

	Commenter Key
AACD	Arkansas Association of Conservation Districts
ACA	Agricultural Council of Arkansas
ACC	Arkansas Canoe Club
ADEQ	Arkansas Department of Environmental Quality
AFB	Arkansas Farm Bureau
AGFC	Arkansas Game and Fish Commission
ANHC	Arkansas Natural Heritage Commission
APPP	Arkansas Public Policy Panel
ARF	Arkansas Rice Federation
ARRC	Arkansas Red River Commission
AWC	Arkansas Waterways Commission
AWF	Arkansas Wildlife Federation
Bryan	Andy Bryan
Bunge	Bunge North America
BWD	Beaver Water District
Carman	Dennis Carman
CARTER	Greg Carter, P.E.
Cloyd	Michael S Cloyd
Cooke	Sam Cooke
Drake	Jackie Drake
Ducks	Ducks Unlimited
Filipek	Steve Filipek
FLEA	Friends of Lake Erling Association
FNFWR	Friends of the North Fork and White Rivers
Gould	Dr. Ken Gould
Harris	Tammy Harris
NWAC	Northwest Arkansas Agricultural Council
RICE	Riceland
Stewart	Jack Stewart
TNC	The Nature Conservancy
Tyson	Tyson Foods, Inc.
UCWCB	Union County Water Conservation Board
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
Wellford	Lin Wellford

Well Metering		
Commenter (see Commenter Key)	Comment	Response
AACD	AACD would not support any action which impacts property rights regarding land use or water rights. Every effort should be made to secure stakeholder input, fully investigate all water conservation options and support a variety of incentive based voluntary efforts.	Revised to recommend voluntary metering
AACD	Metering of water wells should be voluntary. However, incentive programs should be made available to the districts to encourage voluntary metering of water wells such as cost share on the installation of flow meters, supplies and tax credits, etc.	Revised to recommend voluntary metering
ACA	We strongly oppose the proposed language to seek authority to condemn wells that do not install meters. This in effect amounts to mandated metering, which we oppose. The plan should not include any mandates.	Revised to recommend voluntary metering
ACA	The Water Plan should not impede, or suggest regulation or laws that would impede, on private property rights, including land use and water use rights. We strongly oppose any proposal that would authorize new policies for restricting water use or allow for condemnation of private wells.	Revised to recommend voluntary metering
AFB	We are also supportive of voluntary efforts such as the above proposed metering program with the exception of the Commission having condemnation authority. Arkansas has been nationally recognized as having the model water-use registration program by which all other states are judged. This program in conjunction with the USDA-NASS data and UofA Division of agriculture research has provided a significant amount of data related to water use. While there is always room for improvement, extreme measures such as condemnation are unnecessary to improve the accuracy of water use reporting to sufficiently satisfy the Commission's goals related to increasing the accuracy of and confidence in its water-use registration program. The voluntary metering program will serve as a means to validate the existing Water User Database (WUDB). Many leaders in the agriculture community have already indicated an interest in and willingness to participate in a metering program. Farm Bureau is ready to assist the Commission in identifying willing participants.	Revised to recommend voluntary metering
ARF-5	In the issue described as "water levels in aquifers are declining", it says ANRC will seek authority to condemn sites for meter installation. The use of condemnation authority for water meters is way out of line. It is contrary to the cooperative approach and the recommendations farmers have brought to this process. We strongly oppose any use of condemnation authority for water meters, and encourage a voluntary approach.	Revised to recommend voluntary metering
RICE	To our knowledge, this language was not presented in public meetings to allow stakeholders an opportunity to voice their opinions. Riceland strongly opposes this language and recommends a voluntary program, funded by the ANRC, for producers who wish to allow ANRC to install meters and to read them on their farms.	Revised to recommend voluntary metering
RICE-1	The final version of the 2014 AWP should not advocate imply or suggest any laws, policies or regulations that diminish private property rights, restrict water use on private property, or allow for condemnation of private water infrastructure.	Revised to recommend voluntary metering
WIMPY	The Commenters support the voluntary placement (i.e. lease or purchase) of meters on selected alluvial wells, but remain opposed to any attempt of or reference to any authority by the ANRC to "condemn sites for meter installation."	Revised to recommend voluntary metering

Groundwater Recovery Areas

Committer (see Committer Key)	Comment	Response
UCWCB	The Union County Water Conservation Board (UCWCB) submitted a DRAFT resolution encouraging the Commission to collaborate with the UCWCB to establish a mechanism and language recognizing aquifer recovery, and by which an area may be re-designated with the existing Board retaining all incentives, rights and authorities granted Critical Groundwater Conservation Boards under the Critical Groundwater Conservation Act 1050 of 1999 to continue protecting its groundwater.	Added to Conjunctive Water Use Issue Implementation Plan

Excess Surface Water Definition

Commenter (see Commenter Key)	Comment	Response
ACA	We believe the implementation plan should also explicitly offer support for the Grand Prairie Irrigation Project and the Bayou Meto Irrigation Project. It should also study additional future surface water projects of similar size and scale for collection, storage and distribution.	Sections 3.1 and 3.3 support completion of the Grand Prairie and Bayou Meto Projects
ACA	3.3 Excess Water for Nonriparian Withdrawal and Use Priority Issue: We believe that any adjustment to available excess surface water should be above the current 25 percent. The amount available, if changed, should be made clear. We support the 1990 Water Plan's suggested increase to 75 percent of excess water. Any change in this should continue to require legislation. We do not support the proposal to depart from the Arkansas Method without substantial scientific proof of need to depart, ample discussion from affected parties, and review and approval from the general assembly. The Arkansas Agriculture Department and Arkansas Natural Resources Commission should consult in any discussion or study to adjust available excess surface water or adjust flow regimes. The General Assembly should maintain its authority over any proposed changes to methods measuring or determining flow regimes and available excess surface water.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
ACA	The Water Plan should make additional surface water available for agricultural purposes by increasing the amount of excess surface water available to nonriparian users. The Water Plan should not establish new methods for measuring stream flows and establishing allocations without justifiable scientific data, public input, and legislative approval.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
ACC	Before removing the 25% rule a sound scientific and stakeholder driven process must be performed that determines the maximum amount of water available to water users while maintaining the health of the stream or river. This is what was agreed to in the stakeholder process. Changing the rule before the science is complete undermines the trust ANRC gained through the stakeholder process and will create greater uncertainty and conflict between water users.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
ADEQ	Section 3.3 Recommendation and Implementation Plan: The recommendation (#1) and implementation (#2) both propose removing the 25% limitation on excess water available for nonriparian withdrawals. The 25% limitation governing the maximum amount of water allocated to nonriparian withdrawals should remain in law as a limit on nonriparian withdrawals until a more appropriate scientifically-based and stakeholder engaged process is initiated and finalized. This approach will ensure appropriate protection of instream aquatic life uses until the most appropriate allocation is derived.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.

Excess Surface Water Definition

AFB	The Bouef-Tensas Basin Study should be funded such that planning for the development, utilization and conservation of water and related land resources can be completed. The US Secretary of Agriculture should expand ongoing investigations and coordinate through the Natural Resources Conservation Service to develop a multi-purpose flood control and comprehensive agricultural water supply plan, including but not limited to a canal system for Chicot, Desha, Ashley, Drew, Lincoln, and Jefferson counties in Southeast Arkansas.	Section 3.3 supports additional funding for water development projects; specific projects should be promoted by the Regional Planning Groups
AFB	While there may not be a strict scientific basis for the 25% limitation, it is commonly accepted engineering design practice to apply a safety factor based on the confidence level in the data used to perform calculations. A 25% limitation is essentially the same thing as a safety factor of 4 which is extremely conservative. More commonly applied engineering factors of safety are 1.1 to 2.0 depending on the type of design being performed. These factors of safety essentially equate to limitations of 59% to 77%. It has been almost 25 years since the last AWP update. During that time flow data collection, the accuracy of the data collected, and our understanding of hydrology have significantly improved. The permitting of excess surface water used by non-riparians has also been improved to better account for the number of users and volumes permitted. These improvements have significantly increased the level of confidence that can be placed on available supplies and instream needs. The Commission should be very confident in increasing the amount of excess surface water available for use from 25% to 75%. This was also a recommendation made in the 1990 AWP.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
AGFC	The Commission believes that changing the statutory definition of "excess water" to remove the existing 25% restriction for non-riparian landowners should be considered only after completion of a thorough review of the technical and administrative components of governing how excess water is calculated and promulgated for nonriparian permitting. Arkansas has a diverse and rich biodiversity, and flow regimes that are necessary to sustain a healthy stream in one area of the state may not be appropriate in other regions of the state. Water allocation determinations should be transparent and based on best available science that recognizes the diversity of Arkansas's stream types and ecological conditions. Additionally, the Commission believes that maintaining the existing 25% limitation will expedite making science-based determinations of excess waters in a water body and avoid unintended destruction of riparian rights.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.

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ANHC	<p>Section 3.3 Recommendations: Removing the 25% restriction on Excess Water did not emerge from the Regional Workgroup process as a priority recommendation. What did emerge was a negotiated, informed consent between Fish&Wildlife/Recreation and Agriculture to conduct a third-party scientific investigation into the most appropriate method(s) for determining the instream flow needs. Furthermore, the Arkansas Method was to remain for determining the fish and wildlife component of instream flow until a scientifically-based and stakeholder engaged process determines otherwise. We feel it is important to remain genuine to the stakeholder process that was used to this point and NOT add a rule-making component that did not emerge from this process. Before removing the 25% rule the maximum amount of water allocated to water users and maintenance of stream health must be assessed using a scientifically sound and stakeholder driven process. Additionally, this aspect of the Arkansas Water Plan was agreed upon during the stakeholder process, but is not reflected in the Final Draft.</p>	<p>Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.</p>
APPP	<p>Before removing the 25% rule a sound scientific and stakeholder driven process must be performed that determines the maximum amount of water available to water users while maintaining the health of the stream or river. This is what was agreed to in the stakeholder process. Changing the rule before the science is complete undermines the trust ANRC gained through the stakeholder process and will create greater uncertainty and conflict between water users.</p>	<p>Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.</p>
ARF	<p>The Water Plan should support water development projects that encourage surface water usage from: 1) large irrigation projects from existing waterways (Ex: Bayou Meto Irrigation District); 2) on-farm collection systems ; 3) existing water reservoirs; 4) storage and distribution systems.</p>	<p>The recommendations in Sections 3.1, 3.2 and 3.3 encourage surface water use</p>
ARF	<p>We believe that because of the water development projects mentioned above, and in order to fulfill the purpose of such projects as well as other similar water development projects, the Water Plan should recommend that additional surface water be used for agriculture-related purposes by increasing the level of surface water available to non-riparian users. The Water Plan should not attempt to impose new or modified measurement methods for stream flows and water allotments without strong scientific and other technical facts, data, information and input from lawmakers and the public, adequate and appropriate consideration of the real and quantifiable costs and benefits associated with implementation of any such methodology, and a demonstration that any such new or modified methodology would result in significant, quantifiable net economic benefits.</p>	<p>Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.</p>

Excess Surface Water Definition

ARF	In order to clarify the ambiguous language found in the 2014 Draft Executive Summary regarding the definition of excess surface water, the Rice Federation offers the following edit. Remove the following language found in page 13: "Remove the 25 percent limitation for estimating excess water available for nonriparian transfer and conduct scientific studies ..." Replace with the following language: "Increase the limitation from 25 percent to 75 percent for estimating excess water available for nonriparian transfer. Conduct scientific studies..."	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
ARRC	The ARRC recommends that the Southwest Arkansas WRPR section of the Arkansas Water Plan include the proposal of a state funded feasibility study. The study would determine the excess water available, the economic development potential for the stated benefits and identify if there are additional beneficial uses. Options should be investigated for use of the excess water for regional use, transfer potential to other state regions and interstate transfers.	Section 3.3 supports additional funding for water development projects; specific projects should be promoted by the Regional Planning Groups
AWF	In the last water plan and in language still spelled out in ANRC Title 3, water withdrawals by non-riparians are statutorily limited by the definition of excess surface water. Excess surface is defined as that amount of water above 25% of the average annual yield from any watershed. This 25% buffer protects riparian landowners, farmers, industrial users, recreationists (and the related economic gains) and fish and wildlife instream flows. The draft AWP's recommendation of removing the 25% rule in the definition of excess water and then working on a study to identify how much water should be reserved did not come out of the collaborative stakeholder process. Instead, in this "cart before the horse" model, farmers and other private landowners will not have this protection the 25% rule provides in the face of over-allocation of water. A better scenario and recommendation is to conduct a sound scientific and stakeholder driven process before any modification of the 25% rule is done so that the maximum amount of water that can be available from a stream or watershed is determined while still maintaining the health of the stream or river. And this is exactly what was agreed upon in the ANRC's stakeholder process which strengthens the trust and collaboration potential between ANRC and all the other agencies, organizations and entities that worked for a year on this plan development.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
Bunge	Now, as part of the Water Plan, ANRC s considering removing the statutory 25% limit without analysis of how any such change will affect protected water needs and uses. Each stream where there is a minimum stream flow will be analyzed for its own requirements, including the protective level of available excess surface water and balanced needs. That process, however, does not justify a sudden shift scrapping the current standard because it may be replaced by a new one. There is no justification for setting aside all protective limits because a different limit maybe recommended upon further review.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.

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BWD	<p>Page 13, Section 3.3, Excess Water for Nonriparian Withdrawal and Use Priority Issue, item 1 under "Recommendations": This item directs the removal of the twenty-five percent (25%) limitation in A.C.A. § 15-22-304(b) on the transfer of excess surface water to nonriparians. Then it directs ANRC (inferred from the second sentence in this item) to conduct a scientific study (actually, multiple studies of the various basins and subbasins in the Water Resource Planning Regions) in consultation with the Arkansas Game and Fish Commission (AGFC) and the Arkansas Department of Environmental Quality (ADEQ). In order to provide for the protection of public drinking water, this item should be revised as follows; (1) replace the word "remove" with "Consider changes to" in regard to the 25% limitation, (2) specify the study is to be completed prior to consideration of changes to the 25% limitation, (3) require that the study incorporate conservative assumptions and cushions, (3) include the Arkansas Department of Health (ADH) as a collaborator on the study; and (4) include a formalized public participation, notice, and comment component in this process.</p>	<p>Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.</p>
BWD	<p>Page 13, Section 3.3, Excess Water for Nonriparian Withdrawal and Use Priority Issue, item 2 under "Implementation Plan": the first sentence should be revised as follows: "ANRC will consider proposing statutory changes regarding the 25 percent limitation on nonriparian withdrawals and will consider promulgating alternative proportions of water available for nonriparian withdrawal...." It is important for the protection of drinking water sources, among other water uses, that the current limitation governing the amount of water allocated to nonriparian withdrawals remain in the law until such time as a scientifically based, precautionary study process that involves stakeholders and the public has been initiated and completed. It is unnecessary and risks irreparable harm to remove the current protections before there is appropriate study and scientific justification for such a change that also supports any replacement standard.</p>	<p>Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.</p>
BWD	<p>Pages 54 and 55, Section 6.1.2, Surface Water Availability, under "Methodology and Approach": This subsection discusses how the amount of surface water available for use is quantified using the definition of "excess surface water" in ANRC Title 3. It notes that the "demands must be accounted for" include listed "Instream Flow Requirements." Interstate Compact flows were omitted from the listed Inflow Stream Requirements (see ANRC Title 3, § 301.3(R) and (W); but see A.C.A. § 15-22-304(b)(4). This subsection also notes that the "instream requirements" are estimated using the protocols in Appendix C and the future demands are estimated using the methods detailed in Appendix E. Again these appendices were not included with the Executive Summary so that they could be reviewed and commented upon. That opportunity should be provided.</p>	<p>The Water Availability Report (Appendix C) has been available on http://www.arwaterplan.arkansas.gov/ since January 2014 and the availability of the report was announced in the AWP Newsletter for January 2014.</p>

