



SUPPLY & DEMAND

2025



BONITA CREEK

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2025 SUPPLY AND DEMAND ASSESSMENT BONITA CREEK BASIN

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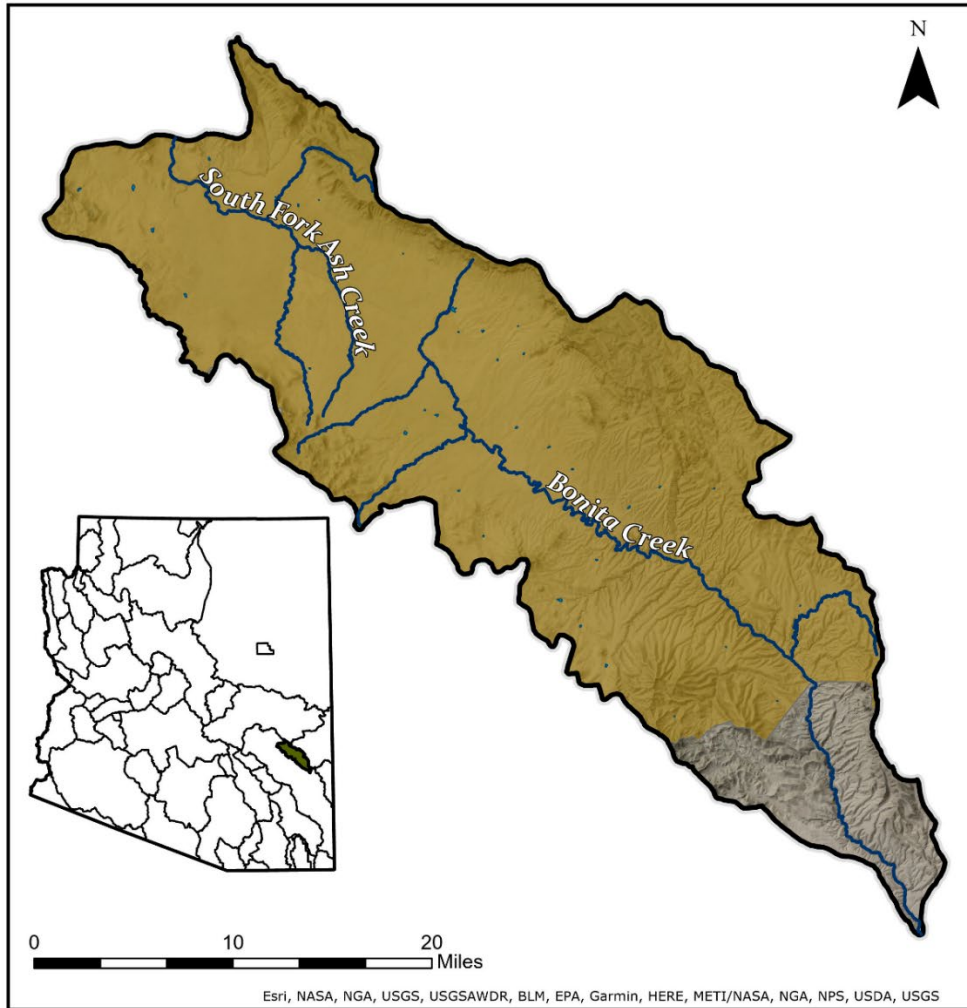


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1 INTRODUCTION

BONITA CREEK BASIN



River
Lake

San Carlos Reservation
Groundwater Basin

Figure 1. Map of the Bonita Creek Basin.

1.1 REPORT BACKGROUND AND PURPOSE

Preparing the Supply and Demand Reports (SDRs) is a duty of the Director of the Arizona Department of Water Resources (ADWR) required by statute, as stated in Arizona Revised Statutes



(A.R.S.) § 45-105(B)(14).¹ Beginning in 2023, the Director must ensure that a water supply and demand assessment for at least six of Arizona's fifty-one groundwater basins are prepared and issued by December 1st of each year.

Although similar assessments have been completed periodically, 2023 was the first time ADWR was allocated dedicated funding and staff to conduct assessments of all of Arizona's groundwater basins on a recurring cycle. By the end of 2027, ADWR will complete assessments for all 51 groundwater basins throughout the state, and each basin will be reassessed at least every five years. The SDRs may be used to inform the Water Infrastructure Finance Authority on funding decisions in the future (see A.R.S. § 49-1304(A)(14)²). The SDRs may also be used as a planning tool for water resource management by ADWR, policymakers, community members, and other interested stakeholders.

