

Arizona Corporation Commission

Mandating Conservation by Arizona's Private Water Companies

Arizona Water Policy

University of Arizona

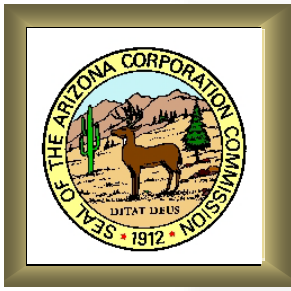
Commissioner Kristin K. Mayes

March 12, 2010



Presentation Outline

- **ACC Background**
- **Orders Preliminary**
- **Integrated Water and Wastewater Companies**
- **Use of Effluent**
- **Consolidation of Distressed Water Companies**
- **Conservation through Tiered Rates and Curtailment Tariffs**
- **Conservation through Hook-up Moratoriums**
- **Blue Ribbon Panel**
- **Water-Energy Nexus**
- **Next Steps**



ACC Historical Overview

- **The Commission was established upon statehood in 1912, as a Constitutional authority**
- **The framers established the Commission as a separate, popularly-elected branch of state government**
- **Originally made up of 3 commissioners; expanded by popular vote to 5 commissioners in 2000**
- **Arizona voters have protected the independence of the Commission--especially its provisions regarding election of commissioners--from constitutional amendment on numerous occasions**
- **The Commission has constitutional authority to regulate public utilities, corporate filings, securities, and railroad and pipeline safety**



Utilities

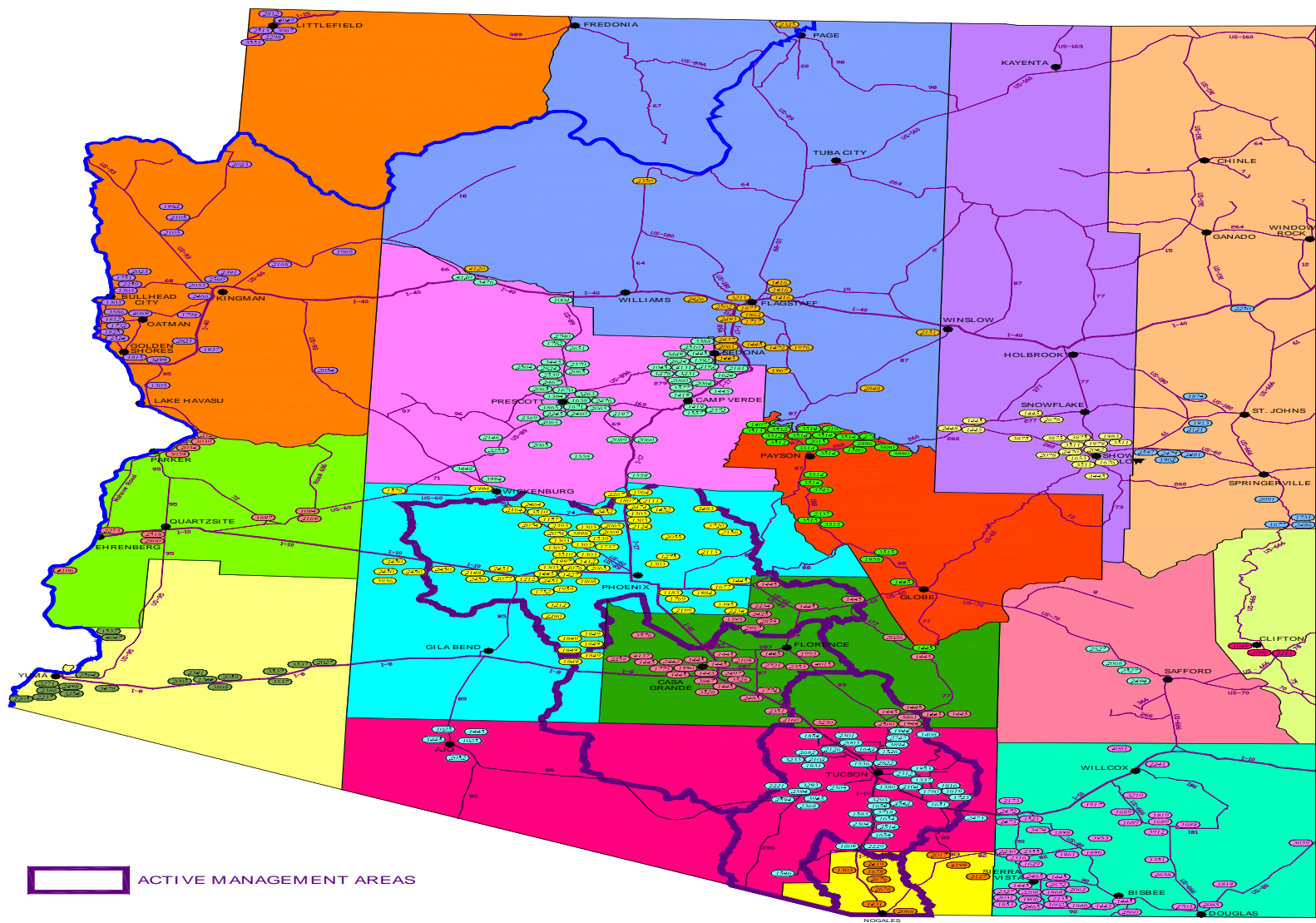
- **Utilities = “Public Service Corporations”**
- **Public Service Corporations - all corporations other than municipal, engaged in furnishing energy or water; collecting or disposing of sewage**
- **ACC regulates over 350 water companies serving an estimated 400,000 customers in the state.**
- **Today, the ACC continues to issue decisions that are rooted in the broad language of the Constitution and in the spirit of *Arizona Corp. Comm’n v. Woods* and the early cases affirming its position as the exclusive regulator of public service corporations in Arizona.**



