



Post Office Box 3544
Ventura, CA 93006-3544
(805) 525-4431
<https://moundbasingsa.org>

**NOTICE IS HEREBY GIVEN that the
Mound Basin Groundwater Sustainability Agency (“Agency”)
Board of Directors (“Directors”) will hold a
REGULAR BOARD MEETING
at 1:00 P.M. on Thursday, March 18, 2021**

In accordance with the **California Governor’s Executive Stay at Home Order** and the **County of Ventura Health Officer Declared Local Health Emergency** and **Be Well at Home Order** resulting from the novel coronavirus (COVID-19), the Ventura City Hall is closed to the public. Therefore, the Mound Basin GSA will hold its Regular Board of Directors meeting virtually using the Zoom video conferencing application.

If you are new to Zoom, please click on this link and watch the short video tutorial:
<https://support.zoom.us/hc/en-us/articles/201362193-How-Do-I-Join-A-Meeting->

To participate in the Board of Directors meeting via Zoom, please access:
<https://us02web.zoom.us/j/82529392240?pwd=eWNzTkdyREdYd2F5WlFtR2x3S05jQT09>

Meeting ID: 825 2939 2240 | Passcode: MBGSA

To call into the meeting (audio only), call: (877) 853-5247 (US Toll-free)

Meeting ID: 825 2939 2240

**MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY
BOARD OF DIRECTORS MEETING AGENDA**

CALL TO ORDER 1:00 P.M.

1. PLEDGE OF ALLEGIANCE

2. ROLL CALL

3. PUBLIC COMMENTS ON ITEMS NOT APPEARING ON THE AGENDA

The Board will receive public comments on items not appearing on the agenda and within the subject matter jurisdiction of the Agency. The Board will not enter into a detailed discussion or take any action on any items presented during public comments. Such items may only be referred to the Executive Director or other staff for administrative action or scheduled on a subsequent agenda for discussion. Persons wishing to speak on specific agenda items should do so at the time specified for those items. In accordance with Government Code §54954.3(b)(1), public comment will be limited to three (3) minutes per speaker.

**4. APPROVAL OF AGENDA
Motion**

5. CONSENT CALENDAR

All matters listed under the Consent Calendar are considered routine by the Board and will be enacted by one motion. There will be no separate discussion of these items unless a Board member pulls an item from the Calendar. Pulled items will be discussed and acted on separately by the Board. Members of the public who want to comment on a Consent Calendar item should do so under Public Comments. (ROLL CALL VOTE REQUIRED)

5a Approval of Minutes

Motion

The Board will consider approving the Minutes from the February 18, 2021, Regular Mound Basin GSA Board of Directors meeting.

5b Approval of Warrants

Motion

The Board will consider approving payment of outstanding vendor invoices.

5c Monthly Financial Reports

Information Item

The Board will receive monthly profit and loss statements and balance sheets for the month of February 2021.

6. BOARD MEMBER ANNOUNCEMENTS

6a Directors will provide updates on matters not on the agenda.

6b Directors will provide oral reports of time spent on grant eligible activities since the previous regular Board meeting.

7. EXECUTIVE DIRECTOR UPDATE

Information Item

The Executive Director will provide an informational update on non-GSP activities since the previous Board meeting.

8. MOTION ITEMS

8a GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)

Motion

The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.

8b Sustainable Management Criteria (Category (d), Task 4)

Motion

The Board will consider directing staff to prepare the draft groundwater sustainability plan using the proposed sustainable management criteria or provide other direction.



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MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY
REGULAR BOARD OF DIRECTORS MEETING

Thursday, February 18, 2021 at 1:00 P.M.
via Zoom, due to COVID-19 Meeting Protocol

DRAFT MINUTES

DIRECTORS IN ATTENDANCE:

Mike Mobley, Chair
Susan Rungren, Vice-Chair/Secretary
Glenn Shephard, Treasurer
Jim Chambers
Conner Everts

STAFF IN ATTENDANCE:

Bryan Bondy, Executive Director
Joseph Hughes, Agency Legal Counsel
Jackie Lozano, Clerk of the Board

PUBLIC IN ATTENDANCE:

Maryam Bral, UWCD
Dan Detmer, UWCD
Burt Handy
Kathleen Kuepper, UWCD
John Lindquist, UWCD
Neal Maguire, MBAWG
Eddie Pech, DWR
Lara Shellenbarger, SCRWC
Steven Slack, CDFW
Dr. Jason Sun, UWCD
Ambry Tibay, UWCD
Jennifer Tribo, City of Ventura

CALL TO ORDER 1:01 PM

Chair Mobley called the meeting to order at 1:01 P.M.

1. PLEDGE OF ALLEGIANCE

Chair Mobley led the participants in reciting the Pledge of Allegiance.

2. ROLL CALL

The Clerk of the Board called the roll. All five Directors were present (Mobley, Chambers, Everts, Rungren, Shephard).

3. PUBLIC COMMENTS ON ITEMS NOT APPEARING ON THE AGENDA

Chair Mobley asked if there were any public comments. None were offered.

4. APPROVAL OF AGENDA

Motion

Director Shephard informed the Board of his need to depart early. Executive Director Bondy suggested moving Item 8d (Review of Future Groundwater Conditions Modeling Results and Implications for Sustainable Management) up on the Agenda to allow Director Shephard to receive the full update on the GSP and provide comment. All Board members agreed.

Motion to approve the agenda, as amended, Director Everts; Second, Director Chambers. Roll call vote: five ayes (Chambers, Everts, Rungren, Shephard, Mobley), none opposed. Motion carried 5/0.

5. CONSENT CALENDAR

5a Approval of Minutes

Motion

The Board will consider approving the Minutes from the January 21, 2021, Regular Mound Basin GSA Board of Directors meeting.

5b Approval of Warrants

Motion

The Board will consider approving payment of outstanding vendor invoices.

5c Monthly Financial Reports

Information Item

The Board will receive monthly profit and loss statements and balance sheets for the month of January 2021.

No comments or questions were offered by the Directors.

No public comments were offered.

Motion to approve the Consent Calendar, Director Everts; Second, Director Shephard. Roll call vote: five ayes (Chambers, Everts, Mobley, Rungren, Shephard), none opposed. Motion carried 5/0.

6. BOARD MEMBER ANNOUNCEMENTS

6a Since the previous Board meeting, Director Everts participated in a monthly NGO groundwater call where he viewed presentations and listened to updates.

6b Since the previous Board meeting, the Directors reported no time was spent on grant eligible activities.

7. EXECUTIVE DIRECTOR UPDATE

Executive Director Bondy reviewed the staff report with the Board regarding updates on non-GSP items.

Information item. No comments or questions were offered by the Directors.

No public comments were offered.

8. MOTION ITEMS

8d Review of Future Groundwater Conditions Modeling Results and Implications for Sustainable Management (Grant Category (c), Task 3 and Category (d), Task 4)

Motion

Executive Director Bondy presented a thorough review of assumptions and scenarios of the modeling results to the Board. The second part of the presentation included recommended approaches for addressing the sustainability indicators in the groundwater sustainability plan. United Water's Hydrogeologist John Lindquist provided additional details concerning the modeling tasks. (Presentation slides are attached to the minutes.)

Director Everts appreciated the presentation and work that went into the modeling. There were also questions regarding if the modeling had addressed an earthquake event due to the outlying faults and/or impact of climate change scenarios with seawater rising, and how that would affect groundwater? Executive Director Bondy responded the faults are a geologic structure and there could already be a connection that exists whether there is an earthquake or not. He added that DWR climate change factors address seawater rise, which was included in the modeling. UWCD staff confirmed the sea level rise values in the Zoom chat during the meeting.

Director Shephard agreed on the recommendations for the sustainable management criteria, but asked how Mound Basin would coordinate with Fox Canyon GMA's GSP? Would DWR want the two linked and/or aligned together? Executive Director Bondy said that coordination with Fox Canyon GMA will be necessary and that the GSP should identify that as an action. He added Mound Basin could seek to enter into a formal coordination agreement, or the coordination could be less formal. Director Rungren thanked staff for the work that went into this report. She had no questions.

Burt Handy asked if seawater intrusion was considered in the vicinity of San Jon Road. Executive Director Bondy replied that there is no groundwater pumping in that area and referred to a presentation figure showing model results indicating offshore groundwater flow in that area.

A question was asked about Ventura's sewer trunkline which runs along Harbor Boulevard. Director Rungren provided clarifications.

Director Everts is interested in hearing more about information factoring in drought and seawater rise. Director Mobley was pleased to see that groundwater levels are projected to be higher than in the past and asked if the results have been reviewed for accuracy. Executive Director Bondy explained that UWCD staff completed several rounds of quality control review of the model results and he feels confident that there are no mistakes.

No further comments or questions were offered by the Directors.

No further comments or questions were offered by the public.

Motion to receive and file the information regarding the modeling results and implications for sustainable management, Director Everts; Second, Director Shephard. Roll call vote: five ayes (Chambers, Everts, Mobley, Rungren, Shephard), none opposed. Motion carried 5/0.

Director Shephard exited the meeting at 2:30 p.m.

**8a Fiscal Year 2020/2021 2nd Quarter Budget Report and Mid-Year Budget Modifications
Motion**

Executive Director Bondy briefly reviewed the staff report and recommendations. There was a question from the public as to the \$55,000 loan from the City of Ventura, asking if the Agency should pay the loan off early? Executive Director Bondy said it would be too early to pay off the loan because the cash balance would fall below the reserve target the Board had adopted.

No comments or questions were offered by the Directors.

No further comments or questions were offered by the public.

Motion to receive and file the report and budget modifications, Director Everts; Second, Director Rungren. Roll call vote: four ayes (Chambers, Everts, Mobley, Rungren), none opposed; one absent (Shephard). Motion carried 4/0/1.

**8b Fiscal Year 2019-20 and FY 2020-21 Biennial Audit
Motion**

Executive Director Bondy recommended approving the new contract with Rogers, Anderson, Malody & Scott LLP (RAMS) in an amount not to exceed \$9,200 for the Fiscal Year 2019-2020 and 2020-2021 audit and associated State Controller's Reports. He also recommended authorizing the Executive Director to sign the engagement letter with RAMS.

No comments or questions were offered by the Directors.

No comments or questions were offered by the public.

Motion to approve and file the contract with RAMS and authorize the Executive Director to execute an engagement letter with RAMS for auditing purposes as discussed; Director Rungren; Second, Director Chambers. Roll call vote: four ayes (Chambers, Everts, Mobley, Rungren), none opposed; one absent (Shephard). Motion carried 4/0/1.

8c GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)
Motion

The Board received an update from Executive Director Bondy concerning development of the Agency's Groundwater Sustainability Plan and grant status.

No comments or questions were offered by the Directors.

No comments or questions were offered by the public.

Motion to receive and file the GSP monthly update, Director Rungren; Second, Director Chambers. Roll call vote: four ayes (Chambers, Everts, Mobley, Rungren), none opposed; one absent (Shephard). Motion carried 4/0/1.

9. FUTURE AGENDA ITEMS

- Discuss Sustainable Management Criteria based on feedback received from the GSP online workshop no. 2.

ADJOURNMENT 2:41 P.M.

Chair Mobley adjourned the meeting at 2:41 P.M. to the next **Regular Board Meeting on Thursday, March 18, 2021**, or call of the Chair. Chair Mobley thanked Executive Director Bondy on a job well done.

I certify that above is a true and correct copy of the minutes of the Mound Basin Groundwater Sustainability Agency's Board of Directors meeting of February 18, 2021.

ATTEST: _____
Susan Rungren, Board Secretary

ATTEST: _____
Jackie Lozano, Clerk of the Board



ITEM 8D
MBGSA
BOARD MEETING
FEBRUARY 18, 2021

2021-02-18



1

SGMA REQUIREMENTS

- SGMA requires minimum 50-yr future projections of groundwater conditions, including water budget for the basin
- Must use \geq 50 yrs. of *historical* hydrology
- Must use most recent conditions for baseline estimate of future water demands
- Must evaluate potential effects on water demand due to:
 - Land Use Change
 - Population Change
 - Climate Change

2021-02-18

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FUTURE CONDITIONS KEY ASSUMPTIONS

- Discussed with Board on 9/17/2020
- Hydrology
 - 1943 – 2019 (77 yrs.) is proxy for future conditions
 - Wide range of conditions during this period
- Groundwater Pumping
 - Agricultural – per MBAWG
 - Ranges from 2,873 AFY in wet yrs. to 3,548 AFY in dry yrs.
 - City of Ventura planned pumping = 4,000 AFY
 - Two industrial wells – same as recent historical pumping

2021-02-18

3

FUTURE CONDITIONS KEY ASSUMPTIONS (CON'T)

- Adjacent Basins
 - Santa Paula – assume future pumping consistent with recent pumping (adjudicated)
 - Oxnard Basin – used FCGMA “Reduction with Projects Scenario from GSP per FCGMA staff recommendation
 - Adjustments made to reduce unrealistically high groundwater levels in Oxnard Basin Forebay (GW levels above land surface)
- Artificial Recharge (UWCD)
 - Existing Freeman Diversion operations + planned expansion project per UWCD staff

2021-02-18

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SGMA REQUIRED ANALYSIS

■ Land Use Impact

- Assume no material change due to SOAR voter initiatives approved through 2050.
- City has net zero policy for development

■ Population Change

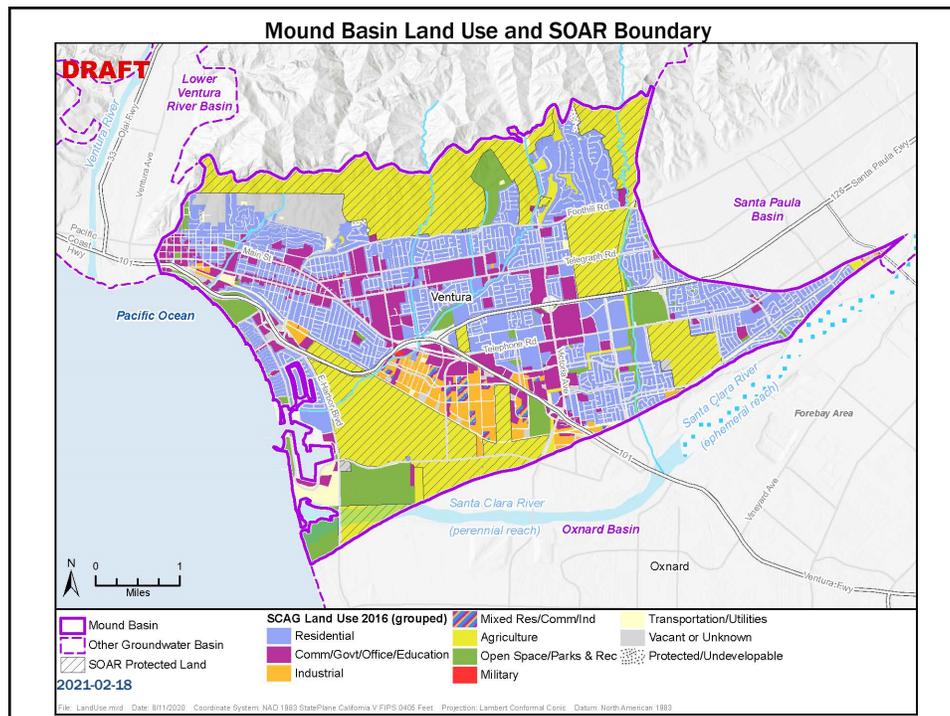
- Same as above.

■ Climate Change

- Evaluated climate change using DWR change factors for 2030 and 2070 climate change conditions

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MODEL SCENARIOS

- **Historical: 1985-2019** (calibration/verification model)
- **Baseline:** This simulation employs the future assumptions described above.
- **2030 Climate Change:** Baseline inputs modified using DWR 2030 “climate change factors”
- **2070 Climate Change:** Baseline inputs modified using DWR 2070 “climate change factors”
- **2070 Climate Change without Freeman Diversion Expansion Project:** Same as “2070 Climate Change” scenario, but w/o expansion project.
- **Particle tracking** to evaluate seawater intrusion risk

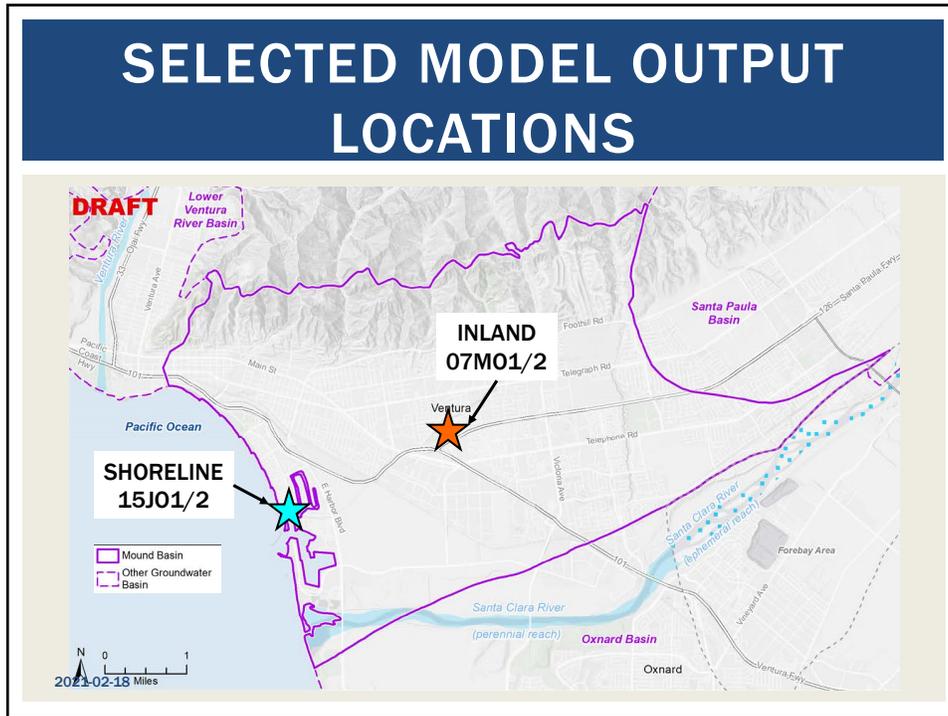
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KEY RESULTS GROUNDWATER LEVELS

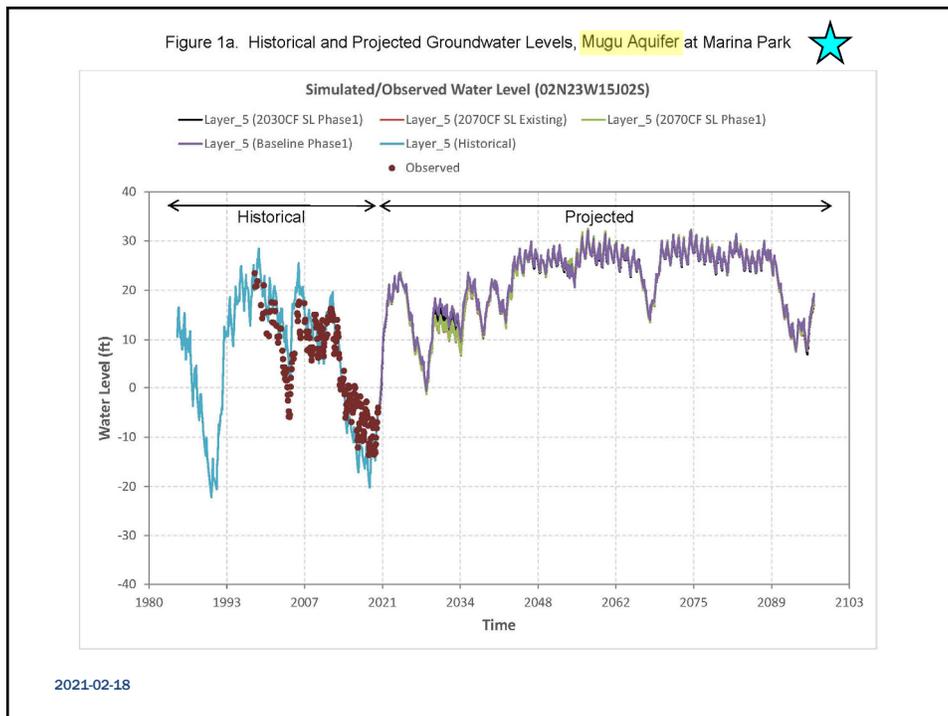
1. Future groundwater levels are predicted to be higher than historical levels due to anticipated increases in Oxnard Basin groundwater levels.
2. The impact of climate change on groundwater levels is typically less than approximately 5 ft.
3. The impact of the Freeman Diversion expansion project is almost undetectable.

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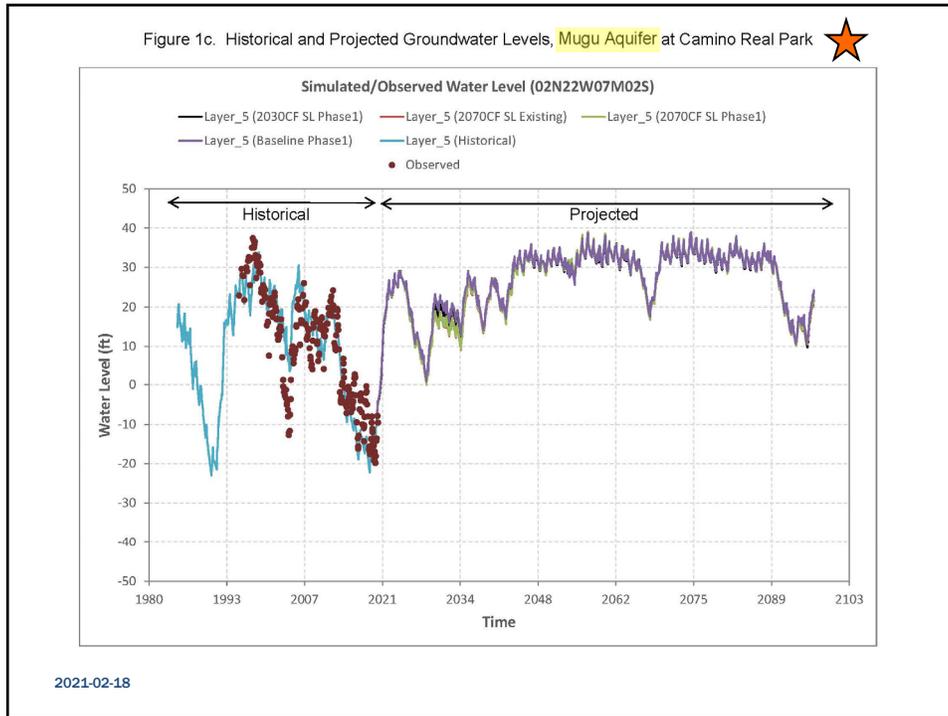
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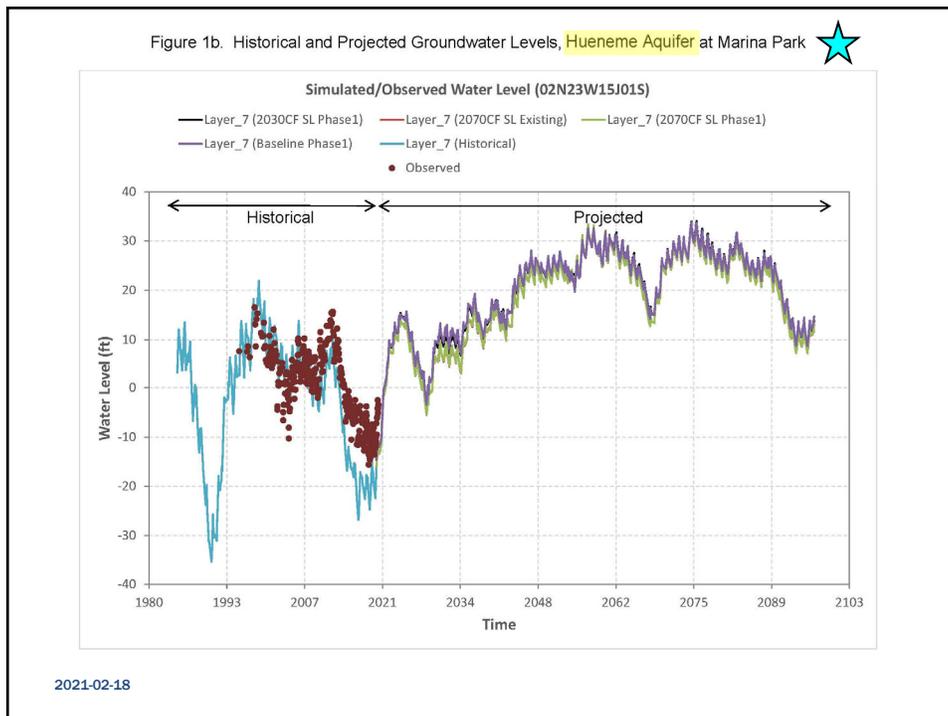
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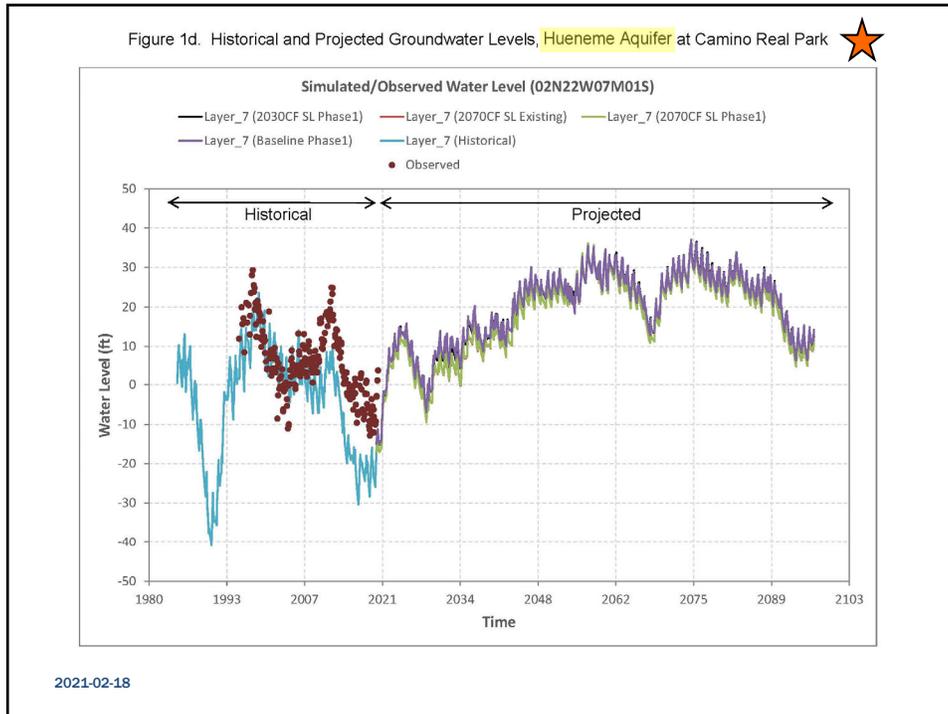
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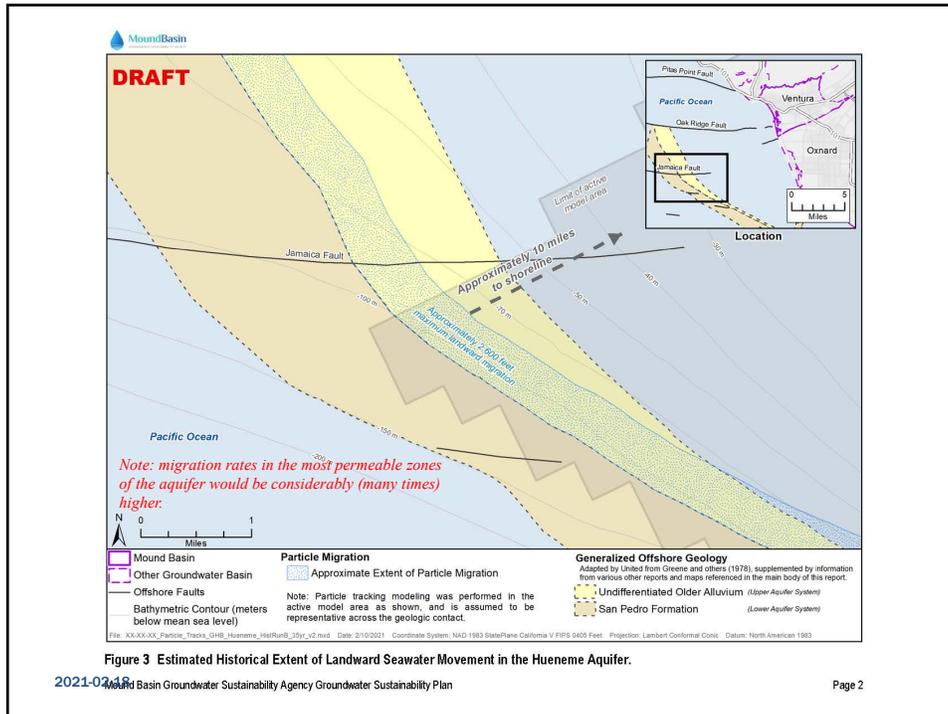
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SEAWATER INTRUSION RISK EVALUATION

- Aquifers are exposed to seawater at subcrop approximately 10.5 miles offshore.
- Between subcrop and shoreline, aquifers are believed to be protected from seawater by thick sequence of fine-grained deposits (aquitard)
- Historical movement of seawater from subcrop toward shoreline was estimated using historical model using particle tracking
 - No landward movement of seawater in Mugu Aquifer
 - Approximately 0.5 miles of average landward movement in Hueneme Aquifer over last century*

*Migration rates in the most permeable zones of the aquifer would be considerably (many times) higher.

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SEAWATER INTRUSION RISK EVALUATION (CON'T)

- **Conclusions:**
 - Seawater is not migrating landward in Mugu Aquifer
 - Timeframe for seawater to migrate from current estimated location in Hueneme Aquifer to shore is longer than SGMA planning horizon
 - However, if a short circuit pathway for seawater migration into aquifers exists nearshore (possible along faults or “stratigraphic windows”), onshore flow of seawater could occur much sooner.

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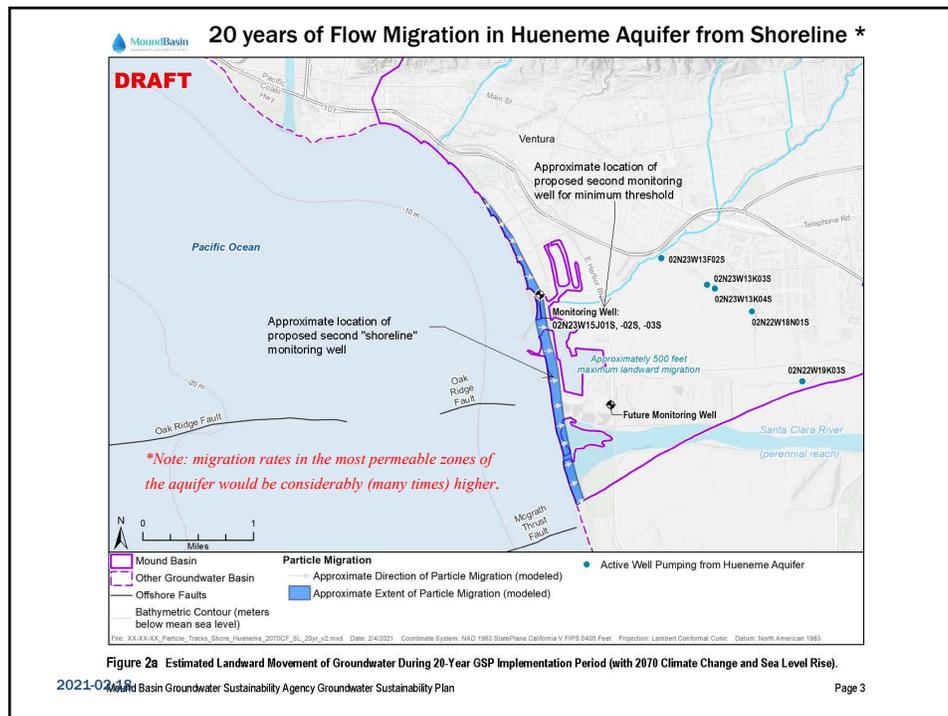
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SEAWATER INTRUSION RISK EVALUATION (CON'T)

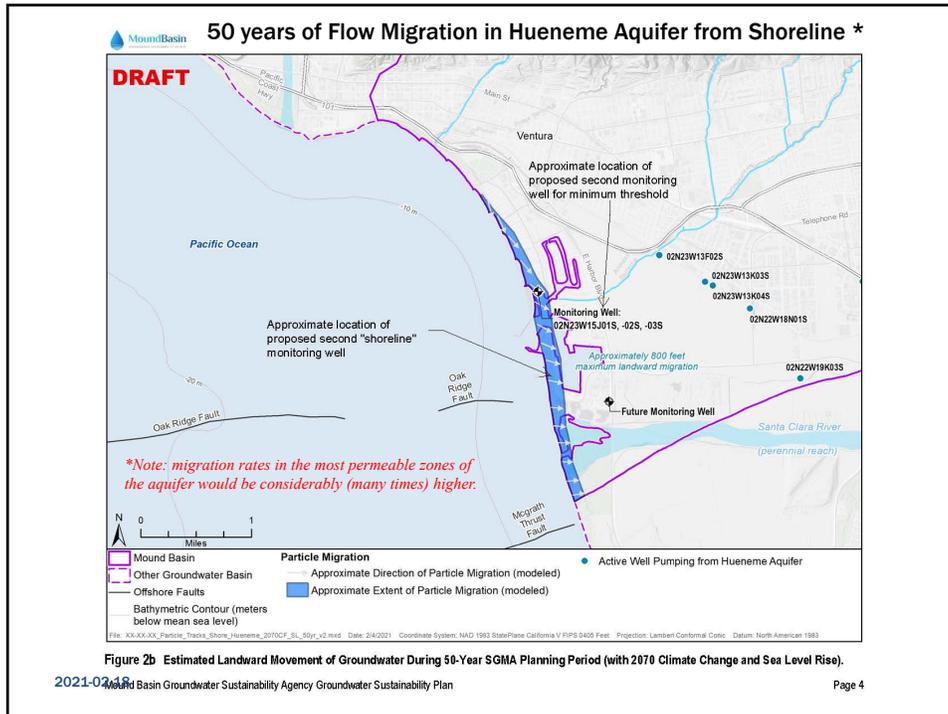
- Particle tracking of groundwater flow directions and flow rates along the shoreline was performed to evaluate risk of onshore migration via a near shore short-circuit pathway.

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KEY RESULTS OF SHORELINE FLOW EVALUATION

1. Particle tracking results suggest that groundwater will flow offshore in the Mugu Aquifer.
2. Particle tracking results suggest that groundwater will flow onshore in the Hueneme Aquifer at an average rate of approximately 1/8 of a mile per 20 years.
 - Note: Migration rates in the most permeable zones of the aquifer could be considerably (many times) higher.

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SUSTAINABLE MANAGEMENT IMPLICATION #1

- Seawater intrusion is not anticipated to be an issue for the Mound Basin during the 50-year SGMA planning horizon; however, a monitoring and contingency plan is warranted to address potential short-circuit pathways for seawater.

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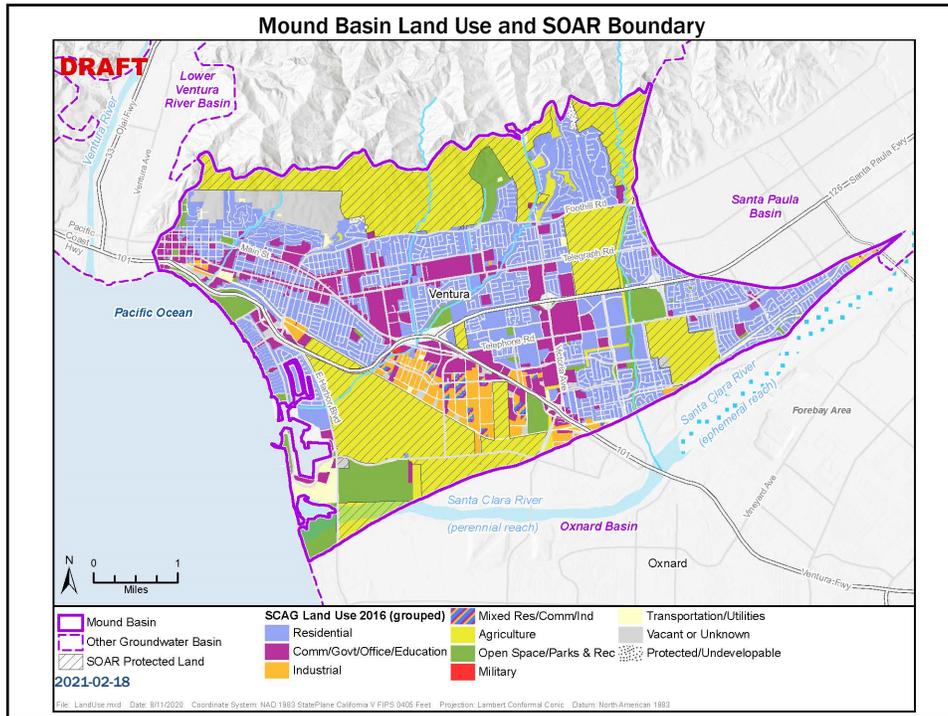
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PROPOSED SEAWATER INTRUSION SMC

- Undesirable Result: Seawater intrusion east of Harbor Blvd.
 - No current or anticipated future beneficial uses of groundwater west of Harbor Blvd.
 - Protect existing beneficial uses east of Harbor Blvd.
- Minimum Threshold:
 - Seawater in monitoring wells near Harbor Blvd.
- Measurable Objective:
 - No indication of seawater in monitoring wells near Harbor Blvd.

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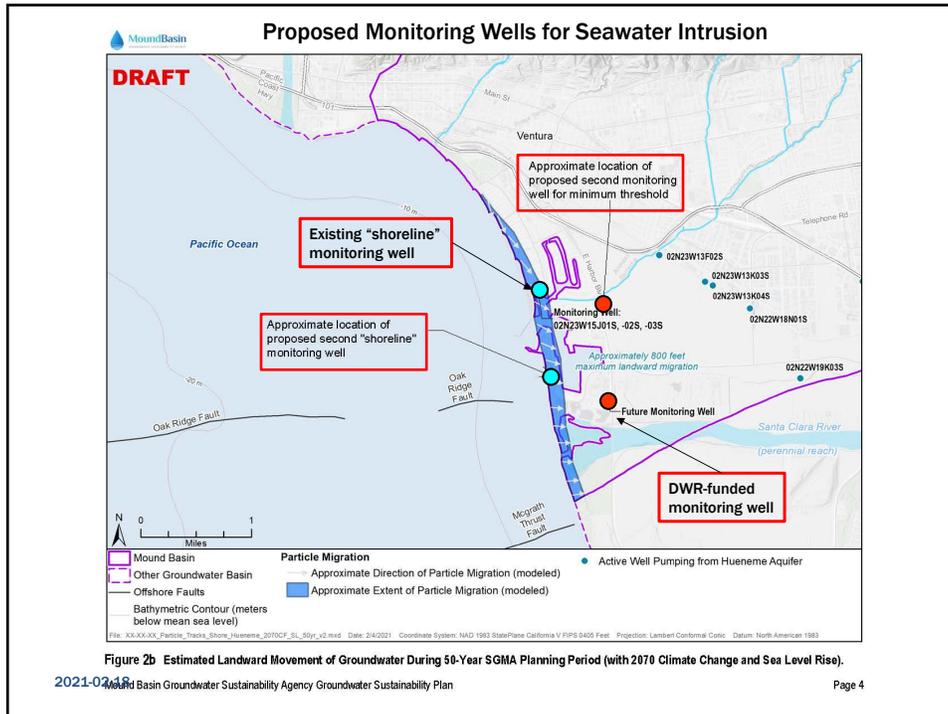
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SEAWATER INTRUSION MONITORING RECOMMENDATIONS

- Construct one additional “shoreline monitoring well”
 - Shoreline monitoring wells provide early detection of seawater and provide time for GSA to implement contingency measures before seawater reaches Harbor Blvd.
- Construct one additional monitoring well along Harbor Blvd. for SMC monitoring
- Estimate cost ~\$500,000 each
 - Pursue SGMA implementation grant

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SUSTAINABLE MANAGEMENT IMPLICATION #2

- Subsidence is not anticipated because modeling results suggest that future groundwater levels will remain above historical low levels.
- Therefore, inelastic land subsidence is not anticipated to be an issue for the Mound Basin during the 50-year SGMA planning horizon.