The basins and subbasins assessed in 2025 include Aravaipa Canyon, Bill Williams (Alamo Reservoir, Burro Creek, Clara Peak, Santa Maria, and Skull Valley Subbasins), Bonita Creek, Coconino Plateau, Dripping Springs Wash, Duncan Valley, Hualapai Valley, Little Colorado River Plateau, Morenci, Sacramento Valley, Safford (San Carlos Valley, Gila Valley, and San Simon Valley Subbasins), Salt River (Black River, White River, Salt River Canyon, and Salt River Lakes Subbasins), and San Simon Wash.

1.2 PROCEDURE AND SCOPE



Figure 2. Depiction of the Bonita Creek water budget, including all available supplies and demands and how they contribute to changes in groundwater in storage.

¹ Arizona Revised Statutes § 45-105(B)(14). <https://www.azleg.gov/ars/45/00105.htm>

² Arizona Revised Statutes § 49-1304(A)(14). <https://www.azleg.gov/ars/49/01304.htm>



The SDRs are structured as water budgets, focusing on total inflows and outflows at the basin scale. The SDRs estimate the volumes of water demands from all uses (categorized into sectors of Agricultural, Industrial, Municipal, and Other) and the volumes of water supplies (Surface Water, Groundwater, Effluent, Incidental Recharge, Transportation Water, and Moved Water) available to meet those demands. The reports also include projected demands and supplies under various influences of future scenarios.

The SDRs are not groundwater flow models with finer geographic results. The development of regional groundwater flow models for each basin is an extensive technical process and is not feasible within the time constraints of this project. Outside of Arizona's regulated Active Management Areas (AMAs) and Irrigation Non-Expansion Areas (INAs), data is much more limited. In instances where data does exist, the data may be outdated or lack reliability. ADWR has endeavored to acquire local and specific data to generate the SDRs. However, when such information was not obtainable, staff utilized scientific literature estimates, averages, or assumptions to formulate water usage estimates.

The SDRs attempt to answer the following questions:

1. What is the estimated annual volume of water demand?
2. What is the estimated annual volume of available water supply?
3. Is there sufficient available water supply to balance water demand annually?

The water budget was calculated by subtracting the estimated annual demand from the estimated annual available supply. If demand exceeds supply in a year, the difference is subtracted from the estimated aquifer storage. If supply exceeds demand, the difference is added to estimated aquifer storage. In this manner, the process is like balancing a checkbook, totaling the credits and debits made to the account through the year to understand how much estimated groundwater is available in storage.

The SDRs are designed to be understandable to the general public. The Methods Appendix includes specific technical information and additional details regarding data and methods: [[Methods Appendix](#)]. Additional SDRs and an interactive dashboard are available for further information: [[Dashboards](#)].

1.3 METHODOLOGY AND LIMITATIONS

This study reviewed and compiled data for two primary purposes:

1. Estimate supply and demand volumes in the basin.
2. Project changes in supply and demand from possible future scenarios.

ADWR developed and compiled baseline data for the period from 1990 to 2024. Staff then developed scenarios based on the most likely impacts on water demands and supplies over 51 years (from 2025 to 2075), and then projections were generated from the baseline data. The results from these scenarios and the combined baseline data were used to estimate whether supply could



meet demand each year from 1990 to 2075. ADWR independently developed both the supply and demand estimates.

Due to the limited reported water data available outside Arizona’s AMAs and INAs, the supplies and demands outlined in the SDRs are estimates only. When available, ADWR used high-quality data from credible sources. Due to the need to focus staff bandwidth on developing initial methods for analysis of all 51 groundwater basins by the December 1, 2027 statutory deadline, outreach was limited to major water users in the basin. When data could not be obtained, research into existing literature and the use of representative data were necessary to develop estimates.

Please see the Methods Appendix for an in-depth discussion of the methodologies and assumptions ADWR applied to create each estimate: [[Methods Appendix](#)].

