

Sustainable Management Criteria and Projects and Management Actions for the CMA

MAY 24, 2021



Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency



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DUDEK

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Presentation Content

1. Sustainable Management Criteria
 1. Groundwater Levels and Groundwater in Storage
 1. Proposed Approach
 2. Buellton Upland
 3. Santa Ynez River Alluvium
 2. Water Quality
 3. Interconnected Surface and Groundwater
 4. Land Subsidence
2. Introduction to Projects and Management Actions
 1. Central Management Area Projects and Management Actions
 2. Basin Wide Projects and Management Actions

Sustainable Management Criteria (SMC) Overview

- Buellton Upland Subarea
 - Buellton principal aquifer (Paso Robles and Careaga Formations)
 - Large data gap regarding water elevations
 - The GSP will propose monitoring program to fill that gap
 - Adding new volunteer wells into the water level monitoring program. Thanks to those contributing wells to the program.
- Santa Ynez River Alluvium Subarea
 - Shallow Wells (< ~150-200 feet deep) in highly permeable recent alluvium
 - Governed by SWRCB as surface water, not subject to SGMA
 - Propose only to monitor groundwater dependent ecosystems.
 - Deep Wells (> ~150-200 feet deep) in lower permeable older deposits
 - Part of the Buellton principal aquifer (Paso Robles and Careaga Formations)
 - Occurs east of Buellton Bend along river (more precise boundary will be determined by recent aerial geophysical study)

Undesirable Results Not Occurring

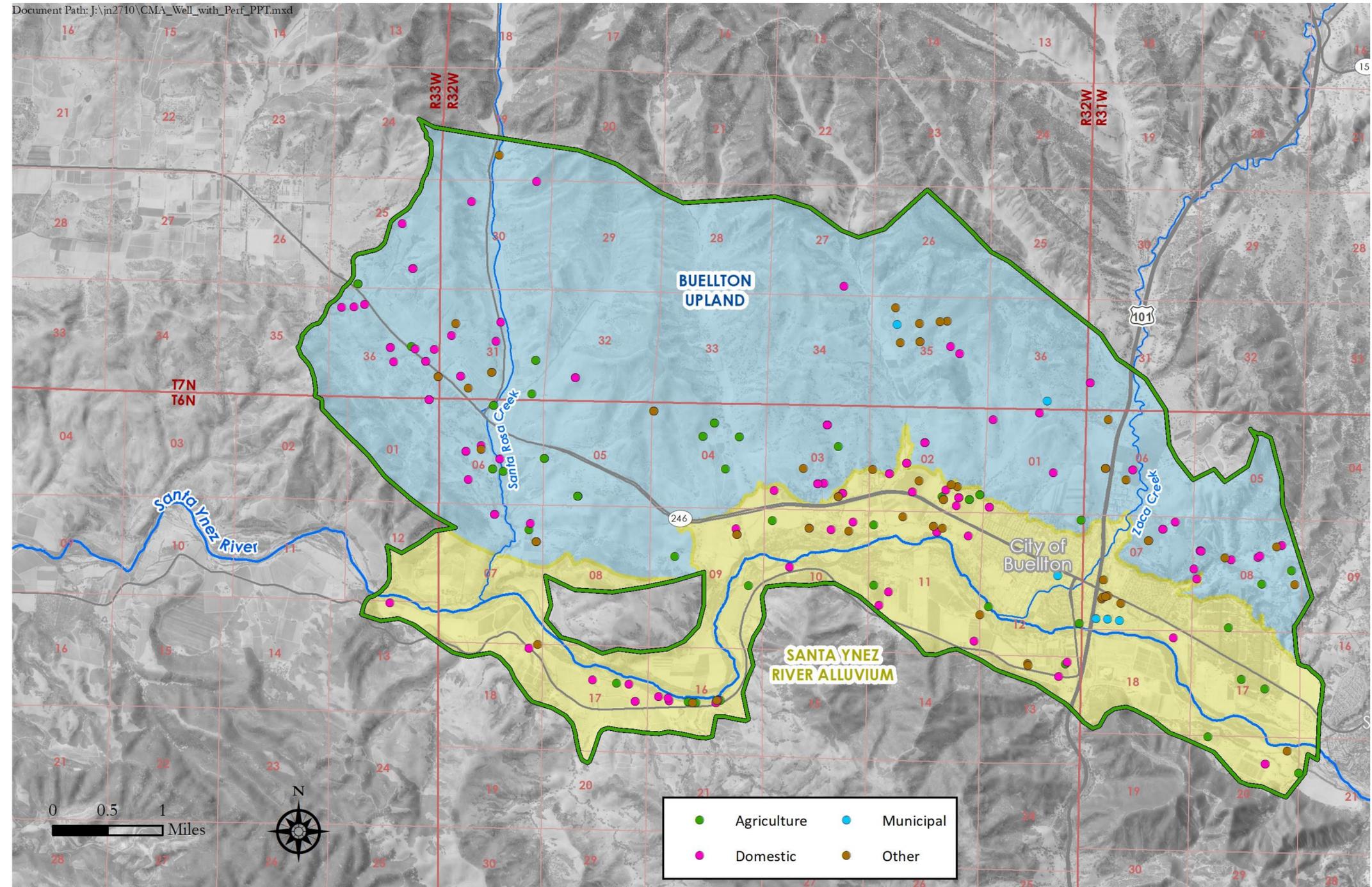
Groundwater Levels and Groundwater in Storage

SMC Approach

- Collected and analyzed available well data
 - Geosyntec and Stetson prepared the Regional Geology and 3D Geologic Model for the Santa Ynez River Valley Groundwater Basin
- Compiled well use type, construction information, and historical water level availability
 - Wells with suitable data used to prepare analysis of Undesirable Results and Minimum Thresholds
- Subset of wells were selected for Representative Monitoring Points (RMPs)
 - Selection based on location, construction, accessibility and availability of historical record
 - Where possible, RMPs include wells in an existing monitoring program
 - Some wells currently monitored for one Sustainability indicator (SIs) will be examined for multiple SI monitoring
- Reviewed potential occurrence of undesirable results (URs) associated with historical low water levels and droughts
- Selected proposed minimum thresholds (MTs) and measurable objectives (MOs) based on the analyses above and correlated results to well construction information to check for potentially excessive water level declines associated with well function

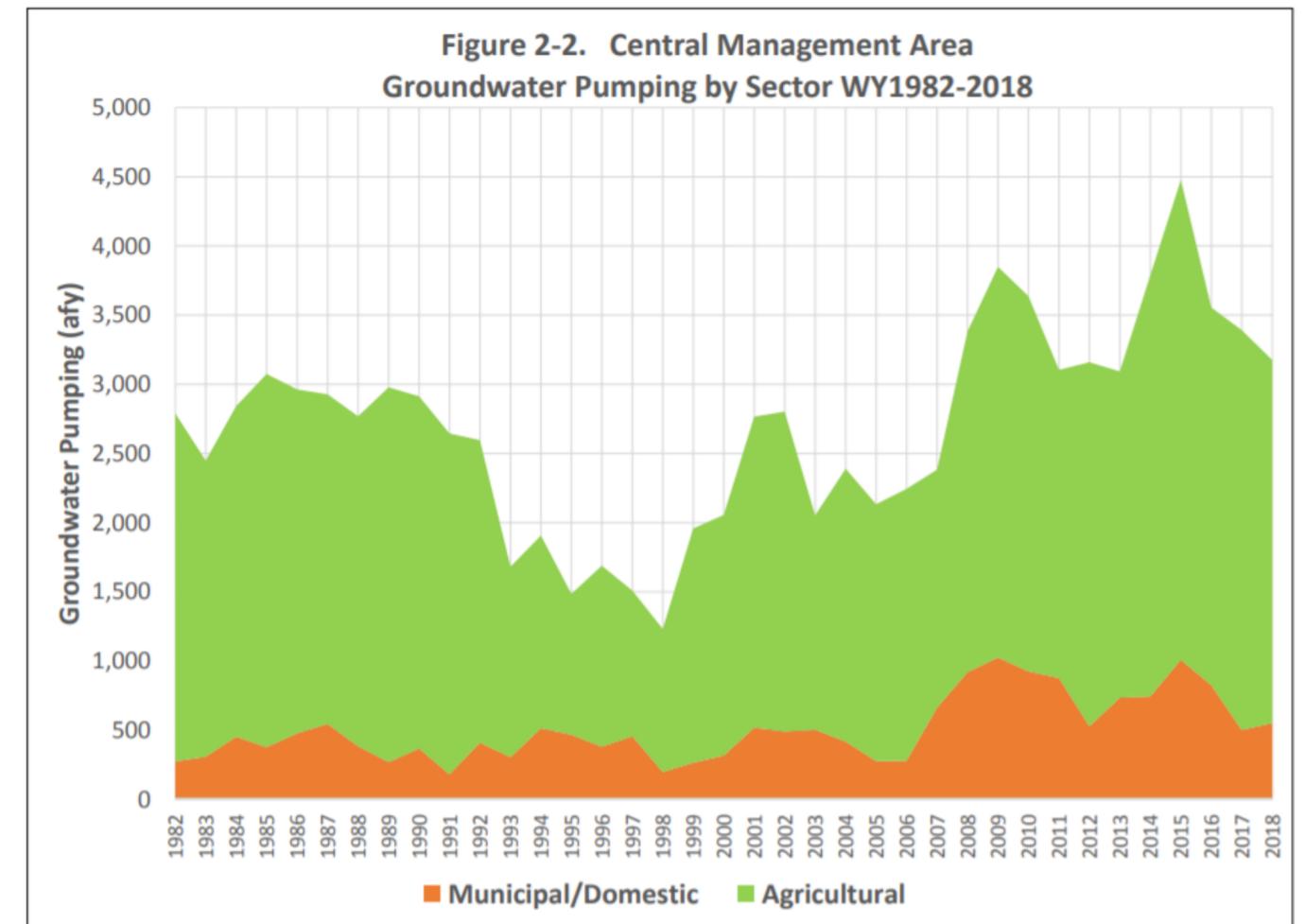
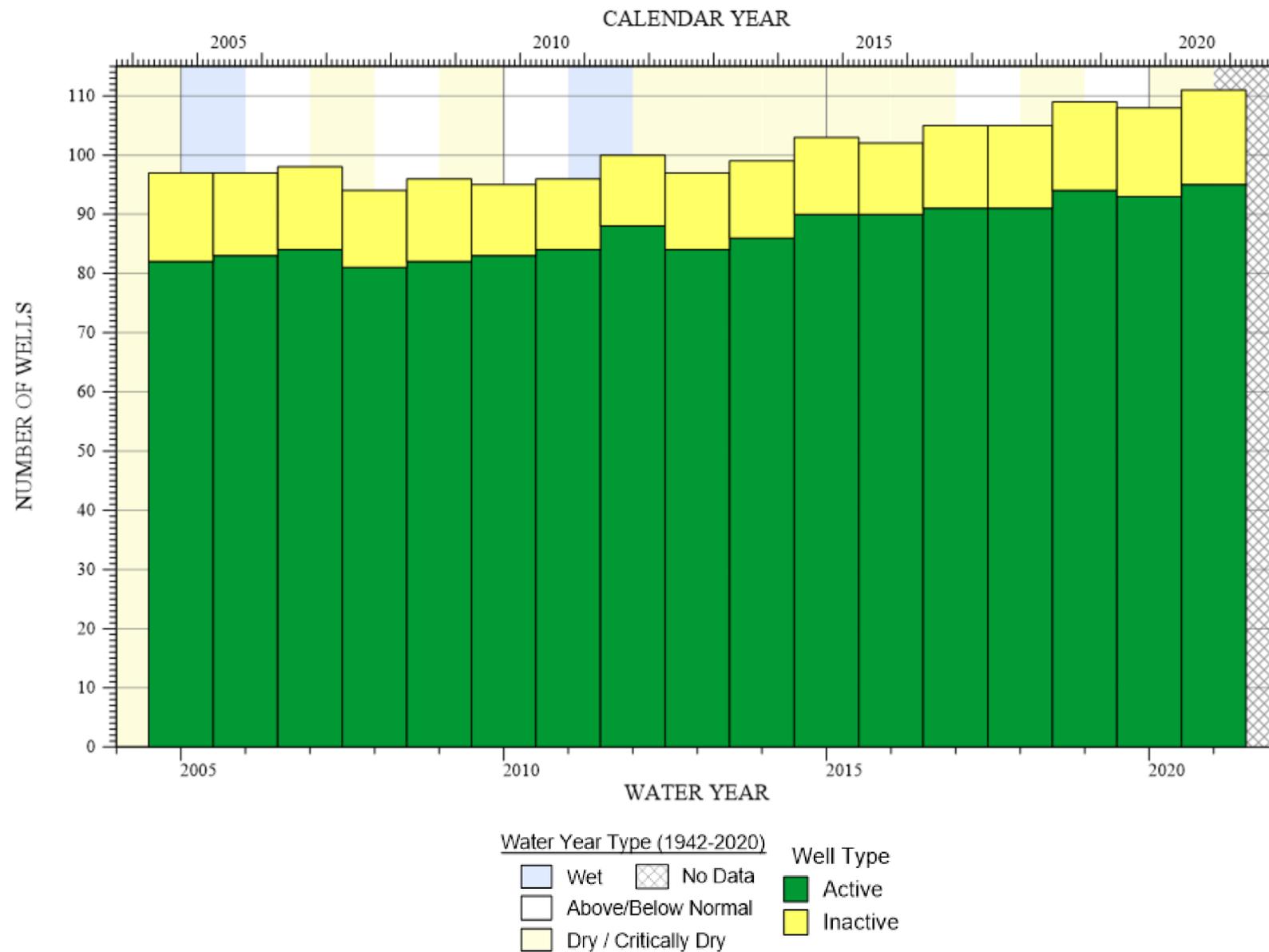
Wells Identified within the CMA that were incorporated into the Undesirable Result Analysis

