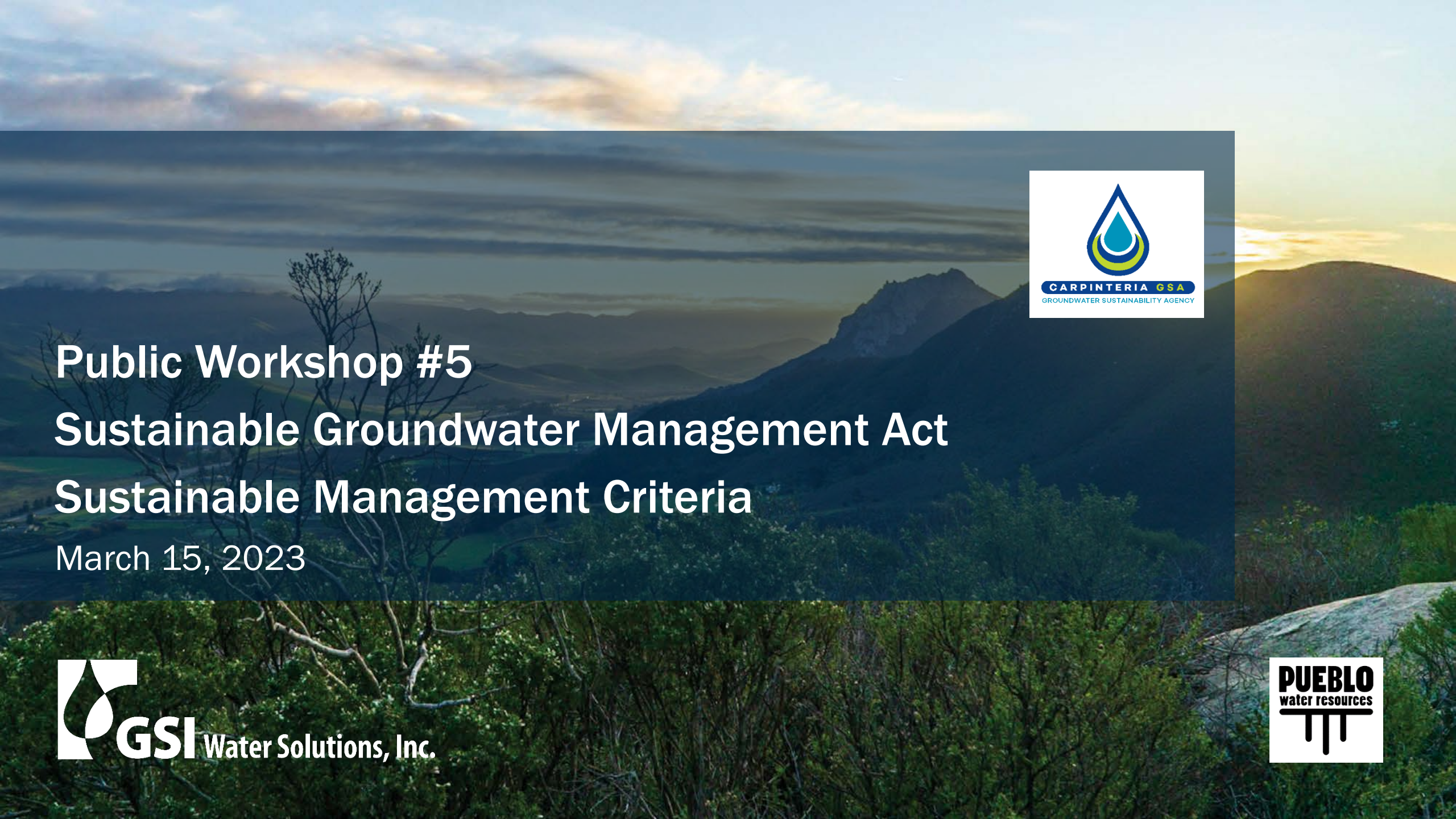


Public Workshop #5
Sustainable Groundwater Management Act
Sustainable Management Criteria

March 15, 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 Seawater Intrusion SMCs

3. Discussion of Groundwater Level Decline/Reduction of Storage Decline SMCs

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

March 2023

- Sea Water Intrusion Review
- Water Level Decline and Reduction of Storage SMCs
- Subsidence SMCs
- WQ SMCs
- GW/SW Interaction SMCs

April 2023

- Wrap up 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

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

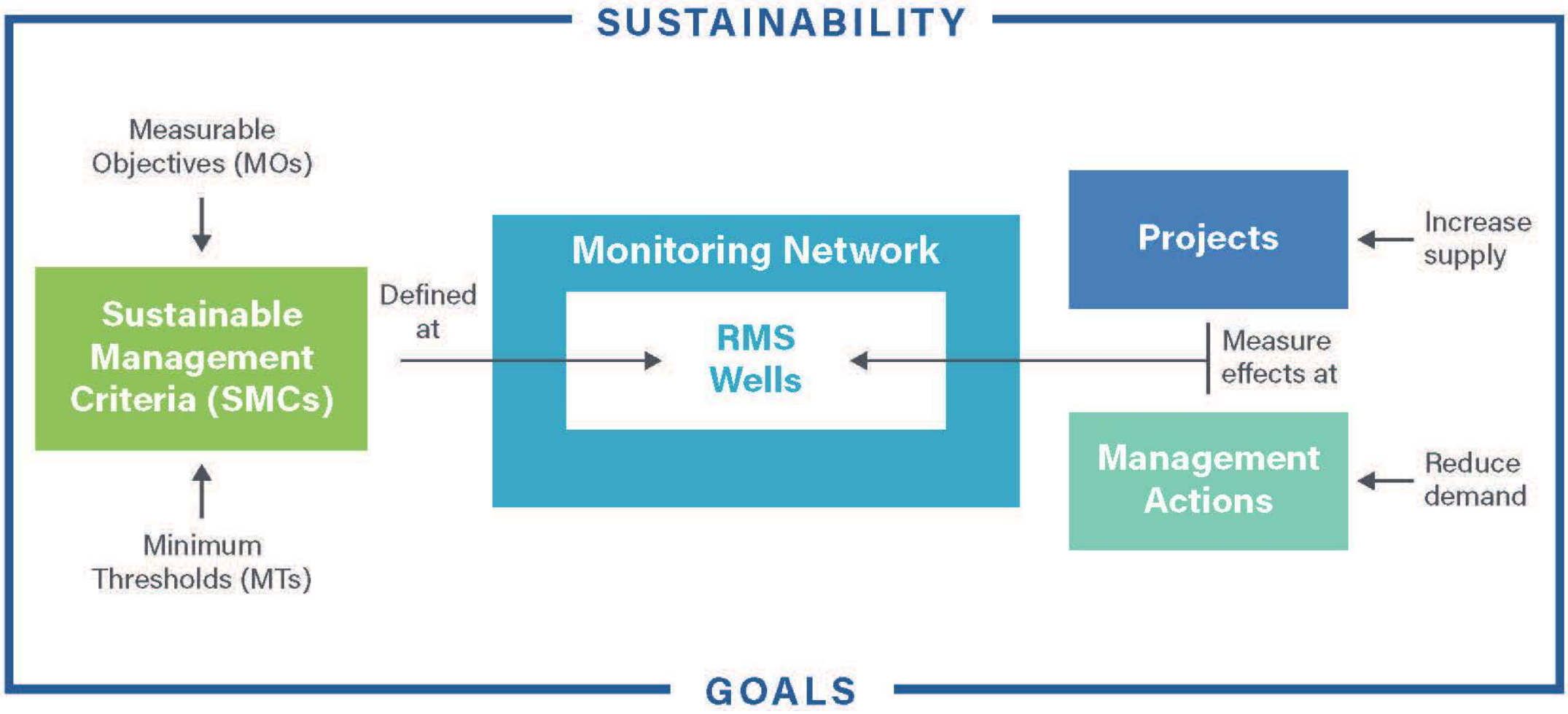
Representative Monitoring Sites (RMS)
A subset of a basin's complete monitoring network, where minimum thresholds, measurable objectives, and interim milestones are set.

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

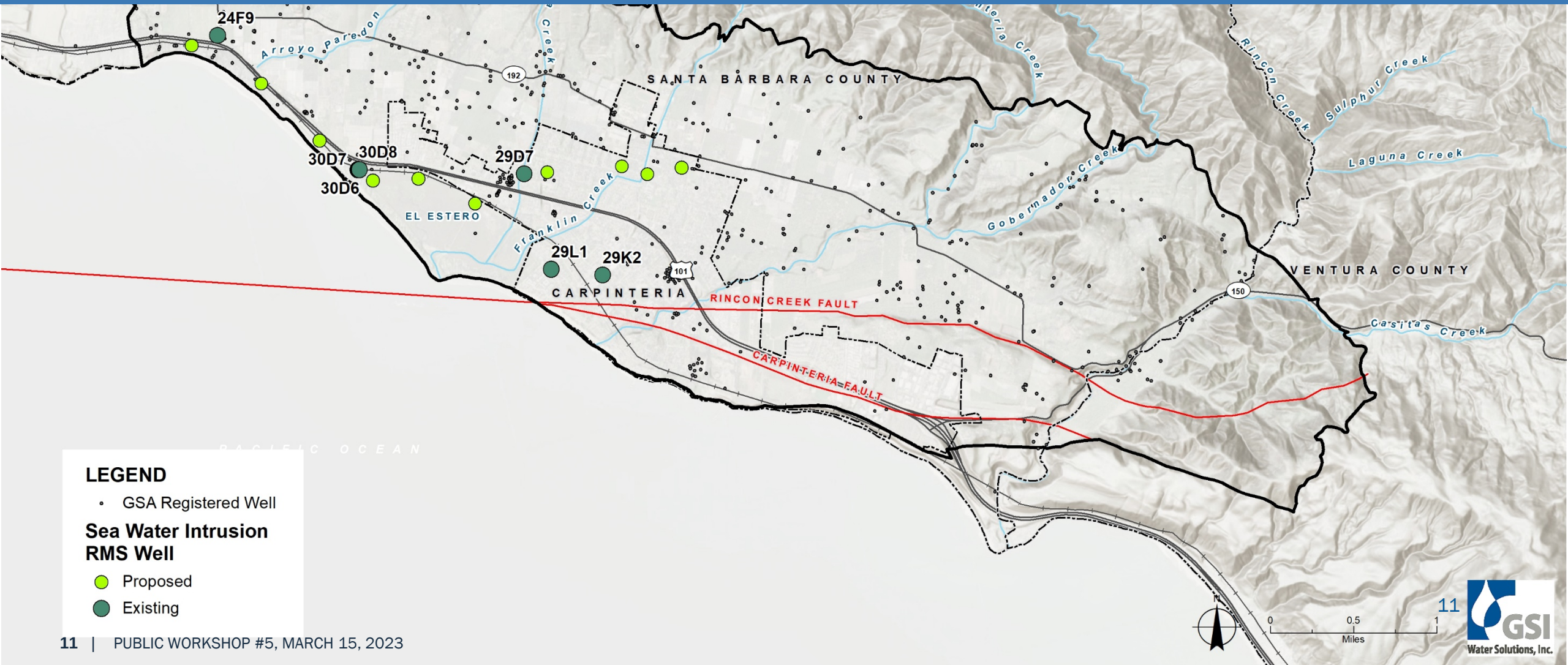
Pathway to Sustainability

- 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.

Seawater Intrusion RMS Wells

New Monitor Wells along Coast would be RMS Wells



SGMA Regulation: Seawater Intrusion SMCs – Chloride Concentration Isocontour Line

§ 354.28. Minimum Thresholds

(3) Seawater Intrusion.

