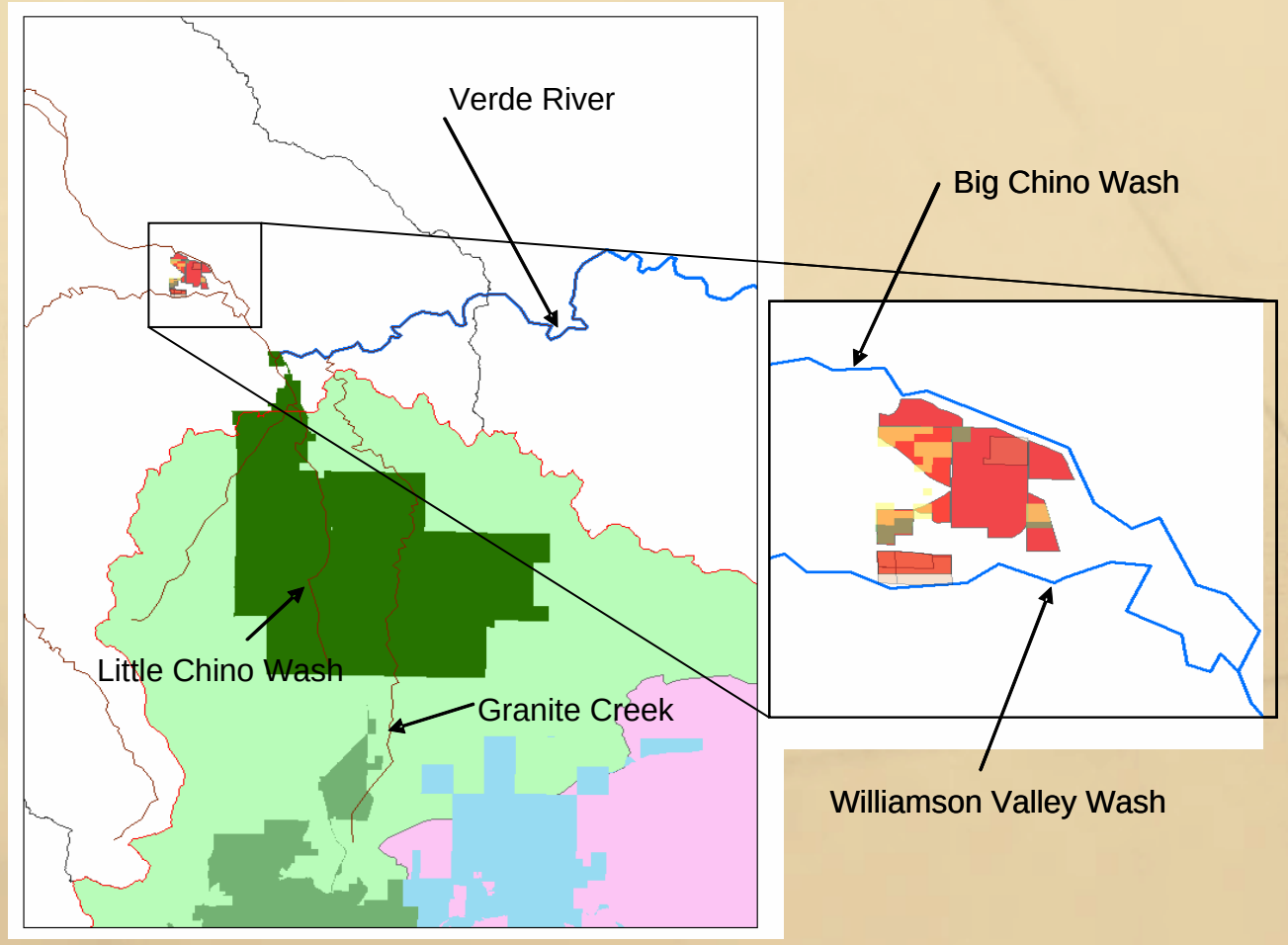


CONSEQUENCES OF LONG TERM NON-SAFE-YIELD CONDITIONS

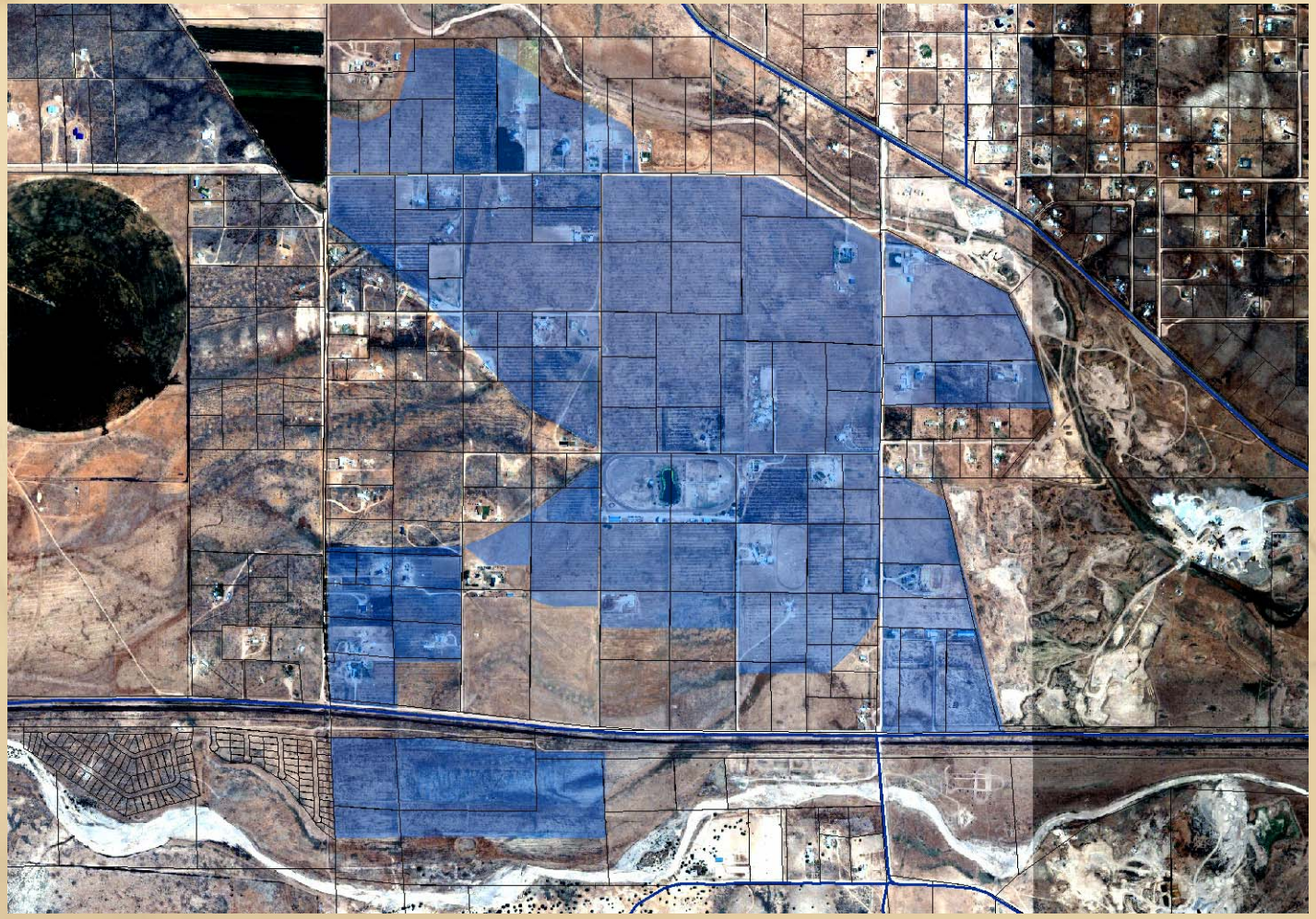
- **Groundwater storage capacity is reduced**
- **Future reliability of water supplies is less certain**
- **Water levels decline – currently declining 2.5 feet per year**
- **Wells may require deepening**
- **Water quality problems may increase**
- **Wells may go dry**
- **Pumping and drilling costs increase**
- **Natural discharge to springs and streams may be reduced**
- **Land subsidence and earth fissuring may occur**

EXPAND THE WATER PORTFOLIO

Historically Irrigated Acres (HIA)

