Second Annual Report Water Year 2022
for the
Santa Ynez River Valley Groundwater Basin
Bulletin 118 Basin No. 3-15
Central Management Area
Groundwater Sustainability Agency

CMA

Central Management Area

March 2023

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COVER PHOTOGRAPHS

Front Cover: Santa Ynez River flowing through the Central Management Area because of the summer and fall 2022 water rights releases from Bradbury Dam. The photograph was taken on August 31, 2022. Water rights releases are conducted by the U.S. Bureau of Reclamation following State Water Resources Control Board orders and the Cachuma Project Settlement Agreement and result in water being released from storage in Lake Cachuma.

Back Cover: National Agriculture Imagery Program (NAIP) natural color orthographic photo mosaic of Central Management Area photographed on May 21, 2022.

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

CENTRAL MANAGEMENT AREA

Second Annual Report Water Year 2022

March 2023

Santa Ynez River Valley Groundwater Basin

Central Management Area

Groundwater Sustainability Agency Committee

Water Year 2022 (October 2021-September 2022)

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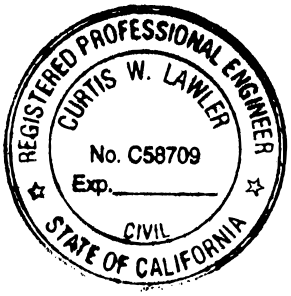

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ACKNOWLEDGMENTS

The Central Management Area Groundwater Sustainability Agency Committee and Stetson Engineers Inc. would like to thank and acknowledge the many stakeholders, entities, and private citizens who have contributed their time and expertise to develop this Second Annual Report.

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LIST OF ACRONYMS AND ABBREVIATIONS

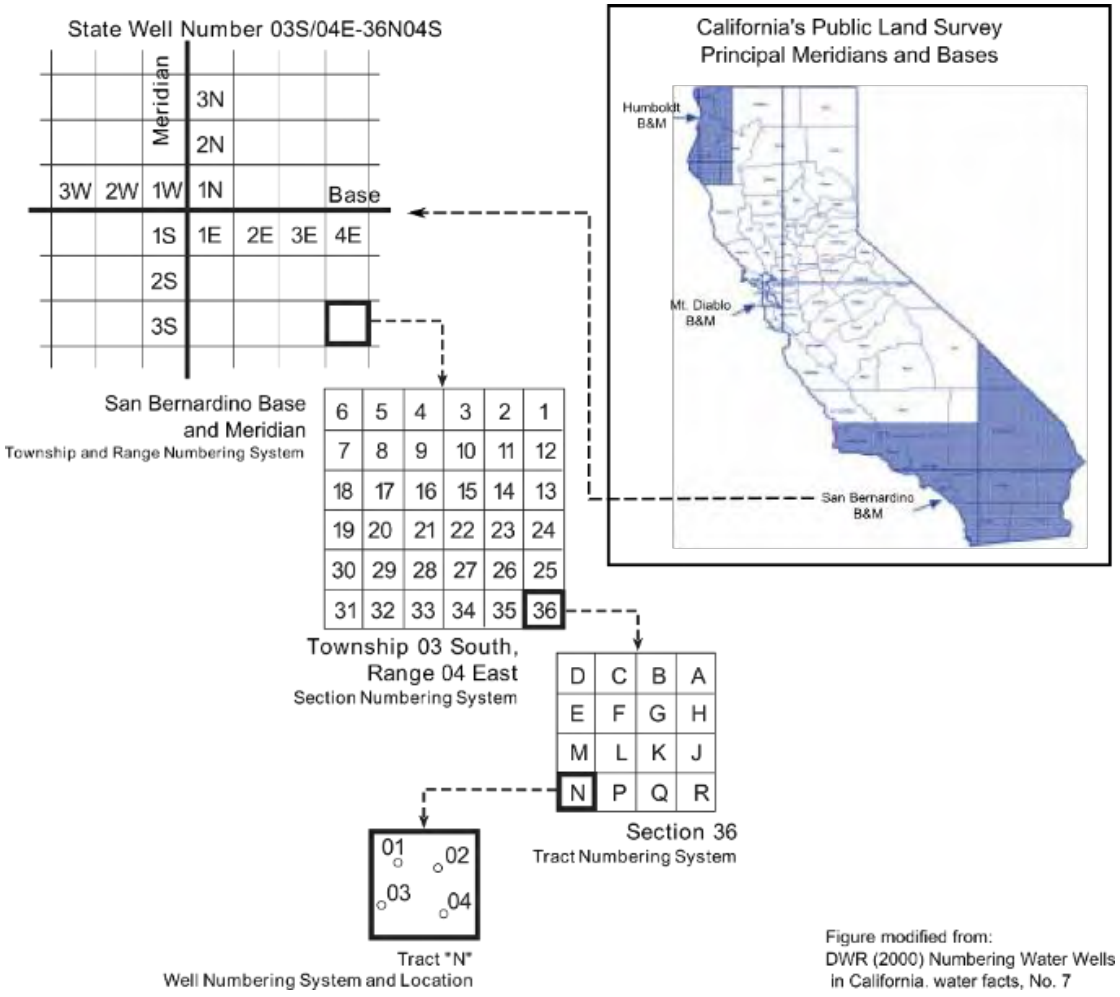
AF	acre-feet
AFB	Air Force Base
AFY	acre-feet per year
CCR	California Code of Regulations
CCWA	Central Coast Water Authority
CEQA	California Environmental Quality Act
CGPS	Continuous Global Positioning System
CIMIS	California Irrigation Management Information System
CMA	Central Management Area
COMB	Cachuma Operation and Maintenance Board
CSD	Community Services District
CWC	California Water Code
DBID	Database Identification Number
DWR	Department of Water Resources
EMA	Eastern Management Area
ET	Evapotranspiration
FY	Fiscal Year (July 1 through June 30)
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
InSAR	Interferometric Synthetic Aperture Radar
mg/L	milligrams per liter
MHCSD	Mission Hills Community Services District
MODFLOW	Modular Three-Dimensional Finite-Difference Groundwater Flow Model
MOU	Memorandum of Understanding
NAIP	National Agriculture Imagery Program
PRISM	Parameter-elevation Regressions on Independent Slopes Model
RMW	Representative Monitoring Well
RWQCB	Regional Water Quality Control Board
SFB	Space Force Base

SGMA	Sustainable Groundwater Management Act
SWP	State Water Project
SWRCB	State Water Resources Control Board
SYRA	Santa Ynez River Alluvium
SYRVGB	Santa Ynez River Valley Groundwater Basin
SYRWCD	Santa Ynez River Water Conservation District
USBR	United State Bureau of Reclamation
USGS	United States Geological Survey
VSFB	Vandenberg Space Force Base
VVCSD	Vandenberg Village Community Services District
WMA	Western Management Area
WR	Water Rights Order
WY	Water Year (October 1 through September 30)

WELL NUMBERING DESCRIPTION

A State Well Number assigned by the California Department of Water Resources (DWR), based on the public land grid which is organized by the Bureau of Land Management (BLM), is assigned to wells in Santa Ynez River Valley Groundwater Basin. The State Well Number includes the township, range, and section numbers in which a well is located. BLM subdivides each section in the public land grid into sixteen 40-acre tracts. Tracts are assigned a letter designation in an "S" shape pattern, as shown on the following page. Because all wells in the Santa Ynez River Valley Groundwater Basin use the San Bernardino ("S") baseline and meridian, this report generally omits the reference to the baseline and the meridian. For areas outside the official BLM Cadastral survey grid, an estimated grid is used to create this label. Much of the SYRVGB land is former Mexican Land grant land and not covered by the BLM Cadastral survey.

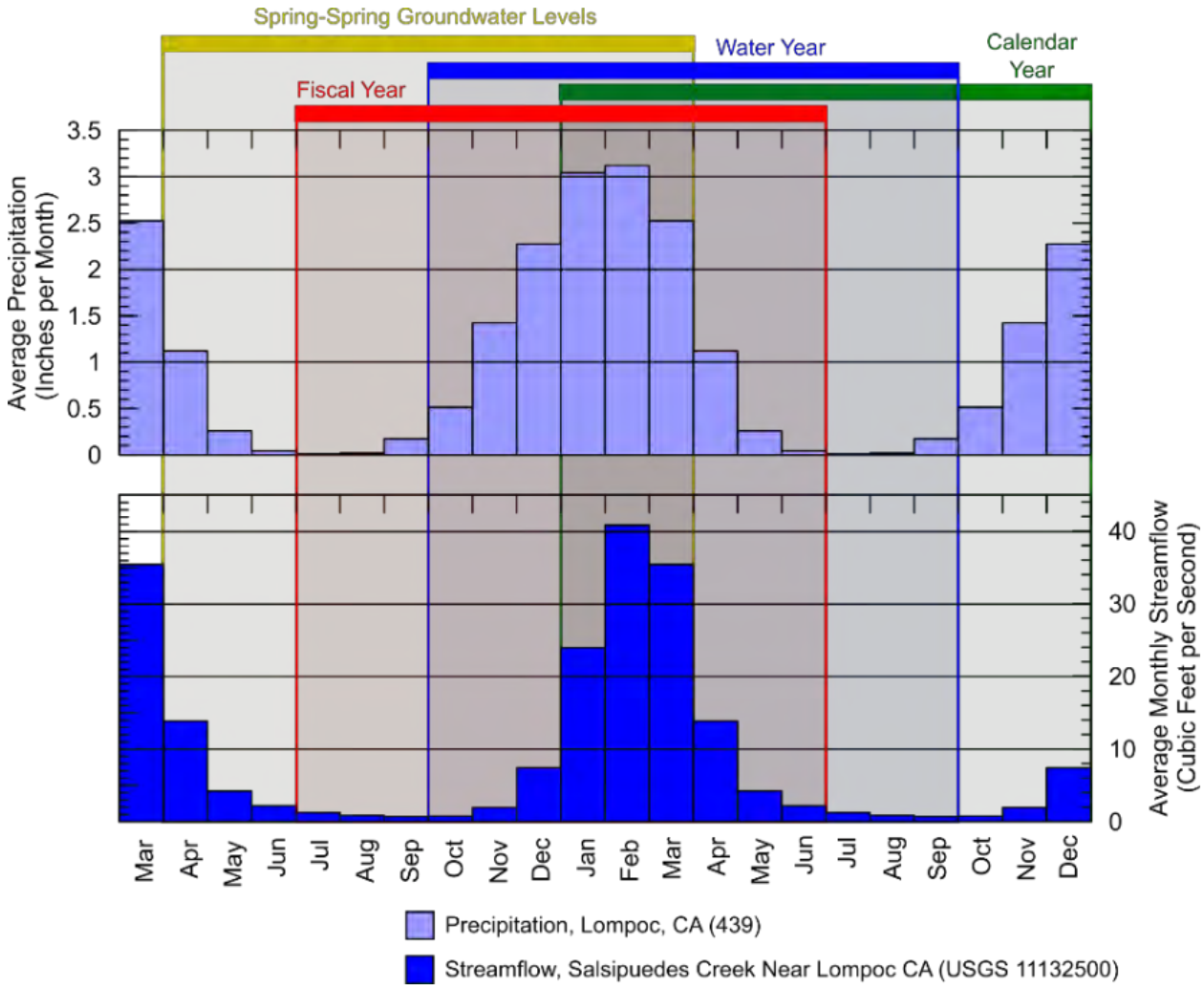
The USGS 15-digit well number based on degrees, minutes, and seconds of latitude (6 digits) and longitude (7 digits) and a sequential number (2 digits) are also shown on wells that are part of the USGS databases. The database management system for this project (sywater.info) additionally assigns a 4-digit unique database identification number (DBID) for each well.



California Department of Water Resources' Numbering System for Water Wells

WATER YEAR DESCRIPTION

Several different annual periods are used in managing Santa Ynez River Valley Groundwater Basin water resources: Water Year, Calendar Year, Fiscal Year and Water Year (July – June), and Spring-Spring Groundwater measurements. For the Sustainable Groundwater Management Act, Water Years are based on the period from October 1st to September 30th, (CWC Section 10721(aa)) which combines the early winter months at the end of a Calendar Year with the remainder of the winter months in the early part of the subsequent Calendar Year, better representing the year on a seasonal basis. Calendar Years are the traditional and commonly used annual period from January 1st to December 31st which starts and ends near the winter solstice. The Santa Ynez River Water Conservation District (SYRWCD) utilizes a Fiscal Year and Water Year (CWC Section 75507(a)) based on the annual period from July 1st to June 30th. Annual spring high groundwater levels are typically evaluated from March of one year to –March of a subsequent year. Finally, the Santa Barbara County Flood Control District annual hydrology reports use a September 1st to August 31st reporting year. The Figure below shows how most of these annual periods compare with the average monthly precipitation at Lompoc and the average monthly stream flow in Salsipuedes Creek at the stream gage.



- Water Year: October 1st to September 30th
- Calendar Year: January 1st to December 31st
- Fiscal Year/ Water Year (SYRWCD): July 1st to June 30th
- Spring-Spring Groundwater Levels: March to March

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EXECUTIVE SUMMARY

This is the second annual report for the Central Management Area (CMA). This report describes changes within the CMA and progress for Water Year (WY) 2022. WY 2022 started on October 1, 2021, and ended on September 30, 2022.

The CMA is the center area in the Santa Ynez River Valley Groundwater Basin (SYRVGB). The SYRVGB is in Santa Barbara County, within the Central Coast Region of California. The Department of Water Resources DWR identifies the SWRVGB as basin number 3-15. The SYRVGB has three management agencies: Western (WMA), Central (CMA), and Eastern (EMA). DWR designated the SYRVGB as a medium-priority groundwater basin. The CMA Groundwater Sustainability Agency (GSA) is implementing the Sustainable Groundwater Management Act (SGMA) law, which is overseen by the DWR.

In WY 2022, the CMA submitted its Groundwater Sustainability Plan (GSP) to DWR in January 2022. DWR has two years to complete a review of the CMA GSP. The CMA GSP indicated that the current CMA conditions are sustainable. The CMA GSP established sustainable management criteria for measuring progress toward groundwater sustainability. The CMA GSP recommended projects and management actions. These projects help maintain sustainability, avoid undesirable results, and avoid unsustainable groundwater conditions. The CMA committee finalized the CMA GSP in WY 2022 and has not completed implementation.

WY 2022 was a dry year in the CMA: it was the eleventh year of drought, and the last wet year in the CMA was 2011. WY 2022 was not the driest year during the drought, but there was little rain, and the Santa Ynez River was dry for most of the year. The largest reservoir on the Santa Ynez River, Lake Cachuma, had not spilled since WY 2011.

The estimated sustainable yield of the CMA is estimated as 2,800 acre-feet per year (AFY). Sustainable yield is the long-term average over the period of record. The total estimated groundwater storage change in the CMA during WY 2022 is a loss of 200 acre-feet (AF). The estimated total groundwater production in the CMA during WY 2022 was about 2,070 AF. Total use includes all water types including groundwater,

surface water (surface and underflow), and imported water. The total estimated water use is about 6,540 AF.

The CMA has organized this Second Annual Report into the following chapters:

- General information (including Basin location) – Chapter 1
- Hydrologic conditions – Chapter 2
- Groundwater elevation data (including contours, with hydrographs as an appendix) – Chapter 3
- Water supply data (including groundwater extraction data) – Chapter 4
- Groundwater storage data – Chapter 5
- Progress towards GSP implementation and sustainability – Chapter 6.

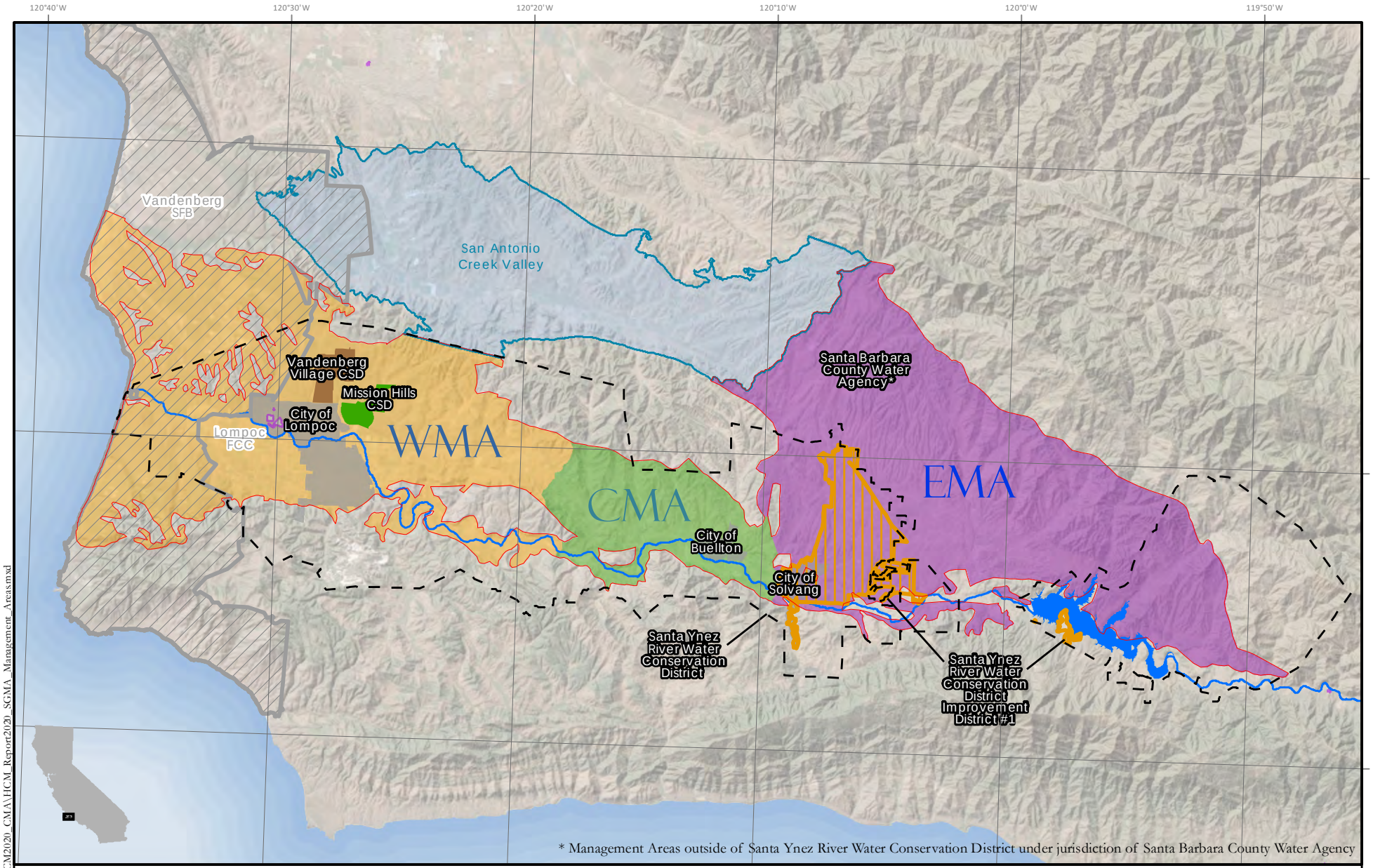
CHAPTER 1: GENERAL INFORMATION

The Central Management Area (CMA) Groundwater Sustainability Agency (GSA) is the responsible local agency for complying with Sustainable Groundwater Management Act (SGMA)[1] requirements in the central portion of the Santa Ynez River Valley Groundwater Basin (SYRVGB). Following the adoption of the Sustainable Groundwater Management Plan (GSP) for the CMA on January 3, 2022, the CMA GSP is required to submit an annual report every April 1st.[2] This second annual report for the CMA is prepared in coordination with the two other management areas within the SYRVGB and covers the water year 2022 (October 1, 2021 – September 30, 2022). **Figure 1-1** shows the location of all three management areas of the SYRVGB[3] and **Figure 1-2** shows the areas managed by the constituent public member agencies of the CMA: the City of Buellton, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency

The SYRVGB is a groundwater basin located in central Santa Barbara County in the central coast region of California (Figure 1-1) which encompasses an area of approximately 133.7 square miles (85,595.5 acres), located within the larger Santa Ynez watershed. This area is geographically diverse, with east-west trending ranges of low mountains and hills interspersed with small to medium-sized valleys and perpendicular north and south-trending canyons that drain out of the mountains and hills.

In the SYRVGB there are eight public water agencies participating in SGMA, three of them in the CMA. **Table 1-1** summarizes the extent and member agencies of all three Management Areas of the SYRVGB. To be consistent with the California legislature's findings that "Groundwater resources are most effectively managed at the local or regional level"[4] the SYRVGB public water agencies divided the SYRVGB into three local management areas based on the geography and extent of local aquifers.

1 CWC Section 10720 et seq. and 23 CCR § 350 et seq.
2 CWC Section 10728, 23 CCR § 351(d), § 355.8, 353.4, 354.40, 355.6(b), 355.8, 356, 356.2.
3 23 CCR § 356.2(a) "[…] location map depicting the basin covered by the report."
4 Sustainable Groundwater Management Act, Uncodified Findings (a)(6)



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Western Management Area (WMA)
Central Management Area (CMA)
Eastern Management Area (EMA)

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
(DWR BULLETIN 118 BASIN NO. 3-105)
AND SGMA MANAGEMENT AREA BOUNDARIES

0 2 4 Miles

N

Sources:
NAIP (2018)
USGS National Elevation Dataset, 2002
Groundwater basin boundary from DWR Bulletin 118, 2018

FIGURE 1-1

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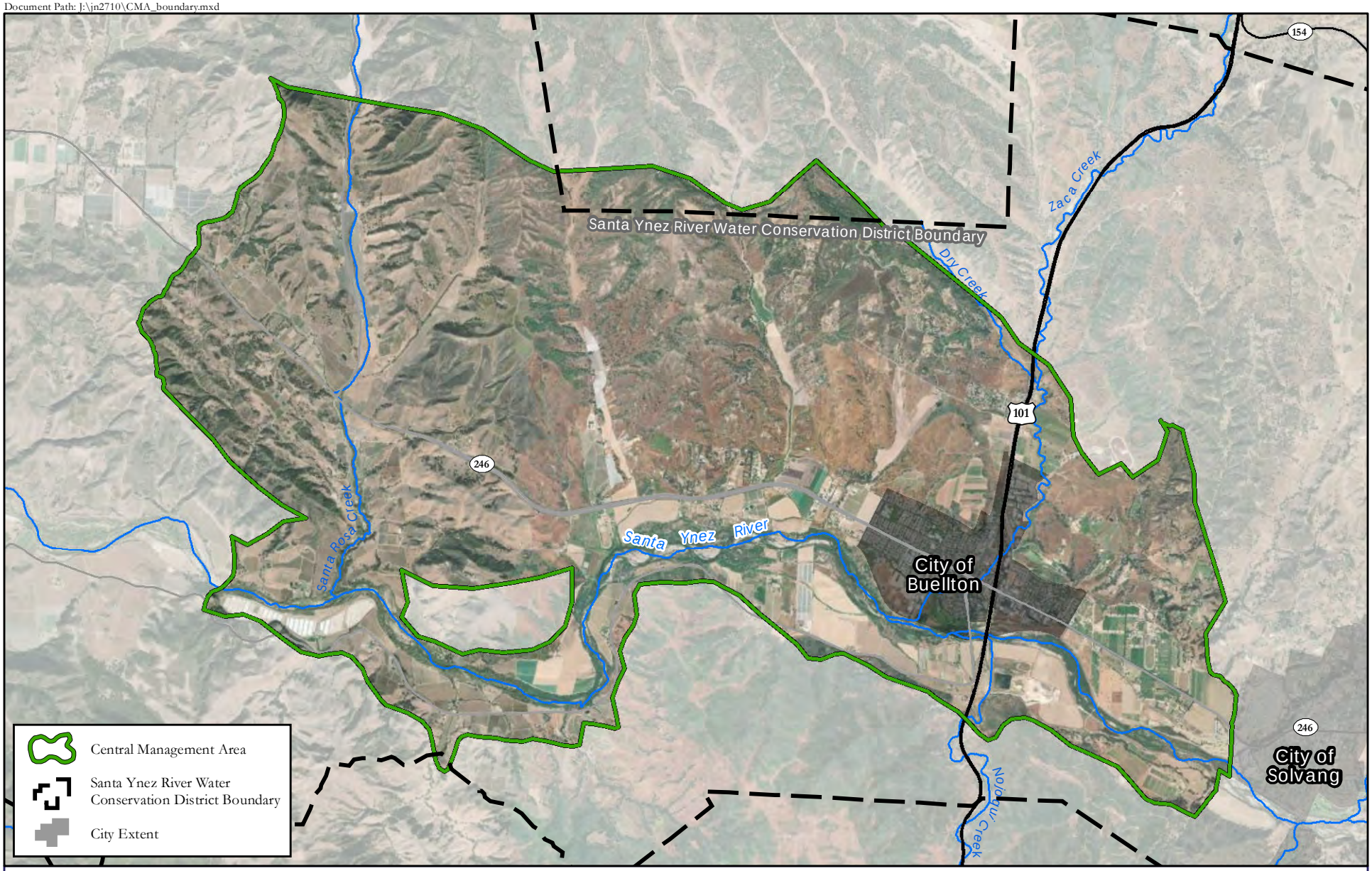

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CENTRAL MANAGEMENT AREA BOUNDARY

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
GROUNDWATER SUSTAINABILITY AGENCY

0 0.5 1 Miles

N

FIGURE 1-2

Table 1-1
Management Areas of the Santa Ynez River Valley Groundwater Basin

Management Area	Physical Description	Committee Member Agencies
WMA Santa Ynez River Valley Groundwater Basin Western Management Area Groundwater Sustainability Agency	133.7 square miles • Santa Ynez River alluvium west of Santa Rosa Park to the Lompoc Narrows • Lompoc Plain • Lompoc Terrace • Burton Mesa • Lompoc Upland • Santa Rita Upland.	• City of Lompoc • Vandenberg Village Community Services District • Mission Hills Community Services District • Santa Ynez River Water Conservation District • Santa Barbara County Water Agency (non-voting member)
CMA Santa Ynez River Valley Groundwater Basin Central Management Area Groundwater Sustainability Agency	32.8 square miles • Santa Ynez River alluvium east of Santa Rosa Park to just west of the City of Solvang • Buellton Upland	• City of Buellton • Santa Ynez River Water Conservation District • Santa Barbara County Water Agency (non-voting member)
EMA Santa Ynez River Valley Groundwater Basin Eastern Management Area Groundwater Sustainability Agency	150.9 square miles • Santa Ynez River alluvium from City of Solvang east • Santa Ynez Upland	• City of Solvang • Santa Ynez River Water Conservation District, Improvement District No.1 • Santa Ynez River Water Conservation District • Santa Barbara County Water Agency

The CMA is bordered on the west by the Western Management Area (WMA), on the north by the Purisima Hills, on the east by the Eastern Management Area (EMA), and on the south by hills along the Santa Ynez River floodplain. The CMA has one aquifer, the "Buellton Aquifer." The Buellton Aquifer consists of the Paso Robles and Careaga Sand Formations. These two formations are located in a wide geologic syncline fold that in places extends below the underflow of the Santa Ynez River. **Figure 1-3** shows these extents.

