Borrego Springs Watermaster
Regular Board Meeting
December 5, 2024 @ 3:00 p.m.
Meeting Available by Remote Access Only*

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Instructions for Public Comment

The public may address the Board on items within the Watermaster's Jurisdiction that are included or not included on the meeting agenda.

To address the Board on items that are not included on the meeting agenda, the public may request to speak during ***Agenda Item II – Public Correspondence***. Comments may be limited to three minutes per speaker.

To address the Board on items that are included on the meeting agenda, the Board Chairperson will call for public comments immediately following the agenda item's staff report presentation and prior to Board discussion.

AGENDA

Items with supporting documents in the Board Package are denoted with a page number.

I. OPENING PROCEDURES (Chair)

A. Call to Order and Begin Meeting Recording
B. Pledge of Allegiance
C. Roll Call
D. Approval of Agenda

II. PUBLIC CORRESPONDENCE/COMMENT (Chair)

The Board may direct staff to include topics brought forward during Public Correspondence and Comment on a future meeting agenda. No action or discussion is otherwise taken by the Board. Written correspondence includes items received between October 31, 2024 and November 27, 2024.

A. Correspondence Received
   i. November 18, 2024 Email from Travis Huxman (UCI).....**Page 3**

B. Public Comment

III. **CONSENT CALENDAR (Chair)**

Action Item: All items may be approved with a single motion

A. Approval of Minutes: Regular Meeting – November 7, 2024 ..... **Page 23**

B. Receive and File 2024 Q3 Grant Reimbursement Request Report – please click on this link or visit Watermaster's website to review the report: SUPPLEMENTAL HANDOUT III.B ..... **Page 30**

IV. CLOSED SESSION

CONFERENCE WITH LEGAL COUNSEL- ANTICIPATED LITIGATION
Initiation of litigation pursuant to paragraph (4) of subdivision (d) of California Government Code Section 54956.9. One case.

V. ITEMS FOR BOARD CONSIDERATION AND POSSIBLE ACTION

A. Redetermination of 2025 Sustainable Yield (MALONE) ..... **Page 33**

B. Entry Agreement with BWD for Access to the Viking Well (MALONE) ..... **Page 50**

C. Scope and Budget for WYs 2026 through 2029 to complete the Redetermination of the 2030 Sustainable Yield (MALONE) ..... **Page 76**

D. Analysis of Carryover Rules (ADAMS) ..... **Page 92**

VI. REPORTS

A. Legal Counsel Report – *verbal*

B. Technical Consultant Report ..... **Page 104**
- Change in groundwater storage from spring 2023 to spring 2024
- Transducers installed in TSS Monitoring Wells
- Biological Restoration of Fallowed Lands Project
- Abandoned Wells Conversion Project
- 5-year Assessment of the GMP

C. Executive Director Reports ..... **Page 109**
- Financials and Pumping Assessments
- SGM Grant Status
- DWR Review of the Judgment and GMP
- BPA and Party Updates
- Upcoming activities

D. Chairperson's Report – *verbal*

VII. APPROVAL OF AGENDA ITEMS FOR DECEMBER 19, 2024 SPECIAL BOARD MEETING ..... Page 111

VIII. BOARD MEMBER COMMENTS

IX. NEXT MEETINGS OF THE BORREGO SPRINGS WATERMASTER

A. Special Board Meeting – Thursday, December 19, 2024 at 3:00 pm

B. Regular Board Meeting – Wednesday, January 15, 2025 at 3:00 pm

X. ADJOURNMENT

Samantha Adams

From: Travis E Huxman <thuxman@uci.edu>
Sent: Monday, November 18, 2024 4:18 PM
To: Samantha Adams; Andy Malone; dave duncan
Subject: Project update 11.19.2024 for Prop. 68 GDE Project
Attachments: Project.Update.11.19.2024.pdf

Hello Samantha, Andy, and Dave,

I hope this note finds you well. Attached please find a project update from our Prop. 68 GDE project that we would like to share with you (and your Board) and other stakeholders in the basin. This work extends research we carried out last year on water-sourcing using stable isotope to document groundwater use in mesquite in the Borrego Springs Subbasin. In short, we find that mesquite near the Borrego Sink have evidence of groundwater in their tissues, supporting our previous mapping and remote sensing activities that also suggested the presence of groundwater dependent ecosystems in the basin. We want to quickly put it in the hands of any vested stakeholders as soon as possible. Please note that it is in the form we use for communication with the Borrego Water District as a reporting structure to DWR.

We are sharing this document with you so the Watermaster can consider the findings and apply any discussion that may be required to the appropriate subcommittees or other stakeholders in the basin. We'd appreciate your help in disseminating it to groups you may feel appropriate.

If you have any questions, comments, or concerns, please do not hesitate to reach out to me. I am happy to discuss the document or plans for the coming growing season as you see fit.

Best,

Travis

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Groundwater use by mesquite near the Borrego Sink

Project Update

19 November 2024

Product of the *Groundwater Dependent Ecosystems (GDE) Identification, Assessment, and Monitoring Program* (hereafter 'the GDE Project')

Prepared by:

Laurel Brigham, Nikki Fiore, & Travis Huxman, UC Irvine

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Robert Staehle, Tubb Canyon Desert Conservancy
Lori Paul, Tubb Canyon Desert Conservancy
Daniel Donovan, SD Natural History Museum
Jon Rebman, SD Natural History Museum
Travis Huxman, UC Irvine

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To: Geoff Poole, General Manager, Borrego Water District; and
Meghan Burkhart, Grant Manager, California Department of Water Resources,
Proposition 68 Sustainable Groundwater Management Grant Program

From: Travis Huxman, Professor and Chair, Department of Ecology and Evolutionary Biology, University of California, Irvine

Subject: Proposition 68 Project Update summarizing recent findings regarding groundwater dependent ecosystems in the Borrego Springs Groundwater Subbasin.

We are pleased to share the attached project update "Groundwater use by mesquite near the Borrego Sink." This is in continued satisfaction of our Work Plan relevant to identifying groundwater dependent ecosystems in Borrego Springs and developing a monitoring plan based on those findings. We will be sharing this document with the Borrego Springs Watermaster for consideration by their appropriate subcommittees, along with stakeholders in the Subbasin.

This document reports on our stable isotopic determination of water in tissues of mesquite trees throughout the Borrego Springs Groundwater Subbasin and the paired comparison site, Clark Dry Lake. Our team has found a signature of groundwater in water extracted from mesquite tissue sampled from multiple sites near the Borrego Sink. The conclusions drawn from these data further strengthen the notion of groundwater dependent ecosystems in the Subbasin. We additionally update several aspects of our program, including 1) aspects of our infrastructure that directly measure evapotranspiration, 2) potential remote sensing approaches that can be used for long-term monitoring, and 3) the status of our work assessing GDE biological diversity.

We anticipate further insights to come to light, from our project, from you, and from other stakeholders as we complete work and close out this project. These insights will shape next steps for many stakeholders in the basin, including the Watermaster and their contemporary focus on estimating sustainable yield. We anticipate an additional project update prior to the final report we will produce at the end of the project period in March 2025. We look forward to your comments, questions, and assistance disseminating this document through your website.

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Summary

- Our first update identified data errors and knowledge gaps that led the Borrego Springs Groundwater Subbasin GMP to ignore groundwater dependent ecosystems (GDE).
- Our second update (1) utilized remote sensing, aerial photography, and field surveys to document approximately 1,800 acres of mesquite bosque habitat near the Borrego Sink exhibiting GDE behavior, (2) provided an initial estimate of groundwater use by mesquite at around 536 acre-feet, and (3) used stable isotopes of oxygen to demonstrate groundwater use at Clark Dry Lake (a site in the Ocotillo-Clark Valley Basin where groundwater is within 25 feet of the surface) in April 2023.
- Here we extend stable isotope analysis to mesquite near the Borrego Sink and find large percentages of groundwater in plant tissue (55 - 83%), confirming GDE presence in the Borrego Springs Subbasin. Groundwater fractions varied within and between sites in a way that may help determine either rates or elevations of groundwater decline that result in undesirable GDE outcomes.
- Our water potential results suggest similar levels of water availability for mesquite between a primary site near the Borrego Sink and our reference site near Clark Dry Lake.
- In 2024, we deployed evapotranspiration sensors across mesquite bosque sites in Borrego Springs and Clark Dry Lake to directly measure groundwater transpired by mesquite.
- We are refining methods for using remotely sensed datasets to assess mesquite health and groundwater use across the Subbasin.
- We continue to document significant GDE reliant biodiversity, including 195 native plant species within the mesquite habitat near Borrego Sink and 175 native plant species within the mesquite habitat near Clark Dry Lake, 17 of which are threatened, endangered or rare, along with more than 45 animal species, 5 of which are species of special concern.
- Interested parties can leverage these findings to help avoid undesirable outcomes associated with groundwater decline given GDEs' role as beneficial users through the 2014 Sustainable Groundwater Management Act (SGMA).

Introduction

The 2014 Sustainable Groundwater Management Act (SGMA) stipulates that all beneficial users of groundwater, including environmental users such as groundwater dependent ecosystems (GDE), be considered in Groundwater Sustainability Plans (GSP) (California Water Code, Part 274, Chapter 4, Section 10723.2). Under SGMA, GDEs are defined as "ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface"

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(California Code Regulations, Title 23, Section 351(m)). While the Borrego Springs Subbasin Groundwater Management Plan (GMP; Borrego Water District and County of San Diego, 2020) originally dismissed GDE presence in the basin, our work funded through the Proposition 68 Sustainable Groundwater Management Grant Program showed that this decision was based on incomplete data sources and flawed analyses (UCI, 2023 Technical Memorandum).

Subsequently we identified several lines of evidence that point to the presence of GDEs in the Borrego Springs Groundwater Subbasin (UCI, 2024 Project Update). To address the knowledge gaps, we produced high quality maps of mesquite bosque habitat from aerial photography using machine learning. When constrained by live tree distribution, this mapping yields ~1,800 acres of potential GDE. Within this distribution we have used the "green island" conceptual framework to detect GDEs with remote sensing (Eamus et al. 2015). This method compares vegetation characteristics between areas with unknown access to groundwater and those with and without access. Combined, we have identified wide-spread hot-spots of GDE activity near the Borrego Sink using these indirect measurements of plant activity. We extended these efforts using available remote sensing tools for evapotranspiration estimation (OpenET) to provide a reasonable upper bound for groundwater use by GDEs for consideration in the Subbasin's water budget (~536 acre feet year^{-1}).

Here, we present recent isotopic analysis findings that confirm groundwater use by mesquite throughout the Borrego Springs Subbasin. Isotopic analyses show groundwater signatures within mesquite tissues, and are supported by field measurements of water potential that reveal similarities in mesquite water availability between the Borrego Springs and Clark Dry Lake sites, indicative of groundwater access. Further details of our methods and analyses will be included in our final report, anticipated for release in March 2025 on the Steele/Burnand Anza-Borrego Desert Research Center website.

Key Findings

1. Isotopic analyses document groundwater use in Borrego Springs and Clark Dry Lake

Our project team uses stable isotope signatures of oxygen in plant-extracted water to partition the source of that water between the surface soil and groundwater pools (methods in Appendix A). Isotopic analysis is a scientific technique used to study the types of atoms (isotopes) present in a substance. Stable isotopes are naturally occurring versions of an element that have the same number of protons but different numbers of neutrons. Scientists measure the ratio of different isotopes of the same element in a sample and this ratio provides information on the origins of the sample because different processes (such as evaporation) leave distinct isotopic "signatures." For instance, lighter

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isotopes (e.g., ^{16}O) evaporate more readily than heavier isotopes (e.g., ^{18}O). Therefore, different levels of exposure to evaporation will result in a different isotopic signature (Barnes & Allison 1988). For this reason, groundwater and surface soil water have different isotopic signatures because of their different paths through the environment and residence times. Surface soil water is strongly affected by the evaporative demand of the atmosphere and receives localized rainfall, so the light-versus-heavy oxygen isotope differs as compared to values from aquifer water. This means that surface soil water loses its "light" isotopes frequently, and retains more of the "heavy" isotopes (higher neutron number; e.g., ^{18}O). We represent the results of isotopic analysis as a delta value relative to the heavier isotope (e.g., $\boldsymbol{\delta}^{18}O$) where larger values indicate enrichment in heavy isotopes, demonstrating the signature of evaporation. Plants absorb water through their roots, which can come from sources at various depths. Thus, the composition of water at any given time in plant tissues is a function of these differential uptake patterns from the various depths. We use these values - surface soil water sampled over the depth of rainwater influence, water from the aquifer, and water extracted from plant tissues - to test our hypotheses regarding the presence of GDEs (Fig. 1).

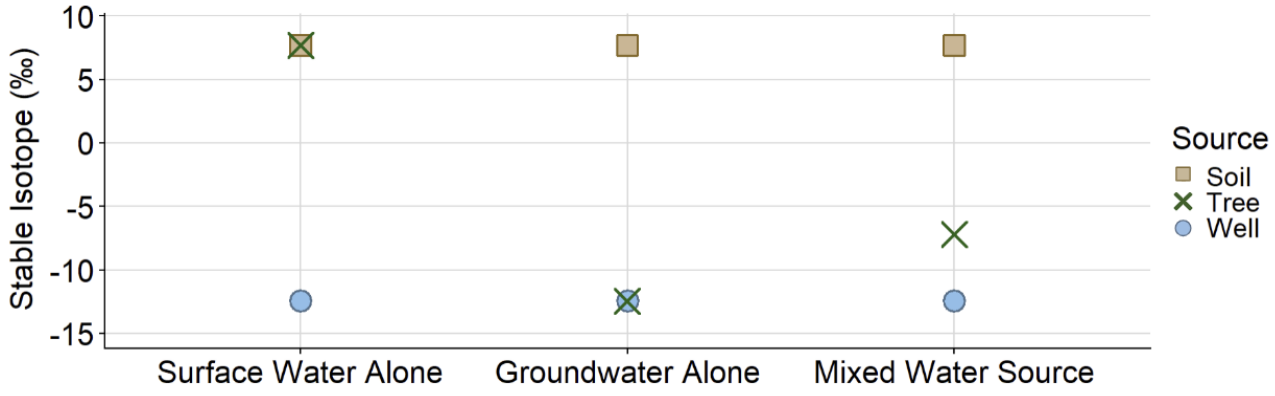

Figure 1. Expected behavior of isotope signatures found under different water-use contexts by trees. For *Surface Water Alone* there is an overlap of the isotope composition (as 'parts per thousand' (‰) compared to a standard reference) of the soil water and tree tissue water. Any variance in the tree tissue water data should be explained by the variance in the soil water signal. In the *Groundwater Alone* scenario (not expected but included as a hypothetical comparison), there is no overlap between the soil water isotope composition data and the tree isotopic composition data; all variance in tissue isotopic composition is explained by the groundwater isotope signal. In the *Mixed Water Source* scenario, the tree tissue isotopic composition is intermediate between the soil water and groundwater isotopic composition. This can be conceptualized by the notion that the surface water signal is diluted by the groundwater signal in the tree tissue.

Previously we reported on the use of this technique at the recognized GDE, Clark Dry Lake, to show that surface water cannot alone explain the isotopic signature of mesquite tissue water (UCI, 2024

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Project Update). Rather, the plant extracted water isotopic signature includes an evenly-mixed to majority-contribution of the local groundwater (Fig. 2). Consistent with the pattern at Clark Dry Lake, mesquite from sites near the Borrego Sink also demonstrate a dilution of the soil surface oxygen isotope values by the groundwater signature (Fig. 2). In each case (Sites 1-5), there is no overlap between the distribution of mean soil oxygen isotope values and the plant tissue extracted isotope values. The data exhibit the trend expected from our *Mixed Water Source* scenario explained in **Figure 1**. This suggests that mesquite trees draw water from both sources, which is consistent with other research showing that mesquite are facultative phreatophytes that can utilize both surface water and groundwater depending on availability (Brunel 2009).

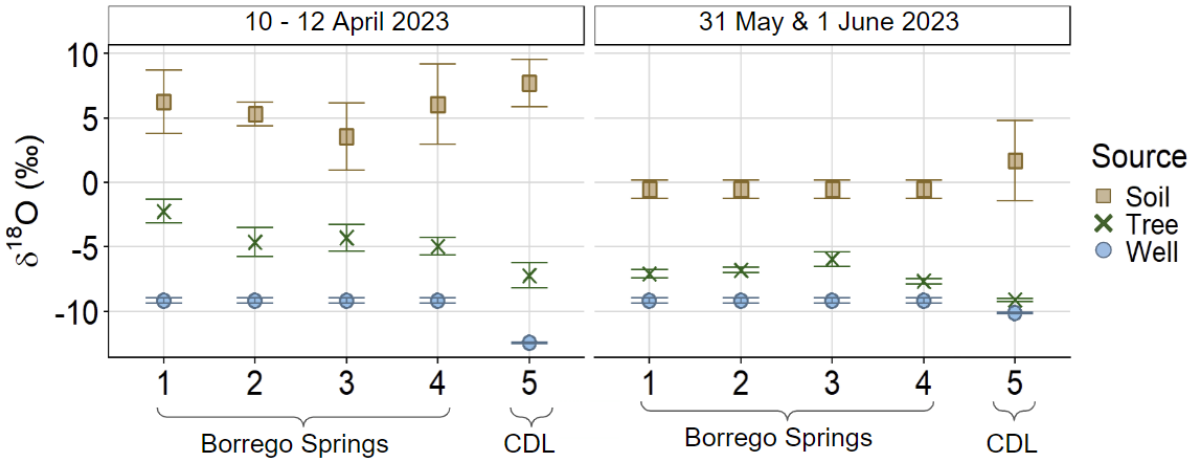

Figure 2. $\delta^{18}O$ of the soil water (brown squares), tree tissue water (green crosses), and well water (blue circles) at the five sentinel sites in Borrego Springs and the reference site at Clark Dry Lake. Well water is a value derived from the most-adjacent well sample possible. These data indicate a mixed water source for mesquite at all locations. The soil, tree, and well water are represented by the mean (point) and standard deviation (error bars).

We can use the isotope data in a simple, two end-member mixing model to estimate the percentage of groundwater in mesquite tree tissue (Fig. 3). In these models, groundwater is one end-member and the average soil profile value as the other end member (Post 2002). This approach assumes that soil moisture contributes uniformly as a source across 0-150 cm soil depth to patterns of root uptake, which is a conservative estimate for determining the end-member. Equation 1 below is an example of how this mixing model calculates the proportion of groundwater in mesquite tissue using average $\delta^{18}O$ data from all 12 trees at the primary Borrego Spring site (Site 1), the MW-3 and MW-5A well water, and the average soil profile values from the primary Borrego Spring site (Site 1) in May 2023.

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$$\text{Proportion of groundwater in mesquite tissue} = \frac{\delta^{18}O_{Tree} - \delta^{18}O_{Soil}}{\delta^{18}O_{Well} - \delta^{18}O_{Soil}} \quad (1)$$

$$\text{Proportion of groundwater in mesquite tissue} = \frac{-7.09 - (-0.54)}{-9.18 - (-0.54)}$$

$$\text{Proportion of groundwater in mesquite tissue} = 0.76$$

$$\text{Percentage of groundwater in mesquite tissue} = 76\%$$

When expanded to all sites in Borrego Springs, the average $\delta^{18}O$ values illustrate between 55% (Site 1 in April) and 83% (Site 4 in May) of the water in mesquite tissues originating from the groundwater isotopic signature (Fig. 3). At Clark Dry Lake, average $\delta^{18}O$ values shift from 73% in April to 91% in

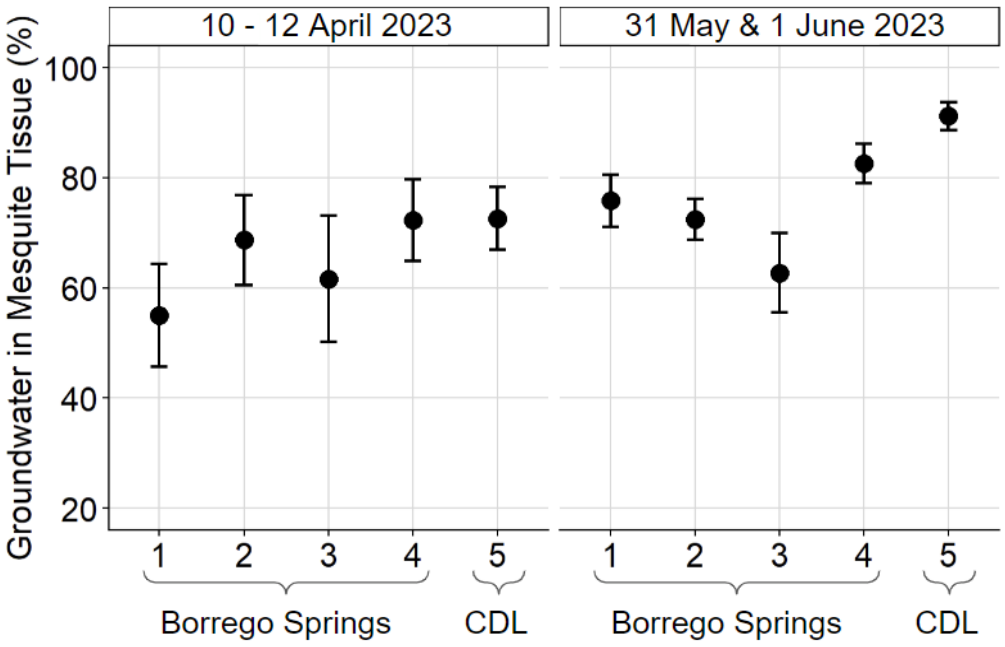

Figure 3. Groundwater fraction in plant tissues calculated from $\delta^{18}O$ of the soil water, tree tissue water, and well water for each of the five sentinel sites in Borrego Springs and the reference site at Clark Dry Lake using a two-end mixing model as in equation 1. Well water is a value derived from the most-adjacent well sample possible.

May. These fractional values increase as surface soil moisture is depleted during the growing season and progresses into the summer dry period (transition from April to May), which is what we expect from a GDE during extended dry periods without rainfall. We used the Elementary School weather station and the Clark Dry Lake weather station to assess the date of last rainfall at the Borrego Springs site and the Clark Dry Lake site, respectively. At the primary Borrego Springs site (Site 1), it had been

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10 days since rainfall (0.25 mm) by the time of the April sampling campaign and 62 days by the May sampling campaign. At the primary Clark Dry Lake site (Site 5), it had been 19 days since rainfall (15.8 mm) by the time of the April sampling campaign and 71 days by the May sampling campaign.

Mesquite trees throughout all sampled locations near the Borrego Sink have signatures of groundwater. While there is some variation in the mean groundwater fraction between locations, most of the variation comes from differences in a few individual trees at select locations (Sites 1 and 3; Fig. 4). We are still investigating the driver of this tree-to-tree variation, which likely can be explained by

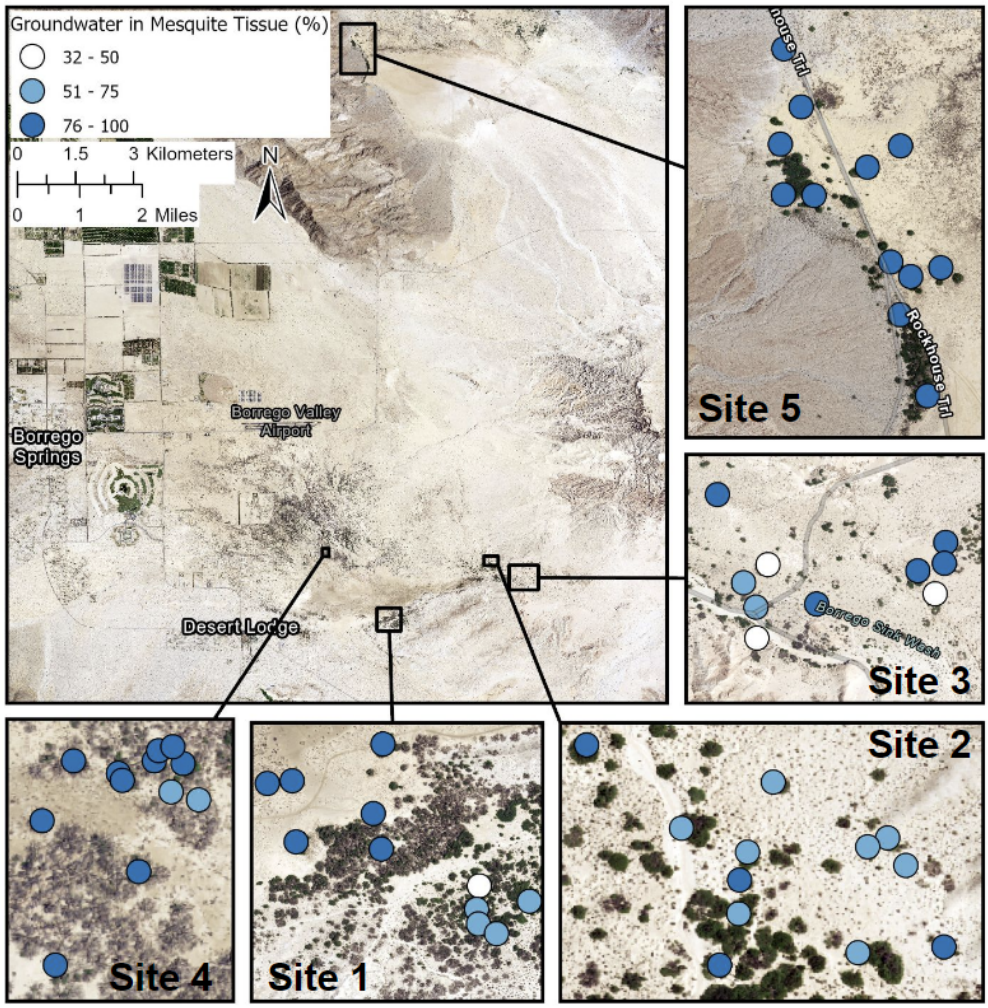

Figure 4. Spatial representation of the groundwater fraction in plant tissues calculated from $\delta^{18}O$ of the soil water, tree tissue water, and well water for each of the four sites in Borrego Springs and the reference site at Clark Dry Lake using a two-end mixing model as in Equation 1. Well water is a value derived from the most-adjacent well sample possible. Base imagery from the National Agriculture Imagery Program (NAIP) taken 22 - 23 April 2016.

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plant age, rooting depth, or access to surface soil moisture. Yet the overall conclusion of these data is that mesquite trees throughout their distribution near the Borrego Sink are accessing groundwater. One opportunity is to leverage differences in groundwater elevation in conjunction with the groundwater fraction data to understand where mesquite may be losing contact with the aquifer or experiencing such rapid declines in groundwater elevation that they cannot adjust their rooting depth to keep up with the change. Thus, we are hopeful that the enhanced hydrologic modeling of the Borrego Valley can inform these data and this key issue in understanding GDE health.

2. **Water potential results indicate similar water availability between site in Borrego Springs and site near Clark Dry Lake**

Leaf water potential reflects the balance between soil moisture supply, atmospheric demand, and plant water uptake and serves as a reliable indicator of water availability and moisture stress (Lambers et al. 2008). As plants transpire (lose water through small leaf openings called stomata) water flows from the soil to the roots. At predawn, when transpiration is minimal and water flow is equilibrated within the plant-soil system, leaf water potential is closely aligned with soil water potential, offering a baseline measure of water availability for plants. Lower, or more negative, predawn leaf water potential values indicate lower water availability. Similar values between condition, site, or plant reflect similar water availability in the soil-plant system.

Here we present the predawn water potential results from our 2023 sampling campaign in May to provide context for the 2023 isotopic analyses (see Appendix A for methods). Predawn leaf water potential was similar during the May sampling campaign between the primary Borrego Springs (mean = -2.02 , SD = 0.32) and Clark Dry Lake sites (mean = -1.87 , SD = 0.34) suggesting equivalent water availability to the mesquite at each site.

3. **Direct measurements of evapotranspiration with ET sensors in Borrego Springs and Clark Dry Lake**

We have expanded our direct measurements of plant activity to better complement our remote sensing analyses and estimates of vegetation groundwater use. In May 2024, we installed LI-COR evapotranspiration (ET) sensors at three mesquite habitat sites near the Borrego Sink, one mesquite habitat site at Clark Dry Lake, and at one non-mesquite habitat site near the Steele-Burnand Anza-Borrego Desert Research Center (Fig. 5). These new sensors measure ET every 30 minutes, providing crucial data on water movement in mesquite bosque habitats. ET is the combination of two processes:

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bare-soil evaporation, where liquid water turns into vapor and rises from the soil surface, and transpiration, where plants release water vapor through small leaf openings called stomata. Together, ET moves water from the land to the atmosphere, playing a key role in the water cycle.

By tracking ET, we can estimate how much groundwater the ecosystem is using. In GDEs, plants often rely on consistent groundwater access, especially during dry periods when surface water is scarce and bare-soil evaporation is negligent. If ET exceeds rainfall or if ET remains steady or increases during drought, it supports the notion that the plants are utilizing groundwater resources. We will additionally use leaf-level measurements of water loss to validate these ET estimates. Monitoring ET patterns over time can help us assess the health of GDEs, quantify their groundwater use, detect changes in groundwater availability, and guide conservation efforts to ensure these ecosystems are sustainably managed.

Figure 5. The LI-COR LI-710 evapotranspiration (ET) sensor measures evapotranspiration by detecting water vapor released from plants and soil, offering real-time insights into the amount of water being transferred from the ecosystem to the atmosphere. Above is an image of the instrument located in the mesquite bosque habitat at Clark Dry Lake.

