



PHX WATER SMART

DROUGHT MANAGEMENT PLAN

**CITY OF PHOENIX
WATER SERVICES DEPARTMENT**

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Table of Contents

1.0	INTRODUCTION.....	2
2.0	SUPPLY AND DEMAND – A CONTEXT FOR DROUGHT MANAGEMENT.....	4
	Figure 2-1. City Domestic Water Supplies by Source	5
	Figure 2-2. City Water Deliveries by Sector, 2025.....	6
3.0	PLANNING FOR DROUGHT	6
	Figure 3-1. Demand Management and Supply Sufficiency	8
4.0	WATER USE REDUCTION GUIDELINES	9
	Figure 4-1. Summary of Water Use Reduction Measures	9
5.0	ADDRESSING A SUPPLY INSUFFICIENCY – CONCLUSION	14



1.0 INTRODUCTION

Phoenix has planned for drought for generations.

In a broad sense, every water-related action the City and its residents have undertaken since the City was founded has been for the purpose of mitigating or responding to drought. Phoenix is located in one of the nation's hottest and driest regions, where drought is a recurring and persistent challenge.

The rehabilitation of ancient canals, the building of Roosevelt Dam, the introduction of Colorado River water into central Arizona, the adoption of the Groundwater Management Act, the settlement of water rights claims with Native American communities, the development of the City's five surface water treatment plants, the installation of 7,200 miles of pipelines, the development of the City's two wastewater reclamation plants that treat water for re-use, the creation of the City's aquifer recharge facilities, exchanges to use other cities' storage facilities, and the implementation of the City's water conservation efforts are all activities undertaken to ensure public safety, economic opportunity, and quality of life in a desert community that basically exists in perpetual drought.

Since the 1980s, Phoenix has implemented water resources, water conservation, and infrastructure master plans. These efforts have led the City to have a diverse water supply portfolio, have helped customers improve their water use efficiency, and have resulted in the infrastructure necessary to effectively convey water to customers. However, drought is a regular phenomenon in the southwestern U.S. and within the Colorado, Salt, and Verde River watersheds, where Phoenix gets most of its supplies. Reconstructed stream flow data on these watersheds indicates drought has endured for decades. Extended drought could lead to future water supply insufficiency for Phoenix. The Drought Plan builds upon these efforts and the City's Water Resource Plan, Water Infrastructure Master Plan, and Water Conservation Plan, and is crafted to:

- prepare Phoenix customers for the impact of a supply insufficiency;
 - identify mechanisms through which the impacts caused by a supply insufficiency can be shared equitably and in proportion to the magnitude of the insufficiency;
 - identify tools that can be deployed to minimize disruption of the economy so that jobs are protected and regional economic stability is preserved;
 - establish reliable two-way communication to provide timely information and feedback relative to voluntary measures and restrictions prior to and during a supply insufficiency;
 - ensure competent implementation of demand reduction measures; and
 - identify tools that can be used to protect public health and safety during the direst water supply insufficiency situations.
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The City of Phoenix has also maintained a very active and successful water conservation program since the 1980's and has experienced a significant decline in residential per capita water consumption rates of roughly 30% over the last twenty years. The City focuses its water conservation efforts on long-term culture change regarding water use and encourages its customers to embrace a desert lifestyle. While demand management tools appear in the Drought Management Plan, these tools should not be confused with on-going water efficiency and conservation efforts, as the drought plan tools are targeted towards short-term efforts and extreme supply insufficiency situations. In other words, the drought plan is not a water conservation program.

1.1 CURRENT DROUGHT MANAGEMENT AUTHORITY AND REQUIREMENTS

1.1.1 DROUGHT MANAGEMENT ORDINANCE

In 1990 the Water Services Department (WSD) completed the first Drought Management Plan. That same year, WSD recommended that drought management authority be codified into ordinance to provide the mechanisms needed to implement the Plan by the WSD Director, which was adopted by City Council as the Drought Management Response Procedure (P.C.C. Chapter 37 Article X). The Ordinance authorized the WSD Director to implement a Drought Management Plan based upon four progressively restrictive water use reduction stages tied to the severity of drought. This 2026 Drought Management Plan serves as the current interpretation of the Drought Management Ordinance.

