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ANSWERS TO QUESTIONS PRESENTED AT THE PHOENIX AMA MODEL BRIEFING

1. Why is it assumed that agricultural demand will increase exponentially despite less land being used for agriculture as that land is developed?

We don't assume an increase in agricultural demand. Agricultural demand is modeled at its current (2021) rate for 100 years, with the exception of agricultural land located within the footprint of an analysis or certificate of assured water supply. In that case, the agricultural demand and associated recharge is removed under the assumption that the land will be developed.

It's possible that the question is based on the graph of **unmet** demand over time. Unmet demand is the portion of total demand that cannot be extracted from the aquifer due to the well going dry or the depth to water exceeding 1,000 ft below land surface. Unmet demand in the model does increase over time. The total demand is static, however.

2. There has been news coverage over the past couple of days regarding how the results of the study will impact future development in the Phoenix area. Where can people go for information regarding what type of new developments will be impacted?

Some development has already been approved and is incorporated in the new model. Developments that have already demonstrated an assured water supply by obtaining a certificate, as well as those with a commitment of service from a designated provider, will not be affected.

Additionally, water supplies other than groundwater could be used to demonstrate an assured water supply for new development.

A list of water providers designated as having an assured water supply for their service areas is available [here](#). Water providers can provide more information about the water supplies they serve.

3. How was the firm chosen to conduct the study and why was an out of state firm chosen?

ADWR's Groundwater Modeling Section developed the groundwater model. S.S. Papadopoulos & Associates, Inc. is the name of the firm chosen to peer review and assist with calibration of the numerical model. This firm was chosen because of their expertise in numerical groundwater modeling and because they have provided peer reviews of past ADWR models (the Pinal AMA model, for example). An out of state firm was chosen to avoid a potential conflict of interest with local firms, many of whom represent applicants to the AWS program.

4. If most of the projected unmet demand is for agriculture and potential development of agriculture land were to prove it would utilize less water than if it were to remain agriculture. Wouldn't this development be a net benefit to the water supply?

Any decrease in future demand of groundwater will be a net benefit to the overall water budget, which currently anticipates an overdraft to the aquifer by a factor of 1.4. The timing and location of the future benefit would need to be modeled to evaluate if it had an impact on the simulated depths to water and unmet demands.

5. How will DAWS renewals be handled? If CC&N expansions have taken place since the last approval and the area that was added had an approved AAWS, will the utilities DAWS be able to be increased in that scenario?

A provider with an existing designation of assured water supply ("designation" or "DAWS") may modify or renew the existing designation to include non-groundwater supplies, as well as the volume of groundwater included in their last designation minus the volume of groundwater pumped since that designation was issued. However, designated providers will not be permitted to increase the volume of groundwater in the designation based on the Phoenix AMA model or issued analyses of assured water supply in the model area.

6. Is this going to affect Re-Issuance and Assignment Applications on existing certificates?

ADWR does not review physical availability of groundwater for applications that meet the criteria for reissuance or assignment of certificates. Those applications are not affected by the new model.

7. How does the Department intend to approach updates and calibrations to the model in the future? Is there a target frequency that the Department hopes to achieve?

Besides the Phoenix AMA model, ADWR maintains groundwater models for the Pinal, Prescott, Santa Cruz, and Tucson AMAs, and is in the process of developing a model for the Douglas AMA. Regular updates and recalibrations in response to new data and improvements to the MODFLOW code will occur on the order of every 5 to 10 years. Updates to the 100-year projections could occur more frequently and would be dictated by significant changes to previous assumptions.

8. How does the model address CAGRD's obligation to replenish the amount of groundwater withdrawn for subdivisions that are enrolled in the CAGRD, assuming that there is water for the CAGRD to buy for replenishment purposes?

The model includes replenishment from CAGRD in the 100-year projection period at rates based on CAGRD's projections from their 2015 Plan of Operations. The location of the recharge is at permitted storage facilities that CAGRD has historically used. The distribution to the facilities is based on past recharge volumes as well as the permitted maximum capacities at the facilities.

9. Is the Phx AMA the only AMA that will stop issuing CAWS? What processes are in place to discuss regulatory changes to address this?

The Phoenix AMA is not the first AMA in which ADWR has identified unmet demand that precludes issuance of new AWS determinations based on groundwater. When ADWR released the 2019 Pinal AMA assured water supply scenario, substantial unmet demand was identified. As a result of the stakeholder process, some statutory changes were made to allow certain development to proceed.

Governor Hobbs' Water Policy Council has established an Assured Water Supply Committee to identify ways to strengthen the program and allow for growth based on water supplies other than Phoenix AMA groundwater. Governor Hobbs has asked the Council to make recommendations regarding AWS changes (policy, administrative or legislative) by the end of this year.

10. Are the projected pumping locations for AAWS & CAWS located within the footprint of the development or within the associated water provider? How will DWR look at new CAWS applications with a renewable supply but served within a system with groundwater (co-mingled supplies)?

Yes, projected pumping locations for AAWS and CAWS are located within the footprint of the development or within the service area of the associated water provider. These assumptions may be updated based on information from the water providers.

