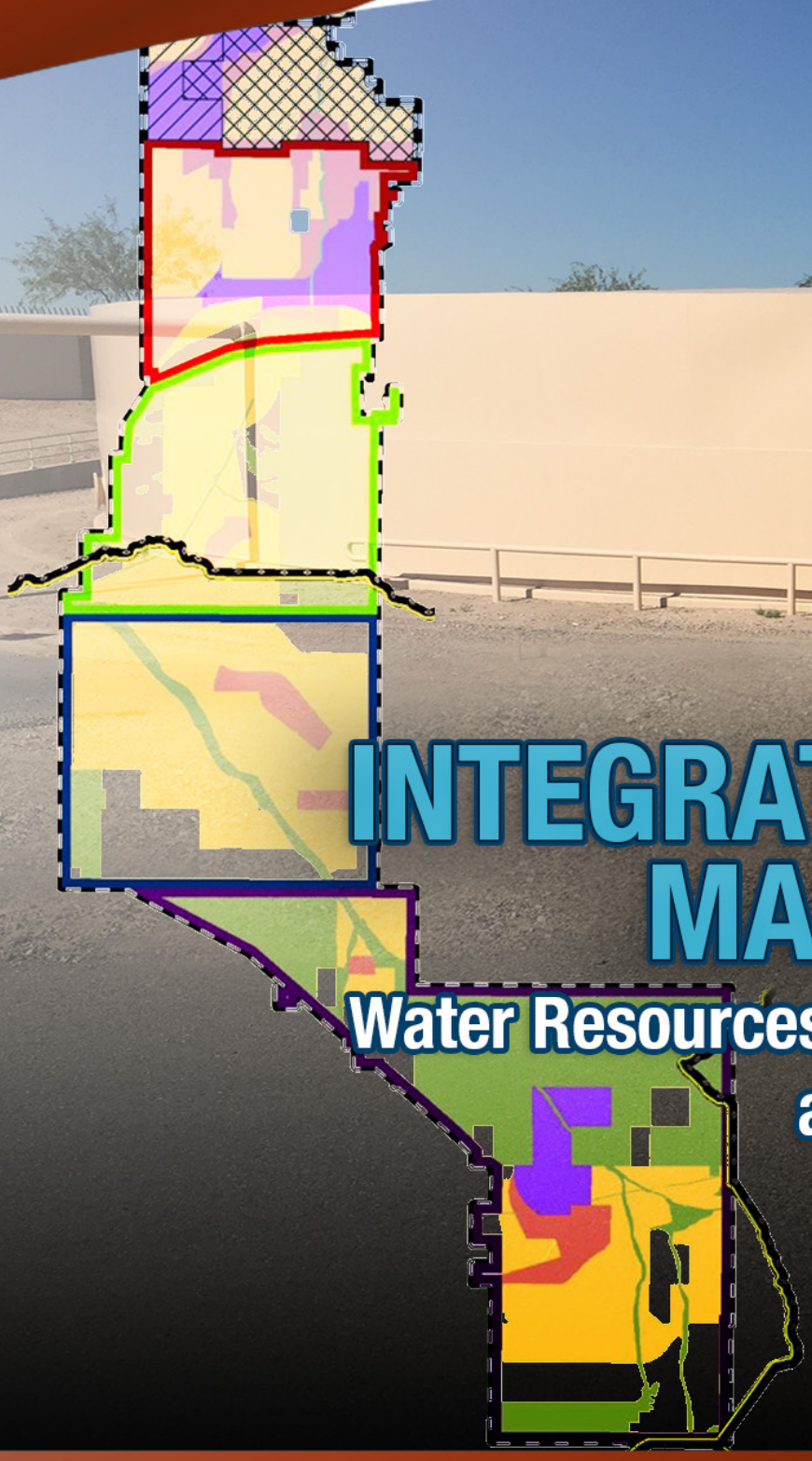
EXECUTIVE SUMMARY

November 2016

CITY OF Goodyear



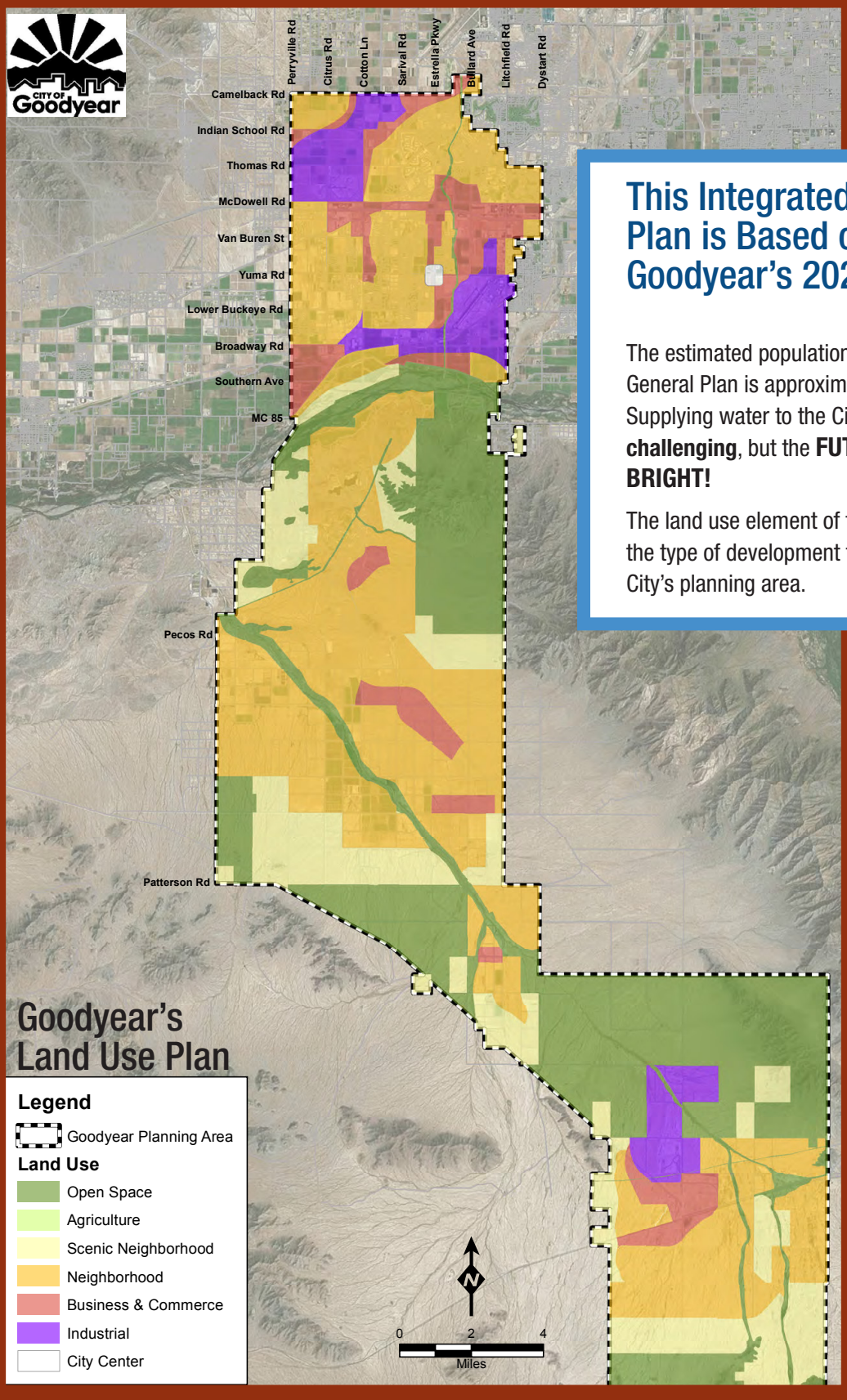
2016 INTEGRATED WATER MASTER PLAN

Water Resources, Water, Wastewater, and Reclaimed Water

carollo

Engineers...Working Wonders With Water®

Over the next 10 years, the 2016 INTEGRATED WATER MASTER PLAN will serve as a planning and capital improvements guide for the City of Goodyear, as the City prepares to provide water services through buildout.



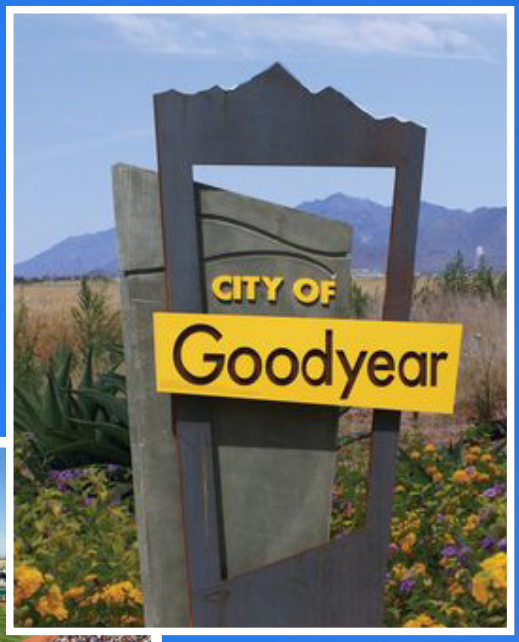
