

ADWR Responses to Questions on the Pinal Groundwater Model Assumptions
February 10, 2020

GW Modeling Programmatic Assumption Questions

1. How is reclaimed water from wastewater providers that are not also water providers or designated with an assured water supply handled in the model?

Response:

Pursuant to A.R.S. § 45-853.01:

- existing LTSCs accrued at USFs are removed from the model over the 100-year projection period at 1/100 of the total volume (14,556 AF total LTSCs at end of 2015), and
- future accrual of LTSCs at USFs was not simulated in 100-year projection because the LTSCs cannot be relied upon by non-storing entities.

If ADWR is provided with detailed Pinal municipal water or wastewater provider effluent reuse or recharge plans, ADWR can review and evaluate those plans to determine if any additional information and assurances would be required in order to update the effluent model assumptions.

2. Concerning AG demands, what assumptions were made for AG demands, within each irrigation district, and outside irrigation districts. What method did ADWR use to come up with AG demands over the 100-year modeling period? What is that based on?

Response:

For non-district IGFR lands, pumping for agricultural wells located on lands with AWS overlays was discontinued at the beginning of the projection period. Agricultural wells located on remaining farmed lands was held constant at 2015 rates through the projection period.

Agricultural water use projections for irrigation district lands were prepared by ADWR AMA staff and generally consisted of calculating total annual demand based on estimated number of acres in production and an historic average water use per acre. Non-groundwater supplies, including CAP water, CAP Ag Pool water, GSF water, surface water and CAGRDR replenishment water, were applied first to meet total agricultural demands, with the groundwater calculated as a residual volume.

CAIDD and MSIDD assumptions included a reduction in agricultural acres, and corresponding annual total water demand, due to urbanization over the projection period. HIDD and SCIDD assumptions did not include reductions in acres due to urbanization. For HIDD and SCIDD, the number of agricultural acres was held constant over the projection period after removing agricultural lands with AWS overlays.

3. How were reduced AG demands from urbanization handled in the model? By uniformly spreading urbanization over the AG lands, other methods?

Response:

Pumping associated with agricultural wells located on lands with AWS overlays was discontinued at the beginning of the projection period. Pumping from wells located on remaining agricultural lands was assumed to continue through the projection period. Pumping to meet the irrigation demands on remaining agricultural lands was applied evenly across the remaining, active agricultural wells. As the amount of agricultural lands and the corresponding total water demand decreased through the projection period, the pumping was reduced evenly across the remaining wells.

4. To what extent are physical supplies limited by depth of wells, depth to bedrock, or depth of saturated thickness as opposed to water exceeding depth BLS of 1100 feet? What portion of the 8.1 MAF is related to these three factors?

Response:

A large majority, approximately 75%, of the total unmet demand occurs due to regional water table elevation being below the bottom of the well, 5% due to the entire cell becoming dewatered or going dry, and 20% where the well demand exceeds the capacity of the cell to produce the desired outflow.

What portion is related to depth BLS exceeding 1100 feet BLS?

Response:

Depth to static water level in excess of 1,100 feet bls after the 100-year projection period was observed only in the vicinity of the City of Eloy. There are several proposed new AWS wells that are located in this 1,100-foot exceedance area.

5. What portion of AAWSS overlay an IGFR?

Response:

57% of all issued certificates or analyses of assured water supply are located within irrigation district boundaries

76,449 acres within the Pinal AMA have issued certificates or analyses of assured water supply
43,919 acres within irrigation district boundaries have issued certificates or analyses of assured water supply

6. Why didn't ADWR consider urbanization of HIDD and SCIDD lands over the 100-year modeling period except for where an AAWS or CAWS overlays these districts?

Response:

ADWR did not consider urbanization of HIDD and SCIDD because ADWR did not have information from HIDD and SCIDD to evaluate regarding urbanization outside of the AAWS or CAWS overlays as ADWR had for MSIDD and CAIDD.

If ADWR had considered urbanization of these district lands, how much would these demands have decreased over time?

Response:

ADWR has not conducted this evaluation.

7. Concerning SCIDD water from the Gila River system, why did ADWR use only the more recent 15-year period of time for supply estimates rather than a longer period of historical Gila flows?

Response:

ADWR used the 15-year period of time because it represents a period with some dry and some wet years without extreme drought or flood conditions that might skew results of a future projection.

How did the average flows for this 15-year period differ from the past 100 years? The past 30 years?

Response:

The average flows for this 15-year period differ from the past 30-year and 100-year periods due to extreme climatic events during those periods.

8. Concerning DAWS demands, what discretion does ADWR in modeling DAWS demands? Is this by statute or rule? Why not ramp up demands in a similar manner to population or urbanization projections or estimates?

Response:

When evaluating physical availability for assured water supply applications, ADWR considers the full issued 100-year assured water supply demand, including designations of assured water supply pursuant to A.A.C. R12-15-716(B)(3)(c)(ii).

9. Concerning CAWS demands, how have actual, or new water use model, demands compared to committed demands for the subdivisions covered by a CAWS? 15% less? 20% less? More?

Response:

In evaluating water use for fully built out CAWS subdivisions in the Pinal AMA as of 2016, ADWR found that on average, these subdivisions use approximately 30% less than the issued certificate demand.

What discretion does ADWR have in modeling demands where ADWR has evidence that actual or estimated demands are less than committed demands?

Response:

In the 2019 Pinal AWS Model Run, ADWR used the actual reported groundwater use for built-out certificated subdivisions where the actual reported use was less than the issued certificate groundwater demand. See A.A.C. R12-15-716(B)(3)(b) and R12-15-716(B)(3)(c). For certificated subdivisions that are not completely built out, ADWR uses the full issued 100-year certificate

demand beginning on year one of the projection period pursuant to A.A.C. R12-15-716(B)(3)(c)(i).

