



**Liberty Utilities®**



# Liberty Utilities Aquifer Replenishment Project:

A Model Water Management Partnership with  
Central Arizona Water Conservation District

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Session 1B

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# The Partners: CAWCD & CAGRD

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## **Central Arizona Water Conservation District (CAWCD or CAP)**

- Contracts with U.S. for delivery of Central Arizona Project water in Pima, Maricopa and Pinal Counties
- Operates and maintains the Central Arizona Project aqueduct.
- Operates the Central Arizona Groundwater Replenishment District (CAGRD)

## **Central Arizona Groundwater Replenishment District (CAGRD)**

- A part of CAP – not a separate entity.
- Created by state legislation in 1993.
- Statutorily required to replenish “excess” groundwater pumped by members.
- Provides “consistency with the management goal” under Assured Water Supply rules.
- Funded by members.

# Project Overview

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- 100-year agreement between Liberty and CAWCD to build and manage a recharge facility in the west Salt River Valley.
- First of its kind public-private partnership between a public water district and a private water utility to develop a recharge facility to augment groundwater supplies.
- Mutually-beneficial goals:
  - Provides long-term water sustainability to region.
    - Replenishment within area of impact – maintain water levels, reduce pumping costs
  - Sustainable water management with good fiscal management:
    - Change a disposal problem into a revenue source
    - Excess groundwater pumping = replenishment obligation
  - Combines Liberty assets (water, infrastructure) with CAWCD expertise and access to financing

# Implementing the Deal

## History

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- Initiated in 2010. Completion planned 6+ years
  - Agreed to study feasibility of recharging effluent within Liberty service area.
- Success depended on feasible site for a recharge facility.
  - Evaluated 11 possible sites and identified several favorable sites
  - Provided the needed assurance to proceed.
- February 2014 - Agreement was executed
  - Secured funding to allow the development phase to proceed.
- December 2014 - A 57-acre property was acquired
  - Site selected on favorable hydrology, direct access to Liberty's existing effluent distribution system, and a willing seller.
- Currently obtaining regulatory permits from ADWR and ADEQ, and completing engineering designs and construction specifications.