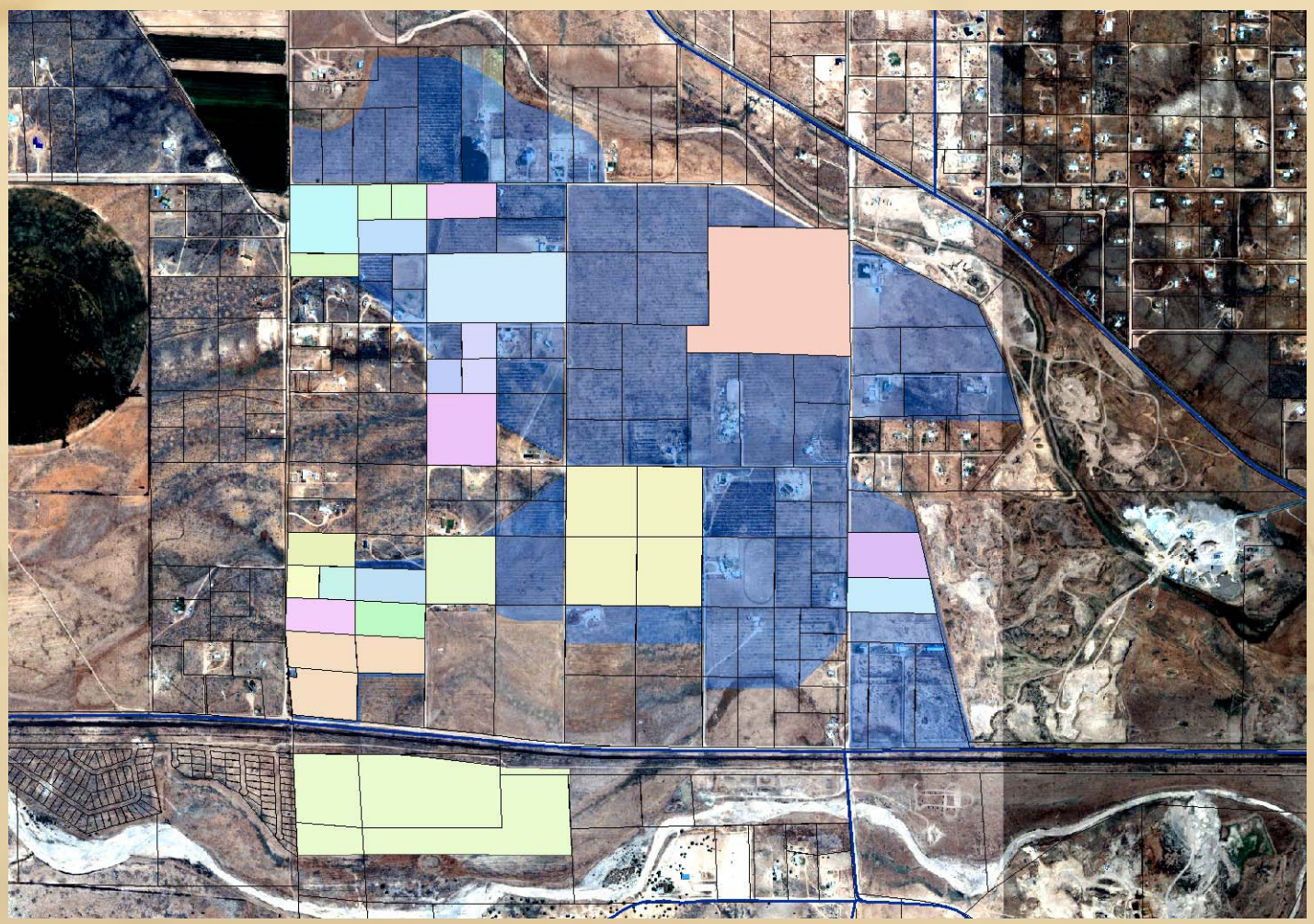


EXPAND THE WATER PORTFOLIO
Historically Irrigated Acres (HIA)



The Garlic Farm near Paulden – approximately 610 acres

EXPAND THE WATER PORTFOLIO
Historically Irrigated Acres (HIA)



Multicolored parcels indicate Town owned HIA acres

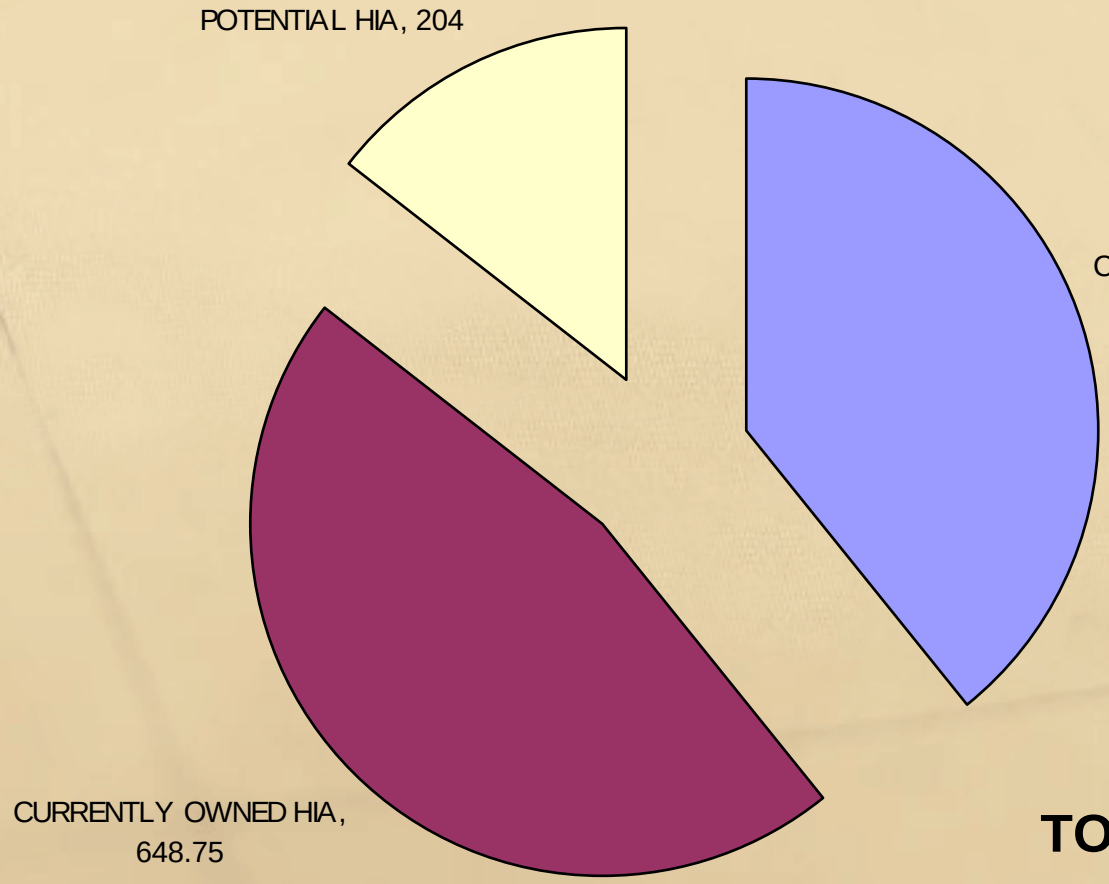
EXPAND THE WATER PORTFOLIO

Historically Irrigated Acres (HIA)

TOWN PURCHASES	ACERAGE	WATER
1. CLOSED ESCROWS	216.25 ACRES	648.75 AF
2. NEGOTIATING	68.00 ACRES	204.00 AF
TOTALS	**284.25 ACRES**	**852.75 AF**

EXPAND THE WATER PORTFOLIO
Historically Irrigated Acres (HIA)