Well Use	Buellton Aquifer	SYR Aquifer	CMA Total
Agriculture	32	13	46
Municipal	3	3	6
Domestic	70	17	87
Other	32	16	47
Total	137	49	186



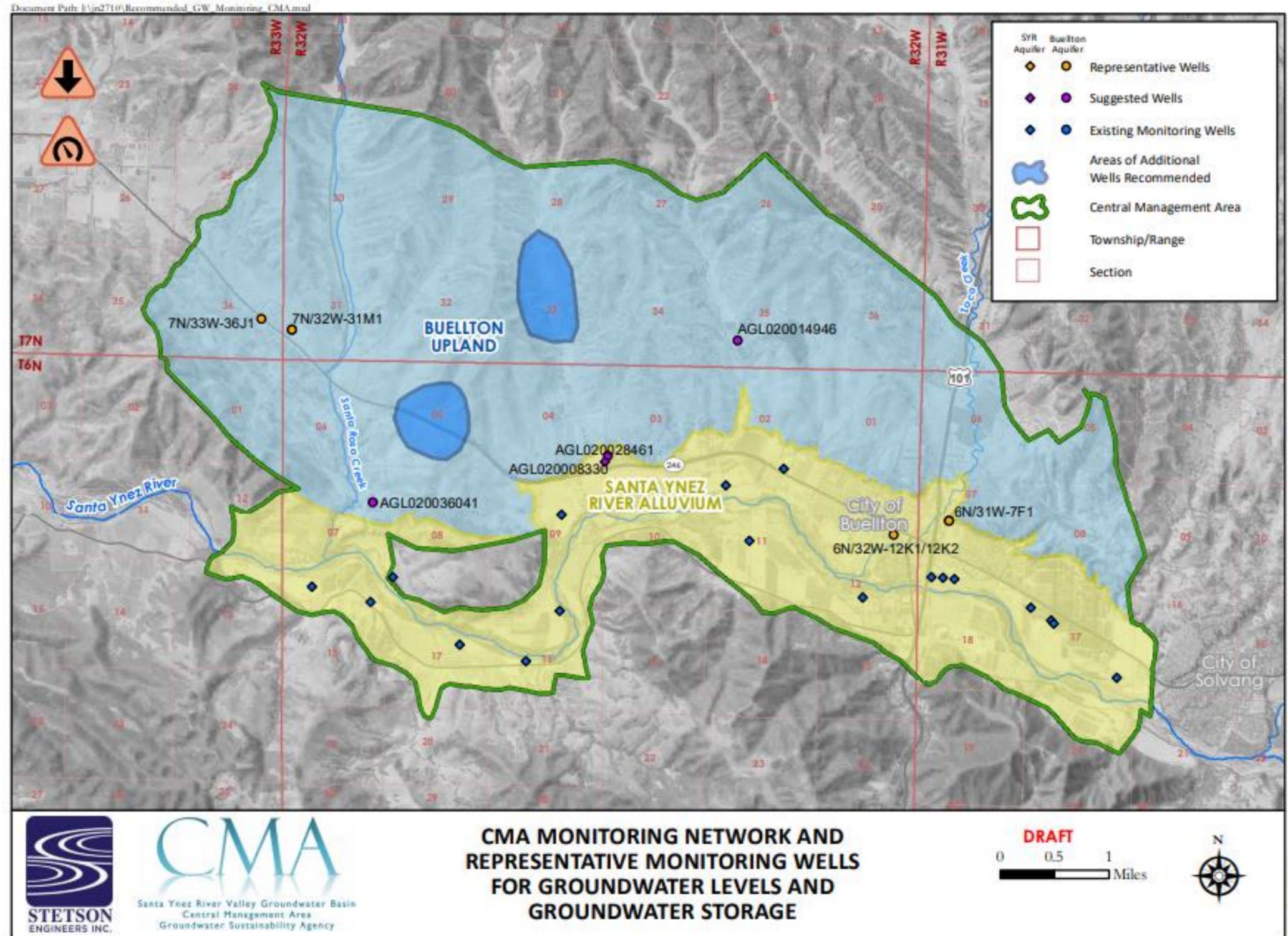
Undesirable Results: Chronic Lowering of Groundwater Levels

- No historical evidence of a depletion of supply



Source: Stetson Engineers Inc.

Wells Identified for Representative Monitoring Groundwater Levels and Groundwater in Storage



Groundwater Levels and Groundwater in Storage

List of Potential Representative Monitoring Wells

<u>Subarea</u>	<u>Well ID</u>	<u>Well Label</u>	<u>Well Type</u>	<u>Well Status</u>	<u>Construction Date</u>	<u>Principal Aquifer</u>	<u>Top of Screen</u>	<u>Bott. of Screen</u>	<u>Total Depth</u>	<u>CMA WQ Monitoring</u>	<u>CMA WL Monitoring</u>	<u>CMA GS Monitoring</u>	<u>CMA GDE Monitoring</u>
SYRA	6N/31W-17R01	USBR Node 17	Monitoring	Inactive	1957	SYRA	8	8	8	Y	Y	Y	Y
SYRA	6N/32W-16G04	USBR Node 13	Monitoring	Inactive	1984	SYRA	43	43	43	Y	Y	Y	Y
SYRA	6N/32W-18C02	USBR Node 10	Monitoring	Inactive	1947	SYRA	19	19	19	Y	Y	Y	Y
SYRA	6N/32W-11L4	6N/32W-11L4	Irrigation	Active	-	SYRA	NA	NA	NA	Y	Y	Y	N
SYRA	6N/32W-13G02	USBR Node 15	Monitoring	Inactive	-	SYRA	NA	NA	NA	Y	Y	Y	N
SYRA	6N/32W-3	AGL020028461	Irrigation	Active	-	SYRA	NA	NA	NA	Y	Y	Y	Y
BU	6N/32W-3	AGL020008330	Irrigation	Inactive	2017	BA	280	280	280	Y	Y	Y	N
BU	6N/32W-7	AGL020036041	Irrigation	Active	1985	BA	120	120	120	Y	Y	Y	N
BU	7N/32W-31M1	7N/32W-31M1	Monitoring	Active	-	BA	NA	NA	NA	Y	Y	Y	Y
BU	6N/31W-7F1	6N/31W-7F1	Monitoring	Active	1976	BA	NA	NA	NA	Y	Y	Y	-
BU	7N/32W-35	AGL020014946	Irrigation	Active	-	BA	NA	NA	NA	Y	Y	Y	N