# Implementing the Deal

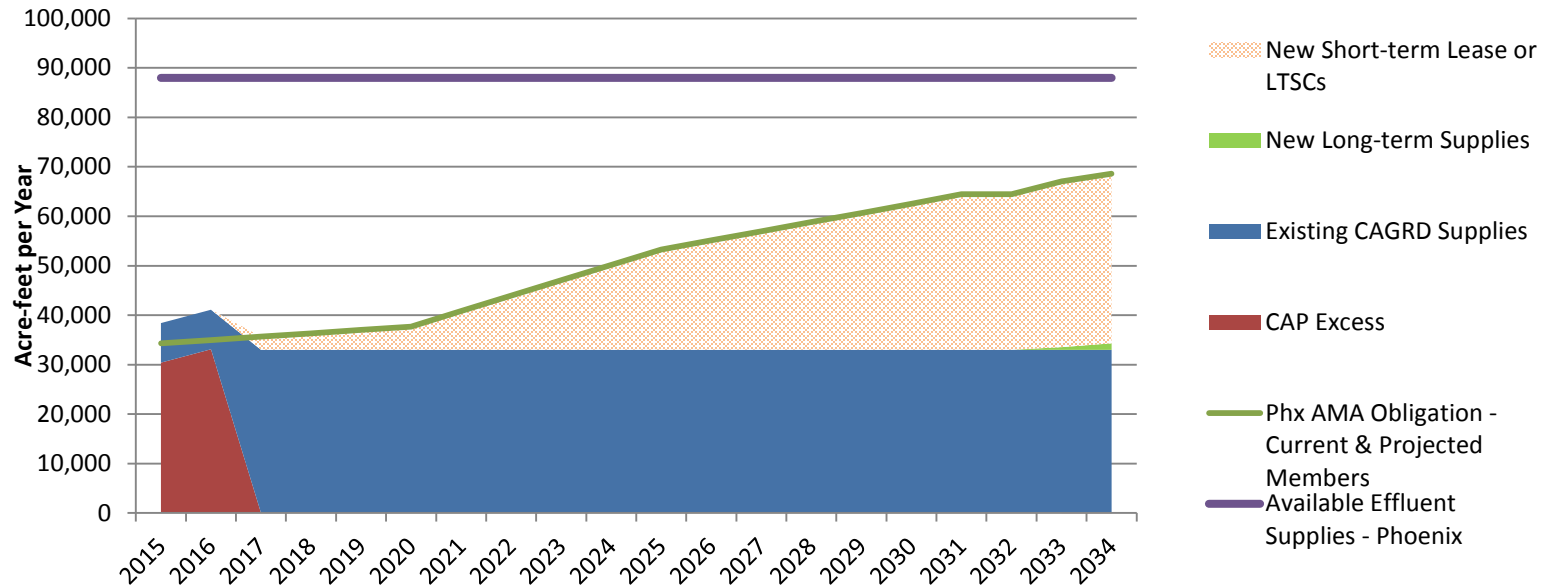
## Timeline

### Development Schedule - Liberty Utilities / CAWCD Effluent Partnership

Development Phases	2010				2011				2012				2013				2014				2015				2016			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Draft, Negotiate and Execute Agreements																												
Conduct Hydrologic Feasibility Investigations																												
Land Purchase																												
ADWR - Underground Storage Facility Permit																												
ADEQ - Aquifer Protection Permit																												
FEMA - Floodplain (CLOMR)																												
Goodyear - Rezoning																												
Engineering Designs / Specifications																												
Construction																												
Facility Start-up / Testing																												

# Importance of the Deal to CAGRD

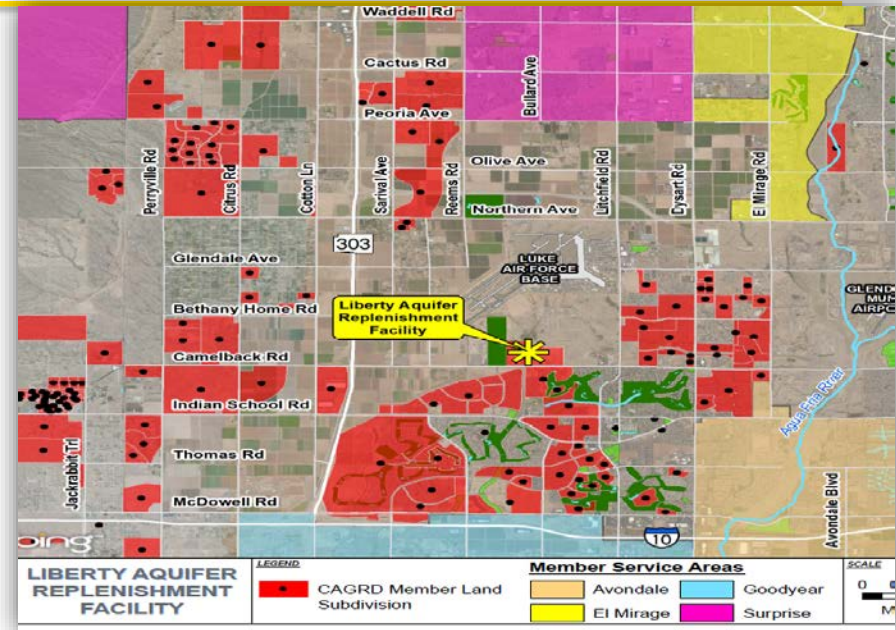
## Projected 20 year replenishment obligations and projected available effluent supplies



- Available effluent (purple line) exceeds projected demands (green line)
  - Phoenix projected 2034 obligation = 68,600 AFY
  - CAGRD projected effluent availability in Phoenix AMA = 88,000 AFY

# Goals and Benefits for CAGRD

- Precedent
  - Template for future agreements.
- Hydrologic
  - Mitigates groundwater overdraft near the “Luke Sink.”
- Obligations
  - Surrounded by existing/future member lands and member service areas
- Liberty Utilities – owns, operates, and maintains facility for the benefit of CAGRD.
- Low-cost, long-term, renewable supply.
  - Meeting fiduciary and statutory obligations to our members.



