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Borrego Springs Watermaster

Technical Advisory Committee Meeting

May 1, 2025

Today's Agenda

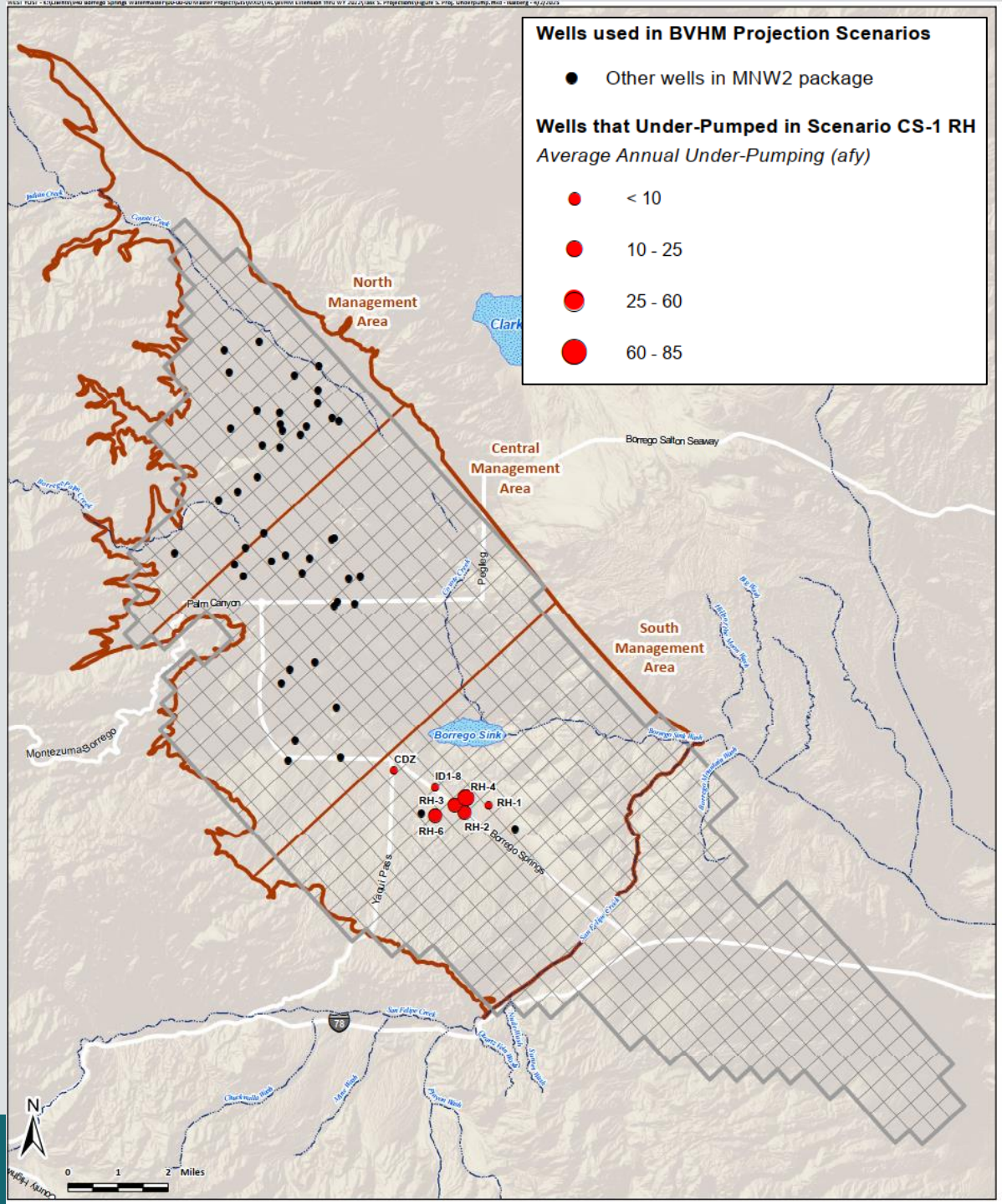
1. Public Comment
2. Use of the 2022 BVHM to Evaluate Future Sustainability
3. Scope of Work and Budget to Review and Use the GDE Study Report
4. Public Comment