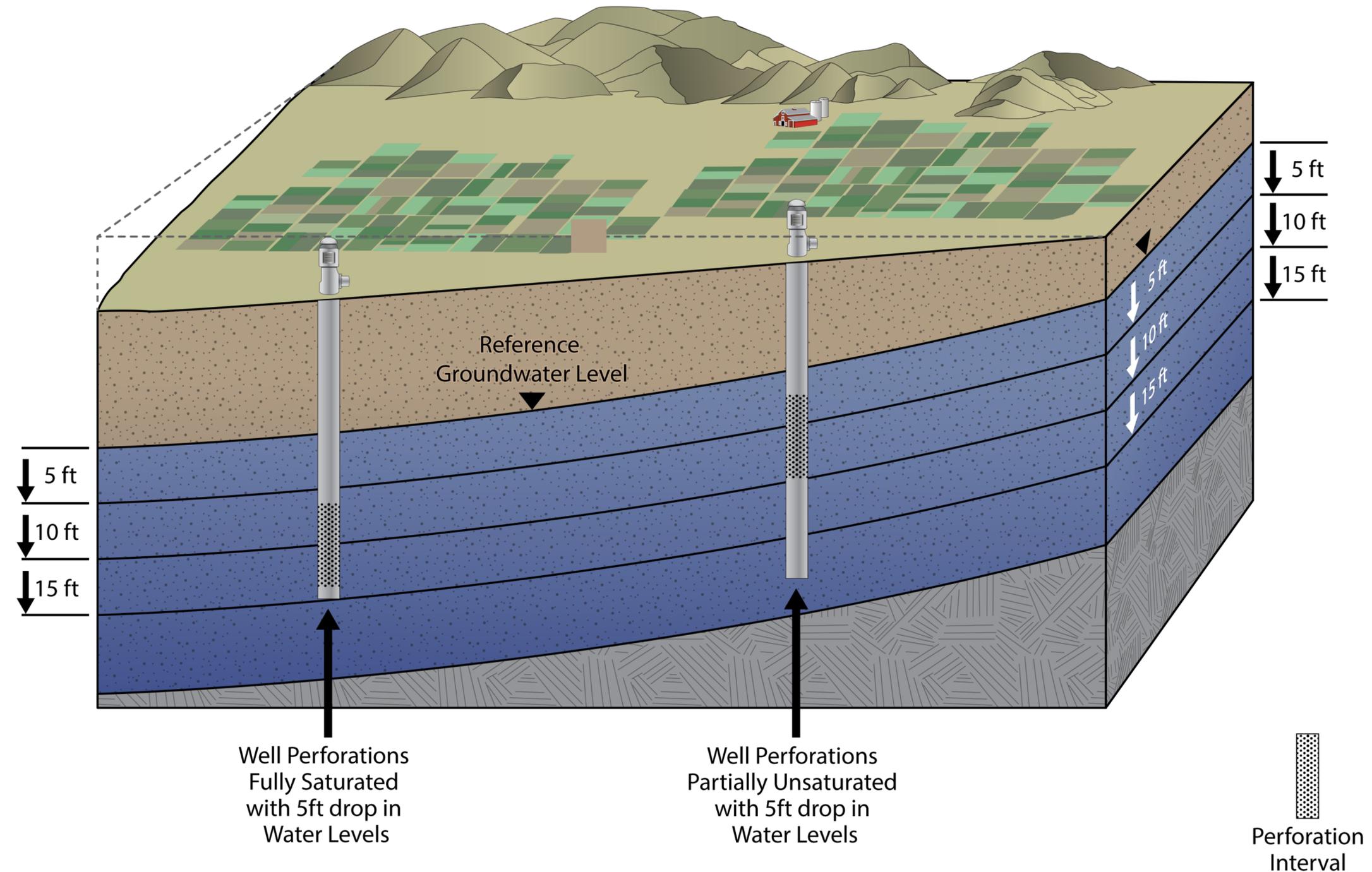
General Considerations for Minimum Thresholds and Measurable Objectives

- Undesirable Results have not occurred within the CMA event during historical (and current) drought periods.
- Water levels in the CMA generally increase and decline in response to wet and dry climate.
- There is a data gap regarding groundwater levels in the Buellton Upland.
 - Currently only 4 monitoring wells are being monitored and have historical water level data over different water year types.
- Groundwater levels that drop below the top of well screens may cause increases in energy costs, water quality degradation, poor function, or pump failure.
 - Domestic and public supply wells in the Buellton Upland subarea are more sensitive to water level decline because they are shallower than agricultural wells.
- The 2011 groundwater level is used for the MO because it was prior to the current drought and after mixed (wet/dry periods) climate conditions.
- Historical low elevations in the Buellton Upland were 0 to 15 feet below 2020 levels (current conditions).
- SMCs may be iterative, updated as additional data is acquired.

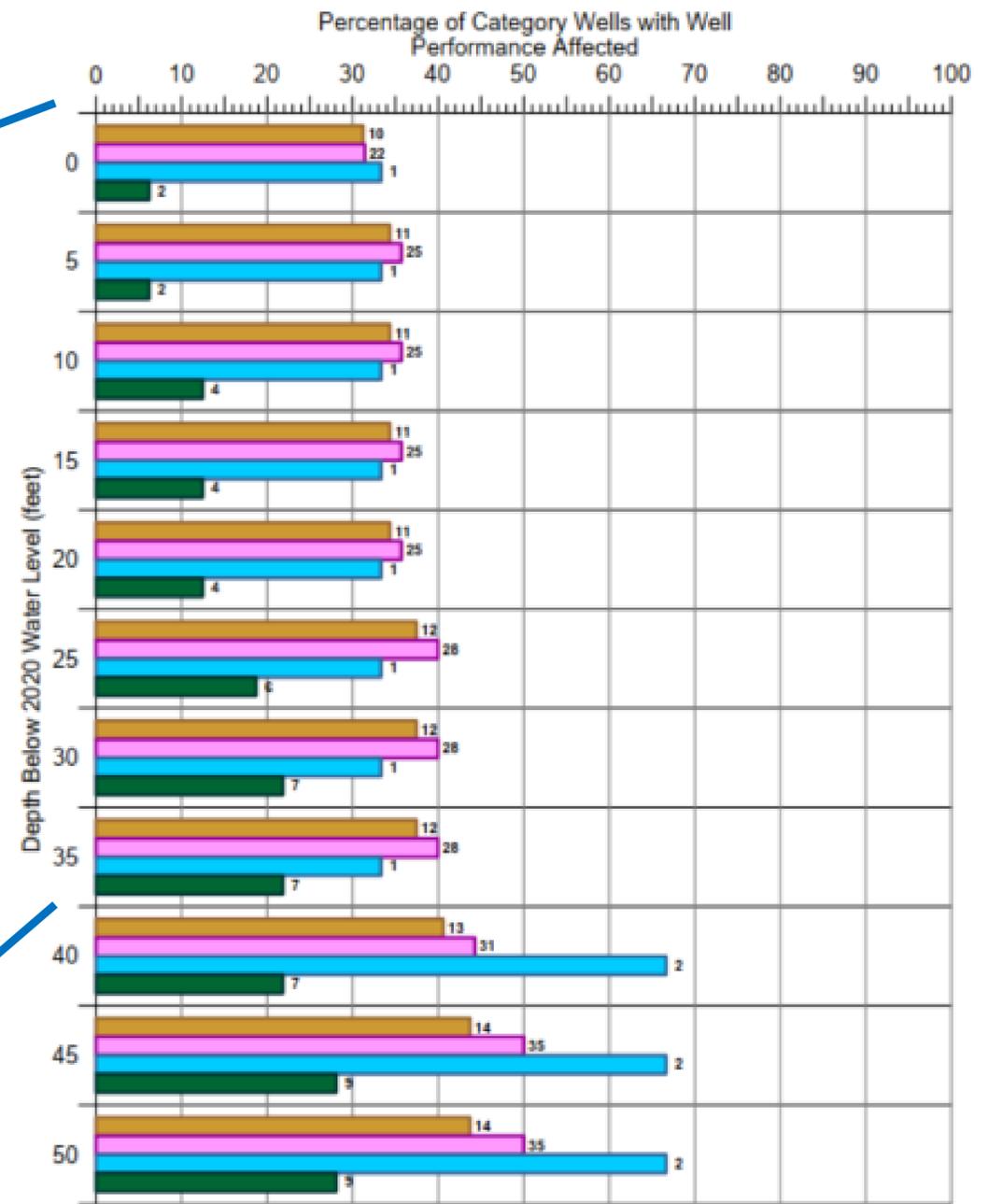
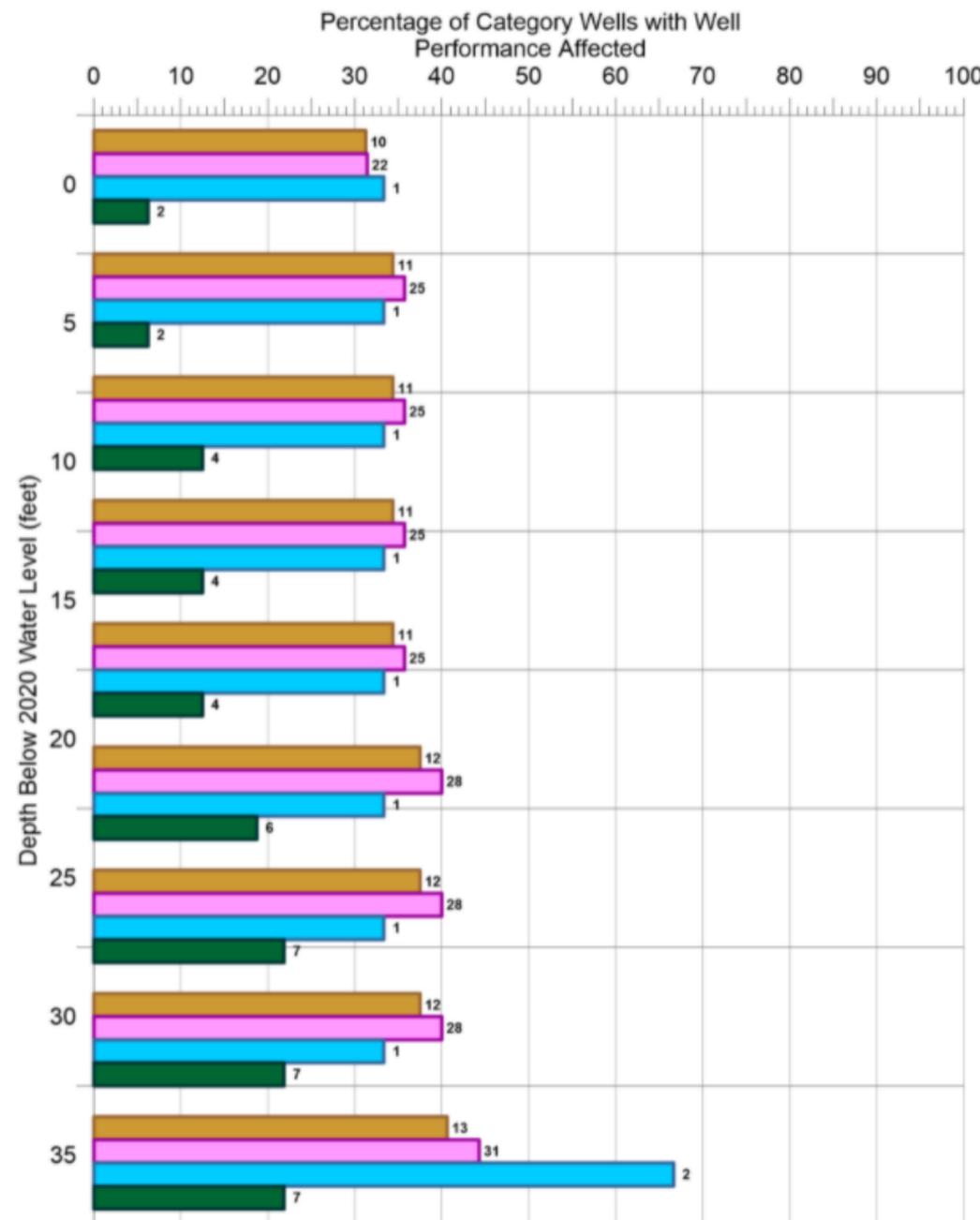
Proposed Minimum Thresholds and Measurable Objectives for Groundwater Elevation and Groundwater in Storage

- Minimum Threshold = 20 feet below 2020 groundwater level. *Need input from GSA Committee.*
- Measurable Objectives = 2011 groundwater level
- Undesirable result occurs with minimum threshold exceeded in half of the RMPs for a period of 2 consecutive years.

