Borrego Springs Watermaster Stakeholder Open House

November 7, 2024

Meet the Team

Samantha Adams,
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Agenda

1:00 – 1:15pm – Welcome and Introductions

1:15 - 2:30pm – Presentation and Q&A

2:30pm – 2:40pm – Intermission

2:40 – 2:45pm – Welcome and Introductions

2:45 – 4pm – Presentation and Q&A

Presentation Outline

1. Overview of the Watermaster Board, TAC, and the Borrego Springs Subbasin
2. Summarize the objectives, methods, and results for the **Redetermination of the 2025 Sustainable Yield**
3. Q&A with public stakeholders on the 2025 Sustainable Yield
   - Questions and feedback will be summarized at November Board meeting this evening

Borrego Springs Watermaster

The Watermaster is a committee of representatives of Parties to the Judgment

The Judgment defines the groundwater pumping rights within the Borrego Springs Subbasin and, together with the Groundwater Management Plan (GMP), is the framework for achieving sustainable groundwater management

Watermaster Board Members:

- Chair Dave Duncan – representing BWD
- Vice Chair Tyler Bilyk – representing agricultural interests
- Shannon Smith – representing Recreational Sector
- Mark Jorgensen – representing community of Borrego Springs
- Jim Bennett – representing County of San Diego

Watermaster Meetings

- The Watermaster Board meets monthly
- Meetings are open to the public
- Agenda packets, presentations, and recordings are posted to the Watermaster website

Check out the Watermaster website!

https://borregospringswatermaster.com/watermaster-board

Technical Advisory Committee (TAC)

- The **TAC** is a committee of technical experts that study the technical aspects of the Basin and issue recommendations to the Board
- TAC members must be:
  - Hired by a Party, County of San Diego, or the community
  - A licensed professional in related field (*i.e.,* hydrogeologist, engineer, etc.)

TAC Members:

- Bob Wagner, PE – representing AAWARE (coalition of Ag pumpers)
- Tom Watson, PG – representing Rams Hill
- Trey Driscoll, PG, CHG – representing BWD
- Jim Bennett, PG, CHG – representing County of San Diego
- John Peterson, PG, CHG – representing Roadrunner Club
- Dr. Russell Detwiler – representing the Borrego Springs Community

TAC Meetings

- The TAC holds about four (4) meetings per year
  - Also holds *Ad-Hoc* TAC meetings at the discretion of the Board, TAC, and Technical Consultant
- Meetings are open to the public
- Agenda packets, presentations, and recordings are posted to the TAC webpage

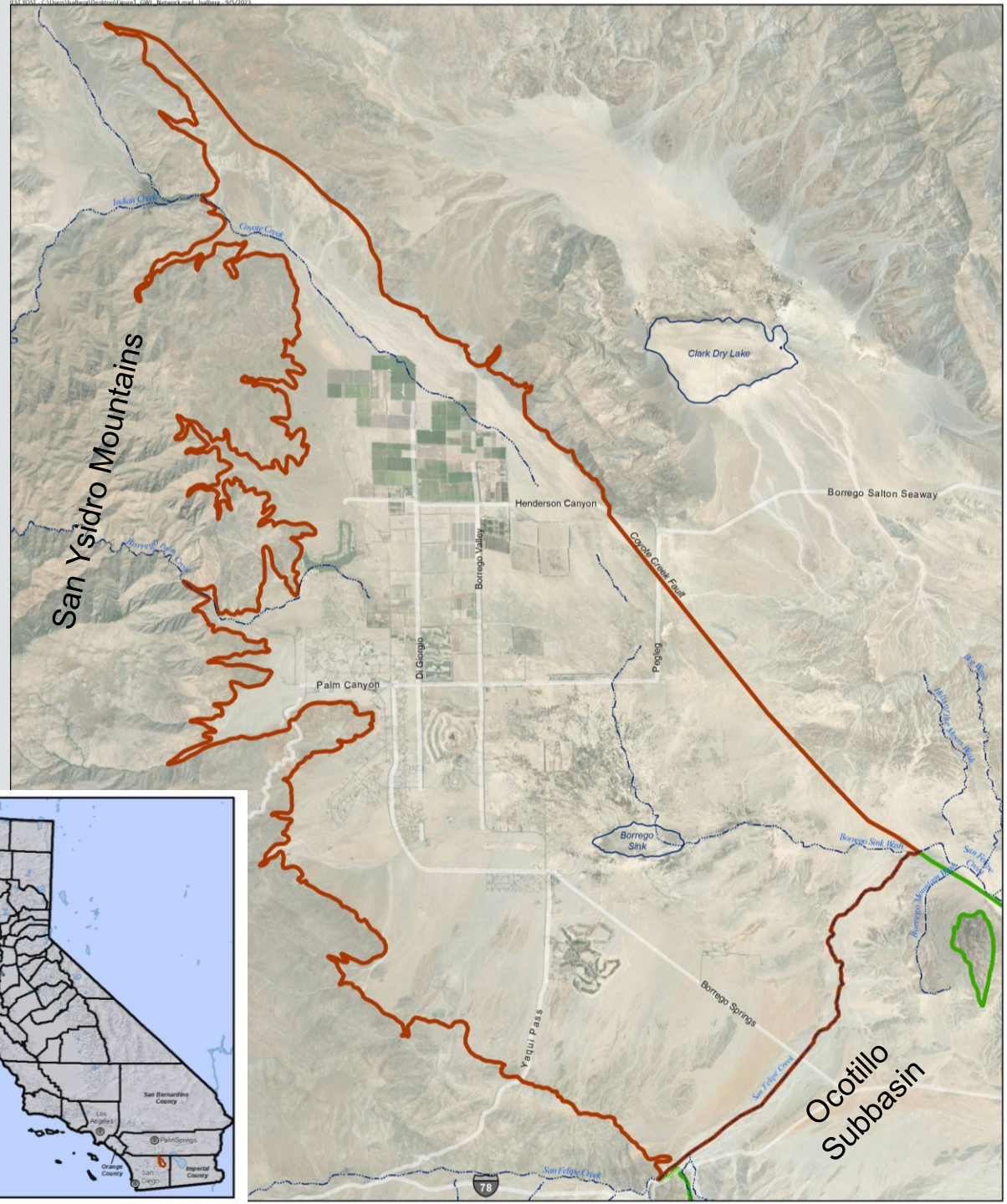
Check out the TAC webpage!

Technical Advisory Committee – Borrego Springs Watermaster

Borrego Springs Subbasin

Groundwater is the only water supply in the Borrego Valley

- Subbasin covers ~100 square miles
- Surrounded by the Anza Borrego Desert State Park
- 2,700 full-time residents; SDAC
- Declining groundwater levels since 1960s
- DWR defined the Subbasin as "Critically Overdrafted“
- Under SGMA, the Subbasin must develop and implement a groundwater sustainability plan

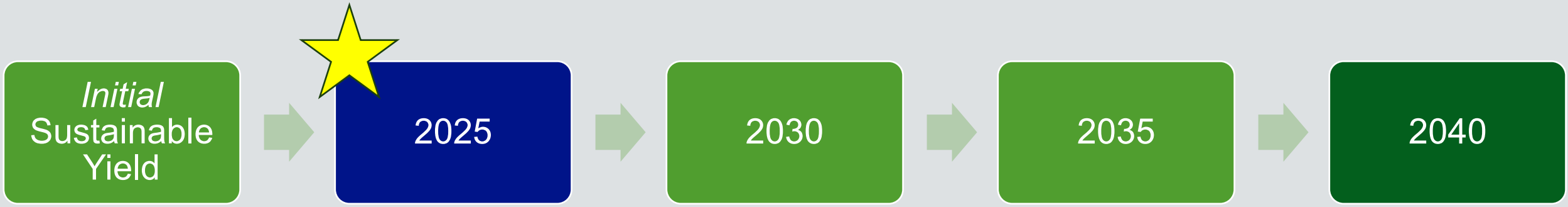


What is the Sustainable Yield?

- **Sustainable Yield** = Average annual volume of groundwater that can be pumped from the Basin without causing an Undesirable Result
  - The main Undesirable Result to avoid in this effort → Chronic overdraft of the Basin
- In the Judgment, the main management activity to achieve sustainability is the "Rampdown" of pumping from 24,335 afy to the Sustainable Yield by 2040
  - *Initial* Sustainable Yield = 5,700 afy
  - **75% reduction in pumping by 2040**
- The Judgment and GMP provide for other activities to monitor for and address Undesirable Results that may arise or be predicted from pumping under the Rampdown

Schedule to Redetermine the Sustainable Yield

- Judgment requires the Sustainable Yield be redetermined every 5 years thru 2040
- Sustainable Yield sets the “Rampdown” schedule for reducing pumping