2 RESULTS

2.1 BASIN SUMMARY

The Bonita Creek Basin encompasses 457 square miles of Graham County, located in the southwest portion of the state. The basin is characterized by medium-high elevation plains and mountain ranges, such as the Gila Mountains that run along the southern basin boundary, and the Nantac Rim which runs along the northern boundary of the basin. Bonita Creek runs from north to south through Bonita Camp, the Gila Mountains, and the Nantac Rim. The land in the Bonita Creek basin is comprised of the San Carlos Apache Indian Reservation (88.5%), and the U.S. Bureau of Land Management (BLM) lands (11.0%). The basin has an estimated population of 41 people, and 0.5% of the basin is privately owned. The major aquifers located in the basin include recent stream alluvium, basin fill, and volcanic rock. Groundwater storage was previously estimated to be 1,300,000 acre-feet (AF) to a depth of 1,200 feet.³ The Bonita Creek Basin includes the Big Bonita Reservoir, South Fork Ash Creek, as well as one perennial stream, Bonita Creek.

2.2 SUPPLIES

2.2.1 Surface Water

ADWR examined all water sources defined as surface water in each basin. Surface water includes all water flowing in streams, canyons, ravines, or other natural channels, or in definite underground channels, whether perennial or intermittent, floodwater, wastewater, or surplus water, and of lakes, ponds, and springs discharging to the surface (A.R.S. § 45-141).⁴ After examining these sources and deducting any existing surface water diversions (stockponds, reservoirs, and agricultural diversions) from the resulting volumes, ADWR generated a final estimate of the remaining water available for diversion or use. When possible, streamgauge data were used to estimate surface

³ ADWR (2009). Arizona Water Atlas, Volume 3, Section 3.2, pg. 123, Table 3.2-4.

https://infoshare.azwater.gov/docushare/dsweb/Get/Document-10428/Volume_3_final.pdf

⁴ Arizona Revised Statutes § 45-141. <https://www.azleg.gov/ars/45/00141.htm>



water volumes. Where active stream gages were absent, which often applies to areas with intermittent and ephemeral streamflow, the Drainage-Area Ratio (DAR) method (see the Methods Appendix) was used to estimate surface water volume.

2.2.2 Groundwater

This report refers to the “inflow to” and “outflow from” the aquifer each year as groundwater. This volume is distinct from the volume of groundwater considered to be available in storage. “Inflow to” represents the annual recharge or replenishment of groundwater through processes such as the percolation of precipitation or surface water into the subsurface, which is observed through processes such as streamflow infiltration, groundwater inflow, and mountain-front recharge. “Outflow from,” the movement of water leaving the system, is represented by such processes as baseflow and groundwater outflow. See the Methods Appendix for more information on how streamflow, baseflow, groundwater inflow/outflow, and mountain-front recharge estimates were obtained.

The total groundwater storage volume provided in this report reflects the volume of groundwater reasonably accessible at the average depth of the wells in the basin, rather than at the 1,200 feet groundwater storage depth used in previous ADWR reports. The water level falling below the basin’s average well depth suggests that wells will have begun to go dry. Using this approach to estimate groundwater storage effectively illustrates the impact of declining water levels on the current existing infrastructure of property owners, residents, and other water users in each basin. Please note that this report does not address potential subsidence or permanent loss of aquifer storage that could occur if the estimated water volume in storage were to be removed from the basin. See the Methods Appendix for more information on how groundwater storage was estimated.

2.2.3 Effluent

Effluent is defined as “water that has been collected in a sanitary sewer for subsequent treatment in a facility that is regulated pursuant to Title 49, Chapter 2.”⁵ ADWR used effluent data provided by the Arizona Department of Environmental Quality (ADEQ) to estimate the amounts of effluent available for reuse. These effluent estimates are based on effluent volumes produced from wastewater treatment plants designated for reuse. These volumes do not include wastewater discharged from the treatment plants. Effluent volumes also do not include septic tanks or other wastewater collection systems. Recharge from septic tanks is included in the Incidental Recharge estimation.

⁵ Arizona Revised Statutes § 45-101(4). <https://www.azleg.gov/ars/45/00101.htm>



2.2.4 Incidental Recharge

Incidental recharge is defined as water from human use that replenishes groundwater supplies. Incidental recharge is associated with agricultural, industrial, and municipal water demands. ADWR used data derived from demand analyses to estimate incidental recharge volumes.

2.2.5 Transportation Water

Certain basins have been identified in A.R.S. Title 45, Chapter 2, Article 8.1⁶ as basins from which groundwater may be withdrawn for transportation to an AMA. Where such transportation has been authorized, that groundwater is referred to as "Transportation Water" in this report.

