

Pre-Workshop Survey Responses

Please find the responses collected from a questionnaire distributed ahead of the planned 2022 Recharge & Recovery Workshops, which have since been postponed for the time being.



What is a topic or topics within the Recharge requirements that you would benefit from further clarification or explanation of?

Need to discuss protection of stored water from irrigation grandfathered rights.

Area of Impact, Safe Harbor, and recharge permits

Being in close proximity to a river makes it extremely difficult to obtain long-term storage credits from recharge. We drilled three injection wells, but were only able to obtain recharge credits for one of them. What is the possibility of obtaining return flow credits for recharging reclaimed water in close proximity to a river? Return flow credits could potentially be of benefit to lessen the potential impacts from the adjudication.

Have there been any leaky lake designs that provide a dual benefit for recharge while providing a lake that provides enhancement to the ecosystem in the area? What recharge well designs have been successful to sustain recharge rates? What well operational practices have been successful to sustain recharge rates? What recharge basin designs have been successful to sustain recharge rates? What open basin operational practices have been successful to sustain recharge rates?

Recharge facility modeling and the statutes, rules, and written policies underpinning the use of maximum permitted recharge volumes for the duration of the permit. Perhaps more importantly, analysis of actual groundwater level rises versus modeled during permitting.

Ability of a member land service area to accrue LTSC to encourage recharge operations

Explain the Area of Impact Analysis. What is the current accepted analysis and why? Would ADWR consider changing the AOI analysis? What AOI concepts are being considered?

Communities that rely 100% on groundwater pumping. Continued approval of development projects that use groundwater.

What is a topic or topics within the Recharge requirements that you would benefit from further clarification or explanation of?

1. Regardless of the current statutory framework, what regulatory elements could be changed to improve the Recharge Program, from ADWR staffs perspective?
2. What assumptions go into the modeling process for a USF permit? For example, is recharge modeled for other USFs if those permits expire during the modelling simulation? What types of pumping and recovery scenarios are included when conducting modeling for a USF permit?
3. How does the Recharge Program interface with the Assured Water Supply Program? Particularly when it comes to the modeling and permitting of USFs, and the evaluation of physical availability for groundwater for AWS determinations.
4. Please review Unreasonable Harm. Can the current requirements for Unreasonable Harm be improved? Has Unreasonable Harm ever happened or come close to happening?
5. How do the Unreasonable Harm and Hydrologic Feasibility requirements consider impacts of a USF on rising water levels?
6. What is the origin of the 1-mile safe harbor Area of Impact (AOI)?
7. How is the Maximum AOI calculated? How has this policy changed from what is described in Substantive Policy Statement R9 and R14? Has it changed subsequently since the release of R14?
8. What is the "Region of Direct Impact"?
9. Please provide a comprehensive overview of AOHI, and how it is used in different contexts. How is AOHI defined and calculated, separate (or before) Substantive Policy RW1 was published? Is AOHI used differently across the recharge and recovery programs? Was AOHI a statutory concept or term that was later replaced with AOI?
10. What are the notification requirements when permitting a USF?
11. Are there opportunities to use less modeled indicators for recharge impact, and utilize more measurements of recharge impacts through water level monitoring? How could this be applied to hydrologic feasibility?
12. To what extent is large, permitted recharge volumes "tying up space" in the aquifer a problem?
13. How did the concept of water that cannot be used directly originate from the 1986 Underground Storage & Recovery legislation? What was the intent of this concept?
14. What is the average length of time to re-permit a USF?
15. What is ADWRs process for seeking public comment and stakeholder input on regulatory changes to the Recharge Program?
16. What is the organizational structure of ADWRs Recharge Program? Are there enough staff and resources? Is the Recharge Program fee structure appropriate? How can stakeholders help?
17. Why have the recharge and recovery siting criteria related to shallow water levels never been enforced since the adoption of the 3MP?
18. How does the modeling "facility on facility off" methodology work?

The timing and need for churning the soil in a recharge basin

What is a topic or topics within the Recharge requirements that you would benefit from further clarification or explanation of?

