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David C. Roberts
Associate General Manager, Water Resources
PAB232 | P.O. Box 52025
Phoenix, AZ 85072-2025
P: (602) 236-2343 | C: (602) 818-7747
Email: Dave.Roberts@srpnet.com

August 2, 2019

(Via E-mail and First Class Mail)

Ms. Einav Henenson
AMA Director
Arizona Department of Water Resources
1110 W. Washington St.
Phoenix, AZ 85007

Re: Comments on the Phoenix AMA Fourth Management Plan Draft

Dear Ms. Henenson:

Formed in 1903, Salt River Project (SRP) is Arizona's first federal reclamation project and the metropolitan area's largest provider of water, delivering about 800,000 acre-feet annually to municipal, industrial, and agricultural water users. SRP is also a community-based, not-for-profit public power utility and the largest provider of electricity in the greater Phoenix metropolitan area, serving more than 1 million customers. We exist to serve our water shareholders, power customers, and community partners. Reliably managing and delivering water and power for our customers is at the core of everything we do.

As a new member of the Phoenix AMA Groundwater Users' Advisory Council (GUAC), I appreciated Natalie Mast's presentation on the status of the fourth and fifth management plans for the Phoenix AMA at the July GUAC meeting. I have worked with my staff to review the draft of the fourth management plan and we have compiled the attached questions and detailed comments for your consideration. We appreciate the opportunity to review the draft plan and provide feedback.

On the whole, the draft plan is an impressive document that maintains ADWR's record of producing quality data and policy analysis. Of particular note, it is encouraging to see that significant progress towards safe-yield has been made since the first management plan, based on the data reported in the plan. The progress achieved toward safe-yield is the result of prudent policies and collective action by members of all water using sectors. Taking the overdraft data from Table 3-8 shows that the rolling average annual overdraft from 1985 through 2017 is just under 38,000 acre-feet/year (see attached graph). This is quite remarkable considering that it is less than 2% of current total annual water use in the AMA – an impressive achievement for the water users in the Phoenix AMA and for the Department.

As we approach 2025, one of the major issues raised by the draft plan is how best to refine the safe-yield definition. As noted in the plan, the goal of the Phoenix AMA is to achieve and maintain

a “long-term balance” between the annual amount of groundwater withdrawals and natural and artificial recharge in an active management area. How exactly to define “long-term” and how to incorporate it into the assessment of safe-yield is an open question. We suggest that ADWR consider measuring safe yield across the historic period of natural variability in surface water supplies available to the Phoenix AMA, which we know from the historical records kept by SRP and tree ring research conducted by the University of Arizona for the Salt River and Verde River watershed approaches 50 to 60 years.

The benefit of a long-term average approach is that it captures the natural variability in available surface water supplies and its effect on groundwater use and natural recharge, and more accurately shows the long-term impact of both wet and dry cycles. Using a shorter period than the natural variability of surface water supplies could give a false assessment of safe-yield, depending on whether the shorter period is during a wet or dry cycle. SRP is keenly interested in this topic and would welcome the opportunity to work with ADWR and other stakeholders on developing an approach for assessing the AMA’s progress towards a long-term, safe-yield balance.

My staff and I also spent time reviewing the agricultural, municipal and industrial chapters of the draft plan. SRP is one of the few entities in the Phoenix AMA with a direct interest in the regulations in each of these three chapters. Some of our direct water delivery customers are agricultural water users and subject to the proposed changes to the water duty calculation. Our understanding is that ADWR is proposing to reduce the highest 25% of the water duties in the Base Program by 10%. We have received a list of the Irrigation Grandfathered Rights subject to the water duty reduction and are reviewing past water use by these direct delivery customers to assess the impact of the water duty change. The impact to SRP customers is unknown at this time, so we are unable to comment specifically. We would like to have the opportunity to provide ADWR with additional feedback once our analysis is complete.

As a large untreated water provider, SRP is also subject to requirements in the municipal chapter. Our understanding is that none of the regulations that pertain to large untreated providers are changing from the third management plan. However, as the cities who deliver treated SRP water to SRP’s shareholders are subject to changes elsewhere in the municipal chapter, we have also reviewed them. We were pleased to see a continued emphasis on increasing conservation requirements, while maintaining regulatory flexibility. We did provide some suggestions for minor changes to the municipal chapter in the attached comments.