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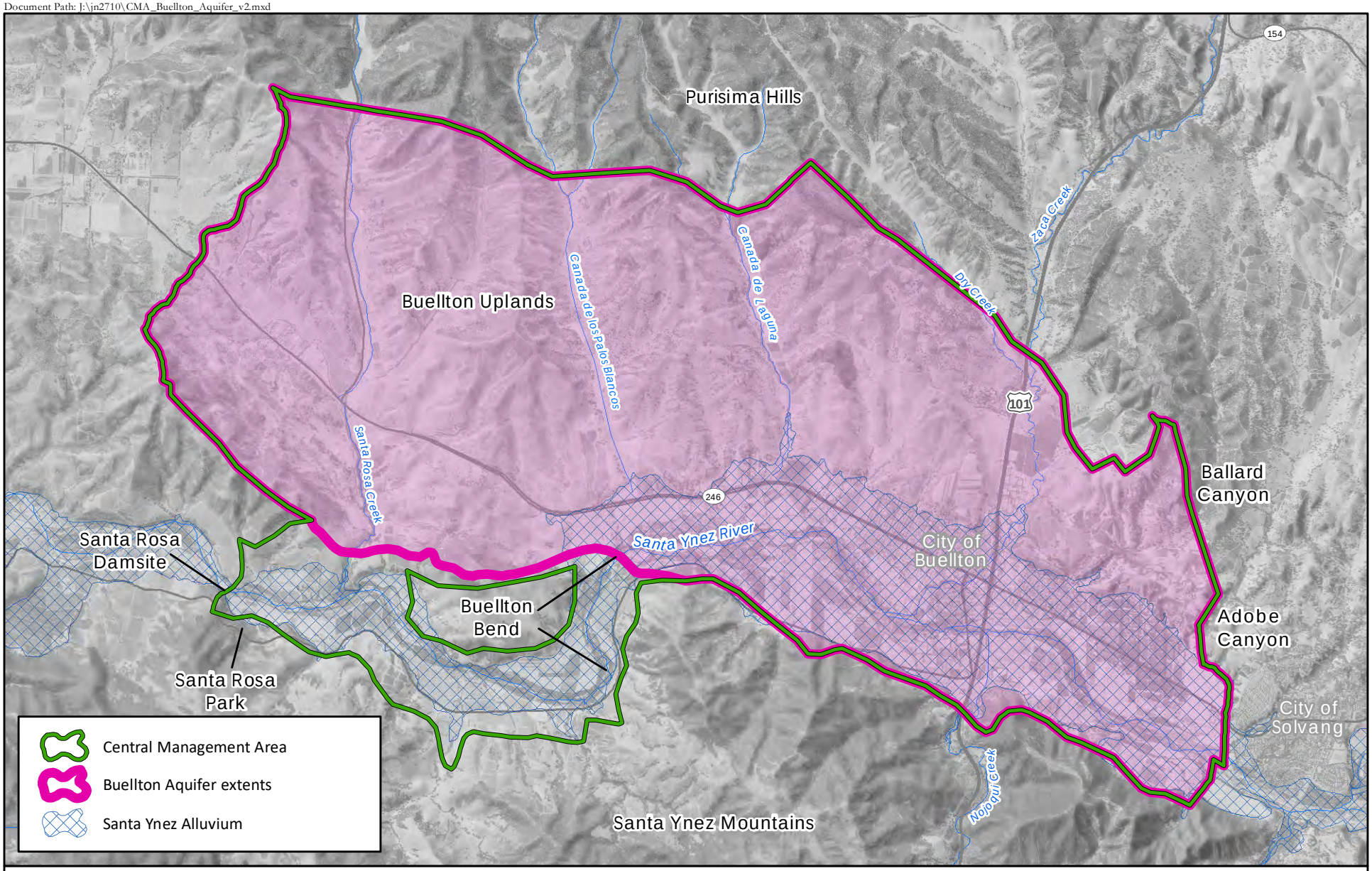

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Central Management Area
Groundwater Sustainability Agency

EXTENTS OF THE BUELLTON AQUIFER
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

FIGURE 1-3

Surface water drains to the Pacific Ocean through the Santa Ynez River and its tributaries. The State Water Resources Control Board (SWRCB) administers Santa Ynez River water, including both surface water and underflow of the Santa Ynez River and the fully allocated surface water rights. Upstream reservoirs are operated by the United States Bureau of Reclamation (USBR) which physically controls the flows of the Santa Ynez River. USBR conducts releases to meet downstream surface water rights and for the benefit of fish. The SGMA statute excludes the CMA from altering the surface water rights of the Santa Ynez River.[5] The SWRCB has long considered the underflow of the Santa Ynez River as part of the river flows.

The CMA is a diverse area divided into two subareas[6] based on more homogeneous hydrogeologic and topographic characteristics. The two subareas are the Buellton Upland and the Santa Ynez River Alluvium. **Figure 1-4** shows the locations and extents of the subareas and **Table 1-2** summarizes the sizes of each subarea.

Table 1-2
Summary of CMA Subareas by Area

CMA Subarea	Acres [A]	Square Miles
Buellton Upland	14,220	22.2
Santa Ynez River Alluvium	6,800	10.6
Total	21,020	32.8

[A] Rounded to the nearest ten acres.

Note: The Buellton Aquifer includes all the Buellton Upland and extends underneath a part of the Santa Ynez River Alluvium.

5 CWC Section 10720.5 (b) "Nothing in this part, or in any groundwater management plan adopted pursuant to this part, determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights."

6 Subareas are like and based on the Santa Ynez River Water Conservation District Annual Report subareas, also used for managing pumping in much of the WMA and a portion of the EMA. Extents were adjusted to cover the entire Bulletin 118 Interim Update 2016 (DWR 2016a) basin boundary.

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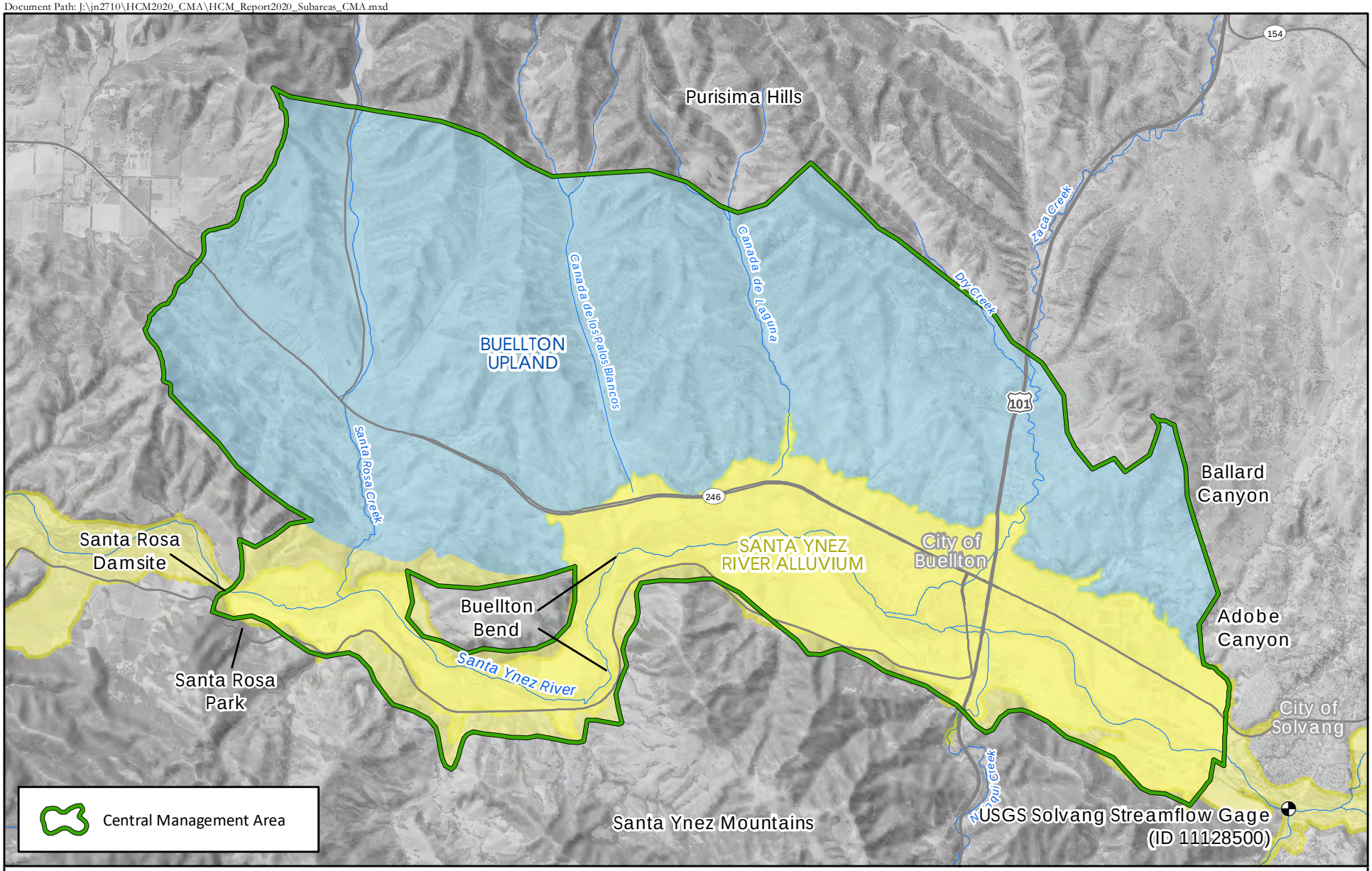

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Central Management Area
Groundwater Sustainability Agency

SUBAREAS
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018)

N

FIGURE 1-4

1.1 PURPOSE OF ANNUAL REPORT

The California legislature identified the following items to include in the SGMA annual reports (California Water Code [CWC] Section 10728):

> On the April 1 following the adoption of a groundwater sustainability plan and annually thereafter, a groundwater sustainability agency shall submit a report to the department containing the following information about the basin managed in the groundwater sustainability plan:
>
> (a) Groundwater elevation data.
>
> (b) Annual aggregated data identifying groundwater extraction for the preceding water year.
>
> (c) Surface water supply used for or available for use for groundwater recharge or in-lieu use.
>
> (d) Total water use.
>
> (e) Change in groundwater storage.
>
> *(Added by Stats. 2014, Ch. 346, Sec. 3. (SB 1168) Effective January 1, 2015.)*

Appendix 1-A includes the SGMA statute and regulations related to the required elements of this annual report. In general, the annual report is required to describe progress toward implementing the GSP and groundwater conditions over the year.

Earlier published reports by the CMA provide historical information before the start of WY 2022. The CMA GSP (adopted on January 5, 2022, submitted to DWR on January 18, 2022) covered historical data through May 2021. The First Annual Report covered conditions for WY 2021 (October 1, 2020 - September 30, 2021) and additional water use and change in storage information for WYs 2019 and 2020 (October 1, 2018 – September 30, 2020). The CMA submitted the first annual report to DWR in March 2022. This Second Annual Report covers conditions for WY 2022 (October 1, 2021 - September 30, 2022).

1.2 SUSTAINABILITY GOAL AND UNDESIRABLE RESULTS

The CMA GSP identified the following sustainability goal for the Basin:

> "The sustainability goal for the Santa Ynez River Valley Groundwater Basin is to manage groundwater resources in the WMA, CMA and EMA for the purpose of facilitating long-term beneficial uses of groundwater within the Basin. Beneficial uses of groundwater in the Basin include municipal, domestic, and agricultural and environmental supply. The sustainability goal is in part defined by the locally defined minimum thresholds and undesirable results. This GSP describes how the CMA GSA will maintain the sustainability of the Basin, and how the measures recommended in the GSP will achieve these objectives and desired conditions" (2022 CMA GSP, Section 3B.1 Sustainability Goal).

Under SGMA,[7] six indicators of sustainability were considered as part of the GSP.[8] The six sustainability indicators are listed as follows.

1. Chronic lowering of groundwater levels

2. Reduction of groundwater storage

3. Seawater intrusion (not applicable to CMA)

4. Degraded water quality

5. Land subsidence

6. Depletion of interconnected surface water

[7] CWC Section 10721 (x), 23 CCR § 354.28(c), 23 CCR § 354.34(c),

[8] 23 CCR § 354.30(a) Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin over the planning and implementation horizon.

1.3 NEW AND UPDATED PLANS, REPORTS, AND DATA OF NOTE DURING WATER YEAR 2022

Every year plans, reports, and data pertinent to the CMA are developed, updated, and released. **Table 1-3** summarizes notable relevant reports and plans that were released during WY 2022 (October 1, 2021 – September 30, 2022) which provide information for use in updating future GSPs.

Table 1-3
New Reports and Data during the Water Year 2022

Calendar Year	Month	Report Title
2021	November	California's Groundwater Update 2020 (Bulletin 118). California Department of Water Resources
2022	January	Groundwater Sustainability Plan. Santa Ynez River Valley Groundwater Basin Central Management Area.
2022	January	City of Buellton. 2021 WWTP Annual Report.
2022	March	WY2021 Annual Monitoring Summary. The Biological Opinion for The Operation and Maintenance of the Cachuma Project on the Santa Ynez River in Santa Barbara County, California. Cachuma Operation and Maintenance Board Fisheries Division.
2022	March	Polonio Pass Water Treatment Plant Water Quality Table. Reporting Period of January-December 2021. Central Coast Water Authority.
2022	March	First Annual Report Water Year 2021 for the Santa Ynez River Valley Groundwater Basin. Santa Ynez River Valley Groundwater Basin Central Management Area.
2022	June	Forty-Fourth Annual Engineering and Survey Report on Water Supply Conditions of The Santa Ynez River Water Conservation District 2021-2022. FINAL June 1, 2022. Accepted by the Board of Directors of the Santa Ynez River Water Conservation District.
2022	June	COMB Sustainability Plan. Cachuma Operation & Maintenance Board
2022	June	City of Buellton. Annual Water Supply Report. June 2022

This CMA SGMA annual report uses the SGMA water year (October 1 to September 30) and includes data through September 30, 2022. One of the CMA member agencies, SYRWCD, produces an annual report (based on July 1 to June 30 water year[9]) entitled "Engineering Investigation and Report upon Ground Water Conditions"[10] which covers related topics to this SGMA report which is now in its 45th year. The SYRWCD report summarizes Santa Ynez River system conditions, basin surface water use, water purchased by contract, production within SYRWCD boundaries, expected future demand, and revenue from groundwater production. The SYRWCD's reports cover a different period than the SGMA annual reports and include projections of surface water and groundwater use through June 30, 2024.

9 CWC Section 75507 (a) "Water year" means July 1st of one calendar year to June 30th of the following calendar year.
10 CWC Section 75560 The district shall annually cause to be made an engineering investigation and report upon ground water conditions of the district.

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CHAPTER 2: BASIN CONDITIONS

The water year type is a classification of how wet or dry basin conditions are due to weather during the year. This is a potential cause of changes to groundwater conditions, as measured through groundwater levels, storage, and water quality. This chapter updates the "Hydrologic Characteristics" subsection of the Hydrogeologic Conceptual Model section of the GSP through the end of WY 2022.

Table 2-1 summarizes the precipitation and the water year type for the recent years of WY 2015 through WY 2022.

Table 2-1
Annual Precipitation and Water Year Classification for CMA, WY2015 through WY2022

Water Year	Buellton Fire Station		Hydrologic Year Type Classification USGS Gage 11132500 (Salsipuedes Creek)	
	Precipitation (in/year)	% of Average [A]	Percentile Rank	Water Year Type Classification
2015	7.01	43%	0%	Critically Dry
2016	10.68	65%	2%	Critically Dry
2017	20.36	124%	73%	Above Normal
2018	7.92	48%	5%	Critically Dry
2019	19.22	117%	79%	Above Normal
2020	15.44	94%	33%	Dry
2021	8.56	52%	49%	Below Normal
2022	9.51	58%	22%	Dry

Years are color coded as follows: yellow indicates dry and critically dry years (below 40 percentile); blue indicates wet years (above 80 percentile); unshaded indicates years that were either in the below normal or above normal years (40 to 80 percentile). Percentages and percentiles are calculated from the respective periods of record.
[An] Average is calculated as the mean of the period of record (WY1955-WY2022).
Notes: CMA = Central Management Area; USGS = U.S. Geological Survey; SWRCB = State Water Resources Control Board; in/year = inches per year.
Source: Precipitation from Santa Barbara County - Flood Control District station #233 - Buellton Fire Station

2.1 PRECIPITATION

Within the CMA, direct annual average precipitation ranges from 16.6 inches per year in portions of Santa Rosa Creek up to 20.4 inches per year along the north side of the Santa Ynez River. **Figure 2-1** shows the average precipitation within the CMA and adjacent watershed.[1] Orthographic lift effects are the primary driver of precipitation within the CMA, and portions of the CMA at lower elevations generally receive less direct precipitation. **Table 2-2**, below, summarizes the annual average direct precipitation for the subareas of the CMA.

Table 2-2
Average Annual (1991-2020) Precipitation by CMA Subarea

CMA Subarea	Size (Acres) [A]	Average Annual Precipitation Per Subarea (Average 1991-2020) inches per year		
		Average	Average Annual Minimum	Average Annual Maximum
Buellton Upland	14,220	17.5	16.6	18.5
Santa Ynez River Alluvium	6,800	18.5	17.3	20.4

[A] Rounded to the nearest ten acres.
Source: Derived from PRISM Climate Group (2021), Average Annual Precipitation 1991-2020.

The precipitation station at Buellton Fire Station is the primary gauge for precipitation within the CMA. Total precipitation during WY 2022 was 9.51 inches. **Figure 2-2** presents annual precipitation data from this station for WY 1955 to the present (WY 2022) and the cumulative departure from the mean (CDM). The CDM trends provide a representation of wet and dry periods within the overall period of record. On a CDM graph, a wet period is indicated with an upward trend over years. Conversely, a downward trend on the graph indicates a dry period.

[1] Average conditions here are updated to include newly released data for the period 1991-2020, compared to the GSP (including GSP Figure 2a.3-2) which used available data for the period 1981-2010.

