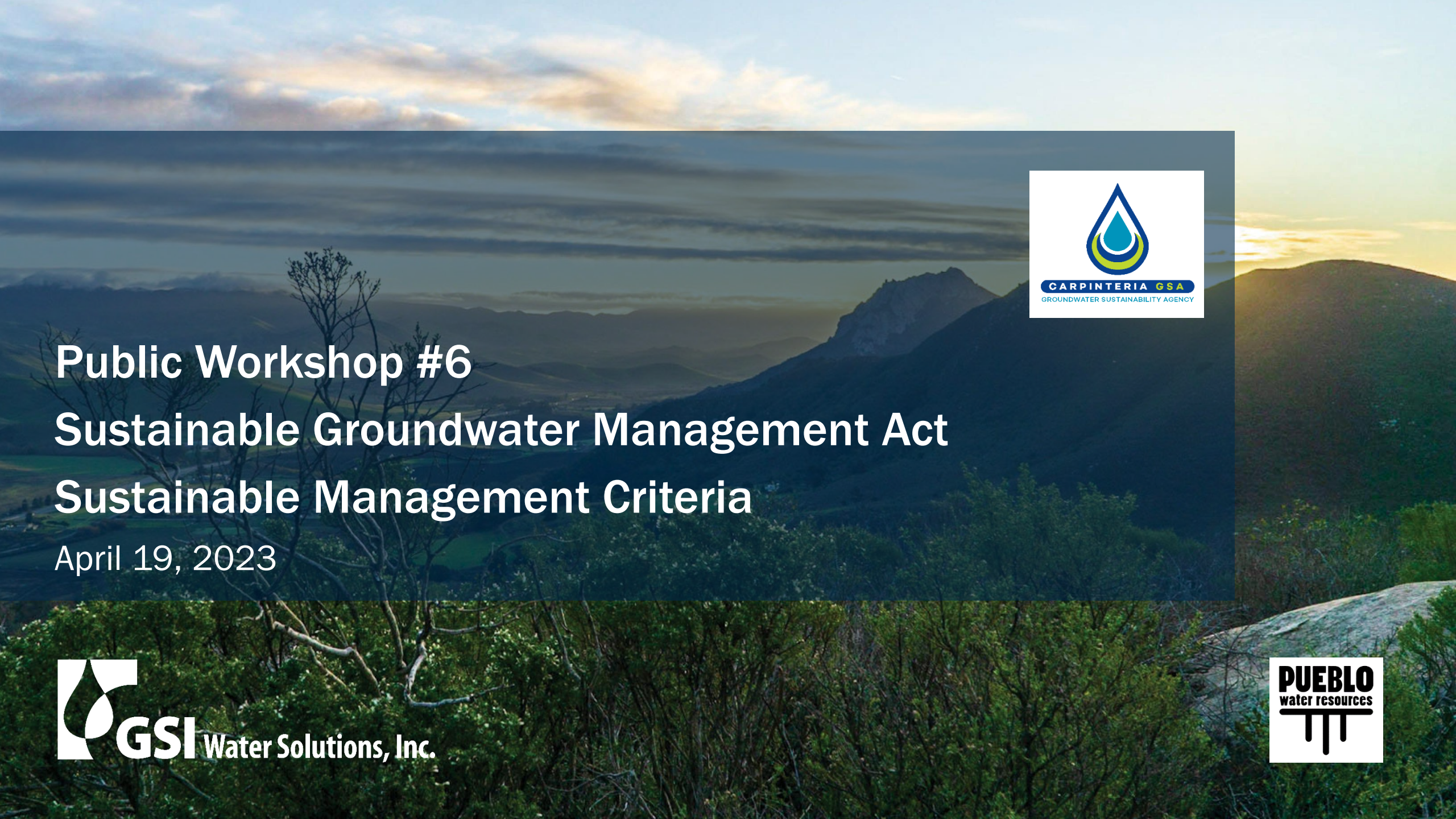


Public Workshop #6
Sustainable Groundwater Management Act
Sustainable Management Criteria

April 19, 2023

CARPINTERIA GSA
GROUNDWATER SUSTAINABILITY AGENCY

GSI Water Solutions, Inc.

PUEBLO water resources

Presentation Outline

Pathway to Sustainability

1. Brief review of GSP Development, Sustainability Management Criteria

2. Review of Proposed SMCs
   - Sea Water Intrusion
   - GW Level Decline/Reduction of Storage
   - Water Quality
   - GW/SW Interaction
   - Subsidence

3. Introduction to Projects and Management Actions

GSP Project Approach

BUILD TRUST THROUGH CLARITY, CONSISTENCY, AND INVOLVEMENT

Complete

PHASE 1

FACT REPORTING AND EDUCATION

- GSP Kickoff
- C& E Plan
- Plan Area and Basin Setting: Hydrogeologic Conceptual Model, Current Historical GW Conditions, and Water Budget
- Groundwater Model Update

March 2022 to December 2022

In Progress

PHASE 2

SUSTAINABLE GOAL SETTING

- Sustainable Management Criteria: Management Areas
- Sustainability Goal, Measurable Objectives, Minimum Threshold, and Undesired Results

January 2023 to May 2023

Summer 2023

PHASE 3

PLAN TO SUSTAINABILITY

- Projects and Management Actions to Achieve Sustainability: Projects and Management Actions
- Plan Implementation: Estimate Costs and Schedule

May 2023 to September 2023

Fall 2023

PHASE 4

GSP DOCUMENTATION

- Administrative Draft GSP
- Public Comment Period
- Final GSP
- GSP Adoption
- GSP submittal to DWR

September 2023 to November 2023

DEFENSIBLE PLAN

GSP Development Schedule

April 2023

- Final Presentation of SMCs
- Goal is to reach consensus on SMC's to be included in Chapter 7
- Introduction to Projects and Management Actions

May- July 2023

- Purpose is to release Draft Chapter 7 – SMC for public comment
- Projects and Management Actions
- Plan Implementation

September – November 2023

- Final Production and Publication of entire GSP for public review
- Response to comments
- GSP Adoption by GSA Board

Quick Review of SGMA and Sustainable Management Criteria (SMCs)

SIX SUSTAINABILITY INDICATORS

Pathway to Sustainability

Seawater Intrusion

Water Quality Degradation

Chronic Lowering of Groundwater Levels

Interconnected Surface Water Depletions

Reduction of Groundwater Storage

Land Subsidence

SGMA allows all indicators except the water quality sustainability indicator to be assessed using **WATER LEVELS** as a proxy metric for direct measurement.

SMC Definitions

Pathway to Sustainability

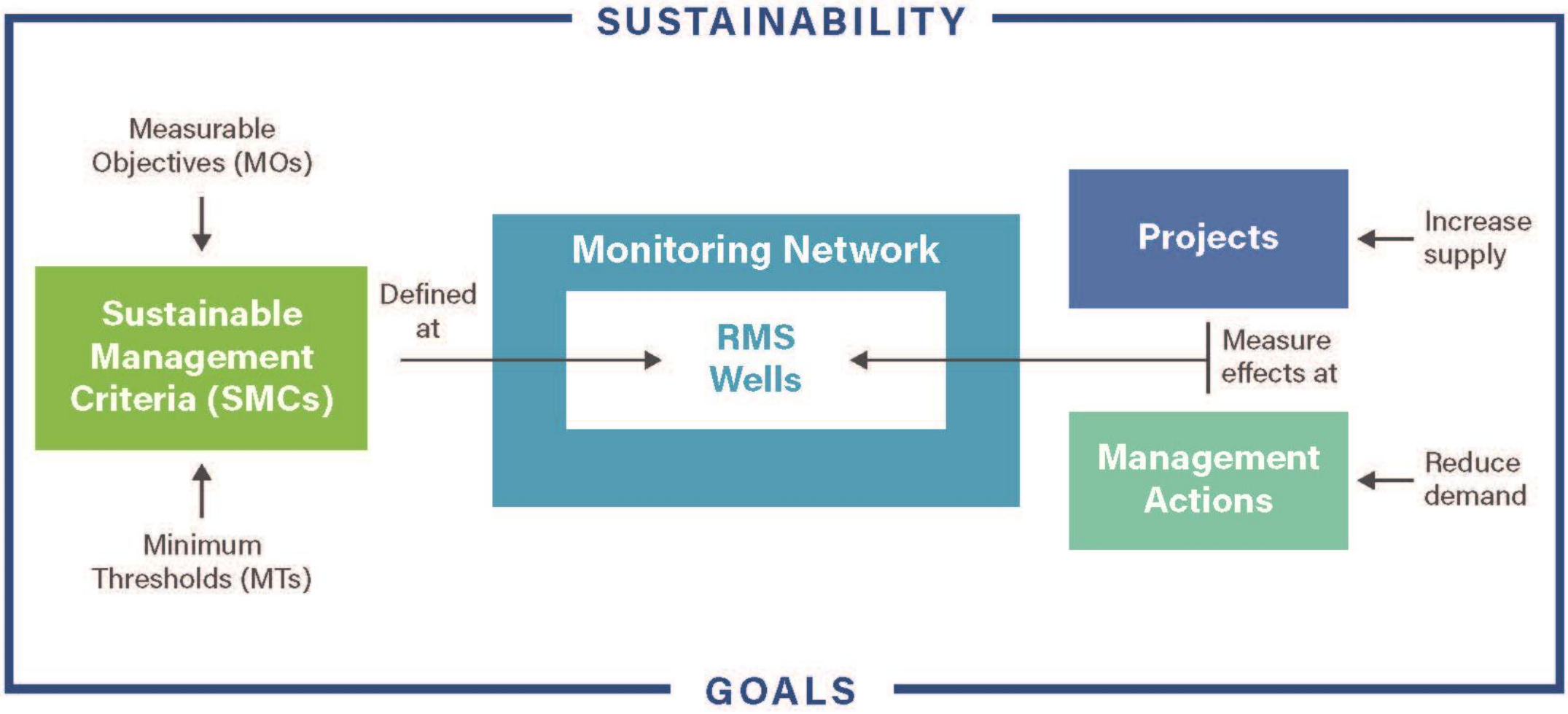
Representative Monitoring Sites (RMS) A subset of a basin's complete monitoring network, where minimum thresholds, measurable objectives, and interim milestones are set.