Well Impact Analysis General Representation



Water Levels and Groundwater in Storage - Well Impact Analysis

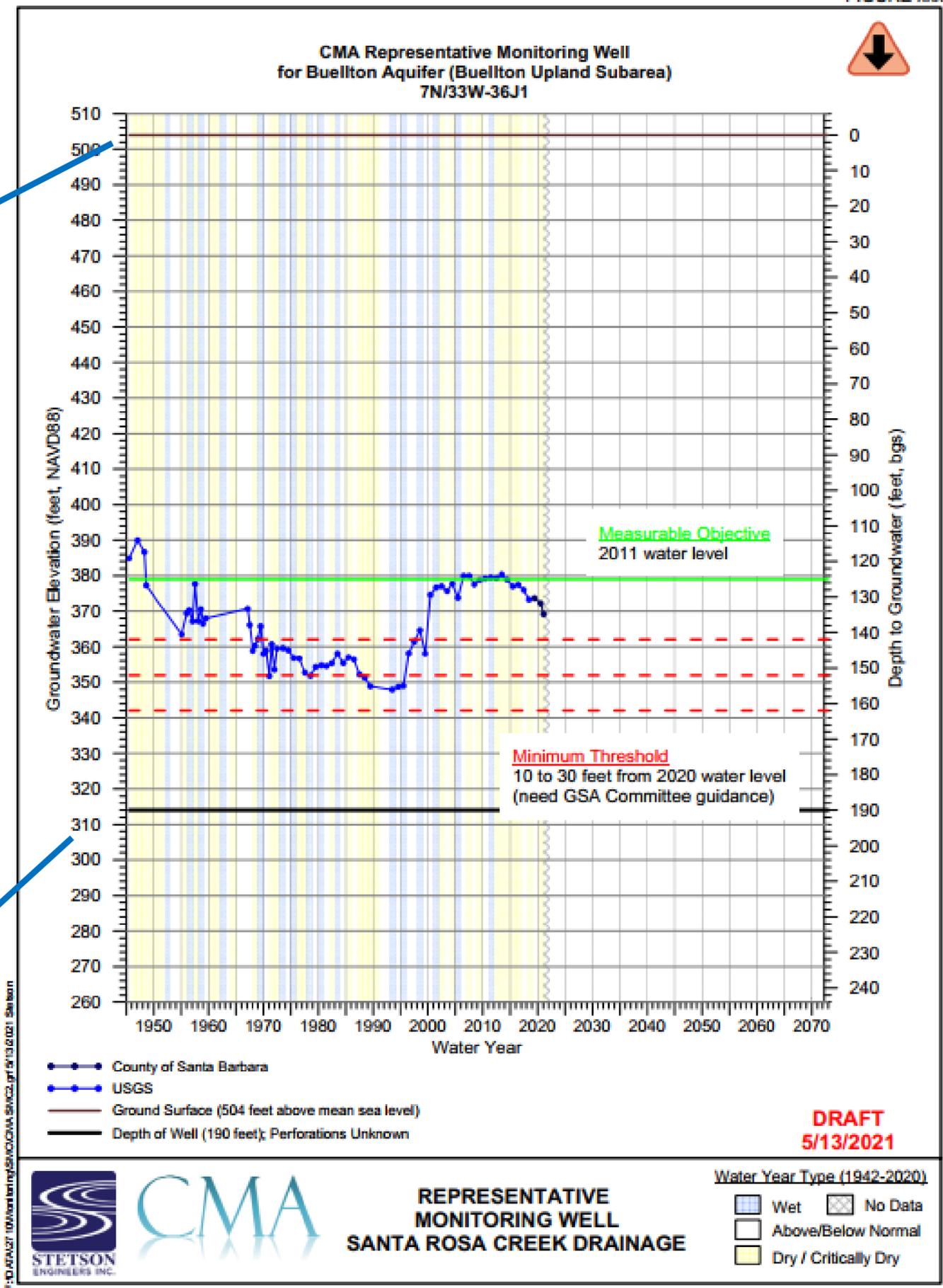
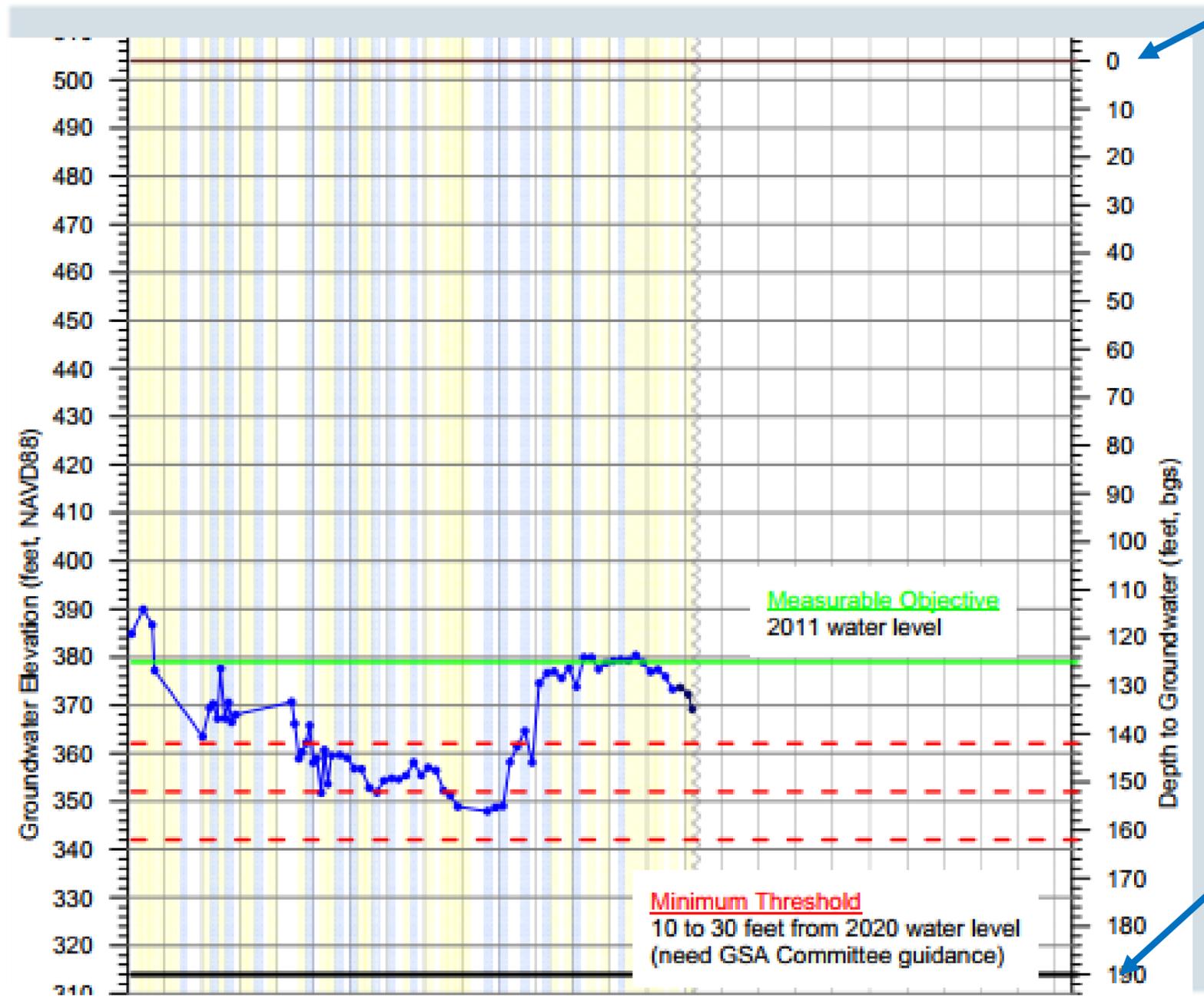