Use of the BVHM to Evaluate Sustainability of Future Pumping

- BVHM is being used to evaluate long-term sustainability of future pumping in the Basin:
  - Trends in groundwater levels are stable or increasing by 2040 and thereafter
  - Groundwater levels are always at sufficient elevations to not cause Undesirable Results
- At the March 2025 TAC and Board meetings, we reported on a discrepancy in the BVHM where wells in the South MA were "under-pumping" during the model projections (*i.e.,* pumping less than their assigned rates)
- Since the March 2025 Board meeting, we:
  - Investigated the pumping discrepancy and identified the cause
  - Opined on how the BVHM projection results can/cannot be used
  - Prepared a scope, cost estimate, and schedule options to: (i) resolve the under-pumping discrepancy and (ii) complete the planned work to evaluate long-term sustainability
  - Prepared a TM to document the work performed and Staff recommendations
  - Presented results and recommendations to Watermaster Board in April → Received Board feedback

BVHM Discrepancy

- In the projection period, 7 model wells in South MA were unable to pump their assigned rates ("under-pumped")
  - All wells are screened across model Layer 3
- **Basin-wide**: Under-pumping is 3% of total pumping (-222 afy)
- **South MA**: Under-pumping is 42% of total pumping
  - Conclusion: This discrepancy should not be discounted because of the importance of future pumping from this portion of the Basin

