

City of Scottsdale
Drought Management Plan (2015 - 2019)
February 3, 2015

Introduction and Overview

The City of Scottsdale has been proactive in the planning of long-term, sustainable water supplies for its community and has secured a diverse and resilient water supply portfolio. These supplies reduce the vulnerability of the community to the risks associated with potential external factors that may present future supply reductions or limitations. A water shortage can occur when a source of supply is reduced to a level at which it is unable to support an existing demand condition. This can be the result of a natural circumstance or an interruption of supply that is outside the control of the City. The duration can vary from a matter of weeks to several months or years.

The City has, as part of its normal water planning, analyzed water demand characteristics during periods of both normal and reduced water supply. Understanding the dynamics of demand management is important, as supply reductions or interruptions can present serious challenges to maintaining the health, safety and economic well-being of the community. Through its strategic planning efforts and the development of a diverse water supply portfolio, Scottsdale has taken steps to protect its customers from the adverse effects of drought for years to come.

The Drought Management Plan (DMP) provides guidelines that can be used to manage water supply and water use during an episode of reduced supply availability. These are based on the establishment of priorities that are designed to consider customer needs, protect the health and safety of the community, preserve environmental resources, and avoid adverse impacts to public activity. The plan should be updated approximately every 5 years consistent with the Water Master Plan update.

“The goal of the Drought Management Plan is to maintain the health, safety and economic well-being of the community to the maximum extent possible during an episode of reduced water supply availability”

The circumstances surrounding supply reduction events can be different, therefore, these guidelines are intended to provide a framework for timely response while at the same time maintaining the flexibility to respond to other unique conditions. These guidelines assist the City in making the necessary decisions throughout the duration of a shortage episode. The Water Resources Division also maintains an emergency response plan separate from the DMP as part of its Emergency Management Toolbox (EMT); the EMT guides the Division’s operational actions and response to emergency situations.

The DMP consists of two primary components – the identification of an event which could trigger the supply reduction episode, and the corresponding actions that are recommended for responding to the event consistent with the goal. The DMP identifies four levels of potential supply reductions accompanied by progressively more stringent actions to address each circumstance.

The following sections of this document describe the individual elements of the DMP which include:

- Supply/Demand estimates for five or more consecutive years
- The Drought Management Team
- Stages and responses to water reduction episodes
- Demand side management option menu