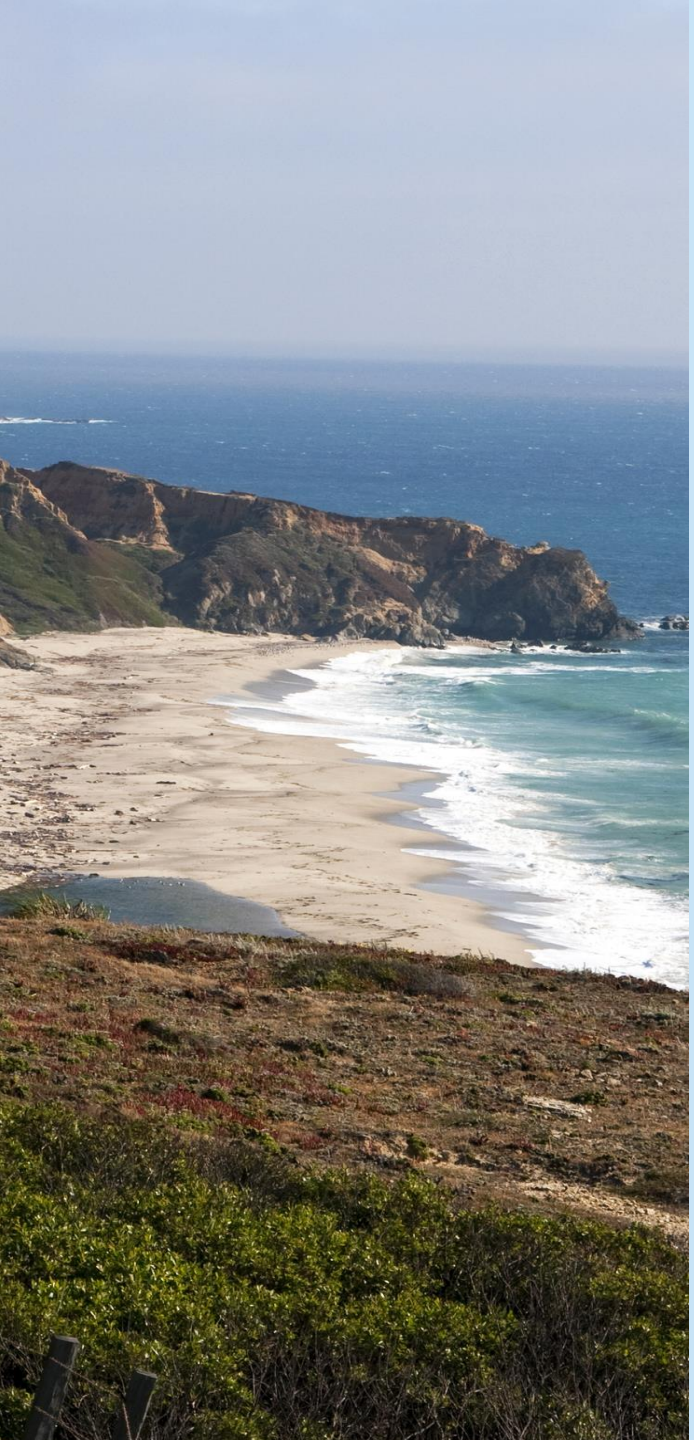
SMCs

Minimum Threshold (MT) -The value that represents groundwater conditions at an RMS that, when exceeded individually or in combination with minimum thresholds at other monitoring sites, may cause an *undesirable result*(s) in the basin.

Measurable Objective (MO) - Measurable objectives are goals that reflect the basin's desired groundwater conditions and allow the GSA to achieve the sustainability goal within 20 years.

Getting to Sustainability – RMS Wells





SEAWATER INTRUSION

EXAMPLES OF SEAWATER INTRUSION UNDESIRABLE RESULTS

Pathway to Sustainability

- Saline groundwater migrating inland from ocean and reaching agricultural production wells, impacting crops and agricultural economy.

- Saline water reaching municipal (or domestic) production wells, impacting water quality for potable supply source, requiring increased level of treatment to serve customer base.

SGMA Regulation: Seawater Intrusion SMCs – Chloride Concentration Isocontour Line

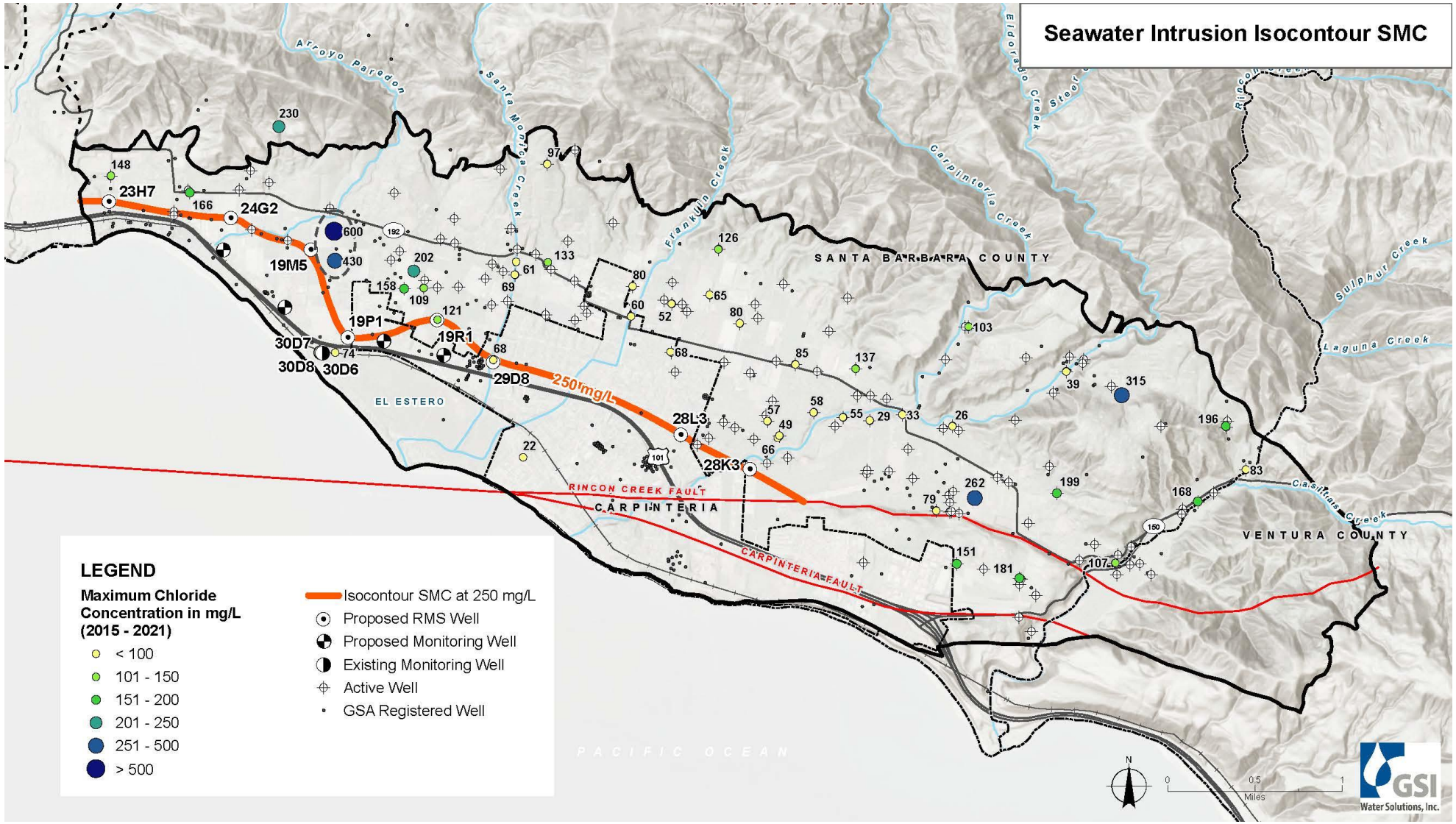
§ 354.28. Minimum Thresholds

(3) Seawater Intrusion.

The minimum threshold for seawater intrusion shall be defined by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results.

Seawater Intrusion SMCs – Isocontour

- Isocontour defined along active wells near coast.
- MT = 250 mg/L (Secondary MCL).
- MO = 142 mg/L (Basin plan "no problem" level for agriculture)
- Specifically excludes area near Arroyo Paredon Creek with documented high chlorides
- Additional MWs proposed seaward of isoconotur



CHRONIC LOWERING OF GROUNDWATER LEVELS &

REDUCTION OF GROUNDWATER STORAGE

Example Undesirable Results of Lowered GW Levels & Reduction in Storage

Conditions causing undesirable results must be *significant* and *unreasonable*

- **Domestic supply wells not an issue in Carpinteria Basin.**
- **Water levels falling below top of screen for Municipal production wells.**
- **Decline in yields of agricultural wells.**

Types of data to be analyzed:

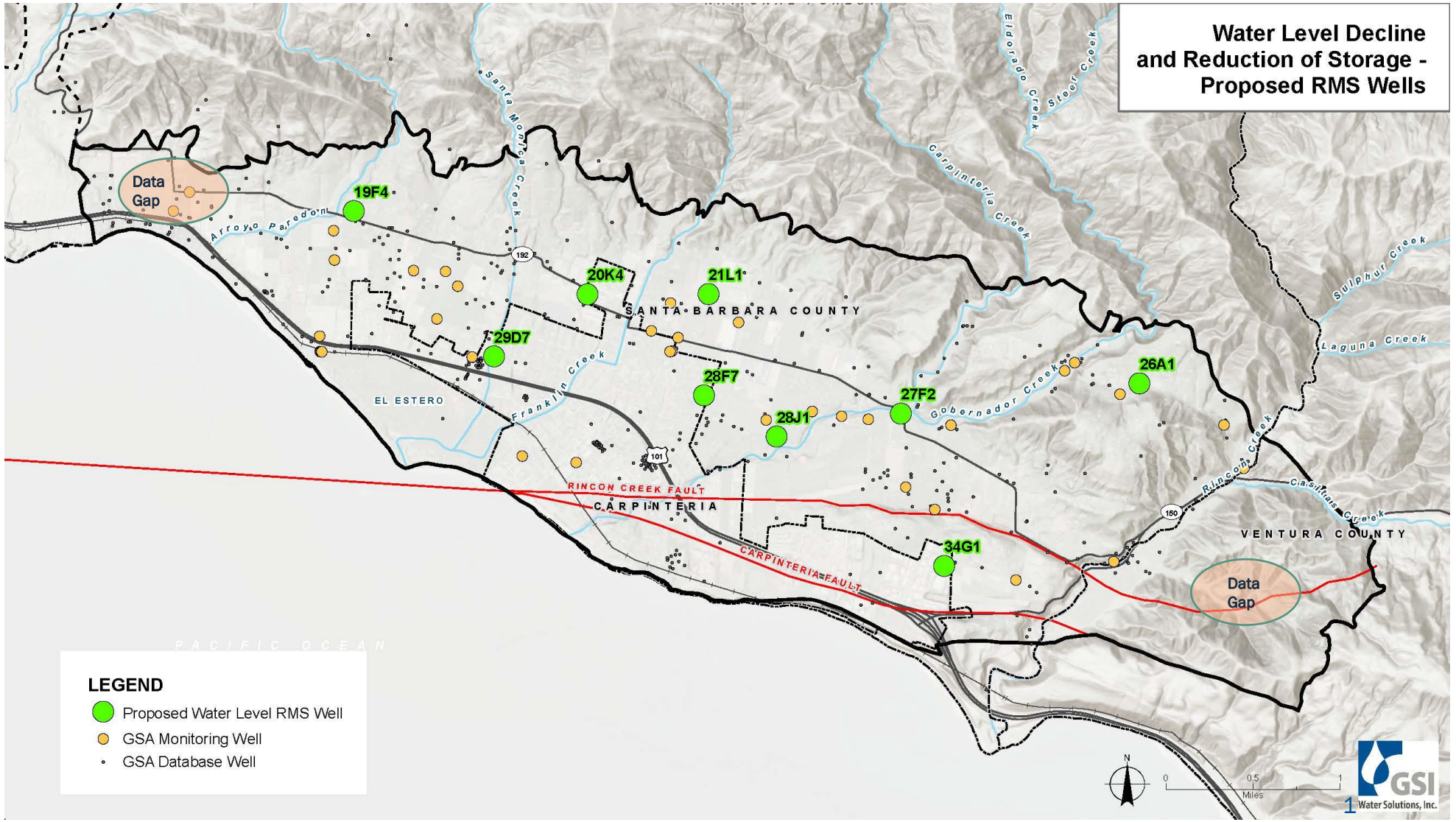
- **Well location**
- **Well depth**
- **Top of screened interval**
- **Saturated Thickness**

Reduction in Storage SMCs are commonly defined as water levels identical to the Water Level Decline SMCs in other accepted GSPs.