Finally, the industrial chapter addresses industries SRP delivers water to, such as turf-related facilities, as well as water use at power plants. In 2018, SRP provided 26,273 acre-feet water to 171 turf-related facilities, including golf courses, schools, parks, and cemeteries. The proposed reduction in the water duty for turf-related facilities could have significant impacts for our customers. We have a number of questions about the proposed requirements set forth in the draft plan. For example, what advancement in conservation technology, or facility management did ADWR base the proposed reduction of 4.9 af/ac to 4.6 af/ac? Has ADWR evaluated how many facilities are currently using more than 4.6 af/ac? What changes will turf facilities need to make to achieve 4.6 af/ac? At what cost? Does ADWR have the staff expertise to assist water users in achieving this new standard? We are currently reviewing the ability of our customers with turf-



related facilities to meet a conservation allotment based on 4.6 af/ac. We would like to have the opportunity to provide ADWR with additional feedback once our analysis is complete.

Power plant water use regulations are also within the industrial chapter. SRP operates four natural gas power plants in the Phoenix AMA: Agua Fria, Kyrene, Santan and Mesquite. These plants currently use water from a variety of sources, including groundwater, Salt and Verde River water, and recovered CAP water. SRP has made a commitment to reduce total water use for all power generation by 20% by the year 2035. Additionally, SRP has also committed to eliminating the use of groundwater for power generation at our plants within both the Phoenix and Pinal AMAs by the year 2035. After reviewing the section on power plant water use, we are not clear on the meaning of and purpose for the definitional and organizational changes to the power plant regulations, specifically the shift from regulating pre- and post-1984 power plants to steam electric and combustion electric power plants. Three of our four Phoenix AMA plants include combined cycle units, where steam turbines and combustion electric units are combined for maximum efficiency. It isn't clear how the new regulatory structure in the fourth management plan applies to these types of units. We have also included questions regarding waivers for 100% reuse and water quality monitoring requirements. We look forward to your response to our questions in this important area for SRP's business.

While we appreciate and support ADWR's plans for promulgating the fourth management plan, it is also important that all stakeholders are given adequate time to review the proposed changes and provide input. Our review of the effect of the regulatory changes in the fourth management plan is ongoing. We would like to reserve our right to provide additional comments should the need arise. Please do not hesitate to contact me, or my staff, if you have any questions. Additionally, we would welcome the opportunity to meet with ADWR staff to discuss our comments and questions. We look forward to working with ADWR on completion of this important regulatory instrument.