Renewable supplies will be critical to growth in the Phoenix AMA moving forward. However, (with limited exceptions) if a renewable supply will be served by an undesignated provider through a system that also includes groundwater, ADWR cannot determine that the water supply for any particular subdivision is an assured water supply. This is because all of the water supplies are shared throughout the provider's system. If there is less of one water supply available, that shortage will be distributed to all customers. This issue may be considered by the Assured Water Supply Committee of the Governor's Water Policy Council.

11. I think I heard that the well locations in the Phoenix AMA model were based on locations in the previously issued determinations of assured water supply in the SRV model, yet in the Hassayampa basin and model well location was not based on well locations in previously issued determinations, but rather wells were simply put in each section. Can you please clarify?

Existing wells are located in their actual locations (as reported to ADWR).

Hypothetical wells (the wells associated with issued-but-unbuilt AAWS and CAWS) are placed in the model as follows:

- 1) If the AAWS or CAWS is in the Lower Hassayampa sub-basin, the associated demand is pumped out of the model using hypothetical wells spread evenly across the footprint of the development at equal pumping rates for each well. This is based on the well locations in the 2023 Lower Hassayampa sub-basin model.
- 2) If the AAWS or CAWS is in the SRV model domain, the hypothetical wells have already been assigned a location by the applicant or by previous ADWR modeling (Hipke, 2010). This is based on well locations in the most recent projection run of the SRV model, which included substantial input on well pumping locations from applicants and water providers.

In all instances, the hypothetical wells are assumed to fully penetrate the aquifer.

Additionally, based on stakeholder feedback, ADWR preemptively deepened existing wells associated with an Assured Water Supply to fully penetrate the aquifer, on the assumption that municipal water providers would have the capacity to install deeper replacement wells in the future if needed.

Any of the pumping locations may be reassigned in subsequent iterations, based on information submitted to ADWR by the water providers regarding reasonable pumping locations.

12. How many certificates were issued based on groundwater alone in the last year?

[The Department has](#) issued 21 Certificates based on groundwater since June 2022 and 41 certificates based on groundwater since January 1, 2022 in the Phoenix model domain.

13. How will the model impact existing designations of assured water supply as they come up for review on the 15 year cycle (and potentially result in revocation of those designations)?

Existing designations subject to review or seeking a modification will be reviewed pursuant to [A.A.C. R12-15-710\(G\)](#) (see document page 25, pdf page 28), which provides that the volume of groundwater previously determined to be physically available, less any groundwater pumped since the designation was issued, shall remain physically available for subsequent modifications.

14. Is there a set time frame in which the model, and reports, will be re-reviewed?

There is not a set time frame in which the model and reports will be reviewed. However, ADWR anticipates regularly updating groundwater models within 5 to 10 years of issuance, and the assumptions that went into the projection can be updated any time significant changes occur. Additionally, projection runs are updated by applicants when submitted to support applications.

15. Many projects have been modeled with homes using 200-300 gpd. Currently we are seeing all communities using closer to 150 gpd or less. What does the Phx AMA model use for households?

The Phoenix AMA model doesn't explicitly assume a rate of water use for existing uses, including any homes built pursuant to certificates or designations. ADWR used reported water use from the municipal water providers, which is disconnected from gallons per capita. For issued but unbuilt determinations (analyses, certificates and designations), the annual estimated water demand associated with each determination was used.

16. Has there been any discussion of a cash-in-lieu program to offset a shortfall for AWS on a particular project?

ADWR recommends that proposals be brought to members of the Governor's Water Policy Council, and particularly to members of the Assured Water Supply Committee, for discussion.

17. Can an issued AAWS, which is about to expire, submit a new AAWS Extension application in order to keep the Analysis from expiring when significant costs have been incurred to move the development forward?

The provisions for extension of the term of an AAWS are set forth in A.A.C. [R12-15-703\(H\)-\(I\)](#). (See document page 20, pdf page 22.)

18. Will new certificates be issued if they are based on CAGR D membership? They usually depend on a physical showing of groundwater availability, which is no longer allowed. What about a development that will use its effluent on-site through indirect potable reuse? Does that overcome the problem of reliance on groundwater?

Enrollment in the CAGR D does not demonstrate physical availability of groundwater. The CAGR D requires that all other requirements for a certificate (including physical availability) be met before the land is enrolled in the CAGR D.

Indirect potable reuse of effluent may be used to demonstrate an assured water supply. However, in order to produce effluent, a separate water supply must also be physically, legally, and continuously available. Additionally, the volume of effluent produced will always be less than the volume of water initially used.

19. Are you assuming that a well can pump its rated volume capacity until the groundwater level hits 1000 ft BGS? and is this assumption used in your unmet demand calculation?

No, we do not assume modeled wells stop pumping if the water level in the well drops to 1,000 ft bgs or lower. If the well is deep enough and the saturated thickness can sustain the pumping, the pumping continues. Unmet demand occurs when the well either goes dry or the saturated thickness of the aquifer is insufficient to sustain the pumping rate.