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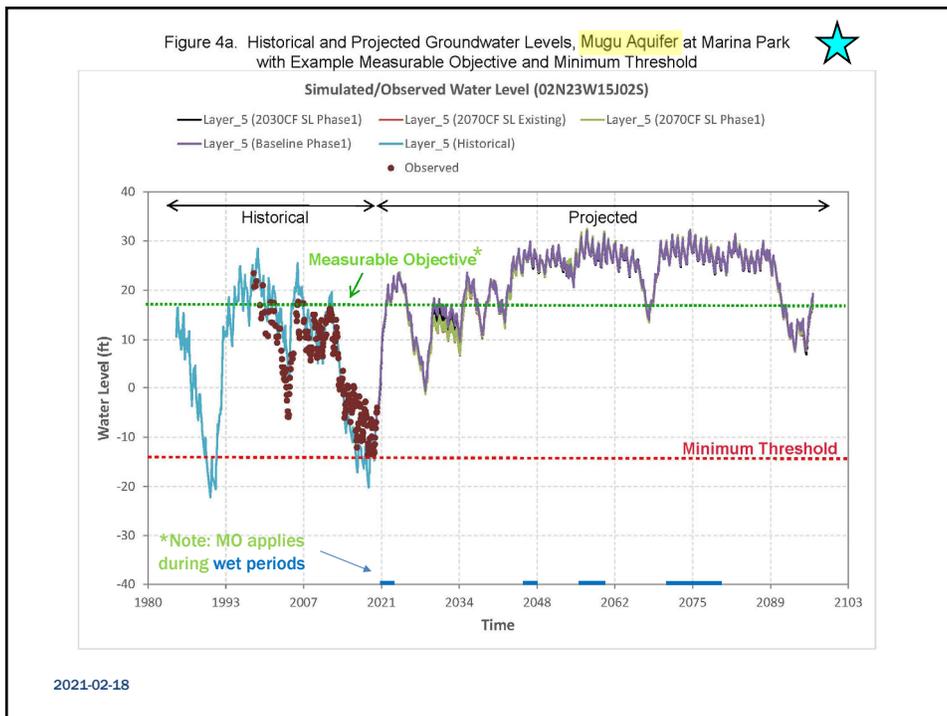
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PROPOSED SUBSIDENCE SMC

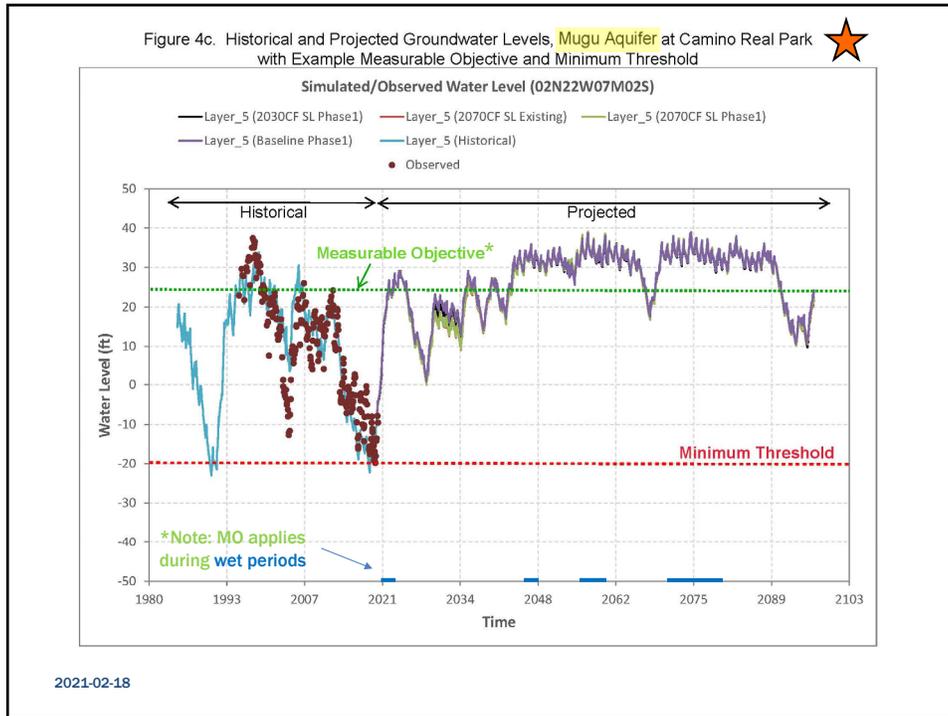
- **Undesirable Result: Measurable inelastic subsidence due to groundwater pumping west of Harbor Blvd.**
 - “Coastal Area” west of Harbor Blvd. is susceptible to land subsidence
 - City sewer main running along Harbor Blvd has low slope
 - Sea level rise impacts to Coastal Area predicted – subsidence would exacerbate sea level rise impacts
- **Minimum Threshold:**
 - Groundwater levels below historical low levels as a proxy for potential onset of subsidence
 - Note: areas east of Harbor Blvd. are less susceptible to effects of subsidence, but it is unlikely that groundwater levels could be sustained below historical lows east of Harbor Blvd. without causing groundwater levels to drop below historical lows in Coastal Area
- **Measurable Objective:**
 - GW levels during wet periods sufficient to prevent dropping below historical lows during droughts

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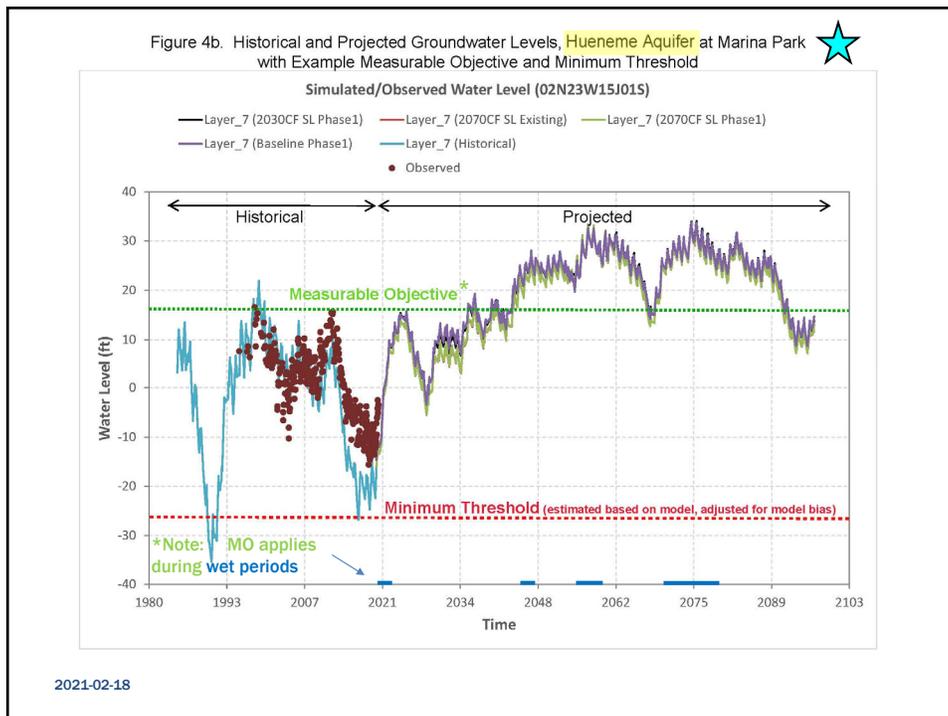
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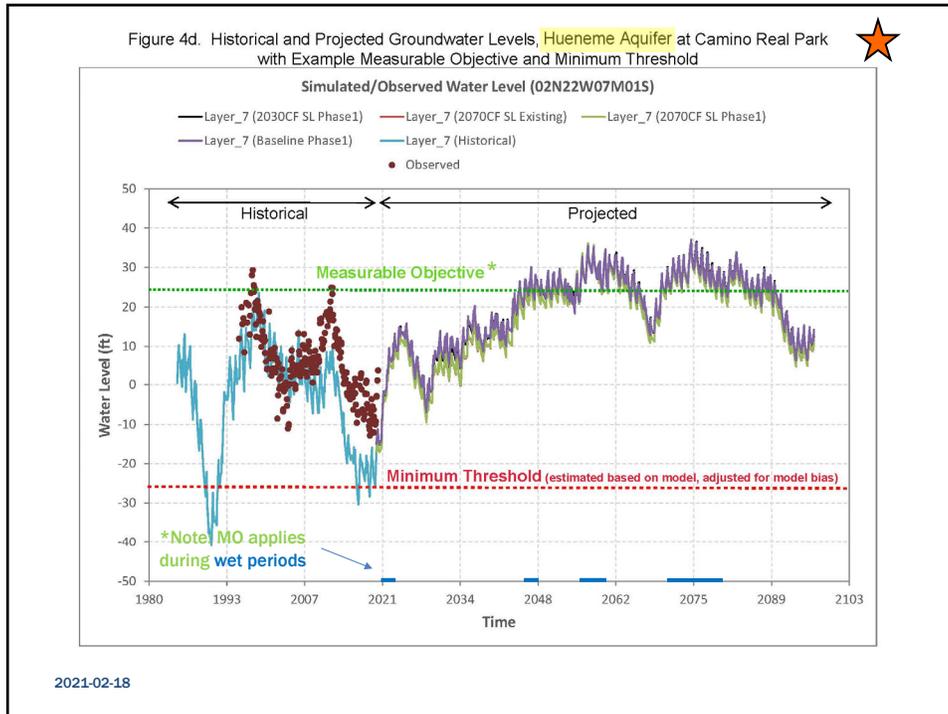
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OTHER SUSTAINABLE MANAGEMENT IMPLICATIONS

- The chronic groundwater level decline and reduction of groundwater storage sustainability indicators will not be controlling factors for sustainable management.
- FCGMA’s progress toward achieving its sustainability goal for the Oxnard Basin will be important to track. MBGSA will need to be prepared to adapt its GSP if FCGMA does not meet its sustainability goal or otherwise dramatically deviates from the plans set forth in its initial GSP.

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PROPOSED NEXT STEPS

- Board feedback today
- Present at upcoming GSP workshop on March 4
- Review and approve for draft SMC for inclusion in draft GSP at March 18 regular Board meeting

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QUESTIONS & DISCUSSION

2021-02-18



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Mound Basin Groundwater Sustainability Agency
Check Detail
March 1 - 10, 2021

<u>Type</u>	<u>Num</u>	<u>Date</u>	<u>Name</u>	<u>Account</u>	<u>Original Amount</u>
Bill Pmt -Check	11383	03/10/2021	Bondy Groundwater Consulting, Inc	10000 · Bank of the Sierra	-9,400.00
Bill Pmt -Check	11384	03/10/2021	County of Ventura- IT Servces Department	10000 · Bank of the Sierra	-686.50
Bill Pmt -Check	11385	03/10/2021	INTERA Incorporated	10000 · Bank of the Sierra	-5,513.00
Bill Pmt -Check	11386	03/10/2021	United Water Conservation District	10000 · Bank of the Sierra	-5,400.32
					<hr/> -20,999.82



MoundBasin
GROUNDWATER SUSTAINABILITY AGENCY

Information Item No. 5c

DATE: March 18, 2021
TO: Board of Directors and Executive Director
FROM: Ambry Tibay, UWCD
SUBJECT: Monthly Financial Reports

SUMMARY

The Board will receive the monthly financial reports for the Mound Basin GSA.

INFORMATIONAL ITEM

UWCD accounting staff has prepared financial reports based on the Mound Basin GSA revenue and expenses for the month of February 2021.

BACKGROUND

FISCAL SUMMARY

Not applicable.

ATTACHMENTS

- A. February 2021 Profit/Loss Statement
- B. February 2021 Profit/Loss by Class
- C. February 2021 Balance Sheet

Mound Basin Groundwater Sustainability Agency
Profit & Loss Budget Performance
 July 2020 through February 2021

	<u>Jul '20 - Feb 21</u>	<u>Annual Budget</u>	<u>Budget</u>
Income			
40001 · Groundwater Extraction Fees	33,233.08	150,000.00	22.16%
41000 · Grant revenue			
41001 · State Grants	161,089.84	493,277.00	32.66%
Total 41000 · Grant revenue	<u>161,089.84</u>	<u>493,277.00</u>	<u>32.66%</u>
47000 · Other Revenue			
47001 · Late Fees	-3,870.13	1,136.00	-340.68%
Total 47000 · Other Revenue	<u>-3,870.13</u>	<u>1,136.00</u>	<u>-340.68%</u>
Total Income	<u>190,452.79</u>	<u>644,413.00</u>	<u>29.55%</u>
Gross Profit	190,452.79	644,413.00	29.55%
Expense			
52200 · Professional Services			
52240 · Prof Svcs - IT Consulting	727.78	494.00	147.32%
52250 · Prof Svcs - Groundwater/GSP Pre			
52252 · Prof Svcs - GSP Consultant	223,130.86	469,842.00	47.49%
Total 52250 · Prof Svcs - Groundwater/GSP Pre	<u>223,130.86</u>	<u>469,842.00</u>	<u>47.49%</u>
52270 · Prof Svcs - Accounting	5,645.31	15,000.00	37.64%
52275 · Prof Svcs - Admin/Clerk of Bd	7,080.06	12,500.00	56.64%
52280 · Prof Svcs - Executive Director	14,850.00	45,000.00	33.00%
Total 52200 · Professional Services	<u>251,434.01</u>	<u>542,836.00</u>	<u>46.32%</u>
52500 · Legal Fees			
52501 · Legal Counsel	2,330.50	35,000.00	6.66%
Total 52500 · Legal Fees	<u>2,330.50</u>	<u>35,000.00</u>	<u>6.66%</u>
53000 · Office Expenses			
53010 · Public Information	2,417.92	5,000.00	48.36%
53020 · Office Supplies	31.10	3,500.00	0.89%
53026 · Postage & Mailing	229.22	700.00	32.75%
53070 · Licenses, Permits & Fees	3,712.80	4,000.00	92.82%
53110 · Travel & Training	237.75	500.00	47.55%
Total 53000 · Office Expenses	<u>6,628.79</u>	<u>13,700.00</u>	<u>48.39%</u>
53500 · Insurance			
53510 · Liability Insurance	1,945.00	3,700.00	52.57%
Total 53500 · Insurance	<u>1,945.00</u>	<u>3,700.00</u>	<u>52.57%</u>
70000 · Interest & Debt Service			
70120 · Interest Expense	0.00	1,238.00	0.00%
Total 70000 · Interest & Debt Service	<u>0.00</u>	<u>1,238.00</u>	<u>0.00%</u>
Total Expense	<u>262,338.30</u>	<u>596,474.00</u>	<u>43.98%</u>
Net Income	<u><u>-71,885.51</u></u>	<u><u>47,939.00</u></u>	<u><u>-149.95%</u></u>

Mound Basin Groundwater Sustainability Agency
Profit & Loss by Class
 July 2020 through February 2021

	A - Grant Administration	Task 03 - Stakeholder Outreach (C - Planning Activities)	Total C - Planning Activities	Task 04 - GSP Development (D - GSP Development)	D - GSP Development - Other (D - GSP Development)	Total D - GSP Development	Unclassified	TOTAL
Income								
40001 · Groundwater Extraction Fees	0.00	0.00	0.00	0.00	0.00	0.00	33,233.08	33,233.08
41000 · Grant revenue								
41001 · State Grants	8,429.50	0.00	0.00	0.00	152,660.34	152,660.34	0.00	161,089.84
Total 41000 · Grant revenue	8,429.50	0.00	0.00	0.00	152,660.34	152,660.34	0.00	161,089.84
47000 · Other Revenue								
47001 · Late Fees	0.00	0.00	0.00	0.00	0.00	0.00	-3,870.13	-3,870.13
Total 47000 · Other Revenue	0.00	0.00	0.00	0.00	0.00	0.00	-3,870.13	-3,870.13
Total Income	8,429.50	0.00	0.00	0.00	152,660.34	152,660.34	29,362.95	190,452.79
Gross Profit	8,429.50	0.00	0.00	0.00	152,660.34	152,660.34	29,362.95	190,452.79
Expense								
52200 · Professional Services								
52240 · Prof Svcs - IT Consulting	0.00	0.00	0.00	0.00	0.00	0.00	727.78	727.78
52250 · Prof Svcs - Groundwater/GSP Pre								
52252 · Prof Svcs - GSP Consultant	8,300.00	5,150.00	5,150.00	199,944.86	0.00	199,944.86	9,736.00	223,130.86
Total 52250 · Prof Svcs - Groundwater/GSP Pre	8,300.00	5,150.00	5,150.00	199,944.86	0.00	199,944.86	9,736.00	223,130.86
52270 · Prof Svcs - Accounting	2,329.10	0.00	0.00	0.00	0.00	0.00	3,316.21	5,645.31
52275 · Prof Svcs - Admin/Clerk of Bd	0.00	170.55	170.55	149.23	0.00	149.23	6,760.28	7,080.06
52280 · Prof Svcs - Executive Director	0.00	0.00	0.00	0.00	0.00	0.00	14,850.00	14,850.00
Total 52200 · Professional Services	10,629.10	5,320.55	5,320.55	200,094.09	0.00	200,094.09	35,390.27	251,434.01
52500 · Legal Fees								
52501 · Legal Counsel	0.00	0.00	0.00	0.00	0.00	0.00	2,330.50	2,330.50
Total 52500 · Legal Fees	0.00	0.00	0.00	0.00	0.00	0.00	2,330.50	2,330.50
53000 · Office Expenses								
53010 · Public Information	0.00	1,775.60	1,775.60	0.00	0.00	0.00	642.32	2,417.92
53020 · Office Supplies	0.00	0.00	0.00	0.00	0.00	0.00	31.10	31.10
53026 · Postage & Mailing	0.00	0.00	0.00	0.00	0.00	0.00	229.22	229.22
53070 · Licenses, Permits & Fees	0.00	0.00	0.00	0.00	0.00	0.00	3,712.80	3,712.80
53110 · Travel & Training	0.00	0.00	0.00	0.00	0.00	0.00	237.75	237.75
Total 53000 · Office Expenses	0.00	1,775.60	1,775.60	0.00	0.00	0.00	4,853.19	6,628.79
53500 · Insurance								
53510 · Liability Insurance	0.00	0.00	0.00	0.00	0.00	0.00	1,945.00	1,945.00
Total 53500 · Insurance	0.00	0.00	0.00	0.00	0.00	0.00	1,945.00	1,945.00
Total Expense	10,629.10	7,096.15	7,096.15	200,094.09	0.00	200,094.09	44,518.96	262,338.30
Net Income	-2,199.60	-7,096.15	-7,096.15	-200,094.09	152,660.34	-47,433.75	-15,156.01	-71,885.51

Mound Basin Groundwater Sustainability Agency

Balance Sheet

As of February 28, 2021

	<u>Feb 28, 21</u>
ASSETS	
Current Assets	
Checking/Savings	
10000 · Bank of the Sierra	98,915.32
Total Checking/Savings	<u>98,915.32</u>
Accounts Receivable	
11000 · Accounts Receivable	207,613.10
Total Accounts Receivable	<u>207,613.10</u>
Total Current Assets	<u>306,528.42</u>
TOTAL ASSETS	<u><u>306,528.42</u></u>
LIABILITIES & EQUITY	
Liabilities	
Current Liabilities	
Accounts Payable	
20000 · Accounts Payable	20,999.82
Total Accounts Payable	<u>20,999.82</u>
Other Current Liabilities	
20001 · Advance from City of Ventura	55,000.00
20510 · Interest Payable	1,958.30
Total Other Current Liabilities	<u>56,958.30</u>
Total Current Liabilities	<u>77,958.12</u>
Total Liabilities	77,958.12
Equity	
32000 · Retained Earnings	300,455.81
Net Income	-71,885.51
Total Equity	<u>228,570.30</u>
TOTAL LIABILITIES & EQUITY	<u><u>306,528.42</u></u>



MoundBasin

GROUNDWATER SUSTAINABILITY AGENCY

Information Item No. 7

DATE: March 18, 2021
TO: Board of Directors
FROM: Executive Director
SUBJECT: **Executive Director Update**

SUMMARY

The following are updates on non-GSP matters since the last Board meeting.

1. Administrative: No update.
2. Financial: Invoices for the 2020-2 semi-annual period (July-December 2020) were issued in early March.
3. Legal: No activity.
4. Groundwater Monitoring Well – DWR Technical Support Services (TSS): Staff coordinated with DWR on next steps. The Coastal Development Permit application is under review by the City of Ventura Planning Department.
5. Correspondence: None.

INFORMATIONAL ITEM

Receive an update from the Executive Director concerning non-GSP matters since the previous Board meeting.

BACKGROUND

Not applicable

FISCAL SUMMARY

Not applicable



MoundBasin

GROUNDWATER SUSTAINABILITY AGENCY

Motion Item No. 8a

DATE: March 18, 2021
TO: Board of Directors
FROM: Executive Director
SUBJECT: **GSP Monthly Update (Grant Category (c), Task 3 and (d), Task 4)**

SUMMARY

The following is a monthly status update on the Groundwater Sustainability Plan (GSP) and associated grant. An updated GSP development schedule is attached for discussion (Attachment A).

GSP Development:

1. **GSP Status:**
 - a. The Executive Director developed presentation content for Workshop No. 2.
 - b. UWCD staff worked on the water budgets section of the GSP and a corresponding presentation for Workshop No. 2
2. **Outreach:**
 - a. Staff worked on preparations for Workshop No. 2, including posting a notice in the Ventura County Star.
3. **GSP Development Schedule:** The updated GSP Development Schedule is provided in Attachment A.

Sustainable Groundwater Planning (SGWP) Grant:

1. **Invoices:**
 - a. Grant Progress Report and Invoice No. 7 were submitted to DWR on January 18, 2021 and were approved in early March. Payment in the amount of \$59,735 is expected in approximately one month.

2. Grant Deliverables:

- a. Remaining grant deliverables include quarterly progress reports and invoices, final report, and the GSP. These deliverables will be submitted as they become due.

RECOMMENDED ACTION

Receive an update from the Executive Director concerning Groundwater Sustainability Plan development and associated grant and consider providing feedback or direction to staff.

BACKGROUND

None.

FISCAL SUMMARY

None.

ATTACHMENTS

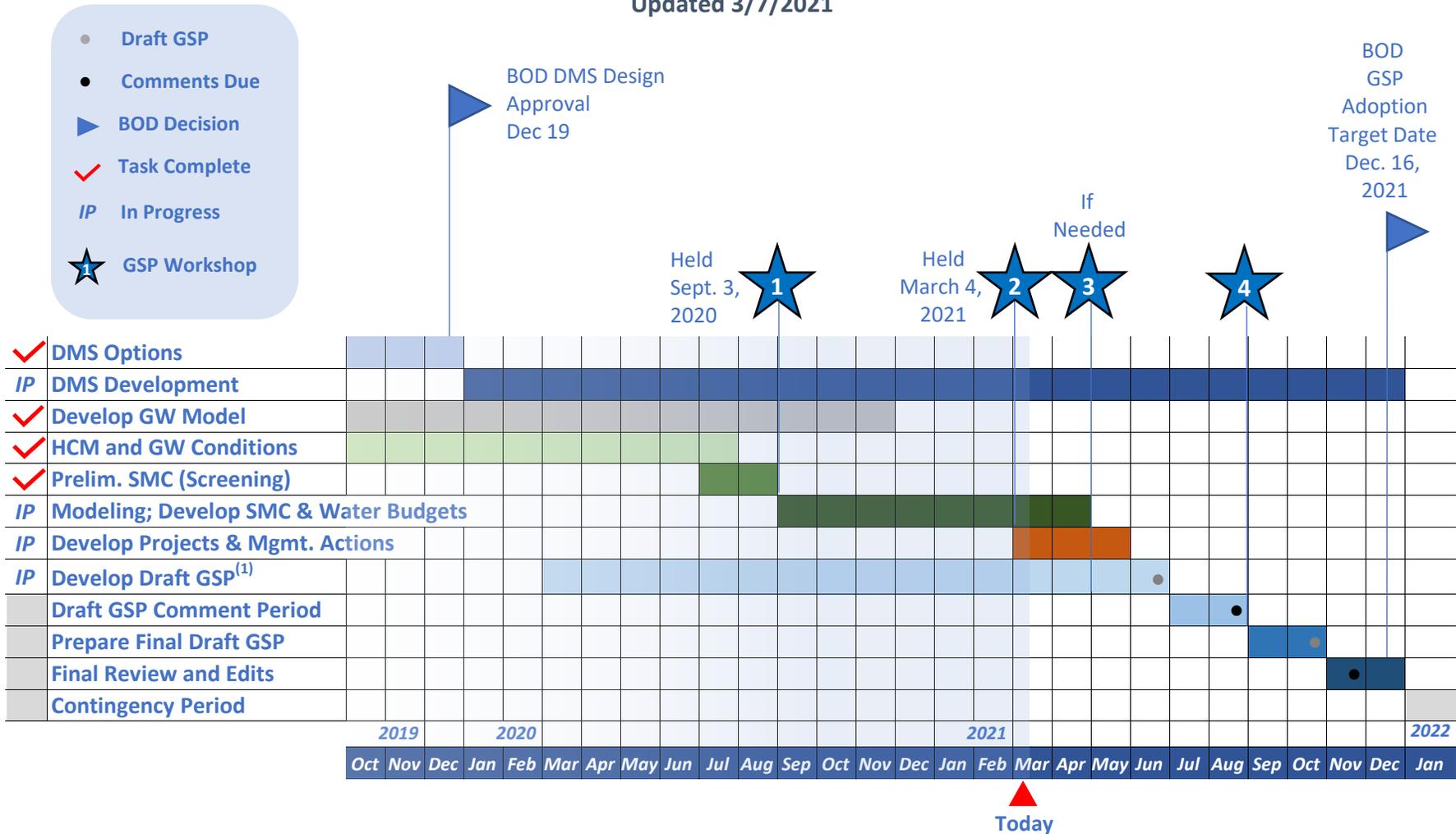
- A. GSP Schedule

Action: _____

Motion: _____ 2nd: _____

S. Rungren ___ M. Mobley ___ G. Shephard ___ J. Chambers ___ C. Everts ___

Mound Basin GSA GSP Development Schedule Updated 3/7/2021



Notes:

(1) GSP topics not listed above generally consist of background or supporting information and will be prepared concurrently with the above-listed tasks.

BOD = Board of Directors; DMS = Data Management System; HCM = Hydrogeologic Conceptual Model; GSA = Groundwater Sustainability Agency;

GSP = Groundwater Sustainability Plan; GW = Groundwater



MoundBasin

GROUNDWATER SUSTAINABILITY AGENCY

Motion Item No. 8b

DATE: March 18, 2021
TO: Board of Directors
FROM: Executive Director
SUBJECT: Sustainable Management Criteria (Category (d), Task 4)

SUMMARY

On February 18, 2021, staff recommended presenting the proposed sustainable management criteria (SMC) at GSP Workshop No 2. Staff further recommended that the Board consider stakeholder feedback during its March 18, 2021 regular meeting and consider approving the proposed SMC for write-up in the forthcoming draft groundwater sustainability plan (GSP). No concerns were expressed about the proposed SMC during the Board meetings in which they were presented or during workshop no. 2. Staff recommends proceeding with preparation of the draft GSP using the proposed SMC. Stakeholders will have additional opportunities to provide comments on the SMC when the draft GSP is released.

BACKGROUND

There are six sustainability indicators (SIs) that must be addressed in the Mound Basin GSP. The status of the SMCs for the SIs is summarized in Table 1 below.

Table 1
SMC Status

SI	SMC Status
Depletions of Interconnected Surface Water	<ul style="list-style-type: none">• Staff proposed screening out this SI during 8/20/20 Board mtg.• Screening result presented at public workshop no. 2 on 3/4/21.
Degraded Water Quality	<ul style="list-style-type: none">• Proposed SMC presented during 12/17/20 Board meeting.• Proposed SMC presented at public workshop no. 2 on 3/4/21.
Seawater Intrusion	<ul style="list-style-type: none">• Proposed SMC presented during 2/18/21 Board meeting.• Proposed SMC presented at public workshop no. 2 on 3/4/21.
Land Subsidence	<ul style="list-style-type: none">• Proposed SMC presented during 2/18/21 Board meeting.• Proposed SMC presented at public workshop no. 2 on 3/4/21.
Chronic Lowering of Groundwater Levels	<ul style="list-style-type: none">• Presented during 2/18/21 Board meeting: If the Board concurs with the proposed approach for the land subsidence sustainability indicator, it will be the controlling factor on Basin management and further detailed discussion of these SIs will not be required.• Described at public workshop no. 2 on 3/4/21.
Reduction of Groundwater Storage	

The following sections summarize the proposed SMC for each SI. The SMC presentations provided during GSP Workshop No. 2 are a good reference for the proposed SMC and are reprinted in Attachment A, as are the original SMC staff reports (Attachments B and C).

Depletions of Interconnected Surface Water

Staff has concluded that this SI is not applicable to the Mound Basin because there is not a material hydraulic connection between surface water bodies and the principal aquifers of the Basin. SGMA does not require SMC for SIs that are not applicable to a basin.

Degraded Water Quality

Staff proposed SMC for the degraded water quality SI during the December 17, 2020 Board meeting. The proposed SMC analysis was updated based on changes to aquifer-well assignments by UWCD during its review of model results. Two representative monitoring wells switched aquifers. This resulted in minor changes to the representative historical concentrations for all indicator constituents and the proposed minimum threshold and measurable objective values for total dissolved solids (TDS) in the Hueneme Aquifer.

With one exception, the proposed minimum thresholds were selected to be consistent with Regional Water Quality Control Board (RWQCB) Water Quality Objectives (WQO) for the Basin, which were established by RWQCB to protect beneficial uses of groundwater. A higher value was selected for TDS in the Hueneme Aquifer because historical concentrations exceed the WQO and MBGSA has no feasible means decreasing the TDS concentrations in the aquifer. The measurable objectives were selected to preserve existing water quality and are based on review of historical water quality.

No projects or management actions are anticipated to be necessary to address the degraded water quality sustainability indicator. However, it is recommended that MBGSA coordinate with other agencies to address any improperly constructed or abandoned wells that act as conduits for migration of poor-quality water from the shallow sediments into the principal aquifers.

The December 20, 2020 staff report provides details concerning the proposed SMC for the degraded water quality SI. That staff report is reprinted in Attachment B with an updated table and charts reflecting the above-described changes.

Seawater Intrusion

Staff proposed SMC for the seawater intrusion SI during the February 18, 2021 Board meeting. In summary, staff concluded that seawater intrusion is not anticipated to be an issue in the Mound Basin during the 50-year SGMA planning horizon, but that it cannot be completely ruled out because potential short-circuit pathways for seawater could exist nearshore that could allow seawater to enter the aquifers and migrate onshore.

Because seawater intrusion cannot be completely ruled out, SMC must be developed. Staff proposed that the undesirable result for seawater intrusion be the migration of seawater within the principal aquifers into areas with current or future potential beneficial uses. Staff proposed Harbor Blvd. as the delineation between areas with no current or anticipated future beneficial uses of groundwater (i.e., the "Coastal Area" located west of Harbor Blvd.) and the agricultural land lying east of Harbor Blvd. The SMCs would be designed to prevent seawater migration east of Harbor Blvd., in the event that seawater is detected at

the shoreline. Two shoreline monitoring wells were recommended to monitor for seawater intrusion and provide adequate time to react to any landward migration of seawater. One shoreline monitoring well already exists. A second shoreline monitoring well along Spinnaker Drive would be needed for this purpose. The minimum thresholds and measurable objectives would apply at two monitoring wells along Harbor Blvd. (the forthcoming TSS well and a future well). The minimum threshold would be concentrations of indicator constituents that indicate seawater presence in the Harbor Blvd. monitoring wells. The measurable objective would be the lack of such indications.

If seawater is detected at one or both shoreline monitoring wells, the GSA would need to develop and implement projects and/or management actions to prevent seawater migration east of Harbor Blvd. Migration from the shoreline to Harbor Blvd would take approximately a decade or longer. Nonetheless, it is recommended that a contingency plan be developed and added to the GSP before the first required 5-year GSP update.

No projects or management actions are anticipated to be necessary to address the seawater intrusion sustainability indicator. However, two monitoring wells would be needed to for seawater intrusion monitoring and a contingency plan for unexpected seawater intrusion should be developed for the first 5-year GSP update.

The February 18, 2021 staff report provides details concerning the proposed SMC for the seawater intrusion SI. That staff report and associated staff presentation from February 18, 2021 are reprinted in Attachment C.

Land Subsidence

Staff proposed SMC for the land subsidence SI during the February 18, 2021 Board meeting. In summary, staff concluded that the potential for inelastic land subsidence is unlikely because future groundwater levels are not predicted to fall below historical low levels. Nonetheless, SCMs must be developed to address the potential for this unlikely event to occur.

Staff proposed that the undesirable result for land subsidence be any measurable inelastic subsidence attributable to groundwater withdrawal within the “Coastal Area” located west of Harbor Blvd. This proposal is based on the fact that the “Coastal Area” is susceptible to impacts of land subsidence due to the presence of critical infrastructure (City of Ventura sewer main) and projected sea level rise impacts to properties in the Pierpont community and Harbor area. Staff proposed using historical low groundwater levels as a minimum threshold proxy for measurable inelastic subsidence. The remainder of the Basin, while being less susceptible to effects of subsidence, cannot be maintained with groundwater levels below historical lows levels for extended periods of time without also causing “Coastal Area” groundwater levels to fall below historical low levels. Therefore, minimum threshold would be historical low groundwater levels throughout the Basin. The proposed measurable objectives would be groundwater levels during wet periods that are sufficiently high to prevent drought levels from dropping below the minimum thresholds.

No projects or management actions are anticipated to be necessary to address the land subsidence sustainability indicator.

The February 18, 2021 staff report provides details concerning the proposed SMC for the seawater intrusion SI. That staff report and associated staff presentation from February 18, 2021 are reprinted in Attachment C.

Chronic Groundwater Level Decline and Reduction of Groundwater Storage

As discussed during the February 18, 2021 Board meeting, the chronic groundwater level decline and reduction of groundwater storage SIs will not be controlling factors for sustainable management if the Board concurs with the proposed approach for the land subsidence SI. Therefore, detailed discussion of the groundwater level and storage indicators is, therefore, not required, unless a different approach to addressing land subsidence is developed.

RECOMMENDED ACTION

Direct staff to prepare the draft groundwater sustainability plan using the proposed sustainable management criteria or provide other direction.

FISCAL SUMMARY

None.

ATTACHMENTS

- A. SMC Slides from Workshop No. 2
- B. Reprinted December 17, 2020 Staff Report re: Degraded Water Quality SMCs with Updated Table and Charts
- C. Reprinted February 18, 2021 Staff Report re: Model Results and SMCs and Associated Board Meeting Presentation Slides

Action: _____

Motion: _____ 2nd: _____

S. Rungren ___ M. Mobley ___ G. Shephard ___ J. Chambers ___ C. Everts ___

Item 8b
Attachment A

SMC Slides from Workshop No. 2



MoundBasin

GROUNDWATER SUSTAINABILITY AGENCY

***GROUNDWATER
SUSTAINABILITY
PLAN
WORKSHOP NO. 2***

***MARCH 4, 2021
6 PM***





MoundBasin

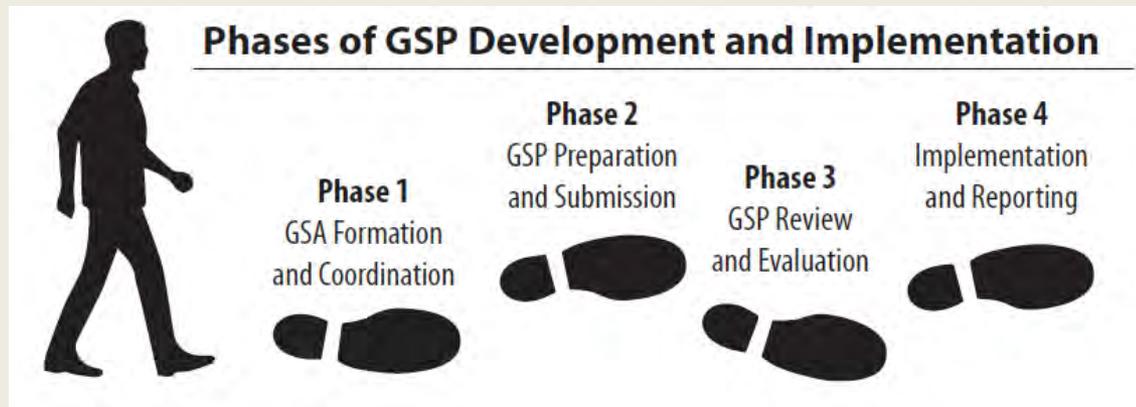
GROUNDWATER SUSTAINABILITY AGENCY

INTRODUCTION TO SUSTAINABLE MANAGEMENT CRITERIA



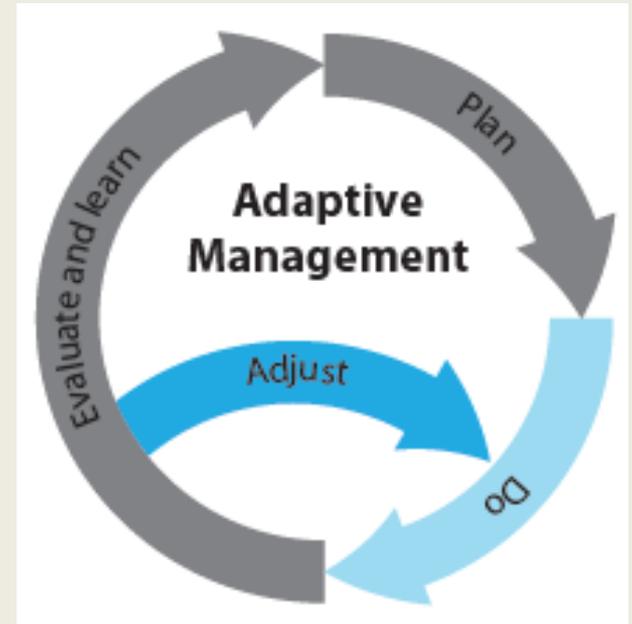
SSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA) REQUIREMENTS

1. Form a Groundwater Sustainability Agency (GSA)
2. Adopt a Groundwater Sustainability Plan (GSP)
 - Due January 31, 2022
3. Achieve Sustainable Groundwater Management
 - 20 years following GSP adoption



WHAT IS A GSP?

The GSP is a flexible road map for how a groundwater basin will achieve long term sustainability by avoiding undesirable results through data-driven adaptive management



WHAT MUST A GSP INCLUDE?

■ GSP Contents

■ Administrative Information

■ Basin Setting

■ Sustainable Management Criteria

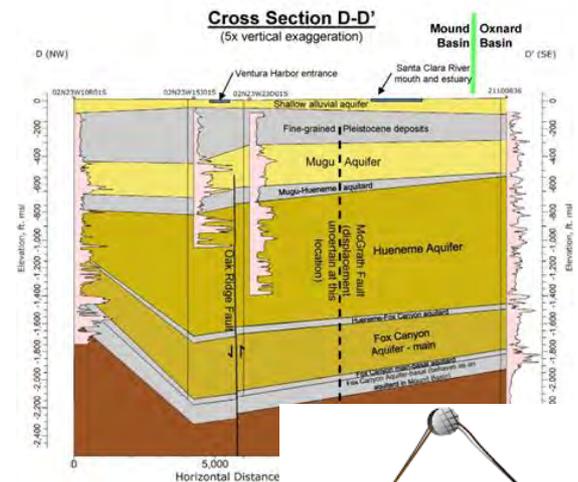
■ Monitoring Networks

■ Projects and Management Actions

■ Implementation

*** Draft Basin Setting Available On MBGSA Website ***

Mound Basin Groundwater Sustainability Plan



SUSTAINABLE MANAGEMENT CRITERIA

- Overarching goal of SGMA is to avoid undesirable results for each of the six SGMA sustainability indicators:



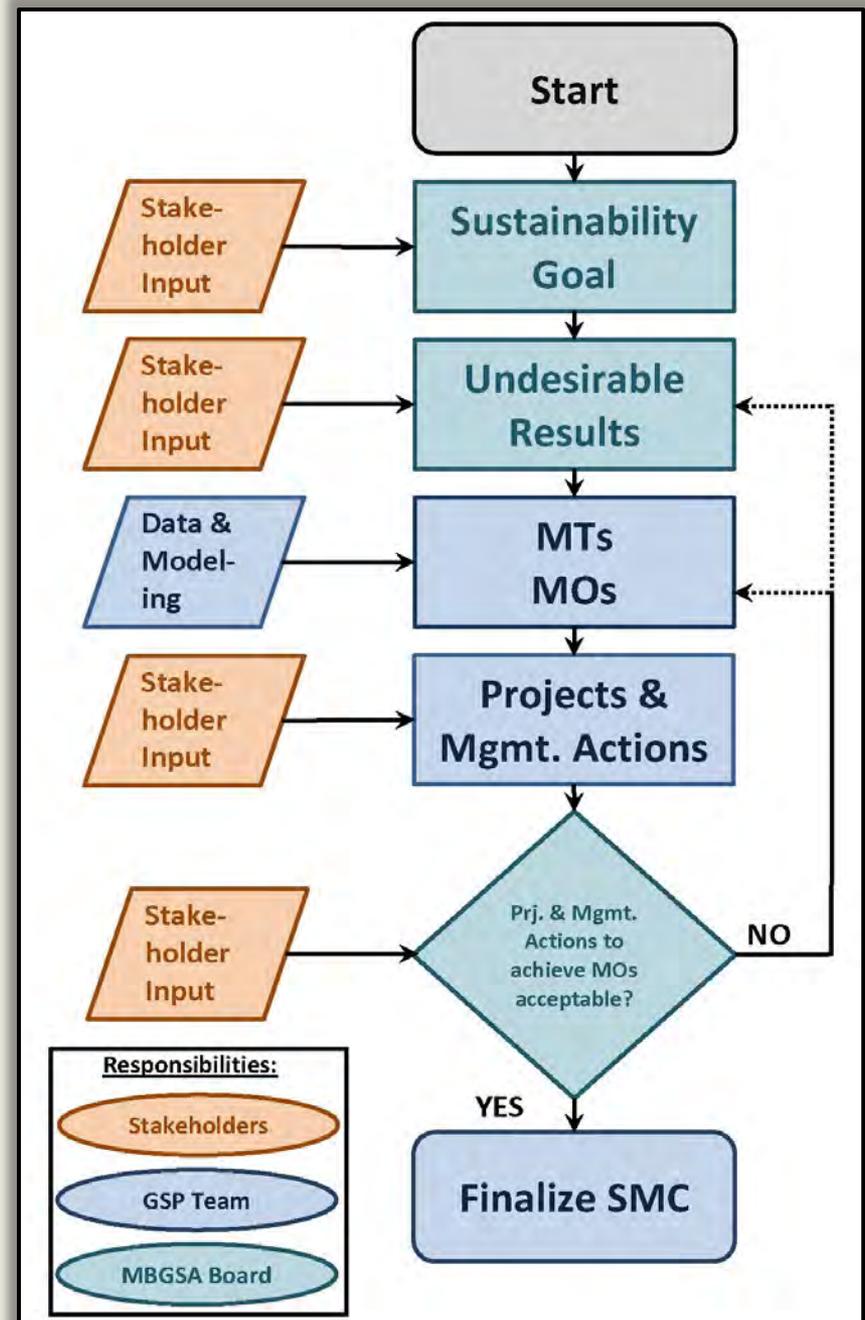
- Undesirable results and actions to prevent them are defined at the local level by the GSA

SUSTAINABLE MANAGEMENT CRITERIA

- **Sustainability Goal**
- **Undesirable Results**
 - Significant and unreasonable effects for sustainability indicators caused by groundwater conditions occurring throughout the basin
- **Minimum Thresholds**
 - Quantitative metrics indicating significant and unreasonable effect likely exist
- **Measureable Objectives**
 - Quantitative metrics that reflect basin desired conditions

SUSTAINABLE MANAGEMENT CRITERIA DEVELOPMENT PROCESS

*SMC will be the
central focus of the GSP*



SUSTAINABILITY GOAL

- High-level policy framework to guide development of Sustainable Management Criteria & Plan Actions

- Adopted on September 17

- Available on-line

Sustainability Goal Adopted September 17, 2020

The goal of this Groundwater Sustainability Plan (GSP) is to sustainably manage the groundwater resources of the Mound Basin for the benefit of current and anticipated future beneficial users of groundwater and the welfare of the general public who rely directly or indirectly on groundwater. Sustainable groundwater management will ensure the long-term reliability of the Mound Basin groundwater resources by avoiding undesirable results pursuant to the Sustainable Groundwater Management Act (SGMA) no later than 20 years from GSP adoption through implementation of a data-driven and performance-based adaptive management framework. It is the express goal of this GSP to develop sustainable management criteria and plan implementation measures to avoid undesirable results for the applicable SGMA sustainability indicators by:

- 1. Using best available science and information, including consideration of uncertainty in the basin setting and groundwater conditions;*
- 2. Conducting active and meaningful stakeholder engagement;*
- 3. Considering potential impacts on the management of adjacent basins and, where necessary coordinating with adjacent basins; and*
- 4. Balancing economic, social, and environmental impacts and benefits associated with the all current and anticipated future beneficial users of groundwater, by considering:*
 - a. Water supply reliability for agriculture and municipal and industrial users;*
 - b. Availability of alternative water sources for domestic groundwater beneficial users;*
 - c. Identifying and considering potential impacts to groundwater dependent ecosystems;*
 - d. State, federal, or local standards relevant to applicable sustainability indicators;*
 - e. Feasibility of projects and management actions necessary to achieve proposed measureable objectives; and*
 - f. Economic impact of projects and management actions necessary to achieve proposed measureable objectives on all beneficial users, with special consideration of disadvantage communities and agricultural landowners lacking alternative land use options.*

UNDESIRABLE RESULTS

“Significant and unreasonable effects for sustainability indicators caused by groundwater conditions occurring throughout the basin.”

