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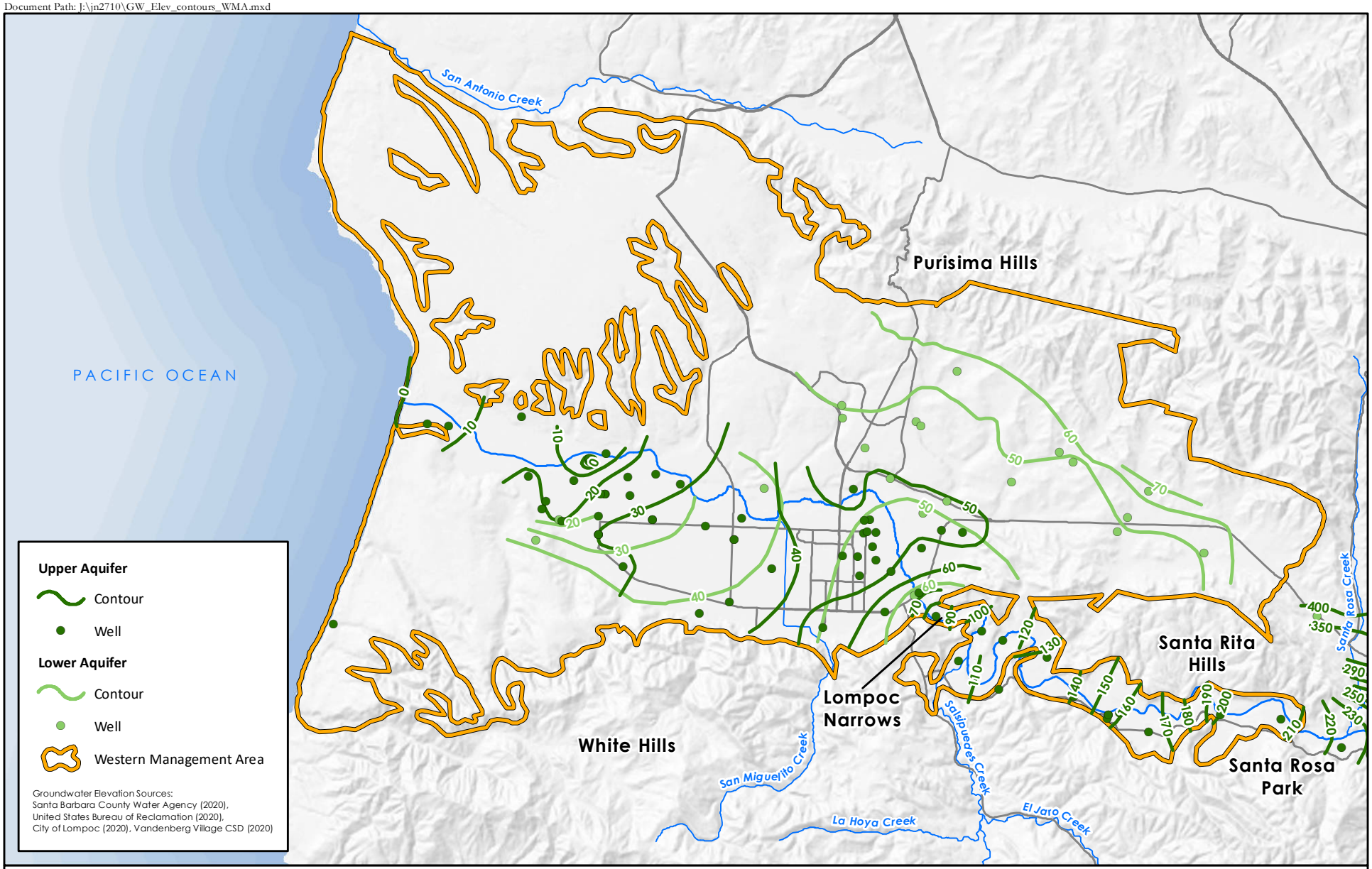

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Western Management Area
Groundwater Sustainability Agency

GROUNDWATER ELEVATION CONTOURS
SEASONAL HIGH
SPRING 2020
WESTERN MANAGEMENT AREA

DRAFT

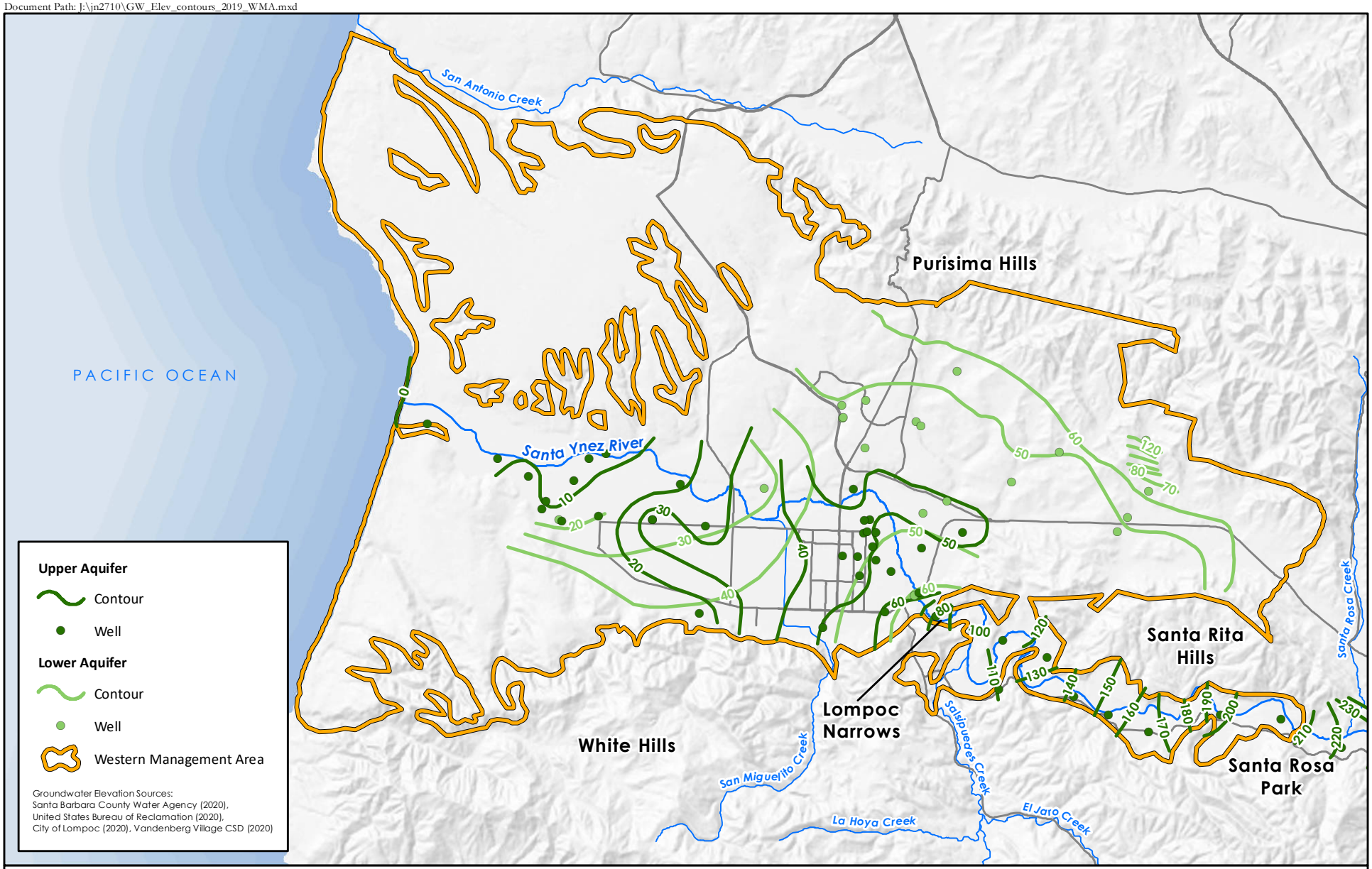
0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 1-1

