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Borrego Springs Watermaster

Technical Advisory Committee Meeting

November 12, 2025

TAC Agenda

II. Public Comment

III. Updated Sustainable Management Criteria based on Board, TAC, and Public Feedback

IV. Scenario 1C BVHM Simulation Results: Northward Shift of Future Pumping

V. Public Comment

Updates to proposed Sustainable Management Criteria based on Board, Public, and TAC Feedback

Today's Objectives:

- Inform the TAC of the final recommended changes to SMC that were made based on input from the TAC, Board, and Public
  - SMC: *Groundwater Levels, Storage, and Groundwater Quality*
- Are there any remaining comments that should be considered/reconsidered?

- The final recommended changes to SMC will be presented to the Board at its December meeting and then incorporated into a draft 5-Year Assessment Report → TAC may submit additional written comments

Table 1. Feedback, Responses, and Final Proposed Updates to SMC for Chronic Lowering of Groundwater Levels

SMC	Summary of Relevant Feedback Received	Responses and Changes to SMC	Final Recommended SMC
Sustainability Goal	• No feedback received	• No changes applied to August 2025 draft proposal.	• **Sustainability Goal**: ○ Groundwater levels are at sufficient elevations to not cause Undesirable Results ○ Trends in groundwater levels are stable or increasing by 2040 and thereafter
Undesirable Results	• Undesirable Results should be defined to occur when groundwater levels decline below a Minimum Threshold at one or two Representative Monitoring Wells for one or two consecutive years (various opinions). • A few domestic wells going dry should not necessarily constitute an Undesirable Result. In some other groundwater basins, a certain percentage of wells (e.g., 15%) has been used as the threshold for defining an Undesirable Result. • The occurrence of Undesirable Results should trigger investigations into the cause(s) and identification of mitigation strategies. • A "screening analysis" is recommended to identify how many and which wells in the Basin are at risk of becoming inoperable due to future declines in groundwater levels before developing criteria for defining Undesirable Results. • A mitigation program can address dry wells (e.g., connecting the pumper to the BWD water distribution system), and hence, address the potential for Undesirable Results associated with future groundwater-level declines.	• The Board has indicated that Undesirable Results should be based on the economic limits for mitigation. Hence, defining Undesirable Results is a policy decision and the Board will decide the final definition. • The Board will determine its economic capacity to mitigate impacts of the management plan and the criteria for implementing domestic well mitigation will be tied to that economic capacity and the projected risk of dry wells occurring. • The Watermaster management framework seeks to proactively address the potential for Undesirable Results, not reactively wait for the conditions to occur. For example, BVHM simulations of future pumping are being used to assess sustainability. To the extent the BVHM projections indicate that a future condition is not sustainable, this finding would trigger consideration of actions needed to avoid that condition, as opposed to simply waiting for that outcome to occur. Results so far indicate MTs will not be exceeded, but some areas will experience continued water level declines, thus indicating a need to explore the feasibility of implementing PMA No. 6 – Intra-Basin Transfers. • Figures 2 and 3 show the results of the "screening analysis" that has been performed to identify how many and which wells in the Basin are at risk of becoming inoperable due to future declines in groundwater levels. The analysis showed that there are no known wells that will be at risk of becoming inoperable through 2040 based on our best understanding of planned pumping; however, the Watermaster does not know of every well in the Basin and the well construction database is incomplete—particularly for domestic wells. Hence, there is a need for developing a well mitigation program, in accordance with DWR RCA No. 2.	• **Undesirable Result**: Groundwater-level declines are considered significant and unreasonable if they result in a lowering in the rate of production at pre-existing groundwater production wells below a rate needed to support the overlying beneficial use(s) in locations where alternative supplies are not technically or financially feasible for the well owner to absorb, either independently or with assistance from the Watermaster, or other available assistance/grant program(s). **The Board will quantify its limit of economic feasibility*

Final Recommended SMC

Chronic Lowering of Groundwater Levels

Sustainability Goal:

- Groundwater levels are at sufficient elevations to not cause Undesirable Results
- Trends in groundwater levels are stable or increasing

Final Recommended SMC

Chronic Lowering of Groundwater Levels

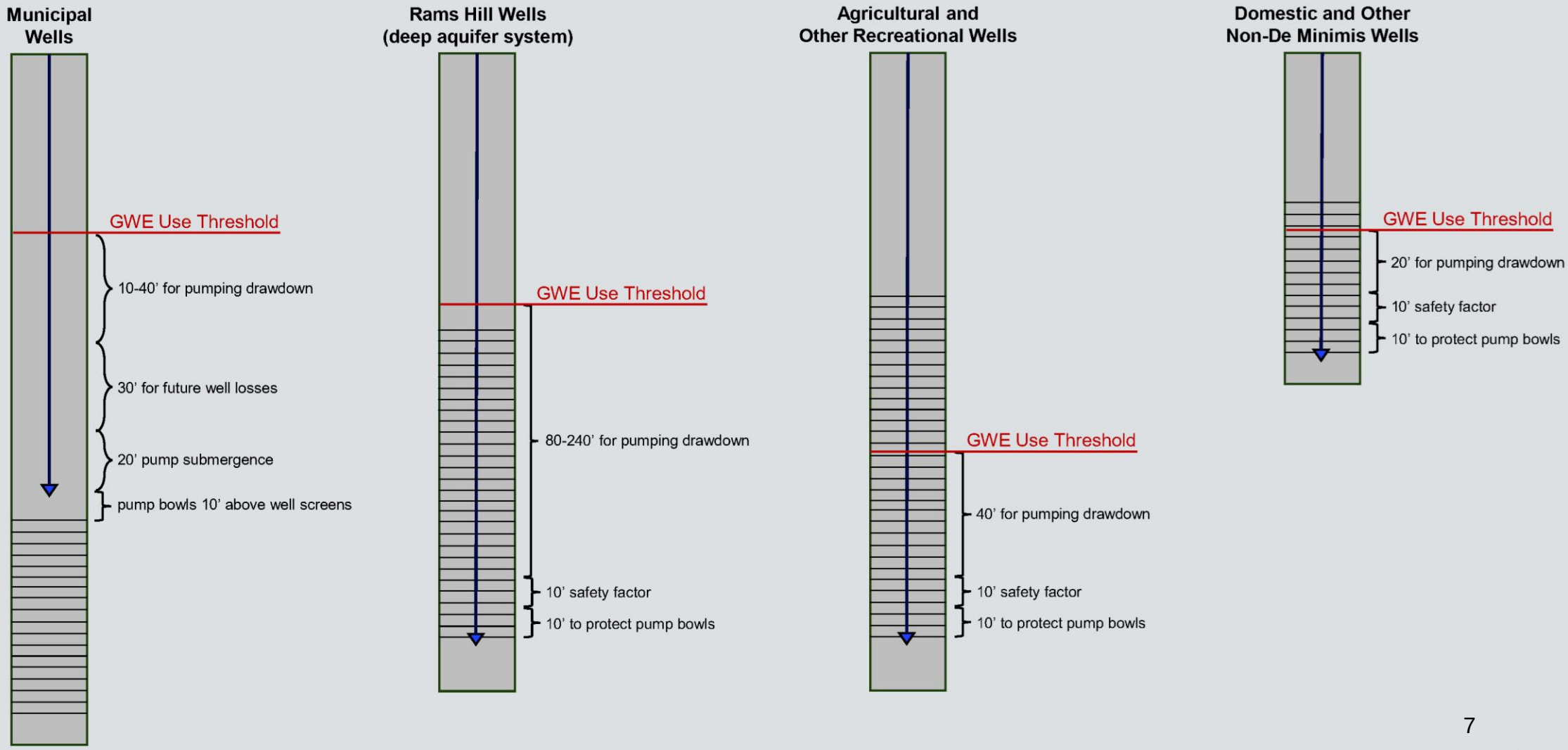
Undesirable Results:

- A lowering in the rate of production at pre-existing groundwater production wells below a rate needed to support the overlying beneficial use(s) in locations where alternative supplies are not technically or financially feasible for the well owner to absorb, either independently or with assistance from the Watermaster, or other available assistance/grant program(s).
- *The Board will quantify its limit of economic feasibility*

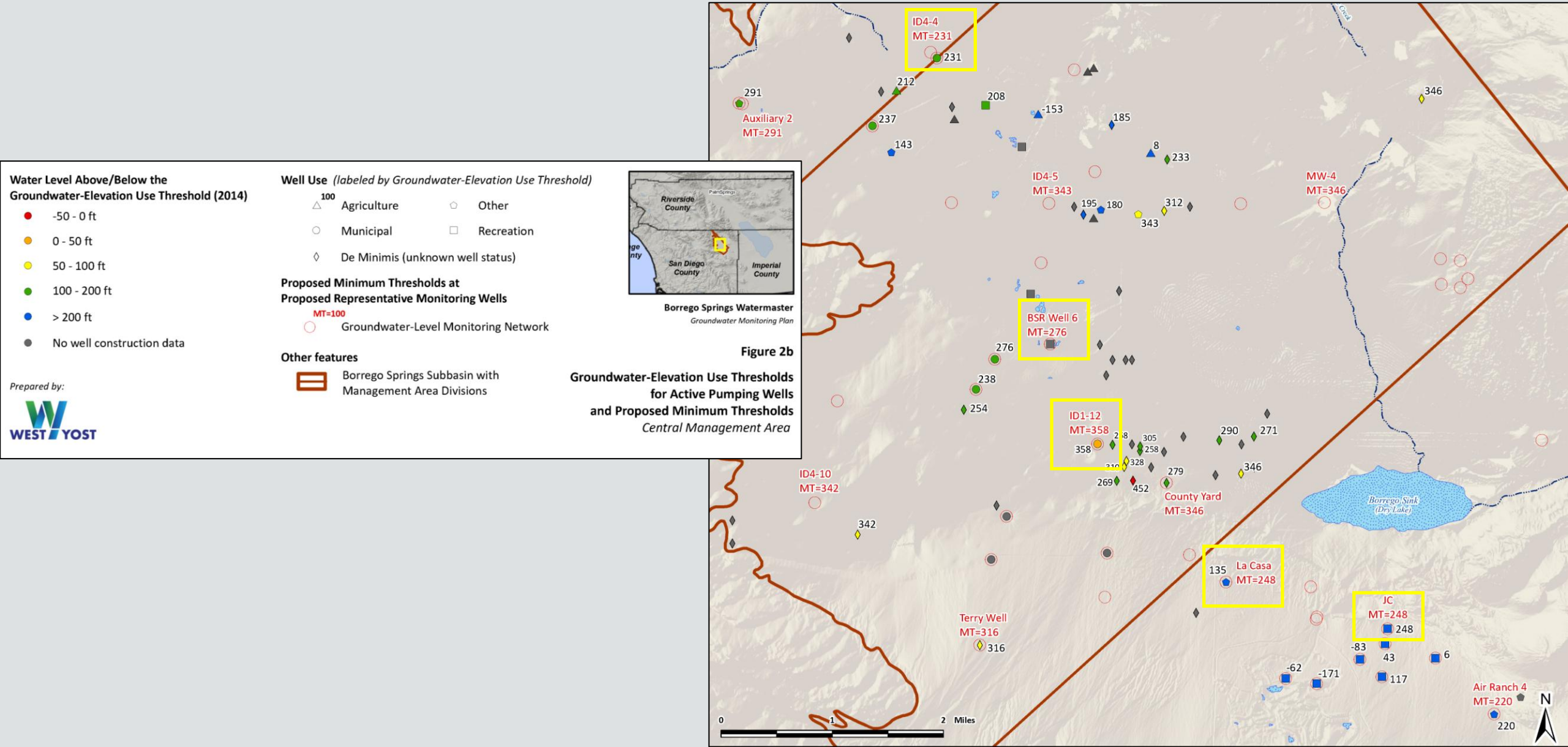
- Deleted: “complete dewatering of the upper aquifer in the Central Management Area”

Minimum Thresholds for Groundwater Levels

Methods to Estimate *Groundwater-Elevation Use Thresholds* for Various Well Types