SCENARIO OF THE TOWN IMPORTING CURRENT HIA



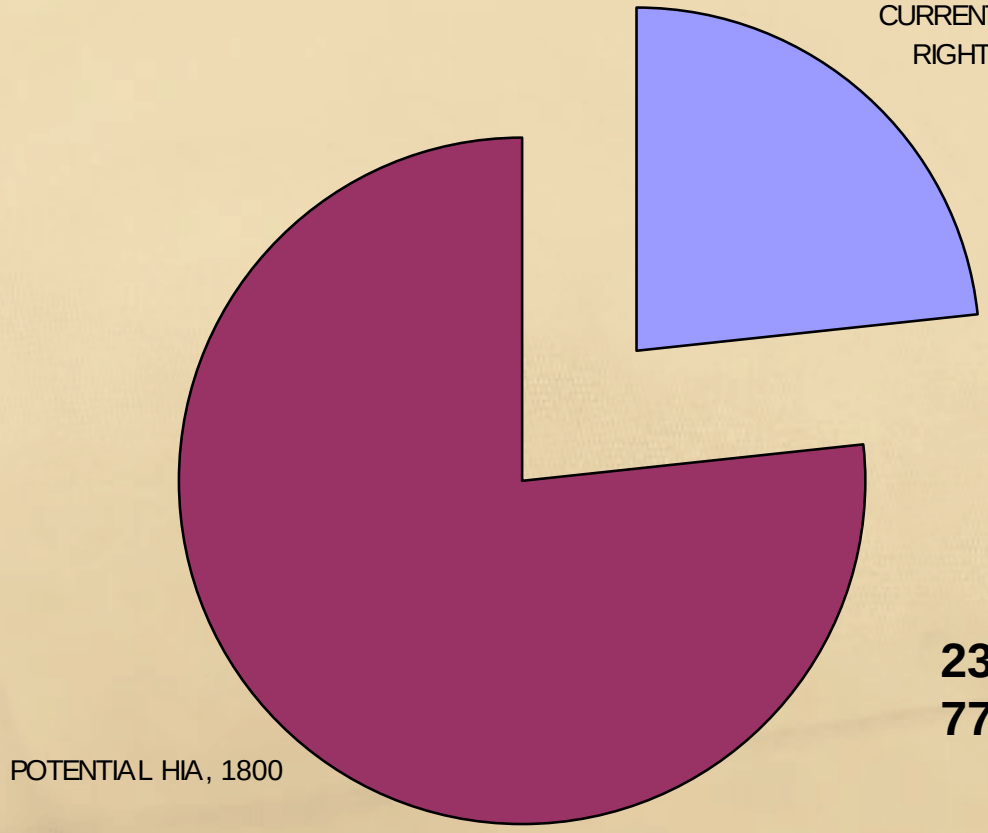
40% AMA Groundwater
60% HIA Water

TOTAL 1400 AF

Units in acre-feet

EXPAND THE WATER PORTFOLIO
Historically Irrigated Acres (HIA)

SCENARIO OF THE TOWN ACQUIRING ALL PAULDEN HIA



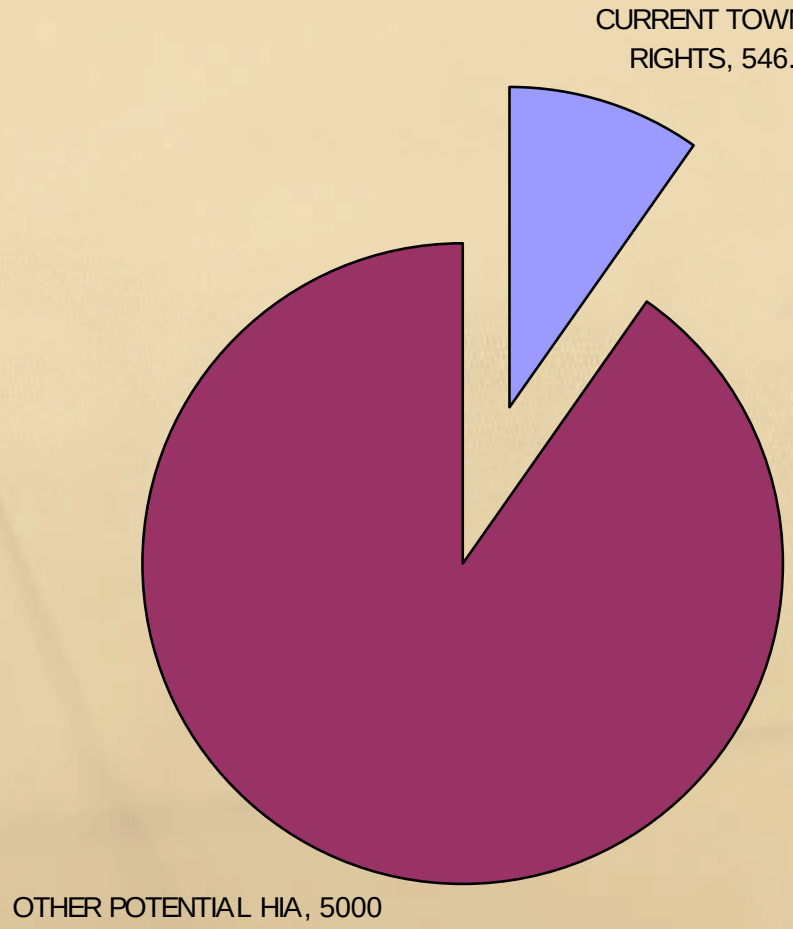
23% AMA Groundwater
77% HIA Water

Units in acre-feet

TOTAL 2346.65 AF

EXPAND THE WATER PORTFOLIO
Historically Irrigated Acres (HIA)

SCENARIO OF THE TOWN ACQUIRING ADDITIONAL HIA



10% AMA Groundwater
90% HIA Water

TOTAL 5546 AF

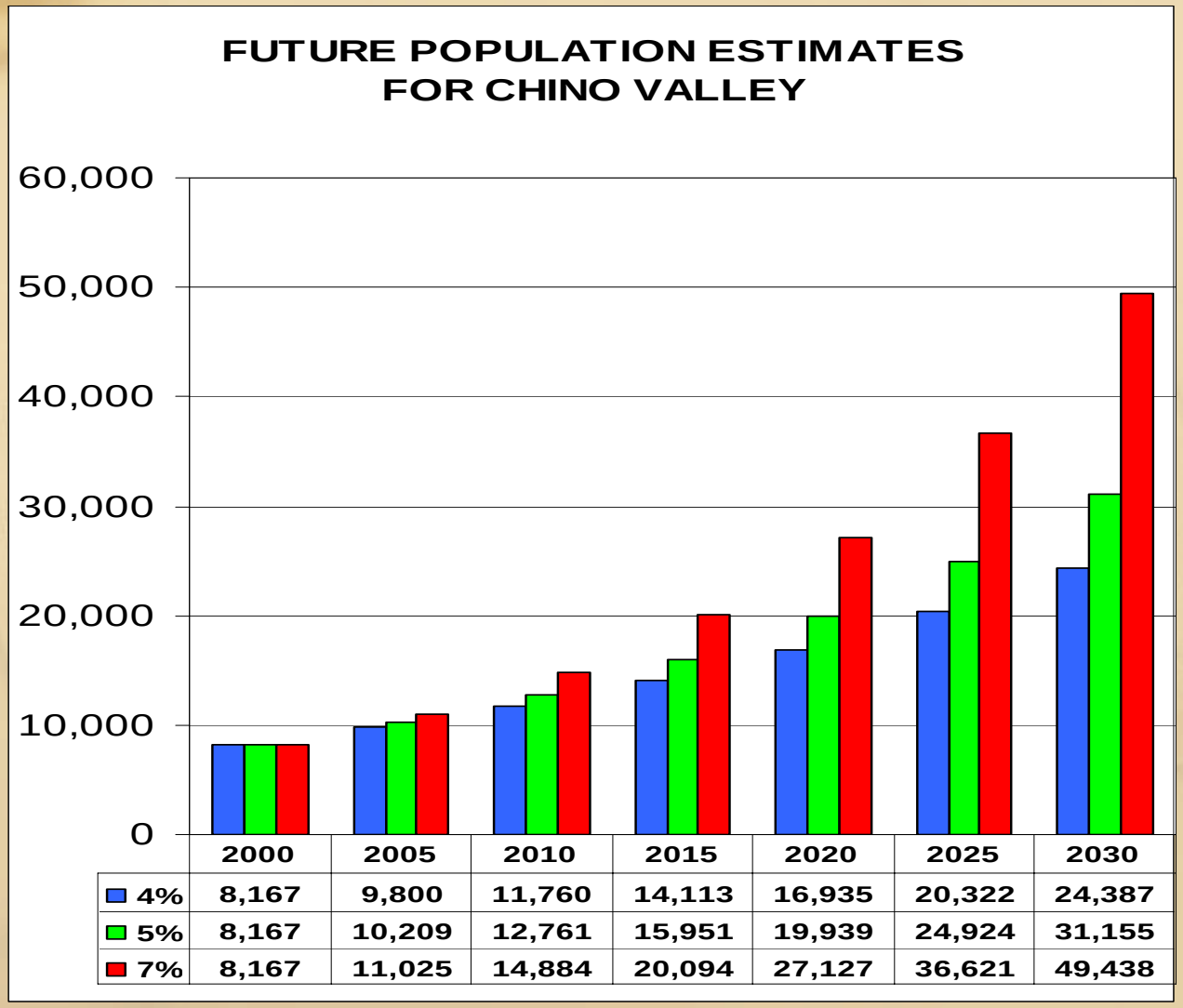
Units in acre-feet

EXPAND THE WATER PORTFOLIO
Historically Irrigated Acres (HIA)