- 5,700 afy
- Established for WY 2020-25
- Defined in the Judgment

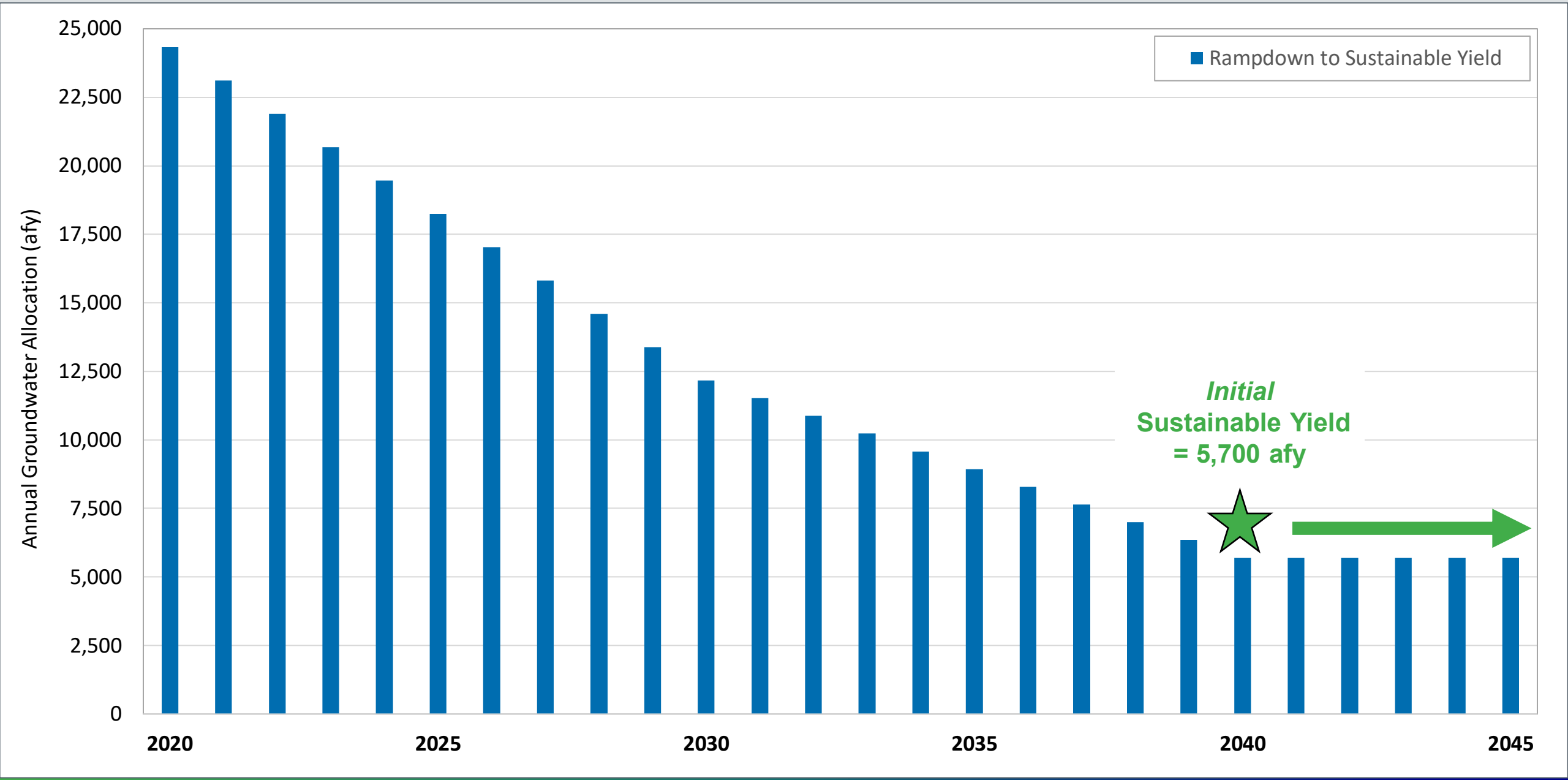
- 1st redetermination
- Board must approve by January 1, 2025

- 2nd redetermination
- Board must approve by January 1, 2030

- 3rd redetermination
- Board must approve by January 1, 2035

- Pumping must be reduced to the 2035 Sustainable Yield by 2040 and forward

Rampdown to *Initial* Sustainable Yield



How is the Sustainable Yield calculated?

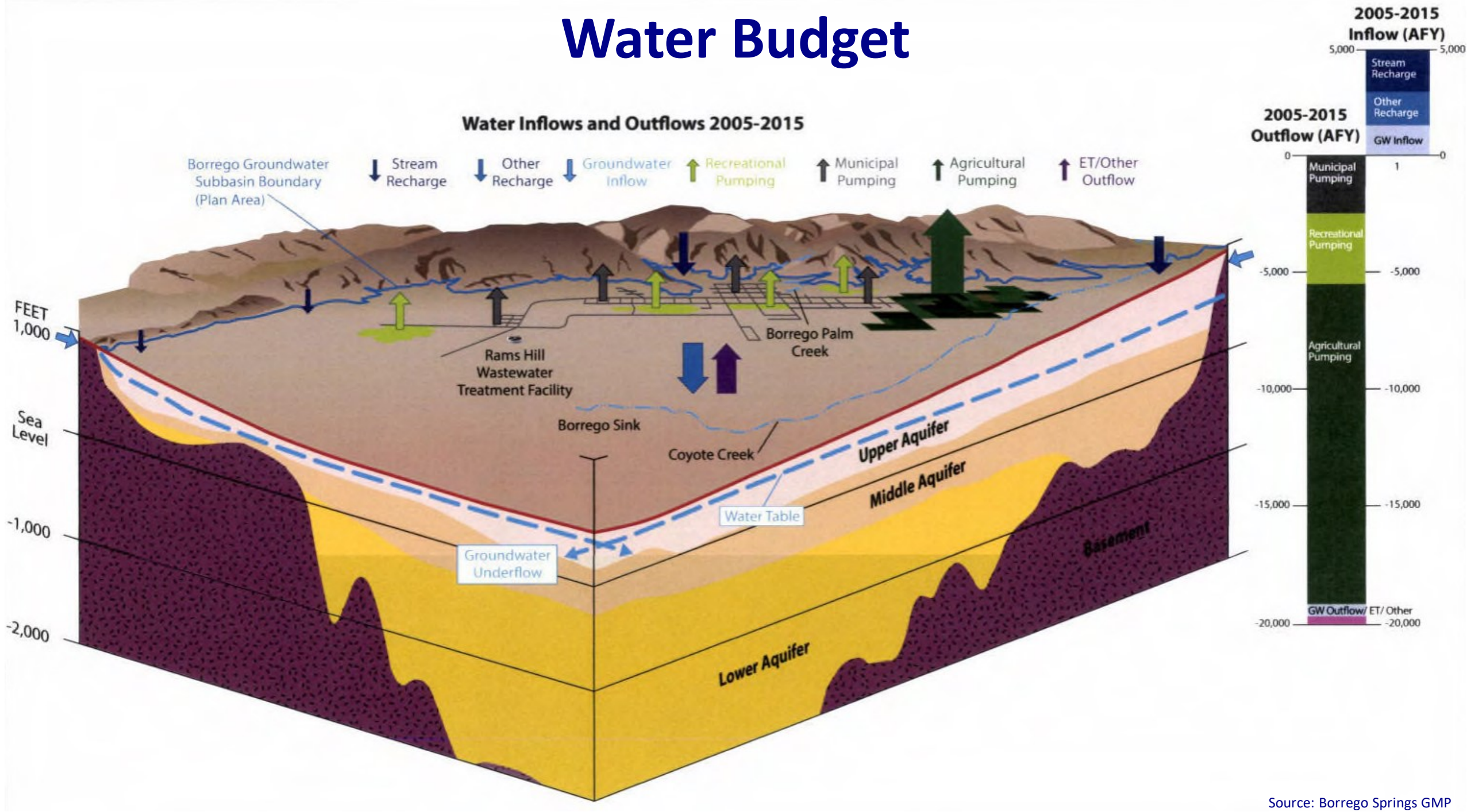
The Sustainable Yield is calculated using the hydrologic concept of net recharge, which is derived from the water budget of the Borrego Springs Subbasin

Sustainable Yield = Natural Inflows – Natural Outflows

- Streambed recharge
- Subsurface inflow
- Return flows from irrigation/precipitation

- ET of shallow groundwater
- Subsurface outflows
- *Groundwater pumping is **not** a Natural Outflow*