Ratemaking

“A REASONABLE RATE IS NOT ONE ASCERTAINED SOLELY FROM CONSIDERING THE BEARING OF FACTS UPON THE PROFITS OF THE CORPORATION. THE EFFECT OF THE RATE UPON PERSONS TO WHOM SERVICES ARE RENDERED IS AS DEEP A CONCERN IN THE FIXING THEREOF AS IS THE EFFECT UPON THE STOCKHOLDERS.”

Arizona Cmty. Action Ass’n v. Arizona Corp. Comm., 123 Ariz. 228, 231, 599 P.2d 184, 187 (1979).



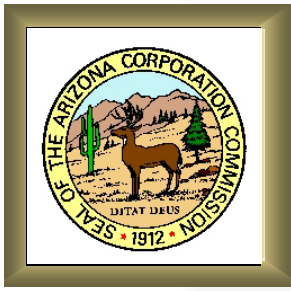
**APPROXIMATE LOCATIONS OF WATER COMPANIES
REGULATED BY THE CORPORATION COMMISSION**

STATE OF ARIZONA



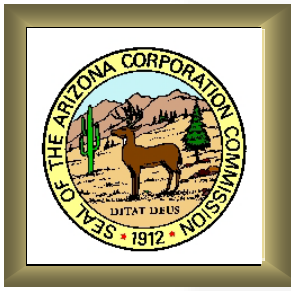
Orders Preliminary

- For decades, the practice of the Commission has been to issue conditional CC&N's, granting the CC&N, conditioned upon the water company's fulfillment of a series of requirements that can be met after the CC&N is issued to the company.
- Developers have favored this form of CC&N because it allows them to proceed with construction and implementation of a water company while the company works on fulfilling the conditions.
- The Commission has begun to question the usefulness of the conditional CC&N, at least in cases involving water companies outside Active Management Areas.



Orders Preliminary

- **A seldom utilized form of CC&N, Orders Preliminary are authorized under ARS § 40-282(D) .**
- **In moving toward the issuance of Orders Preliminary outside AMAs, the Commission was attempting to avoid situations in which it granted a water company a CC&N allowing it to begin serving customers, and later found that the company had failed to meet the conditions for the CC&N.**
- **In August, 2006 the Commission directed Staff to begin using Orders Preliminary as a matter of standard practice when preparing recommendations on all new CC&N applications and CC&N extensions outside the state's AMAs .**



Orders Preliminary

- **Using Orders Preliminary, the Commission can outline conditions to be met by companies that are specific to the needs and particular concerns of the service area in question.**
- **The Orders Preliminary can be used to require a company to prove that it has demonstrated to third party agencies that it has secured an adequate or assured water supply, as required by the Arizona Department of Water Resources (ADWR), or an Approval to Construct, as required by the Arizona Department of Environmental Quality (ADEQ).**