1. **AMA Groundwater Budget – 550 AF**
2. **AMA + Owned & Negotiating HIA – 1400 AF**
3. **AMA + All Paulden HIA – 2300 AF**
4. **AMA + All Paulden HIA + Addition HIA – 5500 AF**

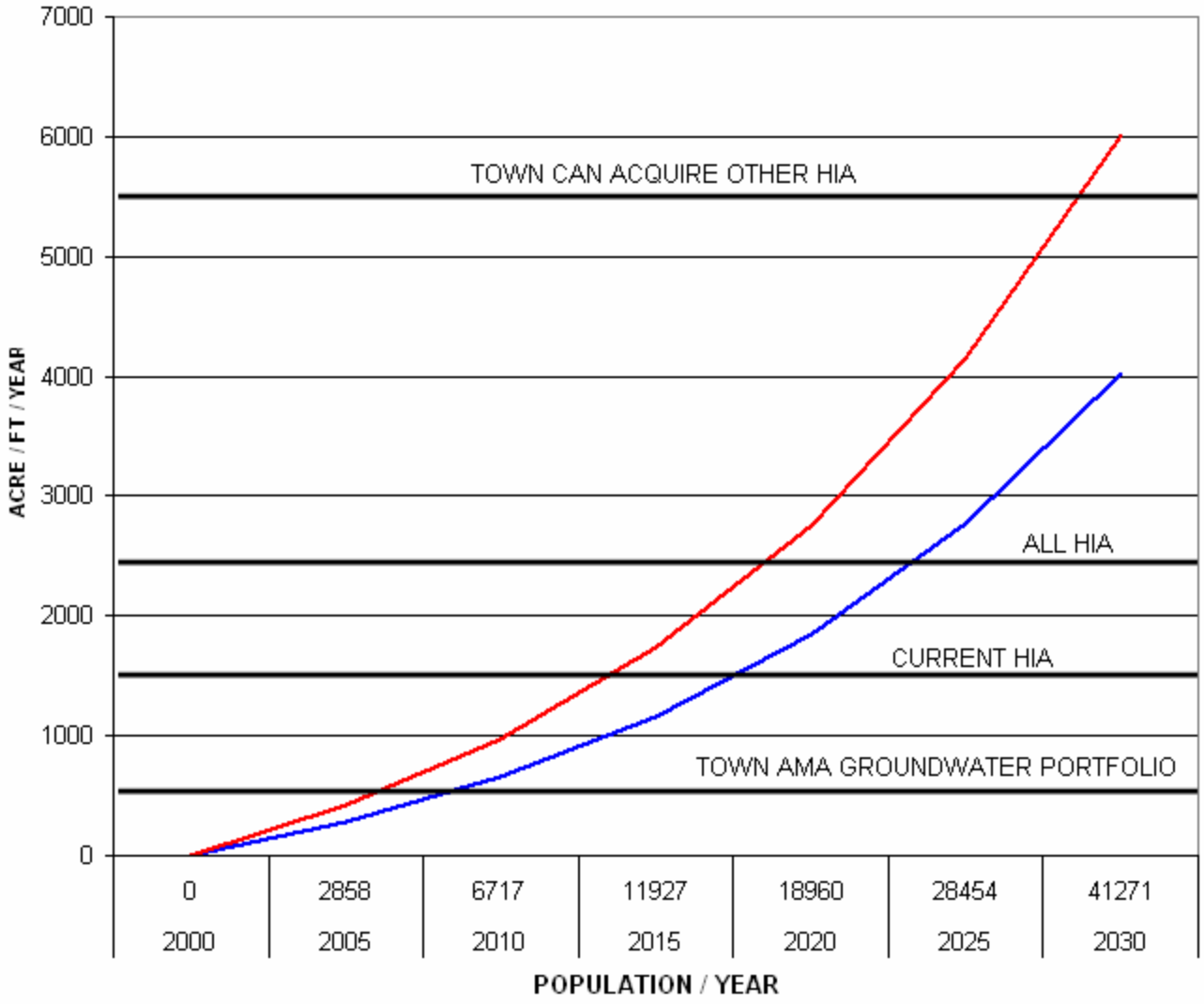
How much water will Chino Valley need for its future?

POPULATION PROJECTIONS



	2000	2005	2010	2015	2020	2025	2030
4%	8,167	9,800	11,760	14,113	16,935	20,322	24,387
5%	8,167	10,209	12,761	15,951	19,939	24,924	31,155
7%	8,167	11,025	14,884	20,094	27,127	36,621	49,438

ESTIMATED WATER DEMAND AT 7 PERCENT GROWTH WITH ONLY NEW RESIDENTS SERVED



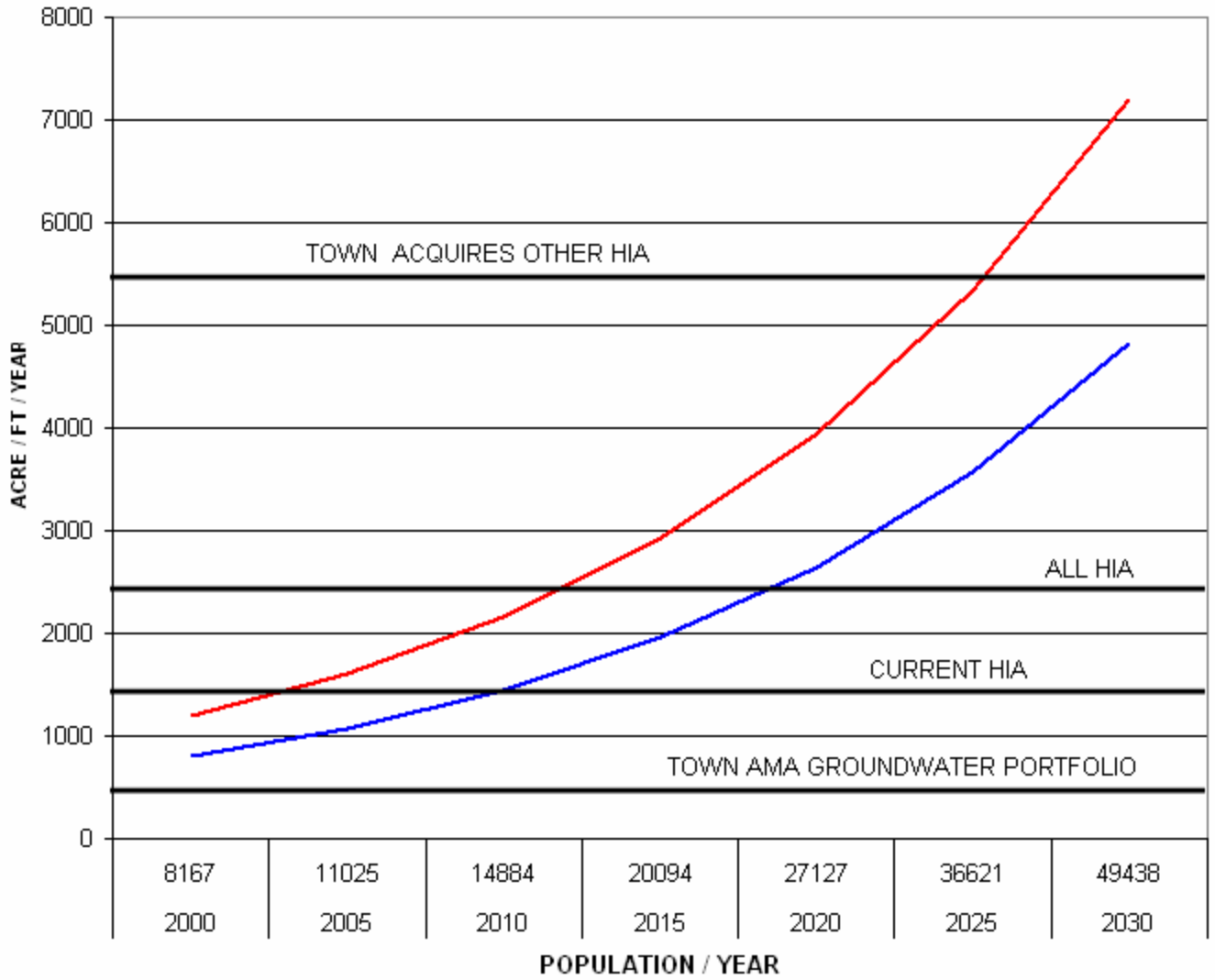
87 GPCD ACTUAL

130 GPCD POTENTIAL

Assumptions

1. All new residents become part of the Town's service area
2. Does not address groundwater withdrawls from current exempt wells
3. No new exempt wells