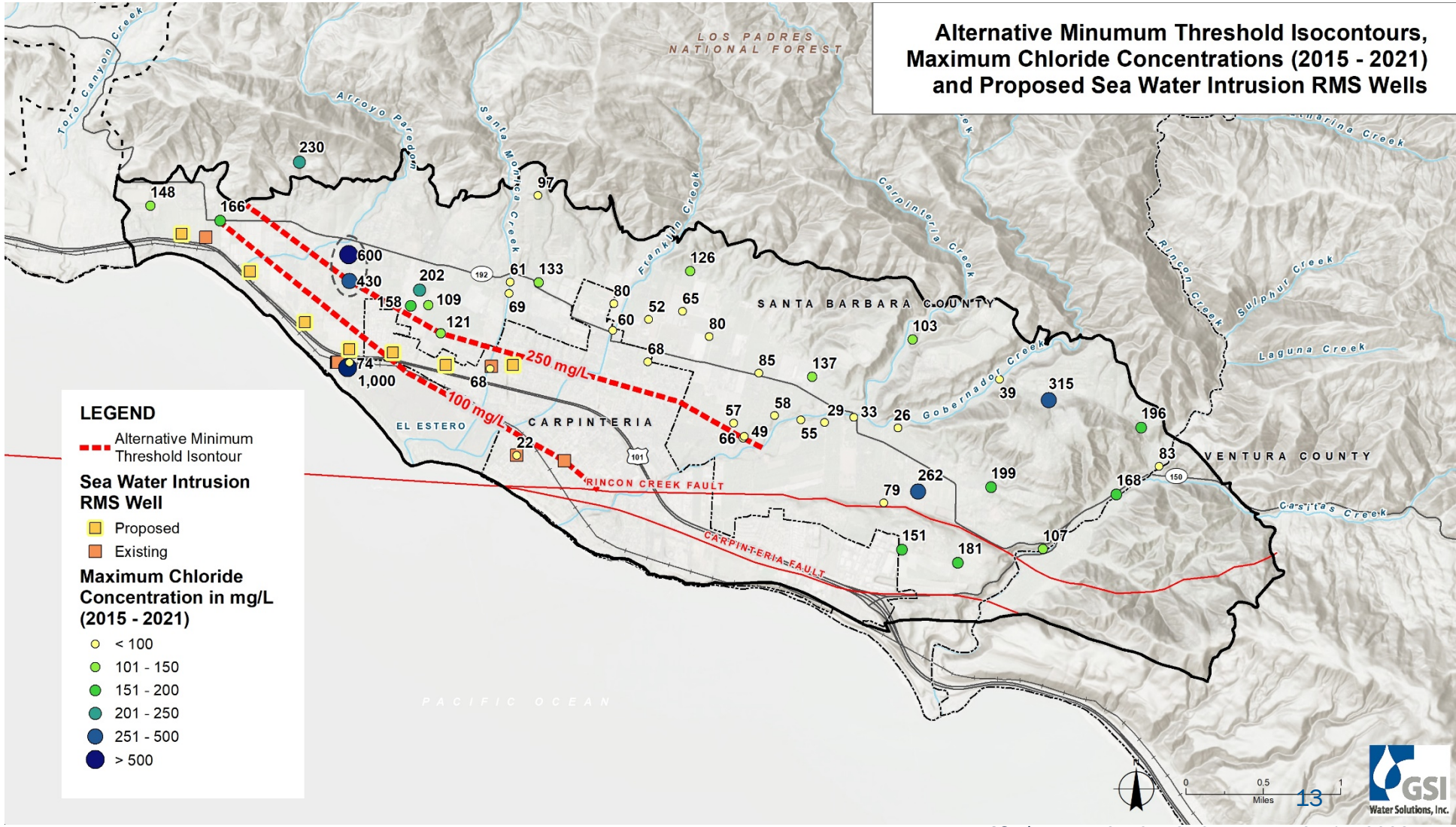
The minimum threshold for seawater intrusion shall be defined by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results.

Seawater Intrusion SMCs – Proposed Minimum Threshold and Measurable Objective Isocontours

Separate Isocontour lines for MTs and MOs.

Considerations for Analysis:

- **MO = 100 mg/L isocontour ~ halfway between coast and active well locations. Future monitoring will focus on this line.**
- **MT = 250 mg/L on a line connecting active wells**
- **Specifically excludes area near Arroyo Paredon with documented high chlorides**



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*

- **Private domestic supply wells losing ability to supply water to homes. 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**
- **Pumping patterns**

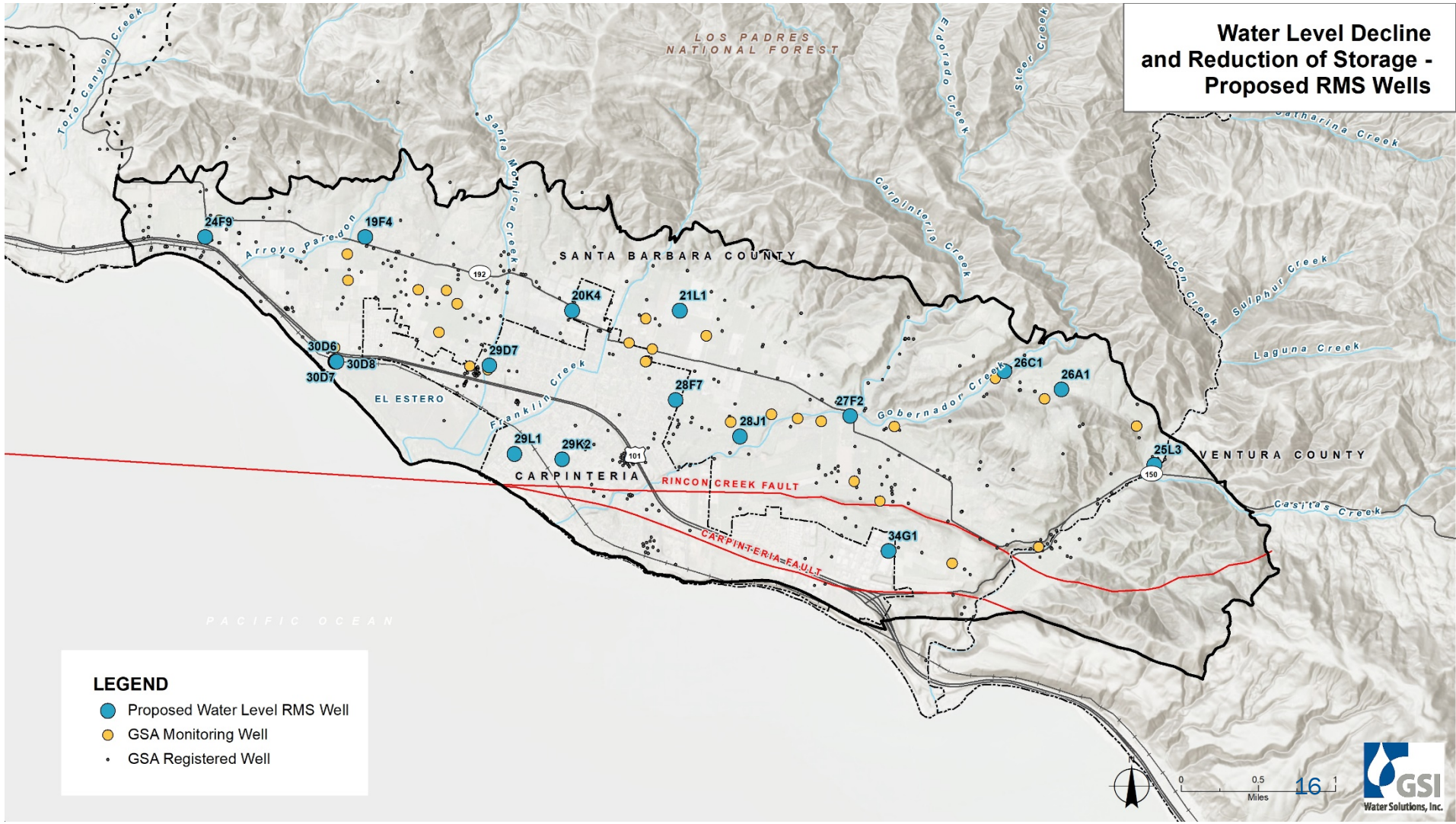
Reduction in Storage SMCs may be, and commonly are, defined as water levels similar to the Water Level Decline SMCs.

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

Metric- Defined GW Elevation

Considerations :

- **Period of Record**
- **Known construction details**
- **Dedicated monitoring well preferred**
- **Data Gaps/spatial distribution**
- **Accessibility for ongoing monitoring**
- **Are they Representative?**



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

Metric- Defined GW Elevation

Considerations :

- **Period of Record**
- **Known construction details**
- **Dedicated monitoring well preferred**
- **Data Gaps/spatial distribution**
- **Accessibility for ongoing monitoring**

Water Level Decline/Storage Reduction RMS Well Information Summary
Carpinteria Groundwater Sustainability Agency

Well No.	Owner	Use	Water Level Monitor	Water Quality Monitor	Year Drilled	Drilled Depth (ft)	Casing Depth (ft)	Water Level Data Start
4N/25W-19F4	Private	M	yes		1930	250		1941
4N/25W-20K4	CVWD	I	yes		1989	1988	903	1989
4N/25W-21L1	Private	A	yes	yes	1991	810	732	1992
4N/25W-25L3	Private	A	yes	yes		190		1996
4N/25W-26A1	Private	M	yes		1941	228 vs 480?		1946
4N/25W-26C1	Private	M	yes			250		1949
4N/25W-27F2	CVWD	A	yes	yes	1975	1150	825	1975
4N/25W-28D5,6,7	CGSA	DM	yes	yes	2023	1240	360, 925, 1040	2023
4N/25W-28F7	CVWD	A	yes	yes	1976	1271	1240/980	1976
4N/25W-28J1	Private	A	yes	yes	1919	175	175	1940
4N/25W-29D7	CVWD	DM	yes		1972	982	950	1977
4N/25W-29K2	Private		yes		1989	320	320	1992
4N/25W-29L1	Private	M	yes			110		1946
4N/25W-30D6	CVWD	DM	yes	yes	2019	1240	1,120	2019
4N/25W-30D7	CVWD	DM	yes	yes	2019	1240	870	2019
4N/25W-30D8	CVWD	DM	yes	yes	2019	1240	340	2019
4N/25W-34G1	Private	M	yes		1990	279	278	1991
4N/26W-24F1	Private	A		yes	1922	262 vs 146	227 vs 146	
4N/26W-24F9	Private	A	yes	yes	1990	481	440	2022

* Data sources includes information collected from State Well Drillers reports, field inspection and SB Co. EHD Well Permits.
Use Categories: A - Active Production Well; I - Inactive Production Well; M - Monitoring Well; DM - Dedicated Monitoring Well.

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?
- Consider depth to well screen 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)

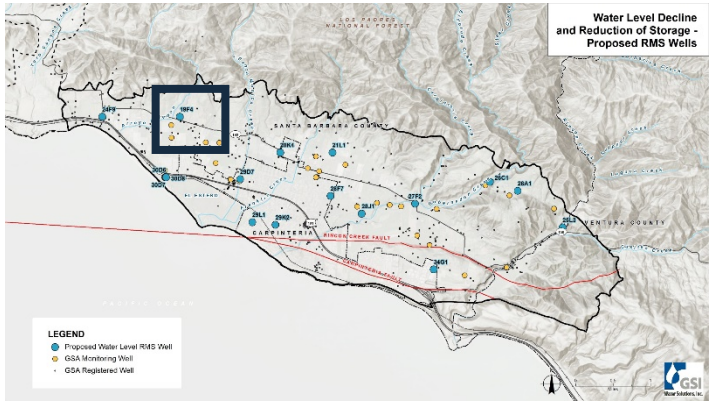
GW Level Declines & Reduction in Storage

Considerations for MOs.
Review water levels at RMS wells.