Document Path: J:\jn2710\GW_Elev_contours_2019_WMA.mxd



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Groundwater Sustainability Agency

GROUNDWATER ELEVATION CONTOURS
SEASONAL LOW
FALL 2019
WESTERN MANAGEMENT AREA

DRAFT

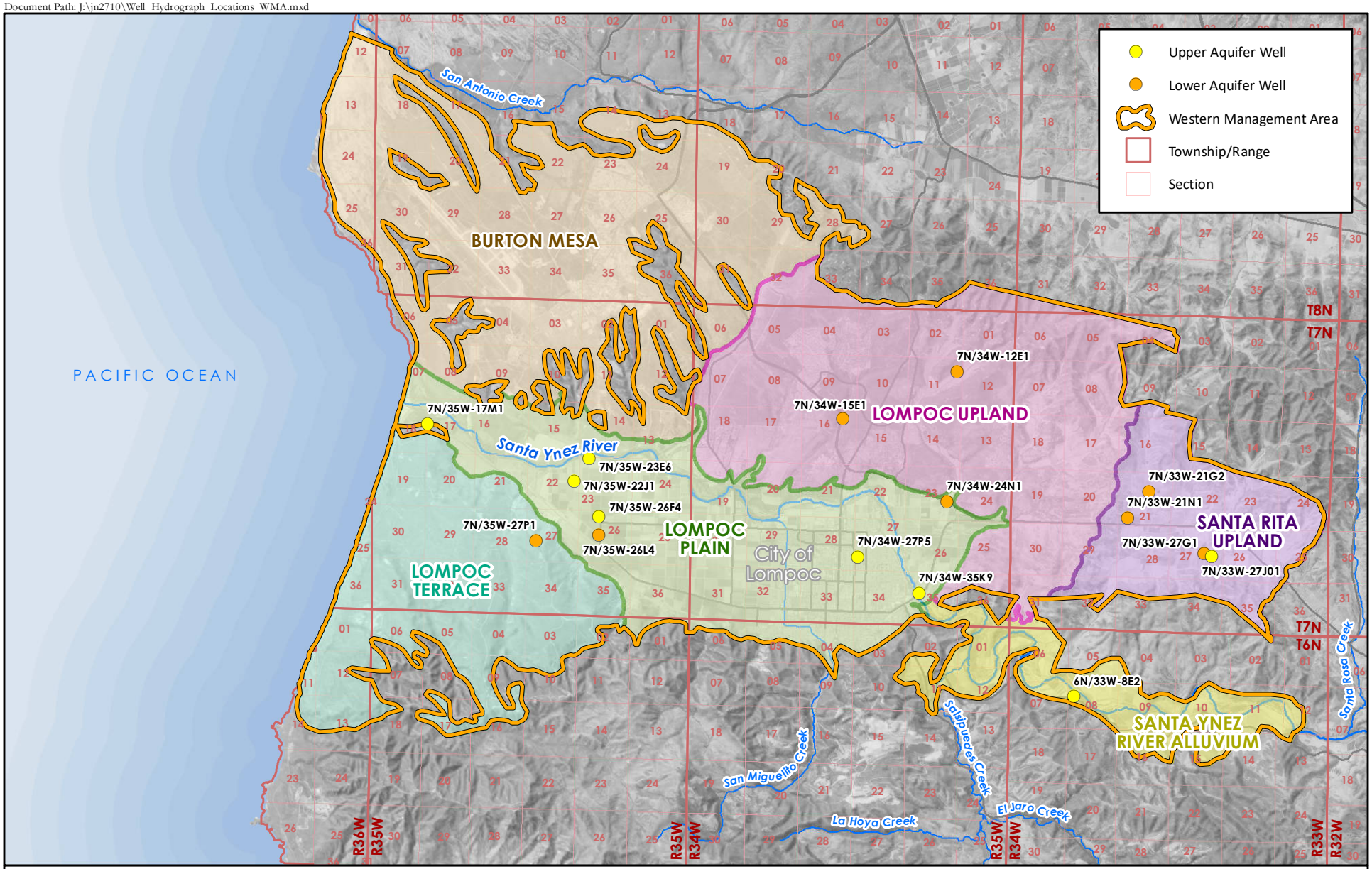
0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 1-2

Document Path: J:\jn2710\Well_Hydrograph_Locations_WMA.mxd



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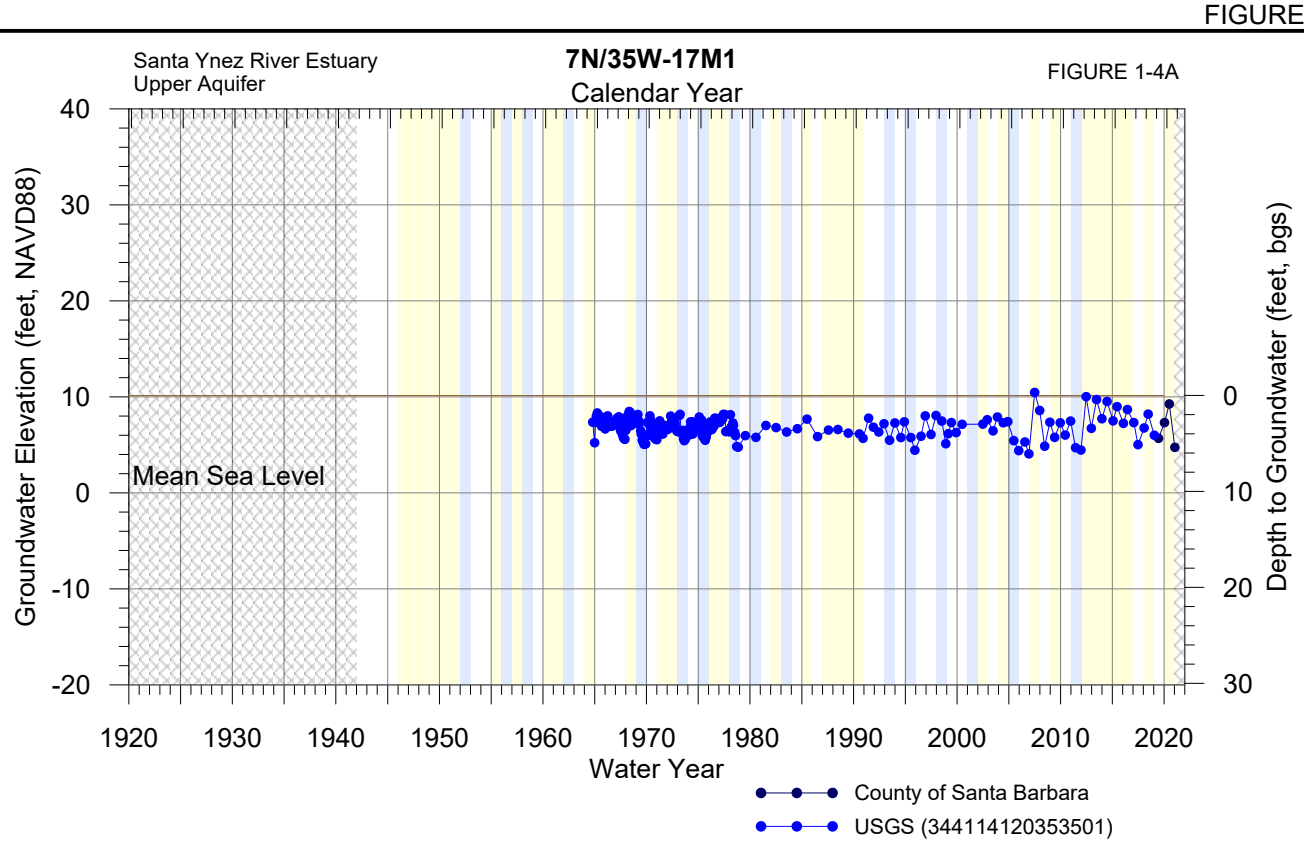
WELL HYDROGRAPH LOCATIONS
WITHIN WESTERN MANAGEMENT AREA