Water Budget



Source: Borrego Springs GMP

BVHM is used to Estimate the Water Budget of the Basin → Sustainable Yield

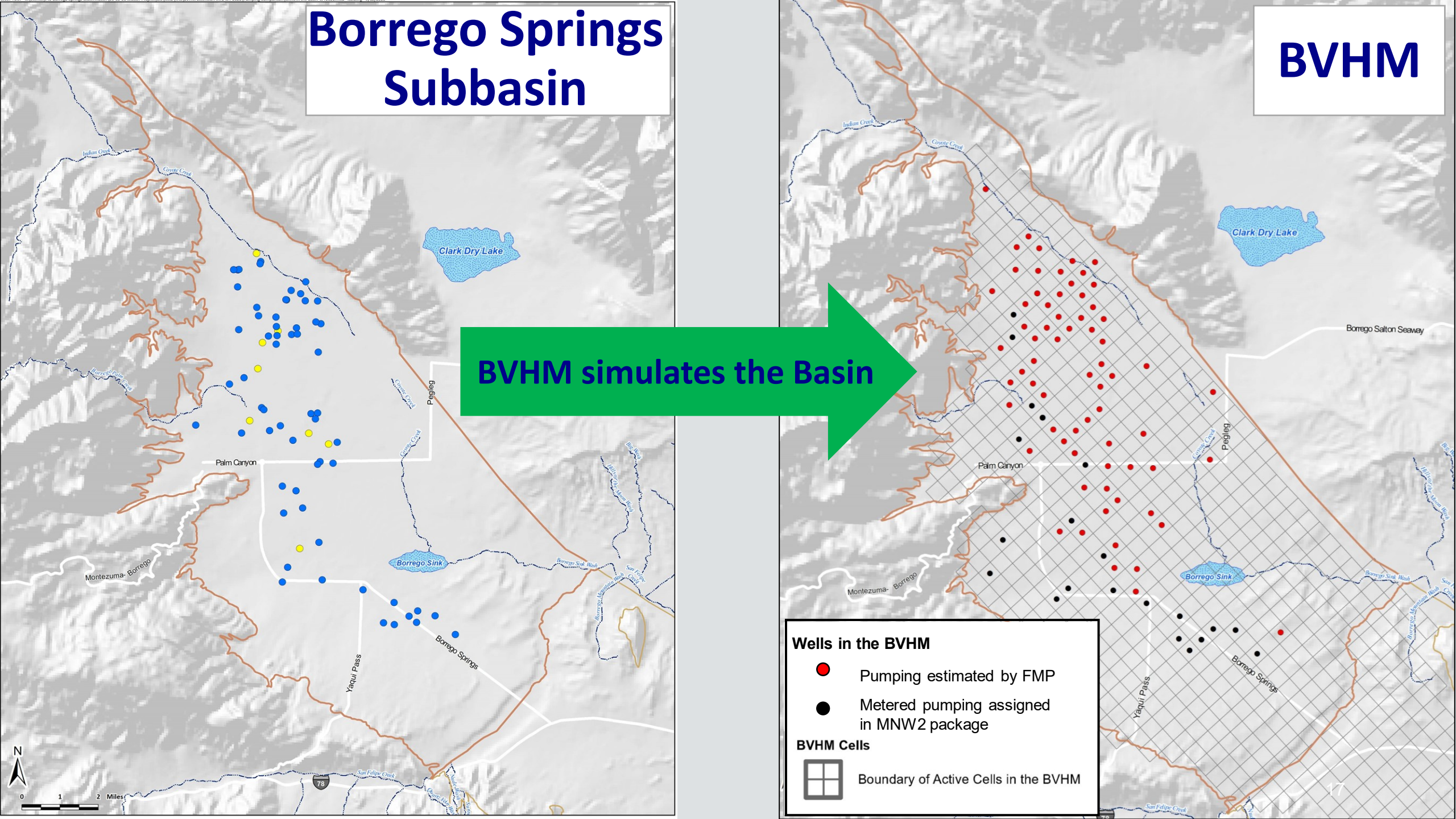
- The **Borrego Valley Hydrologic Model** (BVHM) is a numerical groundwater-flow model that simulates the hydrology of the Basin:
  - Inflows and Outflows
  - Groundwater levels and groundwater in storage
- Judgment requires the redetermination of the Sustainable Yield by:
  - Data collection
  - Refinement of the BVHM
  - Use of model runs to redetermine the Sustainable Yield

The BVHM has been updated and improved over time

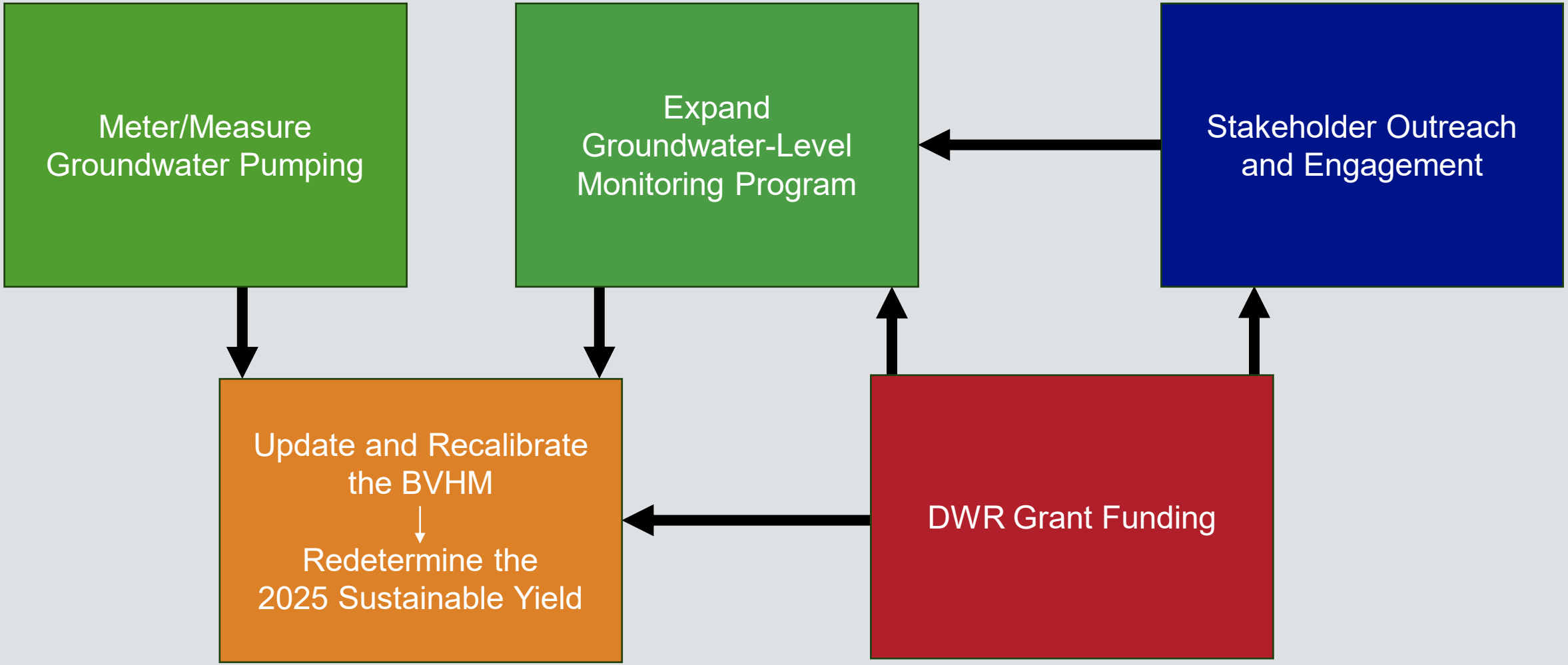
Initial BVHM – developed by the USGS with simulation period of October 1929 through December 2010

2016 BVHM – version extended through September 2016 →
Used to set *Initial* Sustainable Yield

2022 BVHM – version extended through WY 2022 →
Used to recommend 2025 Sustainable Yield


Borrego Springs Subbasin
BVHM
BVHM simulates the Basin
Clark Dry Lake
Palm Canyon
Pegleg
Borrego Sink
Borrego Springs
Yaqui Pass
Montezuma- Borrego
Borrego Salton Seaway
Wells in the BVHM
Pumping estimated by FMP
Metered pumping assigned in MNW2 package
BVHM Cells
Boundary of Active Cells in the BVHM
N
0 1 2 Miles

Overview of Work Performed



Scope of Work was executed by Technical Consultant with TAC/Board oversight

- Collaborative effort:
  - 12 TAC meetings
  - Monthly updates at Board meetings
- General process:
  - Technical Consultant performs technical work and publishes task memoranda
  - TAC reviews and comments on:
    - Technical methods
    - Results, conclusions, and recommendations
- TAC and Technical Consultant prepare separate recommendations for the Board

Memos for each task available on the TAC website:

The scope of work was executed by the Watermaster's Technical Consultant in collaboration with the TAC and the Watermaster Board. The results and conclusions of the work have been documented in the *2025 Sustainable Yield Technical Report*. Each memo documenting each completed task is also listed below:

- Task 1 – *Compare FMP-Estimated Pumping to Actual Pumping for WY 2022*
- Task 2 – *Update Water-Use Factors in the FMP*
- Task 3 – *Correct Errors Identified in the 2021 BVHM*
- Task 4 – *Perform Model Recalibration*
  - Model Recalibration Methods
  - Preparatory Work for *Task 4 – Model Recalibration*
  - Method for using OpenET as a validation check on the FMP
  - Results of FMP Calibration
  - Task 4 – Model Calibration and Redetermination of the 2025 Sustainable Yield
- Task 5 – *Determine the Sustainable Yield*
  - Time Period to Evaluate the Sustainable Yield
  - Methods to Determine the Sustainable Yield