Minimum Thresholds for Groundwater Levels



Final Recommended SMC

Chronic Lowering of Groundwater Levels

Measurable Objectives and Interim Milestones:

- Based on the predicted groundwater elevations in Scenario 1A at the Representative Monitoring Wells over the pumping rampdown (2020-2040)
- *Justification*: Scenario 1A represents the best current estimate of future cultural conditions in the Basin under a reasonable estimate of future climate conditions
- Measurable Objectives are the predicted groundwater elevations in 2040
- Interim Milestones are the predicted groundwater elevations in 2025, 2030, and 2035

Final Recommended SMC

Chronic Lowering of Groundwater Levels

Analysis of Progress Toward Sustainability:

- Implement the basin-wide groundwater-level monitoring program
- Annually compare measured groundwater levels at Representative Monitoring Wells to SMC and projected groundwater-level trends
- Document progress in SGMA annual reports and 5-year assessment reports

Final Recommended SMC

Reductions in Storage

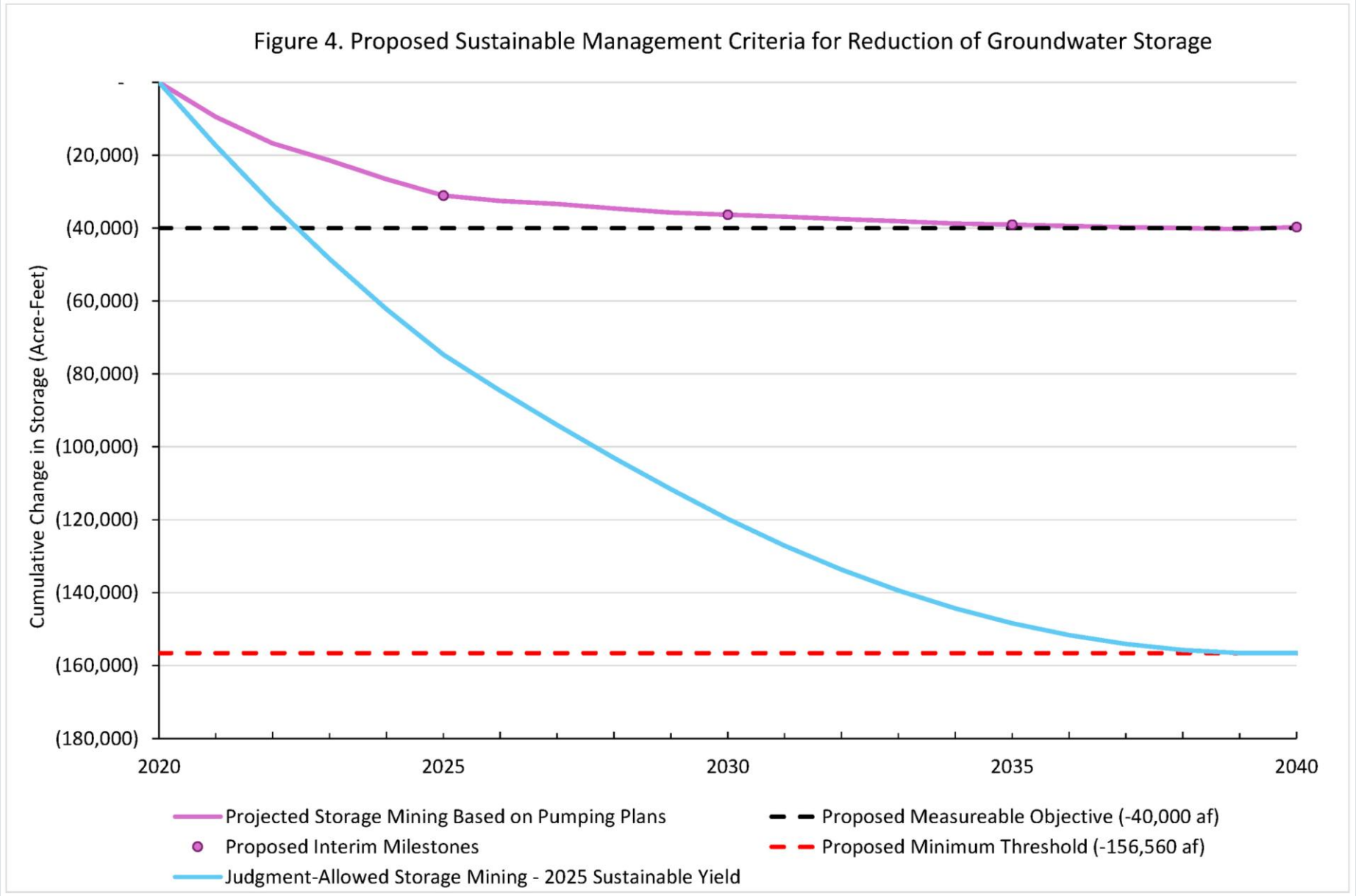
Sustainability Goal:

- Avoidance of overdraft conditions that are not permitted by Judgment

Undesirable Result:

- When cumulative groundwater mining exceeds 156,560 af during 2020-2040 and thereafter
- Such an occurrence would represent overdraft conditions that are not permitted by Judgment

MTs, MOs, and IMs for Groundwater Storage



Final Recommended SMC

Reductions in Storage

Analysis of Progress Toward Sustainability:

- Implement the basin-wide groundwater-level monitoring program
- Annually estimate storage changes using measured changes in groundwater levels and/or BVHM hindcasts of Basin conditions during periodic update/recalibration of the BVHM
- Annually compare estimated storage changes to SMC and projected storage trends
- Document progress in SGMA annual reports and 5-year assessment reports

Final Recommended SMC

Degradation of Groundwater Quality

Sustainability Goal:

- California Title 22 drinking water standards are met for potable water supplies, and water quality in non-potable wells be suitable for agricultural and recreational use

Final Recommended SMC
Degradation of Groundwater Quality

Undesirable Results:

- When the magnitude of degradation in any Management Area or subarea of the Basin precludes the use of groundwater for current and/or potential future beneficial uses, if:
  - Impairment of the beneficial use(s) occurs after SGMA enactment (2014)
  - Cause of degradation is demonstrated to be related to implementation of the Judgment/GMP
  - There are no technically or financially feasible alternative means of treating or otherwise obtaining sufficient groundwater resources
  - *The Board will quantify its limit of economic feasibility* (could include BWD input)

Final Recommended SMC

Degradation of Groundwater Quality

Constituents of Concern (COCs):

- Nitrate
- TDS
- Sulfate
- Arsenic
- Remove fluoride as a COC
- Pesticides have not been detected in drinking water wells to warrant inclusion as a COC

Final Recommended SMC

Degradation of Groundwater Quality

Minimum Thresholds:

- No changes recommended → use the MCLs → MCLs represent the best protective threshold for most sensitive beneficial use → potable water supply
- MTs will no longer reference protection of irrigation quality as this is not the most sensitive beneficial use → resolves DWR RCA-5
- MTs will apply to all active BWD potable supply wells and any well in the monitoring network whose COC concentrations are below MCLs.
- All data from monitoring program will be compared to the MTs to support analysis and interpretations of changes in groundwater quality over time
- Revisit MTs in 2030 after more data are collected

Final Recommended SMC

Degradation of Groundwater Quality

Measurable Objectives and Interim Milestones:

- Recommend a change to MOs to constitute an operation range
- MOs for wells with COC concentrations that were below MCLs at the start of GMP implementation (2020) will be set equal to the COC concentration in WY 2020, or the first available sample result following WY 2020
- MOs will no longer reference protection of irrigation quality → not the most sensitive beneficial use → resolves DWR RCA-5
- IMs will remain undefined → no credible approach with available data and tools to establish expected trajectory of changes in groundwater quality

Final Recommended SMC

Degradation of Groundwater Quality

Analysis of Progress Toward Sustainability:

- Implement a revised PMA No. 5: Water Quality Monitoring and Management
  - Implement a water-quality monitoring plan
  - Analyze data annually → Statistically characterize conditions and trends
  - TC and TAC annually determine if trends may threaten beneficial uses
  - Board can direct Staff to further investigate in accordance with the Judgment to determine: impacted uses; cause(s) of degradation; Watermaster contribution to cause; potential mitigation measures; and mitigation costs
    - If Watermaster is the cause → develop mitigation plan or adaptive management plan
    - If Watermaster is not the cause → no further Watermaster action

TAC Agenda

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IV. Scenario 1C BVHM Simulation Results: Northward Shift of Future Pumping

V. Public Comment

Use of the BVHM to Evaluate Sustainability of Future Pumping

- Three projection scenarios have been run to-date:
  - **Initial Scenario –** Performed using SGM grant funding. Superseded by Scenario 1A.
  - **Scenario 1A** – New "Baseline" Scenario → reduced BWD demands
  - **Scenario 1B** – Shifted ~920 afy of pumping from the CMA to the NMA
- Each projection scenario was run through WY 2070 using the BVHM, where:
  - Pumping projections were assigned to wells based on plans of all major Pumpers
  - Future land uses were updated based on plans of all major Pumpers
  - Future climate/hydrologic conditions were based on a repeated historical hydrology (1975-2022)
- "Sustainability" of future groundwater-level conditions was defined as:
  - Trends in groundwater levels are stable or increasing by 2040 and thereafter
  - Groundwater levels are always at sufficient elevations to not cause Undesirable Results

Results and Recommendations from Scenarios 1A/1B

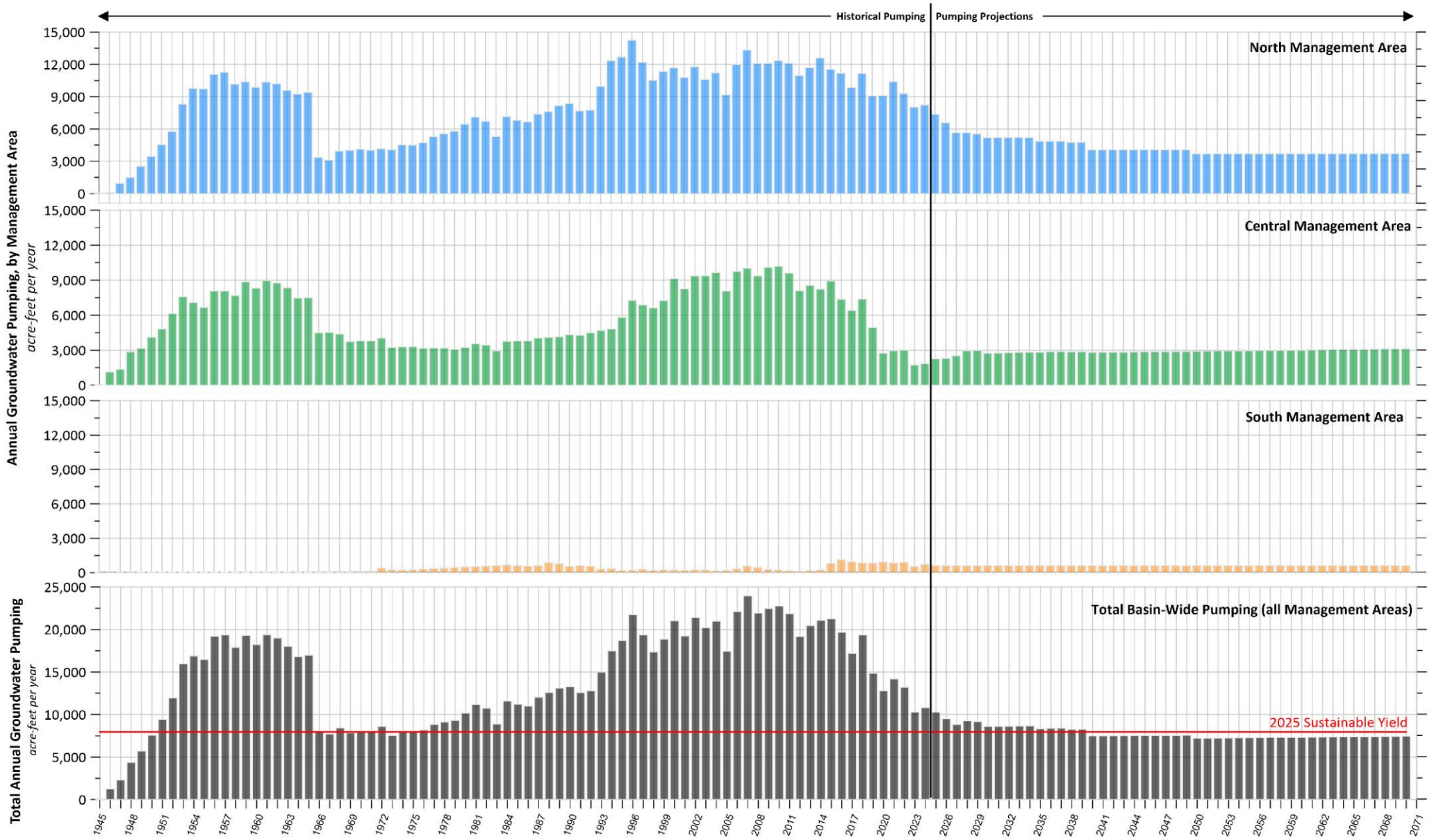
- **Results**:
  - NMA: Future groundwater levels increased and then stabilized by WY 2040
  - CMA and SMA: Future groundwater levels declined continuously through WY 2070
    - However, shifting pumping from the CMA to NMA can assist in stabilizing groundwater levels in the CMA (Scenario 1B)
    - Additional pumping may need to be shifted from CMA to NMA
- **Recommendation**: Continue exploring a northward shift of BWD pumping
  - Board directed shifting a total of ~1,800 afy to the NMA ("Scenario 1C")
  - ***Objective***: better balance pumping and groundwater levels across the Basin