ESTIMATED WATER DEMAND AT 7 PERCENT GROWTH WITH ALL RESIDENTS SERVED



87 GPCD ACTUAL

130 GPCD POTENTIAL

Assumptions

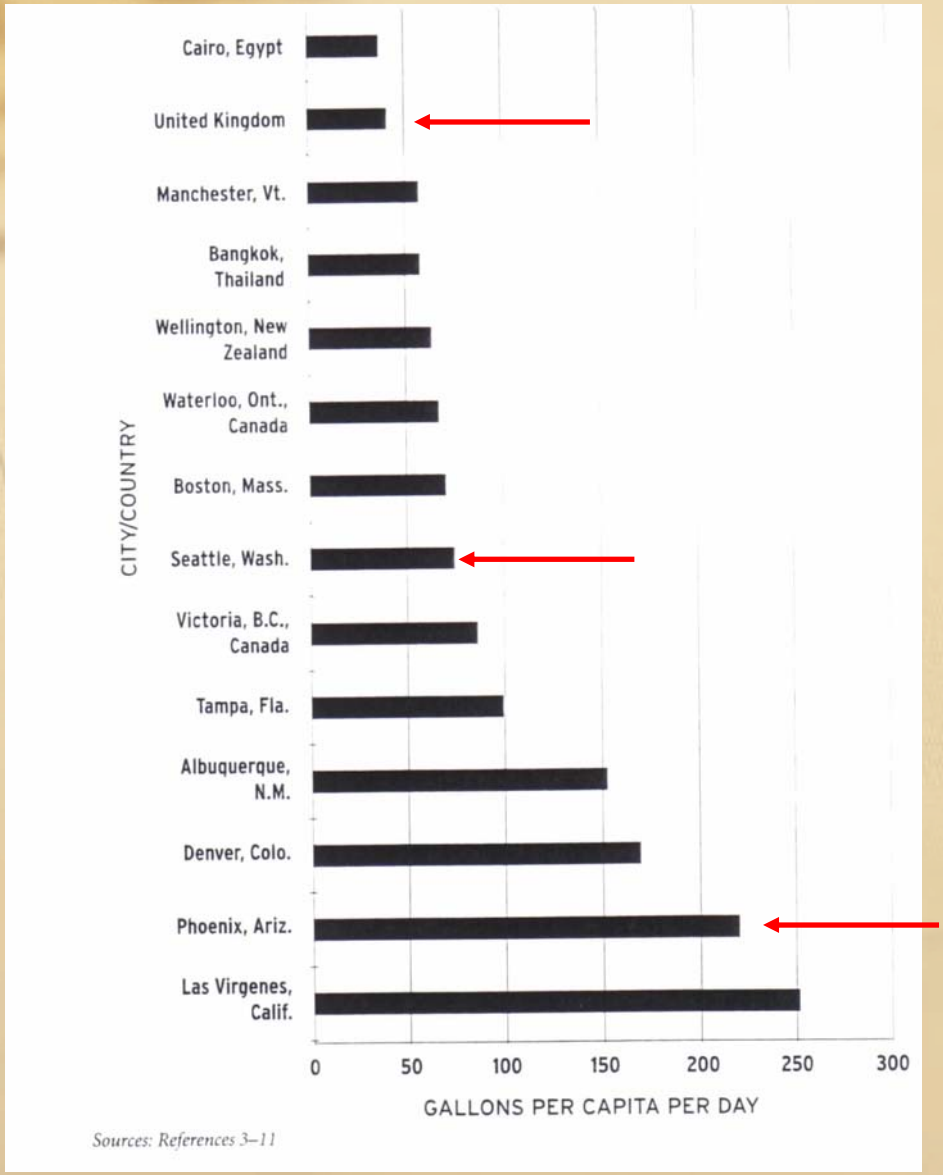
1. All new and existing residents become part of the Town's service area
2. No groundwater withdrawals from exempt wells

WATER PORTFOLIO REQUIREMENTS

1. The Town will need minimally 5,500 AF in its water portfolio to serve the community as a whole until the year 2030 at the 7% population growth

    - Will require strict water conservation measures
    - Will require water resource smart growth development
    - Will require alternative water for outdoor landscape watering
    - Will require Town-wide sewer collection
    - Will require the collection, treatment, and recharge of imported effluent from outside the AMA

HOW IS ARIZONA DOING?



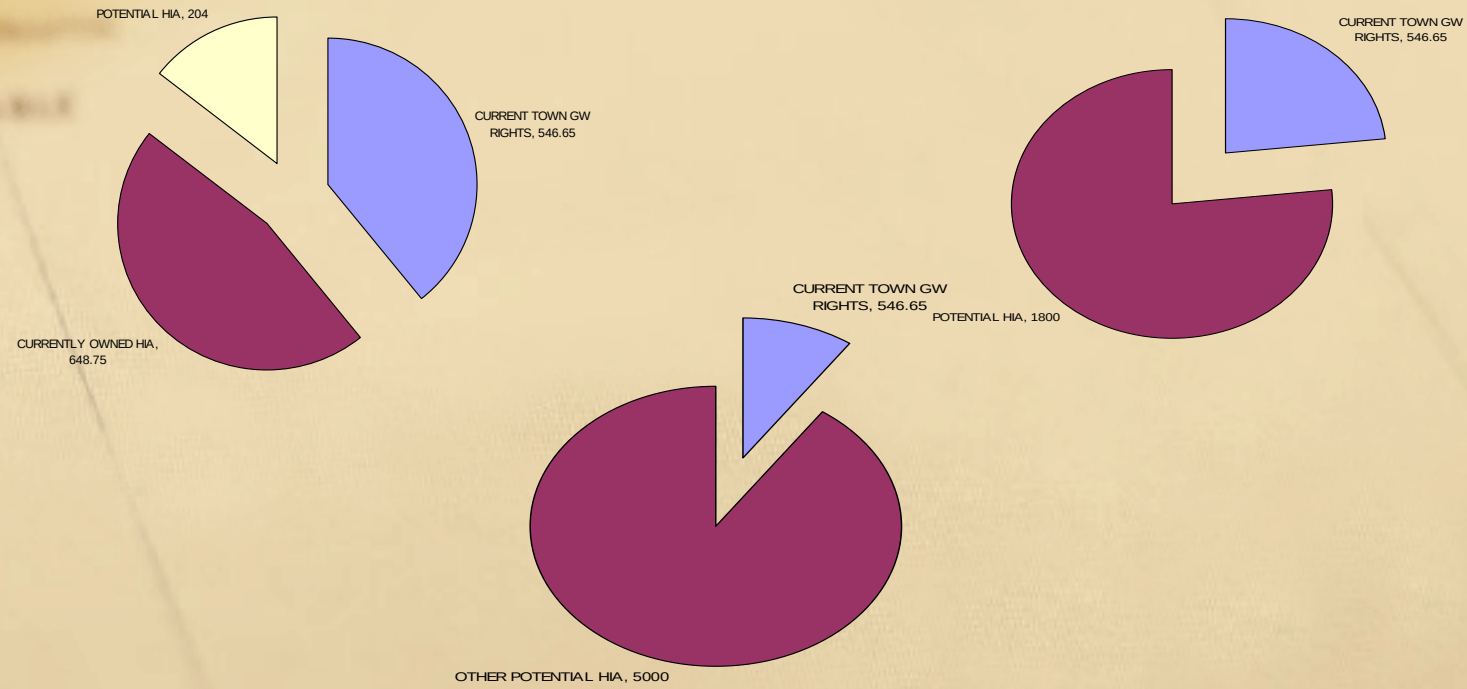
Gallons Per Capita Per Day
GPCD

1. **United Kingdom - <50 GPCD**
2. **Seattle, Wash – 75 GPCD**
3. **Phoenix, AZ – 220 GPCD**
4. **City of Prescott – 150 GPCD**