Sincerely,

Christa McJunkin on behalf of

David C. Roberts

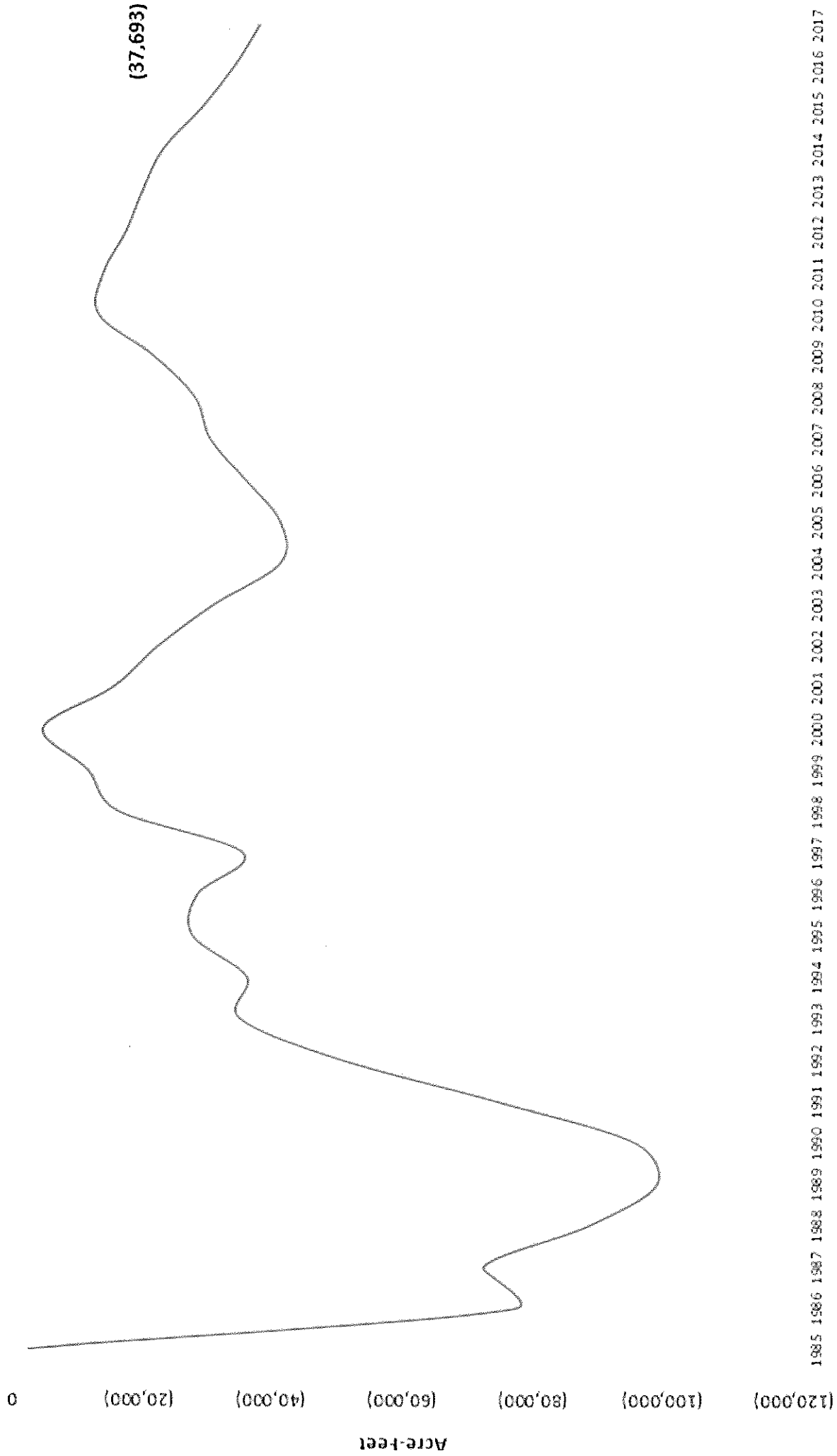
Attachments

cc: Anthony Beckham
Christa McJunkin



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Phoenix AMA Overdraft Rolling Average, 1985 to 2017



Overdraft (Table 3-8)

Salt River Project Comments on Fourth Management Plan
8/2/2019

Chapter 1—Introduction			
Page #	Section #	Paragraph #	Comment
1-2	1.2	4	We suggest including an explanation of the term “consistency with management goal” in order to explain the connection between the AWS rules and achievement of the AMA goal.
1-2	1.2	4	The various programs of the GMA work together to encourage use of renewable water supplies instead of groundwater (Plan A). Since renewable supplies are the primary way most demand served under the Assured Water Supply program meet this requirement, we suggest listing it first. If renewable supplies are not available, but sufficient groundwater is physically available, then joining the CAGR D meets the goal requirement (Plan B).
1-2	1.2	5	We suggest explaining that when a DAWS or CAWS is issued, ADWR establishes the <u>beginning balance</u> for the groundwater allowance, so it is clear that the original groundwater allowance is a one-time “bucket” and not an annual allowance.
1-2	1.2	5	The last two sentences could be simplified to: “For a CAWS or a new DAWS in the PhxAMA, the beginning balance of the groundwater allowance is reduced over time, to zero in 2025.”
1-3	1.2	7	Seems like an odd place for this paragraph. The paragraph refers to groundwater use outside of the AWS program. Perhaps it should be located elsewhere. Also, comparing the % of groundwater used in 1985 to 2017 may not tell the whole story. The overall growth in demand is a huge factor, as well.
1-4	1.4		This section should probably mention the Army Corps of Engineers and the Maricopa Flood Control District.