Water Level Decline and Reduction of GW in Storage Proposed RMS Wells

Considerations :

- **Long Period of Record**
- **Construction details**
- **Spatial distribution**
- **Accessibility**
- **Representative**
- **Data Gaps at Basin edges**



GW Level Declines & Reduction in Storage

Considerations for MOs.
Review water levels at RMS wells.

- Recent “average” operational water levels.
- SGMA Baseline: Consider 2015 conditions

GW Level Declines & Reduction in Storage

Conditions causing undesirable results must be *significant* and *unreasonable*

Considerations for MTs.

Review recent low water levels at RMS wells:

- Were undesirable effects observed? Not reported.
- Consider WL < well screen as potentially undesirable
- Consider reduction of Saturated Thickness beyond some threshold as potentially undesirable
- In inland areas it may be reasonable to set MTs lower than recently observed low water levels
- In areas at risk of seawater intrusion, probably no lower.
- How to evaluate; other basins use multiple years of exceedance before triggering action.
- May be written as representing normal conditions (excluding significant drought, undesirable results)

Well Impact Analysis of MTs Below Recent Low WLs

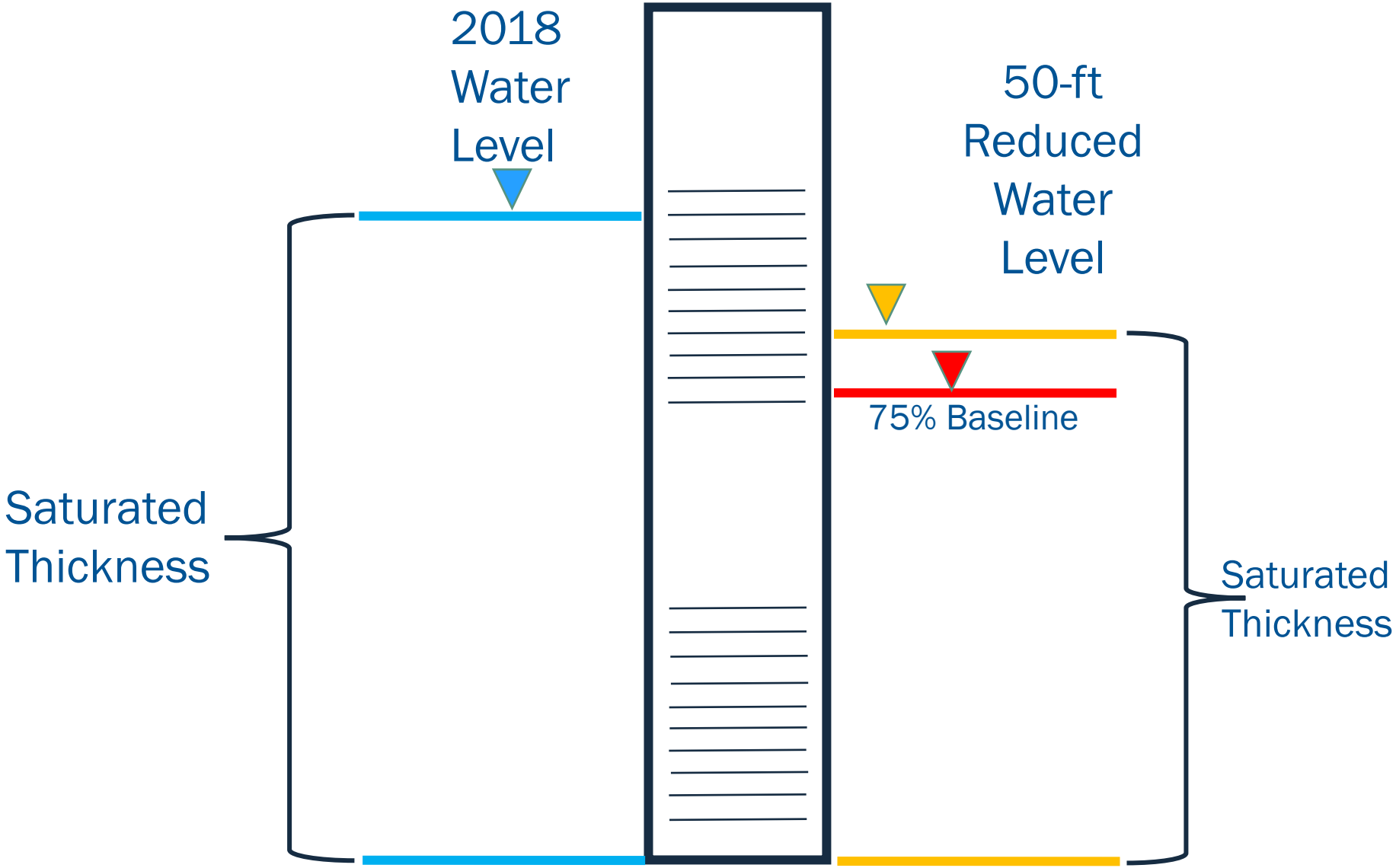
GW Level Declines & Reduction in Storage

Impact Analysis of Reduced Groundwater Elevation Surface.

- Take GW Elevation Surface from Fall 2018 as representative of Recent Low Water Levels
- Reduce this surface in increments of 5 feet from 5 to 50 feet below Fall 2018 Water Levels
- Compare these GW Elevations at well locations for wells with screen interval data.
- Compare Saturated Thickness and Intersection of WL with screen (<75% Baseline Saturated Thickness).
- Assess based on these results what depth below 2018 water levels is acceptable.
  - Water levels have recovered from past droughts (1950s, 1990s, 2010s)
  - Recent low WLs are not the historical lows (1950s drought)

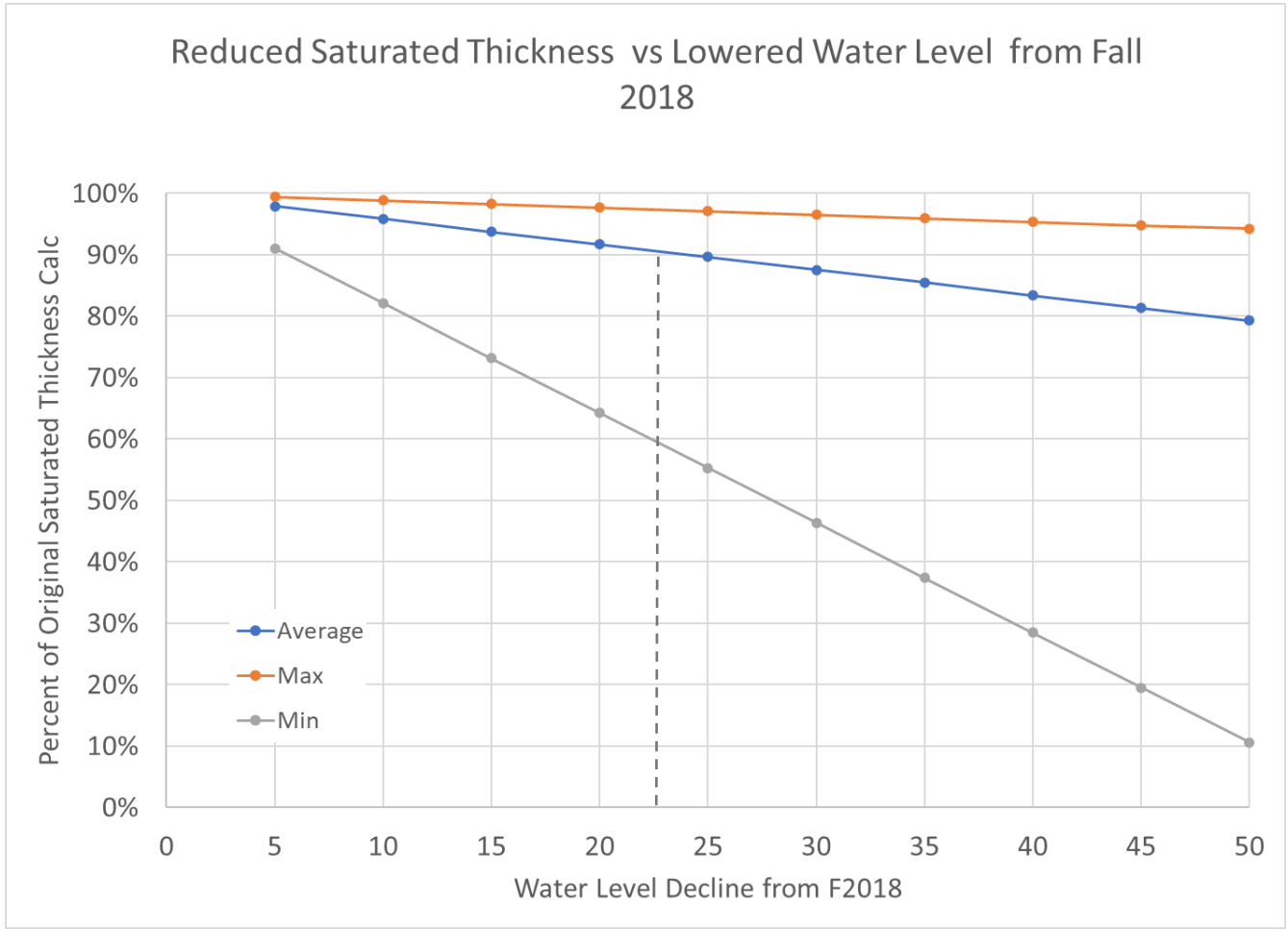
Well Impact Analysis of MTs Below Recent Low WLs

GW Level Declines & Reduction in Storage



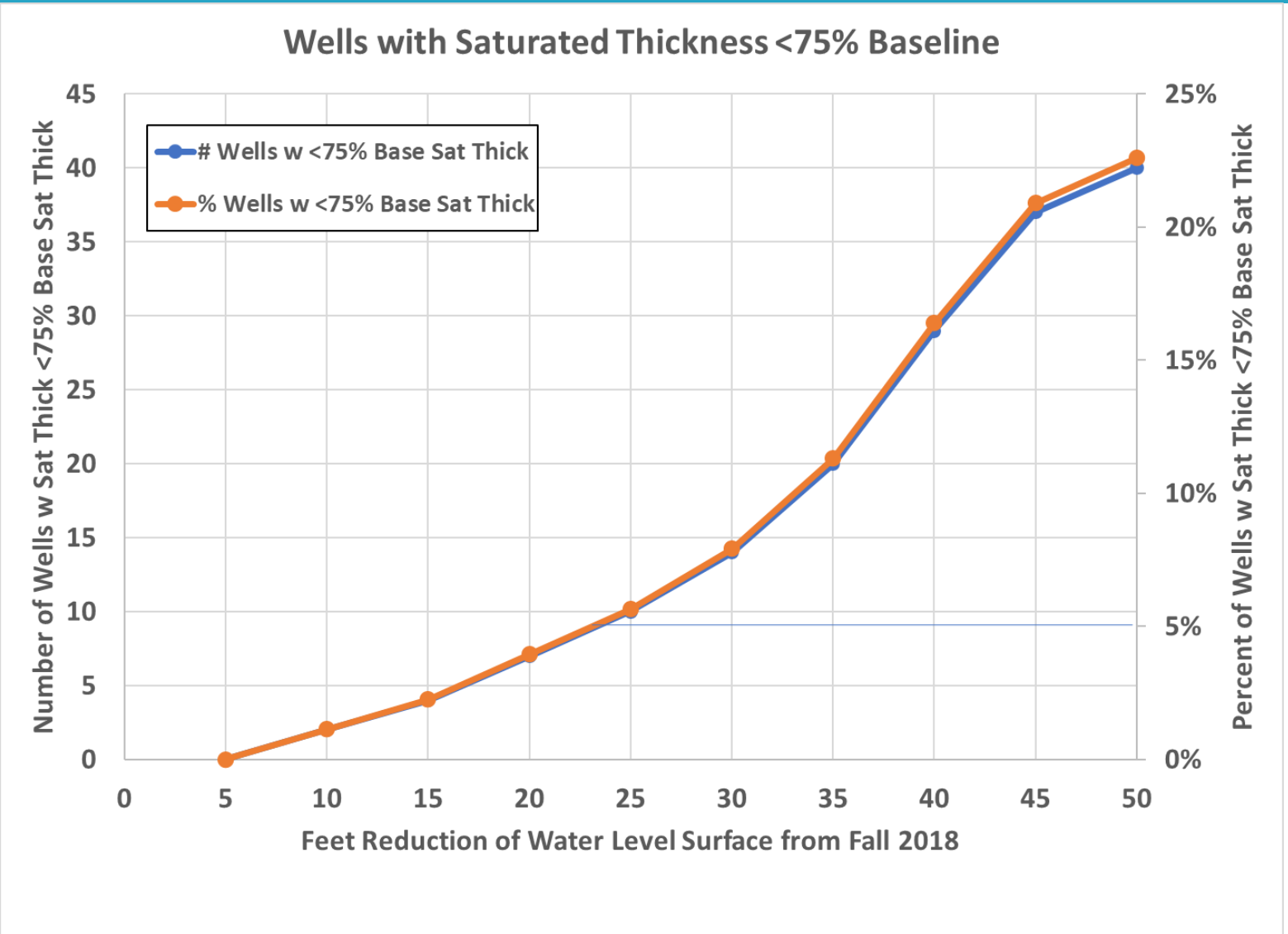
Well Impact Analysis of MTs Below Recent Low WLs