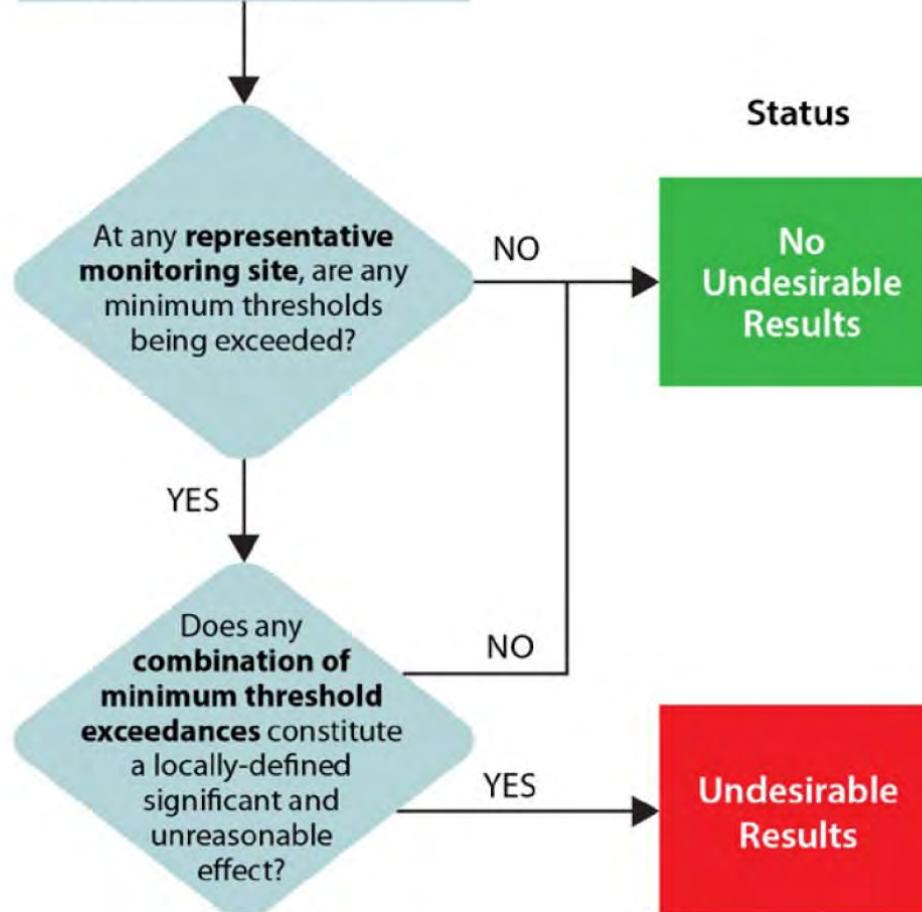
1. Significant and Unreasonable Effects: Undesirable results are significant and unreasonable effects related to a sustainability indicator. For example, seawater intrusion that impacts beneficial uses of groundwater.
2. Caused by Groundwater Conditions: The significant and unreasonable effects must be caused by managed groundwater conditions (i.e., pumping or GSP projects).
3. Throughout the Basin: The significant and unreasonable effects must occur or be caused by conditions throughout a large portion of the basin.

Sustainability Indicators



Apply Sustainable Management Criteria

- Review data
- Consider beneficial uses and users of groundwater
- Review specific metrics for each sustainability indicator



Status

No
Undesirable
Results

Undesirable
Results

UR PROCESS

Minimum Thresholds:
Quantitative measures that indicate significant and unreasonable effects in a particular area

Undesirable Results:
Combination of minimum thresholds exceedances that defines undesirable results

SUSTAINABLE MANAGEMENT CRITERIA

The overarching goal of SGMA is to avoid undesirable results

- Groundwater Levels
- Groundwater Storage
- Seawater Intrusion
- Water Quality
- Land Subsidence
- Interconnected Surface Water

Sustainability Indicator

IM #1

IM #2

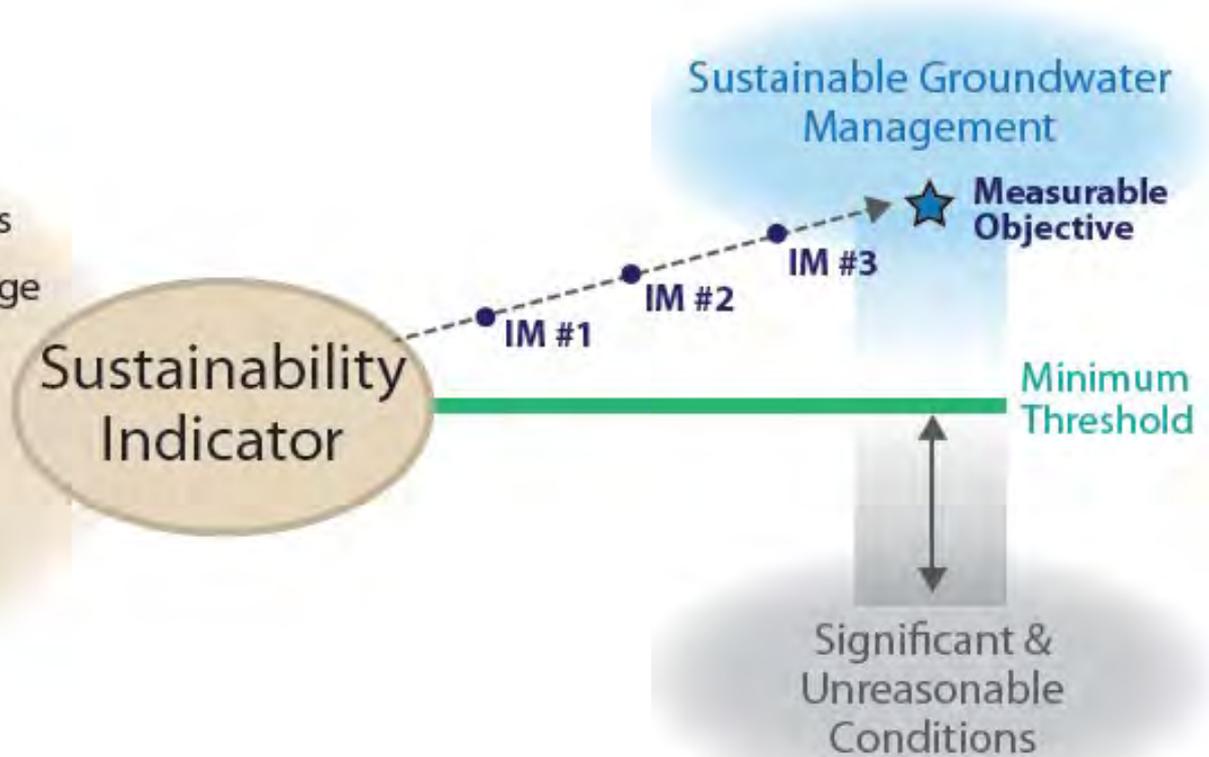
IM #3

Sustainable Groundwater Management

★ Measurable Objective

Minimum Threshold

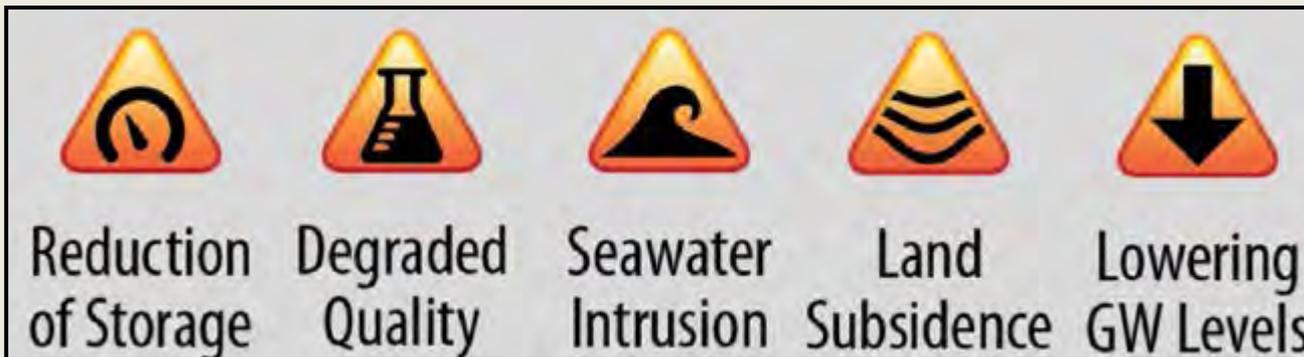
Significant & Unreasonable Conditions



SUSTAINABLE MANAGEMENT CRITERION STATUS



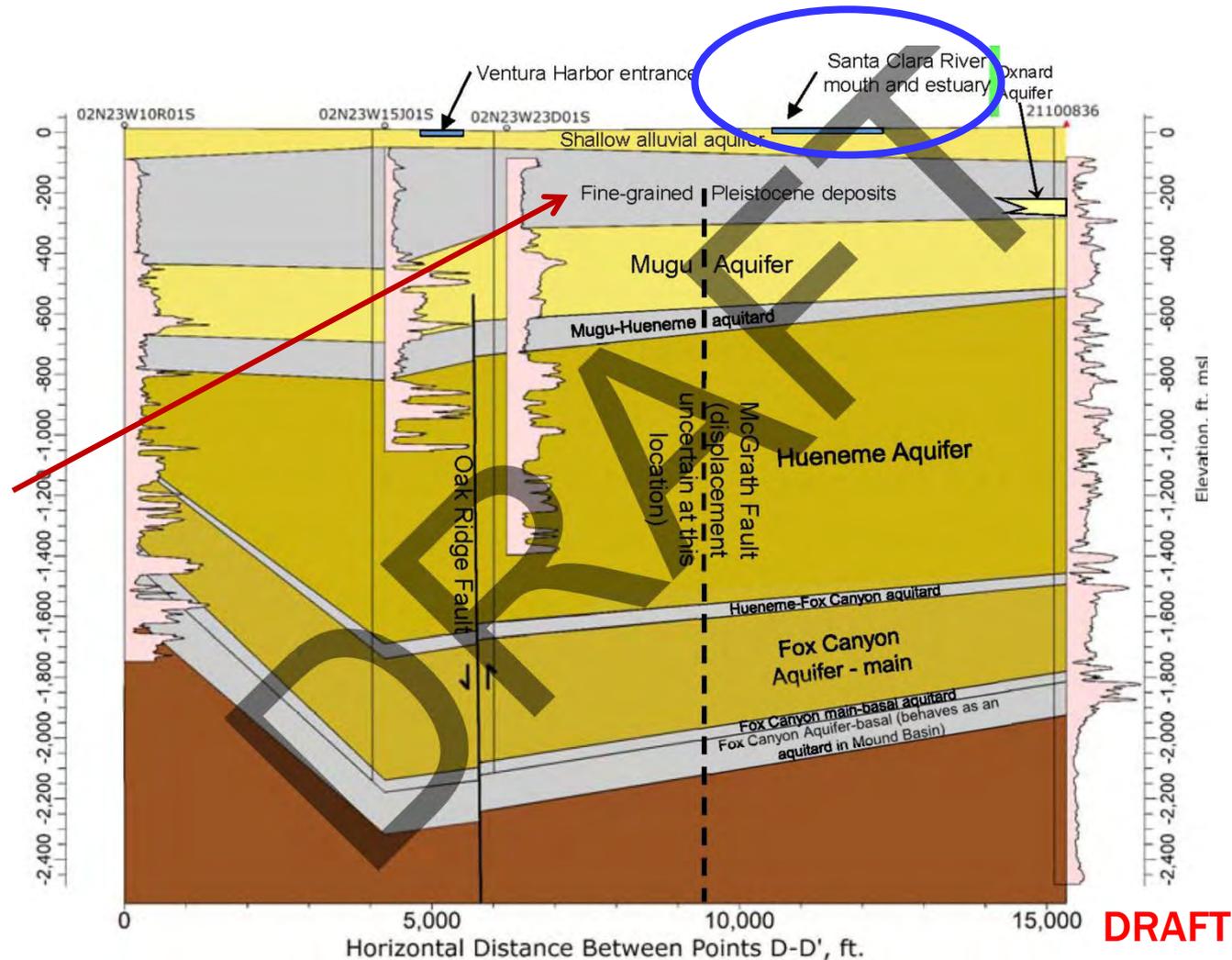
Surface Water Depletion is not an applicable sustainability indicator. Surface water is not materially connected to principal aquifers (not affected by pumping).



*Proposed SMC
to be discussed
during third
presentation*

INTERCONNECTED SURFACE WATER

- **Shallow GW likely interconnected with river, however, there is no pumping from shallow aquifer.**
- **Surface water is separated from principal aquifers by thick aquitards. Pumping in principal aquifers is not believed to materially affect surface water.**



QUESTIONS?



View looking north from Olivas Park Drive



MoundBasin

GROUNDWATER SUSTAINABILITY AGENCY

PROPOSED SUSTAINABLE MANAGEMENT CRITERIA



DRAFT WATER QUALITY SMC



- **Current water quality supports beneficial uses (currently no undesirable results)**
- **Nexus between URs and groundwater conditions**
 - Pumping could increase downward movement of poor quality water
- **Potential Effects on Beneficial Users**
 - Increased costs for treatment, decreased crop yield, increased water demand for leaching, etc.

DRAFT WATER QUALITY MINIMUM THRESHOLDS



- **Criteria for Minimum Threshold Development**
 - Maximum Contaminant Levels (MCLs)
 - RWQCB Water Quality Objectives (WQOs)
 - Agricultural Toxicity Thresholds
 - Existing Water Quality
- **MTs based on significant and unreasonable effects consistent with sustainability goal**
 - RWQCB WQOs used except in one case where existing water quality does not meet WQO (Hueneme Aquifer – TDS)

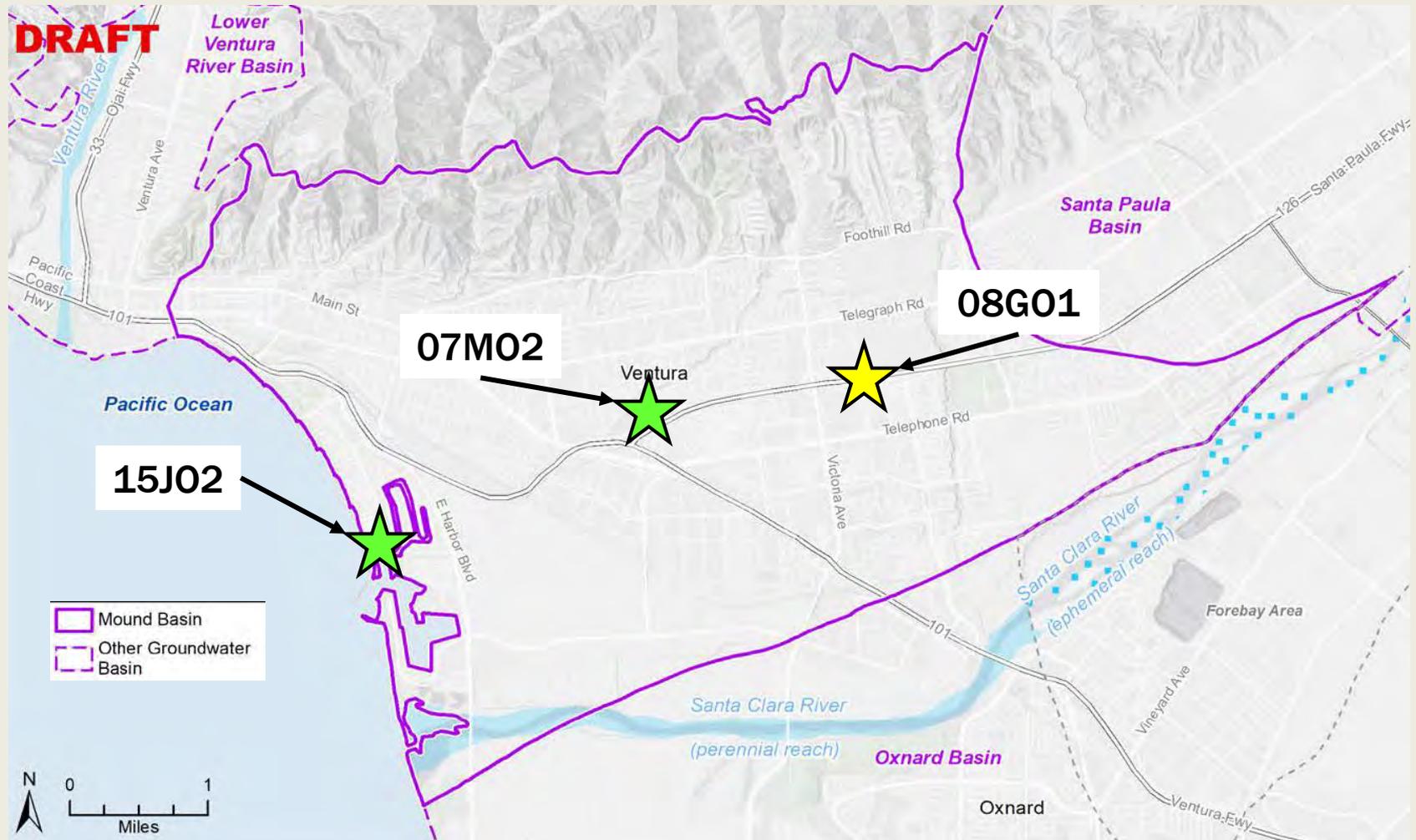
DRAFT WATER QUALITY UNDESIRABLE RESULTS



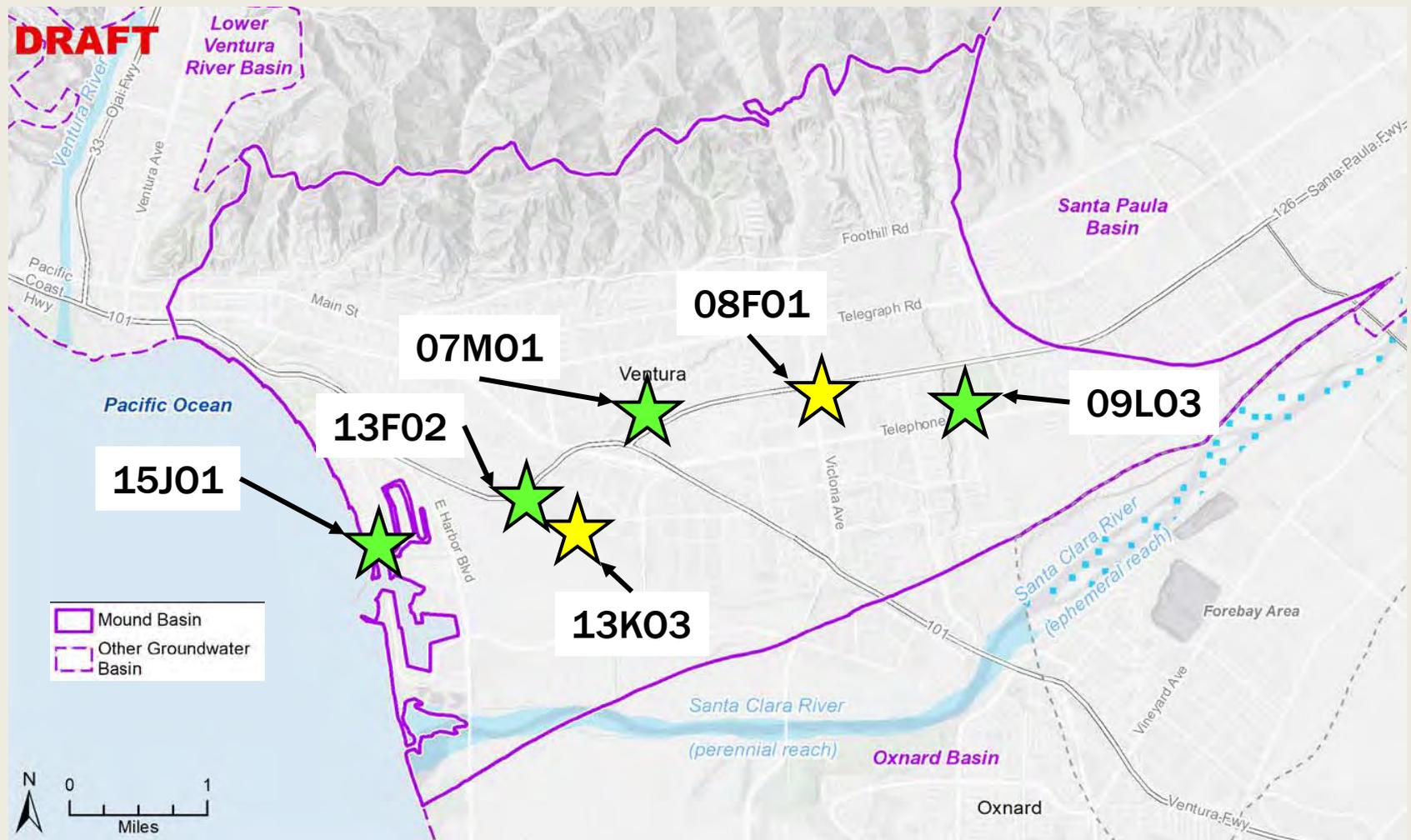
■ Criteria for Undesirable Results:

- SGMA undesirable results are considered to be occurring when all representative wells in a principal aquifer (Mugu or Hueneme) exceed a minimum threshold concentration continuously for two years and MBGSA determines that the exceedances are caused by groundwater pumping.

WATER QUALITY MONITORING LOCATIONS – MUGU AQUIFER



WATER QUALITY MONITORING LOCATIONS - HUENEME AQUIFER



DRAFT WATER QUALITY MEASURABLE OBJECTIVES



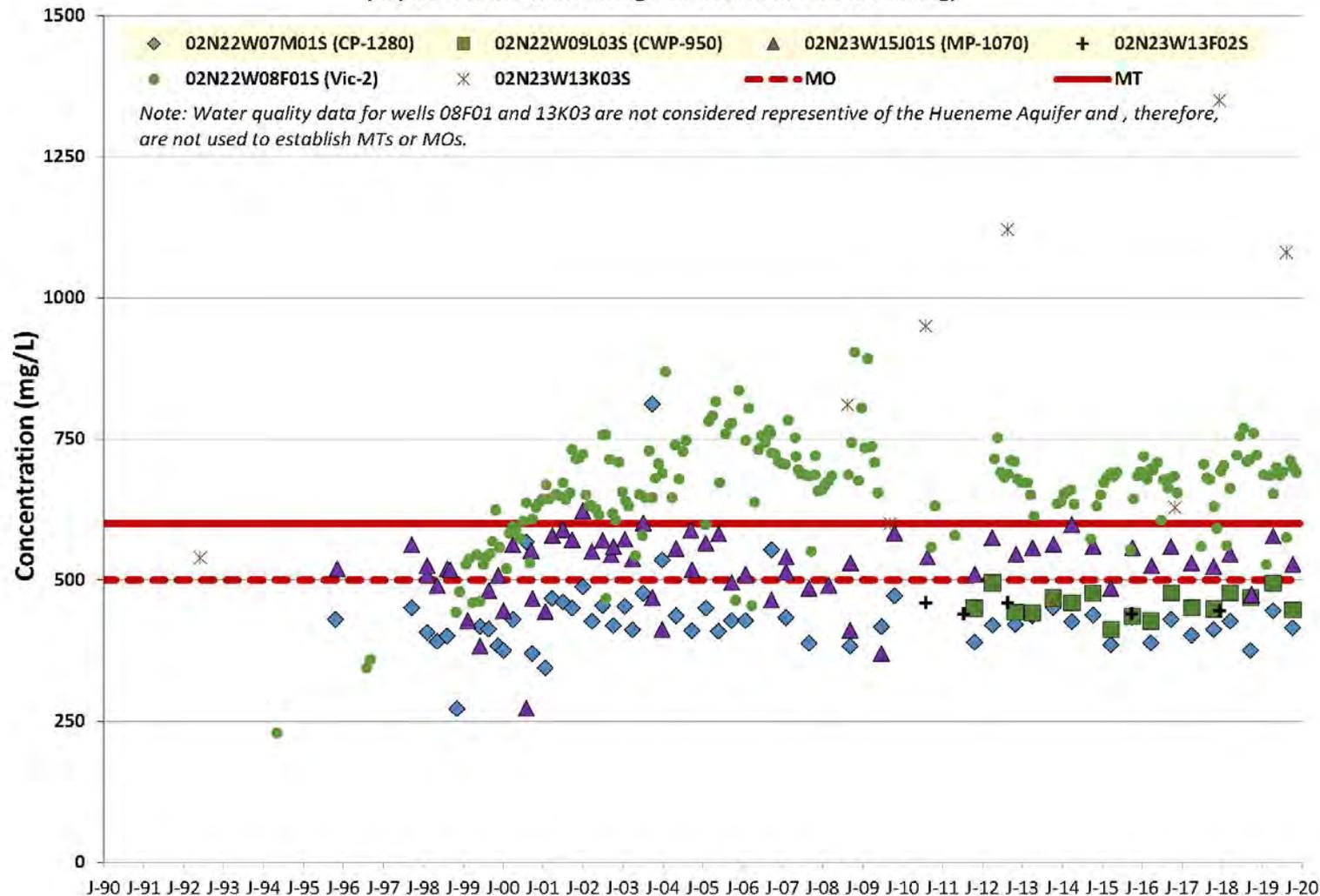
- Goal is to preserve existing water quality
- MOs are based recent historical water quality

EXAMPLE WQ SMC CHART



DRAFT

Hueneme Aquifer - Sulfate
(Representative Monitoring Sites Noted in Yellow Shading)



DRAFT WATER QUALITY SMC



Constituent	MCL (mg/L)	Sec. MCL (R/U/ST) (mg/L)	RWQCB WQO (mg/L)	Average Conc. Representative Monitoring Wells Last 10 Years (mg/l)	Proposed MT (mg/L)	MT Rationale	Proposed MO (mg/L)	MO Rationale
Mugu Aquifer								
Nitrate	45	N/A	45	Non-Detect	45	Protect water quality for potable uses.	5	Preserve existing water quality for potable uses.
TDS	N/A	500/1,000/1,500	1,200	902	1,200	Protect agricultural, municipal, and industrial beneficial uses consistent with RWQCB WQOs.	1,000	Preserve existing water quality for agricultural, municipal, and industrial beneficial uses. MO is set at Upper Consumer Acceptance Level to support potable uses.
Sulfate	N/A	250/500/600	600	350	600	Protect municipal beneficial use consistent with RWQCB WQOs and prevent exceedances of Short-Term Consumer Acceptance Level.	500	Preserve existing water quality for municipal beneficial use. MO is set at Upper Consumer Acceptance Level to support potable uses.
Chloride	N/A	250/500/600	150	50	150	Protect agricultural beneficial use consistent with RWQCB WQOs.	75	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.
Boron	N/A	N/A	1	0.47	1	Protect agricultural beneficial use consistent with RWQCB WQOs.	0.75	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.
Hueneme Aquifer								
Nitrate	45	N/A	45	Non-Detect	45	Protect water quality for potable uses.	5	Preserve existing water quality for potable uses.
TDS	N/A	500/1,000/1,500	1,200	1,171	1,400	Protect agricultural, municipal, and industrial beneficial uses. MT is 200 mg/L higher than RWQCB WQO based on current and historical data at representative monitoring wells (set at upper range of data from past ten years).	1,200	Preserve existing water quality for agricultural, municipal, and industrial beneficial uses.
Sulfate	N/A	250/500/600	600	488	600	Protect municipal beneficial use consistent with RWQCB WQOs and prevent exceedances of Short-Term Consumer Acceptance Level.	500	Preserve existing water quality for municipal beneficial use. MO is set at Upper Consumer Acceptance Level to support potable uses.
Chloride	N/A	250/500/600	150	76	150	Protect agricultural beneficial use consistent with RWQCB WQOs.	100	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.
Boron	N/A	N/A	1	0.62	1	Protect agricultural beneficial use consistent with RWQCB WQOs.	0.75	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.

[1] Consumer Acceptance Levels, where R = Recommended, U = Upper, and ST = Short Term

[2] Undesirable results are considered to occur when all representative monitoring wells in a principal aquifer exceed the minimum threshold concentration for a constituent for two consecutive years.

[3] Sustainability Goal for degraded water quality for a given constituent is considered to be met when the two-year running average concentration for at least one representative monitoring well is below the measurable objective.

OTHER SUSTAINABILITY INDICATORS



Reduction
of Storage



Seawater
Intrusion



Land
Subsidence



Lowering
GW Levels

- The remaining sustainability indicators are related to groundwater levels.
- Model simulations of future conditions used to evaluate these sustainability indicators

SIMULATED FUTURE GROUNDWATER LEVELS

- 1. Future groundwater levels are predicted to be higher than historical levels due to anticipated increases in Oxnard Basin groundwater levels.**
- 2. The impact of climate change on groundwater levels is typically less than approximately 5 ft.**
- 3. The impact of the Freeman Diversion expansion project is almost undetectable.**

SELECTED MODEL OUTPUT LOCATIONS

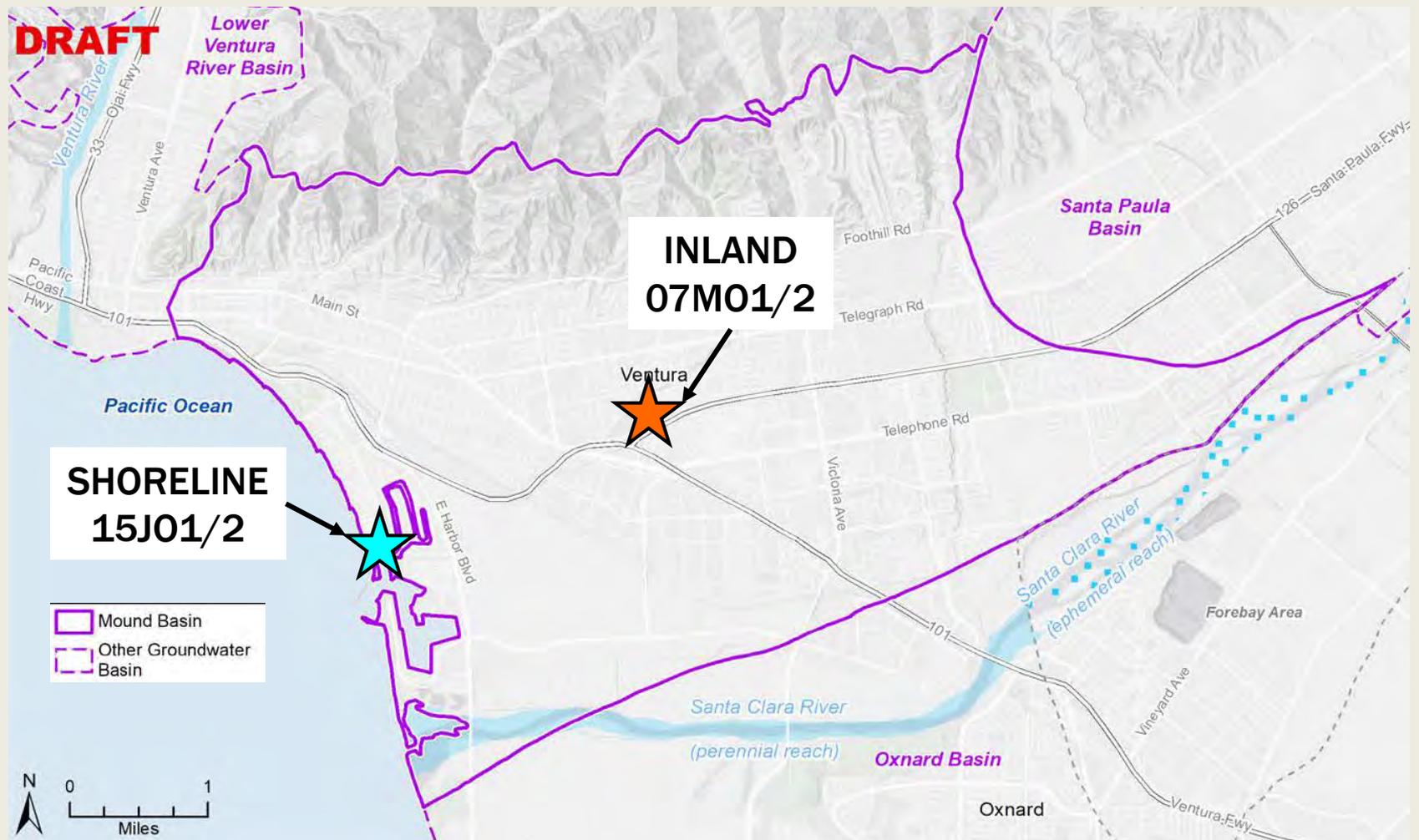
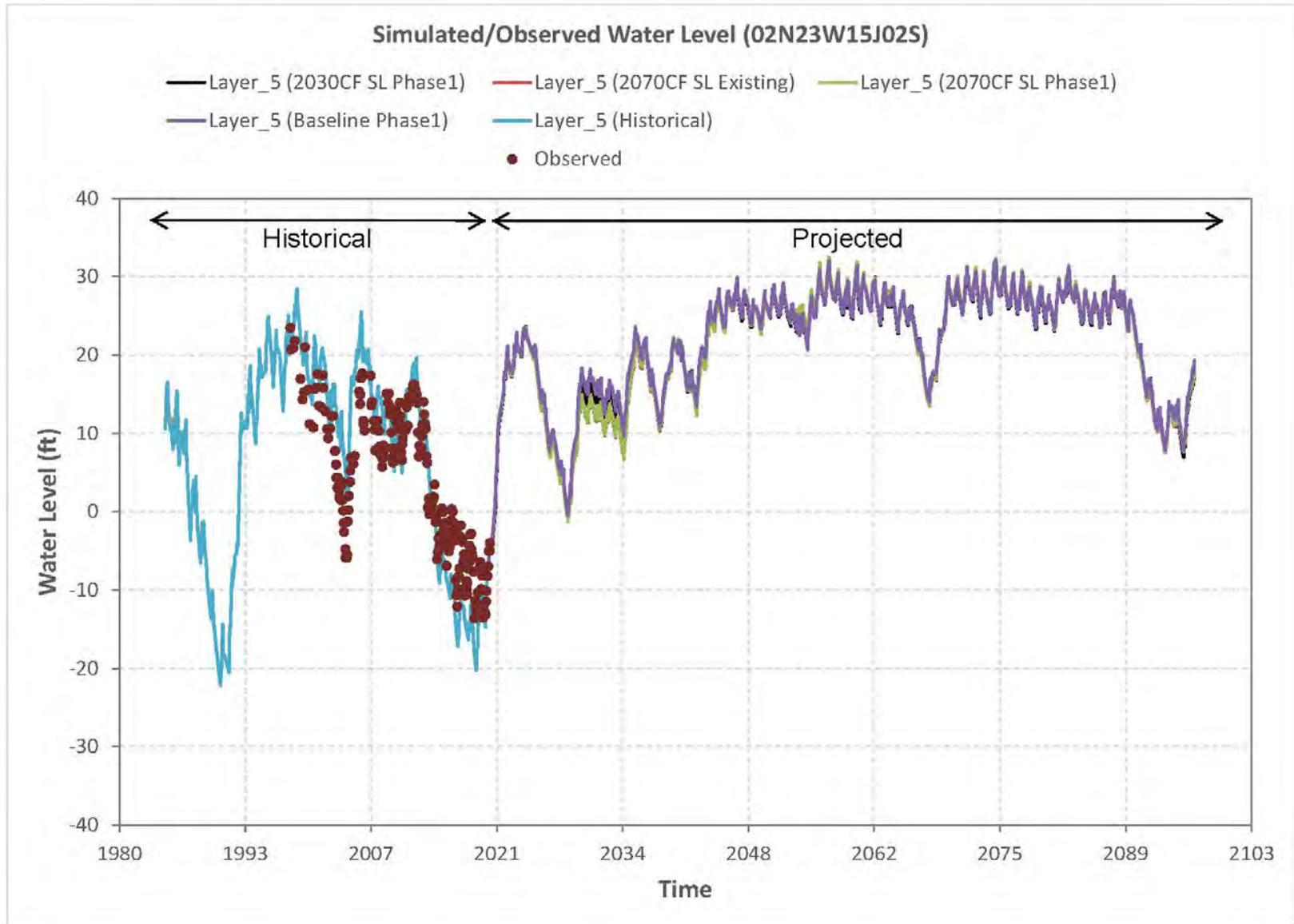


Figure 1a. Historical and Projected Groundwater Levels, Mugu Aquifer at Marina Park



DRAFT

Figure 1b. Historical and Projected Groundwater Levels, Hueneme Aquifer at Marina Park

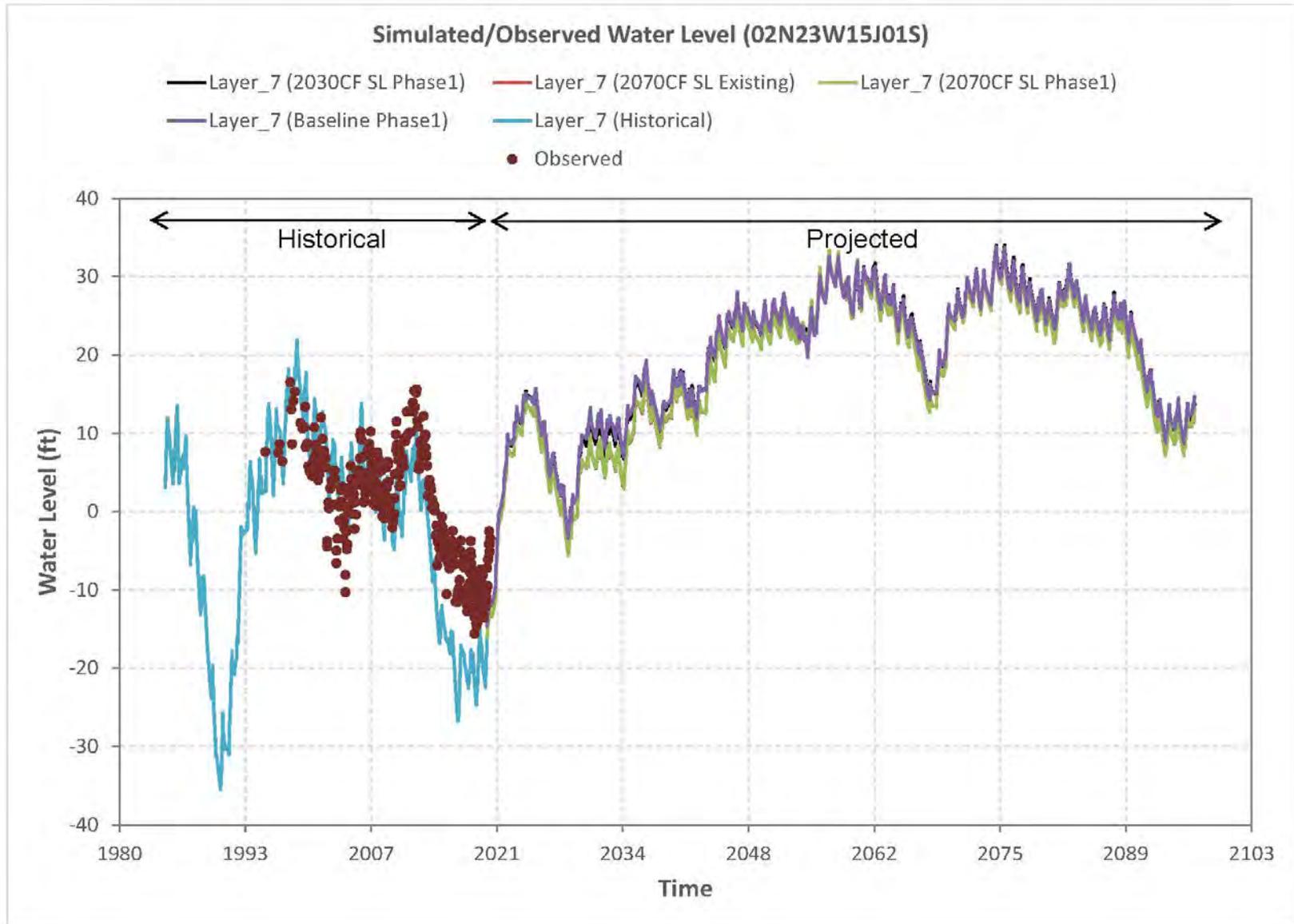
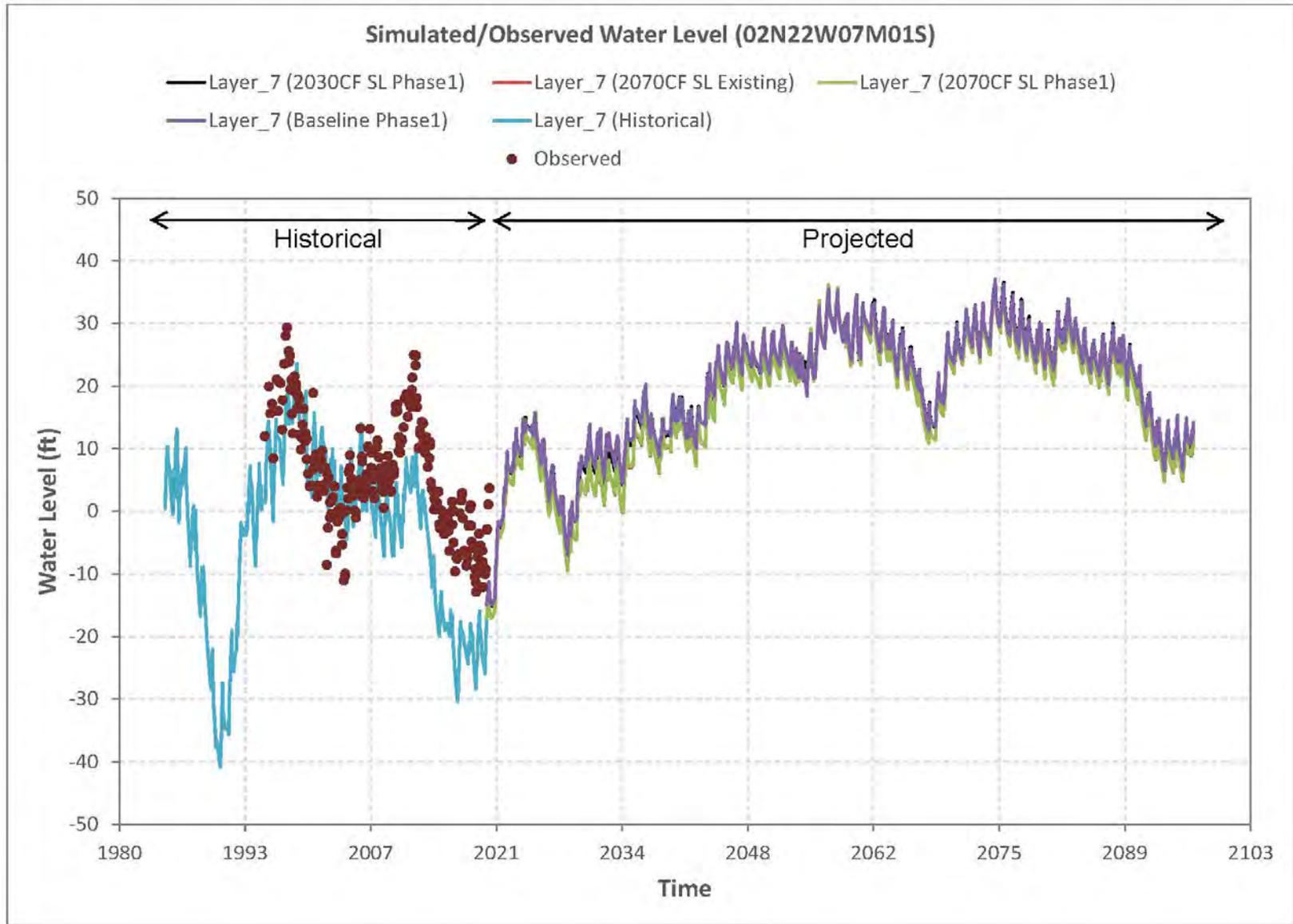


Figure 1d. Historical and Projected Groundwater Levels, **Hueneme Aquifer** at Camino Real Park



DRAFT

SEAWATER INTRUSION RISK EVALUATION

- Aquifers are exposed to seawater at subcrop approximately 10.5 miles offshore.
- Between subcrop and shoreline, aquifers are believed to be protected from seawater by thick sequence of fine-grained deposits (aquitard)
- Historical movement of seawater from subcrop toward shoreline was estimated using historical model using particle tracking
 - No landward movement of seawater in Mugu Aquifer
 - Approximately 0.5 miles of average landward movement in Hueneme Aquifer over last century*

**Migration rates in the most permeable zones of the aquifer would be considerably (many times) higher.*

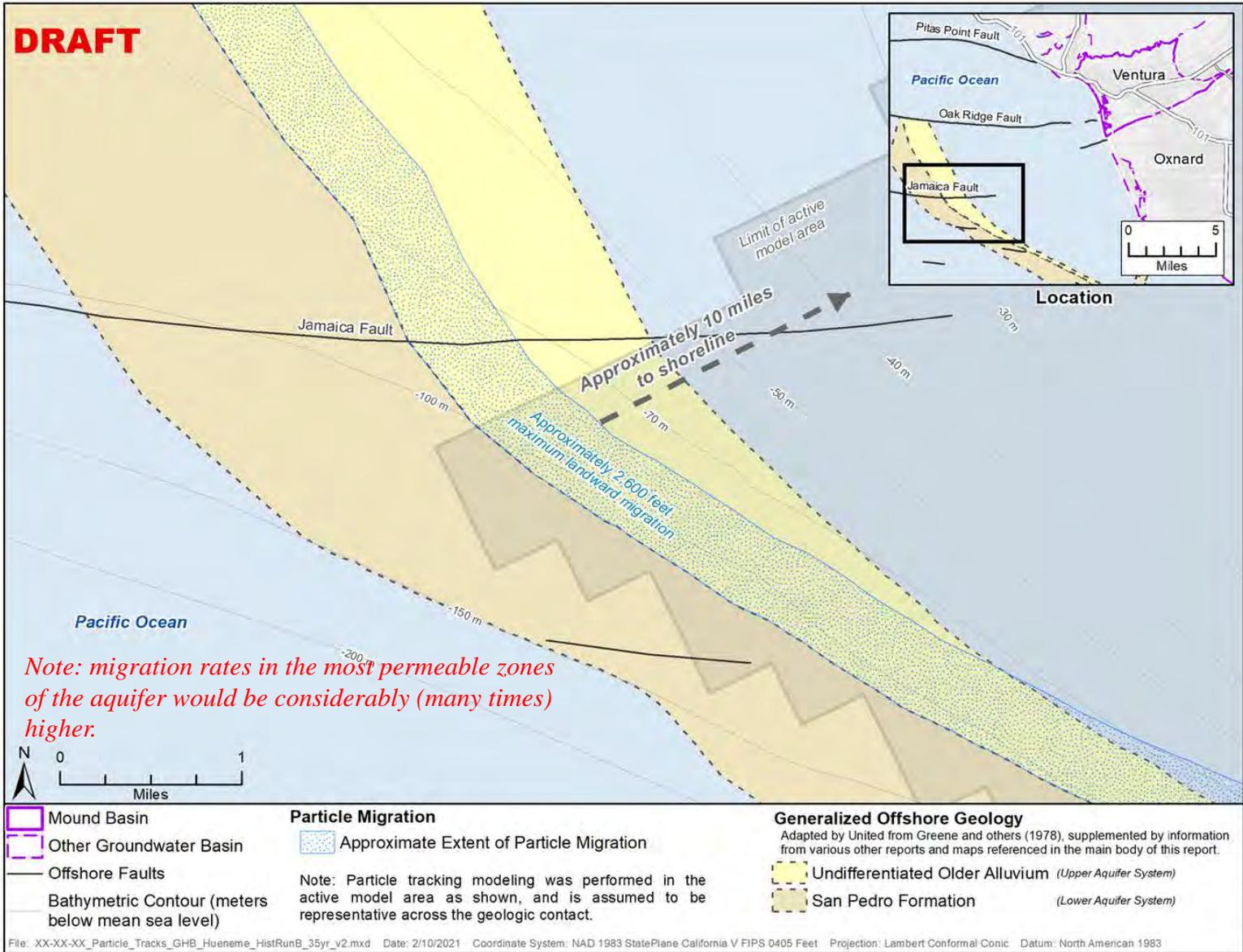


Figure 3 Estimated Historical Extent of Landward Seawater Movement in the Hueneme Aquifer.