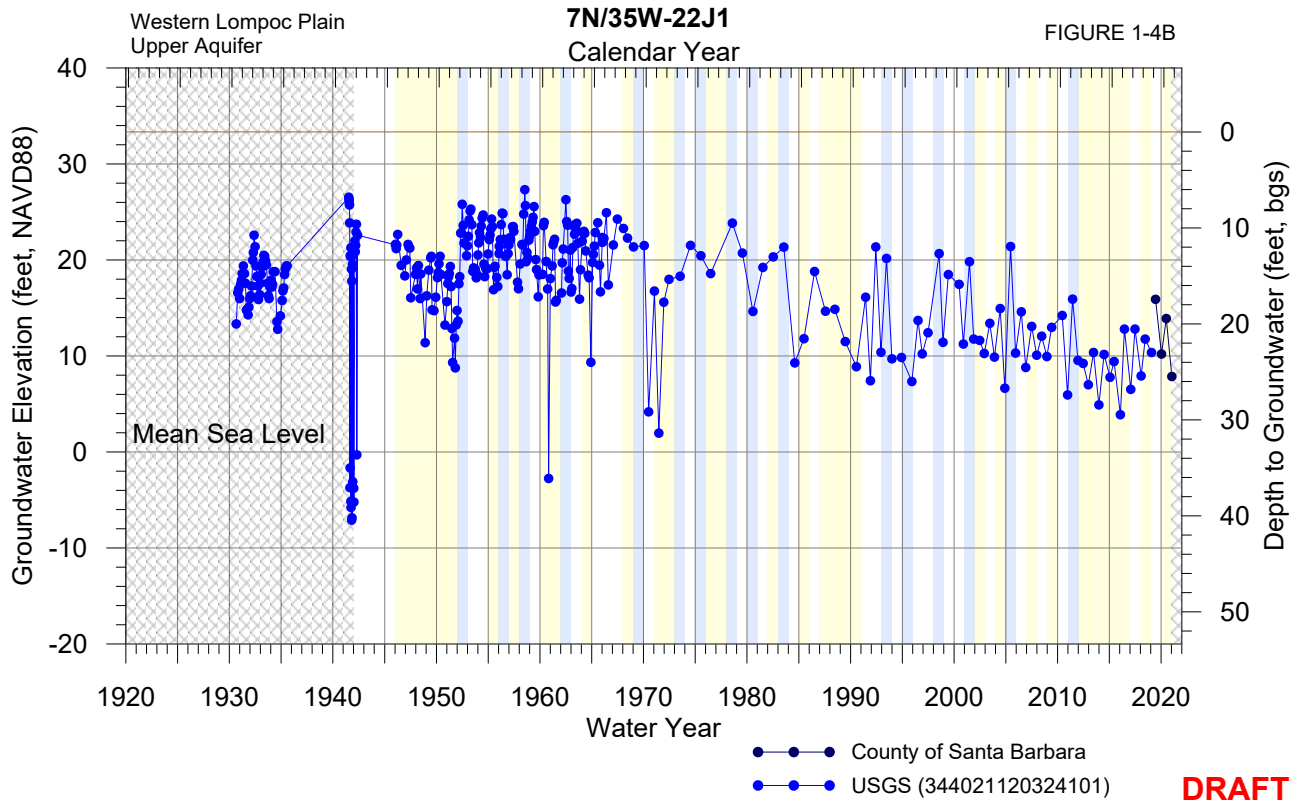
DRAFT

0 1 2 Miles

N

FIGURE 1-3





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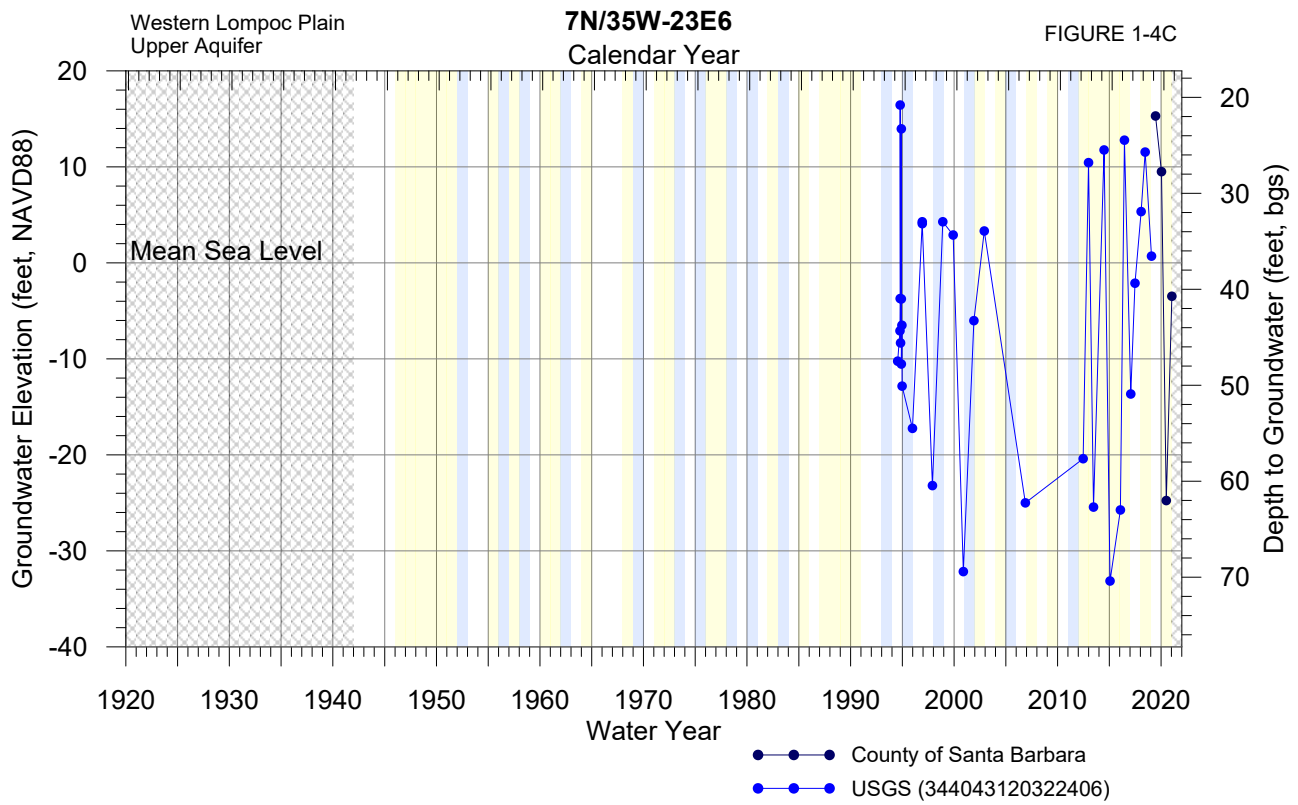
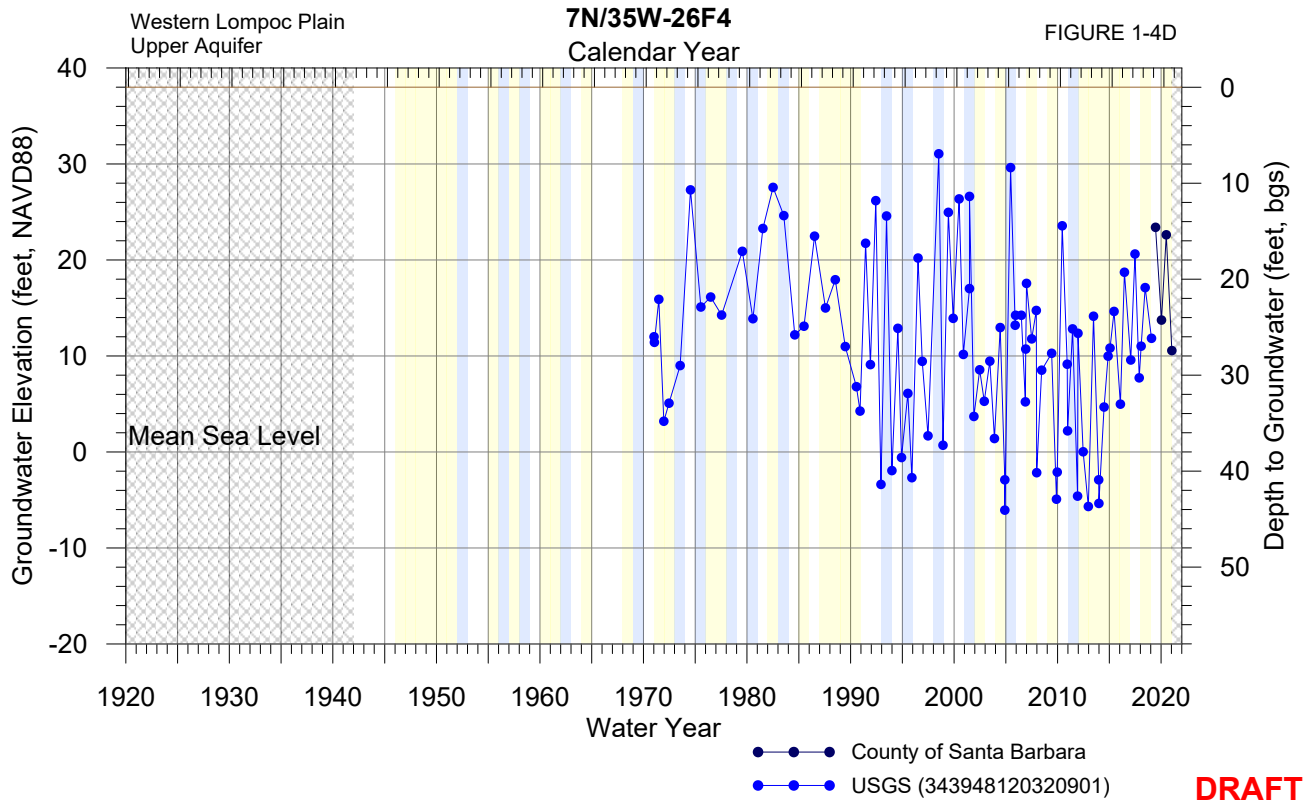
SELECTED HYDROGRAPHS
LOMPOC PLAIN