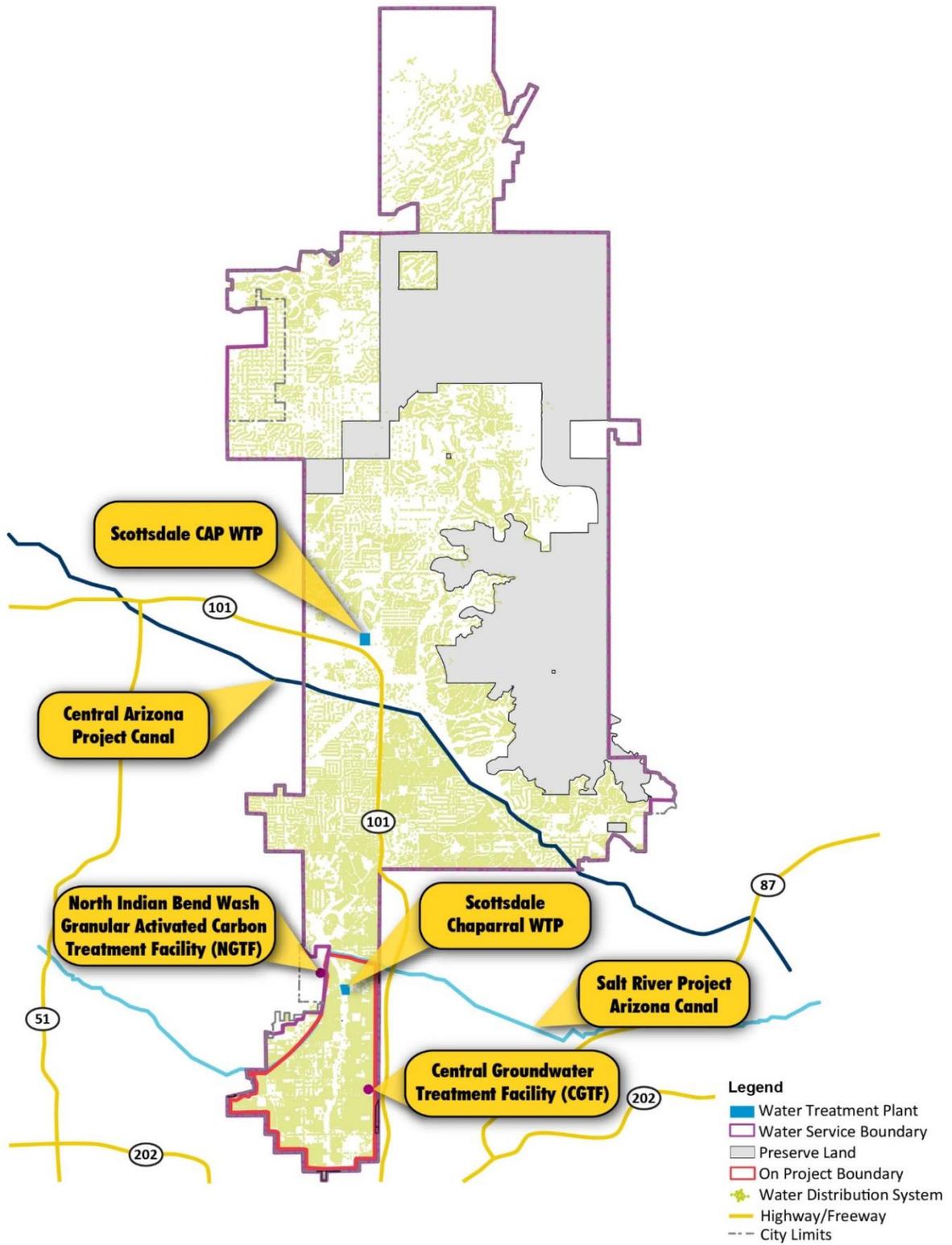
Supply/Demand

The City’s portfolio of water resources provides for a continuous, sustainable water supply which can be delivered to customers at a reasonable cost. The City’s water supplies are consistent with the state regulatory requirements for a long term 100 year Assured Water Supply (AWS). The development of the current water resources portfolio is based on a strategic long term direction emphasizing the increased use of renewable supplies rather than mining groundwater in order to meet the City’s water demands. In addition to surface water supplies, reclaimed water supplies are also included in the renewable water resource portfolio, however the DMP will focus on potable water supplies.

The City’s potable water resources portfolio consists of 3 water supplies. Each of these supply sources has its own set of delivery and use restrictions based on regulatory, contractual, and operational limitations that impact where and how they can be used to meet the community’s needs. The City combines the following varied water resources to strategically meet the potable needs of its service area. Figure 1 displays the general service area.

Supply	Water Source	Infrastructure Components
Colorado River- Central Arizona Project (CAP)	Central Arizona Water Conservation District through the CAP canal	Delivered through the City’s CAP Water Treatment Plant
Salt and Verde Rivers	Salt River Project	Delivered through the City’s Chaparral Water Treatment Plant
Groundwater	Wells located within the City’s service area	Well production facilities are interconnected with the City’s distribution system

Figure 1- Service Area Map



Colorado River Water Supply

Scottsdale's largest renewable supply originates from the Colorado River and is managed and delivered by the Central Arizona Water Conservation District (CAWCD) through the Central Arizona Project (CAP) canal. The City of Scottsdale has access to 81,110 acre feet (AF) of CAP supply annually, which comprises approximately 70 percent of the total water supply utilized by the City. This supply is delivered through the City's existing CAP Water Treatment Plant.

The United States Bureau of Reclamation (BOR) studies the River conditions year-round and publishes its findings in regular reports. The potential for a shortage on the Colorado River System has been discussed and reviewed for years, and recent studies have indicated the potential for CAP water deliveries to be reduced may occur prior to 2018. This could change if above normal runoff conditions occur in the interim. If the Colorado River should experience a shortage, water deliveries to the CAP would be reduced to the State of Arizona by 320,000 AF as an initial stage of reduction. Under this condition, some sub-contract holders, including the City would be affected, and supply to agricultural users would be reduced.

Salt River Project Water Supply

The Salt River Project (SRP) water supplies originate from the Salt and Verde River systems. These systems are fed from precipitation and snow pack in the northeastern and central Arizona areas. The water is stored in a series of reservoirs and is delivered to the City through SRP's canal to the City's Chaparral Water Treatment Plant. SRP's water supply also consists of an allocation of groundwater pumped from wells located on lands within the SRP service area. The SRP supply is available for use only on lands within its service area, and are known as "On-Project" lands. SRP's available groundwater and surface water supplies varies from year to year, sometimes significantly. SRP lands are located in the Southern portion of the City's service area. The City's remaining service area is referred to as "Off-Project".

Under normal supply conditions, the City's SRP Lands, 6,071 acres, are entitled to a total of 3 AF/acre of surface water and groundwater, which during normal flow years is 18,213 AF per year. The average water demand on the City's SRP lands averages approximately 2.5 AF/acre in recent years. When shortages develop on the SRP system, normal delivered volumes are typically reduced corresponding to the shortage. Shortages have occurred within SRP over the last several decades, most recently during the 2003/2004 time frame, which saw an allocation reduction to approximately 2 AF/acre.