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4. Refining remote sensing approaches to monitor GDE health and water use patterns

Building on previous efforts, this year we developed remote sensing methods to map and monitor GDE health and water use across the subbasin. By analyzing high-resolution multispectral imagery, LiDAR, climate data, and other environmental datasets, we can now assess ecosystem health in near real-time. Our approaches use normalized difference vegetation index (NDVI) to monitor vegetation health and greenness, and the normalized difference moisture index (NDMI) to track moisture levels, allowing for precise mapping of GDEs. This method can be applied across multiple seasons and years to create time-series assessments of ecosystem health. Our approach focuses on evaluating vegetation response during extended dry periods to identify possible groundwater use. Vegetation that maintains a high NDVI or NDMI throughout dry spells is likely connected to groundwater.

Here we demonstrate an approach to identify mesquite that may be using groundwater during a dry period in 2023, focusing on the 20-day window surrounding the May 2023 isotope sampling campaign (Fig. 6 and 7). Using Sentinel-2 imagery, we calculated NDVI at a 10-meter resolution, which captures detail down to large trees or patches of trees. In 2023, there was no rainfall from 31 March to 10 June, allowing us to examine mesquite NDVI behavior under prolonged dry conditions. We calculated the mean NDVI from imagery taken between 20 May and 10 June, corresponding to days 50–70 of the dry period and spanning 10 days before and after isotope sampling (Fig. 6). Areas with high NDVI (shown in darker green) are likely accessing groundwater, while areas with lower NDVI (in white or light green) may depend more on precipitation (Fig. 7). By comparing these trends in Borrego Springs with mesquite at Clark Dry Lake—where groundwater is within 25 feet of the surface—we can better understand the NDVI characteristics of groundwater-connected mesquite.

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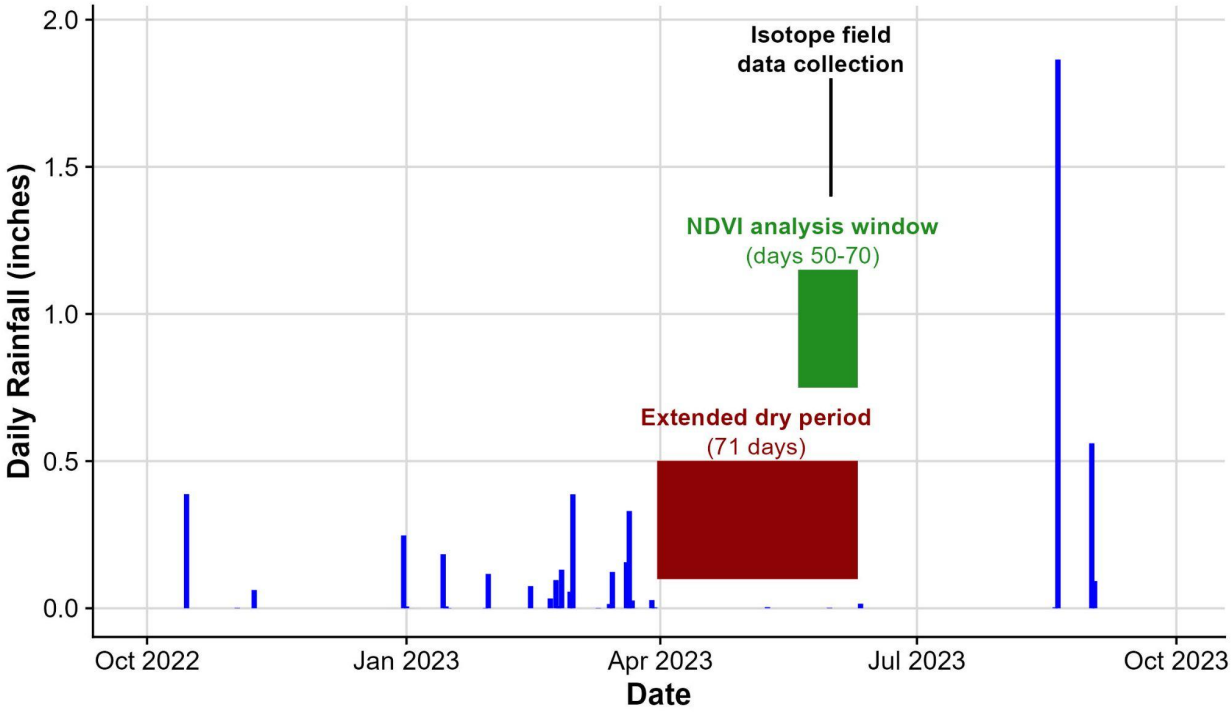

Figure 6. We can identify potential groundwater use by analyzing the normalized difference vegetation index (NDVI; a proxy for vegetation health and greenness) from satellite imagery during extended dry periods. During the 2023 water year, there was a dry period that spanned 71 days from 31 March to 10 June (shown in red). We analyzed imagery from days 50-70 of this drought (shown in green) to identify mesquite displaying high NDVI, indicating access to groundwater. This time frame corresponds to the 20-day window surrounding the May 2023 isotope field data collection (shown in black). Daily rainfall data (shown in blue) for the mesquite bosque distribution was obtained from PRISM Climate Group.

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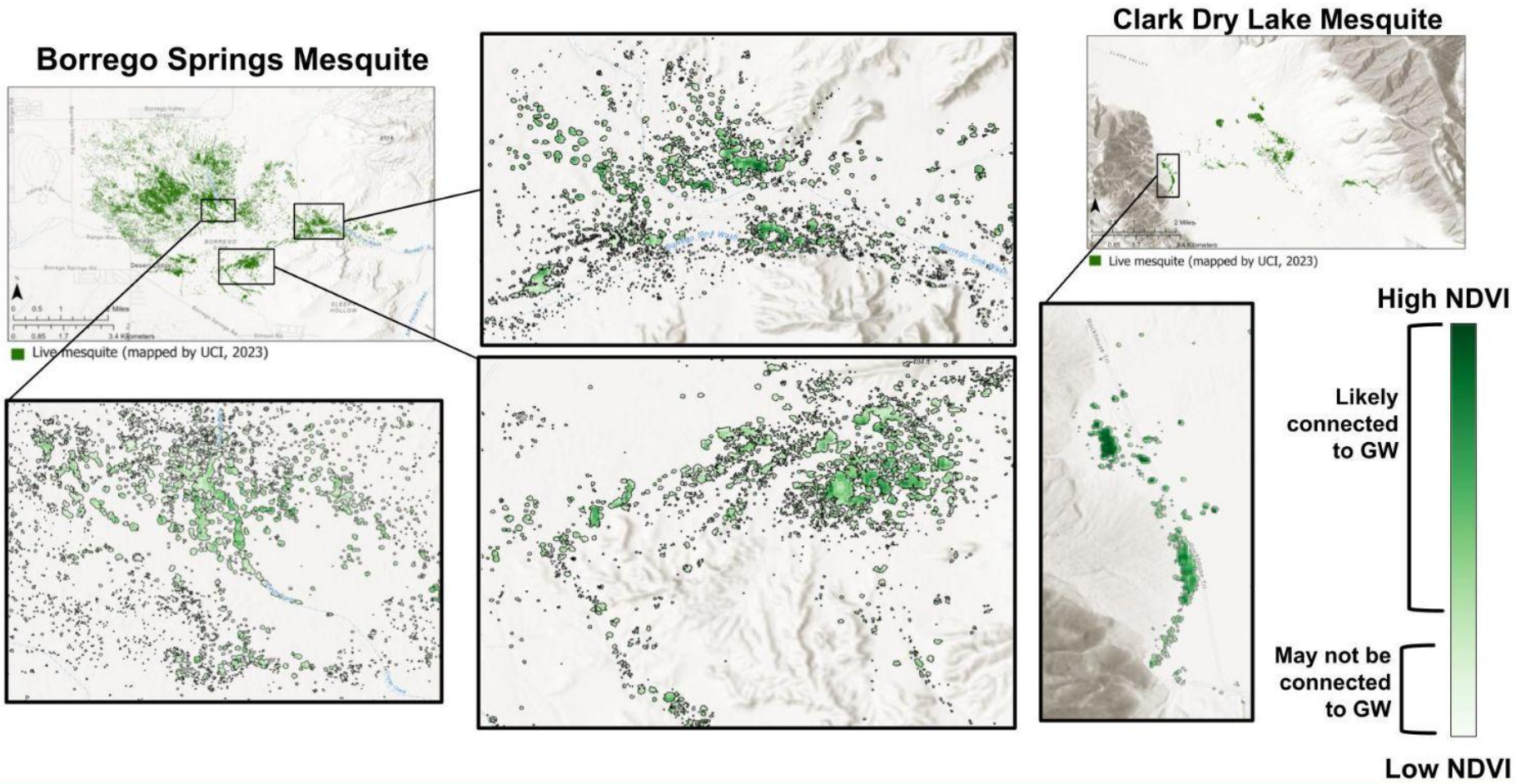

Figure 7. Example remote sensing approach to identify groundwater dependent mesquite using normalized difference vegetation index (NDVI; a proxy for vegetation health and greenness) from Sentinel 10 m satellite imagery. Map shows the mean NDVI from 20 May to 10 June 2023 (days 50–70 of the dry period in 2023). Areas with high NDVI (shown in darker green) likely have groundwater access that enables them to maintain high vegetation greenness during drought, while areas with low NDVI (white or light green) may rely more on precipitation.

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Project Updates

Plant surveys of the mesquite bosque habitat

Borrego Springs Mesquite Bosque

In 2024, the San Diego Natural History Museum (SDNHM) documented 31 additional plant species in the mesquite bosque habitat near Borrego Sink, including 10 that had not been previously recorded in the area. Notable new findings included two sensitive species: *Cryptantha ganderi* (California Rare Plant Rank 1B.1) and *Cleomella palmeri* (2B.2). With data from recent surveys, voucher specimens, and verified iNaturalist observations, SDNHM's current inventory of plant species in this habitat now stands at 218, of which 195 are native and 11 are rare, endangered, or threatened. Of these, 49 species were newly observed during SDNHM's surveys in 2023 and 2024.

Clark Dry Lake Mesquite Bosque

In 2024, SDNHM identified 53 additional plant species in the mesquite bosque habitat near Clark Dry Lake, including 27 that were previously undocumented in this area. Among the new finds were three sensitive species: *Johnstonella costata* (ranked 4.3), *Cleomella palmeri* (2B.2), and *Johnstonella angelica* (not yet ranked). An unusual discovery was *Ambrosia x platyspina*, a new hybrid record for San Diego County. This plant is believed to be a cross between *Ambrosia dumosa* and *Ambrosia salsola*, two species commonly found in the region. The current inventory of plant species in this habitat, based on surveys, voucher specimens, and verified iNaturalist observations, now totals 196 species, 175 of which are native and 6 are rare, endangered, or threatened. Of these, 65 species were newly recorded during SDNHM surveys in 2023 and 2024.

The year's most notable find was a population of *Johnstonella angelica* (Angelic Johnstonella) discovered in a mesquite bosque on the eastern side of Clark Dry Lake. This is only the second U.S. observation of this plant, with the first at the Steele/Burnand Anza-Borrego Desert Research Center in Borrego Springs in 2019. This discovery supports that *J. angelica* is native to the U.S. and suggests it should be considered for rare-plant listing. The discovery has been published in *Madroño*: https://doi.org/10.3120/0024-9637-71.3.105 (Donovan & Rebman 2024).

Wildlife camera monitoring and bird surveys in the mesquite bosque habitat

Fourteen wildlife cameras were installed at mesquite habitat sites near the Borrego Sink and at Clark Dry Lake in 2023. These motion-activated cameras capture photos when triggered by movement, providing valuable data on the animal species that inhabit the mesquite bosque. Additionally, three bird surveys were carried out in the mesquite bosque habitat at Clark Dry Lake and Borrego Sink

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during late 2023 and early 2024. Both resident and migratory bird species, including several species of special concern, were observed. This information helps us better understand the biodiversity and ecological interactions within these groundwater dependent ecosystems. To date, the wildlife cameras and bird surveys have captured 28 different animal species in both the mesquite habitat near Borrego Sink and Clark Dry Lake for a total of 47 species across both sites. Among these, five are classified as species of special concern. These findings highlight the vital role of mesquite habitats in supporting diverse and vulnerable wildlife in the region.

Figure 8. A photo of a badger with a small mammal in its mouth was captured by a wildlife camera at the Clark Dry Lake site on 2 July 2023 at 2:30 pm.

Local high school GDE Internship Program

In Summer 2024, the GDE Project team launched its first internship program, providing a unique educational experience for high school students from Borrego Springs and San Diego County. Led by three UC Irvine master's students, the program guided four local high school students in studying mesquite bosque habitats and analyzing data from wildlife cameras. Building on this success, we are excited to begin our second internship cycle in Winter 2025, with plans to include 3–4 new local high school students.

Conclusions and Next Steps

Our project results to date confirm the existence of GDEs in the Borrego Springs Subbasin, supported by multiple independent lines of evidence, including the recent direct measurement of groundwater in plant tissues using isotopes. In summary, our advancements in mesquite bosque mapping using high resolution imagery from 2016 resulted in the identification of ~1,800 acres of mesquite bosque near

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the Borrego Sink (UCI, 2024 Project Update). The remote sensing analyses and estimates of groundwater transpired from OpenET indicate that mesquite in this area actively use groundwater at a scale relevant to the basin water budget (UCI, 2024 Project Update). In this report we have additionally provided direct isotope evidence of groundwater use at sites near the Borrego Sink, equivalent to what is seen at Clark Dry Lake. This is supported by predawn leaf water potential measurements that indicate water availability is similar between the primary Borrego Springs and primary Clark Dry Lake sites in May 2023. Looking forward, our project will focus on refining our remote sensing analyses, analyzing additional isotope data from established sites, transitioning our flora and fauna assessment efforts to a plan for monitoring, and analysis of ET sensor data to estimate the amount of groundwater transpired by mesquite at our sites near the Borrego Sink and at our comparison site at Clark Dry Lake. We anticipate one more communication to the community prior to completion of the project and production of a final report in March 2025.

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APPENDICES

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Appendix A.

Isotopic analysis

Methods

Mature mesquite twigs with expanded new leaves were selected from sunlit branches near the outer canopy. Twigs were cut approximately in 1-2 centimeter lengths, with a maximum thickness of 1.2 cm diameter. To minimize the effects of evaporation of water from the twigs, vials were quickly filled with cut twigs and capped with minimal headspace. Vials were then sealed with parafilm and were refrigerated until analysis. Twigs were collected on 10 through 12 April 2023 and on 31 May and 1 June 2023.

Soil sampling locations for the collection of soil water were placed near tagged mesquite trees. Soil cores were extracted using a 8 cm diameter manual auger at the following depth ranges: 0-10 cm, 10-40 cm, 40-70 cm, 70-100 cm, 100-130 cm. To minimize the effects of evaporation of water from the soil, jars were quickly filled and capped with minimal headspace, sealed with parafilm, and refrigerated until analysis. Soil samples were collected from all five sites on 10 through 12 April 2023 and at only the primary Borrego Springs site (Site 1) and Clark Dry Lake site (Site 5) on 31 May and 1 June 2023.

Well water was collected to serve as the groundwater source for our isotopic comparisons. Well water from a well owned by Anza-Borrego State Park located near Clark Dry Lake was collected on 11 April and 31 May. These well samples are used as the groundwater source in mixing models for the Clark Dry Lake site (Site 5). Well water was collected from the monitoring wells MW-3 and MW-5A in the Borrego Springs Subbasin between 12 and 16 November 2023 by West Yost. An average of these wells is used as the groundwater source in mixing models for sites in the Borrego Springs Groundwater Subbasin (Sites 1 - 4).

Water isotopes were analyzed by the University of Wyoming Stable Isotope Facility using a Temperature Conversion Elemental Analyzer coupled to a Thermo Delta Plus IRMS. We detected three samples with values outside three standard deviations from the mean across all trees, indicating they were outliers (tree 5-9 in April and trees 3-4 and 3-7 in May); these points were therefore removed. We also removed two trees from Site 3 (3-8 and 3-12) and two trees from Site 5 (5-8 and 5-11) in April because these samples were flagged by the University of Wyoming Stable Isotope Facility as having data of intermediate quality.

Water Potential

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Methods

To assess water availability and water stress of the mesquite over time we assessed predawn and midday water potential during 2023 on 10 through 12 April, 31 May and 1 June, and 15 and 16 August.

We collected three twigs per tree using the protocol described by Rodriguez-Dominguez et al. (2022). Briefly, we collected a twig containing several leaves, placed it into a plastic bag which was nested within a larger plastic bag containing a moist paper towel, and then placed it into a cooler such that the bag did not touch the ice packs. Midday water potential was assessed between 11:15 am and 1:15 pm and predawn water potential was assessed between 3:00 and 5:30 am. In the lab, we used a Scholander-style pressure bomb (PMS Instrument Company, Corvallis, OR, USA) to determine water potential, noting the pressure at the first sign of water.

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MINUTES
BORREGO SPRINGS WATERMASTER BOARD MEETING
Conducted In-Person at Borrego Springs Library and Virtually via GoToMeeting
Thursday, November 7, 2024, 4:30 p.m.

The following individuals were present at the meeting:

Directors Present	Chair Dave Duncan – Borrego Water District (BWD)
	Vice Chair Tyler Bilyk – Agricultural Sector
	Secretary and Treasurer Shannon Smith – Recreational Sector
	Mark Jorgensen – Community Representative
	Jim Bennett – County of San Diego
Watermaster Staff Present	James M. Markman, Legal Counsel
	Samantha Adams, Executive Director, West Yost
	Andrew Malone, Lead Technical Consultant, West Yost
	Lauren Salberg, Staff Geologist, West Yost
Others Present	Cathy Milkey, representing Rams Hill
	Diane Johnson, BWD Board Member
	Esmeralda Garcia
	Geoff Poole, BWD General Manager
	Gina Moran, BWD Board Member
	Rich Pinel, Board Alternate – Recreational Sector
	Steve Anderson, BB&K, representing BWD
	Tammy Baker, BWD Board Member
	Trey Driscoll, Intera, TAC Member representing BWD

Please visit the Watermaster's Website[1] to access the Agenda Packet, recording, and presentation for the November 7, 2024 Meeting.

I. **Opening Procedures**

A. Chair Duncan called the meeting to order at 4:30 PM at which time the meeting recording was started.

B. Chair Duncan led the meeting participants in the Pledge of Allegiance.

C. Samantha Adams, Executive Director (ED) called roll and confirmed that a quorum of all members of the Board were present.

D. Approval of Agenda.

Motion: Motioned by Vice Chair Bilyk, seconded by Director Smith to approve the Agenda. *Motion carried unanimously by voice vote (5-0-0).*

II. **Public Correspondence**

A. Correspondence Received. None.

B. Public Comments. Chair Duncan called for public comments. There were no public comments.

[1] https://borregospringswatermaster.com/past-watermaster-meetings/

III. **Consent Calendar.** Chair Duncan called for any discussion on the Consent Calendar items included in the November 7, 2024 agenda package. Discussion included:

- Director Smith noted that DWR grant disbursements are delayed. ED Adams explained that two of the most recent reimbursement requests have been approved, but that DWR has reported to BWD they are currently experiencing a 60-day delay in issuing payments.
- Chair Duncan asked ED Adams if she had any comments on the five water rights transfers included in the Consent Calendar; she replied that none of these transfers are out of the ordinary.

Motion: Motioned by Director Jorgensen, seconded by Director Bennett to approve the Consent Calendar. *Motion carried unanimously by roll-call vote (5-0-0).*

IV. **Board Workshop to Review Draft Recommendations on the Redetermination of the 2025 Sustainable Yield.** Andy Malone presented on the methods and results for redetermining the 2025 Sustainable Yield and provided the Board with a report-out from the Stakeholder Open House held prior to the Board meeting. Mr. Malone explained that the feedback received in the meeting (and from the Open House) would be relayed to the TAC and The Board asked questions throughout Mr. Malone's presentation. At the conclusion of the presentation, Chair Duncan opened the floor to public comment, followed by Board discussion. Public comment was made by Steve Anderson, Tammy Baker, Rich Pinel, and Cathy Milkey.

Public questions and comments, including Board and staff response if any, included:

- Steve Anderson, legal counsel for BWD, reported that it is typical for Sustainable Yield values in other adjudications to have round numbers. He asked if it's easier (administratively) to operate with a Sustainable Yield rounded to the nearest zero. ED Adams replied that there are no differences in the administrative or technical steps associated with implementing a Sustainable Yield that is or is not a rounded number.
- Questions about the differences in the ten different model versions used in the uncertainty analysis. Mr. Malone explained that the model parameters (primarily aquifer properties) adjusted during model calibration are different in each of the ten model versions.
- A Sustainable Yield that indicates an accuracy to the nearest acre-foot (*i.e.* 7,952 afy) could suggest a level of accuracy in our understanding of the basin that does not exist.
- Concern that a higher Sustainable Yield could cause Pumpers to ease up on reducing pumping. It was requested that the pumpers receive clear information about their future allocations so they understand there are still reductions that must occur. Staff explained that all pumpers will receive a notice of the new Sustainable Yield and a schedule of their pumping allocations through 2040.
- Isn't the best available science to the exact result of the "best" calibrated model simulation?
- Members of the public had various recommendations to the Board:
    - Adopt a Sustainable Yield of 7,952 afy based on the majority TAC recommendation.

- Adopt a Sustainable Yield of 7,900 afy because this does not imply a level of accuracy to the nearest acre-foot.

The key points of discussion by the Board included:

- Of all the improvements made to the Farm Process (FMP), adjusting irrigation efficiencies had the greatest impact on increasing (and improving) FMP-estimated pumping.
- The model results plotted on presentation slides (see Board presentation slides 9 and 11) are based on results from the *Calibrated* Borrego Valley Hydrologic Model (BVHM) (*e.g.* the run that yielded a result of 7,952 afy).
- A footnote can be added to the communication of the 2025 Sustainable Yield that explains/reminds there is a potential for it to be modified and reduced during future redeterminations in 2030 and 2035.
- There should be some indication of the uncertainty in the value of the Sustainable Yield. Mr. Malone explained that the TAC requested an uncertainty analysis be performed to help constrain the range of reasonable estimates of the Sustainable Yield to better inform their recommendation. This uncertainty is explained in technical reports and considered in the recommendation reports.
- The TAC and the Technical Consultant are recommending the *Calibrated* BVHM be used to simulate future pumping projection scenarios.
- The definitions of "best" and "most defensible" calibrated version of the BVHM and Sustainable Yield and the process by the TAC and the Technical Consultant for selecting the "best" version.
- Concern that adopting a Sustainable Yield of 7,952 afy may convey more accuracy than the model can simulate (i.e., Can the model really estimate the water budget to the nearest acre-foot?).
- Why did the Technical Consultant recommend a Sustainable Yield of 7,900 afy – and not the result of the best calibrated model?
- Pumpers will not experience a significant difference in their Rampdown schedule if the adopted Sustainable Yield falls within the recommended range of 7,800 to 7,952 afy.

No Board action was taken.

V. **Items for Board Consideration and Possible Action**

A. *Final Water Year 2024 Water Rights Accounting.* ED Adams summarized the memo included in the Agenda package. At the conclusion of the presentation, Chair Duncan opened the floor to public comment, followed by Board discussion. Public comment was made by Diane Johnson.

Public questions and comments, including Board and staff response if any, included:

- What was the Pumping Assessment from last year (WY 2024)?

The key points of discussion by the Board included:

- Revisions to pumping estimates for WY 2021 through 2023 for one new BPA Party, who purchased a BPA property in 2021, will result in changes to prior pumping invoices for those years. The new invoices will reflect a lower assessment fee due to a lower pumping estimate.
- There is one remaining unmetered Pumper.
- A director described the motivation for establishing Carryover rules in the Judgment and identified that some Pumpers have maxed out their Carryover account balances (capped at 2 times Baseline Pumping Allocation [BPA]).
- The Judgment requires Carryover rules be analyzed by January 1, 2025.

Motion: Motioned by Director Bennett, seconded by Vice Chair Bilyk, to approve the WY 2024 Water Rights Accounting. *Motion carried unanimously by roll-call vote (5-0-0).*

B. Final Water Year 2024 Budget Status and Approve Carry Forward Request to WY 2025. ED Adams provided a summary of the memo included in the agenda package. At the conclusion of the presentation, Chair Duncan opened the floor to public comment, followed by Board discussion. There were no public comments.

The key points of discussion by the Board included:

- The Board needs assurance that the work will be completed using grant funding.
- Concerns that several projects have been behind schedule all year and that there may not be enough time to complete these projects within the grant-funded timeframe. Staff explained that if work cannot be performed and completed using grant funding by March 2025, then the work will not be performed. BWD is supporting communications with DWR staff on items that are behind schedule and how to best address this.
- If there are concerns that not all grant funding will be spent on grant-funded projects, the Watermaster can repurpose some funding, such as purchasing transducers for future groundwater-level monitoring. This would ensure that the grant saves Pumpers as much money as possible. But, additional work would only be performed if there is time and it is approved by DWR.

Motion: Motioned by Director Smith, seconded by Director Jorgensen directing Watermaster Staff to bring forward a revised WY 2025 budget inclusive of the 'carry forward' request with the contingency that the vendors must take on the financial risk the additional budget is not reimbursed by the SGM grant if the work is not completed on time. *Motion carried unanimously by roll-call vote (5-0-0).*

C. *Easement Agreement and Cost Estimate for Monitoring the Viking Well.* ED Adams provided a summary of the memo included the agenda package, noting that BWD wrote a letter to Watermaster staff on the future use of the Viking Well. Chair Duncan then requested that Geoff Poole and Steve Anderson clarify their position on the ownership of the well. Geoff Poole, General Manager of the BWD, described the letter submitted on behalf of BWD to support this

agenda item and clarified BWD's position on the ownership of the Viking Well. At the conclusion of the presentation, Chair Duncan opened the floor to public comment, followed by Board discussion. There were no public comments. The key points of discussion by the Board included:

- Other private well owners participating in the Groundwater Monitoring Program have not asked the Watermaster to help fund the eventual abandonment of their wells.
- BWD clarified that their request is to have the option of asking the Watermaster to assist BWD in funding the eventual abandonment of the well, if needed.
- Mr. Malone described that the Viking Well was identified as a good candidate to fill a groundwater-level monitoring data gap and was recommended in the Board-approved Groundwater Monitoring Plan published in 2023.
- Mr. Poole summarized the work performed by BWD to ensure the well could be added to the Watermaster's groundwater monitoring network.
- Director Duncan stated he will relay this information to the BWD Board and the BWD can decide whether or not to execute this agreement with the Watermaster.

Motion: Motioned by Director Smith, seconded by Director Jorgensen, for Watermaster Staff to continue to pursue an Entry Agreement for the Viking Well and to add this well to the groundwater-level monitoring program, as prescribed in the Board-approved Groundwater Management Plan. *Motion carried by majority roll-call vote (4-0-1).* Director Duncan abstained from the vote.

D. *Consideration of Approval of Next TAC Meeting Agenda*. Mr. Malone presented the proposed agenda for the future TAC meeting scheduled for December 9, 2024. At the conclusion of the presentation, Chair Duncan opened the floor to public comment, followed by Board discussion. There were no public comments. The key points of discussion by the Board included:

- The agenda item on the redetermination of the 2025 Sustainable Yield is a tentative item and would be removed from the agenda if the Board approves the redetermination prior to the December 9th TAC meeting.

Motion: Motioned by Director Smith seconded by Vice Chair Bilyk, to approve the TAC agenda. *Motion carried unanimously by roll-call vote (5-0-0).*

E. Scope of Work to Redetermine the 2030 Sustainable Yield. Mr. Malone described the memo included in the agenda package and summarized the potential tasks the TAC is considering for inclusion in a recommended scope of work to redetermine the 2030 Sustainable Yield over the WY 2026 to 209 period. At the conclusion of the presentation, Chair Duncan opened the floor to public comment, followed by Board discussion. Public comment was made by Tammy Baker.

Public questions and comments, including Board and staff response if any, included:

- Is the task for upgrading the BVHM to a new version or another platform being recommended due to cyber security concerns?
    - No, this task was developed for technical purposes, not security concerns.

The key points of discussion by the Board included:

- The TAC has provided their feedback on the list of potential tasks to include the future scope of work and their feedback will be discussed during the November 19, 2024 TAC meeting.
- The TAC recommendations and rankings of the potential tasks will be useful for the Board in making their decision to approve a scope of work.
- A recommendation to focus on monitoring and that the Watermaster doesn't need to develop a perfect model.

No Board action was taken.

VI. **Reports.**

A. Legal Counsel Report. Discussion included:

- Mr. Marman requested Mr. Anderson, BWD Legal Counsel, provide him with the documents related to the Viking Well for his review in support of negotiating the entry agreement.
- There are no updates related to the existing litigation case filed by Doljanin against certain persons associated with the Watermaster.

B. Technical Consultant Report. Mr. Malone reported on the items listed in the agenda package memo (see slides 59 through 61 of the Board presentation slides). There were no additional topics discussed.

Board questions and comments included:

- Request for the draft reports and presentation on the Biological Restoration of Fallowed Lands project be presented to the Board prior to the March 2025 Board meeting, so that the Board has time within the grant-funded period to consider the results of this study and make recommendations.
- Is a Judgment amendment required to incorporate alternative fallowing methods identified and recommended from the Biological Restoration of Fallowed Lands project. If an amendment is required, can SGM grant funding be used for the amendment? Mr. Markman stated he would review the Judgment to clarify if an amendment is required. Grant funding could not be used to for costs associated with amending the Judgment.

C. Executive Director Reports. ED Adams reported on the items listed in the agenda package memo (see slides 62 through 63 of the Board presentation slides). There were no additional topics discussed.

Public question and comment included:

- When Board meeting dates change to the third Wednesday at 3pm starting in January 2025, will the agenda package be published earlier? Agenda packages for future Board meetings will continue to be published in accordance with Brown Act standards (72 hours prior to the meeting).