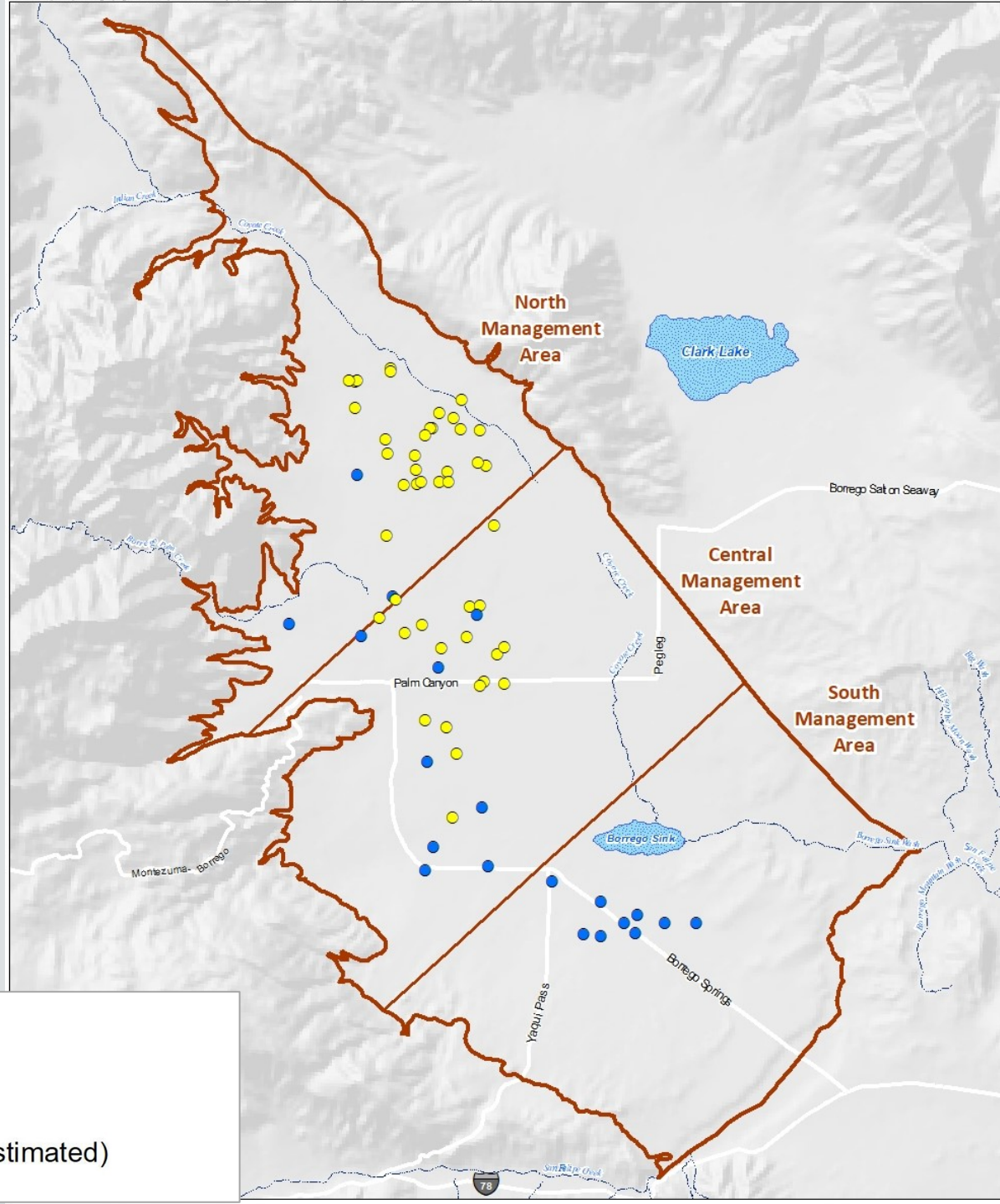
Objective #1: Improve the ability of the BVHM to estimate groundwater pumping

- Prior work indicated BVHM under-estimates groundwater pumping by up to 42%
- Used pumping data from Watermaster well metering program to compare **metered pumping** vs. **model-estimated pumping**
- Adjusted model parameters to get the best match
- Aimed for model-estimated pumping within +/- 10% of metered pumping

Initial Well Metering

2020

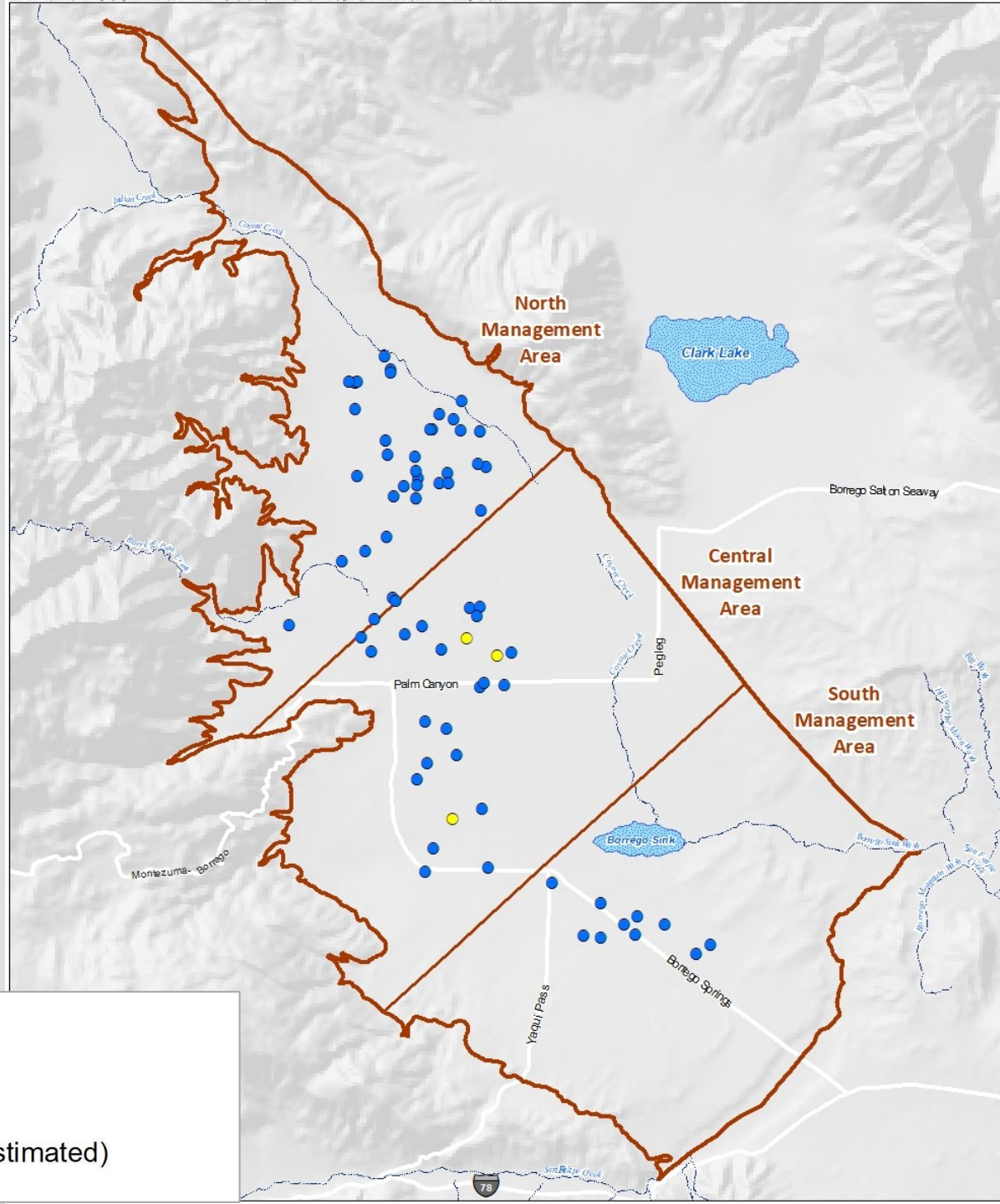
- Majority of wells are unmetered
- Metered wells are:
  - Municipal
  - Recreational (golf courses)
- Pumping from un-metered wells was estimated