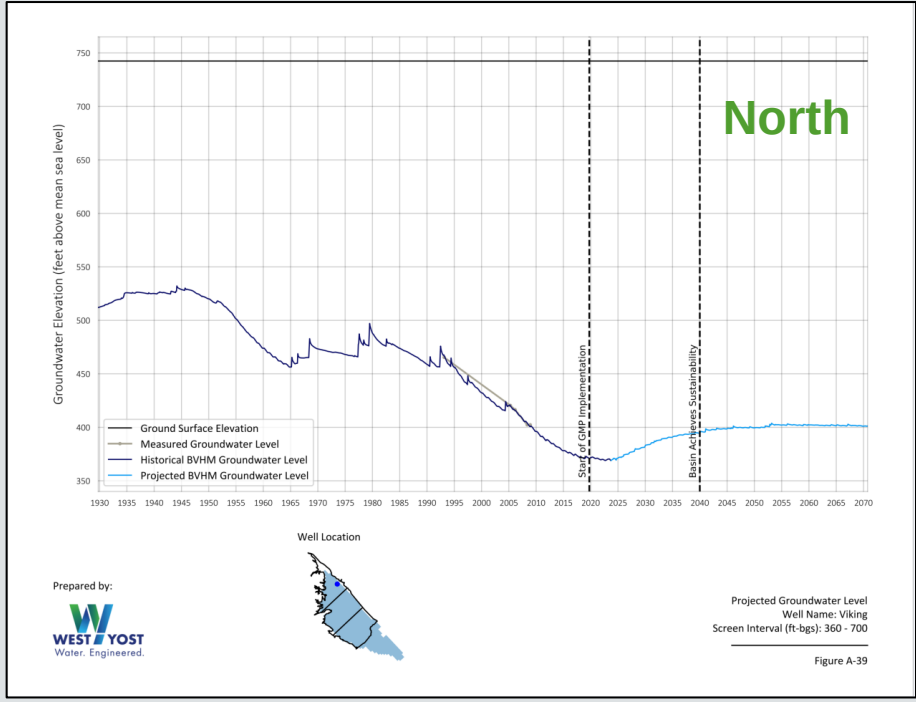


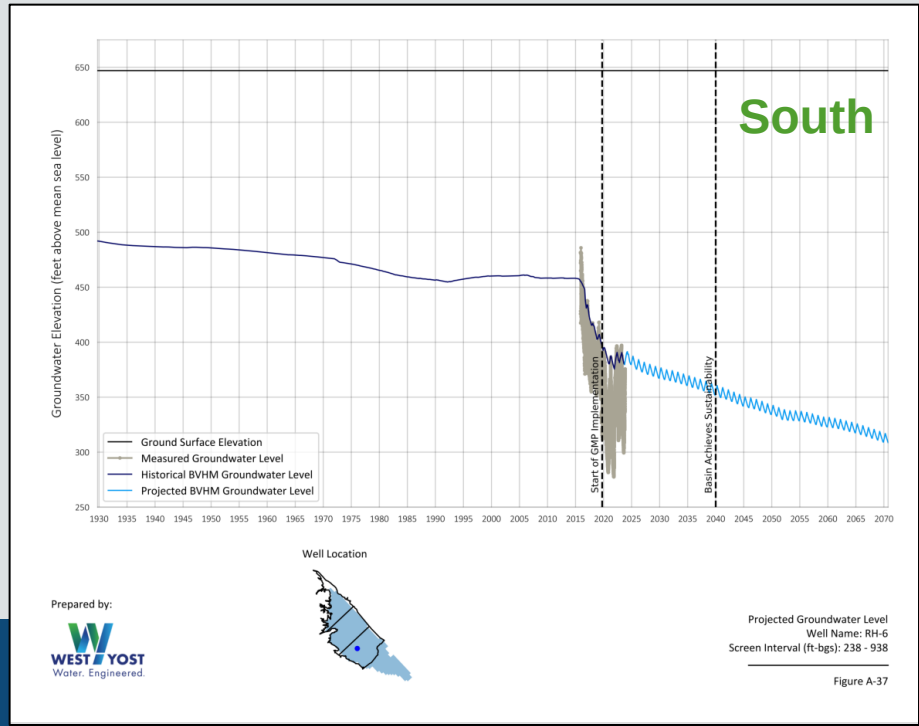
Attempts to Resolve BVHM Discrepancy

- Initially, we believed the discrepancy was related to inaccurate aquifer properties in Layer 3 of the South MA
- We manually adjusted aquifer properties in Layer 3 near the wells that under-pumped and re-ran BVHM from WY 1945-2070
- **Observations (from our manual adjustments to the Layer 3 aquifer properties):**
  - Reduced the under-pumping discrepancy
  - Significantly changed the simulated groundwater levels (*i.e.,* "de-calibrated" the BVHM)
- **Conclusions:**
  - The geology in South MA is complicated and likely not well represented in BVHM → hinders the ability to calibrate the BVHM in this area
  - The under-pumping discrepancy can't be fixed with manual adjustments to aquifer properties

Preliminary Interpretations of BVHM Projection Results

- BVHM can be used to infer **trends** in projected groundwater levels
- North Management Area:
  - Groundwater levels are likely to increase and stabilize by WY 2040
- South and Central Management Areas:
  - Groundwater levels may decline continuously through WY 2070





Limitations to Interpretation of BVHM Projection Results

- Due to under-pumping discrepancy, BVHM should not be used to infer the **magnitude** of projected changes in groundwater levels (especially in South Management Area)

- This limits the ability of the Watermaster to:
  - Evaluate sustainability of future pumping (i.e., can't compare projected groundwater-levels to Minimum Thresholds)
  - Use BVHM projections to support updates to Sustainable Management Criteria