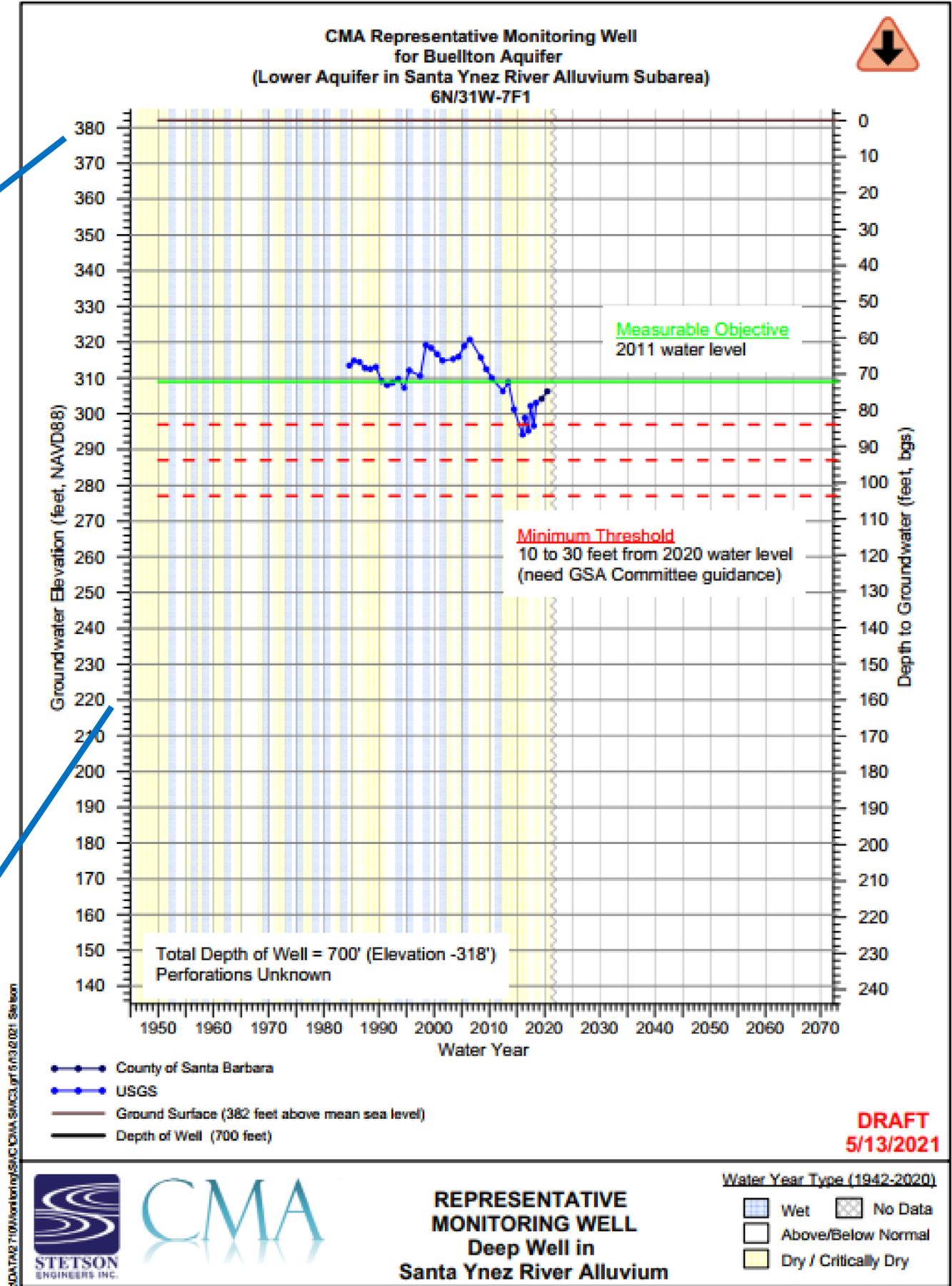
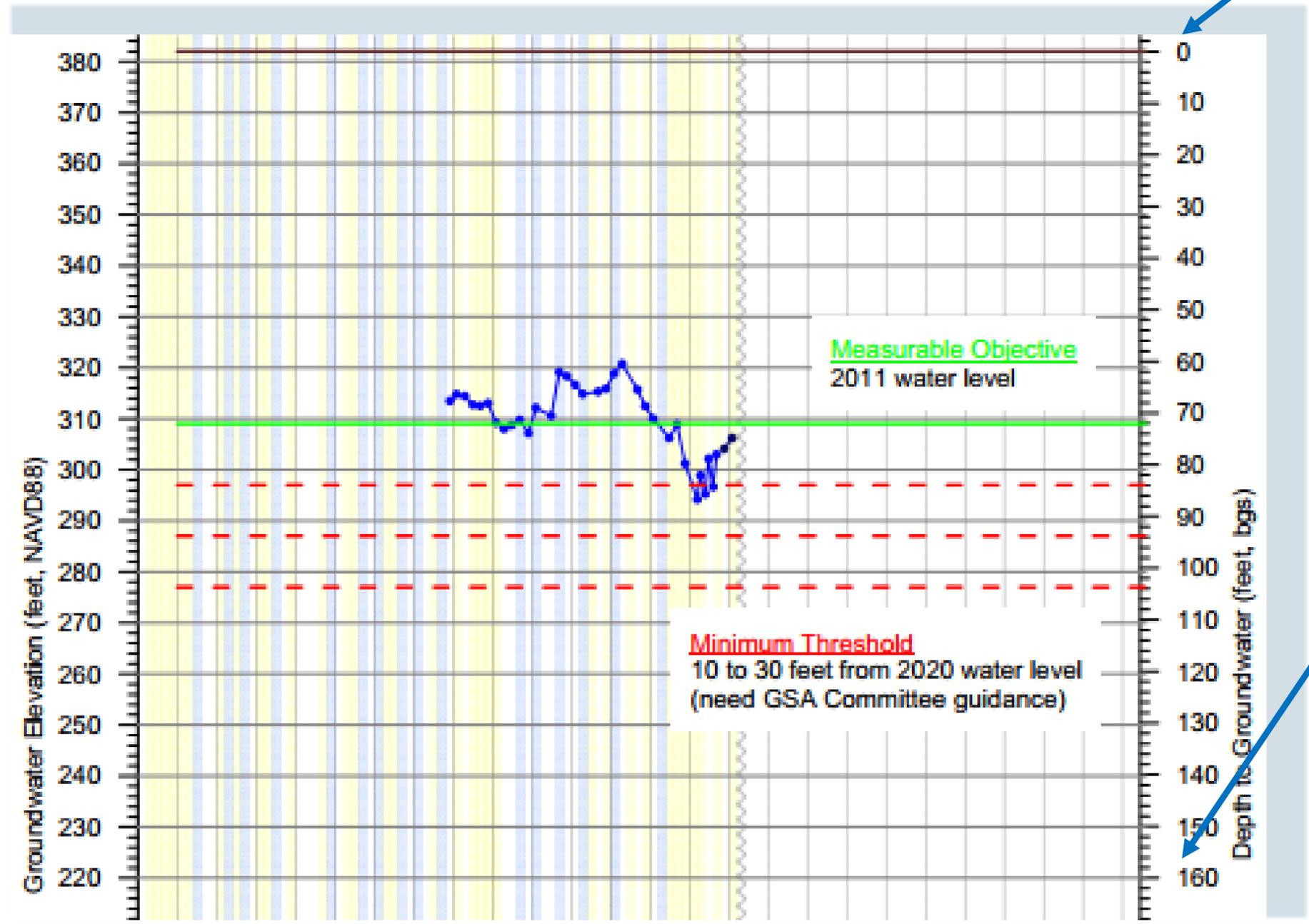
- Agricultural Wells (32)
- Domestic Wells (70)
- Municipal Wells (3)
- Other Wells (32)

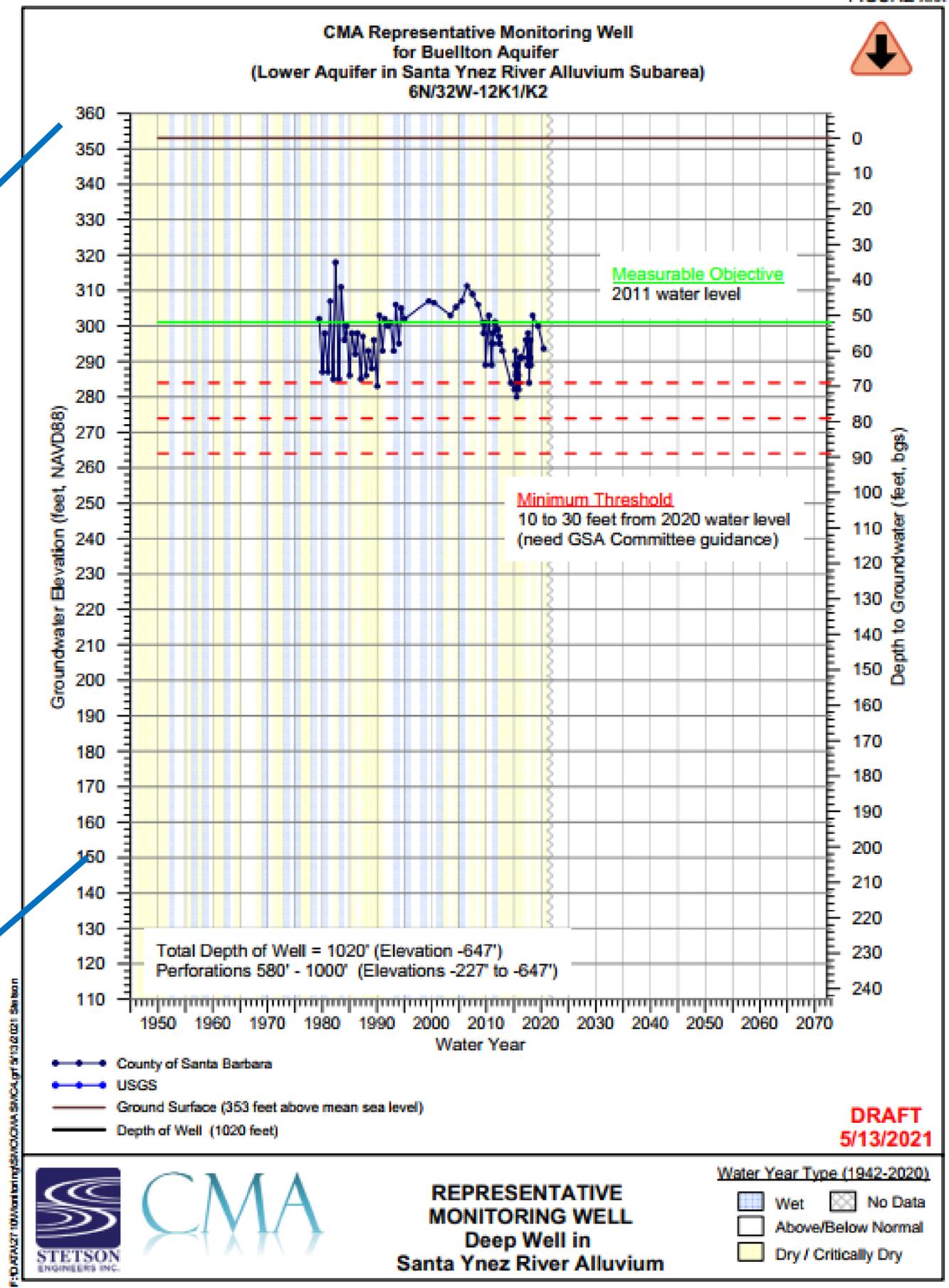
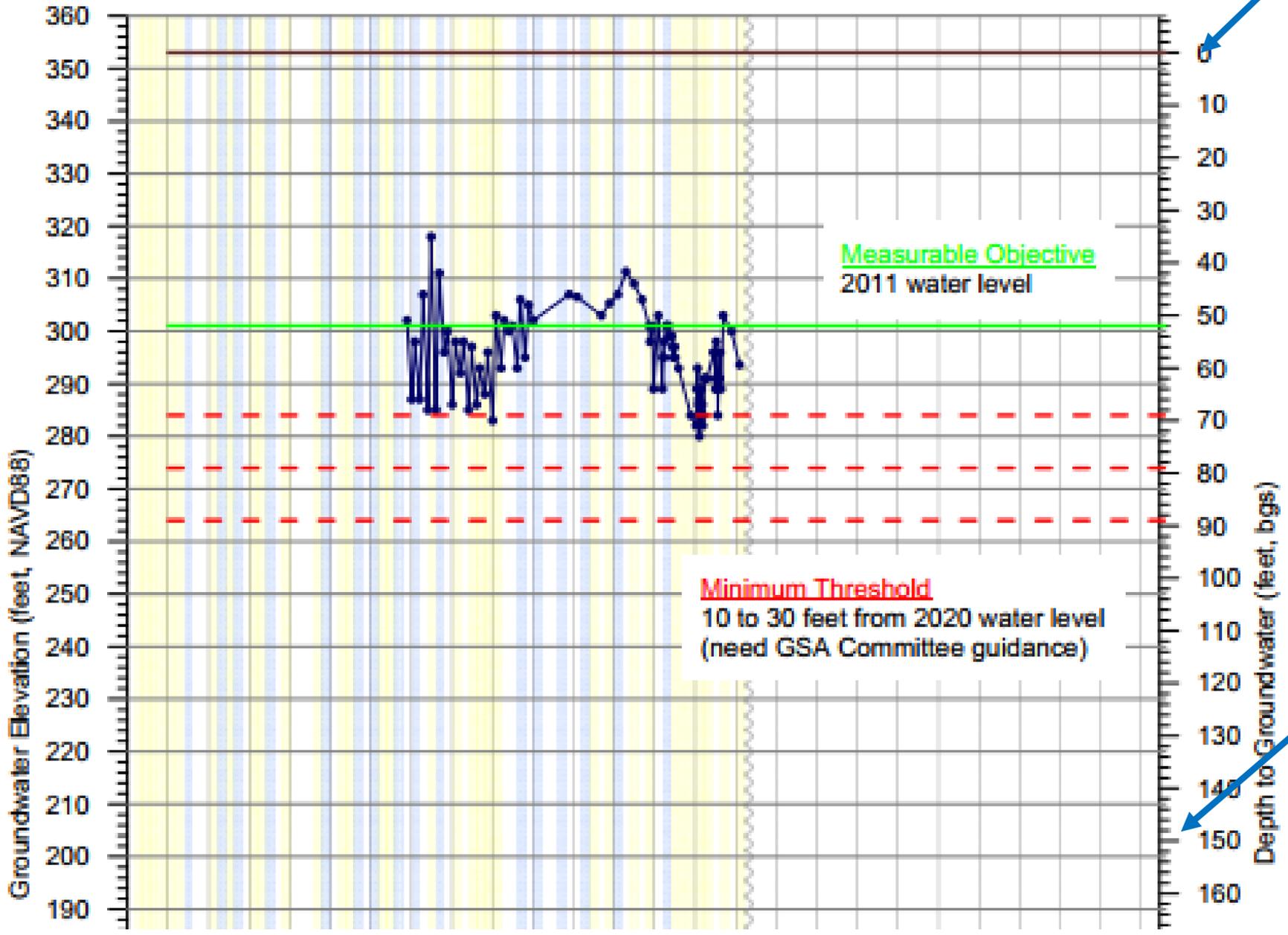
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**WELL PERFORATIONS RELATIVE TO
BUELLTON AQUIFER SPRING 2020
WATER DEPTH (TOP 50 FT)**