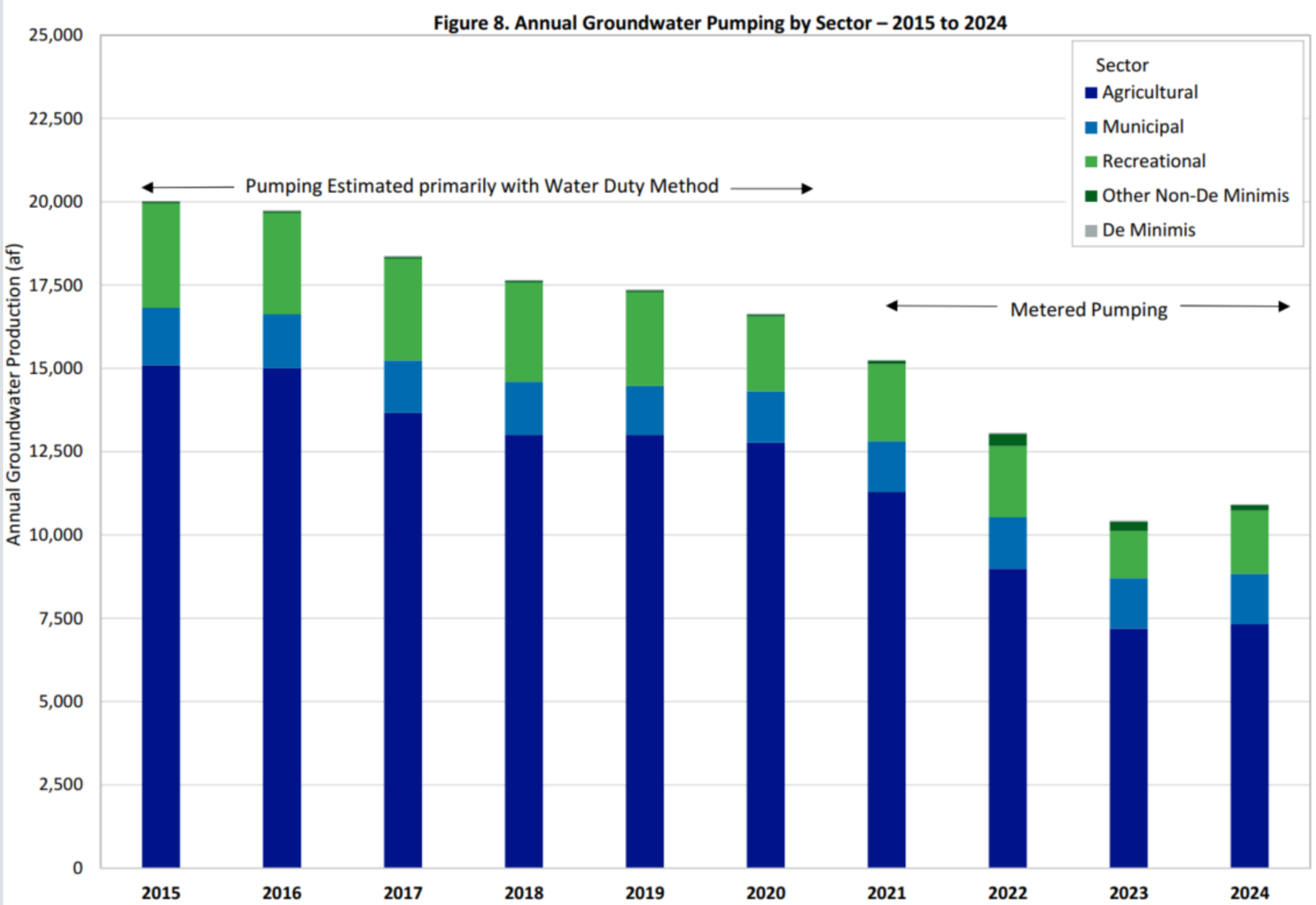
Current Well Metering

WY 2024

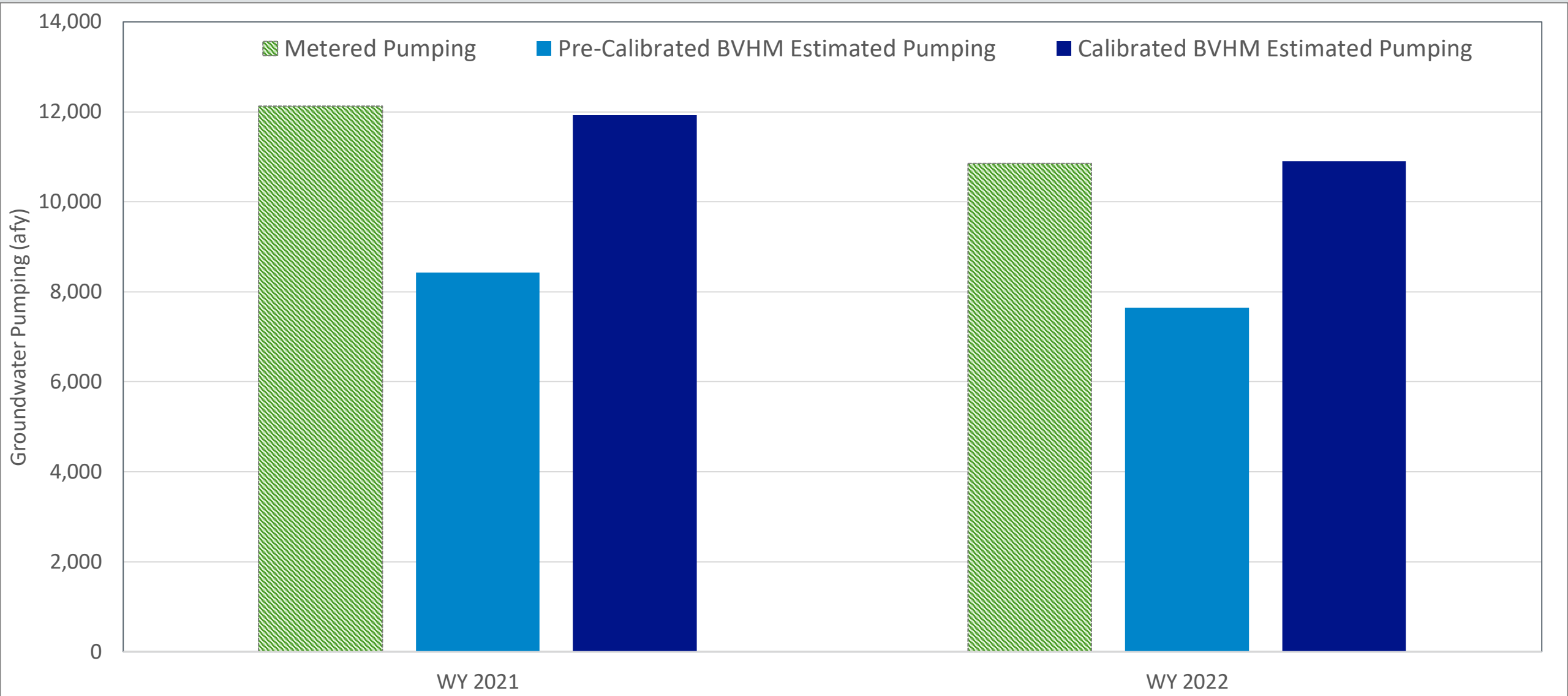
- Nearly all pumping is metered (99%)
- Pumpers submit monthly meter readings to the Watermaster



Reduced Groundwater Pumping



Conclusion: Improved ability of the BVHM to estimate groundwater pumping



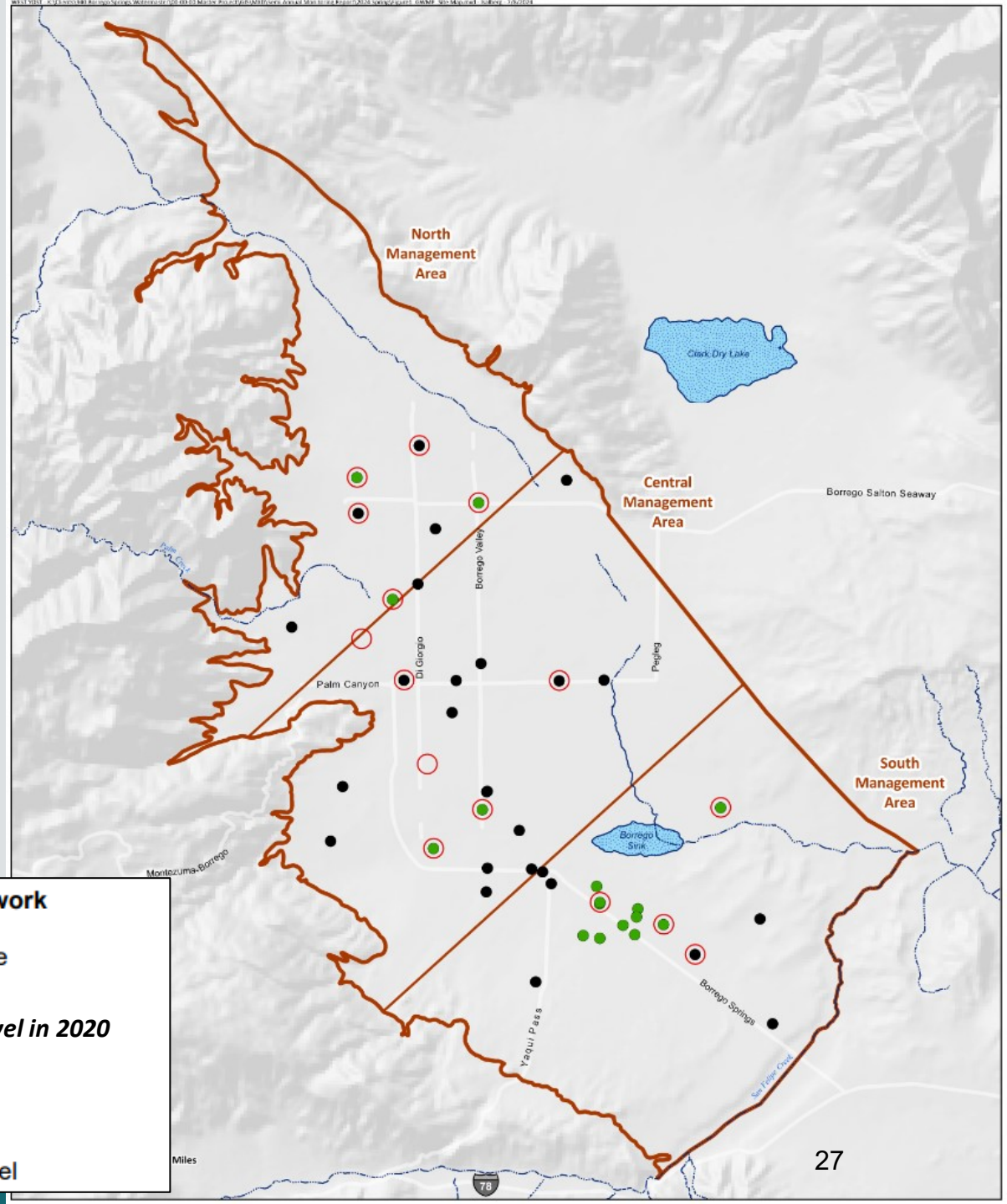
Objective #2: Improve the ability of the BVHM to simulate groundwater-levels and water budget