Orders Preliminary

- **The practical effect of using Orders Preliminary is that while construction of a given subdivision may be delayed during the time that it takes a developer to obtain the permits called for by the Order Preliminary, the Commission will have assured that the new water company in question has actually proven that it has an adequate or assured water supply, an approval to construct, and has obtained the necessary county franchise permit, prior to serving customers.**



Orders Preliminary

- **The consequence of this decision for the internal operations of the Commission is that most if not all of the Recommended Opinion and Orders (ROOs) in cases involving new CC&N requests and CC&N extensions in areas outside AMAs that come before the Commission for our final vote, will come to us in the form of an Order Preliminary.**
- **This will create a bifurcated licensing process: The Commission will issue an Order Preliminary; Companies will then meet the conditions; once these conditions are met, the Commission will issue a CC&N.**



Integrated Water & Wastewater Companies

- **In recent cases, a majority of Commissioners have voiced their view that new subdivisions should be served by an integrated water and wastewater company in order to achieve economies of scale, encourage conservation efforts, and facilitate the use of effluent for golf course irrigation, ornamental lakes and other ornamental features.**
- **One of these cases involved a clash between the Arizona Water Company (AWC), a stand-alone water utility, and a competing entity that proposed to serve the area in question with an integrated water and wastewater operation.**



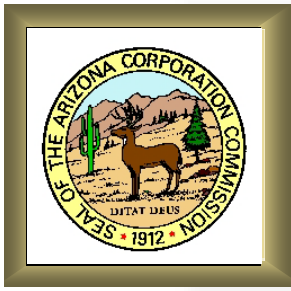
Integrated Water & Wastewater Companies

- In the Woodruff Water decision, the Commission was presented with a choice between two water companies wanting to serve a 3,200 acre parcel called Sandia in a fast growing area of Pinal County.
- The Commission awarded the CC&N to Woodruff Water and Sewer Companies over Arizona Water, in part finding that Woodruff was superior because it would use effluent for the proposed golf course in the planned development generated from its planned wastewater treatment facility.
- During the hearing in the matter, the Company testified that their integrated approach to wastewater and water was “strategic” from the standpoint of the Company’s ability to facilitate and oversee a 20-year build out of the development, and that it would allow it to implement a water re-use program that it called “essential” to the project.



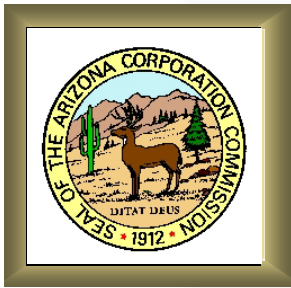
Integrated Water & Wastewater Companies

- **The decision was heavily influenced by the question of whether the CC&N should be granted to an entity capable of utilizing effluent, and, in the end, the Commission concluded that “The benefits of developing and operating integrated water and wastewater utilities in this instance outweigh the economies imputed to AWC’s larger scale.”**
- **During the Open Meeting at which the Commission approved the Woodruff CC&N, the company’s attorney told the Commissioners that the developer, and water company which had agreed to voluntarily postpone construction of two golf courses until such time as effluent was made available from build-out of second phase of the development.**



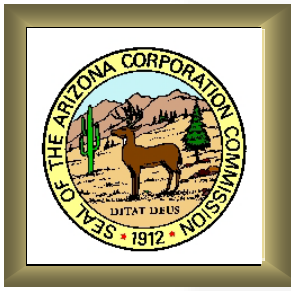
Integrated Water & Wastewater Companies

- **It seems apparent that, at least for the moment, Companies that are competing for the right to serve some of the state's fastest growing areas are advantaged when they present an integrated approach to the Commission, allowing the body the opportunity to mandate the use of effluent from the moment of the service area's creation.**



Effluent

- **In recent orders, the ACC has ordered water companies to use effluent on their system for certain projects.**
- **The general language adopted by the ACC:**
 - The Commission has become increasingly concerned about the prolonged drought in Central Arizona. While the Company has stated that its development project will not include any parks, recreation areas, golf courses, green belts, ornamental lakes or other water features, the Commission remains concerned that any future changes to these plans could result in the use of groundwater for these purposes. We believe that in light of the ongoing need to conserve groundwater, the company should be prohibited, in accordance with its stated plans, from selling groundwater for the purpose of irrigating any golf courses within the certificated area or any ornamental lakes or water features located in the common areas of the proposed new developments within the certificated area.”