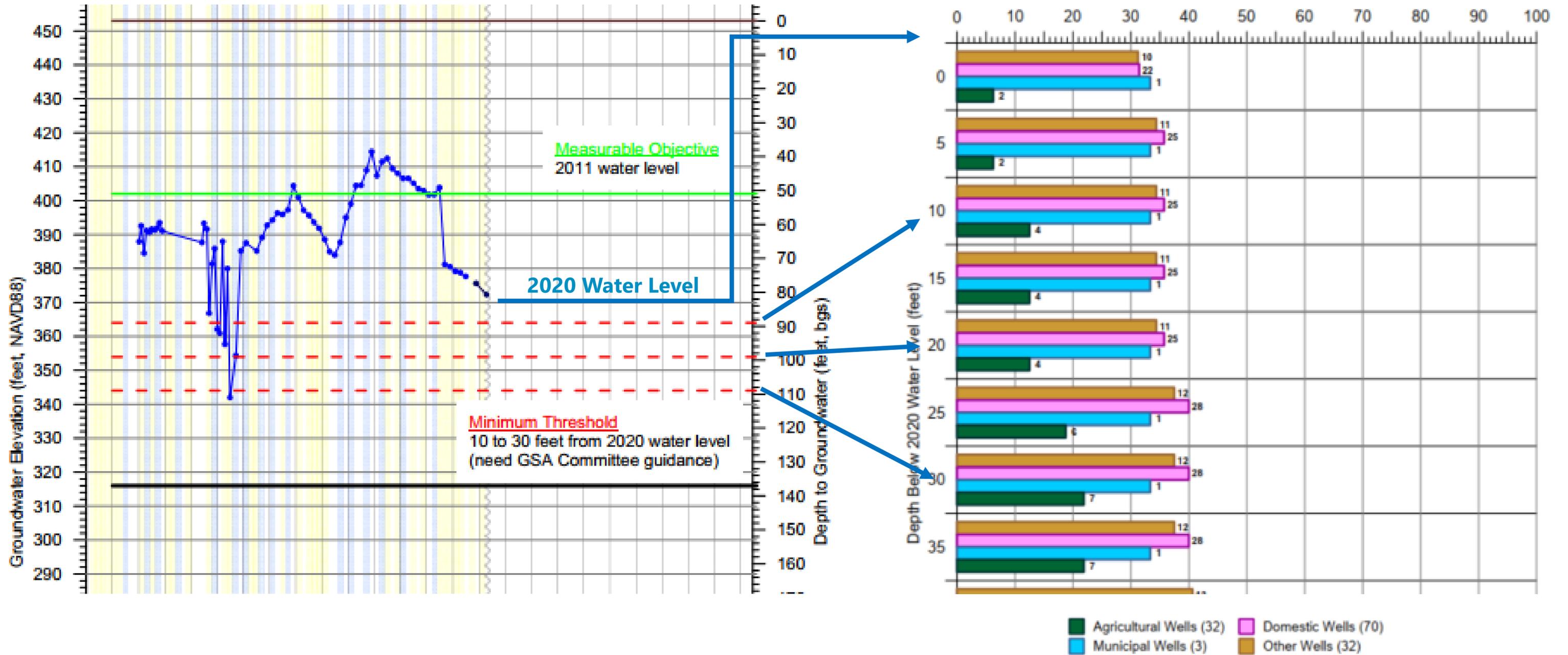






Proposed Minimum Thresholds and Undesirable Results

Water Levels and Water in Storage - Well Impact Analysis



Current Monitoring Program – Water Quality

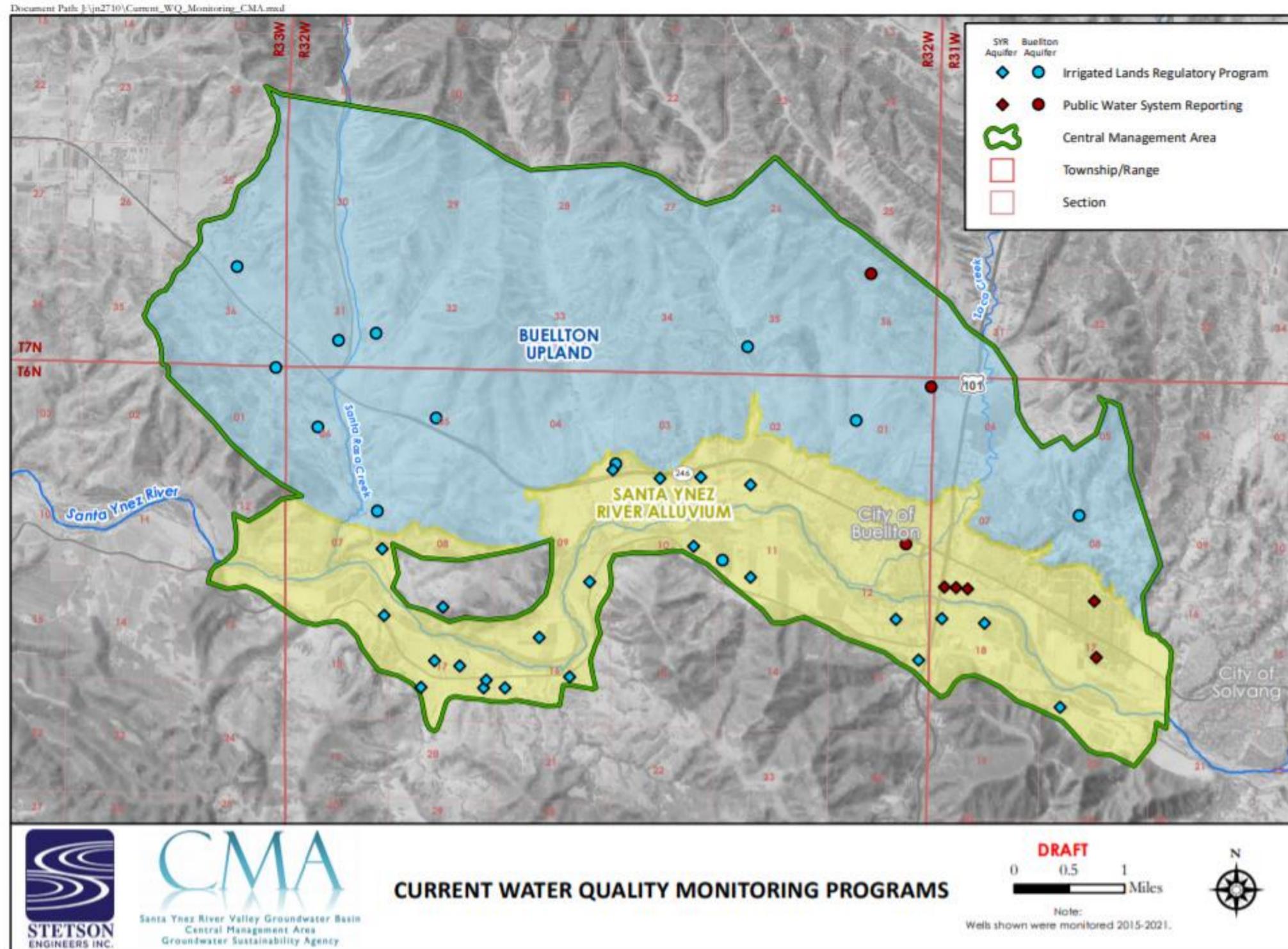


FIGURE 1-2

Wells Identified for Representative Monitoring Groundwater Quality

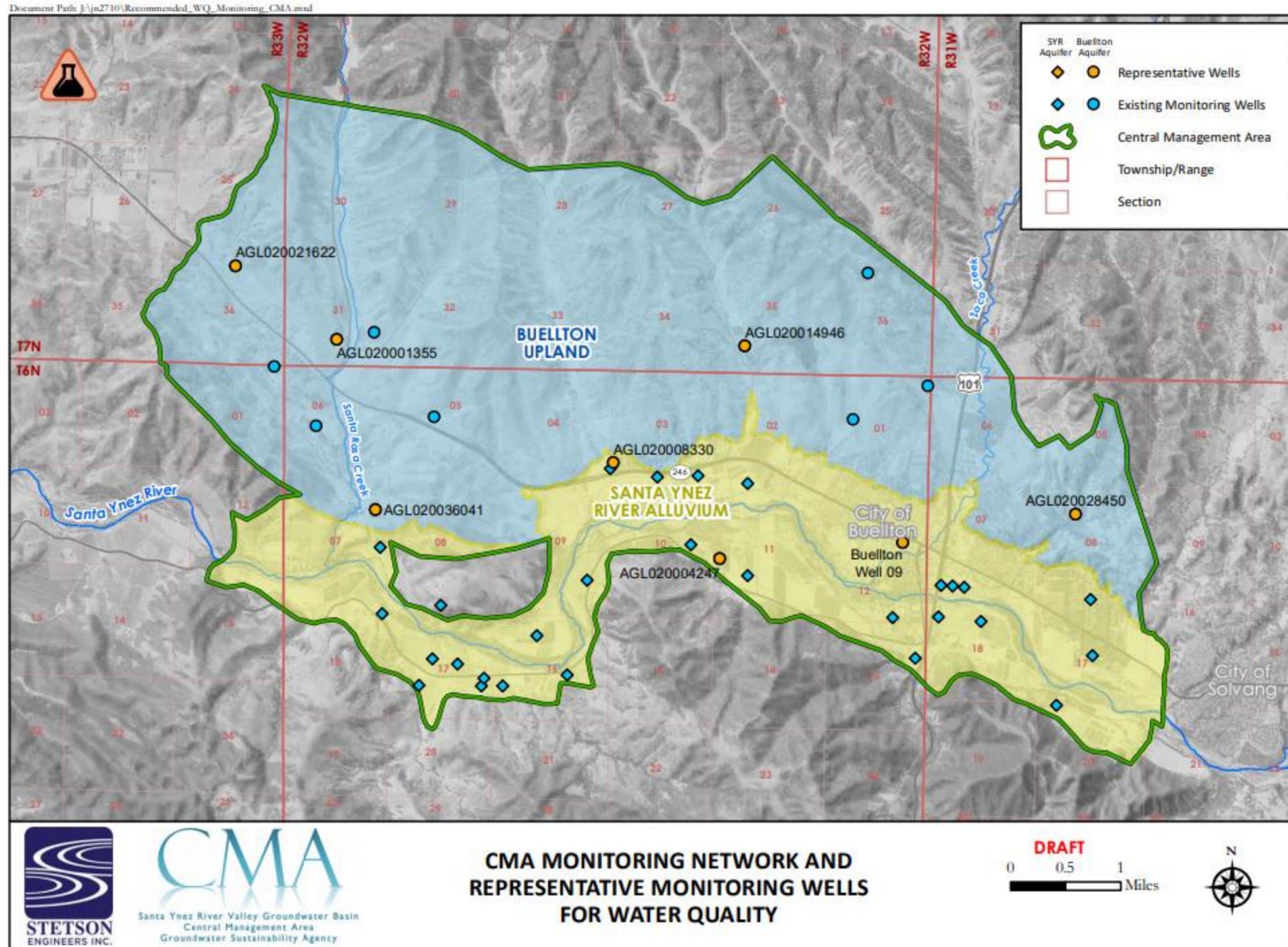


FIGURE 2-2

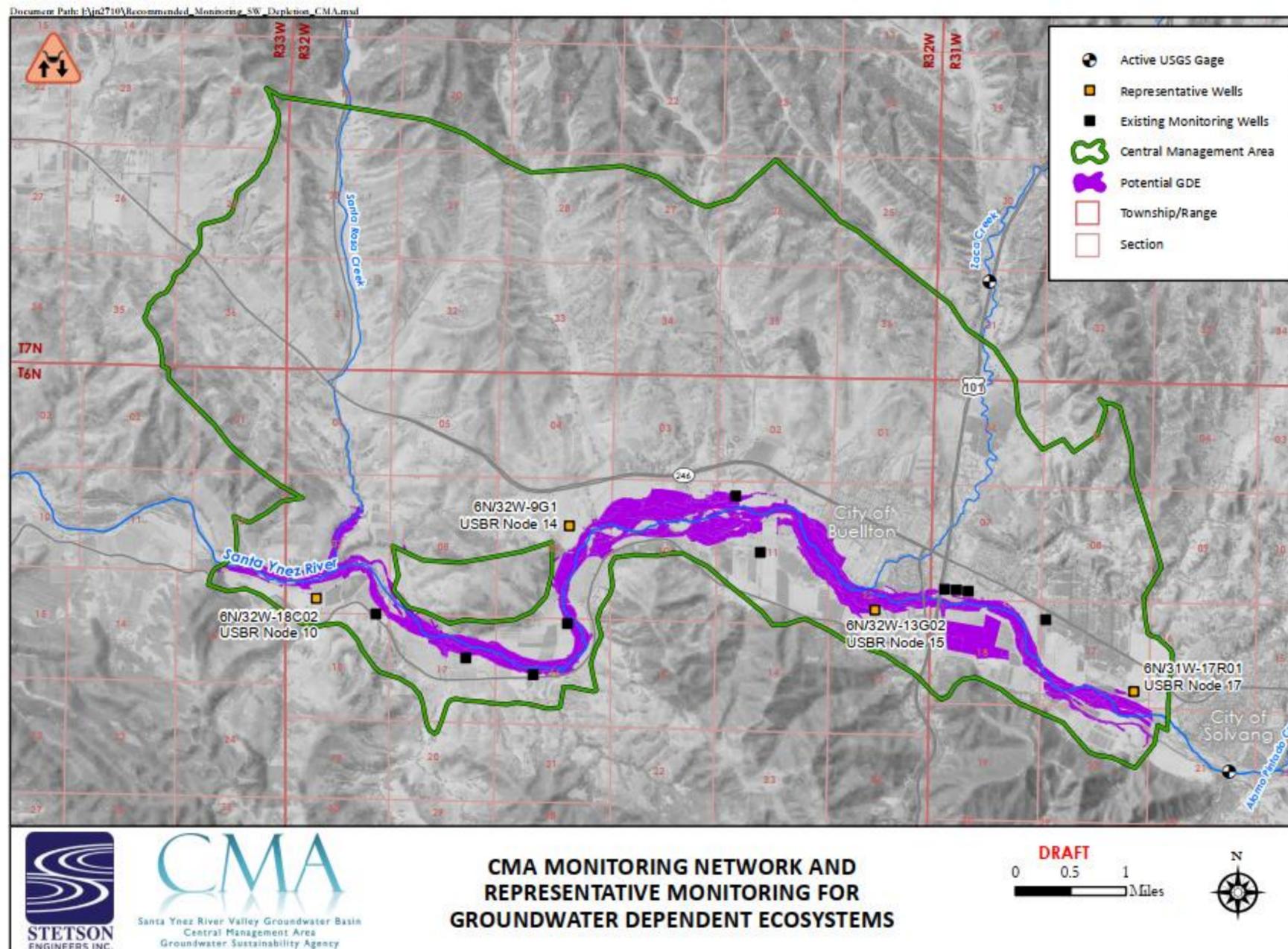
Undesirable Results: Water Quality

Table X: Median Groundwater Quality Objectives (mg/L) and average 2015-2018 salt and nutrient concentrations (mg/L) in the CMA														
Basin/Subarea	Salinity as Total Dissolved Solids (TDS)			Chloride		Sulfate		Boron		Sodium		Nitrate as N		
	Basin Plan Objective (mg/L)	MCL (mg/L)	Avg 2015-2018	Basin Plan Objective (mg/L)	MCL (mg/L)	Avg 2015-2018								
Buellton Upland	1,500	1000	379	150	58	700	77	0.5	NA	100	41	1	10	3.5

- Basin Plan Water Quality Objectives not currently exceeded in CMA
- Measurable Objectives for SGMA proposed to be the Water Quality Objectives from the Basin Plan
 - Water Quality SMCs to be informed by trend analysis under development
 - Proposed Measurable Objective for Nitrate is the MCL of 10 mg/L
 - Proposed Measurable Objective for TDS is the MCL of 1000 mg/L
- Thresholds set at exceedance of the Water Quality Objectives:
 - In half of the representative monitoring points
 - Showing an increasing trend for at least 2 years
- SMCs not set for Santa Ynez River Alluvium Subarea
 - Water quality impacted by releases from Cachuma Reservoir in accordance with water rights