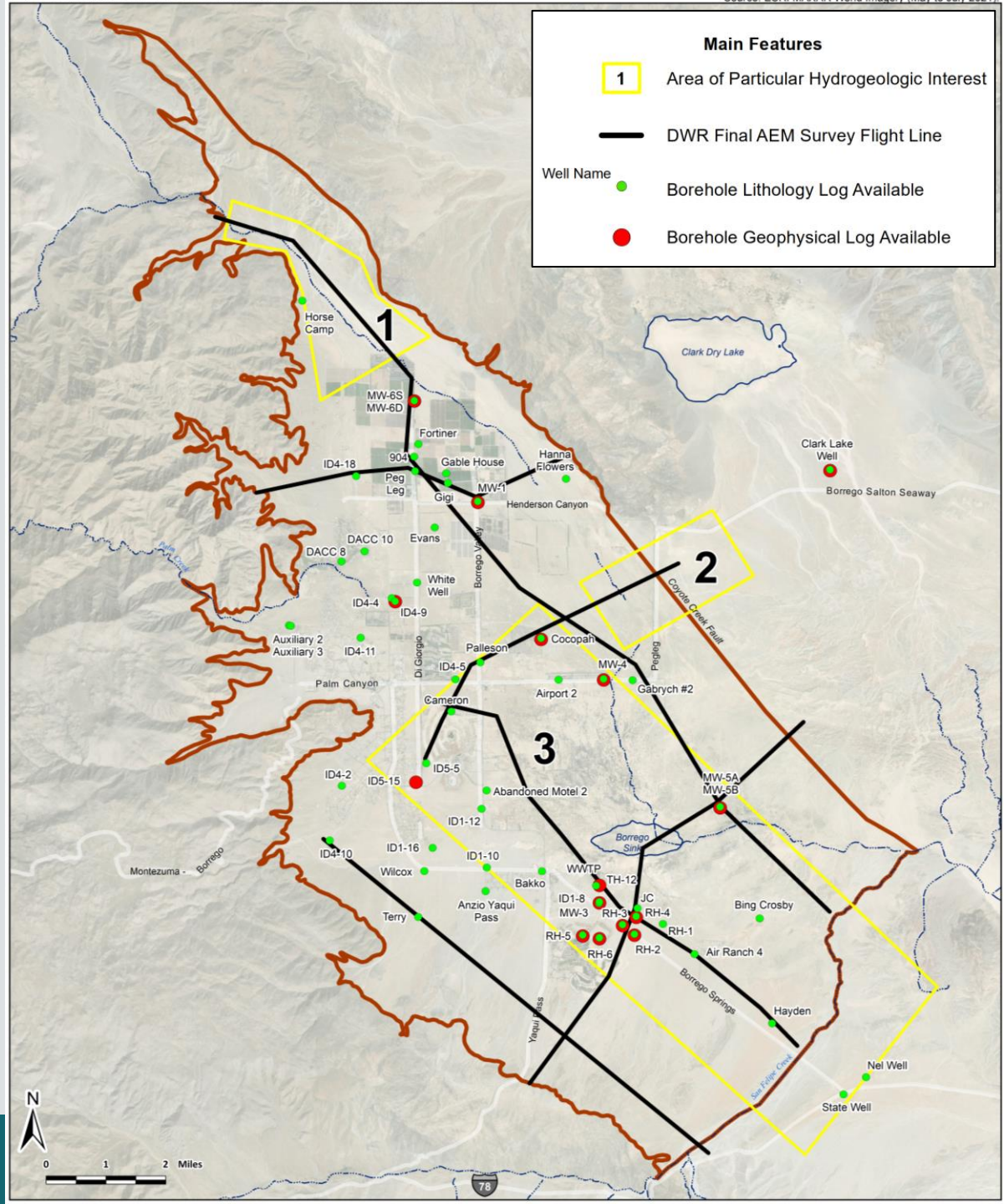
Recommendation to Resolve BVHM Discrepancy

Objective: Improve BVHM so it can confidently be used to evaluate the long-term sustainability of future pumping in the Basin

- **Task 1**. **Update the Hydrogeologic Conceptual Model** in the BVHM using new information
- **Task 2**. **Recalibrate the BVHM** → Under-pumping discrepancy should be eliminated
- **Task 3**. **Evaluate future Basin conditions under variable future climate conditions** (2023-2070) using the recalibrated BVHM
- **Task 4**. **Characterize the sustainability of future pumping in the Basin** by interpreting the Task 3 results:
  - Trends in groundwater levels and storage are mostly stable or increasing by WY 2040
  - Groundwater levels do not cause Undesirable Results (compare to Minimum Thresholds)