# Hydrologic Benefits

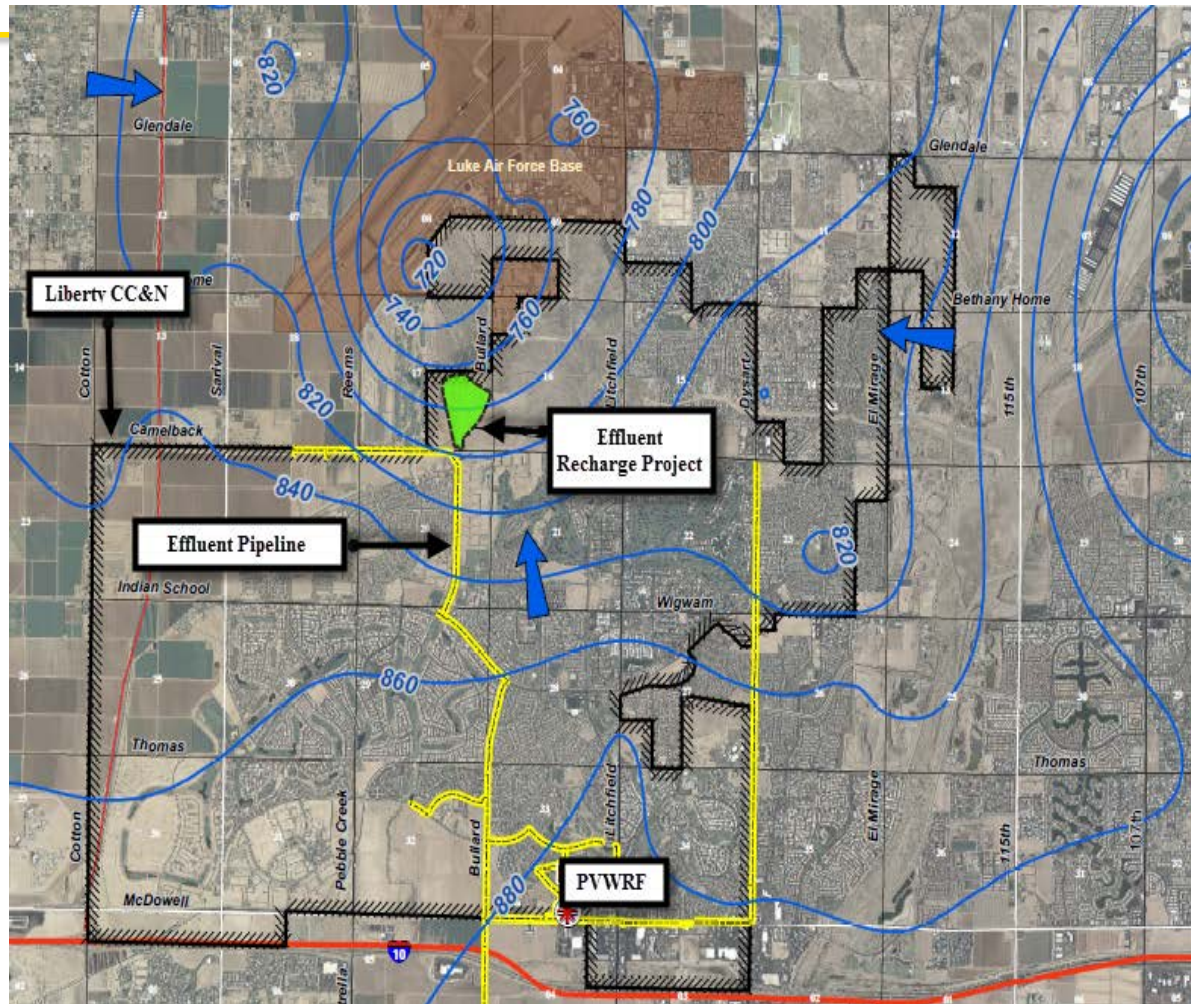
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- Replenishes the aquifer in the same location that groundwater is extracted by CAGRD members.
- Significant available storage capacity.
  - Water table 280 ft. below land surface at the recharge site.
- Groundwater levels are projected to rise 86 feet beneath the basins after 20-years of recharge (100,000 acre-feet of effluent stored).
- The facility is directly adjacent to, and flows towards, the “Luke Sink”
  - A large cone of depression (100 – 200 foot declines) in the aquifer caused by historic groundwater overdraft.
  - ADWR groundwater model show potential for 200-400 feet of additional water level decline across the region over next 100-years.
  - Land subsidence concerns.