Scenario 1C Assumptions

- Coordinated with T2 and BWD to develop a new pumping projection scenario
- **Scenario 1C** → Average of 1,876 AFY shifted to NMA (WY 2030-2070)
  - Of the 1,876 AFY shifted to the NMA:
    - 1,476 AFY is shifted from the CMA (BWD wells)
    - 400 AFY is shifted from the SMA (Rams Hill wells)
  - No change in total pumping compared to Scenarios 1A/1B (only pumping locations change)

Water Year	Planned Pumping (Scenarios 1A-1B) *(a)*	Planned Pumping *(Scenarios 1C)* *(b)*	Difference in Planned Pumping (Scenario 1C - 1A/B) *(c) = (b) - (a)*
2025	**10,270**	**10,270**	**0**
2026	9,513	9,513	0
2027	8,818	8,818	0
2028	9,247	9,247	0
2029	9,164	9,164	0
2030	**8,585**	**8,585**	**0**
2031	8,604	8,604	0
2032	8,622	8,622	0
2033	8,641	8,641	0
2034	8,651	8,651	0
2035	**8,332**	**8,332**	**0**
2036	8,381	8,381	0
2037	8,392	8,392	0
2038	8,240	8,240	0
2039	8,251	8,251	0
2040	**7,496**	**7,496**	**0**
2041	7,507	7,507	0
2042	7,518	7,518	0
2043	7,529	7,529	0
2044	7,540	7,540	0
2045	**7,550**	**7,550**	**0**

Pumping Projections – Scenario 1A



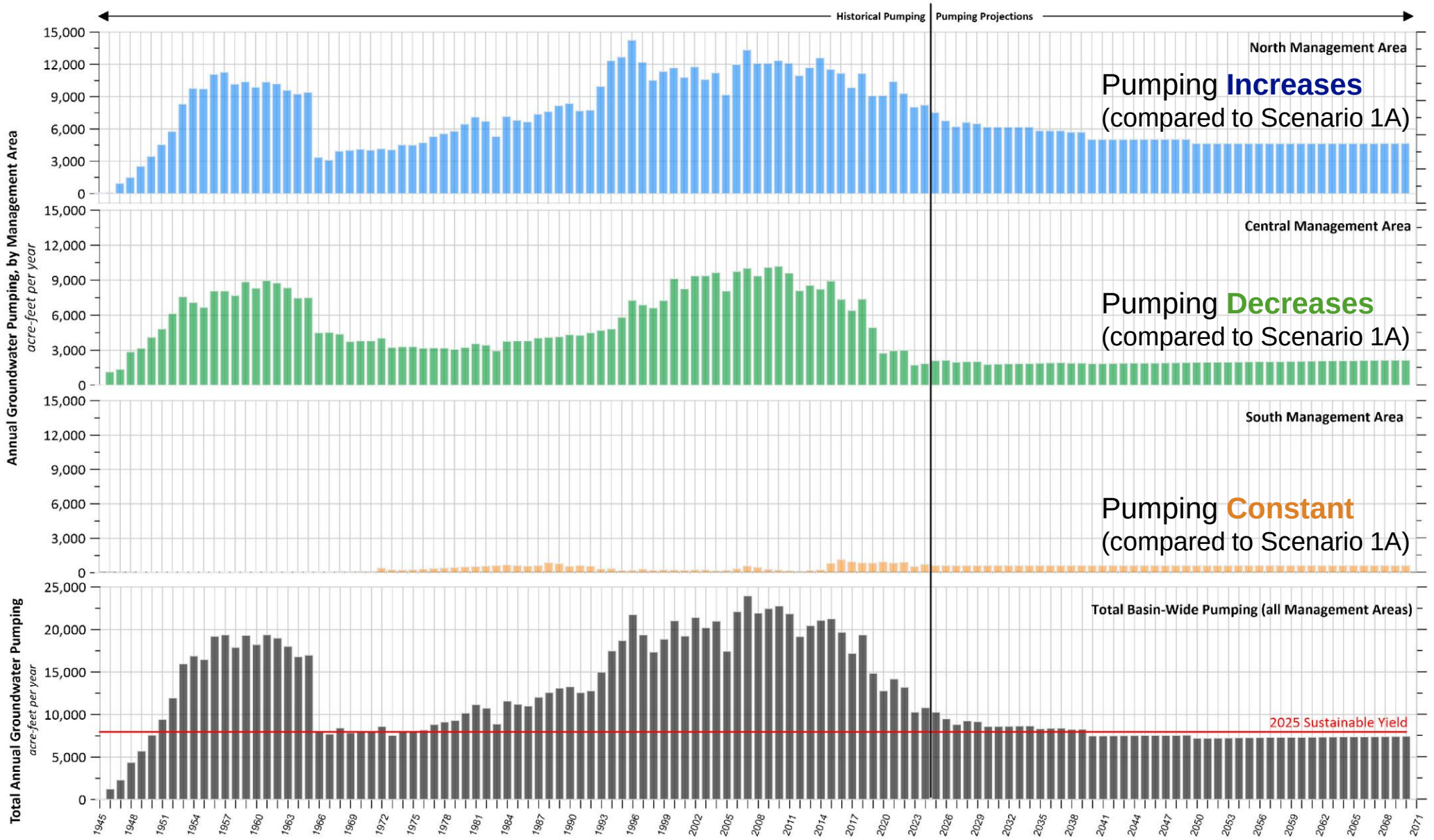
Avg. Basin-wide Pumping (2030 – 2070)

NMA = 4,108 AFY

SMA = 2,926 AFY

SMA = 632 AFY

Pumping Projections – Scenario 1B



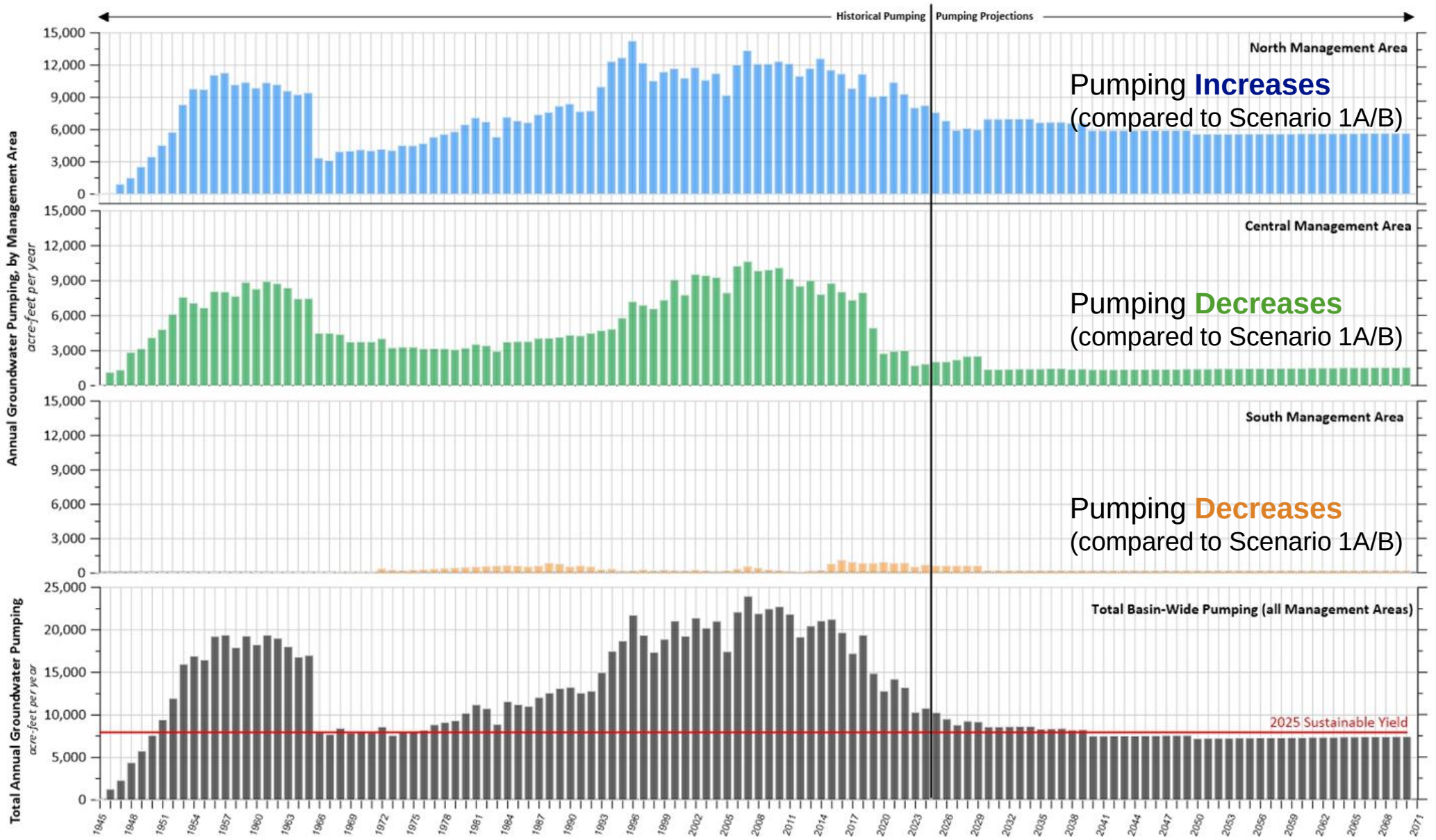
Avg. Basin-wide Pumping (2030 – 2070)