2.2.6 Moved Water

Any water that crosses basin boundaries through artificial means and that does not fall under the Transportation Water definition is referred to as "Moved Water" in this report. Moved Water includes groundwater that is transported between basins that are not AMAs, pursuant to A.R.S. Title 45, Chapter 2, Article 8.⁷

2.3 Supply Results

This subsection contains ADWR's estimates of annual supplies available to the Bonita Creek Basin.

2.3.1 Surface Water

In the Bonita Creek Basin, ADWR identified the following surface water conveyances (USGS streamgages in parentheses):

- Ash Creek
- Bonita Creek (09447800)
- Dry Creek
- Johnny Creek
- Midnight Creek
- Ninemile Creek
- North Fork Ash Creek
- Park Creek
- Paymaster Creek
- Sevenmile Creek
- Soldier Hole Creek
- South Fork Ash Creek

Flows on the Bonita Creek are measured with streamgage (09447800). For streams without streamgage data, the DAR method was applied to estimate streamflow volumes. The streamflow volume estimates provided in the table below are composites of the streamgage and DAR estimation methods.

⁶ Arizona Revised Statutes Title 45, Chapter 2, Article 8.1.
<https://www.azleg.gov/arsDetail/?title=45>

⁷ Arizona Revised Statutes Title 45, Chapter 2, Article 8.
<https://www.azleg.gov/arsDetail/?title=45>



Table 1. Estimated Surface Water Volumes in the Bonita Creek Basin for 1990-2024. (SDR 2025)

Basin	Streamflow Minimum	Streamflow Maximum	Average Streamflow (Streamgauge Method)	Average Streamflow (DAR Method)	Total Average Streamflow	Median Streamflow
Bonita Creek	1,080(2024)	88,592(1993)	6,371	1,996	8,367	3,912

All values are shown in AF. Parentheses indicate the year streamflow volume was recorded.

Surface water is estimated to contribute 3,912 AF to the supplies in the basin in a typical year. However, there are years with extremely high or low surface water inflows. Due to the extremely high flow years associated with floods, the average surface water supply in the basin is much higher than the median of 3,912 AF per year.

Table 2. Estimated Surface Water Volumes Diverted for Use in the Bonita Creek Basin for 1990-2024. (SDR 2025)

Year	Diverted Streamflow
1990	636
2007	636
2024	636
Average Annual Diverted Streamflow from 1990-2024	636

All values are shown in AF.

The estimated surface water volumes were diverted for storage in reservoirs in the Bonita Creek Basin.

2.3.2 Groundwater

The following groundwater volumes were estimated in the Bonita Creek Basin:

Table 3. Estimated Streamflow Infiltration Volumes in the Bonita Creek Basin for 1990-2024. (SDR 2025)

Basin	Average Annual Streamflow Infiltration (Perennial)	Average Annual Streamflow Infiltration (Intermittent & Ephemeral)	Total Average Annual Streamflow Infiltration
Bonita Creek	542	NA	542

All values are shown in AF. NA, or Not Applicable, applies to fields without estimates.

- Streamflow Infiltration: Infiltration for perennial streams was estimated using the fixed percentage listed in the Methods Appendix. Infiltration for intermittent and ephemeral streams was not estimated due to the lack of available data. The predominant soil type



was fine.⁸ The standard storm duration utilized was 1.5 hours.⁹ Total estimated streamflow infiltration for perennial streams peaked in 1994 at approximately 5,374 AF and was lowest in 2024 at 70 AF.

Table 4. Estimated Groundwater Volumes in the Bonita Creek Basin for 1990-2024. (SDR 2025)

Basin	Average Annual Baseflow	Average Annual Groundwater Inflow	Average Annual Groundwater Outflow	Average Annual Mountain-Front Recharge	Calculated Initial Groundwater Storage
Bonita Creek Basin	-2,412	0	-6,300	8,919	NA

*All values are shown in AF. NA, or Not Applicable, applies to fields without estimates.
Negative numbers indicate demands or water flows leaving the basin.*