Undesirable Results: Interconnected Surface Water

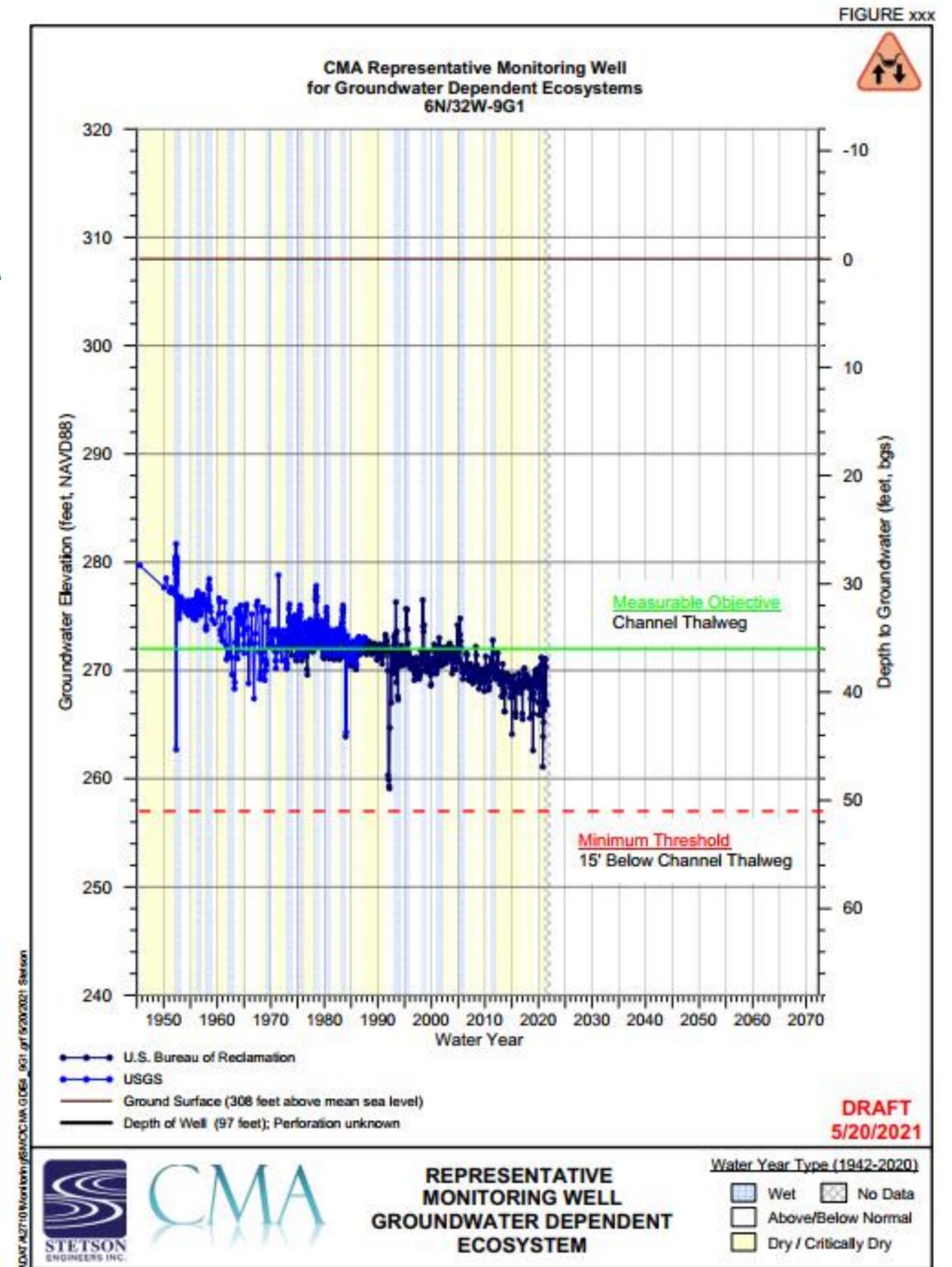
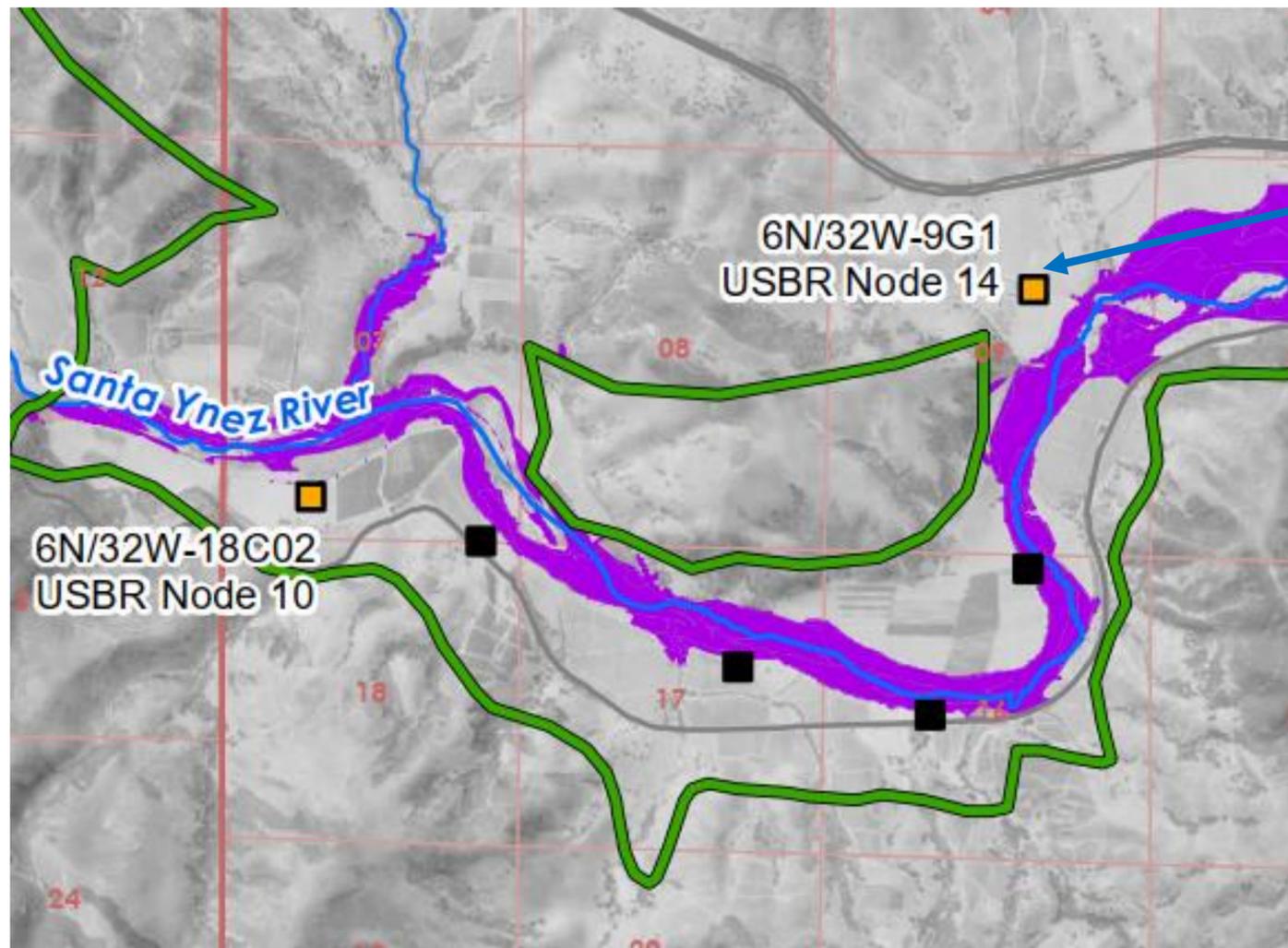
“...the rate or volume of surface water depletions *caused by groundwater use* that has adverse impacts on beneficial uses of surface water” (§354.28 (c) (1) – Minimum Thresholds)



- Depletion of interconnected surface water assessed by identifying presence of groundwater dependent ecosystems (GDEs)
- Propose to monitor potential GDEs (purple) using shallow wells within the alluvium
- Water level within Santa Ynez Alluvium Subarea is controlled by water rights agreements and environmental agreements
- No sustainable management criteria proposed for GDEs within Santa Ynez River alluvium Subarea
- For GDEs outside of the Santa Ynez River Alluvium (lower Santa Rosa Creek only), propose the measurable objective to be the thalweg elevation of the channel with minimum threshold of 15 feet below that at nearby well 6N/32W- 9G1.

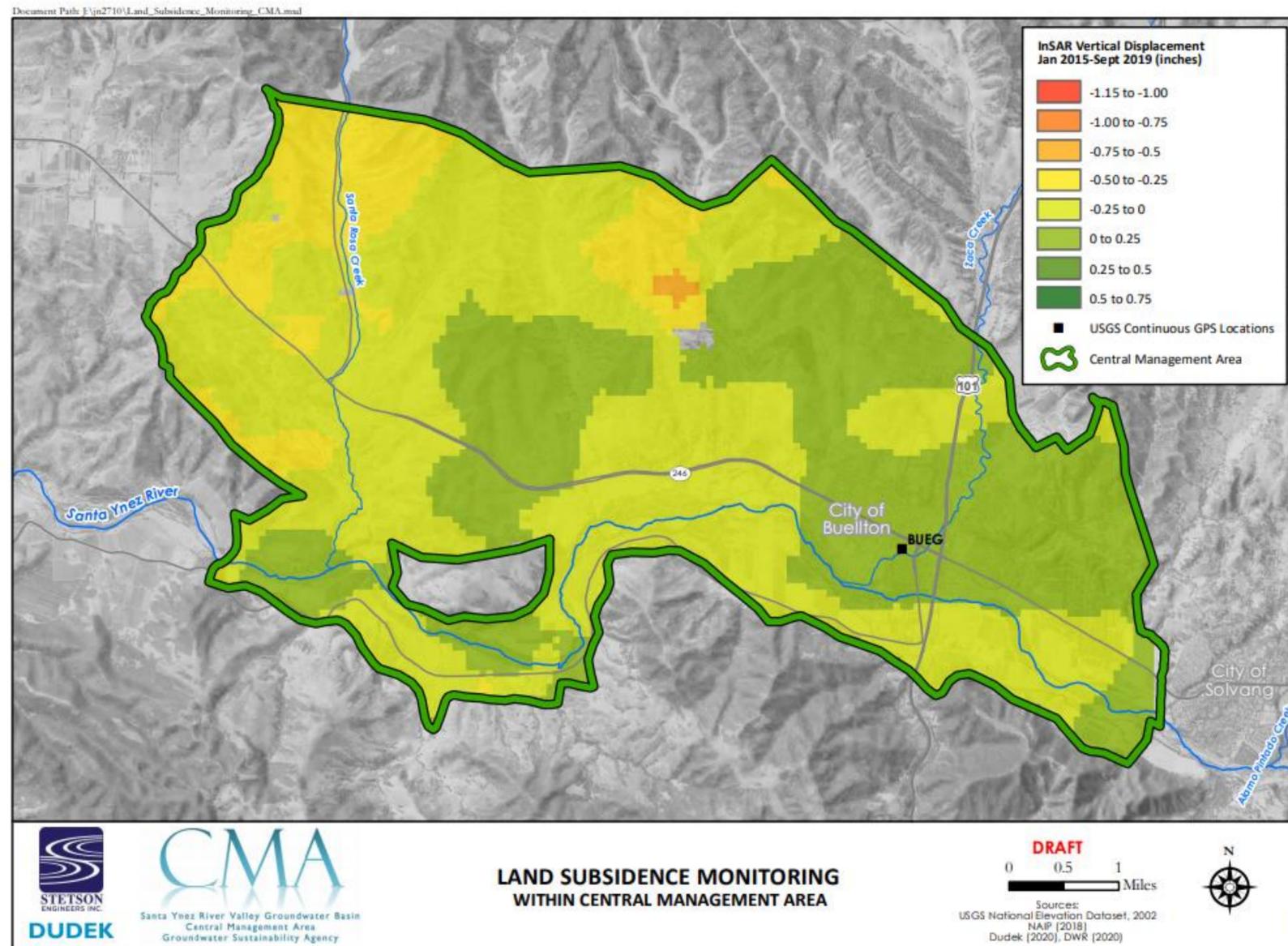
FIGURE 2-4

Undesirable Results: Interconnected Surface Water



Undesirable Results: Land Subsidence

“...the rate and extent of subsidence that substantially interferes with land uses and may lead to undesirable results” (§354.28 (c) (1) – Minimum Thresholds)



- No historical evidence of groundwater-related subsidence in the CMA
 - City of Buellton, Solvang Public Works Department, Santa Ynez River Conservation District, Central Coast Water Authority
- Undesirable Results not likely to occur
 - Thick, saturated, and extensive fine-grained materials not known to be present
- Propose:
 - Ongoing monitoring of InSAR data, continuous GPS data, and infrastructure condition.
 - Proposed minimum threshold of a half-foot of subsidence from 2015 elevation caused by groundwater extraction and interfering with land uses or infrastructure.

Projects and Management Actions

- "...a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin." (§354.44 (a))
- May be pursued to achieve aspirational goals or provide operational flexibility
- Triggered in response to approach of minimum thresholds
- Projects and Management Action example project purposes:
 - Fill data gaps
 - Increase water supply
 - Increase water use efficiency
 - Respond to emergencies or droughts
 - Improve water quality

Example Projects and Management Actions

CENTRAL MANAGEMENT AREA:

Data Gaps:

- Buellton Upland Monitoring Program
- Video Logging of representative monitoring wells
- Mandatory or incentivized well extraction metering program

Water Quality:

- Water Softener ban
- Groundwater pre-treatment

Increase Water Supply:

- State Water Project increased supply
 - Suspended Table A
 - Use of undelivered water
- Diversion of Santa Ynez River water to spreading basins

Drought/Emergency Response:

- Increases water efficiency programs
- Urban runoff recharge
- Groundwater well deepening

Example Projects and Management Actions

BASIN WIDE:

Data Gaps:

- Continued geophysical studies

Increase Water Supply:

- Watershed management programs
- Phreatophyte removal program