10. Concerning CAWS demands, considering that the current demands associated with CAWS are well below the total CAWS demand, couldn't the model show a ramp up of demands consistent with TAZ or DES population projections rather than 100% in year 1?

Response:

See the answer to question 9.

11. Concerning CARGD replenishment, for projects not included in the CAGRD's 2015 plan of operation, how does ADWR intend to include such replenishment where a subdivision has become a member land after the 2015 plan of operation? Incrementally?

Response:

ADWR's most recent model run includes an assumption for 15,500 acre-feet per year of CAGRD replenishment for the entire 100-year projection period. The full 15,500 acre-feet per year replenishment assumption begins in the first year of the model run to be consistent with the inclusion of the full issued assured water supply demands beginning in the first year. The 15,500 acre-feet per year replenishment obligation is based on the estimate from the 2015 CAGRD Plan of Operation, which includes replenishment obligations for reasonable projections of additional member lands and member service areas through 2024, pursuant A.R.S. § 45-576.02(C)(2)(b). Pursuant to CAGRD's most recent annual report, it's replenishment obligation in 2018 was 551.9 acre-feet. (<https://www.cagrd.com/documents/annual-reports/2018-CAGRD-Annual-Report-to-ADWR.pdf>). ADWR does not intend to include a replenishment assumption for replenishment volumes greater than those included in the CAGRD Plan of Operation.

Does ADWR recognize that the groundwater allowance for subdivisions platted or where a CAWS is approved after the 2019 AWS rule change for Pinal AMA requires 100% replenishment for non-IGFR land and approximately 85% for IGFR lands that extinguish the IGFR rights?

Response:

ADWR has not issued any certificates of assured water supply since the 2019 groundwater allowance and extinguishment credit rule change. The volume of extinguishment credits pledged to any future certificate of assured water supply applications will be evaluated at that time.

12. Concerning AAWS demands, considering that ADWR's demand model currently uses has a lower volume of water in calculating demands for AAWS and CAWS, why shouldn't ADWR use the lower demand in its programmatic assumptions in the Pinal GW model?

Response:

See the answer to question 9 for certificates of assured water supply. Because all analyses of assured water supply demands are unbuilt, ADWR uses issued analysis demands in its modeling assumptions. See A.A.C. R12-15-716(B)(3)(c)(iii).

13. Has ADWR run the Pinal AMA GW model within the last 24 months to see how any of the changes in programmatic assumptions that were the subject of stakeholder discussions in the past 3 years may have reduced unmet demands? What were the results of those model runs concerning unmet demands?

Response:

Within the last 24 months, ADWR ran the model using the following programmatic assumptions that were the subject of the stakeholder discussions and that were not included in the 2017 and 2019 model runs:

- Use of an updated AWS water demand calculator for issued but unbuilt AWS demands that resulted in lower 100-year projected demand.
- Reuse of all effluent that would be produced by subdivisions with issued AWS determinations.
- Full CAGRDR replenishment for AWS determinations (in excess of 100,000 acre-feet).
- Significant lateral movement of well pumping.

The Department did not include these assumptions in the 2019 model run because they were determined to be unrealistic or not permissible under statute or rule.

14. Concerning industrial water use assumptions in the Pinal AMA GW model, what portion of such industrial use is associated with Type 1 rights? GIU permits? Type 2 Rights?

Response:

Industrial water use projections were based on reported industrial uses in 2015 and held constant over the 100-year projection. ADWR did not categorize industrial demands by type of industrial groundwater right.

15. What is the typical or average term of a GIU permit?

Response:

There is no "typical" term for the permits because each permit is issued on a case-by-case basis depending on specific details related to the permit. There is a maximum length of time for which GIU permits may be issued. GIU permits may be issued for up to 50 years and are subject to renewal under the same criteria used in granting the original permit, pursuant to A.R.S. § 45-515. For active GIU permits in the Pinal AMA, the terms of these permits range from 2 years to 49 years.

16. Concerning LTSCs, how many of the existing or future LTSCs have been set aside for firming M&I allocations? Should this portion of LTSCs be reserved in the Pinal AMA for firming AWC's, Eloy's,

and Florence's CAP subcontracts? If so, should the model reduce the amount of credits taken out or pumped out over 100 years?

17. Where a municipal provider has prepared a water supply plan that shows where wells may be replaced, new wells drilled, existing wells deepened, or new wells strategically placed outside areas of unmet demand, would ADWR use such information to refine the assumptions in the model as a means of mitigating at least a portion of the unmet demands?

ADWR Policy Questions

18. Concerning the generation of LTSCs from CAP deliveries to GSFs in the Pinal AMA, how does ADWR view the requirement that the GSF operator agreeing not to pump groundwater on and acre foot per acre foot basis in exchange for receiving CAP water affect the preservation of the CAP water stored within the GSF boundary? In other words, does the agreement not to pump the groundwater that the GSF operator otherwise could have pumped extend beyond the year in which the in-lieu water was stored, or such that the water stored cannot be pumped by the GSF operator at any time?
19. Concerning the Pinal AMA GW model, for projects with an AAWS that decide to file for a CAWS under ADWR's proposed substantive policy for CAWS, how does ADWR plan to handle any portion of unmet demands for projects with either a CAWS or AAWS that predate the CAWS applicant's application? Denial? Reduce available physical supplies to CAWS? Require CAWS applicant rerun the model such that no unmet demand results for any prior approved AWS CAWS, DAWS, and AAWS?
20. On what basis does ADWR assert that any previously approved DAWS, CAWS, or AAWS has priority over any subsequent application?
21. Concerning the protection of consumers, what consumers does ADWR allege are required to be protected? From what authority does ADWR conclude such protection is required?