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BWD	The last paragraph in this subsection discusses the third part of the excess water calculations, computing the 25 percent of the flow that is "excess" to the demands....." This discussion fails to mention that, in addition to the twenty-five percent (25%) limit, A.C.A. § 15-22-304(e) places further numerical limits on the transfer of water in the White River Basin. That additional restriction should be included in the discussion and probably should also be included as a footnote to Figure 6-3, the "Surface Water Calculation Steps." The additional restriction is noted in the last paragraph on page 12 under Section 3.3, the Excess Water for Nonriparian Withdrawal and Use Priority Issue.	The restrictions on transfer of water in the White River Basin is noted in two locations in the final AWP 2014 Update: Section 3 and Section 6.
Cooke	In section 3.3, it is important that the currently adopted and statutorily defined twenty-five percent limitation on the transfer of excess water be allowed to remain in place until further science based studies are completed prior to implementation of a stakeholder involved risk based system established for determining in-stream flow needs.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
Ducks	Development of surface water use for crop irrigation and other water demands - The vast abundance of surface water in the state of Arkansas has drawn great attention as the substitute for groundwater demands. As the Summary demonstrates, there is an abundance of excess water available in all of the river basins in eastern Arkansas, but it is important to remember that this abundance is on an annual average basis. Demands on surface water vary seasonally and are usually the highest when stream flow is lowest. Nonetheless, much opportunity exists to augment groundwater withdrawals with surface water to meet crop irrigation needs. Ducks Unlimited supports the agricultural communities (including the rice industry) desires to complete the existing/ongoing surface development projects in eastern Arkansas. However, we caution that the development costs, although grand (Summary estimate \$500M for Grand Prairie Project), are but a portion of long-term operation and maintenance costs. Budgeting plans must include both development and long-term O&M for true benefits of these projects to be realized.	Refer to Appendix G for explanation of project cost estimates
Filipek	Before removing the 25% rule, a sound scientific and stakeholder driven process must be performed to determine the optimum amount of water available to water users while maintaining the health of a river.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
FLEA	Arkansas water policy should be to use surface water instead of ground water whenever possible.	The recommendations in Sections 3.1, 3.2 and 3.3 encourage surface water use

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FLEA	The amount of water allocated for transfer from a watershed should be determined on a case by case basis. The statewide 25% of excess cap currently in place does not allow for discretion.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
FNFWR	Retain the 25% limitation governing the maximum amount of water allocated to nonriparian withdrawals in the law until a more appropriate scientifically-based and stakeholder engaged process is initiated and finalized.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
Gould	By placing within parenthesis "(i.e., interbasin transfer)" immediately following "watershed," the sentence appears to equate watersheds with basins. The two terms are not equivalent, watersheds may exist within basins. In addition, strict traditional riparian doctrine may prohibit transport of water beyond the riparian tract, not outside the watershed.	Section 5.4 has been revised to reflect this comment
Gould	Re the ANRC proposing statutory changes to eliminate the 25% limitation on nonriparian withdrawals. Should note be made here or at another appropriate location that the absolute limitation on nonriparian withdrawals is set by case law. That is, that water cannot be transferred off the riparian owner's land (or at the most outside the watershed) if another riparian is harmed due to there being insufficient water in the stream to satisfy the needs of that other riparian. A statutory change to allow greater transfers of water to nonriparians probably would have to protect the rights of riparians under those circumstances. See, Harrell v. City of Conway, 224 Ark. 100, 271 S.W.2d 924 (1954) The Arkansas Supreme Court has indicated that, at least under some circumstances, the rights of riparians are vested rights that could not be constitutionally negated by either the court or, presumably, the legislature. See, e.g., Harris v. Brooks, 225 Ark. 436, 283 S.W.2d 129 (1955).	Footnote added in Section 3.5 to reflect this.
Rice	Riceland agrees with the Executive Summary's recognition that the 25 percent limitation for estimating excess water available for nonriparian transfer should be removed. We support the 1990 AWP's suggested increase to 75 percent of excess water. Without a definite increase recommendation concerning the definition of excess surface water, Riceland believes current environmental and conservation projects may be put on hold due to an increased level of uncertainty. Riceland also agrees that scientific studies and planning should begin with the East Arkansas Region, and legislative approval should be sought to change the definition of excess water. Riceland also agrees that the "Arkansas Method" should continue to be used in estimating the portion of the total available water needed to satisfy fish and wildlife flows needed in estimating excess water of nonriparian withdrawals and transfers.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.

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Stewart	<p>Because the analysis of available groundwater indicates that it will be inadequate to meet the demands in the delta and it appears that future solutions will likely include use of surface water above the excess level. Excess surface water is currently defined as 25 percent of the water in streams after several defined needs have been met, including instream flow needs. The calculation of these defined needs relies on the Arkansas Method to determine the instream flow portion. It is very important to use the best possible measurements of instream flow needs. It is further clear that increasing demands will be made on our surface water for out-of-stream uses. As a result of this increasing demands on our surface water for out-of-stream uses we must be sure that our calculations of instream flow needs are based on the best available science and techniques. It is not clear if the Water Plan takes makes use of the best available science in these calculations and Section 3.3 proposes removal of the 25% rule that governs the use of excess water in the state before a sound scientific process has determined the amount of excess water in the stream or river.</p>	<p>Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.</p>
TNC	<p>The results of the supply and demand studies conducted as part of the water plan update process show that there are only a few streams in the state, all in the eastern region, that may need to have the 25% rule removed or fully meet the needs projected by all users, including agriculture, out to the year 2050. Employing best management practices in water conservation will help in this region. If such practices are not enough, a variance from the 25% rules for just these few rivers will solve the increased need for surface water until the year 2050.</p>	<p>Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.</p>
USFWS	<p>We recommend that you continue to work with experts within state and federal agencies and from academia to develop and adopt such methodologies to better describe the requirements of fish and wildlife in Arkansas' river basins. Until such improved methodologies are incorporated into the process of determining "excess water", we recommend that the 25% limitation stay in place as a buffer to ensure that non-riparian diversions do not result in irreparable harm to the state's fish and wildlife resources.</p>	<p>Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.</p>
Wellford	<p>Also, I am concerned about what seems to be an arbitrary change in the amount of water that may be allowed to be taken from waterways. While some larger rivers may easily afford to have more flow syphoned off, others can not, and such decisions should be made stream by stream, not across the board. Until a study can be done to determine scientifically how much water can safely be taken from any waterway above the amount that has been established all these years, please consider keeping the 25% rule in place. It has worked well thus far, and tripling the amount seems both rash and reckless.</p>	<p>Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.</p>

Fish and Wildlife Flows

Commenter (see Commenter Key)	Comment	Response
ACA-10	The final two bullet points in the summary suggest that Arkansas should depart from the Arkansas Method. This was not the sentiment of the agriculture group not the bulk of the other stakeholders involved in the Water Plan stakeholder meetings. We strongly believe that the state should not depart from the current methodologies without substantial scientific proof of need to depart, ample discussion from affected parties, and review and approval from the general assembly.	Recommendations in Section 3.5 maintain the use of the Arkansas Method until studies are completed that will form the basis for defining instream flow needs.
ACC-4	Water quantity and water quality are inextricably connected and their relationship is complex. Healthy stream flows help maintain water quality while high quality water helps aquatic systems to function better in periods of low flow. The Arkansas State Water Plan should address quality and quantity together. Basin specific flow objectives should be created that produce rivers containing high quality water in healthy quantities.	Recommendations in Section 3.5 maintain the use of the Arkansas Method until studies are completed that will form the basis for defining instream flow needs.
AFB-4	This language is an overstatement of the need to evaluate alternative methods of determining minimum stream flows and excess surface water and is written as if the framework proposed by the Fish and Wildlife Flows Subgroup and the FWR Stakeholders has been accepted by the other stakeholder groups. The FWR Stakeholders may believe there is a "recognized need" but the Agriculture Stakeholders and other non-FWR Stakeholders are not so certain.	Recommendations in Section 3.5 maintain the use of the Arkansas Method until studies are completed that will form the basis for defining instream flow needs.
ANHC-5	Section 3.3 Implementation Plan: The Fish and Wildlife Flow Framework was a priority recommendation throughout the stakeholder process, yet is absent from the Final Draft of the Arkansas Water Plan. The Fish and Wildlife Flows sub-group had lengthy discussions about the Framework as a process for determining appropriate flows. All conversations from the regional workgroups throughout the rest of the stakeholder process were focused on recommendation of conducting a "scientific study" to determine the proportion of water needed to meet non-riparian needs in various basins. The study needs to include review and validation of the administrative process for determining instream flow needs and scientific components of fish and wildlife flows.	The Fish and Wildlife Framework is explicitly referenced in Sections 3.5 and 3.6.
Audubon-1	We encourage you to move quickly to act on these goals of improving the methods used to determine instream flow needs. It is clear that agricultural irrigation will continue to put increasing pressure on our surface water resources, and we could severely damage out valuable streams and floodplains if we do not have the best available information to use in our decision making.	Recommendations in Section 3.5 maintain the use of the Arkansas Method until studies are completed that will form the basis for defining instream flow needs.

Fish and Wildlife Flows

Audubon-2	<p>One of the improved stream flow needs calculation techniques that you should consider is the Ecological Limits of Hydrological Alteration assessment technology. This framework is data driven and incorporates the complexity of river systems in its calculations.</p>	<p>The Fish and Wildlife Framework for adopting alternative approaches to fish and wildlife flows is explicitly referenced in Sections 3.5 and 3.6.</p>
Barton-2	<p>2) Since the Arkansas Method is used to estimate a satisfactory flow to meet instream fish and wildlife demands, why is there not a good copy included with the Water Plan or a link to one? The Arkansas Academy of Science Archive has one that is fuzzy when magnified to read tables and maps. http://libinfo.uark.edu/aas/issues/1987v41/v41a12.pdf It might also be good to know if the success of using the Arkansas Method since implementation has been measured by the AGFC or others. If not, why not?</p>	<p>The Arkansas Academy of Science Archive is the publically available copy of the Filipek et al 1987 paper on the Arkansas Method.</p>
BWD-14	<p>Page 13, Section 3.3, Excess Surface Water for Nonriparian Withdrawal and Use Priority Issue, Item 1 under "Implementation Plan": The first sentence in this item should be changed to include ADH as a collaborator in the study along with ANRC, ADEQ, and AGFC. A new second sentence along the lines of the following should be added to item 1: "The study will utilize a precautionary approach and incorporate conservative assumptions."</p>	<p>This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties</p>
Filipek-3	<p>Basin specific flow objectives should be created that produce rivers containing high quality water in healthy quantities.</p>	<p>Recommendations in Section 3.5 maintain the use of the Arkansas Method until studies are completed that will form the basis for defining instream flow needs.</p>
FNFWR-3	<p>While managing water resources in a manner that will protect the ecological needs of fish and wildlife is recognized as a goal of the Arkansas Water Plan, Friends notes that water needed to maintain aquatic life uses is not separately addressed in the Key Findings related to Water Availability.</p>	<p>The surface water dedicated to maintaining fish and wildlife has been added to Section 2.2</p>
FNFWR-6	<p>Because water quantity and water quality are intertwined the AWP should address the issues together establishing basin specific flow objectives that produce rivers containing high quality rivers in health quantities.</p>	<p>Recommendations in Section 3.5 maintain the use of the Arkansas Method until studies are completed that will form the basis for defining instream flow needs.</p>

Fish and Wildlife Flows

Gould-3	In the document there are several references to the "Arkansas Method". For clarity, should a brief summary of the Arkansas Method be included at the first mention?	A reference citation for the Arkansas Method is included
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Drought Planning

Committer (see Commenter Key)	Comment	Response
AACD	The Water Plan should include AACD and conservation districts in the development of a drought contingency plan for water resource management with regards to livestock, row crop, and any aspect of the agriculture industry	This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties
ACA	We believe that agriculture should be heavily represented in the development or implementation of any drought contingency plan through stakeholder input and through participation by the Arkansas Agriculture Department. Agriculture should be the second highest priority behind public drinking water needs in drought scenarios.	This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties
AFB	While this section does list the Commission's regulations related to the allocation of water during times of shortage there is no discussion of the State's priorities related to reserved Uses and Allocatable Uses as defined by A.C.A. § 15-22-21 7. This statute lists agriculture as having the highest priority among the allocatable sources and behind only those considered "Reserved Uses."	The issue and recommendation calls for compliance with the cited statute
AFB	We are supportive of accurate reporting of both surface water and groundwater usage. If the following things are not already being done, the Commission should consider: 1) developing uniform standards or improving existing standards for water use reporting, 2) requiring and funding mandatory regular training for staff to ensure uniform implementation of water use reporting, 3) developing an electronic template for data collection, and 4) developing online water use data reporting.	The suggestions are included in Supporting Issue Water Use Reporting
AFB	Also, an issue that received little discussion during the stakeholder process was recharging aquifers using surface water. Studies have been performed in the past that determined costs to be prohibitive; however, aquifer recharge should not be dismissed as unfeasible without at least a basic evaluation. A cost benefit analysis of large scale surface water irrigation projects should also include aquifer recharge alternatives. Large surface water users in the Phoenix, Arizona, area, such as the Central Arizona Project and the Salt River Irrigation Project, are currently using surface water to recharge their aquifer. Similarly, the City of Wichita, Kansas, is using surface water from the Little Arkansas River to recharge the Equus Beds Aquifer.	Feasibility studies for aquifer recharge should be promoted by Regional Planning Groups

Drought Planning

AFB	Agricultural needs should also be given consideration as part of this evaluation. ARFB is supportive of releasing public impounded surface waters for use in critical areas should shortages develop in agriculture; however, ARFB also acknowledges that humanitarian life-sustaining needs, i.e. drinking water, should be the highest priority during times of shortage.	The cited uses for reservoir water are in the USACE guidance manual
AGFC	Drought contingency planning (Issue 3.2) should specifically include a recommendation to examine in-stream flows necessary to sustain fish and wildlife as a critical component when determining water allocation for riparian and non-riparian users within a basin. The Arkansas Game and Fish Commission supports full examination of both the economic effects and the natural resources at risk during times of water shortages.	Section 3.6 (formerly Section 3.2) has been revised to include such a statement
ANHC	The Constitutional and statutory state agencies whose mission is directly tied to water management during shortages and droughts should be explicitly identified as members of the DRTs, which should be the Arkansas Natural Resources Commission (ANRC), Arkansas Department of Environmental Quality (ADEQ), the Arkansas Game and Fish Commission (AGFC), and Department of Agriculture (DOA).	This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties
ANHC	Neither the Goals, Recommendations, or Implementation Plan sections include consideration of fish and wildlife for drought or shortage planning. The Final Draft of the Arkansas Water Plan did not contain a recommendation for identifying minimum flow requirements for each sector, which would include recreation and fish and wildlife. Consideration of fish and wildlife instream flows during shortages and droughts should be explicitly identified as a goal of the Drought Response Teams (DRTs).	Section 3.6 (formerly Section 3.2) has been revised to include consideration of fish and wildlife in drought contingency planning
ANHC	Natural Resources Recommendations -As challenges mount for landowners and communities related to environmental concerns, the conservation districts are the first line of defense. Through voluntary, incentive based programs, outreach and education, as well as having a position of trust with their landowners' conservation districts have provided assistance to landowners since 1937. Their mission is to improve soil health, enhance water quality and water usage and provide technical assistance to landowners for such issues as water quality impairment, threatened & endangered species, critical habitat designation, invasive species.	This statement was added in Section 3.9

Drought Planning

<p>APPP</p>	<p>Water quantity and water quality are inextricably connected and their relationship is complex. Healthy stream flows help maintain water quality while high quality water helps aquatic systems to function better in periods of low flow. The Arkansas State Water Plan should address quality and quantity together. Basin specific flow objectives should be created that produce rivers containing high quality water in healthy quantities.</p>	<p>Recommendations in Section 3.5 maintain the use of the Arkansas Method until studies are completed that will form the basis for defining instream flow needs.</p>
<p>BWD</p>	<p>These items touch on conservation practices to reduce water use. The listed practices focus on reducing domestic water use. While we agree that domestic water users should adopt conservation practices - especially in a time of drought - about eighty percent (80%) of the water use in Arkansas is for crop irrigation (see Executive Summary Section 2.1). Given the amounts of domestic versus agricultural water use projected, it will require roughly a twenty percent (20%) reduction in domestic water use to have the same impact as a one percent (1 %) reduction in agricultural use. The fact of the much larger water savings to be gained by reducing crop irrigation water use should be noted in this subsection.</p>	<p>Section 3.2 recommends water conservation practices for agriculture</p>
<p>BWD</p>	<p>The Executive Summary should include a clear and prominent statement that during periods of water shortage, public water systems have priority and a reserved water right while nonriparian users- including recipients of water from the types of water development projects supported by the Arkansas Water Plan update - are subordinate and this may mean that during periods of drought they receive no water and suffer economic loss. Similarly direct language should be utilized by ANRC in its nonriparian permitting program. A commitment to this could be included in the "Recommendations" and "Implementation Plan" subsections of Sections 3.2 and 3.3 of the Executive Summary.</p>	<p>State law and the AWP 2014 Update explicitly recognize the priority of drinking water</p>
<p>CARTER</p>	<p>Surface water modeling should be run under dry conditions, similar to the MERAS model for groundwater, to provide a more accurate estimation of the available water supply during drought when the system is stressed the most. I recommend using a 10 percentile year based on available USGS gauge data. I do realize that the surface water rules are based on ANRC Title 3 methodology. I also understand that the methodology has historically been effective in dividing up the available surface water and in determining the amount of available surface water. My concern is that with the desire to move irrigated agriculture from groundwater to surface water, the surface water system will become more highly stressed due to higher future demands, and water users who start depending on surface water may find that it is short when they need it the most.</p>	<p>The methodology used for calculating excess surface water is defined in ANRC Title 3</p>