The WSD Director is authorized to declare water use reduction stages and impose water use reduction measures as generally prescribed below:

- A Stage 1 Water Alert is when an insufficient supply situation appears likely. This stage triggers an intensive public education and information program.
 - A Stage 2 Water Warning is when an insufficient supply situation occurs. This stage authorizes the WSD Director to impose and enforce water use reduction regulations and to impose a drought surcharge on the City Services Bill.
 - A Stage 3 Water Emergency is when additional reductions in water supplies occur beyond the Stage 2 level, and water transfers and groundwater pumping are insufficient to meet water demands in the service area. Additional or increased water use reduction regulations and increased surcharges may be implemented by the WSD Director at this stage.
 - A Stage 4 Water Crisis is when the WSD Director determines that, based on the severity of the crisis, additional measures must be instituted to protect human health and safety.
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1.1.2 STATE COMMUNITY WATER SYSTEM REQUIREMENTS – DROUGHT PREPAREDNESS PLAN

The State of Arizona’s State Community Water System requirements (A.R.S. § 45-341 - 45-343) specify that large community water systems (those systems that serve more than 1,850 persons) must prepare a drought preparedness plan that shall be designed to meet the specific needs of the water system.

2.0 SUPPLY AND DEMAND – A CONTEXT FOR DROUGHT MANAGEMENT

Phoenix has a unique portfolio of water supplies and specific characteristics about its water demand that are intrinsic to the management of potential supply insufficiencies. Brief overviews of the City’s supplies and demands described below are intended to provide some context for Phoenix’s drought management and supply insufficiency mitigation approach. A comprehensive summary of supplies and demands can be found in the Water Resources Plan.

2.1 SUPPLY

Phoenix’s typical water supplies delivered to customers are grouped into six major categories:

- Surface water associated with the Salt River Project (SRP);
- Salt and Verde River water supplies developed by or exchanged to Phoenix;
- Colorado River water delivered through the Central Arizona Project (CAP);
- Groundwater pumped from City wells or delivered by SRP;
- Reclaimed water; and
- Long-term Storage Credits.

The first three categories are all surface water supplies. Normally, more than 90 percent of the City’s demand is met with surface water from the Colorado, Salt and Verde Rivers. Surface water supplies are considered renewable because they are replenished with runoff from melting winter snowpack from the mountainous watersheds of the rivers. This contrasts with groundwater, which is generally considered non-renewable because natural recharge into the underground aquifer can occur more slowly than groundwater pumping. However, unlike groundwater, surface water supplies in the southwest are susceptible to multi-year cyclical wet and dry periods. Drier periods caused by drought can last many years, which can lead to a supply insufficiency for Phoenix. Climate change may exacerbate the risks associated with hotter, longer and more severe drought conditions in the Southwest, placing additional stress on regional water supplies.



Phoenix (and the Arizona Water Banking Authority on behalf of Phoenix and other entities) also periodically recharges surface water supplies into the aquifer as a hedge or bank against possible supply insufficiencies. Once stored, this water becomes a Long-term Storage Credit that can be pulled back out of the aquifer, or “recovered” through the use of wells.

