POSTED 8-2-2024 (REVISED 9-19-2024)

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), Gateway and New Conservation Space (NCS) water on the Salt and Verde rivers, and service area groundwater.

For a map of the WRAF service areas, please refer to Map #8 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 per connection for On-Project areas.

Off-Project areas of the City are currently served predominantly by Municipal and Industrial (M&I) CAP Subcontract 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 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. Several states, including Arizona, have responded with a plan to slow down the decline in Lake Mead and Lake Powell storage levels, or the 'Lower Basin Drought Contingency Plan'. The plan seeks to use voluntary reductions in the near term to avoid lake levels reaching the point where the Secretary of the Interior will have to impose significant and unknown mandatory restrictions on future usage. Even if the plan is implemented, it is possible that if conditions worsen over time that new institutional and legal arrangements will add to the severity of cuts to Arizona and the CAP system and impose major restrictions on the ability of Phoenix to obtain CAP supplies.

While the City's rights are of relatively high priority 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 the Tucson area and accumulate long-term storage credits. During years when allocations are met, Phoenix sends water via the CAP to Tucson, which uses aquifer storage and recovery wells to supplement its storage. During years when allocations of Colorado River are reduced due to shortages, Tucson can recover long-term storage credits and Phoenix can utilize a portion of Tucson's CAP deliveries.

- Establishing a well lease capacity arrangement with the Salt River Project that will allow the City to pump additional groundwater supplies during periods of shortage on the Colorado River.

- Storing over 160,000 acre-feet of water to build reserves that can be recovered during periods of shortage on the Colorado River.

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 for use both during normal and shortage situations is required. Additional water resource needs and associated costs in this plan are calculated assuming incremental need during a Tier 3 Shortage on the CAP system. In the future, however, worsening shortages on the Colorado River may force the City to charge impact fees to new development that consider additional needs triggered by further reduced deliveries of CAP water.

DROUGHT RESILIENCY PROGRAM

The City must meet water demands at all times, regardless of fluctuations in water supply. Since the passage of the 1980 Groundwater Management Act, the City's policy has been to serve both existing and future customers with renewable water supplies. Creating a water resource portfolio that is both reliable and renewable has required the City to develop a three-pronged approach to drought resiliency.

Renewable surface water is the cornerstone of the City's water resource portfolio. However, surface water is sensitive to climatic variability, which can affect the seasonal and annual availability of water. Further, surface water supplies are often directly connected to existing resources, impacting the extent to which one supply can serve as backup for another. Because of the sensitivity to climate and the interrelated nature of supplies, the City's policy for decades has been to maintain surface water rights greater than demands, as is the case today. However, recent changes in water resources conditions have shown that this policy, while valuable, is not sufficient on its own. For example, available proposals for post-2026 operating guidelines on the Colorado River include significant cuts to supplies previously thought to be extremely reliable, such as Municipal and Industrial sub-contracts with the CAP. Because there are few additional surface water supplies available, the City will have to develop new alternatives to meet demands when shortages, such as anticipated shortages on the Colorado River, occur. To meet future demand increases specifically associated with growth, the City will preferentially acquire surface water before groundwater in addition to implementing the reuse projects described below. The total quantity of surface water and groundwater to be acquired will be no less than the projected demand increase.

Water reuse allows the City to maximize the utility of the water it can access. However, water reuse is ultimately derived from other water sources and is not a replacement for other supplies. Water reuse is preferable to unreplenished groundwater use because it is renewable. The City has examined the potential of both indirect and direct potable reuse for its service area and adopted direct potable reuse via Advanced Water Purification (AWP) as its reuse method. The City is actively investing in programs to reuse all effluent available from existing customers via Advanced Water Purification. Should an existing non-potable reuse agreement end in the future, the City will increase its AWP programs. Similarly, if new effluent becomes available due to growth, AWP capacity will be increased to accommodate the reuse of the increased availability of wastewater.

For more than 40 years the City's policy has been to use groundwater as a supply of last resort. Should surface water supplies and reuse facilities prove insufficient, infrastructure must be available for the City to access groundwater at a rate adequate to meet demands. The City will therefore develop groundwater wells in a quantity necessary to meet current and future shortfalls.

The City is actively pursuing programs to implement all three of these strategies for both new and existing customers. These programs are summarized in **Table 1**. For the purposes of assigning costs associated with new customers to fee categories, surface water and groundwater are considered in the WRAF. AWP is considered in the Water Treatment Impact Fee.

