ALISO WATER DISTRICT GSA PUMPING REDUCTION PLAN

FINAL | Approved February 28, 2025

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1 INTRODUCTION

The Aliso Water District GSA (AWDGSA) has developed this Pumping Reduction Plan (PRP) in accordance with Section 16.1.1 of the 2024 revised Groundwater Sustainability Plan (2024 GSP) for the Delta Mendota Subbasin (Basin). This PRP addresses the following six required components of the PRP framework outlined in the 2024 GSP:

- Monitoring and Data Collection Plan;
- Overdraft Mitigation Plan;
- Groundwater Level Minimum Threshold (GWL-MT) Avoidance Plan;
- Water Quality Minimum Threshold (WQ-MT) Exceedance Plan;
- Subsidence Avoidance Plan, and;
- Groundwater Allocation Backstop.

For applicable PRP components, specific triggers and procedures are defined. These include an entry trigger to activate the PRP, a zone of impact (ZOI) to determine where the PRP will be applied, a cutback approach to provide quantitative estimates of pumping reductions, an exit trigger to conclude the cutback once objectives are met, and enforcement measures to ensure successful implementation. Additional monitoring and reporting requirements are outlined in each component, aligning with the Monitoring and Data Collection Plan.

The District will develop and adopt regulations to implement the actions described in this plan.

2 MONITORING AND DATA COLLECTION PLAN

In accordance with Section 16.1.1 of the 2024 GSP, the Monitoring and Data Collection Plan developed by each GSA or GSA Group must include commitments and strategies for achieving the eight components outlined in Table 1. The Aliso Water District GSA has committed to meeting all these requirements as detailed in Table 1.

Table 1. Scheduled compliance with the requirements of the monitoring and data collection plan

Requirement	Commitment
Regular monitoring network(s) assessment	To be conducted during each annual report cycle, an evaluation will be performed of the monitoring network to understand if the data collected is representative of the GSA.
Quarterly groundwater level monitoring	Water levels will be measured at Representative Monitoring Wells for Water Levels (RMW-WL) quarterly starting in the 1st Quarter of 2025. Measurements will be as follows: 1st Quarter: between January 1st and March 31st, with a target of February 1st – 15th 2nd Quarter: between April 1st and June 30th, with a target of May 1st – 15th 3rd Quarter: between July 1st and September 30th, with a target of August 1st – 15th 4th Quarter: between October 1st and December 31st, with a target of October 15th – 31st
Semiannual water quality monitoring	Water quality will be sampled twice per year at each Representative Monitoring Well for Water Quality (RMW-WQ). 1st Half: Between January 1st and March 31st, with a target of February 14th -28th 2nd Half: between July 1st and September 30th, with a target of August 1st -15th
Well registration policy	For both well registration and metering, a policy was adopted on September 18, 2024, Entitled: *Regulations Regarding Registration of Wells and Metering of Groundwater.* (https://www.alisowdgsa.org/assets/Well-Registration-and-Metering-Regs_Adopted-20240918.pdf)
Well metering policy	Key points regarding well registration: • All active production wells must be registered, with location Lat/long, by 12/31/2024 • Construction information including diameter, and perforated intervals, along with justification (well log, video log, or similar), must be submitted by 12/31/2029 • De minimis wells need only be registered with location • New wells must satisfy the construction requirements of the *Policy for the Construction of Groundwater Extraction Wells within the Aliso Water District. Adopted May 19, 2023.* ○ https://www.alisowdgsa.org/assets/Construction%20of%20GW%20Extraction%20Wells-20230519.pdf) Key Points Regarding Well Metering Policy • Meters shall be installed and registered by 12/31/2024