Groundwater

Scottsdale meets the majority of its customer's water demands with surface water and meets the Arizona Department of Water Resources safe yield requirements. Safe yield requires that for every gallon of groundwater withdrawn from the aquifer, another gallon must be recharged back into the aquifer. However, the City still must utilize groundwater for operational performance, to meet peak demand, conduct groundwater remediation, and as backup for surface water supply during shortage conditions or other surface water supply interruptions.

Due to emphasized and prolonged use of renewable surface water supplies and the City's water recharge efforts, the City's groundwater supplies are significantly less impacted by drought; however, during chronic drought episodes the City may be required to increase planned groundwater pumping to meet customer demands if surface water supplies are reduced.

Reclaimed Water Supply

It should be noted that reclaimed water is also an important component in the overall portfolio of Scottsdale water resources. Planning for the use of reclaimed water within the City is accomplished within the framework of integrated water resource management with its focus on meeting irrigation demands, maintaining the goal of safe yield, and maximizing recharge opportunities. Through its recent 2012 Water Reuse Master Plan Update, the City has implemented strategic efforts in order to maximize their capability to locally reuse and recharge reclaimed water. The City's obligation to deliver reclaimed water to non-potable customers via the Reclaimed Water Distribution System (RWDS) includes the use of untreated CAP canal water; therefore, during a drought episode, there may be the need to monitor the potential service impacts to this portion of the customer base.

In summary, through the development, diversification, and management of its water supplies, the City has positioned itself to provide significant resiliency against the potential occurrence of various water supply reduction events.

Demand Profiles

The City's current Water Master Plan update developed potable water demand projections for the service area. The growth projections in the Water Master Plan were developed in terms of the number of housing units for residential areas and square footage for commercial, employment, resorts, and public areas. Water demand projections were estimated using the acreages of growth coupled with unit demands by land use type. The projections also accounted for redevelopment in specific areas; further details are available in the current Water Master Plan update.

The potable water demand projections for On- and Off-Project in 2015 and 2020 are shown in Figure 2 below. The figure also includes the available groundwater, SRP, and CAP supplies during the same time periods.

Figure 2-Projected Demands/Supplies



Water Conservation

The City has a water conservation ordinance that includes water conservation rebate programs, limitations on water intensive landscaping, and restrictions on water waste from irrigation systems. The ordinance provides measures for the City to issue violations including issuance of fines. As a result of these conservation measures, the City has recognized reductions in per capita demand. The demand management strategies presented in the following stages and responses will involve additional customer efforts.

Drought Management Team

An effective DMP includes establishing a team to manage and oversee the City's response. The Drought Management Team's (Team) responsibilities will include evaluating the severity of the drought and the oversight of the action plan based upon forecasted supply and demand, and projected impacts to the City. A primary goal of the Team's activities will be to ensure that clear communication and outreach between the utility and its customers is achieved throughout the duration of a drought occurrence.

The Team will be led by the Water Resources Director and be comprised of key members of the Water Resources Division's staff along with representatives from Public Works, Community Services, the City Attorney's office, Finance, Business Services, Communications, and other City departments as appropriate.

The responsibility of the Team is to evaluate the current water supply status, water demands, infrastructure, water supply levels and other shortage-related scenarios and report their findings and recommendations to the City Manager. These recommendations include identifying the appropriate stage and response levels for the utility in the event of a supply reduction and determining appropriate demand management options to be implemented. Should additional conservation efforts during a particular stage significantly reduce system demand, the Team may recommend to adjust or terminate the drought stage designation. In addition, through continuous monitoring during a drought episode the Team will also be prepared to identify the point at which to recommend to the City Manager the appropriate time to terminate a drought stage and resume normal conditions of supply and system usage or implement a different stage.

The Team may recommend to the City Manager that the introduction of a Drought Surcharge be part of the drought response based on the severity of the drought condition. A Drought Surcharge provides pricing signals to the utility customers that are designed to increase awareness of the drought's severity, assist in meeting water-use reduction targets, and maintain the financial health of the utility. It is different from the regular rate structure in that it is temporary in nature. The Team will include within its recommendation the definition of the criteria for implementing and removing the Drought Surcharge. A drought surcharge may only be implemented with approval of the City Council.

Stages and Responses

This Plan outlines four water supply reduction stages that could possibly be the result of regional drought conditions and/or the interruption of supply due to other circumstances outside the control of the City. Each stage is progressively more serious and presents the possible circumstances related to the reduction. Stages 1 may be declared and authorized by the City Manager. Stages 2, 3, and 4 must be declared and authorized by the City Council.

In response to the stages, the corresponding best management practices are identified which appropriately respond to the reduction stage. Table 1 is a menu of demand side management options that may be implemented throughout each stage.

Stage 1 - Minimum Water Shortage (Equivalent to Reduction of 0-5 mgd)

Description:

This stage will be characterized by increased awareness and customer communication to alert the community that there may be an upcoming episode of water supply reduction. Regional water suppliers may be experiencing the effects of extended dry weather conditions and other local municipalities and water suppliers may be preparing to respond to a potential reduction in future water deliveries. Generally, customers will be encouraged to continue to use water efficiently. See Figure 3.