- 90% Of Average Saturated Thickness is maintained with a water level decline of 20-25 feet below 2018 lows.
- Since no undesirable results were reported in 2018, this seems like a reasonable threshold.



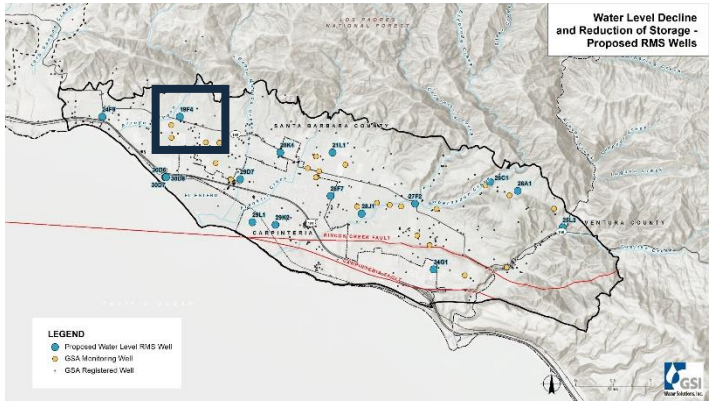
Well Impact Analysis of MTs Below Recent Low WLs

- If water levels are reduced 20 feet below 2018 levels, less than 5% of wells in the Basin fall below the 75% Saturated Thickness threshold.
- Since no undesirable results were reported in 2018, this seems like a reasonable threshold.



Water Level Decline and Reduction of GW in Storage Section 19

- Undesirable effects not reported.
- Proposed MT 20 feet lower than 2018 WL.



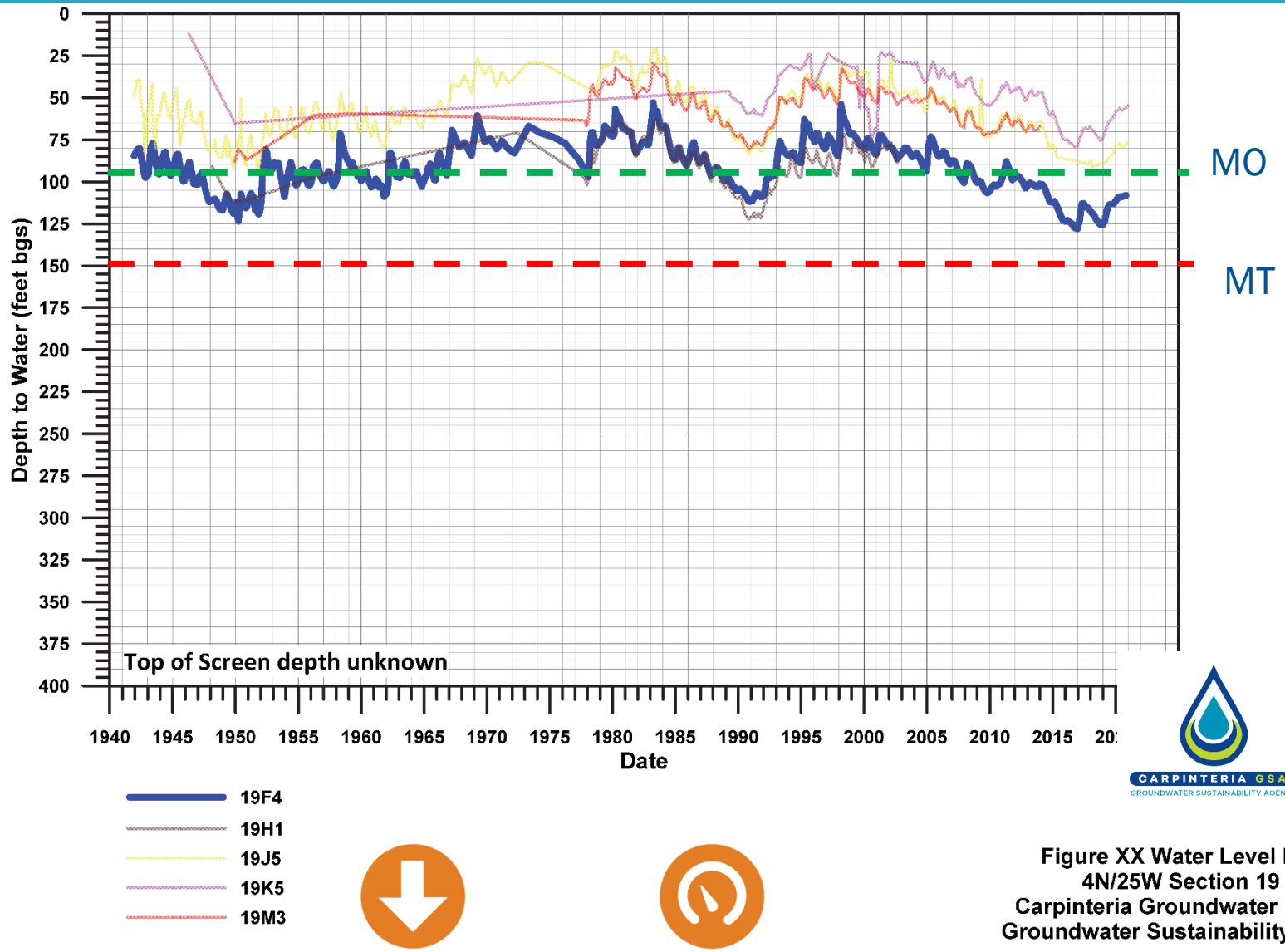
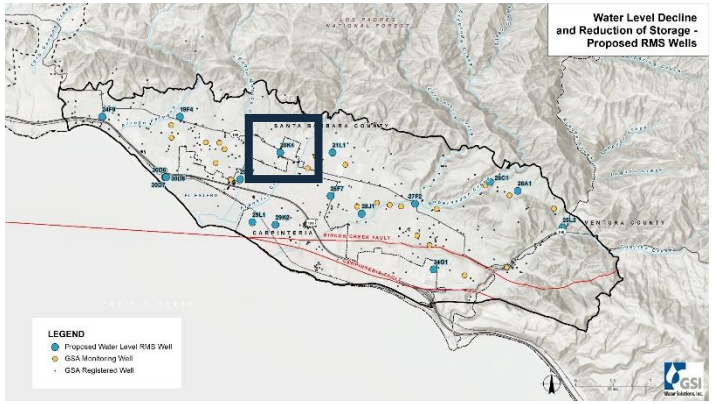


Figure XX Water Level Data
4N/25W Section 19 Wel
Carpinteria Groundwater Bas
Groundwater Sustainability Pla

Water Level Decline and Reduction of GW in Storage Section 20

- Undesirable effects not reported.
- Top of Screen 230 feet below recent low WLs.
- Proposed MT 20 feet lower than 2018 WL.



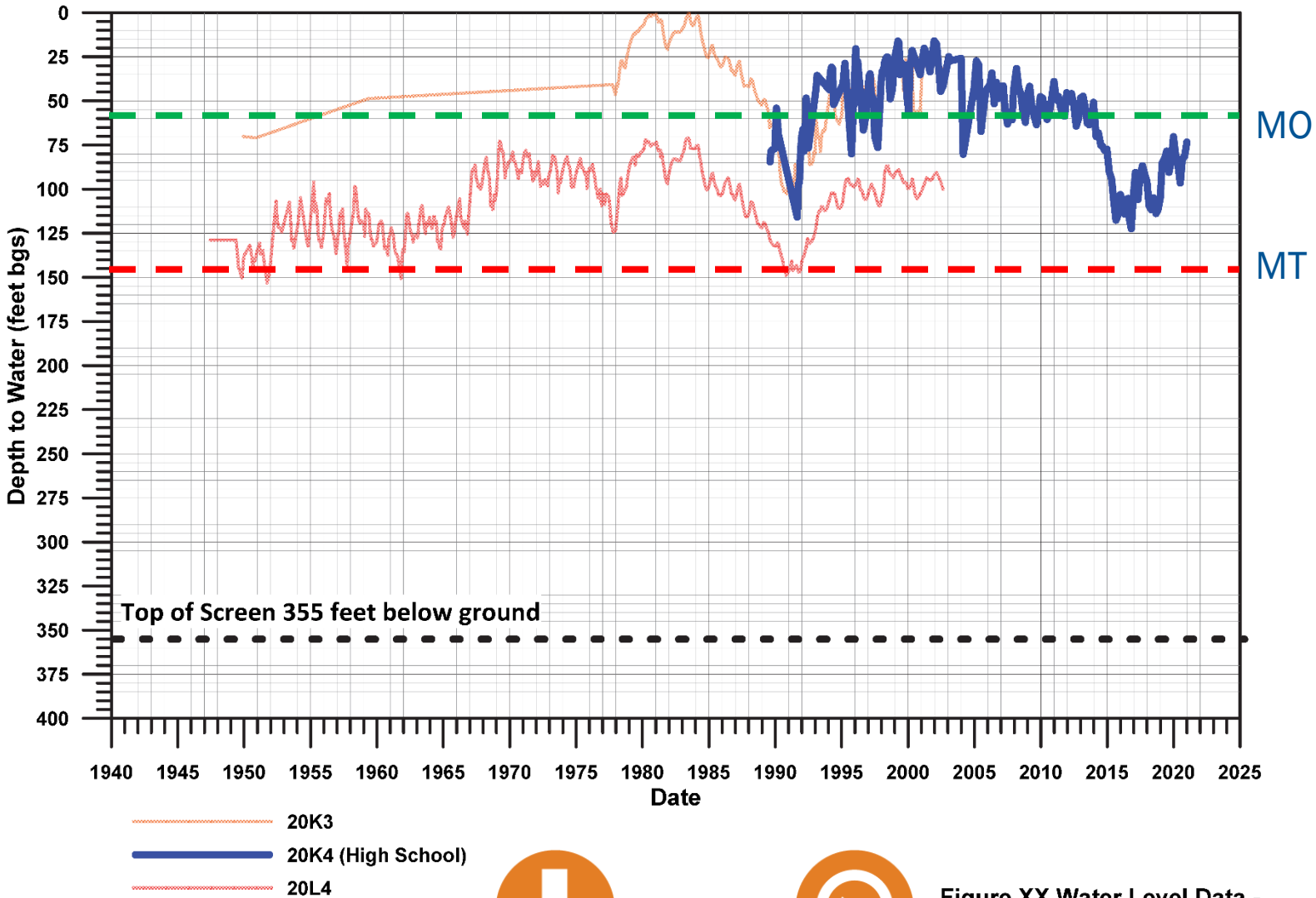
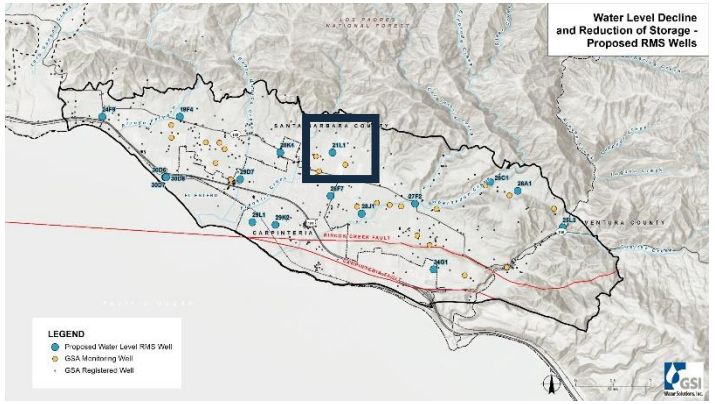