Chapter 2—Hydrology			
Page #	Section #	Paragraph #	Comment
2-1	2.1	2	The statements about effluent throughout the document should be consistent. For example, in this section there is no mention of the significant amount of reclaimed wastewater going to Palo Verde, but it is mentioned in other chapters. Including Palo Verde in this section would show that effluent isn’t an underutilized supply in the AMA.
2-1	2.1	3	Consider mentioning that sections of the lower Salt and Verde within the AMA are perennial.
2-1	2.1	4	“Reclaimed” water is written as “eclaimed”.
2-1	2.1	4	Report discussed specific canals. We would recommend adding canals to Figure 2-1.
2-2; 2-3	2.2	2	The recent 23 year drought (1996 – present) has, by some measures, been the worst drought in the entire historical and paleo record. We recommend that you add mention of the recent 23 year drought when talking about extensive droughts in the 3 rd sentence.
2-3	2.3	1	We recommend replacing the 7th sentence with: “In order to maintain resiliency in meeting demand, groundwater pumping is used to supplement surface water supplies as storage levels decrease.”

Chapter 2—Hydrology			
Page #	Section #	Paragraph #	Comment
2-3	2.3	1	The ninth sentence might understate the amount of recharge that can occur when the reservoirs are spilling. As an example, in 2005 approximately 1,000,000 acre-feet of water was spilled from the Verde reservoirs, but only 500,000 acre-feet made it to Painted Rock Dam. We recommend that the sentence be modified to acknowledge that the amount of water recharged in the AMA from a spill event is dependent on the duration and volume of water spilled.
2-4	2.3.1	2	Our information shows the Verde watershed is approximately 6,625 square miles. We recommend the 7,000 square mile reference be changed to say 'approximately 6,600 square miles of central Arizona'.
2-4	2.3.1	3	When listing the dams of the Salt River Project within the text, we recommend that CC Cragin be added. This would be consistent with Table 2-1 and relevant since water from Cragin can be diverted and delivered to the AMA.
2-5	2.3.1	1	Diversion volumes from 1913 to 1997 were discussed in the report. We recommend that this reference be updated to include data through 2018 or 2019.
2-5	2.3.1	4	Roosevelt Dam was raised 77 feet. This raise increased Roosevelt's capacity to ~1.6 million AF of conservation storage and ~3.4 million AF of total storage (which includes flood control and Safety of Dam storage). We recommend the 2 nd sentence on the page be modified to reflect these values.
2-5	2.3.1	4	The last two sentences on the page mention that the additional storage capacity of Roosevelt is divided between Phoenix, Mesa, Chandler, Scottsdale, Tempe, and Glendale. These cities actually split the New Conservation Space (NCS) which is only a portion of the additional Roosevelt capacity. We recommend you update the sentences to reflect this.
2-9	2.4	1	Figure 2-3 shows Water Level Elevations in 1900. We suggest that arrows be added to this map to show flow directions.
2-10	2.4	1	Figure 2-4 shows water level change in 2000-2014. Since water level sweeps were completed in 2017, we suggest that this figure be updated with 2017 water levels. Using 2015 water level data might also be appropriate since that would be consistent to data shown on Figure 2-5.
2-11	2.4	1	Figure 2-5 shows water level elevations in 2015. We recommend that arrows be added to this map to show groundwater flow directions. Furthermore, we recommend that data from the Rainbow Valley area be included in the figure.
2-12	2.4	1	Figure 2-6 shows the depth to water in 2014. We recommend that the data in the figure be updated to be consistent with figures 2-4 and 2-5. We also recommend that data from Rainbow Valley be included.
2-13	2.4.1	1	The Report discusses the hydrogeologic units within the basin-fill sediments in the East SRV Sub-basin. We recommend that this Section also reference the more recent Arizona Geological Survey study of the basin margin, 'Subsurface Hydrogeology Investigation of the Superstition