# Hydrologic Benefits

## The Luke Sink



### EXPLANATION

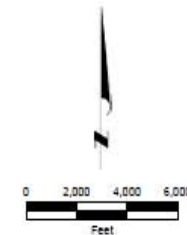
—920— Contour of Groundwater Level Elevation

← General Direction of Groundwater Movement

### Liberty Water Service Area

Water Service Area Boundary

Effluent Pipeline



CAGRD  
CENTRAL ARIZONA GROUNDWATER REPLENISHMENT DISTRICT  
Liberty Utilities  
Effluent Recharge Feasibility Study

SITE LOCATION MAP

# Hydrologic Benefits

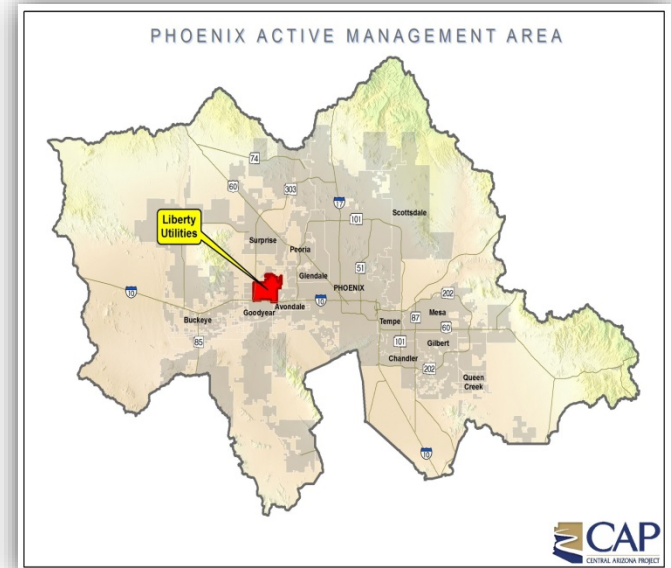
## The Luke Sink



Luke Sink elevation comparison 1957-1991

# The Partners: Liberty Utilities

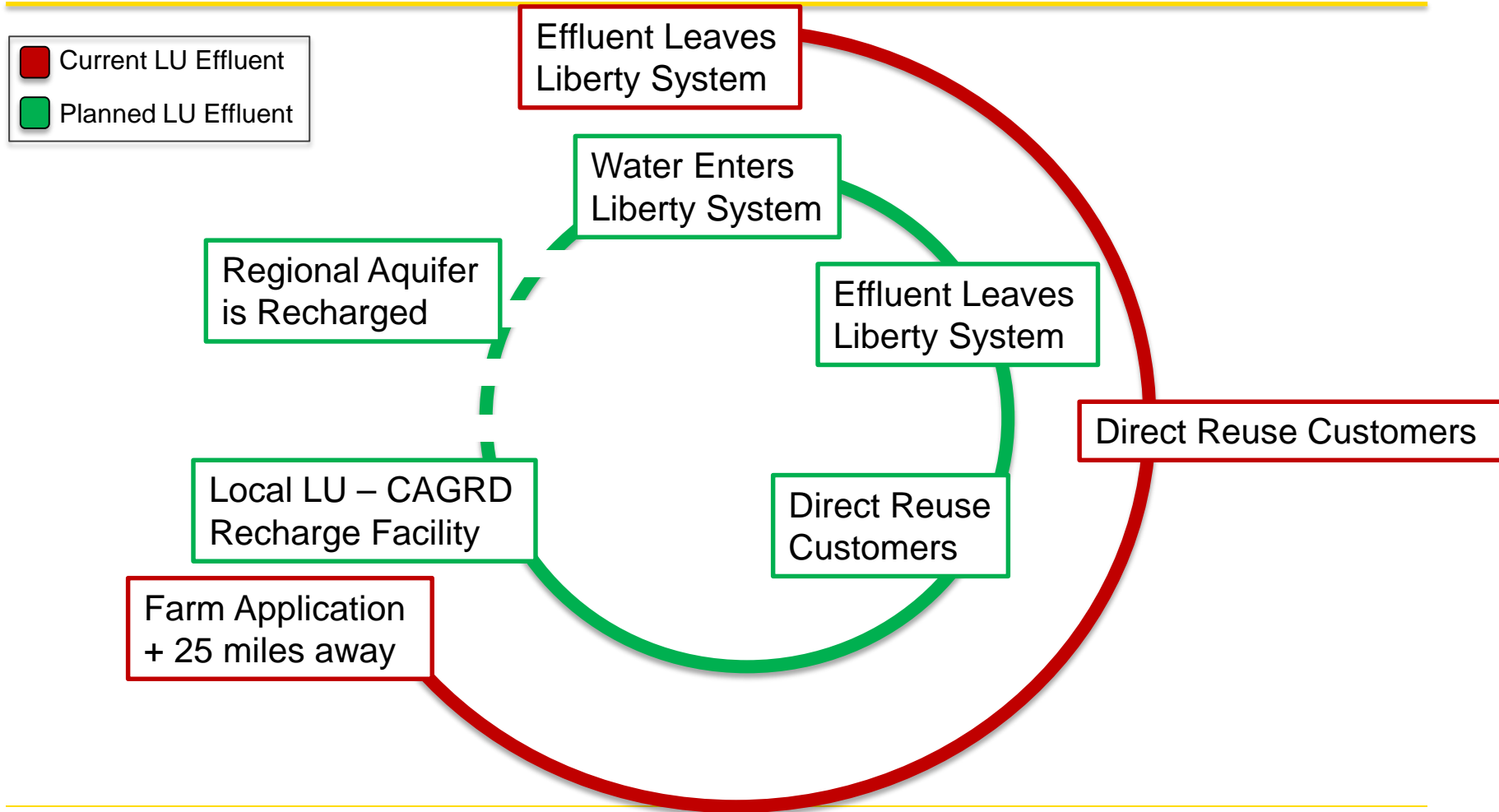