1. Projection of maximum AOI:

1a. Why is the maximum AOI for a GSF assumed to be the boundary of the GSF rather than being projected the same way as for a USF, given that the hydrologic effect of decreasing withdrawals is the same as increasing recharge

1b. Clarification of when the maximum AOI should represent the effects of only the applicant's recharge (incremental AOI) versus the composite effects of the applicant's recharge plus all other pumping and recharge in the AMA (composite AOI)

2. Clarification of policy regarding simulation of other permitted USFs in groundwater models:

2a. At what stage of the USF permitting process is a new USF required to be included in models for subsequent USF permit applications? Is it after the permit is issued, or upon submittal of initial application? If the latter, is there a minimum standard the initial submittal must meet before the associated recharge must be included in other applicant's models?

2b. Given that most USFs will have permit renewals and continue to operate beyond the expiration date of their current permit, clarify if and why ADWR requires applicant's groundwater models to exclude recharge from other USFs beyond the USF permit expiration dates.

3. Clarification of conditions under which a USF permit applicant can include in their groundwater model the recovery of water to be stored at the USF

4. Unreasonable harm assessment for USF permit applications: Can ADWR provide links to online public resources that can be used to identify and characterize sites of potential unreasonable harm (such as gravel pits and landfills)?

5. Operation Prohibition Limits (OPLs) on groundwater levels at USFs: Clarification of policy regarding minimum depth to groundwater level at the USF when no potential for unreasonable harm to other land or water users has been identified. Why not allow water levels to approach land surface at the USF?

6. Topics for USF permit renewals:

6a. Requirements for calibrating groundwater model based on groundwater level data obtained as part of the USF monitoring program

6b. Confirmation that only those land and water uses that predated the original USF permit need to be considered in unreasonable harm assessment

6c. Projection of maximum incremental AOI (due only to the applicant's recharge): If groundwater levels are declining, the projected maximum incremental AOI overstates the areal extent of impact since the 1-foot contour represents a 1-foot decrease in water level decline rather than a 1-foot rise in water level. Does the applicant have the option of projecting the cumulative AOI instead of the incremental AOI?

What is a topic or topics within the Recharge requirements that you would benefit from further clarification or explanation of?

1. The recharge criteria that is included in ADWR's 5MP language seems to conflict or overlap with the USF language under A.R.S 45-811.01 (C)(2) & (3).
 - o During the USF permitting process, the Director is required to determine the maximum amount of water to be stored at a facility is hydrologically feasible. In addition, the storage at the facility must not cause unreasonable harm to land or other water users within the maximum area of impact from the maximum amount of water that can be stored at anyone one time during the duration of the permit. It seems that if the regulatory goal is to prevent recharge from contributing to areas of shallow groundwater, this goal could be accomplished when the facility was being permitted and doing so would avoid making the recovery of recharged water more difficult.
2. Focusing on areas where drainage or dewatering activities are occurring
 - o Are water levels intended to be used for this guidance? An area can have dewatering or drainage activities occurring and yet have near shallow groundwater conditions. For clarification, if the maximum area of impact (Max AOI) intersects an area with shallow groundwater, then this triggers the one-mile recovery safe-harbor from the USF facility?
 - o If this is correct, has the Department assessed how this will affect recharge and recovery operations?
 - o What if the USF facility has proven a larger AOI, how will the shallow groundwater policy be applied?
 - o SRP has critical power generation facilities that depend on recharge and recovery to provide water supplies for cooling purposes. If a one-mile recovery was required for GRUSP and/or NAUSP, this could burden SRP, SRP shareholders, and SRP municipal partners with additional infrastructure costs that provide little to no benefit.

What is a topic or topics within the Recovery requirements that you would benefit from further clarification or explanation of?

- Timing of recovery well permit processing needs to be shortened.
- ADWR methodology and strategic Plans
- Comingling reclaimed and groundwater to serve certificates solely on reclaimed water supplies
- Case Studies on what others have done to define and monitor hydrology impacts of recovery. What recovery well designs have been successful to sustain recovery rates? What operational practices have been successful to sustain recovery rates?
- Explanation of where recovery can occur. Are there locations where recovery is not allowed?
- First and foremost: One-mile area of impact history, rationale, and intersection with the Mgmt Plans and AWS Program. Differences (or similarities) with requirements for a recovery well versus a non-recovery well--never understood the need for two sets of permits; perhaps there are opportunities for streamlining statutorily.
- For recovery purposes, the area of hydraulic conductivity/impact modeling required to expand beyond the one mile safe harbor provision
- Why is a 1-mile buffer zone for recovery being considered? Wouldn't this constraint recovery operations?