Chapter 2—Hydrology			
Page #	Section #	Paragraph #	Comment
			Vistas Planning Area, Maricopa and Pinal Counties, Arizona, Report, prepared by the Arizona Geological Survey, University of Arizona, dated July 2017, funded in part by a grant from the ADWR Water Management Assistance Program.
2-13	2.4.1	3	The report referred to Figure 2-4 (2000-2014), but the text only discussed water level conditions up to 1998. We suggest that the discussion be updated to match the data presented on Figure 2-4
2-13	2.4.1	4	The report referred to Figure 2-5 (2015) and Figure 2-6 (2014), but the text only discussed water level conditions up to 1998. We suggest that the discussion be updated to reflect the data presented in the figures.
2-14	2.4.2	4	The report referred to Figure 2-5 (2015) and Figure 2-6 (2014), but the text only discussed water level conditions up to 1998. We suggest that the discussion be updated to reflect the data presented in the figures.
2-15	2.4.2.1	3	The Report states that high salinity in the groundwater in the water logged area has been somewhat mitigated by the influx of treated wastewater in certain areas. We suggest that the supporting evidence to this statement be included in the report.
2-15	2.4.3	2	The report referred to Figure 2-5 (2015), but only discussed water level conditions up to 1998. We suggest that the report discussions be revised to match the data shown on Figure 2-5.
2-16	2.4.4	3	The report referred to Figure 2-5 (2015), but no water level data is shown on Figure 2-5 for Rainbow Valley. We suggest that either the figure reference or the report discussion be revised to address the discrepancy.
2-17	2.4.5	4	Water levels up to 1998 are discussed. We suggest that current water level data be included and discussed in the report.
2-18	2.4.6	5	Water levels in 1998 are discussed, but the section refers to Figure 2-6 which includes water levels in 2014. We suggest the discussion be revised to reference the more current water level data in Figure 2-6.
2-18	2.4.7	4	Water levels up to 1998 are discussed, but the section refers to Figure 2-4 which includes water levels from 2000-2014. We suggest that the discussion be revised to reference the more current water level data in Figure 2-4.
2-19	2.5	Table 2-2	<p>Table 2-2 would benefit from an appendix that explained each column in detail, including methodology and data sources.</p> <p>How is Ag Recharge Calculated and why did it peak in 2000? What is the reasoning for lagging ag recharge?</p> <p>For mountain front and groundwater inflow, it seems that there may be more inter-year fluctuations from cones of depression and annual variances in hydrology, among other factors. We suggest ADWR consider a methodology that does not hold these values as constants.</p> <p>Stream recharge in Table 2-2 seems high for non-wet years (1989, 1990) and low for wet years (1992, 1993, 1995, 2005 and 2010). Canal Seepage</p>

Chapter 2—Hydrology			
Page #	Section #	Paragraph #	Comment
			<p>seems much higher than simulated in SRV Model 2009. Agricultural recharge seems lower than simulated in SRV model 2009. We would suggest these figures be reviewed and any unexpected data points be explained in the discussion.</p> <p>“Riparian Transpiration (GW)” is shown as a discharge of groundwater. From our perspective, riparian plants do not draw upon groundwater supplies, but rather they intercept surface water or subflow that would have otherwise contributed to “Natural Recharge—Stream Channel.” We suggest ADWR add an explanation of how stream channel recharge is estimated to ensure that Riparian Transpiration isn’t being counted as a subtraction twice.</p> <p>Table 2-2 aims at showing net natural recharge, but includes human caused additions and subtractions, such as canal seepage, ag recharge, and groundwater withdrawals. Perhaps Table 2-2 should include only the natural sources of additions and subtractions to the AMA water balance to arrive at the net natural recharge. The net natural recharge would then be an input to Table 3-8.</p>
2-20	2.6	2	AMA-wide water level sweeps were completed in 2008 and 2017. Would it be possible for 2017 water levels be used on all related water level maps to show current water level conditions?
2-21	2.6.1	1	Report indicates that groundwater storage is estimated by SRV model. How was groundwater storage estimated for the areas outside the SRV model (Hassayampa and Lake Pleasant)?
2-23	2.7	8	Appears to be a typo on the Figure number. Figure 2.2 should be changed to Figure 2-7.
2-25	2.9.2	1	Appears to be a typo on Section Number. Section 2.9.2 should be changed to 2.8.2.
25	2.9.3	1	Appears to be a typo on Section Number. Section 2.9.3 should be changed to 2.8.3.

Chapter 3—Water Demands & Supply			
Page #	Section #	Paragraph #	Comment
3-17	3.3	3	2 nd sentence discusses the impact of flood flow on estimated stream-channel recharge and correctly references 1993 as an illustration of the effect of massive flooding (more than 4 MAF spilled into the Salt River below Granite Reef Dam), but Figure 3-6 doesn’t match the text. We suggest that Figure 3-6 be revised to match the text.
3-17	3.3	3	The last sentence states that Table 3-8 and Table 2-2 don’t match because Table 3-8 includes “incidental recharge from human activities, cuts to the aquifer, canal seepage, and CAGRDR replenishment, while Table 2-2 does not.” Are the tables supposed to match? Also, it is unclear why including incidental recharge, net natural recharge, cuts to the aquifer,