	• Meters shall demonstrate 5% accuracy by 12/31/2025
Well extraction reporting policy (including estimation of pumping from composite wells)	A policy was adopted on September 18, 2024, Entitled: *Regulations Regarding Registration of Wells and Metering of Groundwater.* (https://www.alisowdgsa.org/assets/Well-Registration-and-Metering-Regs_Adopted-20240918.pdf) • Meters shall be read monthly, and submitted to the GSA quarterly. Composite well pumping is estimated to pump 60% from the upper 40% from the lower aquifer on average, based on evaluation by the AWDGSA's contracted hydrogeologist. A grower may perform a site-specific test to refine that estimate, based on a policy to be adopted for the implementation of this plan.
Provide well construction information for all monitoring wells	All information has been provided to the 2024 GSP consultant.
Replacing composite/production RMW-WL wells in the monitoring network with dedicated monitoring wells by 2030	AWDGSA currently has one composite well that is an RMW-WL. AWDGSA has 4 upper aquifer-specific and 2 lower aquifer-specific RMW-WLs. AWDGSA intends to expand the lower network with a minimum of 2 wells by 12/31/2029, scheduled to be complied with through planned monitoring network expansion

3 OVERDRAFT MITIGATION PLAN

3.1 Objective and Requirement

The AWDGSA along with the GSAs in Zone 1 are required to reduce their average pumping by a total of approximately 5,700 AF acre-feet per year (AFY) by 2030, based on the overdraft evaluation period (Water Year [WY] 2003 to WY 2023). The 2024 GSP mandates achieving this reduction through an annual minimum of 20% of the total apportioned pumping cut, beginning in January 2025 and continuing each year for the following five years.

3.2 Implementation Approach

Regarding Lower Aquifer Pumping, it is AWDGSA's understanding that in current practice, Farmers Water District GSA and Fresno County Management Areas A & B do not have any lower aquifer or composite wells. It is also understood that the Central Delta-Mendota GSA Members in Zone 1 (Tranquillity ID, Fresno Slough WD, and Fresno County White Area), do have lower aquifer wells, but are only used in dry years and in limited quantities (less than 1 AF/ac). However, it is unclear how previous practices (dating back to 2003) may have influenced the estimated pumping reduction requirements outlined in Table 2.

Regarding Upper Aquifer Pumping, it is AWDGSA's understanding that no other parties in Zone 1 are experiencing decline in their upper aquifer wells. Some parties (e.g. Farmers WD GSA) report they already have management practices in place to correct overdraft issues when encountered, and return water levels to their steady state.

Therefore, for planning purposes, AWDGSA is developing a program to mitigate the full 5,700 AF of overdraft reduction; 2,800 AF from the Upper Aquifer and 2,900 AF from the Lower Aquifer. Recognizing that 5,700 AF is an estimate derived from a coarse model and that true groundwater sustainability is determined by maintaining water levels above the established minimum thresholds, the AWDGSA's program is designed to be scalable. This will allow the program to adapt to the actual needs of the basin and be able to mitigate more or less overdraft as necessary to be sustainable. AWDGSA overdraft mitigation plan results will be achieved by implementing other elements of the Pumping Reduction Plan.

Based on 5,700 AF, the AWDGSA will reduce on the following schedule, recognizing that the AWDGSA is ultimately adhering to the Sustainable Management Criteria (SMC) MO's and MT's, based on Table PI-1 of the GSP

Table 2. Pumping reduction schedule

Implementation Year	Reduction in Overdraft	Upper Aquifer Reduction (AF)	Lower Aquifer Reduction (AF)	Total Reduction (AF)
2025	0%	0	0	0
2026	20%	560	580	1,140
2027	40%	1,120	1,160	2,280
2028	60%	1,680	1,740	3,420
2029	80%	2,240	2,320	4,560
2030	100%	2,800	2,900	5,700

3.3 Coordination with other GSAs to Achieve Required Pumping Reduction

Zone 1 parties have met and agreed to the above approach. All parties understand that they are ultimately responsible for maintaining SMC targets in their respective areas.

3.4 Additional Monitoring and Reporting Requirements

Planned pumping reductions will be verified and adjusted through pumping estimation using ET products in 2025 and metered pumping after, conducted according to the monitoring and data collection plan.

Adjustments to targets will be made as SMCs are evaluated.

3.5 Enforcement

Groundwater Allocation Backstop will be enforced in cases of implementation lapses, with further actions governed by the dispute resolution mechanisms in the Basin GSAs' Memorandum of Agreement (MOA).