NMA = 5,070 AFY

CMA = 1,965 AFY

SMA = 632 AFY

Pumping Projections – Scenario 1C



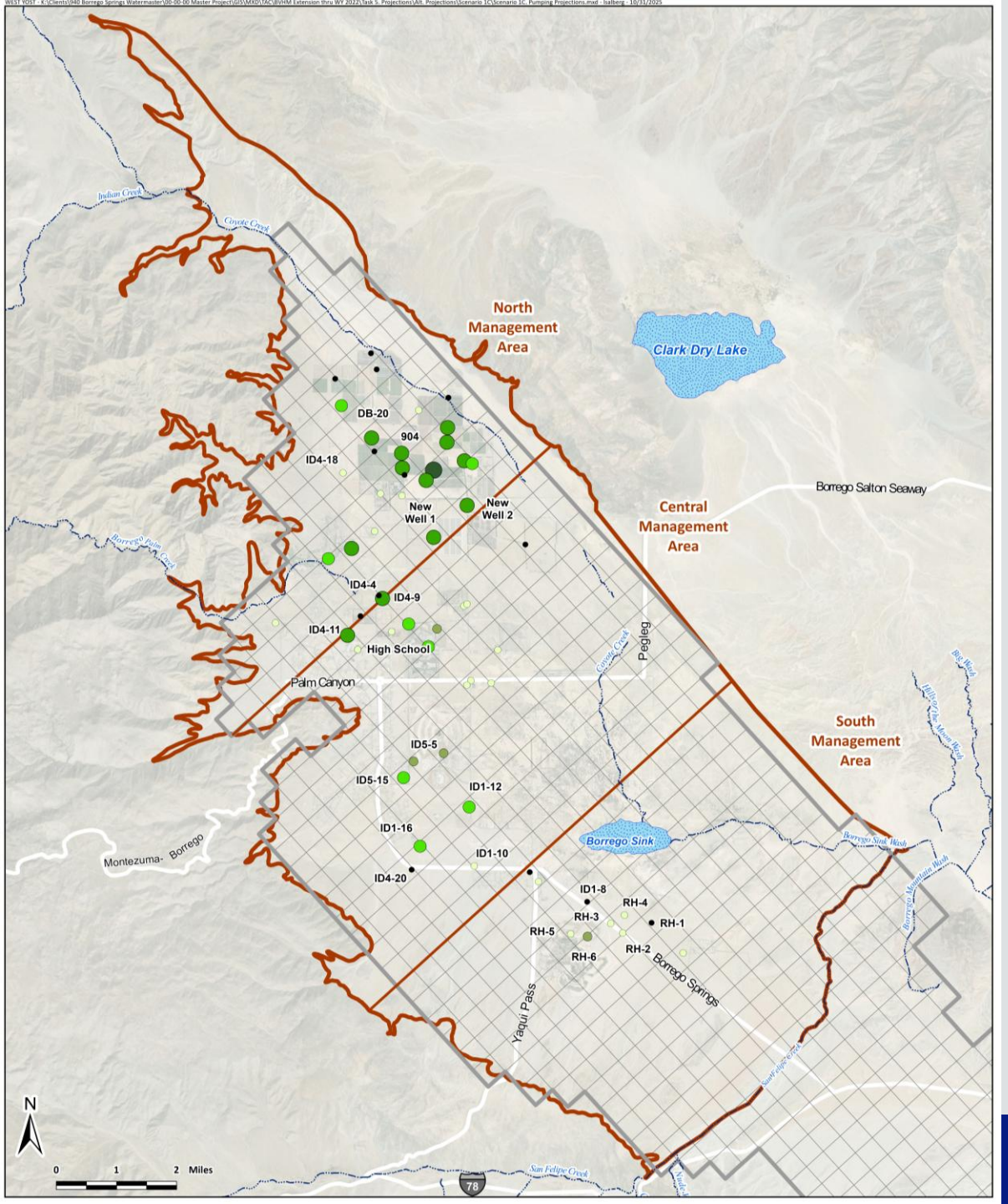
Avg. Basin-wide Pumping (2030 – 2070)