- Private water, wastewater, natural gas, electric transmission/ distribution utility serving over 500,000 customers and operating in 10 states.
- Owns Litchfield Park Water and Sewer Corp., a water and reclaimed water provider serving portions of Goodyear, Avondale, Litchfield Park and Glendale.
- Owns and Operates Palm Valley Water Reclamation Facility, a 5.1 MGD facility located in Goodyear, AZ producing A+ effluent for recharge and reuse.



## Water & Sewer Service:

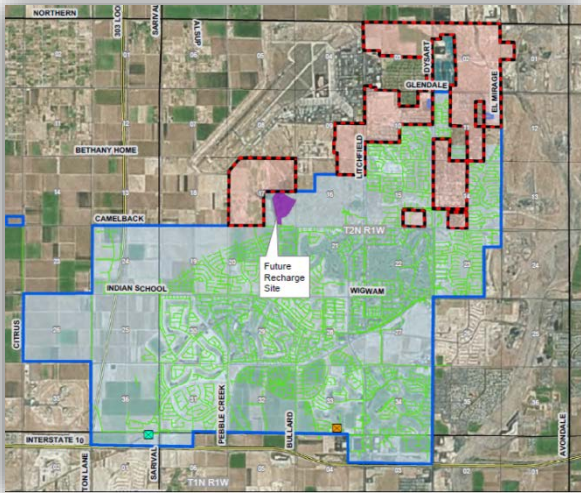
- Goodyear
- Avondale
- Litchfield Park
- Glendale
- Maricopa County