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

Water Level Decline and Reduction of GW in Storage Section 19

- Representative? Yes. Similar patterns as surrounding wells.
- Undesirable Effects?
  - Not reported. Will check with GSPAC representatives.
  - Water levels could go lower than historically observed if water levels stay above screen



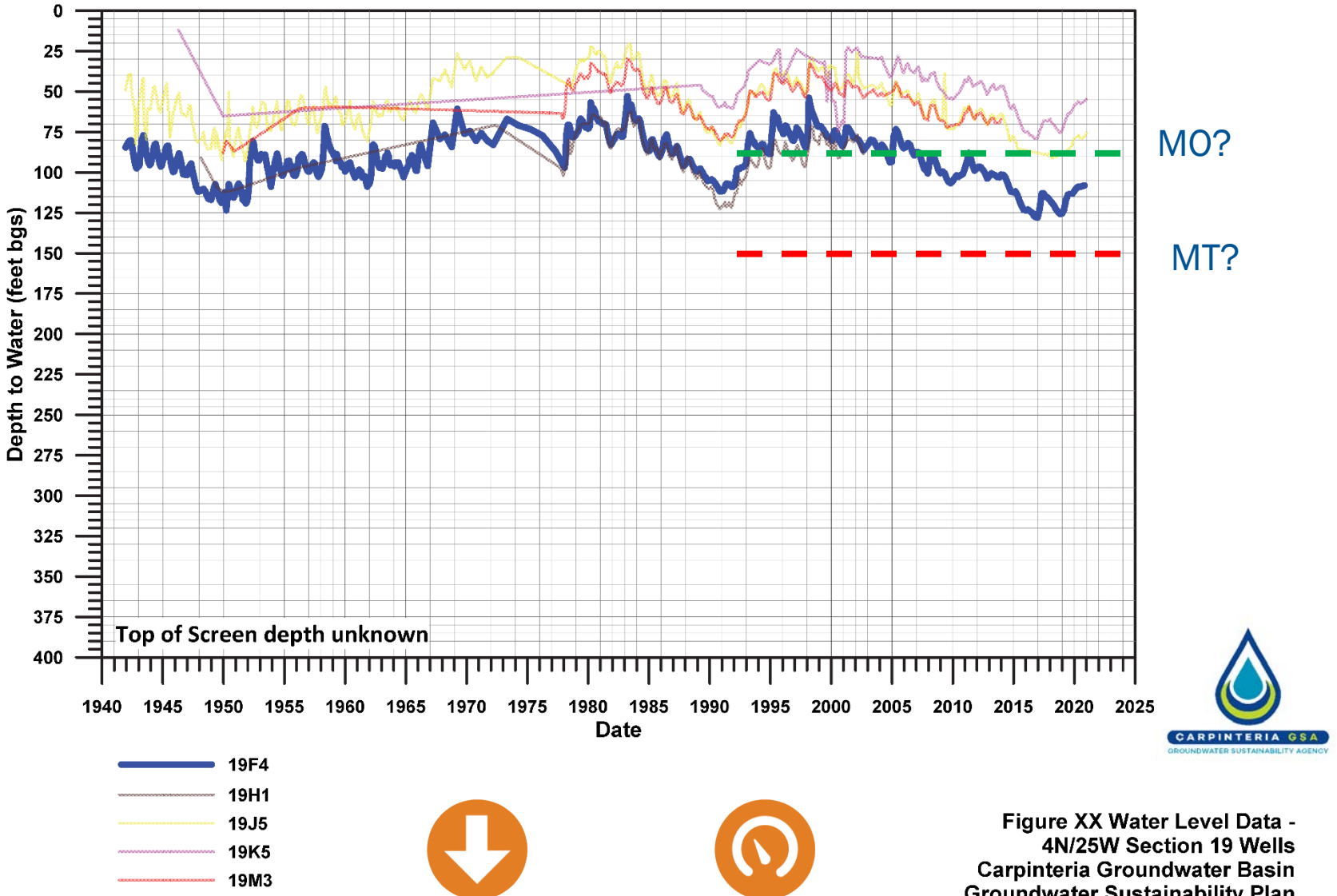
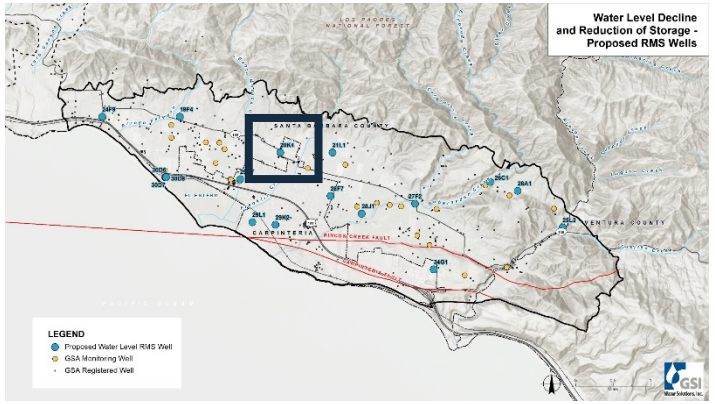


Figure XX Water Level Data - 4N/25W Section 19 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 20

- Representative? Yes.
- Top of Screen 230 feet below recent low WLs.
- Undesirable Effects?
  - Not reported



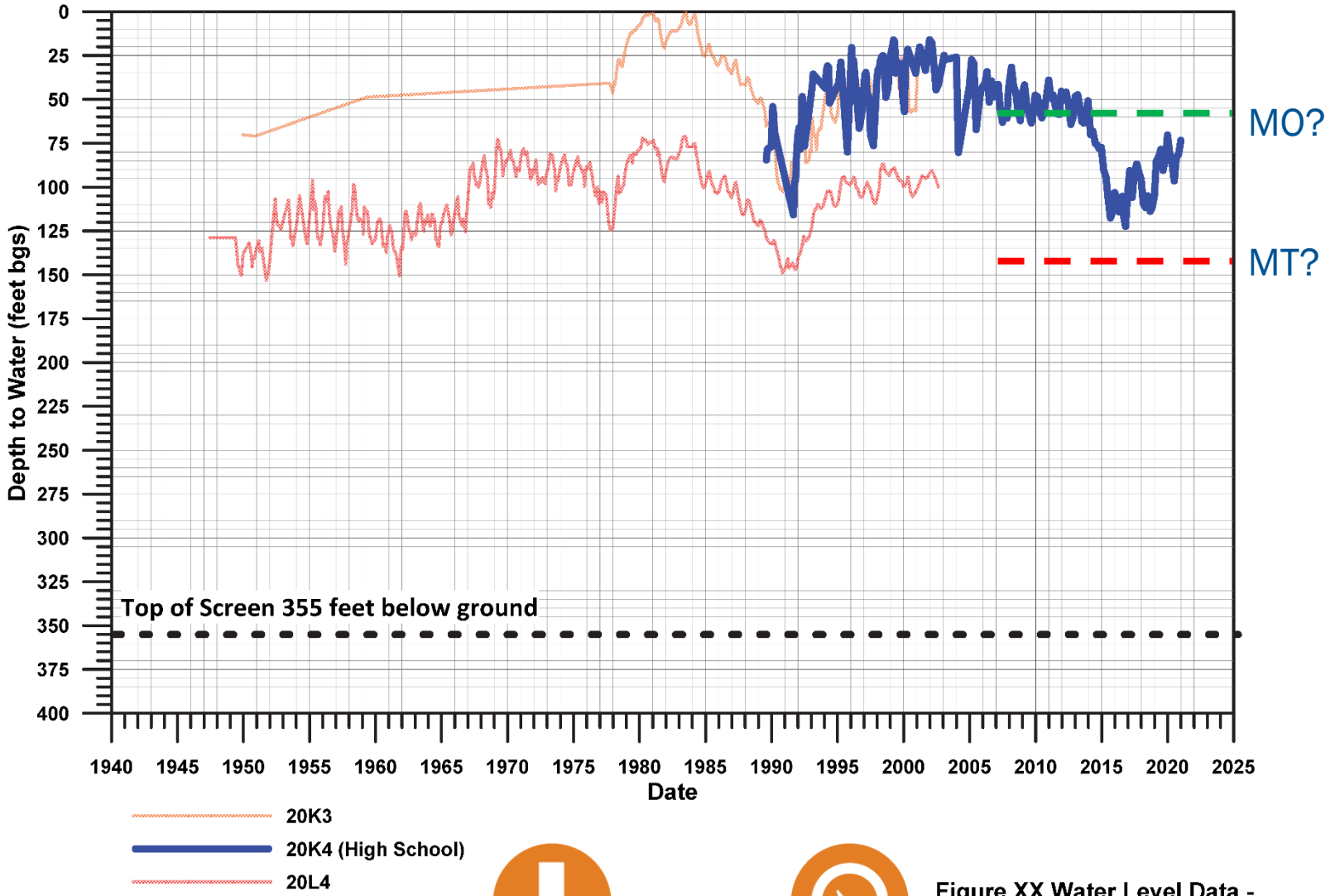
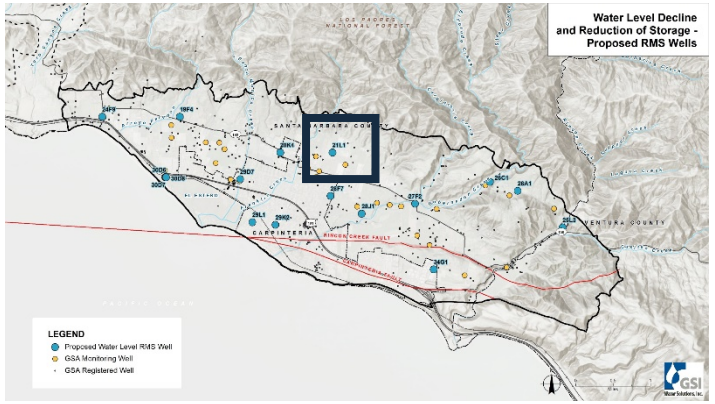


Figure XX Water Level Data - 4N/25W Section 20 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 21

- Representative? Yes.
- Top of Screen 235 feet below recent low WLs.
- Undesirable Effects?
  - Not reported