D. Chairperson's Report. NONE

VII. **Approval of Agenda Items for December 5, 2024 Board Meeting.** ED Adams reviewed the potential agenda items for the next Board meetings listed in the agenda package. The Board discussed items to be included on the December 5, 2024 Board meeting agenda, in addition to items listed in the Agenda package. Discussion included:

- ED Adams updated the proposed Agenda for the December 5, 2024 meeting on the meeting screen based on discussion, noting it now includes the following items:
  - Review updated recommendations on the 2025 Redetermination of the Sustainable Yield
  - Review draft recommendation of the Scope and Budget for WYs 2026 through 2029 to complete the 2030 Redetermination of the Sustainable Yield
  - Review calculation of the change in groundwater storage from spring 2023 to spring 2024
  - WY 2025 Budget Amendment
  - Viking Well follow-up
  - DWR comments, if any

Motion: Motioned by Director Smith seconded by Vice Chair Bilyk, to approve the December 5, 2024 agenda as presented on the monitor. *Motion carried unanimously by roll-call vote (5-0-0).*

VIII. **Board Member Comments.** Chair Duncan called for comments.

- Director Smith acknowledged that he is pushing hard on West Yost on the challenges related to the grant funded work and clarified that his comments are meant to encourage West Yost to continue making progress and meet deadlines.

IX. **Next Meetings of the Borrego Springs Watermaster.** Chair Duncan reviewed the meetings listed in the agenda package.

X. **Adjournment**

- Chair Duncan adjourned the meeting at 7:18 PM.

Recorded by:
Lauren Salberg, Staff Geologist, West Yost

Attest:
Shannon Smith, Secretary and Treasurer of the Board

To: Board of Directors

From: Samantha Adams, Executive Director

Date: December 2, 2024

Subject: Sustainable Groundwater Management Grant Reimbursement Request Report for the July 1, 2024 to September 30, 2024 Reporting Period (Reimbursement Request #7)

The Watermaster was awarded grant funding for two projects as a subgrantee to the Borrego Water District (BWD), by the California Department of Resources (DWR) under the Proposition 68 Sustainable Groundwater Management Implementation grant program (SGM grant). Watermaster is one of four grant-funded entities under the BWD's master SGM grant agreement with DWR. The two Watermaster SGM grant projects are listed in Table 1.

Table 1. SGM Grant Projects awarded to Borrego Springs Watermaster

Grant Package Component	Project Name	Grant Award
Component 6	Biological Restoration of Fallowed Lands	$755,340
Component 7	Monitoring, Reporting, and Groundwater Management Plan Update	$1,983,250

Watermaster staff submitted the seventh SGM grant quarterly reimbursement request documentation to the BWD on November 15, 2024 and BWD submitted the complete quarterly reporting package for the eight grant components to DWR prior to the due date on November 30, 2024. Watermaster Staff provided the BWD with detailed documents summarizing work performed during the seventh grant reimbursement period (July 1, 2024 to September 30, 2024), including annotated invoices for grant eligible expenses, organized by the two SGM grant components. The total reimbursement request for the reporting period was **$295,964.79**.

The materials submitted to the BWD for the SGM Grant Reimbursement Request included:

1. **Progress Report.** This document describes the work performed during the grant reimbursement period for each task under Component 6 and Component 7. For each component, tasks are categorized into five component categories: (A) Component Administration, (B) Planning, Design, and Environmental, (C) Construction and Implementation, (D) Monitoring Assessment, and (E) Stakeholder Outreach. For each task, the Progress Report summarizes the work performed, identifies milestones or deliverables completed, any identifies any impediments to completing the task and any the associated impacts to the schedule or budget.
2. **Invoice Package for Component 6: Biological Restoration of Fallowed Lands**. The package includes tables of the reimbursable expenses, by task and invoice, for each vendor. Annotated versions of each individual vendor invoice received by the Watermaster during the grant reimbursement period are also included as documentation of the expenditures. The

reimbursement request for the reporting period was **$147,972.19.** The reimbursement amounts by category are summarized in Table 2.

3. **Invoice Package for Component 7: Monitoring, Reporting, and Groundwater Management Plan Update.** The package includes a summary table of the reimbursable expenses, by task and invoice, for each vendor. Annotated versions of each individual vendor invoice received by the Watermaster during the grant reimbursement period are also included as documentation of the expenditures. The reimbursement request for the reporting period was **$147,992.60**. The reimbursement amounts by category are summarized in Table 2.

The materials submitted have been compiled in to a PDF for your review and are on available on the Watermaster's website at: https://borregospringswatermaster.com/wp-content/uploads/2024/11/HANDOUT-III.B-Grant-Reimbursment-2024-Q3.pdf

Table 2. Summary of Requested Reimbursement Amounts by Component and Task for the July 1, 2024 to September 30, 2024 Reporting Period

SGM Grant Component Category		Component 6. Biological Restoration of Fallowed Lands	Component 7. Monitoring Reporting and GMP Update	Total Amount Requested for Components 6 and 7
a)	Component Administration	$2,530.61	$9,406.25	$11,936.86
b)	Environmental/Engineering Design	$0.00	$8,870.10	$8,870.10
c)	Implementation/Administration	$0.00	$2,370.00	$2,370.00
d)	Monitoring/Assessment	$140,601.08	$113,254.75	$253,855.83
e)	Engagement/Outreach	$4,840.50	$14,091.50	$18,932.00
	Total	**$147,972.19**	**$147,992.60**	**$295,964.79**

Table 3 summarizes the reimbursements requested to date and the status of review, approval, and payment of each request.

Table 3. Summary of Reimbursement Amounts Requested and Paid

Reimbursement Request and Period		Component 6. Biological Restoration of Fallowed Lands	Component 7. Monitoring Reporting and GMP Update	Total Reimbursement Requested	Status of Request and Payment
1	Jan 2022 to Mar 2023	$168,272.54	$456,607.83	$624,880.37	Approved and Paid
2	Apr to Jun 2023	$40,278.94	$106,402.75	$146,681.69	Approved and Paid
3	July to Sep 2023	$49,196.04	$64,918.25	$114,114.29	Approved and Paid

Reimbursement Request and Period		Component 6. Biological Restoration of Fallowed Lands	Component 7. Monitoring Reporting and GMP Update	Total Reimbursement Requested	Status of Request and Payment
4	Oct to Dec 2023	$53,986.66	$174,521.28	$228,507.94	Approved and Paid
5	Jan to Mar 2024	$36,074.30	$143,741.25	$179,815.55	Approved and Paid
6	Apr to Jun 2024	$60,757.35	$179,052.89	$239,810.24	Under Review
7	July to Sep 2024	$147,972.19	$147,992.60	$295,964.79	Submitted
	Total	**$556,538.02**	**$1,273,236.85**	**$1,829,774.87**	

Borrego Springs Watermaster
Board of Directors Meeting
December 5, 2024
AGENDA ITEM IV.A

To: Board of Directors

From: Andy Malone, Technical Consultant

Date: December 2, 2024

Subject: Redetermination of the 2025 Sustainable Yield

✓ **Recommended Action**	☐ **Provide Direction to Staff**	☐ **Information and Discussion**
☐ **Fiscal Impact**	☐ **Cost Estimate: $**	

Recommended Action

Redetermine the 2025 Sustainable Yield.

Alternative Action: Direct Watermaster Staff to continue discussion on the 2025 Sustainable Yield with the TAC at their upcoming December 9, 2024 TAC meeting.

Fiscal Impact: None. The WY 2025 budget includes funds to Redetermine the 2025 Sustainable Yield.

Background and Objectives

Sections II.E and III.F of the Judgment require the Sustainable Yield of the Basin to be redetermined by January 1, 2025 through a process that includes: collecting additional data, refining the Borrego Valley Hydrologic Model (BVHM), and using model runs to update the Sustainable Yield (2025 Sustainable Yield). The Watermaster Board approved a scope of work and budget for water years (WYs) 2023 and 2024 to update the BVHM and redetermine the 2025 Sustainable Yield.[1] The scope of work was executed by the Watermaster's Technical Consultant in collaboration with the Technical Advisory Committee (TAC) and the Watermaster Board. The results and conclusions of the work have been documented in the *2025 Sustainable Yield Technical Report*, which was published on October 30, 2024.[2]

The TAC and Technical Consultant have considered the results and conclusions of the technical work to redetermine 2025 Sustainable Yield and each prepared independent recommendation reports to the Watermaster Board. The objective of the reports is to provide the Watermaster Board with technical opinions and justifications to assist the Board in establishing the 2025 Sustainable Yield. The recommendation reports and the redetermination of the 2025 Sustainable Yield were distributed to

[1] Scope of Work to Redetermine the Sustainable Yield by 2025.

[2] West Yost. 2024. *Compilation of Technical Work to Redetermine the 2025 Sustainable Yield*. Prepared for the Borrego Springs Watermaster. October 29, 2024.

the Watermaster Board and Stakeholder distribution list on October 30, 2024, which initiated the Stakeholder outreach process. The recommendation reports and the 2025 Sustainable Yield were then discussed at the November 7, 2024 Stakeholder Open House event and Board meeting, which provided the Board and the public the opportunity to make verbal comments on the recommendations and redetermination. Written comments were accepted through November 14, 2024, although no written comments were received. All public and Board comments received throughout the Stakeholder outreach process are summarized in Exhibit 1 (attached).

The TAC met on Tuesday, November 19, 2024 to discuss the Board and public comments received during the November 7, 2024 Stakeholder Open House and Board meeting, which resulted in no changes to the TAC Recommendation Report.

Based on questions and comments from the Board, the Technical Consultant Recommendation Report was updated to include a description justifying the recommendation to set the 2025 Sustainable Yield at 7,900 afy, clarifying how this value utilizes "best available science".

The *final* TAC and Technical Consultant Recommendation Reports are attached as Exhibits 2 and 3, respectively, and are summarized below.

Summary of TAC Recommendation

Exhibit 2 is the TAC Recommendation Report. The TAC recommendations for the redetermination of the 2025 Sustainable Yield are:

1. Use of the BVHM to redetermine the Sustainable Yield:
    - Consensus TAC recommendation: The *Calibrated BVHM* is a good simulator of the hydrology of the Basin and can confidently be used to redetermine the 2025 Sustainable Yield.
2. 2025 Sustainable Yield:
    - Majority TAC recommendation: **The 2025 Sustainable Yield should be set at 7,952 afy.**
        - Three TAC members (representing AAWARE, County of San Diego, and Rams Hill) recommend the 2025 Sustainable Yield be set at 7,952 afy.
    - Alternative Recommendations:
        - Two TAC members (representing BWD and the Roadrunner Club) recommend the 2025 Sustainable Yield be set at 7,900 afy.
        - One TAC member (representing the Borrego Springs Community) recommends the 2025 Sustainable Yield be set at 7,800 afy.

The TAC Recommendation Report provides additional detail on each TAC member's recommendation, including Table 1 which provides justifications or other considerations.

Summary of Technical Consultant Recommendation

Exhibit 3 is the Technical Consultant Recommendation Report. The Technical Consultant's recommendations for the redetermination of the 2025 Sustainable Yield are:

1. **The 2025 Sustainable Yield should be set at 7,900 afy.** This value is derived by rounding-down the Sustainable Yield of 7,952 afy as estimated by the *Calibrated BVHM* (the most defensible BVHM realization) towards the average Sustainable Yield from all 10 model realizations in the uncertainty analysis of about 7,800 afy. The rounding down to 7,900 afy is an attempt to utilize "best available science" via a holistic consideration of all relevant scientific information, including: (i) the results of the *Calibrated BVHM* (7,952 afy); the range of uncertainty in the Sustainable Yield (7,600 – 8,100 afy); and the average Sustainable Yield from all 10 model realizations in the uncertainty analysis (7,800 afy).
2. The *Calibrated BVHM* should be used to predict future groundwater conditions in the Basin under future groundwater pumping plans and climatic conditions to: (i) assess the long-term sustainability of future groundwater conditions under a pumping Rampdown to 7,900 afy under various potential climatic conditions; (ii) evaluate Watermaster's current Carryover rules; and (iii) support the GMP Assessment Report.

2025 Sustainable Yield and Rampdown

The Judgment provides guidance on how to modify the Pumping Rampdown if the 2025 Sustainable Yield is greater than or less than the 2020 Sustainable Yield. Specifically, the Judgment states that "If the revised estimate of Sustainable Yield for the Second Five-Year Period exceeds or falls below 5,700 AFY, the Rampdown Rate will be reduced or increased, and ***the 2030 Target will be increased*** or reduced, proportional to the percentage that the revised estimate of Sustainable Yield exceeds or falls below 5,700 AFY, thus achieving a cumulative quantity of all Pumper's Annual Allocation ***equal to the mid-point between the revised estimate of Sustainable Yield and the cumulative quantity of all Pumper's BPA by Water Year 2029-2030*****"** (emphasis added).

The new 2030 Annual Allocation Target, *e.g.* the mid-point between the revised estimate of Sustainable Yield and the cumulative quantity of all Pumper's BPA (24,293 af), is as follows for the Technical Consultant and TAC recommendations:

2025 Sustainable Yield Recommendation	**Total Rampdown Amount = 24,293 - 2025 SY**	**Half of Rampdown Amount = ½ x Rampdown**	**2030 Target: Mid-point between BPA and 2025 SY = 24,293 – (½ x Rampdown)**
7,900 afy (Technical Consultant Rec.)	16,393 af	8,196.5 af	16,096.5 af
7,952 afy (TAC Rec.)	16,341 af	8,170.5 af	16,122.5 af

Figure 1 (attached) compares the original Rampdown schedule for 2020 through 2040 to the revised Rampdown schedule under each of the recommended 2025 Sustainable Yield values. The new Rampdown rate between WYs 2026 and 2030 to reach the revised 2030 target will be about 1.75%

Rampdown per year. Table 1 (attached) shows the Rampdown percentage and Annual Allocation through WY 2040 under the 2020 Sustainable Yield and the 2025 Sustainable Yield recommendations.

Next Steps

At the December 5th meeting the Board should consider approval of a 2025 Sustainable Yield. If additional information is needed, the Board may refer additional questions to the TAC. The TAC will meet on Monday, December 9, 2024 and can discuss how to address Board comments and questions received during the December 5, 2024 Board meeting, if any.

Enclosures

Exhibit 1: Summary of Public and Board Comments received during Stakeholder Outreach Process

Exhibit 2: TAC Recommendation Report – Redetermine the Sustainable Yield by 2025

Exhibit 3: Technical Consultant Recommendation Report - Redetermine the Sustainable Yield by 2025

Figure 1. Annual Allocation Under Rampdown to 2020 and Recommended 2025 Sustainable Yields

Table 1. Annual Allocation Under Rampdown to 2020 and Recommended 2025 Sustainable Yields

Exhibit 1.
Summary of Comments Received during Stakeholder Outreach Process

The objective of this memo is to summarize the verbal feedback received by the public and the Watermaster Board on the redetermination of the 2025 Sustainable Yield during the Stakeholder Outreach process from October 30, 2024 through November 14, 2024.

Public Comments

Two 90-minute presentations and Q&A sessions were held during the Stakeholder Open House held on November 7, 2024, which provided the public with the opportunity to provide feedback and ask questions about the redetermination of the 2025 Sustainable Yield. At the Open House, the Technical Consultant primarily fielded questions pertaining to the technical work performed to estimate the Sustainable Yield. Additional public comments occurred during the Watermaster Board meeting. Generally, public comments and questions included:

- How long does it take for return flows to travel to the water table?
- What happens to the water budget (inflows) as agriculture pumping is reduced? Will this affect the Sustainable Yield in the future?
- Does the evapotranspiration term match the estimates made by UCI in their current study of GDEs in the subbasin?
- How is climate change factored into the analysis of Sustainable Yield given it may impact inflows to the Subbasin in the future?
- Can the model estimate water quality impacts on the Basin?
- How will the Rampdown change when the Sustainable Yield is revised?
- Can and how will the model be used to assess water level conditions in specific locations of the Subbasin in the future (*e.g.,* the impacts of the revised Rampdown schedule)?
- How was the "best" model calibration selected? What was the basis for that decision?
- What is the accuracy of the model – can it really estimate the Sustainable Yield down to one acre-foot?
- What is the Court process once the 2025 Sustainable Yield is adopted by the Board?
- Is it easier (administratively) to operate with a Sustainable Yield rounded to the nearest zero?
- What are the differences in the ten model realizations that were generated in the uncertainty analysis?
- Concern that if the redetermined Sustainable Yield is published without any explanation, Pumpers may ease up on reducing pumping. A discussion amongst the Board and the public ensued covering topics such as:

  - Reasons why Pumpers have reduced pumping already.
  - Are future redeterminations of the Sustainable Yield expected to result in such a large change as the 2025 Sustainable Yield?
  - What is the best way to communicate changes to the Sustainable Yield to the public?
  - How should Watermaster Staff communicate the 2025 Sustainable Yield with the Pumpers to help them understand the impact to their pumping allocations?
- Members of the public recommended that the Board:
  - Adopt a Sustainable Yield of 7,952 afy based on the majority TAC recommendation.
  - Adopt a Sustainable Yield of 7,900 afy because this does not imply a level of accuracy to the nearest acre-foot.

Watermaster Board Comments

At the November 7, 2024 Board meeting, West Yost gave a summary of: (i) the process to redetermine the Sustainable Yield, (ii) the TAC and Technical Consultant Recommendation Reports and, (iii) a summary of public comments from the Stakeholder Open Houses held earlier. The discussion during the Board Meeting was mainly focused on the topic of the use of "best available science" in redetermining the Sustainable Yield and the level of accuracy of the Sustainable Yield. Discussion included:

- The definition of "best" and "most defensible" calibrated version of the BVHM and Sustainable Yield and the process by the TAC and the Technical Consultant for selecting the "best" version.
- Concern that adopting a Sustainable Yield of 7,952 afy may convey more accuracy than the model can simulate (*i.e.,* Can the model really estimate the water budget to the nearest acre-foot?). There should be some indication of the uncertainty in the value of the Sustainable Yield.
- Is it considered best available science to recommend a Sustainable Yield that indicates a higher level of accuracy than the model provides (*i.e.* 7,952 afy)?
- Why did the Technical Consultant recommend a Sustainable Yield of 7,900 afy?
- Pumpers will not experience a significant difference in their Rampdown schedule if the adopted Sustainable Yield falls within the recommended range of 7,800 to 7,952 afy.
- Board members provided the following preliminary recommendations for the 2025 Sustainable Yield:
  - The most defensible number is from the "best" and "most defensible" version of the BVHM (*i.e.,* 7,952 afy).
  - Adopt a Sustainable Yield of 7,900 afy because this value does not imply a level of accuracy to the nearest acre-foot.

- Express a range of uncertainty along with the redetermined Sustainable Yield. The uncertainty analysis should be used to quantify the uncertainty.
- Professional judgment and best available science should be used to redetermine the 2025 Sustainable Yield.

TAC RECOMMENDATION REPORT

DATE: October 29, 2024

TO: Board of Directors
Borrego Springs Watermaster

FROM: Technical Advisory Committee
Borrego Springs Watermaster

SUBJECT: Redetermination of the 2025 Sustainable Yield

BACKGROUND AND OBJECTIVES

The Borrego Valley Hydrologic Model (BVHM) and its supporting tools, the Basin Characterization Model (BCM) and the Farm Process (FMP), were originally developed by the United States Geological Survey (USGS)[1] and were used by the USGS to improve the hydrogeologic understanding of the Borrego Springs Subbasin (Basin) and evaluate future management scenarios that would eliminate conditions of overdraft (*Initial BVHM*).

The *Initial BVHM* was updated and extended by Dudek and used to simulate historical groundwater conditions from October 1929 through September 2016 (*2016 BVHM*).[2] The *2016 BVHM* results were used to characterize the water budget for the Basin and estimate the initial Sustainable Yield for the Basin at 5,700 acre-feet per year (afy).

Sections II.E and III.F of the Judgment requires the Sustainable Yield of the Basin to be redetermined by January 1, 2025 through a process that includes: collecting additional data, refining the BVHM, and using model runs to update the Sustainable Yield (2025 Sustainable Yield). The Watermaster Board approved a scope of work and budget for water years (WYs) 2023 and 2024 to update the BVHM and redetermine the 2025 Sustainable Yield.[3]

Summary of Work Performed, Results, and Conclusions

The scope of work was executed by the Watermaster's Technical Consultant in an iterative process and in collaboration with the Technical Advisory Committee (TAC). The TAC provided feedback on each task. The scope of work involved updating and calibrating the BVHM using historical and newly collected data—most importantly, metered groundwater pumping and measured groundwater elevations at wells. The BVHM was recalibrated over the historical period of 1945-2022 and included a model sensitivity analysis. The final recalibrated model is referred to herein as the *Calibrated BVHM*.

In summary, the *Calibrated BVHM* resulted in a model simulation of the historical hydrology of the Basin (1945-2022), including estimates of historical groundwater pumping, groundwater elevations,

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[1] USGS. 2015. Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley, San Diego County, California.

[2] Dudek. 2019. Update to USGS Borrego Valley Hydrologic Model for the Borrego Valley GSA (draft final).

[3] Scope of Work to Redetermine the Sustainable Yield by 2025.

groundwater-flow directions, and the water budget of the Basin. The simulated water budget was used to calculate the Sustainable Yield and recommend the 2025 Sustainable Yield using the following formula:

Natural Inflows – Natural Outflows = Sustainable Yield

The Sustainable Yield is intended to represent the average annual volume of groundwater that can be pumped from the Basin without causing chronic overdraft conditions or other undesirable results. The methods and results of this work are documented in the *2025 Sustainable Yield Technical Report.*[4] The main conclusions of the report are:

- The *Calibrated BVHM* is a good simulator of the hydrology of the Basin and can confidently be used to redetermine the 2025 Sustainable Yield.
- The 2025 Sustainable Yield should be set between 7,600 afy to 8,100 afy based on the 10 best model realizations identified through the uncertainty analysis. The most defensible model realization is the *Calibrated BVHM*, which yielded a Sustainable Yield estimate of 7,952 afy.
- The *Calibrated BVHM* can and should be used to predict future groundwater conditions in the Basin under future groundwater pumping plans and climatic conditions to: (i) assess the sustainability of future groundwater conditions under a Rampdown to the 2025 Sustainable Yield established by the Watermaster; (ii) evaluate Watermaster's current Carryover rules; and (iii) support the Groundwater Management Plan (GMP) Assessment Report.[5]

The TAC has considered the results and conclusions of the effort to redetermine 2025 Sustainable Yield and has prepared this TAC Recommendation Report to the Watermaster Board. The objective of the TAC Recommendation Report is to provide the Watermaster Board with technical opinions and justifications to assist the Board in establishing the 2025 Sustainable Yield. The TAC strives for consensus opinions, but when consensus is not achieved, this report describes the differences in opinions.

Organization of the TAC Recommendation Report

The remainder of this TAC Recommendation Report includes the following sections:

- **TAC Recommendation.** This section describes the TAC recommendations for the redetermination of the 2025 Sustainable Yield (including any differences in TAC opinions).
- **Supplemental Information**. This section describes the purpose of and requirements for supplemental information prepared by TAC members to support the basis of their recommendations. The supplemental information, if any, is included as an attachment.

[4] West Yost. 2024. *Compilation of Technical Work to Redetermine the 2025 Sustainable Yield*. Prepared for the Borrego Springs Watermaster. October 29, 2024. https://borregospringswatermaster.com/wp-content/uploads/2024/10/2025-SYR-Final-Technical-Report.pdf

[5] The GMP Assessment Report is due to the DWR by June 25, 2026.

TAC RECOMMENDATION

This section describes the TAC recommendation(s) on the redetermination of the 2025 Sustainable Yield (including a description of any differences in TAC member opinions). In summary:

- Consensus TAC recommendation: The *Calibrated BVHM* is a good simulator of the hydrology of the Basin and can confidently be used to redetermine the 2025 Sustainable Yield.
- Majority TAC recommendation: The 2025 Sustainable Yield should be set at 7,952 afy. TAC members have differing opinions on the value of the 2025 Sustainable Yield:
    - Three TAC members (representing AAWARE, County of San Diego, and Rams Hill) recommend the 2025 Sustainable Yield be set at 7,952 afy.
    - Two TAC members (representing BWD and the Roadrunner Club) recommend the 2025 Sustainable Yield be set at 7,900 afy.
    - One TAC member (representing the Borrego Springs Community) recommends the 2025 Sustainable Yield be set at 7,800 afy.

Table 1 documents each TAC member recommendation, including any justifications or other considerations, to assist the Board in establishing the 2025 Sustainable Yield.

Table 1. Summary of TAC Recommendations
Redetermination of the 2025 Sustainable Yield

TAC Member Name and Appointing BPA Party	Considerations/Recommendations			
	The *Calibrated* BVHM is a good simulator of the hydrology of the Basin and can confidently be used to redetermine the 2025 Sustainable Yield. (Y/N)	**The 2025 Sustainable Yield should be set at _____ afy.**	**Description of the limitations of the analysis that the Board should consider in setting the 2025 Sustainable Yield (*if any*).**	**Additional Considerations/Recommendations:**
Bob Wagner ***AAWARE***	The Calibrated BVHM is adequate to calculate sustainable yield for 2025.	7,952 AFY	The Board should adopt 7,952 AFY or 8,000 AFY if rounded.	Since we are rounding to the nearest hundredth, sustainable yield should be 8,000 AFY.
Russell Detwiler ***Borrego Springs Community***	Yes, given the currently available data, the Calibrated BVHM is a good simulator of the hydrogeology of the basin.	7,800 afy. The sensitivity analysis that considered the 10 'best' model formulations resulted in estimates of sustainable yield ranging from 7568 afy to 8078 afy. The mean of these 10 estimates (7803 afy) provides a sustainable yield that accounts for the range of model uncertainty.	The Calibrated BVHM model was selected as the single 'best' from thousands of calibration runs. There were a number of models with similar values for various metrics of goodness of fit to the data. The uncertainty reflected by these different models should be considered in current and future decisions about sustainable yield.	
Trey Driscoll ***Borrego Water District***	Yes, The BVHM is currently the best available tool to estimate/redetermine the Sustainable Yield for the Borrego Springs Subbasin.	7,900 acre-feet per year (afy).	The uncertainty analysis of the Sustainable Yield estimate based on the current version of the model is 7,600 to 8,100 acre-feet per year. Future climate may be different than the past climate impacting inflows to the Subbasin that should be tracked with empirical data annually using measured groundwater levels and annual estimates of change in groundwater storage.	Adaptive Management will be implemented to redetermine the Sustainable Yield estimate on least a 5-year basis as per the Judgement and more frequently should monitoring indicate that the Subbasin is not on track to meet sustainability goals defined in the Groundwater Management Plan.
Jim Bennett ***County of San Diego***	Yes	7,952 acre-feet per year, which represents the best fit of the realizations	In a parallel process, the Watermaster is conducting the five-year update of the Groundwater Management Plan (GMP). As part of this update, the groundwater model will simulate future conditions based on various groundwater pumping and climate scenarios. The model's results will be compared to sustainable management criteria for groundwater levels and storage. If the model results indicate the likelihood of undesirable results occurring after 2040, mitigation measures may be implemented, including the development of projects or management actions, or adjustments to the sustainable yield, if deemed necessary.	None
Tom Watson ***T2 Borrego, Rams Hill***	Yes, based on the WM efforts to date.	7,952 AFY	Future refinement of the model will be useful e.g., FMP estimated pumping v. metered pumping.	Continue to refine BVHM based on best available science/data over the next 5 years.
John Peterson ***Roadrunner Club***	I believe that the work that has been completed is a good simulator on the basin.	I believe that we should use the 7,900 ac-ft/yr value.	Time will tell. It is likely that climate trends will affect this value. In the future.	The key factor will be monitoring the basin. This is vitally important.

SUPPLEMENTAL INFORMATION

TAC guidelines[6] allow TAC members to prepare supplemental materials to support the basis of their recommendation, such as memoranda or PowerPoint presentation slides that describe their analyses and recommendations. To be included in the TAC Recommendation Report, all supplemental information must be reviewed and discussed by the TAC.

No supplemental information was provided by the TAC.

[6] Available on the Watermaster's website at: https://borregospringswatermaster.com/wp-content/uploads/2023/03/Resolution-23-01-Guidelines-for-TAC-Process-Executed.pdf

TECHNICAL CONSULTANT RECOMMENDATION REPORT

DATE: November 22, 2024

TO: Board of Directors
Borrego Springs Watermaster

FROM: Technical Consultant (West Yost)
Borrego Springs Watermaster

SUBJECT: Redetermination of the 2025 Sustainable Yield

BACKGROUND AND OBJECTIVES

The Borrego Valley Hydrologic Model (BVHM) and its supporting tools, the Basin Characterization Model (BCM) and the Farm Process (FMP), were originally developed by the United States Geological Survey (USGS)[1] and were used by the USGS to improve the hydrogeologic understanding of the Borrego Springs Subbasin (Basin) and evaluate future management scenarios that would eliminate conditions of overdraft (*Initial BVHM*).

The *Initial BVHM* was updated and extended by Dudek and used to simulate historical groundwater conditions from October 1929 through September 2016 (*2016 BVHM*).[2] The *2016 BVHM* results were used to characterize the water budget for the Basin and estimate the initial Sustainable Yield for the Basin at 5,700 acre-feet per year (afy).