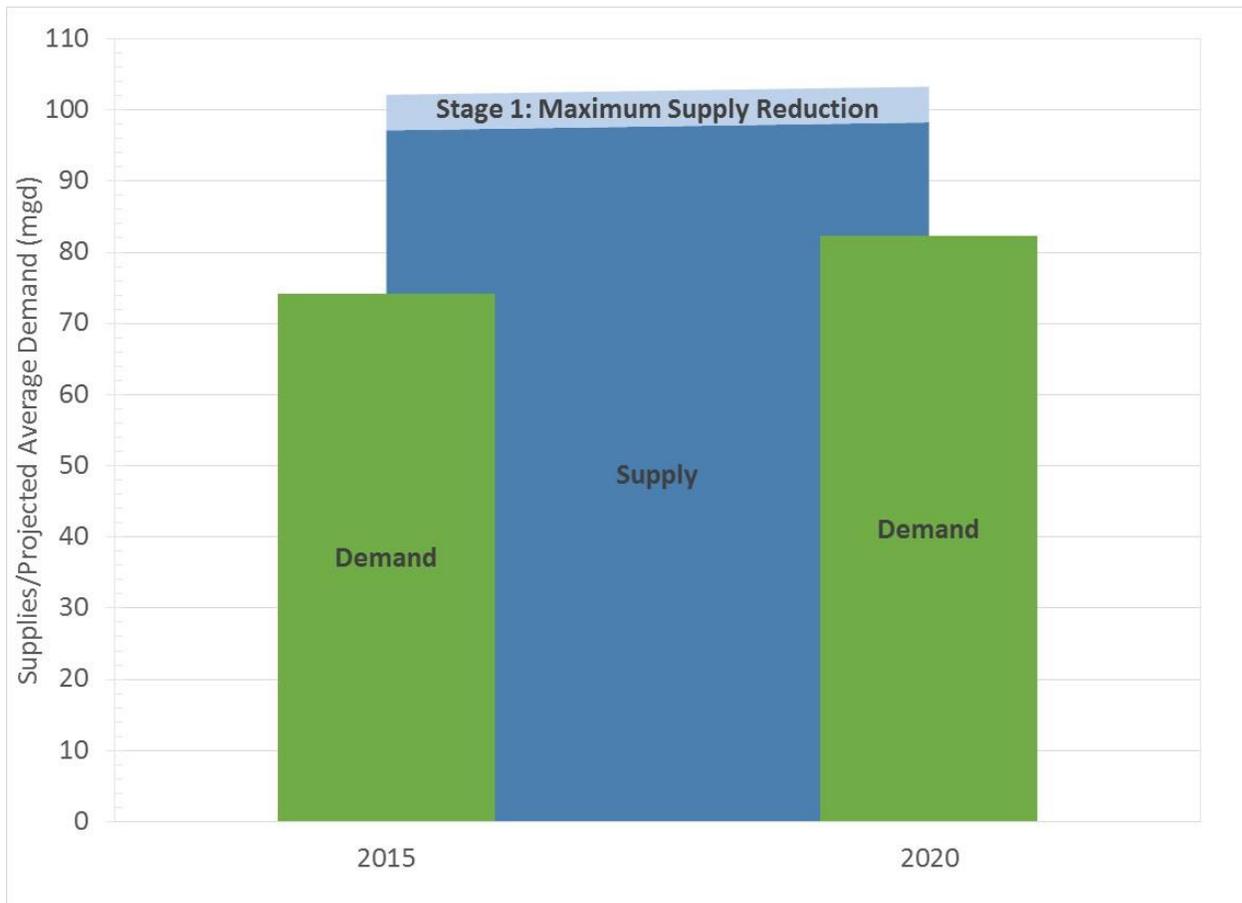
Example Scenario:

This stage addresses perhaps the most likely, near-term probability of a water supply reduction occurrence. The Colorado River Basin has been experiencing an extended period of drought conditions which results in declining levels of storage in its reservoir system. In accordance with established agreements among the Colorado River Basin water using entities, once the elevation of the surface of Lake Mead drops to a certain elevation, the Secretary of the Interior will declare a water shortage condition. The Bureau of Reclamation has recently projected that this condition could occur in the year 2016 to 2018 time frame. This will trigger a reduction in overall water deliveries to the CAP system in Arizona of 320,000 AF, or about 20 percent statewide. For Scottsdale, this shortage condition would result in a reduction of 3,140 AF of CAP water, which represents an approximately 4% reduction in available CAP supply to the City.

Responses:

- Supply-side Management
 - The City has a portion of its CAP allocation that is currently unused to meet customer demands, which is recharged for future use. During a “Minimum Water Shortage” condition, the City has the flexibility to reduce its recharge operations and re-direct this supply to meet customer demand.
- Demand-side Management
 - See Table 1
- Public Outreach – Website updates, Council Announcements, Press Releases, etc.

