

WATER RESOURCES ACQUISITION INFRASTRUCTURE IMPROVEMENTS PLAN

The City of Phoenix (City) charges a Water Resources Acquisition Fee (WRAF) to fund the acquisition of incremental water resources and related infrastructure needed to meet increasing water demands resulting from new development. Revenue generated from the WRAF is not used for operations, maintenance, or rehabilitation purposes; and are not used to meet environmental or other regulations for existing customers.

SERVICE AREAS

The WRAF is calculated for two distinct areas of the City – the area provided water by the Salt River Project (SRP), called ‘On-Project’, and the area provided water by sources other than SRP, called ‘Off-Project’. Based on legal and institutional precedents going back over a century, On-Project areas are primarily supplied by water from the Salt and Verde River systems through a series of reservoirs and canals managed by SRP. Off-Project areas rely upon other sources such as Colorado River water, delivered via the Central Arizona Project (CAP), and service area groundwater.

For a map of the WRAF service areas, please refer to **Map #7** from the supplemental report titled: *Impact Fee Service Area Maps*, that is posted on the 2025 Impact Fee Update webpage.

Initial calculations indicate that water supplies for On-Project areas served by the SRP system are adequate to meet future development projected to occur over the current WRAF period, and that no additional water resources or associated infrastructure are needed for those areas over the next 10 years. As a result, **the WRAF is proposed to remain at \$0 for On-Project areas.**

Off-Project areas of the City are currently served predominantly by Municipal and Industrial (M&I) and other Colorado River water supplies that are subject to severe reductions when shortage conditions are declared on the Colorado River. All CAP deliveries to the City are now being used for direct deliveries or for water banking purposes that will protect existing customers during anticipated shortages. Under existing legal and institutional arrangements, cuts to Arizona’s allocation of Colorado River water will be disproportionately high, with reductions in the CAP transfers being greatly reduced.

It is widely accepted that the Colorado River is over-subscribed, with theoretical allocations greatly exceeding actual flows even under normal conditions, and the river is experiencing ongoing and worsening drought conditions that are reducing flows to Lake Powell, Lake Mead and downstream recipients like the CAP.

While the City’s priority rights are good within current CAP allocation arrangements, a major reduction in overall CAP deliveries could significantly impact the ability of the City to maintain full service to existing customers, and efforts are being made to provide additional back-up supplies during short and intermediate-time frame restrictions. These efforts have included:

- Establishing an exchange arrangement with the City of Tucson that allows Phoenix to effectively store water in Tucson. During years when allocations are being met completely, Phoenix sends water via the CAP to Tucson, which uses storage and recovery wells to supplement its storage. During years when allocations of Colorado River are reduced due to shortages, Tucson will pump more groundwater and allow Phoenix to take a portion of Tucson’s CAP deliveries. The cost of this exchange program has been more than \$30 million.
- Establishing a well lease capacity arrangement with the Salt River Project that will allow the City to pump additional groundwater during periods of shortage on the Colorado River. This arrangement has cost Phoenix in excess of \$12 million.
- Storing over 160,000 acre-feet of water to build groundwater reserves that can be recovered during periods of shortage on the Colorado River. With the cost of purchasing raw water at approximately \$200 an acre-foot, total expenditures on raw water alone exceed \$40 million.

Given the City’s need to spend significant and increasing amounts of rate revenue to provide supply security to existing customers, calculations in this plan assume that no surplus water is available to serve new development and that acquisition of additional resources is required for both normal and shortage situations.

LEVEL OF SERVICE

While there are many different parameters that affect the amount of water resources required to serve the City’s On- and Off-Project areas, the assumptions used to establish the proportionate amount of infrastructure required to serve an EDU are summarized below. Additional detail can be found in supplemental report: *City of Phoenix 2024 Equivalent Demand Unit Study Final Report*, Keen Independent Research LLC, March 2024):

Table WRA.1: Water Demand Assumptions and Planning EDU Factors

Land Use	Gal/Unit/Day	EDU Factor
Single-Family	289	1.00
Multifamily	162	0.56
Retail	52	0.47
Office	28	0.25
Industrial	57	0.51
Public	41	0.37
Other/Institutional	59	0.53

The level of service selected by the City for this WRAF update requires that the City supply water resources sufficient to meet a 100-year Assured Water Supply under a Tier 3 Shortage on the Central Arizona Project. To address disparities in the vulnerability of different potential sources of water, this update assigns a 'reliability factor' to Off-Project supplies based on expected reductions under a Tier 3 shortage.