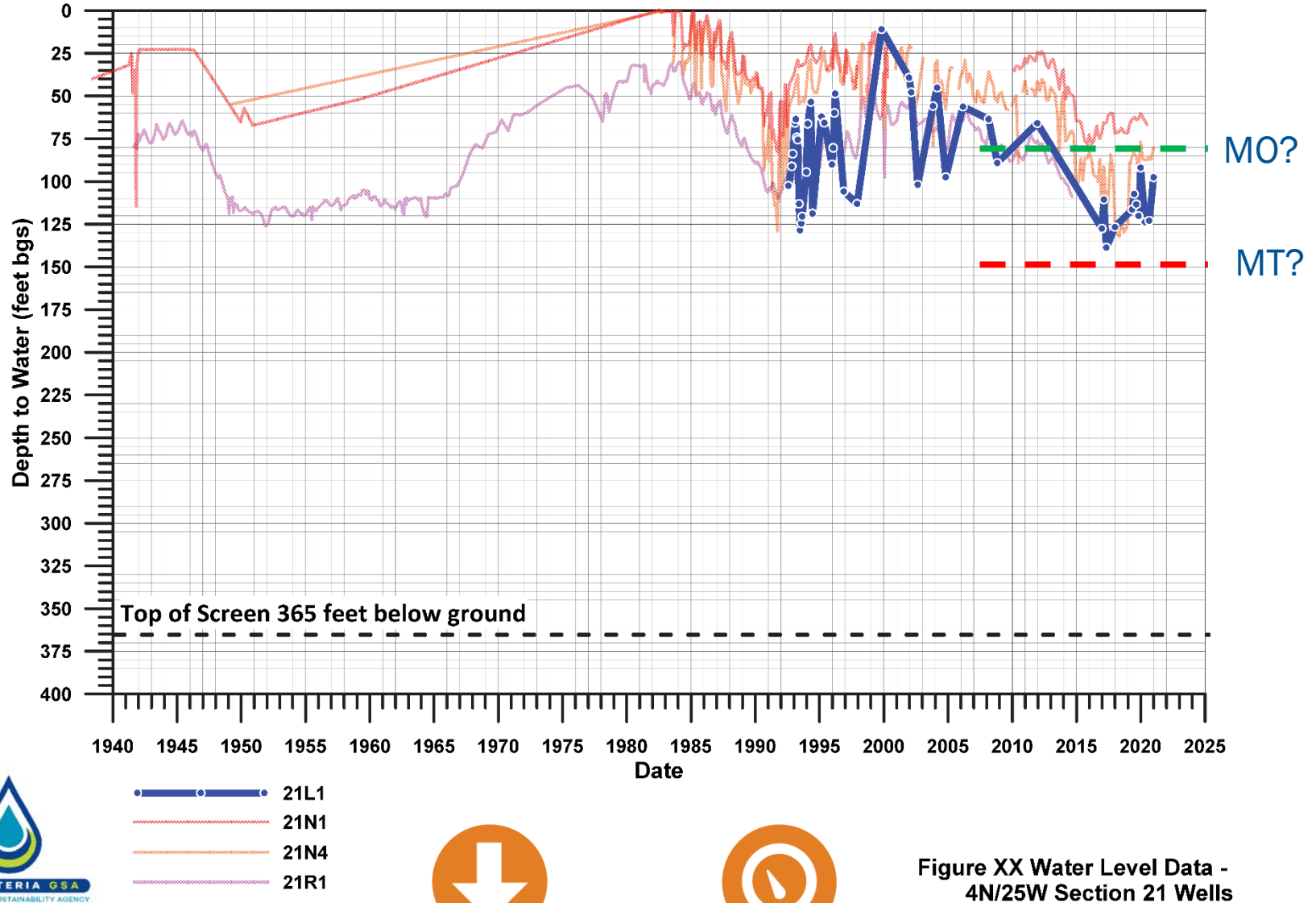
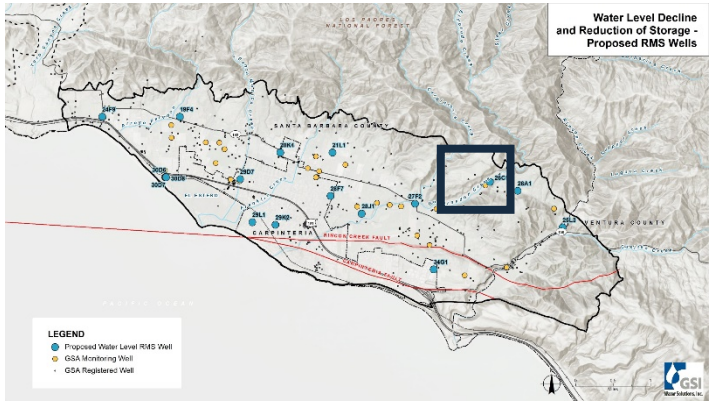
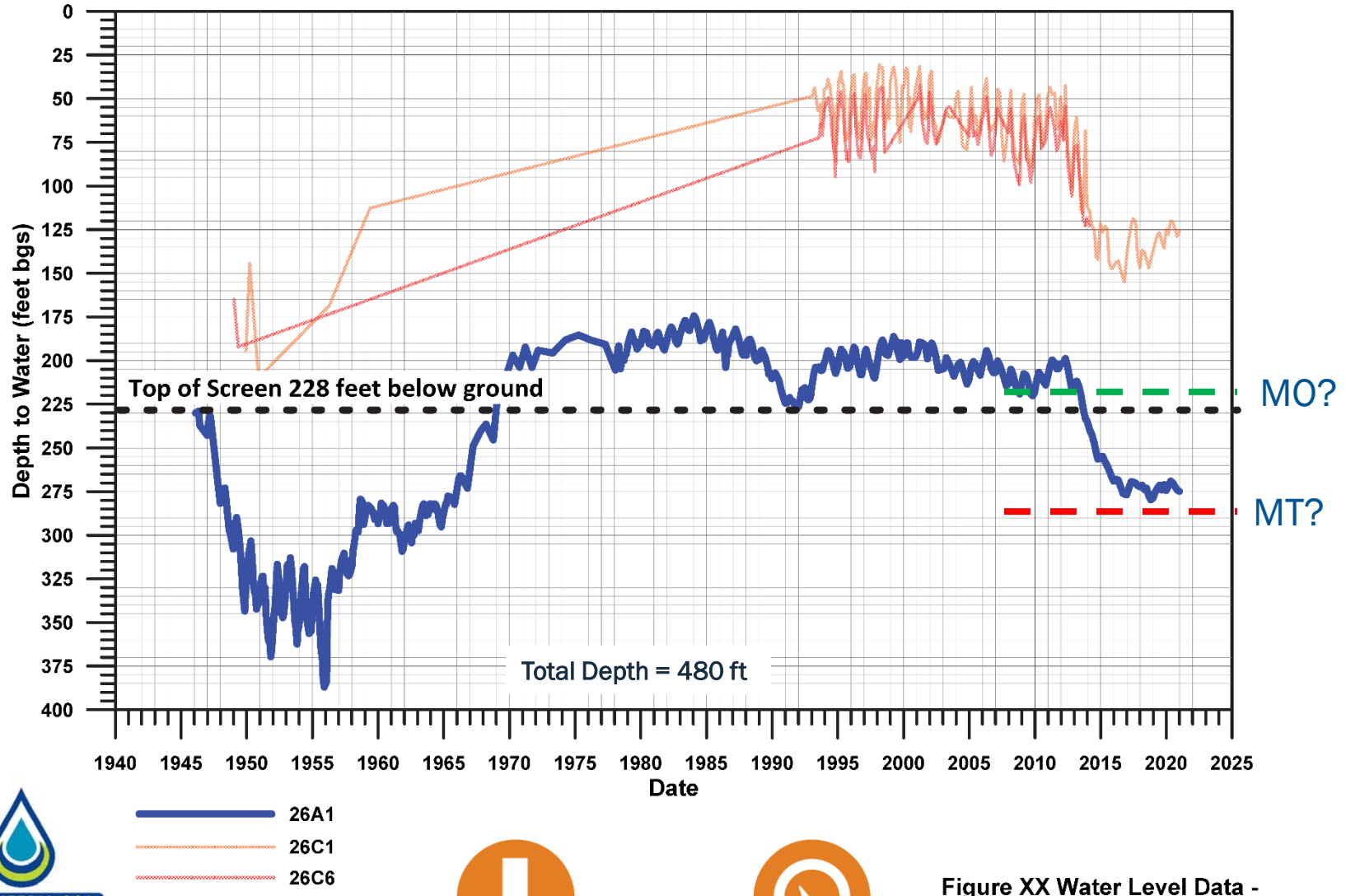


Figure XX Water Level Data - 4N/25W Section 21 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 26

- Representative? Yes.
- Recent low WLs were below top of screen.
- 1950s WLs nearly dropped below well (dry well)
- Undesirable Effects?
  - Not reported
  - Can check with GSPAC members.



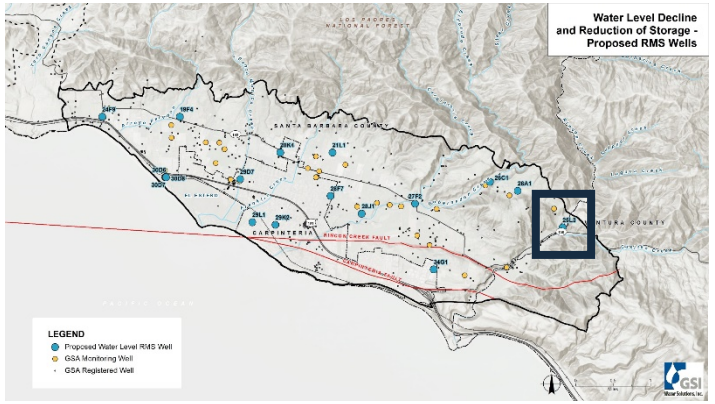


CARPINTERIA GSA
GROUNDWATER SUSTAINABILITY AGENCY

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 25

- Hydrograph appears to indicate spring-fed flow in creek. SGMA can't manage that.
- Could consider to set MTs lower than wet weather flow levels, but only to be considered during wet weather period, if pumping affects WLs.



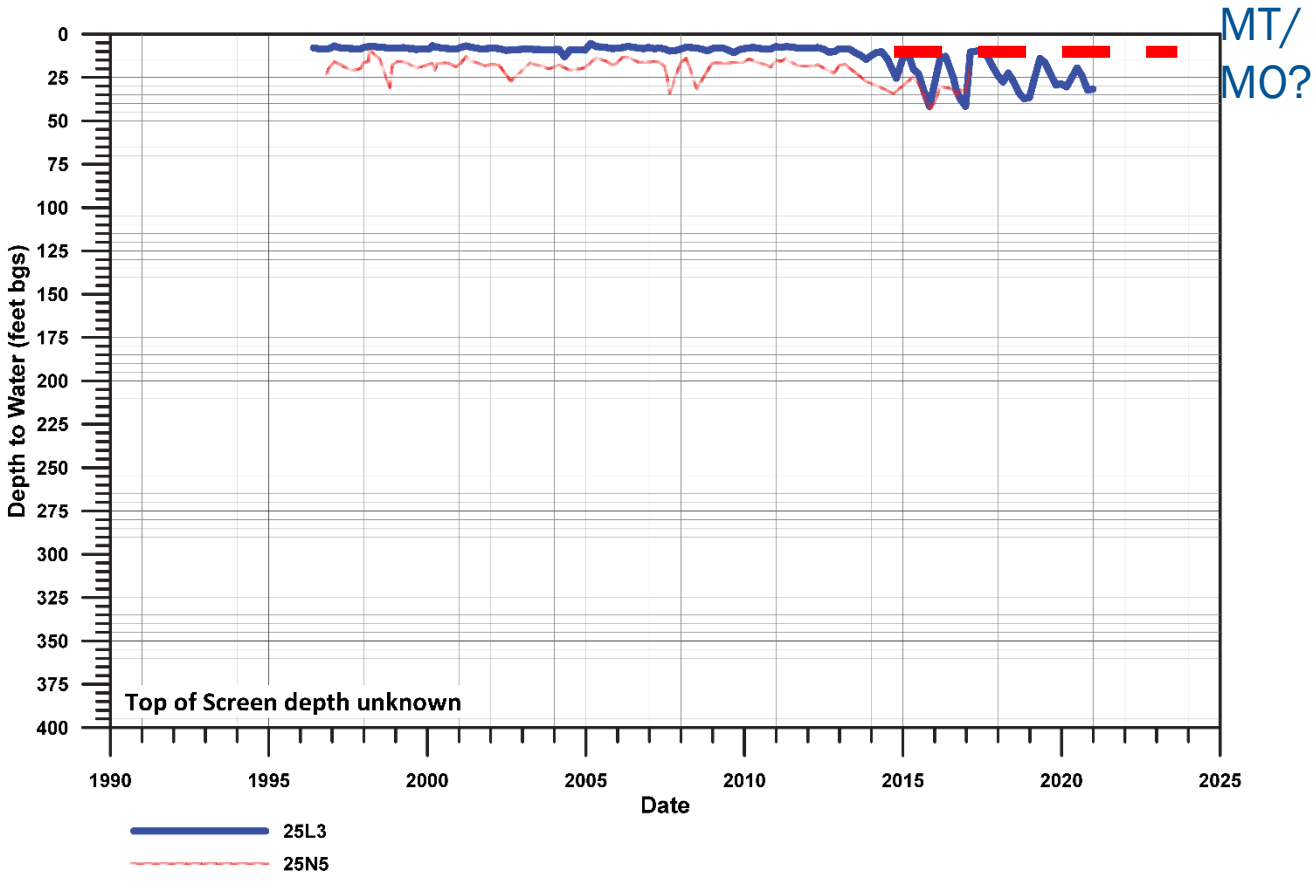
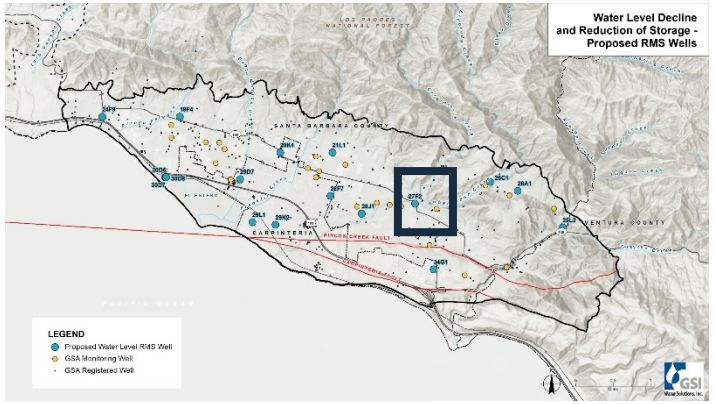


Figure XX Water Level Data - 4N/25W Section 25 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

CARPINTERIA GSA
GROUNDWATER SUSTAINABILITY AGENCY

Water Level Decline and Reduction of GW in Storage Section 27

- Representative? Yes.
- Screen top 245 feet below recent low WL.
- Undesirable Effects?
  - Not reported