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\WMA 1-04AB Lompoc Plain GWE.grf 1/13/2021 M. McCammon





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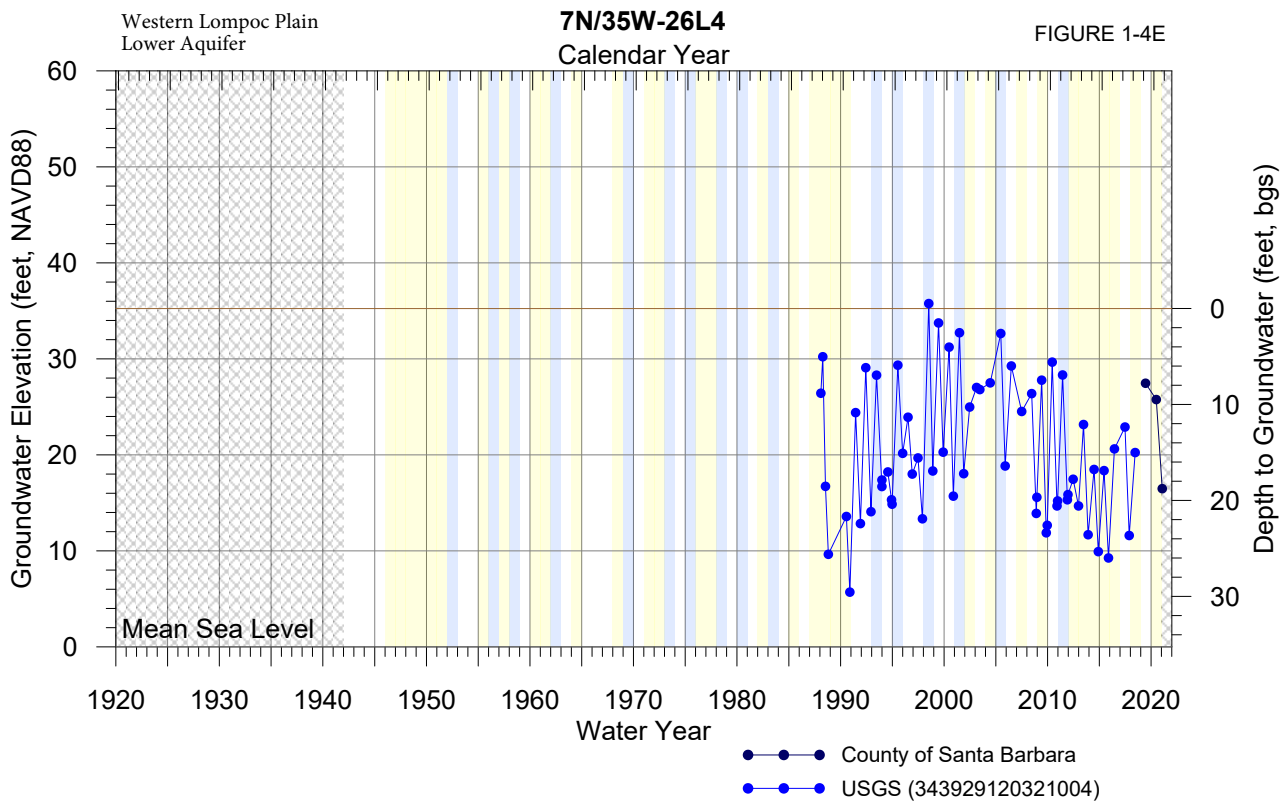
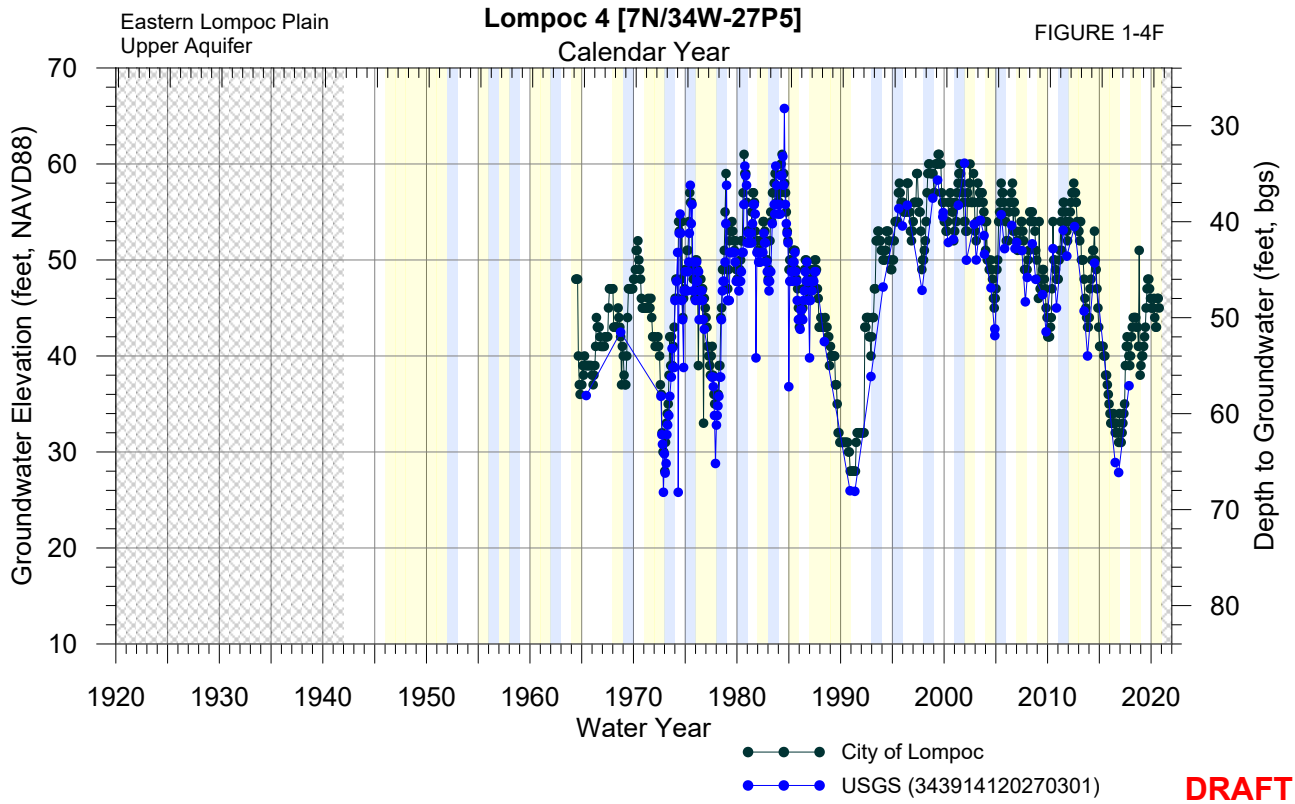
SELECTED HYDROGRAPHS
LOMPOC PLAIN