NMA = 5,984 AFY

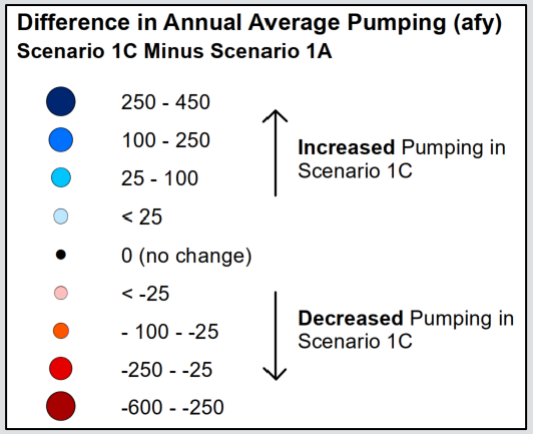
CMA = 1,450 AFY

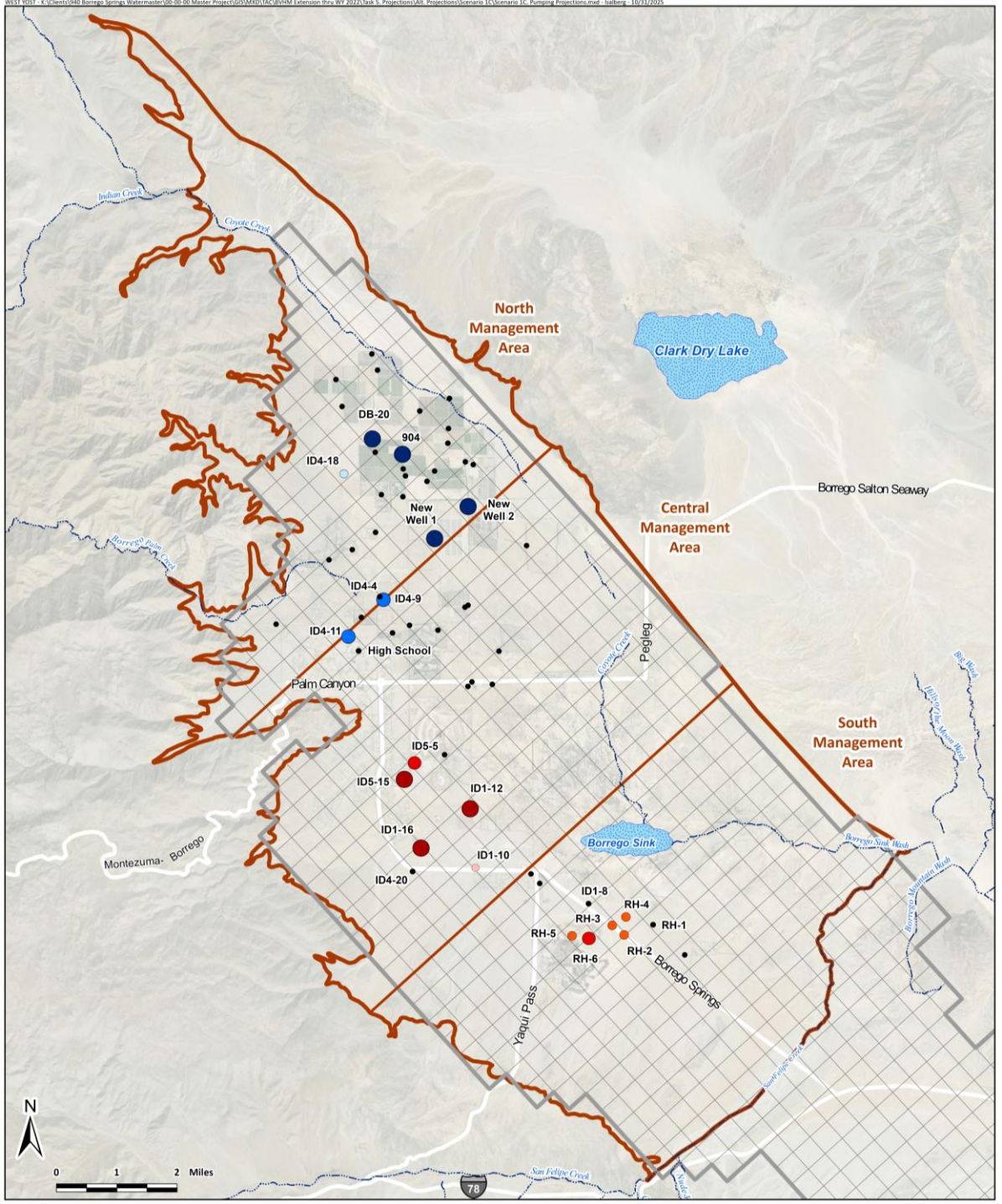
SMA = 232 AFY

Scenario 1C
Pumping Projection



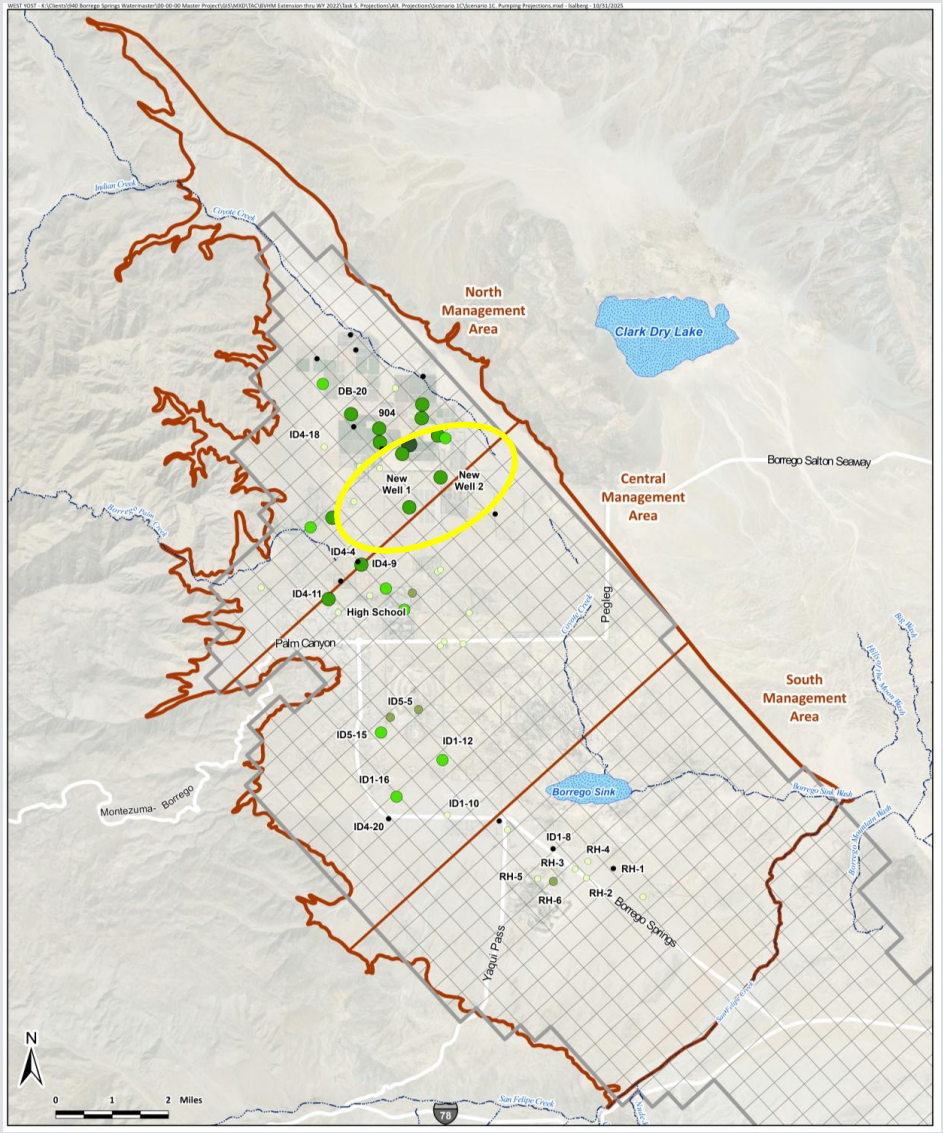
Scenario 1C Minus 1A





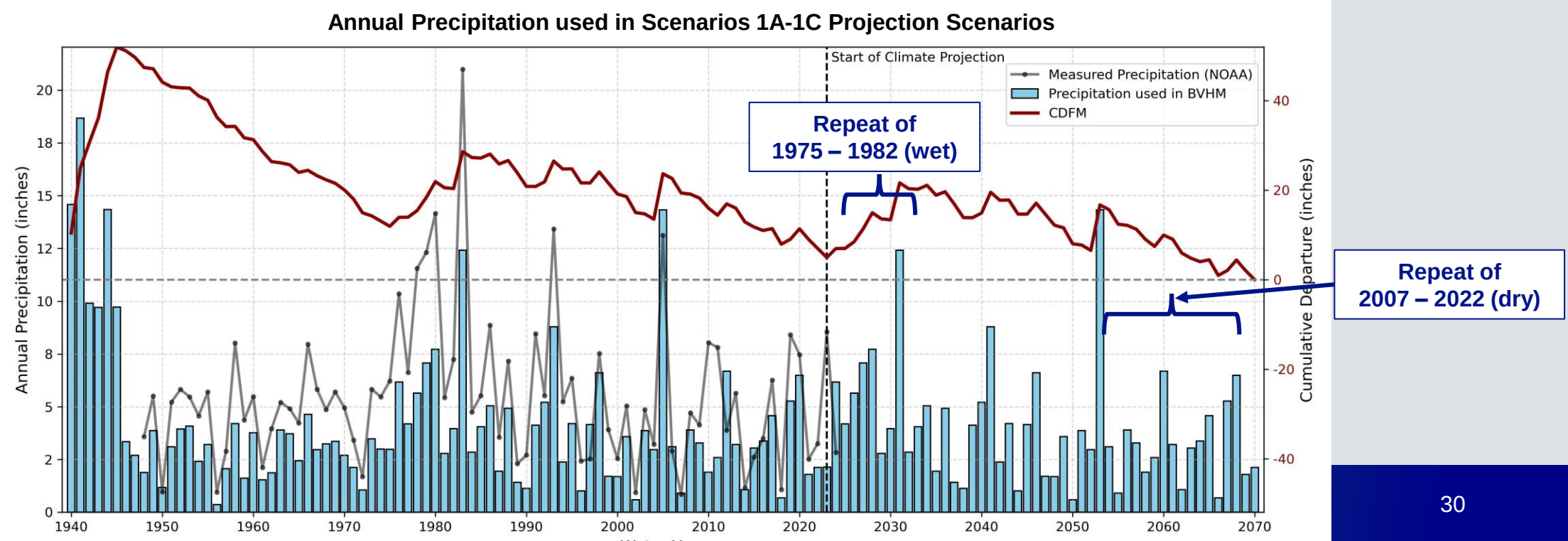
Modeling Work Completed:

- Added two new theoretical wells in the NMA to the BVHM
- New theoretical NMA wells were:
  - Sited based on proximity to other future pumping wells (i.e. not located near major pumping centers)
  - Screened in Layers 2 and 3 of the BVHM
- Updated future assigned pumping in the MNW2 package (no other changes to other input files)



Ran Scenario 1C using the BVHM

- Like other Scenarios, Scenario 1C simulates:
  - Pumping Rampdown to 2025 Sustainable Yield by 2040
  - *Repeated Hydrology*: 47-year climate period of WY 1975-2022 was repeated for WY 2023-2070
    - Repeated hydrology begins with repeat of a wet period and ends with a prolonged drought period

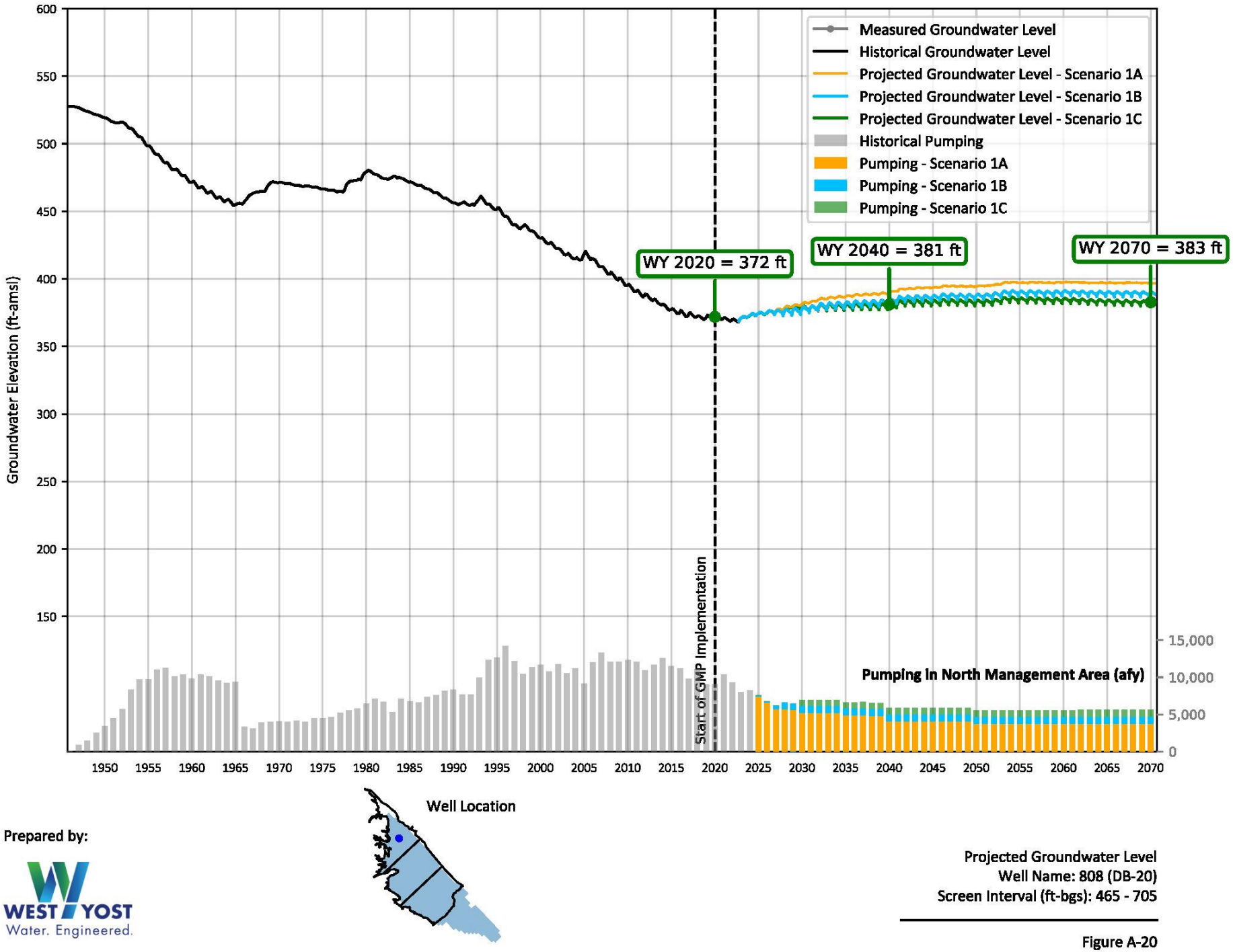


Reviewed Model Results

- Compared general trends in groundwater-levels by Management Area across all scenarios
- Reviewed hydrographs
- Reviewed water budget
- Reviewed maps of change in groundwater elevation (2020-2040) for each scenario
  - Changes over time
  - Comparisons between Scenarios (Scenario 1A vs. 1C)

NMA:

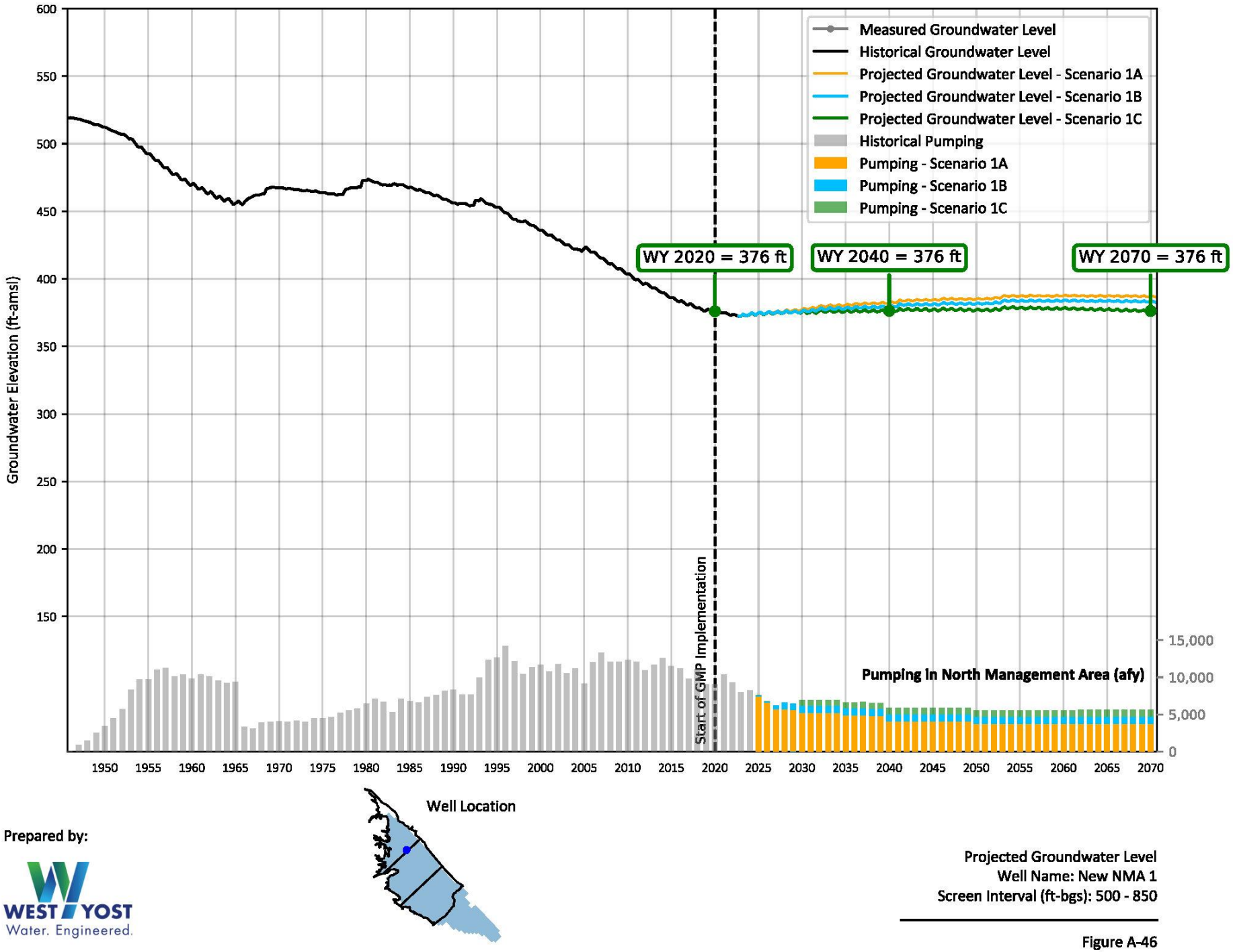
- In all scenarios, groundwater levels begin to recover during GMP implementation and then stabilize after 2040
- Scenario 1C GWE are lowest of all three scenarios, but still “stable” in WY 2040+



NMA:

- New theoretical well* is able to pump 450 AFY in WY 2030+ without causing declines in groundwater levels