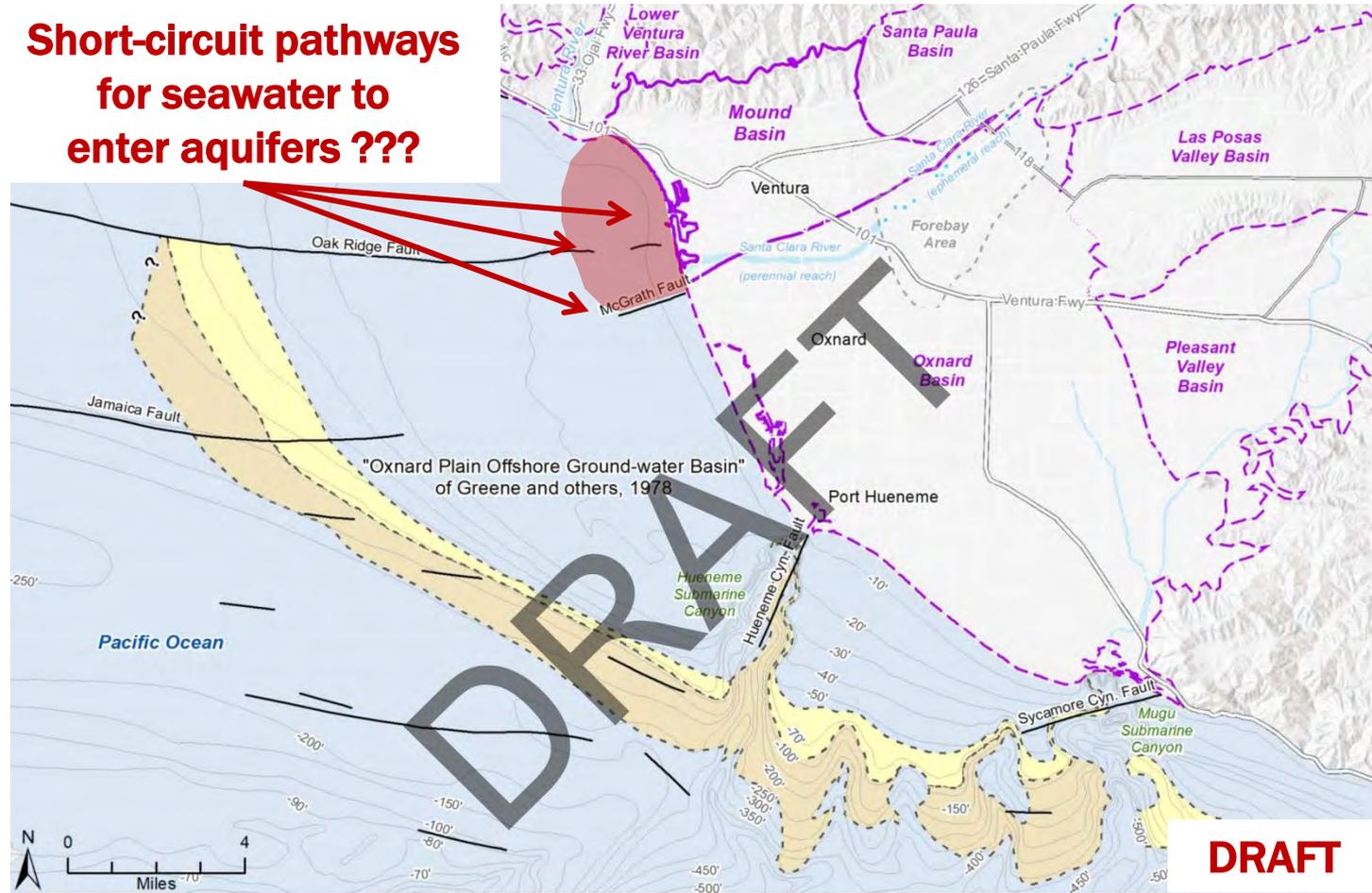
SEAWATER INTRUSION RISK EVALUATION (CON'T)

- **Conclusions:**
 - Seawater is not migrating landward in Mugu Aquifer
 - Timeframe for seawater to migrate from current estimated location in Hueneme Aquifer to shore is longer than SGMA planning horizon
- However, if a short circuit pathway for seawater migration into aquifers exists nearshore (possible along faults or “stratigraphic windows”), onshore flow of seawater could occur much sooner.

SEAWATER INTRUSION POTENTIAL VIA SHORT-CIRCUIT PATHWAYS?

Potential gaps in the confining layer above the aquifers and/or faulting could possibly provide short-circuit pathways for seawater intrusion near the shoreline. If such short-circuit pathways exist, seawater could reach the shoreline within the GSP implementation period.

Short-circuit pathways for seawater to enter aquifers ???



- Mound Basin
- Other Groundwater Basin
- Offshore Faults
- Bathymetric Contour (meters below mean sea level)

Generalized Offshore Geology

Adapted by United from Greene and others (1978), supplemented by information from various other reports and maps referenced in the main body of this report.

- Undifferentiated Older Alluvium (Upper Aquifer System)
- San Pedro Formation (Lower Aquifer System)

DRAFT

Note: Area depicted in red is conceptual and provided for discussion purposes only.

SEAWATER INTRUSION RISK EVALUATION (CON'T)

- Particle tracking of groundwater flow directions and flow rates along the shoreline was performed to evaluate risk of onshore migration via a near shore short-circuit pathway.

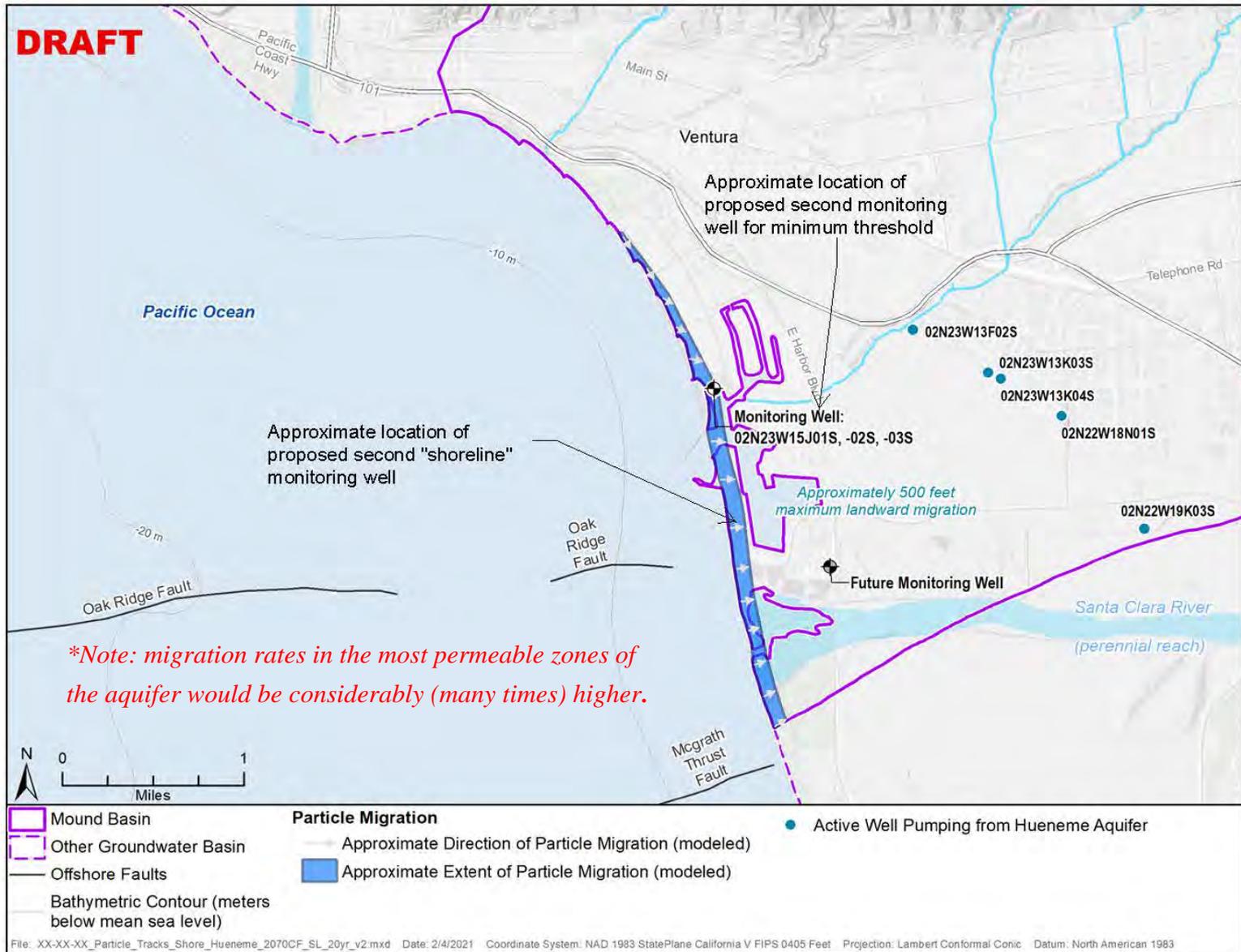


Figure 2a Estimated Landward Movement of Groundwater During 20-Year GSP Implementation Period (with 2070 Climate Change and Sea Level Rise).

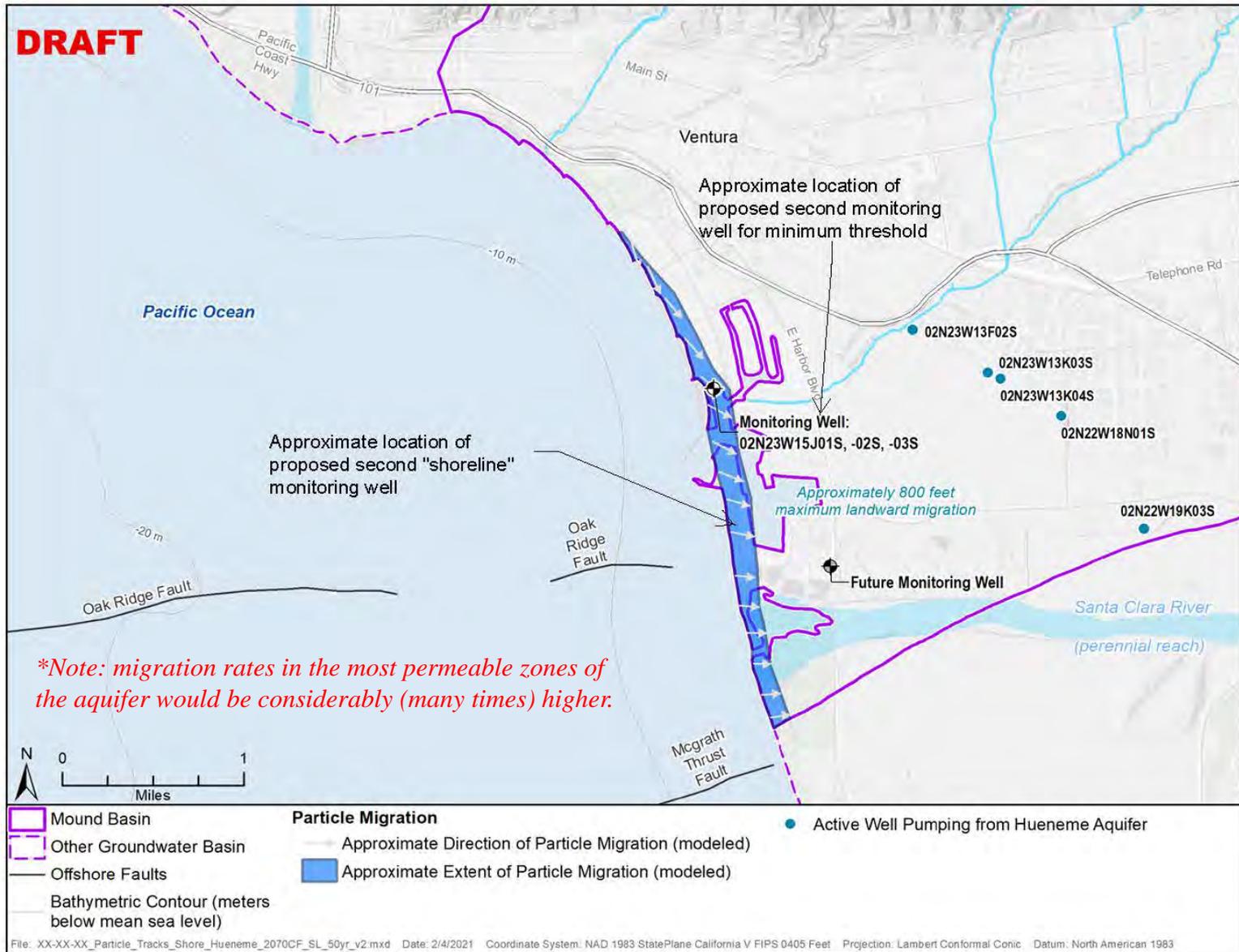


Figure 2b Estimated Landward Movement of Groundwater During 50-Year SGMA Planning Period (with 2070 Climate Change and Sea Level Rise).

KEY RESULTS OF SHORELINE FLOW EVALUATION

1. Particle tracking results suggest that groundwater will flow offshore in the Mugu Aquifer.
2. Particle tracking results suggest that groundwater will flow onshore in the Hueneme Aquifer at an average rate of approximately 1/8 of a mile per 20 years.
 - Note: Migration rates in the most permeable zones of the aquifer could be considerably (many times) higher.

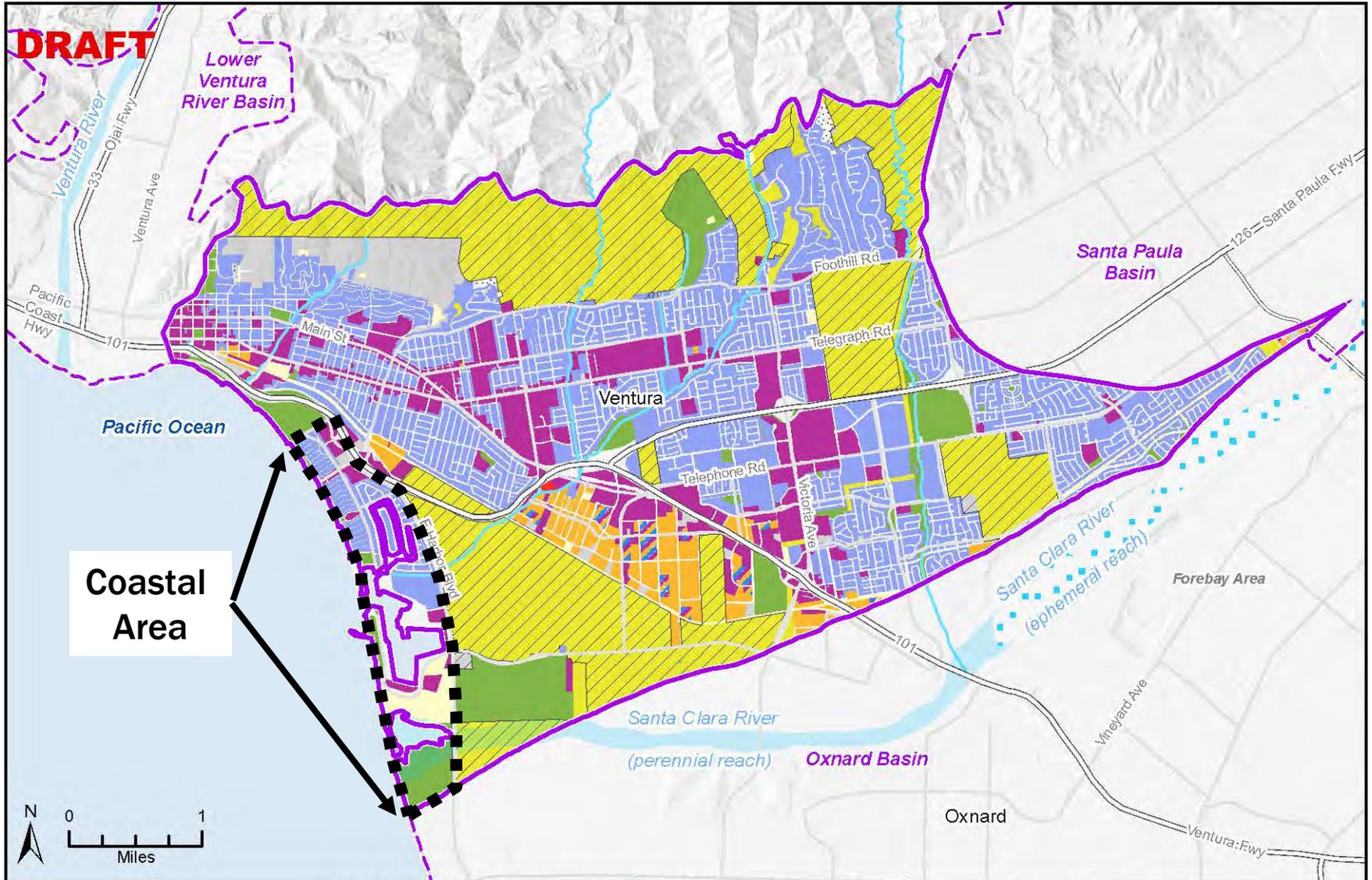
SUSTAINABLE MANAGEMENT IMPLICATION #1

- Seawater intrusion is not anticipated to be an issue for the Mound Basin during the 50-year SGMA planning horizon; however, a monitoring and contingency plan is warranted to address potential short-circuit pathways for seawater.

PROPOSED SEAWATER INTRUSION SMC

- **Undesirable Result: Seawater intrusion east of Harbor Blvd.**
 - No current or anticipated future beneficial uses of groundwater west of Harbor Blvd.
 - Protect existing beneficial uses east of Harbor Blvd.
- **Minimum Threshold:**
 - Seawater in monitoring wells near Harbor Blvd.
- **Measurable Objective:**
 - No indication of seawater in monitoring wells near Harbor Blvd.

Mound Basin Land Use



SEAWATER INTRUSION MONITORING RECOMMENDATIONS

- **Construct one additional “shoreline monitoring well”**
 - **Shoreline monitoring wells provide early detection of seawater and provide time for GSA to implement contingency measures before seawater reaches Harbor Blvd.**
- **Construct one additional monitoring well along Harbor Blvd. for SMC monitoring**
- **Estimate cost ~\$500,000 each**
 - **Pursue SGMA implementation grant**

Proposed Monitoring Wells for Seawater Intrusion

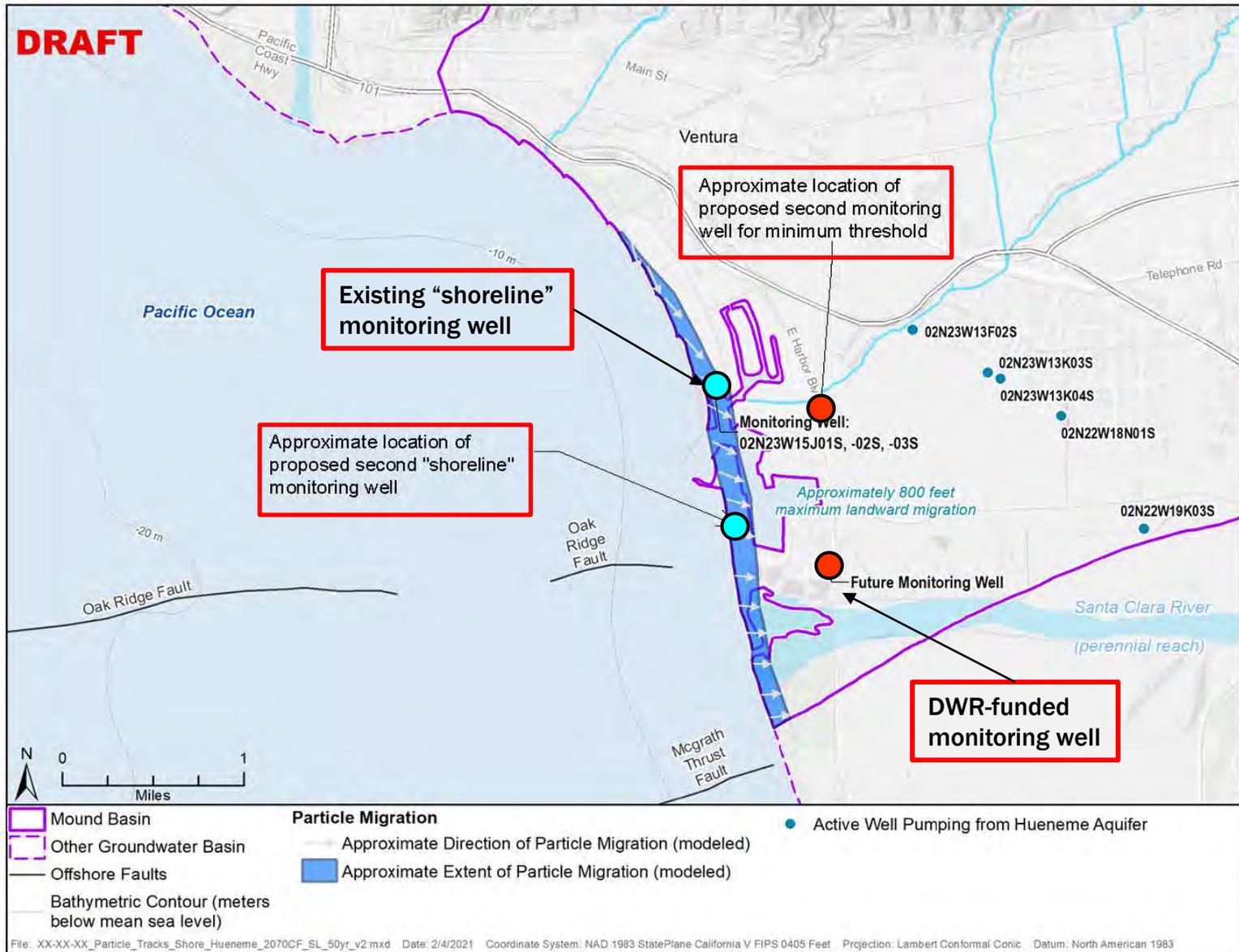


Figure 2b Estimated Landward Movement of Groundwater During 50-Year SGMA Planning Period (with 2070 Climate Change and Sea Level Rise).

SUSTAINABLE MANAGEMENT IMPLICATION #2

- Subsidence is not anticipated because modeling results suggest that future groundwater levels will remain above historical low levels.
- Therefore, inelastic land subsidence is not anticipated to be an issue for the Mound Basin during the 50-year SGMA planning horizon.

PROPOSED SUBSIDENCE SMC

- **Undesirable Result: Measurable inelastic subsidence due to groundwater pumping west of Harbor Blvd.**
 - “Coastal Area” west of Harbor Blvd. is susceptible to land subsidence
 - City sewer main running along Harbor Blvd has low slope
 - Sea level rise impacts to Coastal Area predicted – subsidence would exacerbate sea level rise impacts
- **Minimum Threshold:**
 - Groundwater levels below historical low levels as a proxy for potential onset of subsidence
 - Note: areas east of Harbor Blvd. are less susceptible to effects of subsidence, but it is unlikely that groundwater levels could be sustained below historical lows east of Harbor Blvd. without causing groundwater levels to drop below historical lows in Coastal Area
- **Measurable Objective:**
 - GW levels during wet periods sufficient to prevent dropping below historical lows during droughts

Mound Basin Land Use

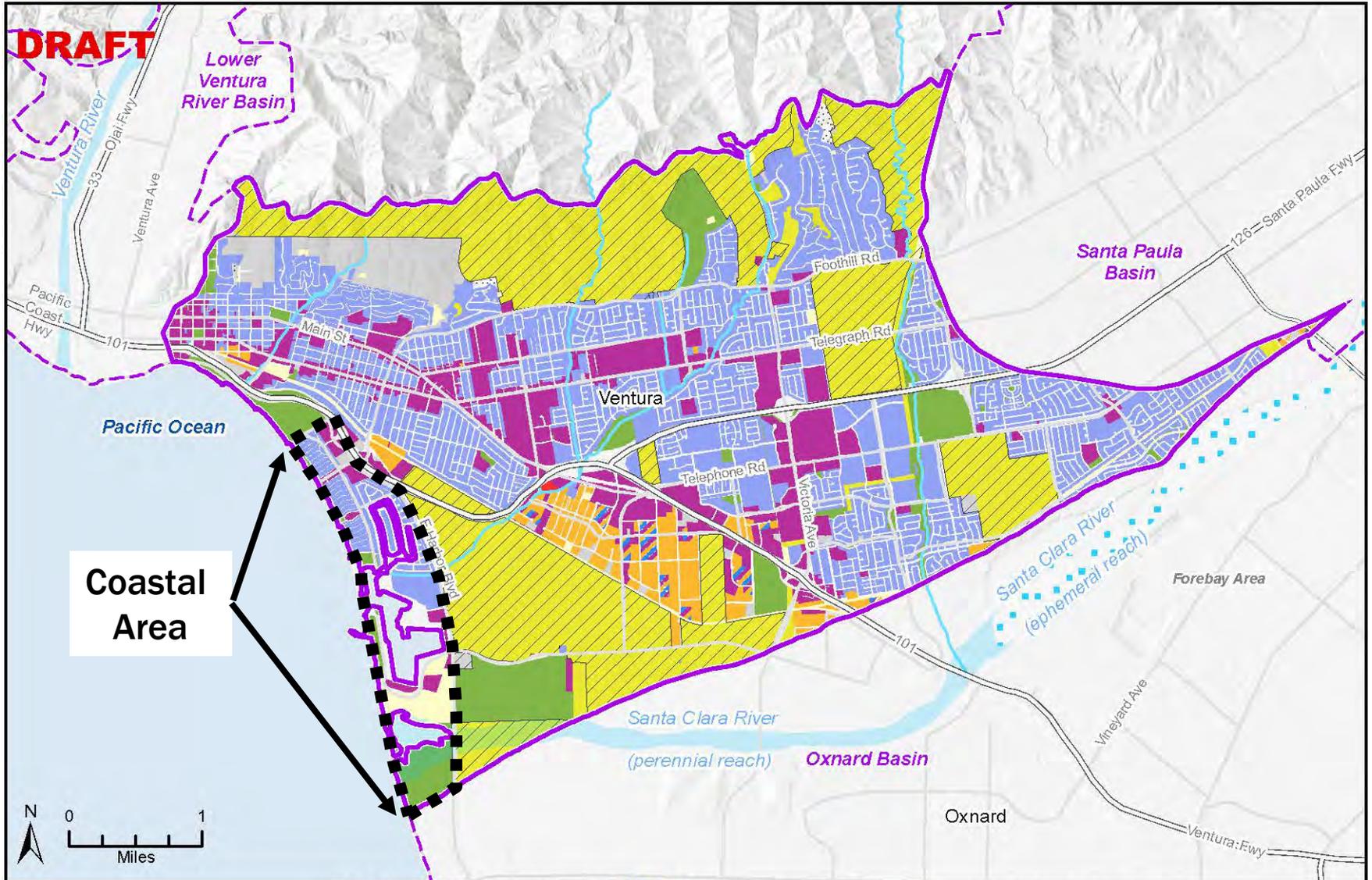


Figure 4a. Historical and Projected Groundwater Levels, **Mugu Aquifer** at Marina Park with Example Measurable Objective and Minimum Threshold

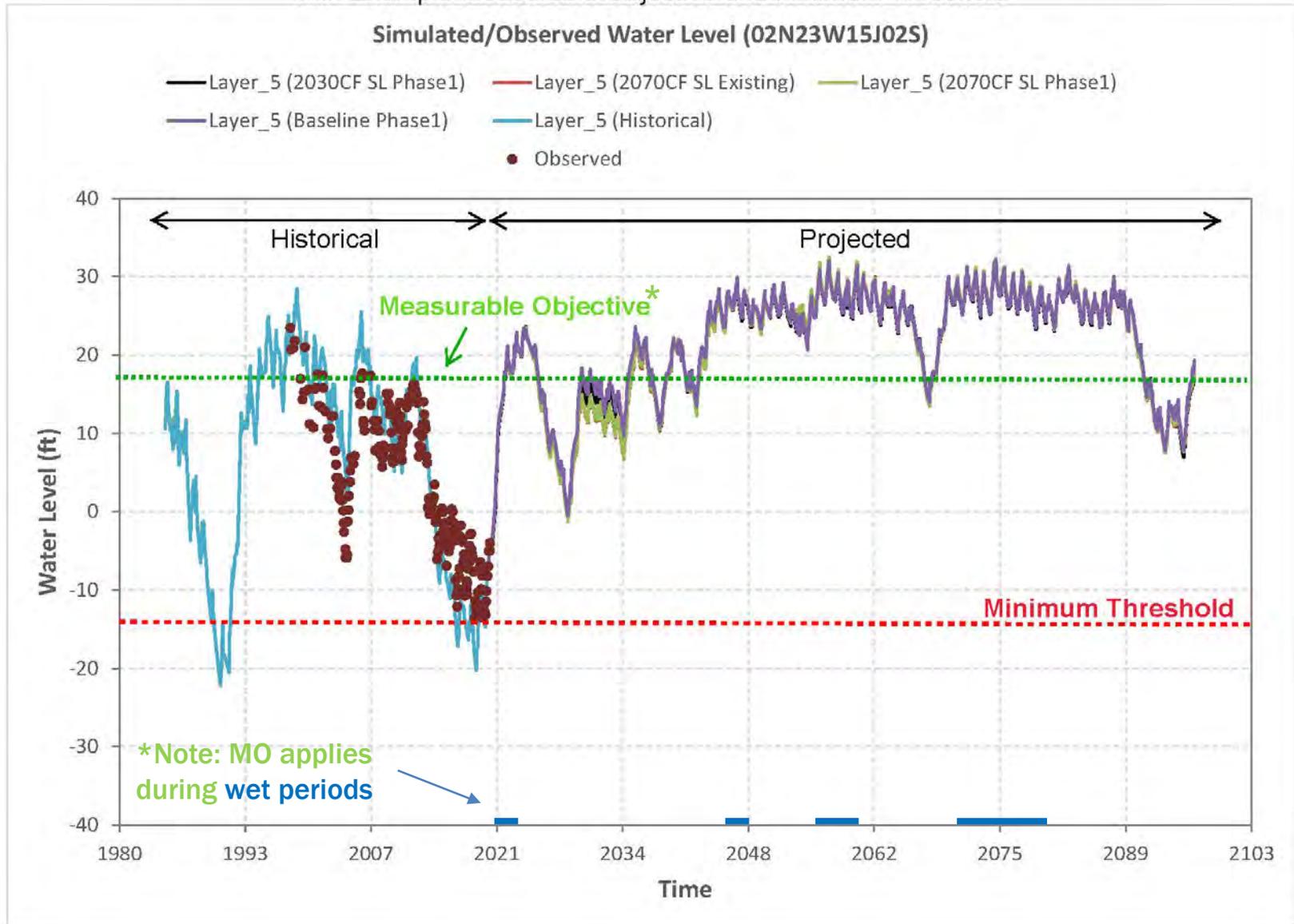


Figure 4c. Historical and Projected Groundwater Levels, Mugu Aquifer at Camino Real Park with Example Measurable Objective and Minimum Threshold

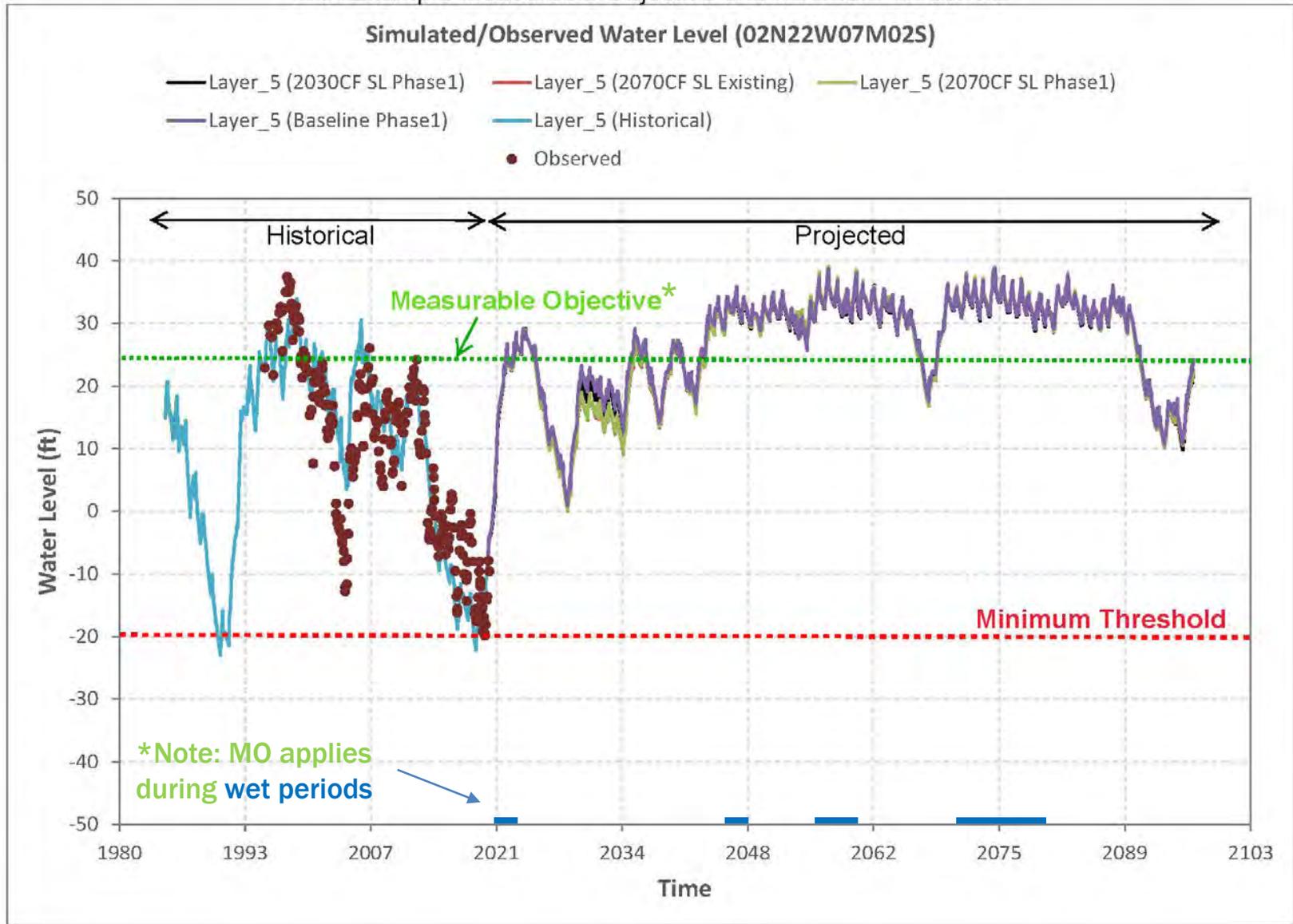


Figure 4b. Historical and Projected Groundwater Levels, Hueneme Aquifer at Marina Park with Example Measurable Objective and Minimum Threshold

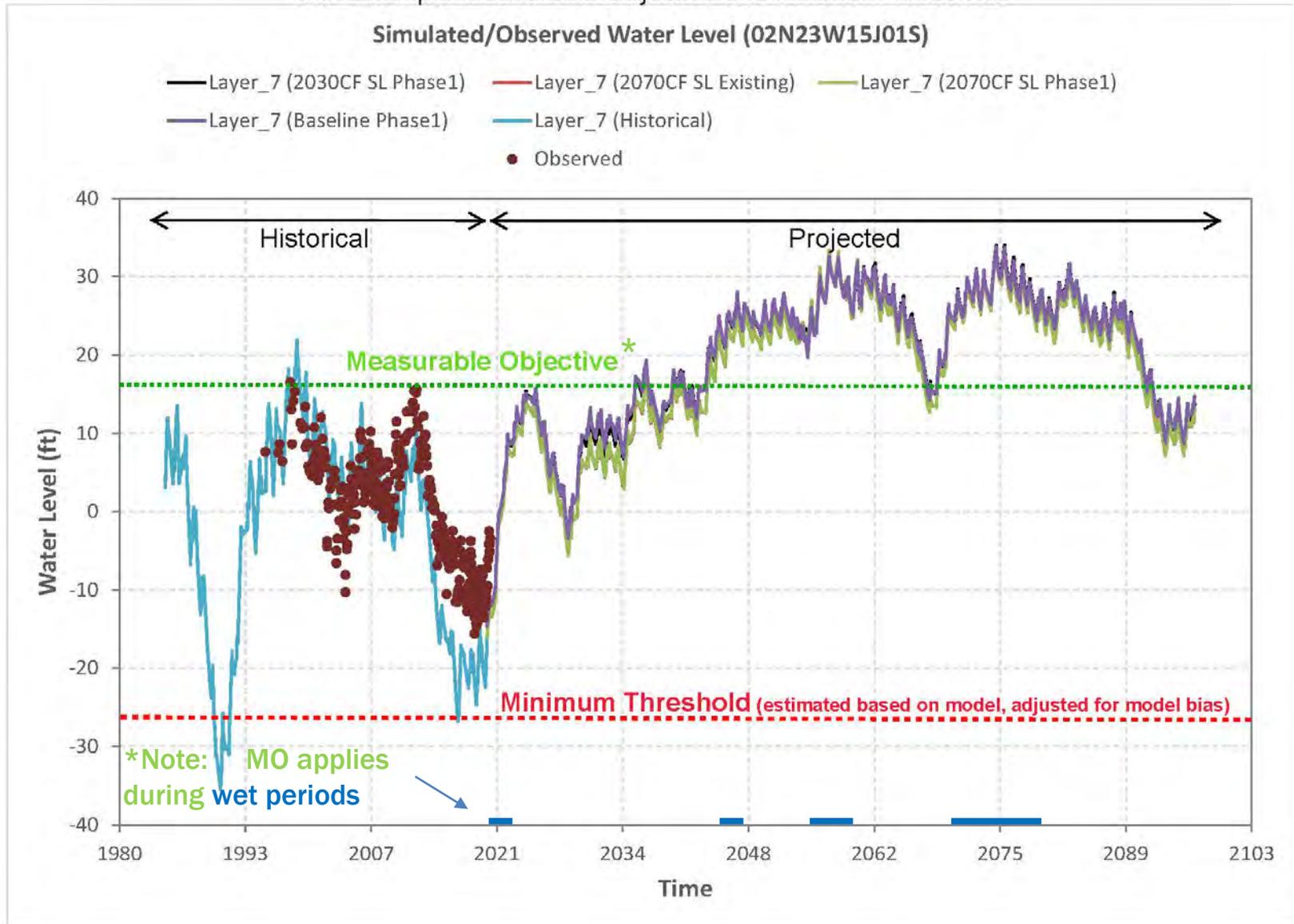
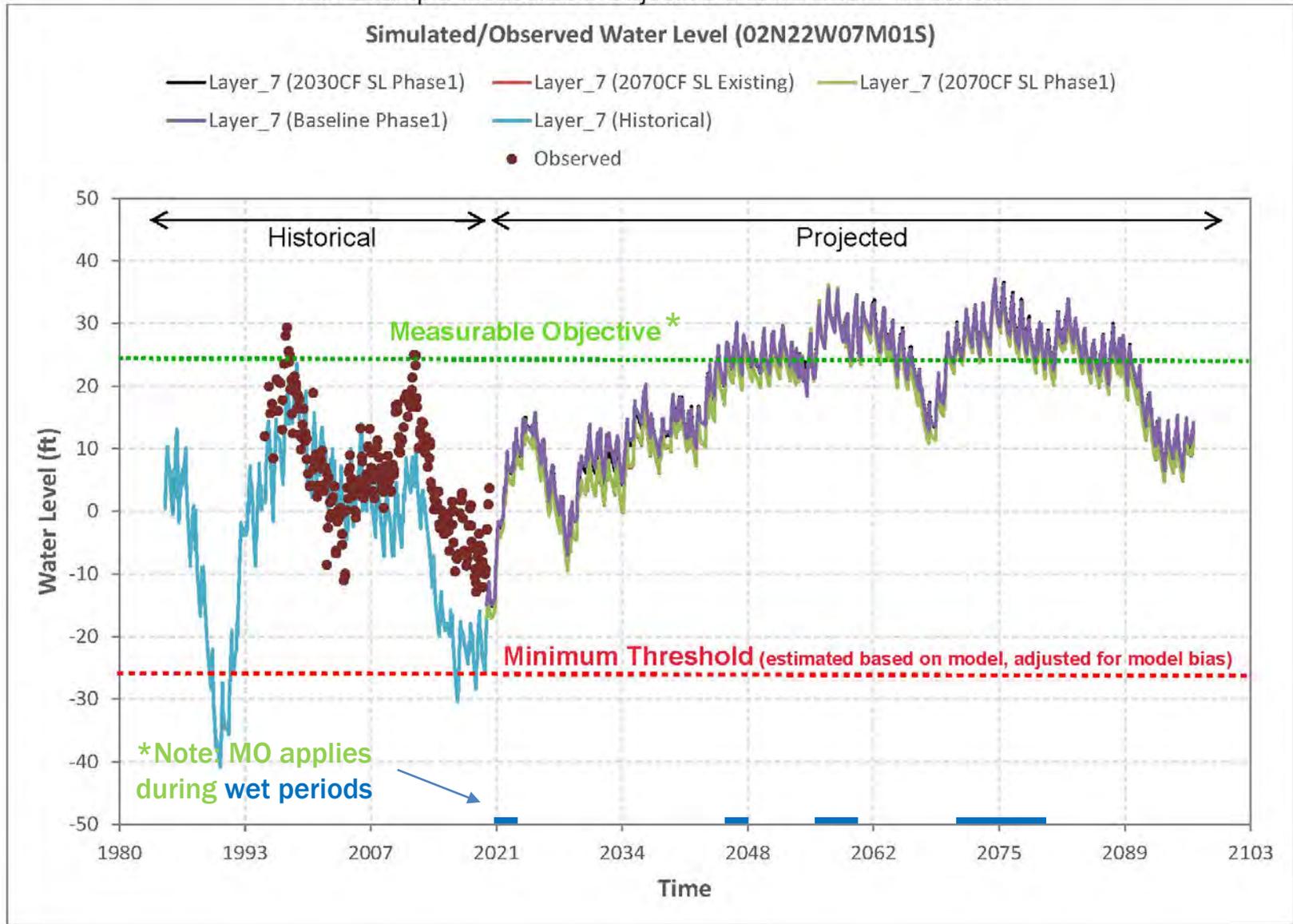


Figure 4d. Historical and Projected Groundwater Levels, **Hueneme Aquifer** at Camino Real Park with Example Measurable Objective and Minimum Threshold



OTHER SUSTAINABLE MANAGEMENT IMPLICATIONS

- The chronic groundwater level decline and reduction of groundwater storage sustainability indicators will not be controlling factors for sustainable management.
- FCGMA's progress toward achieving its sustainability goal for the Oxnard Basin will be important to track. MBGSA will need to be prepared to adapt its GSP if FCGMA does not meet its sustainability goal or otherwise dramatically deviates from the plans set forth in its initial GSP.