Drought Planning

EASELY	There appears to be inaccuracies reported with the statewide municipal and self-supplied drinking water supply demand values. This may mean that the total projected statewide drinking water supply demand is too low.	The methodology used to projecting drinking water demand was approved by the Demand Technical Working Group and described in the detail in the Demand Projection Report (available on http://www.arwaterplan.arkansas.gov/ since November 2013)
EASELY	None of the appendices are included with the Plan made available for public review. The fact that the appendices were not included limits the public's ability to fully analyze and understand the Plan. It is recommended that a corrected and full copy of the plan be made available for public comment including extending an additional 30 day public comment period.	The technical appendices (Water Availability Report, Water Forecast Demand Report, Gap Report, and Alternatives Analysis Report) have been available on http://www.arwaterplan.arkansas.gov/ starting in November 2013. The availability of each report was announced in the monthly newsletter as it was posted on the website.
NWAC	In our view, before any other recommendations or actions are taken, a detailed study of the fast-growing White River basin is necessary and prudent to determine future water demands in northern Arkansas, to determine potential water conservation and water reuse opportunities in the basin, and to protect Northwest Arkansas water needs during drought conditions.	Feasibility or other studies should be promoted by Regional Planning Groups
USFWS	According to the Plan, the ANRC hopes to improve this deficiency. One of the stated goals of the Plan is to: "Refine criteria for declaring drought, water shortages and excess water, and advance policies and procedures for allocating water during times of shortage or drought." We hope that this effort to plan on the front end, before a drought or other water shortage occurs, will improve the overall implementation of this ANRC responsibility.	The recommendations related to drought contingency planning are in Section 3.6

Water Quality		
Commenter (see Commenter Key)	Comment	Response
AACD-22	The Water Plan will seek to provide additional funding and programs to promote the appropriate management of nutrients. With the addition of 600+ poultry houses to be installed in NE Arkansas efforts will needed to educate farmers on how to use poultry litter properly. Conservation districts will need qualified staff to work with farmers on issues such as proper storage of poultry litter, application rates and times, need for soil samplings, etc.	The AWP 2014 Update recommends nutrient management for applications of poultry litter and animal manure
AACD-23	The Water Plan to include recommendations for addressing efforts to implement an Unpaved Road Initiative with local leaders to include grant funds and a conservation water resources education component. Lack of education for local road and bridge departments and county officials is a primary factor in sediment loading and water quality impairment in rural areas.	Included in Section 3.8.
AACD-5	ANRC work with AACD to offer training sessions annually on 319 grant writing, program development, watershed assessment and resource assessment	Included in Section 3.8.
AACD-14	The Water Plan should seek state and federal funds to be used with EPA 319 funding to address water quality and nutrient management concerns. Leveraging state funds with federal funds would greatly increase our ability to remove stream segments from the EPA 303(d) list for impaired streams.	Included in Section 3.8.
ACA-16	3.5 Improving Water Quality through Nonpoint Source Management Priority Issue. We believe the Arkansas Agriculture Department should be participants in water quality review processes and developing solutions to any identified water quality challenge.	This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties
ACC	The Arkansas Department of Environmental Quality is tasked with protecting the quality of the waters of the state under their regulatory authority. Regulation 2 states that these "standards are designed to enhance the quality, value, and beneficial uses of the water resources of the State of Arkansas, to aid in the prevention, control and abatement of water pollution, to provide for the protection and propagation of fish and wildlife and to provide for recreation in and on the water." The Arkansas State Water Plan should acknowledge and endorse all the water quality protections and management strategies adopted into ADEQ Regulation Number 2.	Included in Section 3.8.

	Water Quality	
ACC-2	<p>Arkansas has abundant high quality water and according to a Congressional study completed in 2001, the aquatic ecosystems of the Ozark Highlands and the Ouachita Mountains have the highest integrity of any of their kind in the nation. Aquatic ecosystems are a valuable indicator of the suitability of water for many human uses and play an important role in maintaining water quality. Healthy aquatic ecosystems also support healthy fisheries that are important to people for both food and sport. This fact is a great benefit to Arkansas citizens and, if maintained, could insure a bright future for our state, environmentally and economically. However, since 2001, water quality has been in steady decline around the nation and in Arkansas. More than forty streams have been added to the 303d list of impaired waters in the state. TMDLs are required but there is no statutory requirement to address impaired waters within any time frame, resulting in a continuing decline in water quality. How do we address this issue? What can the new Arkansas State Water Plan do to help?</p>	Included in Section 3.8.
ADEQ-4	<p>ADEQ utilizes all existing and readily available data, including that provided by ANRC, AGFC, and others, to assess water quality for attainment with the water quality standards. ADEQ publishes the 303(d) list of impaired waterbodies, which do not attain the water quality standards. This list is published for public comment and submitted to EPA in the 305(b) Report every two years as required by the CW A and federal regulations. Extensive opportunities for participating in the Triennial Review of the state's water quality standards are available to interested stakeholders, whether state agencies, members of the regulated community or nonprofit organizations, and participation by all interested parties is welcome and necessary as part of the decision-making process. Given that these processes have been established under the federal Clean Water Act and federal regulations, ADEQ has previously commented on this recommendation, and again requests revision. The second recommendation under Section 3.5 should be revised to read as follows: 2. Comments and data will be provided to ADEQ during the biennial Clean Water Act water quality review processes and the triennial water quality criteria review.</p>	Included in Section 3.8.
ADEQ-5	<p>Section 3.5 Implementation Plan, 3: As previously noted, ADEQ reviews all available data as part of the assessment associated with the 303(d) list. Accordingly, ADEQ requests that you clarify the beginning of #3 to read, "Provide data for evaluation and comments on the Arkansas' Impaired Waterbodies List, required under the CW A Section 303(d), focusing on nonpoint source pollution, and nonpoint source management practices to restore streams to their designated uses and protecting streams currently attaining those uses."</p>	Included in Section 3.8.
ADEQ-6	<p>Section 3.5 Implementation Plan, 4: ADEQ welcomes participation in the Triennial Review process, including participation on the stakeholder workgroup established before the Triennial Review is formally initiated. Because proposals to change water quality standards should be considered and reviewed by all stakeholders and interested parties, ADEQ requests that you change Implementation Plan #4 to read as follows, "Participate in the Triennial Review of water quality standards, including the stakeholder workgroup proceedings, to ensure that proposals to change water quality criteria support the goal of protecting the quality of Arkansas's waters and those waters' designated uses."</p>	Included in Section 3.8.

	Water Quality	
AFB-10	<p>Many in Northwest Arkansas still question the methodology used to establish the Nutrient Surplus Areas (NSAs) and still believe that they were not based on science, but resulted from political and legal pressure from the State of Oklahoma. The adoption of the Arkansas Phosphorus Index (P-Index) and phosphorus based nutrient management plans (NMPs), the most restrictive in the country according to some, significantly reduced poultry litter application rates, i.e. nutrients, in Northwest Arkansas and throughout the NSAs. The cost agricultural producers tens of millions of dollars and possibly significantly more. Adoption of the Arkansas P-Index and P-based NMPs, has influenced nutrient applications outside the NSAs as well. While not a written clause in poultry growers contracts, it is common knowledge that the poultry companies require their contract growers to obtain NMPs regardless of their location. Combining this with the fact the USDA-NRCS and the county conservation districts will not write non-phosphorus based NMPs means that NSAs have essentially already been expanded statewide.</p>	<p>The AWP 2014 Update recommends nutrient management for applications of poultry litter and animal manure</p>
AFB-11	<p>Regarding row crop production, nutrients, are one of the largest input costs for row crop farmers. It does not make economic sense for them to apply more nutrients than a crop requires. New technologies and best management practices such as grid sampling, variable rate fertilizer applications, cover crops, tailwater recovery, etc. are being rapidly adopted to ensure that the nutrients are applied and that the nutrients stay in the field where they are needed. While this is occurring for economic reasons, it also results in environmental benefits.</p>	<p>Public education on the benefits of agriculture in Arkansas are the subject of Public Awareness and Education Priority Issues (Section 3.9)</p>
AFB-12	<p>Agriculture producers believe in the responsible use of nutrients for environmental reasons as well as economic reasons. The Discovery Farms Program was created to determine what agriculture's contribution of sediment and nutrients were to the state's waterbodies. Early results from ongoing research are showing minimal sediment and nutrient transport from agricultural fields. While several more years of research are necessary before any conclusions can be made, these numbers suggest that agriculture is using nutrients wisely, implementing BMPs and being good environmental stewards. It is for all the above discussed reasons that no justification currently exists to expand the NSAs.</p>	<p>The AWP 2014 Update recommends nutrient management for applications of poultry litter and animal manure</p>
ANHC-6	<p>Section 3.5 Water Quality Improvement Implementation Plan: Collaboration on the triennial review should include ANHC, AGFC, ANRC, and ADEQ.</p>	<p>This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties</p>

	Water Quality	
APPP-2	The Arkansas Department of Environmental Quality is tasked with protecting the quality of waters in the state under their regulatory authority. Regulation 2 states that these "standards are designed to enhance the quality, value, and beneficial uses of the water resources of the State of Arkansas, to aid in the prevention, control and abatement of water pollution, to provide for the protection and propagation of fish and wildlife and to provide for recreation on and in the water." The Arkansas State Water Plan should acknowledge and endorse all the water quality protections and management strategies adopted into ADEQ Regulation Number 2.	Included in Section 3.8.
AWF	Arkansas has some of the best water quality of any state in the United States and a plan to manage the waters of the state would be shallow if the quality of the water was not considered along with the quantity of it. In fact, water quality and water quantity are intimately related and they can't be considered in a vacuum of just one or the other. The trout die offs in the North Fork and White River tailwaters in north Arkansas are excellent examples of where just ample amounts of water flowing from beneath the dams was not sufficient to keep the invaluable trout fishery intact ample levels of dissolved oxygen also had to be present or substantial fish kills entailed. The AWP should address water quality and quantity issues together. Basin specific flow objectives should be created that produce rivers with high quality water in healthy quantities.	Recommendations in Section 3.5 maintain the use of the Arkansas Method until studies are completed that will form the basis for defining instream flow needs.
AWF-3	Unfortunately, water quality in the US and even in Arkansas has declined in many waters and more than 40 Arkansas streams have been added to the 303d list of impaired waters. To rectify this decline in water quality, the AWP needs to have stronger recommendations on the water quality aspects of the plan. The AWP should specifically acknowledge and endorse all the water quality regulations and management strategies adopted by the Arkansas Department of Environmental Quality in their Regulation #2.	Included in Section 3.8.
BWD-16	Page 15, Section 3.5, Improving Water Quality through Nonpoint Source Management Priority Issue, item 2 under "Recommendations.": This item about ANRC collaborating with ADEQ and AGFC "to determine" waterbody attainment or nonattainment during biennial water quality assessment and reporting process under Sections 303(d) and 305(b) of the Clean Water Act could be interpreted as conflicting with the process and procedures established under the CWA. This item should be revised to acknowledge the supporting role that ANRC, AGFC, and also ADH play in providing information, data, and other valuable input to ADEQ as it fulfills its duties under the CWA.	Included in Section 3.8.
BWD-17	Page 16, Section 3.5, Improving Water Quality through Nonpoint Source Management Priority Issue, item 3 under "Implementation Plan": This item has the same problem that is discussed in comment 15 above. It provides that ANRC will "participate with ADEQ and AGFC" in the biennial assessments conducted under CWA Section 303(d). Again, this item should be revised to provide that ANRC will contribute information, data, and other valuable input to ADEQ as it carries out its obligations under CWA Sections 303(d) and 305(b).	Included in Section 3.8.
BWD-17	Page 16, Section 3.5, Improving Water Quality through Nonpoint Source Management Priority Issue, item 2b under "Recommendations": We recommend that the recommendation be revised as follows: "Streams currently attaining water quality standards in priority watersheds, including the watersheds of public drinking water sources, will be considered for protection through the NPS management program."	Public drinking water sources are already included in priority watersheds.

	Water Quality	
BWD-18	Page 16, Section 3.5, Improving Water Quality through Nonpoint Source Management Priority Issue, item 4 under "Implementation Plan": This item deals with ADEQ's triennial review of Arkansas surface water quality standards pursuant to CWA Section 303(c)(1). It also needs to be reworded so that it is clear that ADEQ makes the decision on "identifying reference water quality for different classes of streams within ecoregions"	Included in Section 3.8.
Cooke-1	In section 2.3 Water Quality. one of the key findings, in reference to 41% of the state's streams not meeting designated use, states there is no pattern of impairment or cause of impairment. Table 6.4 is given as a reference as well as the ADEQ 303d list of impaired waters. It is impossible to draw a conclusion as to cause of impairment from the table. However, an ADEQ supplied map of impaired streams in the state shows a majority of the impaired streams in areas of the greatest concentration of irrigated farmland. The ADEQ 2012 305b Report states that 43.1% of the impaired stream miles have been assigned agriculture as the cause of impairment. Of the known sources of impairment, this is the largest source. Previous assessments by ADEQ have pinpointed agriculture as the largest contributor to nonpoint source pollution statewide. This includes all types of agriculture practices. The same report addresses primary sources of groundwater contamination. It mentions agriculture as one of the two largest contributors to groundwater contamination. The fact that 41% of streams and 36% of lake fail to meet designated use is a general pattern of impairment. As to pattern of cause, agriculture leads the list of causes.	The description of nonpoint source pollution in Sections 5 and 6 have been revised to include sources of impairment
Easley-10	6. Page 16, Section 3.5, Improving Water Quality through Nonpoint Source Management Priority Issue, item 2.b under "Recommendations:" This states, "Streams currently attaining water quality standards in priority watersheds will be considered for protection through the NPS management program." There is no indication in Section 3.5 as to what constitutes a "priority watershed." It is recommended the sentence be revised as follows: "Streams currently attaining water quality standards in priority watersheds, and the watersheds of public drinking water sources, will be considered for protection through the NPS management program."	Public drinking water sources are already included in priority watersheds.
Easley-12	8. Page 16, Section 3.5, Improving Water Quality through Nonpoint Source Management Priority Issue, item 4 under "Implementation Plan:" This deals with ADEQ's triennial review of the Arkansas surface water quality standards pursuant to CWA Section 303(c)(1). It should be clarified that ADEQ makes decisions on "identifying reference water quality for different classes of streams within ecoregions."	Included in Section 3.8.
Easley-2	Degradation of water quality from non-point sources (i.e. agricultural runoff, forestry practices, gravel mining, road erosion) is a problem throughout the state. While prioritizing 303d listed waters is admirable, additional emphasis should be placed on anti-degradation in drinking water source areas.	Included in Section 3.8.
Easley-3	The highest and best use of water (both surface and ground) is as a source of drinking water for human consumption. The plan should recognize and designate "Drinking Water Sources" as a high priority in ADEQ regulations, including Reg 2 and Reg 6, thus elevating these sources in management decisions. This would be much like the existing ADEQ designation of "Extraordinary Resource Waterbodies".	State law and the AWP 2014 Update recognize drinking water as the highest priority.