CHINO VALLEY'S SAFE-YIELD EFFORTS

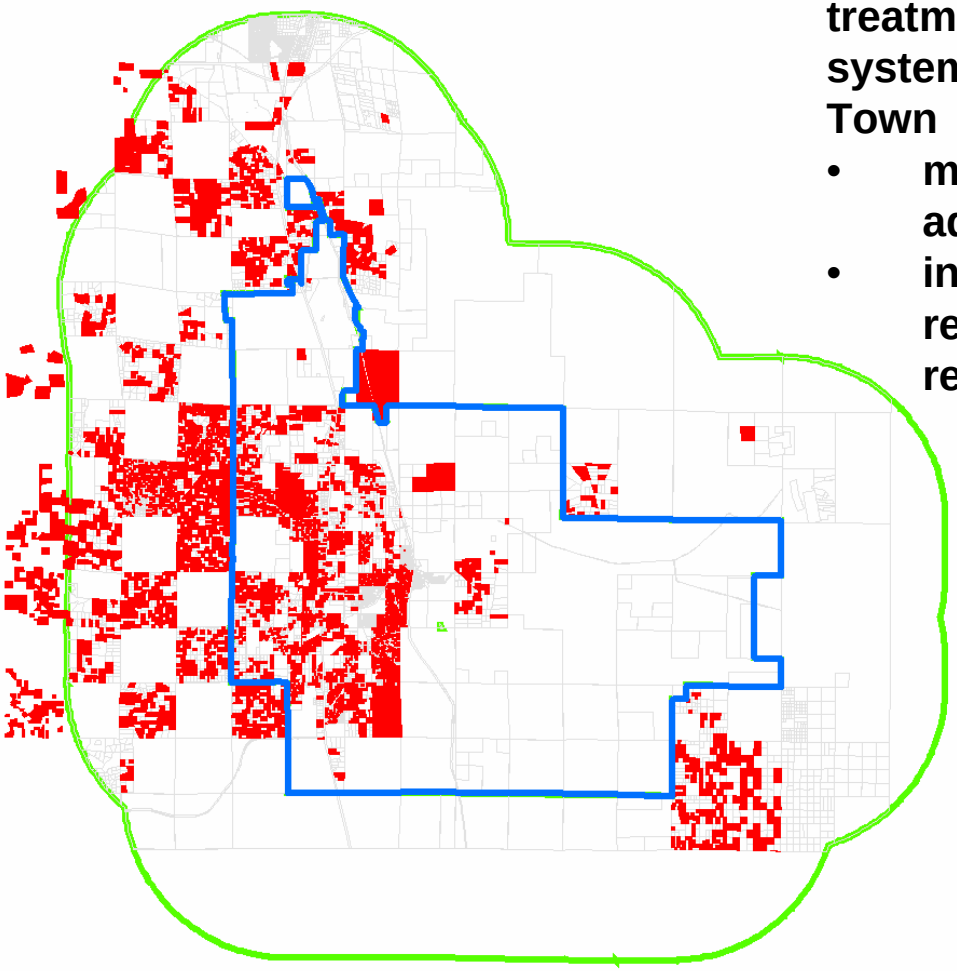
1. Plan for immediate Big Chino water importation
2. Encourage exempt well owners to connect to the Town's water service area.
   - Reduce the AMA groundwater withdrawals
3. Expand the sewer collection, treatment, and recharge system
   - Replenish the Little Chino aquifer with both AMA and HIA water
4. Create strict water conservation ordinances
5. Create strict outdoor low water-use landscape and alternative water supply ordinances
   - Reduce outdoor landscape watering with AMA groundwater or limit landscape watering with HIA water

CHINO VALLEY'S SAFE-YIELD EFFORTS



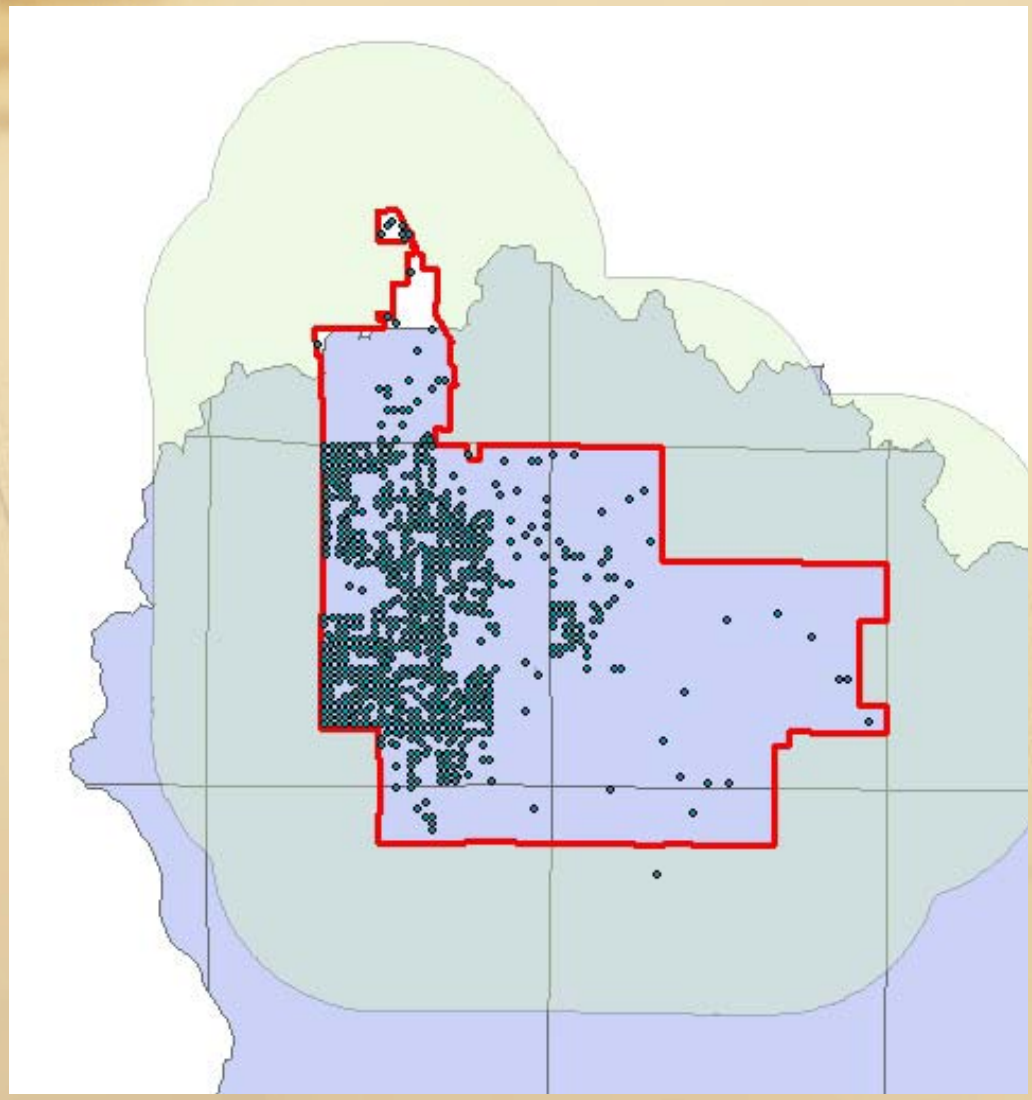
Each of these scenarios will use more non-AMA groundwater and recharge the aquifer with AMA and HIA groundwater creating a net gain