This Integrated Master Plan is Based on the City of Goodyear's 2025 General Plan

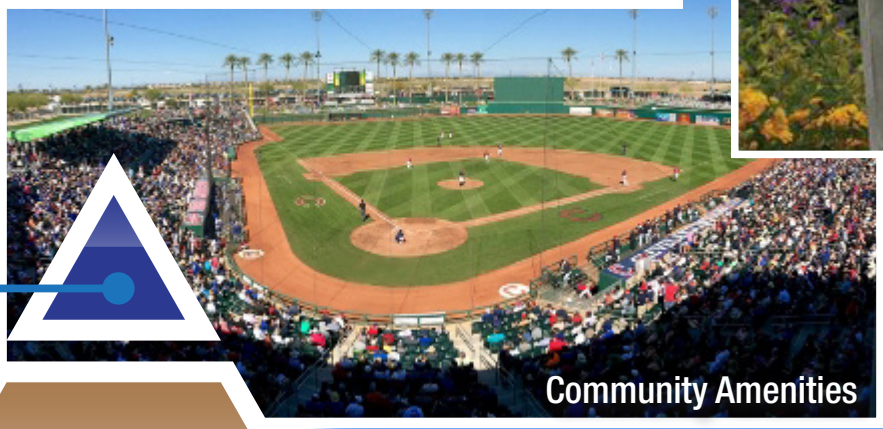
The estimated population at buildout in the 2025 General Plan is approximately 760,000 people. Supplying water to the City by buildout will be **challenging**, but the **FUTURE FOR GOODYEAR IS BRIGHT!**

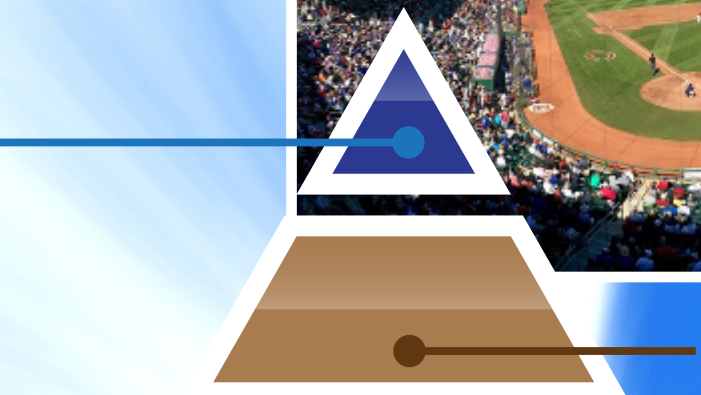
The land use element of the General Plan identifies the type of development that is anticipated for the City's planning area.