	Water Quality	
Easely-9	Page 15, Section 3.5, Improving Water Quality through Nonpoint Source Management Priority Issue, item 2 under "Recommendations:" The item regarding ANRCs collaboration with ADEQ and AGFC "to determine" waterbody attainment or nonattainment during the biennial water quality assessment and reporting process under Sections 303(d) and 305(b) of the Clean Water Act (CWA) should be revised to acknowledge the role that ANRC, AGFC, and the Arkansas Department of Health (ADH) play in providing information, data, and other valuable input to ADEQ as it fulfills its duties under the CWA. ADH is listed as a funding source under Source Water Protection and the Safe Drinking Water Act, but not as a collaborator.	Included in Section 3.8.
Easley-11	7. Page 16, Section 3.5, Improving Water Quality through Nonpoint Source Management Priority Issue, item 3 and item 4 under "Implementation Plan:" These items have the same problem discussed in Comment 5 above. It provides that ANRC will "participate with ADEQ and AGFC" in the biennial assessments conducted under CWA Section 303(d). This should be revised to recognize collaboration with ADH and provide that ANRC will contribute information, data, and other valuable input to ADEQ as it carries out its obligations under CWA Sections 303(d) and 305(b).	Included in Section 3.8.
Filipek-2	The Arkansas Water Plan should acknowledge and endorse all the water quality protection and management strategies adopted into ADEQ Regulation #2	Included in Section 3.8.
FLEA	Water quality should be monitored periodically on all potential surface water sources	Description of the water quality monitoring program is included in Section 6.1.2
FLEA-7	Animal waste disposal practices should also be determined for as small of a unit of land as possible, recognizing the differences that factors such as animal density, crops, and soil types have on the amount of nutrients that may be applied without adverse effects.	The AWP 2014 Update recommends nutrient management for applications of poultry litter and animal manure
FNFWR-5	Friends affirms the regulatory authority of ADEQ to protect the quality of the waters of the state and recommends the Arkansas Water Plan acknowledge and endorse all the water quality protections and management strategies adopted in the ADEQ Regulation Number 2.	Included in Section 3.8.
FNFWR-7	Friends believes that public participation is necessary in the decision-making process involved in both the Triennial Review and the 303d list work of ADEQ. We recognize and uphold the opportunities made available by ADEQ to interested stakeholders, state agencies, members of the regulated community and non-profit organizations.	Included in Section 3.8.
NWAC-2	We're recommending that specific language be added to the state water plan, requiring timely reviews of the 303(d) list. We need assurance that streams that meet their designated uses are removed from the list as soon as possible.	This comment will be referred to ADEQ.

Water Quality		
RICE-8	Riceland recommends including the University of Arkansas, Division of Agriculture and the Arkansas Department of Agriculture as collaborating members in the Clean Water Act water quality review processes and the water quality criteria review, etc.	This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties
Tyson-1	The sentence, "The combined efforts of elected officials and the agencies and entities associated with managing and protecting the States water must be informed by quality information to justify extremely consequential and costly decisions.", is very well stated. Tyson recommends further clarification to include the importance of using "quality information" to develop Water Quality Standards and in review of the State's 303(d) list. When water bodies can be de-listed, they should be removed in a timely manner to ensure extremely consequently decisions are not made.	Included in Section 3.8.
Tyson-2	Tyson fully supports regulatory changes that requires nutrient management planning for all forms of nutrient management.	The AWP 2014 Update recommends nutrient management for applications of poultry litter and animal manure
Tyson-3	Recommendation #1 states, "Propose legislation to designate funding specifically for financing NPS pollution management programs and implementing NPS management practices." Tyson Foods is in full support of this recommendation, however Tyson believes it is necessary to specifically mention the need to provide long term funding to the University of Arkansas Discovery Farms program. This program is critical in understanding baseline NPS runoff, evaluation of BMP effectiveness, and education of producers in environmental stewardship.	Discovery Farms are specifically mentioned in Section 3.8
Wimpy-6	Section 3.5 Improving Water Quality through Nonpoint Source Management - Recommendations 2.b and 3: The Commenters strongly support the voluntary utilization of nutrient management plans and other nonpoint source management programs; however, the Commenters are concerned with the pursuit of a mandated expansion of the Nonpoint Source Pollution management program into watersheds with streams currently attaining water quality standards. Further, the Commenters oppose any requirement for the adoption of mandatory nutrient management plans outside current nutrient surplus areas.	The AWP 2014 Update recommends nutrient management for applications of poultry litter and animal manure

Irrigation Incentives		
Commenter (see Commenter Key)	Comment	Response
AACD	The Water Plan recommend to the Legislature to expand funding for urban and agricultural water use efficiency research, development and implementation through existing programs.	Included in Section 3.9
AACD	Water Plan should include funding to building capacity within the conservation districts rather than allow them to become displaced by other organizations which have their own "mission" and not that of the landowner. Lack of funding has eroded their capacity to deliver services to landowners.	Included in Section 3.9
AACD	The Water Plan should expand existing programs to provide technical assistance, shared data and information, and incentives to urban and agricultural local water agencies, as well as conservation districts.	Included in Section 3.9
AACD	The Water Plan will promote regional and local projects that improve the efficiency of how water is pumped and used. These actions will save water, energy, and money.	Thank you
AACD	Districts should be provided the resources needed to hire qualified staff to work with farmers to encourage and implement groundwater conversion projects, conservation practices and irrigation efficiency; PHAUCET, Pipe Planner, flow meter, etc.	Included in Section 3.2
AACD	Water Plan should continue to build on the incentive programs such as agricultural enhancement loan program and tax credits to encourage landowners to implement conservation practices.	Included in Section 3.2
AACD	Landowner education could be implemented efficiently and effectively by conservation districts through field days, demonstration days, workshops, newsletters, etc. They are only limited by their current resources.	Included in Section 3.9
AACD	The Water Plan should seek additional funding for the agricultural enhancement loan program and support for additional tax credits for water conservation projects.	Included in Section 3.2
AACD	Arkansas Conservation Partnership be utilized to address those issues which overlap agency boundaries and programs such as nutrient management, conservation programs, technical service providers, etc.	Included in Section 3.8
AACD	Providing funding for locally-driven, multi-benefit projects is critical.	Included in Section 3.8
AACD	ANRC should work with AACD to establish formal training for employees on programs with involve landowner funds, ag loan program and tax credits.	Included in Section 3.2
ACA	<i>Implementation Plan</i> - We believe that land improvement incentives, including precision land leveling, can have a substantially positive impact on water demand. This should be supported by the plan along with on-farm storage systems, tail water recovery systems, and the purchase of water conservation technologies such as PHAUCET, Pipe Planner, flow meters, surge valves, remote on-off switches, and other irrigation systems, technologies, and BMPs.	Included in Section 3.2

Irrigation Incentives		
ACA	<p><i>3.9 Tax Incentives and Credits for Integrated Irrigation Water Conservation Priority Issue</i> : We strongly believe in this concept and the important impact these incentives can have on water conservation. The Water Plan should support existing incentives and look to improve and expand on what is on the books today. These incentives should be made available to all landowners and should cover a broad range of water conservation methods. In addition, we support grants and cost sharing from the state and federal government for water conservation efforts. On Recommendation #5, we suggest listing any conservation non-profit as eligible for developing awareness programs. The Water Foundation is listed along with the Conservation Districts, but we are not aware of the Water Foundation.</p>	Included in Section 3.2
ACA	<p><i>Incentivizing Water Conservation:</i> The Water Plan should recognize the benefits of existing incentives for farmers to adopt technologies, on farm-irrigation systems, land improvements, and other best management practices. The Water Plan should also encourage the expansion of these incentives. We know that substantial gains are already available through existing technologies and practices, and future technologies and best management practices will further reduce our water needs.</p>	Included in Section 3.2
ACA	<p><i>Conjunctive Water Management:</i> The Water Plan should encourage additional surface water utilization from existing water reservoirs, on-farm collection, storage and distribution systems, and large irrigation projects from existing waterways.</p>	Included in Section 3.2
AFB	<p>Implementation 2. States, "<i>ANRC will work with Conservation Districts to develop a ranking system for cost-sharing support that encourages, and provides higher ranking to, applications that include multiple, integrated conservation practices, with flow meters being included in these suites of practices. This ranking system should also consider perpetual easements of eliminating land from agricultural production and irrigation.</i>" ARFB supports increasing cost share incentives to increase the rate of voluntary meter installation. However, while ARFB supports individuals' rights to voluntarily enter into conservation easements, we do not encourage these use of perpetual easements. In many cases, they are counterproductive because they reduce adoption rates, and an uncertain future may reveal that every tillable acre may be needed for food production.</p>	Reference to perpetual easements has been removed
AFB	<p>The Commission should also consider streamlining the procedures for land leveling and irrigation reservoir construction to qualify for Arkansas income tax credits under the Water Resources Conservation and Development Incentives Act of 1995. The project design and construction costs should be allowed to be submitted for qualification at any time during a project's construction, including up to the time of final inspection and issuance of certification of completion. These tax credits should be available for all qualifiable projects completed in a tax year.</p>	Included in Section 3.2

Irrigation Incentives		
AFB	The Water Plan Executive Summary mentions in several locations that agriculture is the largest water user in Arkansas. Agriculture readily acknowledges that it is, without question, the largest water user; however, this water use is for a very noble and life sustaining purpose... the production of food and fiber that is used to feed and clothe not only Arkansas but the world. While feeding and clothing the world, agriculture has also made significant strides by reducing its environmental footprint as documented through independent evaluations performed by Field to Market® evaluated land use, soil erosion, irrigation water applied, energy and greenhouse gas emissions over a more than thirty year period beginning in 1980. These evaluations revealed that agriculture has reduced its environmental footprint on a per unit produced basis for every parameter evaluated for every commodity considered and on an overall basis, depending on the commodity considered. What does this mean? Agriculture is producing more food and fiber per acre while at the same time reducing soil erosion and water usage, i.e. it is more efficient and better steward of natural resources than at any time in history. For commodity specific information, go to :	Section 3.9 contains recommendations for public awareness and education on agriculture
AFB	None of these scenarios incorporated the conservation measures that are being adopted by the agriculture community. Some of these conservation measures can reduce water usage by as much as 30% and significantly more when used in combination. In conjunction with the considerations discussed above, adoption of conservation measures should simulate assuming and incremental adoption rate of 10% until <u>at least</u> a 30% savings is reached on existing irrigated tillable acres and immediate adoption on tillable acres not currently irrigated. The combination of the above scenarios could reflect significantly reduced projected demands from agriculture crop irrigation and quite possibly project an overall reduction in demand from current levels.	The analysis of conservation measures is included in Appendix G
AFB	The utilization of surface water for irrigation has been shown to have a positive impact on water quality and reduces groundwater use. ARFB recommends the incorporation of incentives that support increasing surface water use for irrigation by expanding the adoption of reservoirs and tailwater recovery systems. Some incentives the Commission might consider are: (1) Cost sharing of 10 percent of the installation costs of irrigation water supply projects that are also federally cost shared; (2) Funding state cost-share programs via revenue bonds; (3) Encouraging federal farm program payments comparable to CRP, WRP, or similar programs for cropland that has been converted to surface water irrigation reservoirs; and (4) In areas of significant groundwater level decline (a) groundwater depletion taxes could be allowed which could be used only for groundwater to surface water conversion projects, and (b) revenue bonds could be available for long-term low interest loans or state funding could be made available to "buy-down" interest on commercially available loans for the construction and use of irrigation reservoirs and tailwater recovery systems. These projects would be prioritized to watersheds which have been declared to have impaired water quality or are within critical groundwater areas.	Included in Section 3.2
ARF	Regarding tax credits, the Draft Executive Summary says "evaluate the effectiveness of existing tax credits". We already know the existing tax credits are grossly inadequate. Please do not waste time studying what we all know is inadequate. It is the entire state's best interest to get a fast broad start on conservation measures and best practices being identified. The tax credits on conservation measures need to i) be a bigger percentage of the costs, ii) have higher annual limits, and iii) allow a longer period over which to claim the credit. Add a sunset to these aggressive tax credits to encourage people to get on board quickly.	Included in Section 3.2

Irrigation Incentives		
ARF	<u>Incentivizing Water Conservation/Tax Credits</u> - The Water Plan should highlight the positive outcomes of existing incentives for new technologies, land improvements, irrigation systems, and related best management practices as water development projects that promote water conservation. Given the success of the incentive programs already in place, we think it is appropriate that the Water Plan should recommend expanding them to further enhance conservation efforts by farmers.	Included in Section 3.2
Cooke	Water conservation should be the principal component of allocation of water resources. Not only would this reduce the need for interbasin transfer of water and all the associated costs, but it would reduce pollution of surface water and groundwater. Ideally, the burden of pollution costs should be shifted to the source of the pollution. Infrastructure use in the form of consumer fees should be associated with any large scale water transfer projects to help offset the taxpayers costs.	Included in Section 3.3
Ducks	<u>Efficiency of Groundwater Use for Crop Irrigation</u> - As part of the crop irrigation working group, we agree a greater emphasis is needed on the implementation and management of integrated irrigation water conservation practices. Incentives to drive the adoption and management of such practices should include a wide array of financial upsides such as extension education on how soon a practice will pay for itself through input savings, practice implementation cost-share such as those through USDA Natural Resources Conservation Service, conservation practice state tax incentives and credits, and more. These integrated practices, just to name a few, should include flow meters, surge valves, PHAUCET/Pipe Planner software applications, multi-inlet irrigation systems, on-farm storage and tailwater recovery systems, pump remote controls, soil moisture monitors, irrigation scheduling, satellite monitoring of soils and crops, and cellular links to weather stations. Water conservation practices are really an integral part of irrigation water management, regardless of whether the source is groundwater or surface water. But with 80% of the state's water withdrawals being for irrigation, and almost all coming from the Alluvial aquifer, opportunity for progress here is great. One hurdle to aggressive implementation and management of integrated irrigation water conservation practices is the on-farm planning and technical assistance needed to do the job best. Ducks Unlimited, the USA Rice Federation, and over 40 other rice industry and conservation partners recently submitted a proposal to the USDA's Regional Conservation Partnership Program. If successful, this proposal will bring both technical and financial assistance to eastern Arkansas to address the very subjects discussed above. This is but one additional example of how partnerships can work within the Arkansas Water Plan to accomplish the needs to the State.	Included in Section 3.2
FLEA	The slow recharge rate of aquifers demands that protective conservation efforts be put in place.	Included in Section 3.2
FLEA	Incentives to conserve resources should be used when possible instead of disincentives.	Included in Section 3.2
FLEA	Implementation of mandatory conservation practices should be reserved for those areas deemed critical.	Incentives for conservation practices are included in Section 3.2

Irrigation Incentives		
RICE	<p><u>Executive Summary</u>, Page 21, Section 3.9, <i>Tax Incentives and Credits for Integrated Irrigation Water Conservation Priority Issue. Implementation Plan 2, "This ranking system should also consider perpetual easements for eliminating land from agricultural production and irrigation."</i> Comment: Riceland views agricultural production and irrigation conservation differently than agricultural production and irrigation elimination. Riceland strongly opposes including this language in the final version of the AWP update. The AWP's vision is to support local and State economies by applying appropriate policies and best management practices with limited regulation and preservation of private property rights. Inducing landowners through a ranking system that consider perpetual easements is not a conservation practice that values the importance of agricultural production in our local and State economies; it is a practice that encourages landowners to forfeit their private property rights. If only considers how many local and regional jobs are supported by the production of agricultural commodities in Arkansas, one can see that perpetual easements that remove land from production agriculture are not a viable conservation practice.</p>	Reference to perpetual easements has been removed
RICE	<p>Stewards of their land, but the costs associated with implementing certain conservation practices are too burdensome for farmers to adopt without incentives. The AWP update should expand policies that increase funding opportunities for conservation practices.</p>	Included in Section 3.2
RICE	<p>Instead of creating regulations, Riceland supports increasing policies that encourage and incentivize farmers to implement conservation practices.</p>	Included in Section 3.2
WIMPY	<p>Section 3.9 Tax Incentives & Credits or Integrated Irrigation Water Conservation - Recommendation 2: The Commenters support the use and expansion of tax credits and other incentives for the development of integrated irrigation water conservation.</p>	Included in Section 3.2