INCREASE EFFLUENT COLLECTION



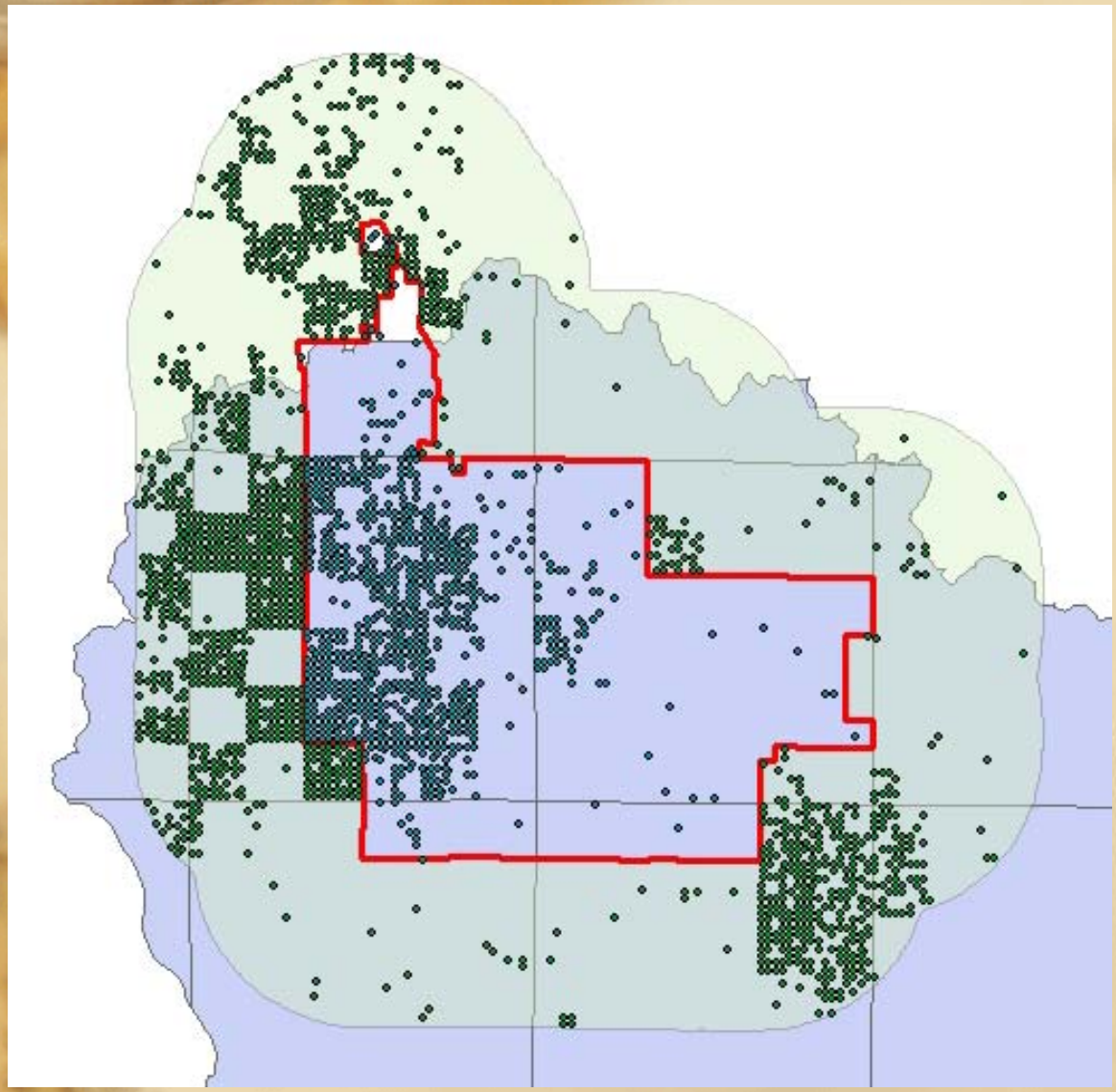
1. **Increase sewer collection, treatment, and recharge system within and outside the Town**
   - **maintain and improve aquifer water quality**
   - **increase aquifer replenishment through recharge**
     - **> 7000 septic systems**

IMPROVE WATER SERVICES



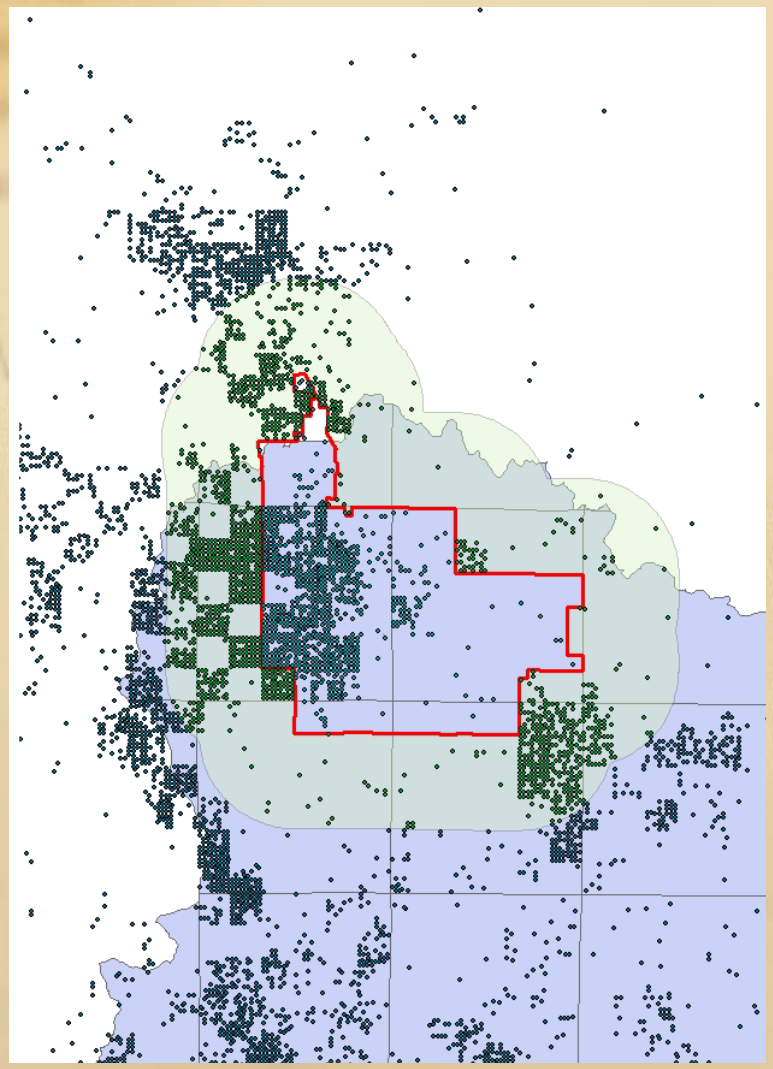
2700 DOEMSTIC EXEMPT WELLS DRILLED WITHIN THE TOWN LIMITS OF CHINO VALLEY