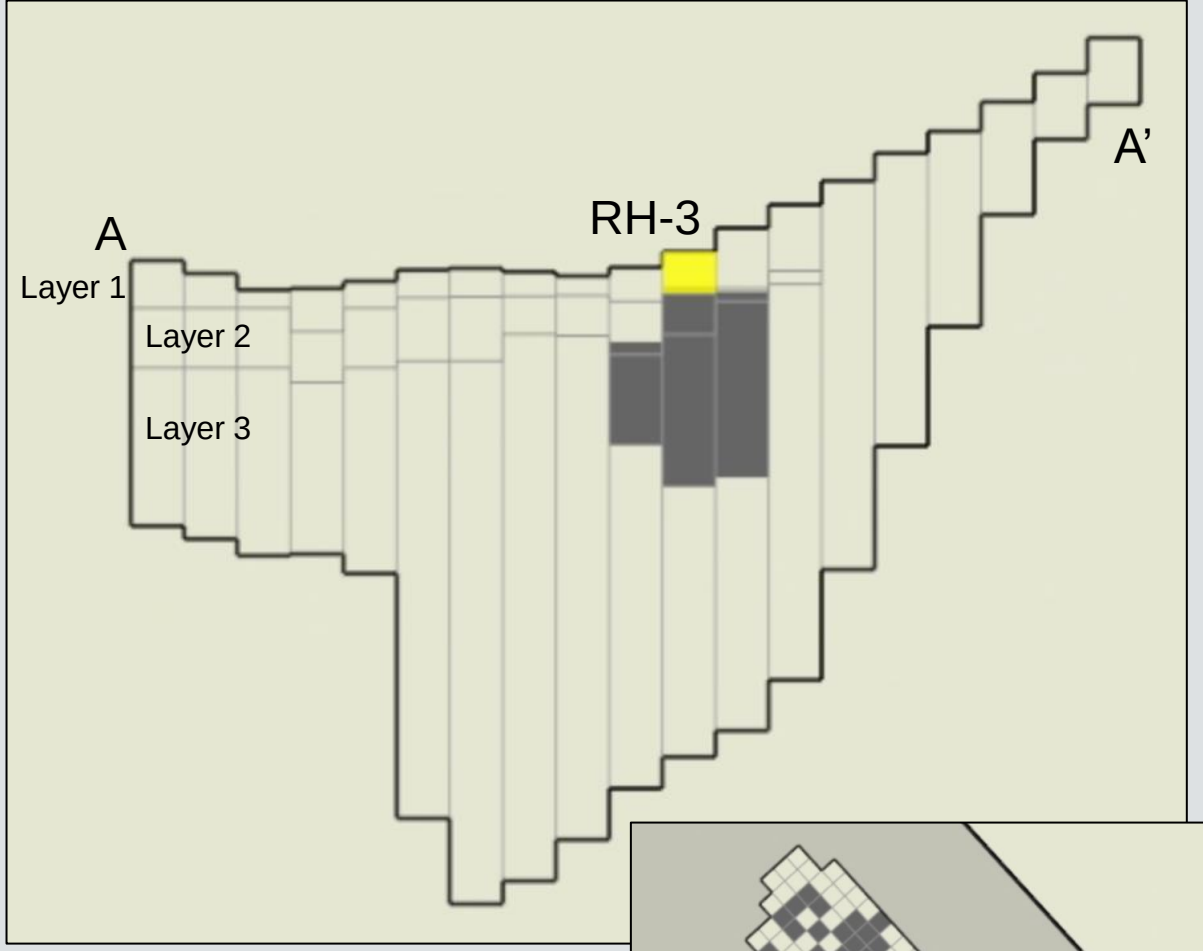
Task 1. Update HCM

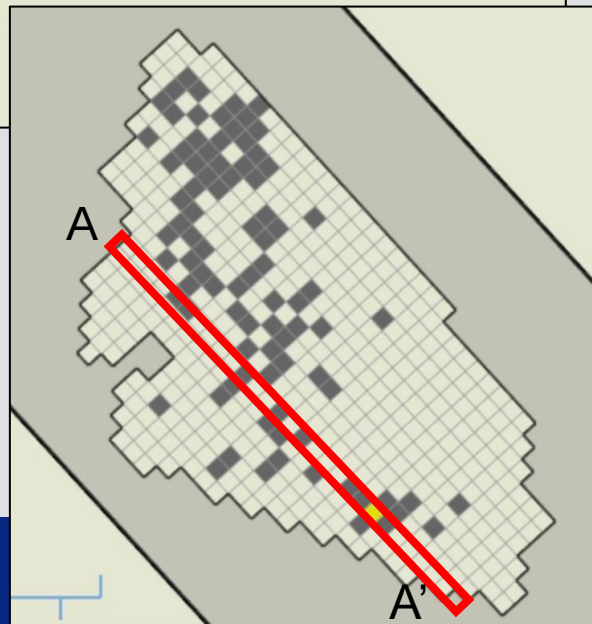
- Review new data/information available since USGS initially developed HCM:
  - AEM Survey Data
  - Well construction information from the Rams Hill wells
  - Pump test results
  - Groundwater-level data
- Optional task: Site-specific investigation to improve understanding
  - Controlled stress testing with monitoring



Task 1. Update HCM

- Compare New Information to Current HCM → Should the HCM be updated?
  - Model layering vs. AEM data vs. Well logs
  - Model parameters vs. Pumping test results
  - Is there evidence of a groundwater-flow barrier? [Go to HydroDaVE]
- Propose recommended updates to TAC
- Update HCM in BVHM
- Run BVHM from 1945-2070, compare water budgets, and check that wells pumped their assigned rates
- Document results





Scope of Work to Resolve BVHM Discrepancy

- **Task 2**. **Recalibrate the BVHM** → Under-pumping discrepancy should be eliminated
- **Task 3**. **Evaluate future Basin conditions under variable future climate conditions** (2023-2070) using the recalibrated BVHM
- **Task 4**. **Characterize the sustainability of future pumping in the Basin** by interpreting the Task 3 results:
  - Trends in groundwater levels and storage are mostly stable or increasing by WY 2040
  - Groundwater levels do not cause Undesirable Results (compare to Minimum Thresholds)

Potential Outcomes

- **Future pumping is deemed sustainable and no additional BVHM simulations are needed.** In this case, the BVHM projections would show:
  - Stable or increasing groundwater levels after WY 2040
  - Absence of Undesirable Results prior to/after WY 2040
- **Future pumping is deemed <u>not</u> sustainable.** In this case, the BVHM projections would show:
  - Continuous decline in groundwater levels after WY 2040
  - Occurrence of Undesirable Results prior to/after WY 2040
  - If future pumping is not sustainable, Watermaster must develop policies or management actions to achieve sustainability. The BVHM would be used to simulate the effects of the policies or management actions.

Estimated Cost of Recommended Actions

- Cost to perform recommended scope of work ranges from $240,000 to $260,000
  - Optional $20,000 site investigation
- SGM grant funding has expired, but there may be other grant funding options available in the future
- Potential to use funding available in WY 2025 Budget

Schedule Options

1. Perform Tasks 1-4 immediately in WY 2025 – 2026
2. Perform Tasks 1-4 incrementally as part of the redetermination of the 2030 Sustainable Yield

Each option has advantages/disadvantages for the Board to consider

Perform All Tasks in WY 2025-26

Advantages:

- Quicker improvements and solutions
- More confident use of BVHM to assess sustainability and test policies
- More confident report to the DWR on the likelihood of achieving sustainability by 2040
- Lower longer-term costs

Disadvantages:

- Higher immediate costs
- Unlikely to acquire additional grant funding due to immediate schedule
- Additional BVHM recalibration may be needed (based on results of scope to redetermine 2030 Sustainable Yield)

Perform Tasks Incrementally with Redetermination of 2030 Sustainable Yield

Advantages:

- Lower immediate costs
- More likely to acquire grant funding
- May be more efficient and avoids multiple BVHM recalibrations

Disadvantages:

- Immediate usefulness of BVHM is limited
- Due to greater uncertainty in future groundwater conditions, more conservative and protective management strategies may be needed
- Higher long-term costs (inflation)