BUILT ENVIRONMENT

CENTRAL TO GOODYEAR'S PHYSICAL GROWTH AND DEVELOPMENT IS GENERAL PLAN GOAL GD-6, which calls for an adequate volume and reliable supply of high quality potable and non-potable water resources that meet both current and future needs. Objective GD-6-1 is addressed by this master plan.

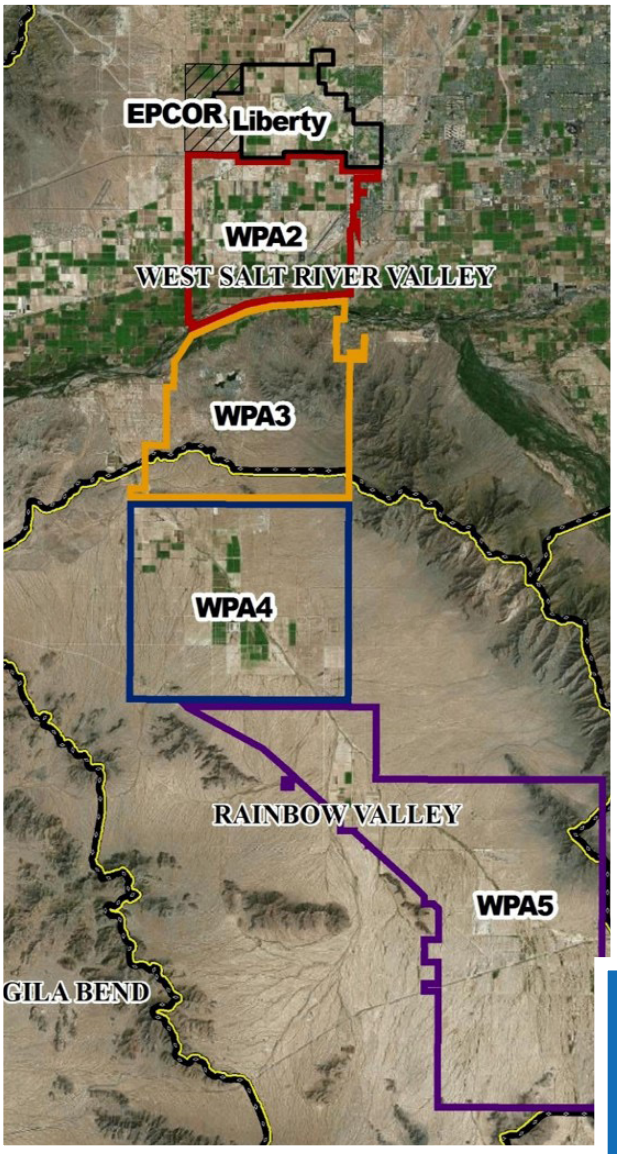






Goodyear has FIVE WATER PLANNING AREAS

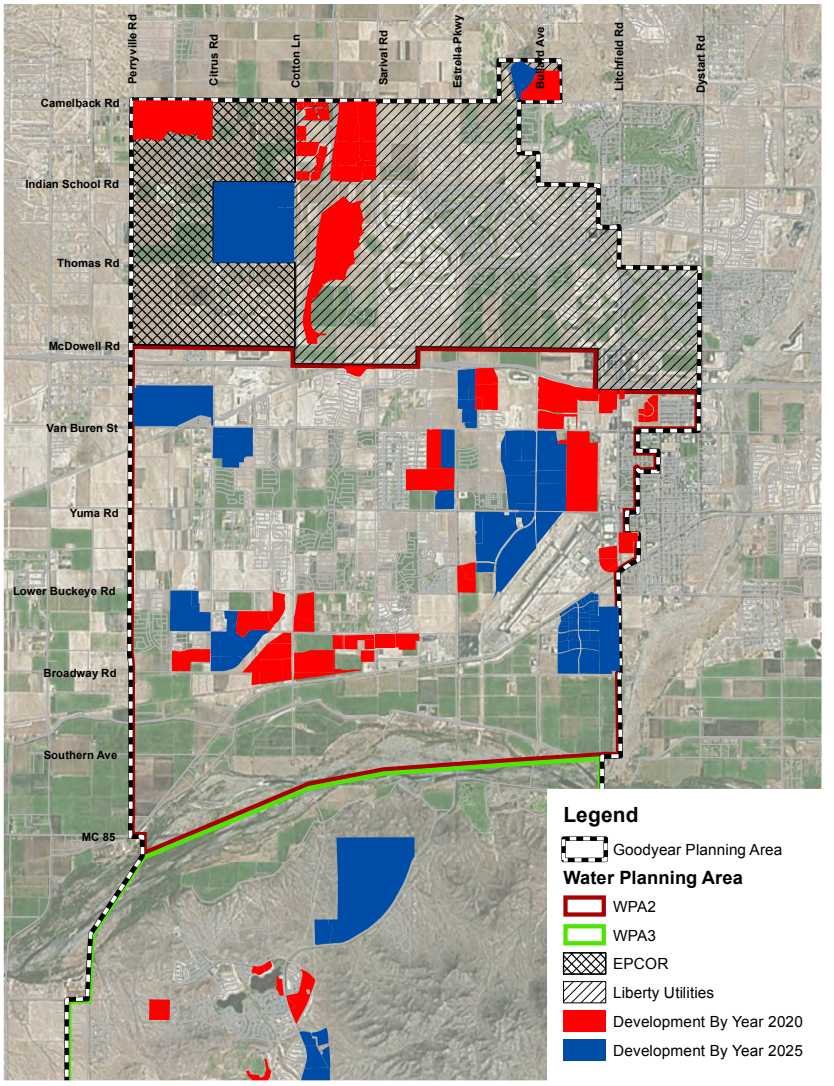
that represent the unique characteristics of the West Salt River Valley and Rainbow Valley groundwater sub-basins.