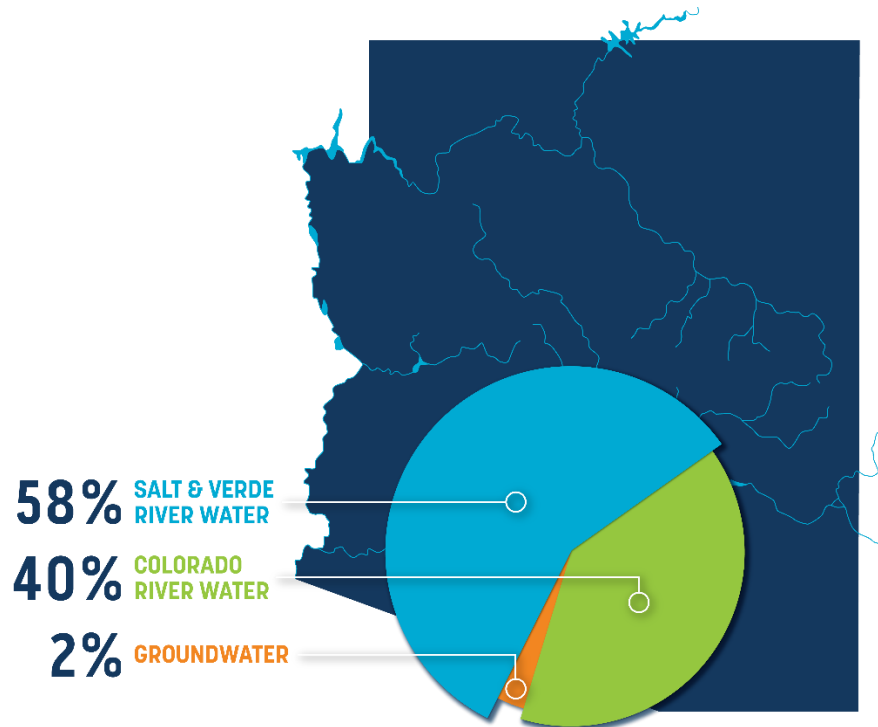


FIGURE 2-1. CITY DOMESTIC WATER SUPPLIES BY SOURCE

2.2 DEMAND

The City serves water for a wide range of uses. Residential water use includes single family homes, apartments, townhouses, condominiums, etc. Commerce, Industry, and local, state, and federal governments include such diverse water uses as retail, restaurants, schools, warehouses, hotels, offices and other non-residential private sector uses. Landscape meters serve water for irrigation purposes to various types of customers, except for single family residential.

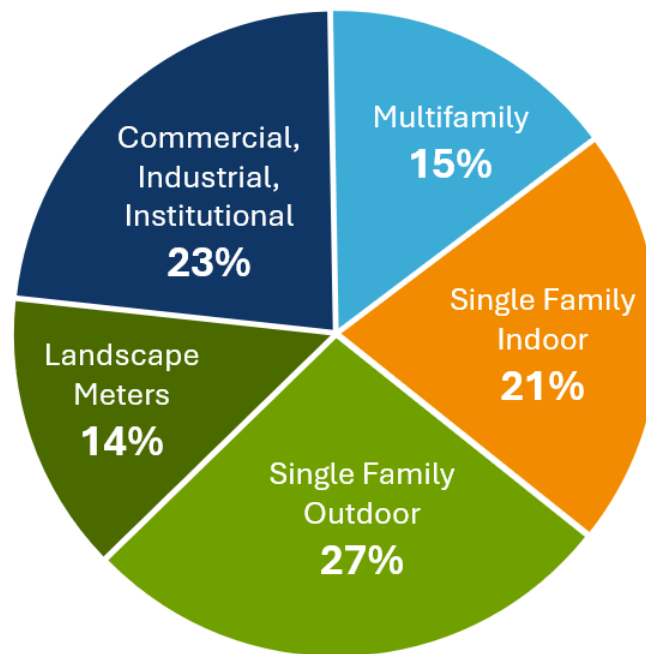


FIGURE 2-2. CITY WATER DELIVERIES BY SECTOR, 2025

3.0 PLANNING FOR DROUGHT

Preparing for drought-induced supply insufficiencies requires strategies to both augment supply and reduce demand. The optimal mix of strategies is determined by the timing and potential volume of the supply insufficiencies, the lead time required to implement water supply augmentation and/or demand reduction projects, and the relative impact of each strategy. To determine the impact of each strategy, one must consider its relative costs, how scalable it is, how enduring its effects are, and its direct and indirect effects on economic, social, and environmental welfare.