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\WMA 1-04CD Lompoc Plain GWE.grf 1/13/2021 M. McCammon





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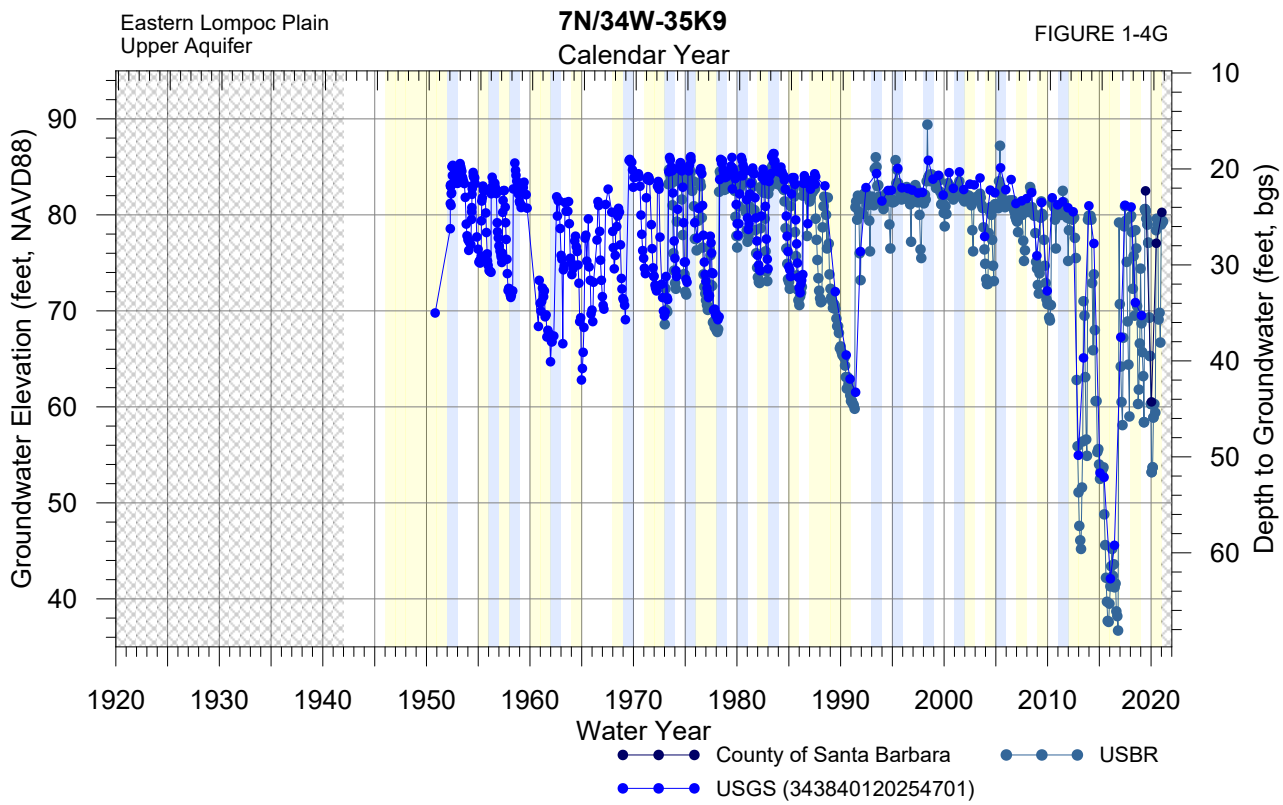
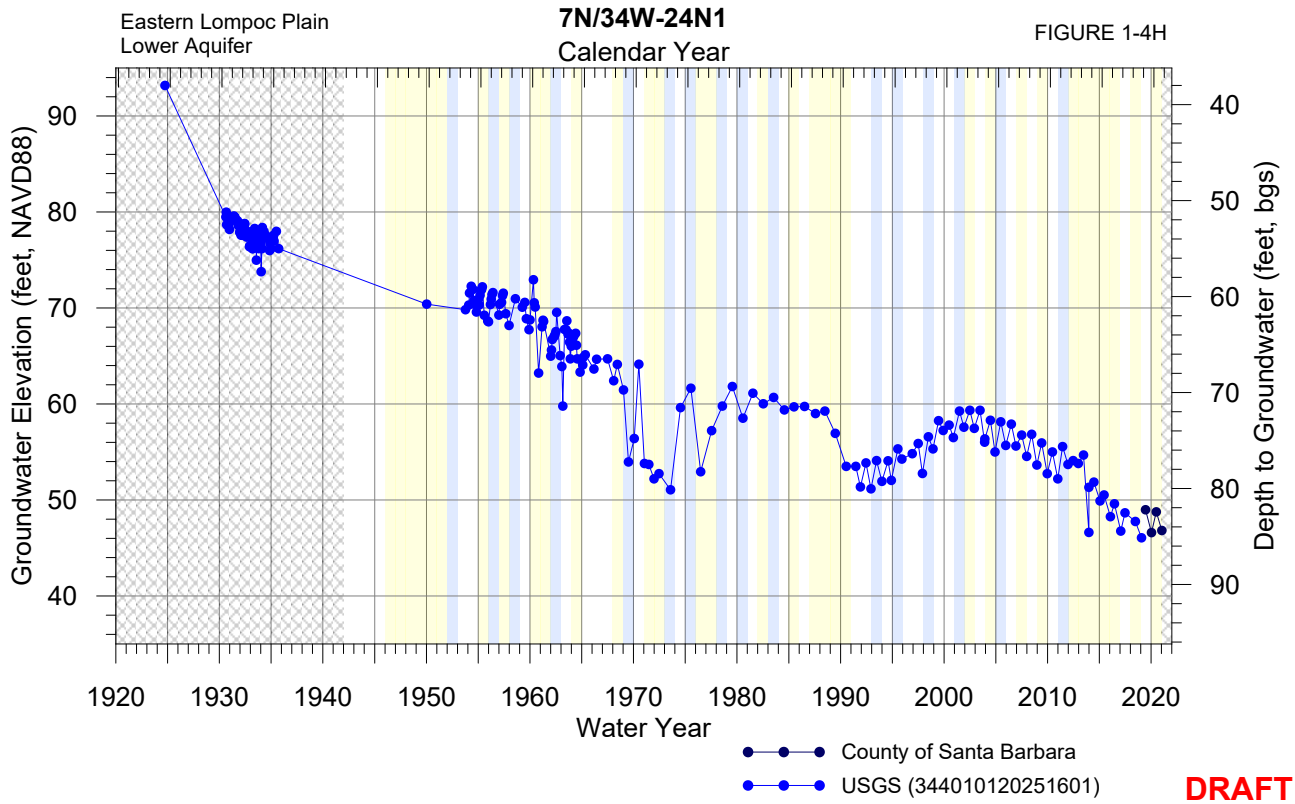
Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
LOMPOC PLAIN