What is a topic or topics within the Recovery requirements that you would benefit from further clarification or explanation of?

Groundwater modeling input assumptions for permits

pricing; location of replacement water--AWA, if established ?

Groundwater management

Recharge of "new" manageable runoff created by urbanization. Note: I am a research scientist with the USDA-Agricultural Research Service, Southwest Watershed Research Center in Tucson and an Adjunct Prof. at UA. Our group, with UA have developed modeling tools to estimate the additional runoff created from development at the lot, sub-division, and small watershed level (Korgaonkar et al. 2018). I would be happy to provide a short presentation of these tools if the workshop organizers would like

Korgaonkar, Y., Guertin, D.P., Goodrich, D.C., Unkrich, C.L., Kepner, W.G., Burns, I.A. 2018. Modeling urban hydrology and green infrastructure using the AGWA urban tool and the KINEROS2 model. *Frontiers in the Built Environment*. 4:58. doi: 10.3389/fbuil.2018.00058.

Requirements for recovery wells located near recharge systems, changes in permitting requirements and impacts to existing and expanding recharge systems.

In many cases the existing regulatory structure places a greater burden on the recovery of stored water than it does on the pumping of groundwater. Further clarification and explanation of the Department's policy rationale for this disparity would be beneficial. In addition, it would be helpful for the Department to perform some level of groundwater modeling and analysis of to put the "spatial disconnect" issue in context. In particular, for areas of projected water level decline, what is the approximate magnitude of contribution from recovery wells versus groundwater pumping.

Will we commit to some percentage of recharged water being left for the aquifer, not all taken out by recovery

1. Regardless of the current statutory framework, what regulatory elements could be changed to improve the Recovery Program, from ADWR staff's perspective?
2. What leads to the expiration of a recovery well permit? What regulatory triggers require a recovery well permit to be renewed?
3. How are the requirements met for proving consistency with the Management Plan for recovery under 8-101(B)(2)(a) of the Third Management Plan? Does it require an AWS Model Run? Has ADWR required any applicant to conduct this AWS modeling for a recovery well permit?
4. Why does Substantive Policy Statement RW1 put the permittee out of compliance with the recovery well permit if the permittees credit balance drops below the AOHI calculation? (Page 3) What if the permittee was already permitted to recover outside of the AOI?
5. How does the AOHI in Substantive Policy Statement RW1 work in an Assured Water Supply context where the water provider would like to show recovery within the AOHI during an AWS Model Run?
6. What is ADWRs procedure for soliciting stakeholder input and updating substantive policy statements?

What is a topic or topics within the Recovery requirements that you would benefit from further clarification or explanation of?

1. Consistency with Management Goal of AMA: Does ADWR have guidelines or minimum requirements on data and methods (e.g., minimum length of historic record) to be used in determining water level trend for comparison to maximum allowable rate of decline?
2. Permitting of a recovery well inside Area of Impact (AOI) of a USF:
 - 2a. Does ADWR have specific requirements regarding the model to be used to determine the AOI of the recharge facility?
 - 2b. If multiple entities store water at the USF, confirm that applicant should simulate the AOI resulting from only the volumes stored by the applicant

1. Substantial changes were made in the past from the First Management Plan, Second Management Plan, and Third Management Plans. Why is language that has not been in effect since 1999 being enforced under the 5MP? Can this language be removed like other language has in the past?
2. What situation is prompting the Departments concern about recovery of water from areas of shallow groundwater?
 - o It seems that this is a solution to an undefined problem.
 - o ADWR should provide analysis of the policy which would include a map of shallow areas of groundwater, identify the USF facilities that will be affected when the facility permits are renewed after 2025, and state the benefits that will occur because of the policy prior to adoption of the 5MP.
3. Why is the maximum AOI used to determine an intersection with an area of shallow groundwater and used at the recovery stage when the maximum AOI is typically used to determine negative impacts to land uses at the facility permitting stage. Is the implication that 50 ft water levels cause negative impacts to land uses?
 - o As expressed by other stakeholder comments, a "one size fits all approach" can have serious impediments to future recovery efforts in the face of a prolonged drought.