Sections II.E and III.F of the Judgment require the Sustainable Yield of the Basin to be redetermined by January 1, 2025 through a process that includes: collecting additional data, refining the BVHM, and using model runs to update the Sustainable Yield (2025 Sustainable Yield). The Watermaster Board approved a scope of work and budget for water years (WYs) 2023 and 2024 to update the BVHM and redetermine the 2025 Sustainable Yield.[3] The scope of work was executed by the Watermaster's Technical Consultant in collaboration with the Technical Advisory Committee (TAC) and the Watermaster Board. The results and conclusions of the work have been documented in the *2025 Sustainable Yield Technical Report*.[4]

In summary, the scope of work involved updating and calibrating the BVHM using historical and newly collected data—most importantly, metered groundwater pumping and measured groundwater elevations at wells. The BVHM was recalibrated over the historical period of 1945-2022 which produced model-simulated estimates of historical groundwater pumping, groundwater elevations, groundwater-flow directions, and the water budget of the Basin.

The update and calibration of the BVHM was performed successfully and represents an improvement to the FMP and BVHM and its ability to simulate the hydrology of the Basin. The simulated water budget

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[1] USGS. 2015. *Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley, San Diego County, California*.

[2] Dudek. 2019. *Update to USGS Borrego Valley Hydrologic Model for the Borrego Valley GSA (draft final)*.

[3] Scope of Work to Redetermine the Sustainable Yield by 2025.

[4] West Yost. 2024. *Compilation of Technical Work to Redetermine the 2025 Sustainable Yield*. Prepared for the Borrego Springs Watermaster. October 29, 2024.

from the model calibration was used to estimate the Sustainable Yield of the Basin using the following formula:

Natural Inflows – Natural Outflows = Sustainable Yield

In this analysis, the Sustainable Yield is intended to represent the average annual volume of groundwater that can be pumped from the Basin without causing chronic overdraft conditions.

The work also included a model "uncertainty analysis" which produced a suite of 10 calibrated realizations of the BVHM, each with its own version of the historical water budget. The most defensible of these 10 calibrated versions of the BVHM is referred to herein as the *Calibrated BVHM*.

The main conclusions from this effort are:

- The *Calibrated BVHM* is a good simulator of the hydrology of the Basin and can confidently be used to redetermine the 2025 Sustainable Yield.
- The 2025 Sustainable Yield should be set between 7,600 afy to 8,100 afy based on the 10 best model realizations identified through the uncertainty analysis. The most defensible model realization is the *Calibrated BVHM*, which yielded a Sustainable Yield estimate of 7,952 afy.
- The *Calibrated BVHM* can and should be used to predict future groundwater conditions in the Basin under future groundwater pumping plans and climatic conditions to: (i) assess the long-term sustainability of future groundwater conditions under a Rampdown to the 2025 Sustainable Yield established by the Watermaster; (ii) evaluate Watermaster's current Carryover rules; and (iii) support the Groundwater Management Plan (GMP) Assessment Report.[5]

TECHNICAL CONSULTANT RECOMMENDATION

West Yost has considered the results and conclusions of the effort to redetermine 2025 Sustainable Yield and has prepared the following recommendations for the Watermaster Board:

- **The 2025 Sustainable Yield should be set at 7,900 afy.** This value is derived by rounding-down the Sustainable Yield of 7,952 afy as estimated by the *Calibrated BVHM* (the most defensible BVHM realization) towards the average Sustainable Yield from all 10 model realizations in the uncertainty analysis of about 7,800 afy. The rounding down to 7,900 afy is recommended for two main reasons:
    1. It is an attempt to utilize "best available science" via a holistic consideration of all relevant scientific information, including: (i) the results of the *Calibrated BVHM* (7,952 afy); the range of uncertainty in the Sustainable Yield derived from the uncertainty analysis (7,600 – 8,100 afy); and the average Sustainable Yield from the uncertainty analysis (7,800 afy).
    2. Rounding the Sustainable Yield (or Safe Yield) to a unit of 100 afy is typical practice in adjudicated groundwater basins in California. This rounding is an implicit

[5] The GMP Assessment Report is due to the DWR by June 25, 2026.

recognition of the uncertainty in the scientific investigations that are used to establish Sustainable Yields (or Safe Yields).

- The *Calibrated BVHM* should be used to predict future groundwater conditions in the Basin under future groundwater pumping plans and climatic conditions to: (i) assess the long-term sustainability of future groundwater conditions under a pumping Rampdown to 7,900 afy under various potential climatic conditions; (ii) evaluate Watermaster's current Carryover rules; and (iii) support the GMP Assessment Report.

Figure 1. Annual Allocation Under Rampdown to 2020 and Recommended 2025 Sustainable Yields

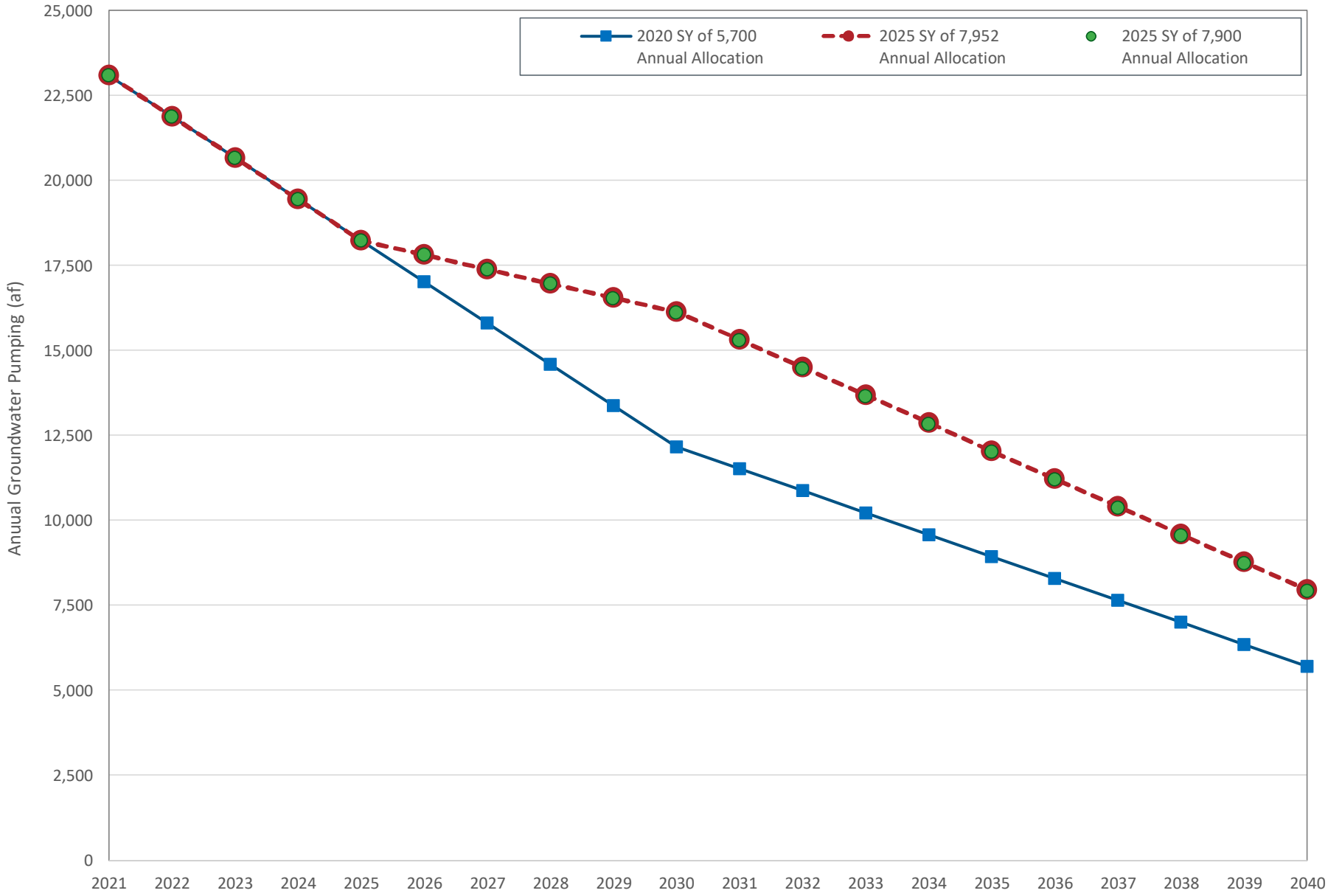

Table 1.
Annual Allocation Under Rampdown to
2020 and Recommended 2025 Sustainable Yields

Rampdown and Annual Allocation						
Water Year	2020 SY Rampdown	2025 SY Rampdown to 7,900 afy	2025 SY Rampdown to 7,952 afy	2020 SY of 5,700 Annual Allocation *(afy)*	2025 SY of 7,900 Annual Allocation *(afy)*	2025 SY of 7,952 Annual Allocation *(afy)*
2020	100.00%	100.00%	100%	24,293	24,293	24,293
2021	95.00%	95.00%	95%	23,078	23,078	23,078
2022	90.00%	90.00%	90%	21,864	21,864	21,864
2023	85.00%	85.00%	85%	20,649	20,649	20,649
2024	80.00%	80.00%	80%	19,434	19,434	19,434
2025	**75.00%**	**75.00%**	**75%**	**18,220**	**18,220**	**18,220**
2026	70.00%	73.25%	73.27%	17,005	17,795	17,800
2027	65.00%	71.50%	71.55%	15,790	17,370	17,381
2028	60.00%	69.76%	69.82%	14,576	16,946	16,961
2029	55.00%	68.01%	68.09%	13,361	16,521	16,542
2030	**50.00%**	**66.26%**	**66.37%**	**12,147**	**16,097**	**16,123**
2031	47.35%	62.89%	63.00%	11,502	15,277	15,305
2032	44.69%	59.51%	59.64%	10,857	14,457	14,488
2033	42.04%	56.14%	56.28%	10,213	13,638	13,671
2034	39.39%	52.76%	52.91%	9,568	12,818	12,854
2035	**36.73%**	**49.39%**	**49.55%**	**8,923**	**11,998**	**12,037**
2036	34.08%	46.02%	46.19%	8,279	11,179	11,220
2037	31.42%	42.64%	42.82%	7,634	10,359	10,403
2038	28.77%	39.27%	39.46%	6,989	9,539	9,586
2039	26.12%	35.89%	36.10%	6,345	8,720	8,769
2040	**23.46%**	**32.52%**	**32.73%**	**5,700**	**7,900**	**7,952**

Borrego Springs Watermaster
Board of Directors Meeting
December 5, 2024
AGENDA ITEM IV.B

To: Board of Directors

From: Andy Malone, Technical Consultant

Date: December 2, 2024

Subject: Entry Agreement with BWD for Access to the Viking Well

✓ **Recommended Action**	✓ **Provide Direction to Staff**	☐ **Information and Discussion**
☐ **Fiscal Impact**	☐ **Cost Estimate: $**	

Recommended Action

Provide direction to Watermaster Staff to execute an Entry Agreement with BWD to allow Watermaster Staff site access for (i) converting the Viking Well to a monitoring well and (ii) conducting future groundwater monitoring activities.

Fiscal Impact: None. Grant-reimbursable funds are included in approved WY 2025 budget to execute standard Entry Agreements with well owners to expand the Watermaster's Groundwater Monitoring Program through the conversion of inactive/abandoned wells.

Background and Previously Related Actions by the Board

The Watermaster's Groundwater Monitoring Plan[1] includes recommendations to expand the existing monitoring network of wells and collect groundwater-level and groundwater-quality data to fill in monitoring gaps within the Basin. The Viking Well was identified as a preferred candidate to add to the groundwater-level monitoring network.

The Viking Well is an abandoned well in the Basin and is now owned by United States Gypsum (USG). The Borrego Water District (BWD) has coordinated with USG to make improvements to this well to allow for monitoring of water levels, including: removal of pumping equipment; bailing of accumulated sediment from the bottom of the well; video logging, and installing a temporary well cap. USG has funded this work.

To add the Viking Well into the Groundwater Monitoring Program, the Watermaster will need to perform a few additional, minor modifications to complete the conversion of the well into a long-term monitoring well:

- Removing the existing well cap

[1] Available on the Watermaster's website at: https://borregospringswatermaster.com/wp-content/uploads/2023/04/R-BSW-Groundwater-Monitoring-Program-FINAL-20230411.pdf

- Installing a new well-head
- Installing new monitoring equipment (transducer and data-logger)

The costs to make these additional improvements to the Viking Well will be paid for by the DWR Sustainable Groundwater Management (SGM) grant funding under the "Conversion of Abandoned Wells" task and the work must be completed by March 2025.

The Watermaster needs access to the Viking Well to make the modifications to the well and to collect groundwater-level measurements during future semi-annual monitoring events. At prior Board meetings, the Board was presented with various options to obtain access to the Viking Well, and then requested that Watermaster Staff work with BWD to obtain access via a standard Entry Agreement.

Discussion

Watermaster Staff and legal counsel have corresponded with BWD staff and legal counsel on this issue following the most recent Board meeting. In summary, BWD is proposing to sign a standard Entry Agreement to allow Watermaster Staff to access the Viking Well site. This method for Watermaster to obtain permission to access wells for monitoring activities is the same as is being executed with other well owners in the Borrego Springs Subbasin. The draft Entry Agreement is included as Attachment A, which is in substantial compliance with the template included as Exhibit 8 in the Judgment.

Next Steps

With Board direction, Watermaster staff will execute the attached draft Entry Agreement with BWD to obtain access to the Viking Well site. The well modifications will be performed by Well Tec during one of its field campaigns and the well will be monitored during the future semi-annual monitoring events.

Enclosures

Attachment A. Draft Entry Agreement for the Viking Well

ENTRY AGREEMENT

This Entry Agreement is dated as of December ___, 2024, and is made by Borrego Water District ("***District***") and the Borrego Springs Watermaster ("***Watermaster***") appointed under that certain Borrego Springs Subbasin Stipulated Judgment entered in *Borrego Water District v. All Persons Who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin, etc*., Orange County Superior Court Case No. 37-2020-00005776 ("***Stipulated Judgment***"). Where appropriate, District and Watermaster are referred to collectively as "Parties" and individually as "Party." References to a Party include, bind, and inure to the benefit of that Party's Board members, officers, agents, employees, successors in interest and assigns.

RECITALS

A. District holds a permanent non-exclusive access and well easement, as well as a temporary construction easement, over a portion ("**Easement Area**") of real property commonly known as Assessor's Parcel Number 140-030-10-00 within the County of San Diego ("**Property**"). The recorded easement deed (Instrument No. 2024-0173600) ("**Easement Deed**") is attached hereto as Exhibit "A" and incorporated herein by reference. United States Gypsum Company, a Delaware Corporation ("**USG**"), is the fee owner of the Property.

B. Watermaster has requested that the District provide Watermaster access to the well ("***Well***") located on the Easement Area so that Watermaster may access and collect groundwater level measurements and/or groundwater quality samples from the Well, and potentially make modifications to the Well (the "**Activities**"), consistent with the Watermaster's groundwater monitoring program established under the Stipulated Judgment or implementation of the physical solution described in the Stipulated Judgment.

C. The Easement Deed allows District guests and invitees to access the Well and, by and subject to the terms of this Entry Agreement, District desires to grant access to the Watermaster to conduct the Activities.

TERMS

This Entry Agreement is issued subject to the following terms and conditions:

1. Purpose and Scope.

(a) For the term of this Agreement, as defined in Section 2 below, District hereby provides Watermaster a limited, non-exclusive license to enter onto the Property to access the Easement Area and Well under the terms and conditions set forth in this Entry Agreement, solely in order to carry out the Activities.

(b) Watermaster's rights under this Entry Agreement are limited to those benefitting the District described in the Easement Deed. In particular, Watermaster acknowledges that, pursuant to Paragraph 4 of the Easement Deed, USG granted a limited temporary construction easement allowing modification to the Well in favor of the District that will expire on or about July 9, 2026. Accordingly, the Watermaster agrees that it will be precluded from undertaking any

construction or other work on the Well after July 9, 2026, without the express written consent of the District and USG.

(c) Only Watermaster employees and contractors covered by Watermaster's or such contractors' comprehensive liability insurance, automobile insurance and workers compensation insurance consistent with the requirements of Section 7 below are permitted to enter the Well Site and conduct the Activities.

(d) Watermaster shall not enter onto the Easement Area other than as necessary to conduct the Activities and shall not enter onto any other portion of the Property.

(e) At the sole election of the District, the District or its representative may accompany Watermaster in any or all of the Activities. Neither District nor USG shall have any responsibility or obligation whatsoever in connection with the Activities.

(f) If the Activities include any survey, test or other investigation, Watermaster shall provide District a copy of the results of the Activities within ten (10) calendar days after the draft results are first made available to Watermaster and prior to their publication, without cost to the District.

(g) Failure to comply with the terms and conditions contained herein shall be cause for immediate termination of this Entry Agreement.

2. Term of this Entry Agreement.

(a) The term of this Entry Agreement shall commence upon its full execution by the Parties (the "***Effective Date***") and shall remain in effect unless terminated by District.

(b) The District may terminate this Entry Agreement at any time upon 60 days written notice to the Watermaster; provided, however, that the District may terminate this Agreement immediately upon any material breach of this Entry Agreement by Watermaster or in case of any determination by USG that provisions of the Easement Deed have been violated.

(c) Watermaster's entry and the Activities must cease on any termination date.

(d) Prior to entering the Property, Watermaster shall certify to the District that the Watermaster personnel who will be conducting the Activities have been provided with a copy of this Entry Agreement and are covered by Watermaster's comprehensive liability insurance, automobile insurance and workers compensation insurance.

3. Government Agreements and Authorizations.

Watermaster shall comply with all Applicable Legal Requirements (defined in Section 10 below) and shall be solely responsible for and obtain at its expense all governmental Agreements and authorizations required by all Applicable Authorities (defined in Section 10 below) for Watermaster to perform the Activities pursuant to this Entry Agreement.

4. Non-Interference with Use of Property.

(a) Watermaster shall not modify the Easement Area or the Well except to the extent permitted by the Easement Deed.

(b) Watermaster's entry upon and use of the Easement Deed shall at all times be subject to the rights of the District and USG. Watermaster shall not interfere with or disrupt any USG activities on the Property, and shall not endanger the health, safety or welfare of District or USG agents, employees, invitees, or Watermaster's employees or contractors, or others on the Property.

5. Assumption of Risk, Release and Indemnity.

(a) Watermaster assumes all risk of loss, damage and injury to itself, its employees and contractors which in any manner may arise out of entry upon or use of the Property under this Entry Agreement. Neither USG nor District shall have any liability to Watermaster, its employees or contractors or to any insurer, by way of subrogation or otherwise, on account of any loss, damage or injury to Watermaster's property, or to Watermaster's employees or contractors, regardless of whether such loss or damage is caused by any negligence of USG, the District or Watermaster, unless Watermaster affirmatively demonstrates that USG or the District acted with willful misconduct, and that such willful misconduct is the proximate cause of such loss, damage or injury. Any award of damages following such a showing of willful misconduct shall be limited to the actual amount of the monetary injury. If any dispute is not resolved following informal attempts to resolve the issue among District and Watermaster staff, either Party or USG may seek declaratory relief, specific performance and/or monetary damages for willful misconduct.

(b) Watermaster shall keep the Property free of mechanic's liens and claims resulting from or in any way related to Watermaster's entry onto the Property or the Activities. Watermaster shall defend District and USG against, and indemnify and hold District and USG harmless from all liens, claims, loses, liabilities and expenses asserted against or incurred Distrit or USG and caused by Watermaster's entry or the Activities or in any way related to such entry or Activities, including the actual expense of legal representation whether by special counsel or by District and USG attorneys, and expert witness fees, arising out of or resulting from injury to or death of any person, or damage to any property or damage to any other interest of District or USG, including, but not limited to, suit alleging noncompliance with any applicable Legal Requirements by Watermaster. Watermaster's duty to defend as described above shall arise immediately upon the making of any claim, the assertion of any cause of action, the initiation of any regulatory proceeding or other action against District or USG, and shall not be dependent upon a finding of any wrongdoing or fault on the part of Watermaster. The Parties' rights and obligations under this Section 6 shall survive termination of this Entry Agreement and shall continue until all claims against District, Watermaster, and USG are absolutely barred by the applicable statutes of limitation.

6. Insurance.

(a) Scope of Insurance. Watermaster shall, prior to any entry onto the Property, acquire and keep in full force and effect comprehensive liability insurance with a combined single limit coverage limit of not less than Two Million Dollars ($2,000,000.00) covering bodily injury, personal injury, death and property damage liability per occurrence and in the aggregate, insuring

the District and USG against any and all liability with respect to or arising out of the entry or Activities. No policies issued on a "claims made" basis will be acceptable and no policies will have any deductible provision in excess of five percent (5%) of the total coverage maintained by the Watermaster. Watermaster shall also obtain and maintain all automobile and workers compensation insurance required by law with respect to the Activities. Watermaster shall provide the District with a certificate evidencing such coverage prior to Watermaster's entry onto the Property.

(b) Policy Form. All such liability insurance policies shall name District and USG as additional insureds. All public liability, property damage, and other casualty policies shall be written as primary policies and any insurance carried by the additional insureds on such policies shall not be contributing with such policies. All policies of insurance under this Entry Agreement shall be issued by reputable insurance companies with general policy holder's ratings of not less than A-, and which are qualified to do business in California.

(c) Blanket Policies. Notwithstanding anything to the contrary contained in this Section 7, Watermaster's obligation to carry insurance may be satisfied by coverage under a so-called blanket policy of insurance, provided, that the requirements set forth in this Section 7 are otherwise satisfied.

(d) Failure by Watermaster to Maintain Insurance. If Watermaster fails to secure and maintain insurance policies complying with the provisions of this Section 7, then the District may secure the appropriate insurance policy or policies, and Watermaster shall pay, upon demand, the cost of same to District, plus a service fee equal to fifteen percent (15%) of the total annual premium cost of the policy or policies.

7. Remedies.

(a) If the Property suffers any damage by reason of the acts or omissions of Watermaster, Watermaster shall be solely responsible for restoring the Property to its condition existing immediately prior to the occurrence of such damage to the satisfaction of the District and USG, and shall compensate District and USG for any damages caused by reason of the acts or omissions of Watermaster, including but not limited to the market value of any crops damaged or destroyed by Watermaster.

(b) Watermaster shall be liable to District and USG for all damage to any person or property which in any manner may be caused by Watermaster. District's and USG's remedies for any such damage shall include, without limitation:

1) requiring that Watermaster immediately pay for the cost of repair and other losses to District and USG (including without limitation, consequential damages) caused by Watermaster; and

2) requiring that Watermaster restore any damaged property, including without limitation the Well, to a condition as near as reasonably possible to that which existed immediately prior to Watermaster's entry. If District elects to require that Watermaster make such repairs and restoration and Watermaster does not timely perform such repairs and restoration, then Watermaster shall be liable to District and USG for the cost of restoring the damaged property to

such condition, and shall further be liable to District and USG for all damages (including, without limitation, consequential damage) resulting from Watermaster's activities on the Property, and any and all associated costs District and USG incur in its related restoration/repair activities.

8. Removal of Materials.

(a) Watermaster hereby warrants and represents that it will not cause the presence, use, storage or disposal of any Hazardous Substances (defined in Section 10 below) on or about the Property without the prior written consent of District. Excluded from this provision are substances necessary to carry out the Activities, provided that said substances are labeled, packaged, stored, contained, handled, managed, transported, documented and disposed of by Watermaster in full compliance with all Applicable Legal Requirements.

(b) Any substance, product, waste or other material of any nature whatsoever which may give rise to liability under any of the Applicable Legal Requirements that Watermaster releases to the Property must be removed and properly disposed of by Watermaster in compliance with the Applicable Legal Requirements and all negative impacts remediated at the sole expense of Watermaster. Said remediation shall restore the Property to the condition existing immediately prior to the Effective Date of this Entry Agreement.

(c) Watermaster agrees to immediately notify District when Hazardous Substances have been released on the Property. Watermaster further agrees to properly notify all Applicable Authorities in the event of a release of Hazardous Substances on the Property. If Watermaster discovers any materials suspected to be hazardous in nature in or around the Watermaster's work area during the course of its Activities, it shall halt all Activities until District, or its agent, can determine the nature of the material and the proper remediation, if any, that is required.

(d) All conditions and stipulations of this Section 9 shall be carried out to the satisfaction of both District and the California Regional Water Quality Control Board — Colorado River Region.

(e) Failure by Watermaster to comply with any of the above provisions within ninety (90) days of written notification of default shall give District and USG authority to have said default cured and remediated, and Watermaster agrees to pay District and USG all direct and indirect costs of said default.

(f) The Parties' rights and obligations under this Section 9 shall survive the termination of this Entry Agreement and continue in effect until all claims against District, Watermaster and USG related to this Entry Agreement are absolutely barred by the applicable statutes of limitation.

9. Defined Terms.

For purposes of this Entry Agreement, the following capitalized terms shall be defined as follows:

(a) Applicable Authorities: The Court administering the Stipulated Judgment, County of San Diego and any other applicable federal, state, regional or local governmental or quasi-governmental agency, body or authority having jurisdiction over the Property, the Meter Program, or the GWMP.

(b) Applicable Legal Requirements: Environmental Laws (as defined below), Stipulated Judgment, and any other statutes, ordinances, rules, codes, requirements, Agreements, regulations, standards (including any standards or requirements now or hereafter applicable to residential use or development of the Property), judgments, orders, writs, injunctions or decrees or the like, of Applicable Authorities.

(c) Environmental Laws: Any federal, state, regional or local statute, regulation, ordinance, rules, codes, requirements, Agreements, standards or requirements (including any standards or requirements now or hereafter applicable to residential use or development of the Property), judgments, regulations, orders, writs, injunctions or decrees or the like, relating to environmental conditions on, under or about the Property that could affect use or development of the Property for residential purposes, including, without limitation, soil and groundwater conditions underlying the Property, and environmental conditions pertaining to wetlands, waters of the United States, waters of the State of California, and listed state- or federally-, threatened or endangered species.

(d) Hazardous Materials: Any materials or substances (a) defined as a "hazardous waste," "extremely hazardous waste" or "restricted hazardous waste" under Sections 25115, 25117 or 25122.7, or listed pursuant to Section 25140 of the California Health and Safety Code; (b) defined as a "hazardous substance" under Section 26316 of the California Health and Safety Code; (c) defined as a "hazardous material," "hazardous substance" or "hazardous waste" under Section 25501 of the California Health and Safety Code, or under Section 25281 of the California Health and Safety Code; (d) petroleum or any other hydrocarbonic substance or by-product; (e) asbestos, PCBs, and other substances regulated under the Toxic Substances Control Act, 15 U.S.C. § 2601 et seq.; (f) polychlorinated biphenyls; (g) listed under Article 9 or defined as "hazardous" or "extremely hazardous" pursuant to Article 11 of Title 22 of the California Administrative Code; (h) designated as a "hazardous substance" pursuant to the Clean Water Act (33 U.S.C. § 1251 et seq.); (i) defined as a hazardous substance" pursuant to Section 101 of the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. § 6901 et seq.); (j) listed by the State of California as a chemical known by the State to cause cancer or reproductive toxicity pursuant to Section 25249.8(a) of the California Health and Safety Code; or (k) found to be a pollutant, contaminant, toxic or hazardous waste or toxic or hazardous substance by any Applicable Authorities or in any reported decision of a federal or state court, or which may give rise to liability under any federal or state common law theory based on negligence, trespass, intentional tort, nuisance or strict liability or under any reported decisions of a state or federal court.

10. Successors and Assigns.

Watermaster shall not assign any of its rights under this Entry Agreement without the prior written consent of District, which consent may be withheld for any reason or for no reason. Any assignment by Watermaster of this Entry Agreement shall not release Watermaster

from its obligations under this Entry Agreement without an express release executed by District.

11. Authorized Signatories.

The individuals executing this Entry Agreement represent and warrant that they are authorized to execute this Agreement entry on behalf of the Party for whom each individual purports to sign and that when executed and delivered to the Parties, this Agreement shall be a valid and binding obligation of the Parties.

12. No Business or Agency Relationship.

District and Watermaster acknowledge and agree that (i) nothing contained in this Entry Agreement shall be construed to constitute the Parties as participants in a joint or common undertaking, (ii) nothing contained in this Entry Agreement shall create any agency relationship between District and Watermaster, and (iii) no Party shall have any right or authority to act on behalf of the other Party.

13. No Third Party Beneficiary.

This Entry Agreement is not intended for the benefit of any third party, except USG, and shall not be enforceable by any party who is not a Party, except USG.

14. Counterparts.

This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same Entry Agreement.

15. Waiver of Covenants and Conditions; No Waiver of Claims.

No covenant, condition, right or remedy under this Entry Agreement shall be waived unless the waiver is in writing and signed by the Party claimed to have made the waiver. One waiver shall not be interpreted as a continuing waiver. The waiver by one Party of the performance of any covenant or condition under this Entry Agreement shall not invalidate this Entry Agreement nor shall it be considered a waiver by it of any other covenant or condition under this Entry Agreement. By entering into this Entry Agreement, District does not waive any legal rights with respect to potential claims or causes of action Watermaster has (or may have in the future) against Watermaster or against any other person or entity not a Party to this Entry Agreement and all such claims are expressly reserved.

16. Governing Law.

The interpretation and enforcement of this Entry Agreement shall be governed by the laws of the State of California. This Entry Agreement shall be interpreted to give effect to its fair meaning and shall be construed as though it was prepared by both Parties. This Entry Agreement contains the entire agreement of the Parties with respect to Watermaster's entry on and investigation of the Property, and all prior negotiations, documents, and discussions regarding the Watermaster's entry and Activities herein are superseded by this Entry Agreement. Section

headings in this Entry Agreement are for convenience only and shall not be used in interpreting its provisions.

17. Venue.

Any controversy or claim arising out of or relating to this Entry Agreement, or the breach thereof, shall be brought in the County of San Diego.

18. Attorney's Fees.

In the event any Party to this Entry Agreement initiates proceedings to enforce the terms of this Agreement, the Party not substantially prevailing in such proceedings shall pay to the substantially prevailing Party all attorneys' fees incurred by the substantially prevailing Party, together with all costs of such proceeding.