- Baseflow: ADWR estimated baseflow using the USGS Hydrologic Toolbox in ArcGIS.¹⁰ Streamgage data were utilized when available. Any gaps in the data were filled using precipitation data from PRISM¹¹ and the USGS StreamStats website.¹²
- Groundwater Inflow/Outflow: Inter-basin underflow volumes were based on USGS predevelopment maps and scientific literature estimates.¹³
- Mountain-Front Recharge: The mountain-front recharge estimates were calculated using precipitation data, model data, scientific literature estimates for groundwater

⁸ Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (NRCS, USDA). (2016). Web Soil Survey (STATSGO2). <http://websoilsurvey.nrcs.usda.gov/>

⁹ Food and Agriculture Organization of the United Nations (FAO). (2024). Annex 2 Infiltration Rate and Infiltration Test. <https://www.fao.org/4/s8684e/s8684e0a.htm>

¹⁰ Barlow, P.M. et al. (2022). U.S. Geological Survey Hydrologic Toolbox — A graphical and mapping interface for analysis of hydrologic data: U.S. Geological Survey Techniques and Methods, book 4, chap. D3, 23 p. <https://doi.org/10.3133/tm4D3>

¹¹ PRISM Climate Group. (2024). 30-Year Normals [dataset] <https://prism.oregonstate.edu/explorer/>

¹² USGS. (n.d.-b). StreamStats [dataset]. <https://www.usgs.gov/streamstats>

¹³ Tillman, F. et al. (2011). Water Availability and Use Pilot: Methods Development for a Regional Assessment of Groundwater Availability, Southwest Alluvial Basins, Arizona (Scientific Investigations Report 2011–5071). United States Geological Survey. https://media.kjzz.org/s3fs-public/field/docs/2011/09/21/sir2011-5071_text.pdf



inflows/outflows,¹⁴ and a water budget accounting for the inflows/outflows that affected the mountain-front recharge volume.

- Groundwater Storage: Storage was calculated using either a model data plus water budget method, if model data were available for the basin, or a GIS-based geological data non-model method, if model data were unavailable for the basin (Section 2.5.4, Methods Appendix). Initial groundwater storage was calculated using wells located within alluvial aquifer boundaries in the basin. A representative year was selected containing the most water level measurements at those wells. Groundwater storage was not calculated for Bonita Creek Basin due to the low number of water level measurements available within aquifer boundaries.

2.3.3 Effluent

None of the effluent produced in the Bonita Creek Basin has been allocated for reuse, so no effluent is categorized as a water supply.

2.3.4 Incidental Recharge

Sources of incidental recharge are agricultural, municipal, and industrial.

Table 5. Estimated Incidental Recharge Volumes in the Bonita Creek Basin for 1990-2024. (SDR 2025)

Sector	1990	2007	2024
Agricultural	0	0	0
Municipal	NEGL	NEGL	NEGL
Industrial	0	0	0

*Negligible (NEGL) refers to values less than 1 AF.
All values are shown in AF.*

- Agricultural Incidental Recharge: Agricultural incidental recharge is determined based on total irrigation withdrawals and irrigation efficiency within a basin. Since there is no agricultural water use in the Bonita Creek Basin, no agricultural incidental recharge occurs.
- Municipal Incidental Recharge: Municipal incidental recharge is a byproduct of lost and unaccounted for (L&U) water from water providers and seepage from septic tanks. The estimated contribution to incidental recharge is approximately 1 AF of water per year to the aquifer, indicating a negligible impact on the basin.

¹⁴ Tillman, F. et al. (2011). Water Availability and Use Pilot: Methods Development for a Regional Assessment of Groundwater Availability, Southwest Alluvial Basins, Arizona (Scientific Investigations Report 2011–5071). United States Geological Survey.

https://media.kjzz.org/s3fs-public/field/docs/2011/09/21/sir2011-5071_text.pdf



- Industrial Incidental Recharge: Industrial incidental recharge occurs from the irrigation of turf facilities and is influenced by irrigation systems' total withdrawals and efficiency. There is no estimated industrial incidental recharge in the basin.

2.3.5 Transportation Water

Certain basins have been identified in A.R.S. Title 45, Chapter 2, Article 8.1 as basins from which groundwater may be withdrawn for transportation to an AMA. Where such transportation has been authorized, that groundwater is referred to as “Transportation Water” in this report.

The Bonita Creek Basin was not identified as a transportation water basin.