Effluent

- **What other policies should the ACC adopt to encourage better use of effluent?**
- **Some companies are pro-actively working on ways to better use and incorporate effluent into their planning.**
 - Global Water in Pinal County
- **One particular development outside of Prescott still uses groundwater to water their golf course because development hasn't come about as quickly as anticipated.**



Effluent

- **Perkins Mountain Utility Company (SW-20379A-05-0489, W-20380A-05-0490)**
 - Amendments were proposed which would have required Perkins to file tariff which would require the use of purple pipe which would bring effluent to the home site for outdoor uses.
 - At hearing it came to light that the planned golf course eliminated any purple pipe installation because there would be insufficient effluent for both projects, as the golf course would utilize all available effluent.



Effluent

- **How should the ACC work with companies that don't provide wastewater service?**
- **Given the current drought in AZ, should there be a blanket prohibition on using groundwater for golf courses, ornamental lakes & irrigation?**
 - DWR has requirements/regulations for the use of effluent in AMA's.
 - The Commission has begun conditioning approval of a water company on assurances that groundwater won't be used for golf courses and other ornamental features.



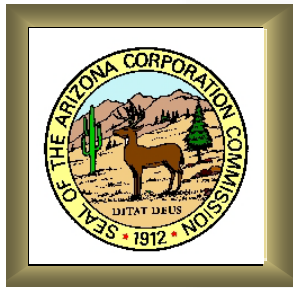
Best Management Practices

- **Best Management Practices (BMPs) encourage conservation through distinct practices such as low flow showerheads, low flush toilets, mandatory xeriscape.**
- **Adoption of BMPs is required within AMA areas, however, the Commission has required companies outside AMAs to adopt BMPs as part of their rate and CC&N applications.**
- **BMPs are being adopted inside and outside AMA's and before 2010 (now).**



Recent Cases

- **Sahuarita**
 - Order required that Sahuarita Water Company implement by 12/31/2009 at least five more Best Management Practices than would otherwise be required for a water company its size
- **Wickenburg Ranch**
 - Order required at least 10 Best Management Practices
 - Amendment required installation of a rain catchment system
 - Another amendment mandated xeriscape in front yards
- **Perkins Mountain**
 - Order required adoption of at least 10 Best Management Practices
 - Company agreed to implement xeriscape in front yards.
- **Double Diamond**
 - Order required adoption of four additional Best Management Practices



Consolidation of Distressed Water Companies

- **Most of the 400 water companies the ACC regulates are small companies**
 - We have few large companies such as Arizona-American, Arizona Water, Global
- **What policies can the ACC enact in order to consolidate the small companies into larger systems?**
- **Benefits:**
 - Rate increases – like for arsenic – can be spread across more customers
 - Infrastructure costs
 - Simplified billing



Consolidation of Distressed Water Companies

- **The implementation of conservation programs is far from the priority at most of the state's troubled water companies.**
- **Rather, some of these companies lack the resources or the management to make conservation a priority.**
- **The only long-term hope for conservation measures at these companies is likely to be their consolidation into other larger utilities.**



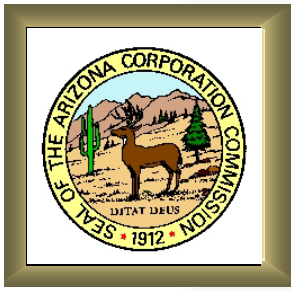
Consolidation of Distressed Water Companies

- To date, rate premiums and acquisition adjustments have not been formally blessed by the Commission via either a rulemaking or policy statement.
- There are no known instances of the Commission allowing a rate premium, and the Commission has turned down proposed acquisition adjustments on several occasions.
- Since the 1993 Water Task Force report was issued, the Commission has only approved an acquisition adjustment once, in a case involving the acquisition by a Class A utility of a small distressed company in southeastern Arizona.



Consolidation of Distressed Water Companies

- Acquisition adjustments and rate premiums hold promise for use when the Commission desires to encourage the consolidation of small, troubled water companies.
- Strengthening the two dozen or so small water companies that currently find themselves on the financial ropes would dramatically improve the opportunities for implementing water conservation programs and conservation measures at those companies.
- The Commission should first endeavor to identify those water companies it believes are the likeliest targets for consolidation.
- It should then establish a policy statement informing the water company community that acquisition adjustments and rate premiums will be considered in cases where the conditions laid out by Staff in the 1999 Water Task Force are met.