Table WRA.1: City of Phoenix Drought Resiliency Programs for New and Existing Customers

	Surface Water	**Advanced Water Purification**	**Groundwater**
Existing Customers Funding Source: Water Rates	Recover storage lost to sedimentation and develop new supplies	Install Advanced Water Purification at CCWRP and 91st Ave	Construct new production wells
New Customers Funding Source: Impact Fees	Increase storage in Bartlett Dam	Install Advanced Water Purification for future wastewater flows	Construct new production wells

LEVEL OF SERVICE

The level of service selected by the City for this WRAF update requires that the City have sufficient water resources to provide a continuous supply of treatable water over a 100-year period to existing and new customers under Tier 3 Shortage conditions on the CAP system. As such, there could be circumstances for which existing and newly acquired water resources would not be sufficient to meet all demands in all circumstances, such as a more severe shortage condition on the CAP or higher than anticipated demand. This update to the City's WRAF incorporates two overlapping time frames, as follows:

- Water Resources Infrastructure Improvements Plan (IIP) Period: 10-year period beginning with fiscal year (FY) 2025/2026 (July 1, 2025) and ending with FY 2034/2035 (June 30, 2035). This is the period for which the City will collect and spend WRAF funds to acquire and develop water resources sufficient 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 FY 2025/2026 and ending with FY 2134/2135. This period encompasses the 10-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.

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 supporting document titled: *City of Phoenix 2024 Equivalent Demand Unit Study Final Report*, Keen Independent Research LLC, March 2024.

- An EDU's average annual daily volume requirement is the same as the average annual daily requirement calculated for all single family residential 5/8″, ¾", and 1" meters installed since 2010. This average annual GPD factor indicates the amount of water volume that will be required by a relatively new single family dwelling unit constructed in Phoenix and serves as a proxy for water resource needs associated with a given amount of demand.

- Based on analysis of single-family (SF) home water use data for the period April 2013 through March 2023, **water use averaged 289 gallons per day, or 0.323 acre-feet/year** (289 gpd x 0.00112) per SF EDU. This is assumed to be consistent with the level of service associated with a 5/8", ¾", or 1" single family meter, and larger SF meters are calculated using a scale indicating recommended maximum rates for continuous operations cited in *American Water Works Association (AWWA)* reference tables. A near-zero proportion of homes built since 2010 have meters larger than 1".

- 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 SF connections is 0.36 acre-feet/year per EDU** (289 gpd x 0.00112 x 1.10).

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 best 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 two-step process, as follows:

1. **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.

2. **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 **0.36 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.

WATER RESOURCE ACQUISITION COSTS AND UPDATED WRAF CALCULATION

WSD staff has identified water resource acquisitions opportunities that, if implemented in a timely manner, could meet the projected Off-Project need. This section describes these projects, their estimated cost to implement, and their anticipated yield.

Table WRA.2 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.2: 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.3 presents the updated WRAF fee calculation for an Off-Project EDU based on the estimated capital cost per acre-foot of acquiring additional water resources and EDU conversion factor.

Table WRA.3: 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**

FUND BALANCE ADJUSTMENT AND POTENTIAL GROSS IMPACT FEE

The calculation for the fund balance adjustment can be found in the supplemental report titled: City of Phoenix, *2025 Development Impact Fee Update Fund Balance Report*. To calculate the preliminary draft gross impact fee per EDU, it is assumed no fund balance adjustment ($0) is applied to reduce the Capital Cost per EDU (note: a review of WRA Fund Balance is underway as of the time of this draft).

Table WRA.4: WRA Gross Fee per EDU

Impact Fee Service Area	Capital Cost	Fund Balance	Gross Fee
Off-Project	$2,123	$0	**$2,123**
On-Project	$0	$0	**$0**

ALTERNATIVE REVENUE OFFSET AND POTENTIAL NET IMPACT FEE

As with prior iterations of the Water Resources Acquisition Fee, there are no alternative revenue offsets required. Additional information on impact fee offsets can be found in the supplemental report titled: City of Phoenix, *2025 Development Impact Fee Update Alternative Revenue Offsets Report*.

Table WRA.5: WRA Net Fee per EDU

Impact Fee Service Area	Gross Fee	Offset	Net Fee
Off-Project	$2,123	$0	**$2,123**
On-Project	$0	$0	**$0**

SUMMARY OF PLANNED IMPROVEMENTS

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 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 2025-2034.

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

Table WRA.6: Off-Project, Projected Revenues, 2025-2034

Number of 2025-34 EDUs	41,936
Net Fee Per EDU	$2,123
Anticipated Revenues, 2025-34 ($MM)	**$89**

Table WRA.7: Off-Project, Planned Improvements and Costs, 2025-2034

Bartlett Dam ($MM)	$135
New Service Area ASR Wells ($MM)	$63
Total New Facilities 2025-34 ($MM)	$198
Projected Revenues 2025-34 ($MM)	$89
Fund Balance	$0
Borrowing Requirement for Future Development	**$109**