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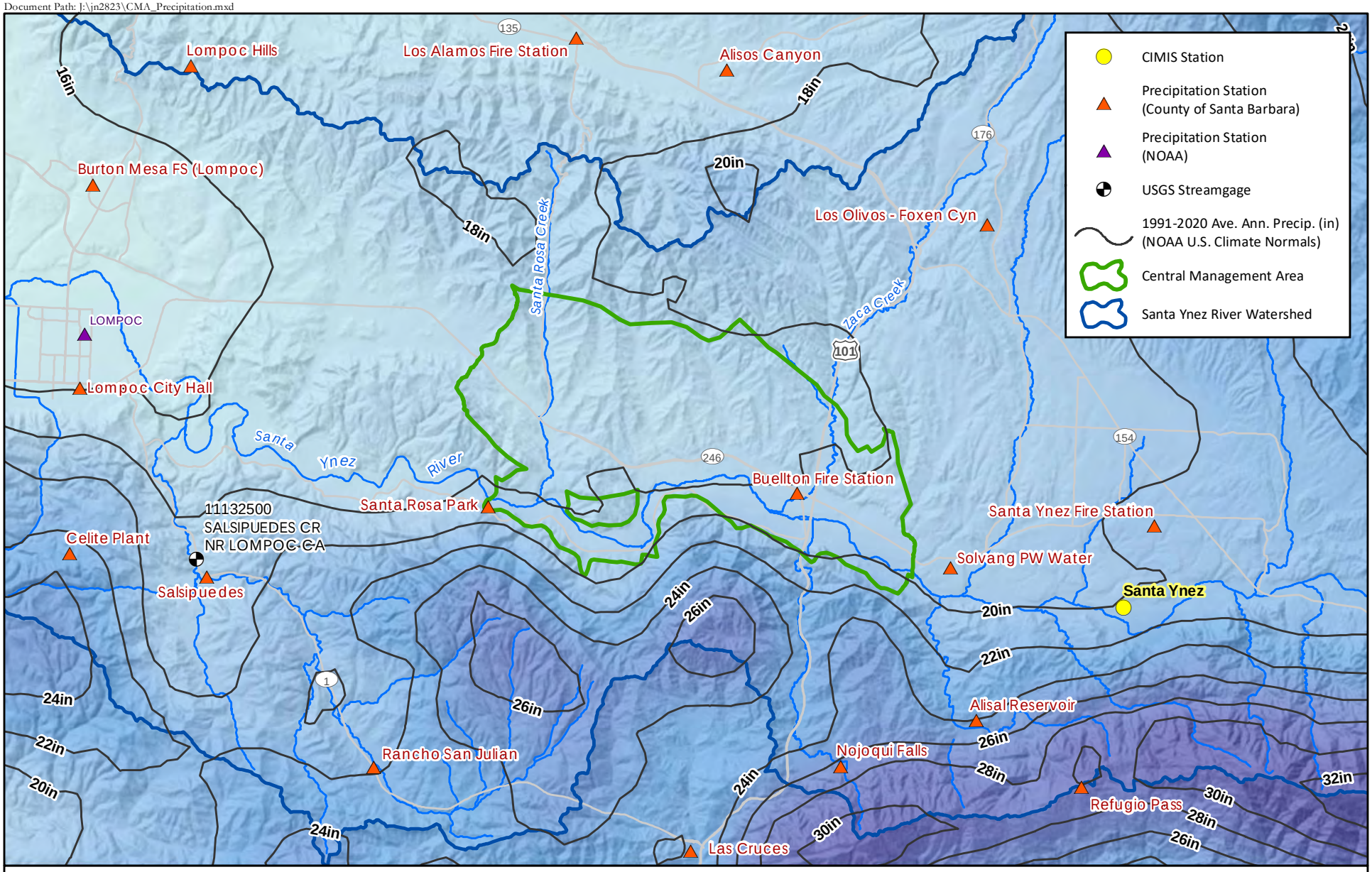

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Central Management Area
Groundwater Sustainability Agency

PRECIPITATION STATIONS AND ISOHYETALS
1991-2020 CLIMATE NORMALS
CENTRAL MANAGEMENT AREA

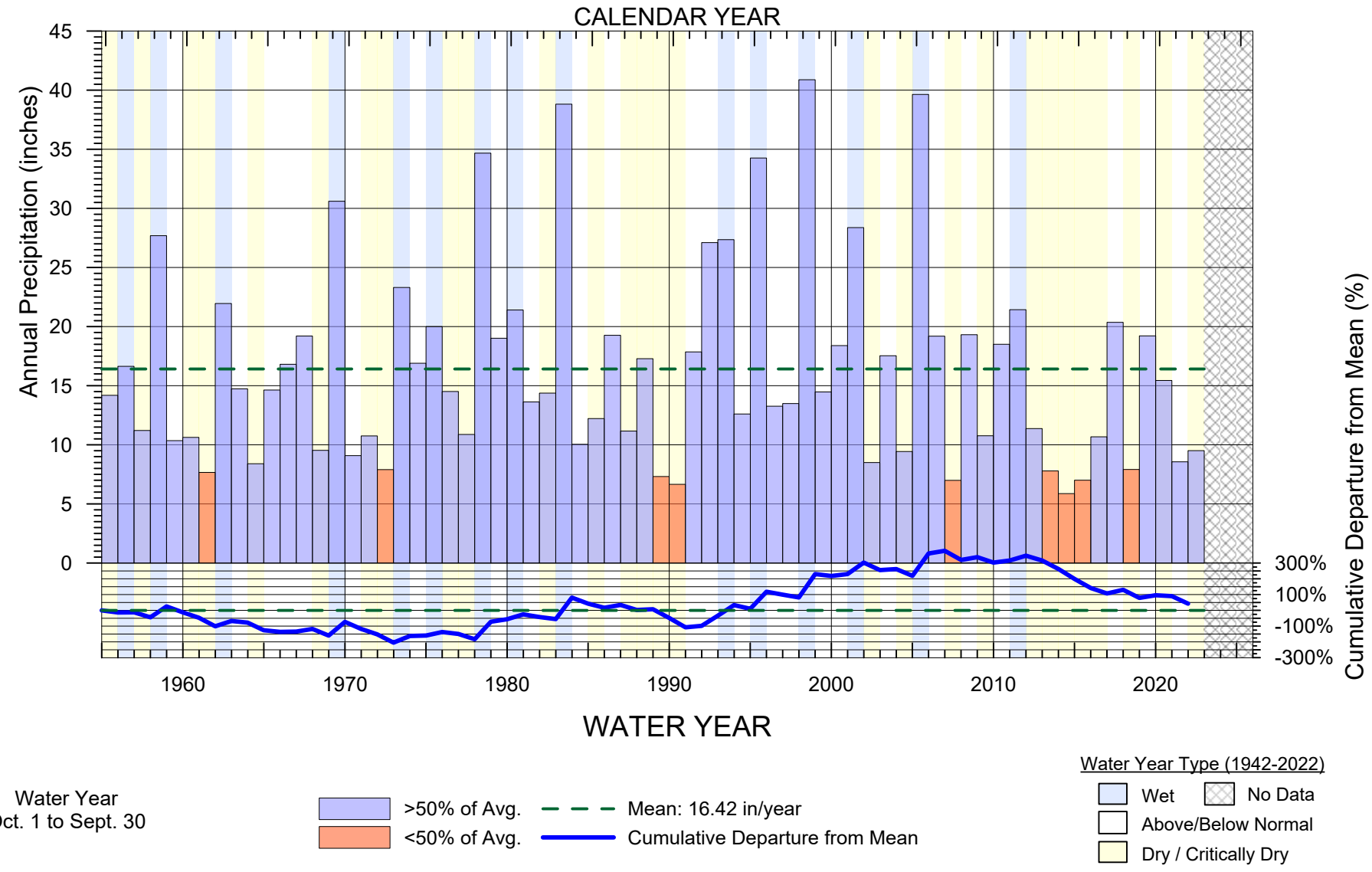
DRAFT

0 1.5 3 Miles

Source Imagery:
ESRI World Imagery (2018 Maxar)
NOAA (2020), WRCC (2020)

N

FIGURE 2-1



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Groundwater Sustainability Agency

BUELLTON FIRE STATION
PRECIPITATION AND
CUMULATIVE DEPARTURE FROM MEAN
WY 1955 - 2022

Source: Santa Barbara County (2023)
Precipitation Gage #233

FIGURE 2-2

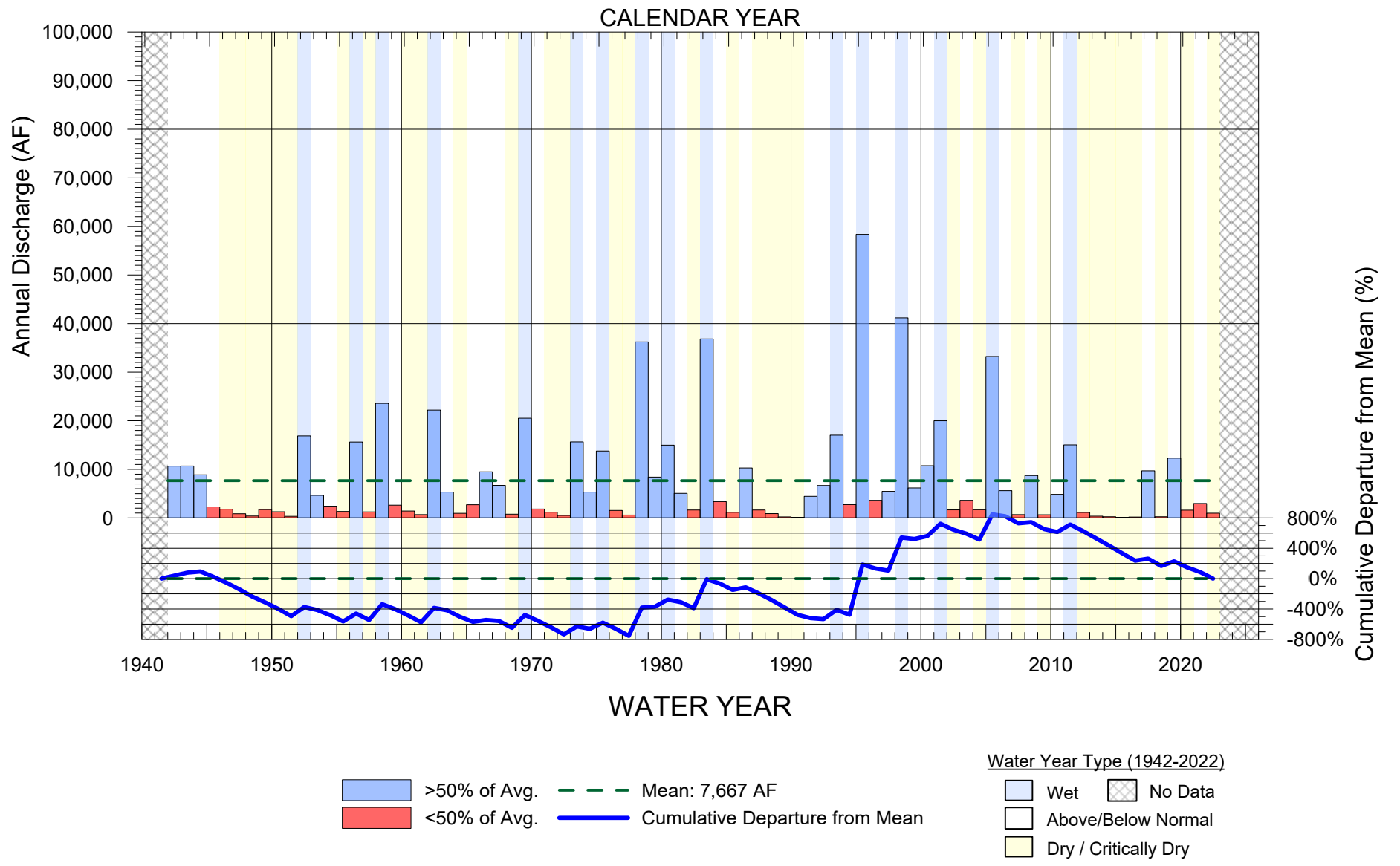
F:\DATA\2823\Analyses\2023-01 WY22 Precipitation CDM Graphs\Fig 2-02 CMA_Buellton_Fire_Station_Precip_CDM WY2022.grf 1/4/2023 M. McCammon

2.2 CLASSIFICATION OF 2022 WATER YEAR

The CMA classified WY 2022 as a dry year based on the Water Year Type. Water Year Type is a generalized characterization of the amount of water that is available in a year. It is a summary of general precipitation and streamflow conditions during the year. The relative ranking in the period of record is used to classify the hydrologic year types into one of five categories: critically dry (bottom 20th percentile), dry (20th to 40th percentile), below normal (40th to 60th percentile), above normal (60th to 80th percentile), and wet (80th to 100th percentile). The WMA and CMA use a method like the long-standing method used by the Cachuma Project operations such as the 2019 State of California Water Resources Control Board (SWRCB) Order WR 2019-0148.

Salsipuedes Creek flows at the stream gage (U.S. Geological Survey [USGS] gage 11132500) are used as the monitoring location for calculating water year types. The USGS Salsipuedes Creek streamflow gage is located on Salsipuedes Creek just below the confluence with El Jaro Creek and has a drainage area of 47.1 square miles (shown in Figure 2-1). The 81-year dataset for the Salsipuedes Creek stream gage spans 1942 through 2022 (in **Figure 2-3**) and represents unimpeded runoff due to the absence of upstream water diversions and storage reservoirs. Annual Salispuedes Creek flow data ordered by the amount of flow in each year is shown in **Figure 2-4**. WY 2022 is indicated in Figure 2-4 which shows that WY 2022 was a dry year compared to the period of record. The background colors on most time series figures in this report are derived from Figure 2-4 and likewise indicate the relative year type.

Conditions for recent years, WY 2015 through WY 2022 are summarized in Table 2-1. The basin was experiencing a historic drought. For the recent 10-year period WY 2013-2022, there were only two years, WYs 2017 and 2019, which were “Above Normal” or “Wet”, and, before January 2023, Lake Cachuma had not spilled since WY 2011.



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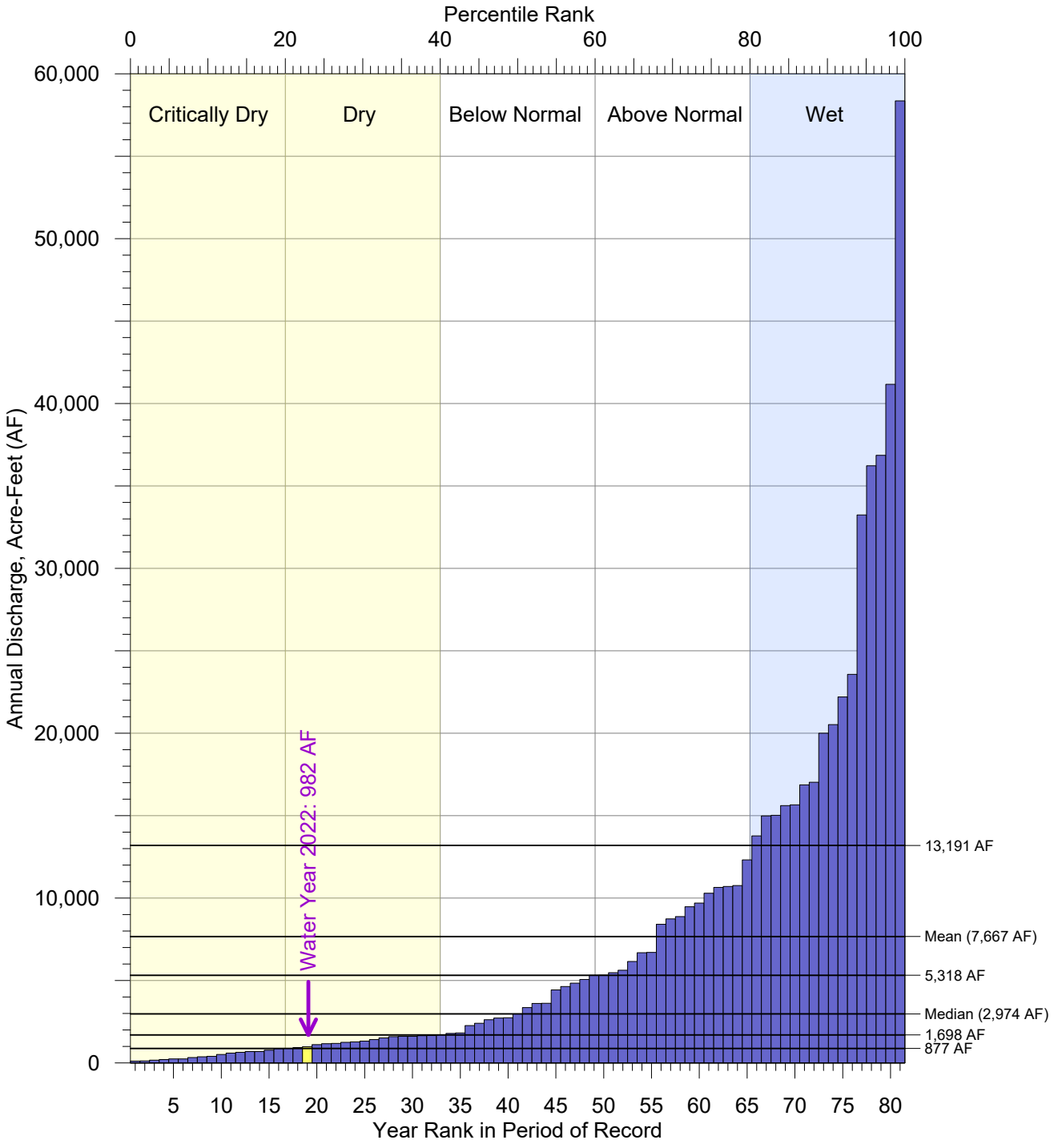
11132500 SALSIPUEDES CREEK NEAR LOMPOC
CUMULATIVE DEPARTURE FROM MEAN AND
PERIOD OF RECORD (WY 1942 - 2022)

Sources: USGS (2023) streamflow data

FIGURE 2-3

F:\DATA\2823\Analyses\2023-01 WY22 SW Flow Statistics\Salispuedes_CDM.grf 1/3/2023 M. McCammon

SANTA YNEZ RIVER ANNUAL FLOWS
11132500 SALSIPUEDES CREEK NEAR LOMPOC
PERIOD OF RECORD (WY 1942 - 2022)



Data Source: USGS (2023) streamflow data

WATER YEAR TYPE
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

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F:\DATA\2823\Analyses\2023-01 WY22 SW Flow Statistics\Salispuedes_Year_type.grf 1/4/2023 M. McCammon

The EMA is located farther from the Salsipuedes Creek stream gage than the CMA. The EMA has adopted a different method based on past and current years of precipitation data for a gage in the EMA (DWR, 2021).[2] The EMA classified WY 2022 as a “Critical” year. For the EMA method, a "Critical" indicates the rank of the water year type index is in the bottom 15th percentile of the period of record. Both methods for water year type meet the DWR requirements (DWR, 2021). The methods were selected in coordination with the entire Basin and based on the management needs of each GSA. Since these are different methods slight differences in water year type designation exist. The results from the two methods exhibit a robust match. Both methods support the same Basin-wide sustainability goals.

[2] The DWR (2021) document states “GSAs may choose to use the SGMA WYT dataset as a resource in the development of their water budget but are not required to. GSAs have the option to develop their own water year types based on best available information (23 CCR Section 354.18d).”

CHAPTER 3: GROUNDWATER HYDROGRAPHS AND CONTOURS

Groundwater levels are a key indicator of sustainability in the basin. Groundwater levels directly impact the beneficial use of the Basin and correlate with or impact most of the groundwater sustainability indicators. The SGMA regulations require that GSP Annual Reports contain "...*groundwater elevation data from monitoring wells identified in the monitoring network [which] shall be analyzed and displayed*."[1]

The CMA assesses the following three SGMA sustainability indicators using groundwater level data:


Chronic lowering of groundwater levels


Reduction of groundwater storage (see Chapter 5)


Depletion of interconnected surface water

The full monitoring of the CMA was not implemented as of October 2021, the start of WY 2022. The CMA published the CMA GSP in January 2022. The CMA is working on implementing the GSP (see Chapter 6). Implementing the recommendations from the CMA GSP will improve monitoring for this indicator.

[1] 23 CCR § 356.2(b)(1)

3.1 GROUNDWATER ELEVATION DATA AND HYDROGRAPHS

Figure 3-1 is a map of the locations of groundwater monitoring network wells. There are several wells included in the CMA monitoring network. Two appendices contain the groundwater level hydrographs[2]: **Appendix 3-A** which is Groundwater Level Hydrographs for Assessing Chronic Decline in Groundwater Levels, and **Appendix 3-B** which are Groundwater Level Hydrographs for Assessing Surface Water Depletion.

Several agencies collect groundwater level data in the CMA. In the CMA these agencies include Santa Barbara County Water Agency, the City of Buellton, and USBR.

The SGMA water year runs from October 1st through September 30th. Seasonal high data is the data from March and April 2022. Seasonal low data is the data from October 2022. Fall data collection of water levels occurs in mid-October, less than a month after the end of the water year. This fall data is technically collected in WY2023. The CMA GSA considers this data as representative of the seasonal low conditions for WY2022.

3.2 GROUNDWATER ELEVATION CONTOUR MAPS

This GSP Annual Report must contain *"...elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions."*[3] according to the SGMA regulations. This Second Annual Report includes Spring 2022 (**Figure 3-2**) and Fall 2022 (**Figure 3-3**) contour maps. These correspond to the seasonal high and seasonal low groundwater conditions.

The CMA developed six sets of groundwater elevation contours for WY 2022, including Fall 2021, Spring 2022, and Fall 2022 for the Buellton Aquifer and the river underflow. The Buellton Aquifer consists of the water-bearing Careaga Sand and Paso Robles Formations. River underflow occurs along the Santa Ynez River. SWRCB administers Santa Ynez River underflow as part of the river, so it is not a principal aquifer of the CMA.

2 23 CCR § 356.2(b)(1)(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

3 23 CCR § 356.2(b)(1)(A)

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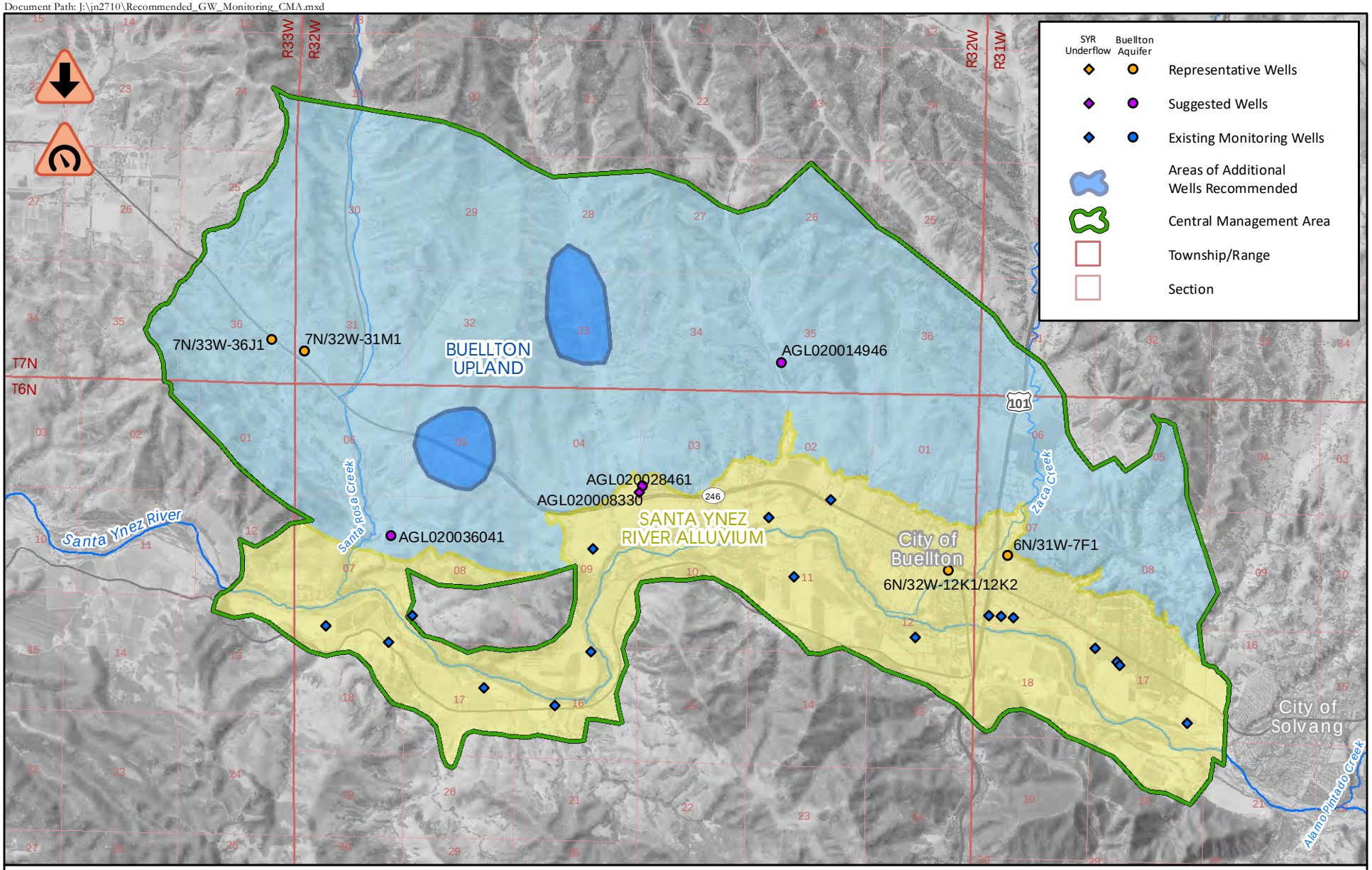

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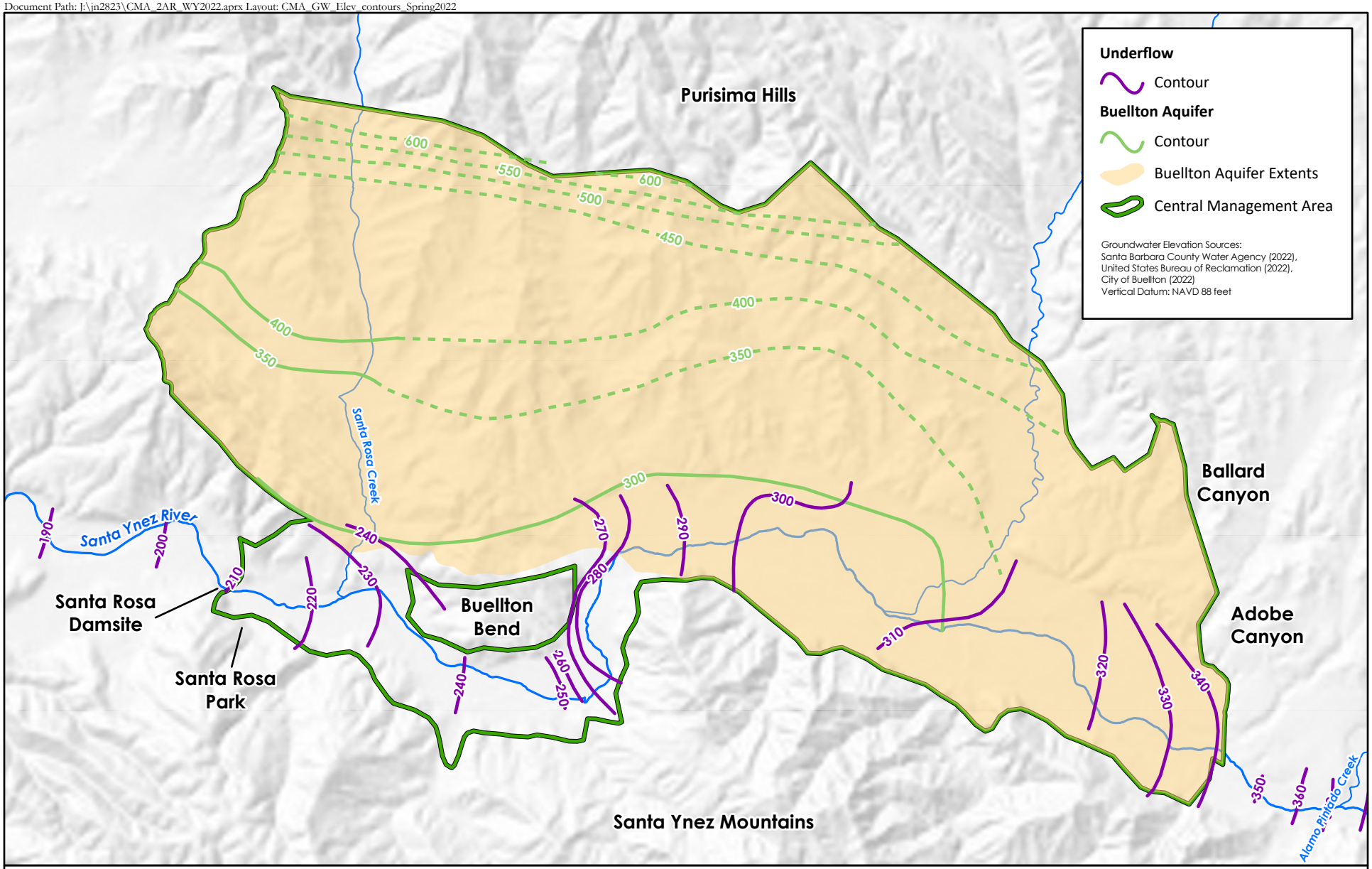
CMA MONITORING NETWORK AND REPRESENTATIVE MONITORING WELLS FOR GROUNDWATER LEVELS AND GROUNDWATER STORAGE