Finance and Infrastructure Condition		
Commenter (see Commenter Key)	Comment	Response
AACD	The Water Plan will seek to provide funding to conservation districts/sponsors of watershed dams, which have been designated high hazard due to the need for rehabilitation. These dams were put into place to prevent flooding and have reached their life span of 50 years thus posing a hazard to structures downstream .	Included in Section 3.4
ACA	The Water Plan should provide support for increasing funding for water infrastructure systems designed to provide additional surface water to farms in Arkansas. Such infrastructure includes large scale projects like the Grand Prairie Project, the Bayou Meto Project, and smaller scale projects on private properties. In addition, the Water Plan should continue to support studies that will lead to future surface water supply and distribution systems that can help agriculture.	Included in Section 3.3
ARF	The Water Plan should recommend additional funding for regional surface water systems that will divert surface water for irrigation use to farmers. Examples include the previously mentioned Bayou Meto Irrigation Project and the Grand Prairie Project. The Water Plan should also voice its support of water infrastructure projects that will aid agricultural water management.	Included in Section 3.3
ARF	Additionally, the Draft Executive Summary recognizes one funding source through ANRC's bonding program. Other sources of funding may be available, so a recommendation should encourage seeking out other funding options including state, federal and local funding and financing options.	Included in Section 3.3

	Finance and Infrastructure Condition	
Bennett	<p>\$3.4 to \$7.7 billion is the range of estimated costs to build the infrastructure necessary to switch from irrigation using groundwater to surface water irrigation in the nine major river basins in the East Arkansas WRPR. The cost of this infrastructure should be considered in the context of the \$9.7 billion annual market value of agricultural products in Arkansas. The Grand Prairie Area Demonstration Project and Bayou Meto Water Management Project, when complete, will provide surface water sources for irrigation to 15 percent of the area with projected groundwater gaps. Arkansas water providers will need \$5.74 billion and wastewater providers will need \$3.76 billion to build, maintain, and replace required infrastructure through 2024. New levels of treatment require additional capital and increase operational costs. Small water and wastewater providers pose a unique challenge when planning at the statewide level, as their individual needs are small and widespread, but together they make up a large portion of the needs. Many of these providers also face the challenge of shrinking population and resulting in reduced revenue streams, following the national trend of increased urban dwelling. Complexity of regulations and lack of financial resources make finding and retaining trained operational and managerial personnel difficult for small systems.</p>	Included in Section 3.4

	Finance and Infrastructure Condition	
Bennett	The following are recommended to address additional issues facing water resources development projects and water and wastewater systems: 1. Seek additional authority to issue an additional \$300 million under the Water, Waste Disposal, and Pollution Abatement Facilities General Obligation Bond Program; 2. Encourage the continued federal funding of the Clean Water and Drinking Water Revolving Loan, funds by the US Environmental Protection Agency and fund obtain the required State match funds; 3. Encourage the continued funding of the US Department of Agricultural Rural Development Community Program and Water -Wastewater Program to assist small communities and rural water systems in the State; 4. Encourage the continued federal funding of the Community Development Block Grant Program to the State and continue to use a significant portion of funds provided to the state for water and wastewater projects to serve the low to moderate income citizens of the State; 5. Increasing the State funding of the State's Water Development Fund and Water, Sewer and Solid Water Fund through additional General Revenue and General Improvement Funds; 6. Continue the use of the Water Wastewater Advisory Committee to coordinate funding of water and wastewater projects. Explore the possibility that the Committee might play an additional role in the coordination of regulatory and funding governmental agencies with respect to water and wastewater systems; 7. Better coordinate and seek additional resources to assist water and wastewater systems with technical, managerial and financial capacity. Train system operators, managers, and system governing boards on actions necessary steps for long term system viability. Work with systems representative and governmental agencies to develop standards for systems viability and consider the application of these standards to all systems. 8. Working with system representatives, determine and work to remove the factors deterring the cooperation, joint operation or merger of water and wastewater systems. ANRC will seek the authority to merge water and sewer systems where necessary in order to bring them into economic viability.	Included in Section 3.4
BWD	This section includes a bullet point that provides cost estimates for Arkansas water and wastewater providers to "build, maintain, and replace required infrastructure through 2024." Additional bullet points note some of the challenges faced by water and wastewater providers. Not mentioned is the increasing need for water providers to devote resources to source water protection efforts. This should be included.	Included in Section 3.4
EASELY	This section includes a bullet point that provides cost estimates for Arkansas water and wastewater providers to "build, maintain, and replace required infrastructure through 2024." However, increasingly water utilities are faced with increasing needs to provide significant resources to source water protection. Source water supplies (lakes, reservoirs, etc.) are as just much an asset that must be protected and maintained, and should be included as such.	Included in Section 3.4
FLEA	The environmental, economic, and governmental roadblocks for the construction of new reservoirs makes the protection of existing reservoirs (Lake Erling) of utmost importance.	Included in Section 3.3
Gould	Obviously funding infrastructure repair & improvements is a major challenge to implementation of the Water Plan. Is there any possibility the plan could be more specific as to how the infrastructure repair & improvements will be funded? Seeking specific legislation? Grants?, etc.	Included in Sections 3.3 and 3.4

Finance and Infrastructure Condition		
Gould	Should there be a suggestion of possible mechanisms for insuring that the public entities will develop sustainability plans? For instance, that the ANRC pursue legislation or regulations requiring development of the sustainability plans.	Incentive of lower interest rates for entities with sustainability plans is included in Section 3.4
RICE	Increased surface water infrastructure along with an increased supply of excess surface water would make a large and positive impact with respect to water supply for agricultural irrigation in Arkansas. The AWP update should include policies that support increased funding for water infrastructure projects on private properties and larger projects such as the Grand Prairie Area Demonstration Project and the Bayou Meto Water Management Project. Encouraging the legislature to expand funding opportunities for these types of projects should be a priority in the AWP update.	Included in Section 3.3

Reallocation in Reservoirs		
Commenter (see Commenter Key)	Comment	Response
BWD	This item should be revised to provide that, "ANRC will review water supply needs within each of the WRPRs and, in conjunction with the public drinking water utilities and in recognition of their existing water rights , determine if these water needs might be supplied through reallocation of water storage in USACE reservoirs within the WRPRs."	Included in Section 3.7
Easely	This item should be revised to provide that, "ANRC will review water supply needs within each of the WRPRs and, in conjunction with the public drinking water utilities in recognition of their existing water rights and determine if these water needs might be supplied through reallocation of water storage in USACE reservoirs within the WRPRs."	Included in Section 3.7
Easley	Site specific and seasonally available stream flows may affect the amount of water reliably available or direct diversion from surface sources to satisfy beneficial out of stream uses (drinking water). New impoundments are needed to provide adequate surface water supply. While there are additional sources of water available for uses such as agricultural or industrial, the water quality in these sources may not be compatible with the production of suitable drinking water nor may be available at the time of need (specifically during droughts). The reallocation of storage for water supply is needed in federal projects (CORPS lakes) to make those sources more readily available for drinking water sources.	Included in Section 3.7
Noland	Comment: In respect to Executive Summary item 3.8 Reallocation of Water Storage in Federal Reservoirs, I offer the following. Based on observation and experience, and given the diverse water needs in the state, I believe that it is a significant deficiency and omission to not include an active and aggressive effort to reauthorize water storage from federal reservoirs as part of the current water plan effort. My reasons and rationale are too numerous to mention here but I would be pleased to discuss this item with the Water Plan personnel. Stewart Noland 664-1552	Included in Section 3.7

SWPA	<p>Southwestern Power Administration (Southwestern) is a Federal agency within the U.S. Department of Energy that is responsible for marketing the hydroelectric capacity and energy from 24 U.S. Army Corps of Engineers (Corps) multi-purpose water resource projects in the region, including 9 projects in the state of Arkansas. Southwestern's Federal hydropower customers are mostly rural electric cooperatives and municipal utilities that ultimately serve nearly 9 million people in a six-state area. Southwestern understands that several storage reallocations for water supply have already occurred at Corps projects in Arkansas and recognizes the potential future need for additional domestic, municipal, or industrial water supply in the state of Arkansas. Storage reallocations from projects that have hydropower always result in a loss of hydroelectric energy and often result in a loss of hydroelectric capacity as well. In order to meet future water supply needs in Arkansas while minimizing the negative impacts on Southwestern and its customers, future reallocations from Corps projects with Federal hydropower in the state of Arkansas should meet the following criteria: 1. Proposed reallocations should be limited to a demonstrated immediate need; i.e. the water supply should be needed within the next 10 years.</p>	Included in Section 3.7
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	Data	
Commenter (see Commenter Key)	Comment	Response
AACD	While there has been much debate about the validity of the water well registration we have to accept it is the best data that we have to date. However, it would appear that the following activities could be implemented by conservation districts which could render greater certainty and assurance among those whose the data collected. Those activities include: increased training of district employees once a year (October/November); mandatory training for any district with more than 20 water wells; consistency in the formulas used to calculate the reporting and/or develop a program which calculates the usage once the employee feeds the data in; clearer understanding of when and why the producer/farmer is pumping the water (wildlife vs crops) and if it is being reported appropriately; Districts work with farmers to increase an awareness of the importance of reporting all pumping episodes during the year regardless of purpose.	Included in Section 3.10
ACA	We believe that the data projections for supply and demand are lacking in accuracy and are, in fact, very likely to be inaccurate, especially in the out years of the forecast and gap analysis due to inaccuracy in data and misguided assumptions made in forecasting. The University of Arkansas's Report (An Evaluation of the Water Demand Forecast Report for the Arkansas Water Plan) identified the many flaws in the data and gap analysis from the Water Plan's Demand Forecast Report. Specifically, the University's report states that "the value and quality of the data in the Water Use Data Base (WUDB) is very suspect and appears unreasonable ... the data (in forecasting) does not appear to reflect climatic or seasonal expected variations, account for geographical differences, and appear unreasonable. The data from the water user database is likely overestimating actual water use ... we believe there are major systemic issues in the water use reporting system ... we question the value and quality of this information from the water user database for water planning purposes. It seems projecting increases in all crops ... may overestimate actual future irrigation development." (Pages 14, 32-33) Disclaimer language should point out this problem.	Disclaimer added to Section 1
ACA	We agree that improved data is necessary for future water plans and better forecasting. We support the establishment of a Technical Working Group that maintains significant representation from agriculture and water users. Additional sample measurements could help improve accuracy of data and forecasting.	Thank you
ACA	The Agricultural Council of Arkansas believes that the Water Plan should contain disclaimer language related to the data utilized for the plan, including supply and demand forecasting. Such language should reveal the likely inaccuracies of the data and clarify the assumptions taken into account with the forecast. Our primary concern with the data is that if not recognized as being anything more than a guess, that the data could be misinterpreted in a way that could lead to unwarranted regulations or laws, negatively impact property values, and cause other unintended or undesired consequences. We are happy to discuss some potential language for you to consider.	Disclaimer added to Section 1

	Data	
AFB	We are supportive of accurate reporting of both surface water and groundwater usage. If the following things are not already being done, the Commission should consider: 1) developing uniform standards or improving existing standards for water use reporting, 2) requiring and funding mandatory regular training for staff to ensure uniform implementation of water use reporting, 3) developing an electronic template for data collection, and 4) developing online water use data reporting.	Included in Section 3.10
AFB	Another issue to consider is the assumption that 100% of tillable acres would become irrigated by 2050. The Agriculture Stakeholders may have been overly ambitious when they suggested that 100% of tillable acres in every county would become irrigated. The logic was that over the past 40 years irrigation has been heavily adopted. As a result, the current percent irrigated acreage is estimated to be 86-87% according to USDA NASS data. It seemed reasonable to assume that the remaining non-irrigated tillable acres would become irrigated over the next 40 years. While this scenario is possible, it may not be probable and may have exacerbated projected supply "gaps." There are some counties that are already irrigating every available tillable acre; there are counties with substantial amounts of non-irrigated tillable acreage; and there are counties that contain tillable acres that are not currently in production. If it was assumed in counties with available tillable acreage not currently in production that those acres would be brought into production AND they would be irrigated, it may have unnecessarily elevated agricultural crop irrigation demands to unrealistic levels and may have further exacerbated projected supply "gaps."	Disclaimer added to Section 1
AFB	The third bullet states, "One factor in estimating the project demand for crop irrigation is the water application rate for each crop. While the best available data was used for the 2014 AWP analysis, stakeholder input suggests that the application rate, particularly for rice, is too high. The alternatives analysis (Appendix G) suggests that varying the application rate could decrease the crop irrigation water demand by about 1.3 million AFY. " [Emphasis added.] The last sentence in the Section 11.2 of the Water Demand Forecast Report states, "Statewide total demand is shown in Table 11.4 with estimated irrigated crop water demand increasing from 8.8 billion gallons per day up to 10 billion gallons per day in 2050. " [Emphasis added.]	Error has been corrected
ARF	The data gathered and used to support the development of the current draft Water Plan should include caveat language as to the data's accuracy and the purposes for which the data should be utilized. The caveat language should point out that this data was used in producing the supply and demand forecasting contained in the Water Plan and should explain the limitations of the methodology and data used and specify the degree of uncertainty attributable both to the data used and to the conclusions reached. The caveat language should point out all assumptions taken into account when formulating the forecast. If the caveat language is not included, and there is not specific language stating that the data contains flaws or explaining the limitations of the methodology, then the data and conclusions in the Water Plan could be misunderstood and could lead to harmful or unnecessary laws and regulations. These unwarranted or unnecessary laws could lead to a number of unintended consequences. We share the concerns expressed over the data collection and forecasting methods in the University of Arkansas' Report (An Evaluation of the Water Demand Forecast Report for the Arkansas Water Plan) which is attached hereto and incorporated into these comments by reference.	Disclaimer added to Section 1

	Data	
Gould	Could a sub item "e." be added to the list that the Science Technological Work Group consider proposing incentives for agricultural users to more accurately report water use?	Added to Section 4.2.1
Riceland	Data used throughout the planning process and the AWP update do not appear to be absolute. Therefore, Riceland encourages the inclusion of a disclaimer in the AWP that states maps, charts, tables, and all planning data were used only for forecasting and planning purposes and are insufficient for legal and business purposes. Example: "The Interior Highlands of Arkansas have less reported groundwater use than other areas of the State, reflection a combination of effects - prevalent and increasing use of surface water, less intensive agricultural uses, lower population and industry densities, lesser potential yield of the resource and lack of detailed reporting.	Disclaimer added to Section 1

Education		
Commenter (see Commenter Key)	Comment	Response
AACD-20	Conservation districts receive training to work with landowners to raise awareness regarding the importance of conservation planning and best management practices for wildlife and other species' habitat. This effort will increase collaboration and transparency and ensure that management decisions are supported by the best available science.	Included in Section 3.9
ACA	We believe non-profit organizations should help participate in public education efforts. One suggestion we have is to establish a water awareness month in the summer to encourage conservation and awareness for all water users.	Included in Section 3.9
ACA	The Water Plan should encourage financial support for educating landowners and farmers of programs and best management practices that can enhance adoption of water conservation systems for agriculture. In addition, the Water Plan should support state-wide campaigns to raise awareness to water and conservation.	Included in Section 3.9
ARF	The Water Plan should recommend funding for education programs that will demonstrate the benefits of water conservation systems and technologies for agriculture to farmers.	Included in Section 3.9
BARTON	3) After approval of the AWP will the arwaterplan page be maintained to keep the public/stakeholders informed about the progress in implementing recommendations? I would be interested in hearing about: a) progress on legislative items like the change of the 25% of excess stream flow definition for available nonriparian water use, as well as the authority to condemn land to dig wells or mandate accessibility for groundwater measurements; b) planning for new wells, measurements, areas of interest where data is to be focused and the objectives of the testing; c) to have results in a format easily transferred to spreadsheet; d) to have announcements when groups are formed or stakeholders' meetings take place; e) when general obligation bonds are to be issued and how accessed; f) and if a person is named with oversight of the AWP implementation, which seems like a good idea.	Included in Section 4.2