# Importance of the Deal to Liberty Utilities



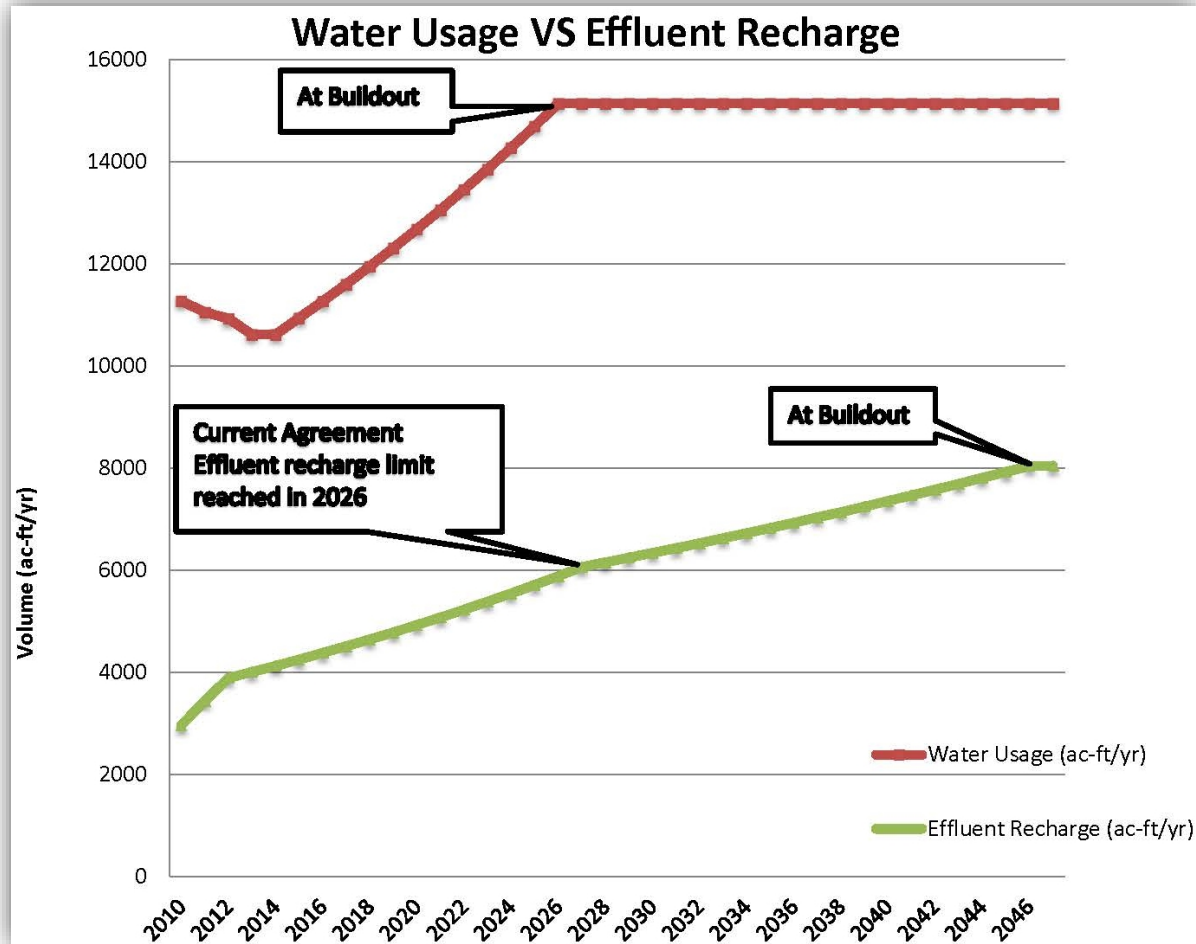


# Goals and Benefits for Liberty



- Provides a long-term drought resistant water supply, ensuring present and future sustainability.
- Strategically located in Liberty's service area, which will augment the aquifer and offset the impacts of local groundwater pumping.
- Liberty serves groundwater to the customers who generate the effluent at Palm Valley WRF
- Maintains local control of valuable water resource for future supply reliability to benefit Liberty customers and the west Salt River Valley basin.
- Minimizes the impact to water rates for Liberty customers by providing funding from CAWCD to construct a recharge facility.
- Creates a cost effective alternative to effluent exportation and other expensive effluent recharge methods (i.e. – Vadose wells)