- Prior versions of BVHM contained errors, and hence, uncertainty in its ability to estimate groundwater levels and the water budget of the Basin
- Corrected errors in the BVHM
- Used groundwater-level data from Watermaster expanded monitoring program to recalibrate the BVHM to best match **model-estimate groundwater levels** vs. **measured groundwater levels**
- Adjusted model parameters during model recalibration to get the best match
- Recalibrated BVHM was used to estimate the **historical water budget** and the **Sustainable Yield**

Conducted Public Outreach to Expand the Groundwater-Level Monitoring Network

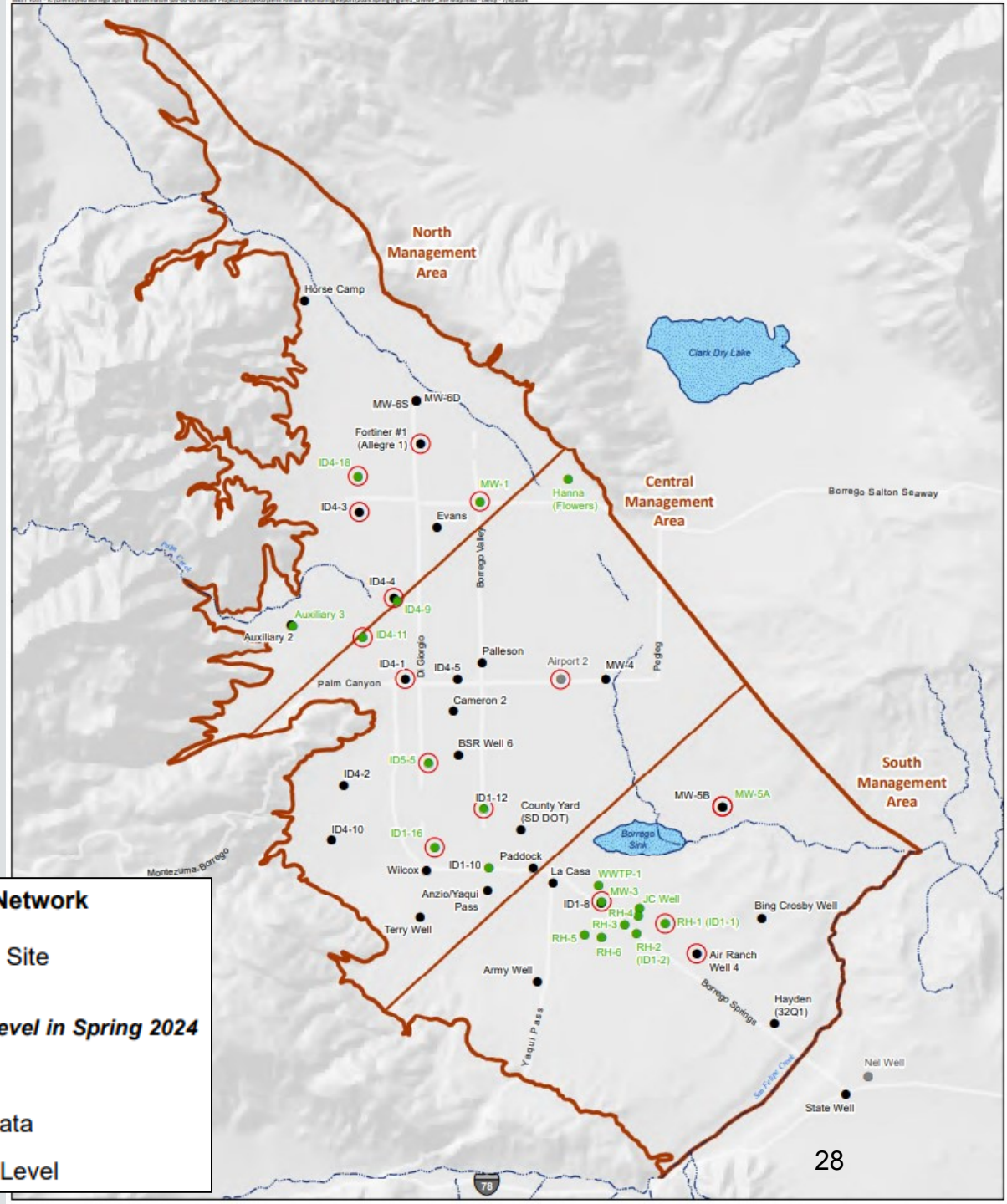
Initial Groundwater-Level Monitoring Network *2020*

- 50 wells in the groundwater-level monitoring network
- *Note:* 6 wells are no longer able to be monitored (collapsed, destroyed etc.)



Expanded Groundwater-Level Monitoring Network *2024*

- 51 wells in the Groundwater-Level Monitoring Program
  - Added new wells to the network thanks to increased public participation!



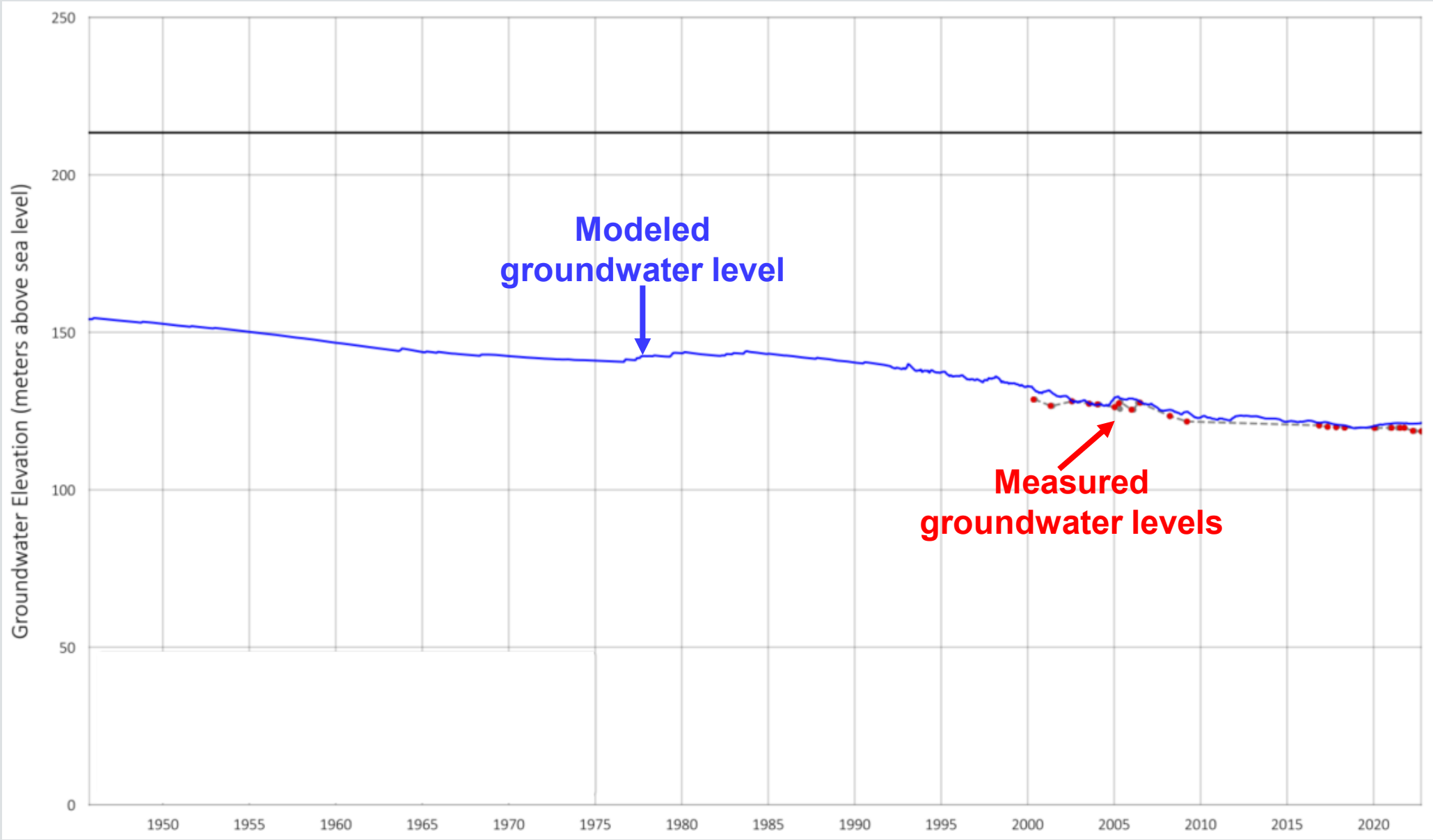
Groundwater-Level Monitoring Network

Representative Monitoring Site

Wells Monitored for Groundwater Level in Spring 2024

- Manual Water-Level Data
- Transducer Water-Level Data
- Unable to Measure Water-Level

Conclusion: Model recalibration improved the ability of the BVHM to simulate groundwater-levels and water budget