3.1 MANAGING DEMAND IN THE CONTEXT OF SUPPLY SUFFICIENCY

The City of Phoenix distinguishes between two water use reduction strategies that are influenced by the availability of supplies relative to demand. The first strategy, efficiency gains, is one of the basic tenets of traditional water conservation efforts. Efficiency programs impart gradual reductions in water use and do not adversely impact customer lifestyles or business opportunities. Improved efficiency proves beneficial to customers and the City by reducing waste, reducing costs and augmenting supplies that may buffer a supply insufficiency. The City of Phoenix emphasizes efficiency gains as a long-term culture change in the community. Citizens are encouraged to embrace a



desert lifestyle as a benefit to the customer and the community, and as proactive mitigation against drought conditions. While a variety of efficiency programs will be ongoing during “normal” supply conditions, these efforts may be accelerated as the probability of a supply insufficiency increases.

The second strategy, demand curtailment, is characterized as an urgent reduction of water demand necessary to mitigate supply shortfalls. Curtailment programs can be structured to minimize customer impacts and avoid measures that impose severe impacts on a customer’s quality of life and/or the local economy. Curtailment programs typically supplement, rather than replace, efforts to accelerate efficiency improvements.

If demand curtailment becomes necessary, the City will employ a triage approach to balance water demand with available supplies; first targeting water use that provides the least value to customers and the community at-large. It is an inherently hierarchical approach, protecting societal and economic needs by initially targeting relatively innocuous uses such as leakage and waste followed by discretionary uses as deemed necessary. Only in the most pressing situations would essential uses get targeted for curtailment (See Figure 3-1, Demand Management and Supply Sufficiency).

The concepts shown in Figure 4-1 provide the foundation for WSD’s approach to prioritizing the water use reduction measures identified under the water use reduction guidelines described in Chapter 4.