Table WRA.2 summarizes the actual reduction of CAP deliveries under a Tier 3 Shortage of 28%, and the aggregate 'gross up' factor applied to all Off-Project Supplies of 25%. For additional detail on water resource service level assumptions, please refer to LRE study (see supporting document: *Water Resources Acquisition Fee Update*, LRE Water, August 2024).

Table WRA.2: Supply Vulnerability Analysis

Water Resource	Reliability Factor	% Reduction
CAP Supplies	0 to 1.0	28%
NCS, Gatewater, RID	0.75 to 0.9	20%
Service Area Groundwater	1.0	0%
Total Off-Project Supplies without Shortage		267,720 AF
Reduction Due To Shortages		(67,462 AF)
% Reduction		25%

A gross-up factor of 1.10 (or 10%) is applied to the EDU demand factor to account for the difference in the amount of raw water diverted into the supply system (e.g., from wells and surface water intakes) and the amount of water used or sold to customers. Losses occur during source water delivery, treatment and within the distribution system. All water systems experience some loss as part of normal operations. An updated water loss analysis conducted by WSD staff concluded that total losses within the City's water system are approximately 10 percent of diversions. Therefore, assuming a 10 percent adjustment for water losses, the effective conversion factor for all new connections, regardless of water service area, is **0.36 acre-feet/year per EDU**.

This update to the City's WRAF incorporates two overlapping time frames, as follows:

- Water Resources Infrastructure Improvements Plan (IIP) Period:** ten-year period from 2025 to 2034. This is the period for which the City will collect and spend WRAF funds to acquire and develop water resources adequate to meet the demands associated with new service connections that occur during this time frame. This time frame is limited to 10 years in accordance with revisions to ARS §9-463.05.
- Water Resources Planning Period:** 110-year period beginning with 2025 and ending with 2134. This period encompasses the ten-year IIP period followed by the City's requirement under the Arizona Department of Water Resources (ADWR) Assured Water Supply (AWS) program to demonstrate an assured water supply that will be physically, legally, and continuously available for the next 100 years.

GENERAL WRAF CALCULATION METHODOLOGY

The WRAF is calculated using the *incremental cost* methodology. This method assigns to new development the incremental cost of water resource acquisition and delivery system expansion needed to serve new development projected to occur during the current WRAF period and is most suited to communities that have limited existing capacity and detailed growth-related capital project plans.

The general methodology for determining the proposed WRAF is a three-step process, as follows:

1. **Estimate Future Demands Based on Forecasted New Off-Project EDUs** – a forecast of the number of new Off-Project EDUs that will be added to the system over the 2025-2034 period. The number of new EDUs is then multiplied by the effective conversion factor of 0.37 acre-feet/year per EDU to estimate future water demands.
2. **Determine the Capital Cost per Acre-Foot of Additional Water Resources** – this step involves calculating the cost per acre-foot to acquire and develop adequate water resources and related infrastructure to provide the selected level of service to new Off-Project customers.
3. **Convert the Capital Cost per Acre-Foot to a Cost per EDU** – the last step includes the application of a conversion factor to the capital cost per acre-foot of additional water resources. As described above, this conversion factor was determined to be **0.37 acre-feet per EDU** for all Off-Project areas based on WSD’s analysis of historical customer billing records. This conversion factor expresses the costs of acquiring and developing water resources on a per-EDU basis.

EQUIVALENT DEMAND UNIT FORECAST

WSD staff has made projections of the number of new Off-Project EDUs that will be added to the City’s water system over the 2020-2029 timeframe. These EDU projections and corresponding demand factors are presented in **Table WRA.3** below.

Table WRA.3: Projected Ten-Year EDU for Water Resources Acquisition, 2025-2034

WRA Service Area	Dwellings		(000's Square Feet)					Total
	SF	MF	Retail	Office	Industrial	Public	Other	
2025-35 Off-Project EDU	23,843	14,804	2,008	138	708	56	379	41,936
2025-35 On-Project EDU	8,973	9,988	1,334	906	8,100	413	1,028	30,741

SUMMARY OF WATER RESOURCES ACQUISITION PROJECTS

Based on new Off-Project EDU projections and the amount of water required to serve an EDU, the estimated future water demand from new Off-Project development is **33,200 AF/yr**. These new Off-Project demand projections incorporate the ‘reliability factor’ as well as the 10 percent adjustment for water system losses. WSD staff has identified water resources acquisitions that, if implemented in a timely manner, could mitigate these projected shortages. A complete description of selected water sources for the WRA is provided in the LRE study (see supporting document: *Water Resources Acquisition Fee Update*, LRE Water, August 2024).