IMPROVE WATER SERVICES



3700 EXEMPT WELLS DRILLED WITHIN THE 3-MILE BUFFER OF CHINO VALLEY

IMPROVE WATER SERVICES

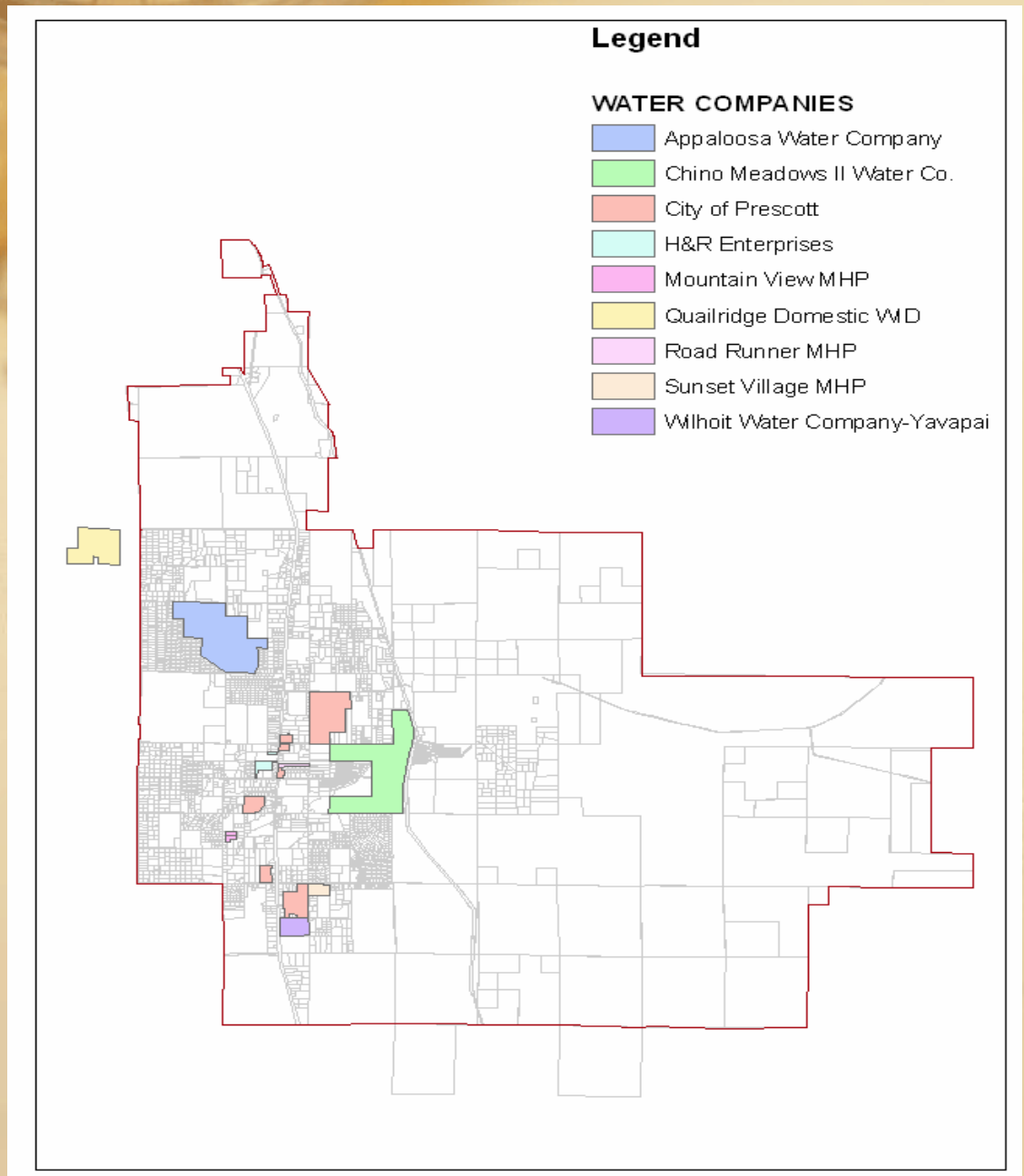


350 NEW EXEMPT WELLS DRILLED WITHIN THE LITTLE CHINO SUB-BASIN ANNUALLY

IMPROVE WATER SERVICES

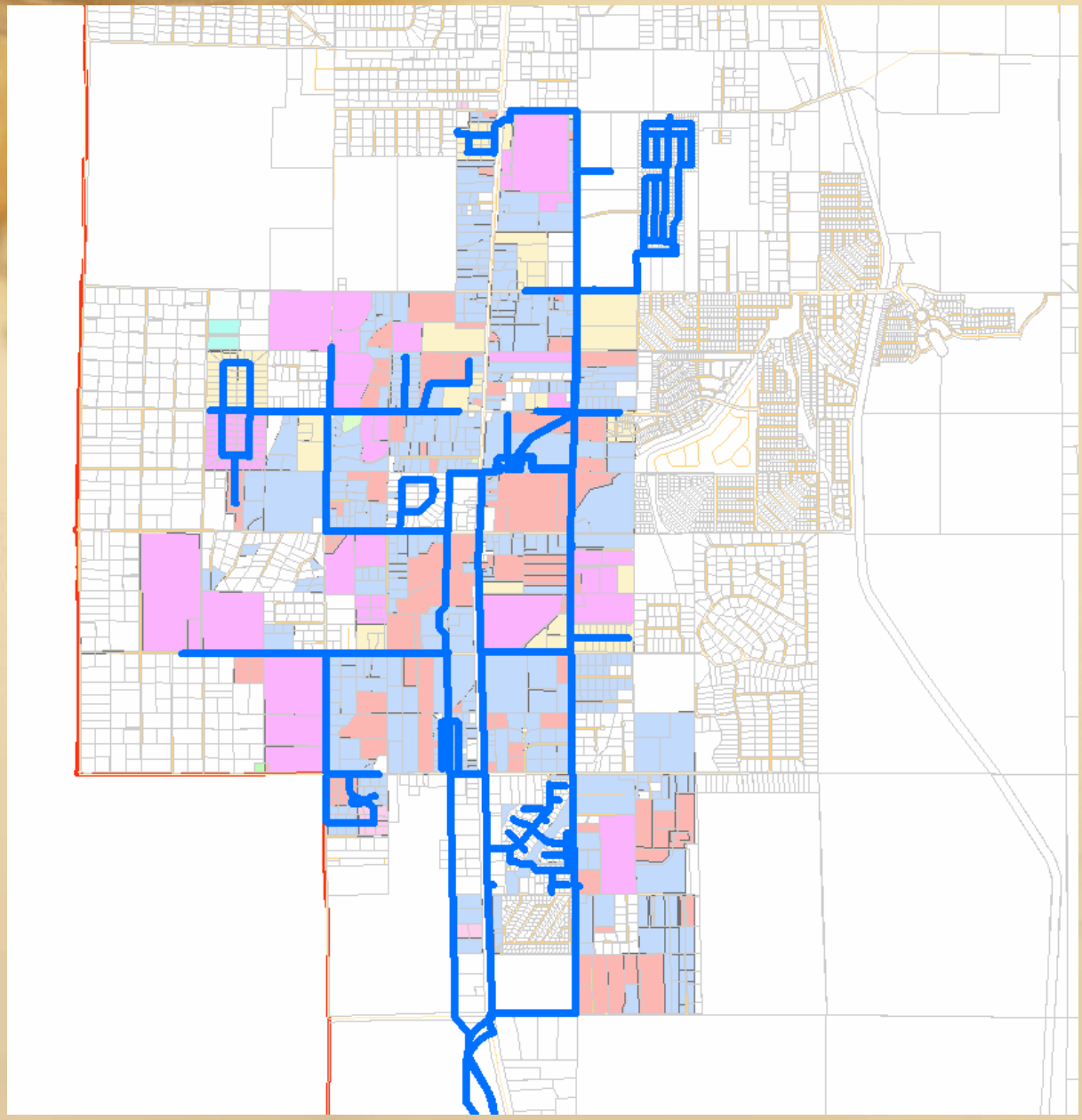
1. **Due to overdraft conditions within the AMA more and more domestic exempt well owners will be impacted by annual drops in the water table and by water quality issues**

2. **What can the Town do to ensure the community has a reliable potable water supply into the future?**



The Town has secured loan priorities through WIFA for the purchase of the water companies within Chino Valley

These service areas will eventually be tied together as part of a Town- wide service area and supply water by primarily HIA water and some AMA groundwater



The Town is also negotiating with the City of Prescott to acquire the CVID service areas, water rights and infrastructure.

These service areas will also be tied together as part of a Town- wide service area and supply water by primarily HIA water and some AMA groundwater

CONSERVATION NEXT STEPS
Ordinances, Policies, and Codes

- All service area landscape watering will require alternative water supplies
- Rain harvesting active or passive system requirements
- Incentives for the retirement of currently irrigated lands
- Improvements to existing water saving technologies
- Expansion of effluent collection, treatment, and recharge systems
- Utility programs to reduce water use
  - Turf reductions
  - Appliance retrofitting
  - Xeriscape incentives
- Regional and local storm water detention recharge projects
- Conservation easements – land permanently set aside for conservation
- Recharge area protection – no increase of non-permeable surfaces in recharge areas
- Implement smart growth programs and policies

Where are the water resources going to come from beyond the year 2030?

FUTURE WATER SUPPLIES

Northern Arizona Municipal Water Users Association (NAMWUA)

- **The Town is currently a member of this organization**

- **The mission of NAMWUA is to provide a forum for dealing with water resource policies, plans, and problems which require action on a regional or area wide-basis**

- **NAMWUA is evaluating the possibility of using the Black Mesa coal slurry alignment for a future Central Arizona Project (CAP) pipeline and must partner with State and Federal Agencies**

- **NAMWUA must work diligently towards securing a CAP water allocation for the Northern Arizona Communities**

FUTURE WATER SUPPLIES

Black Mesa Complex – coal slurry pipeline alignment


Questions
or Comments?