0 0.5 1 Miles

N

FIGURE 3-1

Document Path: J:\jn2823\CMA_2AR_WY2022.aprx Layout: CMA_GW_Eley_contours_Spring2022



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GROUNDWATER AND UNDERFLOW ELEVATION CONTOURS
SEASONAL LOW
SPRING 2022
CENTRAL MANAGEMENT AREA

DRAFT

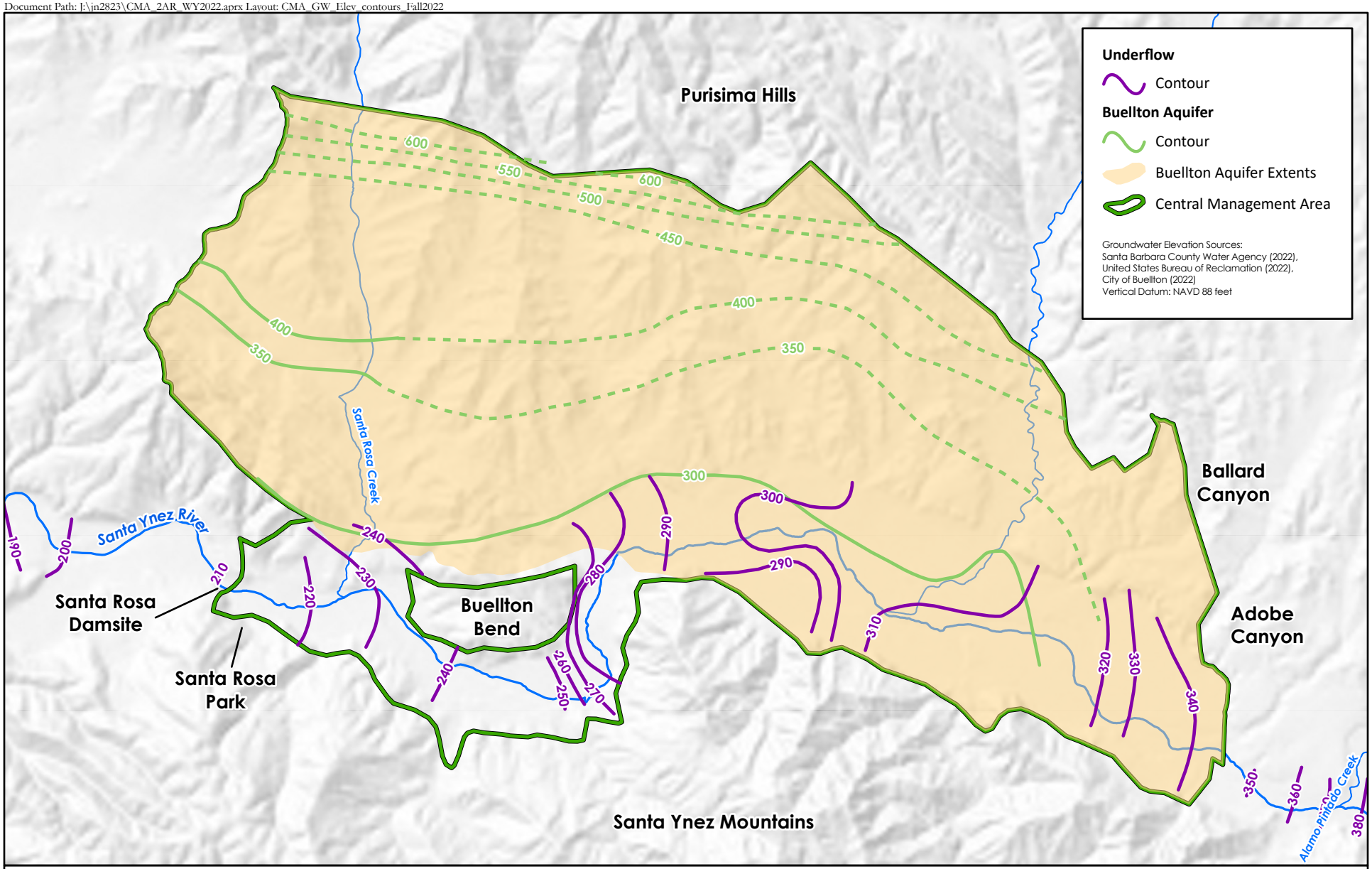
0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 3-2

Document Path: J:\jn2823\CMA_2AR_WY2022.aprx Layout: CMA_GW_Eley_contours_Fall2022



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GROUNDWATER AND UNDERFLOW ELEVATION CONTOURS
SEASONAL LOW
FALL 2022
CENTRAL MANAGEMENT AREA

DRAFT

0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 3-3

3.2.1 Fall 2021 –Start of Year Seasonal Low Contours

The First Annual Report included Fall 2021 groundwater elevation contour map. The map for Fall 2021 represents conditions at the start of WY 2022. Please see the First Annual Report for the Fall 2021 map.

3.2.2 Spring 2022 – Seasonal High Contours

Figure 3-2 is a groundwater level contour map developed for Spring 2022, which is the seasonal high for WY 2022. Relative to Spring 2021, wells in the Buellton Aquifer indicated a lower water level in Spring 2022. This is likely due to the dry conditions of WY 2022. As identified in the CMA GSP, the well network for the CMA has data gaps. Chapter 6 addresses the progress of plans to resolve these data gaps.

3.2.3 Fall 2022– End of Year Seasonal Low Contours

The Fall 2022 groundwater elevations represent the seasonal low groundwater levels for WY 2022. Figure 3-3 is a groundwater level contour map developed for this seasonal low.

The Buellton Aquifer showed a slight increase in groundwater levels in Fall 2022 relative to Fall 2021. As with the Spring 2022 water levels, the CMA identified data gaps. Chapter 6 addresses the progress of plans to resolve these data gaps.

CHAPTER 4: WATER USE AND AVAILABLE SURFACE WATER

Water use is a major component of the water budget. The SGMA regulations require that *"...water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type*."[1] This chapter of the Second Annual Report provides an update on water use in the Basin.

4.1 GROUNDWATER USE

Groundwater production within the CMA Buellton Aquifer is used for agricultural, domestic, municipal, and industrial purposes. There are no managed wetlands in the CMA. Outside of the municipal uses by the City of Buellton, most of the CMA is a mixture of rural areas with agriculture and some rural-suburban development. Groundwater production is reported semi-annually to the Santa Ynez River Water Conservation District (SYRWCD).

SYRWCD's semi-annual groundwater production data was converted to monthly values using monthly evapotranspiration (ET) from California Irrigation Management Information System (CIMIS) sites (see Figure 2-1 for CIMIS site locations). Municipal data provided by the City of Buellton was compiled into monthly data. Domestic and agricultural data for the fourth quarter (July-September) of WY 2022 was estimated using the reported data from the fourth quarter of the previous water year (WY 2021). **Figure 4-1** shows the monthly groundwater use in the CMA Buellton Aquifer, and **Figure 4-2** shows the annual

[1] 23 CCR § 356.2(a) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.

groundwater use for each water year.[2] **Figure 4-3** is a map[3] showing the spatial distribution of groundwater pumping in the Buellton Aquifer during WY 2022. **Table 4-1** summarizes the groundwater production for WY 2022.

Table 4-1
Summary CMA Groundwater Extraction for Water Year 2022

Water Use Sector	Buellton Aquifer	Method of Measurement	Estimated Accuracy
	Acre-Feet		Acre-Feet
Domestic	280	Self-Reported to SYRWCD may include estimates using crop usage, estimated for July-September using WY 2021 data	± 30 (~10%)
Agricultural	1,440	Self-Reported to SYRWCD may include estimates using crop usage, estimated for July-September using WY 2021 data	± 140 (~10%)
Municipal	350	City of Buellton Daily totalizer values	± 10 (~1%)
Total	2,070		± 180

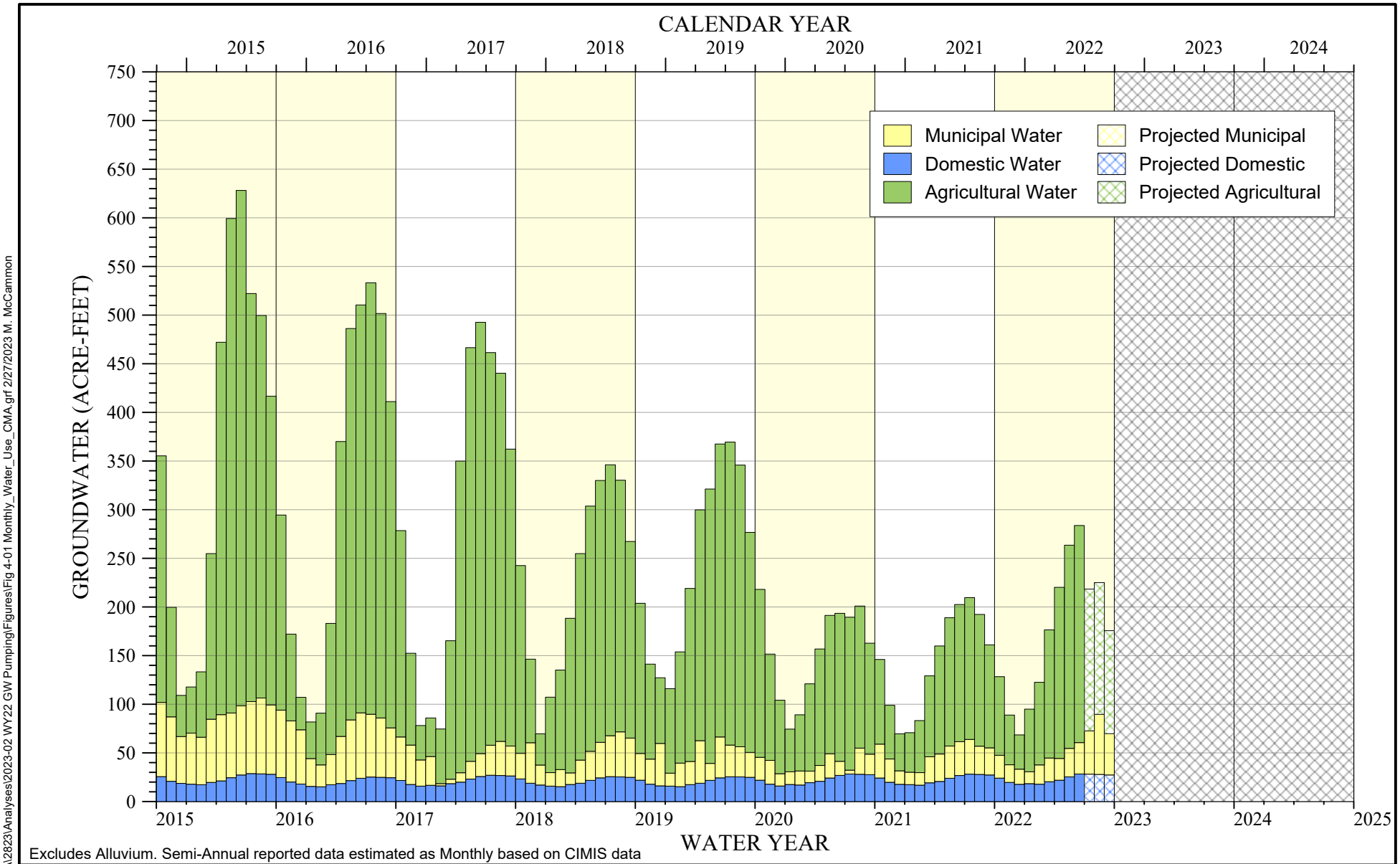
SYRA pumping (SYRWCD Zone A) is managed as surface water and excluded from Table 4-1 (see Table 4-2).
All numbers rounded to the nearest 10 acre-feet.
Source: SYRWCD (2022), City of Buellton (2022)

4.2 SURFACE WATER USE

The CMA relies on two surface water source types: local water and imported water. Local water includes both local tributary flows and the flows of the Santa Ynez River which are partially retained in Lake Cachuma. Imported water is from State Water Project (SWP). The City of Buellton is the sole water-importing entity in the VMA.

2 Figures in the GSP showed groundwater production based on the SYRWCD's Fiscal Year (July-June), production data presented here is recalculated to the Water Year (October-September) basis.

3 23 CCR § 356.2(a)(2) "Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in [..] a map that illustrates the general location and volume of groundwater extractions."



Excludes Alluvium. Semi-Annual reported data estimated as Monthly based on CIMIS data

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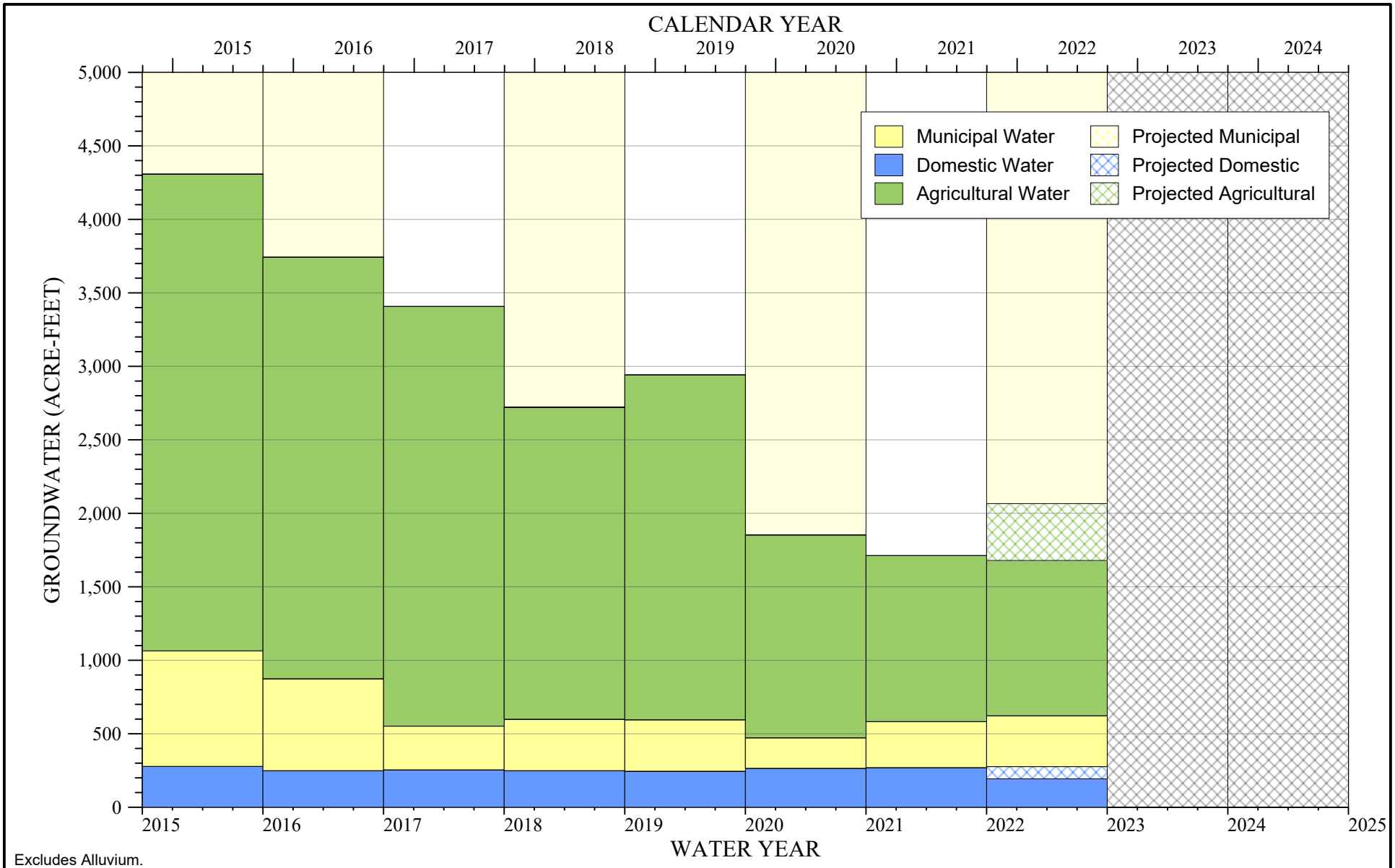
MONTHLY GROUNDWATER USE
BUELLTON AQUIFER

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry
- No Data

Source: Santa Ynez River Water Conservation District (2023), City of Buellton (2023)

FIGURE 4-1

\\192.168.16.33\main\DATA\2823\Analyses\2023-02 WY22 GW Pumping\Figures\Fig 4-01 Monthly_Water_Use_CMA.grf 2/27/2023 M. McCammon



Excludes Alluvium.

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ANNUAL GROUNDWATER USE
BUELLTON AQUIFER

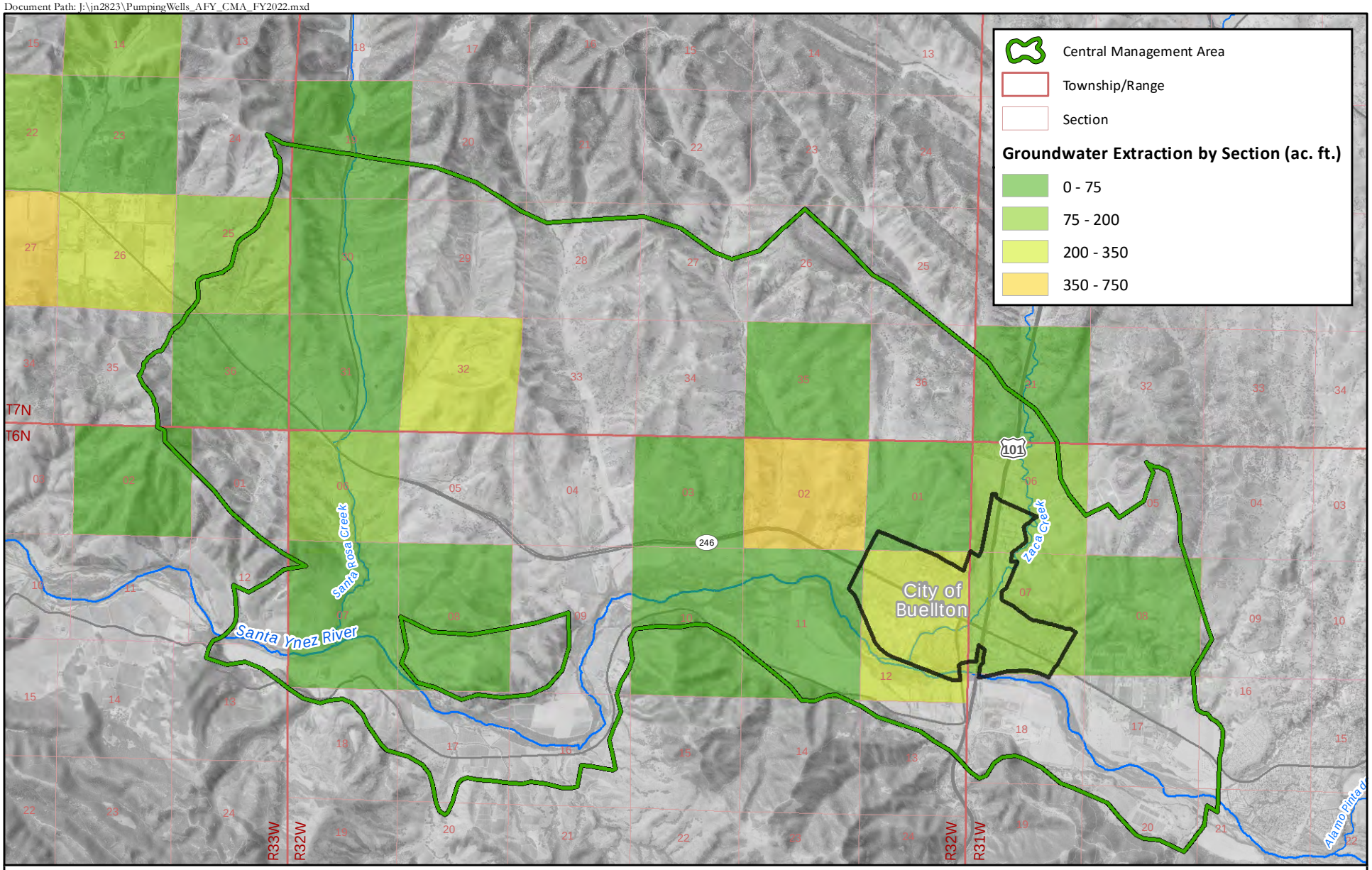
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry
- No Data

Source: Santa Ynez River Water Conservation District (2023), City of Buellton (2023)

FIGURE 4-2

\\192.168.16.33\main\DATA\2823\Analyses\2023-02 WY22 GW Pumping\Figures\Fig 4-02 Annual_Water_Use_CMA.grf 2/27/2023 M. McCammon

Document Path: J:\jn2823\PumpingWells_AFY_CMA_FY2022.mxd



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LOCATION AND VOLUME OF GROUNDWATER EXTRACTION 2022

Source: Santa Ynez River Water Conservation District (2023)

0 0.5 1 Miles

N

FIGURE 4-3

4.2.1 Surface Water Diversions from Santa Ynez River Underflow

Upstream of the Lompoc Narrows the SWRCB manages the underflow of the Santa Ynez River as surface water. This management follows the SWRCB water rights Order of 1973 (WR 73-37), as amended in 1989 (WR 89-18) and most recently amended in 2019 (WR 2019-0148). SWRCB considers water extracted from wells upstream of the Lompoc Narrows as Santa Ynez River diversions. Well pumpers from the underflow report the amount pumped to both the SYRWCD and the SWRCB. **Table 4-2** shows the total extraction of underflow via river wells upstream within the CMA for WY 2022. [4]

Table 4-2
Summary CMA Surface Water Diversions for Water Year 2022

Water Use Sector	Total	Method of Measurement	Estimated Accuracy
	Acre-Feet		Acre-Feet
Domestic	560	Self-Reported to SYRWCD	± 60 (~10%)
Agricultural	3,080	Self-Reported to SYRWCD may include estimates using crop usage, estimated for July-September using WY 2021 data	± 300 (~10%)
Municipal	750	City of Buellton Daily totalizer values	± 10 (~1%)
Total	4,390		± 370

4.2.2 Water Imports

The Central Coastal Water Authority (CCWA) delivers imported water from the SWP to the SYRVGB since 1997. CCWA makes water deliveries at turnouts to water distribution systems. CCWA delivers to Lake Cachuma for the South Coast customers outside of the SYRVGB. The Cachuma Project Settlement Agreement allows for comingling of CCWA water with local water for water rights releases. Within the SYRVGB, four agencies contract with CCWA to provide for SWP deliveries: VSFB, the City of Buellton, the City of Solvang, and the Santa Ynez River Water Conservation District Improvement District Number 1. Of these, only the City of Buellton is in the CMA.