Table WRA.3 summarizes the estimated capital costs to acquire and develop the water resources described above to provide the City’s selected level of service to new Off-Project customers.

Table WRA.3: Planned Water Resource Projects/Acquisitions and Estimated Costs, 2025-2034

New Water Resources	Est. Capital Costs	Avg. Annual Supply (AF/yr)	Capital Cost per Acre-Foot
Bartlett Dam Raise	\$135,000,000	15,000	\$9,000
Groundwater Production Wells (17)	\$63,000,000	18,200	\$3,462
Totals	\$198,000,000	33,200	---
Weighted Avg. Capital Cost per AF of Water Resources			\$5,964

WATER RESOURCES ACQUISITION CAPITAL COST PER EDU

Table WRA.4 presents the updated WRAF fee calculation for an Off-Project EDU based on the capital cost per acre-foot of additional water resources and current EDU conversion factor.

Table WRA.4: Updated WRAF Fee Calculation, Off-Project Area, 2025-2034

Summary of WRAF Fee Calculation	
Total Estimated Capital Cost of 10-Year IIP (\$MM)	198
Total AF of Additional Water Resources	33,200
Capital Cost per AF of Water Resources (\$)	5,964
EDU Conversion Factor (AF/EDU)	0.36
Capital Cost per EDU	\$2,123

POTENTIAL GROSS WRA IMPACT FEE

The potential gross WRA impact fee is the cost per EDU in Table WRA.4 of \$2,123.

FUND BALANCE ADJUSTMENT

Table WRA.5: WRA Fund Balance Adjustment

Estimated Available Fund Balance ¹ (\$MM)	TBD
Forecasted 10-year Water Resources Acquisition EDU	41,936
Fund Balance per EDU (\$/EDU)	TBD

1) Estimated Fund Balance is 50% of the Off-Project fund balance as of 6-30-2024. This value will be updated to reflect future collections, the 2025/26 CIP, and other relevant information.

POTENTIAL NET WRA IMPACT FEE

The potential net fee per EDU is calculated by subtracting uncommitted fund balance from the potential gross fees from Table WRA.4. There are no alternative revenue offsets of revenue for water resources acquisition projects.

Table WRA.6: WRA, Potential Net Impact Fee per EDU

Impact Fee Service Area	Gross Fee	Fund Balance	Net Fee
Off-Project	2,123	TBD	TBD
On-Project	\$0	\$0	\$0

SUMMARY PLANNED IMPROVEMENTS AND COSTS, 2025-2034

A.R.S. 9-463.05 requires that impact fees collected must be spent on either 1) new projects that serve new development, or 2) to repay debt (interest and principal) incurred to fund the construction of projects that serve new development. It is anticipated that the funds collected in will be used to acquire the resources identified in this IIP, and no funds will be used to pay debt. It should be noted that A.R.S. 9-463.05 (and impact fee common law) also prohibit impact fee revenues from being spent on operations, maintenance, repair, rehabilitation, environmental or other non-capital expenditures.

For the purpose of this analysis, the following assumptions have been made:

- Development of residential units and non-residential space will take place at the pace assumed by Applied Economics projections;
- That all of the water resources identified in this IIP will be acquired within the ten-year planning period 2020-2029.

A summary of the planned improvements and expenditures is shown below.

Table 11.8: Water Resources Acquisition Fee Projected Revenues, 2020-2029

Number of 2025-34 EDUs	41,936
Net Fee Per EDU	TBD
Anticipated Revenues, 2025-34 (\$MM)	TBD

Table 11.9: Water Resources Acquisition Fee Projected Expenditures, 2020-2029

Bartlett Dam (\$MM)	\$135
New Service Area ASR Wells (\$MM)	\$63
Total New Facilities 2025-34 (\$MM)	\$198
Projected Revenues 2025-34 (\$MM)	TBD
Fund Balance	TBD
Borrowing Requirement for Future Development	TBD