4 GROUNDWATER LEVEL MINIMUM THRESHOLD AVOIDANCE PLAN

4.1 Objective and Requirements

The Basin GSAs are required to identify GWL-MT hotspots based on defined triggers by the end of February each year and implement targeted pumping cutbacks, on an acre-foot per acre basis, for identified groundwater level representative monitoring wells (RMW-WL) within each principal aquifer.

The AWDGSA will manage the Groundwater Level Minimum Threshold Avoidance Plan through its Groundwater Pumping Limit program discussed in *Section 7 - Groundwater Allocation Backstop.*

4.2 Investigation Trigger

The occurrence of any of the following conditions at an RMW-WL will trigger a GWL-MT investigation that may lead to hotspot designation and require pumping reductions:

- Exceedance of the GWL-MT, determined by comparing the most recent seasonal low measurement (Fall) to the defined MTs.
- Projected exceedance of the GWL-MT, based on the linear trend of the previous four Fall groundwater level measurements (using the seasonal average if multiple measurements are taken).
- Exceedance of a trigger point.
    - Trigger points are established as halfway between the MO and MT.

4.3 Investigation Approach

AWDGSA does not intend to conduct investigations, other than comparing to other wells and past data to verify that the data is not an anomaly. Actions will be taken based on the pumping reduction plan described in *Section 7 – Groundwater Allocation Backstop*.

4.4 Zone of Impact and Cutback Approach

The AWDGSA will manage the GSA as a single zone at this time. A cutback will be GSA-wide.

4.5 Cutback Exit Trigger

The pumping cutback may be exited upon occurrence of any/all of the following conditions:

- Monitoring indicates groundwater levels have recovered to above the established trigger level.

4.6 Additional Monitoring and Reporting Requirements

Monitoring and reporting will be conducted as detailed under the Monitoring and Data Collection Plan.

4.7 Enforcement

Groundwater Allocation Backstop will be enforced in cases of implementation lapses, or if a GSA fails to implement policy within two quarters. Further actions will be governed by the dispute resolution mechanisms in the Basin GSAs' MOA.

5 WATER QUALITY MINIMUM THRESHOLD EXCEEDANCE PLAN

5.1 Objective and Requirements

Aliso Water District GSA is responsible for identifying exceedances or projected exceedances of WQ-MT. If such exceedances are linked to Basin management, GSAs must investigate the cause and, if necessary, design and implement appropriate mitigation measures, including pumping cutbacks or other strategies, to prevent future WQ-MT exceedances caused by Basin management.

The WQ-MT Plan triggers pumping cutbacks only when a direct relationship or convincing linkage is established between changes in water quality concentrations exceeding or projected to exceed their MTs and management actions of the GSAs in the Basin or changes in groundwater levels. In the absence of such correlations or due to data gaps, continued monitoring and data collection are prioritized. When necessary, pumping cutbacks are implemented using the same approach outlined in the GWL-MT Plan.

5.2 Investigation Trigger

The occurrence of any of the following conditions at an identified groundwater quality representative monitoring well (RMW-WQ) triggers a 60-day investigation requirement:

- Exceedance of the WQ-MT.
- Projected exceedance of the WQ-MT, based on a statistically significant linear trend of the previous three Fall groundwater level measurements (using the seasonal average if multiple measurements are taken).

5.3 Investigation Approach

Respective GSAs are required to conclude an investigation within 60 days of reporting an investigation trigger and recommend the next steps to be taken.

The GSA will contract with a qualified hydrogeologist and a study area will be defined. Within the study area, a review of the water quality of the subject well and at least one well upgradient and downgradient of the well with an exceedance, will be performed. The investigation will look at water quality trends of all the GSP constituents of concern over the longest period possible where quality data exists. The trends of water levels will be reviewed for the same period. The two data sets will be overlaid to observe correlation and causation. An investigation will also be done to understand which beneficial users are affected by the exceedance, if any.

5.4 Mitigation Approach

AWDGSA will mitigate with the following approach depending on the cause of the water quality issue:

- Degradation due to GWL decline:
    - Establish a new MO/MT/Trigger point for the well that is not detrimental to water quality.
    - Adjust the pumping limit to reach a new target.
- Degradation due to recharge projects:

- Recharge of groundwater is of the utmost importance to the GSA. If it is determined that recharge has caused an exceedance of groundwater quality thresholds, the GSA will:
  - First, offer alternative sources of water to the affected parties
  - Second, cease recharge in that area, until corrective actions can be determined and implemented.