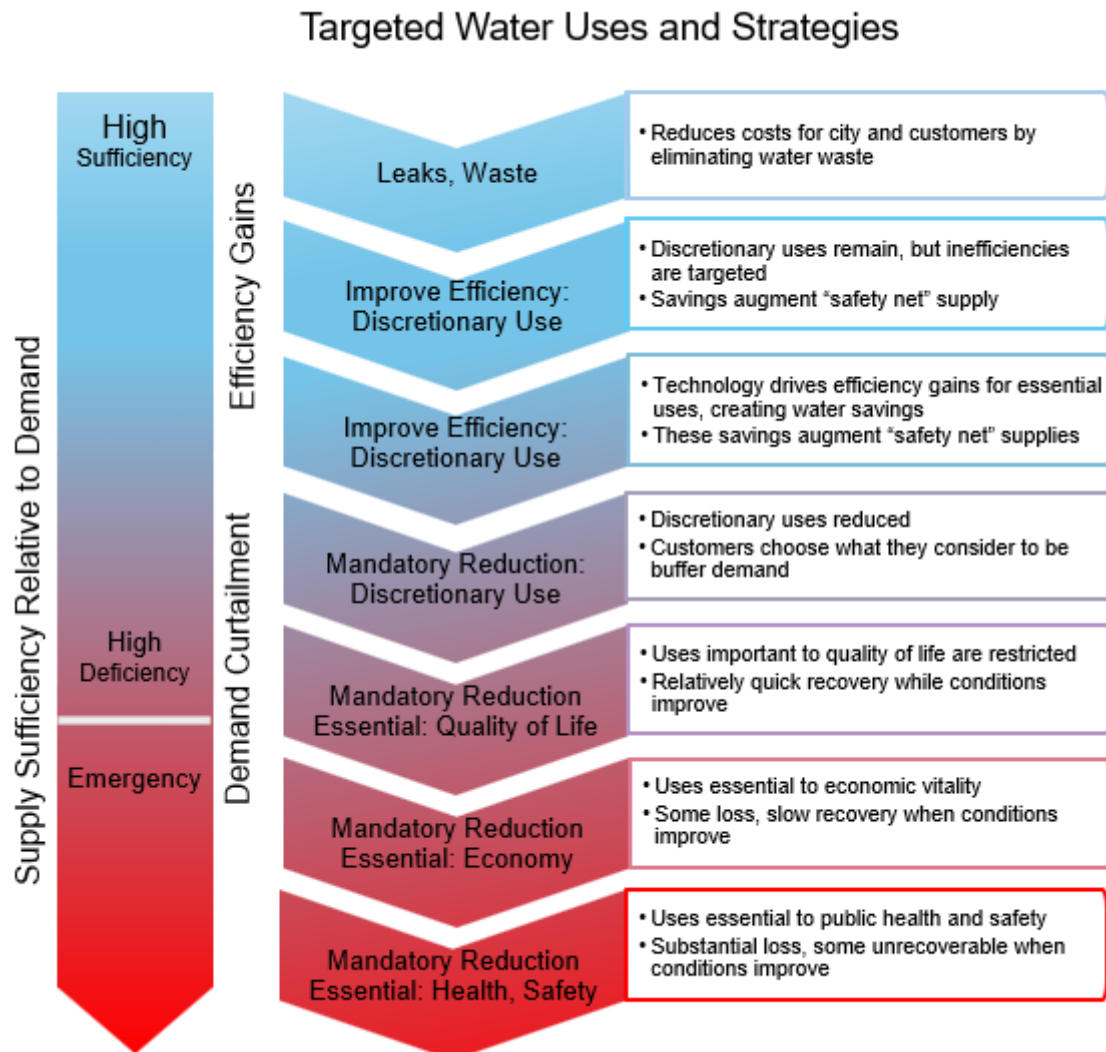


FIGURE 3-1. DEMAND MANAGEMENT AND SUPPLY SUFFICIENCY

One purpose of the Drought Management Plan and Water Use Reduction Guidelines is to raise customer awareness about ways to reduce their vulnerability to drought. This can be accomplished in part by identifying the types of water uses that are most likely to be impacted by regulations and/or surcharges when the City is faced with responding to supply insufficiencies. It is a goal of the WSD to make adequate water available for customers to maintain a lifestyle of their choice, however it is important for customers to understand decisions on how water is used can come with a risk when the City is facing supply deficits.



4.0 WATER USE REDUCTION GUIDELINES

Because the severity, timing, and duration of a supply insufficiency is highly unpredictable, the measures described within this chapter serve as guidelines for specific actions that may be taken by the WSD Director.

The water use reduction guidelines are summarized in Figure 4-1.

Water Use Reduction Stage	Customer Outreach	City Actions	Voluntary Reductions	Consultations (formerly Audits)	Incentives (formerly Rebates)	Efficiency Standards	Surcharges	Mandatory Reductions	Moratorium of Growth
Stage 1 - Water Alert	✓	✓							
Stage 2 - Water Warning	✓	✓	✓	✓	✓	✓	✓		
Stage 3 - Water Emergency	✓	✓	✓	✓	✓	✓	✓	✓	
Stage 4 - Water Crisis	✓	✓	✓	✓	✓	✓	✓	✓	✓

FIGURE 4-1. SUMMARY OF WATER USE REDUCTION MEASURES

4.1 WATER USE REDUCTION MEASURES

The following contains brief descriptions of the types of measures WSD would consider if it becomes necessary to accelerate efficiency and/or curtail water use.

4.1.1 CUSTOMER OUTREACH

Although the City maintains an active and effective conservation outreach program as part of its efforts to encourage customers to embrace a desert lifestyle, during certain drought or supply insufficiency conditions enhanced outreach will be necessary to update customers on water supply conditions and provide clear expectations about their water use. In addition, enhanced outreach communicates important ways customers may reduce their vulnerability to drought impacts and become more aware of supply insufficiency response measures, including voluntary reductions. Customer outreach may include general messages and/or targeted communication directed at specific types of customers or water uses. It may utilize traditional or social media platforms.



4.1.2 CITY ACTIONS

During a supply insufficiency it will be important for the City to demonstrate it is doing its part to extend available water supplies. The City will implement water use reduction measures to correspond with the Water Reduction Stages. The water use reduction measures will be implemented in a manner to avoid direct impacts on customers, though depending on the severity of the situation facilities used by customers such as parks and community pools may be impacted.