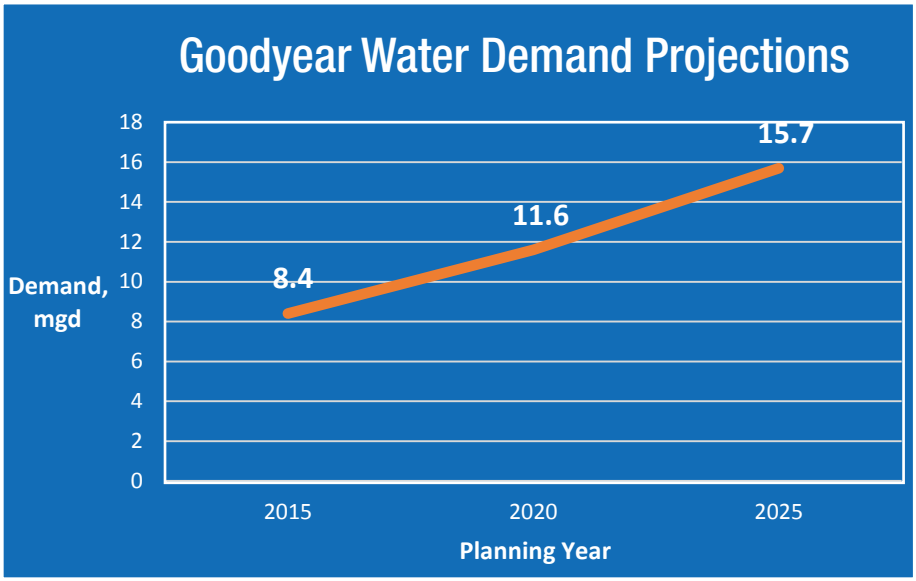
Goodyear Water Planning Areas

- WPA1 - Private Water Utilities (EPCOR, Liberty)
- WPA2 - Central
- WPA3 - Sierra Estrella
- WPA4 - Rainbow Valley
- WPA5 - Sonoran Valley

Goodyear identified the land areas most likely to be developed over the next 5 - 10 years.

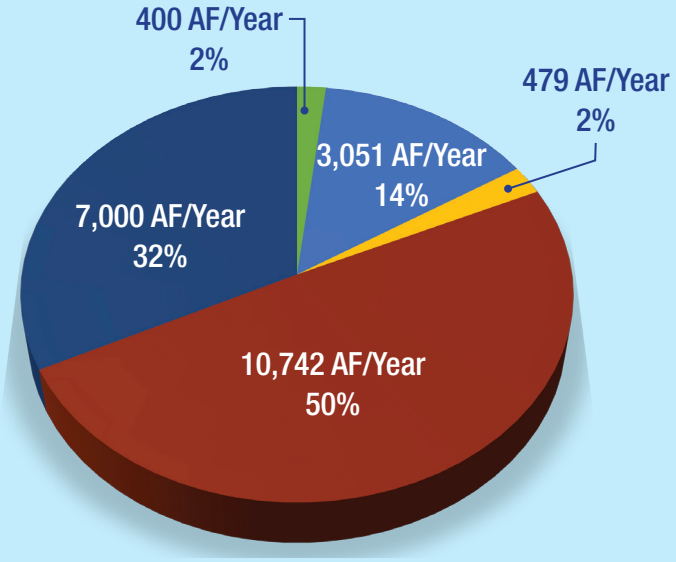


Goodyear Water Demand Projections



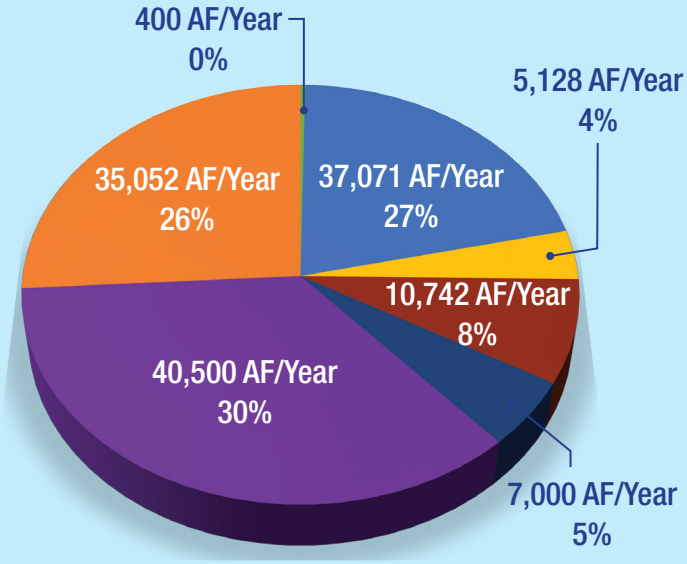
Goodyear's CURRENT WATER RESOURCE PORTFOLIO is sufficient to support growth to 2040, but additional water resources are needed beyond 2040.

Goodyear's Current Water Resource Portfolio



21,672 AF/year

Water Resource Needed for Buildout



135,208 AF/Year

- Reclaimed Water for Irrigation
- Reclaimed Water for Recharge
- CAP M&I Subcontract
- CAP GRIC Lease
- New Water Sources
- Water Conservation
- Renewable Groundwater

Recommendations from the Water Resources Master Plan

- Add wells to fully use physically available groundwater in the West Salt River groundwater basin
- Expand groundwater storage facilities to maximize reclaimed water storage
- Establish policies that return reclaimed water to the City
- Aggressively seek opportunities to purchase or lease additional water resources
- Construct the pipelines and possibly the treatment facilities to directly use the City's CAP water allotment
- Implement water conservation by reducing outdoor water use. One suggestion for the City's consideration would be to reduce outdoor water use by half, by a yet to be determined date
- Support legal changes that make additional water supplies available, including canal water sources or direct potable reuse
- Support research to lower the cost of brine disposal from well water

Increase Water Supply:

CONSERVE

RECHARGE RECLAIMED WATER

PURCHASE ADDITIONAL WATER

Water conservation through low water use landscaping saves water while providing beautiful landscapes.