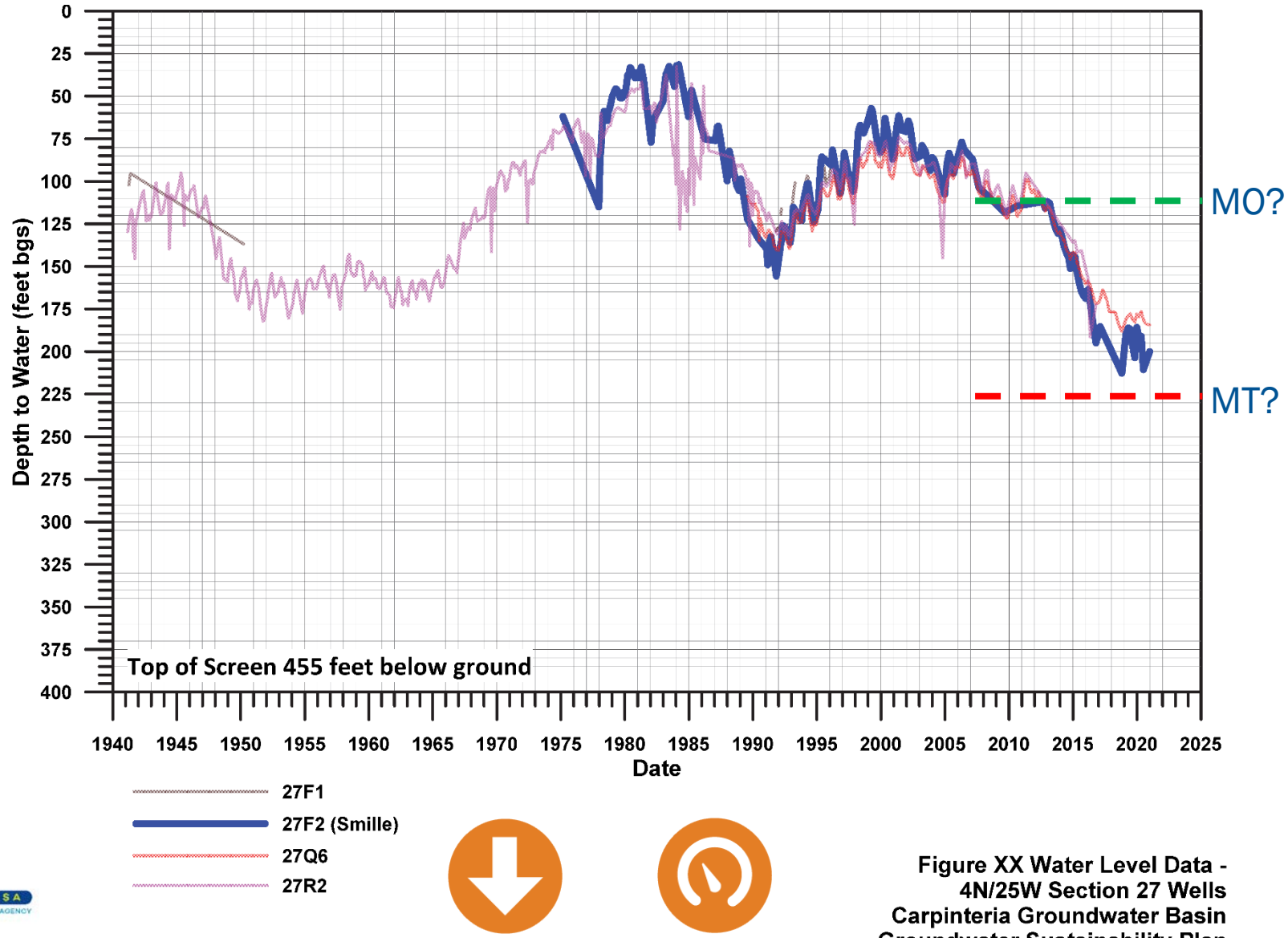
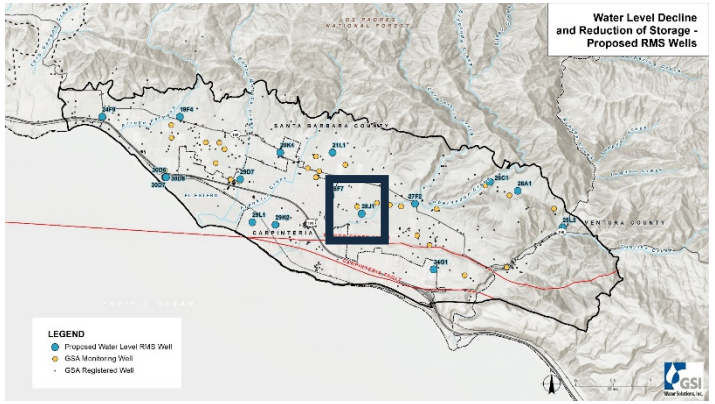


Figure XX Water Level Data - 4N/25W Section 27 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 28

- Representative? Yes.
- Screen top unknown.
- Undesirable Effects?
  - Not reported



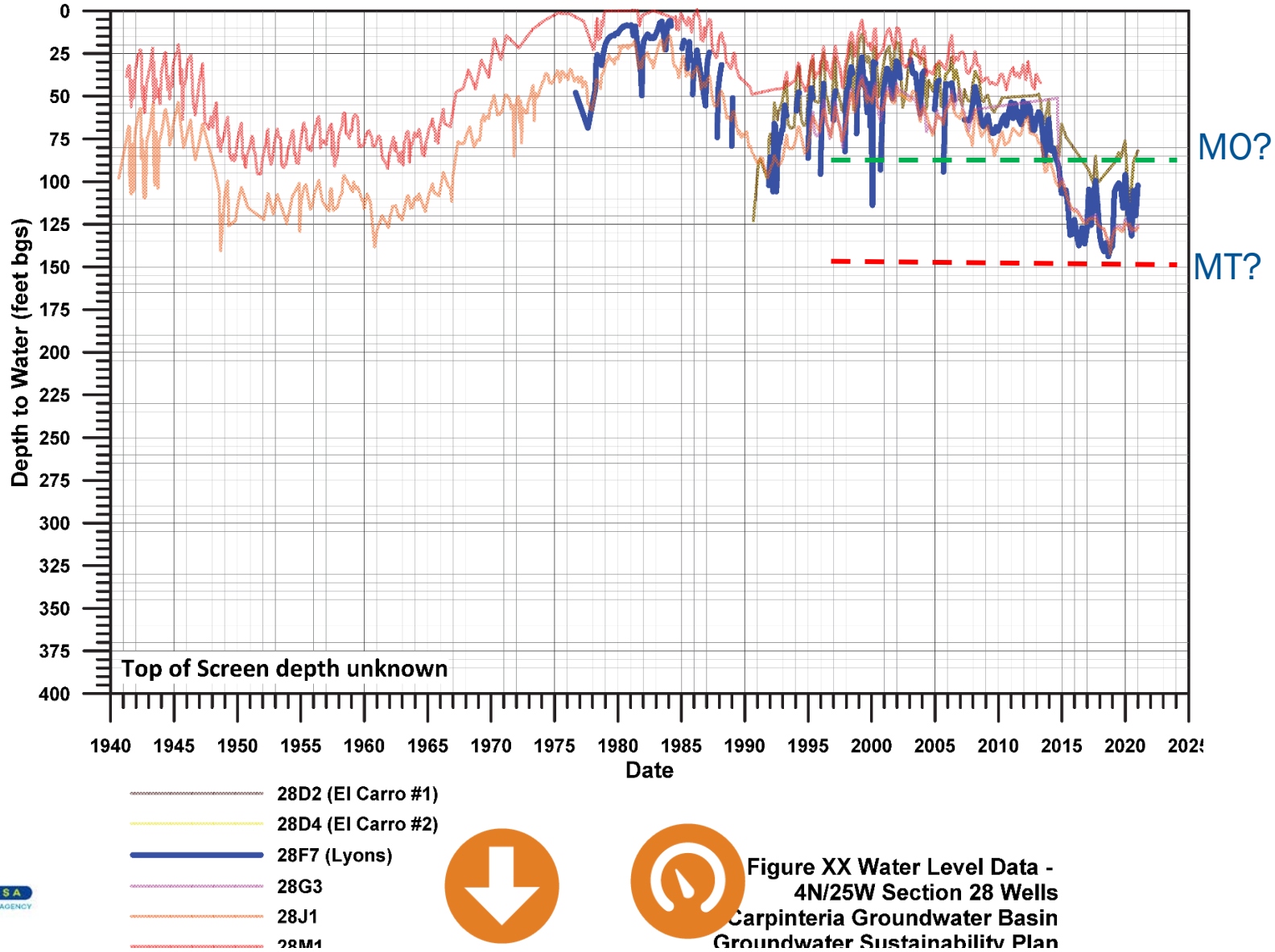
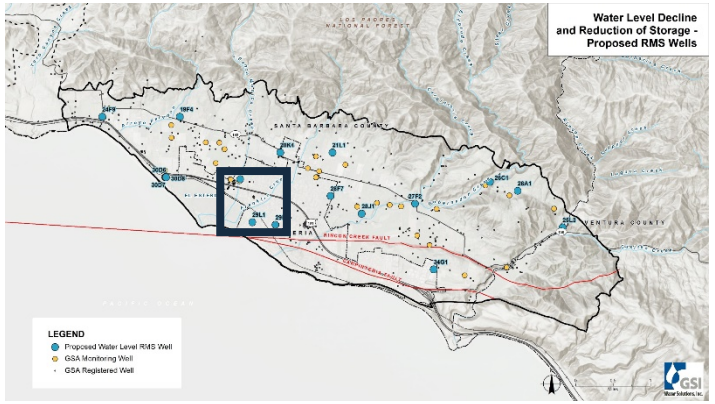


Figure XX Water Level Data - 4N/25W Section 28 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 29

- Representative? Yes.
- Apparent pumping effects on WLs 29D7 need to be screened out.
- Top of Screen ~150 feet below recent low WLs.
- Undesirable Effects?
  - Not reported



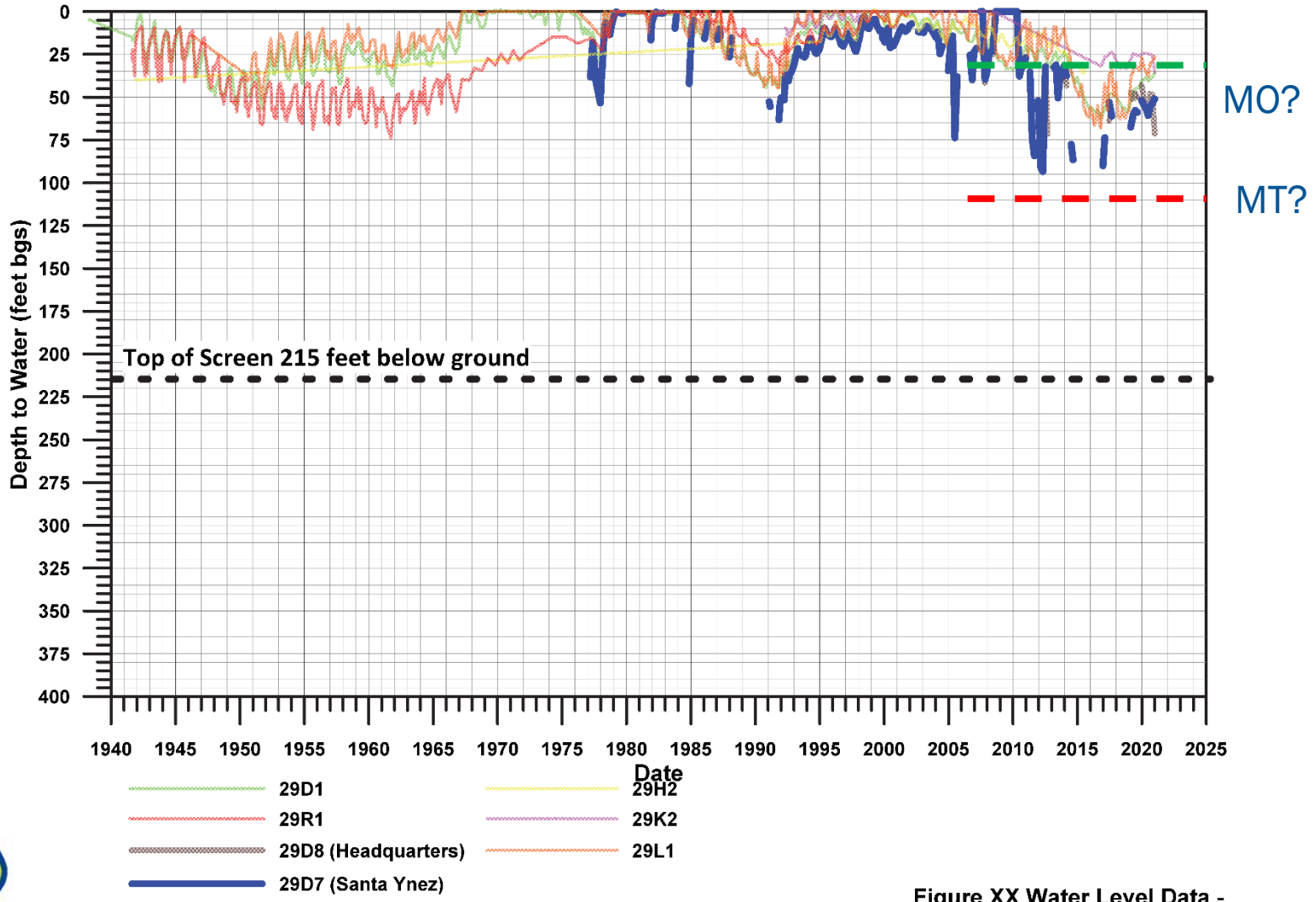
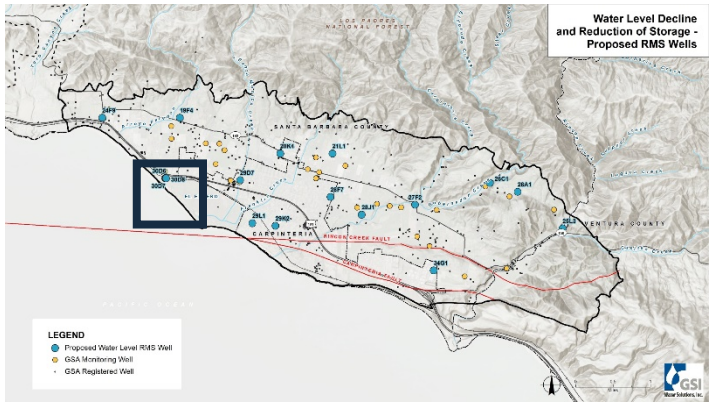


Figure XX Water Level Data - 4N/25W Section 29 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 30

- Artesian flow during wet periods.