Federal Stimulus Funds

- **Federal Economic Recovery Package includes over \$7 billion through USDA, Clean Water Act and Safe Drinking Water Act State Revolving Funds**
- **In Arizona, the Water Infrastructure Financing Authority (“WIFA”) will be administering over \$81 million dollars.**
- **Safe Drinking Water Act allocation exceeds \$26 million.**

Tiered Rates



- **Goal is to encourage conservation**
- **Set the tiers so a breaking point is below the median or average usage – depending on the system (Not all systems have tiered rates)**
- **Three or two tiers**
- **GENERAL rule of thumb**
 - For a high usage system set the top of the second tier below the average or median usage
 - For low usage system set the bottom of the second tier below the average or median usage



Tiered Rates

- **The ACC has adopted tiered rates in most recent rate cases, regardless of the size of the system**
 - Chaparral City
 - Arizona Water (Western System)
 - Arizona Water (Eastern System)
 - Arizona-American Water (ex., Tubac & Anthem)



Chaparral City Water Company

Monthly Usage Charge

<u>Meter Size</u>	<u>Charge</u>
3/4"	\$13.60
1"	\$22.70
1.5"	\$45.40
2"	\$73.00
3"	\$146.00
4"	\$227.00
6"	\$454.00
8"	\$730.00
10"	\$1,043.00
12"	\$1,980.00



Chaparral City Water Company

● Commodity Rates (per 1,000 Gallons)

¾" Residential

1,000-3,000 Gallons:	\$1.68
3,001-9,000 Gallons:	\$2.52
Over 9,000 Gallons:	\$3.03

¾" Commercial & Industrial

1,000-9,000 Gallons:	\$2.52
Over 9,000 Gallons:	\$3.03

2" Meter (Residential, Commercial & Industrial)

From 1,000-100,000 Gallons:	\$2.52
Over 100,000 Gallons:	\$3.03



Arizona Water Company

● BISBEE SYSTEM

Monthly Bill:	Minimum:	\$ 16.32	for	5/8" x 3/4"	meter	
		43.78	"	1"	"	"
		141.06	"	2"	"	"
		267.25	"	3"	"	"
		477.98	"	4"	"	"
		662.53	"	6"	"	"
		891.27	"	8"	"	"
		1200.36	"	10"	"	"
Commodity Rate:	\$.2594	per 100 gallons for 0 to 10,000 gallons				
	\$.3242	per 100 gallons for 10,001 to 25,000 gallons				
	\$.3890	per 100 gallons for gallons in excess of 25,000 gallons				

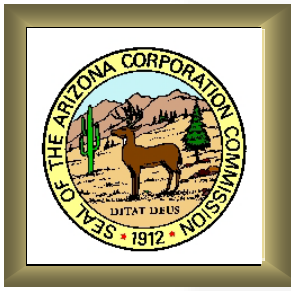


Arizona Water Company

● APACHE JUNCTION

Monthly Bill:	Minimum: \$	12.54	for	5/8" x 3/4"	meter
		34.30	"	1"	"
		120.20	"	2"	"
		236.03	"	3"	"
		480.25	"	4"	"
		774.01	"	6"	"
		926.15	"	8"	"
		1157.69	"	10"	"

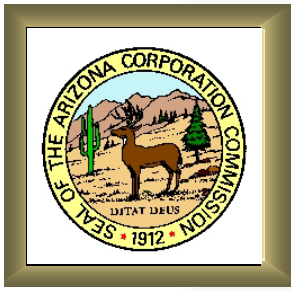
Commodity Rate: \$.19688	per 100 gallons	for 0 to 10,000 gallons
\$.24610	per 100 gallons	for 10,001 to 25,000 gallons
\$.29532	per 100 gallons	for gallons in excess of 25,000 gallons



Arizona-American Water Anthem Water District

Monthly Usage Charge

<u>Meter Size</u>	<u>Charge</u>
3/4"	\$15.00
1"	\$26.42
1.5"	\$60.78
2"	\$79.29
3"	\$151.97
4"	\$375.00
6"	\$1,200.00
8"	\$1,725.00