	General	
Commenter (see Commenter Key)	Comment	Response
ARF	Please confirm whether and how the Executive Summary dated June 30, 2014, becomes the final Arkansas Water Plan adopted by ANRC. The title of the report is Executive Summary. A summary of what? Will ANRC develop additional reports for each of the five regions? If so, will these region reports become part of the water plan? The stakeholder process for the Water Plan update was generated many supporting documents and proposed recommendations. The ANRC should clearly delineate which of those recommendations become part of the Water Plan.	The name of the document has been changed to the Arkansas Water Plan 2014 Update
ARF	The recommendations that ultimately become the Water Plan, whether contained in the Executive Summary or elsewhere, must demonstrate due regard for the public interest of the entire state; consequently, to the extent that any of the proposed recommendations developed during the stakeholder process do not satisfy this requirement, or if the record does not adequately demonstrate this requirement, such recommendations should not be adopted into the Water Plan itself.	The Issues and recommendations in the AWP 2014 Update are those selected by the ANRC as priority. The stakeholder process and results are presented in Appendix H
ARF	A more practical approach would be to clearly separate the final Water Plan findings and recommendations from the efforts of the stakeholder process. The final Water Plan would serve as the official and final plan containing those limited findings and recommendations that ANRC has actually and affirmatively determined relate to a comprehensive plan for water development projects and to be in the "public interest of the entire state," based on record evidence of scientific, economic, cultural, historical, legal and other proper factors supporting ANRC's decision. A separate document, e.g., a water plan stakeholder process report, could serve as a repository and future resource for all issues and recommendations identified by stakeholders or the public, consistent with the ANRC's authority under Ark. Code Ann. § 15-22-220.	The Issues and recommendations in the AWP 2014 Update are those selected by the ANRC as priority. The stakeholder process and results are presented in Appendix H
Barton	1) The figures for flow of the Mississippi River as well as those rivers flowing through the body of the state look unreasonably high, i.e., the reported average discharge of the Mississippi of 593,000 cuft/sec calculates as ~433 million acre-feet/year. This flow also begs the question of why the Mississippi is not considered on the eastern side of the state as a source of surface water?	A note that excludes the Mississippi River from flow calculations has been added to Section 5.2

General		
Barton	Does making these comments through CDM Smith means that someone in Arkansas will not necessarily see them?	The ANRC commissioners and staff were provided with copies of all comments received
Bryan	I think the overall approach the ANRC has taken in developing the 2014 Water Plan is commendable. Using surface water in lieu of groundwater where possible is sensible. Protecting existing surface water sources is very important. Lake Erling is over 7000 acres of underutilized surface water. While the lake is a recreational paradise, economically important to business interest, and vitally important to Lafayette County as a source of tax revenue, what Lake Erling can provide in the future is even more important. Lake Erling has the potential to be either a municipal water supply or industrial water supply. In light of the instability of the present ownership of Lake Erling, it is appropriate for the ANRC to monitor Lake Erling closely. This body of water is vital to the future of southwest Arkansas and should be guarded accordingly by state government. I look forward to the finalization of the 2014 Arkansas Water Plan and have confidence the ANRC is in position to implement standards that will ensure our state remains rich with clean and abundant water.	Feasibility studies or specific projects should be promoted by the Regional Planning Groups.
BWD	The Executive-summary was made available for public comment, but it is unclear what it summarizes. In other words, <i>what constitutes the entire Arkansas Water Plan Update</i> ? It would be helpful to include an explanation of this in the Executive Summary's Introduction. If multiple documents make up the Arkansas Water Plan Update, a Table listing the documents and how they can be accessed should be included in the Executive Summary's Introduction. It also would be helpful if the Introduction included a discussion of whether and how the ANRC will consider approval or adoption of the Executive Summary once it is finalized. Further, an explanation is needed regarding whether and how the ANRC might incorporate all or portions of the Arkansas Water Plan Update into its regulations.	The name of the document has been changed to the Arkansas Water Plan 2014 Update

	General	
BWD	<p>understanding is that several of the appendices did not exist at the time the Executive Summary went to public notice. The fact that the appendices were not posted with the Executive Summary limited the public's ability to fully analyze and understand the Executive Summary and whatever constitutes the full Arkansas Water Plan Update. The remedy for this would be for ANRC to reopen the comment period and make all of the appendices available with the Executive Summary.</p>	<p>The technical appendices (Water Availability Report, Water Forecast Demand Report, Gap Report, and Alternatives Analysis Report) have been available on http://www.arwaterplan.arkansas.gov/ starting in November 2013. The availability of each report was announced in the monthly newsletter as it was posted on the website.</p>
BWD	<p>We suggest that this sentence be revised to emphasize the priority of public drinking water. We recommend the following changes: "As such, water must be managed in a sustainable manner to, first and foremost, provide for public health and safety through public drinking water and to support local and state economies, protect public health and natural resources, and enhance the quality of life of all citizens by applying appropriate policies and best practices with limited regulation and preservation of private property rights."</p>	<p>This statement was not changed because not all water is managed as drinking water.</p>

	General	
BWD	This section begins with the following sentence: "The technical analyses completed for the 2104 AWP are described in detail in reports that are included as appendices to the AWP. These reports are: Water Availability (Appendix C), Demand Forecast (Appendix E), Gap Analysis (Appendix F), and Alternatives Analysis (Appendix G)." As discussed in Comment 4, above, the appendices were not made available with the public review copy of the Executive Summary. This limited the public's ability to review and comment upon the key findings from each of the reports that are discussed in Section 2 of the Executive Summary. ANRC should reopen the comment period and provide the Appendices with the Executive Summary.	The technical appendices (Water Availability Report, Water Forecast Demand Report, Gap Report, and Alternatives Analysis Report) have been available on http://www.arwaterplan.arkansas.gov/ starting in November 2013. The availability of each report was announced in the monthly newsletter as it was posted on the website.
BWD	This subsection discusses the projected groundwater gap for the White River basin. References are made to using not just "excess" surface water, but, rather, the total available surface water, to fill the groundwater gap. It would be a mistake to consider that approach. See Comment 11, above. We are raising this issue in relation to the White River basin, but similar statements are made in regard to the other major river basins.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
BWD	This subsection discusses the projected groundwater gap for the North Arkansas WRPR. Again, multiple references are made to using the total available surface water to fill the groundwater gap. See also Table 6-14. We reiterate that such an approach is inadvisable, and this and related sections should include a discussion of the downsides to such an approach. (See Comments 11 and 24, above). As before, we note this issue in relation to the North Arkansas WRPR because that is where BWD is located, but our comments apply to the sections on the other WRPRs, as well.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.

	General	
BWD	This subsection notes that, "The Gap Analysis Report (Appendix F) evaluated the "total available" surface water, which is the available water when, after accounting for various riparian and instream needs, 100 percent of the remaining water is available for use." First, Appendix F was not provided with the Executive Summary, and the public should have the opportunity to take it into consideration when commenting on the Executive Summary. Second, while BWD understands the theoretical value of calculating the "total available" surface water, the Executive Summary should not assume, or even infer, that such amounts can be treated as "excess" surface water. Doing so would have many adverse consequences, including putting at risk the State's current and future drinking water supplies.	Revised to recommend leaving the 25 percent limitation until studies are completed that will form the basis on future changes in the excess water definition.
BWD	Page ii of the Table of Contents for the Executive Summary lists ten appendices (A through J). None of the appendices, however, are included with the Executive Summary that was made available online for public review. With a fair amount of effort, it was possible to track down elsewhere some of the documents listed as appendices.	The technical appendices (Water Availability Report, Water Forecast Demand Report, Gap Report, and Alternatives Analysis Report) have been available on http://www.arwaterplan.arkansas.gov/ starting in November 2013. The availability of each report was announced in the monthly newsletter as it was posted on the website.
Carman	Add that the projected water supply gap in the St. Francis River basin is based on poor data as described in the Alternatives Analysis Report.	Disclaimer added in Section 1
Cloyd	The plan for water resources can be conserved, given standards are adhered and best management practices provided. Thank you for the AWP research.	Thank you
Drake	We ask that you consider the enormous value of Lake Erling and all fresh water lakes and streams, for recreation use, agricultural use and industrial use and the impact to the counties of SW Arkansas should this lake be drained or diminished to the point of not being navigable. Employment in our area is at an all time low and this lake remains a substantial attraction for industry to this area as well as the economic boost by people building homes on the lake.	Feasibility studies or specific projects should be promoted by the Regional Planning Groups.

	General	
EASELY	It is recommended the sentence be revised to specifically emphasize the priority of public drinking water.	State law and the AWP 2014 Update recognize that drinking water is the highest priority
FLEA	The Arkansas Water Plan should recognize the local and regional economic importance of water supplies, both ground and surface.	Section 1 describes the importance of water to the economy of Arkansas
FLEA	3) Development of a communications strategy: We believe that an informed and engaged populace can be an important catalyst to the long term success of the AWP. It will be essential to create grassroots interest and cause the general population to engage and demand appropriate focus by governmental bodies at the federal, state, county, and municipal levels. We would like to suggest that this strategy include a "call to action" by the population of this state in understanding the importance of this plan and how they can take an active role in supporting its implementation. The ANRC has exemplified this approach through the meetings held to obtain public input into development of the plan. We must find a way to generate greater sustained engagement by the public.	Thank you
FLEA	Presently underdeveloped sources of surface water (e.g. Lake Erling) should be considered for development regardless of whether or not they are in an area deemed critical.	Feasibility studies or specific projects should be promoted by the Regional Planning Groups.
FLEA	Funding of infrastructure (pipelines, intakes, reservoirs, levees, etc.) construction and maintenance costs should be addressed by the Arkansas legislature.	Funding for water resource projects is in Section 3.3
FLEA	We would like to emphasize the importance of three critical issues addressed in the AWP: 1) The importance of immediate and ongoing funding to address the infrastructure needs: There is no doubt that competition is fierce at all levels of government for worthy funding projects. We must ensure that an effective campaign is waged so that those allocating dollars understand the importance of this initiative to the state. We must be proactive in requesting and accessing all available funding needed to execute this plan once adopted.	Funding for water resource projects is in Section 3.3

	General	
FLEA	<p>2) The need to align efforts throughout our state: With so many entities involved in executing the AWP, it will be easy for efforts to become fractured, no doubt resulting in less than optimal outcomes. We particularly appreciate your proposed approach in supporting those at the municipal level in developing effective water plans, which ultimately must be aligned with the overall state plan. This is an essential component to the AWP, as few municipalities possess the knowledge or expertise in this critical area. Municipalities should be encouraged to consider local sources of surface water and ensure its inclusion in their planning. We believe, for instance, that Lake Erling, which is located in Southwest Arkansas in Lafayette County, should be considered in water plans at both the state and local levels.</p>	<p>Feasibility studies or specific projects should be promoted by the Regional Planning Groups.</p>
FNFWR	<p>Water quantity and water quality are intertwined in a complex relationship. Friends recognizes that water must be managed sustainably, with certain priorities, drinking water, local and state economies, applying policies and best practices while preserving private property rights. The Arkansas Game and Fish Commission notes that the state "is rich with mountain streams, most of which are tributary orders including the Buffalo, an ozark zone Blue Ribbon smallmouth bass stream and a national recreation destination." In Arkansas, EPA estimates that 52 percent of the streams have no other streams flowing into them, and that 63 percent do not flow year-round. Small streams, including those that don't flow all of the time, make up the majority of the country's waters. The health of small streams is critical to the health of the entire river network and downstream communities. EPA states that 941,225 people in Arkansas receive some of their drinking water from areas containing smaller streams and that at least 389 facilities located on such streams currently have permits under the federal law regulating their pollution discharges. Aquatic ecosystems are valuable indicators of the suitability of water for many human uses and play an important role in maintaining water quality. These ecosystems also support healthy fisheries that feed our people and our economies. The tourism industry reports \$3-4 billion into our state's economy, with fishing, hunting and wildlife watching making up a large portion of those dollars. Over 550,000 fishers; 335,000 hunters and 800,000 photographers!</p>	<p>The importance of tourism and recreation to the economy of Arkansas is discussed in Section 5</p>

	General	
FNFWR	<p>Friends does not understand the statement, "there is no pattern of impairment or cause of impairment" found in this section in reference to 41% of the state's streams not meeting designated use. Table 6.4 is given as a reference as well as the ADEQ 303d list of impaired waters. It is impossible to draw a conclusion as to cause of impairment from the table. However, an ADEQ supplied map of impaired streams in the state shows majority of the impaired streams in areas of the greatest concentration of irrigated farmland. The ADEQ 2012 305b Report states that 43.1% of the impaired stream miles have been assigned agriculture as the cause of impairment. Of the known sources of impairment, this is the largest source. Previous assessments by ADEQ have pinpointed agriculture as the largest contributor to nonpoint source pollution statewide. This includes all types of agriculture practices. The same report addresses primary sources of groundwater contamination. It mentions agriculture as one of the two largest contributors to groundwater contamination. The fact that 41% of streams and 36% of lakes fail to meet designated use is a general pattern of impairment. As to pattern of cause, agriculture leads the list of causes.</p>	<p>The technical appendices (Water Availability Report, Water Forecast Demand Report, Gap Report, and Alternatives Analysis Report) have been available on http://www.arwaterplan.arkansas.gov/ starting in November 2013. The availability of each report was announced in the monthly newsletter as it was posted on the website.</p>
FNFWR	<p>The Executive summary is a colossal document and a challenge to the most dedicated citizen In digesting it so that effective comments can be made. While those who participated in the process knew where to find the background research and basis for certain statements In the Executive Summary, much of the science was not included. Comment - Friends believes it would be beneficial to provide that detail at this point of the process and extend the comment period allowing for response to the complete information.</p>	<p>The technical appendices (Water Availability Report, Water Forecast Demand Report, Gap Report, and Alternatives Analysis Report) have been available on http://www.arwaterplan.arkansas.gov/ starting in November 2013. The availability of each report was announced in the monthly newsletter as it was posted on the website.</p>
FNFWR	<p>Friends recommends the continuation of the Water Resource Planning Regions where utilizing the reality of best available science, the participants-water users (sectors), agencies and citizens can work together to adapt plans and actions. We believe this process will profit the availability and use of our natural resources into a future that we who participate now are not likely to see.</p>	<p>Public involvement in water planning and implementation is addressed in Section 4</p>

General		
Harris	Will this raise my water bill? I am in the royal water district in Hot Springs, Arkansas. I already pay \$35 for water and \$12 for water usage. This will continue for 20 years. Thank you, Tammy Harris.	The AWP 2014 Update does not address impacts on water rates
Wellford	Finally, it has been suggested that a board of professionals be assembled to lend expert advice going forward, people with enough background in water issues to be able to help shape changes that will make the plan better and without vested interests that make their advice self-serving. These issues are complicated and implementing such a group could be most helpful.	Public involvement in water planning and implementation is addressed in Section 4

	Navigation	
Commenter (see Commenter Key)	Comment	Response
AWC	<p>I am extremely disappointed with the omission of a section on Navigation in the executive summary of the Arkansas State Water Plan. Navigation and the pools for navigation on both the Ouachita and the McClellan-Kerr Arkansas River Navigation System (MKARNS) play a critical part in providing much needed water resources to the State of Arkansas. In fact, three of the four projects that were featured in the executive summary- Plum Bayou, the Bayou Meto Water Management Project and the Ouachita River Alternative Supply Project could not exist without navigation, as the projects all are supplied water from navigation pools. The fourth project, the Grand Prairie Demonstration Project also exists on a navigable waterway. In addition to the aquifer recovery that the navigation pool assists with near El Dorado, navigation pools on the MKARNS also assist with aquifer recovery in critical groundwater areas of the state southeast of Pine Bluff. The Bouef-Tensas Irrigation Project, a newly proposed irrigation project in Southeast Arkansas will also depend on a navigation pool on the MKARNS to provide their water supply. These navigation systems also provide hydropower, recreation, environmental, and additional agricultural benefits to our state. While Arkansas has benefitted greatly from water resources the Federal investment in navigation systems has provided; we must keep an eye toward the future. Currently both the Ouachita and MKARNS have a maintenance backlog that could threaten the benefits that the state receives. Each year the Federal Government continues to cut the budget of the US Army Corps of Engineers (USACE) and this, in turn, affects the ability of the USACE to adequately provide operations and maintenance of locks and dams in Arkansas. It is quite possible that in the future, the Federal Government will require assistance from State Governments or the private sector to provide the necessary maintenance required to receive the water resource benefits that we currently have. This is another reason that omission of navigation from the State Water plan is simply unacceptable. I am hopeful that you will consider adding a section to the executive summary on Navigation. Without it, we are simply not giving a true picture of the water resources in our state.</p>	<p>The navigation systems in Arkansas have been added to Sections 3.3, 3.4 and 5</p>