Figure 3- Stage 1 Supply/Demand



Stage 2 - Moderate Water Shortage (Equivalent to Reduction of 5-15 mgd)

Description:

This stage is characterized by increased monitoring and evaluation activities related to the drought episode. The Team will track water supply projections from the major surface water providers. Customer water usage and its corresponding revenue generated will be compared to normal use. This stage may impose limited water use restrictions and require effort on the part of the utility customers. The Team may increase public outreach and adopt more specific restrictions depending on conditions. See Figure 4.

Example Scenario:

This stage addresses the response to a potential episode where the City experiences an initial CAP shortage as described in Stage 1 combined with a simultaneous reduction of supply within the Salt and Verde Systems.

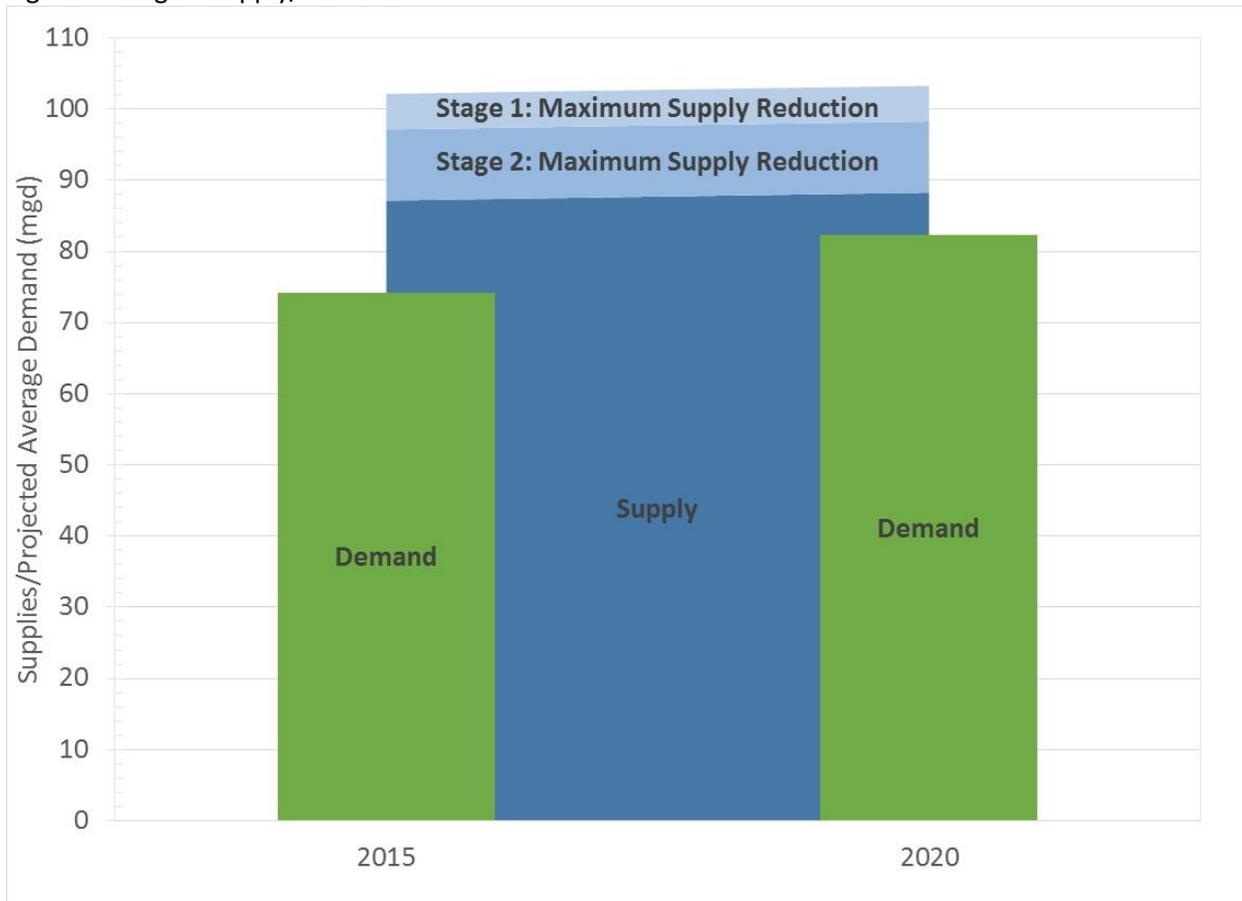
As previously mentioned, SRP delivers their water supplies through surface water from the system's watershed and groundwater from SRP wells. During drought or shortage episodes, SRP has the option of limiting the total amount of water being delivered. It can also adjust the water source mix (surface or groundwater) depending on the severity of the drought condition.