NEXT STEPS



SUSTAINABLE MANAGEMENT CRITERIA QUESTIONS



Item 8b
Attachment B

Reprinted December 17, 2020 Staff Report re: Degraded
Water Quality SMCs with Updated Table and Charts



Motion Item No. 9b

DATE: December 17, 2020
TO: Board of Directors
FROM: Executive Director
SUBJECT: **Degraded Water Quality Sustainable Management Criteria (Grant Category (d), Task 4)**

SUMMARY

Purpose

The purpose of this item is to present proposed sustainable management criteria (SMC) for the degraded water quality (DWQ) sustainability indicator. The proposed DWQ SMC were developed based on information presented in the draft Basin Setting section of the Groundwater Sustainability Plan (GSP). Therefore, readers may find it helpful to review the draft GSP Basin Setting section in conjunction with this staff report. The draft GSP Basin setting is available at <https://www.moundbasingsa.org/gsp/>.

Overview

The Sustainable Groundwater Management Act (SGMA) requires Groundwater Sustainability Agencies (GSAs) to address contaminant plumes and other water quality issues that could cause significant and unreasonable impacts on beneficial uses. There are no known contaminant plumes in the basin. Potential impacts related to elevated concentrations of common ions and nitrate are also considered.

The Agency must consider local, state, and federal water quality standards when establishing water quality SMC. It is noted that the Agency is required to consider, but not necessarily adopt, such standards. Justification must be provided in cases where the GSP water quality SMC do not align with other standards. The applicable standards for consideration include drinking water maximum contaminant levels (MCLs) and Regional Water Quality Control Board Basin Plan Water Quality Objectives (WQOs).

The common ion chemistry of the groundwater in the Mugu and Hueneme principal aquifers is not ideal, but is beneficially used by municipal and agricultural users across the Basin. Common ions with RWQCB WQOs include sulfate, boron, and chloride. Total dissolved solids (TDS) also has a WQO. In general, TDS, sulfate, boron, and chloride concentrations are lower in the Mugu Aquifer and meet the WQOs with few exceptions. In general, TDS, sulfate, boron, and chloride concentrations are higher in the Hueneme Aquifer and meet the WQOs at more locations than not. The dissolved constituents are derived from natural sources, and pumping does not appear to be correlated with common ion chemistry concentrations.

It is noted that the City of Ventura has experienced elevated TDS and sulfate concentrations relative to secondary maximum contaminant levels (MCLs) and detectable nitrate in pumped water from its wells. Based on comparison with monitoring data from other wells in the Basin, the elevated concentrations of sulfate and TDS in the City's wells appear to be related to well seal or casing integrity issues that facilitate intrusion of very poor quality water from the shallow groundwater system into the well. This is considered a well construction/condition issue and not an indicator of regional degradation of water quality in the principal aquifer that can or should be managed by the GSA. This same pattern is also observed in some agricultural wells.

Nitrate can impact drinking water beneficial uses. The nitrate maximum contaminant level (MCL) is 45 milligrams per liter (mg/L) as NO_3 (equivalent to 10 mg/L as N). Nitrate concentrations in excess of the drinking water MCL have been detected in groundwater samples from three agricultural wells that are screened in principal aquifers (Mugu and Hueneme Aquifers) in Mound Basin. Nitrate is also detected frequently in one of the two City of Ventura wells at concentrations above background but below the MCL. The other City of Ventura well has periodic low level detections of nitrate. All of these wells exhibit anomalously high concentrations of TDS, sulfate, and chloride, suggesting influence of shallow groundwater through a possibly compromised well seal or well casing, rather than presence of nitrate "plumes" in the Mugu and Hueneme Aquifers in Mound Basin. It is further noted that other wells in the Basin do not exhibit elevated nitrate concentrations, further reinforcing the conclusion that nitrate is not a widespread issue in the Mound Basin principal aquifers.

In summary, groundwater quality in the Mound Basin is marginal due to natural geochemical processes and groundwater pumping does not appear to exacerbate these natural processes. Occurrences of elevated sulfate, TDS, and nitrate concentrations appear to be related to well construction/condition issues that facilitate intrusion of very poor quality water from the shallow groundwater system into these wells, as opposed to being an indicator of regional water quality degradation in the principal aquifers. In conclusion, it does not appear that significant or unreasonable groundwater quality degradation has occurred in the Mound Basin. Nonetheless, MBGSA must establish water quality sustainability criteria and monitor groundwater quality relative to those criteria. The GSP regulations require consideration of existing WQOs and drinking water standards and potential impacts to beneficial uses. When developing the water quality SMC, it is important to remember that MBGSA has no feasible means of changing in situ groundwater water quality.

Proposed SMCs

Undesirable Results

Current groundwater quality supports beneficial uses in the Basin. Therefore, it does not appear that significant or unreasonable groundwater quality degradation has occurred in the principal aquifers of the Mound Basin as a result of groundwater extractions.

Causes of Groundwater Conditions that Could Lead to Undesirable Results

Potential future increases in Mugu Aquifer pumping could potentially induce downward movement of very poor quality water from the shallow groundwater system into the Mugu Aquifer, which could potentially lead to undesirable results. Additionally, improperly constructed wells that remain in use and abandoned wells that have not been properly destroyed (backfilled) can provide conduits for downward movement of very poor quality water from the shallow groundwater system into the Mugu and/or Hueneme Aquifers.

Potential Effects on Beneficial Uses and Users

Potential effects on municipal beneficial uses would be increased costs for treatment or blending to meet drinking water standards. Potential effects on agricultural beneficial uses could include lower quality crops, increased water use to meet leaching requirements, and implementation of treatment or blending to reduce salinity. All of the potential effects on agricultural beneficial uses would result in increased costs and potential impacts on lease rates and land values.

Criteria Used to Define Undesirable Results

The effects of groundwater conditions deemed to cause undesirable results is considered to occur when all representative monitoring wells in a principal aquifer exceed the minimum threshold concentration for a constituent for two consecutive years.

Minimum Thresholds

The minimum threshold for degraded water quality shall be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality as determined by the Agency that may lead to undesirable results. The minimum thresholds shall be based on the number of supply wells, a volume of water, or a location of an isocontour that exceeds concentrations of constituents determined by the Agency to be of concern for the basin. In setting minimum thresholds for degraded water quality, the Agency shall consider local, state, and federal water quality standards applicable to the basin

Criteria Used to Define Minimum Thresholds

- **Primary MCLs**: Applicable to nitrate only. It is desirable to maintain existing water quality at levels suitable potable water for human consumption for current and future beneficial uses. Widespread occurrence of nitrate in excess of the MCL is considered a significant and unreasonable effect.
- **Secondary MCLs**: Applicable to TDS, sulfate, and chloride. It is desirable to maintain water quality at levels acceptable to consumers. Widespread occurrence of TDS, sulfate, or chloride concentrations in excess of the Short Term Consumer Acceptance Level would be considered a significant and unreasonable effect.

- RWQCB WQOs: These standards are designed to protect beneficial uses and preserve existing water quality at the time of RWQCB Basin Plan development from degradation, consistent with the Porter-Cologne Act and State Water Resources Control Board Antidegradation Policy (Resolution No. 68-16).
- Agricultural Thresholds: Certain crops grown in the Basin are sensitive to chloride and boron in irrigation water. The RWQCB WQOs were developed, in part to protect agricultural beneficial uses of water. Therefore, widespread chloride or boron concentrations in excess of WQOs for these constituents would be considered a significant and unreasonable effect.
- Existing Water Quality: Current groundwater quality is known to support beneficial uses in the Basin and there is an absence of significant and unreasonable effects due to water quality. Therefore, minimum thresholds should be set equal to or greater than existing water quality to recognize the absence of significant and unreasonable effects at present.
- GSA's Ability to Improve Water Quality: TDS, sulfate, chloride, and boron are naturally occurring constituents that are derived from groundwater interaction with subsurface sediments. The GSA has no feasible means of reducing the existing in situ concentrations of these constituents in the Basin. The GSA can take measures to minimize the downward migration of these constituents and nitrate from the shallow groundwater into the principal aquifers.

The proposed minimum thresholds and corresponding rationales are listed in Table 1. The proposed minimum thresholds are shown on the water quality plots attached to this staff report (Attachment A).

Measureable Objectives

Measureable objectives are quantitative metrics that reflect desired conditions for the sustainability indicator. Measurable objectives must be established using the same metrics and monitoring sites as are used to define the minimum thresholds. Those metrics were described above. The proposed measureable objectives and corresponding rationales are listed in Table 1. The proposed measureable objectives are shown on water quality plots attached to this staff report (Attachment A).

Interim Milestones

Interim milestones are used to show the anticipated progress or path to achieving the measureable objectives within 20 years. The GSA must define the interim milestones using the same metric as the measurable objective in increments of five years. Because the measureable objectives for all water quality constituents are already met, there is no need to show interim milestones.

UPDATED MARCH 2021

Table 1. Proposed Minimum Thresholds and Measureable Objectives

Constituent	MCL (mg/L)	Sec. MCL (R/U/ST) ¹ (mg/L)	RWQCB WQO (mg/L)	Average Conc. Representative Monitoring Wells Last 10 Years (mg/l)	Proposed MT ² (mg/L)	MT Rationale	Proposed MO ³ (mg/L)	MO Rationale
<i>Mugu Aquifer</i>								
Nitrate	45	N/A	45	Non-Detect	45	Protect water quality for potable uses.	5	Preserve existing water quality for potable uses.
TDS	N/A	500/1,000/1,500	1,200	902	1,200	Protect agricultural, municipal, and industrial beneficial uses consistent with RWQCB WQOs.	1,000	Preserve existing water quality for agricultural, municipal, and industrial beneficial uses. MO is set at Upper Consumer Acceptance Level to support potable uses.
Sulfate	N/A	250/500/600	600	350	600	Protect municipal beneficial use consistent with RWQCB WQOs and prevent exceedances of Short Term Consumer Acceptance Level.	500	Preserve existing water quality for municipal beneficial use. MO is set at Upper Consumer Acceptance Level to support potable uses.
Chloride	N/A	250/500/600	150	50	150	Protect agricultural beneficial use consistent with RWQCB WQOs.	75	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.
Boron	N/A	N/A	1	0.47	1	Protect agricultural beneficial use consistent with RWQCB WQOs.	0.75	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.
<i>Hueneme Aquifer</i>								
Nitrate	45	N/A	45	Non-Detect	45	Protect water quality for potable uses.	5	Preserve existing water quality for potable uses.
TDS	N/A	500/1,000/1,500	1,200	1,171	1,400	Protect agricultural, municipal, and industrial beneficial uses. MT is 200 mg/L higher than RWQCB WQO based on current and historical data at representative monitoring wells (set at upper range of data from past ten years).	1,200	Preserve existing water quality for agricultural, municipal, and industrial beneficial uses.
Sulfate	N/A	250/500/600	600	488	600	Protect municipal beneficial use consistent with RWQCB WQOs and prevent exceedances of Short Term Consumer Acceptance Level.	500	Preserve existing water quality for municipal beneficial use. MO is set at Upper Consumer Acceptance Level to support potable uses.
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¹ Consumer Acceptance Levels, where R = Recommended, U = Upper, and ST = Short Term

² Undesirable results are considered to occur when all representative monitoring wells in a principal aquifer exceed the minimum threshold concentration for a constituent for two consecutive years.

³ Sustainability Goal for degraded water quality for a given constituent is considered to be met when the two-year running average concentration for at least one representative monitoring well is below the measureable objective.

RECOMMENDED ACTION

Discuss proposed sustainable management criteria for the water quality sustainability indicator and consider providing feedback to staff.

BACKGROUND

SMC are the most important GSP component because they define certain conditions in the basin that will be desirable to avoid and certain conditions that are desirable to achieve. The SCM will be a marriage of policy and technical elements. Policy elements will be approved by the Board in consultation with stakeholders. Technical information will be derived from the Basin Conditions section of the GSP and additional technical analysis. The SMC will be achieved through implementation of projects and management actions, as necessary and appropriate. Progress toward meeting and/or maintain the SMC will be evaluated via monitoring programs associated with each applicable Sustainability Indicator.

While developing the SMC, it will be important to remember that sustainable groundwater management will be achieved through adaptive management over a 20 year period. New data obtained from future actions to address data gaps and from monitoring actions will lead to improved understanding of the basin, which will form the basis for refinement of the SMC and projects and management actions over time, which will be memorialized in GSP updates. The forthcoming GSP, including the SMC, should be viewed as a flexible roadmap for a 20 year journey to sustainable management for the Mound Basin.

The SMC includes the following elements.

- Sustainability Goal
 - Statement of the GSA's objectives and desired conditions of the groundwater basin.
- Undesirable Results
 - Significant and unreasonable effects related to any applicable Sustainability Indicator. It is important to note that, even if a basin does not currently have undesirable results, the GSP Regulations require GSAs to describe the significant unreasonable effects that, if they were to occur, would be considered an undesirable result.
- Minimum Thresholds
 - Quantitative metrics indicating significant and unreasonable effects may occur for applicable Sustainability Indicators. The GSP seeks to avoid the MTs in order to avoid undesirable results. In the above example, groundwater levels at which the well pumping capacity is lost would be determined using information about the wells and modeling to determine under what conditions those water levels might occur.
- Measureable Objectives (MOs)

- Quantitative metrics that reflect basin desired conditions for applicable Sustainability Indicators. The GSP seeks to achieve the MO within 20 years to provide operational flexibility above the MT to accommodate droughts, climate change, and other factors. In the above example, modeling would be performed to estimate groundwater levels that would prevent MTs from being reached after accounting for expected groundwater level fluctuations.

FISCAL SUMMARY

Not applicable.

ATTACHMENTS

- A. Plots of Historical Water Quality, Minimum Thresholds, and Measureable Objectives
- B. Maps Showing Water Quality Monitoring Locations

Action: _____
Motion: _____ 2 nd : _____
J.Chambers: _____ C.Everts: _____ M.Mobley: _____ S.Rungren: _____ G.Shephard: _____

UPDATED MARCH 2021

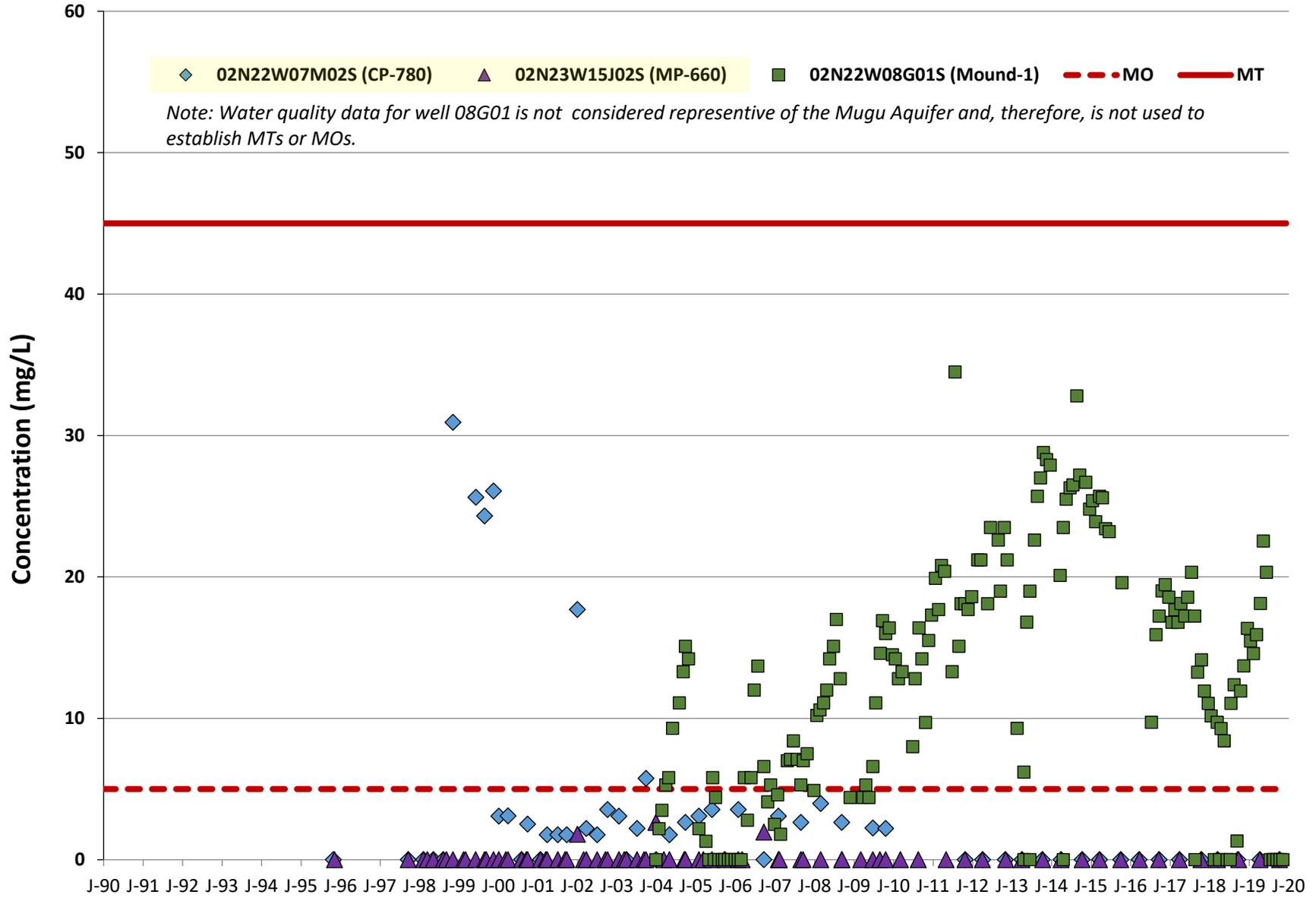
Item 9b

Attachment A

Plots of Historical Water Quality, Minimum Thresholds, and
Measureable Objectives

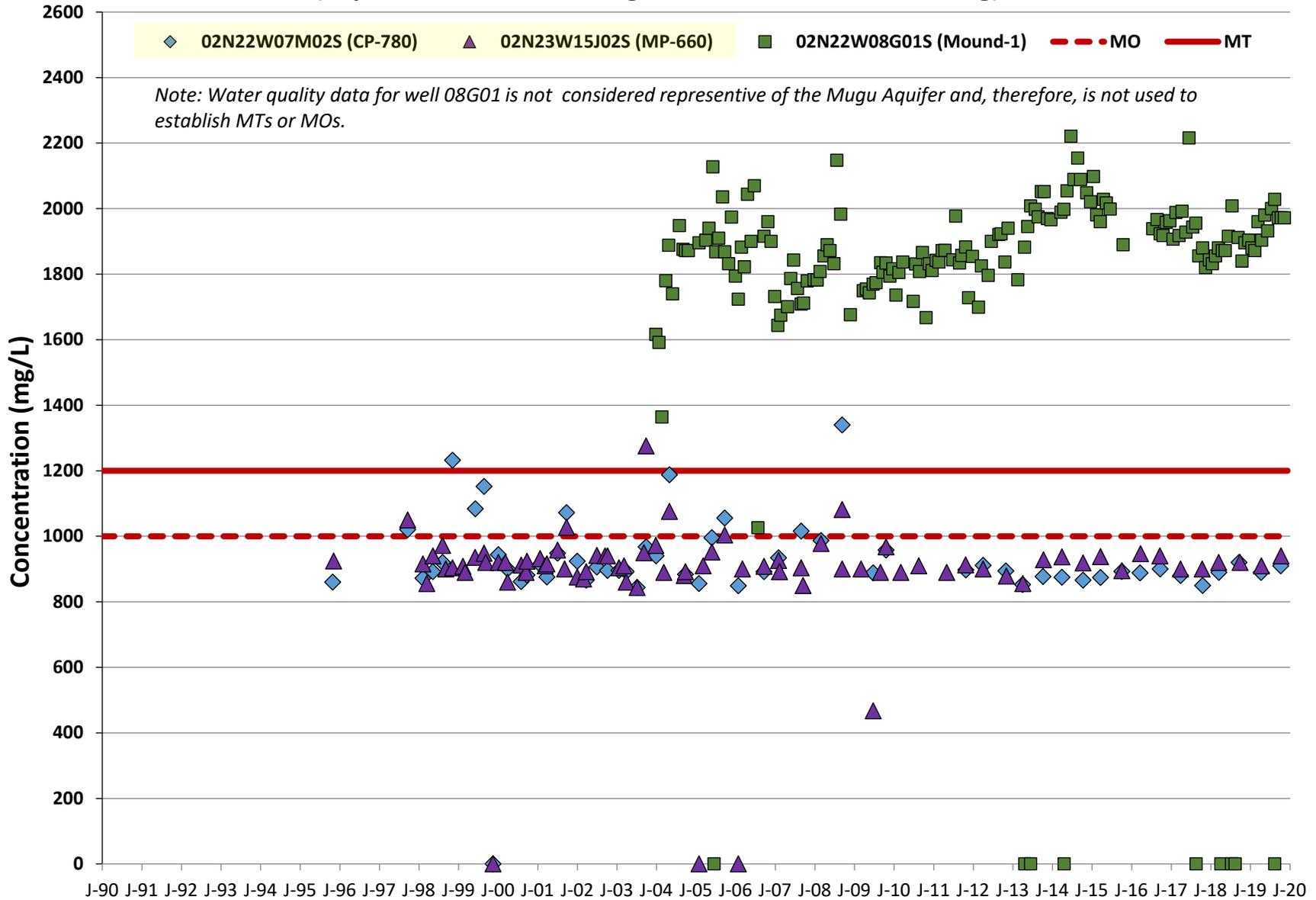
UPDATED MARCH 2021

Mugu Aquifer - Nitrate (Representative Monitoring Sites Noted in Yellow Shading)



UPDATED MARCH 2021

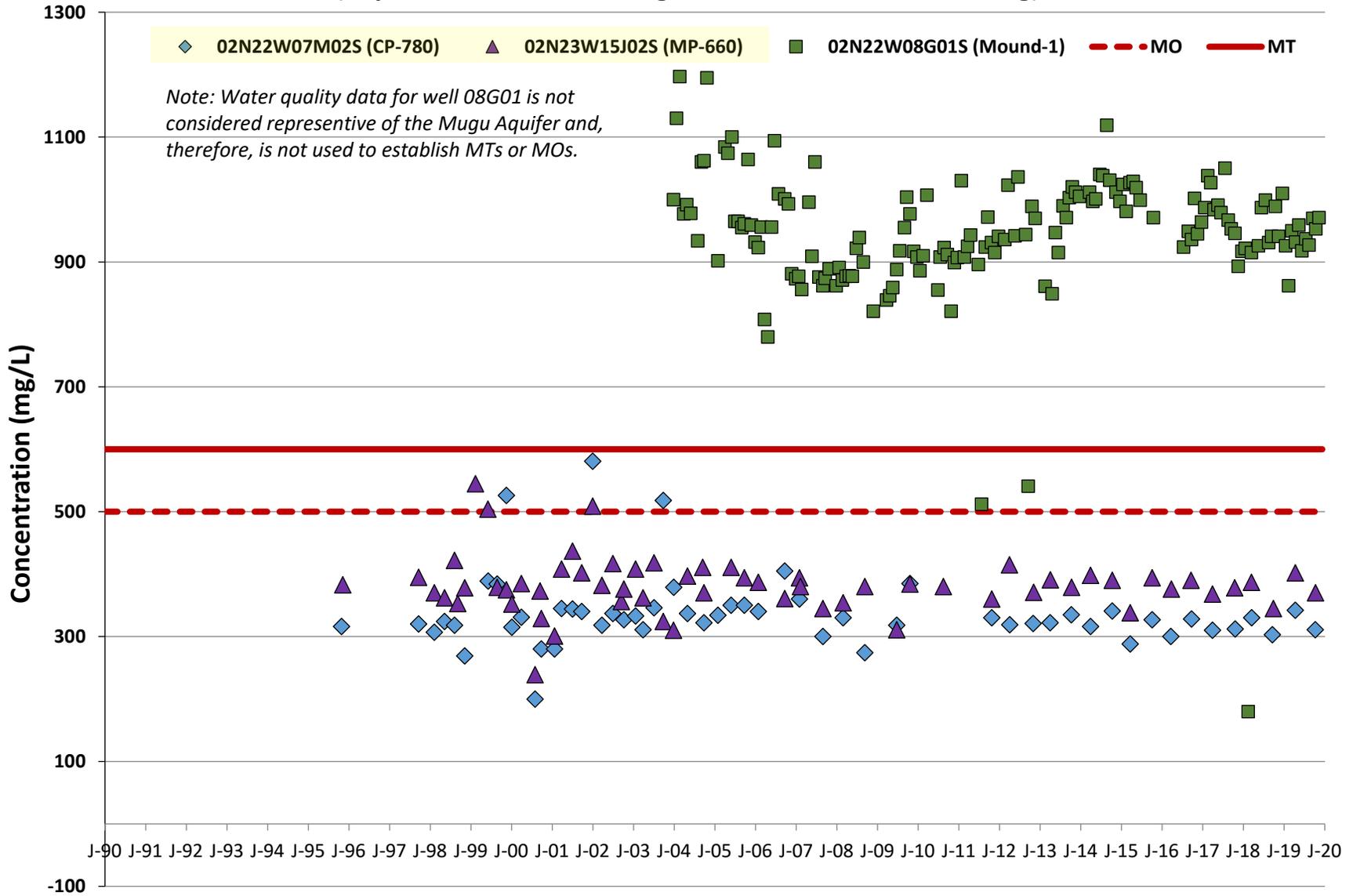
Mugu Aquifer - Total Dissolved Solids (Representative Monitoring Sites Noted in Yellow Shading)



UPDATED MARCH 2021

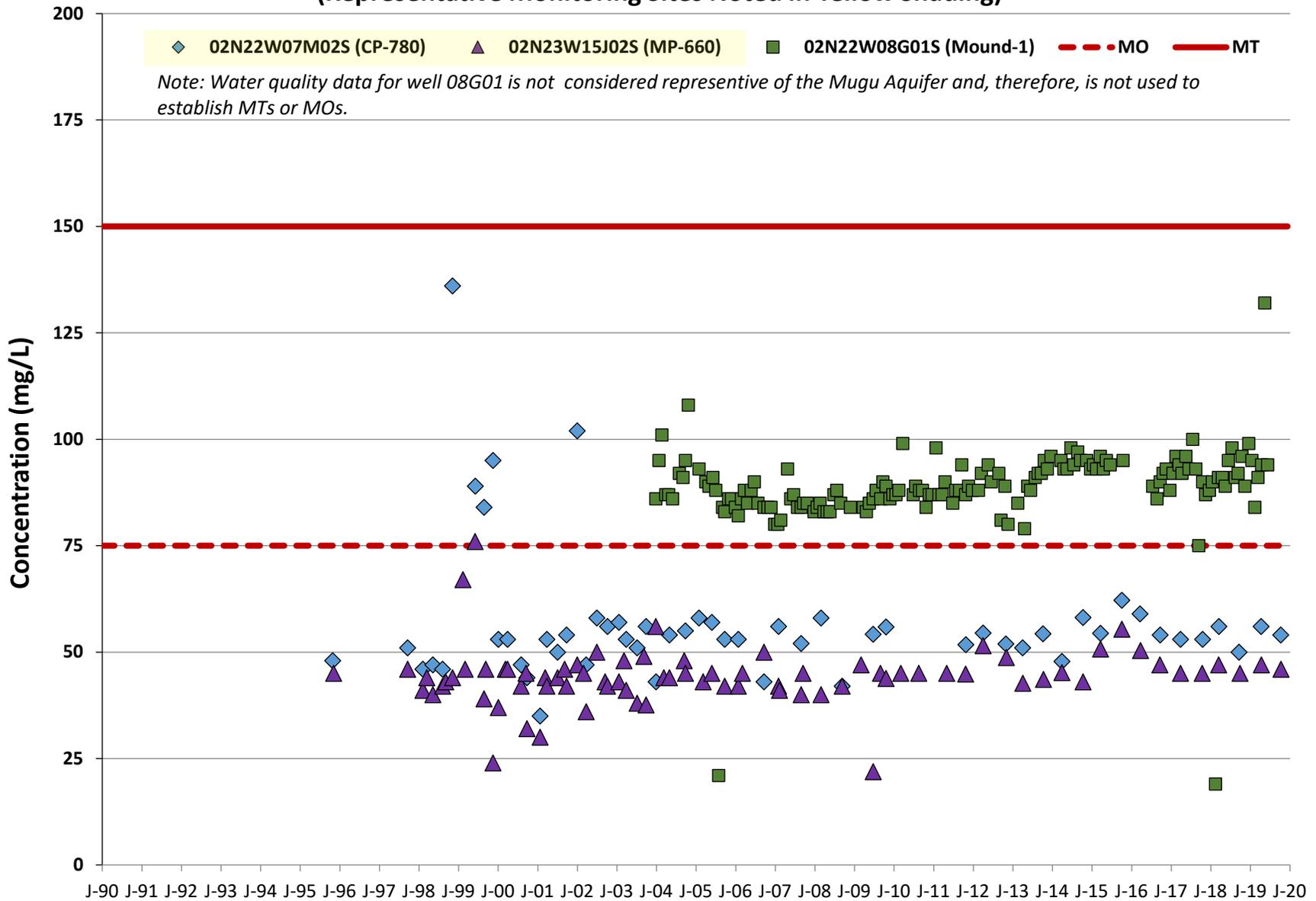
Mugu Aquifer - Sulfate

(Representative Monitoring Sites Noted in Yellow Shading)



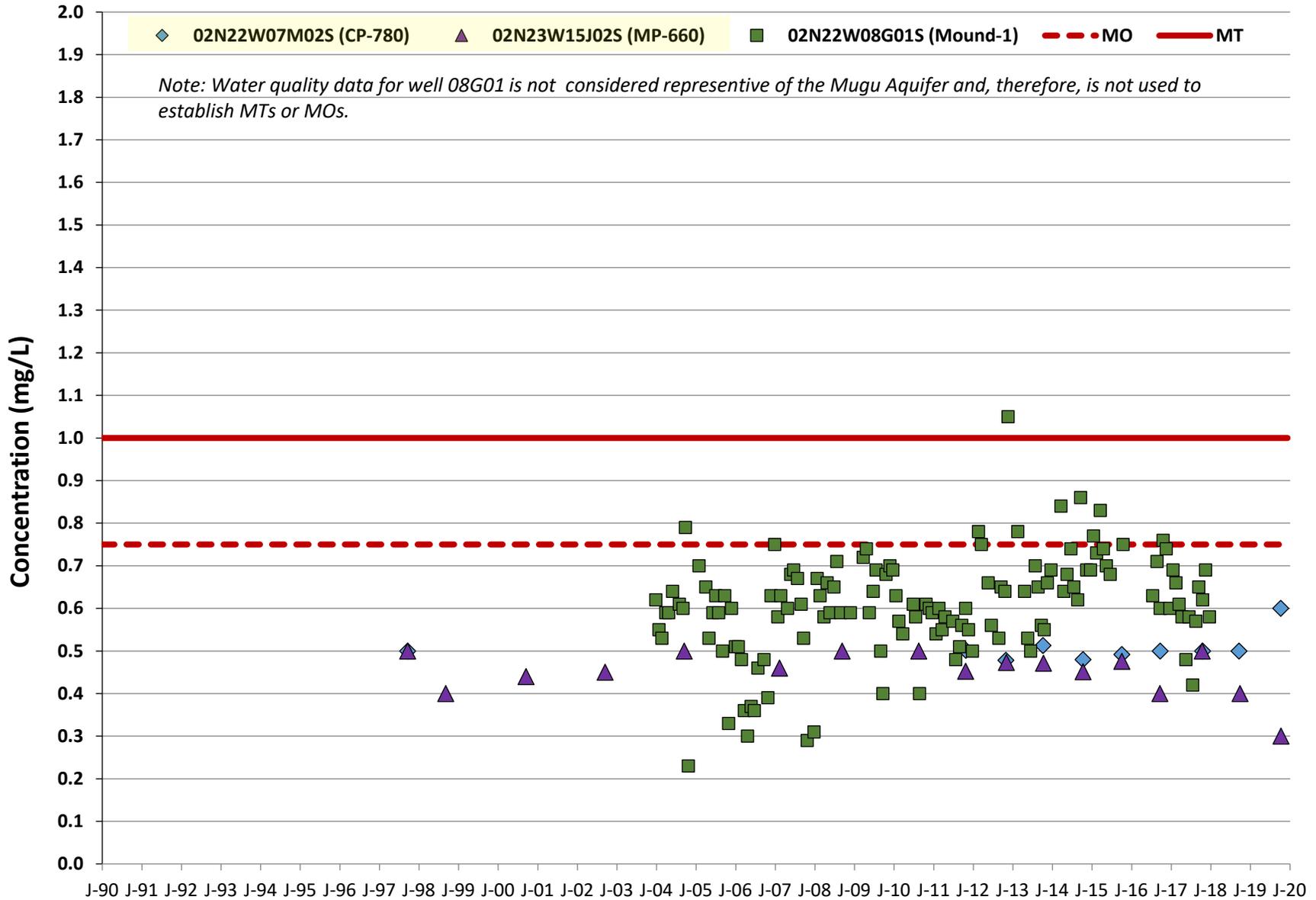
UPDATED MARCH 2021

Mugu Aquifer - Chloride (Representative Monitoring Sites Noted in Yellow Shading)



UPDATED MARCH 2021

Mugu Aquifer - Boron (Representative Monitoring Sites Noted in Yellow Shading)



UPDATED MARCH 2021

Hueneme Aquifer - Nitrate

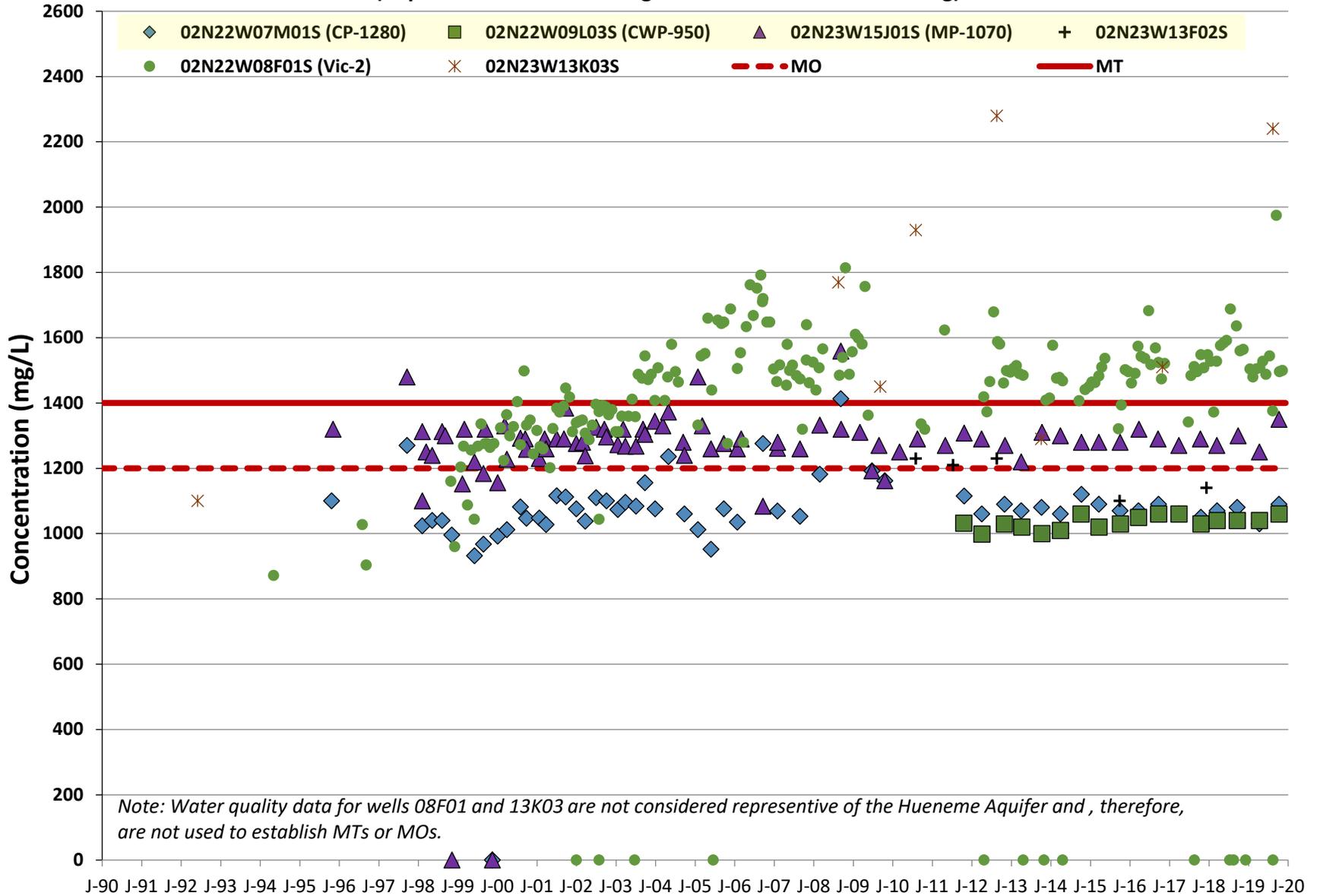
(Representative Monitoring Sites Noted in Yellow Shading)



UPDATED MARCH 2021

Hueneme Aquifer - Total Dissolved Solids

(Representative Monitoring Sites Noted in Yellow Shading)

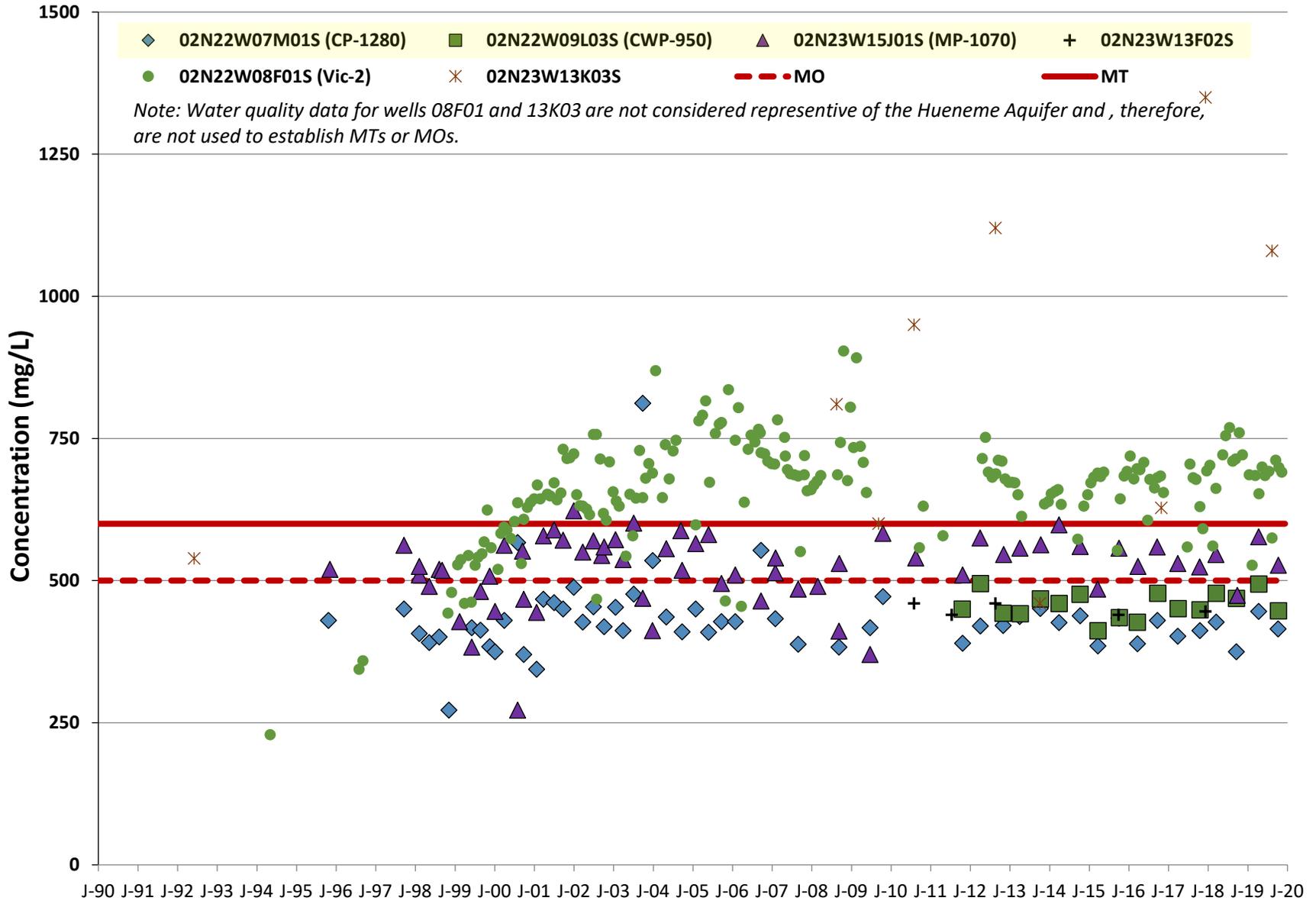


Note: Water quality data for wells 08F01 and 13K03 are not considered representative of the Hueneme Aquifer and, therefore, are not used to establish MTs or MOs.