Implementation Teams		
Commenter (see Commenter Key)	Comment	Response
AACD	Water Plan should include conservation districts in all stakeholder groups which involve soil and water matters	This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties
ACA	The Water Plan process in the future should incorporate the University of Arkansas System's Division of Agriculture's Cooperative Extension Service to a greater degree as they have a tremendous amount of expertise in public policy development through stakeholder involvement. They also lend exceptional knowledge on agricultural water use and water conservation. In addition, we suggest that the ANRC not allow for other state agencies to fund water planning processes if the agencies intend on being active in policy or planning development. Further, we believe that inter-agency meetings on the water plan and water policy should be open to all stakeholders in the future. With regard to contracting with technical experts for plan development, we encourage the ANRC to contract with planning consultants from the State of Arkansas to the maximum extent possible. Lastly, we would like to see stakeholder interest groups in the future receive a voice with weight that reflects their water needs as well as the economic impact that they provide. The agriculture group feels that it was slighted in some of the public meetings when "dots" were allocated among the designated stakeholder groups tasked with setting water plan priorities.	This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties

	Implementation Teams	
ACC	The Arkansas State Water Plan will create multi-agency, multi-disciplinary implementation teams to oversee various components of the water plan. These teams should be instituted as a permanent body to address shifting conditions as they arise, research the best available science and recommend changes as needed. State agency staff is knowledgeable, and committed to protecting the environment, with authority and resources to keep Arkansas streams healthy.	Thank you
APPP	The Arkansas State Water Plan will create multi-agency, multi-disciplinary implementation teams to oversee various components of the water plan. These teams should be instituted as a permanent body to address shifting conditions as they arise, research the best available science and recommend changes as needed. State agency staff is knowledgeable, and committed to protecting the environment, with authority and resources to keep Arkansas streams healthy.	Thank you
AWF	In order to carry out all the objectives of the AWP, multi-agency/group, multi-disciplinary implementation teams will need to be created to oversee the numerous components of the water plan. These future teams should be instituted as permanent bodies to address changing conditions as they arise, be able to research the best available science, work together and recommend changes as needed. The AWP needs to be a "living document" and teams need to be developed on a permanent ongoing basis.	Public involvement in water planning and implementation is addressed in Section 4
EASELY	The completed plan should be flexible enough to adjust to new information (Adaptive Management). Specifically address how adaptive management and updates can be incorporated into the State Water Plan. Part of the consideration of this addition should include how the State Water Plan will address changes demands, both current and future.	The process of incorporating new data and management into the AWP is addressed in Section 4
Gould	Would a structural mechanism provided by legislation or other authority be advisable if the ANRC, ADEQ, AGFC, Agriculture, & ADH are to form a water policy work group as described? That is, would the likelihood that the work group will be formed & become operational be enhanced if there is a structural mechanism provided?	Public involvement in water planning and implementation is addressed in Section 4
Gould	Should the ANRC five year updates of the Water Plan be required by legislation or regulation?	Formal updates of the AWP recommended every 10 years in Section 4

	Implementation Teams	
Gould	For both the implementation and ongoing review & update of the Water Plan should a named position or entity be created either within ANRC (or otherwise) charged with seeing to the implementation, review, & update? Of course, the person or entity would report to the Executive Director of the ANRC.	The AWP 2014 Update does not contemplate addition of a new ANRC position or program
RICE	Finally, the Executive Summary identifies agriculture as being responsible for eighty percent of Arkansas's water usage. Riceland recommends including representatives from the University of Arkansas, Division of Agriculture and the Arkansas Department of Agriculture as part of more work groups and consulting agencies in the final AWP update.	This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties
TNC	A very valuable outcome of the draft Arkansas State Water Plan is the creation of the multi-agency, multi-disciplinary implementation team. This team needs to be a permanent team that guides the recommendations in the draft, addresses changing conditions as they arise, researches the best available science and makes changes as needed.	State agency involvement in water planning and implementation is addressed in Section 4
USACE	Recommend that the Memphis District of the U.S. Army Corps of Engineers participate with a panel member of the Science and Technical Advisory Panel.	This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties

	Implementation Teams	
USGS	<p>Concerning Surface Water, one major concern we have is the fact that it appears the USACE was left out of the recommended groups for future planning and implementing the Water Plan. It seems prudent to identify them as major players when it comes to surface water planning (Ken Brazil and I had a lengthy conversation about this and he was in agreement). We did have a couple of other very minor comments, and they are attached as a *.pdf.</p>	<p>This list and others in the AWP 2014 Update were not intended to be comprehensive or exclusive. The lists of agencies have been replaced by the following phrase: state, regional, and local agencies with constitutional and statutory water management duties</p>

Editorial, Errors and Omissions		
Commenter (see Commenter Key)	Comment	Response
ADEQ	The water needed for maintaining aquatic life uses is not separately addressed in the Key Findings related to Water Availability, although managing water resources in a manner that protects the ecological needs of fish and wildlife is clearly recognized as a goal of the Arkansas Water Plan.	Corrected
ADEQ	The last sentence of the first paragraph refers to the "ADEQ Pollution Control and Ecology Commission." The Commission's correct name is "Arkansas Pollution Control and Ecology Commission."	Corrected
ANHC	There is no mention of the water needs to maintain ecosystem viability despite ecological needs of fish and wildlife being a major goal in the Vision, Mission, and Goals. Furthermore, there is no mention of the Fish and Wildlife Flows Framework being a major finding of the Water Availability Workgroup.	Corrected
Audubon	One point in the Executive Summary causes some confusion. On page 64, under "White River", the document states "If only excess surface water is assumed available in the basin, a combined source surplus of greater than 1,600,000 AF is projected to exist." Yet in Table 6-9 this same amount is presented as a deficit. This important contradiction should be corrected.	Corrected
BWD	2. Water Quality as related to "Available" and "Excess" Surface Water: The Executive Summary should include a discussion, perhaps in Sections 3.3 and 6.1.2, of the link between water quality and how much surface water is "Available" or "Excess." Water quality and water quantity are inextricably linked, and the Arkansas Water Plan Update needs to factor that into its evaluations and calculations. According to Table 6-4 on page 57, twenty-seven percent (27%) of lake acres assessed are impaired for drinking water use and twenty-five percent (25%) of stream miles assessed are impaired for fish and wildlife use. In what, if any, fashion were those and other impaired lake acres and stream miles taken into account in the calculations related to Available and "Excess" Water? See also Comments 11-14, below.	Corrected
BWD	This subsection is a repeat of the first two sentences of the Foreword on Page 1 and should be revised as set forth in Comment 5, above.	No change because not all water is managed for drinking water
BWD	the "Excess Surface Water" and the "Total Available Surface Water" numbers in Table 6-10 and Figure 6-11 don't match, there's either an error somewhere or there needs to be an explanation for the discrepancies.	Corrected
BWD	The eighth bullet point states that, "Statewide municipal and self-supplied drinking water supply demand is projected to increase by about 25 percent from 462,500 acre feet per year (AFY) in 2010 to 578,000 AFY in 2050 ..." The Executive Summary predicts an increase in statewide demand of 115,500 AFY for drinking water. BWD's current water usage is approximately 60,500 AFY; our long-range studies project a demand for the year 2054 of approximately 161,600 AFY, an increase by 2054 of about 101,100 AFY. BWD's projected growth, therefore, accounts for approximately eighty-five percent (85%) of the Executive Summary's projected growth in statewide demand by 2050. This may mean that the total projected statewide drinking water supply demand is too low.	The methodology used to projecting drinking water demand was approved by the Demand Technical Working Group and described in the detail in the Demand Projection Report (available on http://www.arwaterplan.arkansas.gov/ since November 2013)

	Editorial, Errors and Omissions	
BWD	This section notes that water utilities and water districts can "promulgate regulations" that "influence management of water resources." Water utilities in Arkansas - whether municipal, regional, rural, or private - do not have regulatory authority to influence water resource management rather those utilities must work with their respective political bodies (cities, counties, and state and federal agencies) to accomplish such regulatory changes.	Corrected
BWD	The first sentence in this subsection states that the "excess water available in the 32 river basins is shown in Table 6-2 and Figure 6-3 displays the average annual excess surface water for the major river basins." First, this appears to be a reference to the wrong Figure, and perhaps the intended Figure has been omitted. Figure 6-3 on page 54 is the "Excess Surface Water Calculation Steps." Second, in Table 6-2, "Calculated Excess Surface Water," for the White River watershed, the Lower White River is missing. Also, because of questions about the "Excess Surface Water" amounts for the North Arkansas Water Resource Planning Region (WRPR) outlined in Comment 25, below, please verify the amount for the Upper White River in Table 6-2 on page 55.	Corrected
BWD	This section discusses the North Arkansas WRPR, which includes the Upper and Lower White River, the Upper Arkansas River, and the Cities of Fayetteville, Springdale, Rogers and Bentonville. Table 6-10 on page 68 is the "North Arkansas WRPR. Summary of Surface Water Availability by Major Basin." It provides that the total of the Major Basin "Excess Surface Water" in AFY is 6,218,701 and that the total of the Major Basin "Total Available Surface Water" is 24,874,802 AFY. Figure 6-11 on page 70 is the "North Arkansas WRPR Regional Watershed Statistics." It notes that, based on analysis of major basins, the "Excess Surface Water" is 5,388,109 AFY and the "Total Available Surface Water" is 21,552,437 AFY.	Corrected
Carter	The first sentence incorrectly lists the three basins in the North Arkansas WRPR. The Arkansas White River Upper.	Corrected
Carter	As I understand it, the Excess Surface Water column and the Total Available Surface Water column are based on the respective numbers for the entire basin, whether it is from the North Arkansas WRPR or from another planning group. It would be more meaningful to list the available water for each specific region rather than for the basin as a whole. I understand that it may not be a totally exact split, but the manner in which it is listed currently implies an overabundance of surface water that the casual reader of the plan might not catch. This same comment applies to each region, as I see it in Table 6-14 page 70 for the North Arkansas WRPR. If possible it would be beneficial to break out the water supply on a per county basis. While I realize that such a division would be an estimate, it would make the plan more user friendly to future users. Such a division may already be included in an appendix, which would be adequately address my comments. Another option would be to have the information included in a specific plan for each region, as the ANRC did in the 1990 regional plans.	Corrected
Carter	Most of this paragraph appears to have been copied from Section 6.2.4. The name of the region was changed, but the river basins and the specified water volumes need to be corrected.	Corrected
Carter	The text refers to Figure 6-19 which does not exist. I think it should be Figure 6-17.	Corrected

Editorial, Errors and Omissions		
EASELY	There appears to be inaccuracies reported with the statewide municipal and self-supplied drinking water supply demand values. This may mean that the total projected statewide drinking water supply demand is too low.	The methodology used to projecting drinking water demand was approved by the Demand Technical Working Group and described in the detail in the Demand Projection Report (available on http://www.arwaterplan.arkansas.gov/ since November 2013)
EASELY-5	None of the appendices are included with the Plan made available for public review. The fact that the appendices were not included limits the public's ability to fully analyze and understand the Plan. It is recommended that a corrected and full copy of the plan be made available for public comment including extending an additional 30 day public comment period.	The technical appendices (Water Availability Report, Water Forecast Demand Report, Gap Report, and Alternatives Analysis Report) have been available on http://www.arwaterplan.arkansas.gov/ starting in November 2013. The availability of each report was announced in the monthly newsletter as it was posted on the website.
Fugitt	Figure 6-3 is extremely important! This should be a complete single page by itself and should include specific volumes, and the percentages of water-resources flow. The groundwater budget should be included in this section, in table and figure format.	Corrected
Fugitt	Revise text according to the recommendations as provided by Tim Kresse. (I will forward these again.)	Done
Fugitt	The term "management" is emphasized throughout this section. This term strongly implies "control" or "to exert control over", and is often used synonymously with regulations and allocation. I recommend that the term "conservation" be utilized much more in this section. Conservation is more line with Arkansas water policy, the wise use of resources, not the allocation of a limited resource.	Revised
Fugitt	The first step towards all of the initiative in the South Arkansas Recovery, was the designation of the State's first Critical Groundwater Area in 1996. This vitally important, first, should not be omitted here.	Revised
Fugitt	Figure 5.3 is far too small and there is too much detail presented here to make this a half-page illustration. Should be a whole page.	Corrected
Fugitt	1st paragraph- "Additionally, the Sparta aquifer was determined to be a sustaining aquifer" ... The sustaining aquifer authority is within Act 1426 of 2001 and should be noted as separate from the "critical area" designation authority of Act 154 of 1991.	Revised
Fugitt	Could we include Phil Hays in the acknowledgements as part of AWP Exe Summary report? Dr. Hayes is the USGS GW specialist and has been essential, though perhaps in the background, of the AWP development. Please do what you can with this.	Phil Hays has been added

	Editorial, Errors and Omissions	
Gould	Comment: Item # 1 on p. 1 contains the first 1 mention in the document of "a groundwater gap." There is no explanation or definition of the term of "groundwater gap" until a reference in the last sentence of the first paragraph on p. 2 and a definition/explanation on p. 6 at 2.4, the first bullet point. For the uninformed reader, the first reference to the term without definition or explanation could be confusing. Using the p. 6 definition at the first mention of "groundwater gap" on p. 1 would be helpful to the reader's understanding and might alleviate potential confusion.	Definition added
Gould	Comment: This comment may be due to my misreading of the sentence - The sentence is: "Changes in water quality since the 1990 AWP are identified through discussion of historical biennial water quality assessments conducted by ADEQ (as required by Section 305(b) of the CWA) and analysis of water quality data." Are the changes in water quality since the 1990 as being identified through " a reference to material in the 2014 Water Plan document? If so, where?	Reference added to the Water Availability Report (Appendix C)
Gould	Also, note that on p. 2 (see above) the reference to what I assume to be the groundwater gap is stated as 7 million acre feet of water demand over water supply while on p. 6 the reference to the gap is stated as "approximately 8.2 million AFY." Perhaps I am misreading the two references as inconsistent, but I wanted to point out the potential inconsistency.	One is the groundwater gap in the east
Gould	Comment: The first sentence of the paragraph states: "The legal framework for management and use of water resources in the State is based on State and federal case law, and rules and regulations enacted by State and federal agencies." Should state and federal statutes be added to the components of the legal framework? That is statutes in addition to case law & rules & regulations? Perhaps the intention is that case law establishes the basic framework while statutes enhance the framework & as a result are not mentioned?	Revised
NRCS	This figure is probably the most important fact of the entire Executive Summary. If you needed a one page summary of the report, it would be this figure. As I stated at lunch today, there is a "typo" in the water plan executive summary. It's on page 64. It's in the discussion of the gap analysis for White River. The third sentence currently reads: If only excess surface water is assumed available in the basin, a combined source surplus of greater than 1,600,000 AF is projected to exist. The "typo" is that a combined source deficit of greater than 1,600,000 AF is projected to exist. You see this when you read table 6-9 column 5 (groundwater sources supply gap w/excess surface water).	Corrected
NRCS	Table 6-9 is EXTREMELY confusing when using the term Gap w/excess surface water in column 5. Mathematically when we say with, we add the numbers together but what is actually being done here is the positive value from column 4 Table 6-9 (the gap) is being shown as positive (this number really is negative because we don't have that water because it is the deficit amount) and then being subtracted from the positive value of the excess surface water from column 4 of Table 6-5. IF Table 6-9 Column 4 is shown as a negative then header for column 5 and 6 of table 6-9 makes more sense.	Table revised