5.5 Exit Trigger

Mitigation action (pumping cutback or mitigation plan) will be exited if the GWL target is reached and WQ has stabilized or improved.

5.6 Additional Monitoring and Reporting Requirements

Monitoring will be generally conducted as outlined under monitoring and data collection plan.

In cases of monitoring exceedances, more frequent measurements will be taken. For exceedances believed to be caused by GSA actions:

- Monthly water levels measurements will be taken at wells in the Study Area,
- Quarterly water quality testing will be performed, and
- Testing frequency will continue until an investigation is conclusive or mitigation measures are demonstrated effective.

5.7 Enforcement

Enforcement of this plan is governed by the dispute resolution mechanisms in the Basin GSAs' MOA. When pumping cutbacks are implemented, enforcement mirrors the procedures used for GWL-MT violations. In such cases, failure to comply with implementation or a delay of more than two quarters will trigger the Groundwater Allocation Backstop.

6 SUBSIDENCE AVOIDANCE PLAN

6.1 Objective and Requirements

Aliso Water District GSA is required to proactively address progressing land subsidence that does not or is not projected to comply with the requirements of the 2024 GSP as soon as feasible and implement pumping cutbacks that will bring back the identified regions into sustainability path of the Basin. The Subsidence Avoidance Plan has two components that lead to different requirements: The Critical Infrastructure Component only applies to critical infrastructure and the hotspot mitigation component applies to the entire Basin.

6.2 Cutback Entry Trigger

Pumping cutback under the Subsidence Avoidance Plan is triggered under the following conditions for each component:

- **Critical Infrastructure Component**: the three-year average subsidence rate exceeds 0.2 feet per year (ft/year) within 0.5 miles of critical infrastructure
- **Hotspot Mitigation Component:** The five-year linear trend established based on land survey data indicates a projected subsidence of more than 2 feet by 2040 (MT), or more than 1.5 feet by 2030 (IM) or exceedance of any subsequent IM.

Triggers under both components should be based on subsidence due to Basin management, or under conditions that such causality cannot be justifiably established.

6.3 Zone of Impact and Cutback Approach

6.3.1 Critical Infrastructure Component

ZOI is identified as areas where the three-year average subsidence rate exceeds 0.2 ft/year and is located within 0.5 miles of critical infrastructure. In the AWDGSA, the GSA is managed as a single zone at this time. Therefore, cutbacks will be GSA-wide.

AWDGSA will incrementally decrease the allowed pumping from the lower aquifer based on Section 7 – Groundwater Allocation Backstop.

6.3.2 Hotspot Mitigation Component

A ZOI is defined as a radius of 0.5 miles around any point that meets the cutback entry trigger. In the AWDGSA, the GSA is managed as a single zone at this time. Therefore, cutbacks will be GSA-wide.

AWDGSA will incrementally decrease the allowed pumping from the lower aquifer based on Section 7 – Groundwater Allocation Backstop.

6.4 Cutback Exit Trigger

Pumping cutback under subsidence avoidance plan may be relieved if and when the conditions defined under each respective component below is met:

- **Critical Infrastructure Component**:
    - Pumping limits will be incrementally increased once the 4-year moving average of subsidence is less than 0.1 ft/yr.

- **Hotspot Mitigation Component:**
    - Pumping limits will be incrementally increased once the 4-year moving average of subsidence is less than 0.1 ft/yr.

6.5 Additional Monitoring and Reporting Requirements

AWDGSA will continue with annual subsidence measurements at its dedicated benchmarks. Further, the *Policy for the Construction of Groundwater Extraction Wells within the Aliso Water District, adopted May 19, 2023 (*https://www.alisowdgsa.org/assets/Construction%20of%20GW%20Extraction%20Wells-20230519.pdf), requires new wells that are deep or composite to install subsidence benchmarks.

6.6 Enforcement

Enforcement of the subsidence avoidance plan is governed by the dispute resolution mechanisms in the Basin GSAs' MOA.