Historically, the worst drought of record on the Salt and Verde system resulted in a reduction of SRP deliveries to approximately 2 AF/acre (comprised of 1.3 AF/acre groundwater and 0.7 AF/acre surface water). The ability for SRP to rely on its groundwater component to assist with deliveries provides a modicum of resiliency to drought conditions.

Responses:

- Supply-side Management
 - Historical use of the SRP supply in Scottsdale has been less than the 3.0 AF/acre allotment, averaging 2.5 AF/acre of demand. The City has a portion of its CAP allocation that is currently unused to meet customer demands, which is recharged for future use. During a “Moderate Water Shortage” condition, the City has the flexibility to reduce its recharge operations and re-direct this supply to meet customer demand on SRP lands.
- Demand-side Management
 - See Table 1
- Public Outreach – (Website updates, Intradepartmental memo from WR Director to other City Divisions outlining water reduction methods and quantities, press releases, Council announcements, etc.).

Figure 4- Stage 2 Supply/Demand



Stage 3 – Severe Water Shortage (Equivalent to Reduction of 15-30 mgd)

Description:

In this stage it is anticipated that drought restrictions will become more severe. The Team will evaluate the need to impose mandatory water use restrictions on utility customers. Other local municipalities may have enacted or are considering more severe restrictions on water use. Through public communication efforts, customers generally anticipate and perceive that an increased level of water-use restrictions is appropriate. It is likely that a drought surcharge program will be used to increase public awareness through pricing signals and also to maintain the financial health of the utility. Drought pricing is typically implemented as a temporary measure. See Figure 5.

Example Scenario:

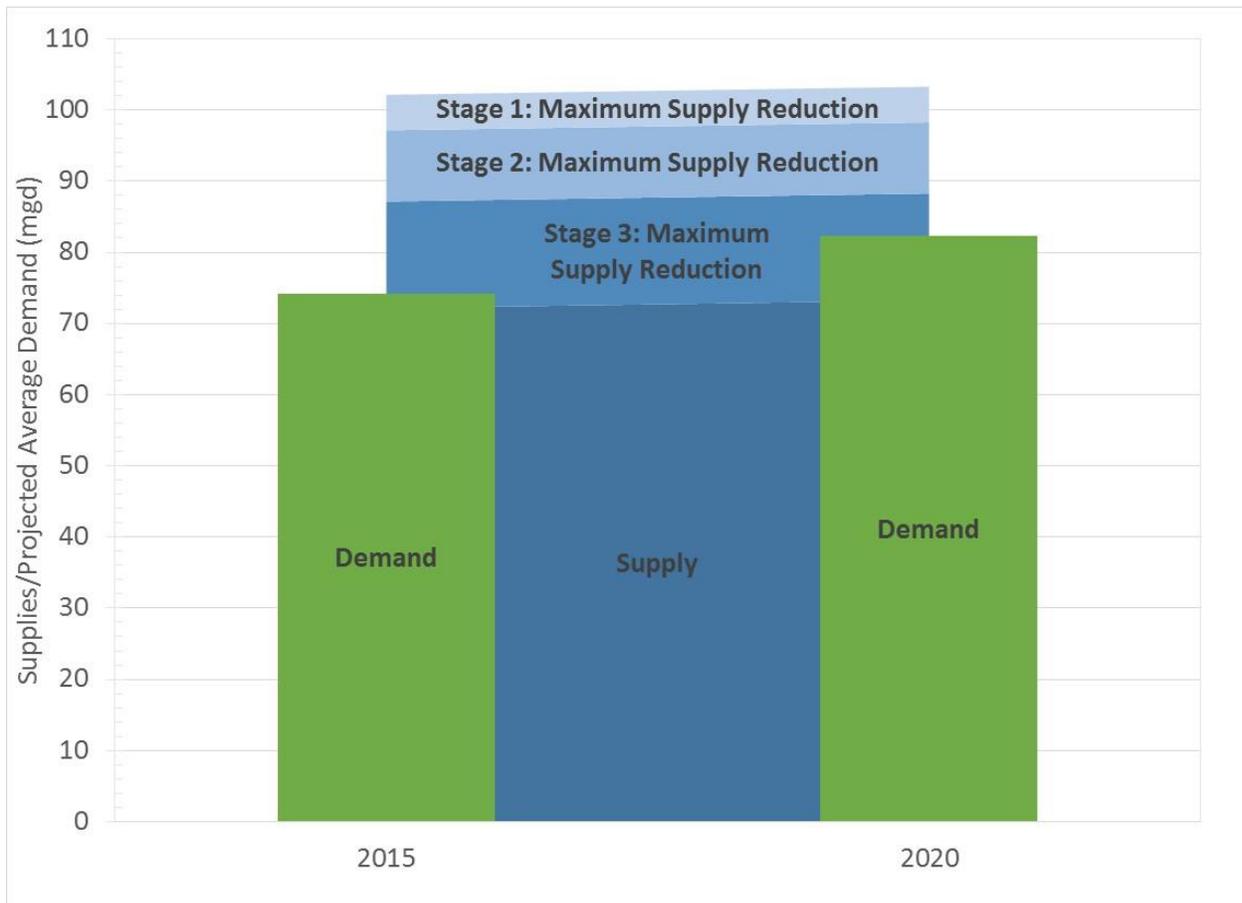
This stage addresses the response to a potential episode where the City experiences an initial CAP shortage as described in Stage 1 combined with a dramatic reduction in the availability of SRP surface water supplies resulting in the loss of availability of the Chaparral surface water treatment plant, whose primary function is to treat and deliver surface water from the SRP system.