4.1.3 VOLUNTARY REDUCTIONS

During the early stages of stressed water supplies, the City may make a call-to-action for voluntary reduction measures. In general, voluntary reductions promote short-term curtailment of discretionary water uses. While customers would identify water uses they can curtail at their own discretion, the City may also recommend opportunities to reduce consumption. Voluntary reductions do not require enforcement and the primary cost of voluntary reductions to the City will be associated with customer outreach and education. Any costs incurred by customers because of voluntary reductions will be at the sole discretion of the customer and may be offset by lower water bills.

4.1.4 WATER CONSULTATIONS

Water efficiency consultations of properties and/or buildings and facilities help customers reduce demand. These typically include detecting leaks, inefficient use, identifying inefficient devices that may be upgraded, and discovering inefficient water management practices. Water efficiency consultations can be conducted at any property and often focus on both indoor and outdoor water use.

The City currently conducts efficiency consultations for single-family residential homeowners and commercial, industrial, and institutional customers on request.

There are two ways that water savings can result from a water efficiency consultation: repairing or replacing devices and changing behaviors by improving water management practices. The expectation that leak repair and behavior change is likely to account for a large portion of any water savings from consultations suggests any initial savings might be somewhat transient. While plumbing fixtures and appliances have a limited operating life, the savings that result from improving the efficiency of a device are considered one-way or permanent. In other words, it is not likely that a customer will revert to a less efficient device at some point in the future.



During supply insufficiencies, customers that use large volumes of water for irrigating landscaping, such as multifamily housing, homeowner association common areas, and large non-functional turf on residential properties could be proactively offered this service. For this reason, new water efficiency consultation programs implemented during a supply insufficiency will likely shift in emphasis to focus initially on residential customer and customers with large irrigation systems.

4.1.5 INCENTIVES

Incentives provide financial assistance to customers encumbered by inefficient water uses found with older buildings or landscaping. The savings potential and scalability of an incentive program is limited by the presence of devices (or plant material) and the relative efficiency of water use.

The City currently assists single-family residential homeowners by providing financial incentives for installing modern, water efficient toilets and smart irrigation controllers and removing grass. In addition, non-residential properties can also apply to receive a financial incentive to replace grass with xeriscaping.

During a supply insufficiency, incentives may prove to be a useful tool for accelerating the process of improving efficiency and reducing water demand by providing an incentive for customers to replace inefficient devices and landscape features with more modern, water efficient equivalents.

Examples of some, but not all, possible incentive programs include installing efficient plumbing fixtures and appliances such as toilets and clothes washers, replacing aesthetic grass with desert adapted vegetation, replacing active (athletic) grass with synthetic turf, or installing smart irrigation components such as weather-based controllers or soil moisture sensors.

4.1.6 EFFICIENCY STANDARDS

The U.S. Congress' passage of the 1992 Energy Policy Act played a big role in raising water and energy efficiency of homes. Since then, the U.S. EPA's Energy Star and WaterSense programs have contributed to further advancements in water and energy efficiency of household devices. Many toilets and washing machines available on the market today far exceed federally mandated efficiency requirements. These innovative technologies continue to drive down water use without impacting customers' quality of life.

In 2025, the City passed a building code update that included indoor plumbing efficiency standards that are consistent with EPA WaterSense standards as of this writing.



Sustained supply insufficiencies may require adoption of additional water efficiency standards by the City.

4.1.7 SURCHARGES

Surcharges are an additional cost added to the monthly bill. Surcharges can take many forms, including but not limited to flat rates, volumetric charges, escalated volumetric charges, and additional charges for specific end uses of water or user types. For additional info, see Section 4.2.1 below.

4.1.8 MANDATORY REDUCTIONS

Mandatory water use reductions impact all customers, new and existing. Reduction schemes typically target discretionary water uses. Common methods include percentage reductions, budgeted (or seasonal) allotments, fixed allotments and bans on specific end-uses:

Percent Reduction mandates reduce water use relative to historic water use. For example, customers may be required to reduce consumption by 10% compared to the prior year. Percent reduction mandates are highly scalable in the sense that the reduction target can be adjusted to achieve the necessary level depending on water supply conditions. Percent reductions can usually be enforced through regular meter reading; however, notice to customers will typically lag water use because of the billing schedule.