19. Severability.

In the event that any provision of this Entry Agreement is deemed unenforceable, the remaining provisions shall remain in full force and effect. In the event any provision of this Entry Agreement is so held invalid, the Parties shall promptly renegotiate in good faith new provisions to restore this Entry Agreement as nearly as possible to its original intent and effect.

20. Notice.

Unless otherwise specified herein, all notices or other communications between the Parties required or permitted hereunder shall be in writing and personally delivered, or sent by certified United States mail, postage prepaid, return receipt requested, or sent via overnight air courier (example, Federal Express) to the following addresses:

If to Borrego Water District, to:	Borrego Water District 806 Palm Canyon Drive Borrego Springs, CA 92004 Phone: 760-767-5806 Fax: 760-767-5994 E-mail: geoff@borregowd.org
With a copy to:	Best Best & Krieger General Counsel to Borrego Water District 3390 University Avenue Riverside, CA 92501 Phone: (951) 686-1450 Email: Steve.Anderson@bbklaw.com
If to Watermaster, to:	Samantha Adams, Executive Director c/o West Yost Associates 23692 Birtcher Drive Lake Forest, CA 9263 Phone: 949-600-7527

Fax: 949-420-4040
E-mail: sadams@westyost.com

With a copy to:

James Markman, Legal Counsel
Richards Watson & Gershon
1 Civic Center Circle
PO Box 1059
Brea, CA 92822-1059
Phone: 714-990-0901
E-mail: jmarkman@rwglaw.com

A notice shall be effective on the date of personal delivery if personally delivered, the next business day after deposit with the overnight air courier, or two (2) business days following the date the notice is postmarked, if mailed via certified mail as set forth above. Either Party may change the address to which notice is to be given to it by giving notice of such change of address in the manner set forth above for giving notice.

21. Watermaster Acceptance.

Watermaster shall indicate its acceptance of the terms and conditions of the permission granted under this Entry Agreement by signing in the space provided below and returning the original executed copy of this Entry Agreement to the District.

IN WITNESS WHEREOF, the Parties have caused this Entry Agreement to be executed as of the latest day and year written below.

WATERMASTER

Dated: _____

_____

By: _____

Its: _____

BORREGO WATER DISTRICT

Dated: _____

_____

By: _____

Its: _____

EXHIBIT A

EASEMENT DEED

[Attached]

Recording Requested by:
CHICAGO TITLE COMPANY
COMMERCIAL DIVISION

DOC# 2024-0173600

Jul 09, 2024 03:16 PM
OFFICIAL RECORDS
JORDAN Z. MARKS,
SAN DIEGO COUNTY RECORDER
FEES: $0.00 (SB2 Atkins: $0.00)
PCOR: N/A
PAGES: 14

RECORDING REQUESTED BY &
WHEN RECORDED RETURN TO:

Borrego Water District
806 Palm Canyon Drive
Borrego Springs, CA 92004
Attn: General Manager

Exempt from recording fee
(Govt. Code § 27383)

Space above line for Recorder's use

GRANT OF PERMANENT NON-EXCLUSIVE ACCESS AND WELL EASEMENT

THIS GRANT OF PERMANENT NON-EXCLUSIVE ACCESS AND WELL EASEMENT ("Easement") is executed as of this 9 day of July, 2024, by UNITED STATES GYPSUM COMPANY, a Delaware corporation ("Grantor") to BORREGO WATER DISTRICT, a special district organized and existing under Division 13 of the Water Code of the State of California ("Grantee" or "District") and is made with reference to the following facts:

RECITALS

A. Grantor is the owner of approximately 10 acres of real property located in the County of San Diego, California, (the "Burdened Property"), more particularly described in the legal description attached as Exhibit A.

B. District desires to obtain, and Grantor has agreed to grant, a non-exclusive permanent easement from Grantor over the Burdened Property to provide District with the right to convert, operate, maintain, and/or repair a monitoring well (the "Well") on a portion of the Burdened Property.

C. Accordingly, Grantor now grants to District a non-exclusive permanent easement over the Burdened Property according to the terms and conditions of this Easement.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Grantor hereby creates the Easement rights described below:

Exempt from fee per GC 27388.1 (a) (2); recorded concurrently in connection with a transfer subject to the imposition of documentary transfer tax

146912

1. Effect of Recitals. The Recitals are incorporated and made a part of this Easement as if fully stated herein.

2. Grant of Access Easement. Grantor hereby grants in favor of Grantee a permanent, non-exclusive access easement (the "Access Easement") for ingress and egress through the Burdened Property over any roads, driveways, or trails leading to the Well Easement Area (as defined below) whether now existing or installed by Grantor in the future; provided, however, that Grantor will ensure that there is always at least one road way available for such access, and will coordinate with Grantee to allow for an independent locking device or another security feature to allow passage through gates, if any (the "Access Easement Area"). The Access Easement is granted for the purpose of ingress and egress by Grantee and its guests and invitees over the Access Easement Area to access the Well Easement Area.

3. Grant of Well Easement. Grantor hereby grants in favor of Grantee a permanent, non-exclusive easement (the "Well Easement") for the purpose of converting, operating, maintaining, and/or repairing a monitoring well (the "Well") in the location more particularly described on Exhibit B attached hereto (the "Well Easement Area"). The Access Easement and the Well Easement are collectively referred to as the "Easement" herein, and the Access Easement Area and the Well Easement Area are collectively referred to as the "Easement Area" herein.

4. Temporary Construction Easement. In connection with Grantee's conversion of the Well, Grantor hereby grants to Grantee a temporary construction easement (the "Temporary Construction Easement") to go upon that portion of Burdened Property to convert and refurbish the Well, in the Well Easement Area. All construction work pursuant to the Temporary Construction Easement shall be in accordance with applicable laws. Grantee shall, to the extent reasonably practicable, restore the Burdened Property to the condition in which it existed prior to such access pursuant to this Temporary Construction Easement. The Temporary Construction Easement shall automatically terminate and be of no further force or effect upon the first to occur of: (a) completion of the conversion and refurbishment of the Well within the Well Easement Area; or (b) twenty-four (24) months following the date of recordation of this Easement.

5. Maintenance and Repair. Grantee has the right, but not the obligation, to maintain and repair the Easement Area as defined in Section 3 above. Except as expressly set forth herein, in no event shall Grantee construct or place any permanent obstructions or structures within the Easement Area without Grantor's prior written consent.

6. Relocation of Well Easement Area. Grantor hereby reserves the right to relocate the Well and the Well Easement Area to another location on the Burdened Property or Grantor's adjacent Property, provided Grantor pays all costs and expenses associated with such relocation of the Well and the Well Easement Area.

7. Covenants Running with the Land. The Easement (a) constitutes covenants running with the land pursuant to California Civil Code section 1468 burdening the Burdened Property; (b) is appurtenant to and shall not be conveyed or otherwise transferred separately from

the Burdened Property; and (c) shall bind and inure to the benefit of the respective heirs, personal representatives, successors and assigns of Grantor and Grantee.

8. Indemnification. Grantee shall indemnify, defend and hold Grantor harmless from any and all losses, claims, causes of action, liabilities and/or damages (collectively, "Claims") to the extent arising out of or due to Grantee's exercise of its rights under this Easement and/or the negligence or willful misconduct of Grantee or its employees, agents, contractors or invitees, except to the extent of the negligence or willful misconduct of Grantor or Grantor's employees, agents, contractor, or invitees. Grantor shall indemnify, defend and hold Grantee harmless from any and all Claims to the extent arising out of or due to the negligence or willful misconduct of Grantor or its employees, agents, contractors or invitees within the Easement, except to the extent of the negligence or willful misconduct of Grantee or Grantee's employees, agents, contractors or invitees.

9. Insurance. Grantor and Grantee shall each maintain commercial general liability insurance covering all use of the Easement, the Temporary Construction Easement, Temporary Construction Easement Area, and the Easement Area hereunder, in commercially reasonable amounts and coverages, and naming the other party hereunder as an additional insured.

10. Attorneys' Fees. In the event of any controversy, claim, or dispute arising out of or relating to this Easement or the alleged breach thereof, the party prevailing in such action shall be entitled, in addition to such other relief as may be granted, to a reasonable sum as its attorneys' fees and costs.

11. Notices. As used in this Easement, notice includes but is not limited to, the communication of any notice, request, demand, approval, statement, report, acceptance, consent, waiver and appointment. All notices must be in writing. Notice is given either when delivered in person to the person or company intended named below, or when delivered if sent via U.S. Mail as first class, registered or certified mail, return receipt requested, with postage prepaid, or by reputable overnight courier (such as Federal Express), addressed by name and sent to all of the addresses for the party or persons intended, as follows:

To Grantor: United States Gypsum Company
550 West Adams Street
Chicago, IL 60661
Attn: Iryna Sladkevych
Real Estate Department #179

With copy to: United States Gypsum Company
550 West Adams Street
Chicago, IL 60661
Attn: Jennifer Adams, Esq.
Legal Department #149

And copy to: Saul Ewing LLP
1888 Century Park East, Suite 1500
Los Angeles, CA 90067
Attn: Damon M. Juha

To Grantee: Borrego Water District
806 Palm Canyon Drive
Borrego Springs, CA 92004
Attn: General Manager

With copy to: Best Best & Krieger LLP
P.O. Box 1028
Riverside, CA 92502
Attn: Borrego Water District General Counsel

And copy to: Best Best & Krieger LLP
3390 University Avenue, 5th Floor
Riverside, CA 92501
Attn: Borrego Water District General Counsel

The addresses will remain valid until such time as a party gives notice of the change of address in accordance with the terms of this section.

12. Assignment. Grantee shall have the right to assign all rights and liabilities under this Easement to any third party or governmental agency, provided that such assignee shall assume in writing all obligations and liabilities of Grantee under this Easement in a written instrument, only after the prior written consent of the Grantor, which consent shall not be unreasonably withheld; provided, however, that if Grantor fails to respond to any request for consent of such written instrument within thirty (30) days after Grantee sends a second notice of the written instrument to Grantor pursuant to Section 11, above, the written instrument will be deemed approved.

13. No Public Dedication. This Easement shall not be deemed to constitute a gift or dedication of any portion of the Burdened Property to the general public or for any public use or purpose whatsoever. Nothing expressed or implied in this Easement shall confer upon any person, other than Grantor and the Grantee, their successors and assigns, any rights or remedies under or by reason of this Easement.

[*Remainder of this page left blank. Signatures on next page.*]

IN THE WITNESS THEREOF, the Parties have caused this Easement to be executed by their duly-authorized representatives on the date and year set forth above.

GRANTEE:

BORREGO WATER DISTRICT,
a special district organized and existing under Division 13 of the Water Code of the State of California

By: _____
Kathy Dice, President

[*Signatures continue on following page*]

GRANTOR:

UNITED STATES GYPSUM COMPANY,
a Delaware corporation

By: _____

* Name: Luis Carrazco
Title: Authorized Signatory

*aka Jose Luis Carrazco

GRANTEE ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)
COUNTY OF San Diego)

On July 3, 2024, before me, Esmeralda Lopez-Garcia, a Notary Public, _____ personally _____ appeared Kathy Dice, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

ESMERALDA LOPEZ-GARCIA
Notary Public - California
San Diego County
Commission # 2471969
My Comm. Expires Nov 15, 2027

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal:

Signature _____

GRANTOR ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)
COUNTY OF Imperial)

On 07/02/24, before me, Dania Piceno a Notary Public, _____ personally _____ appeared Jose Luis Carrazco, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal:

Signature _____

DANIA PICENO
COMM.# 2474896
NOTARY PUBLIC - CALIFORNIA
IMPERIAL COUNTY
My Comm. Expires Dec. 3, 2027

52519761.2
722694-00946

EXHIBIT "A"

LEGAL DESCRIPTION OF THE BURDENED PROPERTY

LAND REFERRED TO HEREIN BELOW IS SITUATED IN SAN DIEGO, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL 1:

SOUTHEAST QUARTER OF SECTION 4, TOWNSHIP 10 SOUTH, RANGE 6 EAST, SAN BERNARDINO BASE AND MERIDIAN, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, DESCRIBED AS FOLLOWS:

EXCEPT THEREFROM THAT PORTION OF THE SOUTHEAST QUARTER OF SECTION 4, TOWNSHIP 10 SOUTH, RANGE 6 EAST, SAN BERNARDINO BASE AND MERIDIAN, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID SOUTHEAST QUARTER; THENCE, SOUTH 89° 48' 03" EAST, ALONG THE NORTH LINE OF SAID SOUTHEAST QUARTER, A DISTANCE OF 2645.33 FEET, TO THE NORTHEAST CORNER OF SAID SOUTHEAST QUARTER; THENCE, SOUTH 00° 13' 30" WEST, ALONG THE EAST LINE OF SAID SOUTHEAST QUARTER, A DISTANCE OF 698.38 FEET, TO AN INTERSECTION WITH A LINE, DISTANT 698.38 FEET, SOUTHERLY OF AND PARALLEL WITH SAID NORTH LINE; THENCE, NORTH 89° 48' 03" WEST, ALONG SAID PARALLEL LINE, A DISTANCE OF 1402.25 FEET, TO AN INTERSECTION WITH A LINE, DISTANT 80.00 FEET, WESTERLY OF AND PARALLEL WITH THE NORTH/SOUTH CENTERLINE OF SAID SOUTHEAST QUARTER; THENCE, SOUTH 00° 11' 28" WEST, ALONG SAID PARALLEL LINE, A DISTANCE OF 703.79 FEET, TO AN INTERSECTION WITH A LINE, DISTANT 86.00 FEET, SOUTHERLY OF AND PARALLEL WITH THE EAST/WEST CENTERLINE OF SAID SOUTHEAST QUARTER; THENCE, NORTH 89° 53' 25" WEST, ALONG SAID PARALLEL LINE, A DISTANCE OF 1241.84 FEET, TO AN INTERSECTION WITH WEST LINE OF SAID SOUTHEAST QUARTER; THENCE, NORTH 00° 09' 27" EAST, ALONG SAID WEST LINE, A DISTANCE OF 1404.11 FEET, TO THE POINT OF BEGINNING.

ALSO EXCEPT THEREFROM THAT PORTION OF THE SOUTHEAST QUARTER OF SECTION 4, TOWNSHIP 10 SOUTH, RANGE 6 EAST, SAN BERNARDINO BASE AND MERIDIAN, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 4; THENCE. NORTH 00° 13' 30" EAST, ALONG THE EAST LINE OF SAID SECTION 4, A DISTANCE OF 1929.58 FEET, TO AN INTERSECTION WITH A LINE, DISTANT 698.38 FEET, SOUTHERLY OF AND PARALLEL WITH THE NORTH LINE OF SAID SOUTHEAST QUARTER; THENCE. NORTH 89° 48' 03" WEST, ALONG SAID PARALLEL LINE, A DISTANCE OF 1402.25 FEET, TO AN INTERSECTION WITH A LINE, DISTANT 80.00 FEET, WESTERLY OF AND PARALLEL WITH THE NORTH/SOUTH CENTERLINE OF SAID SOUTHEAST QUARTER; THENCE, SOUTH 00° 11' 28" WEST, ALONG SAID PARALLEL LINE, A DISTANCE OF 703.79 FEET, TO AN INTERSECTION WITH A LINE, DISTANT 86.00 FEET, SOUTHERLY OF AND PARALLEL WITH THE EAST/WEST CENTERLINE OF SAID SOUTHEAST QUARTER; THENCE. NORTH 89° 53' 25" WEST, ALONG SAID PARALLEL LINE, A DISTANCE OF 897.10 FEET, TO AN INTERSECTION WITH A LINE, DISTANT 344.74 FEET, EASTERLY OF AND PARALLEL WITH THE WEST LINE OF SAID SOUTHEAST QUARTER; THENCE, SOUTH 00° 09' 27"' WEST, ALONG SAID PARALLEL LINE, A DISTANCE OF 1231.57 FEET, TO AN INTERSECTION WITH THE SOUTH LINE OF SAID SECTION 4; THENCE, SOUTH 89° 58' 48" EAST, ALONG SAID SOUTH LINE, A DISTANCE OF 2297.49 FEET, TO THE POINT OF BEGINNING.

PARCEL 2:

AN EASEMENT AND RIGHT OF WAY FOR INGRESS AND EGRESS, OVER, UNDER, ALONG AND ACROSS THE SOUTHERLY 30.00 FEET OF THE SOUTHWEST QUARTER OF SECTION 4, TOWNSHIP 10 SOUTH, RANGE 6 EAST, SAN BERNARDINO BASE AND MERIDIAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF.

APN: **140-030-10-00**

EXHIBIT "B"

LEGAL DESCRIPTION AND DEPICTION OF THE EASEMENT AREA

All that certain real property situated in the County of San Diego, State of California, described as follows:

MONITOR WELL EASEMENT AREA (E3) MEASURING APPROXIMATELY 30 FEET X 60 FEET

BEING A PORTION OF SOUTHWEST ONE QUARTER OF THE SOUTHEAST ONE QUARTER OF SECTION 4, TOWNSHIP 10 SOUTH, RANGE 6 EAST, SAN BERNARDINO BASE AND MERIDIAN, UNINCORPORATED AREA OF SAN DIEGO COUNTY, STATE OF CALIFORNIA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SOUTHWEST ONE QUARTER OF THE SOUTHEAST ONE QUARTER OF SAID SECTION 4;

THENCE, N89°53'25"W ALONG THE NORTHERLY LINE OF SAID SOUTHWEST ONE QUARTER, A DISTANCE OF 79.99 FEET TO AN ANGLE POINT;

THENCE, S 00°11'28" W, 86.00 FEET TO A POINT ON A LINE THAT IS PARALLEL AND OFFSET 86 FEET SOUTHERLY OF THE NORTHERLY LINE OF SAID SOUTHWEST ONE QUARTER;

THENCE ALONG SAID PARALLEL LINE, N 89°53'25" W, A DISTANCE OF 1,241.84 FEET TO A POINT ON THE WESTERLY LINE OF SAID SOUTHWEST ONE QUARTER;

THENCE ALONG SAID WESTERLY LINE, S 00°09'27" W, A DISTANCE OF 1,172.11 FEET TO THE **POINT OF BEGINNING**;

THENCE LEAVING SAID WESTERLY LINE, S 89°58'48" E, 60.00 FEET TO AN ANGLE POINT;

THENCE, S 00°09'27" W, 30.00 FEET TO AN ANGLE POINT; THENCE, N 89°58'48" W, 60.00 FEET TO AN ANGLE POINT;

THENCE, N 00°09'27" E, 30.00 FEET TO THE **POINT OF BEGINNING**.

SUBJECT PROPERTY CONTAINS 1,800 SQUARE FEET OR 0.0413 ACRE, MORE OR LESS, AND SUBJECT TO ANY EASEMENTS OR RIGHTS-OF-WAYS OF RECORD, AS DEPICTED AS "E3" ON THE MAP BELOW:

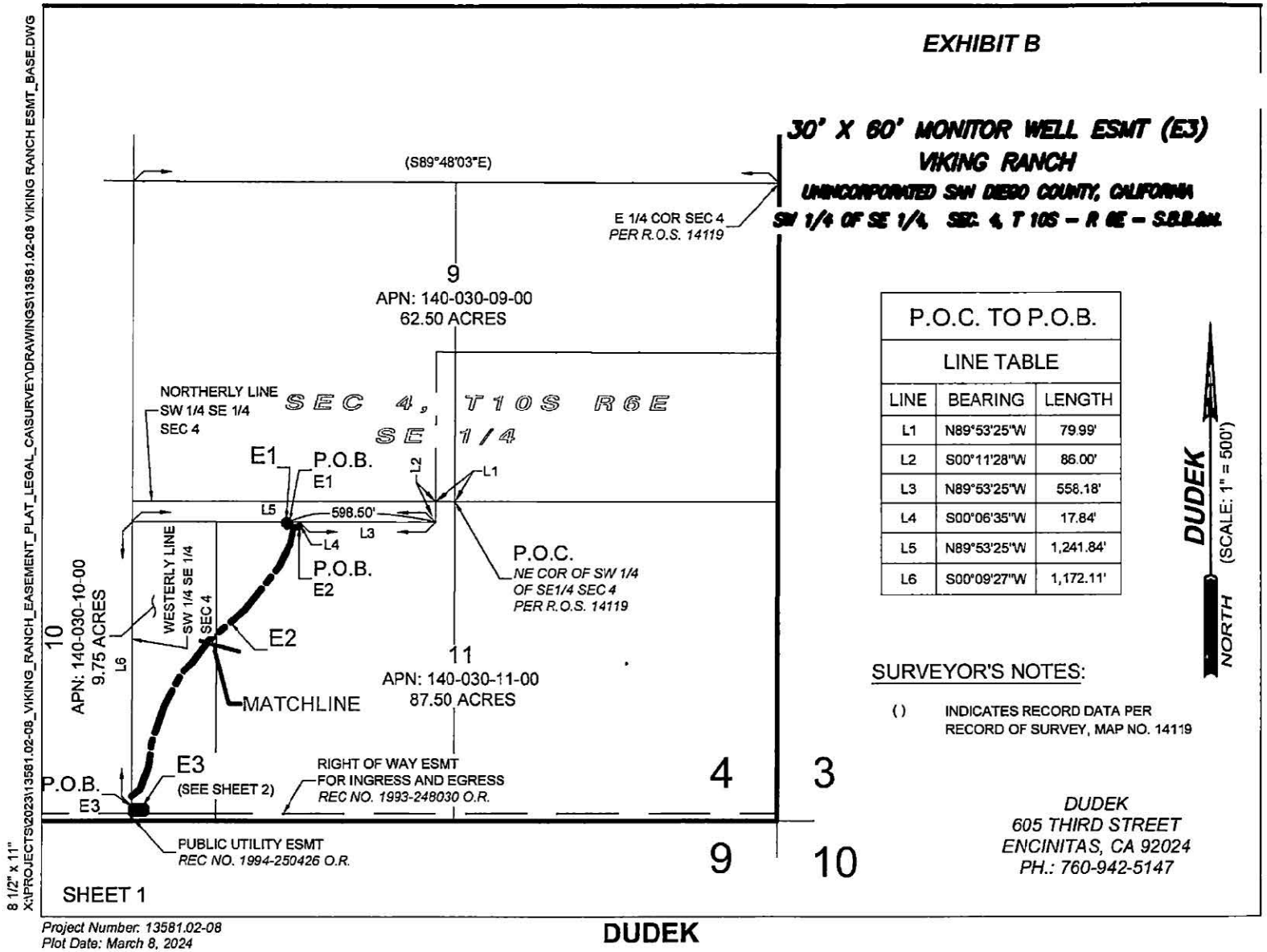

Exhibit "B"

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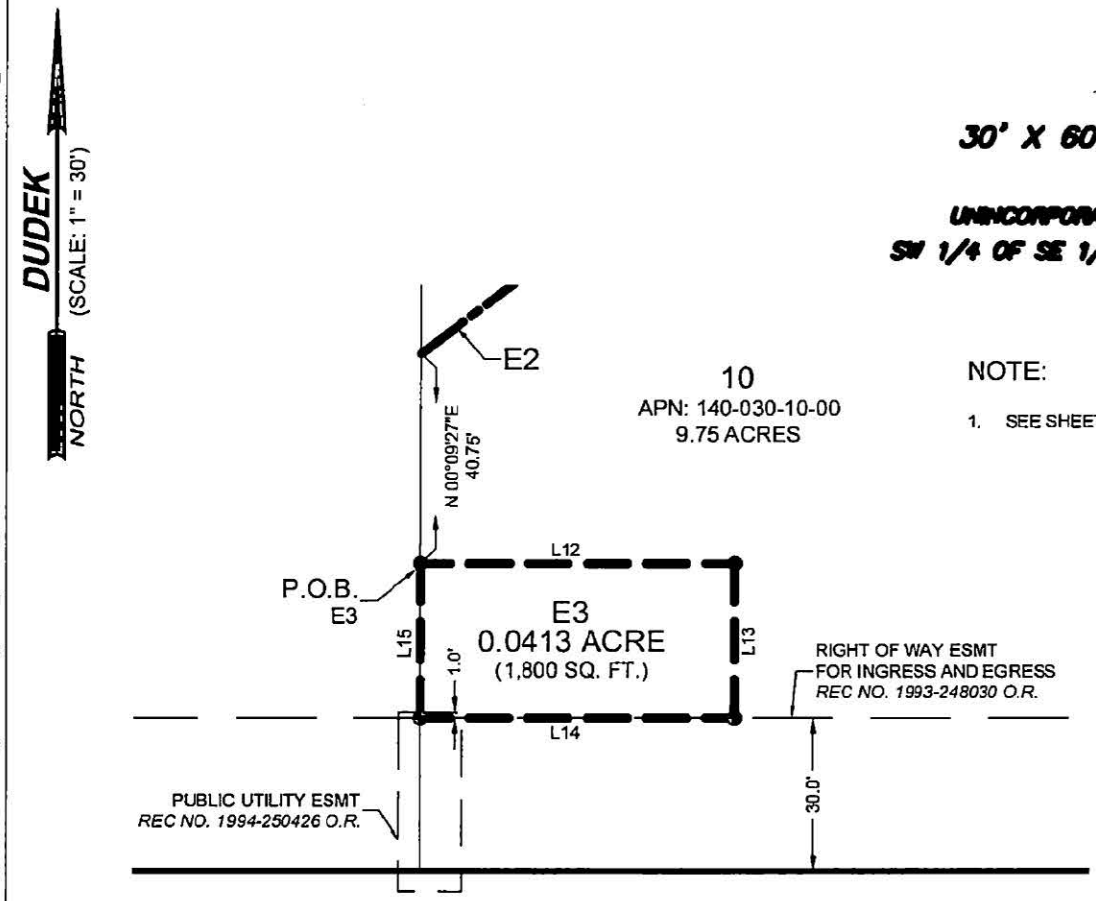
8 1/2" x 11"
X:\PROJECTS\2023\13581.02-08_VIKING_RANCH_EASEMENT_PLAT_LEGAL_CA\SURVEY\DRAWINGS\13581.02-08 VIKING RANCH ESMT_BASE.DWG

EXHIBIT B

30' X 60' MONITOR WELL ESMT (E3)
VIKING RANCH
UNINCORPORATED SAN DIEGO COUNTY, CALIFORNIA
SW 1/4 OF SE 1/4, SEC. 4, T 10S – R 0E – S.B.B.&M.



NOTE:

1. SEE SHEET 1 FOR P.O.C.TO P.O.B. LINE TABLE.

E3 30' X 60' MONITOR WELL EASEMENT		
LINE TABLE		
LINE	BEARING	LENGTH
L12	S89°58'48"E	60.00'
L13	S00°09'27"W	30.00'
L14	N89°58'48"W	60.00'
L15	N00°09'27"E	30.00'

DUDEK
605 THIRD STREET
ENCINITAS, CA 92024
PH.: 760-942-5147

SHEET 2

Project Number: 13581.02-08
Plot Date: March 8, 2024

DUDEK

Exhibit "B"

722694-00946

CERTIFICATE OF ACCEPTANCE

This is to certify that the interest in real property conveyed by United States Gypsum Company, a Delaware corporation, on the Grant of Permanent Non-Exclusive Access and Well Easement dated July 3rd, 2024, to Borrego Water District, a special district organized and existing under Division 13 of the Water Code of the State of California ("Grantee"), is hereby accepted by the undersigned officer on behalf of the Grantee, pursuant to authority conferred by the Board of Directors, and Grantee consents to recordation thereof by its duly authorized officer.

GRANTEE:

Date: July 3, 2024

BORREGO WATER DISTRICT, a special district organized and existing under Division 13 of the Water Code of the State of California

By: _____
Kathy Dice, President

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Borrego Springs Watermaster
Board of Directors Meeting
December 5, 2024
AGENDA ITEM IV.C

To: Board of Directors

From: Andy Malone, Technical Consultant

Date: December 2, 2024

Subject: Scope of Work to Redetermine the 2030 Sustainable Yield

☐ **Recommended Action**	✓ **Provide Direction to Staff**	✓ **Information and Discussion**
☐ **Fiscal Impact**	☐ **Cost Estimate: $**	

Recommended Action

Board discussion.

Fiscal Impact: The total cost is dependent on the work ultimately approved by the Board.

Background and Previously Related Actions by the Board

Section III.F of the Judgment outlines the process and schedule for redetermining the Sustainable Yield every five years. The Sustainable Yield is to be redetermined through the Technical Advisory Committee (TAC) processes and be based on best available science, including the use of the Borrego Valley Hydrologic Model (BVHM) and consideration of all sources of Basin replenishment and outflow. In tandem with each redetermination, a future scope of work and budget must also be prepared for the technical work to redetermine the Sustainable Yield over the subsequent five-year period.

Presently, the Watermaster, with TAC input, must develop a scope of work and budget-level estimates for the next four years (water years [WYs] 2026-29) to redetermine the 2030 Sustainable Yield by January 1, 2030.

Work Completed to Date

At its October 10, 2024 meeting, the TAC discussed potential tasks to consider in a potential scope of work to redetermine the 2030 Sustainable Yield. Following the meeting, West Yost prepared a technical memorandum (TM) presenting the various scope of work options for WY 2026-2029, including initial budget-level cost estimates. The TAC was asked to review and provide comment on the potential tasks. Initial feedback from the TAC identified there was hesitation in recommending additional/optional tasks because the results of tasks are unknown and there is uncertainty whether model updates and recalibration would be necessary or not.

West Yost considered the TAC comments and revised its presentation of the scope of work options to describe a "workflow" for performing the additional/optional tasks. The workflow concept makes it clear that there are logical steps with "off-ramps" that allow the TAC/Board to recommend whether or not the next step in the workflow needs to be performed. At its November 19, 2024 meeting, the TAC discussed the workflow concept. Based on TAC feedback, West Yost updated the TM distributed it to the TAC for review and recommendations for specific workflow tasks. The TM is attached (Attachment A).