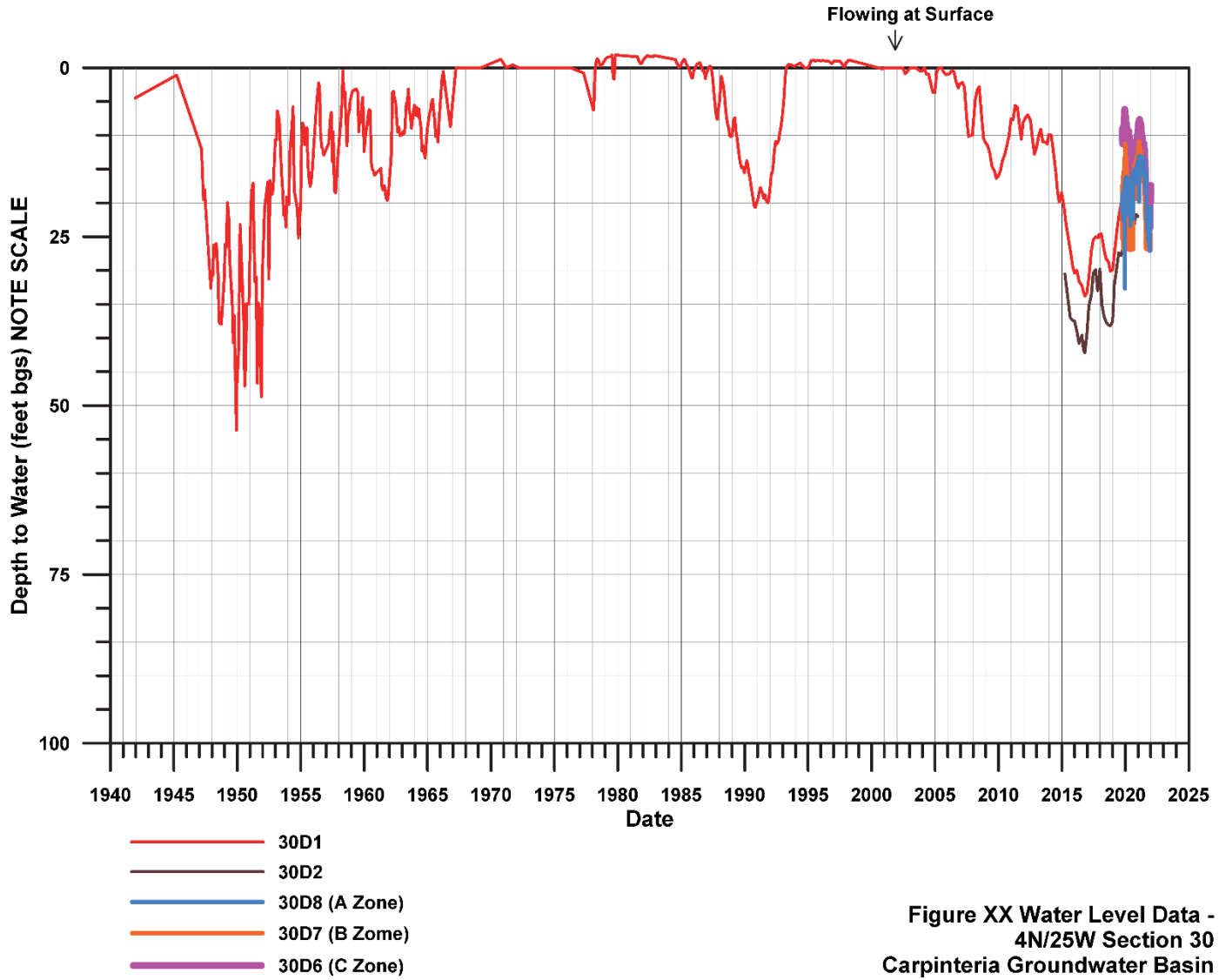
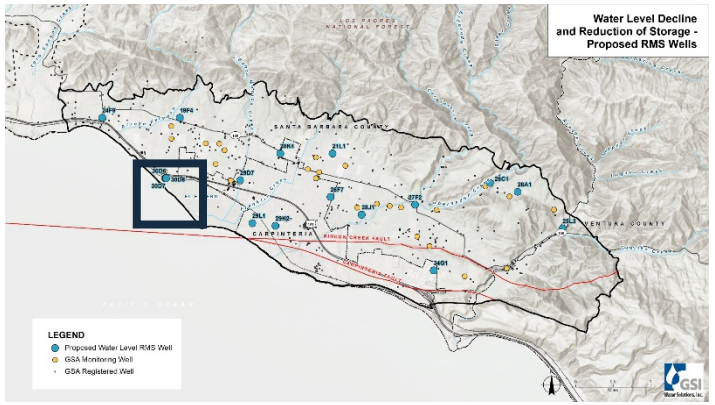


Figure XX Water Level Data - 4N/25W Section 30 Carpinteria Groundwater Basin Groundwater Sustainability Plan

Water Level Decline and Reduction of GW in Storage Section 30

- Sentinel Wells could be used as RMS for water level & GW storage



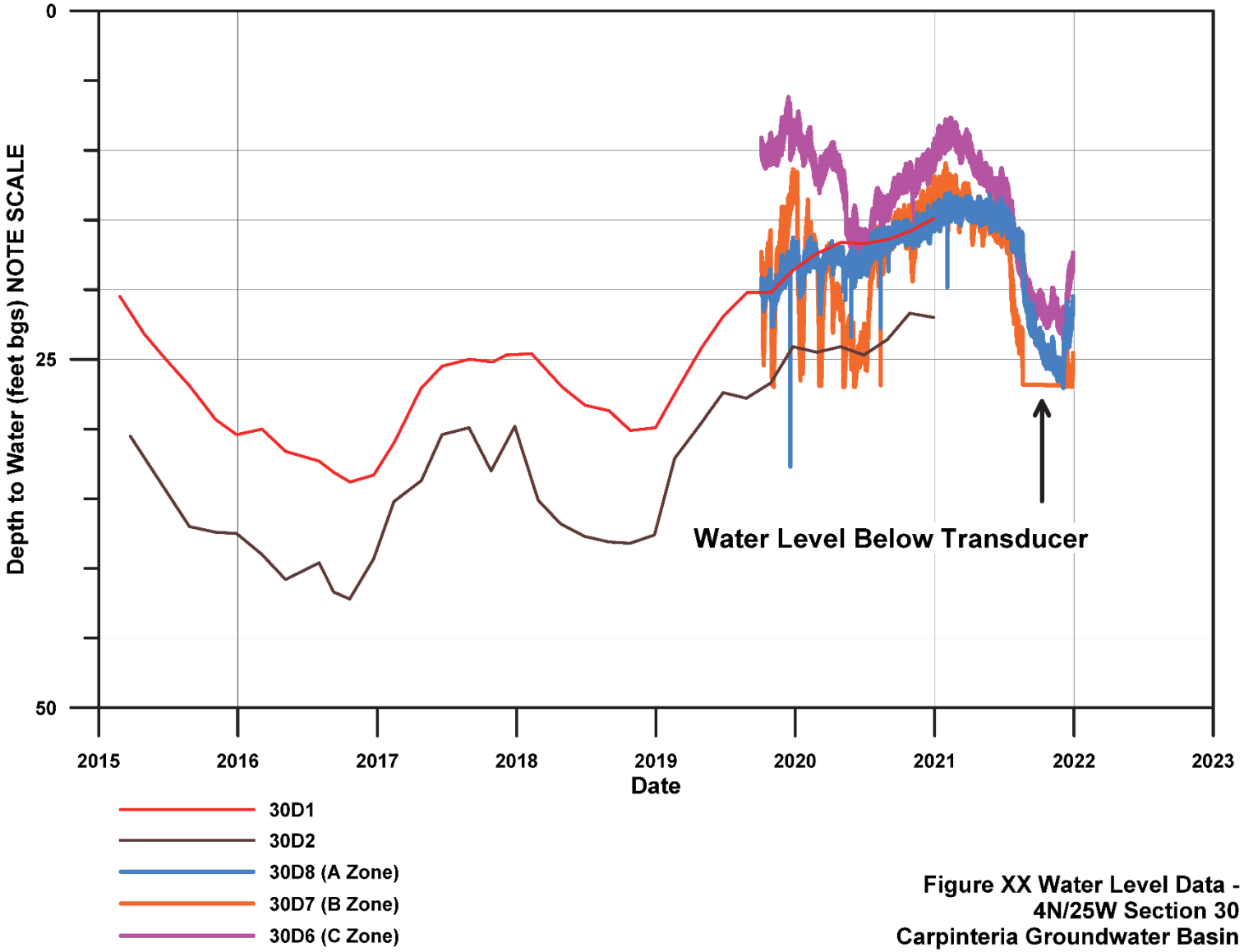
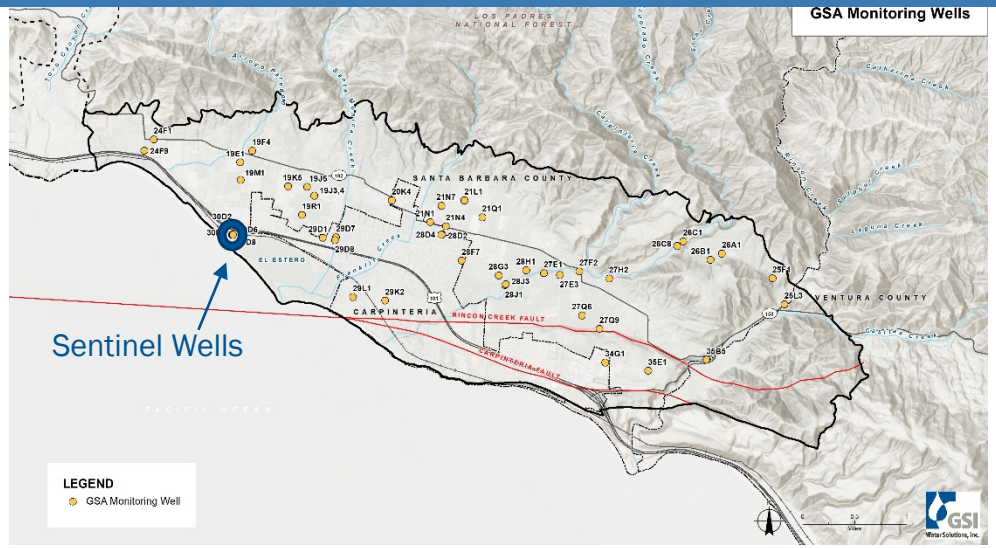
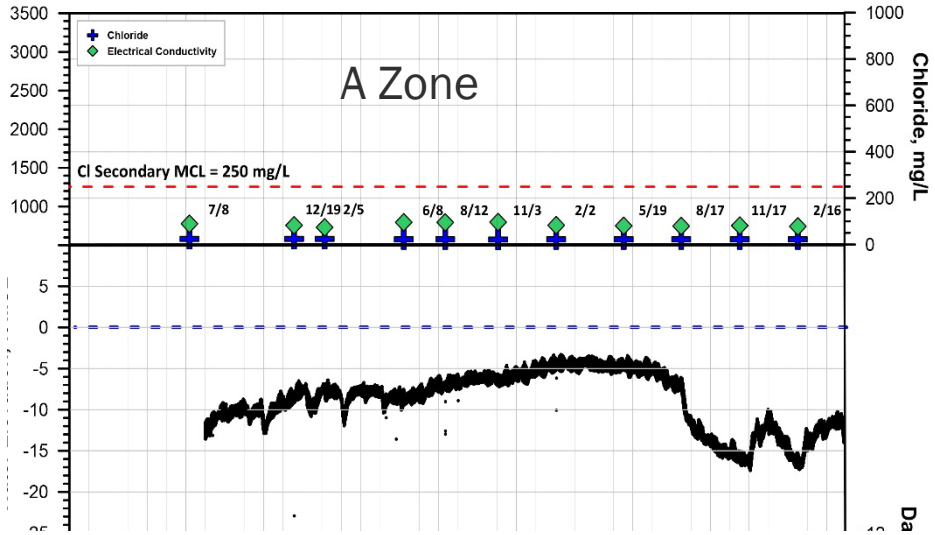