UPDATED MARCH 2021

Hueneme Aquifer - Sulfate

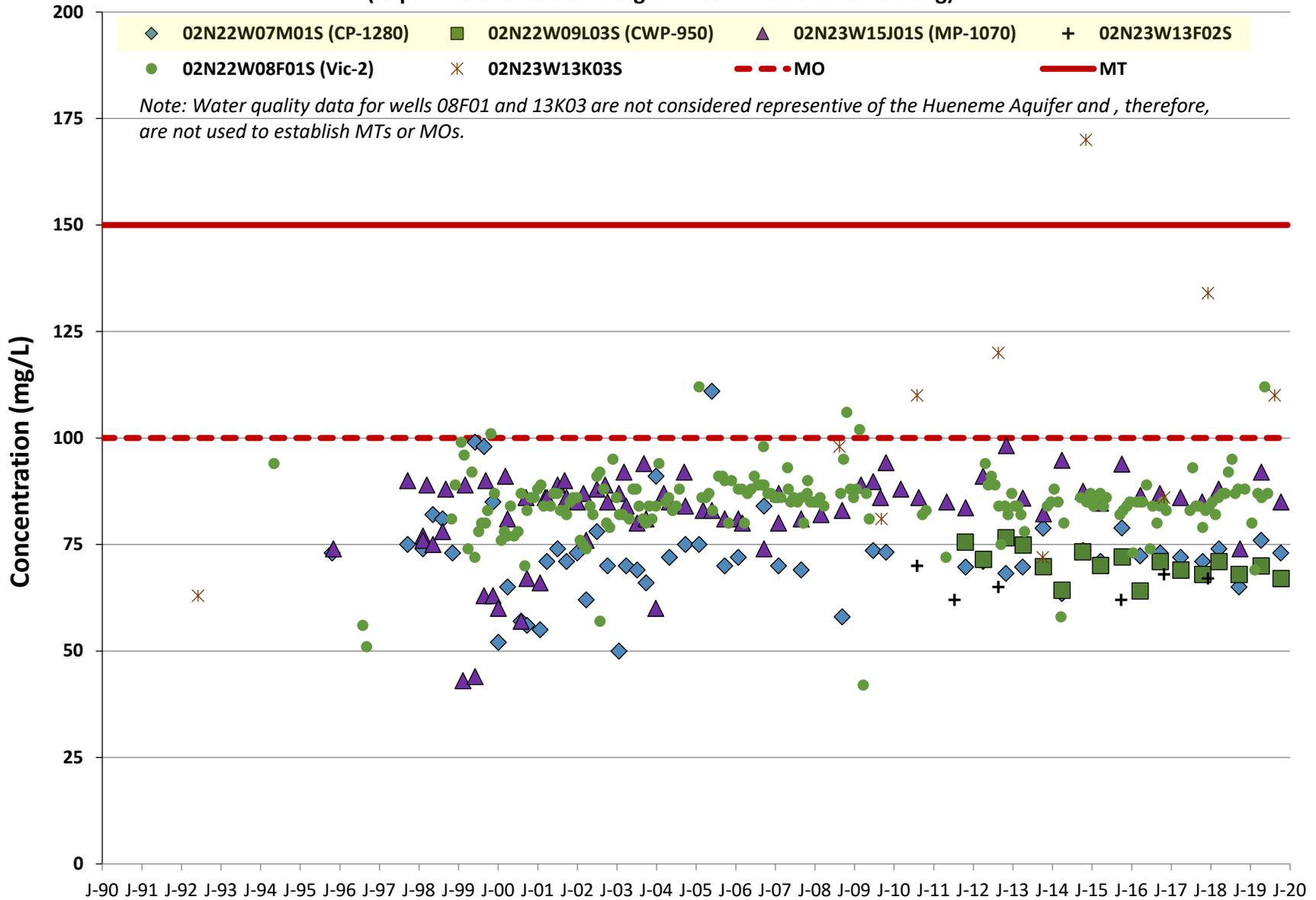
(Representative Monitoring Sites Noted in Yellow Shading)



UPDATED MARCH 2021

Hueneme Aquifer - Chloride

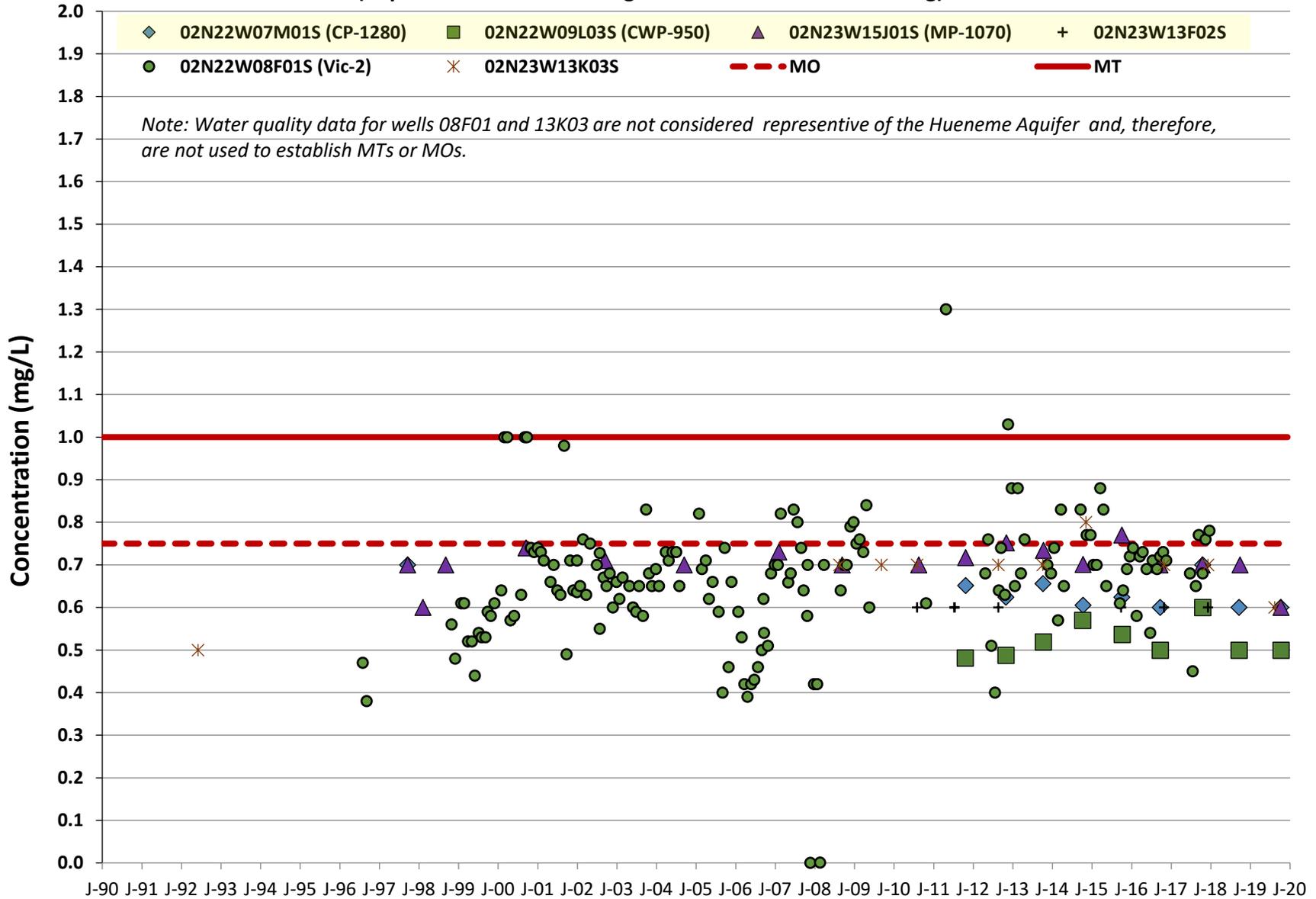
(Representative Monitoring Sites Noted in Yellow Shading)



UPDATED MARCH 2021

Hueneme Aquifer - Boron

(Representative Monitoring Sites Noted in Yellow Shading)



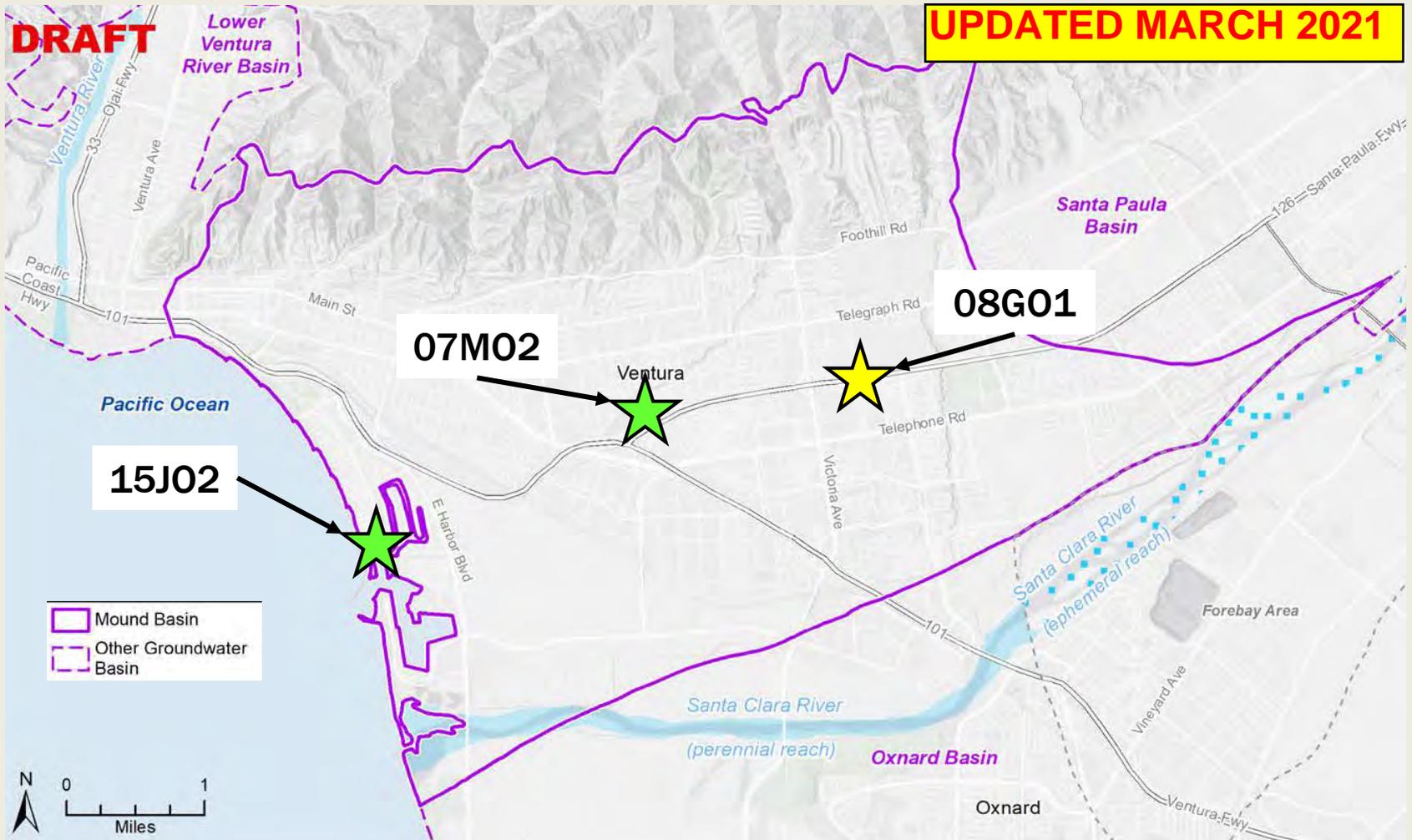
UPDATED MARCH 2021

Item 9b

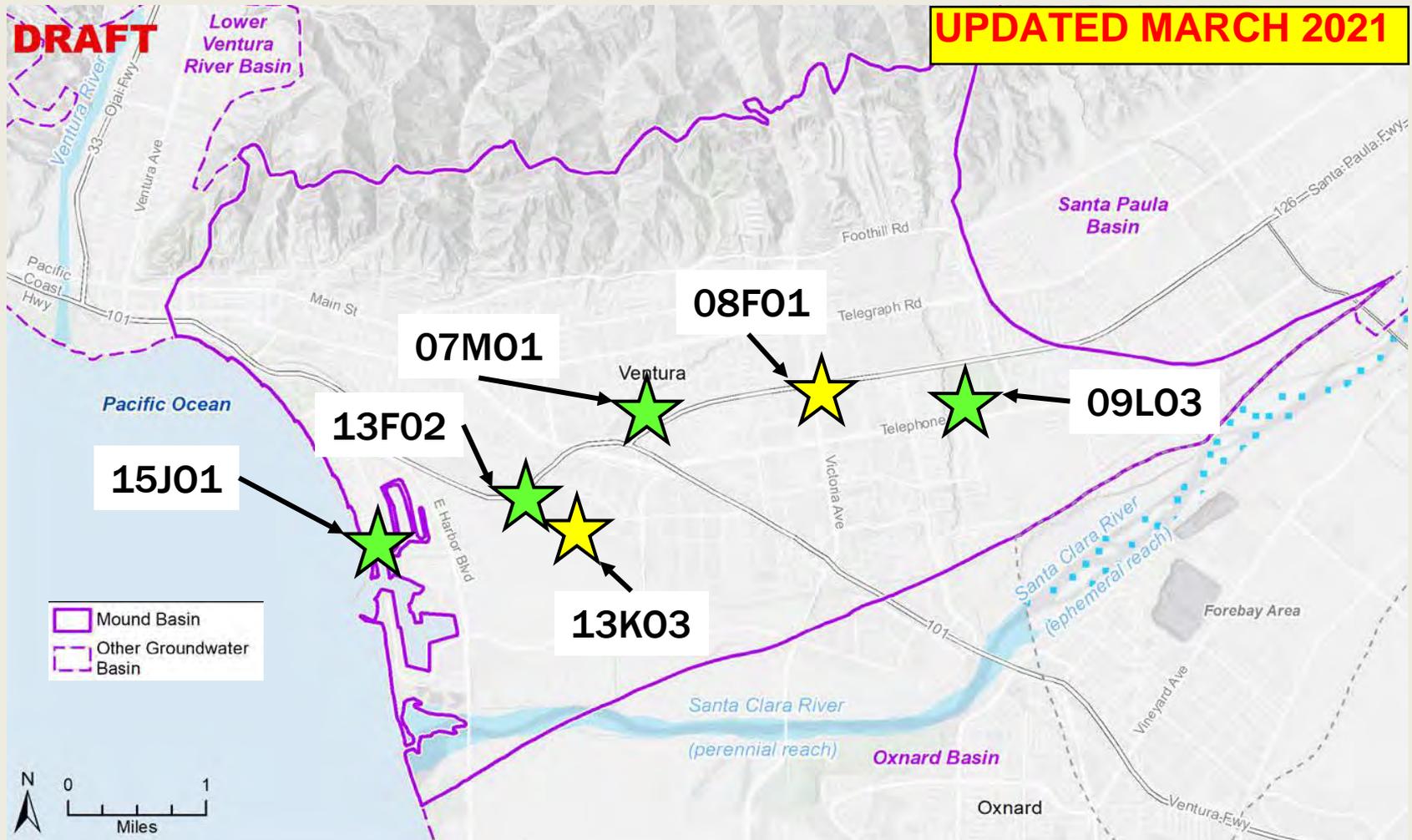
Attachment B

Maps Showing Water Quality Monitoring Locations

WATER QUALITY MONITORING LOCATIONS – MUGU AQUIFER



WATER QUALITY MONITORING LOCATIONS - HUENEME AQUIFER



Item 8b
Attachment C

Reprinted February 18, 2021 Staff Report re: Model Results
and SMCs and Associated Board Meeting Presentation Slides



MoundBasin

GROUNDWATER SUSTAINABILITY AGENCY

Motion Item No. 8(d)

DATE: February 18, 2021
TO: Board of Directors
FROM: Executive Director
SUBJECT: Review of Future Groundwater Conditions Modeling Results and Implications for Sustainable Management (Grant Category (c), Task 3 and Category (d), Task 4)

SUMMARY

The GSP Development team will provide a presentation summarizing key results of the simulations of future groundwater conditions and discuss implications for sustainable management criteria.

Overview of Model Simulations

Four simulations of future groundwater conditions were performed. Key assumptions for the future modeling scenarios were discussed with the Board on September 17, 2020. The assumptions are as follows:

- Hydrologic Conditions: Each simulation uses historical hydrologic conditions from the period 1943 through 2019 as a proxy for future hydrologic conditions.
- Groundwater Extractions: Groundwater extractions are based on input received from the Mound Basin Agricultural Water Group (MBAWG) and the City of Ventura. Assumed future agricultural pumping ranges from 2,873 acre-feet per year (AFY) in wet years to 3,548 AFY in dry years. City of Ventura future pumping is assumed to be 4,000 AFY. Pumping by the two industrial users in the Basin (Saticoy Lemon Association and Ivy Lawn Memorial Park) is assumed to be the same as current.
- Land Use: Future land use is assumed to be static due to the Save Open Space and Agricultural Resources (SOAR) voter initiatives that are currently approved through 2050.
- Adjacent Basins:
 - Santa Paula Basin: Recent pumping rates were carried forward to approximate potential future groundwater conditions in the Santa Paula Basin.

- Oxnard Basin: Based on feedback obtained from Fox Canyon Groundwater Management Agency (FCGMA) staff, the Oxnard Basin GSP's "Reduction with Project Scenario" was used to approximate potential future groundwater conditions in the Oxnard Basin.
- United Water Conservation District (UWCD) Artificial Recharge: The existing Freeman Diversion plus planned expansion project is assumed.

Three model simulations were performed to evaluate climate change effects. A fourth simulation was performed to evaluate the sensitivity of groundwater conditions to United Water Conservation District's planned Freeman Diversion expansion project. The four scenarios are:

1. Baseline: This simulation employs the assumptions described above.
2. 2030 Climate Change: This simulation considers the effects of estimated 2030 climate change conditions. Model inputs impacted by climate change were modified using 2030 "climate change factors" provided by the Department of Water Resources (DWR) for use by groundwater sustainability agencies (GSAs).
3. 2070 Climate Change: This simulation considers the effects of estimated 2070 climate change conditions. Model inputs impacted by climate change were modified using 2070 "climate change factors" provided by DWR for use by GSAs.
4. 2070 Climate Change without Freeman Diversion Expansion Project: Same as "2070 Climate Change" scenario, but without the expansion project. This can be thought of as the most conservative or worst-case scenario.

In addition to the groundwater flow simulations, particle tracking was performed to assess the movement of seawater into the aquifer at its offshore subcrop location and the movement of fresh groundwater near the shoreline.

Summary of Key Results

The following is a summary of the key results from the modeling.

1. Regardless of the scenario, future groundwater levels are predicted to be higher than historical levels due to anticipated increases in groundwater levels in the adjacent Oxnard Basin (Figures 1a-1d).
2. The impact of climate change on groundwater levels is typically less than approximately 5 feet (Figures 1a-1d).
3. The impact of the Freeman Diversion expansion project is almost undetectable.
4. Particle tracking results suggest that groundwater will flow offshore in the Mugu Aquifer.
5. Particle tracking results suggest that groundwater will flow onshore in the Hueneme Aquifer at an average rate of approximately 1/8 of a mile per 20 years (Figures 2a-2b). It should be noted that particle tracking assumes the aquifer is uniform and, therefore, provides an average migration rate. Migration rates in the most permeable zones of the aquifer would be considerably (many times) higher.

Implications and Recommendations for Sustainable Management Criteria

The following are key implications for sustainable management criteria.

1. Seawater intrusion is not anticipated to be an issue for the Mound Basin during the 50-year SGMA planning horizon, but a monitoring and contingency plan is warranted. Onshore migration of seawater is not anticipated during the 50-year SGMA planning horizon. This is due to the large distance between the shoreline and the edge of the continental shelf offshore where the aquifers are hydraulically connected to seawater (Figure 3)¹. The travel time for seawater to reach the coast is estimated to be many centuries or more. This is in contrast with the adjacent Oxnard Plain Basin, where the aquifers are highly vulnerable to lateral seawater intrusion due to the existence of two deep submarine canyons at Port Hueneme and Point Mugu that expose the aquifers to seawater at a very close distance to the shoreline. Although the model suggests onshore flow in the Hueneme Aquifer, it is believed this water will most likely continue to consist of fresh groundwater from the offshore portion of the aquifer. However, the GSP should consider the possibility that a short-circuit pathway for seawater could exist nearshore (for example along the Oak Ridge fault), which could be allowing seawater to enter the aquifer that could migrate onshore during the SGMA planning horizon.

There are no current or anticipated future beneficial uses of groundwater in the “coastal area” located west of Harbor Blvd. Agricultural beneficial uses exist east of Harbor Blvd. Therefore, it is recommended that the sustainable management criteria and a contingency plan be developed to prevent seawater migration east of Harbor Blvd, if seawater is detected at the shoreline. To effectively monitor for seawater intrusion and provide adequate time to react to any landward migration of seawater, a second shoreline monitoring well along Spinnaker Drive is recommended (Figures 2a-2b). The proposed measurable objective (i.e., goal) for seawater intrusion would be lack of seawater detections in the two shoreline monitoring wells. The proposed minimum threshold would be seawater detections at/near Harbor Blvd. The planned monitoring well at the City’s wastewater treatment plan would serve as one monitoring location for application of the minimum threshold. The other monitoring well would be constructed near Harbor Blvd., east of Marina Park (Figures 2a-2b).

If seawater is detected at one or both shoreline monitoring wells, the GSA would need to develop and implement projects and/or management actions to prevent seawater migration east of Harbor Blvd. Migration from the shoreline to Harbor Blvd would take approximately a decade or longer. Nonetheless, it is recommended that a contingency plan be developed and added to the GSP before the first required 5-year GSP update.

2. Inelastic land subsidence is not anticipated to be an issue for the Mound Basin during the 50-year SGMA planning horizon. Inelastic land subsidence is not anticipated because modeling results suggest that future groundwater levels will remain above historical low levels. Nonetheless, sustainable management are required in the GSP.

¹ Available data suggest that the aquifers are protected from vertical migration of seawater into the aquifers by a significant thickness of fine-grained deposits (aquitard) above the aquifers.

Staff suggests the following approach. It is noted that the “coastal area” located west of Harbor Blvd. is susceptible to impacts of land subsidence. Primary sewer lines to the City’s wastewater treatment plant runs along Harbor Blvd. and have a low slope that could be impacted by relatively small amounts of land subsidence. The developed areas located west of Harbor Blvd, particularly the Pierpont community will be impacted by sea level rise. Any subsidence in this area would exacerbate sea level rise effects. For these reasons it is suggested that any amount of inelastic land subsidence in the “coastal area” could potentially result in significant and unreasonable effects and that the sustainable management criteria be designed to prevent land subsidence in this area. Essentially, this means the GSP would seek to maintain groundwater levels in the “coastal area” above historical lows. In theory, the portion of the Basin located east of the “coastal area” could likely withstand some subsidence without significant and unreasonable effects. However, the hydraulics of the basin are such that it is unlikely that groundwater levels below historical low levels could exist east of Harbor Blvd. for an extended period without causing groundwater levels in the “coastal area” to fall below historical low levels. Therefore, it is proposed that the minimum threshold for groundwater levels be the historically observed low level throughout the entire Basin. The proposed measurable objective (i.e., goal) for land subsidence would be groundwater levels during wet periods that prevent drought levels from dropping below the minimum thresholds (Figures 4a-4d). The modeling results suggest that the proposed sustainable management criteria for land subsidence will be attainable without management actions or projects.

3. The chronic groundwater level decline and reduction of groundwater storage sustainability indicators will not be controlling factors for sustainable management. If the Board concurs with the proposed approach for the land subsidence sustainability indicator, it will be the controlling factor on Basin management and further detailed discussion of the groundwater level and storage indicators would not be needed.
4. FCGMA’s progress toward achieving its sustainability goal for the Oxnard Basin will be important to track. MBGSA will need to be prepared to adapt its GSP if FCGMA does not meet its sustainability goal or otherwise dramatically deviates from the plans set forth in its initial GSP.

Recommended Next Steps

Staff recommends presenting the information and recommendations described above during GSP Workshop No 2. It is further recommended that the Board consider stakeholder feedback during its March 18 regular meeting and consider approving the above-described recommendations for write-up in the forthcoming draft GSP.

RECOMMENDED ACTION

Receive a presentation from the GSP Development Team concerning modeling results and implications for sustainable management. Consider providing feedback or direction to staff concerning sustainable management criteria.

BACKGROUND

Staff presented an overview of sustainable management criteria on August 20, 2020. Key assumptions for the future modeling scenarios were discussed with the Board on September 17, 2020.

FISCAL SUMMARY

None.

ATTACHMENTS

A. Figures

Action: _____

Motion: _____ 2nd: _____

J.Chambers: _____ C.Everts: _____ M.Mobley: _____ S.Rungren: _____ G.Shephard: _____

Figure 1a. Historical and Projected Groundwater Levels, Mugu Aquifer at Marina Park

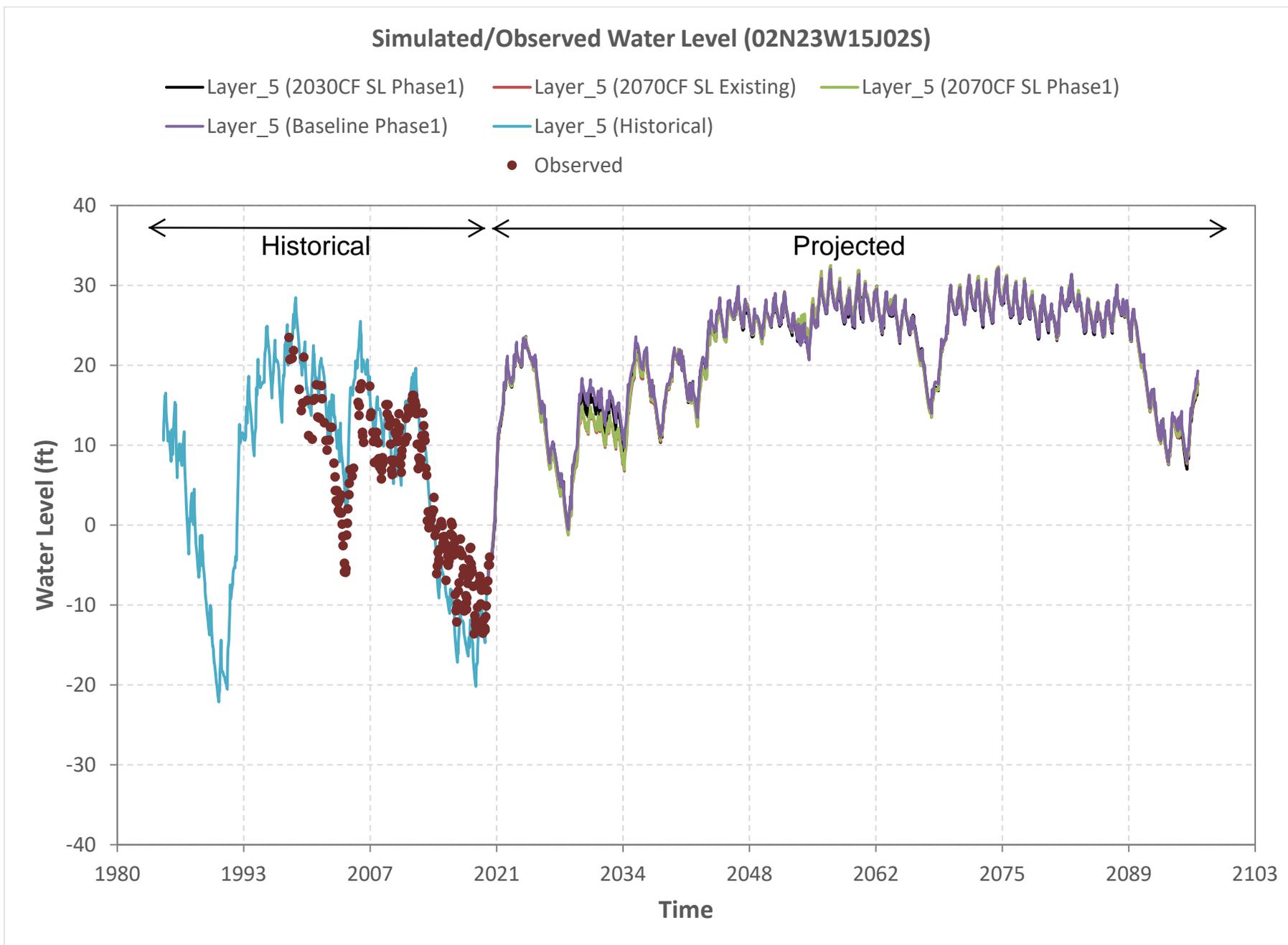


Figure 1b. Historical and Projected Groundwater Levels, Hueneme Aquifer at Marina Park

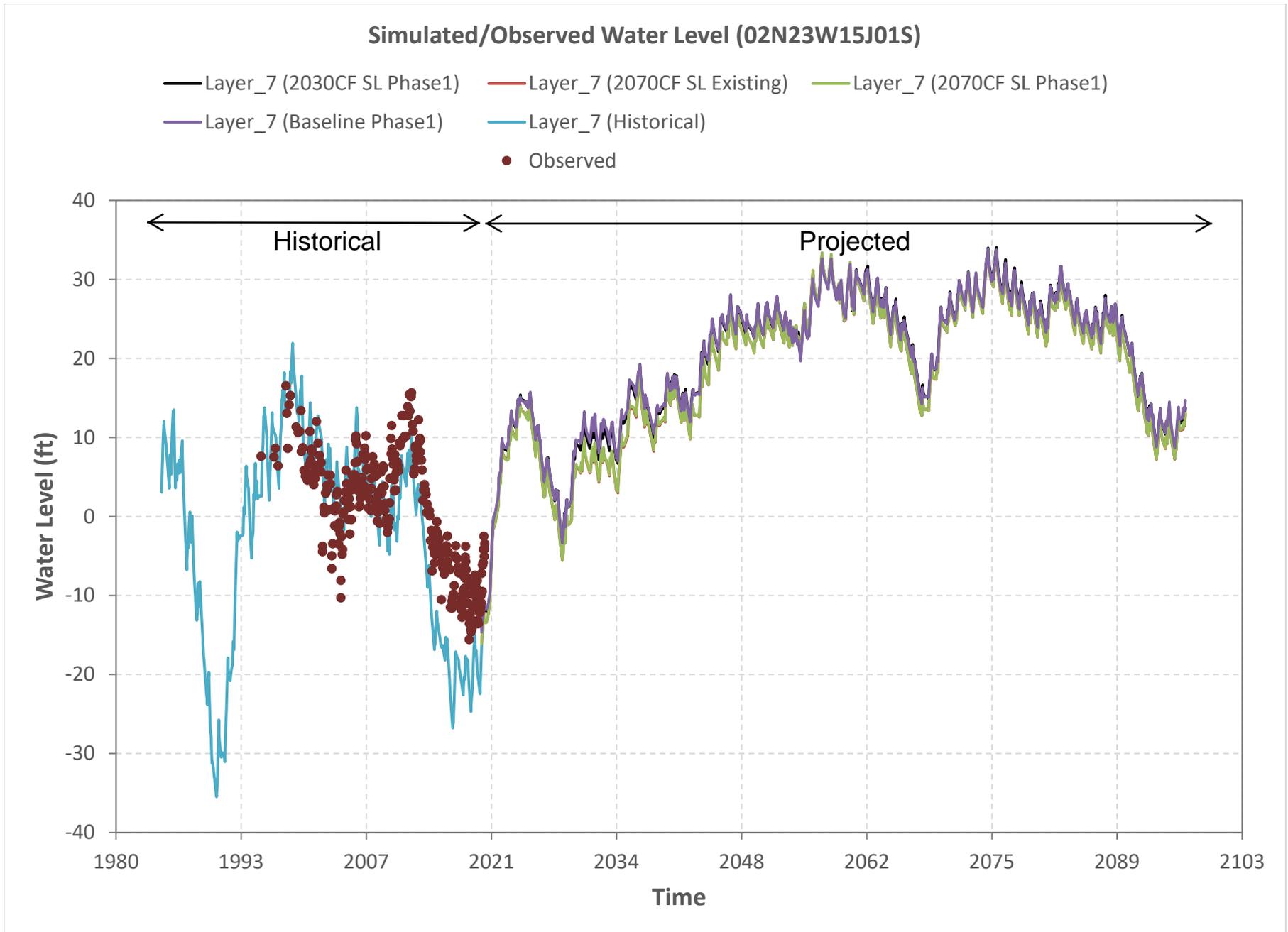


Figure 1c. Historical and Projected Groundwater Levels, Mugu Aquifer at Camino Real Park

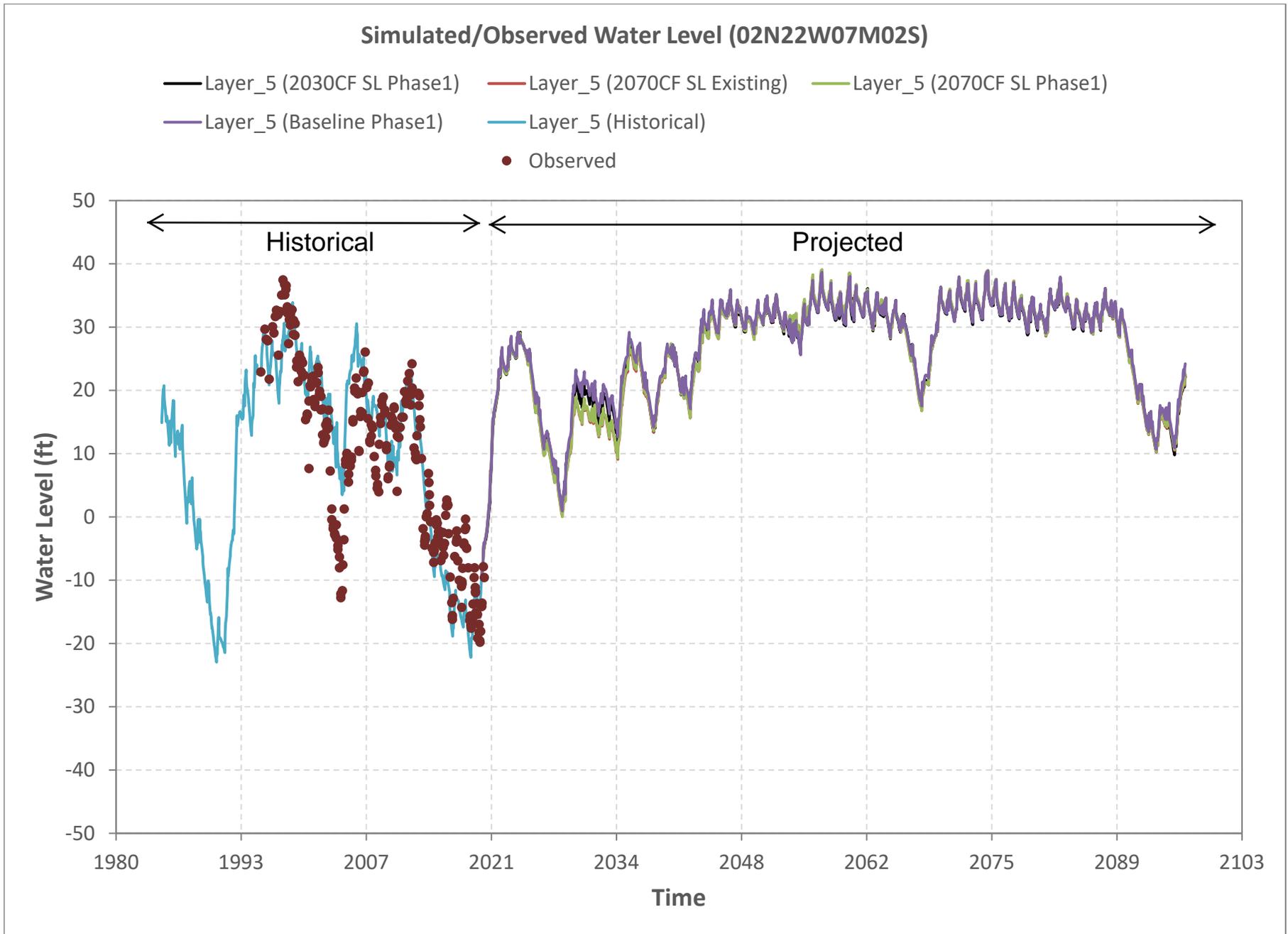
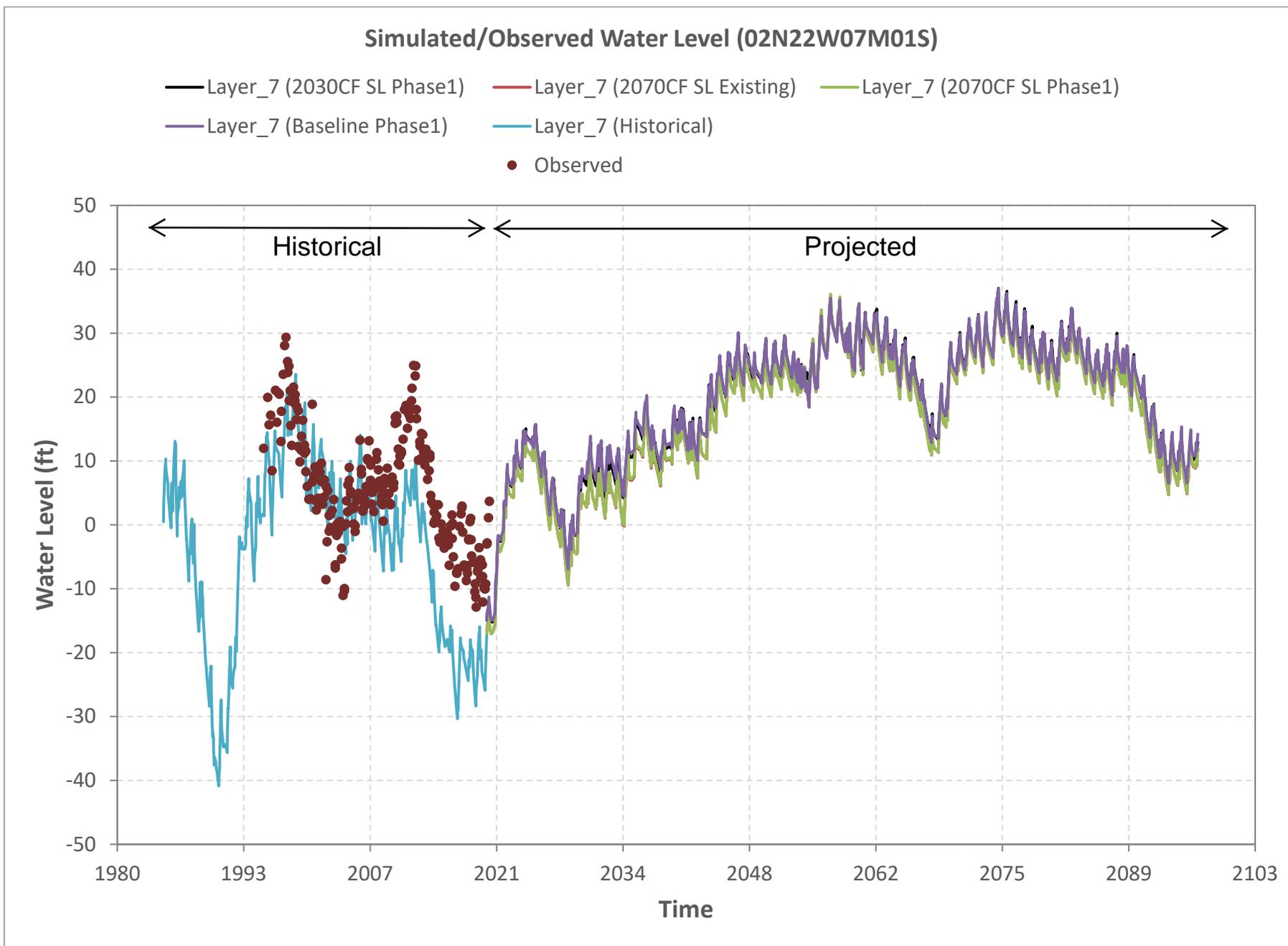


Figure 1d. Historical and Projected Groundwater Levels, Hueneme Aquifer at Camino Real Park



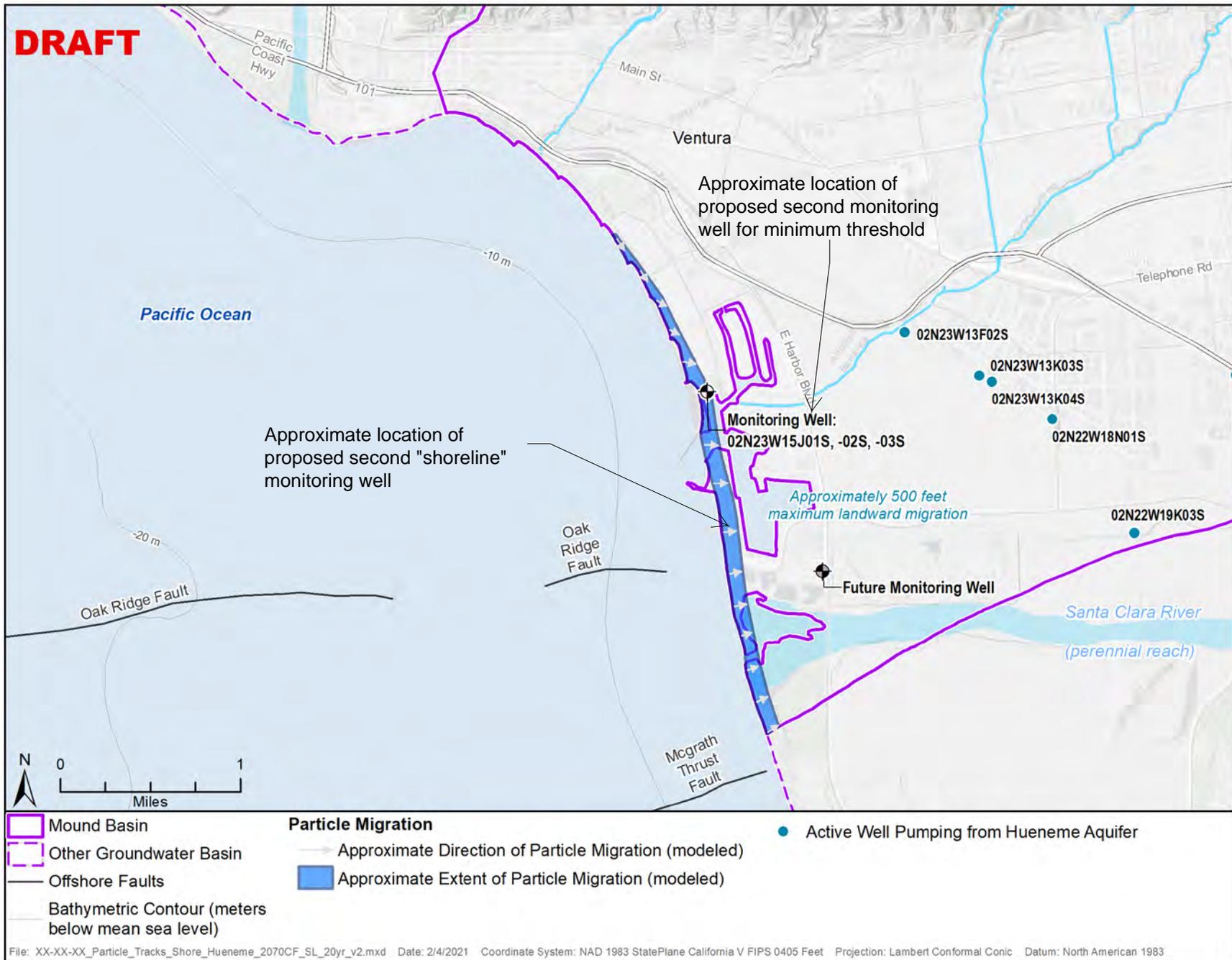


Figure 2a Estimated Landward Movement of Groundwater During 20-Year GSP Implementation Period (with 2070 Climate Change and Sea Level Rise).