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\WMA 1-04EF Lompoc Plain GWE.grf 1/13/2021 M. McCammon





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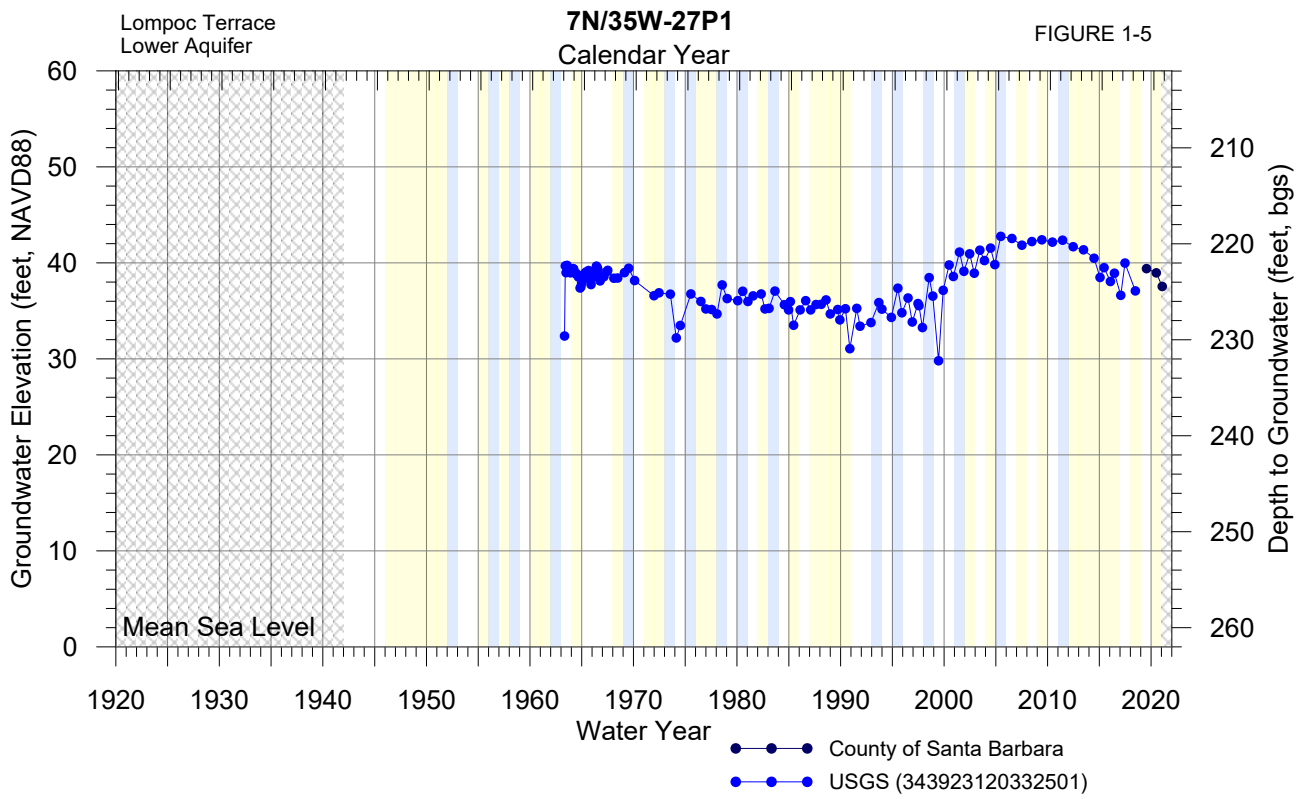
Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
LOMPOC PLAIN

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\WMA 1-04GH Lompoc Plain GWE.grf 1/13/2021 M. McCammon