Scope of Work Options and Workflow for Additional/Optional Tasks

The revised Scope for Work options for the 2030 Sustainable Yield now include:

1. **Minimum Required Scope-of-Work.** This is the minimum scope-of-work required to redetermine the 2030 Sustainable Yield and represents the lowest cost option. The budget-level estimate, given what we know today, is about $100,000. The minimum scope does not include efforts to incorporate other new information/data that could be used to further validate the BVHM and/or improve its ability to simulate the hydrology of the Basin. Therefore, executing this task alone may not be applying "best available science" for the redetermination of the 2030 Sustainable Yield.
2. **Additional/Optional Tasks.** These are additional/optional tasks to redetermine the 2030 Sustainable Yield and *could* be implemented to further validate the BVHM and/or improve its ability to simulate the hydrology of the Basin. The additional/optional tasks are focused on reviewing/evaluating new data and information and include:
    - **Task 1. Airborne Electromagnetic Survey (AEM) Results** will be reviewed to determine if updates should be made to the hydrogeological conceptual model (HCM) to improve the structure and aquifer properties assigned in the BVHM.
    - **Task 2. Groundwater Dependent Ecosystem (GDE) Study Results** will be reviewed to determine if improvements should be made to the BVHM to improve its ability to simulate the evapotranspiration of shallow groundwater.
    - **Task 3. Monitoring Program Data (groundwater-levels and metered pumping)** will be analyzed to determine if improvements should be made to the BVHM to improve its ability to estimate pumping and/or simulate groundwater levels.
    - **Task 4. Estimates of Natural Inflows**, specifically those estimated by the Basin Characterization Model (BCM), will be investigated to determine if a reproducible method of estimating natural inflows can be developed and used as input data to the BVHM.
    - **Task 5. Other Model Platforms** will be evaluated to determine if the current model platform should be upgraded.

    Following selection of one or more of these additional/optional tasks, a workflow would be implemented containing up to five steps. The workflow is shown graphically in Figure 1 of Attachment A and is summarized below.

- Step 1. Review New Data and Compare to the BVHM
  Note: The results of Step 1 will be used to determine (i) if the model should be updated (proceed to Step 2) or (ii) that no updates are needed and the BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5).
- Step 2. Develop Methods
- Step 3. Update and Validate the BVHM
  Note: The results of Step 3 will be used to determine: (i) if the model needs to be recalibrated (proceed to Step 4) or (ii) that model recalibration is not needed and the BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5).
- Step 4. Recalibrate the BVHM
- Step 5. Redetermine the 2030 Sustainable Yield

At a minimum, the workflow would include performing Steps 1 and 5. The need to perform steps 2 through 4 is dependent on the outcome of the prior step (*e.g.,* Steps 2 and 3 are depending on the results of Step 1; Step 4 is dependent on the results of Step 3).

For each potential task, the TM describes a problem statement (*e.g.,* why the task would be beneficial), a brief task description (including each step of the workflow for the additional/optional tasks), and the consequence of not completing the task. The TM also includes Table 1, which is a high-level cost estimate for each option and step of the Workflow (Steps 1-5) for the additional/optional tasks. Except for Step 1, all other steps are dependent on the results from prior steps. As such, the cost of Step 1 is considered the most certain, since this is the only step that will be performed in the first two years of the scope (WY 2026 and 2027).

A summary of the cost estimates to address each additional/optional task that could be included in Step 1 is presented below.

Additional/Optional Tasks	**Cost Estimate for Step 1 in WY 2026-27**
AEM Results	$55,000
GDE Study Results	$40,000
Monitoring Program Data	$55,000
Estimates of Natural Inflows	$50,000
Other Model Platforms	$60,000
AEM Results	$55,000

The total costs to perform Steps 1 through 5 of the Workflow could range from $140,000 to $720,000 depending on how many optional tasks are selected and the results of the work performed for those tasks.

The TAC was asked to provide written recommendations on the potential scope of work by Monday, December 2, 2024.

Next Steps

At the Board meeting, West Yost will summarize options for the scope of work and summarize the written input received by the TAC.

The next steps to approve a Scope of Work to Redetermine the 2030 Sustainable Yield are:

- **December 4, 2024:** Prepare and distribute a *draft* TAC Recommendation Report to the TAC for review and comment.
- **December 5, 2024:** Board meeting to discuss and receive input on the potential tasks to include in the scope of work and the TAC feedback received.
- **December 9, 2024** – TAC meeting to discuss *draft* TAC Recommendation Report and Board comments on the potential scope of work. The TAC may decide to revise the TAC Recommendation Report based on discussion and feedback from the December 5th Board meeting.
- **December 10, 2024** – Deadline for additional TAC comments on the *draft* TAC Recommendation Report.
- **December 12, 2024** - *Final* TAC and Technical Consultant Recommendation Reports published for Board review.
- **December 19, 2024** – Board meeting to consider approval of the Scope of Work to Redetermine the 2030 Sustainable Yield.

Enclosures

Attachment A. Draft Scope of Work to Redetermine the 2030 Sustainable Yield

TECHNICAL MEMORANDUM

DATE: November 25, 2024

TO: Technical Advisory Committee
Borrego Springs Watermaster

FROM: West Yost Associates
Watermaster Technical Consultant

SUBJECT: **Potential Scope-of-Work to Redetermine the 2030 Sustainable Yield – *Water Years 2026 - 2029***

BACKGROUND AND OBJECTIVES

Section III.F of the Judgment outlines the process and schedule for redetermining the Sustainable Yield of the Borrego Springs Basin (Basin) every five years. The Sustainable Yield is to be redetermined through the Technical Advisory Committee (TAC) processes and be based on best available science, including the use of the Borrego Valley Hydrologic Model (BVHM) and consideration of all sources of Basin replenishment and outflow. In tandem with each redetermination, a future scope of work and budget must also be prepared for the technical work to redetermine the Sustainable Yield over the subsequent five-year period through a process that includes: collecting additional data, refining the BVHM, and using model runs to update the Sustainable Yield.

Presently, the Borrego Springs Watermaster (Watermaster), with TAC input, is developing a scope of work and budget to implement over the next four years (water years [WYs] 2026-29) to establish the 2030 Sustainable Yield by January 1, 2030. The TAC must prepare a TAC Recommendation Report to the Board that describes a recommended scope of work (including any differences in TAC member opinions), which will assist the Board in its future decision-making and budgeting processes.

The objective of this technical memorandum (TM) is to describe various tasks that the TAC could recommend for the scope of work to redetermine the 2030 Sustainable Yield. After TAC review and input, a *draft* TAC Recommendation Report will be prepared for TAC review and comment. Based on TAC feedback, a *final* TAC Recommendation Report will be prepared for Board consideration in December 2024.

PREVIOUS EFFORTS

To redetermine the 2025 Sustainable Yield, the Watermaster, with TAC input, developed and implemented a scope of work[1] to improve the ability of the BVHM to estimate inflows and outflows to the Borrego Springs Subbasin (Basin). During this process, the TAC identified additional advancements and improvements that could be made to the BVHM to improve its ability to estimate: (i) the hydrology of the Basin (*e.g.,* water budget, groundwater levels, and groundwater-flow directions) and (ii) the 2030 Sustainable Yield.

[1] https://borregospringswatermaster.com/wp-content/uploads/2024/10/Scope-of-Work_Redetermine-2025-SY.pdf

The TAC met on October 16 and November 19, 2024 to discuss the potential advancements and improvements for the redetermination of the 2030 Sustainable Yield. TAC members were asked to provide written feedback on the potential tasks to include in the future scope of work. The potential tasks, inclusive of TAC feedback, are summarized below.

POTENTIAL SCOPE-OF-WORK TO REDETERMINE THE 2030 SUSTAINABLE YIELD

The potential scope of work is described below by task, including: a problem statement, the objective of the task, a description of the work to complete the task, a high-level cost estimate, an approximate schedule, and a description of the consequences of not performing each task.

Typically (but not always) each task is broken down into two main steps: (i) collect, compile and evaluate data and information to develop recommendations for next steps, and (ii) implement the next steps. This approach provides the Watermaster with the ability to: terminate the task based on the findings of the first step; develop a well-vetted scope and budget for the next steps; and apply for grant funding to implement the next steps. For these reasons, the precise scope-of-work for each task cannot be known, and hence, the cost estimates provided herein are ranges based on professional judgment and past experience.

The remainder of this memorandum includes:

1. **Minimum Required Scope-of-Work.** This section describes one option for a potential scope of work, which represents the minimum required scope of work to redetermine the 2030 Sustainable Yield, and therefore, the lowest cost option.
2. **Workflow for Additional/Optional Tasks.** This section describes a proposed workflow for various additional/optional tasks that could be executed as the scope of work.
3. **Next Steps for TAC**. This section describes the next steps for the TAC, which are to:
    a. Review this memorandum
    b. Recommend a scope-of-work. If additional/optional tasks are recommended, fill out Table 2 (attached) to identify which tasks are recommended.

Minimum Required Scope-of-Work

This task is considered the minimum effort required to redetermine the 2030 Sustainable Yield and represents the lowest cost option.

REDETERMINE 2030 SUSTAINABLE YIELD WITH NO IMPROVEMENTS TO THE BVHM

Problem Statement: The Sustainable Yield must be redetermined every five years (through the TAC process) based on best available science including BVHM runs and consideration of all sources of Basin replenishment and outflow. The Watermaster has limited resources to perform this work, so this work requires efficiency.

Objective: Redetermine the 2030 Sustainable Yield in the most efficient manner possible.

Task Description: In this task, the BVHM will be extended from WY 2022 to WY 2028 with the following data/information: metered pumping data; land use; crop type; temperature; potential evapotranspiration; precipitation; and surface water inflows. No improvements will be made to the

model. The BVHM will be run over the historical period of WY 1930 through WY 2028 to produce an annual water budget for the Basin. The 2030 Sustainable Yield will be determined using the following formula:

2030 Sustainable Yield = Long-term Natural Inflows – Short-term Natural Outflows

Cost Estimate: $75,000 - $100,000.

Schedule: This task must be completed in WY 2029.

Consequence of Not Completing the Minimum Scope: The Judgment requires this task to be performed.

Additional Considerations: The minimum scope does not include efforts to incorporate other new information/data that could be used to further validate the BVHM and/or improve its ability to simulate the hydrology of the Basin. Therefore, executing this task alone may not be applying "best available science" for the redetermination of the 2030 Sustainable Yield.

Workflow for Additional/Optional Tasks

This section describes a proposed workflow to execute various additional/optional tasks during the redetermination of the 2030 Sustainable Yield. These additional/optional tasks *could* be implemented to validate and/or improve the BVHM and its ability to estimate the water budget. The potential tasks include:

Task 1. Airborne Electromagnetic Survey (AEM) Results will be reviewed to determine if updates should be made to the hydrogeological conceptual model (HCM) to improve the structure and aquifer properties assigned in the BVHM.

Task 2. Groundwater Dependent Ecosystem (GDE) Study Results will be reviewed to determine if improvements should be made to the BVHM to improve its ability to simulate the evapotranspiration of shallow groundwater.

Task 3. Monitoring Program Data (groundwater-levels and metered pumping) will be analyzed to determine if improvements should be made to the BVHM to improve its ability to estimate pumping and/or simulate groundwater levels.

Task 4. Estimates of Natural Inflows, specifically those estimated by the Basin Characterization Model (BCM), will be investigated to determine if a reproducible method of estimating natural inflows can be developed and used as input data to the BVHM.

Task 5. Other Model Platforms will be evaluated to determine if the current model platform should be upgraded.

For each task, a workflow would be implemented containing up to five steps. These steps are sometimes interdependent; meaning that the results of one step may require performing another step. As such, the steps are presented as a workflow as illustrated graphically in Figure 1. The workflow allows each task to be performed in logical steps with "off-ramps" that allow the TAC/Board to recommend whether the next step be performed (or not). The workflow is organized as follows:

Step 1. Review New Data and Compare to the BVHM
Note: The results of Step 1 will be used to determine (i) if the model should be updated (proceed to Step 2) or (ii) that no updates are needed and the BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5).

Step 2. Develop Methods

Step 3. Update and Validate the BVHM
Note: The results of Step 3 will be used to determine: (i) if the model needs to be recalibrated (proceed to Step 4) or (ii) that model recalibration is not needed and the BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5).

Step 4. Recalibrate the BVHM

Step 5. Redetermine the 2030 Sustainable Yield

Table 1 contains a high-level cost estimate for each step (Steps 1-5) for each additional/optional task. Except for Step 1, all other steps are dependent on the performance and results from prior steps. As such, the cost of Step 1 is considered the most certain, since this is the only step that will be performed in the first two years of the scope (WY 2026 and 2027). The costs for all other tasks are high-level cost estimates that will be refined if the TAC recommends and the Board approves developing a detailed scope and cost estimate.

Each additional/optional task is described below:

Task 1. Airborne Electromagnetic Survey (AEM) Results

Problem Statement: In 2024, the DWR flew an AEM survey across the Basin to develop new information on the structure and composition of the aquifer system. The survey results may provide improved information on the hydrogeologic conceptual model (HCM) of the Basin, which could then be used to update and improve the BVHM—particularly in areas of the Basin where complex hydrogeology is not well represented in the BVHM.

Objective: Use improved understanding of Basin hydrogeology to update the BVHM and improve its ability to simulate the water budget and groundwater levels.

Task Description: If implemented, this task will follow the proposed workflow:

- *Step 1:* The AEM survey results are reviewed and compared against the current HCM of the BVHM to determine if there are significant differences and, therefore, model updates are recommended. Based on the comparison, the TAC may recommend to the Board that either (i) the differences between the AEM survey data and the current HCM are significant and methods should be developed to update the HCM (proceed to Step 2) *or,* (ii) the differences are not significant, no changes to the model are recommended, and the BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5). ***Estimated cost: $55,000***
- *Step 2:* If the results of Step 1 indicate that the HCM should be updated, then methods for updating the HCM (and associated cost estimates) are developed and recommended for Board approval through the TAC process.
- *Step 3:* The methods developed in Step 2 are implemented and the BVHM is run over the historical simulation period of 1945-2022. The model results are then compared against the model results from the 2025 Redetermination of the Sustainable Yield. Based on the comparison, the TAC may recommend to the Board that either (i) the differences are significant

and the model should be recalibrated (proceed to Step 4) *or,* (ii) the differences are not significant and the updated BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5).

- *Step 4:* If the results of Step 3 indicate the need for model recalibration, then the BVHM is extended through WY 2028 and recalibrated.
- *Step 5:* The BVHM is extended from WY 2022 to WY 2028 (if not already extended in Step 4) and run over the historical period of WY 1930 through WY 2028 to produce an annual water budget for the Basin, which is then used to redetermine the 2030 Sustainable Yield.

Consequence of Not Completing Task 1: The value and usefulness of the AEM survey results would not be analyzed and not be used to redetermine the 2030 Sustainable Yield. Not completing this task may bypass the application of "best available science."

Task 2. Groundwater Dependent Ecosystem (GDE) Study Results

Problem Statement: Currently, the BVHM simulates evapotranspiration of shallow groundwater with the FMP and reports this information as a natural outflow of groundwater. By April 2025, the results of a GDE study being performed by UCI in the Mesquite Bosque area near the Borrego Sink will be complete. The GDE study may provide new data and improved understanding of evapotranspiration of shallow groundwater that occurs in the Basin. The new data and improved understanding could potentially be used to improve the BVHM and its ability to estimate the water budget for the Basin.

Objective: Use improved understanding of GDEs in the Basin to update the BVHM and improve its ability to simulate the water budget and groundwater levels.

Task Description: If implemented, this task will follow the proposed workflow:

- *Step 1:* The GDE study results are reviewed and compared against the current BVHM to determine if there are significant differences and, therefore, model updates are recommended. Based on the comparison, the TAC may recommend to the Board that either (i) the differences between the GDE study results and the current BVHM are significant and methods should be developed to update the BVHM (proceed to Step 2) *or,* (ii) the differences are not significant, no changes to the model are recommended, and the BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5). ***Estimated cost: $40,000***
- *Step 2:* If the results of Step 1 indicate that the BVHM should be updated, then methods for updating the BVHM (and associated cost estimates) are developed and recommended for Board approval through the TAC process.
- *Step 3:* The methods developed in Step 2 are implemented and the BVHM is run over the historical simulation period of 1945-2022. The model results are then compared against the model results from the 2025 Redetermination of the Sustainable Yield. Based on the comparison, the TAC may recommend to the Board that either (i) the differences are significant and the model should be recalibrated (proceed to Step 4) *or,* (ii) the differences are not significant and the updated BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5).
- *Step 4:* If the results of Step 3 indicate the need for model recalibration, then the BVHM is extended through WY 2028 and recalibrated.

- *Step 5:* The BVHM is extended from WY 2022 to WY 2028 (if not already extended in Step 4) and run over the historical period of WY 1930 through WY 2028 to produce an annual water budget for the Basin, which is then used to redetermine the 2030 Sustainable Yield.

Cost Estimate: $40,000

Consequence of Not Completing Task 2: The value and usefulness of the GDE study results would not be analyzed and not be used to redetermine the 2030 Sustainable Yield. Not completing this task may bypass the application of "best available science."

Task 3. Monitoring Program Data (groundwater-levels and metered pumping)

Problem Statement: The Watermaster has developed and implemented groundwater monitoring programs, which include the collection of metered groundwater pumping data and measured groundwater-levels. The version of the BVHM used to estimate the 2025 Sustainable Yield used the first two years of metered pumping data from the Watermaster's metering program to improve the ability of the BVHM to simulate groundwater pumping. Additionally, groundwater-level measurements collected through 2022 were used during model calibration. The data collected under these monitoring programs since WY 2022 could be used to improve the ability of the BVHM to estimate groundwater pumping and simulate groundwater levels (or as model validation).

Objective: Use newly collected groundwater data to update the BVHM and improve its ability to estimate groundwater pumping and simulate groundwater levels.

Task Description: If implemented, this task will follow the proposed workflow:

- *Step 1:* The BVHM is extended from WY 2022 to 2025 (or the latest year with data) and run over the historical period of WY 1930 through 2025. The model results are compared to the metered groundwater pumping data and measured groundwater-levels. Based on the comparison, the TAC may recommend to the Board that either (i) the differences are significant and methods should be developed to improve the BVHM (proceed to Step 2) *or,* (ii) the differences are not significant, no changes to the model are recommended, and the BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5). ***Estimated cost: $55,000***
- *Step 2:* If the results of Step 1 indicate that the BVHM should be updated, then methods for updating the BVHM (and associated cost estimates) are developed and recommended for Board approval through the TAC process.
- *Step 3:* The methods developed in Step 2 are implemented and the BVHM is run over the historical simulation period. The model results are then compared against the groundwater monitoring program data to evaluate the need for model recalibration. Based on the comparison, the TAC may recommend to the Board that either (i) the differences are significant and the model should be recalibrated (proceed to Step 4) *or,* (ii) the differences are not significant and the updated BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5).
- *Step 4:* If the results of Step 3 indicate the need for model recalibration, then the BVHM is extended through WY 2028 and recalibrated.
- *Step 5:* The BVHM is extended from WY 2022 to WY 2028 (if not already extended in Step 4) and run over the historical period of WY 1930 through WY 2028 to produce an annual water budget for the Basin, which is then used to redetermine the 2030 Sustainable Yield.

Consequence of Not Completing Task 3: The Watermaster has developed and implemented its groundwater monitoring programs with the stated objective of using the data to improve the BVHM. If the data collected from these programs are not used to evaluate and/or improve the BVHM and redetermine the 2030 Sustainable Yield, then the Watermaster is not utilizing the data as intended. Not completing this task may bypass the application of "best available science."

Task 4. Estimates of Natural Inflows

Problem Statement: The natural recharge to the Basin occurs primarily via stream inflow from the surrounding watersheds (that translate into streambed infiltration overlying the Basin) and subsurface inflow from the surrounding mountain fronts. These sources of natural recharge are key components of the Sustainable Yield. The TAC has identified two issues relating to the estimates of natural recharge that have historically been simulated in the BVHM:

1. Past modeling efforts by the United States Geological Survey (USGS) (Initial BVHM), Dudek (2016 BVHM), and West Yost (2021 BVHM) have used inconsistent and non-reproducible methods for estimating stream inflows to the BVHM domain. As documented in the TM entitled *Extension of the Borrego Valley Hydrologic Model through Water Year 2021* (2021 BVHM TM)[2], the method for estimating stream inflow by the USGS could not be reproduced by Dudek during the 2016 BVHM extension, which resulted in Dudek developing a new methodology, which in turn, could not be reproduced by West Yost during the 2021 or 2022 BVHM extensions. The inability to reproduce methods and results may produce inaccurate estimates for these sources of natural recharge.
2. In all past modeling efforts, the rates of subsurface inflow have been applied at a constant rate of 1,367 acre-feet per year (afy). This rate was first established in the *Initial BVHM* developed by the USGS as a "simplified" average rate of subsurface inflow over the simulation period (Faunt et al., 2015).[3] A constant rate of subsurface inflow does not account for hydrologic variations in the watershed (*e.g.,* more subsurface inflow to the Basin occurs during and after wet years/periods, and less subsurface inflow occurs during and after dry years/periods).

Developing reproducible methods for estimating natural recharge to the Basin was identified as a need by the TAC in its review of the 2021 BVHM TM. This task was considered, but ultimately not recommended by the TAC, for the scope of work to redetermine the 2025 Sustainable Yield.

Objective: Develop improved and reproducible methods for estimating stream and subsurface inflows to the Basin and use the methods to generate input data for the streamflow routing (SFR) and flow and head boundary (FHB) packages in the BVHM.

Task Description: If implemented, this task will follow the proposed workflow:

- *Step 1:* Methods of estimating stream and subsurface inflows are evaluated, including estimates from the Basin Characterization Model (BCM). If multiple methods are evaluated, a white paper

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[2] West Yost. 2022. *Extension of the Borrego Valley Hydrologic Model through Water Year 2021.* Available at: https://borregospringswatermaster.com/wp-content/uploads/2022/12/TM-940-2021-BVHM-Extension-220921.pdf

[3] Faunt, C.C., C.L. Stamos, L.E. Flint, M.T. Wright, M.K. Burgess, M. Sneed, J. Brandt, P. Martin, and A.L. Coes. 2015. Hydrogeology, hydrologic effects of development, and simulation of groundwater flow in the Borrego Valley, San Diego County, California: U.S. Geological Survey Scientific Investigations Report 2015-5150. Available at: https://pubs.usgs.gov/sir/2015/5150/sir20155150.pdf

is prepared that compares the different data sources and methods. Estimates of natural inflows are compared against the estimates of inflows from the current BVHM to determine if there are significant differences and, therefore, model updates are necessary. Based on the comparison, the TAC may recommend to the Board that either (i) the differences are significant and methods should be developed to improve the BVHM (proceed to Step 2) *or,* (ii) the differences are not significant, no changes to the model are recommended, and the BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5). ***Estimated cost: $50,000***

- *Step 2:* If the results of Step 1 indicate that the BVHM should be updated, then methods for updating the BVHM (and associated cost estimates) are developed and recommended for Board approval through the TAC process.
- *Step 3:* The methods developed in Step 2 are implemented and the BVHM is run over the historical simulation period of WY 1930 to 2022. The model results are then compared against the model results from the 2025 Redetermination of the Sustainable Yield. Based on the comparison, the TAC may recommend to the Board that either (i) the differences are significant and the model should be recalibrated (proceed to Step 4) *or,* (ii) the differences are not significant and the updated BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5).
- *Step 4:* If the results of Step 3 indicate the need for model recalibration, then the BVHM is extended through WY 2028 and recalibrated.
- *Step 5:* The BVHM is extended from WY 2022 to WY 2028 (if not already extended in Step 4) and run over the historical period of WY 1930 through WY 2028 to produce an annual water budget for the Basin, which is then used to redetermine the 2030 Sustainable Yield.

Consequence of Not Completing Task 4: The TAC and West Yost have previously noted that the methods used by the USGS, Dudek, and West Yost to estimate stream and subsurface inflows have been inconsistent, non-reproducible, not representative of the hydrologic variability that occurs in the watershed over time, and hence, the historical estimates of stream and subsurface inflows used as inputs to the BVHM may not be accurate.

Task 5. Different Model Platforms

Problem Statement: The BVHM uses the first version of the model code One-Water Hydrologic Flow Model (MODFLOW-OWHM 1 [version 1.0.0]) that was released in 2014 and includes Farm Process 3. During the 2016 and 2021 extensions of the BHVM, several "bugs" were identified in MODFLOW-OWHM 1. Examples of bugs identified in the current version of the BVHM include discrepancies between calculations produced by ZoneBudget and model listing file results and differences in the pumping estimated by individual packages vs. pumping reported in the model listing files (West Yost, 2022). The 2021 BVHM TM documented several of these "bugs" and identified that further investigation was warranted to identify why these inconsistencies exist.

The most recent version of MODFLOW-OWHM as of this writing was released in January 2024, known as MODFLOW-OWHM 2 (version 2.3.0). MODFLOW-OWHM 2 includes Farm Process 4 which offers several advancements over Farm Process 3, including: (i) improved water use and allocation between water sources and agricultural demands; (ii) improved support of dynamic land use changes over time; (iii) enhanced crop and irrigation modeling; and (iv) improved handling of water allocation rules.

Another potential model platform is MODFLOW 6, which is the most recent version of the MODFLOW variants. The most recent version of MODFLOW 6 as of this writing was released in May 2024, known as

MODFLOW 6 (version 6.5.0). Furthermore, by the time this scope of work is implemented, a newer model version may be available.

This task was proposed, but ultimately not recommended by the TAC, for the scope of work to redetermine the 2025 Sustainable Yield.

Objective: Upgrade the BVHM from MODFLOW-OWHM 1 to a new platform, such as MODFLOW-OWHM 2 or MODFLOW 6.

Task Description: If implemented, this task will follow the proposed workflow:

- *Step 1:* Potential new modeling platforms are researched and a "white paper" is prepared that evaluates and compares the different modeling platforms and the level of effort to convert the BVHM to these platforms. The white paper may also evaluate structural changes to the existing BVHM, such as removing the FMP. The white paper will be reviewed by the TAC and the TAC will have the opportunity to recommend to the Board that either (i) the model platform should be upgraded/migrated to another platform, and hence, methods should be developed for this migration (proceed to Step 2) *or,* (ii) the model platform should not be upgraded/migrated and the BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5). ***Estimated cost: $60,000***
- *Step 2:* If the TAC recommends that the model platform be upgraded in Step 1, then methods for changing the model platform (and associated cost estimates) are developed and recommended for Board approval through the TAC process.
- *Step 3:* The methods developed in Step 2 are implemented and the BVHM is run over the historical simulation period of WY 1930-2022. The model results are then compared against the model results from the 2025 Redetermination of the Sustainable Yield. Based on the comparison, the TAC may recommend to the Board that either (i) the differences are significant and the model should be recalibrated (proceed to Step 4) *or,* (ii) the differences are not significant and the updated BVHM can be used to redetermine the 2030 Sustainable Yield (skip to Step 5).
- *Step 4:* If the results of Step 3 indicate the need for model recalibration, then the BVHM is extended through WY 2028 and recalibrated.
- *Step 5:* The BVHM is extended from WY 2022 to WY 2028 (if not already extended in Step 4) and run over the historical period of WY 1930 through WY 2028 to produce an annual water budget for the Basin, which is then used to redetermine the 2030 Sustainable Yield.

Consequence of Not Completing Task 5: The BVHM will continue to use MODFLOW-OWHM 1, which contains bugs in the code and is no longer maintained by the USGS.

Other Considerations: All models have bugs. West Yost and the TAC are now familiar with the bugs in MODFLOW-OWHM 1, whereas bugs in other model platforms are not yet known.

NEXT STEPS FOR TAC

After review of this memorandum, TAC members should indicate their recommendations for the scope-of-work. Specifically, the TAC is asked to recommend if:

1. ***Only* the Minimum Required Scope-of-Work should be performed.**

2. **One or more of the Additional/Optional tasks should be performed.** If such tasks are recommended, please understand that the recommendation to the Board is *only* to complete Step 1 of the Workflow in WY 2026 – 2027. Evaluation of the results of Step 1 is always necessary before recommending subsequent steps. If additional/optional tasks are recommended, the TAC is asked to complete Table 2 documenting:
    - The additional/optional tasks that are recommended to be performed
    - If the task is recommended, ranking each task in order of priority
    - TAC comments on each task
    - Description of additional tasks that are recommended, but not included in this TM

Each TAC member should provide their recommendations in Table 2 via email to Andy Malone (amalone@westyost.com) and Lauren Salberg (lsalberg@westyost.com) by **Monday, December 2, 2024**. Please remember to CC the entire TAC.

Following receipt of TAC comments in Table 2, West Yost will:

- December 4, 2024 - Prepare and distribute a *draft* TAC Recommendation Report for TAC review and comment.
- December 5, 2024 – Board meeting to discuss and receive input on the potential tasks to include in the scope of work and the TAC feedback received.
- December 9, 2024 – TAC meeting to discuss TAC and Board comments on the potential scope of work.
- December 10, 2024 – Deadline for additional TAC comments on the *draft* TAC Recommendation Report.
- December 12, 2024 - Prepare a *final* TAC Recommendation Report based on TAC feedback.
- December 19, 2024 – Board meeting to consider approval of the scope of work to redetermine the 2030 Sustainable Yield.