	Editorial, Errors and Omissions	
USACE	Information below was provided by Ms. Elizabeth Burks, Project Manager of the Grand Prairie Project, with the Memphis District. Paragraph 2 of 4.1.1: Please change "The project will be 50 miles in length," to "The project will have 102 miles of canal and 290 miles of pipeline," Paragraph 3 of 4.1.1: Please delete the last two sentences (About \$132 million...), and replace with the following: To date, a total of \$172,000,000 has been invested in the project (\$127,000,000 Federal and \$45,000,000 non-Federal including farmer's contributions for on-farm recovery systems). The project is 26% complete.	Revised
USACE	The paragraph below reflects the most current information about the project. Information was provided by Mr. Tracy James, Project Manager of the Bayou Meto Project, with the Memphis District. 4.1.3 Bayou Meto Water Management Project Issue B.1 in the 1990 AWP addressed water in Bayou Meto. The issue was that water use exceeded supply in the irrigation season. The Bayou Meto Water Management Project is planned to divert Arkansas River water in order to convert nearly 268,000 irrigated acres from groundwater to surface water. Major features of the project include four pump stations, 107 miles of canals, and 464 miles of underground pipelines. The project area includes portions of Lonoke, Prairie, Arkansas, and Jefferson counties. The project will also provide increased flood control and enhanced waterfowl management. The water supply portion of the project is projected to cost \$574 million for the primary delivery system (does not include any on-farm improvements). This project was first funded for construction in 2010. To date, a total of \$111 million has been invested in the project (\$76 million federal; \$35 million nonfederal), and the project is 17 percent complete. Construction continues on both pump station structures and is 100 percent complete for Pump Station No. 1. Little Bayou Meto pump station is about 92 percent complete.	Revised
USACE	This is a comment for almost all of the figures in the Executive Summary. The legend is almost impossible to read, and the map is fuzzy as well. Recommend that the clarity be improved for all the figures.	Corrected
USGS	More importantly, I believed they have misquoted the 2005 water use report on pg 64: "The primary water use of these aquifers is for agriculture, with crop irrigation accounting for 84 percent of water used in 2005 (USGS 2009)." In the context of this sentence, In 2005, gw use for irrigation was 92 percent of total groundwater use, while 84 percent of irrigation use comes from groundwater.	Corrected
USGS	Industrial water resources can be either or both groundwater or surface water sources. Sometimes the needs of the industrial process determines which water source an industry will use.	Revised
USGS	Most waterfowl water use comes from groundwater sources.	Revised
USGS	Both surface water and groundwater are public supply sources.	Revised
USGS	Domestic wells could include . . . such as irrigation and livestock, as domestic I would say domestic somewhere in this paragraph, as it is in the section title. Also I would say that domestic self-supplied water is from groundwater sources.	Revised

Comments Related to the Appendices		
Commenter (see Commenter Key)	Comment	Response
BWD	<p>First, this subsection uses the term "North AWRPR." We assume this should be "North Arkansas WPRP."</p> <p>Second, this subsection provides that "Table A.1 in Appendix A summarizes the waterbodies in North AWRPR that were assessed for the 2008 biennial assessment, those that were not attaining their designated uses, and the associated use sectors that were impacted." According to the Table of Contents, Appendix A is the "2013 Arkansas Groundwater Protection and Management Act." Clearly, the referenced Table A.1 is not to be found in that Act. Regardless of whether or not Appendix A was incorrectly labeled in the Table of Contents, the appendices were not included with the Executive Summary. Therefore, the public was unable to fully review and comment on this subsection. Again, we would appreciate the opportunity to do so.</p>	Reference corrected
BWD	<p>We were able to locate the Water Availability Report. Appendix A to that report is called a "Summary of the Excess Water Calculation Method and Relevant Assumptions." While eight river basins are covered in Appendix A to the Water Availability Report (which is supposed to be Appendix C to the Executive Summary), it does not include a section for the White River Basin. The title of Appendix B to the Water Availability Report is "Excess Surface Water Calculation Spreadsheets and Basin Maps." A map of the White River Basin is included. Unlike the other river basins, however, no calculation spreadsheets are included for the White River Basin. These are significant omissions given the importance of the White River Basin to water planning in Arkansas.</p>	White River calculations included in the final Appendix C
BWD	<p>According to Figure 4-7 in the Water Availability Report (which is supposed to be Appendix C to the Executive Summary), the only gage on the main fork of the White River used for calculating water availability was USGS station 07077000 at DeValls Bluff. The drainage area above this station contains 23,400 square miles, a large portion of which is in Missouri. It's unlikely that this one station adequately characterizes the available water from a reach of the river as remote as the Beaver Lake watershed. Water from Beaver Lake flows directly into Missouri and at that point is not subject to Arkansas' Water Plan. The uppermost segment of the White River, from the Missouri State line upstream to the headwaters, should be treated as a peripheral watershed, and all availability and excess water calculations should be computed separately from the remainder of the basin.</p>	The selection of stream gages for excess water calculations is described in Appendix C.

RICE	The Base Year for rice is 2010 when Arkansas rice acreage was at its all time high, 1.785 million acres. The very next year, Arkansas rice acres were 1.154 million acres. Riceland urges the Commissioners to review the Rice Research and Extension Center, University of Arkansas, Division of Agriculture's study that reviews the Water Demand Forecast Report. Riceland requests that the Commissioners review the conclusions and recommendations found by the Division of Agriculture's study: An Evaluation of the Water Demand Forecast Report for the Arkansas Water Plan.	The ANRC commissioned the cited report and has reviewed it. A disclaimer has been added to Section 1
RICE	Riceland does not agree with the projected irrigated acres by crop, especially rice. Arkansas on average grows approximately 1.3 million acres of rice. Rice acres may increase or decrease, depending on supply/demand and commodity prices, but the rice market finds equilibrium when Arkansas rice is planted on about 1.3 million acres. The Water Plan Forecast Report seems to use the 2010 Base Year, 1.785 million acres, as a floor for Arkansas rice acreage. As mentioned above, 2010 was the record for rice acres in Arkansas. Table 11.3 does not, in our opinion, represent reality for projected future irrigated acres, considering Arkansas's average planted acreage compared to the projected average of 1. 785- 1.927 million acres of irrigated rice for the years 2010-2050.	A disclaimer has been added to Section 1
WIMPY	Finally, the Commenters oppose the utilization of the Ecological Limits of Hydrologic Alteration (ELOHA), referenced in the Water Availability Report, as the method for calculating minimum flows and excess surface water.	The Water Availability Report references Ecological Limits of Hydrologic Alteration (ELOHA) as one possible method of estimating fish and wildlife flows, but does not endorse it as "the method" for use in Arkansas.

Recommendations for Future Work		
Commenter (see Commenter Key)	Comment	Response
USGS	ISSUE: Lack of continuous monitoring to evaluate effects of pumping on induced migration of high salinity groundwater into high-quality groundwater areas. RECOMMENDATION: The recent Aquifers of Arkansas report (ANRC, USGS, and FTN Associates) established three main areas of elevated salinity in the Mississippi River Valley alluvial aquifer; one of the most important natural resources in the State. There exists a strong need to select wells in these areas for continuous monitoring to investigate if continued high-volume pumping for irrigation is resulting in migration of high-salinity groundwater into fresh-water areas, which could threaten future crop production.	This will be considered with the water policy workgroup as described in Section 4.2
USGS	ISSUE: Every large-scale groundwater model developed in Arkansas has highlighted the importance of accurate groundwater-use reporting in predicting aquifer conditions and for developing effective management approaches. These models also have indicated potential error in water-use reporting and resultant databases. Most recently, evidence of possible inaccurate reporting of use from the Mississippi River Valley alluvial aquifer was indicated by modeling efforts (Clark and others, 2013) that explored the effects of reported use on simulated heads. Reducing the reported use by as much as 50 percent resulted in substantial improvements of observed compared to simulated water levels in several localized areas, indicating the possibility of considerable over-reporting of water use. The poorest matches of observed versus simulated water levels were noted after the early- to mid-1980s. RECOMMENDATION: Metering of wells provides a consistent method for reporting of water use from wells in the Mississippi River Valley alluvial aquifer should result in more accurate use values. Short of this requirement, however, additional studies could assist in evaluating the accuracy of water use reporting. One recommended study would entail calculating water use from annual crop production and required water demand, which have well-documented figures, and comparing these values to reported use over a specified time period (for example, from 1970-present time). Results would show if large deviations exist between calculated water demands from annual crop statistics compared to water-use reporting values, and identify time periods and areas of the State reflecting the largest discrepancies. Similar studies could be applied to other aquifers, where necessary.	This will be considered with the water policy workgroup as described in Section 4.2

Recommendations for Future Work		
USGS	<p>ISSUE: As the Mississippi River Valley alluvial aquifer has become unable to meet agricultural water needs in some areas of eastern Arkansas, an increasing number of wells have been completed in the deeper Sparta aquifer to augment yields. Many wells are believed to be dual completions (producing from both the alluvial aquifer and the Sparta), and there is concern that water-use from many wells that produce from the Sparta is reported as alluvial aquifer water use. The Sparta aquifer is a confined aquifer with orders of magnitude less water available from storage than the alluvial aquifer. Drastic water-level declines in the Sparta aquifer could occur very quickly if subjected to extensive pumping for agricultural demands. The number of wells producing from the Sparta may be underreported as well as water use from the Sparta. RECOMMENDATION: One recommended study to determine whether production from the Sparta may be incorrectly assigned would be to run basic water chemistry analyses on a number of wells and determine geochemically from which aquifer that water is derived. Such an approach would be able to quantify the relative contributions of Sparta and alluvial aquifer in mixed water from dually completed wells.</p>	This will be considered with the water policy workgroup as described in Section 4.2
USGS	<p>ISSUE: Critical declines have been noted in several areas of the Mississippi River Valley alluvial aquifer. Many of these areas are along major rivers, which are identified as major recharge sources to the aquifer. Evidence from recent studies, however, suggests that infiltration of precipitation through coarse channel proximal to the Arkansas River serves as a larger component of recharge compared to actual influx (leakage) of water from the river. If the greatest component is through infiltration of precipitation, then potential changes in climate resulting in reduced annual precipitation, even where maintaining reasonable or current river stage from water outside the State, will result in greater declines in groundwater levels due to in-State reduced rainfall infiltration. RECOMMENDATION: A study is recommended to quantify the various components of recharge along the Arkansas River in the Mississippi embayment. While similar studies could be useful along other major rivers (for example, the White River), more data are available in the area of the Arkansas River, which would reduce the need for collection of additional, new data. Knowledge related to quantification of water contributed by the various sources of recharge (leakage from rivers, infiltration of precipitation through permeable surface sediments, leakage from underlying aquifers, and other minor pathways) will assist in future groundwater planning and management scenarios.</p>	This will be considered with the water policy workgroup as described in Section 4.2

	Recommendations for Future Work	
USGS	<p>ISSUE: The recent Aquifers of Arkansas report (ANRC, USGS, and FTN Associates) compiled abundant available data to document historical and current water use, water levels, water-level decline trends, and water-quality conditions for 16 major and minor aquifers of the State. However, no method currently is available for use of the data to accurately quantify water availability and identify areas that have additional development capacity from the regional extent of all aquifers, which is driven by criteria including economics (depth of pumping requirements), available water storage, variable water quality, and other important indicators of freshwater availability. RECOMMENDATIONS: The economy of Arkansas continues to grow, and with it an increasing demand on water resources in the State. Some aquifers in the State are known to have additional development potential; however, this knowledge is available only by searching and interpreting numerous reports and databases. No single tool is available for integrated evaluation of water availability and aquifer development potential. A beneficial tool for categorizing and compartmentalizing available groundwater sources throughout the State would be gained from the creation of a set of indices for ranking available groundwater sources and applying these rankings on a well-by-well basis for each of the State’s aquifers. It is recommended that such a study be conducted to identify and weigh important ranking criteria, to devise a method for spatially applying these rankings to each aquifer, and to produce a map of the resulting rankings for each aquifer for use by ANRC in identifying optimum areas for future supplemental water supplies to meet ongoing water demands in the State.</p>	This will be considered with the water policy workgroup as described in Section 4.2
USGS	<p>ISSUE: A pressing need continues for exploring and expanding conjunctive use as a means to reduce groundwater level declines in the Mississippi River Valley alluvial and Sparta aquifers. Although some historical studies have discounted artificial recharge systems to replenish groundwater, mainly as a result of economic considerations, newer passive storage systems have demonstrated technical improvements and improved cost-benefit analysis. Such systems could reduce use of valuable land used for on-farm reservoir systems. RECOMMENDATION: Conversations with farm owners and managers currently using surface-water diversion technology as a supplemental source of irrigation supply have expressed interest in studies to evaluate the efficacy of passive-storage techniques for replenishing groundwater storage following irrigation season. There is a need to conduct these studies for evaluating the feasibility of its use in Arkansas.</p>	This will be considered with the water policy workgroup as described in Section 4.2

	Recommendations for Future Work	
USGS	<p>ISSUE: Confidently identifying and delineating areas where aquifers are beginning to show consistent water-level declines, including declines that would fall within the definition for critical groundwater areas, is difficult in areas with a scarcity of water-level measurements. Where monitored, most water-level measurements are taken annually, and no effective means are available for documenting seasonal as compared to long-term (drought years versus wet years) variation in water levels from natural causes. Additionally, many aquifers in the State are not regionally extensive, are only of local to sub-regional importance, and currently receive lesser monitoring attention. RECOMMENDATIONS: There is a critical need to develop an integrated continuous groundwater-level monitoring network throughout the State, especially within the Mississippi embayment. Real-time monitoring not only assists agencies charged with water-resource planning and management responsibilities, but assists farm managers in evaluating water-level changes during the irrigation season. Recent meetings with various farm owners and managers have revealed a willingness by the farming community to assist in funding efforts for such an effort.</p>	This will be considered with the water policy workgroup as described in Section 4.2
USGS	<p>ISSUE: Long-term viability of groundwater resources is a primary goal for water managers in the State, and a well-defined knowledge of sustainable yield is paramount to achieving that goal. Studies determining sustainable yield have played an important role in providing information for management and policy development for areas of the Mississippi River Valley alluvial and Sparta aquifers; however, our knowledge of sustainable yield of other smaller, though important, aquifers in the State is completely lacking. RECOMMENDATIONS: Aquifers for which sustainable yield information is lacking should be prioritized, and data assimilation and modeling approaches should be applied to determine sustainable yield, as defined by relevant Arkansas regulation and policy, for other important aquifers in the State.</p>	This will be considered with the water policy workgroup as described in Section 4.2

	Recommendations for Future Work	
USGS	<p>ISSUE: Water availability has been the limiting factor for economic development and growth in several areas of the State. One of these areas is the Ozarks, particularly the Boston Mountains and Springfield Plateaus, where communities have drilled numerous, deep, high-cost, high-risk (in terms of achieving desired yields and water quality) wells in the marginal zones of the Ozark aquifer. These deep Ozark wells often have relatively low yields and require considerable treatment to insure good water quality, but are nonetheless viable water sources. In recent years expansion of rural water districts has brought surface water from northern Arkansas lakes to these areas, resulting in less dependence or outright abandonment of the deep wells. Because of potential liability issues, an ill-considered response has been to move forward with plugging of these wells, which represent millions of dollars of investment. RECOMMENDATIONS: Deep Ozark aquifer wells which are being abandoned represent a water source made available by very large capital investments, and although Federal support of expansion of surface-water delivery in the State has changed the economic equation, deep Ozark wells should be preserved as viable alternative water sources in the case of extended drought, terroristic sabotage of surface-water impoundments or delivery systems, or need for augmented supply for the time when growth in these areas results in water demand exceeding what surface water can supply. The community-supply, deep Ozark aquifer wells are some of the only water-level monitoring points available for broad areas of the Ozark aquifer, and provide an excellent opportunity to establish continuous monitoring of water levels and water quality at each of these wells. Such a project would provide an important reason for maintaining these boreholes, yielding critical groundwater level and quality information while preserving a near-immediately available alternative water source locally. The pragmatic nature of this recommendation is seen in the very recent moves of two communities—Marshall and Lead Hill—to move back to their original groundwater sources.</p>	This will be considered with the water policy workgroup as described in Section 4.2
USGS	<p>ISSUE: ANRC and other water-management and water-monitoring agencies in the State have conducted a large number of studies and accrued voluminous information on the various aspects of groundwater budget—precipitation, evapotranspiration, recharge, storage, transit rates, pumping, leakage, stream discharge, etc.; however, no single publication or tool has been developed consolidating all of this information, identifying knowledge gaps, linking connected aquifers and spatially separated aquifer zones, and synthesizing a single, integrated, user-friendly construct that can quickly address questions and issues on large-scale water budget. RECOMMENDATION: An integrated spatial database of water budget data for the State with an outcome and needs specific interface and companion publication should be developed. Such a product will also highlight data gaps and enable targeted collection of any additional needed data. Outputs from this tool would include budget quantities for various budget compartments and interfaces, such as recharge values for a given area of an aquifer, or leakage between two aquifers in a specific location.</p>	This will be considered with the water policy workgroup as described in Section 4.2