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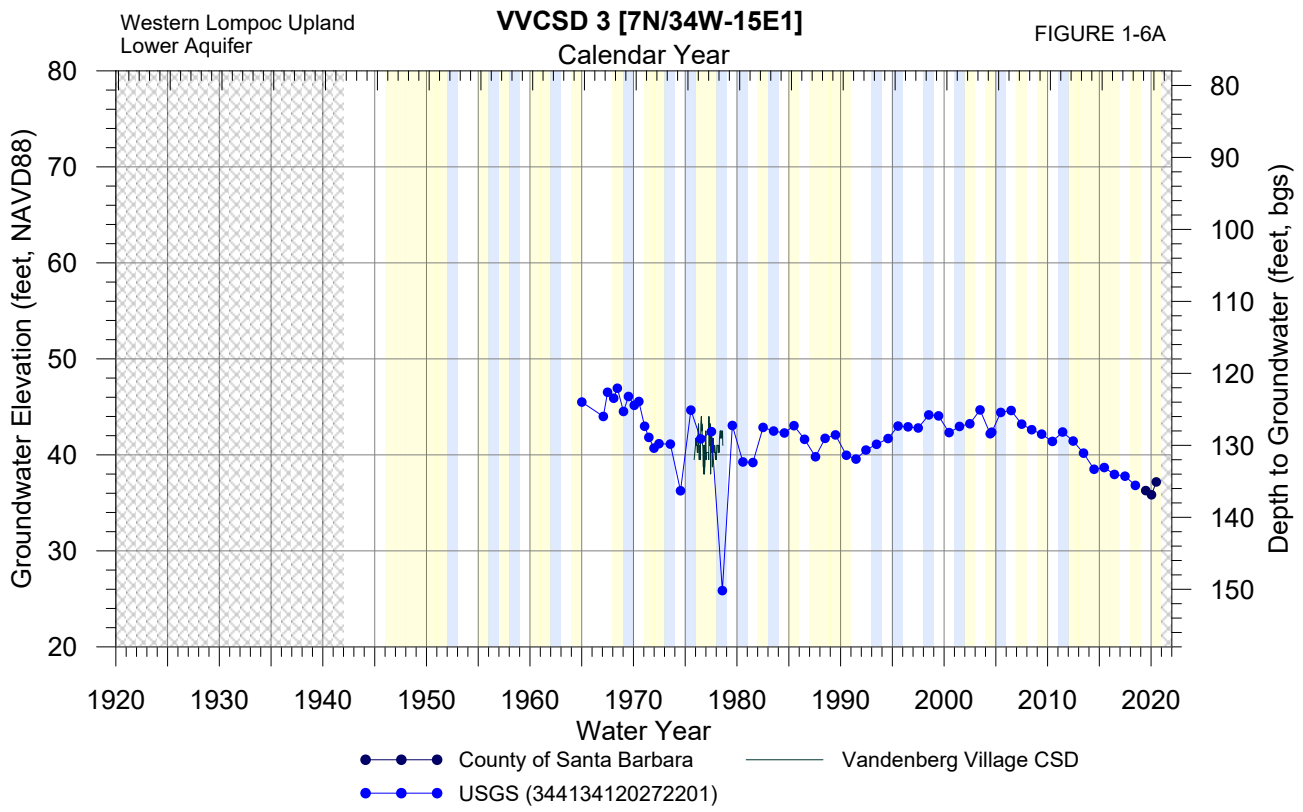
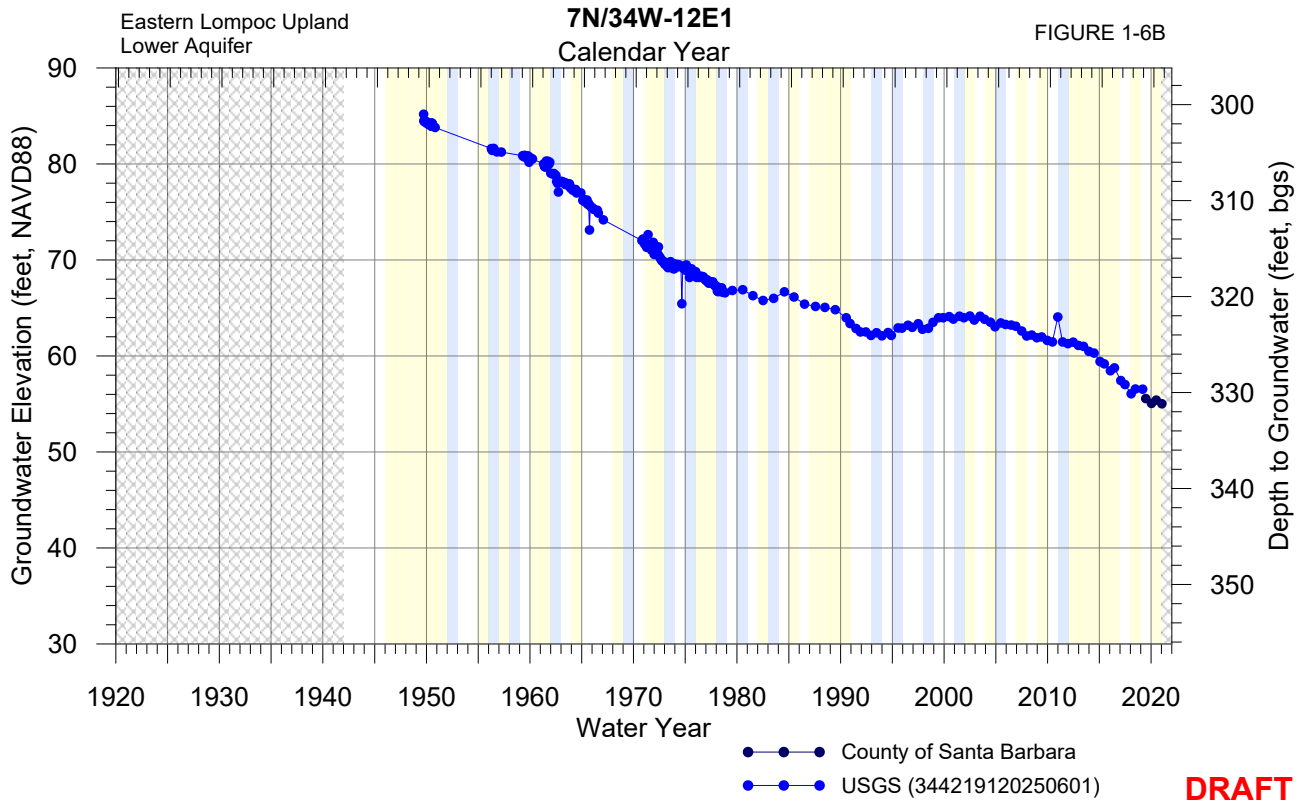
Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPH
LOMPOC TERRACE

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\WMA 1-05 Lompoc Terrace GWE.grf 1/13/2021 M. McCammon