**well is not constructed but used in model projection*



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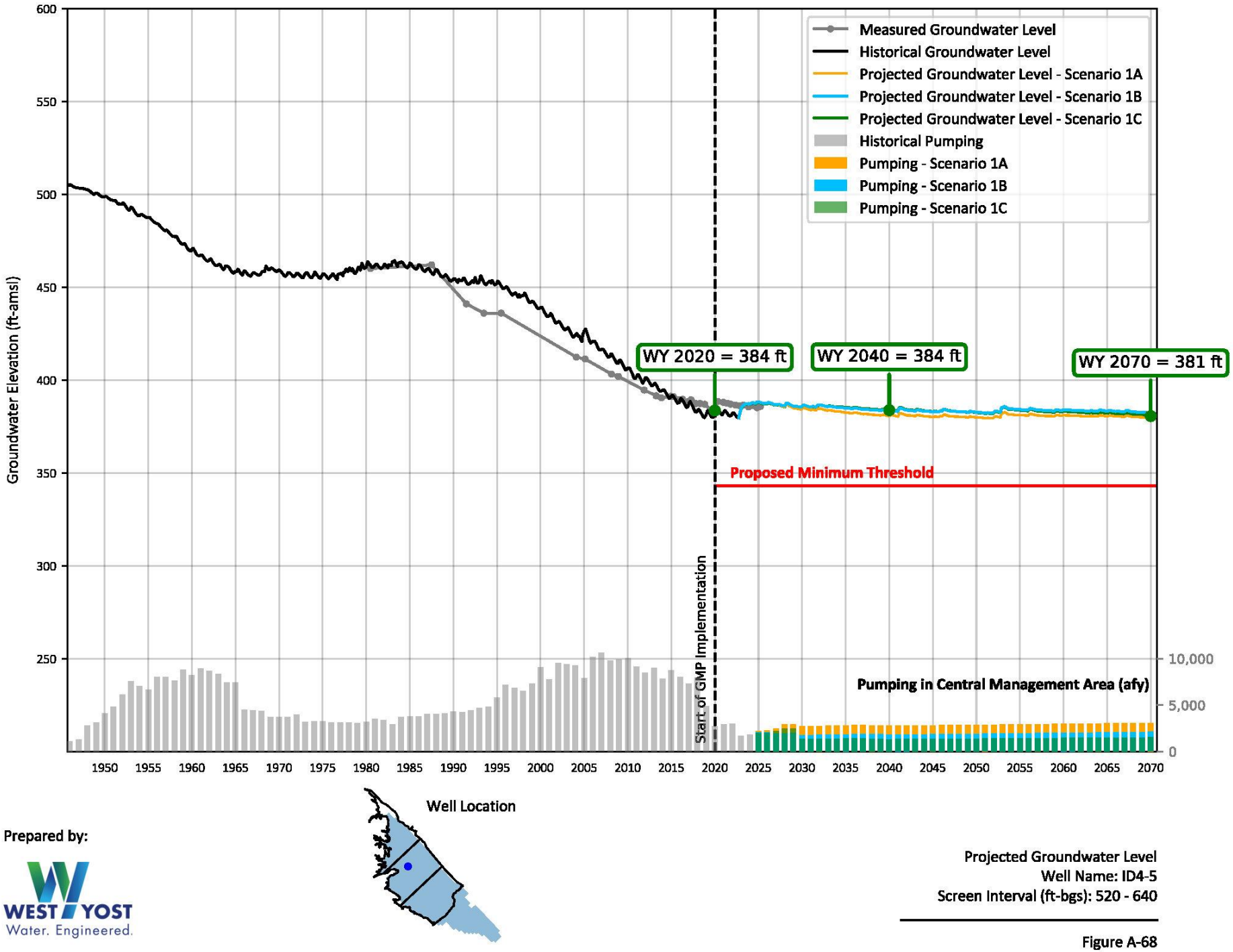
Projected Groundwater Level
Well Name: New NMA 1
Screen Interval (ft-bgs): 500 - 850

Figure A-46

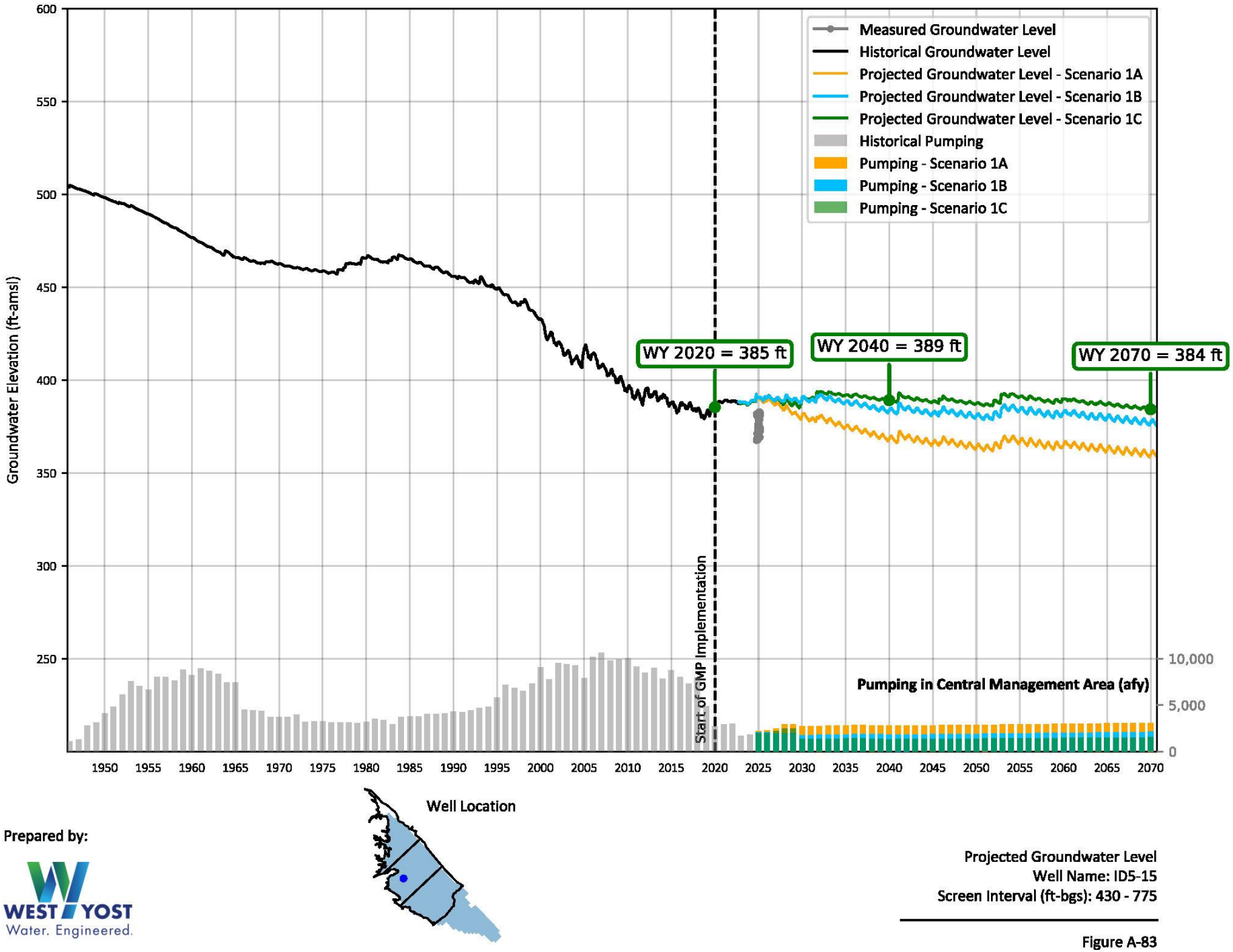
Northern part of CMA:

- Future groundwater levels are relatively stable in all three scenarios



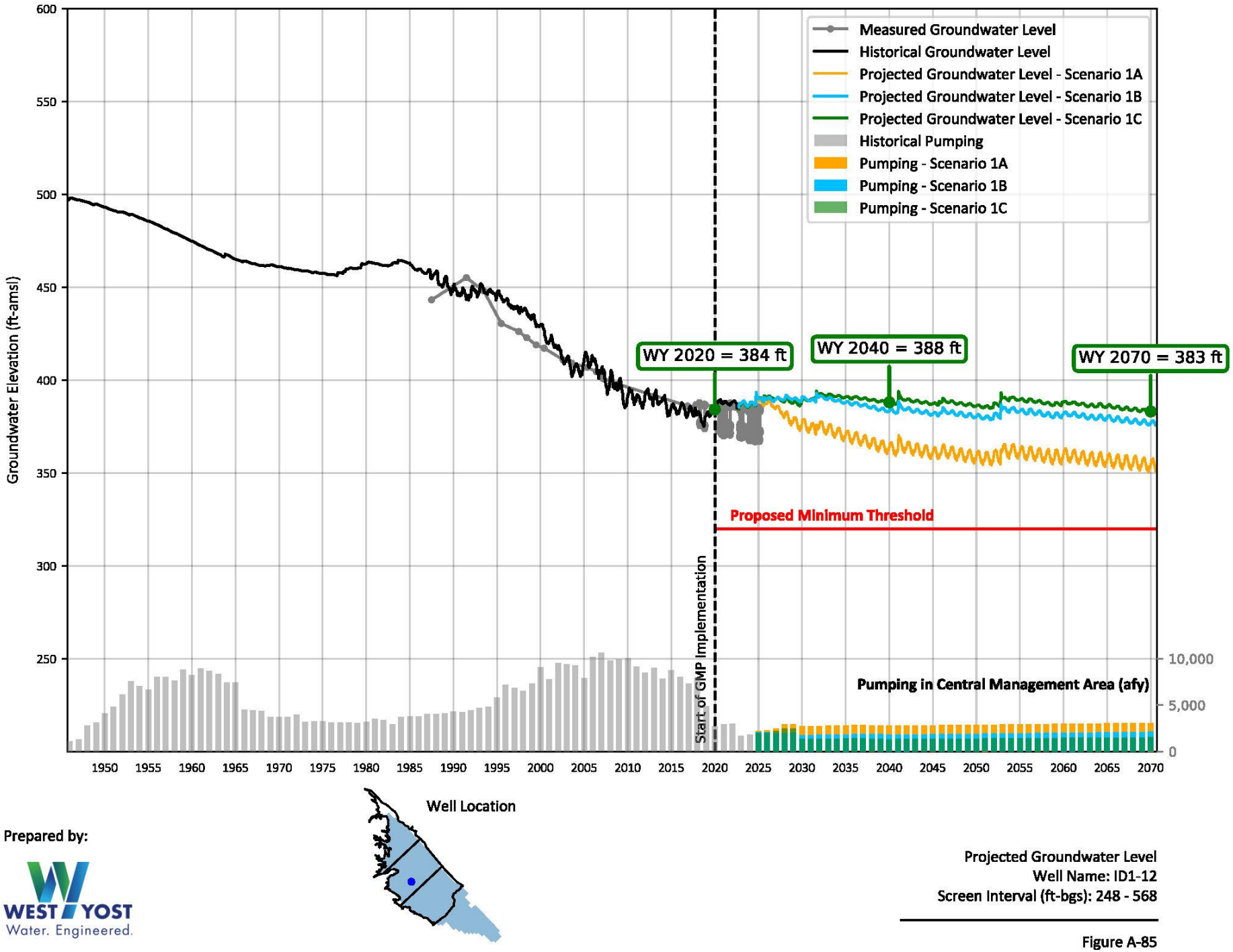
Central part of CMA:

- Of the three scenarios, groundwater elevations are projected to be highest in Scenario 1C
- Projected groundwater levels in Scenario 1C are considered "stable"



Southern part of CMA:

- Projected groundwater levels in Scenario 1C are considered “stable”
- Shifting additional pumping from CMA to NMA (Scenario 1C) helped stabilize groundwater levels in the CMA