Figure XX Water Level Data - 4N/25W Section 20 Wells
Carpinteria Groundwater Basin
Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 21

- Undesirable effects not reported.
- Top of Screen 235 feet below recent low WLs.
- Proposed MT 20 feet lower than 2018 WL.

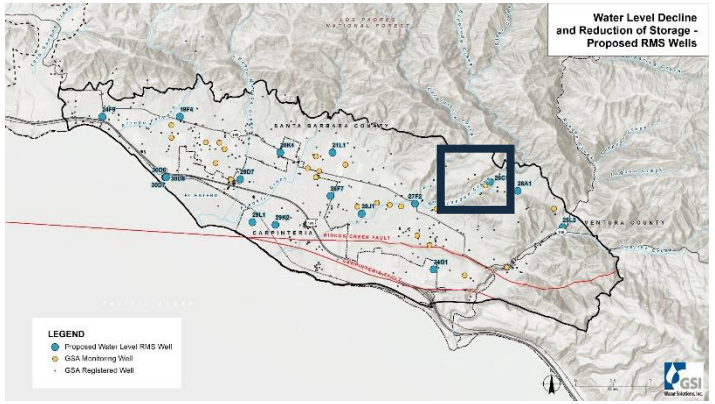


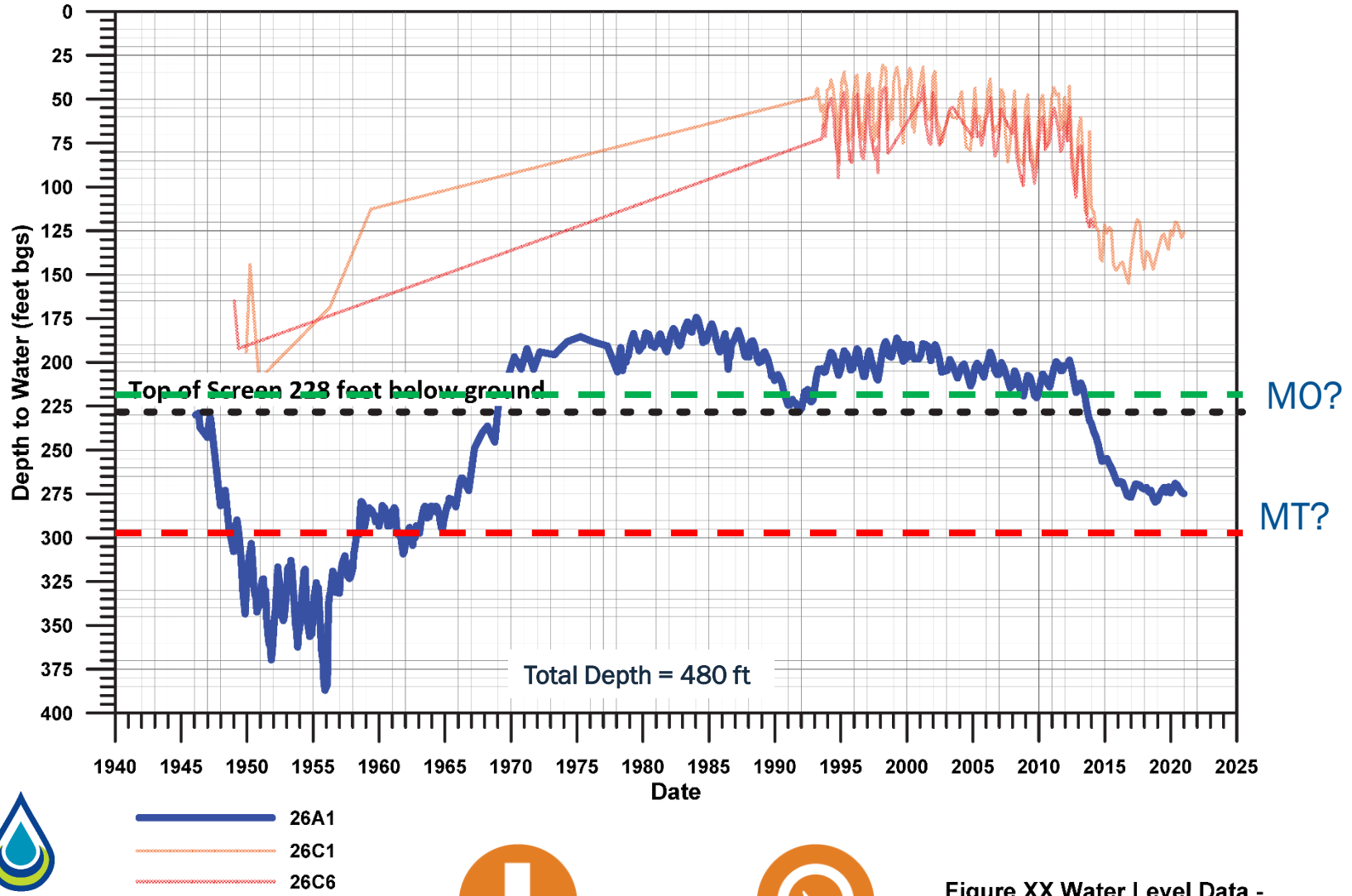
CARPINTERIA GSA
GROUNDWATER SUSTAINABILITY AGENCY

Figure XX Water Level Data - 4N/25W Section 21 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 26

- Undesirable effects not reported.
- Recent low WLs <u>were</u> below top of screen.
- 1950s WLs nearly dropped below well (dry well)
- Proposed MT 20 feet lower than 2018 WL.





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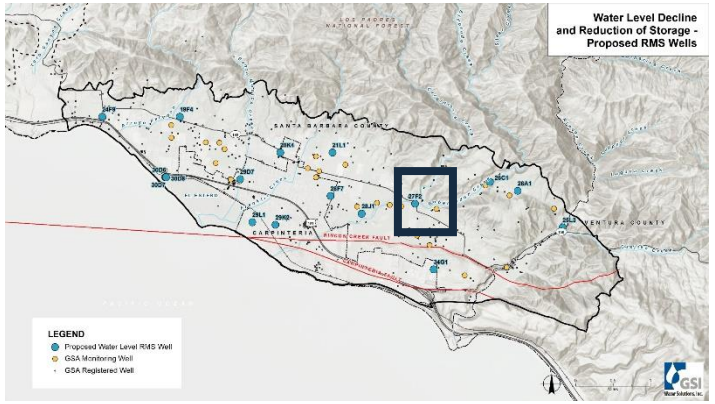
GROUNDWATER SUSTAINABILITY AGENCY

Figure XX Water Level Data - 4N/25W Section 26 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 27

- Undesirable effects not reported.
- Top of screen 245 feet below recent low WL.
- Proposed MT 20 feet lower than 2018 WL.



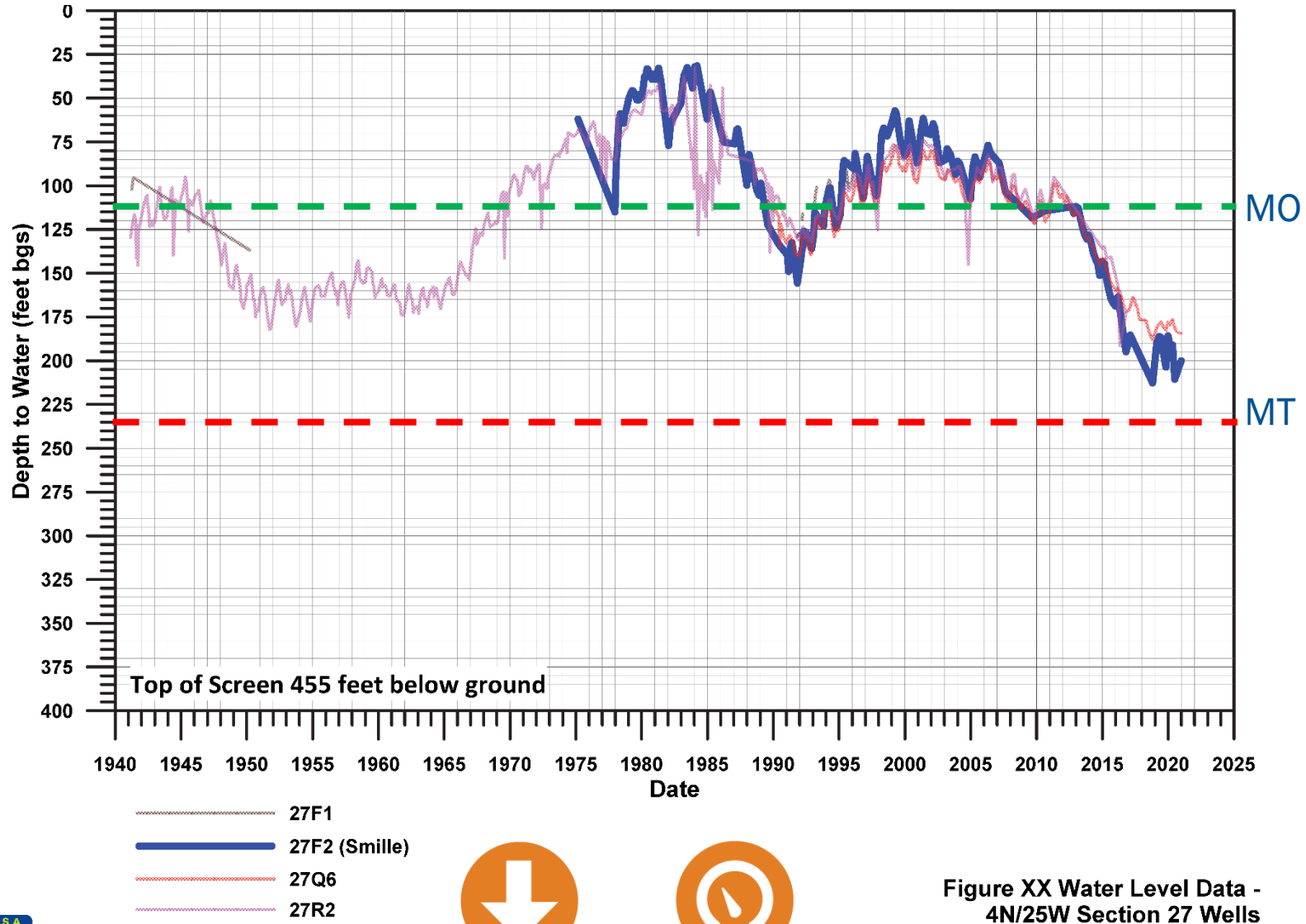
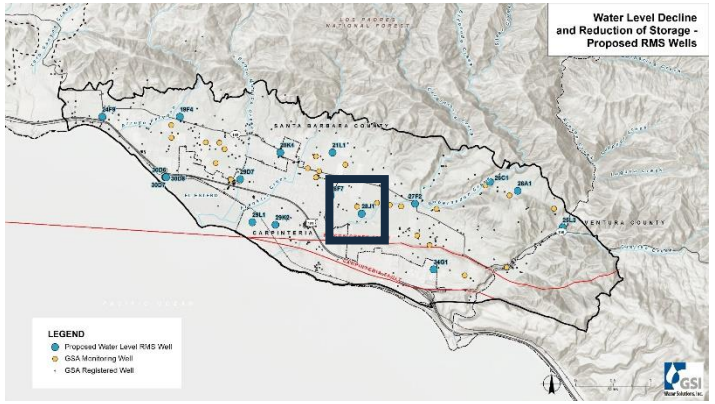


Figure XX Water Level Data - 4N/25W Section 27 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 28

- Undesirable effects Not reported.
- Proposed MT 20 feet lo wer than 2018 WL.