[4] The SYRWCD records pumping in the Santa Ynez River Alluvium as Zone A.

In WY 2022 the City of Buellton imported 82 acre-feet of water, all sourced from the SWP through the CCWA pipeline. **Table 4-3** and **Figure 4-4** show the annual imports through the CCWA pipeline to the CMA and the entire SYRVGB updated through the end of WY 2022.

Table 4-3
Santa Ynez River Valley Groundwater Basin Water Imports in Acre-Feet for Recent Years

Water Year	WMA	CMA	EMA	Total Basin
2015	109	0	2,125	2,234
2016	1,758	82	483	2,241
2017	1,924	293	3,272	5,196
2018	2,296	224	1,994	4,290
2019	2,361	268	3,290	5,651
2020	2,893	359	3,172	6,065
2021	2,239	200	2,251	4,490
2022	268	82	801	1,069

Source: CCWA (2023)

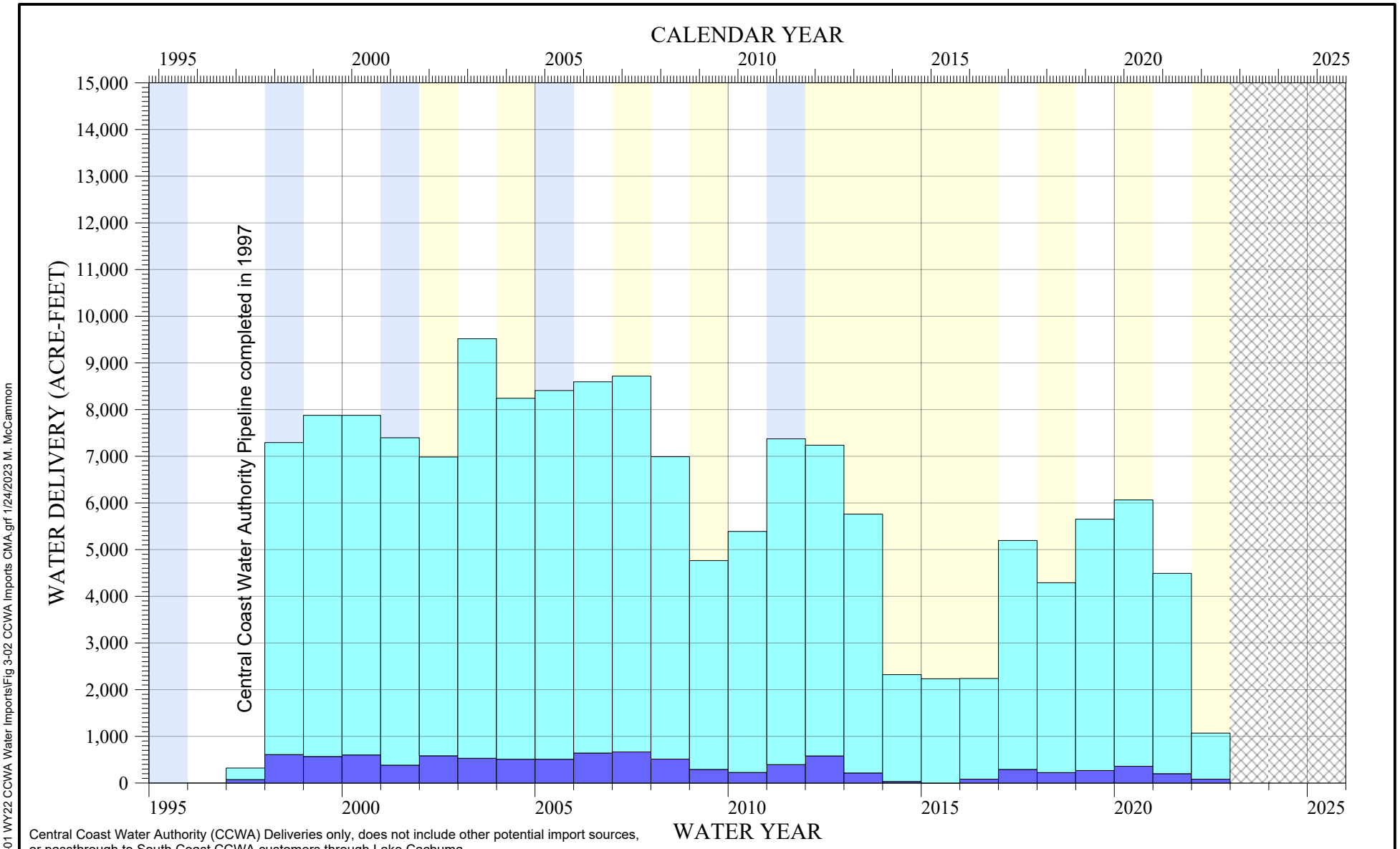
4.3 SURFACE WATER AVAILABLE FOR GROUNDWATER RECHARGE

During WY 2022, there were no projects within the CMA for direct groundwater recharge or in-lieu use.[5]

The Santa Ynez River and its underflow are within the jurisdiction of and regulated by the SWRCB. SWRCB regulates for beneficial purposes including supporting the steelhead trout (*Oncorhynchus mykiss, O. mykiss*) population.[6] Following the SWRCB, USBR releases water stored in Lake Cachuma to meet downstream water rights and support fish habitat.

5 23 CCR § 356.2(b)(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.

6 The Cachuma Operation and Maintenance Board (COMB) Fisheries Division conducts the monitoring of steelhead (*Oncorhynchus mykiss*) population in the Santa Ynez River and its tributaries. However, the COMB report comes out in the second quarter of the following water year, which is expected to be published concurrent or after this annual report.



Central Coast Water Authority (CCWA) Deliveries only, does not include other potential import sources, or passthrough to South Coast CCWA customers through Lake Cachuma.

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ANNUAL WATER IMPORTS
CENTRAL COAST WATER AUTHORITY

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry
- No Data

Santa Ynez Imports
- City of Buellton
- Non-CMA

Source: Central Coast Water Authority (2023)

FIGURE 4-4

F:\DATA\2823\Analyses\2023-01 WY22 CCWA Water Imports\Fig 3-02 CCWA Imports CMA.grf 1/24/2023 M. McCammon

During the summer and fall of WY 2022, USBR made water rights releases. These water rights releases started on August 8, 2022, and extended through October 5, 2022. During these 58 days, seven thousand four hundred and forty-five acre-feet (7,445 AF) were delivered to the USGS Solvang streamflow gage. Location of the Solvang gage is shown on Figure 1-4.

Measurements at the Solvang stream gauge represent more than 90% of all local surface water flows entering the CMA (Stetson, 2022). **Figure 4-5** shows flows of the Santa Ynez River at the USGS Streamflow gage 11128500 at Solvang, at the EMA-CMA boundary for WY2015 through February 2023.

4.3.1 Treated Wastewater Sources

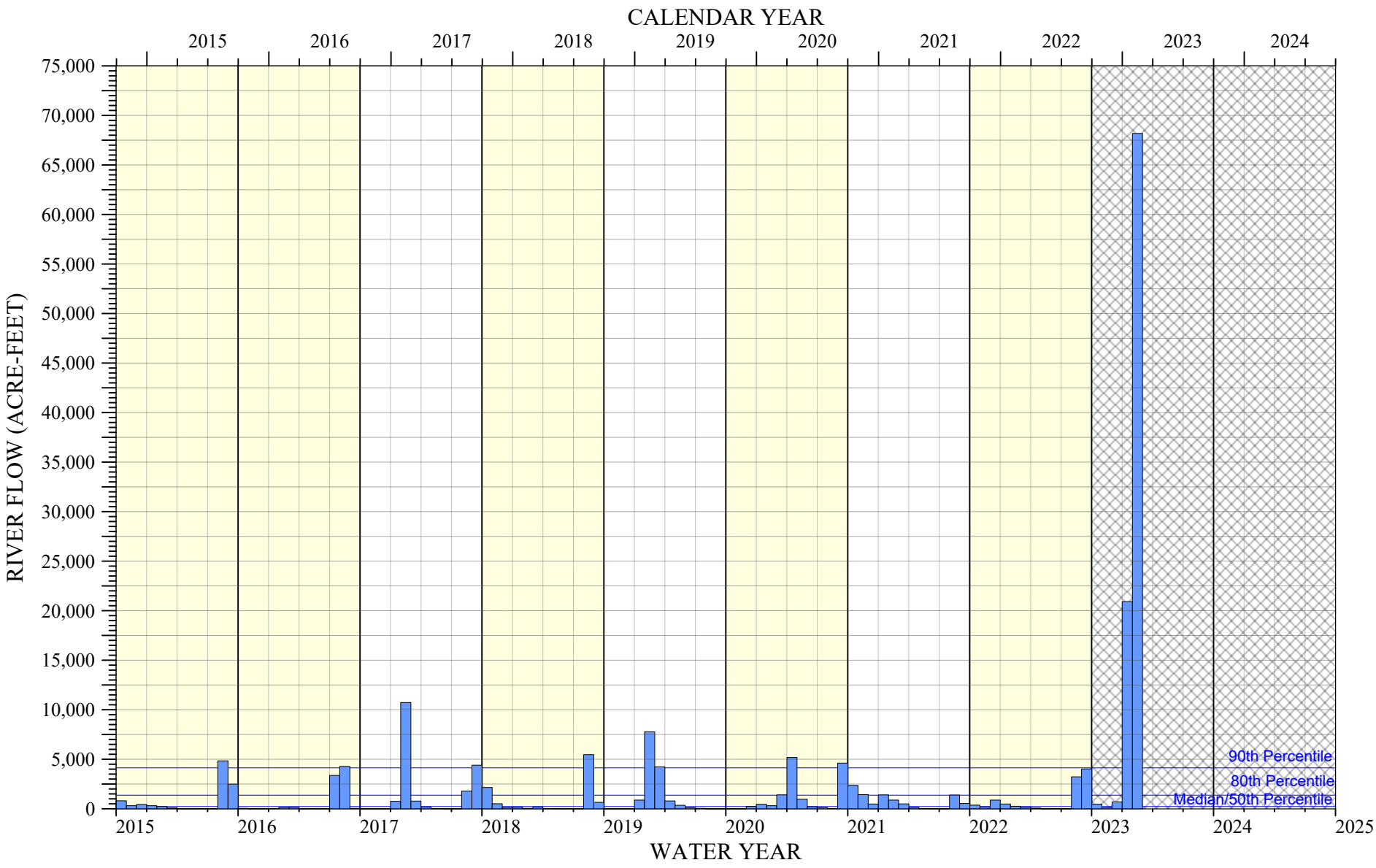
Within the CMA, wastewater is managed by the City of Buellton and the City of Solvang[7]. Wastewater is conveyed to the treatment facilities before it is discharged as treated effluent to percolation ponds over the Santa Ynez River alluvium. The average daily secondary treated effluent from the City of Buellton and the City of Solvang since 2015 is provided in **Table 4-4** as wastewater plant influent flows.

Table 4-4
Wastewater Influent Volumes

Water Year	City of Buellton Plant Influent	City of Solvang Plant Influent
	Acre-Feet per Year	Acre-Feet per Year
2015	447	710
2016	470	705
2017	472	719
2018	522	696
2019	571	736
2020	503	690
2021	508	717
2022	499	702

Source: City of Buellton (2021, 2022, 2023), City of Solvang (2021, 2022, 2023)

[7] Solvang Wastewater Treatment Plant is located within the City of Solvang outside of the CMA but discharges its wastewater at the border of the CMA and EMA inside the CMA.



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MONTHLY SURFACE FLOW
SANTA YNEZ RIVER AT SOLVANG CALIFORNIA
USGS STREAMGAGE 11128500

Water Year Type (1942-2022)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Source: USGS NWIS (2023)

FIGURE 4-5

\\192.168.16.33\main\DATA\2823\Analyses\2023-01 WY22 SW Flow Statistics\Fig 4-05 CMA Monthly_11128500 SANTA YNEZ R A SOLVANG CMA.grf 3/1/2023 M. McCammon

4.4 TOTAL WATER USE

Total water use in the CMA during WY 2022 is comprised of groundwater supplies, surface water diversions from the Santa River underflow, and imported SWP water. See Chapters 4.1 and 4.2 above for additional detail on these supplies. **Table 4-5** shows the summary of total water use by sector for the water year 2022. **Table 4-6** shows the summary of total water use for WY 2015-WY 2022. Total water use in the CMA was 6,540 AF in WY 2022.

Table 4-5
Summary CMA Total Water Use by Sector for Water Year 2022

Water Use Sector	Total	Method of Measurement	Estimated Accuracy
	Acre-Feet		Acre-Feet
Domestic	840	Self-Reported to SYWRCD	± 85
Agricultural	4,520	Self-Reported to SYWRCD and estimates	± 450
Municipal	1,180	Daily totalizer values; Includes CCWA imports to the City of Buellton	± 15
Total	6,540		± 550

Table 4-6
Summary CMA Total Water Use by Source for Water Years 2015-2022

Water Year	Total Groundwater (Buellton Aquifer)	Total Surface Water (River Underflow Well Pumping)	Total Imports (CCWA)	TOTAL WATER USE
	Acre-Feet per Year	Acre-Feet per Year	Acre-Feet per Year	Acre-Feet per Year
2015	4,310	4,420	0	8,730
2016	3,740	4,460	80	8,280
2017	3,410	4,900	290	8,600
2018	2,720	5,230	220	8,170
2019	2,940	4,940	270	8,150
2020	1,850	5,040	360	7,250
2021	1,710	4,450	200	6,360
2022	2,070	4,390	80	6,540

CHAPTER 5: GROUNDWATER STORAGE

Groundwater storage is one of the SGMA sustainability indicators. This chapter presents the changes in storage components required by the SGMA regulations:

> *"(5) Change in groundwater in storage shall include the following:*
>
> *(A) Change in groundwater in storage maps for each principal aquifer in the basin.*
>
> *(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year." (*23 CCR § 356.2(b))

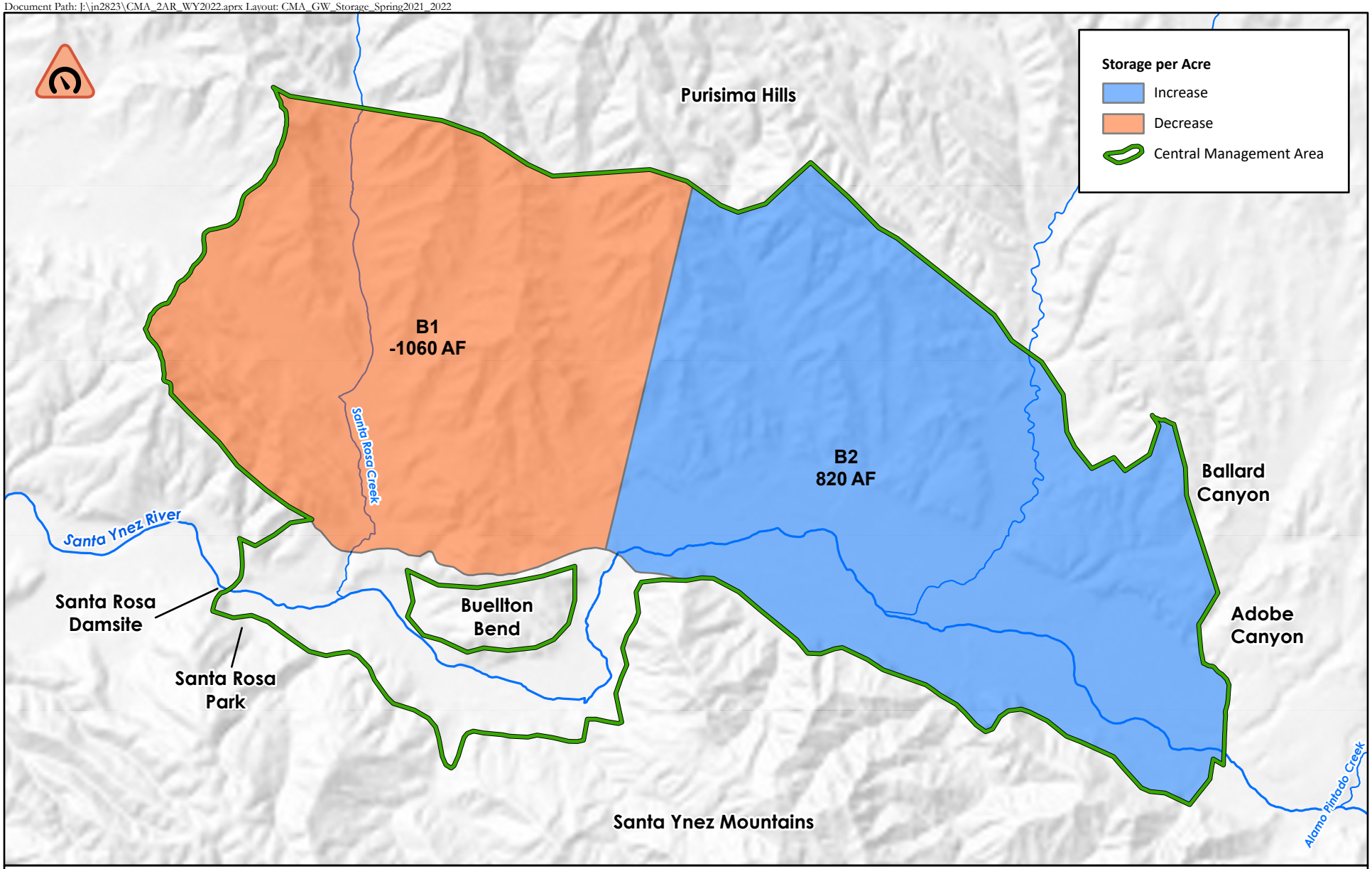
Storage changes are calculated and mapped for the seasonal high (spring-to-spring) using a Thiessen polygon method. This method uses water level observations at representative monitoring wells. In the CMA there is a longer period of record for seasonal high spring water levels than there is for seasonal low fall water levels. Agencies collected water levels from fewer wells during the fall. The CMA uses the spring-to-spring storage changes for trends due to this historical data collection.

5.1 CHANGE IN GROUNDWATER IN STORAGE MAPS

The SGMA regulations[1] require every Annual Report to contain *"change in groundwater in storage maps for each principal aquifer in the basin."* On the following maps, the polygon color indicates the change in groundwater storage. Blue indicates increased storage. Orange indicates decreased storage. Color intensity is relative to the area of the polygon. Darker colors indicate a greater change in storage per acre. Numbers shown in each polygon are the estimated volume change in acre-feet. **Figure 5-1** shows the spring change in storage.

[1] 23 CCR § 356.2(b)(1)

Document Path: J:\jn2823\CMA_2AR_WY2022.aprx Layout: CMA_GW_Storage_Spring2021_2022



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CHANGE IN GROUNDWATER IN STORAGE
SPRING 2021-SPRING 2022
BUELLTON AQUIFER
CENTRAL MANAGEMENT AREA

DRAFT

0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002

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FIGURE 5-1

The node of each polygon comes from existing representative monitoring wells (Figure 3-1). The area of each polygon is the area that is closest to the node point, compared to the other node points. The external boundary is the aquifer extent. The CMA uses the following equation to calculate the change in groundwater in storage for each polygon:

Change of Groundwater in Storage (acre-feet) = [area (acres)] x [Sy (unitless)] x [change in groundwater elevation (ft)]

Total Change of Groundwater in Storage (acre-feet) = Σ (Change in Storage for each Polygon)

Table 5-1 summarizes the total change in storage calculated for WY 2022.

Table 5-1
Estimated Change in Storage
in Acre-Feet

Period		Buellton Aquifer
Seasonal High	Spring 2021 to Spring 2022	-200

Numbers rounded to the nearest 100 AF.

Spring 2021 to Spring 2022 change in storage is shown in Figure 5-1. This figure represents changes between the seasonal high of 2021 and 2022. Figure 5-1 shows that storage in the east increased and decreased in the west. The total change in groundwater storage for the CMA's Buellton Aquifer was a loss of 200 AF using this spring-to-spring approach.

5.2 GROUNDWATER USE AND EFFECTS ON STORAGE

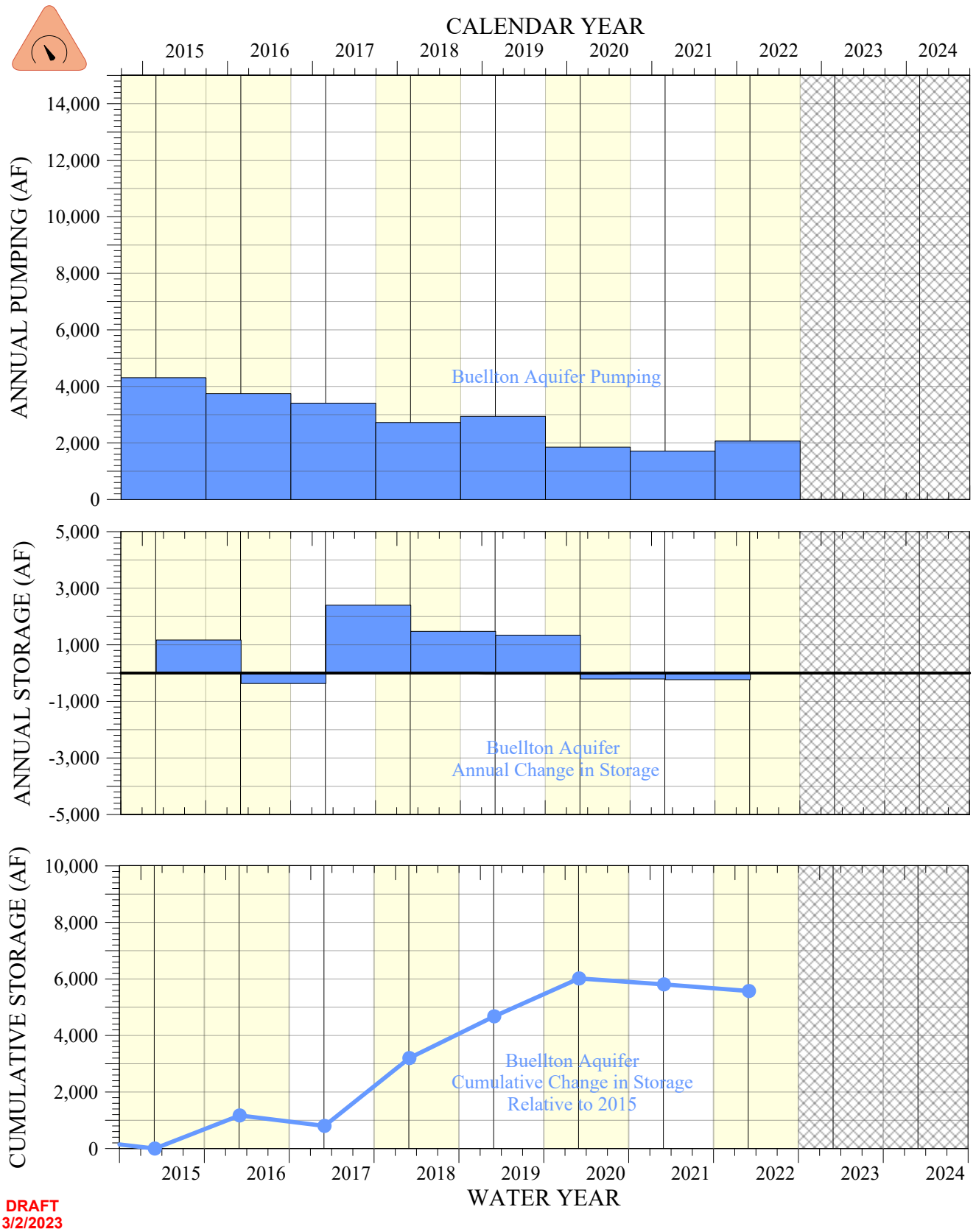
The SGMA regulations require that GSP Annual Reports contain "*A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year*."[2]

The Water Year Type is classified in Chapter 2 of this report using the same method as described in the CMA GSP. Updated groundwater use for WY 2022 is described in Chapter 4. The method for calculating the annual change in groundwater in storage is described earlier in this chapter. Annual storage change was calculated for historical years, including from WY 2015 through the present. In the CMA there is a longer period of record for seasonal high spring water levels than there is for seasonal low fall water levels. Agencies collected water levels from fewer wells during the fall. The CMA uses the spring-to-spring storage changes for trends due to this historical data collection.