Budgeted Allotments limit the amount of water that is allowable for specific uses. For example, a water budget for outdoors could scale the amount of water available to a customer by the amount of landscaping on the property. An indoor water budget would include information on the type and number of plumbing fixtures and the number of occupants of the building. Water budgets have the benefit of being able to be scaled to reflect individual customer conditions. Budgeted allotments can often be enforced through regular meter reading. In addition, budgeted allotments can also be adjusted to achieve the necessary reduction levels depending on water supply conditions. For example, a water budget may be designed to ensure “efficient” irrigation takes place during early stages of a supply insufficiency, or a budget may be reduced to require deficit irrigation practices, if necessary, under severe supply insufficiency conditions.

Fixed Allotments are similar to budgeted allotments, but they are not scaled to reflect unique customer conditions. For example, each customer could be allotted a fixed volume for outdoor use and/or indoor use. The primary benefit of fixed allotments is they can be more easily enforced than budgeted allotments.



End-Use Bans are imposed through customer information and enforcement. Specific bans, such as prohibiting the washing of your car at home and watering nonfunctional turf, can be effective at reducing peaks as well as overall demand. Bans also help generate awareness across the community. The enforcement of bans within a service area the size of Phoenix can be very challenging and costly.

Restricting water use further could occur in the service area when additional measures are necessary to protect human health and safety.

4.1.9 MORATORIUM ON GROWTH

The intent of a moratorium is to stop or limit the increase of new water uses in the service area when earlier emergency supply and water use reduction measures are insufficient to ensure water demands are met in the service area. This could take the form of limiting new specific water-intensive uses or limiting new development.

A limit to specific water-intensive uses could include Large Water Users as defined by the Large Water Users Ordinance (PCC Chapter 37, Article III, Division 2). Limiting new development, even when allowed only with the most essential water uses, could occur when new discretionary use puts enough of a burden on the city's existing water supplies or infrastructure that it may be considered enough of a risk of undue harm to providing an adequate supply to the existing customer base. Expanding water resource acquisition projects funded by new development may help avoid a moratorium.

4.2 SURCHARGES, FINES AND PENALTIES

The Drought Ordinance authorizes the assessment of surcharges, fines, and penalties to be placed in a special fund and to strictly meet the expenses of enforcing demand reduction measures, providing demand reduction assistance to customers, meeting demand reduction-induced cash shortfalls, or augmenting water supplies.

4.2.1 SURCHARGES

The Drought Ordinance authorizes the WSD Director to implement drought surcharges when declaring a Stage 2 – Water Warning, Stage 3- Water Emergency or Stage 4- Water Crisis. Surcharges serve two purposes: 1) encourage demand curtailment motivated by cost avoidance, and 2) generate additional revenue. Revenue generated from the surcharge can be used to offset revenue losses resulting from water use reduction measures, augment water supplies, fund programs that assist customers with reducing demand, and recover costs of enforcing mandatory reduction measures.



4.2.2 FINES AND PENALTIES

The Drought Ordinance also authorizes the WSD Director to implement fines when declaring a Stage 2 – Water Warning, Stage 3 - Water Emergency or Stage 4 - Water Crisis and in conjunction with mandatory water use reduction measures. Similar to surcharges, fines would encourage demand reduction. However, because fines and penalties are imposed only after there has been a violation of an existing curtailment measure, they would of course result in an additional cost to a customer or business.

5.0 ADDRESSING A SUPPLY INSUFFICIENCY – CONCLUSION

The City’s approach to managing drought and the measures undertaken for water supply insufficiencies will evolve with time. Changes in the water use characteristics by customers, the type and location of development and redevelopment in Phoenix, the regional climate and how regionally important supplies are managed all may alter Phoenix’s drought management and water use reduction strategies. Phoenix will continuously strive to improve its water supply resiliency and to address these changes to ensure public safety, economic opportunity, and quality of life for residents and business.