Opportunites can be created to deliver water to Goodyear through canals in the West Valley.

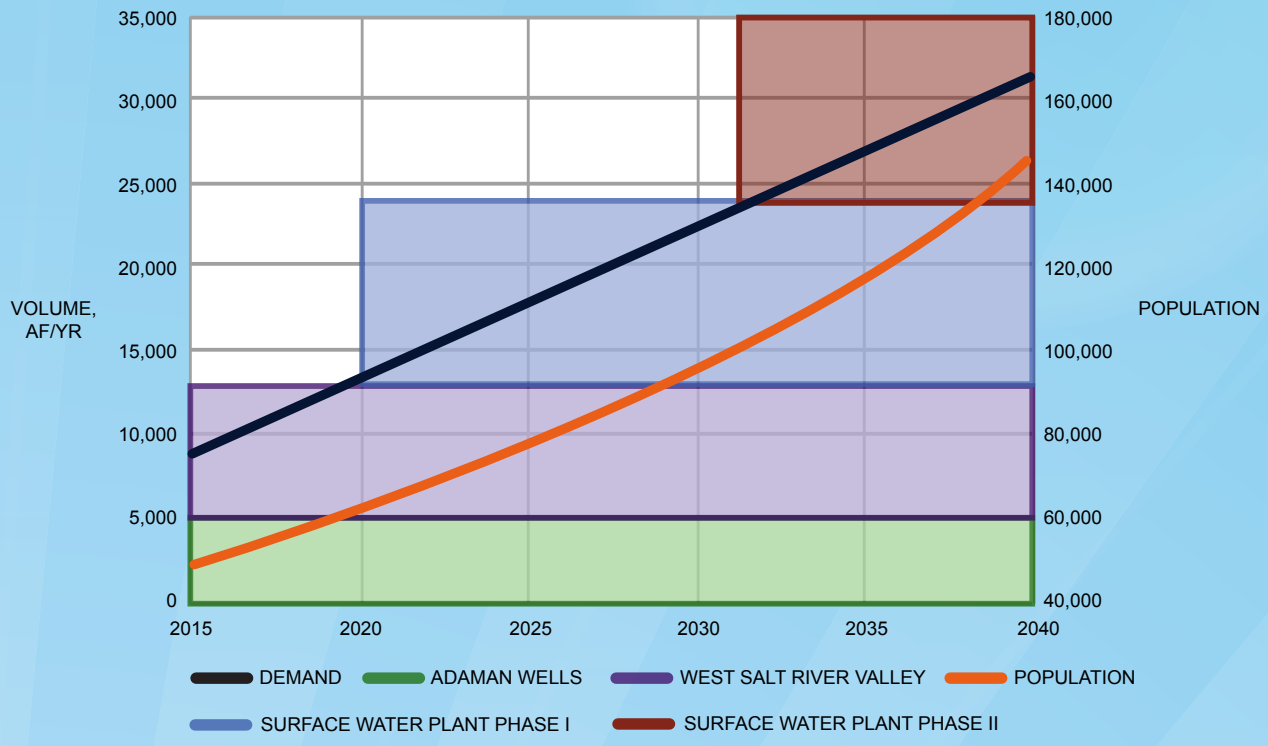
Storing reclaimed water provides a reliable, local water supply that can enhance community amenities.

Gilbert Riparian Preserve

City of Chandler, Veterans Oasis Park

Direct delivery of treated Central Arizona Project water is the top priority for Goodyear's water supply development strategies.

Physical Water Availability and Projected Demand



Treated CAP Water Delivery Options

Option 1 Purchase of capacity at EPCOR WTP, partially wheel the water through an EPCOR line, and construct a 5.4-mile City-owned pipe to the Silva site.

Option 2 Purchase of capacity at EPCOR WTP and construct an 11.5-mile City-owned pipe to the Silva site.

Option 3 Construct a 12.3-mile raw water line from Beardsley Canal to a new Goodyear WTP near the Goodyear Water Reclamation Plant.

Option 4 Construct a 7.9-mile raw water line from Beardsley Canal to a new Goodyear WTP at the Silva site.

Option 5 Construct a 7.2-mile raw water line from the SRP Outfall pipeline at 99th Ave. to a new Goodyear WTP west of the Goodyear Water Reclamation Plant.

Phase 1 (up to 8 mgd)

Cost range: $66 - 108M

Phase 2 (up to 16 mgd)

Cost range: $143 - 158M

Key Decision Variables for CAP Water Delivery Options

1. Water supply partner relationship
2. Opportunity to treat additional water supplies
3. Manage surface water quality, THM levels
4. Cost
5. Goodyear controls its destiny

Advantages of Surface Water Supplies

1. Renewable over groundwater
2. Increased supply reliability
3. Avoids groundwater treatment challenges, including brine disposal

Current customers will benefit from investments to renew water and wastewater infrastructure through 2020.

Water Projects	Project Cost, $M
Wells	$27.90
Pumping	$1.70
Water Storage	$4.80
Central Arizona Project Capital	$1.40
Bullard Campus Water Treatment Rehabilitation	$0.14
Water Main Replacements	$2.90
Distribution System Management Program	$0.10
Water Total	**$38.94**

Wastewater Projects	Project Cost, $M
Rainbow Valley Plant Improvements	$1.30
Corgett Plant Improvements	$1.00
Goodyear Plant Improvements	$2.90
Lift Station and Force Mains	$2.50
Collection System	$4.80
City Identified Wastewater Projects	$5.90
Wastewater Total	**$18.4**

Well Projects

- Adaman Well with treatment
- Well siting study
- New well with treatment
- Second new well with treatment
- Replace Well 1
- Rehabilitate Well 3
- Rehabilitate Well 18B
- Rehabilitate Well 18A
- Rehabilitate Well 19

Water Storage Projects

- 1.5 MG new storage
- Site 13 reservoir rehabilitation

Wastewater Improvement Projects

- Collection system renewal
- Lift station and force main rehabilitation
- Rainbow Valley WRF
- Corgett WRF
- Goodyear WRF