Annual reported groundwater use for the CMA in the Buellton Aquifer is compared to cumulative groundwater storage loss in **Figure 5-2**. The Water Year classifications shown in this figure are consistent with the classification of water years shown in Figure 2-4.

The top of Figure 5-2 shows the annual reported groundwater use for the CMA Buellton Aquifer. The middle of Figure 5-2 shows the annual change in storage, and the bottom of Figure 5-2 set shows the cumulative change starting in March 2015.

[2] 23 CCR § 356.2(b)(5)(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.



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3/2/2023

Annual Pumping Data Includes Projected Data for WY2022Q4

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COMPARISON OF WATER YEAR, USE, ANNUAL STORAGE, AND CUMULATIVE STORAGE RELATIVE TO MARCH 2015

Water Year Type (1942-2022)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

\\192.168.16.33\main\DATA\2823\Analyses\2023-02 WY22 Storage\CMA Fig 5-02 Dewatered_Storage_Comparison.2015.grf 3/2/2023 M. McCammon

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CHAPTER 6: PROGRESS TOWARDS GSP IMPLEMENTATION AND SUSTAINABILITY

The SGMA regulations (Appendix 1-A) require that the SGMA Annual Reports contain "*A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report*."[1] As indicated by the previous chapters discussing groundwater levels, water use, and storage, groundwater conditions within the CMA remain sustainable with no undesirable results for the SGMA sustainability criteria. Below summarizes the conditions within the CMA for the additional SGMA indicators.

Implementation of general projects and management actions identified in the CMA GSP has begun. The CMA is in the process of taking the steps to ensure funding to complete the actions planned in the GSP.

6.1 SUSTAINABILITY INDICATORS

Analyses conducted for the CMA GSP indicate that current Basin conditions are sustainable with no current undesirable results, with no significant and unreasonable impacts occurring. This chapter discusses changes in the Basin concerning GSP-identified minimum thresholds, measurable objectives, and interim milestones[2] for both the previously discussed sustainability indicators of groundwater levels, storage, and interconnected surface water, as well as the remaining sustainability indicators.


Seawater intrusion (not applicable to CMA)


Degraded water quality


Land subsidence

1 23 CCR § 356.2(a) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.

2 23 CCR § 356.2(a) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.

Interconnected surface water

6.1.1 Chronic Lowering of Groundwater Levels

Chapter 3 provided data and maps for the chronic lowering of groundwater levels sustainability indicator. The January 2022 CMA GSP (3B.2 Undesirable Results) states the following regarding monitoring groundwater levels for undesirable results:

> "Spring groundwater elevations that drop below the established groundwater elevation minimum thresholds in more than 50% of the representative monitoring wells for two consecutive, non-drought[3] years would correspond to an undesirable result associated with chronic lowering of groundwater elevations."

Similarly, for measurable objectives and interim milestones, the CMA GSP (3B.4 Measurable Objectives) states:

> "Measurable objectives are achieved when the 2011 groundwater elevation is reached in half of the representative monitoring wells (RMWs)."

The interim milestones were set to measurable objectives due to GSP finding that the CMA conditions were sustainable with no current undesirable results.

The CMA currently has four representative groundwater level monitoring wells in the Buellton Aquifer. **Table 6-1** compares the groundwater level elevations to the sustainable management criteria for each well. The sustainable management criteria include Measurable Objectives, Early Warning, and Minimum Thresholds. the groundwater elevations at the four representative groundwater monitoring wells. These tables show all wells were above their Minimum Threshold levels for WY 2022. No undesirable results related to water levels occurred in WY 2022.

[3] Two or more consecutive years that are classified as Dry or Critically Dry (Section 2b, GC) will be defined for this purpose as drought years. All other year types and combination of year types will be defined as non-drought years for the purpose of defining undesirable results under a groundwater sustainability plan.

Table 6-1
Groundwater Elevations for Groundwater Levels (feet in NAVD88)

Name	ID	Measuring Point	Reference Values			Water Year 2021		Water Year 2022	
			Measurable Objective	Early Warning	Minimum Threshold	Spring	Fall	Spring	Fall
7N/33W-36J1	82	504.54	379	362	357	372	369	370	369
7N/32W-31M1	75	452.60 (±20)	402	364	359	373	370	371	370
6N/32W-12K1, 12K2	909	352.56 (±5)	301	281	276	306	305	307	305
6N/31W – 7F1	90	382.81	307	297	292	307	302	n/a	301

n/a = No available data
NAVD88 = North American Vertical Datum of 1988

6.1.2 Reduction of Groundwater in Storage

Chapter 5 of this report addressed the reduction of groundwater in storage. In addition, progress towards sustainability for groundwater storage is tracked along with groundwater levels as discussed in Section 6.1.1.

6.1.3 Water Quality

The CMA GSP found "Groundwater quality in the CMA is currently suitable for agricultural, domestic, and municipal supply purposes." The GSP further describes the current groundwater quality monitoring in the CMA. Annual assessment of water quality is not listed under the SGMA statute and SGMA regulations on Annual Reports, see Appendix 1-A.

6.1.4 Seawater Intrusion

The CMA is an inland management area of the Basin and is greater than 20 river miles[4] above the Pacific Ocean. Therefore, seawater intrusion is not an applicable sustainability indicator for the sustainable management of the CMA, and the CMA GSP did not set specific targets within the CMA. For the Santa Ynez River Valley Groundwater Basin as a whole, the seawater intrusion sustainability indicator is addressed by the WMA which includes a portion of the coast.

[4] River miles are distance that water flows along the river which accounts for the bends and meanders of the river.

6.1.5 Land Subsidence

Significant land subsidence due to groundwater withdrawal is not occurring in the CMA. Conditions in the CMA are considered to have dropped below the land subsidence minimum threshold when both (1) a decline of six inches (a half foot) from the 2015 land surface elevation because of groundwater extractions, and (2) that decline interferes with either land use or infrastructure.

Two primary sources of data are used to characterize the movement of the land surface: remote sensing area data from Interferometric Synthetic Aperture Radar (InSAR), and point data from continuous global positioning system (CGPS). Both InSAR and CGPS methods provide absolute changes in elevation and do not differentiate between land subsidence resulting from excessive groundwater extraction and other sources of vertical movement such as tectonic movement. Significant lowering of ground levels indicated by these methods would need to be followed up to identify the cause.

The InSAR maps show the elevation change of the ground over a wide area between two points in time. Figure 6-1 is a map comparison of October 2021 and October 2022, showing change over WY 2022. **Figure 6-2** is a map comparison of January 2015 and October 2022 which shows cumulative change since 2015. These two figures show that the vertical change is less than the InSAR method accuracy for most of the CMA.[5]

CGPS collects very high-resolution three-dimensional movement of a sensor over time. The BUEG station, located near the City of Buellton (see **Figure 6-2**), is a CGPS station that has been in operation since January 2015. [6] **Figure 6-3** graphs the horizontal movement (north-south, east-west) and vertical movement (up-down). Since 2015 the graph shows movement to the north of 11 inches and movement west of 9 inches. Vertical movement is down by less than an inch, with a date entry change in 2016 and 2017. This lateral movement is aseismic tectonic movement, and not due to groundwater conditions.

Both InSAR and CGPS methods show there were no undesirable results related to land subsidence during WY 2022.

5 Reported as 18 mm (0.71 inches) vertical accuracy at 95% confidence level in Towill (2021).

6 Data at the USGS LOMP stations is through June 29, 2022, this is due to a telemetry issue related to a network configuration change (SCGN, 2023), and is expected to be temporary.

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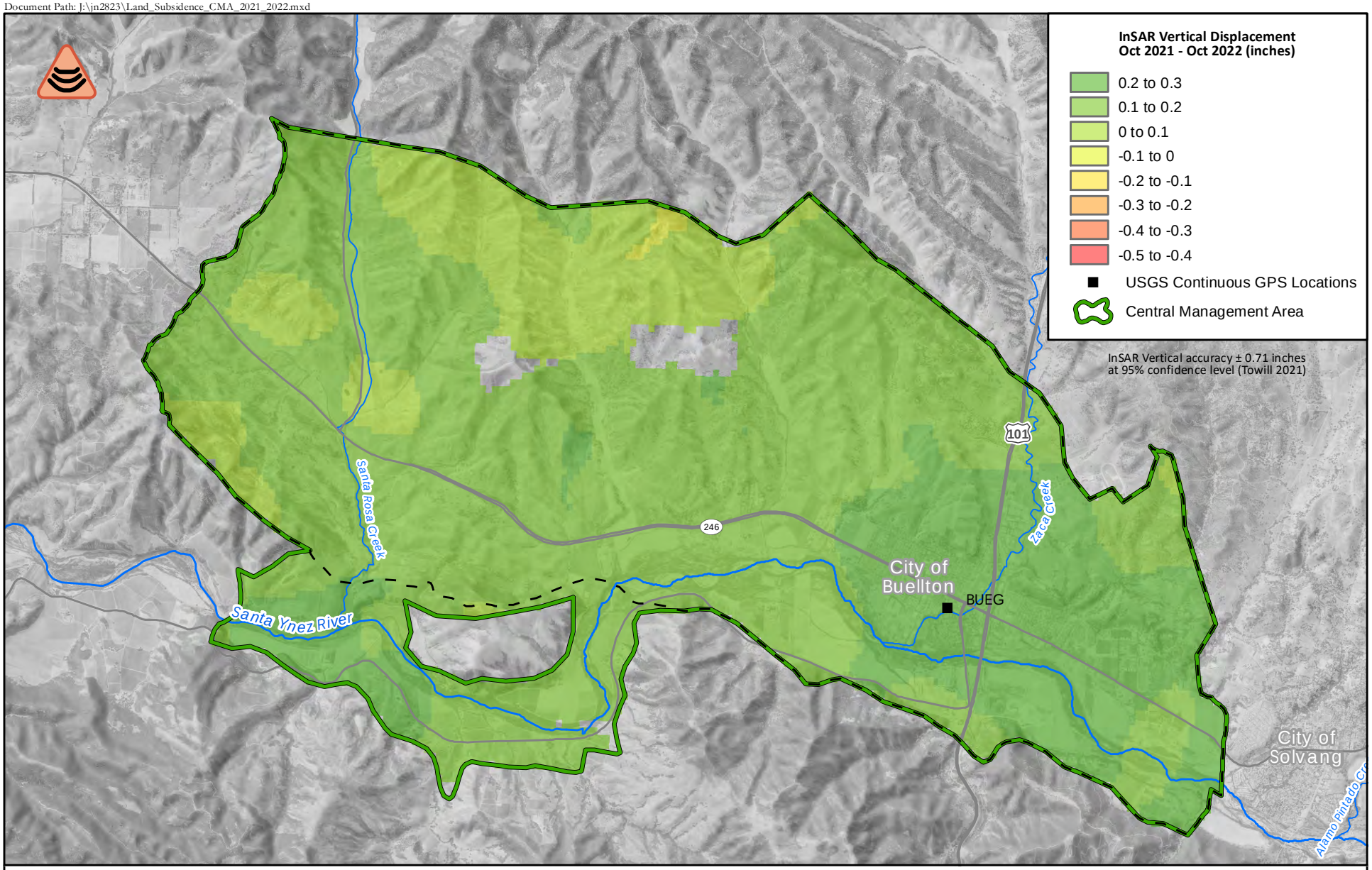

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LAND SUBSIDENCE
OCTOBER 2021 TO OCTOBER 2022
INSAR DATA
WITHIN CENTRAL MANAGEMENT AREA

DRAFT

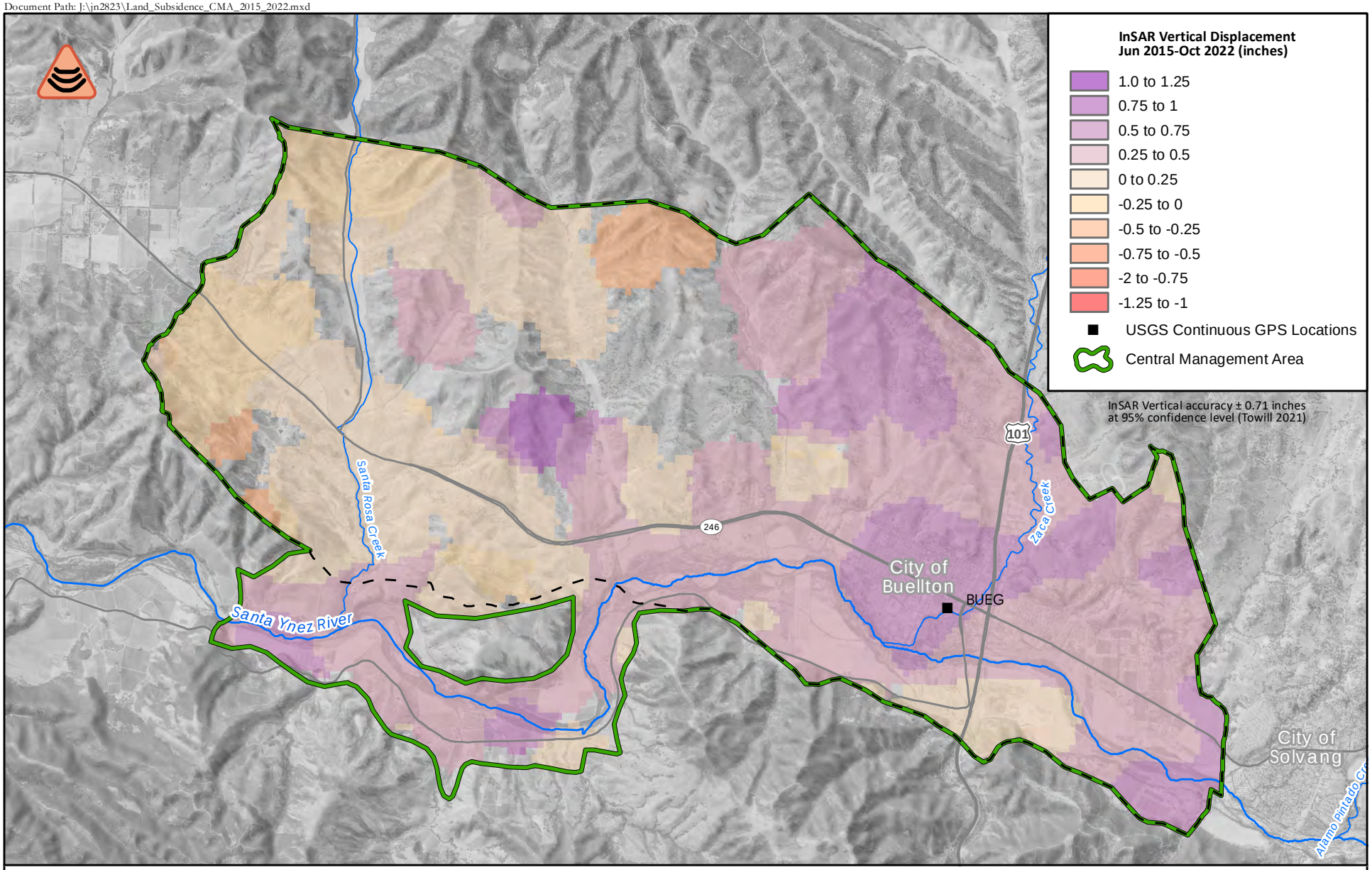
0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018), DWR (2022)

N

FIGURE 6-1

Document Path: J:\jn2823\Land_Subsidence_CMA_2015_2022.mxd



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LAND SUBSIDENCE
JUNE 2015 TO OCTOBER 2022
INSAR DATA
WITHIN CENTRAL MANAGEMENT AREA

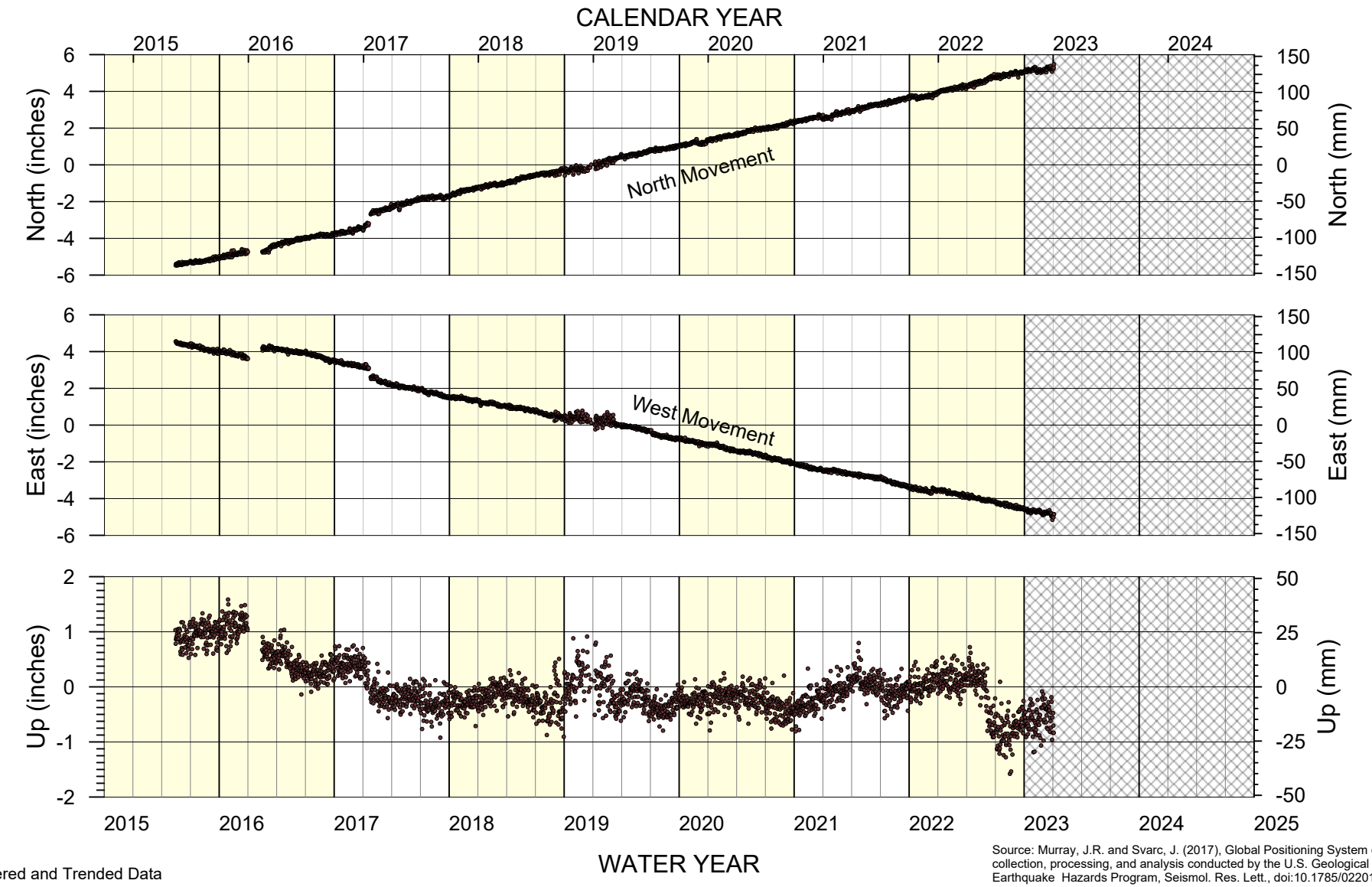
DRAFT

0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018), DWR (2022)

N

FIGURE 6-2



Filtered and Trended Data

Source: Murray, J.R. and Svarc, J. (2017), Global Positioning System data collection, processing, and analysis conducted by the U.S. Geological Survey Earthquake Hazards Program, Seismol. Res. Lett., doi:10.1785/022016020 .

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CONTINUOUS GLOBAL POSITIONING SYSTEM
BUEG STATION TRENDS
LAND SUBSIDENCE

Water Year Type (1942-2022)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

FIGURE 6-3

F:\DATA\2823\Analyses\2023-01 WY22 CGPS Land Subsidence\Fig 6-03 CMA_CGPS WY2022_shift.grf 1/10/2023 M. McCammon

6.1.6 Interconnected Surface Water and Groundwater Dependent Ecosystems

The SGMA sustainability indicator "depletion of interconnected surface water," is related to the effects of groundwater on surface water flows. Under SGMA, groundwater is water in the identified groundwater aquifers, and not the subsurface flow through a known and definite channel such as the underflows of the Santa Ynez River through its alluvial sediments. The SWRCB under Order WR 2019-0148, and earlier orders and decisions, regulates all flows of the Santa Ynez River. This regulation by the SWRCB extends to and includes the subsurface flows through the alluvial channel.

The groundwater level hydrographs presented in Appendixes 3-A and 3-B further address the potential depletion of interconnected surface water. As stated in the 2022 CMA GSP (Section 3b.2-6), groundwater elevations in the Santa Ynez River Alluvium that drop to fifteen feet below channel thalweg elevations in two out of the three representative monitoring wells for two consecutive non-drought[7] years would indicate significant and undesirable results for interconnected surface water and groundwater-dependent ecosystems. Similarly, the measurable objective and interim milestone (2022 GSP, Sections 3b.4-6 and 3b.5-6) established goals for the groundwater levels in the Santa Ynez River Alluvium underflow to rise to at least 5 feet below the channel thalweg elevation. **Table 6-2** summarizes the groundwater elevations at the three wells used to measure potential impacts on surface water. This table shows that all wells had water levels above the minimum threshold during Water Year 2022.

Table 6-2
Groundwater Elevations for Interconnected Surface Water (feet in NAVD88)

Name	ID	Reference Values		Water Year 2021		Water Year 2022	
		Measurable Objective	Minimum Threshold	Spring	Fall	Spring	Fall
6N/32W – 9G1	1120	267	257	267	264	268	271
6N/32W – 13G2	1115	304	294	315	319	316	316
6N/32W – 17R1	1111	332	322	332	336	338	339

NAVD88 = North American Vertical Datum of 1988.
The Measurable Objective is five feet below the Channel Thalweg.
The Minimum Threshold is fifteen feet below the Channel Thalweg.

[7] For this purpose, a year is a drought if it is two or more consecutive years that are classified as Dry or Critically Dry (see Chapter 2 for year classifications). All other year types and combination of year types will be defined as non-drought years for the purpose of defining undesirable results under a groundwater sustainability plan.

The Cachuma Operation and Maintenance Board (COMB) Fisheries Division monitors for migration of the Southern California Steelhead/rainbow trout (*O. mykiss*) in the Santa Ynez River from Lake Cachuma to the Pacific Ocean. The COMB publishes the WY 2022 report concurrently or after this annual report, and therefore conclusions from that report about WY 2022 are currently unavailable.

6.2 PLANNED FUTURE PROJECTS AND MANAGEMENT ACTIONS

The CMA GSP identified future projects and management actions to improve sustainability. **Table 6-3** is a summary of the projects and management actions envisioned in the GSP. **Table 6-4** identifies the expected additional water and the benefit-to-cost ratio. Completion is subject to funding and approval from the CMA GSA committee.

6.2.1 Implementation Progress During Water Year 2022 (February 2022-September 2022)

During WY 2022 the CMA published its first annual report. This report covered Water Year 2021 (October 2020-September 2021). On February 28, 2022, the CMA committee held a presentation on the annual report. The CMA committee approved the first annual report on March 21, 2022. The final first annual report for Water Year 2021 is 119 pages including appendices. The CMA committee submitted it to DWR on March 30, 2022, before the April 1 deadline.[8]

[8] CWC Section 10728 "On the April 1 following the adoption of a groundwater sustainability plan and annually thereafter, a groundwater sustainability agency shall submit a report to the department [..]"