Figure XX Water Level Data - 4N/25W Section 30 Carpinteria Groundwater Basin Groundwater Sustainability Plan

REVIEW OF SENTINEL WELL DATA

Section 30





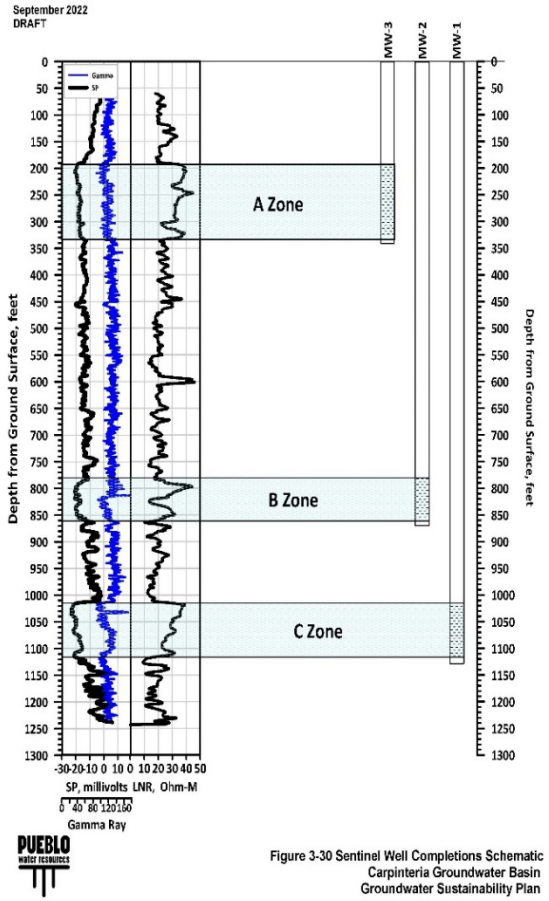
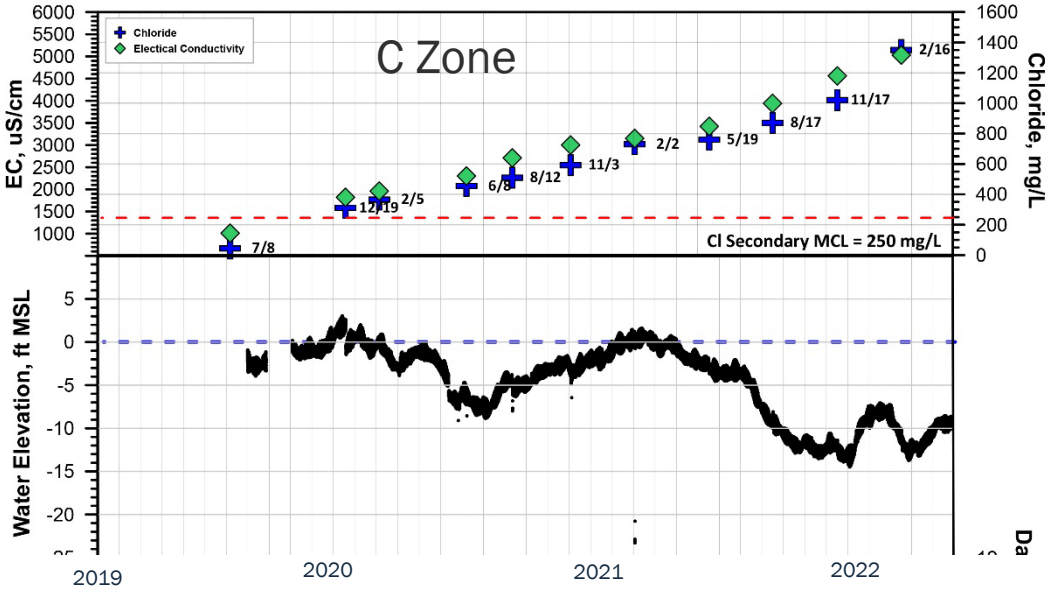
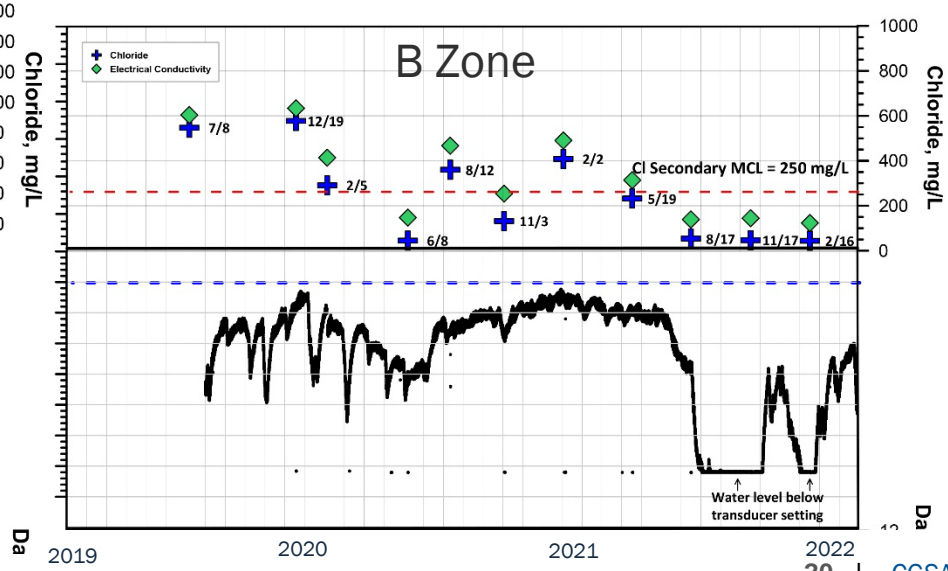


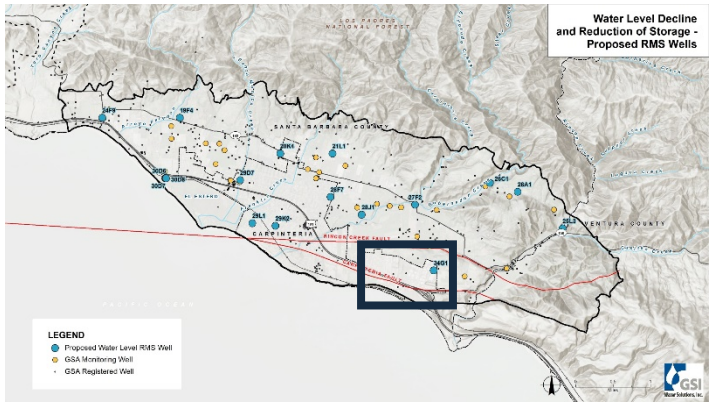
Figure 3-30 Sentinel Well Completions Schematic
Carpinteria Groundwater Basin
Groundwater Sustainability Plan





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

- South of Rincon Creek Fault.
- Screen top unknown.
- Limited GW use in this area.
- Undesirable Effects?
  - Not reported



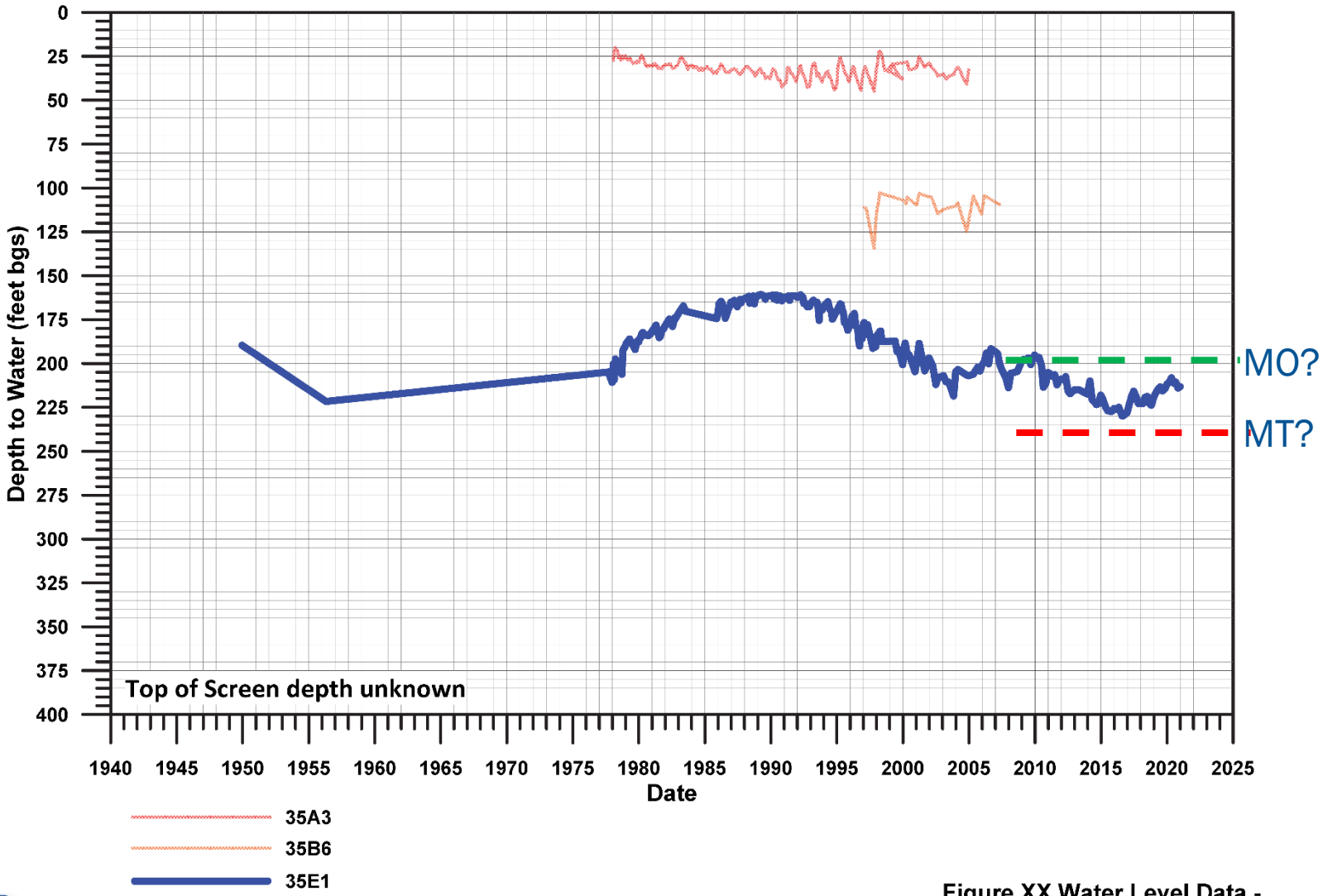


Figure XX Water Level Data - 4N/25W Section 35 Wells Carpinteria Groundwater Basin Groundwater Sustainability Plan