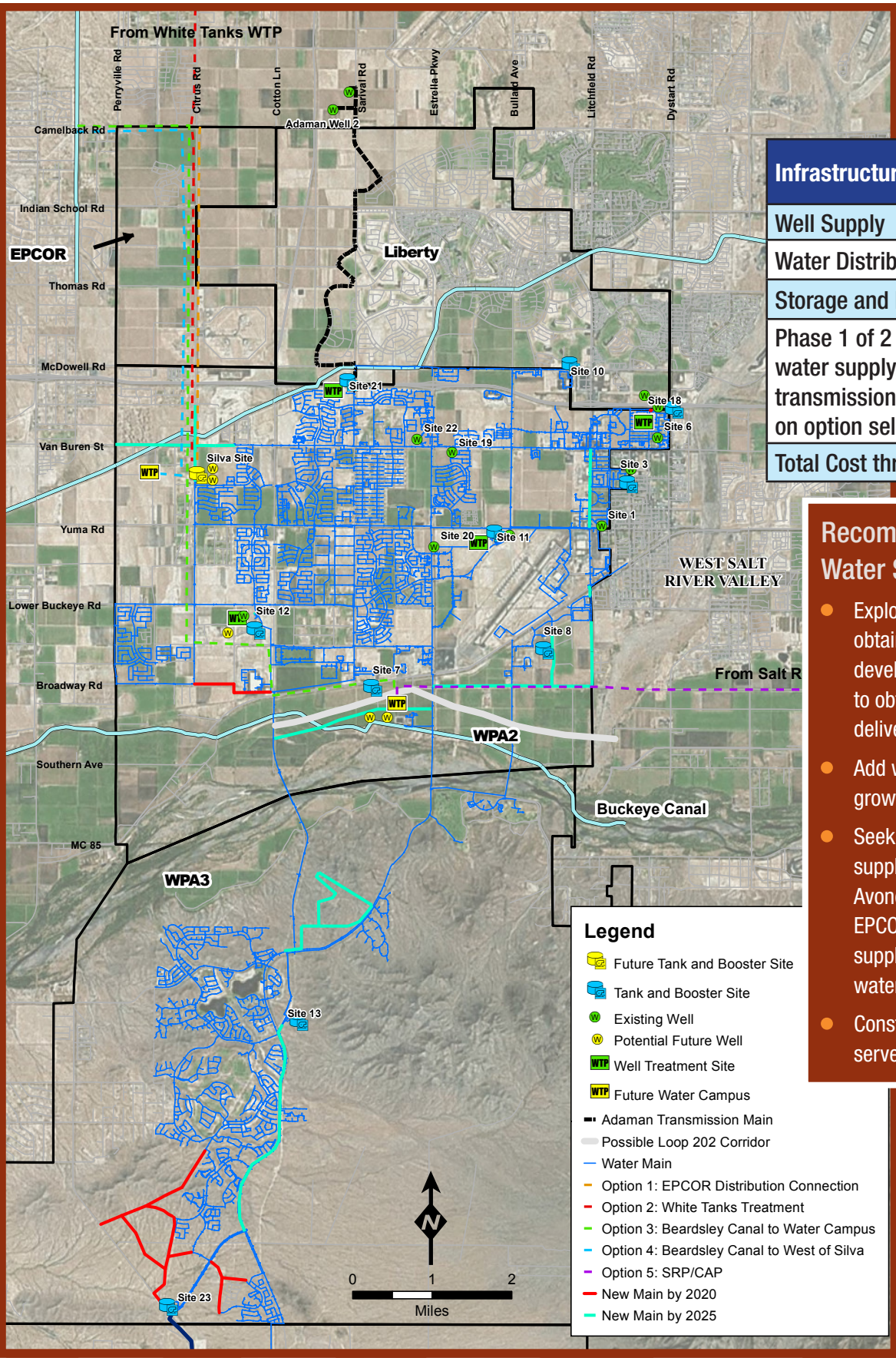
Pumping Capacity Projects

- Site 12 booster station
- Site 13 booster station
- Pump station corrosion study

Other Capital Expenditures

- Bullard Campus Water Treatment Rehabilitation

Water master plan identifies new CAP water supply, wells, pipelines needed for growth through 2025.