Table 6-3
Summary of CMA GSP Implementation Projects

Project Category	Task	Occurrence
Completing Ongoing Field Investigations	Surveying Representative Wells	One Time
	SkyTEM Airborne Geophysics	One Time
Monitoring Network Gaps	Video Logging and Sounding Wells	One Time
	Add new GWL Monitoring	One Year
	Dedicated GWL Monitoring Wells (Outreach)	One Time
	SW Gage Installation (planning)	One Time
Projects and Management Actions	Water Conservation	Annual
	Groundwater Extraction Fee Study	5 Year
	Supplemental Imported Water Fund Reserve Options	One Time
	Feasibility Study for Bioswale Stormwater Retention	One Time
Improved Data Collection for Management	Well Registration Update	One Time
	Well Metering Requirement	One Time
Data Management	Data Updates	Annual
Reporting and Plan Updates	SMGA WY Annual Reports	Annual
	SGMA Five-Year Plan Assessment	5 Year

Table 6-4
Summary of Project and Management Actions in the CMA- Sustainability Benefits and Implementation Process

Timetable	Project and Management Action Title	Relevant Sustainability Indicators Affected					Required Permits	Estimated Additional Water (AFY)	Estimated Benefit: Cost Ratio
		Groundwater Levels	Reduction in Storage	Water Quality	Land Subsidence	Interconnected Surface Water			
Group 1- Initiated in the first three years (see Table 4b.1-1)	Water Conservation	x	x	x	x	x	None	150-450	High
	Well Meters, Update Well Registration, and Groundwater Extraction Fees	x	x	x	x	x	Proposition 26 / 218 or Local Ballot Initiative	150-450	High
	Supplemental Imported Water Program	x	x	x	x	x	Santa Barbara County, DWR, CEQA	500-1,000	Low to Medium
	Increased Stormwater Recharge	x	x	x	x	x	Santa Barbara County, USACE, DWR, CDFW, CEQA	20-200	Low to Medium
Group 2 - Initiated if Early Warning Triggers	Water Rights Releases Request	x	x	x	x	x	None	0; minimal	High
	Supplemental Conditions on New Wells	x	x	x	x	x	None	20-200	High
Group 3 - Initiated if Minimum Thresholds Reached	Annual Pumping Allocation Plan	x	x	x	x	x	Proposition 26 / 218 or Local Ballot Initiative	300-900	Medium to High

Timetable	Project and Management Action Title	Relevant Sustainability Indicators Affected					Required Permits	Estimated Additional Water (AFY)	Estimated Benefit: Cost Ratio
		Groundwater Levels	Reduction in Storage	Water Quality	Land Subsidence	Interconnected Surface Water			
Group 4 - Pending further decision by GSA to initiate	Non-native Vegetation Removal	x	x		x		Santa Barbara County, USACE, DWR, CDFW, CEQA, SWRCB	20-200	Low to Medium
	Agricultural Land Retirement/ Pumping Allowance	x	x	x	x	x	CEQA	300-900	Low to Medium
	Santa Rosa/ Zaca Creek Recharge Pond Project	x	x	x	x	x	Santa Barbara County, USACE, DWR, CDFW, CEQA	50-300	Low to Medium
	Recycled Water Project	x	x	x	x	x	Santa Barbara County, RWQCB, DWR, CEQA	300 - 500	Low to Medium
	Drought Mitigation - Pumping Optimization and Deepen Existing Wells			x			Santa Barbara County, DWR, CEQA	0	Low to Medium

USACE = United States Army Corps of Engineers, DWR = Department of Water Resources, CDFW = California Department of Fish and Wildlife, CEQA = California Environmental Quality Act, RWQCB = Regional Water Quality Control Board

During the third and fourth quarters of WY 2022, the CMA addressed the California Governor's Executive Order N-7-22 for Well Permits, and written verification from a Groundwater Sustainability Agency managing the basin. The CMA GSA passed Resolution CMA-2022-002 which established a fee and deposit for conducting well verifications to comply with the order. Staff worked on Groundwater Basin Well Metering Program. Additional items included work on future governance, joint powers authority, interim cost sharing, and long-term funding for CMA expenses including GSP Implementation Projects as well as annual reporting. Additional items addressed during the second half of the WY 2022 included the SkyTEM Airborne Geophysics dataset update and resulting updates to the geological and hydrogeological models.

In the latter half of WY 2022, the CMA conducted planning for eight projects. This included the development of grant funding requests. This included supporting resolutions through the CMA committee. These eight projects included:

1) Well Extraction Measurement Demonstration Projects and Basin Reporting Program.

2) Santa Ynez River Basin WMA, CMA, and EMA – SGMA Rate Study;

3) Basin GSPs 5-Year Update.

4) Monitoring Improvement and Expansion.

5) Stormwater Capture and Infiltration Project Designs.

6) Water Use Efficiency Strategic Plan.

7) Recycled Water Feasibility Study.

8) Grant Administration.

The objective of these projects is to achieve the stated goals of the GSP to avoid undesirable results and demonstrate progress towards measurable objectives. Successful completion of the projects will help ensure continued groundwater accessibility, not only for existing wells, but for all beneficial uses of water in the CMA.

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CHAPTER 7: REFERENCES

CCWA (Central Coast Water Authority). 2022. Emails Regarding WY2021 CCWA Delivery Data. Adam, L. Central Coast Water Senior Accountant. Personal Emails dated February 2 and 4, 2022.

CCWA 2022b. Email Regarding Land Subsidence. Brady, J. Central Coast Water Authority. Deputy Director of Operations and Engineering. Personal Email dated February 2, 2022.

Dunne, Thomas, and Luna Leopold, 1978. Water in Environmental Planning.

DWR (Department of Water Resources). 2019. CA Bulletin 118 Groundwater Basins. GIS Vector Digital Data Set. Accessed 2019-02-11. https://data.cnra.ca.gov/dataset/ca-bulletin-118-groundwater-basins.

DWR. 2021. Sustainable Groundwater Management Act Water Year Type Dataset Development Report. SYWATER 473.

State Water Resources Control Board (SWRCB). 2019. Order WR 2019-0148. In the Matter of Permits 11308 and 11310 (Applications 11331 and 11332) held by the United States Bureau of Reclamation for the Cachuma Project on the Santa Ynez River. State Water Resources Control Board, State of California. SYWATER 218.

Stetson (Stetson Engineers). 2022. Groundwater Sustainability Plan. Santa Ynez River Valley Groundwater Basin Central Management Area. Prepared for Central Management Area Groundwater Sustainability Agency. 1,229 pg. SYWATER 453.

Towill (2021) InSAR Data Accuracy for California Groundwater basins CGPS Data Comparative Analysis January 2015 to October 2020. Final Report. Towill, Inc. California Department of Water Resources. 259 pg. SYWATER 472.

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CHAPTER 8: APPENDICES

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Chapter 1 – General Information

Appendix 1-A:

Portions of Sustainable Groundwater Management Act Statute and Regulations Specific to Annual Report Requirements Effective August 15, 2016

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Portions of Sustainable Groundwater Management Act Statute and Regulations Specific to Annual Report Requirements

CALIFORNIA WATER CODE
DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES
PART 2.74. SUSTAINABLE GROUNDWATER MANAGEMENT
CHAPTER 6. GROUNDWATER SUSTAINABILITY PLANS

Section 10728. Annual Reporting By Groundwater Sustainability Agency To Department

On the April 1 following the adoption of a groundwater sustainability plan and annually thereafter, a groundwater sustainability agency shall submit a report to the department containing the following information about the basin managed in the groundwater sustainability plan:

(a) Groundwater elevation data.

(b) Annual aggregated data identifying groundwater extraction for the preceding water year.

(c) Surface water supply used for or available for use for groundwater recharge or in-lieu use.

(d) Total water use.

(e) Change in groundwater storage.

CALIFORNIA CODE OF REGULATIONS
TITLE 23. WATERS
DIVISION 2. DEPARTMENT OF WATER RESOURCES
CHAPTER 1.5. GROUNDWATER MANAGEMENT
SUBCHAPTER 2. GROUNDWATER SUSTAINABILITY PLANS

ARTICLE 2. Definitions

§ 351. Definitions

The definitions in the Sustainable Groundwater Management Act, Bulletin 118, and Subchapter 1 of this Chapter, shall apply to these regulations. In the event of conflicting definitions, the definitions in the Act govern the meanings in this Subchapter. In addition, the following terms used in this Subchapter have the following meanings:

[...]

(d) "Annual report" refers to the report required by Water Code Section 10728

[..]

(am) "Water year" refers to the period from October 1 through the following September 30, inclusive, as defined in the Act.

ARTICLE 4. Procedures

§ 353.4. Reporting Provisions

Information required by the Act or this Subchapter, including Plans, Plan amendments, annual reports, and five-year assessments, shall be submitted by each Agency to the Department as follows:

(a) Materials shall be submitted electronically to the Department through an online reporting system, in a format provided by the Department as described in Section 353.2.

(b) Submitted materials shall be accompanied by a transmittal letter signed by the plan manager or other duly authorized person.

ARTICLE 5. Plan Contents
SUBARTICLE 4. Monitoring Networks

§ 354.40. Reporting Monitoring Data to the Department

Monitoring data shall be stored in the data management system developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.

ARTICLE 6. Department Evaluation and Assessment

§ 355.6. Periodic Review of Plan by Department

[...]

(b) The Department shall evaluate approved Plans and issue an assessment at least every five years. The Department review shall be based on information provided in the annual reports and the periodic evaluation of the Plan prepared and submitted by the Agency.

§ 355.8. Department Review of Annual Reports

The Department shall review annual reports as follows:

(a) The Department shall acknowledge the receipt of annual reports by written notice and post the report and related materials on the Department's website within 20 days of receipt.

(b) The Department shall provide written notice to the Agency if additional information is required.

(c) The Department shall review information contained in the annual report to determine whether the Plan is being implemented in a manner that will likely achieve the sustainability goal for the basin, pursuant to Section 355.6.

ARTICLE 7. Annual Reports and Periodic Evaluations by the Agency

§ 356. Introduction to Annual Reports and Periodic Evaluations by the Agency

This Article describes the procedural and substantive requirements for the annual reports and periodic evaluation of Plans prepared by an Agency.

§ 356.2. Annual Reports

Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:

(a) General information, including an executive summary and a location map depicting the basin covered by the report.

(b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan:

(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:

(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.

(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.

(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.

(4) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.

(5) Change in groundwater in storage shall include the following:

(A) Change in groundwater in storage maps for each principal aquifer in the basin.

(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.

(c) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.

ARTICLE 8. Interagency Agreements

§ 357.4. Coordination Agreements

[…]

(d) The coordination agreement shall describe a process for submitting all Plans, Plan amendments, supporting information, all monitoring data and other pertinent information, along with annual reports and periodic evaluations.

Chapter 3 – Groundwater Hydrographs and Contours

Appendix 3-A:

Groundwater Level Hydrographs for Assessing Chronic Decline in Groundwater Levels, Central Management Area

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APPENDIX 3-A: GROUNDWATER LEVEL HYDROGRAPHS FOR ASSESSING CHRONIC DECLINE IN GROUNDWATER LEVELS, CENTRAL MANAGEMENT AREA

WATER YEAR 2022

This appendix includes hydrographs, which are graphs of water levels in wells. These are the representative wells for monitoring groundwater level decline. As per the SGMA regulations, this includes the period from January 1, 2015 through the end of the Water Year 2022. Shown on these graphs are key SGMA criteria: measurable objective, early warning, and minimum threshold. All included wells are in the Buellton Aquifer.

The Groundwater Sustainability Plan (GSP) includes hydrographs of the long-term period of record. A copy of the GSP, water level data, and hydrographs are available at https://sywater.info .

LIST OF ACRONYMS AND ABBREVIATIONS

BGS	below ground surface
CASGEM	California Statewide Groundwater Elevation Monitoring
CMA	Central Management Area
FT	feet
NAVD88	North American Vertical Datum of 1988
USBR	United States Bureau of Reclamation
USGS	United States Geologic Survey
WL	Water Level

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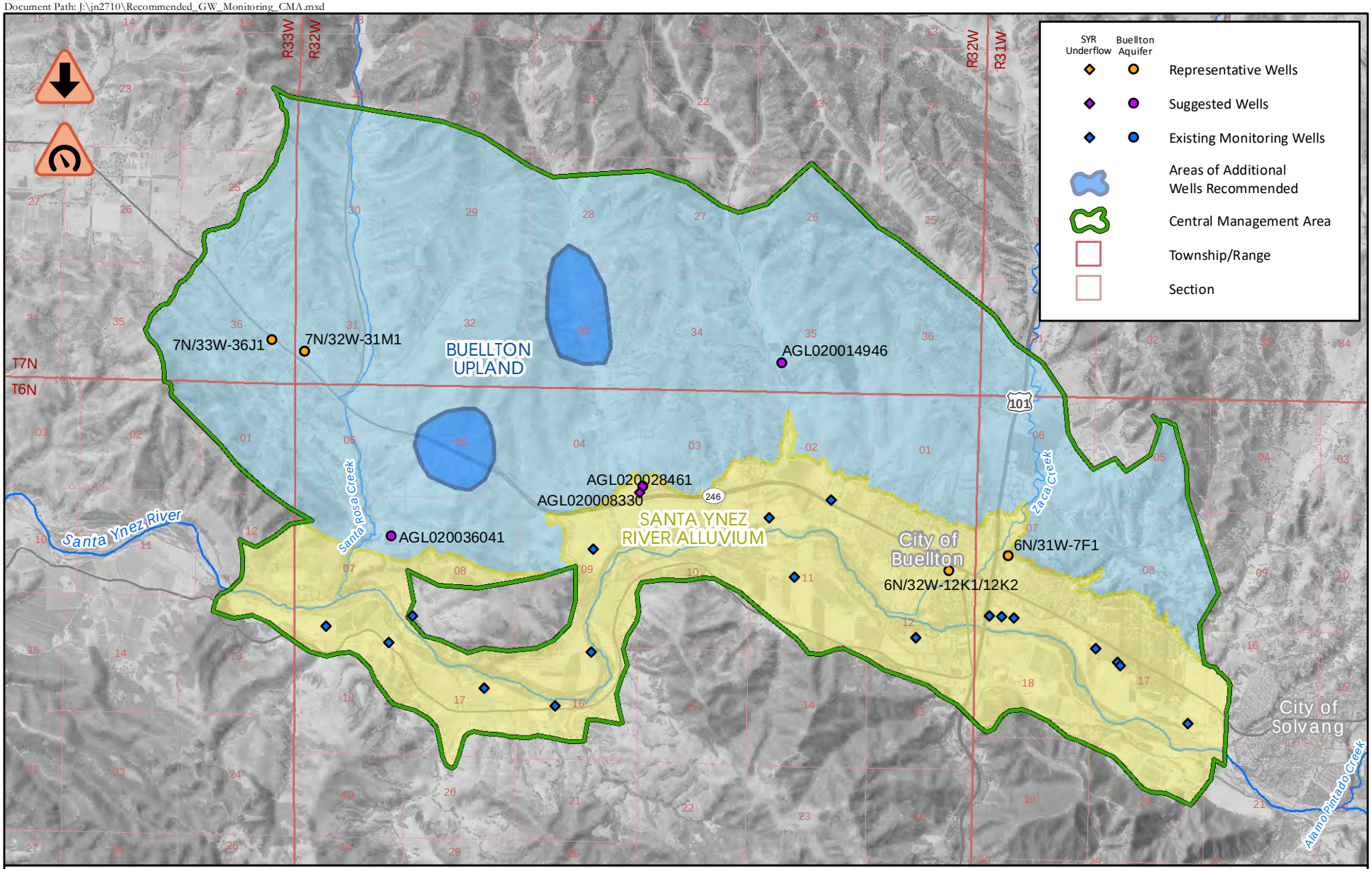

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CMA

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

CMA MONITORING NETWORK AND REPRESENTATIVE MONITORING WELLS FOR GROUNDWATER LEVELS AND GROUNDWATER STORAGE

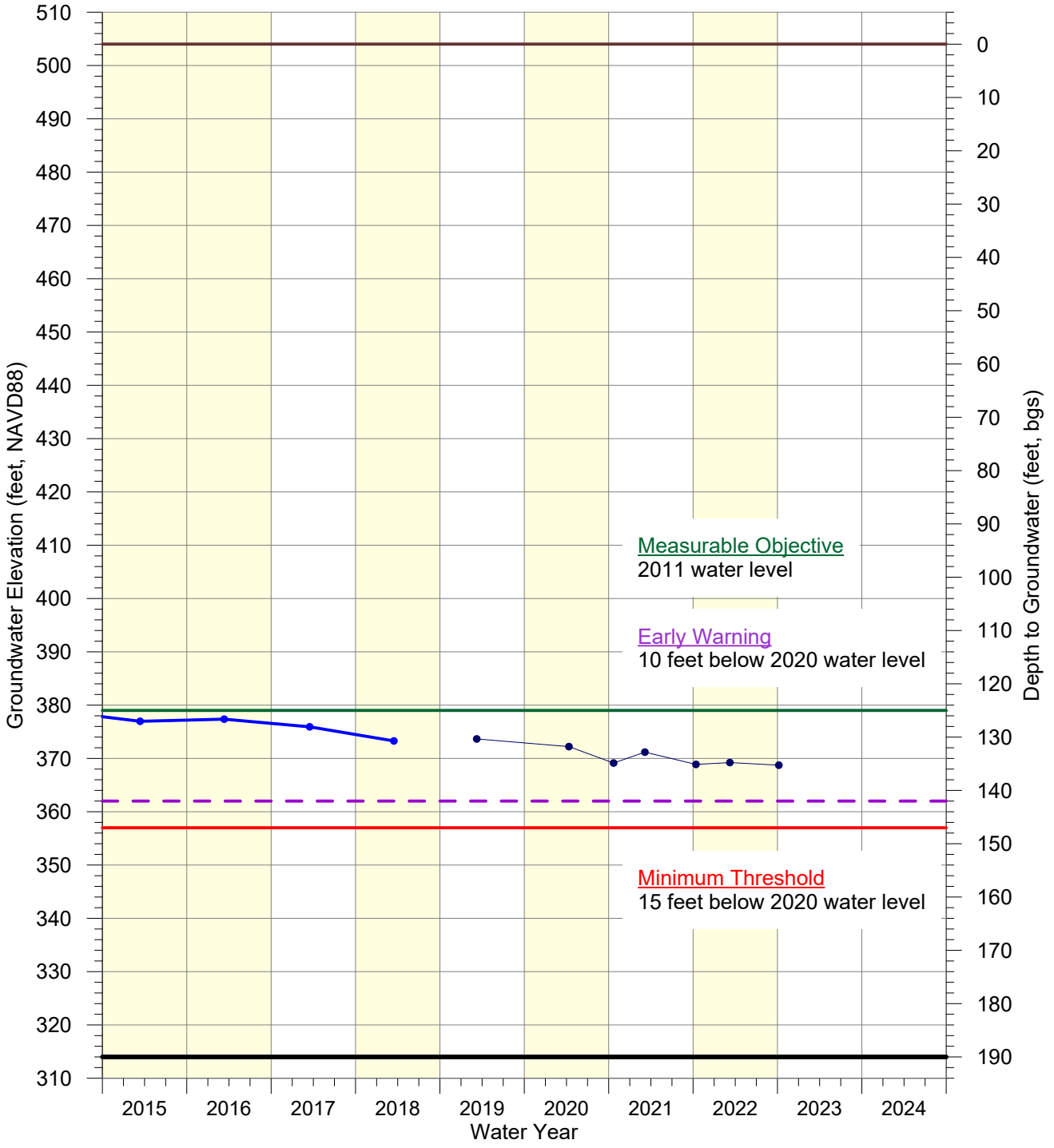
0 0.5 1 Miles

N

FIGURE A1-01

CASGEM ID
25268
Voluntary

CMA Representative Monitoring Well
for Buellton Aquifer
(Buellton Upland Subarea)
7N/33W-36J1



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Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Buellton Aquifer - Buellton Upland

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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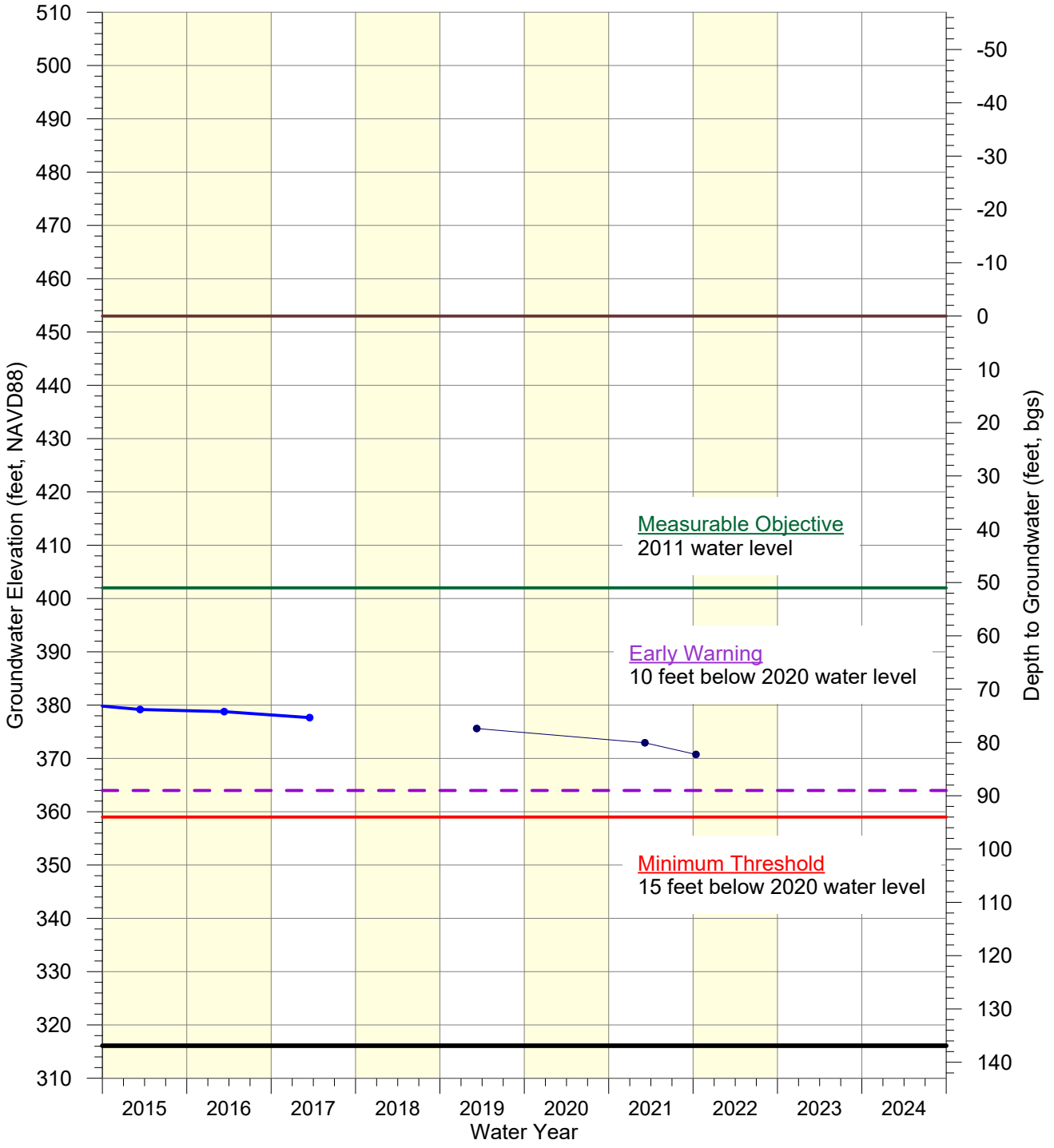
FIGURE A1-02

CASGEM ID
23681
Voluntary

CMA Representative Monitoring Well
for Buellton Aquifer
(Buellton Upland Subarea)
7N/32W-31M1