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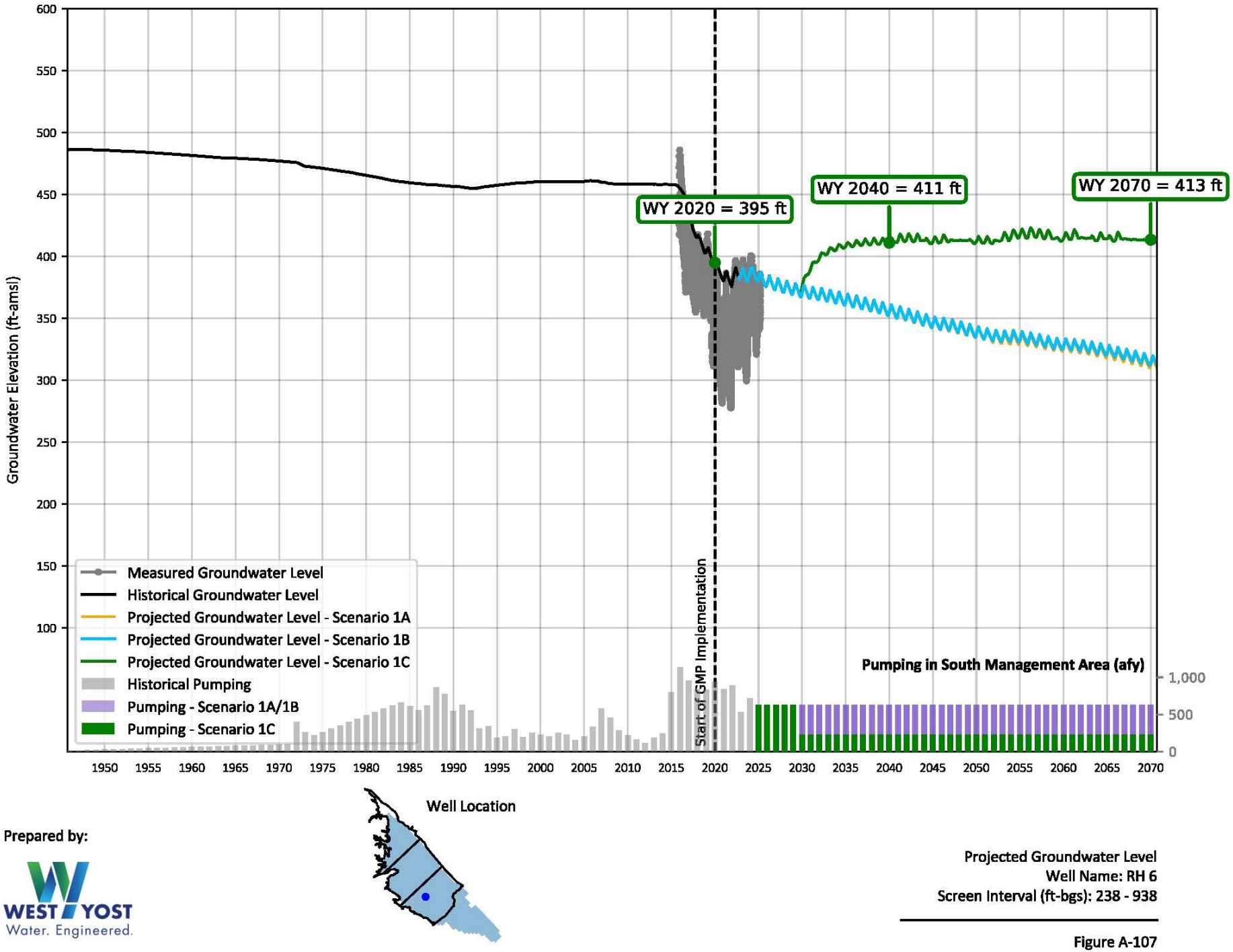
Projected Groundwater Level
Well Name: ID1-12
Screen Interval (ft-bgs): 248 - 568

Figure A-85

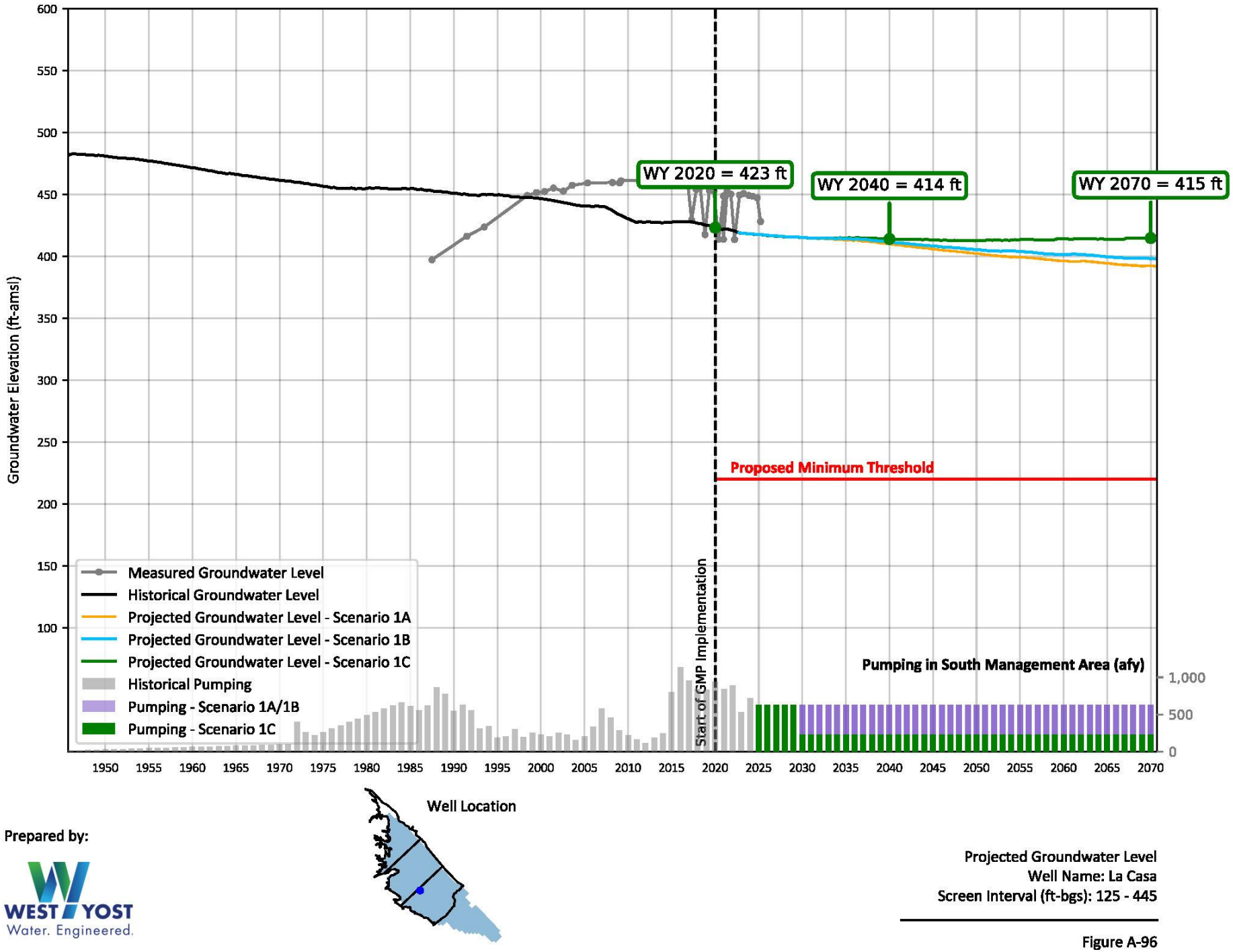
SMA:

- In Scenario 1C, groundwater levels **increase** and stabilize in WY 2030+ once Rams Hill pumping is reduced to 200 AFY



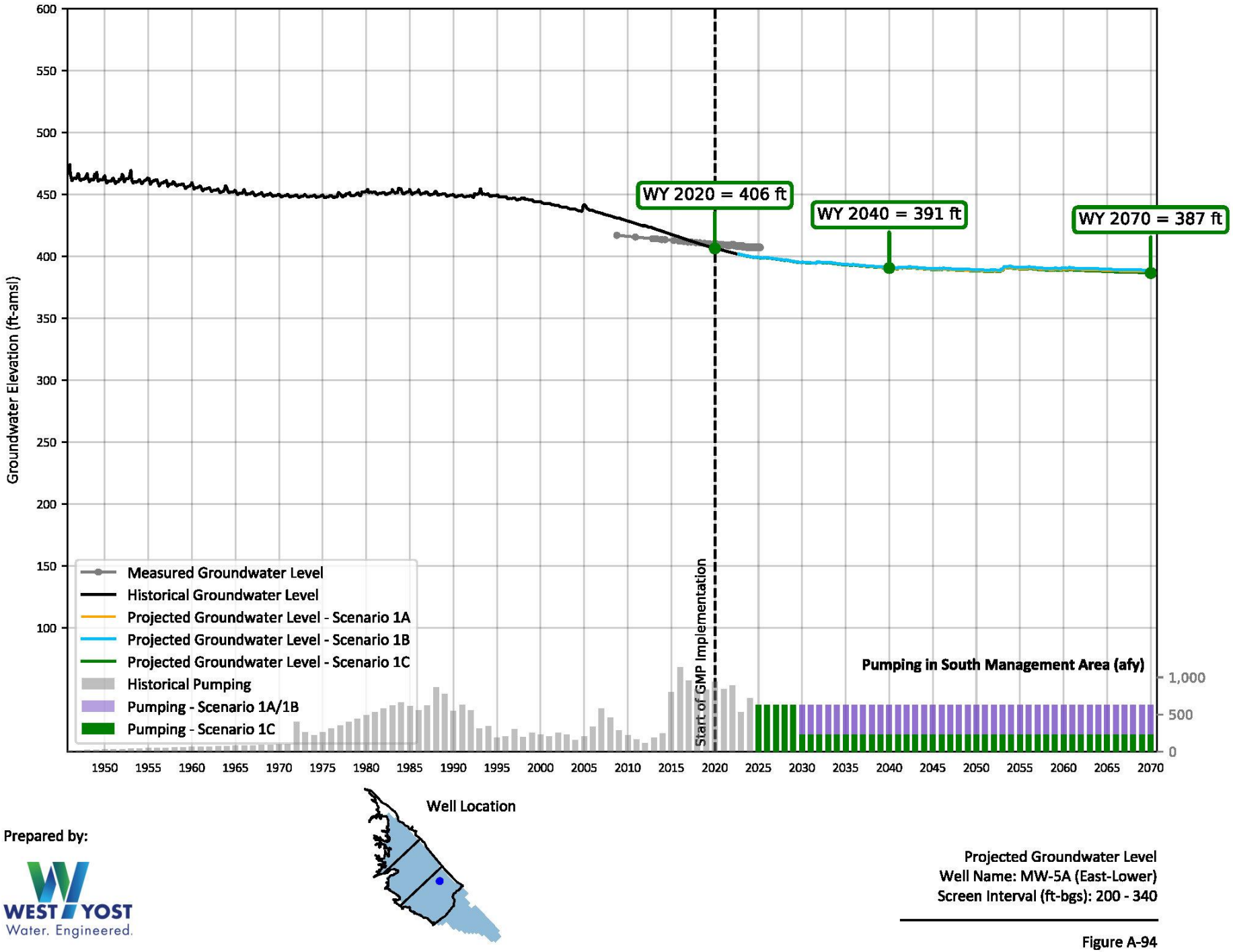
SMA:

- Groundwater levels stabilize in Scenario 1C
- This area has known calibration issues → model does not capture trends in historical groundwater levels



SMA:

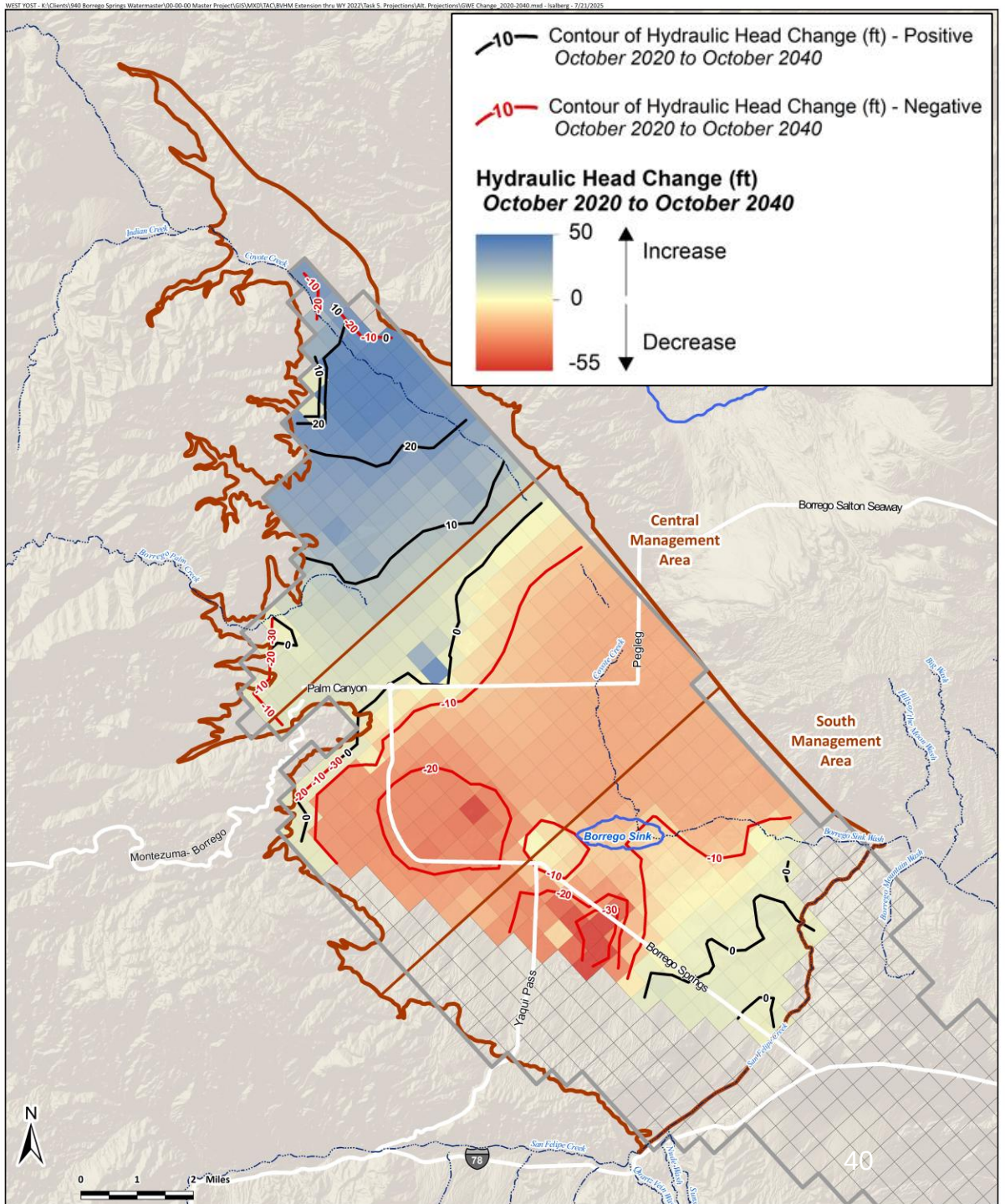
- Projected groundwater levels gradually decline through 2070 in all three scenarios
- Measured groundwater levels also decline at ~0.5-0.6 ft/yr
- *Observation*: Groundwater levels appear disconnected from influence of SMA-pumping



Change in Groundwater Elevation

Scenario 1A

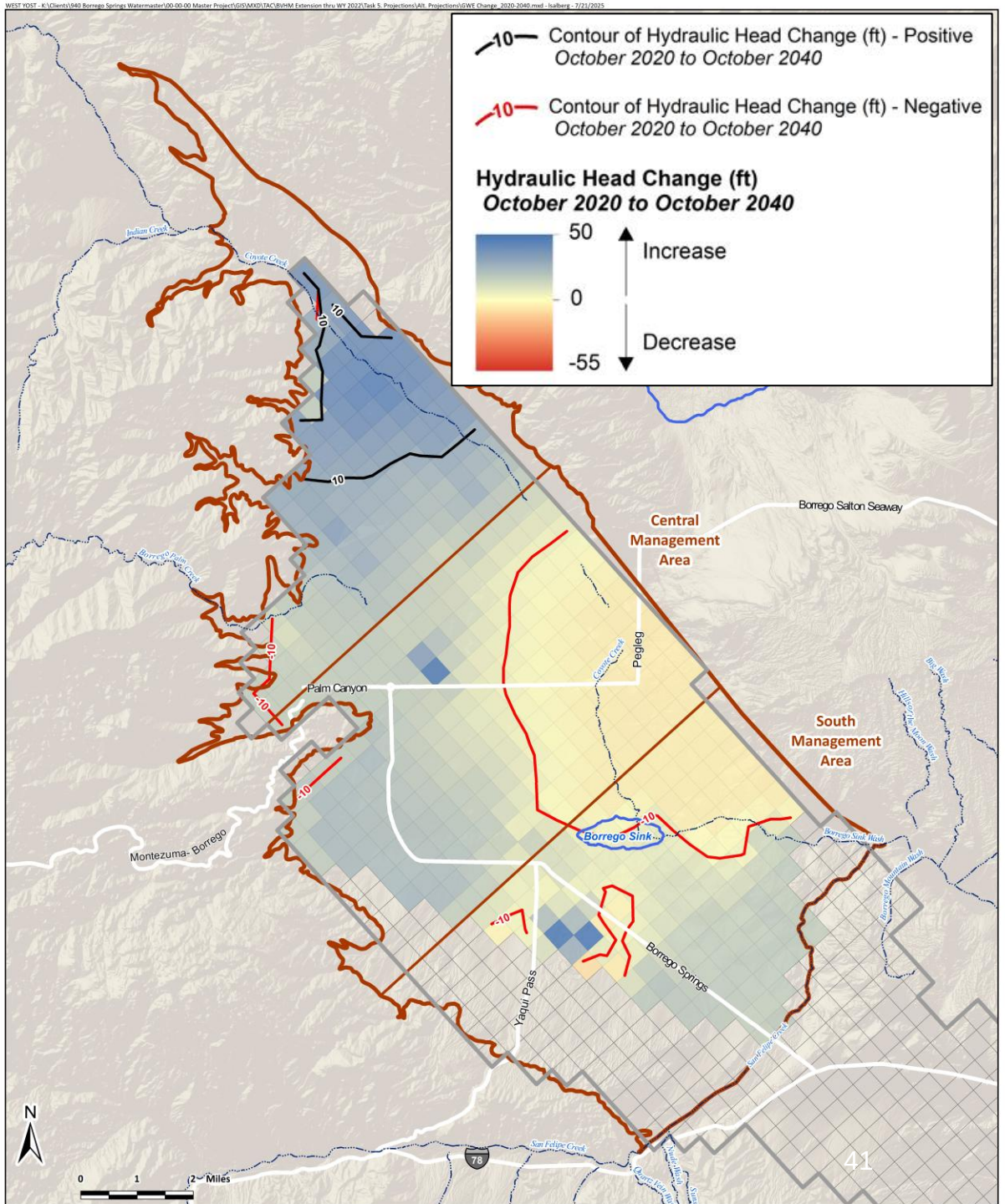
(WY 2040 minus 2020)



Change in Groundwater Elevation

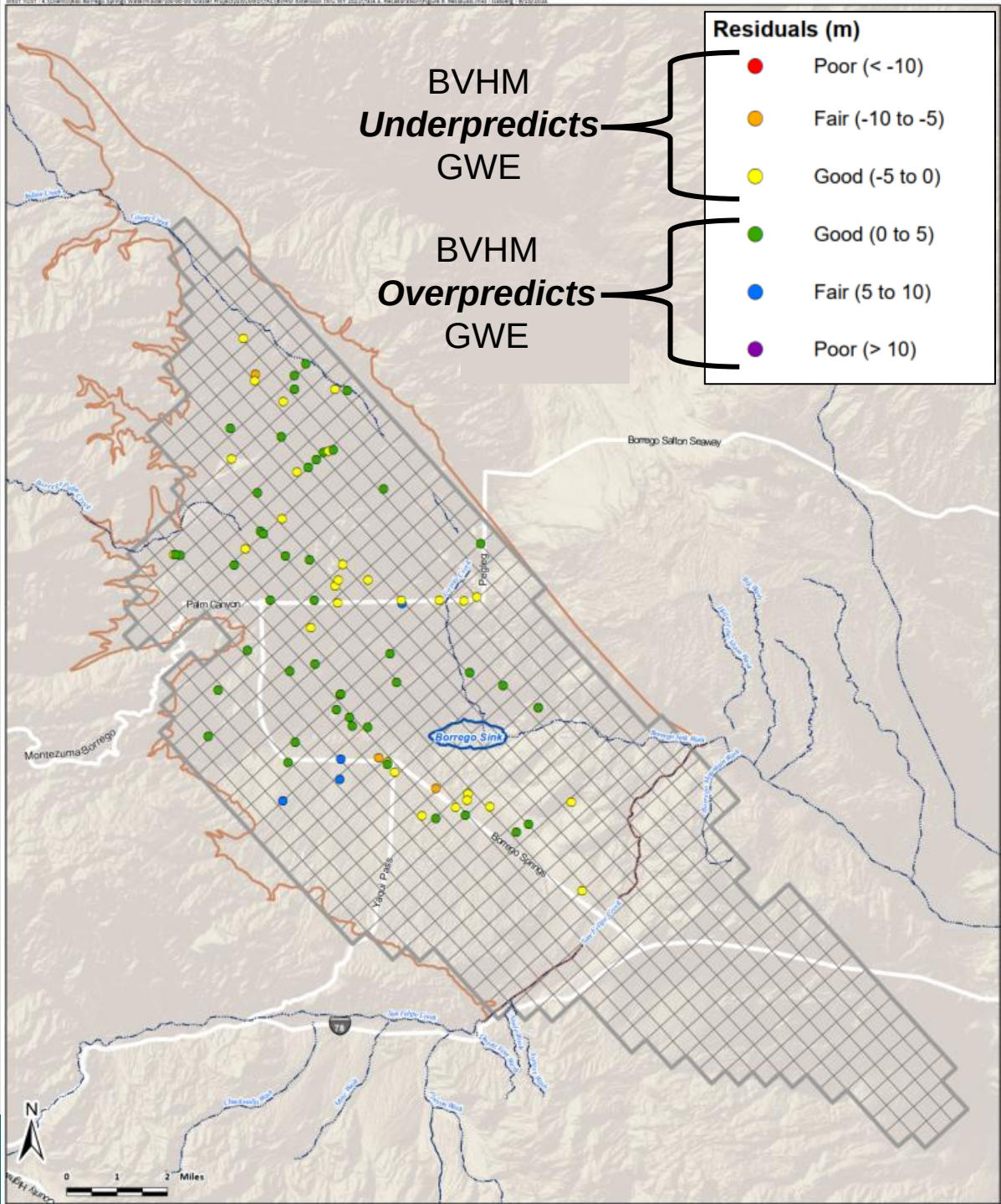
Scenario 1C

(WY 2040 minus 2020)



Measured vs. Modeled Groundwater Levels

- Model calibration identified where the BVHM under-estimates and over-estimates groundwater levels
- Simulated groundwater levels are generally within +/-5 m of measured
- Model predictions include uncertainty; results should be viewed as approximate, not absolute



Interpretations

- Scenario 1C results show:
  - Stable groundwater levels in the NMA and CMA
  - Increase in and stabilization of groundwater levels Rams Hill well field
  - Gradual decline in groundwater levels near the Borrego Sink
- Scenario 1C indicates that a shift of 1,800 afy of future pumping from the CMA/SMA to the NMA can achieve stable groundwater levels across the Basin
- The projected fluctuations in groundwater levels reflect assumptions in variable climate → simulated declines in groundwater levels (2050-2070) reflects repeat of ~20-year drought

Recommendations

- Results from Scenario 1C can be used to inform DWR of future efforts to achieve sustainability (PMA No. 6)
- There are uncertainties and known discrepancies in the model that could be affecting model results → update and recalibrate the BVHM for the 2030 redetermination of Sustainable Yield
  - HCM in the southern part of the Basin
  - Linkage between the Farm Process and Unsaturated Zone Recharge (UZF) package
  - Bugs in Zonebudget

Next Steps

- Today – Answer questions and receive any TAC feedback
- Present results and recommendations to the Board at its November meeting
- Board has requested to perform an additional BVHM projection scenario, in which water rights assigned in the Judgment are simulated (i.e. Pump full annual allocation at all BPA Parcels – even if not currently active or plans to rampdown sooner)
- Update and resubmit the SGM Memo to DWR with updated model results, including new simulation not yet performed
- Use model results to help complete the 5-year GMP Assessment Report and GMP update

TAC Agenda

II. Public Comment

III. Updated Sustainable Management Criteria based on Board, TAC, and Public Feedback

IV. Scenario 1C BVHM Simulation Results: Northward Shift of Future Pumping

V. Public Comment

Next TAC Meetings

December 2025 *(tentative*)*

- BVHM projection scenario – discuss assumptions to use in a scenario that simulates water rights as allocated in the Judgment

**meeting is dependent on Board action at its Nov. 2025 meeting*

February 2026 (joint meeting with EWG):

- Presentation on findings from review of the GDE Study Report

Thank You!