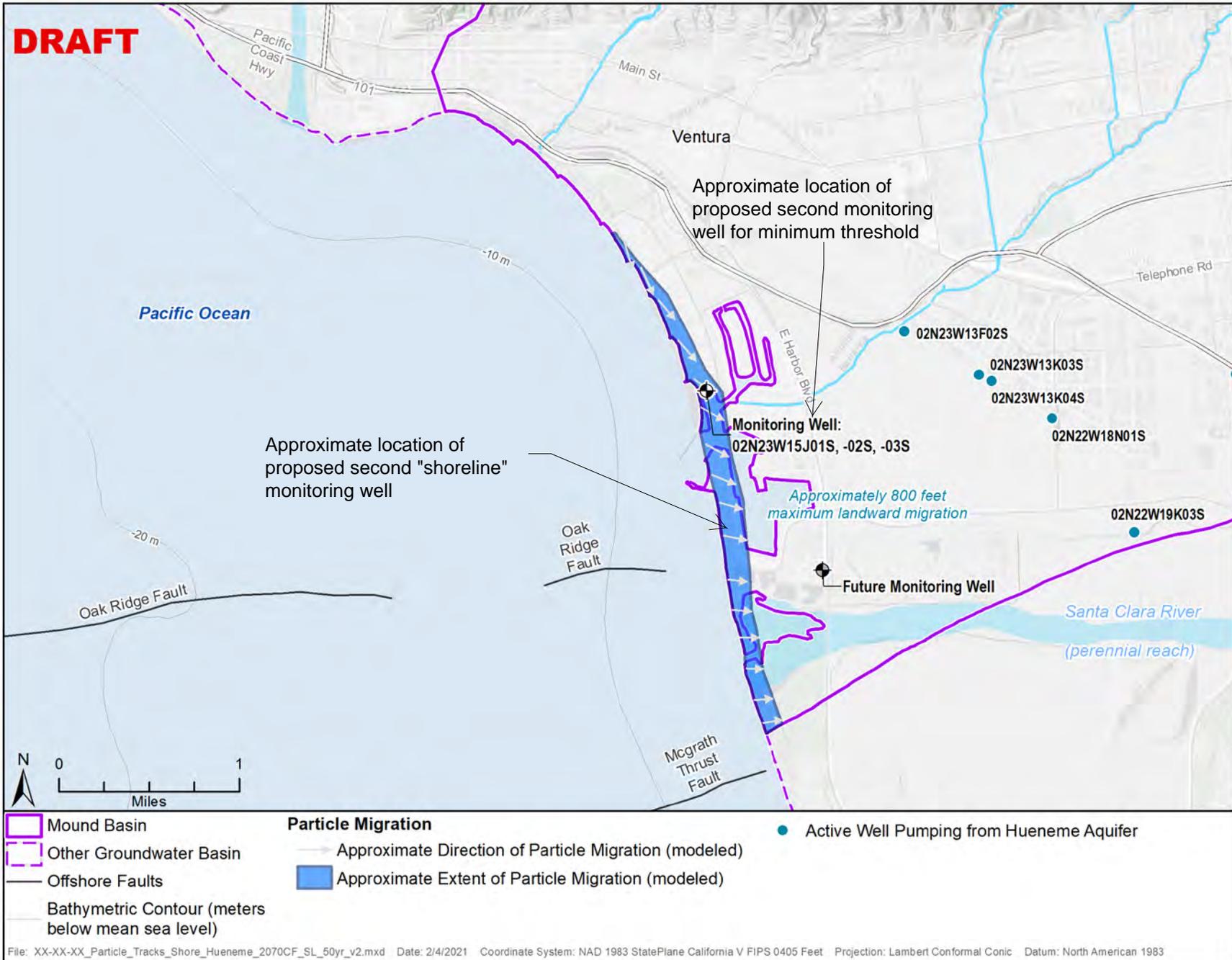


Figure 2b Estimated Landward Movement of Groundwater During 50-Year SGMA Planning Period (with 2070 Climate Change and Sea Level Rise).

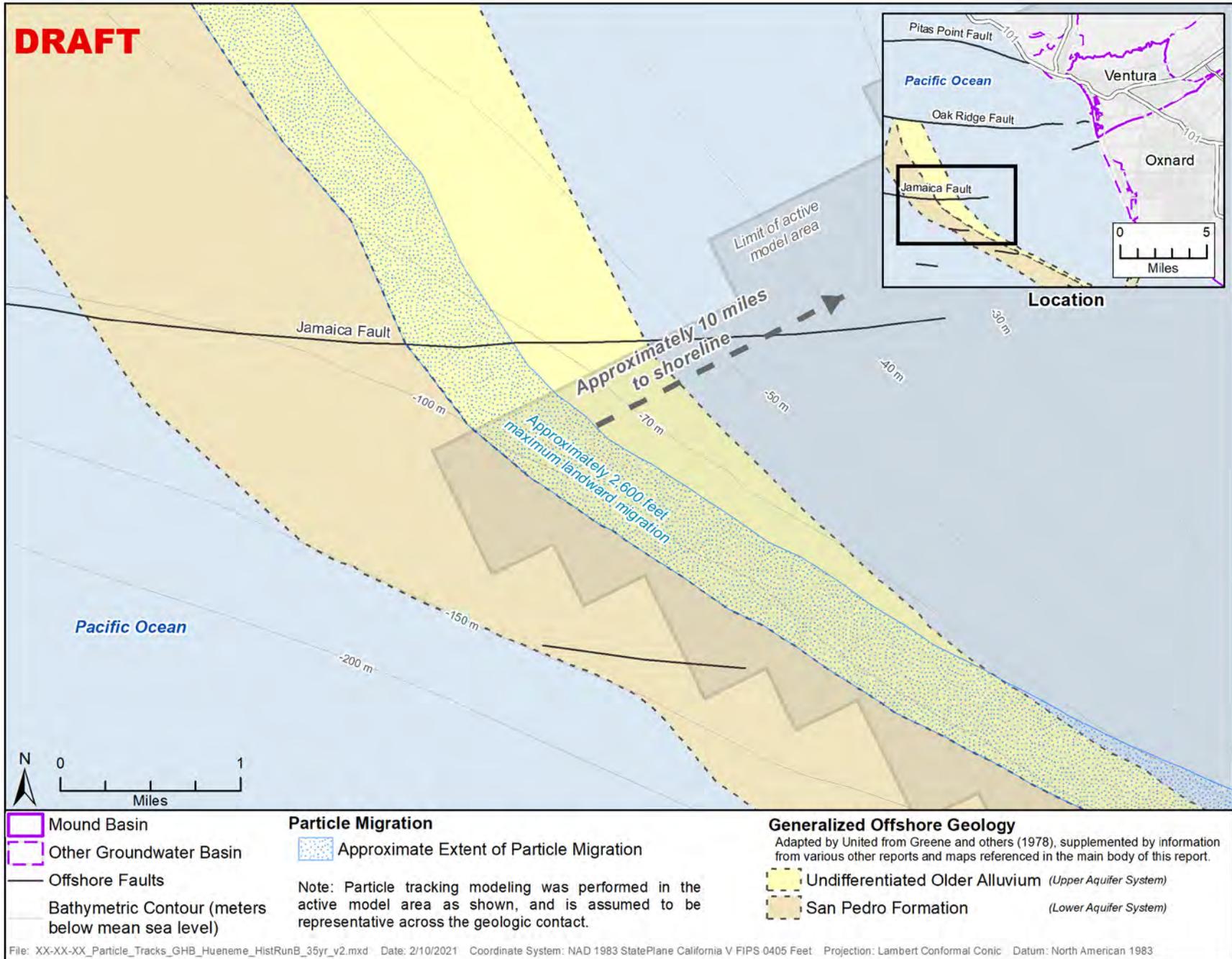


Figure 3 Estimated Historical Extent of Landward Seawater Movement in the Hueneme Aquifer.

Figure 4a. Historical and Projected Groundwater Levels, Mugu Aquifer at Marina Park with Example Measurable Objective and Minimum Threshold

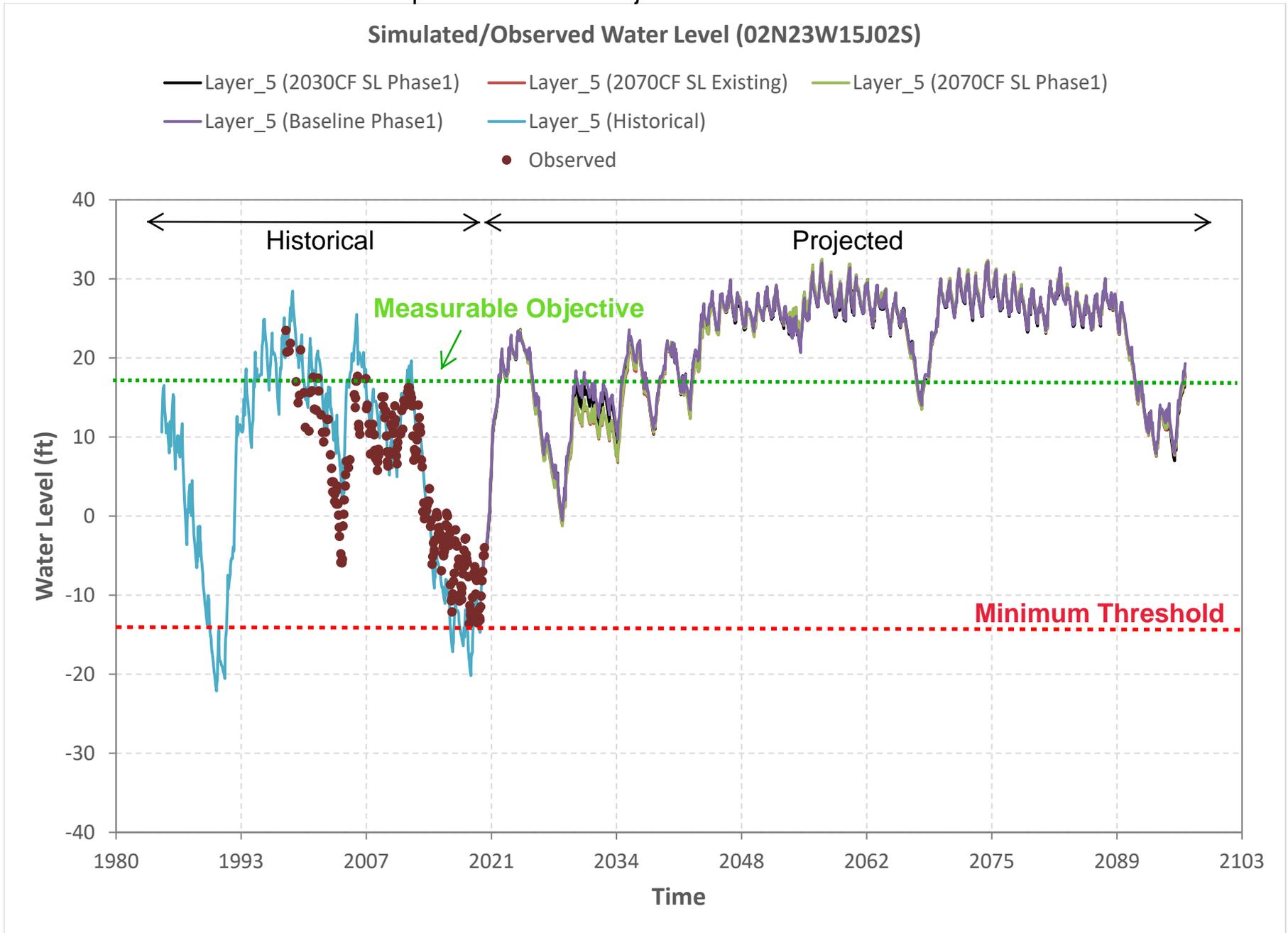


Figure 4b. Historical and Projected Groundwater Levels, Hueneme Aquifer at Marina Park with Example Measurable Objective and Minimum Threshold

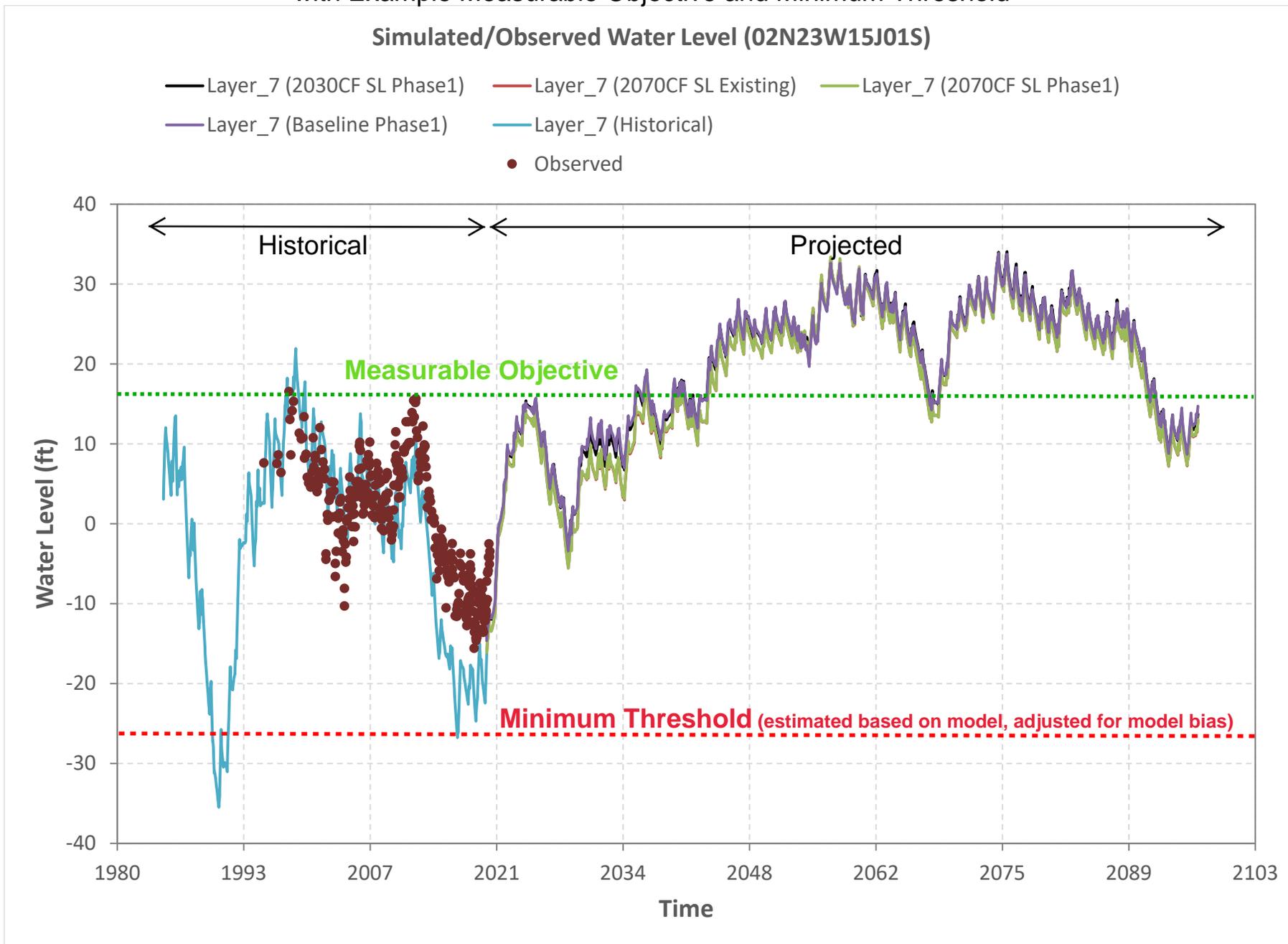


Figure 4c. Historical and Projected Groundwater Levels, Mugu Aquifer at Camino Real Park with Example Measurable Objective and Minimum Threshold

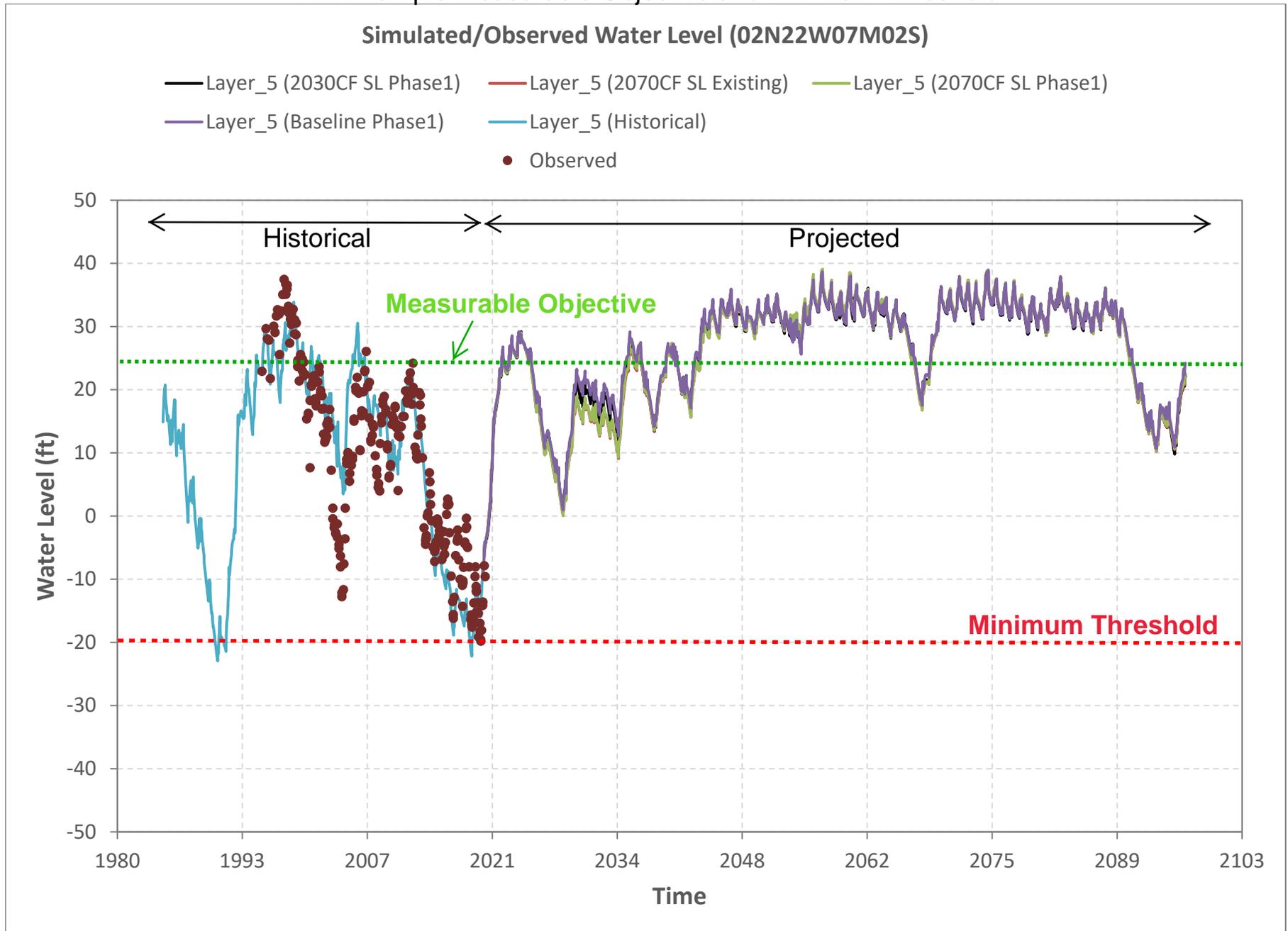
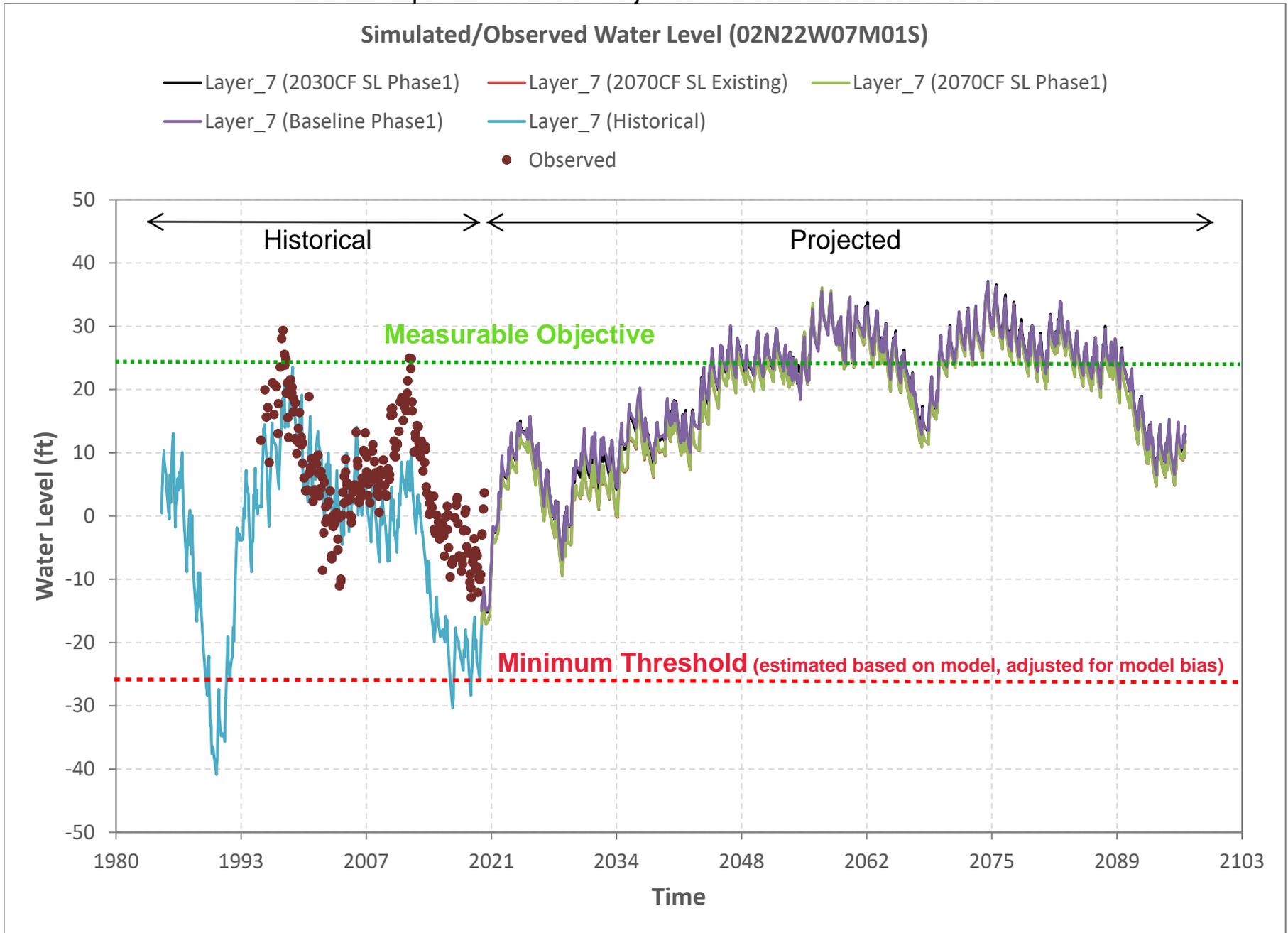


Figure 4d. Historical and Projected Groundwater Levels, Hueneme Aquifer at Camino Real Park with Example Measurable Objective and Minimum Threshold





MoundBasin

GROUNDWATER SUSTAINABILITY AGENCY

ITEM 8D

MBGSA

BOARD MEETING

FEBRUARY 18, 2021



SGMA REQUIREMENTS

- SGMA requires minimum 50-yr future projections of groundwater conditions, including water budget for the basin
- Must use ≥ 50 yrs. of *historical* hydrology
- Must use most recent conditions for baseline estimate of future water demands
- Must evaluate potential effects on water demand due to:
 - Land Use Change
 - Population Change
 - Climate Change

FUTURE CONDITIONS

KEY ASSUMPTIONS

- Discussed with Board on 9/17/2020
- Hydrology
 - 1943 – 2019 (77 yrs.) is proxy for future conditions
 - Wide range of conditions during this period
- Groundwater Pumping
 - Agricultural – per MBAWG
 - Ranges from 2,873 AFY in wet yrs. to 3,548 AFY in dry yrs.
 - City of Ventura planned pumping = 4,000 AFY
 - Two industrial wells – same as recent historical pumping

FUTURE CONDITIONS KEY ASSUMPTIONS (CON'T)

■ Adjacent Basins

- Santa Paula – assume future pumping consistent with recent pumping (adjudicated)
- Oxnard Basin – used FCGMA “Reduction with Projects Scenario from GSP per FCGMA staff recommendation
 - Adjustments made to reduce unrealistically high groundwater levels in Oxnard Basin Forebay (GW levels above land surface)

■ Artificial Recharge (UWCD)

- Existing Freeman Diversion operations + planned expansion project per UWCD staff

SGMA REQUIRED ANALYSIS

■ Land Use Impact

- Assume no material change due to SOAR voter initiatives approved through 2050.
- City has net zero policy for development

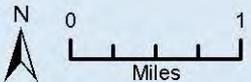
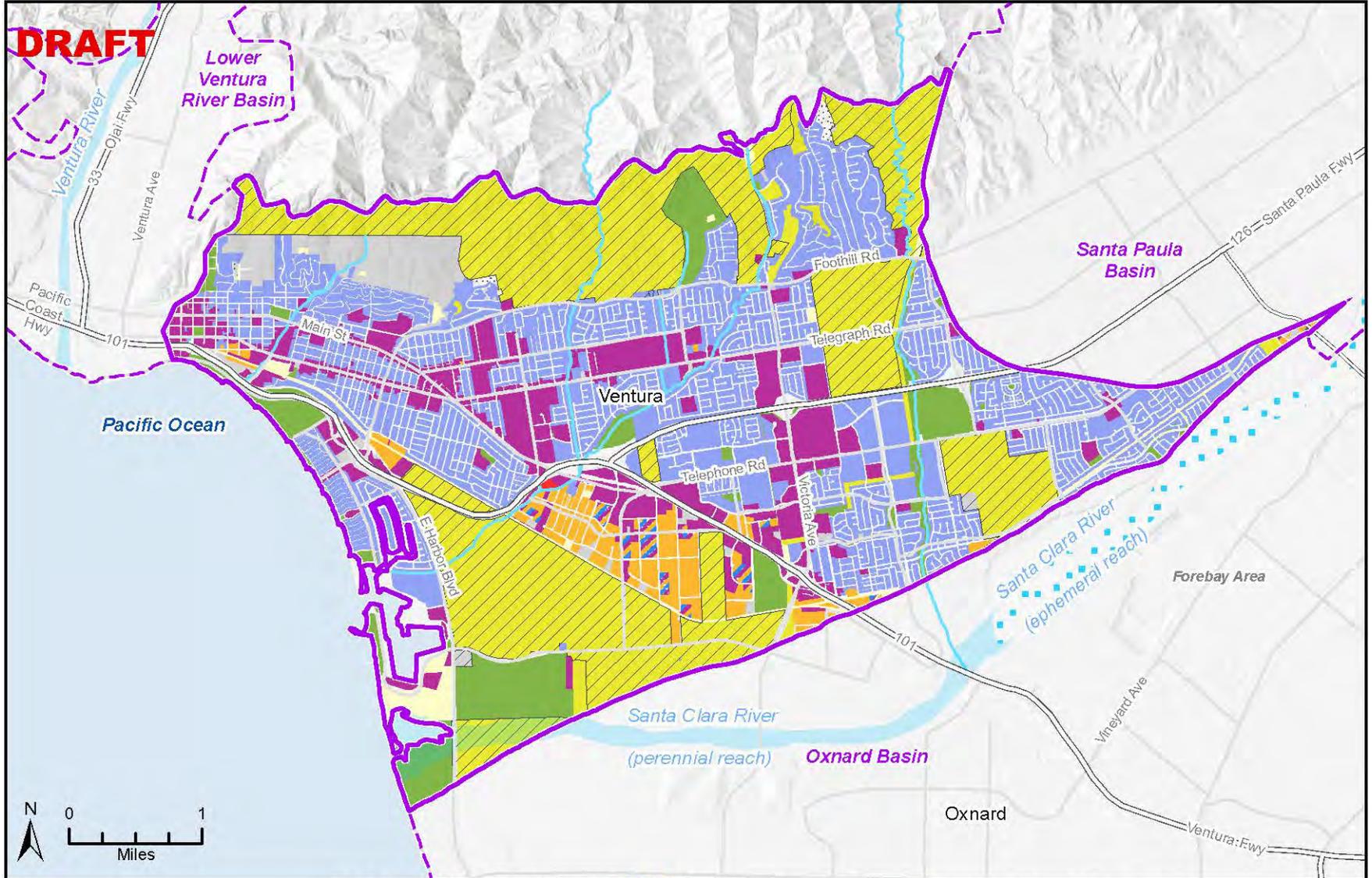
■ Population Change

- Same as above.

■ Climate Change

- Evaluated climate change using DWR change factors for 2030 and 2070 climate change conditions

Mound Basin Land Use and SOAR Boundary



Mound Basin	Residential	Mixed Res/Comm/Ind	Transportation/Utilities
Other Groundwater Basin	Comm/Govt/Office/Education	Agriculture	Vacant or Unknown
SOAR Protected Land	Industrial	Open Space/Parks & Rec	Protected/Undevelopable
		Military	

MODEL SCENARIOS

- Historical: 1985-2019 (calibration/verification model)
- Baseline: This simulation employs the future assumptions described above.
- 2030 Climate Change: Baseline inputs modified using DWR 2030 “climate change factors”
- 2070 Climate Change: Baseline inputs modified using DWR 2070 “climate change factors”
- 2070 Climate Change without Freeman Diversion Expansion Project: Same as “2070 Climate Change” scenario, but w/o expansion project.
- Particle tracking to evaluate seawater intrusion risk

KEY RESULTS

GROUNDWATER LEVELS

- 1. Future groundwater levels are predicted to be higher than historical levels due to anticipated increases in Oxnard Basin groundwater levels.**
- 2. The impact of climate change on groundwater levels is typically less than approximately 5 ft.**
- 3. The impact of the Freeman Diversion expansion project is almost undetectable.**

Figure 1a. Historical and Projected Groundwater Levels, Mugu Aquifer at Marina Park

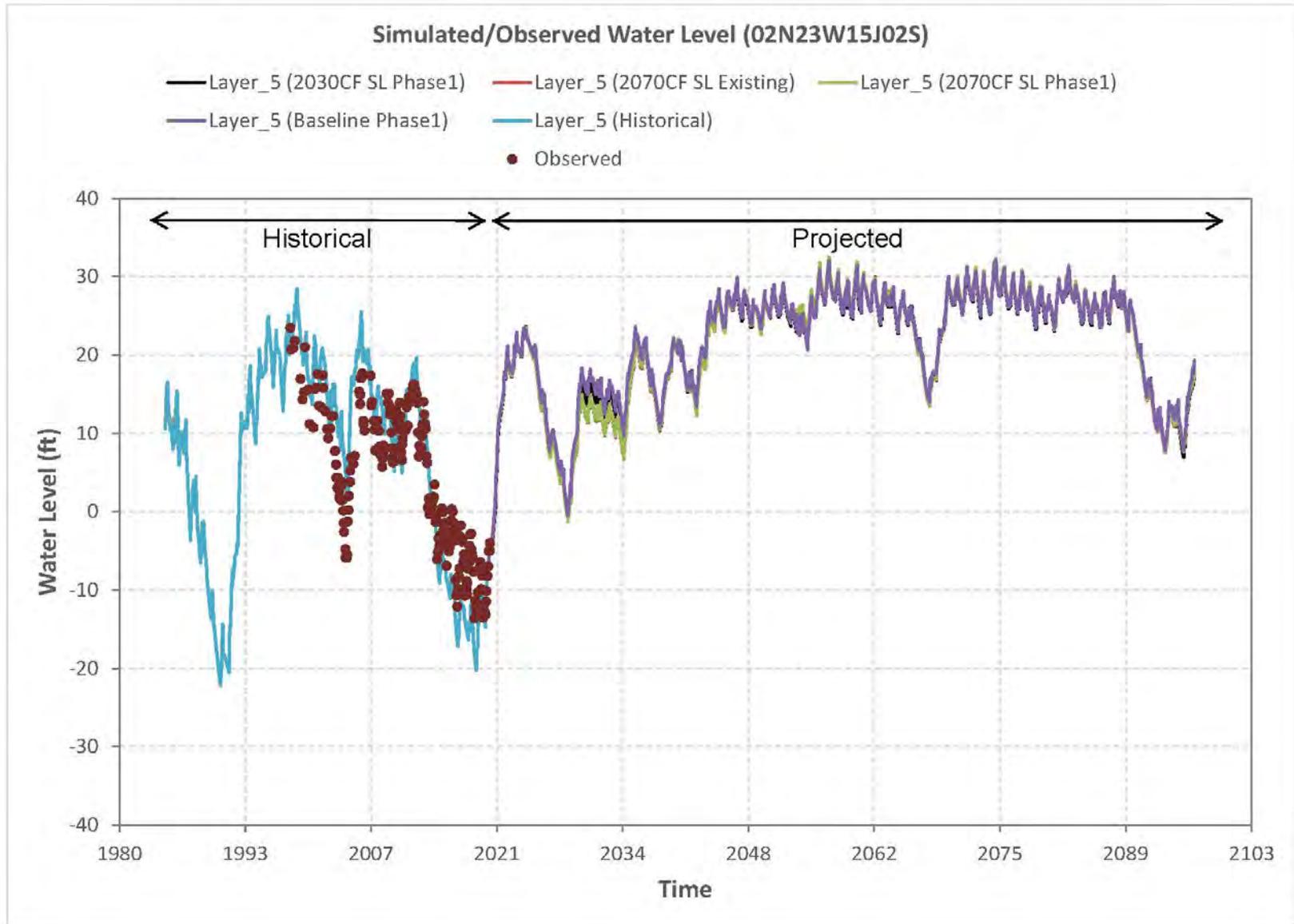


Figure 1b. Historical and Projected Groundwater Levels, Hueneme Aquifer at Marina Park

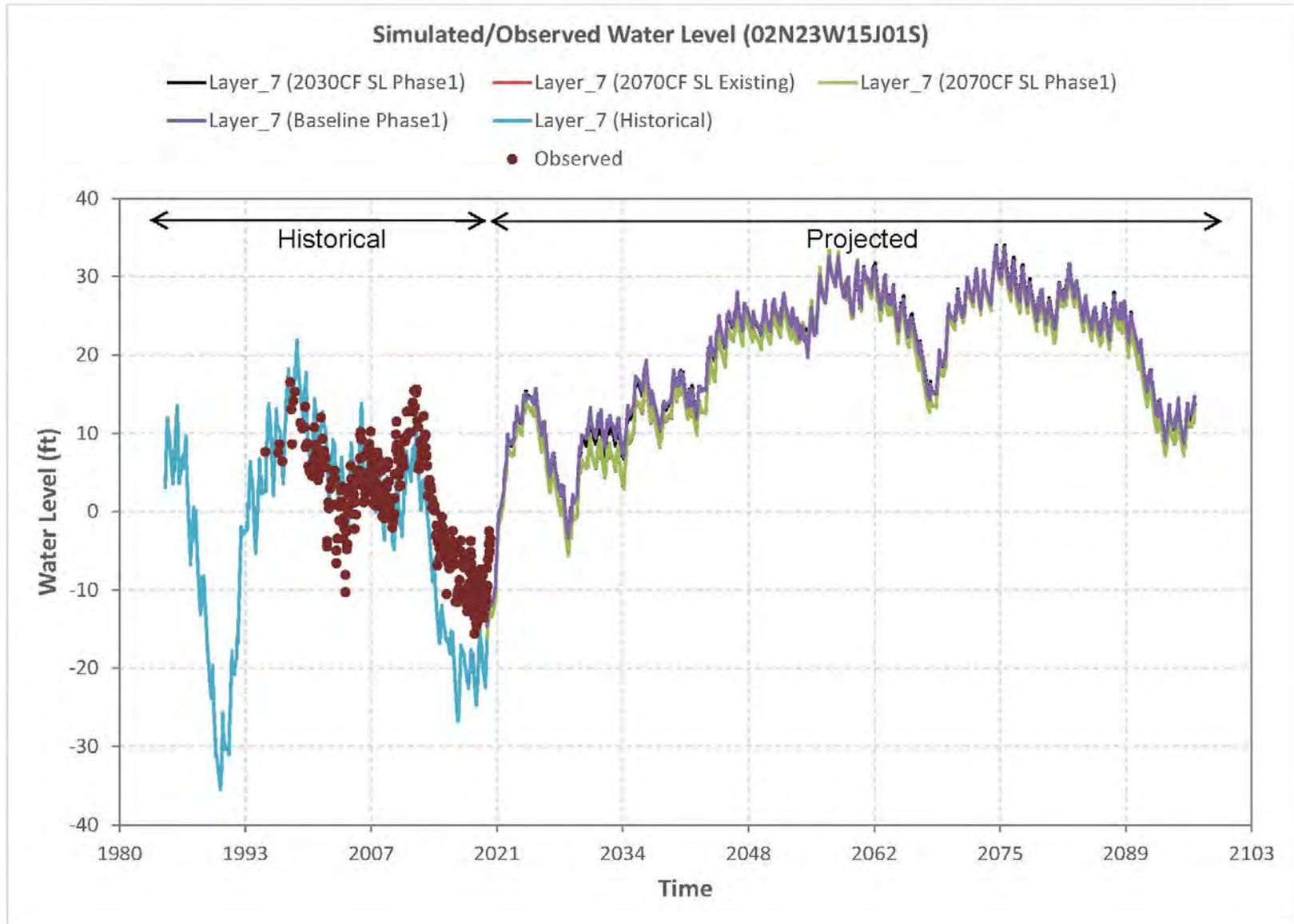
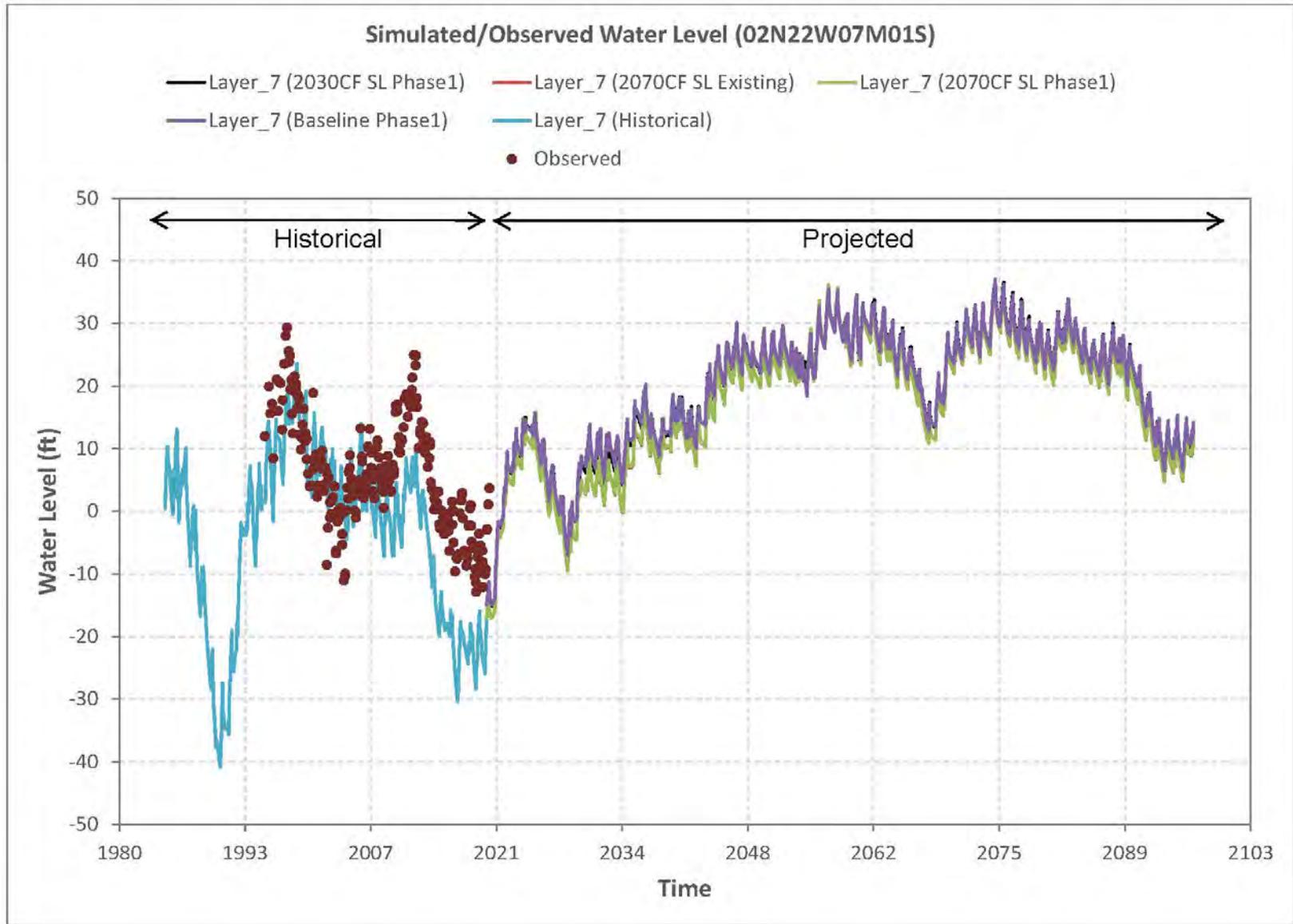