2.3.6 Moved Water

Any water that crosses basin boundaries through artificial means and that does not fall under the Transportation Water definition is referred to as “Moved Water” in this report. Moved Water includes groundwater that is transported between basins that are not AMAs, pursuant to A.R.S. Title 45, Chapter 2, Article 8.

The Bonita Creek Basin was not identified as a basin with moved water.

2.4 DEMAND RESULTS

The Demand subsection contains ADWR’s estimates of annual demands in the Bonita Creek Basin.

Table 6. Estimated Demand Volumes for the Bonita Creek Basin by Sector for 1990-2024. (SDR 2025)

Sector	Subsector/Water Type	Year		
		1990	2007	2024
Agricultural	Agriculture	0	0	0
Municipal	Residential Provider	0	0	0
	Residential Non-Provider	-1	-2	-2
	Non-Residential	0	0	0
	L&U	0	0	0
Industrial	Dairies	0	0	0
	Feedlots	0	0	0
	Grazing	-44	-44	-44
	Mining	0	0	0
	Power	0	0	0
	Sand and Gravel	0	0	0
	Turf	0	0	0
	Other	0	0	0
Environmental	Riparian	-985	-985	-985

Negative numbers indicate demands or water flows leaving the basin—all values in AF.



2.4.1 Agricultural

Agricultural demand is water applied to two or more acres of land to produce plants or parts of plants for sale for human consumption or use as feed for livestock, range livestock, or poultry.

There is no agricultural water use in the Bonita Creek Basin.

2.4.2 Municipal

Municipal demand is defined as the non-agricultural and non-industrial uses of water supplied by a city, town, private water company, irrigation district, domestic water improvement district, water cooperative, or private domestic well.

The Bonita Creek Basin has an estimated 41 residents, with no current population centers or large institutions present within the basin.

- Residential Provider: Residential provider use is supplied by a municipal provider, or a Community Water System (CWS) as defined in A.R.S. 45-341.¹⁵ There are no Community Water Systems or municipal providers in the Bonita Creek Basin.
- Residential Non-Provider: Residential non-provider use is any residential water use that is not supplied by a municipal provider but rather by a non-public water system or domestic well. An estimated 41 residents in the basin rely on self-supplied water resources. Over the baseline period, the estimated water usage rose by approximately 60%.
- Non-Residential: Non-residential use is defined as municipal water not used for residential purposes but instead used for commercial, institutional, recreational, or transitory uses. Due to the absence of large institutions or incorporated towns, there is no non-residential water demand identified in the Bonita Creek Basin.
- Lost and Unaccounted for Water: Lost and Unaccounted for water is defined as the total quantity of water from any source that enters a water distribution system minus the total amount of authorized deliveries from the distribution system during the calendar year. L&U does not account for water loss from a non-public water system or domestic well. There are no residential providers in the basin, so there is no reported L&U water.

2.4.3 Industrial

Industrial demand is water used by an industrial facility, such as a golf course, dairy, feedlot, power plant, mine, or paper mill.

Currently, grazing is the only industrial water demand in the Bonita Creek Basin.

- Grazing: Grazing demand is defined as the water used to maintain stock ponds for the sole purpose of watering livestock. An estimated 2,624 cattle graze in the Bonita Creek Basin, consuming 44 AF of water annually.

¹⁵ Arizona Revised Statutes § 45-341. <https://www.azleg.gov/ars/45/00341.htm>

2.4.4 Environmental

Environmental demand is defined within this report as evapotranspiration along streams, rivers, lakes, and drainage ways. Most riparian habitat in the Bonita Creek Basin are located along the lower reaches of Bonita Creek in the southeastern part of the basin. The riparian demand values in the SDRs represent a high-end estimate of the potential water needs of riparian plants within a basin. In the absence of site-specific data, these estimates assume an average value for riparian plants' water needs, which does not consider local environmental conditions. Please see the Methods Appendix for an in-depth explanation of the methodologies.

- Annual net water requirements for the riparian plants are estimated to be 985 AF.

3 COMBINING SUPPLY AND DEMAND

Due to a lack of available water level measurements, ADWR has not estimated the amount of groundwater in storage for this basin. However, other water supply components have been assessed, such as streamflow, streamflow infiltration, groundwater inflow, and mountain-front recharge, alongside various demand sectors. Despite these estimates, the lack of groundwater storage data prevents the complete combination of supply and demand results, limiting ADWR's ability to present a comprehensive picture of the basin's overall water budget.