Chapter 3—Water Demands & Supply			
Page #	Section #	Paragraph #	Comment
			<p>CAGR D Replenishment, and canal seepage would make offsets to groundwater pumping lower than total natural recharge in Table 2-2. This seems inaccurate for two reasons:</p> <ol style="list-style-type: none"> 1. If Table 3-8 included these additional off-sets to groundwater withdrawals, wouldn't the overdraft shown in Table 3-8 be smaller than what is shown in Table 2-2? 2. Table 2-2 does have columns for incidental recharge from human activities (Ag Recharge) and canal seepage. <p>Perhaps it would be better for Table 2-2 to focus only on natural additions and subtractions from the AMA, with the resulting "Net Natural Recharge" acting as an input to Table 3-8, which would then serve as the AMA water balance.</p>
3-18	3.3	Table 3-6	Table 3-8 would benefit from an appendix that explained each column in detail, including methodology and data sources.

Chapter 5—Municipal			
Page #	Section #	Paragraph #	Comment
5-9	5.3.1.3	1	Instead of only limiting new turf-related facilities to a maximum of 90 acres, perhaps it would be better to factor in the percentage of turf areas compared to the overall size of the facility.
5-10	5.3.1.5	1	We suggest adding "main" web page.
5-10	5.3.1.5	2	We suggest adding "online tools".
5-47		1.1 – 1.3	We suggest including additional points if co-branded with another entity showing a consistent water conservation message and collaboration.
5-47		1.1 – 1.4	Appear to be points missing for the BMP's listed.
5-47		2.3	We suggest adding hyphens to "low-water-use landscaping" and "low-water-use".
5-48		2.1 – 3.2	Appear to be points missing for the BMP's listed.
5-48		2.3	We suggest including an email option with links for notifications instead of mail.
5-49		3.3, 3.6 – 3.7	Appear to be points missing for the BMP's listed.
5-50		3.8	Appear to be points missing for the BMP's listed.
5-51		5.1	We suggest adding hyphens to "low-water-use landscaping" and "low-water-use".
5-51		5.3	We suggest that the EPA WaterSense standards be adopted.
5-51		5.7	We suggest adding hyphens to "low-water-use landscaping" and "low-water-use".
5-51		5.10	We suggest that the EPA WaterSense standards be adopted.
5-52		6.1	We suggest that the EPA WaterSense standards be adopted.
5-52		6.2	We suggest that the EPA WaterSense standards be adopted.

Chapter 5—Municipal			
Page #	Section #	Paragraph #	Comment
5-53		6.7	Seems redundant to list both “replacing turf with xeriscape” and “converting a high-water use landscape to a low water use landscape.” We suggest simplifying this section.
5-53		6.8	We suggest ADWR consider removing this incentive. If the home comes with front yard landscape included, most of the time it’s xeriscape and an additional incentive is not needed.

Chapter 6—Industrial			
Page #	Section #	Paragraph #	Comment
6-12	6.2.26	Table 6-2	Given that the primary objective of the management plan is achievement of safe-yield, it would be most effective to make comparisons between sectors and within sectors based on total groundwater use. Doing so makes it easier to determine the opportunities for improvements that will have the greatest impact on safe-yield achievement. For example, given that the vast majority of power plant water use in the Phoenix AMA is renewable supplies, a reduction in total power plant water use by 10% wouldn’t contribute as much towards safe-yield as a 10% reduction in remaining groundwater use.
6-14	6.3.2.1		Reducing the base allotment for turf-related facilities from a water duty of 4.9 af/ac to 4.6 af/ac could present a problem for existing facilities. What advancement in conservation technology or facility management did ADWR base this reduction upon? Has ADWR evaluated how many facilities are currently using more than 4.6 af/ac? What changes will turf facilities need to make to achieve 4.6 af/ac? At what cost? Does ADWR have the staff expertise to assist water users in achieving this new standard?
6-46	6.9	Definitions #2 and #13	The Large Scale Power Plant category in the 3MP has been changed to Steam Electric Power Plant and Combustion Electric Power Plant. Most of SRP’s Phoenix AMA power plants use both steam and combustion technologies (Combined Cycle). How do these sections apply to a power plant that uses both steam and combustion technologies (Combined Cycle)?
6-50	6-908.B.1		“...in any year in which the beneficial reuse exceeds the conservation requirement” is unclear. We would suggest ADWR add an additional explanation of this exemption, in part to answer questions such as, <ul style="list-style-type: none"> • Is this section different from the reuse waiver allowed in the 3MP? • How does the power plant demonstrate meeting the 6-908.B.1 requirement? • Is there an annual application for a waiver required?
6-51 – 6-53	6-909	A1 a-e	6-909.A.1.a, b, c “of each cooling tower at the facility” <ul style="list-style-type: none"> • Does this apply to all towers regardless of makeup water source type?