# Goals and Benefits for Liberty Water Supply Reliability



# Terms of Agreement

## 100-year Effluent Lease

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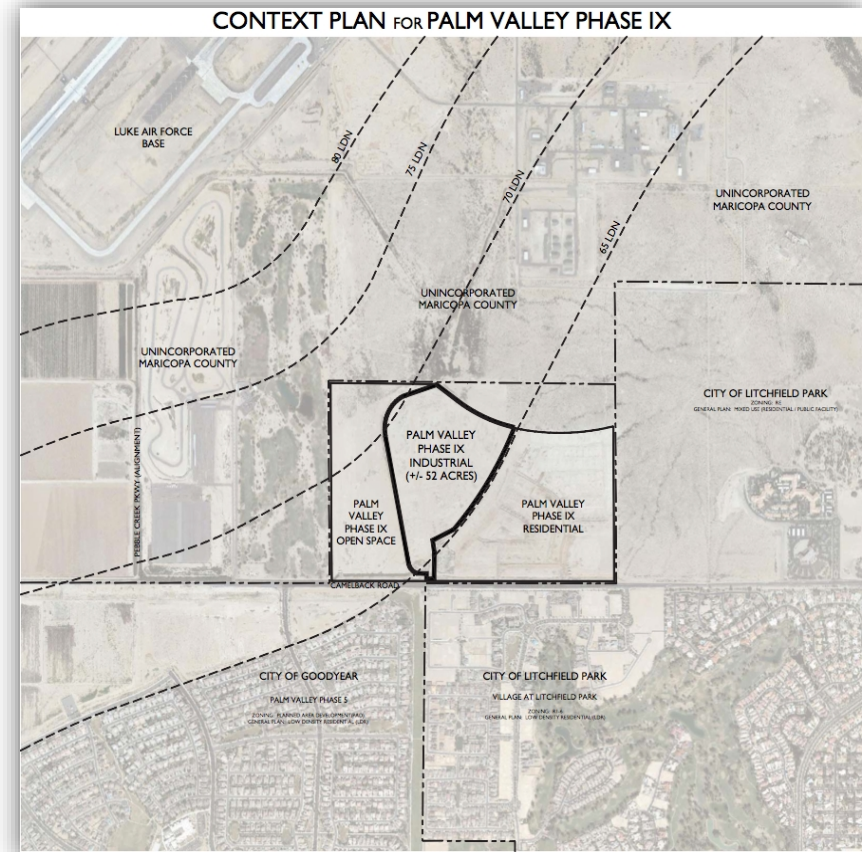
Western Maricopa County

- Liberty leases 2,400 acre-feet of effluent to CAWCD each year through 2114
- A+ effluent produced at Palm Valley WRF - or substitute / replacement WRF
- CAWCD pays Liberty \$4.8 million
- CAWCD funds contribute to development costs of recharge facility.

# Terms of Agreement

## Facility Development

- Liberty to construct, own and operate a recharge facility in its service area with a minimum annual recharge capacity = 5,000 acre-feet/year.
- CAWCD receives “storage capacity entitlement” of 2,400 acre-feet / year sufficient to replenish its leased effluent for 100-years. Liberty owns all storage capacity in excess of CAWCD’s entitlement.