4 RESULTS OF PROJECTION SCENARIOS

Staff developed scenarios based on the most likely impacts on water demands and supplies over 51 years (from 2025 to 2075). Projections were then generated from the baseline data.

The projection scenarios developed are:

1. Status Quo: baseline volumes were carried forward through the projection period.
2. Growth: volumes were assumed to increase within specific parameters throughout the projection period.
3. Conservation: volumes were assumed to be influenced by specific conservation practices through the projection period.
4. Technology: volumes were assumed to be influenced by technological advancements through the projection period.
5. Climate: volumes were adjusted for three different climate scenarios, using a 1-degree Fahrenheit temperature increase in the mean annual temperature for the projection period, following a lower emissions pathway for Arizona; a 5-degree Fahrenheit temperature increase, following a medium emissions pathway; and a 10-degree Fahrenheit temperature increase, following a high emissions pathway.



4.1 SUPPLY PROJECTION RESULTS

4.1.1 Surface Water

For the Status Quo scenario, the estimated projected volume of surface water will remain constant until 2075.

Table 17. Estimated Surface Water Status Quo Projection Volumes for the Bonita Creek Basin for 2025-2075. (SDR 2025)

Basin	Volume
Bonita Creek	3,119

All values are shown in AF.

Due to ongoing projection scenario improvements, no other projection scenarios were applied to surface water for this report.

4.1.2 Groundwater Storage

In the Bonita Creek Basin, groundwater storage was not estimated due to a lack of available water level measurements. Therefore, no projection scenarios were applied for groundwater storage.

4.1.3 Effluent

In the Bonita Creek Basin, none of the effluent produced has been allocated for reuse. Therefore, no effluent is used as a water supply, and no supply projections were applied to the data.

4.1.4 Incidental Recharge

Table 8. Estimated Municipal Incidental Recharge Projection Volumes for the Bonita Creek Basin for 2025-2075. (SDR 2025)

Sector	Scenario	2025	2050	2075
Municipal	Status Quo	3	3	3
	Climate – Low	3	3	3
	Climate – Medium	3	3	3
	Climate - High	3	3	3
	Conservation	3	2	2
	Growth	3	3	4
	Technology	3	2	2

All values are shown in AF.

- Status Quo: The Status Quo scenario estimated projected volume will remain constant through 2075.
- Climate: The Climate scenario anticipates that rising temperatures and increased evaporation rates will elevate water usage demands. In the Bonita Creek Basin, the estimated projected volumes will remain constant through 2075.



- Conservation: The Conservation scenario assumes implementation of requirements similar to those in the AMA 5th Management Plans. Under this scenario, incidental recharge in the Bonita Creek Basin is estimated to decline 33% by 2050 and remain relatively constant till 2075.
- Growth: Under the Growth scenario, population projections from the Arizona Commerce Authority Office of Economic Opportunity (ACA OEO)¹⁶ were used to estimate that incidental recharge will increase 25% by 2075, driven by anticipated population growth and rising municipal water demand.
- Technology: The Technology scenario assumes widespread adoption of water monitoring technologies, such as advanced metering infrastructure (AMI) or home-based devices, with active leak detection and customer response. Estimated savings of 14,000 gallons per household per year reflect reductions from leaks and improved water use efficiency. This reduction is anticipated to result in a 33% decline in incidental recharge by 2050, then remain constant until 2075.

4.1.5 Agricultural Incidental Recharge

In the Bonita Creek Basin, there is no estimated agricultural incidental recharge. Therefore, no projection scenarios were estimated.

4.1.6 Industrial Incidental Recharge

In the Bonita Creek Basin, there is no estimated industrial incidental recharge. Therefore, no projection scenarios were estimated.

4.2 DEMAND PROJECTION RESULTS

4.2.1 Agricultural

In the Bonita Creek Basin, there is no estimated agricultural demand. Therefore, no projection scenarios were estimated.

¹⁶ Arizona Commerce Authority (ACA). (2022a). Population Estimates. Arizona Commerce Authority. <https://www.azcommerce.com/oEO/population/population-estimates/>



4.2.2 Municipal

Table 9. Estimated Projected Demand Volumes for the Municipal Sector for Bonita Creek Basin for 2025-2075. (SDR 2025)

	Residential Provider			Residential Non-Provider		
	2025	2050	2075	2025	2050	2075
Status Quo	0	0	0	-2	-2	-2
Climate – Low	0	0	0	-2	-2	-2
Climate – Medium	0	0	0	-2	-2	-2
Climate - High	0	0	0	-2	-2	-2
Conservation	0	0	0	-2	-2	-2
Growth	0	0	0	-2	-3	-3
Technology	0	0	0	-2	-2	-2

Negative numbers indicate demands or waterflows leaving the basin—all values in AF.