ATTACHMENTS

Figure 1. Workflow for Additional/Optional Tasks to Redetermine the 2030 Sustainable Yield

Table 1. Cost Estimates for Additional/Optional Tasks

Table 2. TAC Recommendations for a Scope-of-Work to Redetermine the 2030 Sustainable Yield – *WY 2026-29*

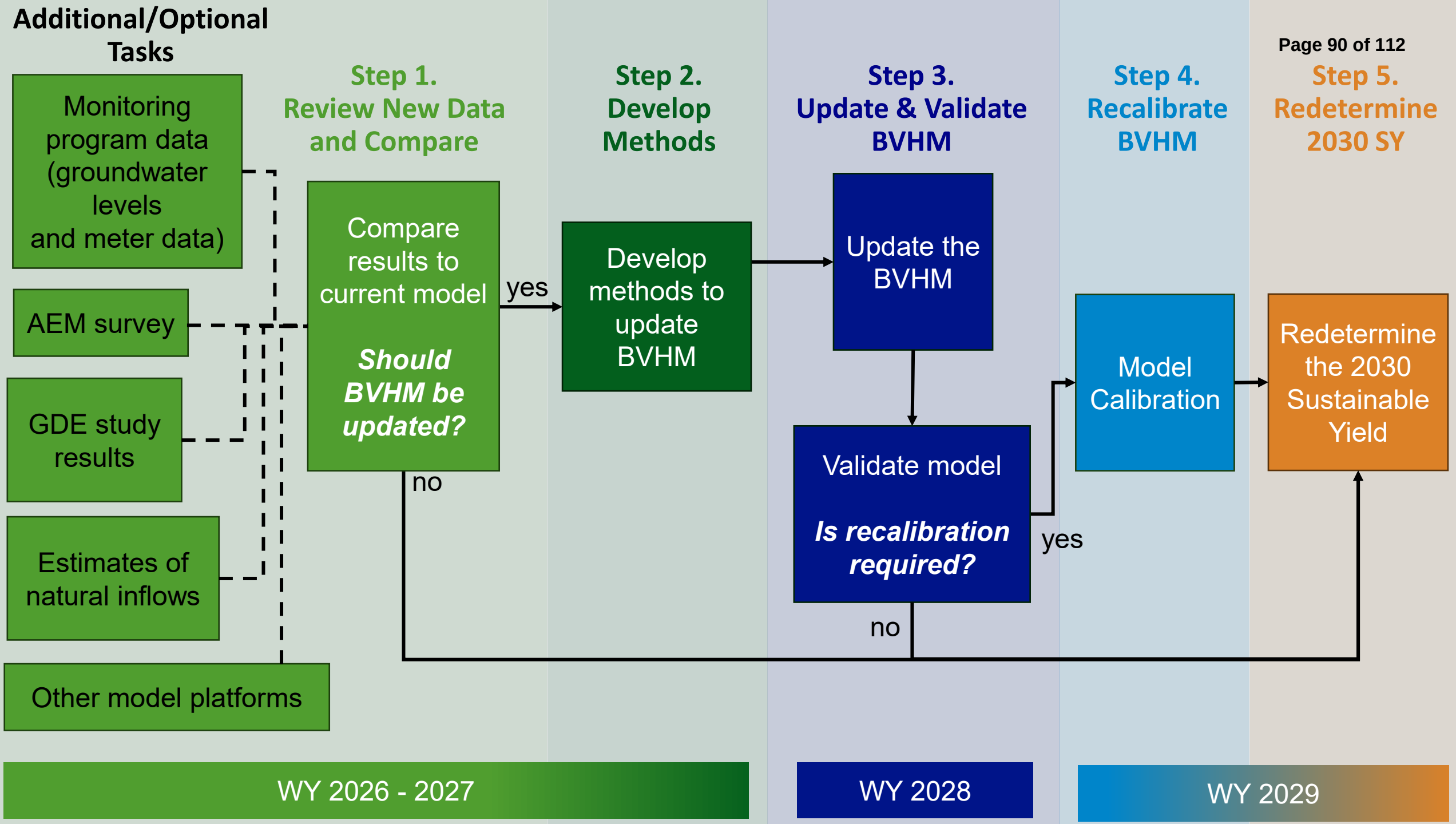

Additional/Optional Tasks
Monitoring program data (groundwater levels and meter data)
AEM survey
GDE study results
Estimates of natural inflows
Other model platforms
Step 1. Review New Data and Compare
Compare results to current model
Should BVHM be updated?
yes
no
Step 2. Develop Methods
Develop methods to update BVHM
Step 3. Update & Validate BVHM
Update the BVHM
Validate model
Is recalibration required?
yes
no
Step 4. Recalibrate BVHM
Model Calibration
Step 5. Redetermine 2030 SY
Redetermine the 2030 Sustainable Yield
WY 2026 - 2027
WY 2028
WY 2029

Table 1. Cost Estimate for Additional/Optional Tasks

Step 1. Review New Data and Compare				Step 2. Develop Methods			Step 3. Update & Validate		Step 4. Recalibrate the BVHM		Step 5. Redetermine the 2030 Sustainable Yield
Task 1	AEM Results	**$55,000**		AEM Results	**$30,000**						
Task 2	GDE Study Results	**$40,000**		GDE Study Results	**$30,000**						
Task 3	Monitoring Program Data (groundwater-level and metered pumping data)	**$55,000**	+	Monitoring Program Data (groundwater-level and metered pumping)	**$30,000**	+	**$50,000 - $75,000**	+	**$100,000 - $230,000**	+	**$5,000 - $100,000**
Task 4	Estimates of Subsurface Inflow and Stream Inflow	**$50,000**		Estimates of Subsurface Inflow and Stream Inflow	**$30,000**						
Task 5	Other Model Platforms	**$60,000**		Other Model Platforms	**$30,000**						
Total Cost:		**$40,000 - $260,000**			**$30,000 - $150,000**		**$50,000 - $75,000**		**$100,000 - $230,000**		**$5,000 - $100,000**

Borrego Springs Watermaster
Board of Directors Meeting
December 5, 2024
AGENDA ITEM IV.D

To: Board of Directors

From: Samantha Adams, Executive Director

Date: December 2, 2024

Subject: Draft Analysis of Carryover Rules

☐ **Recommended Action**	✓ **Provide Direction to Staff**	✓ **Information and Discussion**
☐ **Fiscal Impact**	☐ **Cost Estimate: $**	

Recommended Action

Board discussion.

Fiscal Impact: None.

Background and Objectives

The Judgment defines Carryover and the mechanisms and limitations for accruing and using it, as follows:

Carryover Definition. Any portion of a Party's Annual Allocation not Pumped in the Water Year in which it is allowed, which may be accrued and produced in future Water Years, provided that the Party complies with the provisions of Section III.B of the Judgment (Section I.A)

Carryover Limits: The initial maximum quantity of Carryover that a Party can accrue is two times the amount of Baseline Pumping Allocation (BPA) then held by that Party (Section III.B). The maximum allowable Carryover balance, in aggregate, would be 48,586 acre-feet (af).

Carryover Elections. Annually during the Water Rights Accounting process, each Party is given the opportunity to elect to purchase unused Annual Allocation as Carryover. There is a 16-day window during which the election can be made (October 16th through 31st). Parties not in good standing (*i.e.,* not reporting pumping or have unpaid pumping assessments) are not eligible to purchase Carryover (Section IV.E.3).

Accounting of Carryover towards Pumping and Overproduction. The first groundwater pumped by a Party each year is deemed to be an exercise of any available Carryover. When calculating a Party's annual water use, any Carryover is applied first, followed by any leased Annual Allocation, and then the Party's current Annual Allocation. (Section III.G).

No Adjustments of Accrued Carryover: Once Carryover has been accrued under the Carryover rules then in effect, the rules cannot be changed in a way that retroactively affects accumulated

Carryover. Accordingly, any Basin-wide need for reduced pumping will be achieved through additional Rampdown of BPA rather than reductions to any Party's accrued Carryover (Section III.B)

Duration of Carryover. The Judgment does not specify an expiration date on the process to accrue Carryover, nor on the Carryover accrued by Parties.

Evaluation of Carryover. Carryover will be re-evaluated by January 1, 2025, by Watermaster, with consultation of the Technical Advisory Committee (TAC). If Watermaster determines that it is necessary to adjust the amount of individual Carryover or the duration that Carryover may be held within the Basin to prevent Undesirable Results, the Watermaster shall advise the Court through a noticed motion for a subsequent order amending the Judgment (Section III.B).

At its September 2024 meeting, the Watermaster Board discussed the Judgment requirement to assess Carryover by January 1, 2025, and some of the challenges of projecting pumping and the use of Carryover at this early stage of the Rampdown. The discussion occurred in the context of a broader discussion on the schedule to complete multiple Judgment requirements by the same date. At the conclusion of the discussion, the Board directed staff to adhere to the January 1, 2025 deadline to assess Carryover using a simple analysis based on the best available information.

The purpose of this memo is to document staff's *draft* analysis of Carryover, including staff's recommended actions based on the analysis. Based on Board feedback, the analysis will be finalized and presented for Board consideration and action at its December 19, 2025 Special meeting.

Accrual and Use of Carryover: WY 2021 to WY 2024

Each year, starting with the conclusion of water year (WY) 2021, Watermaster staff has performed detailed Water Rights Accounting in accordance with the Judgment. The Carryover Elections are presented annually to the Board in November in an annual Water Rights Accounting memo and subsequently documented in the Annual Report to the Court and the Department of Water Resources (DWR). The figures below illustrate the accrual and use of Carryover over the last four WYs.

Figure 1 compares the Annual Allocation for WYs 2021 through 2025 to the total Pumping through WY 2024 (period that just ended September 30, 2024). The Annual Allocation eligible for Carryover is the difference between the Allocation and the total amount pumped. As presented and discussed over the years, the Parties are significantly ahead of the Rampdown schedule, meaning they are pumping less than the Annual Allocation each year. As such, most Parties have had the ability to elect (purchase) their unused Annual Allocation as Carryover.

Figure 2 shows the Annual Allocation eligible for Carryover and the amount of Carryover Elected by Parties for WY 2021-2024. Since WY 2021, a total of 54,652 af of unpumped Annual Allocation has been eligible for purchase and a total of 45,682 af (84%) was elected. Over this four-year period, annual elections of Carryover ranged from 82 to 87% of the eligible amount.

Figure 3 is a chart that shows the portion of total pumping that was deemed an exercise of Carryover for WY 2021-2024 based on the Judgment accounting process. This chart helps illustrate why there is a large amount of Carryover eligible for purchase each year. Because the first water

pumped is deemed an exercise of Carryover, a much smaller portion of the Annual Allocation is used and becomes eligible Carryover (subject to the maximum Carryover limit of each Party). For example, in WY 2024, 85% of total pumping was deemed an exercise of Carryover.

Figure 4 shows the aggregate end-of-year Carryover account balance for WYs 2021 through 2024. The figure shows that the rate of increase in the amount of Carryover decreased in WY 2024. By the end of WY 2024, there was a total of 24,960 af of Carryover held by the Parties.

Analysis of Carryover

The Carryover rules should only be changed if they prevent the Watermaster Parties from achieving sustainability by 2040 and beyond by causing Undesirable Results that cannot be mitigated. As defined in the Judgment, Sustainable Groundwater Management is "management of the Basin and Pumping and use of Groundwater from the Basin in a manner that can be maintained during the Planning and Implementation Horizon without causing Undesirable Results, consistent with SGMA" (Section I.A.56). And, "… the Physical Solution prescribed by the Judgment will be implemented to ensure that the Basin is operated within its Sustainable Yield, consistent with SGMA" (Section I.A.45).

In our analysis of Carryover, we considered the following questions:

1. Could the Carryover rules defined in the Judgment enable Parties to pump in excess of the Sustainable Yield beyond 2040?
2. If yes, would that lead to a potential occurrence of Undesirable Results?

A simple analysis can only address question #1. Modeling is required to answer question #2. Answering question #2 can be done as a follow-up exercise, as part of the planned analysis of the long-term sustainability of the 2025 Sustainable Yield using the BVHM (see below).

As part of the grant-funded work to redetermine the Sustainable Yield and review the Groundwater Management Plan (GMP), staff reached out to all of the Parties that are active Pumpers in the Basin to understand their future pumping plans, including how they will adjust pumping to comply with the Rampdown and ultimately pump at their allocation of the Sustainable Yield. The purpose of this outreach is to prepare future pumping projections that can be simulated using the Borrego Valley Hydrologic Model (BVHM). The model results will be used to determine if there is the potential for Undesirable Results to occur (relative to groundwater levels and storage) under the revised 2025 Sustainable Yield. The future pumping projections will assume the use of Carryover by the Parties, as allowed by the Judgment.

A majority of Parties expressed that they wished to continue pumping and adjust their operations to comply with the Rampdown. Most of these Parties also stated that they intend to maximize the use of Carryover to support their ability to make pumping adjustments over time, and to help determine when they should implement operational adjustments that would reduce their annual pumping demands. Several Parties explained that they intend to make stepwise changes to their operations, rather than change everything all at once. Also of note is that while most Parties desire to remain in operation, their ability to do so will be influenced by a number of factors, including future revisions to

the Sustainable Yield (2025, 2030, and 2035) and external economic/market factors. With that in mind, the Parties advised that their pumping projections should be considered "preliminary" and that additional adjustments may be considered over the next several years of the Rampdown.

Using the information learned from the Parties to prepare a future pumping projection, we developed an example pumping projection and Carryover accounting to answer question #1 above. The example projection should be considered a generalized representation of the planned pumping of a subset of Parties with a combined BPA of 4,000 af. The BPA and pumping were rounded to anonymize this analysis, as it is not important to this analysis or its conclusions which Parties the example represents. What is more important is that the following example is realistic and representative of how pumping could change over time for this subset of Parties with a combined BPA of about 4,000 af. The analysis does make the simplifying assumption that this subset of Parties will all make their stepwise operational adjustments at the same time during the projection.

Figure 5 is a time-series chart for WY 2021 through WY 2070 that shows the example pumping projection. Figure 5 includes:

- The Annual Allocation of pumping based on 4,000 af of BPA (red dashed line), assuming that the 2025 Sustainable Yield is 7,952 af.[1]
- Total annual pumping, including the portion deemed to be an exercise of Carryover (the blue bars represent the portion of pumping deemed an exercise of Carryover and the green bars represent the portion that is deemed an exercise of Annual Allocation). For WY 2021 through WY 2024, the chart represents "actual" pumping and Carryover elections, the remainder years (WY 2025 – 2070) represent a pumping projection.
- The end-of-year Carryover account balance, assuming that the Parties purchase 100% of their eligible Carryover each year (black line).

The pumping projection assumes that the Parties make three adjustments to their pumping operations over time to step-down demand in 2025, 2040, and 2065. The timing was based on the direction to assume that operational adjustments would be implemented when needed based on availability of Carryover water to supplement the Annual Allocation.

Interpretation of Figure 5 reveals the following:

- The Parties' pumping is less than the Rampdown schedule through 2035.
- The total Carryover account balance reaches the maximum allowable of 8,000 af (2x BPA of 4,000) in 2031. The Carryover account balance begins to decline starting in 2037.
- Due to the large Carryover account balance in 2040 (7,000 af), the Parties are able to pump in excess of the 2040 Annual Allocation through 2064, which is 24 years beyond the period when pumping is intended to be within the Sustainable Yield. In this example, the available Carryover

[1] The projection would be nearly the same utilizing any of the 2025 Sustainable Yield values recommended by the TAC and Technical Consultant, which ranged from about 7,800 to 8,000 af.

results in the Parties pumping about 20% more groundwater than afforded by the 2025 Sustainable Yield.

Figure 6 compares the cumulative allowed pumping under the Annual Allocation (orange line) to the cumulative projected pumping utilizing Carryover for the example Parties (blue line) through 2070. The orange line represents the maximum allowable pumping in accordance with the Rampdown for the period shown. The figure demonstrates that the total cumulative pumping allowed by the Annual Allocation through 2070 is 89,063 af. Under the cumulative pumping projection of the Parties, about 97% of the Annual Allocation is pumped through 2070 (86,621 af). What is notable is that for the period through 2040, the pumping projection (40,881 af) is significantly less than the Annual Allocation under the Rampdown (50,033 af) for this period (about 20% less).

Conclusions and Recommendations

In performing this analysis of the Carryover rules, we considered the following question: Could the Carryover rules defined in the Judgment enable Parties to pump in excess of the Sustainable Yield beyond 2040? The example presented in Figure 5 shows that it is possible for Parties to pump in excess of the 2040 Annual Allocation (*e.g.,* the Sustainable Yield) by utilizing their accrued Carryover as allowed by the current Judgment rules. Thus, there is a potential that the Carryover rules could result in non-sustainable pumping conditions beyond 2040. The magnitude and location of impacts would need to be assessed using the BVHM, which is beyond the scope of this analysis. The preliminary pumping projection being developed to support the GMP Assessment could be used to assess if and how Carryover might be a cause of any potential Undesirable Results. The Carryover Rules are not anticipated to result in Undesirable Results through 2040 as the Parties are pumping less than was planned and is allowed under the Rampdown through this period, as shown in Figure 6.

While the analysis illustrates the potential for Parties to pump in excess of the Sustainable Yield beyond 2040, it is important to note that the Watermaster is only four years into the pumping Rampdown, and hence, it is too soon for Parties to definitively articulate their pumping plans beyond 2030. It would be premature to consider revising the existing Carryover rules at this time, especially given that any potential impact is likely to occur after 2040. Given the current level of uncertainty, it would be appropriate for the Watermaster to revisit these questions as part of the redetermination of the 2030 Sustainable Yield. In the meantime, the planned use of the BVHM to assess a future pumping projection could help to refine how this analysis is done in the future.

TAC Input and Next Steps

The Judgment requires that the analysis of Carryover be done in consultation with the TAC. The draft analysis was presented to the TAC at the November 19th TAC meeting and this draft memo was shared with them on November 27th with the intent to obtain their input and feedback at the December 9th TAC meeting.

Watermaster staff is seeking Board discussion and feedback on this draft analysis. This input will be considered in finalizing the analysis and will be shared with TAC. The TAC input will be considered and

documented in a final memo that will be presented to the Watermaster Board at the December 19th Special meeting.

Enclosures

Figures 1 through 6.

Figure 1. Annual Allocation Under Rampdown to 2020 and 2025 Sustainable Yield Amounts

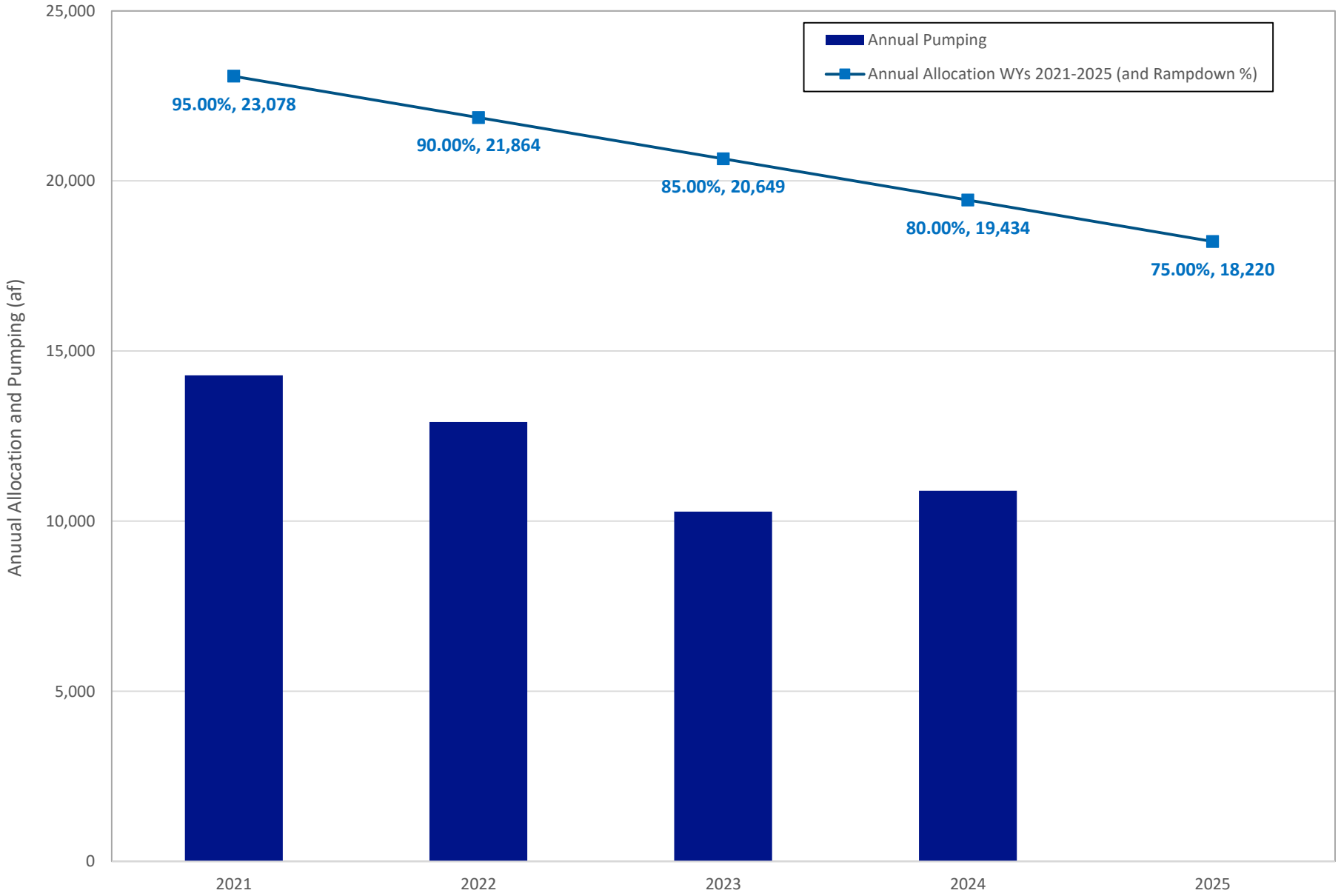


Figure 2. Allocation Eligible for Carryover vs. Carryover Elected, *WY 2021 - 2024*

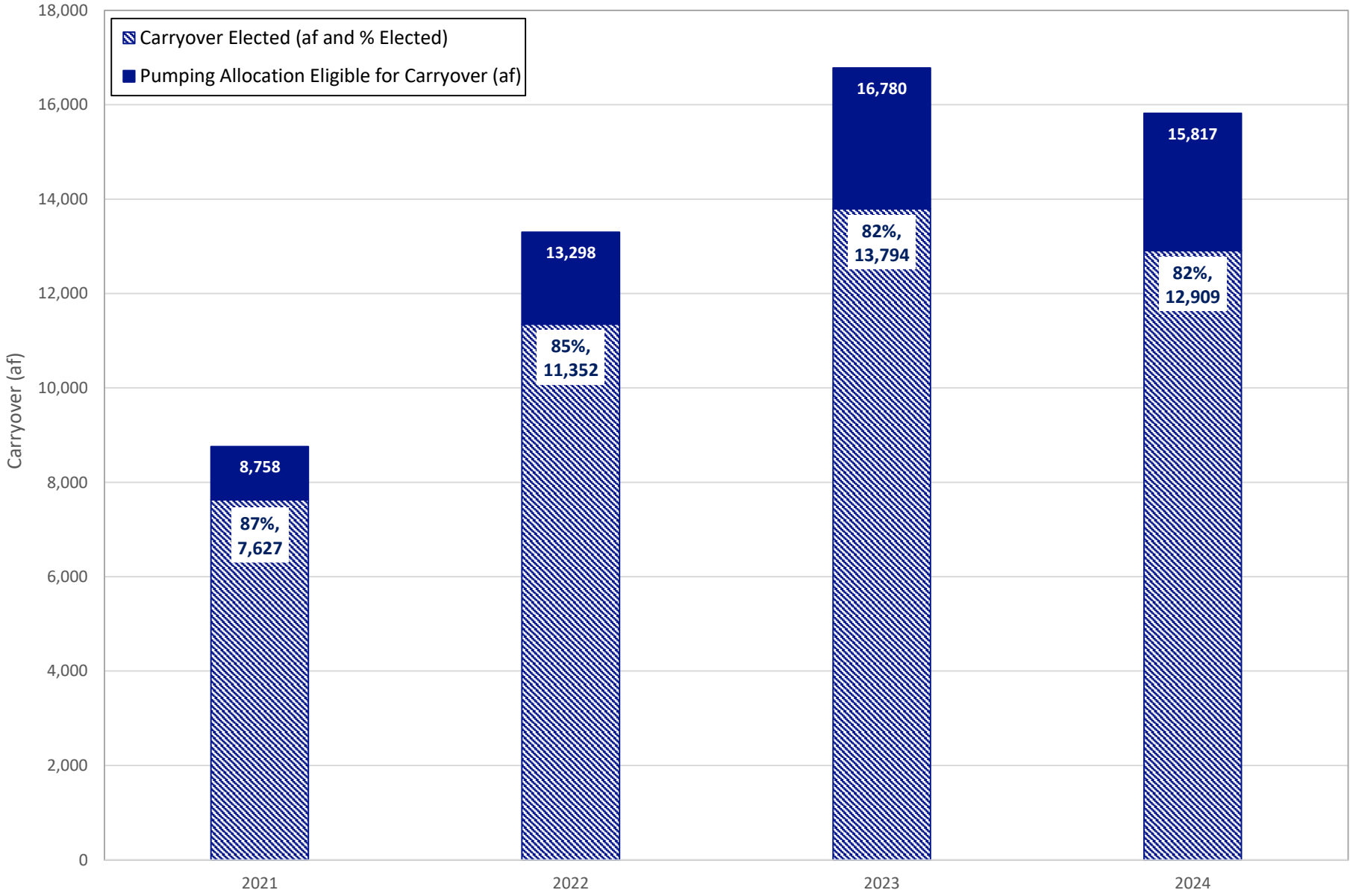


Figure 3. Annual Amount of Pumping Deemed an Exercise of Carryover, *WY 2021 - 2024*

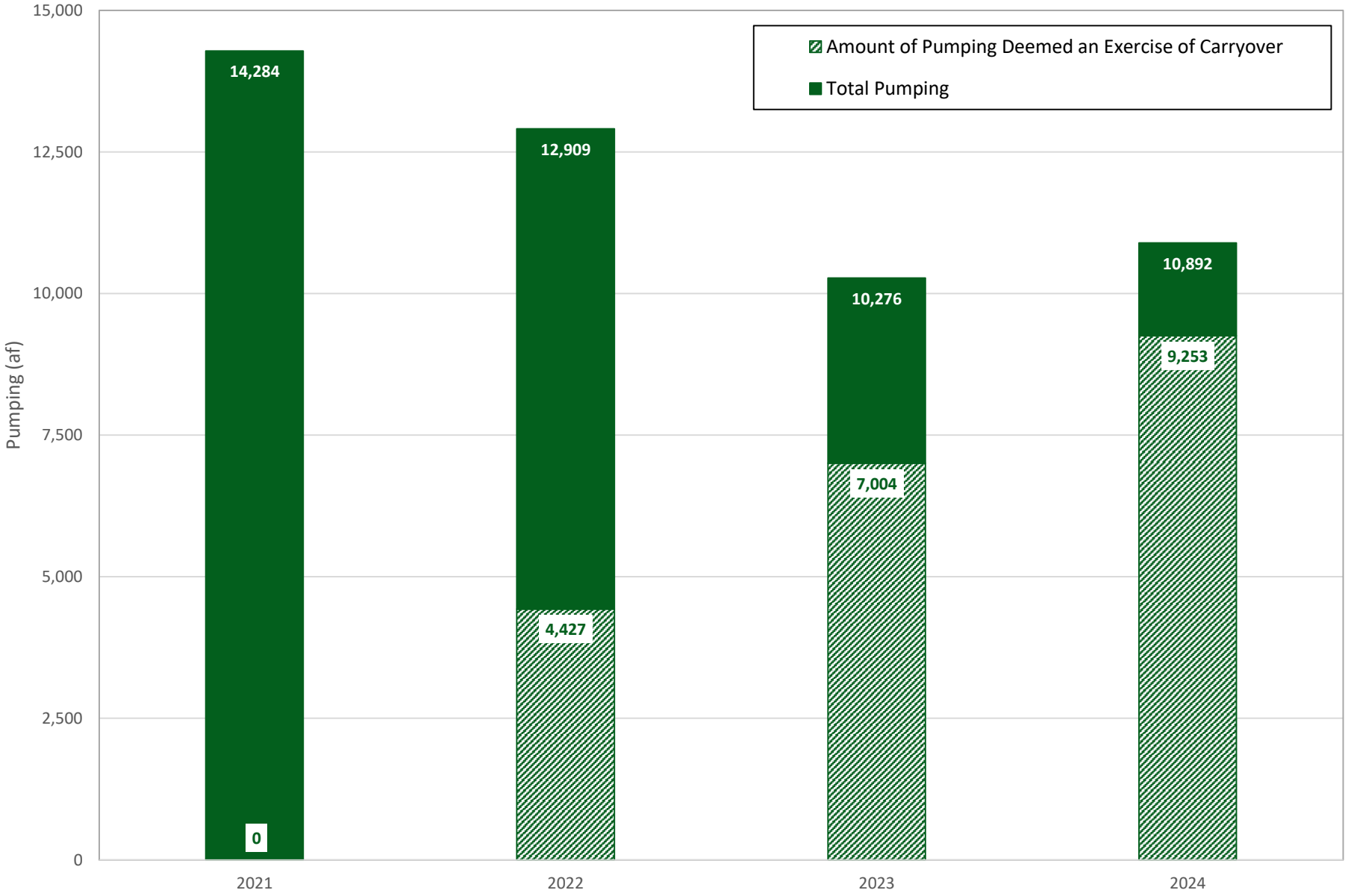


Figure 4. Time History of Carryover Account Balance

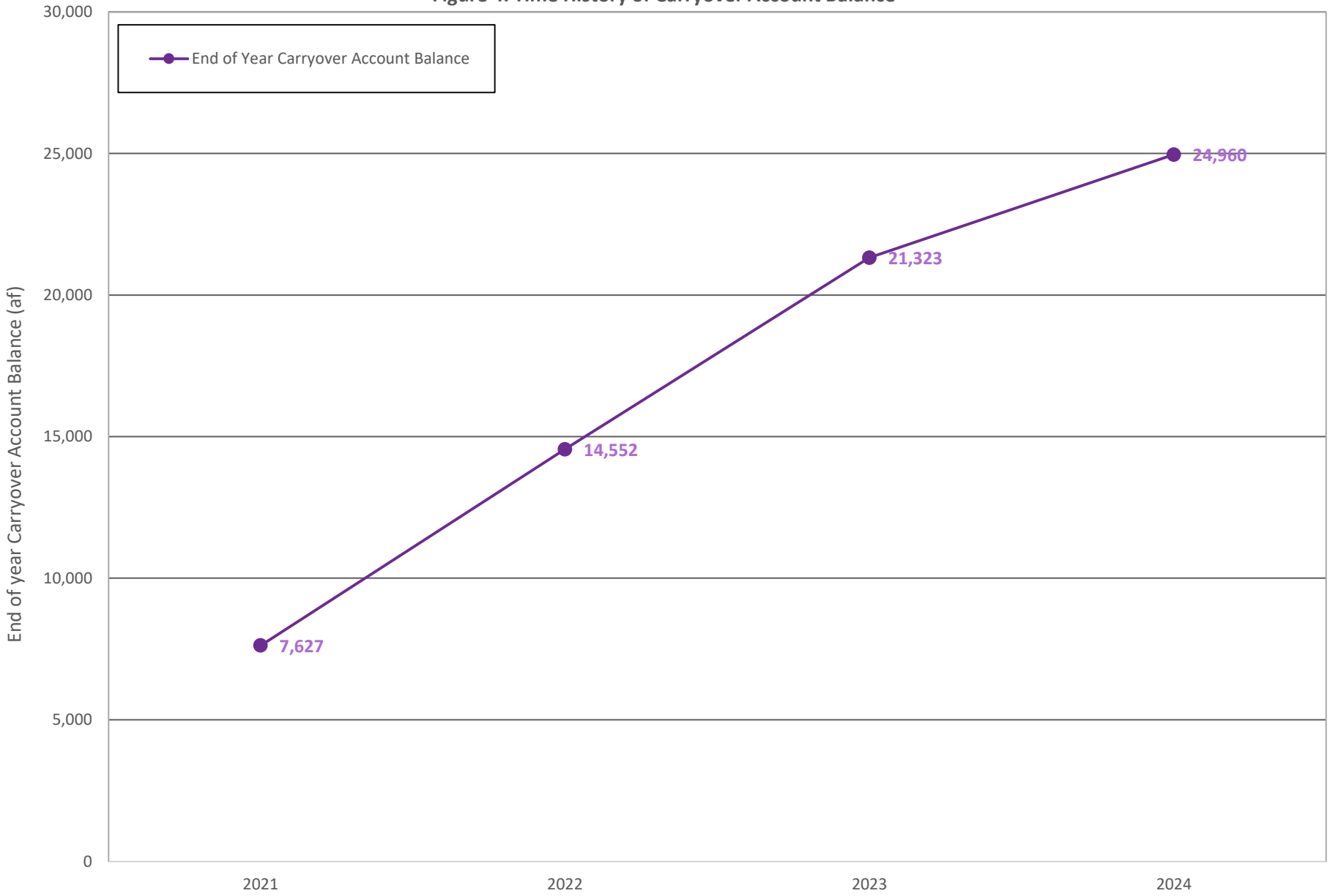


Figure 5. Example Future Pumping Projection utilizing Carryover per Judgment Rules, *WY 2021 - 2070*