OTHER SMCS

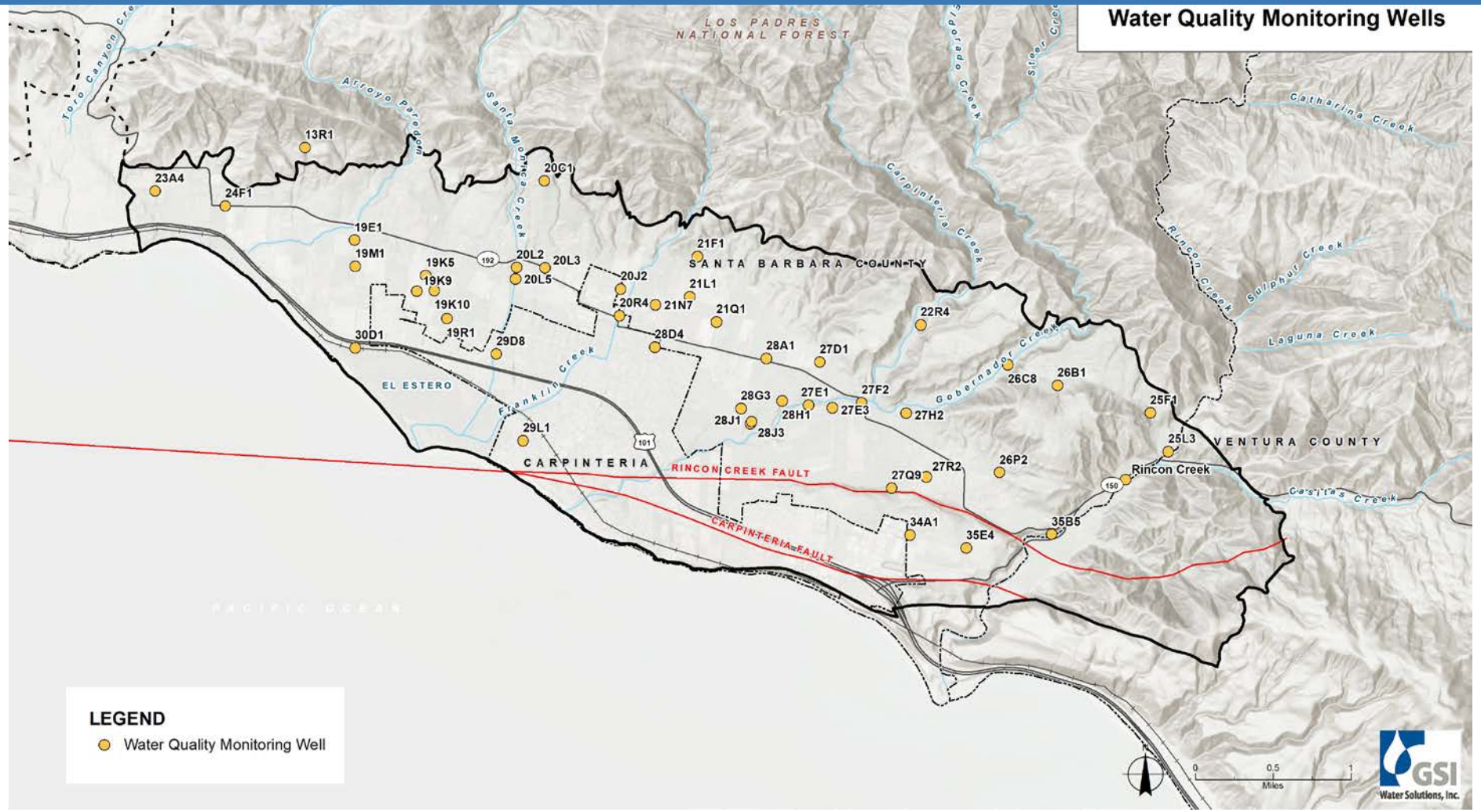
Water Quality Degradation

Interconnected Surface Water Depletions

Land Subsidence

GSA Water Quality Monitoring Network

Existing Water Quality Monitored Wells



RMS wells for WQ monitoring will be a subset of the existing network.

GSA Water Quality Monitoring Network

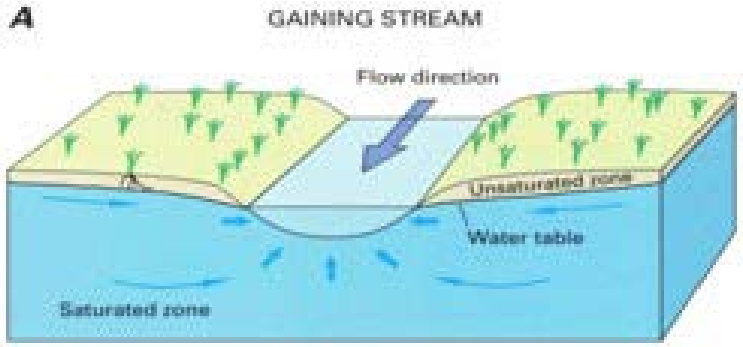
Existing Sampling Program

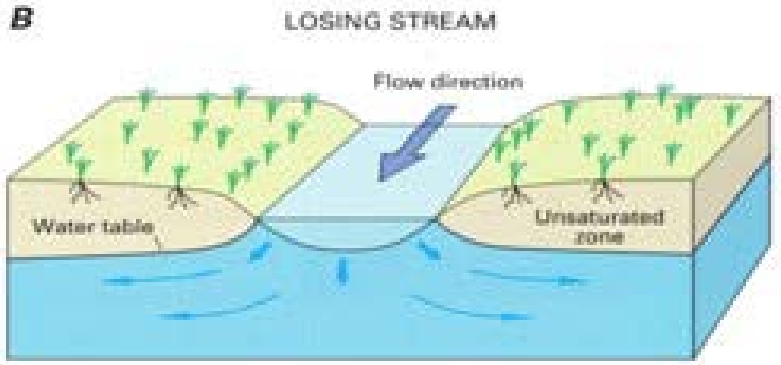
1. Semi-annual Data Collection since 2000.
2. General Mineral Constituents (Anions, Cations, Dissolved Solids, Nitrates, Electrical Conductance.
3. Continuance of SW sampling to be included in Carpinteria Basin GSP. (Surface Water sampling not required by SGMA but GW quality is related to surface water quality in some areas, i.e., Arroyo Paredon.
4. SGMA not intended to manage to improve water quality, just to avoid degradation due to groundwater use. SMCs will be based on historical WQ data.
5. 2015 is baseline for SGMA conditions.

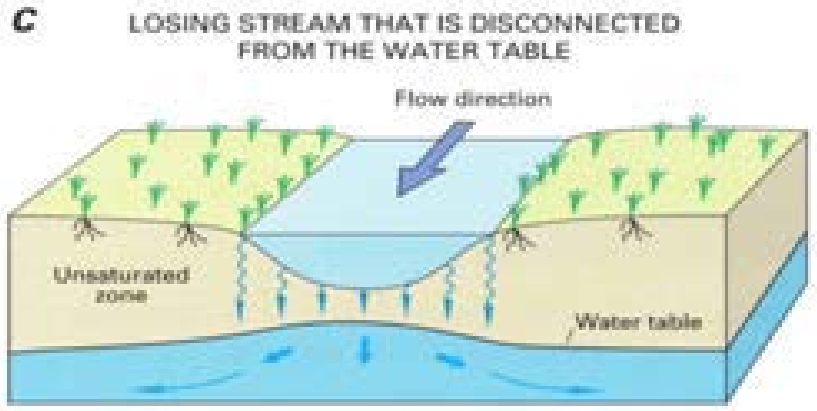
Interconnected Surface Water and Groundwater

- The potential interactions between surface water bodies (such as creeks) and groundwater in a basin can take place in three basic ways:

1. A gaining stream or creek that receives water from groundwater,
2. A losing stream or creek that recharges basin aquifers from surface water, or
3. A stream or creek that may be separated from groundwater by a hydrologic formation, such as a low-permeability aquitard that prevents interaction between surface water and groundwater completely.



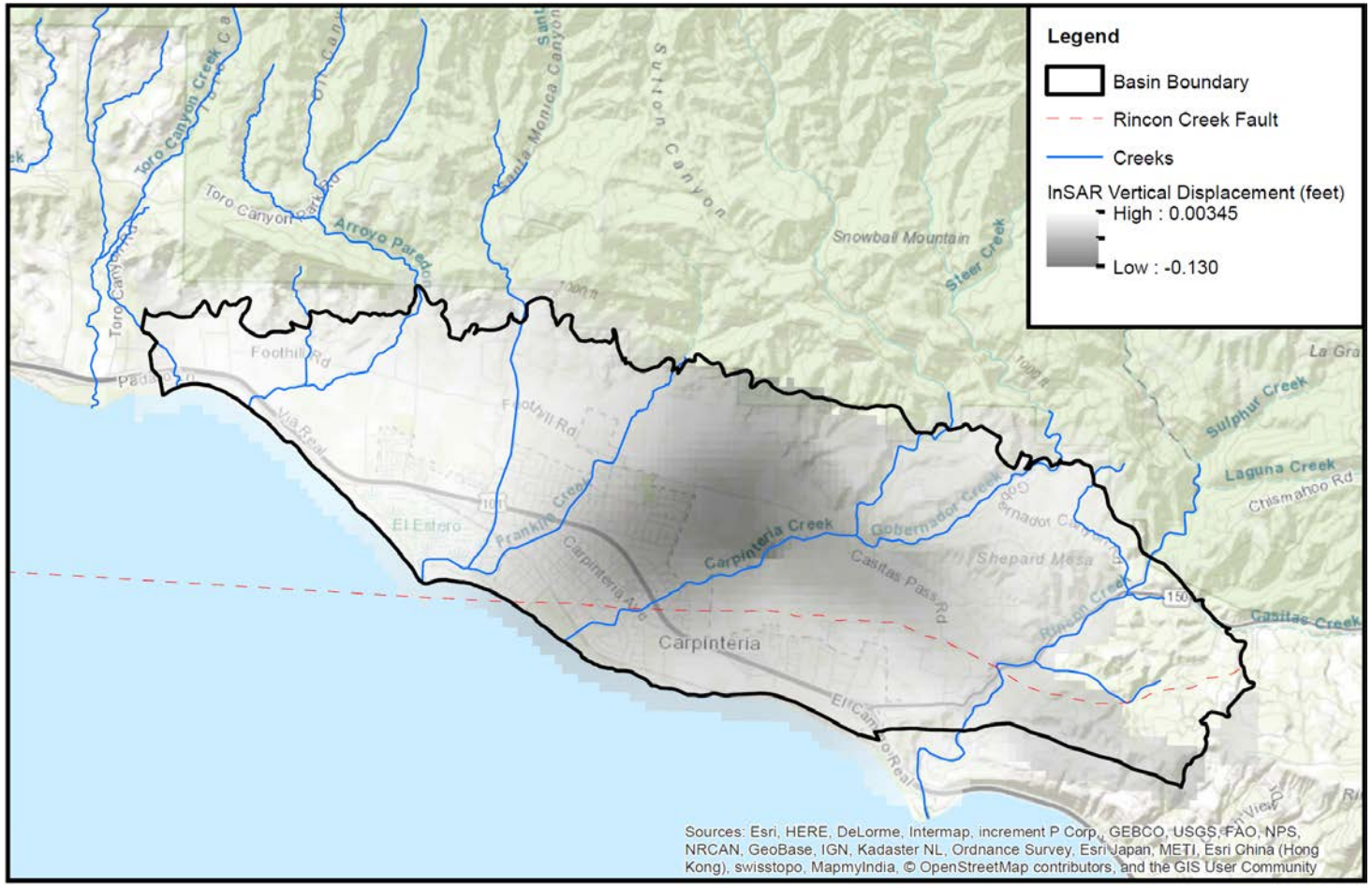




DWR guidance on this SI was unclear. Additional Guidance coming.
Likely to be model-based analysis in the future.

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

- Subsidence 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



WHAT'S NEXT

WHAT'S NEXT: Upcoming Public Workshops

SMCs → **Projects and Management Actions** →

PUBLIC WORKSHOP

GSA Public Workshop
April 19 2023•
6:00pm-8:00pm

PUBLIC WORKSHOP.

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

Learn more or take action at
CarpGSA.org

GSPAC Schedule and Topics

February 2023
GSPAC Meeting #1 (Completed)

1. Welcome, Introductions/Icebreaker.
2. Overview of SGMA.
3. Discuss purpose and plan for advisory committee involvement in GSP process.
4. Establish guidelines for committee participation; review bylaws.
5. Schedule and topics for future meetings.
6. Review topics from previous workshops: basin conditions; introduction to SMCs.

March 28 2023
GSPAC Meeting #2

1. Review Seawater Intrusion SMCs.
2. Discuss draft SMCs for Water Level Declines and Reduction in Storage, and comment on which are most appropriate for the basin.
3. Review 3 “minor” sustainability indicators and SMCs (subsidence, WQ, GW/SW interaction).

April 25, 2023
GSPAC Meeting #3

1. What projects and management actions are preferred and are the priority?
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?