Board Feedback from April 16th Meeting

- Based on trends in groundwater-levels from preliminary model results, Management Areas may need to be managed differently
- Any additional modeling efforts should consider different scenarios for *where* pumping may occur
- Recommendation to use the BVHM in its current condition and modify projected pumping:
  - Shift some BWD pumping from Central to the North Management Area to determine if sustainability can be achieved in both Management Areas
  - Reduce pumping of Rams Hill wells by ~200 afy to determine if these wells can support future pumping
- Concern about costs to pumpers, since there is no additional grant funding

Additional Feedback

- Additional Board questions:
  - What are the drivers of the projected increase in pumping from CMA?
  - What are the “new information” available to update the HCM in the SMA?
- TAC member recommendation: Discuss MF-OWHM with the USGS developer
  - New versions of MF-OWHM may have corrected issues in the MNW2 package

Questions for the TAC

- **Should the pumping discrepancy in the BVHM be fixed?**
  - If so:
    - Do you agree/disagree with the methods recommended?
    - When should discrepancy be fixed (in WY 2026 or over the period to redetermine 2030 Sustainable Yield)?
  - If not, why?
- **Should the *2022 BVHM* be used immediately (before fixing discrepancy) to test future pumping plans?**
- **Any other recommendations?**

Next Steps

- **Today** - TAC provides input on path forward to address BVHM discrepancy. Recommendation will be used to develop an integrated scope, schedule, and budget for WY 2026 to:
  - Address DWR recommended corrective actions
  - Finish the 5-year GMP Assessment Report
  - Begin the scope to redetermine the 2030 Sustainable Yield
- **May 7th –** deadline for written TAC feedback
- **May 21, 2025 Board Meeting** – draft WY 2026 Budget presented to the Board

Today's Agenda

1. Public Comment
2. Use of the 2022 BVHM to Evaluate Future Sustainability
3. **Scope of Work and Budget to Review and Use the GDE Study Report**
4. Public Comment

Background

- Mesquite Bosque is not considered a GDE in the GMP
  - Rooting depths disconnected from the regional aquifer by ~1985 due to groundwater-level declines
- A GDE Study was performed by UCI to generate more information on the groundwater dependency of the Mesquite Bosque
- The GDE Study is “new information” that could be used to:
  - Update the BVHM and improve its ability to simulate groundwater ET by the Bosque
  - Update the GMP regarding the Bosque as a GDE and user of Basin groundwater
- GDE Study has not yet been reviewed by the Watermaster or determined to be “best available science”

Best Available Science

- Watermaster policy on Best Available Science states:
  - Technical information not generated by the Watermaster can be used to inform its policy decisions
  - Watermaster shouldn't rely on outside technical information without review and recommendation by the TAC, EWG, and/or Technical Consultant

- Draft scope of work and budget → GDE Study and its results must be evaluated before using the information to take action or inform Watermaster policy

Task 1: Evaluate the GDE Study Report as "Best Available Science"

Objective: Determine if the GDE Study Report constitutes "best available science" that can be relied upon by the Watermaster to take action/make policy decisions

Task 1 scope includes:

Task 1.1 – Review GDE Study Report and Prepare Comments

Task 1.2 – Briefing with UCI (and optional field trip)

Task 1.3 – Prepare TAC Recommendation Report

Schedule: October 2025 through January 2026

Task 2: Evaluate the Need for BVHM Updates for Simulation of Groundwater ET

Objective: Determine if new information in GDE Study Report should be used to improve the BVHM and its ability to estimate the water budget

Task 2 scope includes:

Task 2.1 – Describe how the FMP Simulates Groundwater ET

Task 2.2 – Compare FMP Estimates of Groundwater ET to GDE Study Results

Task 2.3 – Prepare TAC Recommendation Report

Schedule: January through April 2026

Cost Estimate

Task 1 = $28,224

Task 2 = $36,953

Total = $65,177

* Total costs are about $25,000 more than original cost estimate due to Task 1

Table 1. Cost Estimate to to Review and Use the GDE Study Report

Task No.	Task / Sub-Task	Labor Hours and Cost							
		Executive Director	Lead Technical Consultant	Principal Sci/Eng. II	Associate Sci/Goel/Eng. I	Task Repetition Multiplier	Person Hours	Cost	
								Sub-Task	Total
1	**Evaluate the GDE Study Report as "Best Available Science"**	**6**	**42**	**0**	**52**		**100**		**$ 28,224**
1.1	***Review GDE Study Report and Prepare Comments***	***1***	***16.5***	***0***	***16***	***1***	***33.5***	***$9,513***	
1.1.1	Distribute GDE Study Report to TAC with instructions to review and comment		0.5			1	0.5	$160	
1.1.2	Review GDE Study Report		12		12	1	24	$6,731	
1.1.3	Prepare comments	1	4		4	1	9	$2,621	
1.2	***Briefing with UCI***	***0***	***9.5***	***0***	***12***	***1***	***21.5***	***$5,929***	
1.2.1	Prepare/distribute agenda packet and notice; update website		1		2	1	3	$801	
1.2.2	Conduct meeting with optional field trip		8		8	1	16	$4,487	
1.2.3	Prepare meeting minutes and update website		0.5		2	1	2.5	$640	
1.3	***Prepare TAC/TC Recommendation Reports***	***5***	***16***	***0***	***24***	***1***	***45***	***$12,783***	
1.3.1	Compile TAC comments; Prepare draft TC and TAC Recommendation reports	2	8		12	1	22	$6,203	
1.3.2	Conduct TAC meeting to solict TAC feedback on TAC Recommendation report	2	4		4	1	10	$2,999	
1.3.3	Address TAC comments; Prepare final TC and TAC recommendation reports	1	4		8	1	13	$3,581	
2	**Evaluate the Need for BVHM Updates for Simulation of Groundwater ET**	**7.5**	**29**	**16**	**82**		**134.5**		**$ 36,953**
2.1	***Describe how the FMP Simulates Groundwater ET***	***0***	***1***	***6***	***24***	***1***	***31***	***$8,006***	
2.1.1	Perform research on how FMP simulates groundwater ET		1	4	16	1	21	$5,444	
2.1.2	Run BVHM over 1945-2022			2	8	1	10	$2,562	
2.2	***Compare FMP Estimates of Groundwater ET to GDE Study Results***	***4.5***	***13***	***7***	***30***	***1***	***54.5***	***$15,318***	
2.2.1	Compare FMP vs GDE Study for groundwater ET; Prepare TM and distribute to TAC	2	8	6	24	1	40	$11,008	
2.2.2	Conduct TAC meeting to solict TAC feedback on TM	2	4		4	1	10	$2,999	
2.2.3	Finalize TM	0.5	1	1	2	1	4.5	$1,311	
2.3	***Prepare TAC/TC Recommendation Reports***	***3***	***15***	***3***	***28***	***1***	***49***	***$13,629***	
2.3.1	Compile TAC comments; Prepare draft TC and TAC Recommendation reports	1	8	2	16	1	27	$7,427	
2.3.2	Conduct TAC meeting to solict TAC feedback on TAC Recommendation report	1	3		4	1	8	$2,300	
2.3.3	Address TAC comments; Prepare final TC and TAC recommendation reports	1	4	1	8	1	14	$3,902	
	Total	**13.5**	**71**	**16**	**134**		**235**		**$ 65,177**

TAC Feedback on the Scope, Budget, and Schedule

- Do you agree/disagree with the scope, budget, and schedule presented?
- Any other recommendations?

Next Steps

- **Today** - TAC provides verbal input on draft scope and budget for WY 2026
- **May 7th –** deadline for written TAC feedback
- **May 16th** – Revised draft WY 2026 scope and budget to review and use the GDE Study Report published as part of the draft WY 2026 Budget
- **May 21, 2025 Board Meeting** – draft WY 2026 Budget presented to the Board

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Next TAC Meeting: June/July

Agenda:

- TBD based on Board-approved WY 2026 budget and path forward using 2022 BVHM