Figure 1d. Historical and Projected Groundwater Levels, **Hueneme Aquifer** at Camino Real Park



SEAWATER INTRUSION RISK EVALUATION

- Aquifers are exposed to seawater at subcrop approximately 10.5 miles offshore.
- Between subcrop and shoreline, aquifers are believed to be protected from seawater by thick sequence of fine-grained deposits (aquitard)
- Historical movement of seawater from subcrop toward shoreline was estimated using historical model using particle tracking
 - No landward movement of seawater in Mugu Aquifer
 - Approximately 0.5 miles of average landward movement in Hueneme Aquifer over last century*

**Migration rates in the most permeable zones of the aquifer would be considerably (many times) higher.*

DRAFT

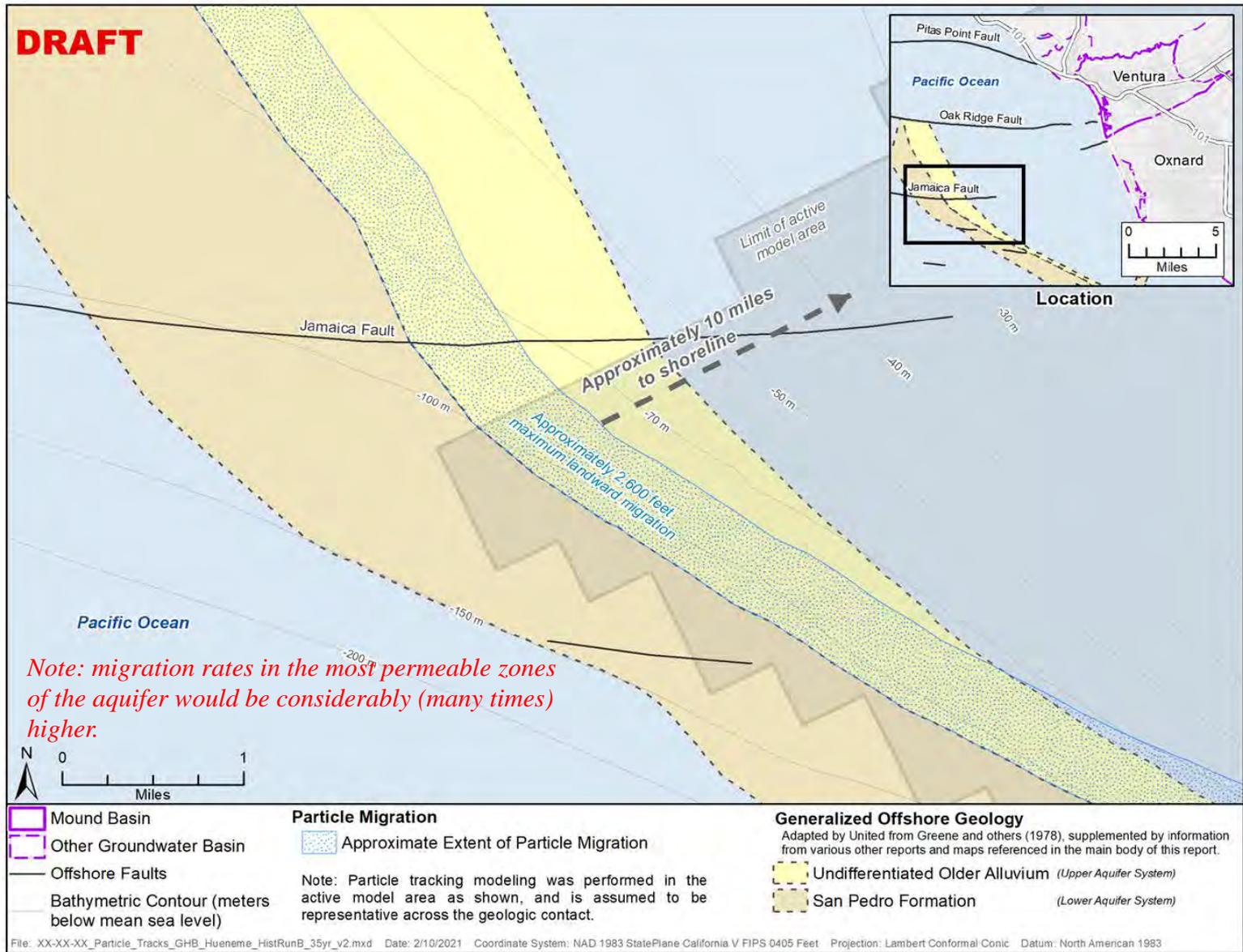


Figure 3 Estimated Historical Extent of Landward Seawater Movement in the Hueneme Aquifer.

SEAWATER INTRUSION RISK EVALUATION (CON'T)

- **Conclusions:**
 - Seawater is not migrating landward in Mugu Aquifer
 - Timeframe for seawater to migrate from current estimated location in Hueneme Aquifer to shore is longer than SGMA planning horizon
- However, if a short circuit pathway for seawater migration into aquifers exists nearshore (possible along faults or “stratigraphic windows”), onshore flow of seawater could occur much sooner.

SEAWATER INTRUSION RISK EVALUATION (CON'T)

- Particle tracking of groundwater flow directions and flow rates along the shoreline was performed to evaluate risk of onshore migration via a near shore short-circuit pathway.

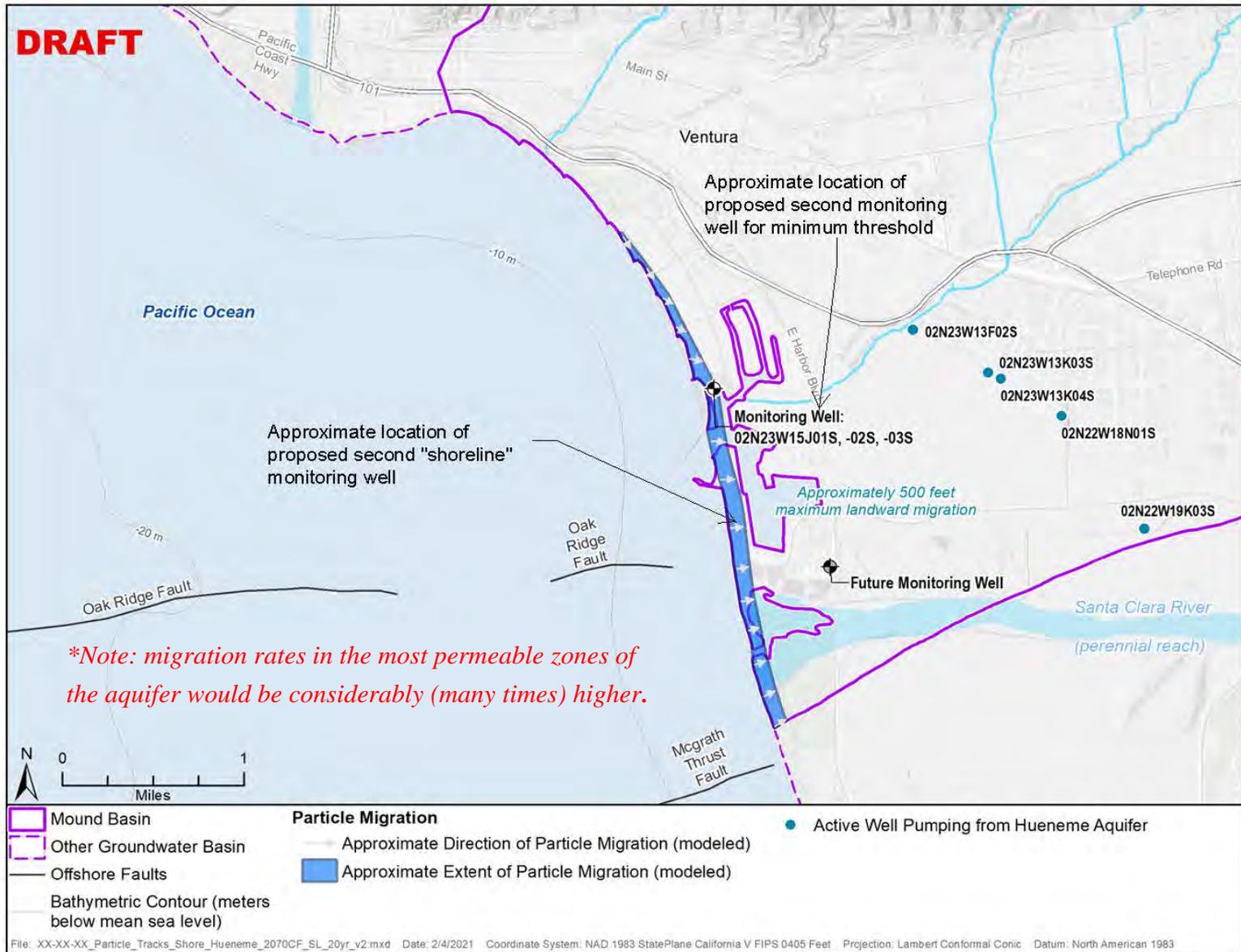


Figure 2a Estimated Landward Movement of Groundwater During 20-Year GSP Implementation Period (with 2070 Climate Change and Sea Level Rise).

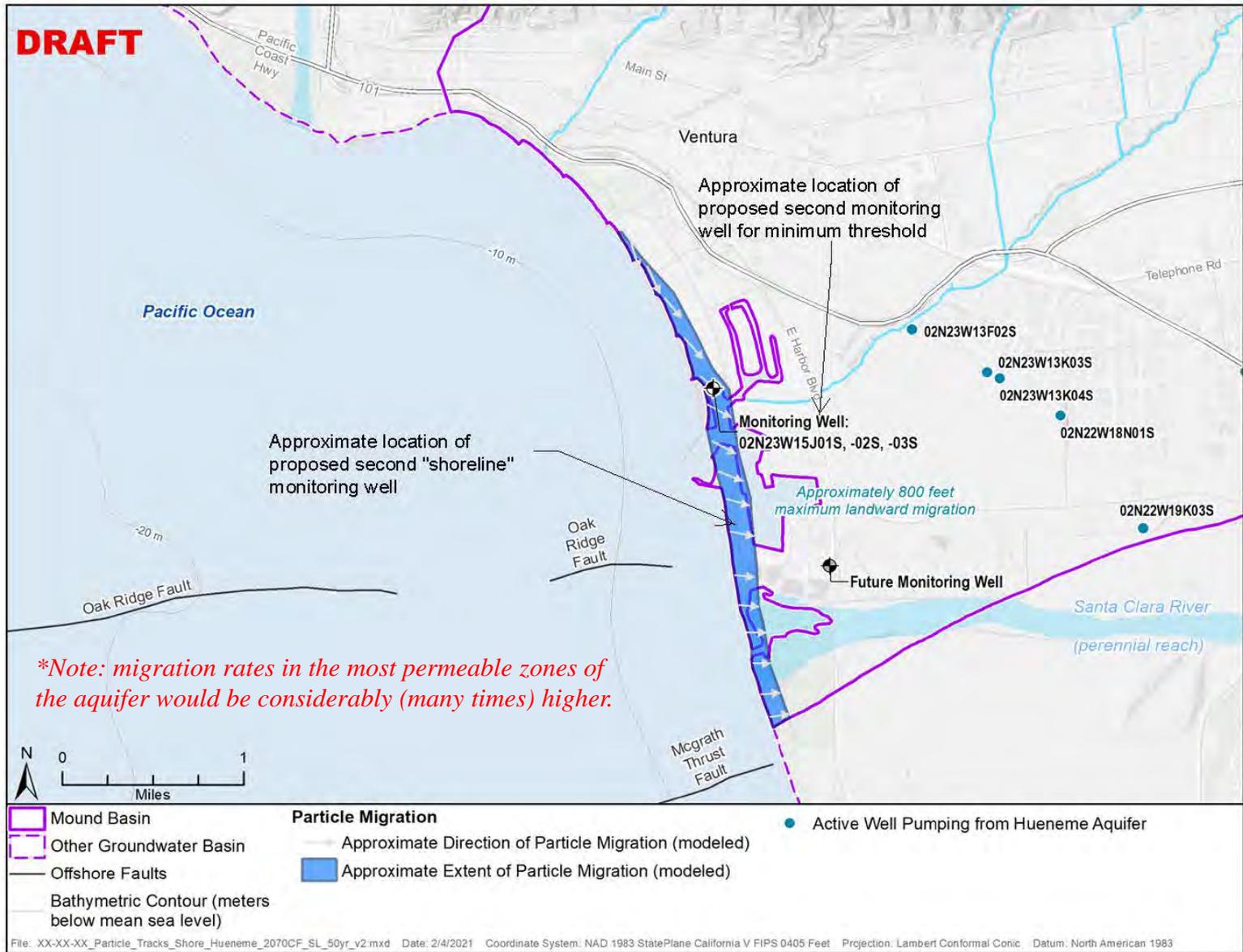


Figure 2b Estimated Landward Movement of Groundwater During 50-Year SGMA Planning Period (with 2070 Climate Change and Sea Level Rise).

KEY RESULTS OF SHORELINE FLOW EVALUATION

1. Particle tracking results suggest that groundwater will flow offshore in the Mugu Aquifer.
2. Particle tracking results suggest that groundwater will flow onshore in the Hueneme Aquifer at an average rate of approximately 1/8 of a mile per 20 years.
 - Note: Migration rates in the most permeable zones of the aquifer could be considerably (many times) higher.

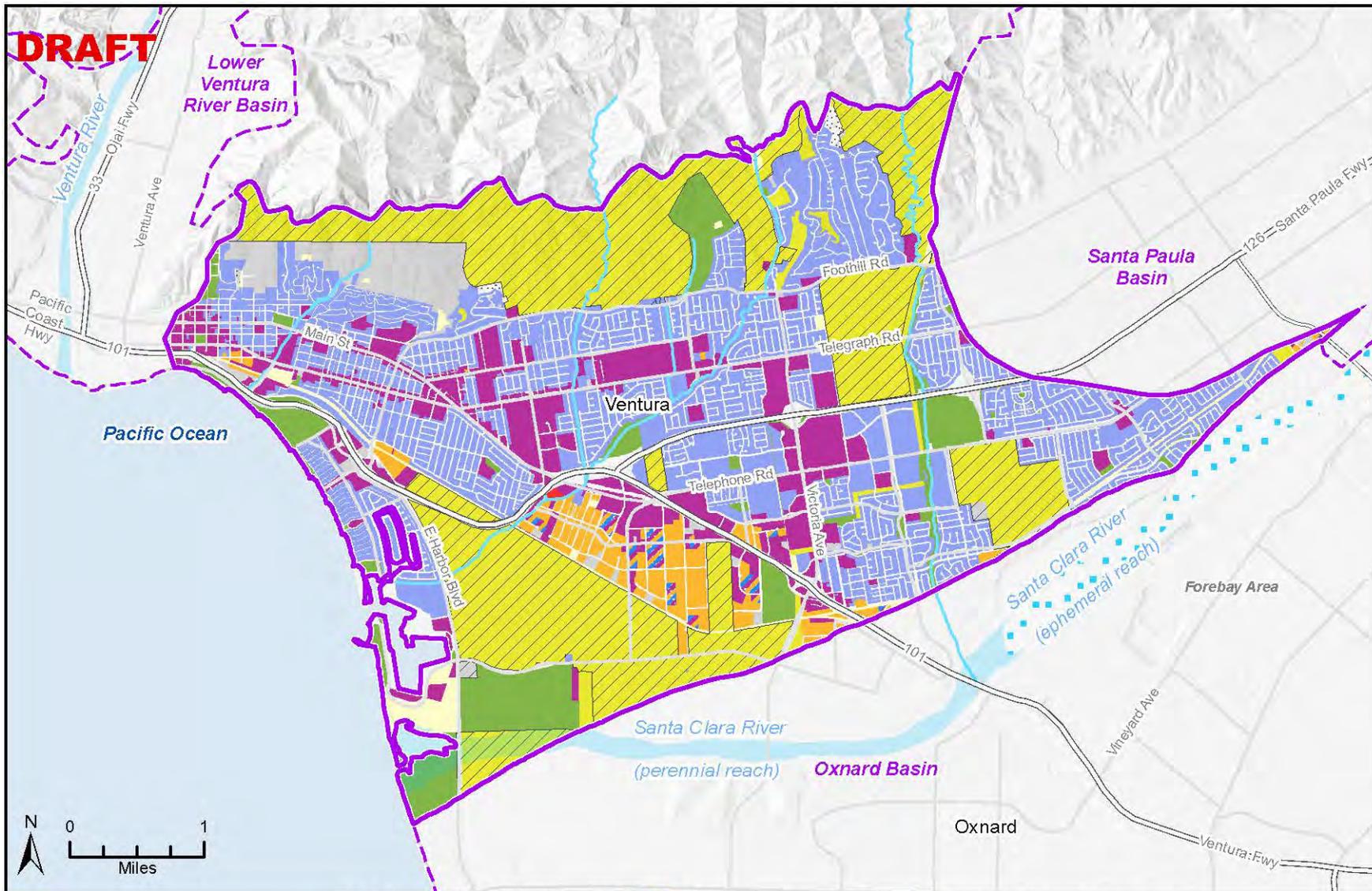
SUSTAINABLE MANAGEMENT IMPLICATION #1

- Seawater intrusion is not anticipated to be an issue for the Mound Basin during the 50-year SGMA planning horizon; however, a monitoring and contingency plan is warranted to address potential short-circuit pathways for seawater.

PROPOSED SEAWATER INTRUSION SMC

- **Undesirable Result: Seawater intrusion east of Harbor Blvd.**
 - No current or anticipated future beneficial uses of groundwater west of Harbor Blvd.
 - Protect existing beneficial uses east of Harbor Blvd.
- **Minimum Threshold:**
 - Seawater in monitoring wells near Harbor Blvd.
- **Measurable Objective:**
 - No indication of seawater in monitoring wells near Harbor Blvd.

Mound Basin Land Use and SOAR Boundary



SEAWATER INTRUSION MONITORING RECOMMENDATIONS

- **Construct one additional “shoreline monitoring well”**
 - **Shoreline monitoring wells provide early detection of seawater and provide time for GSA to implement contingency measures before seawater reaches Harbor Blvd.**
- **Construct one additional monitoring well along Harbor Blvd. for SMC monitoring**
- **Estimate cost ~\$500,000 each**
 - **Pursue SGMA implementation grant**

Proposed Monitoring Wells for Seawater Intrusion

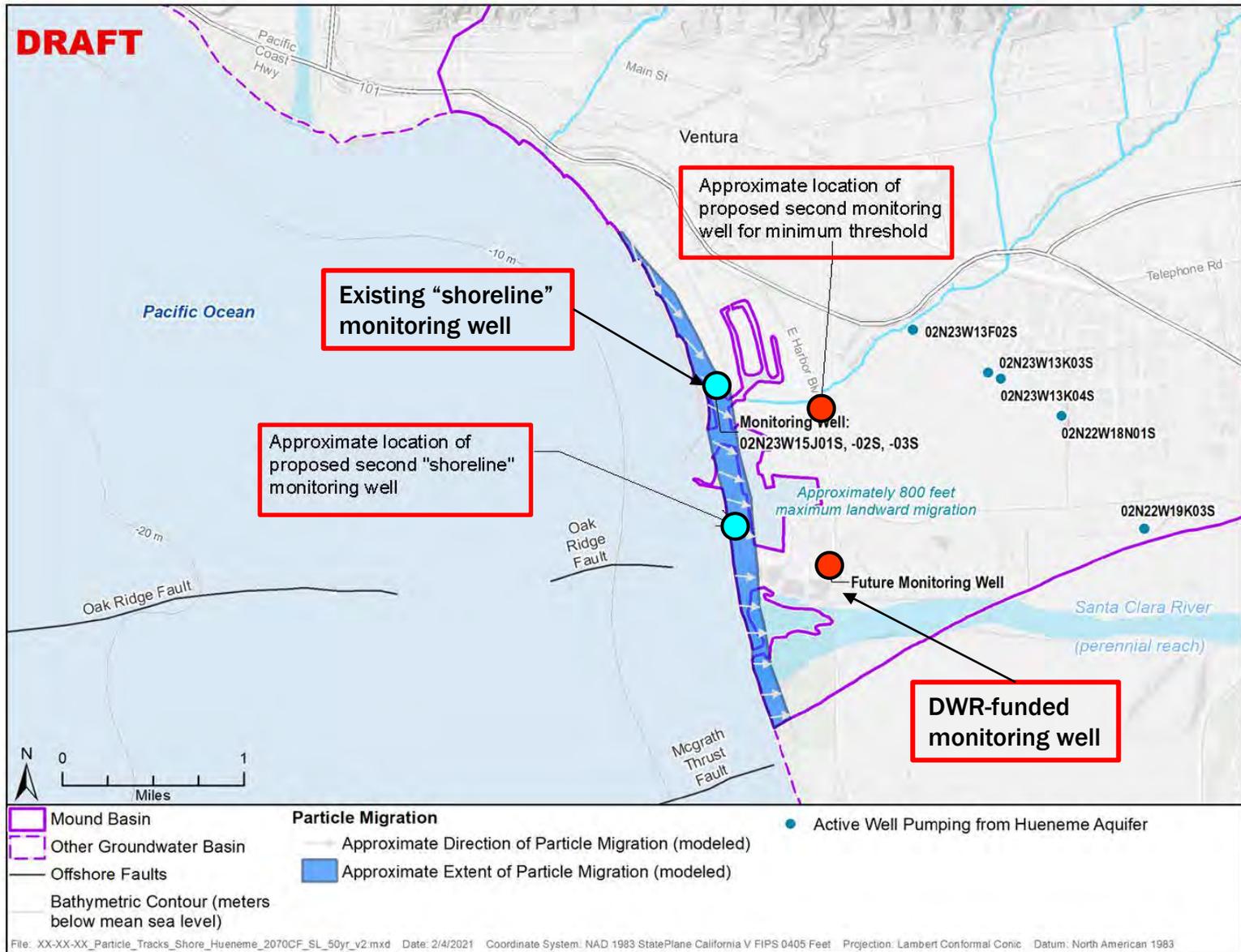


Figure 2b Estimated Landward Movement of Groundwater During 50-Year SGMA Planning Period (with 2070 Climate Change and Sea Level Rise).

SUSTAINABLE MANAGEMENT IMPLICATION #2

- Subsidence is not anticipated because modeling results suggest that future groundwater levels will remain above historical low levels.
- Therefore, inelastic land subsidence is not anticipated to be an issue for the Mound Basin during the 50-year SGMA planning horizon.

PROPOSED SUBSIDENCE SMC

- **Undesirable Result: Measurable inelastic subsidence due to groundwater pumping west of Harbor Blvd.**
 - “Coastal Area” west of Harbor Blvd. is susceptible to land subsidence
 - City sewer main running along Harbor Blvd has low slope
 - Sea level rise impacts to Coastal Area predicted – subsidence would exacerbate sea level rise impacts
- **Minimum Threshold:**
 - Groundwater levels below historical low levels as a proxy for potential onset of subsidence
 - Note: areas east of Harbor Blvd. are less susceptible to effects of subsidence, but it is unlikely that groundwater levels could be sustained below historical lows east of Harbor Blvd. without causing groundwater levels to drop below historical lows in Coastal Area
- **Measurable Objective:**
 - GW levels during wet periods sufficient to prevent dropping below historical lows during droughts

Figure 4a. Historical and Projected Groundwater Levels, Mugu Aquifer at Marina Park with Example Measurable Objective and Minimum Threshold

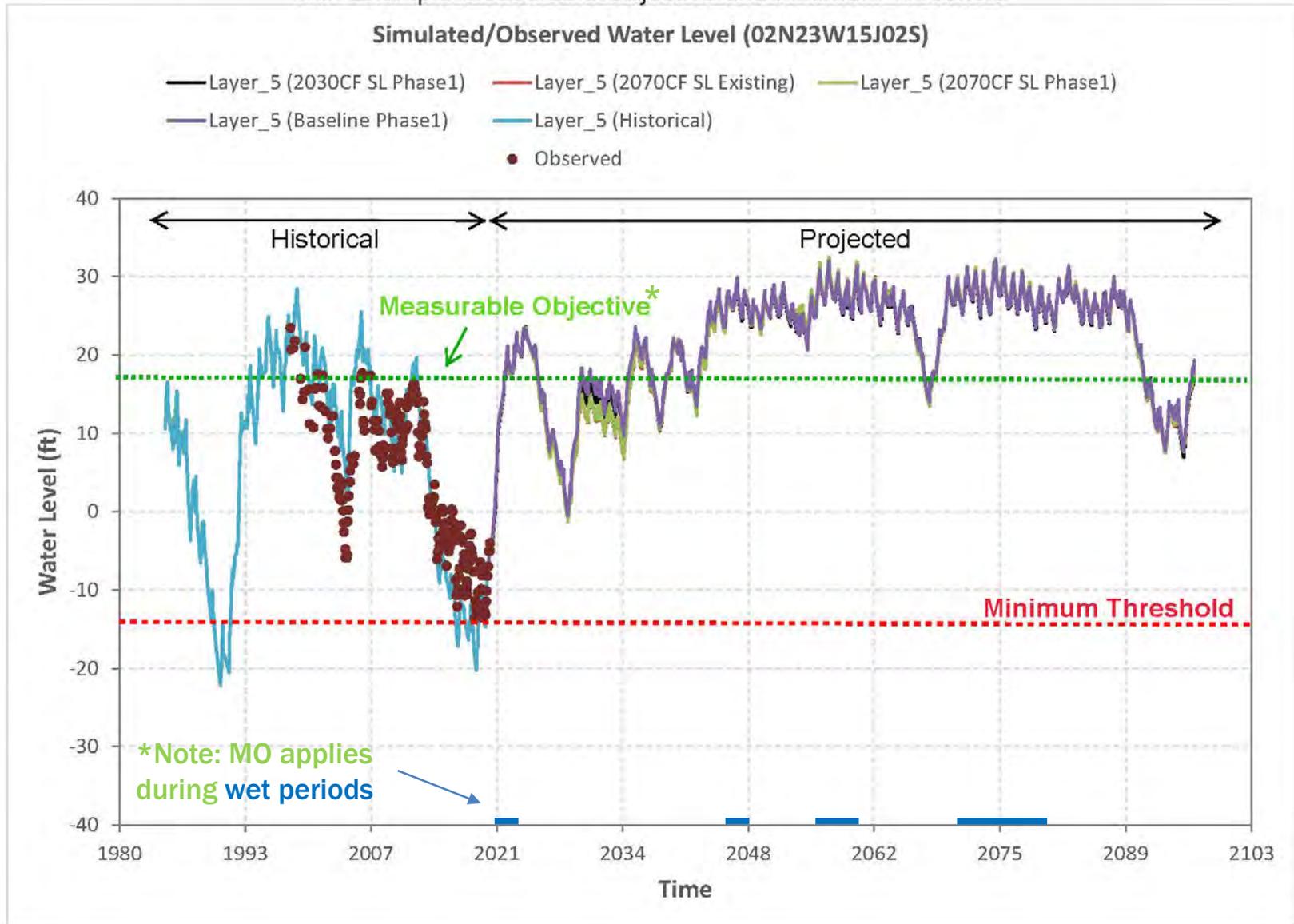


Figure 4c. Historical and Projected Groundwater Levels, Mugu Aquifer at Camino Real Park with Example Measurable Objective and Minimum Threshold

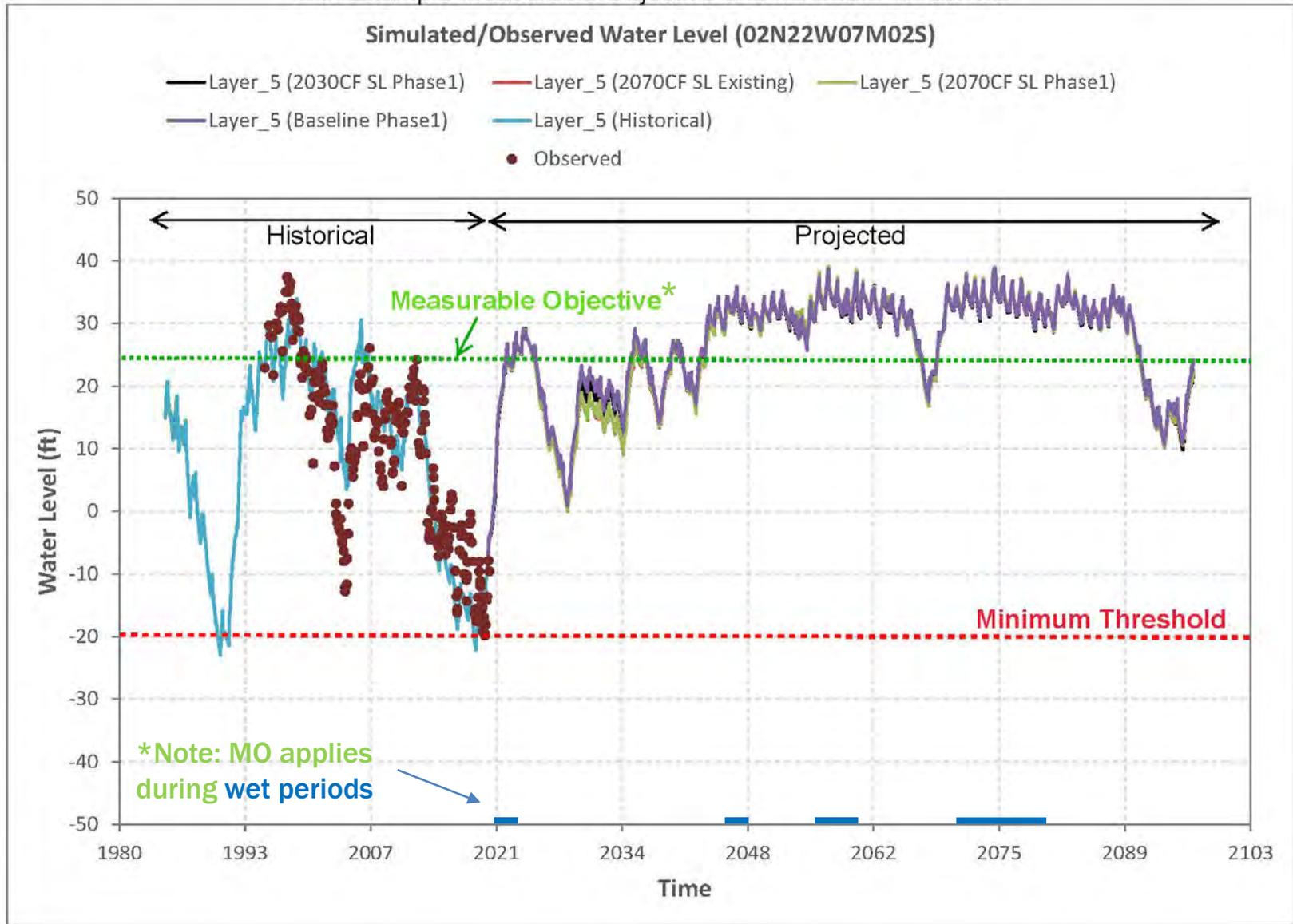


Figure 4b. Historical and Projected Groundwater Levels, Hueneme Aquifer at Marina Park with Example Measurable Objective and Minimum Threshold

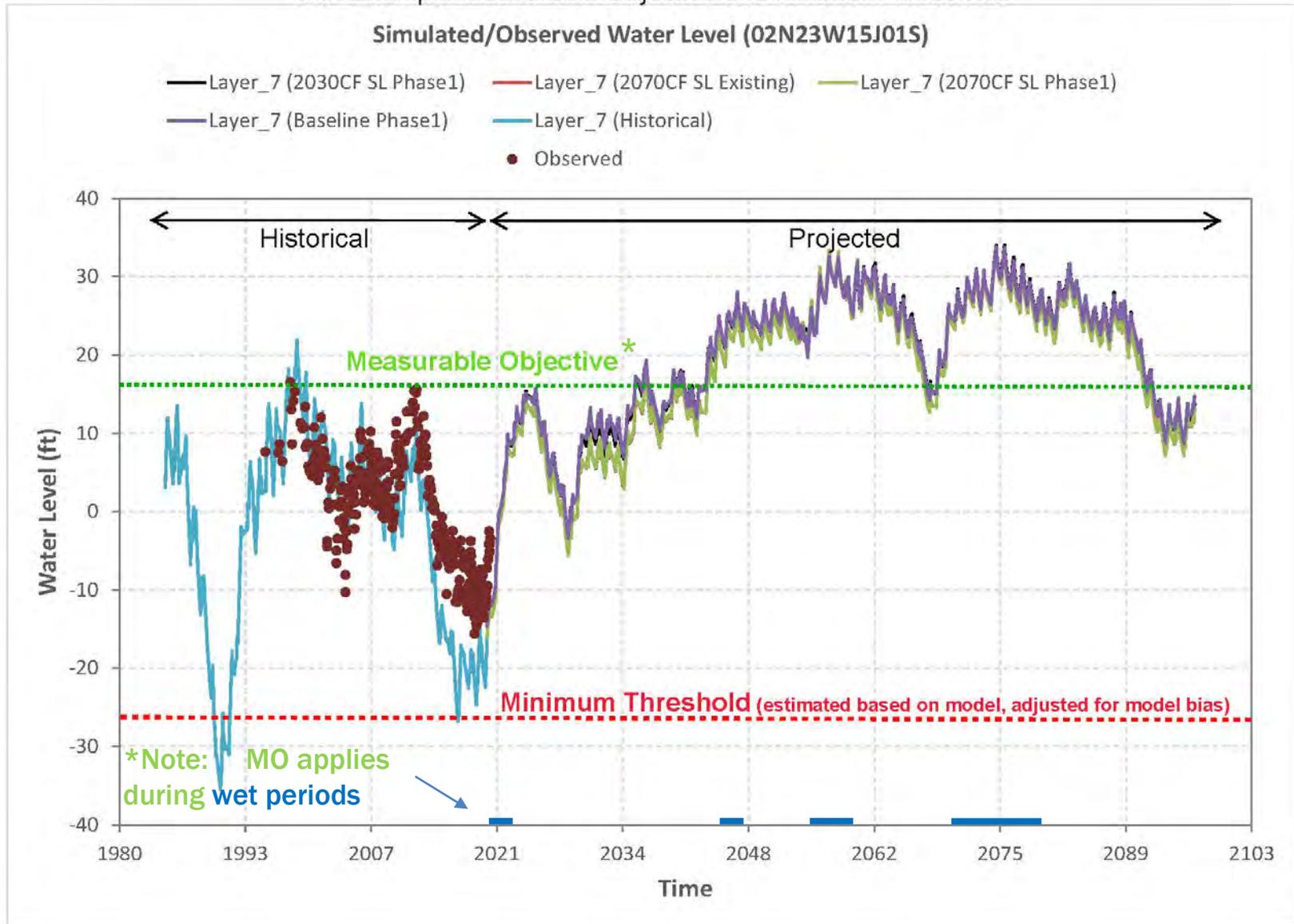
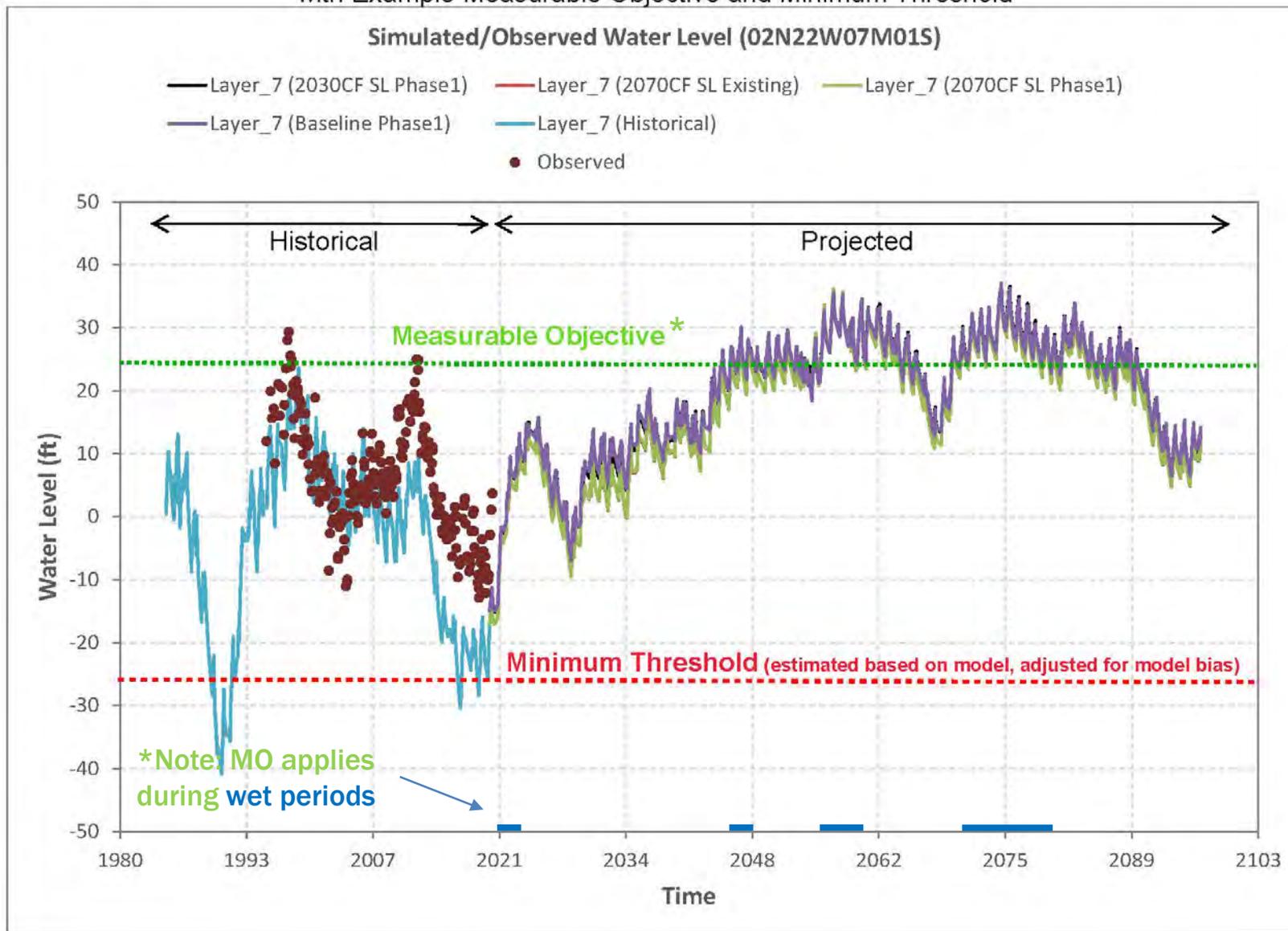


Figure 4d. Historical and Projected Groundwater Levels, **Hueneme Aquifer** at Camino Real Park with Example Measurable Objective and Minimum Threshold



OTHER SUSTAINABLE MANAGEMENT IMPLICATIONS

- The chronic groundwater level decline and reduction of groundwater storage sustainability indicators will not be controlling factors for sustainable management.
- FCGMA's progress toward achieving its sustainability goal for the Oxnard Basin will be important to track. MBGSA will need to be prepared to adapt its GSP if FCGMA does not meet its sustainability goal or otherwise dramatically deviates from the plans set forth in its initial GSP.

PROPOSED NEXT STEPS

- Board feedback today
- Present at upcoming GSP workshop on March 4
- Review and approve for draft SMC for inclusion in draft GSP at March 18 regular Board meeting



MoundBasin

GROUNDWATER SUSTAINABILITY AGENCY

QUESTIONS & DISCUSSION