Water Capital Recommendations Summary

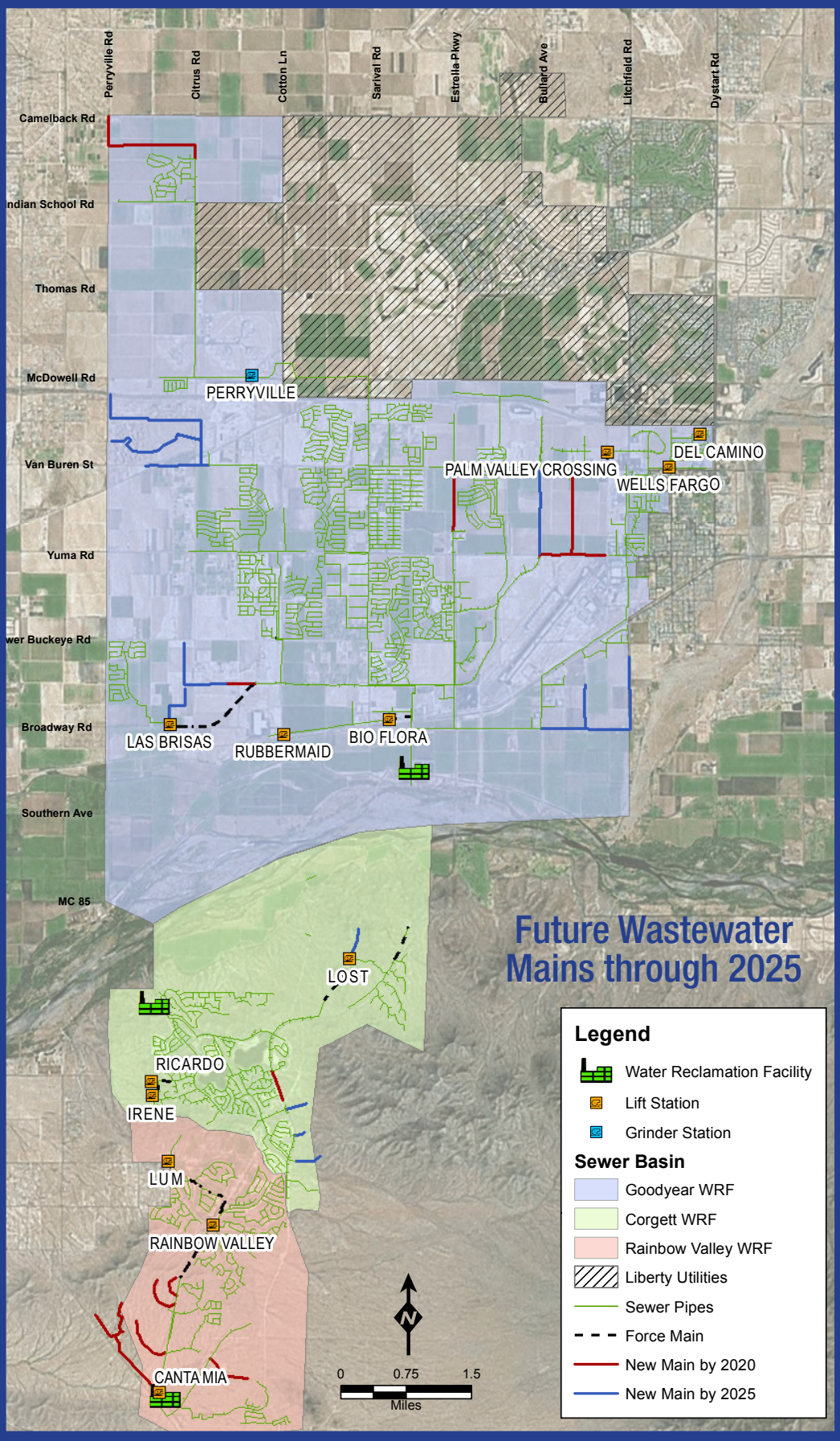
Infrastructure Type	Project Cost, $M
Well Supply	40
Water Distribution Mains	25
Storage and Pumping	16
Phase 1 of 2 for CAP water supply, treatment, transmission (depends on option selected)	87 - 107
Total Cost through 2025	152 - 172

Recommendations for the Water System through 2025

- Explore the options available to obtain treated CAP water directly; develop partnerships needed to obtain direct CAP water deliveries.
- Add well supplies to supply growth through 2020.
- Seek opportunities to have water supply interconnections with Avondale, Liberty Utilities, and EPCOR as emergency water supplies in the event of a well or water supply disruption.
- Construct additional mains to serve developing areas.

Water Capital Improvements through 2025

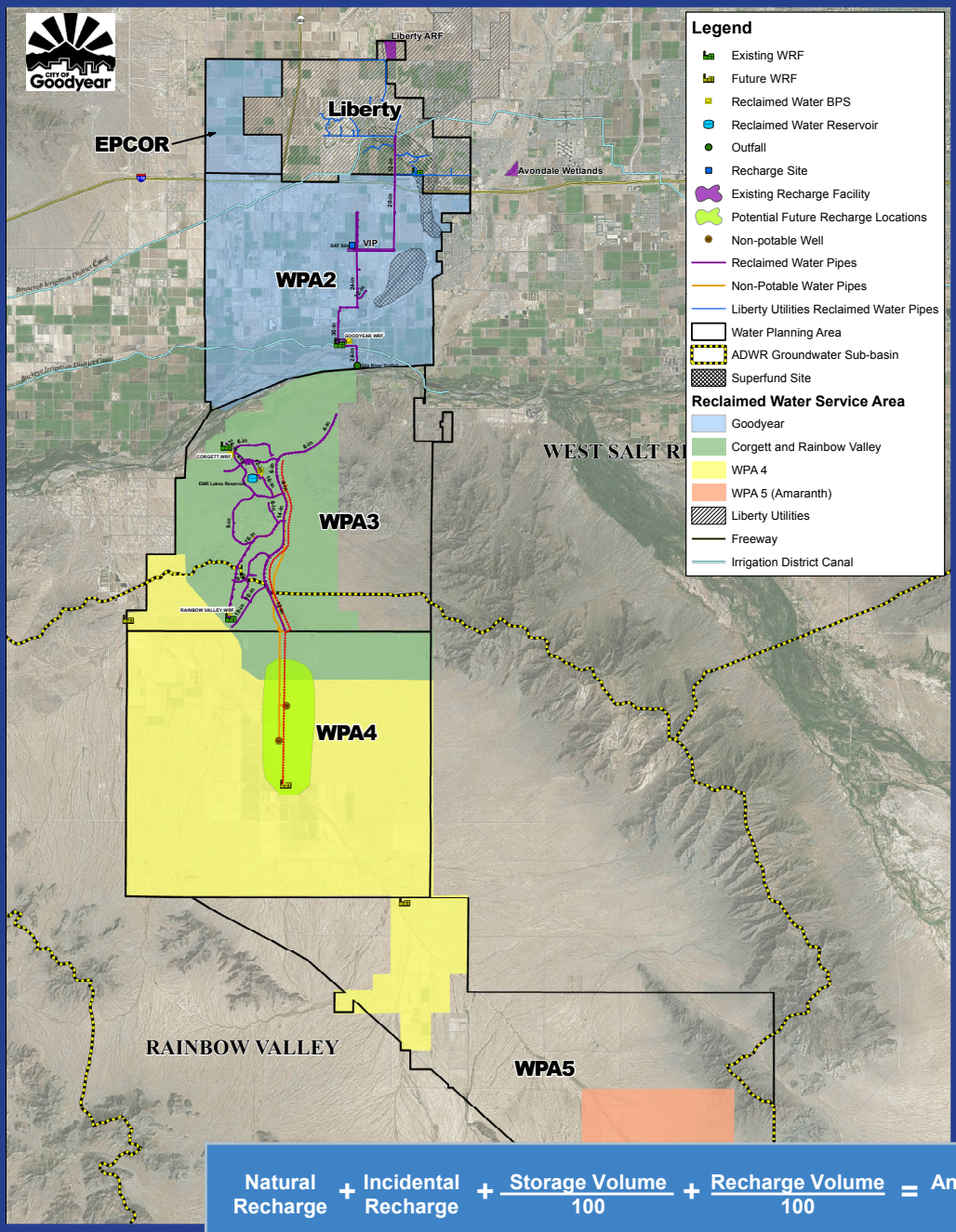
Wastewater master plan addresses wastewater collection, treatment, and conveyance needs through 2025.