Arizona-American Water Anthem Water District

● Commodity Rates

3/4" Residential

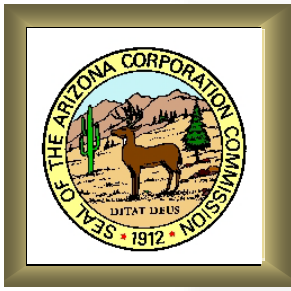
1,000-4,000 Gallons:	\$1.13
4,001-18,000 Gallons:	\$1.70
Over 18,001 Gallons:	\$2.04

3/4" Commercial

1,000-18,000 Gallons:	\$1.70
Over 18,001 Gallons:	\$2.04

2" Meter (Residential, Commercial & Industrial)

From 1,000-175,000 Gallons:	\$1.70
Over 175,001 Gallons:	\$2.04



Arizona-American Water Tubac Water District

Monthly Usage Charge

<u>Meter Size</u>	<u>Charge</u>
3/4"	\$19.68
1"	\$29.63
1.5"	\$59.26
2"	\$97.49
3"	\$115.65
4"	\$169.18
6"	\$231.30
8"	\$1,577.08



Arizona-American Water Tubac Water District

● Commodity Rates

3/4" Residential

1,000-4,000 Gallons:	\$1.89
4,001-20,000 Gallons:	\$2.85
Over 20,001 Gallons:	\$3.41

3/4" Commercial

1,000-20,000 Gallons:	\$2.85
Over 20,001 Gallons:	\$3.41

2" Meter (Residential, Commercial & Industrial)

From 1,000-150,000 Gallons:	\$2.85
Over 150,001 Gallons:	\$3.41



Curtailment Tariffs

- **Not originally developed for drought - although are extremely useful in time of drought**
- **Originally developed to allow water companies to deal with emergencies, e.g., lightning striking a well or a truck crashing into a storage tank**
- **The tariff allows companies to respond to emergencies (a decrease in production) in a timely manner**
- **Without a curtailment tariff a company would need to seek an order from the ACC, a process that could take weeks**
- **With a curtailment tariff a company can respond in a matter of hours**
- **The first step is a call from the company to ACC Consumer Services, after which the company can notify its customer and implement curtailment measures**

TARIFF SCHEDULE

Utility: _____
Docket No.: _____
Phone No.: _____

Tariff Sheet No.: **Page 1 of 4**
Decision No.: _____
Effective: _____

CURTAILMENT PLAN FOR

(Template 063004)

ADEQ Public Water System No: _____

_____ (“Company”), is authorized to curtail water service to all customers within its certificated area under the terms and conditions listed in this tariff.

This curtailment plan shall become part of the Arizona Department of Environmental Quality Emergency Operations Plan for the Company.

The Company shall notify its customers of this new tariff as part of its next regularly scheduled billing after the effective date of the tariff or no later than sixty (60) days after the effective date of the tariff.

The Company shall provide a copy of the curtailment tariff to any customer, upon request.

Stage 1 Exists When:

Company is able to maintain water storage in the system at 100 percent of capacity and there are no known problems with its well production or water storage in the system.

Restrictions: Under Stage 1, Company is deemed to be operating normally and no curtailment is necessary.

Notice Requirements: Under Stage 1, no notice is necessary.

Stage 2 Exists When:

- a. **Company’s water storage or well production has been less than 80 percent of capacity for at least 48 consecutive hours, and**
- b. **Company has identified issues such as a steadily declining water table, increased draw down threatening pump operations, or poor water production, creating a reasonable belief the Company will be unable to meet anticipated water demand on a sustained basis.**

Restrictions: Under Stage 2, the Company may request the customers to voluntarily employ water conservation measures to reduce water consumption by approximately 50 percent. Outside watering should be limited to essential water, dividing outside watering on some uniform basis (such as even and odd days) and eliminating outside watering on weekends and holidays.

TARIFF SCHEDULE

Utility: _____
Docket No.: _____
Phone No.: _____

Tariff Sheet No.: _____ Page 2 of 4
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Notice Requirements: Under Stage 2, the Company is required to notify customers by delivering written notice door to door at each service address, or by United States first class mail to the billing address or, at the Company's option, both. Such notice shall notify the customers of the general nature of the problem and the need to conserve water.