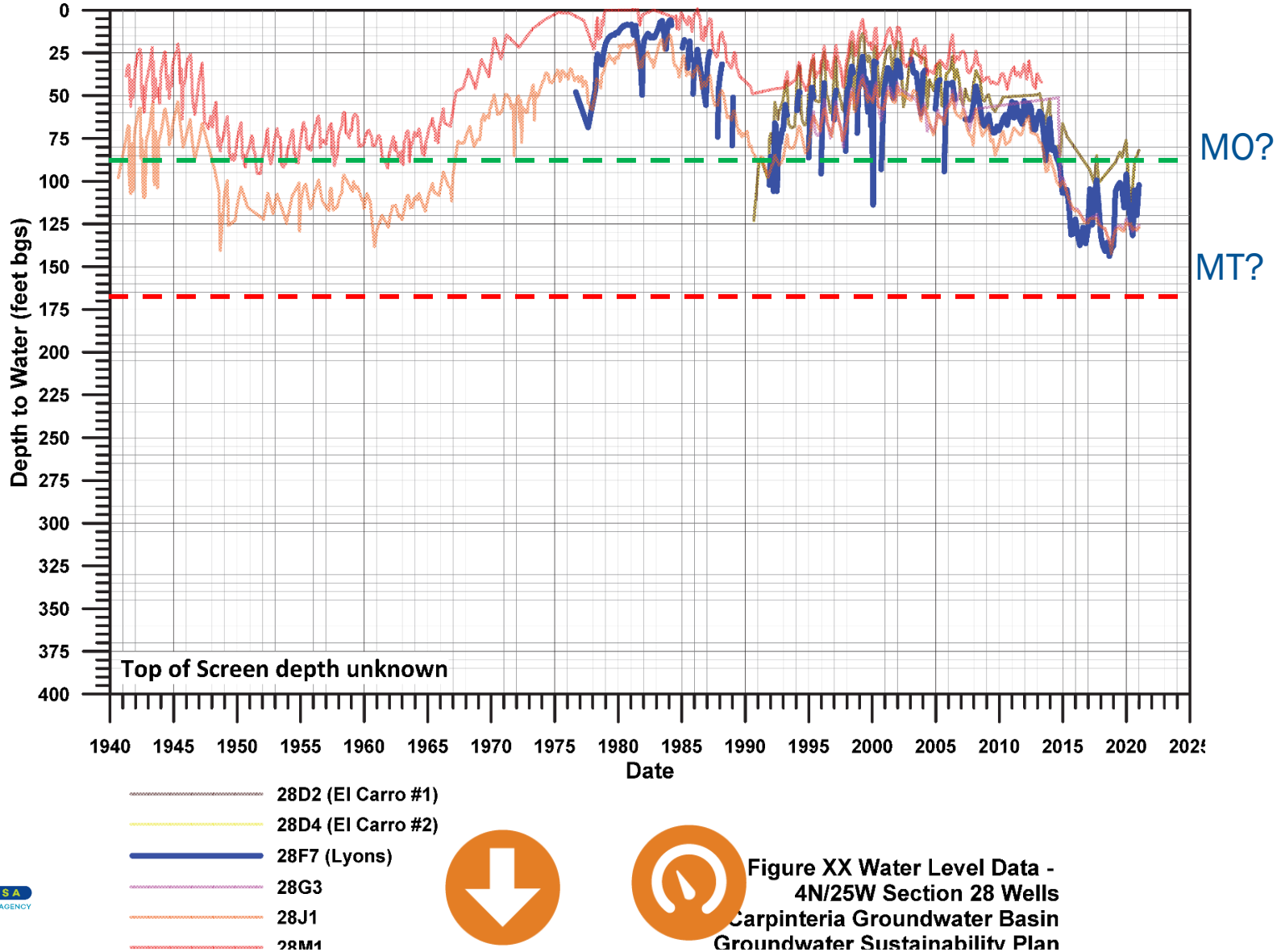
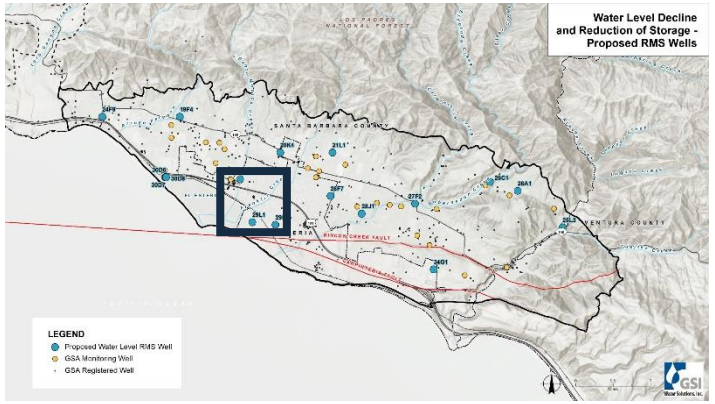


Figure XX Water Level Data - 4N/25W Section 28 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

CARPINTERIA GSA
GROUNDWATER SUSTAINABILITY AGENCY

Water Level Decline and Reduction of GW in Storage Section 29

- Undesirable effects not reported
- Apparent pumping effects on WLs 29D7 removed from data set.
- Top of Screen ~150 feet below recent low WLs.
- Proposed MT 20 feet lower th an 2018 WL.



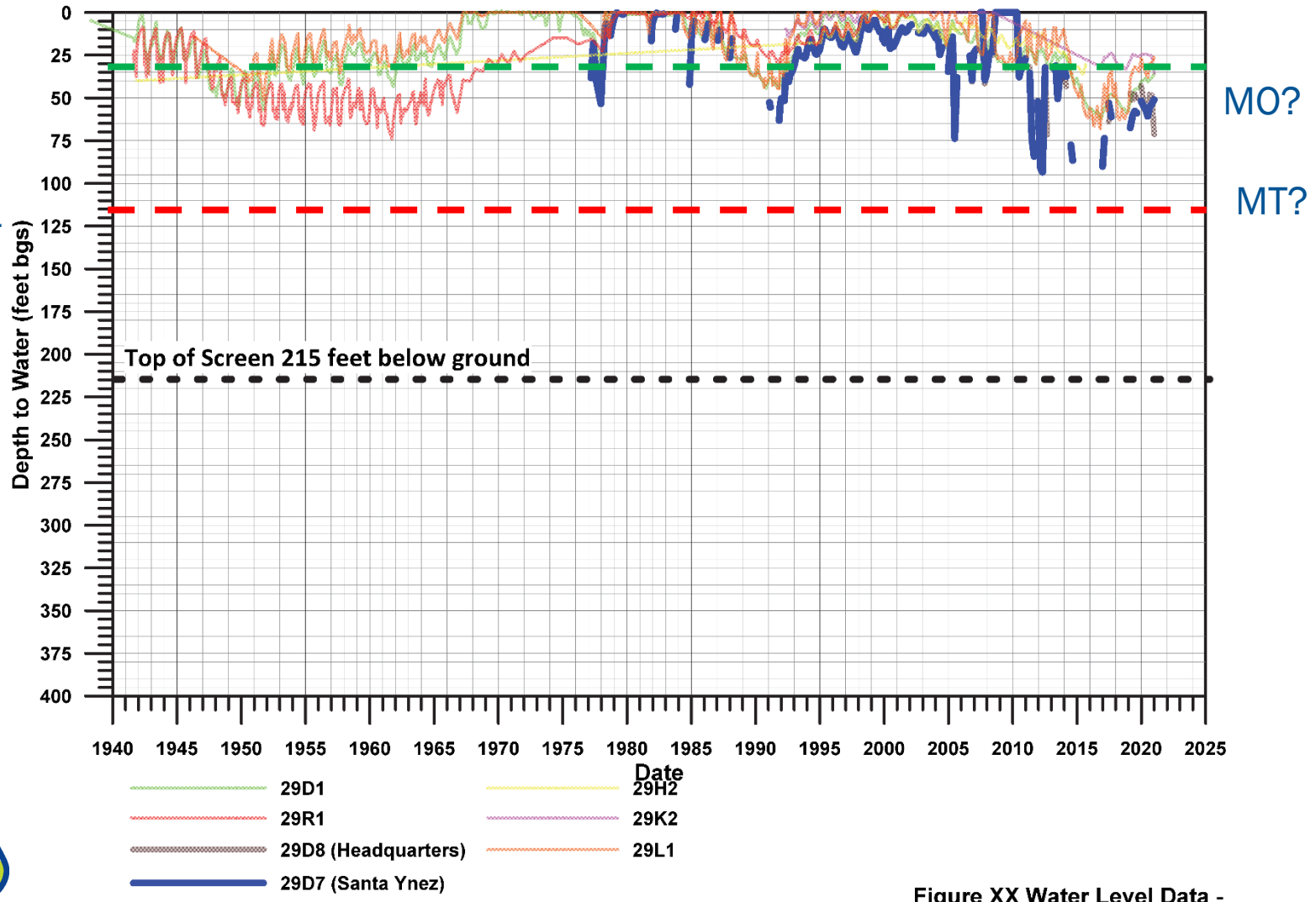
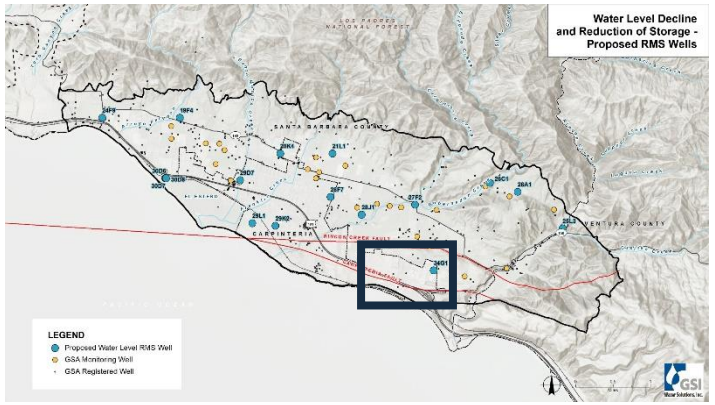


Figure XX Water Level Data - 4N/25W Section 29 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