According to the City's operating plans, this facility typically produces water in the range of 8 to 12 mgd. In addition, SRP groundwater wells will be able to provide a certain complement of supply to the On-project customers.

Responses:

- Supply-side Management
 - The City has a portion of its CAP allocation that is currently unused to meet customer demands, which is recharged for future use during this DMP time frame. During a “Severe Water Shortage” condition the City has the flexibility to reduce its recharge operations and re-direct this supply to meet customer demand on SRP lands. This available increment is greater than the anticipated initial CAP shortage amount.
 - Reserve groundwater supplies can be activated to support customer needs throughout the water service area.
- Demand-side Management
 - See Table 1
- Public Outreach – Similar to previous Stages

Figure 5- Stage 3 Supply/Demand



Stage 4 - Critical Water Shortage (Equivalent to Reduction of >30 mgd)

Description:

The conditions that may lead to Stage 4 are unlikely. During this stage the Team will evaluate the potential for substantially reducing water use through more structured mandatory water use restrictions. Discretionary uses of water by customers may be eliminated and the public awareness of the critical level of the shortage will be heightened. During this stage the primary focus of the Team response will be to maintain the health, safety, and economic vitality of the community to the maximum extent possible. Substantial curtailment of outdoor water use may be prescribed before imposing restrictions on domestic indoor uses. Clear and consistent messaging from the Team will be important in order to instill utility customer confidence. Further implementation of drought surcharges may be warranted. See Figure 6.

Example Scenario:

This stage presents a potential scenario wherein the City’s water system may experience a substantial or complete interruption of surface water supply from the CAP delivery system, which is outside the control of the City.

Such circumstances may include a CAP conveyance system failure or an external water quality incident related to the raw water supply to the City resulting in the need to discontinue use of the City’s CAP Water Treatment Plant. This also assumes that the SRP supply is unaffected and it is able to continue deliveries through the Chaparral WTP and/or SRP groundwater sources.

Responses:

- Supply-side Management
 - The City will carefully monitor the supply and demand conditions within the SRP service area to ensure that the use of available SRP supplies are maximized so as to minimize the demand on the CAP supply facilities during this stage.
 - Reserve groundwater supplies can be activated to support customer needs throughout the water service area.
 - The City shall attempt to increase its water supplies by activating any available emergency interconnections with adjoining municipal water users. These options may present unique governmental and technical issues which depend on the circumstances at the time of the drought.
- Demand-side Management
 - See Table 1
- Public Outreach – Similar to previous Stages