# Terms of Agreement

## Facility Use



- Each partner is responsible for proportionate share of annual “operation and maintenance costs” for use of the recharge facility.
- CAWCD pays additional \$1.3 million for “effluent pipeline capacity reservation” to acquire 100-year entitlement in Liberty’s existing 24” effluent pipeline sufficient.
- CAWCD pays annual “pipeline fee” to cover pumping costs and O&M.

# Terms of Agreement

## Long-term Storage Credit Purchase and Sales

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- Liberty will store excess effluent at the recharge facility
  - All effluent produced at Palm Valley WRF that is not leased to CAWCD or sold for reuse.
- Long-term storage credits will be sold to CAWCD each year for 100-years
  - The volume will increase over time as effluent production increases.
- Purchase price CAWCD pays for credits increases at the CPI-U with a periodic “market rate” adjustment provision every 5 years.
- CAWCD will pay Liberty to purchase Long-term storage credits through the life of the facility.

# Recharge Facility Design



- “Constructed” Underground Storage Facility consisting of surface infiltration basins.
  - First Phase = 4 basins covering 9-acres, storage capacity of 5,000 acre-feet per year (infiltration rates observed @ 3 - 5 ft./day).
  - Second Phase = Up to 3 additional “contingency basins” covering 13-acres, additional 3,500 acre-feet per year of storage capacity.
- Existing Liberty 24” reclaimed pipeline extends north 3 miles from Palm Valley WRF to the recharge site.
- Bird netting over basins to address concerns expressed by Luke AFB.

# In Conclusion

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This agreement is unique, complex and unprecedented, therefore, deal development was lengthy requiring creative thinking and commitment by the partners (and especially their attorneys!)

## Lessons learned:

- Effluent in excess of reuse demand can be turned into a revenue-stream for undesignated water providers.
  - The unique nature of the CAGRD allows beneficial use of intermittent and non-potable supplies such as effluent.
- Keep well qualified “subject matter experts” on the team.
- Conduct hydrologic due diligence up-front before investing substantial capital.
- An open, honest relationship where both parties receive equitable benefit is crucial for successful negotiations.



# Recognition to Date

## Nominated for the Global Water Awards 2014 Deal of the Year

### Liberty Water/CAGRDR Recycled Water Recharge Scheme

#### What is it?

A deal to construct Arizona's first public-private recycled water recharge facility. The project will enable the reuse of up to 5,000 acre-feet per year (6,760m<sup>3</sup>/d) of high-quality municipal effluent through groundwater recharge. The Central Arizona Groundwater Replenishment District (CAGRDR) is contributing \$6.1 million to the project, while Liberty Utilities is contributing \$1.2 million.

#### Who is responsible?

Liberty Utilities, a private water and wastewater utility owned by Canada's Algonquin Power and Utilities Corp., will build, own and operate the groundwater recharge facility. The Central Arizona Groundwater Replenishment District (CAGRDR) is the client. WestWater Research acted as CAGRDR's transaction advisor.

#### What makes it special?

- With the Colorado River seriously overstretched and seawater desalination not an option, land-locked states in the arid US Southwest are seeking ingenious new ways to secure scarce water resources in the face of drought and changing demographics. The groundbreaking public-private partnership signed in February 2014 between Liberty Utilities and the CAGRDR will enable treated effluent from Liberty's Palm Valley Water Reclamation Facility on the outskirts of Phoenix to be recharged to the local aquifer for subsequent extraction, whilst generating tradeable recharge credits.
- The transaction forms part of CAGRDR's Water Supply Program, which has a statutory mandate to replenish excess groundwater withdrawn by its members. Crucially, the deal provides CAGRDR with access to a minimum of 2,400 AFY (8,044m<sup>3</sup>/d) of renewable water supplies via a 100-year lease agreement and access to an existing conveyance pipeline, as well as the right to purchase additional recharge credits from Liberty.
- The deal's unique profile utilises a public-private partnership to promote indirect potable reuse in a whole new way. It provides an important template for financing future water recycling projects throughout the US Southwest by monetising undervalued effluent supplies using a mix of private and public capital.

# Questions?