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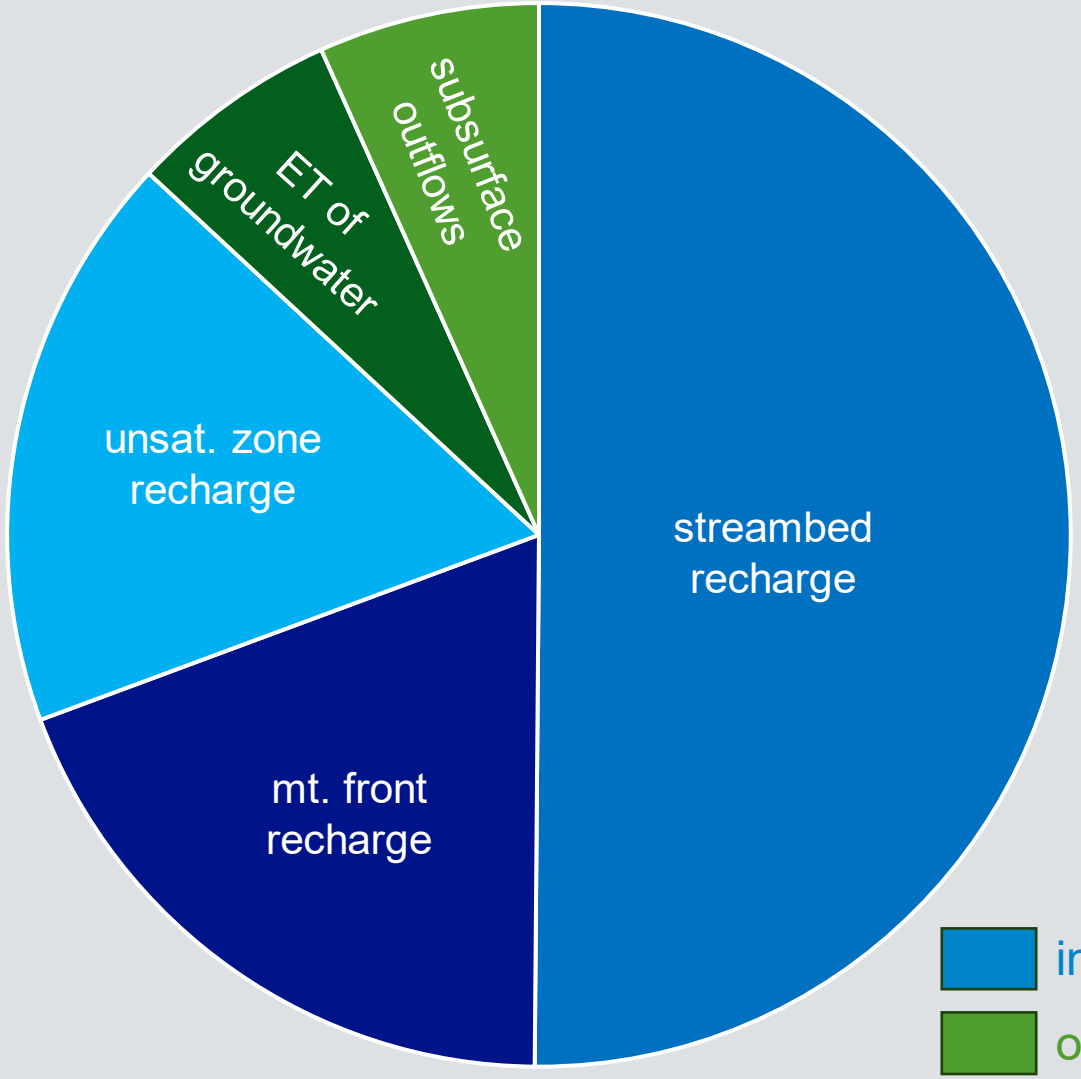
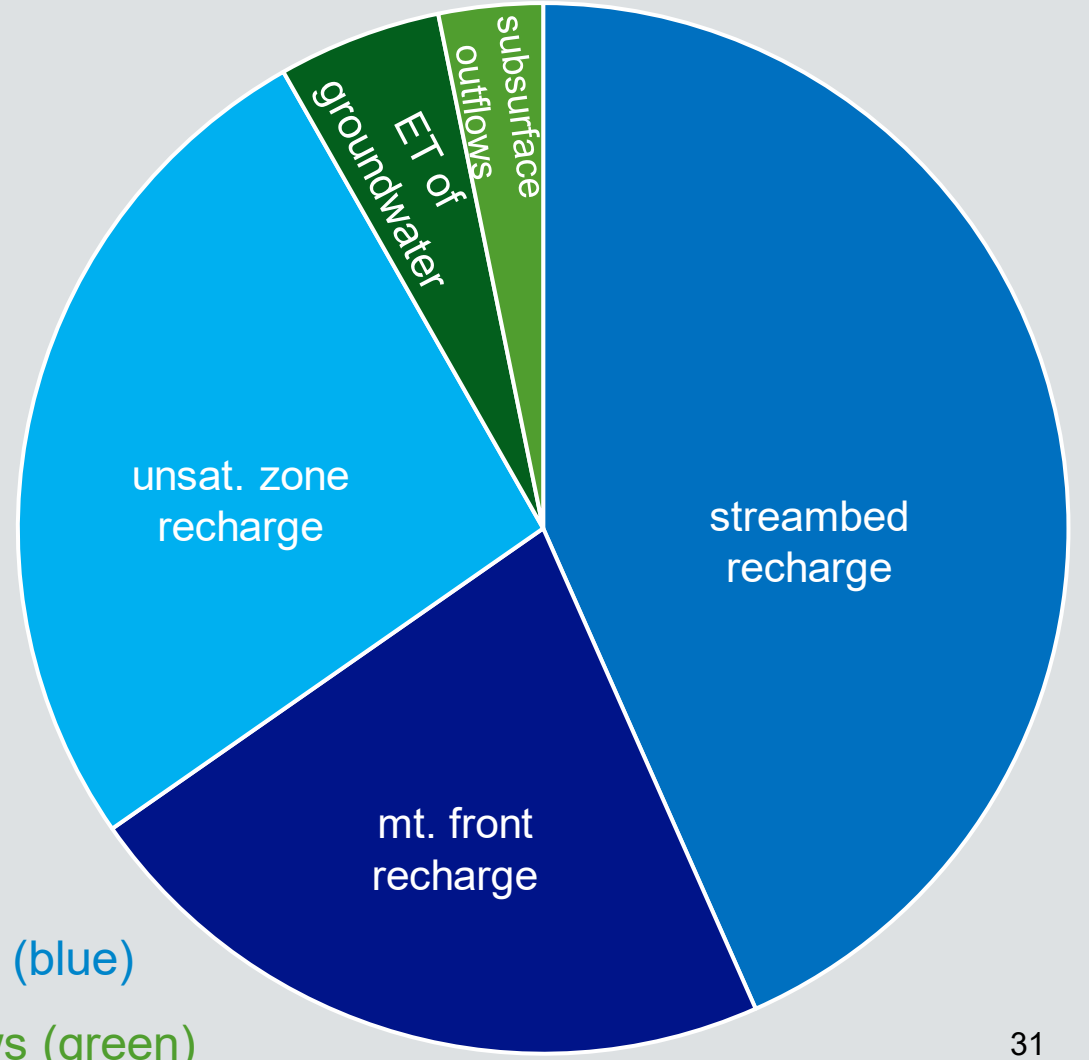
7,952 afy	=	8,726 afy	–	784 afy

Initial Sustainable Yield vs. 2025 Sustainable Yield

Initial Sustainable Yield = 5,700 afy



Preliminary 2025 Sustainable Yield = 7,952 afy

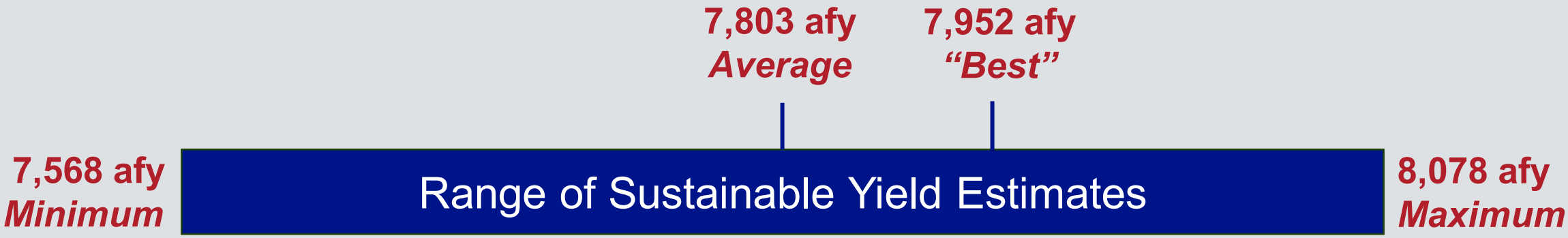


inflows (blue)

outflows (green)

Objective #3: Account for model uncertainty

- No model is perfect
  - The Calibrated BVHM is not the only “calibrated” version of the BVHM
  - 7,952 afy is not valid estimate of the Sustainable Yield
- Performed an uncertainty analysis to calculate the range in Sustainable Yield values by running thousands of versions of the BVHM, each with different model parameters → calculated Sustainable Yield using the 10 best versions



Conclusion #1 from the *Final Technical Report*

The *Calibrated BVHM* is a good simulator of the hydrology of the Basin and can confidently be used to redetermine the 2025 Sustainable Yield.