CARPINTERIA GSA
GROUNDWATER SUSTAINABILITY AGENCY

Water Level Decline and Reduction of GW in Storage Section 34-35

- Undesirable effects not reported
- South of Rincon Creek Fault
- Limited GW use in this area
- Proposed MT 20 feet lower than 2018 WL



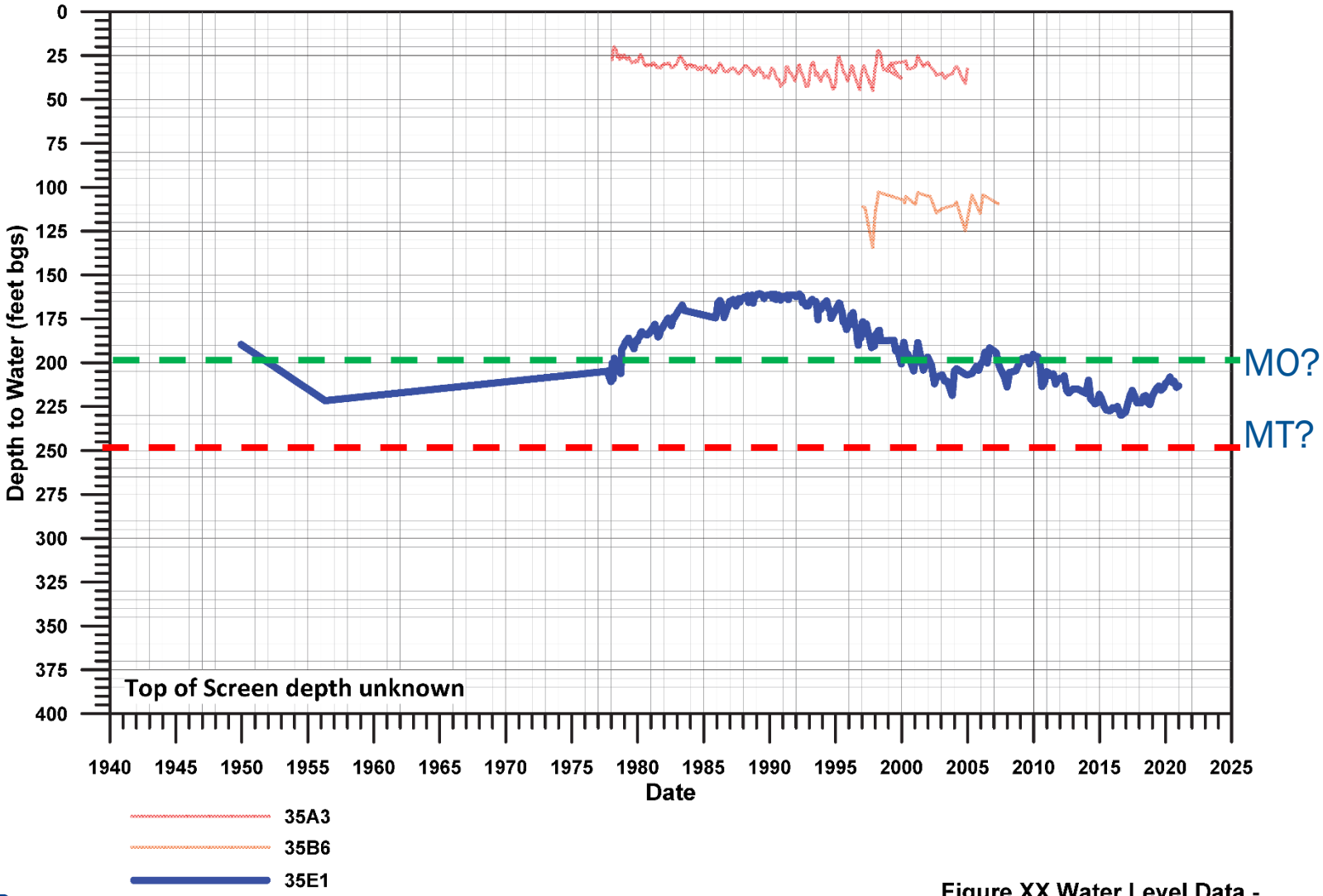


Figure XX Water Level Data - 4N/25W Section 35 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage
Summary of MTs/MOs

	RMS Wells	MT	MO
1	19F4	145	90
2	20K4	145	60
3	21L1	160	80
4	27F2	235	115
5	26A1	295	220
6	28J1	235	110
7	28F7	165	90
Removed	~~29K2~~	--	--
8	29D7	115	35
9	34G1	245	200
SMCs presented as Depth to Water (DTW).			

CARPINTERIA GSA
GROUNDWATER SUSTAINABILITY AGENCY

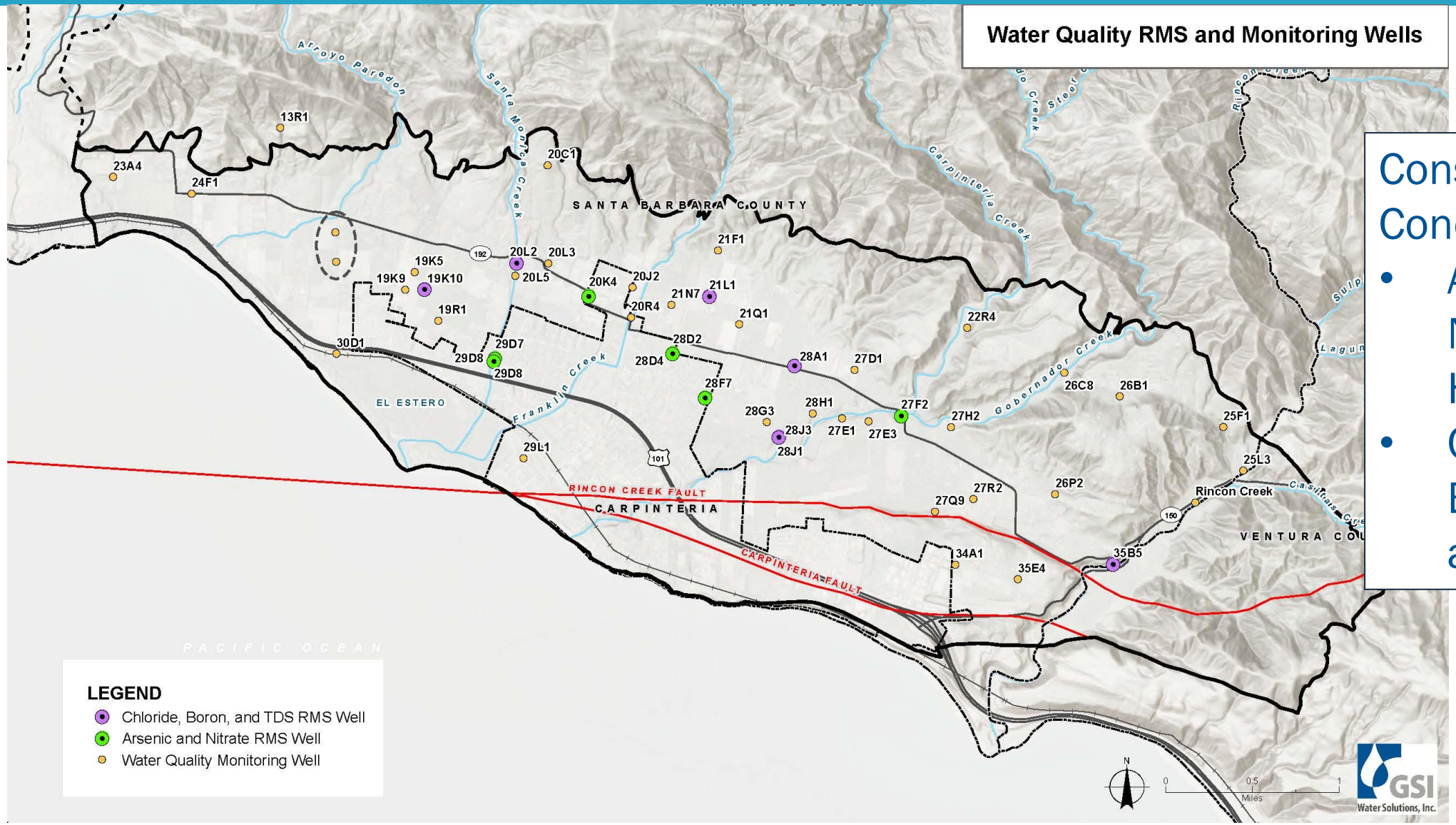
Water Quality Degradation

Water Quality SMCs

Existing Sampling Program

1. SGMA not intended to manage to ***improve*** ambient water quality, just to avoid degradation due to groundwater management.
2. SMCs will be based on MCLs and RWQCB Basin Objectives while considering historical WQ data.
3. 2015 is baseline for SGMA conditions.
4. CVWD has maintained Semi-annual Data Collection since 2000.
   a) General Mineral Constituents (Anions, Cations, Dissolved Solids, Nitrates, Electrical Conductance.
5. Continuance of current sampling program to be included in Carpinteria Basin GSP.

Water Quality SMCs

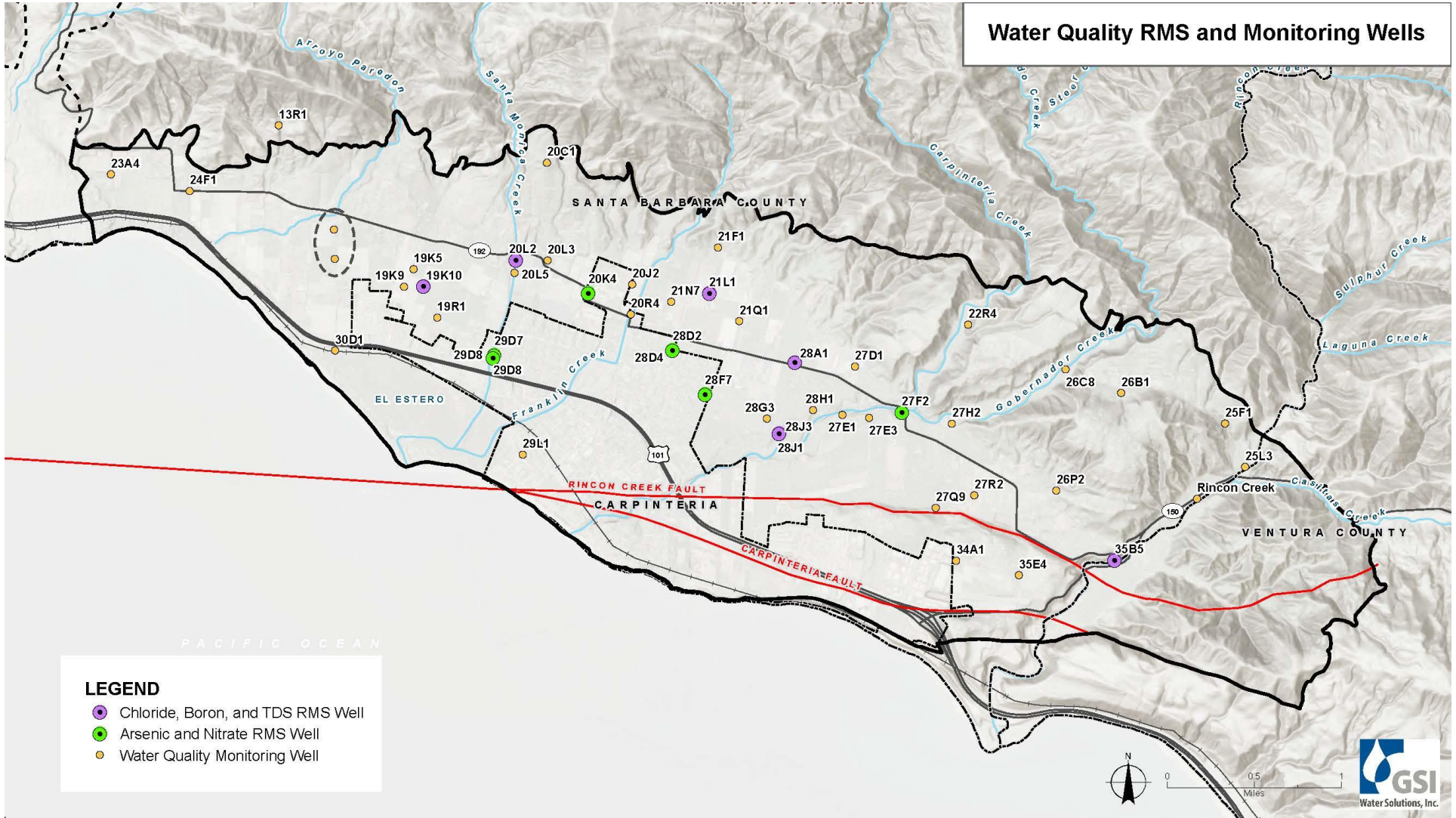


Constituents of Concern:

- Arsenic and Nitrate (Human Health)
- Chloride, TDS, Boron (Agriculture and General WQ)

Water Quality SMCs

Proposed RMS Wells



RMS Wells

- Arsenic and Nitrate monitored at 5 CVWD Supply Wells ,RMS sites.
- Chloride, TDS, Boron monitored at 6 additional RMS sites

GSA Water Quality Monitoring Network

Water Quality MTs and RMS Wells

Constituent	MT	RMS Locations	Rationale
Arsenic	10 ug/L	5 CVWD supply Wells	MCL is federal regulation for drinking water. District is only potable water supplier in Basin
Nitrate (as N)	10 mg/L	5 CVWD supply Wells	MCL is federal regulation for drinking water. District is only potable water supplier in Basin
TDS	1,000 mg/L	5 CVWD + 6 monitor wells	MT set at secondary MCL
Chloride	142 mg/L	5 CVWD + 6 monitor wells	MT set at Basin Plan "no problem" ag threshold
Boron	0.5 mg/L	5 CVWD + 6 monitor wells	MT set at Basin Plan "no problem" ag threshold

OTHER SMCS

Interconnected Surface Water Depletion

Land Subsidence

1. The HCM characterized creeks in the Basin as disconnected from the principal aquifer. Thus, not subject to management under SGMA.
2. There may be data gaps that might require additional characterization during implementation requiring shallow piezometers to document groundwater conditions.

Interconnected Surface Water and Groundwater

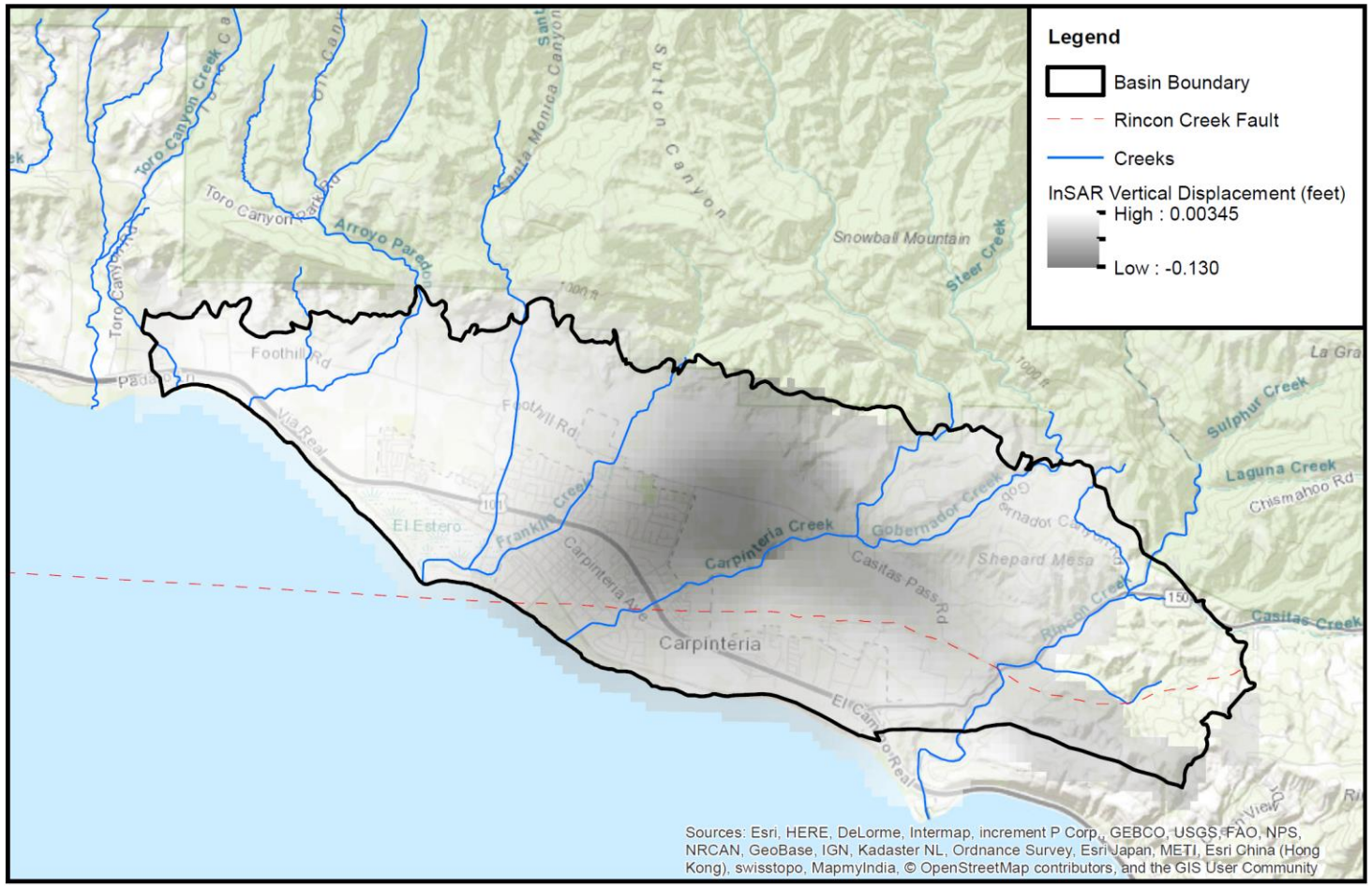
Creeks in the Basin are disconnected from aquifer.

DWR guidance on this SI was unclear. Additional Guidance coming.

Likely to be model-based analysis in the future.

Subsidence – InSAR Data from DWR Vertical Displacement (June 2015 – July 2022)

- Not historically in issue in the Basin
- Error bar of about 0.1 foot in InSAR data
- InSAR data will be reviewed annually upon publication by DWR.
- Proposed SMC of less than 0.1 foot subsidence per year (after accounting for data error).



Projects and Management Actions

Potential Projects

- Monitor Well Clusters along coast to monitor seawater intrusion (SGMA Grant funding applied for)
- IPR Project CAPP – Indirect Potable Reuse project using Basin Aquifer for storage
- Seawater Barrier Project – Injection wells along coast

Potential Management Actions

- Technical assistance for water use efficiency
- Well metering/measurement
- Improved monitoring to address data gaps

WHAT'S NEXT

WHAT'S NEXT: Upcoming Public Workshops

SMCs → **Projects and Management Actions** →

Public Presentations Completed!
Commence writing GSP chapter…

PUBLIC WORKSHOP.

GSA Public Workshop
May 17 2023•
6:00pm-8:00pm

Learn more or take action at
CarpGSA.org

GSPAC Schedule and Topics

April 25, 2023

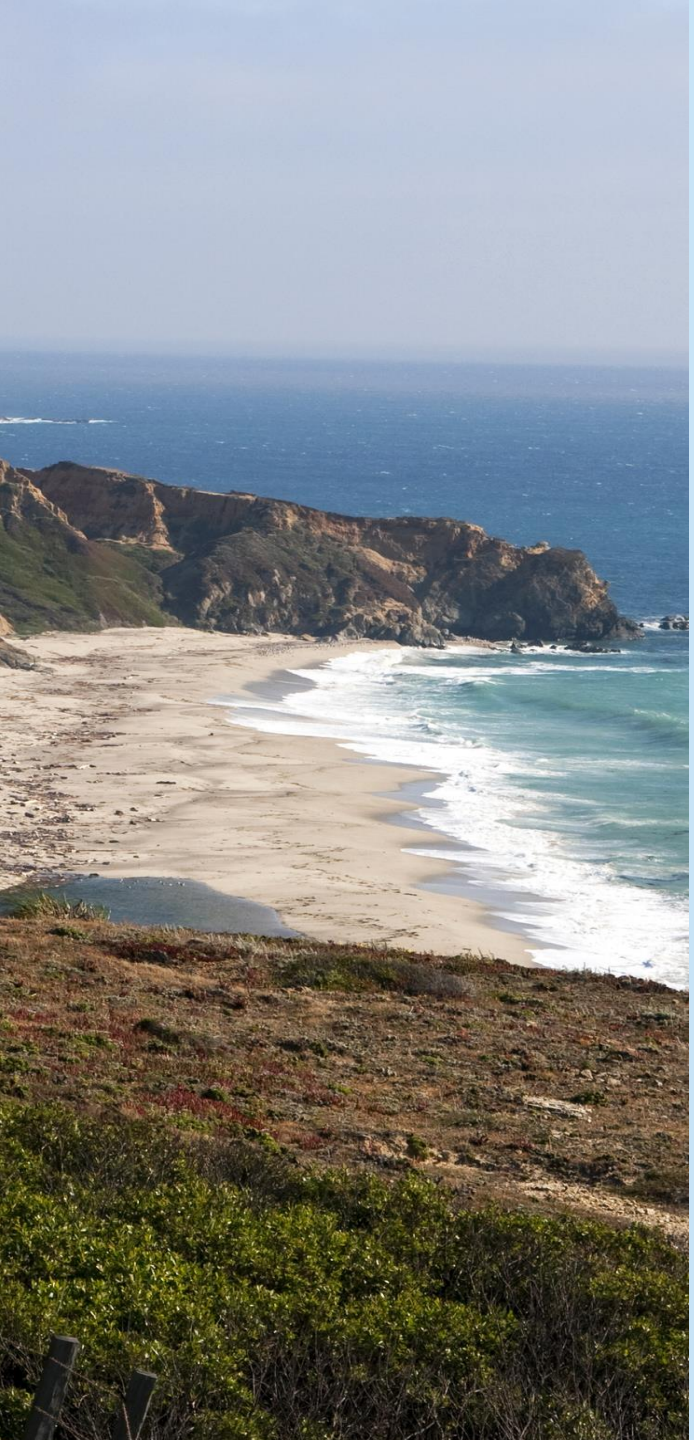
GSPAC Meeting #3

1. Final presentation on SMCs?
2. How should climate change be considered in developing sustainable management criteria.
3. Is a pumping fee vs an acreage-based fee the most appropriate in Carpinteria?
4. Should the GSA require meters on wells?
5. Would stakeholders be interested in importing water at a cost to replace groundwater when needed?

May 23, 2023

GSPAC Meeting #4

1. Should individual well pumping rates be limited such that they do not affect neighboring wells?
2. Should new wells or expanded wells be limited? For good or just during drought?
3. If allocation for groundwater pumping is needed should crop type or water use type be considered in determining the allocation.
4. Should different management areas be created to address different priorities?



QUESTIONS?