Stage 3 Exists When:

- a. Company's total water storage or well production has been less than 50 percent of capacity for at least 24 consecutive hours, and
- b. Company has identified issues such as a steadily declining water table, increased draw down threatening pump operations, or poor water production, creating a reasonable belief the Company will be unable to meet anticipated water demand on a sustained basis.

Restrictions : Under Stage 3, Company shall request the customers to voluntarily employ water conservation measures to reduce daily consumption by approximately 50 percent. All outside watering should be eliminated, except livestock, and indoor water conservation techniques should be employed whenever possible. Standpipe service shall be suspended.

Notice Requirements:

1. Company is required to notify customers by delivering written notice to each service address, or by United States first class mail to the billing address or, at the Company's option, both. Such Notice shall notify the customers of the general nature of the problem and the need to conserve water.
2. Beginning with Stage 3, Company shall post at least ____ signs showing the curtailment stage. Signs shall be posted at noticeable locations, like at the well sites and at the entrance to major subdivisions served by the Company.
3. Company shall notify the Consumer Services Section of the Utilities Division of the Corporation Commission at least 12 hours prior to entering Stage 3.

Once Stage 3 has been reached, the Company must begin to augment the supply of water by either hauling or through an emergency interconnect with an approved water supply in an attempt to maintain the curtailment at a level no higher than Stage 3 until a permanent solution has been implemented.

TARIFF SCHEDULE

Utility: _____
Docket No.: _____
Phone No.: _____

Tariff Sheet No.: _____ Page 3 of 4
Decision No.: _____
Effective: _____

Stage 4 Exists When:

- a. Company's total water storage or well production has been less than 25 percent of capacity for at least 12 consecutive hours, and
- b. Company has identified issues such as a steadily declining water table, increased draw down threatening pump operations, or poor water production, creating a reasonable belief the Company will be unable to meet anticipated water demand on a sustained basis.

Restrictions: Under Stage 4, Company shall inform the customers of a mandatory restriction to employ water conservation measures to reduce daily consumption. Failure to comply will result in customer disconnection. The following uses of water shall be prohibited:

- Irrigation of outdoor lawns, trees, shrubs, or any plant life is prohibited
- Washing of any vehicle is prohibited
- The use of water for dust control or any outdoor cleaning uses is prohibited
- The use of drip or misting systems of any kind is prohibited
- The filling of any swimming pool, spas, fountains or ornamental pools is prohibited
- The use of construction water is prohibited
- Restaurant patrons shall be served water only upon request
- Any other water intensive activity is prohibited

The Company's operation of its standpipe service is prohibited. The addition of new service lines and meter installations is prohibited.

Notice Requirements:

1. Company is required to notify customers by delivering written notice to each service address, or by United States first class mail to the billing address or, at the Company's option, both. Such notice shall notify the customers of the general nature of the problem and the need to conserve water.
2. Company shall post at least _____ signs showing curtailment stage. Signs shall be posted at noticeable locations, like at the well sites and at the entrance to major subdivisions served by the Company.
3. Company shall notify the Consumer Services Section of the Utilities Division of the Corporation Commission at least 12 hours prior to entering Stage 4.

TARIFF SCHEDULE

Utility: _____
Docket No.: _____
Phone No.: _____

Tariff Sheet No.: **Page 4 of 4** _____
Decision No.: _____
Effective: _____

Customers who fail to comply with the above restrictions will be given a written notice to end all outdoor use. Failure to comply within two (2) working days of receipt of the notice will result in temporary loss of service until an agreement can be made to end unauthorized use of outdoor water. To restore service, the customer shall be required to pay all authorized reconnection fees. If a customer believes he/she has been disconnected in error, the customer may contact the Commission's Consumer Services Section at 1-800-222-7000 to initiate an investigation.

Once Stage 4 has been reached, the Company must augment the supply of water by hauling or through an emergency interconnect from an approved supply or must otherwise provide emergency drinking water for its customers until a permanent solution has been implemented.