Chapter 6—Industrial			
Page #	Section #	Paragraph #	Comment
			<p>6-909.A.1.e.iii <i>“weighted average concentration of total dissolved solids or other... for each month” “determined by direct analysis” or “calculated based on average monthly electrical conductivity if... conditions have been met”</i></p> <ul style="list-style-type: none"> Does this indicate that continuous monitoring is required in order to obtain a weighted average per month?

Chapter 8—Underground Water Storage, Savings, and Replenishment			
Page #	Section #	Paragraph #	Comment
8-3	8.2.3	3	Total USF and GSF delivery does not match the total included on Table 8-2. We suggest the text or the table be revised to match.
8-10	8.2.3	4	We suggest ADWR consider including a table summarizing historic USF and GSF storage by water type (CAP, Effluent, and Surface Water).
8-12	8.3	1	There appears to be a typo on the Section Number in the last sentence. There is no Section 2.9 should be Chapter 2, Section <u>2.8</u> .
8-17	8.3.2	1-4	We suggest adding a reference to the substantial reuse of reclaimed water at Palo Verde Nuclear Generating Station.
8-18	8.3.4	1	Plan 6 was more than a means to develop reservoir facilities for storing CAP water. That was one goal. A second important goal was addressing design upgrades needed after the Safety of Dams evaluation of facilities. We suggest adding this information to the first sentence for a complete picture of the purpose of Plan 6.
8-27	8.5.1.4	3	We suggest ADWR consider including some of the stakeholder input collected through the RPAG process in the “Advice to the AWBA,” particularly regarding the location of water storage in the AMA.

Chapter 9—Water Management Assistance			
Page #	Section #	Paragraph #	Comment
			Is the current funding and structure of the WMAP sufficient to assist water users meet the new requirements of the 4MP? ADWR should consider assessing the sufficiency of the WMAP and propose changes in the 4MP, if necessary.
			We suggest ADWR include a discussion of the other sources of assistance for water users (federal, local, etc.) in this section.

Chapter 10—Implementation			
Page #	Section #	Paragraph #	Comment
10-2	10.3.1	1	Have schools with turf facilities been able to obtain variances due to “compelling economic circumstances” in the past?

Chapter 10—Implementation			
Page #	Section #	Paragraph #	Comment
10-8	10.7.3	7	There is a reference to allowing the purchase and extinguishment of long-term storage credits as a way to offset conservation requirement violations. Where is this specified in the management plan? How does it work?
10-9	Appendix 10A	5	It would be helpful for Appendix 10A to include an explanation of how in lieu water use (GSF) is accounted for with regard to safe-yield and a clear explanation that not all water pumped from a well is accounted for as groundwater (i.e. recovery of stored renewable supplies).
10-10	1.b.	2	The management plan and the AWS rules should align when it comes to determining whether the use of a proposed source of water is consistent with the management goal. Certifying the use of a groundwater allowance as being consistent with the management goal of the AMA under the AWS rules, while counting that groundwater use against the AMA water balance for safe-yield is confusing. We would suggest that ADWR choose one approach or the other and make the necessary changes to the management plan or the AWS rules to implement it.
10-10	2.	1	From our perspective, evapotranspiration isn't a groundwater depletion because riparian plants do not draw upon groundwater supplies, but rather they intercept surface water or subflow that would have otherwise contributed to stream channel infiltration.
10-11	4.		The paragraph that begins "Not all water stored..." appears to be part of <u>4. Artificial Recharge</u> and should be indented.
10-11			The paragraph that begins "The volume of groundwater that can be..." should also address the need to formalize the manner in which safe-yield may be measured over the long-term. Appendix 10A should include ADWR's recommendation on how to incorporate the long-term view into the assessment of the AMA water balance.
10-12		1	It would be helpful if the section on stacking explicitly addressed whether and/or how the management plan requirements apply to water users who use zero groundwater.
10-13		1	Many water users rely upon the management plans for explanations of water regulations and policies. The section on volumetric accounting should include a discussion of exceptions based on delivery of water in a comingled system based on water rights. For example, certain SRP lands are entitled to certain water supplies based on their water rights. Most of the water SRP delivers is from a common, comingled supply, but deliveries to each SRP shareholder are accounted for based on their particular water rights, not a pro rata percentage of the total supply composition. There is a similar exception for wells with multiple users. Any number of water withdrawal authorities can be placed on a single well, including the recovery of long-term storage credits. While the physical supply produced by the well is homogenous, each recipient of water from the well is entitled to a certain type of water based on their particular water right.