Capital Improvement Summary for the Collection System through 2025

Infrastructure Type	Cost, $M
Sewer Mains	19
Goodyear Water Reclamation Plant Expansion to 8 mgd	44
Corgett Water Reclamation Plant Expansion to 1.2 mgd and Redundancy Improvements	26
Rainbow Valley Water Reclamation Plant Expansion to 1.2 mgd	26
Total Cost through 2025	115

Reclaimed water master plan sets forth a strategy to maximize the benefits of reclaimed water.

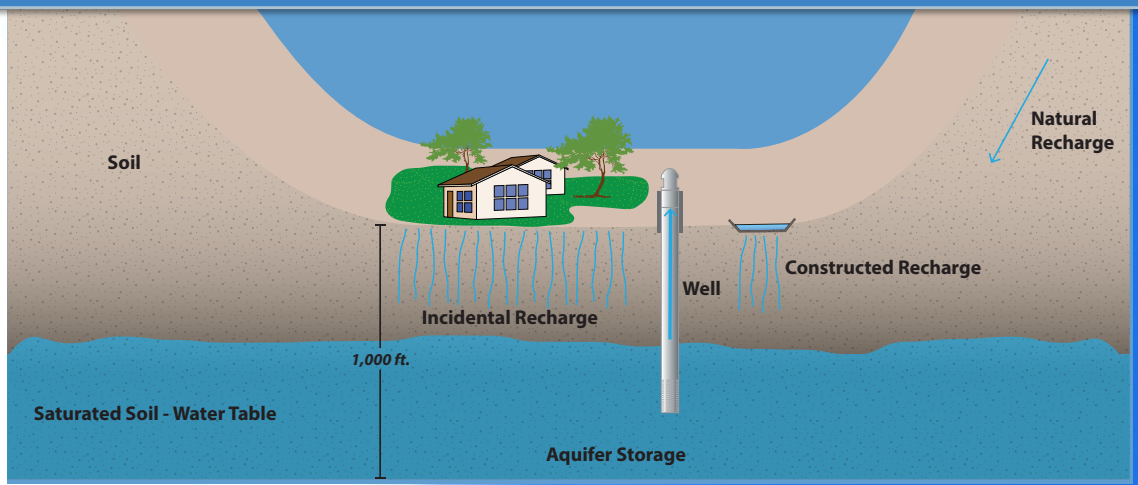


Policy Recommendations to Maximize the Benefit from Reclaimed Water

- Discourage the use of reclaimed water for turf irrigation.
- Maximize the use of reclaimed water for recharge to augment potable water supplies.
- Identify additional locations for recharge in WPA2 north of the Gila River to recharge all of the reclaimed water produced by the 157th Avenue water reclamation plant.
- Identify locations in Rainbow Valley for aquifer recharge and recovery so that development plans work around these areas.
- Discontinue the practice of providing reclaimed water to developers.
- Remove requirements to use reclaimed water for dust control, and to irrigate parks and open spaces.
- Remove the requirement to install reclaimed water systems in developments.

$$\text{Natural Recharge} + \text{Incidental Recharge} + \frac{\text{Storage Volume}}{100} + \frac{\text{Recharge Volume}}{100} = \text{Annual Agricultural Pumping} + \text{Sustainable Annual Pumping Allowance}$$

The best use for reclaimed water is to recharge the aquifer to provide sustainable groundwater supplies.



Acknowledgments

City Manager's Office

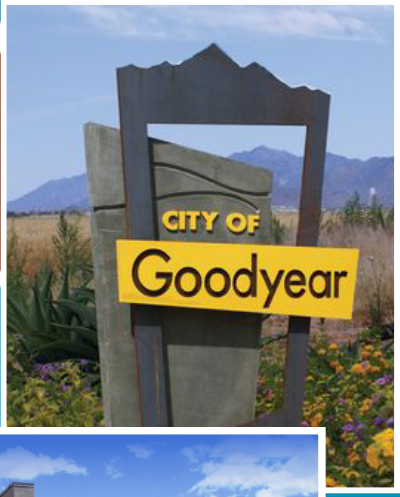
Public Works Department

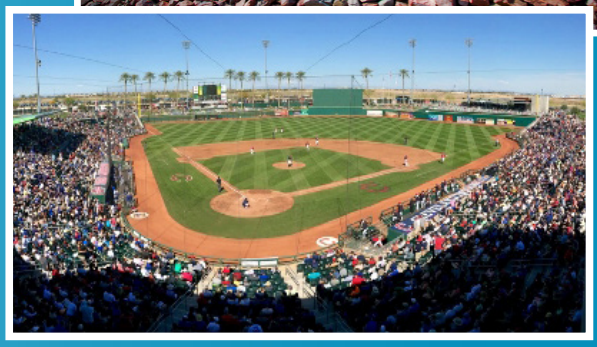
Engineering Department

Development Services Department

Economic Development Department

Finance Department





Goodyear faces challenges in providing water, but the future looks bright because of the solutions Goodyear is implementing.

carollo

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