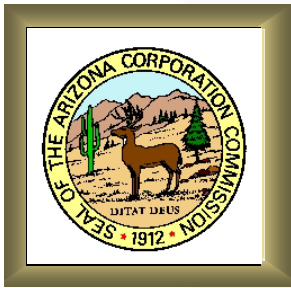
ADWR Conservation & Ratemaking

- **Water companies have long argued that they cannot implement conservation programs because they are unable to obtain rate relief from the Commission for their conservation efforts.**
- **The Commission has never been asked for rate recovery of these programs, and Commission Staff have made it clear that they would be receptive to filings from Companies seeking to recover in rates the costs of implementing conservation programs, in particular those designed to satisfy ADWR's new rulemaking.**
- **The Commission should continue to make it clear that it is ready to facilitate conservation efforts by water companies, especially those programs that are necessary to meet DWR's new rules.**



ADWR Conservation & Ratemaking

- **The Commission should notify water companies that they can file tariff applications with the Commission that are designed to implement conservation programs.**
- **For example, these tariffs could be designed to allow water companies to carry out conservation measures in the same way municipalities do.**
- **Such water company tariffs could condition service on the installation of low flow toilets, low flow shower heads, or minimal or zero usage of groundwater for outdoor irrigation.**
- **The Commission could adopt these tariffs as part of rate cases, CC&N applications or CC&N extensions.**



Moratoriums

- **In recent years, the Commission has been among the few Arizona governmental entities to implement a comprehensive hook-up moratorium on a water system.**
- **The duration of a moratorium may be for months or years – depending on the company’s ability to restore existing wells to meet capacity or to find another water source**
- **2 recent examples:**
 - Pine Water
 - McLain Water Systems
 - Proposed moratorium on the Desert Hills Water Company

Pine Water



- **The water systems in Pine and the surrounding area have experienced water shortages for over a decade**
- **In Decision No. 59753 (1996) the ACC limited the Pine system to one residential connection per month with a complete moratorium on new main extensions**
- **In Decision No. 64400 (2002) the ACC modified the moratorium to allow the company to add up to 25 new service connections per month and to allow the company to enter into main extension agreements provided that the developer could contribute a certain minimum quality of water to the water company. This change was due to the completion of Project Magnolia, a pipeline that brings water from the system in Strawberry to Pine**
- **In Decision No. 67823, the Commission imposed a total moratorium on new commercial hook-ups and two residential hook-ups per month.**



McLain Water

- **Decision No. 68272, the ACC ordered a moratorium on new hook-ups on the McLain water systems in Cochise County.**
- **The multiple McLain water systems had been neglected by its owner for decades and came to a head last year with numerous lengthy outages.**
- **The ACC hook-up moratorium order will be in place until numerous repairs on the system are complete**

The seal of the Arizona Corporation Commission is circular, featuring a landscape with a deer, a cactus, and mountains. The text around the border reads "SEAL OF THE ARIZONA CORPORATION COMMISSION" and "1912". The motto "LITAT DEUS" is at the bottom.

Blue-Ribbon Panel on Water Sustainability

- **Hope for the Blue Ribbon Panel**
 - Support conservation efforts at other agencies.
 - Examine what has been done and what remains to be done,
 - Develop an “Arizona Water Action Plan” as a precursor to updating Arizona’s Groundwater Management Act which has not been updated in 30 years.
 - Examine the water/energy nexus: What can be done to limit the amount of water used to produce electricity and the amount of electricity used to pump/deliver water.



Water-Energy Nexus

- Recent projects proposed for Arizona will deploy photovoltaic or Solar Thermal technologies
- Water usage by solar facilities is closely scrutinized by the Commission and state agencies



Solar Water Use



- **Important to focus on technology and underlying land usage; water usage depends on technology chosen.**
- **According to a Department of Energy Report, a wet-cooled Solar Thermal plant can require up to 800 gal/MWh; with dry-cooling this can be reduced to 80 gal/MWh.**
 - Coal plant uses 500 gal/MWh
 - Nuclear plant uses 620 gal/MWH
- **Photovoltaic and wind plants use 1 gallon/MWh.**



Solar-Water Nexus

- **Last month broached the topic of adopting dry or hybridized cooling technologies.**
 - Commission may move forward with a Notice of Inquiry inviting stakeholder feedback on the issue and potentially establishing a schedule for requiring these technologies.
 - Utility resource plans acknowledge the eventuality of adopting these technologies; issue is one of timing.



Arizona Public Service Johnson Utilities Project in Queen Creek

1.0 MW



Other Issues

- **Need for greater cooperation between agencies with responsibility for regulating water companies.**
- **Infrastructure costs – let growth pay for growth.**



Conclusion

Any Questions?