Chapter 11—Water Management Strategy			
Page #	Section #	Paragraph #	Comment
11-1	11.2	1	This paragraph references moving into a “drier future.” This is a simplistic view of climate change. A Phoenix AMA-specific analysis has shown that likely climate change scenarios will include higher highs (more streamflow) along with lower lows (less streamflow). Policies that allow water users to plan for both circumstances are needed. We would suggest that a better description is that the future will be more variable, not necessarily, or only, drier.
11-1	11.2.2	1	We suggest customizing the references to CAP use to the Phoenix AMA instead of the state of Arizona.
11-3	11.2.3	Industrial Sector	We believe PVNGS isn’t an example of the effect of regulatory incentives, but actually a wise use of effluent from the beginning. Construction actually began in 1976 prior to the Groundwater Code.
11-4	11.2.3	Industrial Sector	Given that the primary objective of the management plan is achievement of safe-yield, it would be most effective to make comparisons between sectors and within sectors based on total groundwater use. Doing so makes it easier to determine the opportunities for improvements that will have the greatest impact on safe-yield achievement. For example, given that the vast majority of power plant water use in the Phoenix AMA is renewable supplies, a reduction in total power plant water use by 10% wouldn’t contribute as much towards safe-yield as a 10% reduction in remaining groundwater use.
11-4	11.2.3	Groundwater Allowance & AWS Program	When identifying “Water Management Challenges” related to the “Groundwater Allowance & AWS Program,” ADWR should consider identifying issues relating to the CAGR, such as limitations on suitable supplies for replenishment and the inability for the CAGR to limit enrollment.
11-5	11.2.3		<p>“Water Management Challenges” should also include:</p> <ul style="list-style-type: none"> • General Stream Adjudication <ul style="list-style-type: none"> • Lack of effective water rights administration • Complicated process for S&T • Water Supply Augmentation Challenges <ul style="list-style-type: none"> • Limited unused renewable supplies • Need for more infrastructure
11-5	11.2.4		ADWR’s current permitting process unfortunately acts as a limitation on underground storage. Shifting to an “applicant at-risk” permitting process would be an improvement and an action item that could be identified in the 4MP.
11-5	11.2.5		Comment applies throughout: “Treated Effluent” is redundant. Effluent is treated wastewater.
11-5	11.2.5		Effluent quality and the concentration of salts from source water is an increasing concern for effluent reuse. While not a fatal flaw, it can present a challenge for effluent reuse planning. We suggest including this factor in the discussion of maximizing effluent use.

Chapter 11—Water Management Strategy			
Page #	Section #	Paragraph #	Comment
11-8	11.3.1	Industrial Sector	What unused Colorado River water or effluent is there for use by industrial subsectors in the future? If this isn't a reference to unused water, what circumstance will arise to make this water available for industrial use in the future? We have moved into a new era of water resource management since the 3MP. Nearly all CAP water is contracted for and nearly all effluent in the AMA is currently being reused, recharged, or discharged for habitat conservation. We suggest these new conditions be acknowledged in the Phoenix AMA water management strategy.
11-9	11.3.2	Augmentation Solutions	This is an excellent list of needs or opportunities for action, but doesn't truly include any actionable solutions. This section would be improved if these concepts were refined into actual policy proposals, so they could be implemented as part of the 4MP. If not, what will ADWR rely upon as the vehicle for implementing any of these solutions if not the management plan itself?