	Non-Residential			L&U		
	2025	2050	2075	2025	2050	2075
Status Quo	0	0	0	0	0	0
Climate – Low	0	0	0	0	0	0
Climate – Medium	0	0	0	0	0	0
Climate - High	0	0	0	0	0	0
Conservation	0	0	0	0	0	0
Growth	0	0	0	0	0	0
Technology	0	0	0	0	0	0

Negative numbers indicate demands or waterflows leaving the basin—all values in AF.

- Status Quo: The Status Quo scenario estimated projected volume will remain constant through 2075.
- Climate: Under the Climate scenario, rising temperatures and increased evaporation rates are expected to increase water demands. However, the Bonita Creek Basin demand volume is projected to remain unchanged across all climate scenario analyses for residential non-providers through the projection period.
- Conservation: Under the Conservation scenario, additional water-saving measures and requirements similar to those in the initial AMAs' 5th Management Plan are implemented. Residential non-provider demand in the basin is expected to remain unchanged through 2075.



- Growth: Under the Growth scenario, population projections produced by the Arizona Commerce Authority Office of Economic Opportunity (ACA OEO) were used to estimate the growth in the basin. In the basin, population growth is expected to result in a 50% increase in residential non-provider water demand between 2025 and 2050, with demand levels stabilizing through 2075.
- Technology: The Technology scenario assumes widespread adoption of water monitoring technologies, such as AMI or home-based devices, with active leak detection and customer response. Estimated savings of 14,000 gallons per household per year reflect reductions from leaks and improved water use efficiency. No change in residential non-provider demand is projected under the Technology scenario through 2075.

4.2.3 Industrial

Table 10. Estimated Projected Demand Volumes for the Industrial Sector for Bonita Creek Basin for 2025-2075. (SDR 2025)

	Grazing
Status Quo	-44

Status Quo projections were applied across all scenarios for the grazing subsector. Negative numbers indicate demands or water flows leaving the basin—all values in AF.

For the Status Quo scenario, the estimated projected volume of grazing demand will remain constant until 2075. Due to ongoing projection scenario improvements, no other projection scenarios were applied to the grazing subsector for this report. No other industrial subsectors were present in the basin. Therefore, no additional projection scenarios were estimated.

4.2.4 Environmental

Table 11. Estimated Projected Environmental Demand Volumes for Bonita Creek Basin for 2025-2075. (SDR 2025)

	Environmental		
	2025	2050	2075
Status Quo	-985	-985	-985
Climate – Low	-985	-989	-992
Climate – Medium	-985	-1,004	-1,021
Climate - High	-985	-1,022	-1,052

Negative numbers indicate demands or waterflows leaving the basin—all values in AF.

- Status Quo: The Status Quo scenario estimated projected volume will remain constant through 2075.
- Climate: The Climate scenarios for riparian use consider the impact of increased temperatures, increased evapotranspiration, and habitat transition. Under the set parameters of these scenarios, riparian use is expected to increase in the Bonita Creek



Basin as the higher temperatures increase evapotranspiration from riparian plants. Riparian water use is estimated to increase by one percent in the low emissions scenario, four percent in the medium emissions scenario, and seven percent in the high emissions scenario.

5 CONCLUSION

ADWR assessed various water supply components in the Bonita Creek Basin, including streamflow infiltration, groundwater inflow, and mountain-front recharge. Demand sectors evaluated include residential non-provider, grazing, and environmental. However, ADWR was unable to calculate a comprehensive water budget due to the lack of available water level measurements needed to estimate groundwater storage, limiting a complete assessment of the basin. No determination can be made about the percentage of wells that would become dry if the water elevation was lowered to the average well depth since no groundwater storage calculation is currently possible for the basin.

A comprehensive water budget for the Bonita Creek Basin is unable to be completed at this time.

5.1 ATTACHMENTS

- [Acronyms and Definitions](#)
- [References \(Sources\) – general](#)