Conclusion #2 from the *Final Technical Report*

The 2025 Sustainable Yield should be set between 7,600 to 8,100 afy

- Range is based on the 10 best model realizations from the uncertainty analysis
- The most defensible model realization yielded a Sustainable Yield of 7,952 afy

Conclusion #3 from the *Final Technical Report*

The *Calibrated BVHM* should be used to predict future groundwater conditions in the Basin under future groundwater pumping plans and climatic conditions to:

- Assess the long-term sustainability under a Rampdown to the 2025 Sustainable Yield
- Evaluate Watermaster's current Carryover rules
- Support the GMP Assessment Report

Recommendation Reports and Stakeholder Input

- The TAC and Technical Consultant each prepared a Recommendation Report to provide the Watermaster Board with technical opinions and justifications to assist the Board in establishing the 2025 Sustainable Yield

- Each report documents the recommendation(s) and additional considerations

- Reports were distributed to the Board and public on October 31, 2024 for review and comment

TAC Recommendation

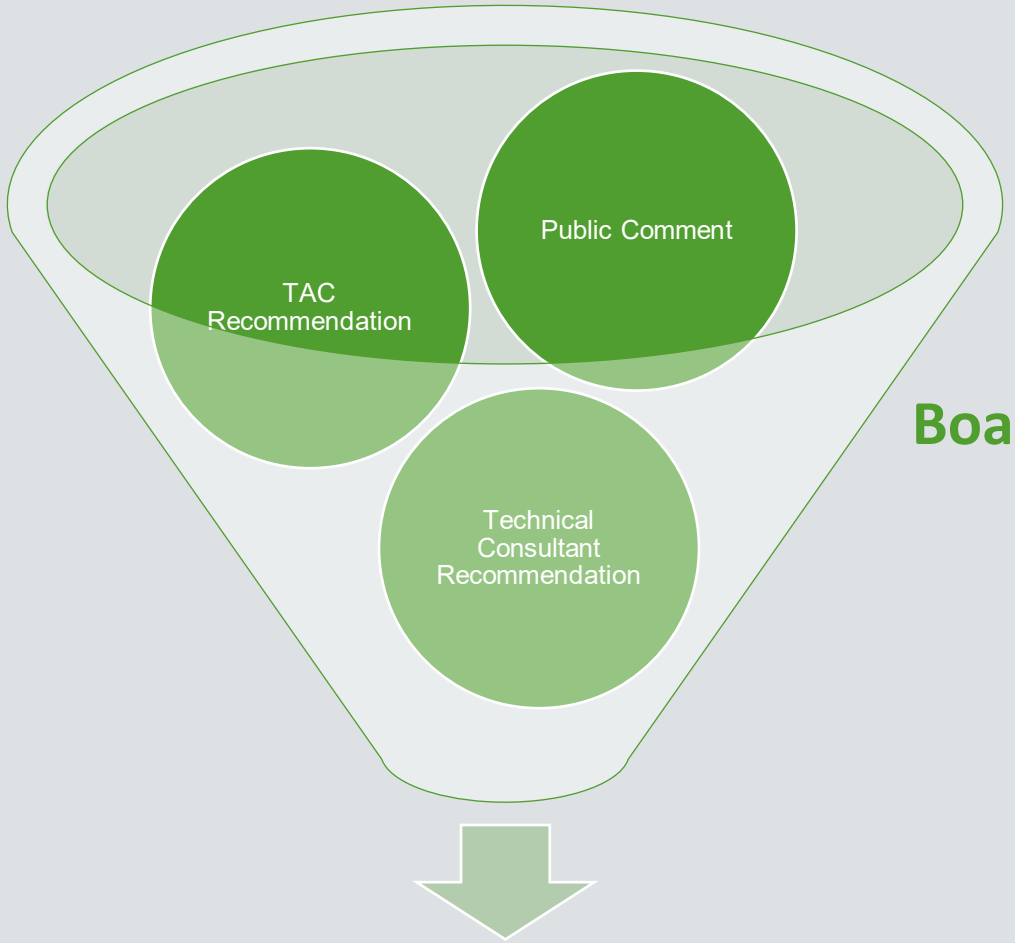
- *Majority TAC Recommendation:* The 2025 Sustainable Yield should be set at **7,952 afy**
  - TAC members recommended a range from **7,800 to 7,952 afy**

- Table 1 of the TAC Recommendation Report summarizes the recommendations and considerations for each TAC member

Technical Consultant Recommendations

- The 2025 Sustainable Yield should be set at **7,900 afy**
- Use the BVHM to simulate projection scenarios to assess future groundwater conditions under the Rampdown to the 2025 Sustainable Yield
  - Develop future pumping projections for all major pumpers
  - Run BVHM through 2024 and beyond to evaluate for Undesirable Results
  - Effort will be funded with SGM grant to the extent possible, and is underway

Recommendation Reports and Stakeholder Input



Board Considerations

Watermaster Board adopts 2025 Sustainable Yield by January 1, 2025

Schedule to establish the 2025 Sustainable Yield

7 Nov. 2024

Present recommendations to Watermaster Board and summary of Public comments

19 Nov. 2024

TAC meeting to discuss Board and Public comments

9 Dec. 2024

TAC meeting to discuss Board and public comments (*if needed*)

Written comments DUE

Send to:
borregospringswm@westyost.com

14 Nov. 2024

Board meeting to consider adoption of 2025 Sustainable Yield

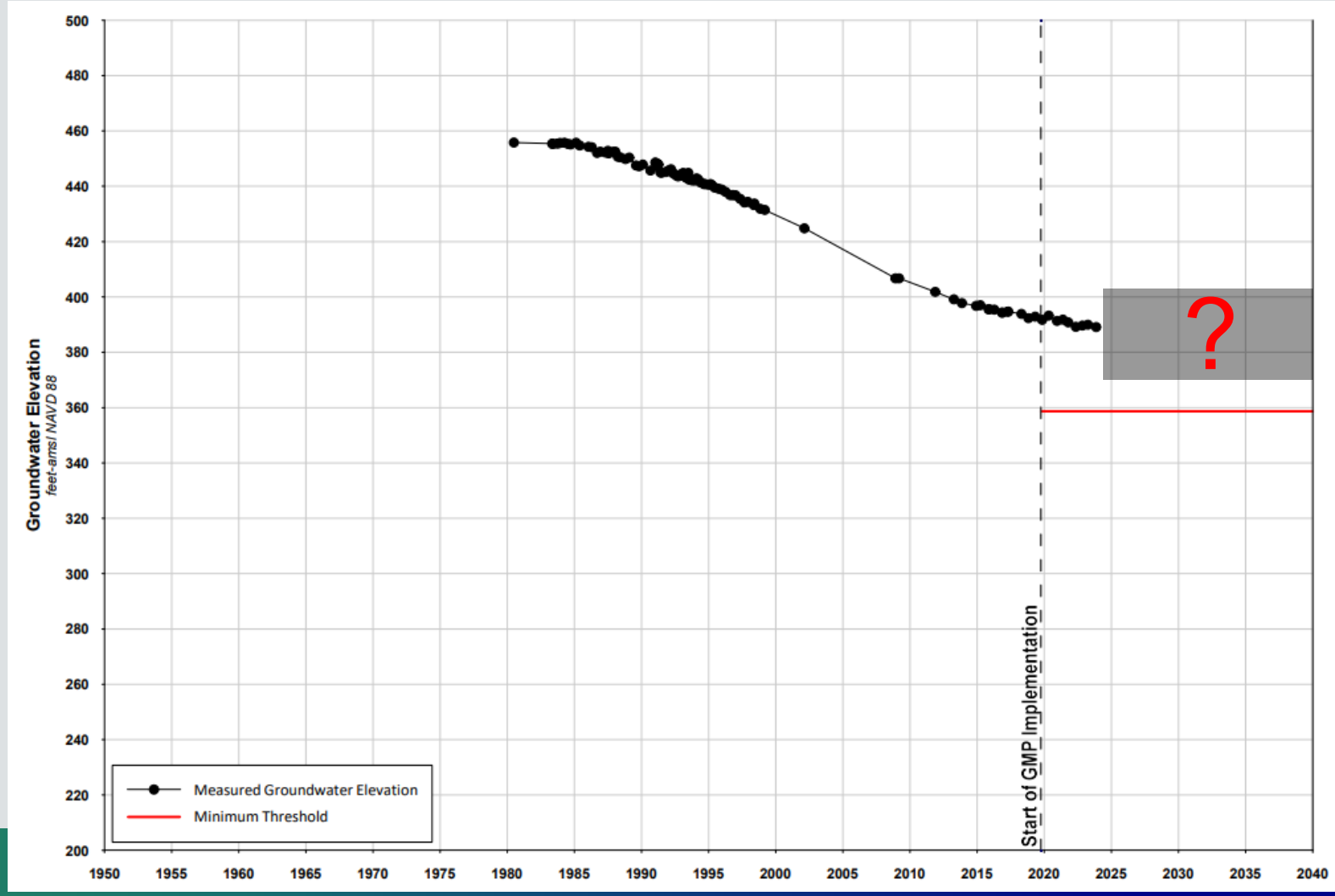
5 Dec. 2024

Board meeting to consider adoption of 2025 Sustainable Yield (*if needed*)

19 Dec. 2024

Next Steps: BVHM Projections to Evaluate for Undesirable Results

- How will pumping under the Rampdown to the 2025 Sustainable Yield be implemented?
- How will groundwater-levels and storage change under the Rampdown?
- If the potential for Undesirable Results are identified, then the Watermaster can make adjustments to the GMP:
  - Management actions
  - Sustainable Yield
  - Sustainable Management Criteria



Give us your Feedback!

- Provide us with your feedback on the 2025 Sustainable Yield
- **Written comments will be accepted through November 14, 2024**
- Email comments to: **borregospringswm@westyost.com**

Questions?

Email the Borrego Springs Watermaster: borregospringswm@westyost.com

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Backup Slides