7 GROUNDWATER ALLOCATION BACKSTOP

7.1 Objective and Requirements

In accordance with Exhibit C of the MOA, GSAs are required to implement the groundwater allocation backstop plan if they cannot sufficiently meet the requirements of the GSP 2024.

7.2 Cutback Entry Trigger

The AWDGSA will implement a Groundwater Pumping Limit Program with its growers in 2025. It will not be a backstop program, or last resort, but rather the main management action to reach sustainability.

In a typical (non-flood) year, the growers in the AWDGSA pump an estimated 2.5 AF/Ac from the upper aquifer and 1.1 AF/Ac from the lower aquifer. However, on an average annual basis over the period of 2019 to 2023 (which included flood years) the average extraction was 2.3 AF/Ac from the upper aquifer and 0.9 from the lower aquifer. These values will serve as the basis for the transition suggested under Section 3 – Overdraft Mitigation Plan.

Regarding the upper aquifer, the average overdraft in the upper aquifer is roughly 0.1 AF/Ac. Deducting 0.1 AF/Ac from the average upper aquifer pumping experienced of 2.3 AF/Ac, results in a sustainable yield target of 2.2 AF/Ac.

Regarding the lower aquifer, the average annual extraction is roughly 0.9 AF/Ac. This overdraft of the aquifer is estimated at 0.1 AF/Ac as described in Section 3. Given this information, the sustainable yield target should be 0.8 AF/ac. However, since subsidence is our biggest concern associated with the lower aquifer, and since it is widely considered that lower aquifer sustainable yield is roughly 0.5 AF/Ac, the AWDGSA will plan for the worse case, and plan to transition to 0.5 AF/Ac.

To align with Section 3 - Overdraft Mitigation Plan, the AWDGSA initial schedule of pumping limits is described below:

Table 3. Pumping Limit Transition

Year	2025	2026	2027	2028	2029
Upper Aquifer Limit (AF/Ac)	2.5	2.5	2.4	2.3	2.2
Lower Aquifer Limit (AF/Ac)	0.9	0.8	0.7	0.6	0.5
Total Limit (Af/Ac)	3.4	3.3	3.1	2.9	2.7

The discussion and recommendation above are based on the best available data at this time. However, it should be recognized that the data was limited in precision and accuracy. With the adoption of recent policies, the AWDGSA's understanding of groundwater extractions, well construction, upper/lower aquifer contributions, etc. will improve with time. These improvements may result in modifications to

the approach. Therefore, all numbers are subject to change and will be based on the status of the SMC, as SMCs are a true measure of sustainability, and the pumping limit is a tool to achieve it.

This program is more fully described in a policy that is yet to be adopted.

7.3 Zone of Impact and Cutback Approach

This plan applies to the entire service area of the GSA.

Regarding Subsidence, the pumping limit of the lower aquifer will be incrementally decreased until the subsidence rate is below 0.1 ft/yr, as described in Section 6 of this pumping reduction plan.

Regarding Water Levels, the pumping limit will be managed as described in Section 4 of this Pumping Reduction Plan, and based on the following table.

Table 4. Adjustment to Pumping Limits

Groundwater Level Position (most recent seasonal low measurement)	Trend (Period = 4 years, Data = Seasonal Low)	Adjustment to Pumping Limit
Above MO	Upward	Increase pumping limit
	Downward	None
Below MO	Upward	Possibly increase limit
	Downward	Possibly decrease pumping limit
Below Trigger	Upward	Maintain pumping limit
	Downward	Decrease pumping limit
At or Below MT	Upward	Maintain pumping limit (possibly decreased)
	Downward	Further decrease pumping limit

7.4 Additional Monitoring and Reporting Requirements

AWDGSA will monitor Water Levels, Subsidence Rates, and Water Quality, at the minimum to the frequency and extent outline under Monitoring and Data Collection Plan or outlined by individual components, to influence the decision regarding pumping limits.

7.5 Enforcement

Enforcement of the groundwater allocation backstop is governed by the dispute resolution mechanisms in the Basin GSAs' MOA. Growers within the AWDGSA will be charged groundwater extraction penalty fees if exceeding the pumping limits established by the GSA. The fees will be up to $500/AF per water code 10732.