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

REPRESENTATIVE MONITORING WELL
Buellton Aquifer - Buellton Upland

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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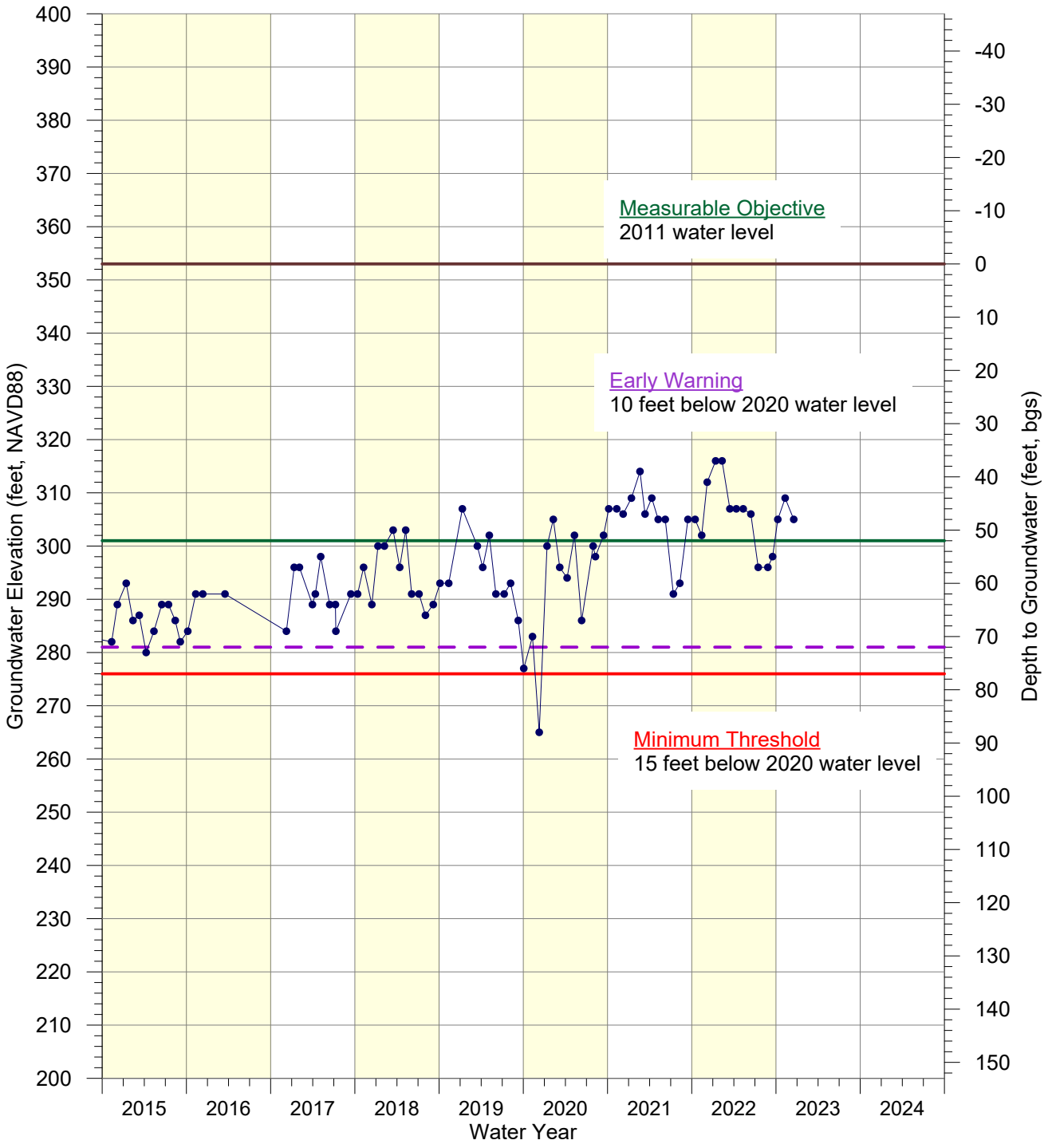
CMA Representative Monitoring Well for Buellton Aquifer (Santa Ynez River Alluvium Subarea) 6N/32W-12K2



USGS (343649120114401)
City of Buellton
Ground Surface (353 ±5 feet above mean sea level)
Depth of Well (1,014 feet); Perforations 620-1,000 feet

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Santa Ynez River Valley Groundwater Basin
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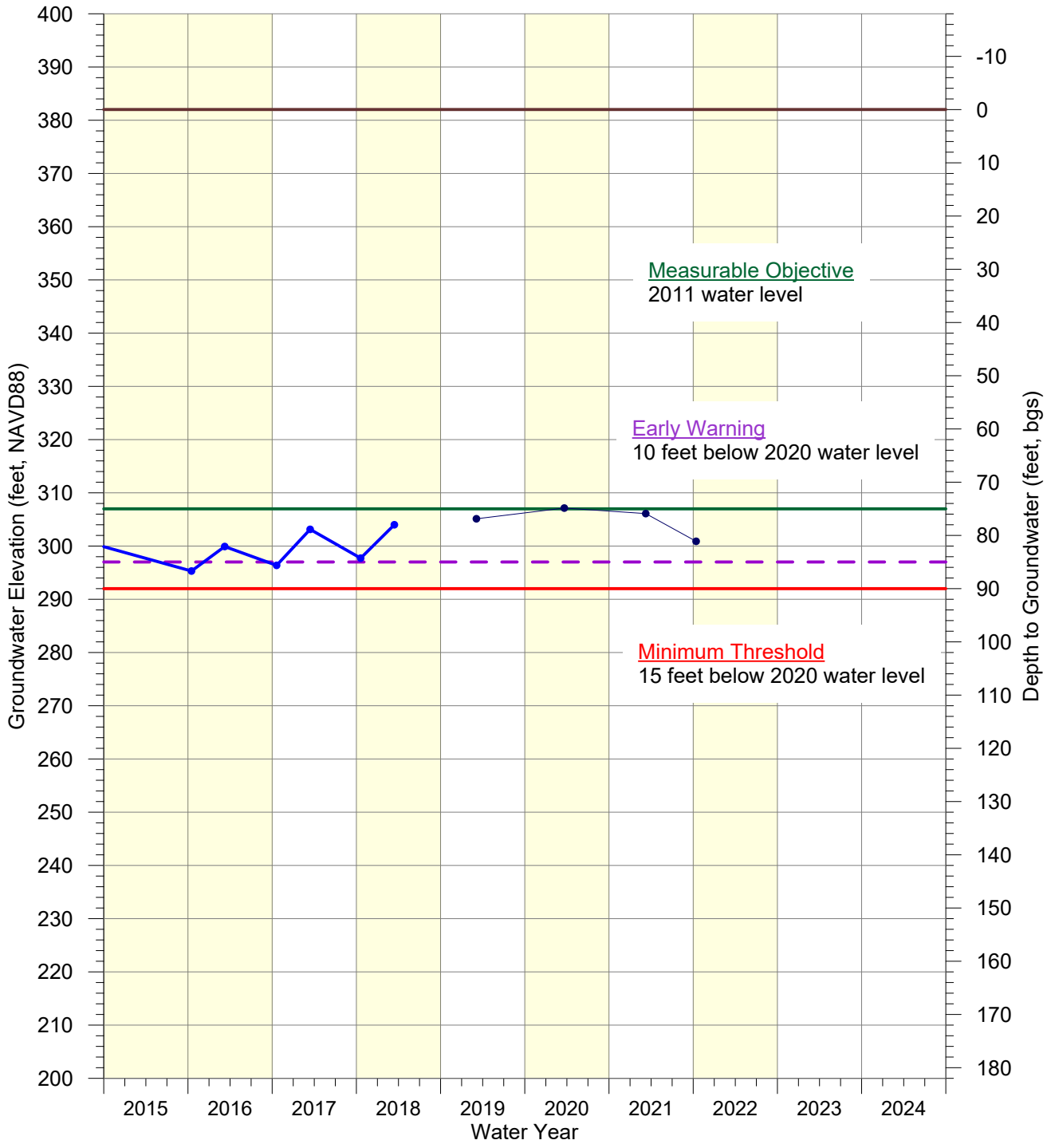
REPRESENTATIVE MONITORING WELL
Buellton Aquifer
Santa Ynez River Alluvium

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

CASGEM ID
49120
CASGEM

CMA Representative Monitoring Well
for Buellton Aquifer
(Santa Ynez River Alluvium Subarea)
6N/31W-7F1



USGS (343655120111201)
County of Santa Barbara
Ground Surface (382 feet above mean sea level)
Depth of Well (700 feet); Perforations TBD

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

REPRESENTATIVE MONITORING WELL
Buellton Aquifer
Santa Ynez River Alluvium

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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Chapter 3 – Groundwater Hydrographs and Contours

Appendix 3-B:

Groundwater Level Hydrographs for Assessing Surface Water Depletion, Central Management Area

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APPENDIX 3-B:

GROUNDWATER LEVEL HYDROGRAPHS FOR ASSESSING SURFACE WATER DEPLETION, CENTRAL MANAGEMENT AREA

WATER YEAR 2022

This appendix includes hydrographs, which are graphs of water levels in wells. These are the representative wells for monitoring potential surface water depletion. As per the SGMA regulations, this includes the period from January 1, 2015 through the end of the Water Year 2022. Shown on these graphs are key SGMA criteria: measurable objective, early warning, and minimum threshold.

The Groundwater Sustainability Plan (GSP) includes hydrographs of the long-term period of record. A copy of the GSP, water level data and hydrographs are available at https://sywater.info.

LIST OF ACRONYMS AND ABBREVIATIONS

BGS	below-ground surface
CASGEM	California Statewide Groundwater Elevation Monitoring
CMA	Central Management Area
FT	feet
NAVD88	North American Vertical Datum of 1988
USBR	United States Bureau of Reclamation
USGS	United States Geologic Survey
WL	Water Level

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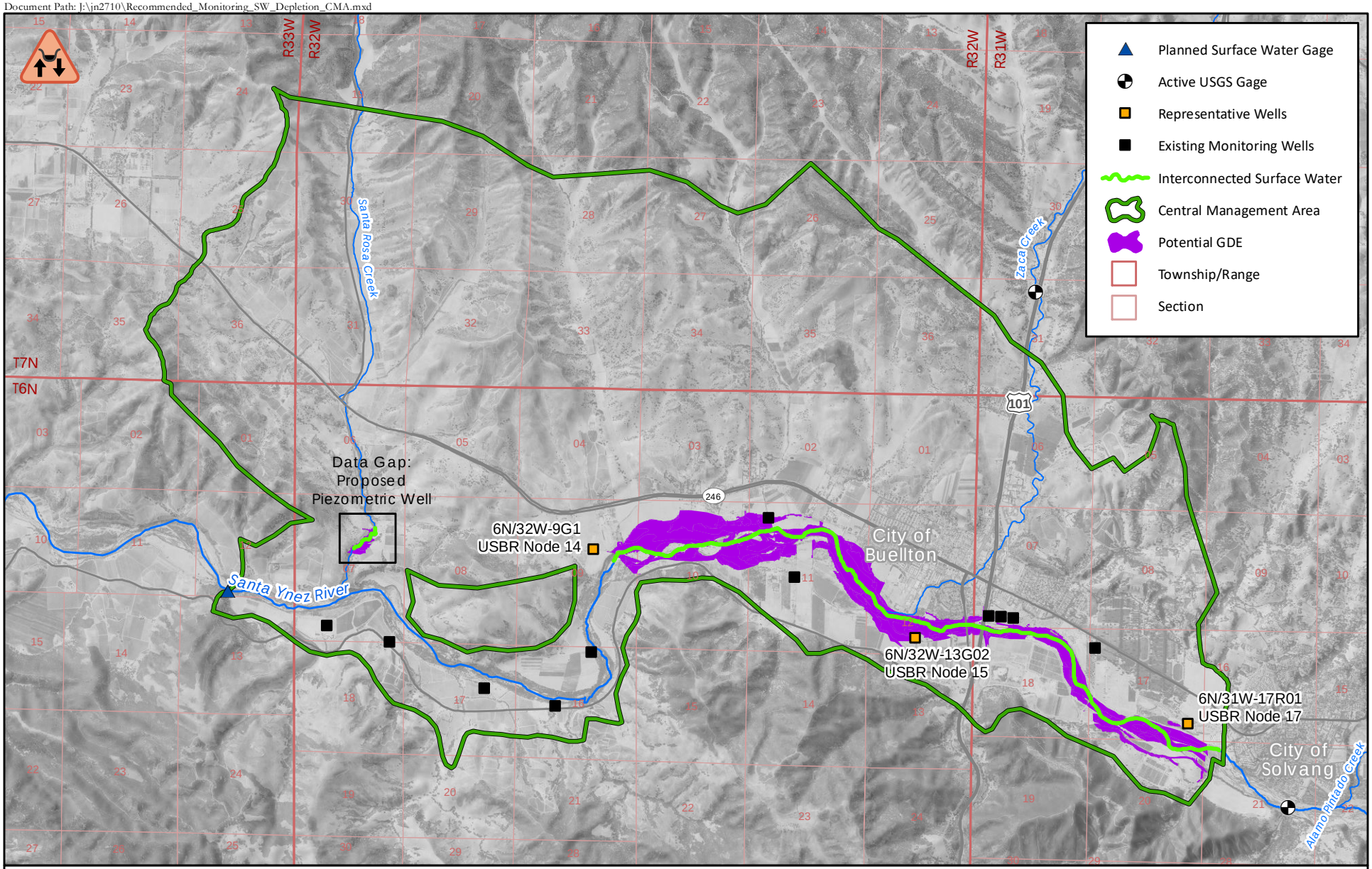

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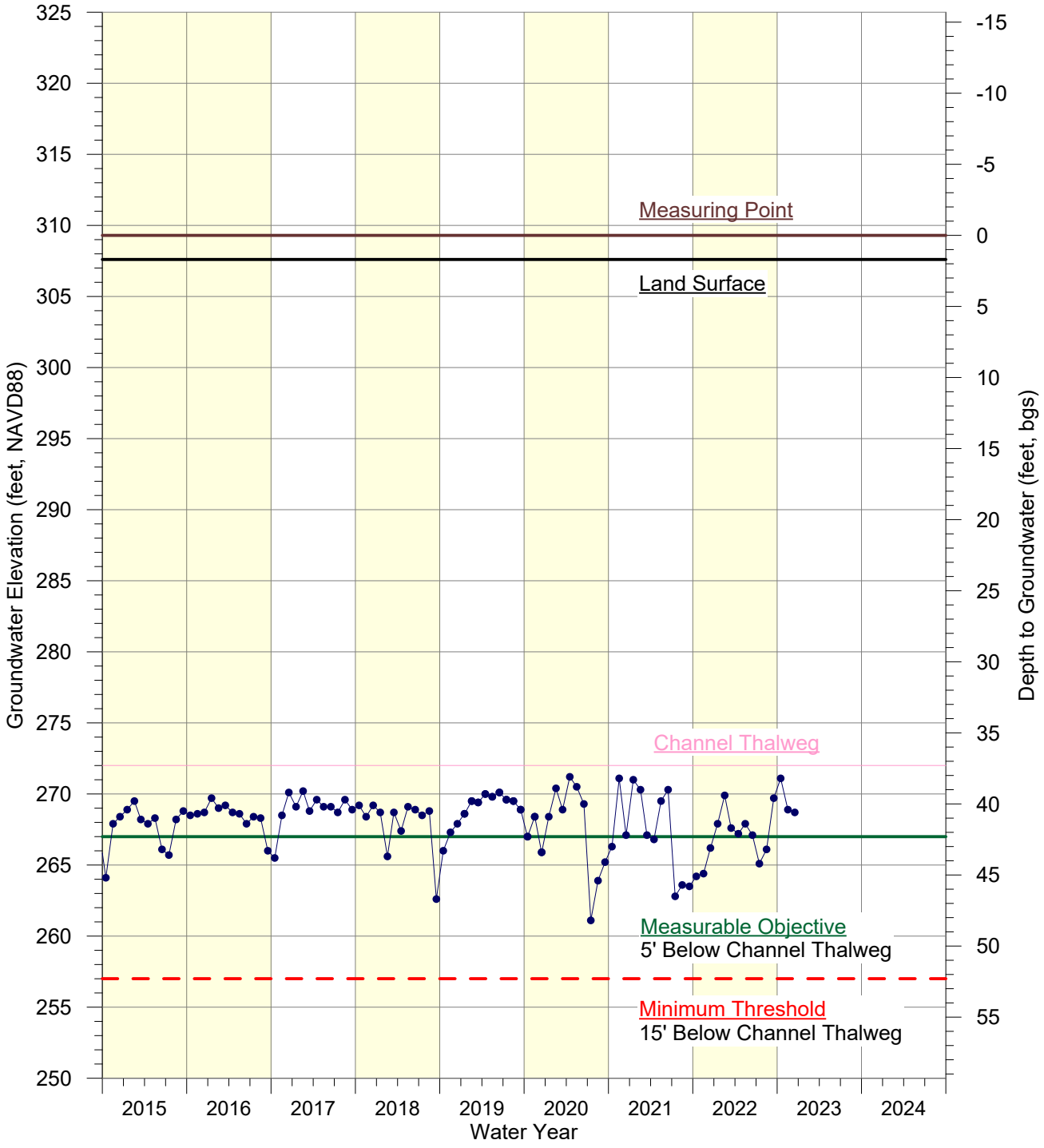
Central Management Area
Groundwater Sustainability Agency

CMA MONITORING NETWORK AND REPRESENTATIVE MONITORING FOR INTERCONNECTED SURFACE WATER AND GROUNDWATER DEPENDENT ECOSYSTEMS

0 0.5 1 Miles

N

CMA Representative Monitoring Well for Interconnected Surface Water and Groundwater Dependent Ecosystems 6N/32W-9G1



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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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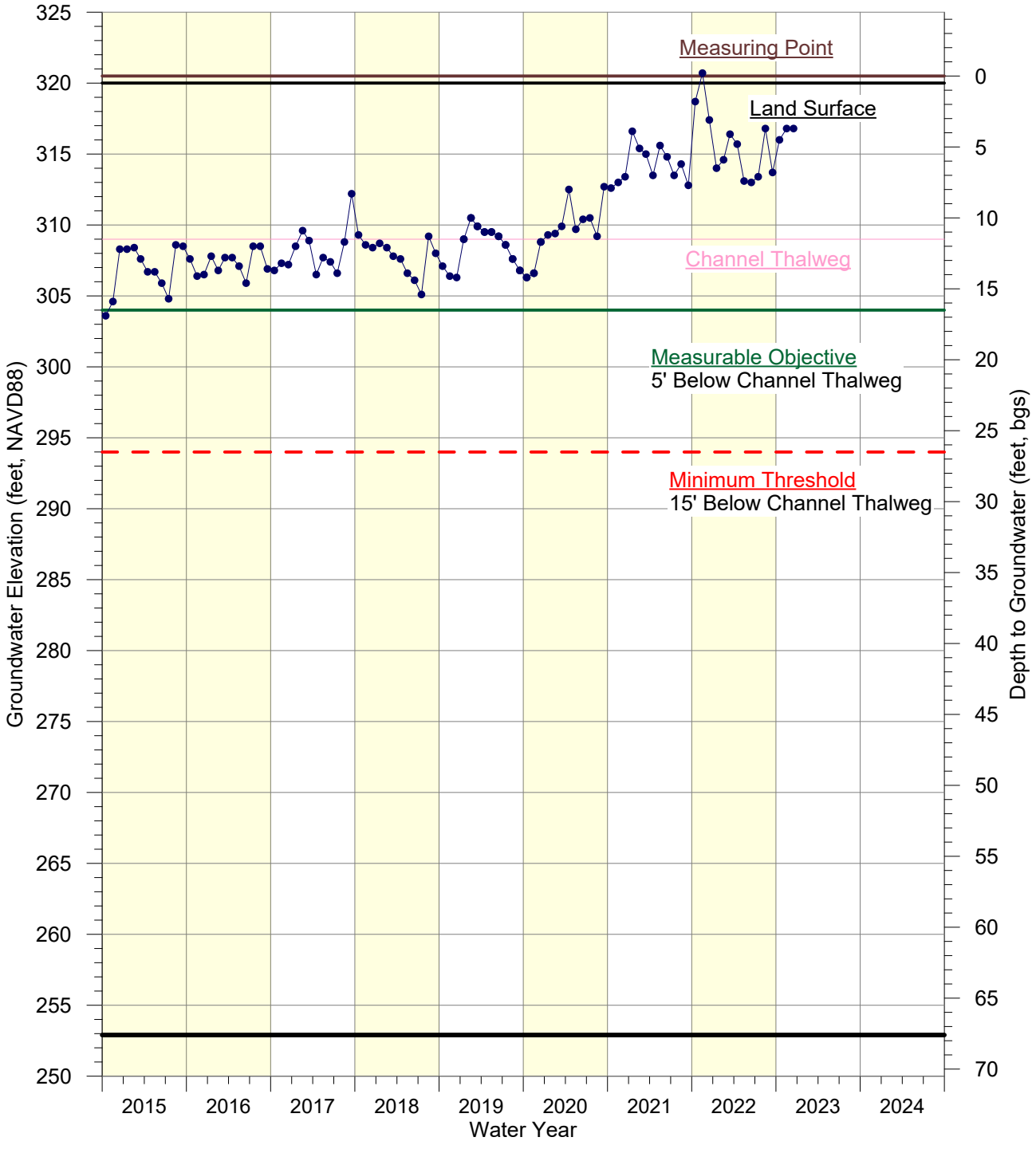
CMA Representative Monitoring Well for
Interconnected Surface Water and Groundwater Dependent Ecosystems
6N/32W-13G2



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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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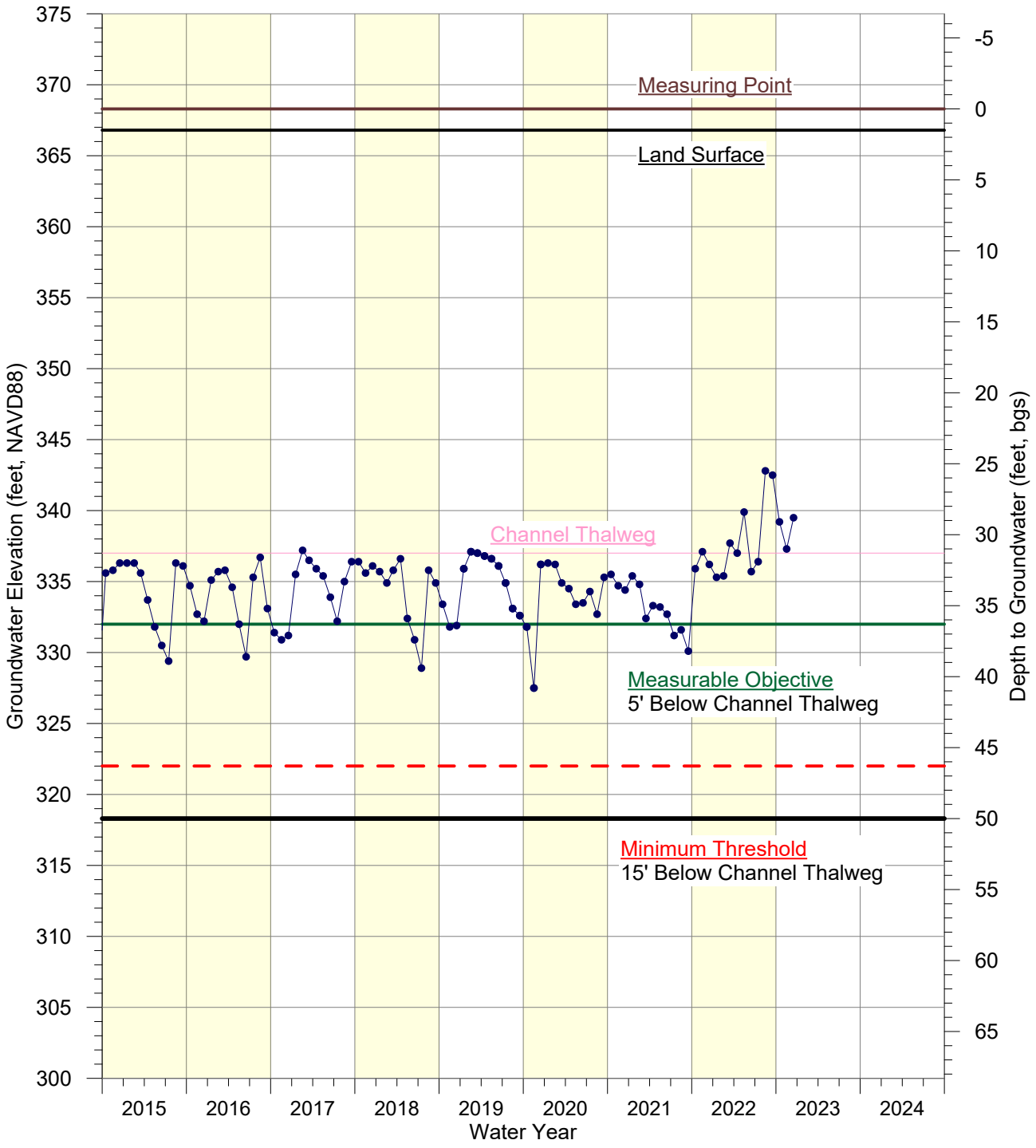
CMA Representative Monitoring Well for
Interconnected Surface Water and Groundwater Dependent Ecosystems
6N/31W-17R1



US Bureau of Reclamation
USGS (343543120093101)
Measuring Point (368.3 feet above mean sea level)
Land Surface (366.8 feet above mean sea level)
Depth of Well (50 feet); Perforations TBD

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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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Second Annual Report Water Year 2022
Groundwater Sustainability Plan

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