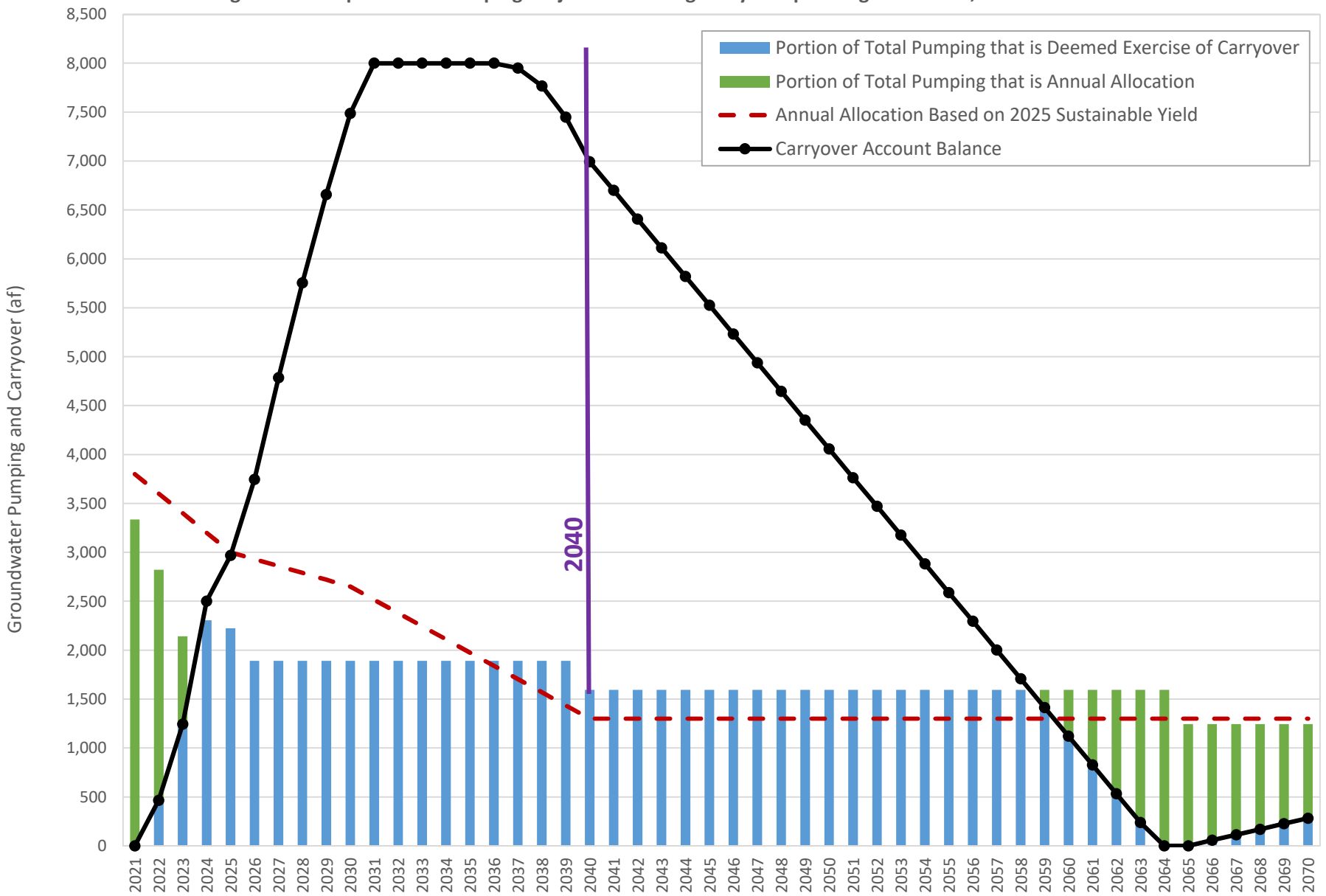
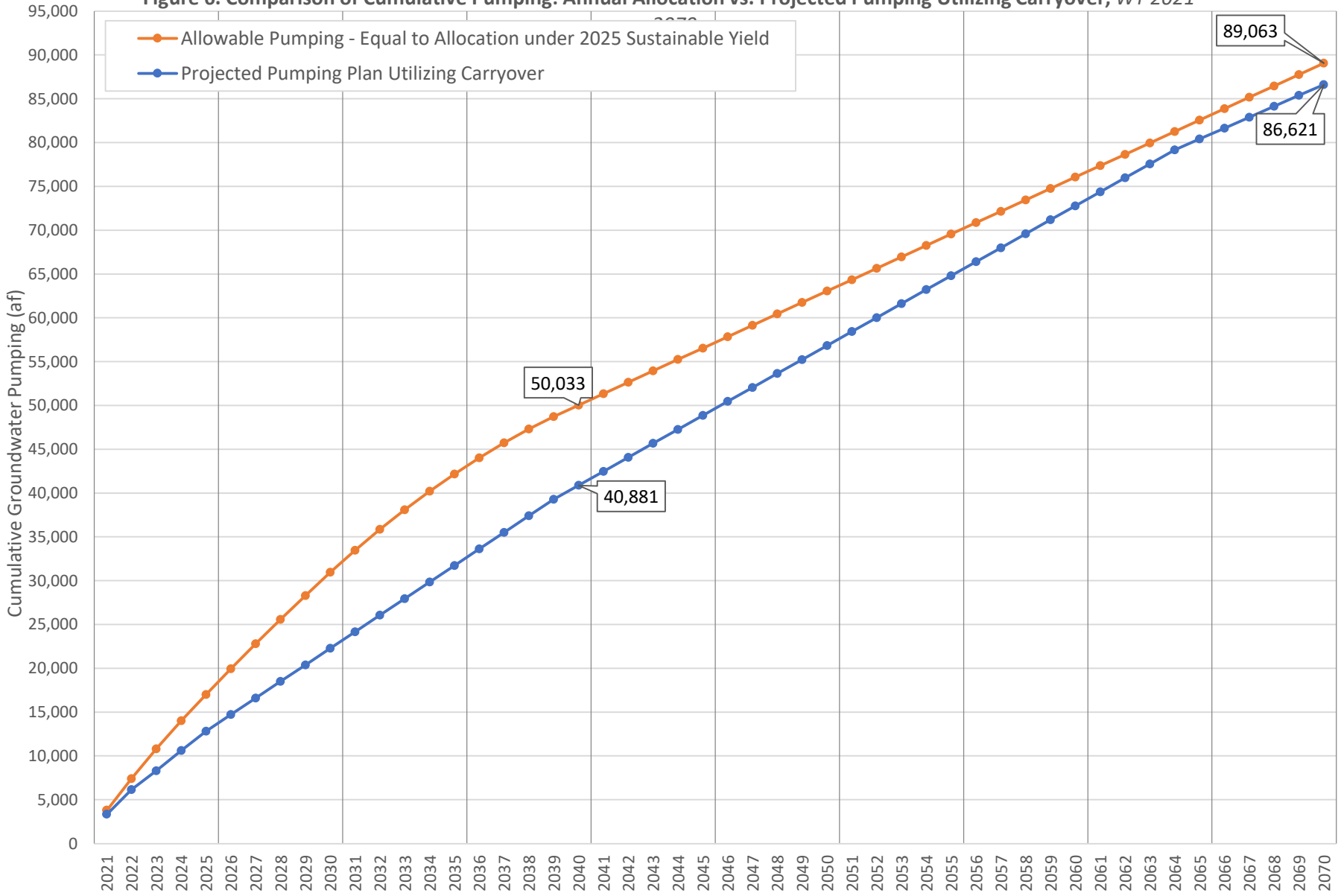


Figure 6. Comparison of Cumulative Pumping: Annual Allocation vs. Projected Pumping Utilizing Carryover, *WY 2021 -*



To: Board of Directors

From: Andy Malone, Technical Consultant

Date: December 2, 2024

Subject: Technical Consultant Report - December 2024

Overview

The purpose of the monthly Technical Consultant Report is to share information with the Board on the status of technical efforts being performed with guidance and input from the Technical Advisory Committee (TAC) and Environmental Working Group (EWG). Additional details and topics that arise after publishing this report will be presented during the Board meeting.

At the December 5, 2024 Board meeting, I intend to report out on the following topics:

- Change in Groundwater Storage from Spring 2023 to Spring 2024
- Transducers installed in the TSS Monitoring Wells
- Biological Restoration of Fallowed Lands Project
- Abandoned Wells Conversion Project
- 5-year Assessment of the GMP

Change in Groundwater Storage from Spring 2023 to Spring 2024

The change in storage calculation for spring 2023 and spring 2024 was performed using the method developed by the TAC and described in the *Methods to Estimate Annual Storage Change in the Borrego Springs Subbasin* (Storage Change Method) Technical Memorandum (TM).[1] In summary, the method uses: (i) static groundwater-level measurements from a network of wells across the Basin and (ii) values of specific yield derived from the Borrego Valley Hydrologic Model (BVHM). The method was applied to calculate the annual change-in-storage from spring 2023 to spring 2024. Storage in the Basin was estimated to have declined by 786 acre-feet (af) during spring 2023 to spring 2024. Figure 1 shows the spatial distribution of this annual change-in-storage across the Basin. General observations and interpretations from Figure 1 include:

- Storage increased in the North Management Area, likely due to relatively wet hydrologic conditions over the past two years which resulted in increased recharge and decreased pumping in this area.
- Storage declined most in the Central Management Area, and to a lesser degree, in the South Management Area.

Each year, the TAC and the Board has reviewed the storage-change estimates produced by the Storage Change Method and concluded that the results reflect the expected changes in storages based on the measured hydrologic conditions that occurred in the Basin, the metered pumping data, and the measured groundwater

[1] https://borregospringswatermaster.com/wp-content/uploads/2023/02/VB-Annual-Change-in-Basin-Storage-Memo-with-Attachments.pdf

elevations; and therefore, are appropriate for the Watermaster's annual reporting to the DWR. West Yost again agrees with these conclusions for the change-in-storage for spring 2023 to 2024.

However, now that the BVHM has been extended through water year (WY) 2022 and recalibrated, results from the *Recalibrated BVHM* can compared to the results from the Storage Change Method. At the Board meeting, West Yost will present a comparison of storage change results using the Storage Change Method and *Recalibrated BVHM*, discuss differences and explanations for differences in the estimates using the different methods, and recommend next steps for documenting this information in either the 2024 Annual Report or the 5-year Groundwater Management Plan (GMP) Assessment Report.

For the 2024 Annual Report, which must be submitted to the DWR by April 1, 2025, the Technical Consultant recommends that the change in storage for spring 2023 to spring 2024 be reported as a decline of 786 af (*i.e.* using results from the Storage Change Method).

Transducers Installed in the TSS Monitoring Wells

The DWR purchased groundwater-level monitoring equipment, including pressure transducers and telemetry, to equip and install in the two Technical Support Services (TSS) wells in Borrego Springs (MW-6S and MW-6D). The equipment was installed on December 2, 2024. Watermaster staff will request the data from DWR semi-annually, around the time of each of the semi-annual monitoring events in the spring and fall. Watermaster staff will continue to collect manual measurements of groundwater-levels in each well semi-annually.

Biological Restoration of Fallowed Lands Project

This project is being led by Land IQ, is DWR grant funded, and is planned to be complete by March 2025. The status of each project task follows.

- *Task 1: Review and Analysis of Existing Data*. This task is complete.
- *Task 2: Existing Fallowed Farmland and Referenced Natural Habitat Field Study*. This task is complete.
- *Task 3: Brush Pile Wildlife Sand Fence Case Study*. The sand fence subcontractor (Jake Fredericks) is behind schedule on completing the sand fence construction. On the BWD property, two of the four treatments have been fully installed (mulch rows and scatter trees), the tree fences are partially complete (4 of the 10 tree fence rows are installed), and the fourth treatment (traditional sand fences) have yet to be installed. UCI staff has installed the monitoring equipment where possible on the BWD property. On the T2 Borrego property, the subcontractor has cleared trees for three of the four treatments, but none of the four treatments are completely installed. The tree fence rows are partially complete with 7 out of 10 tree rows constructed. Land IQ is keeping the landowners (BWD and T2 Borrego) abreast of the project progress. The subcontractor has said that the delays are mainly related to its misunderstanding of level of work to move the dead citrus trees, but they have learned from their experience on the BWD property and are performing the work more efficiently on the T2 property. Land IQ is continuing to work with the subcontractor to ensure the field work is completed per the agreed scope of work and within the project budget. Land IQ believes all sand fences and monitoring equipment can be installed by January 2025. UCI will conduct the monitoring of airborne dust emissions using grant funding from January 2025 through March 2025. UCI scientists and master students will continue to monitor the project after the expiration of grant funding (end of March 2025) and can report the monitoring results to the EWG and the Board.
- *Task 4: Farmland Fallowing Rehabilitation Studies*. A draft report on fallowing recommendations was distributed to the EWG for review and comment and key findings were presented to the EWG at its November 20, 2024 meeting. The EWG has the opportunity to provide written comments through

December 13, 2024 and will meet in January 2025 to discuss their comments and feedback with Land IQ. Following this EWG meeting, a draft-final report will be prepared. Key findings will be presented to the Board by its February 2025 meeting. Board feedback will be incorporated, and a final report will be prepared and presented at the March 2025 Board meeting.

- *Task 5: Farmland Fallowing Prioritization*. An updated fallowing prioritization map is being prepared and is expected to be released in early 2025. This map will identify and rank parcels for suitability for rehabilitation. Key findings will be presented to the Board at its February 2025 meeting. Board feedback will be incorporated, and a final prioritization map will be prepared and presented at the March 2025 Board meeting.

- *Task 6: EWG Meetings*. An EWG meeting was held on November 20, 2024, which included (i) a review of key findings from the draft Task 4 report and (ii) a field trip to inspect the newly constructed sand fences and monitoring work related to Task 3. Notable presentation and discussion at the EWG meeting included:
    - Farming has irreparably changed the soil profile (chemical and physical characteristics), so full "restoration" to desert habitat may not always be possible in the near term.
    - The Task 4 report includes a "decision tree" to guide rehabilitation strategies depending on the location and characteristics of the fallowed land.
    - Removal of invasive species will likely need to be part of all rehabilitation strategies. And, planting of invasive species (e.g., rye grass) should not be part of the "minimum fallowing standards" in the Judgment.
    - The final results of this study may cause the Board to consider changes to the "minimum fallowing standards" in the Judgment.
    - On the field tour of the BWD site:
        - The three types of treatments were observed (mulch rows, scatter trees, and tree fences).
        - Two types of dust monitoring have been installed: dust collectors and erosion pins.
        - The EWG was informed of the schedule delays associated with the subcontractor.

  Upcoming EWG Meetings in 2025 are anticipated in:

    - *January 2025*:
        - Review EWG comments on the draft Task 4 TM
        - Project update from UCI on the monitoring and data collection
    - *Late May/early June 2025*: Project update from the UCI student group on the monitoring and data collection from the sand fences.

Inactive/Abandoned Wells Conversion Project

This project is being led by the Technical Consultant, is DWR grant funded, and is planned to be complete by March 2025. However, BWD alerted West Yost that DWR has recently had issues with agreements for monitoring at private wells. Prior understandings and the verbal agreement that BWD had from the prior grant manager may no longer be valid. West Yost submitted all executed entry agreements to DWR Legal Counsel for review. BWD is checking in with the current grant manager and awaiting a direction from DWR on how to

proceed with the agreement process for conversion of private monitoring wells. The current understanding is that there are two possible outcomes from DWR's review:

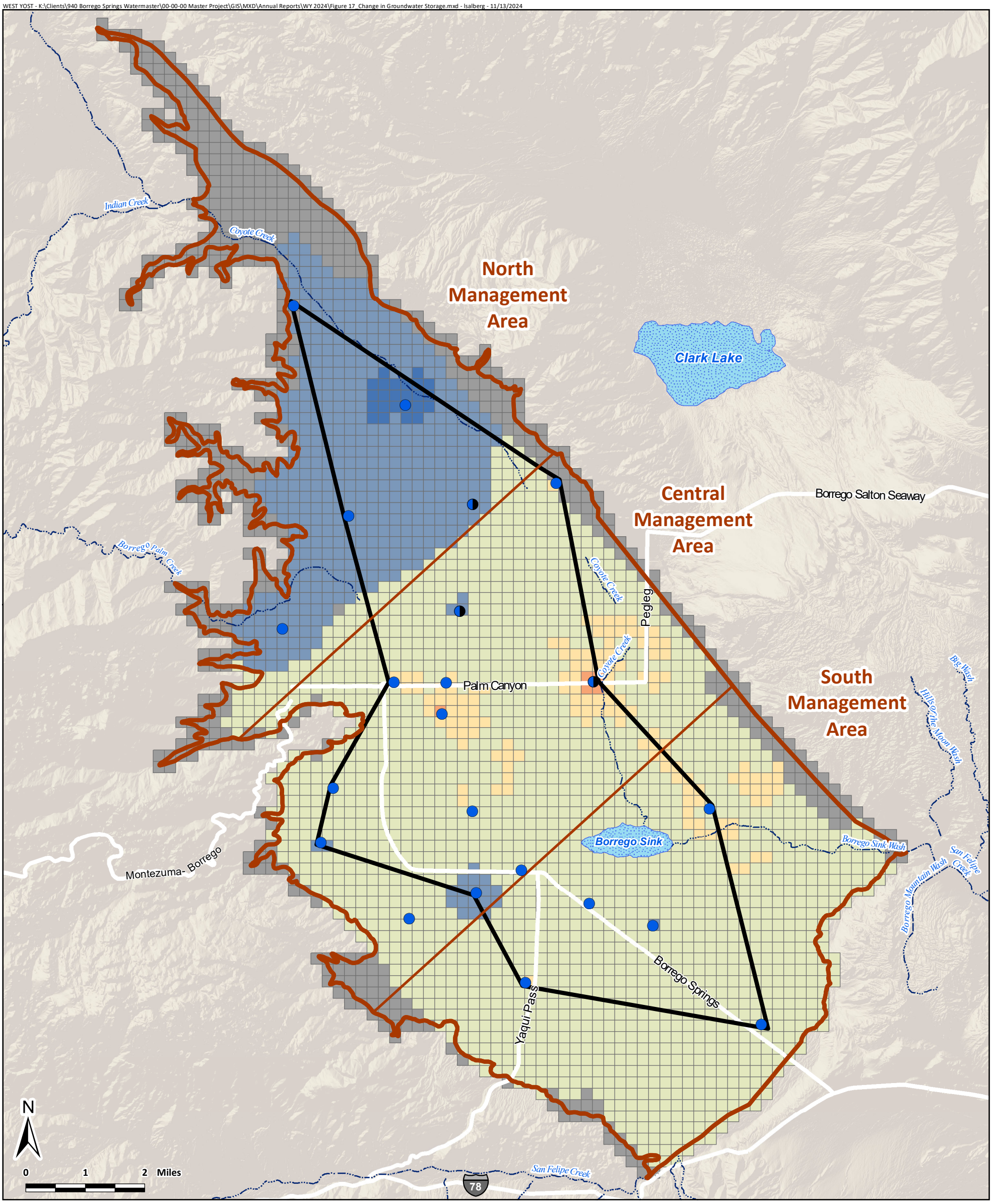
- The entry agreements are acceptable, or require minor modifications, and DWR will allow the well conversions and monitoring to be performed using grant funding. In this case, field work will be performed the well conversions. West Yost has scheduled Well Tec, the subcontractor, to perform the well conversions in January 2025 if DWR approves use the entry agreements.
- The entry agreements are not acceptable, in which case, the DWR would not allow grant funding to be used to perform this task. In this case, West Yost will work with BWD and DWR to request a budget transfer so that the funds for the abandoned well task could be reallocated for other work during the remainder of the grant funding period.

5-Year Assessment of the Groundwater Management Plan (GMP)

This project is being led by the Technical Consultant and is grant funded through March 31, 2025. The 5-year GMP Assessment Report is due June 25, 2026. Recent progress on this task includes:

- Continued work on elements that don't require DWR feedback to address.

WEST YOST - K:\Clients\940 Borrego Springs Watermaster\00-00-00 Master Project\GIS\MXD\Annual Reports\WY 2024\Figure 17_Change in Groundwater Storage.mxd - lsalberg - 11/13/2024



Groundwater Monitoring Wells with Measured Groundwater Elevation in Spring 2023 and Spring 2024

- True static groundwater elevation (ft-amsl)
- Estimated static groundwater elevation (ft-amsl)

Groundwater Storage Change

Spring 2023 to Spring 2024 (af)

> - 4	-1 to 0
-4 to -3	0
-3 to -2	0 to 1
-2 to -1	1 to 2

Other Features

- Storage Change Mask
- Borrego Springs Groundwater Subbasin (7-024.01)

Surface Water Features

- Stream Channel
- Dry Lake

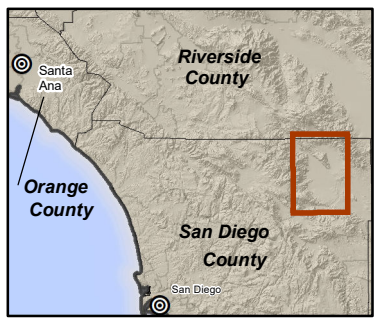


Figure 1

Change in Groundwater Storage
Spring 2023 to Spring 2024

Borrego Springs Watermaster
Borrego Springs Subbasin
2024 Annual Report

Prepared by:

WEST YOST

To: Board of Directors
From: Samantha Adams, Executive Director
Date: December 2, 2024
Subject: Executive Director Report - December 2024

Overview

The purpose of the monthly Executive Director (ED) Report is to share information with the Board on the status of key administrative items, including identifying recommended items for future discussion and action. At our December 5, 2024 Board meeting, I intend to report out on the following items. Some information for each item is provided herein, where available. Additional details and topics that arise after publishing this report may be presented during the meeting. December 2024 ED Report topics include:

- Financials and Pumping Assessments
- SGM Grant Status
- DWR Review of the Judgment and GMP
- BPA and Party Updates
- Upcoming Activities

Status Updates

Financials and Pumping Assessments

- Due to the timing of the rescheduled December meeting, the November 2024 financial report will not be ready in time to include in the December 5, 2024 agenda package. Instead, the November 2024 financial report will be included in the December 19, 2024 Special Meeting agenda package for review and approval.
- Invoices for the first installment of the WY 2025 Pumping Assessment were issued in November and are due to Watermaster by December 31, 2025.

SGM Grant Status

- Reimbursement Requests #4 and #5 have been approved and paid by DWR. Reimbursement #4 was two months behind schedule and #5 was one month ahead of schedule. Watermaster received a wire transfer with the funds from BWD on November 21st. Payments totaling about $335,000 were issued to Vendors to pay down outstanding balances.
- Reimbursement Request #6 was submitted to DWR at the end of August and is under review. The financial model assumed payment by March 2025.
- Reimbursement Request #7 was submitted to the DWR by BWD on November 30th.
- The new grant manager is still reviewing the Entry Permits for the well conversion project and we have not yet heard if there are any specific issues or changes required to proceed with the project. BWD is actively facilitating the conversation and has informed DWR of the urgency of completing their review.
- There may be a final opportunity to transfer budget between grant categories, if needed. For example, if we are not able to spend all of the funding available on monitoring well conversions, those funds could get transferred to another category to cover other grant reimbursable activities, such as an additional monitoring event in the spring (if done in March 2025).

- Staff will be working with BWD in December to start compiling information for a "Final Grant Report". It is typical for this to begin several months before the end of the grant period.

DWR Review of the Judgment and GMP

- No update available as of the writing of this memo.

BPA & Party Updates

- Three interventions by new Parties have been filed with the Court and are pending approval. The motions are set for hearing in Dept. CX104, Orange County Superior Court at 2 p.m. on February 13, 2025.

Upcoming Activities

- Annual Meter Verification Process - This is the final year that grant funding will be available to cover the costs of the annual meter verification process. Staff began outreach in November to complete the testing by the end of January 2025.

Borrego Springs Watermaster
Board of Directors Meeting
December 5, 2024
AGENDA ITEM VI

To: Board of Directors

From: Samantha Adams, Executive Director

Date: December 2, 2024

Subject: Establishing Agenda for December 19th Special Board Meeting

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Process

To set the agenda, the Board will:

1. Review the initial agenda topics planned by Staff, as listed below
2. Review the tentative topics planned by Staff for the January and February 2025 Board meetings and previously requested items by Board members, as listed below
3. List out additional items that have arisen during the December 5, 2024 Board meeting (such as during public comment)
4. Call on Directors to request additional items for consideration of inclusion on the December 19, 2024 or other future agenda
5. Consider motion(s) to approve the agenda (the agenda can be approved in a single motion or multiple motions to cover each item). The Agenda/items are approved by majority vote (3 of 5 directors)

Staff's Initial Agenda for December Special Meeting

The December 19, 2024 Special meeting (held virtually) will include some of the standard items of: public correspondence, consent calendar (meeting minutes, financial reports, staff invoices, etc.), verbal Staff and Chair reports, establishing the agenda for the subsequent meeting, Board member comments, listing of future meeting dates, and adjournment.

In addition to the standard items, the initial agenda planned by Staff for the Special December 2024 includes the following business items for consideration and possible action:

1. Consideration of Approval of the Redetermination of the Sustainable Yield (if not already approved at December Regular meeting)
2. Consideration of Approval for Scope and Budget for the Redetermination of the Sustainable Yield by 2030
3. Consideration of Approval of Carryover Analysis Findings

4. Consideration of Approval of WY 2025 Budget Amendment to Carry Forward Unspent Budget from WY 2024 for certain Grant-funded Work
5. DWR Review of 2020 GMP (if available)

Staff's Tentative Topics for January and February 2025

January Agenda Topics

1. Review WY 2024 Annual Report status and schedule
2. DWR Review of 2020 GMP (if available)
3. Status report on the 5-year Assessment of the GMP
4. Land IQ Presentation of Biological Restoration Project Results to Date
5. 1st Quarter WY 2025 Budget Status Review
6. Fall 2024 Semi-Annual Monitoring Report (if all data available)

February Agenda Topics

1. Hearing to review the 2024 Draft Annual Report to the DWR
2. DWR Review of 2020 GMP (if available)
3. Status report on the 5-year Assessment of the GMP
4. Land IQ Presentation of Biological Restoration Project