Figure 6- Stage 4 Supply/Demand

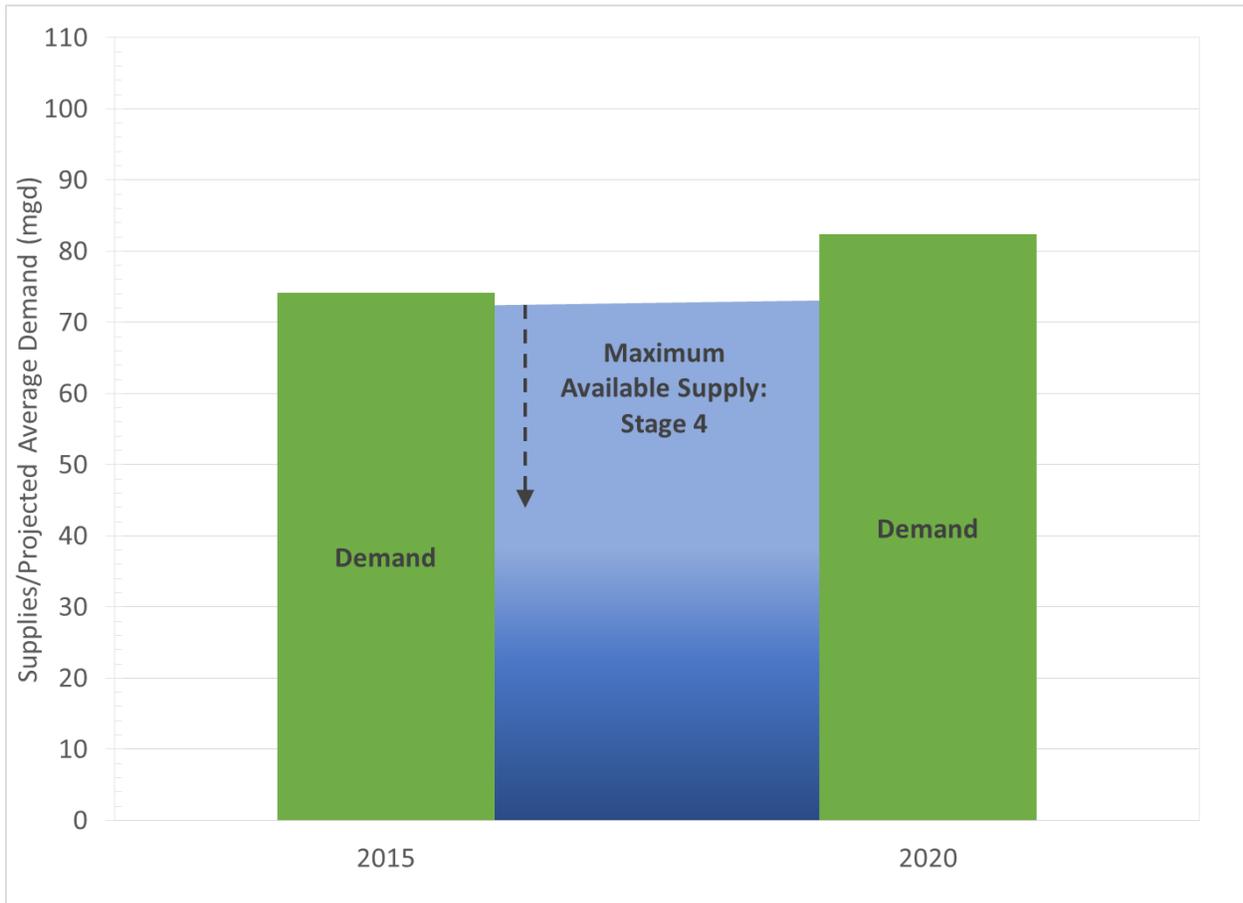


TABLE 1-Demand Side Management Option Menu

Customer Class	Response Options		Stage 1	Stage 2	Stage 3	Stage 4
Municipal	A	Reduce/eliminate irrigation for municipal parks and landscaping	Reduce	Reduce	Reduce	No turf irrigation
	B	Educate municipal staff on Indoor/outdoor water saving techniques	x	x	x	x
	C	Limit/prohibit washing of municipal fleet vehicles		Limit	Prohibit	Prohibit
	D	Limit hydrant flushing		Limit	Limit	NA (See F)
	E	Limit use of water for fire training		Limit	Limit	NA (See F)
	F	Eliminate all fire hydrant uses except those required for public safety				x
	G	Turn off municipally owned ornamental fountains	x	x	x	x
	H	Conduct indoor water audits			x	x
	I	Public information/awareness campaign	Initiate	Expand	Intensify	Intensify
Residential	A	Enforce landscape watering restrictions		x	x	x
	B	Limit/Prohibit overseeding for a winter lawn		Limit/ Prohibit	Prohibit	Prohibit
	C	Limit maximum number of watering days per week and the duration of watering time		3 days/week (odd/even)	2 days/week (odd/even)	No turf irrigation
	D	Limit/prohibit installation of new sod, seeding, and/or other landscaping				Prohibit
	E	Enforce restrictions on spraying of impervious surfaces		x	x	x
	F	Prohibit vehicle washing			Prohibit	Prohibit
	G	Turn off ornamental fountains		x	x	x
	H	Promote conservation with respect to operation and maintenance of swimming pools (cover, leak repair)	x	x	x	x
	I	Educate customers on indoor/outdoor water saving techniques	x	x	x	x
	J	Promote/enforce reduction of evaporative coolers				x
Non-Residential	A	Enforce/prohibit use of construction water		Enforce permits	Enforce permits	Prohibit
	B	Enforce policy guidelines/limitations for installation of new sod and/or other landscaping		x	x	x
	C	Enforce landscape watering restrictions		x	x	x
	D	Limit/prohibit overseeding for a winter lawn			Prohibit	Prohibit
	E	Limit maximum number of watering days per week and the duration of watering time		3 days/week (odd/even)	2 days/week (odd/even)	No turf irrigation
	F	Promote/require indoor and outdoor water audits		Promote	Promote	Require
	G	Turn off indoor and outdoor ornamental fountains		x	x	x
	H	Promote conservation with respect to operation and maintenance of swimming pools (cover, leak repair)		x	x	x
	I	Educate customers on indoor/outdoor water saving techniques	x	x	x	x
	J	Limit/prohibit dealership washing of vehicles		Limit	Limit	Prohibit
	K	Enforce water use restrictions on commercial car washes		No water waste	No Water Waste	Prohibit
	L	Promote/enforce service of water in restaurants only upon request		x	x	x
	M	Promote/enforce reduction in frequency of linen and towel washing in hotels		x	x	x