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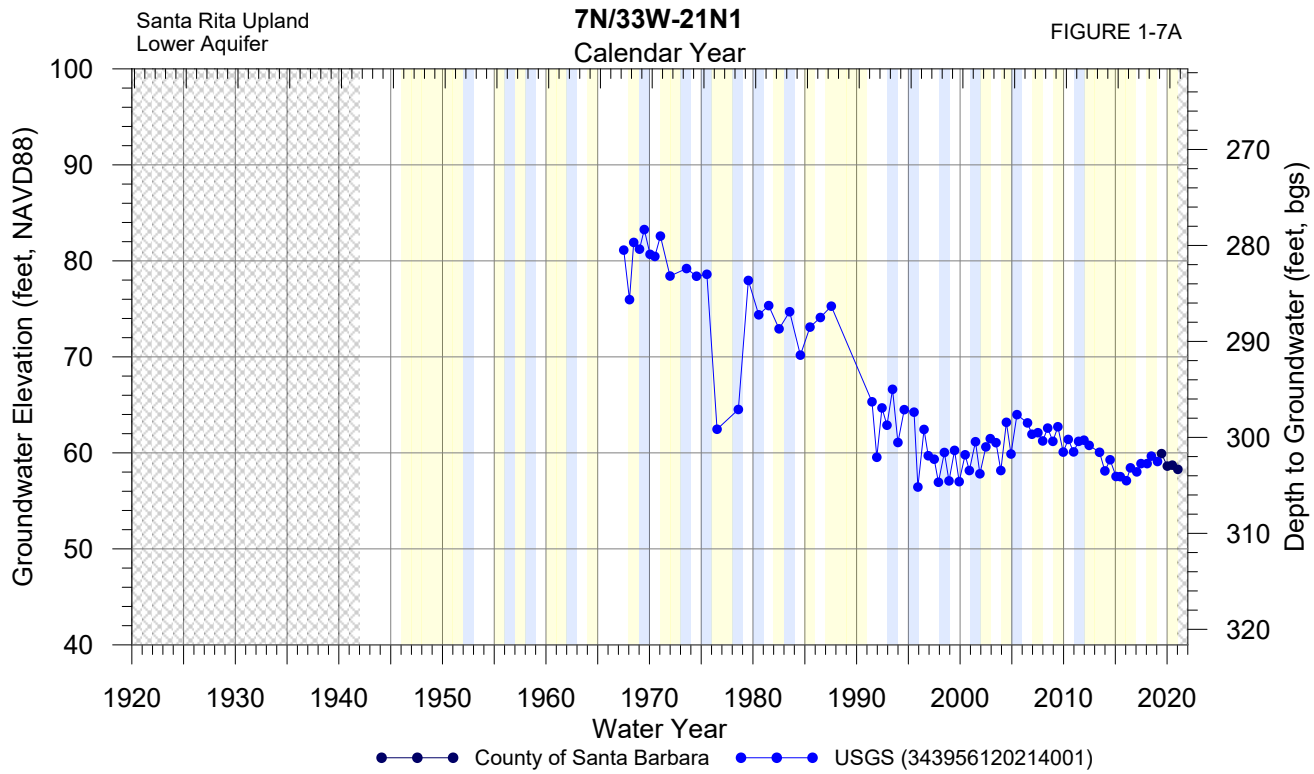
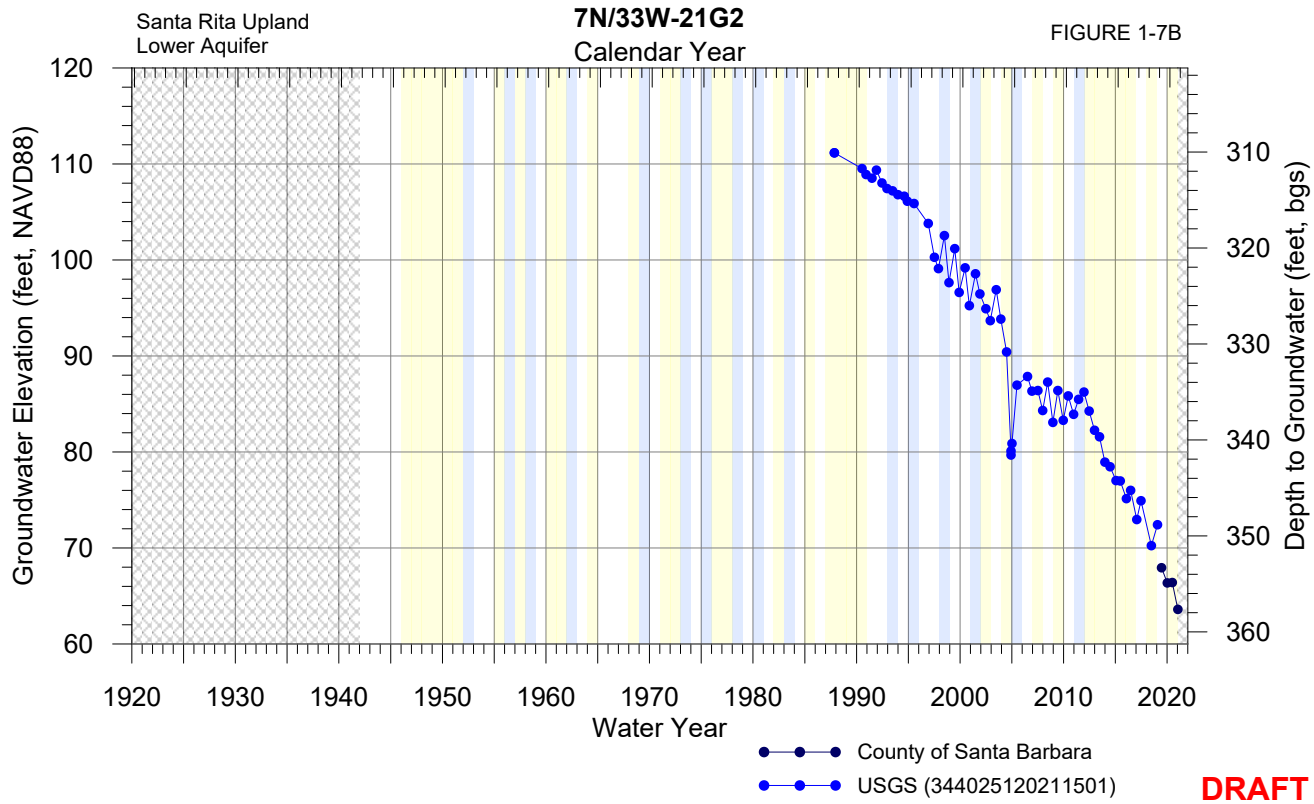
Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
LOMPOC UPLAND

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\WMA 1-06 Lompoc Upland GWE.grf 1/13/2021 M. McCammon





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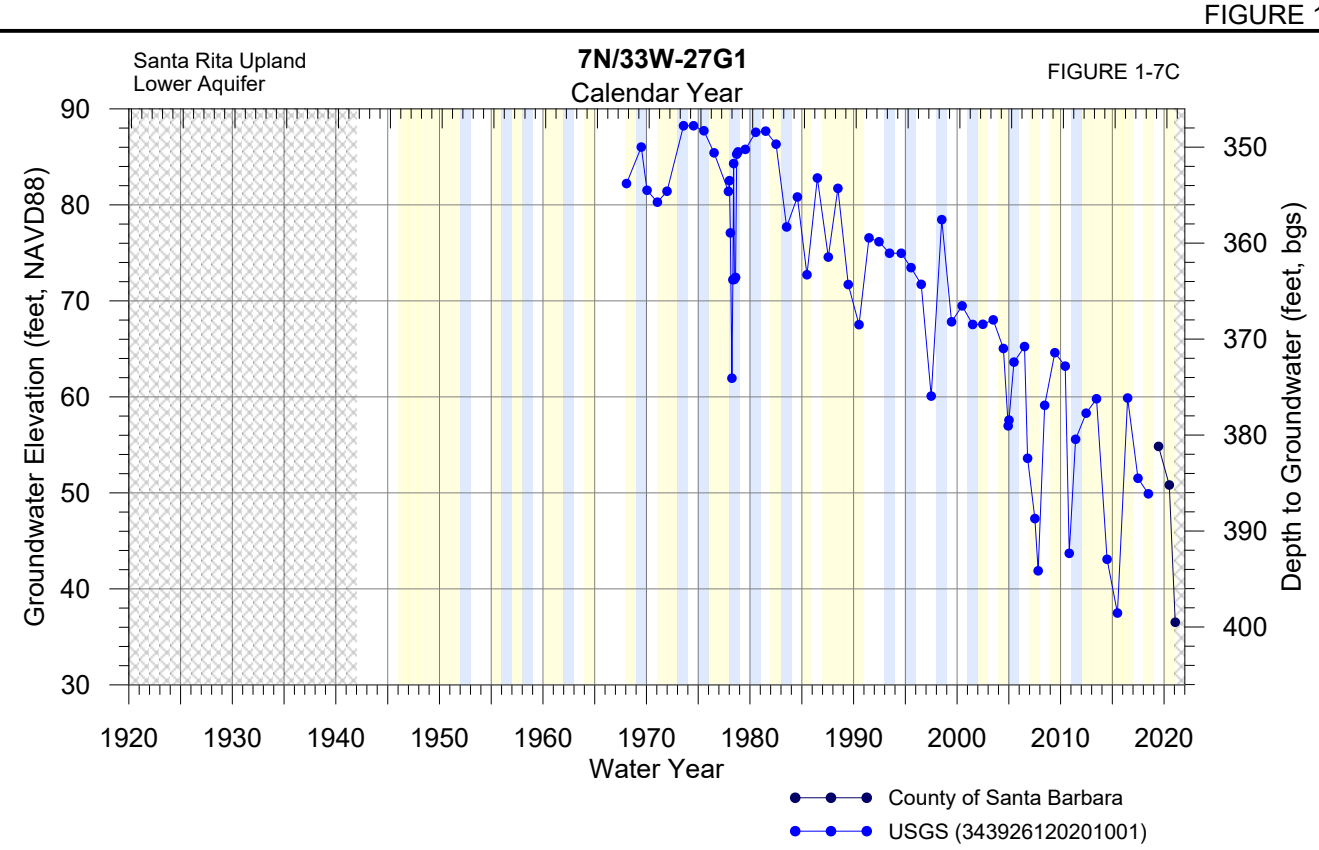
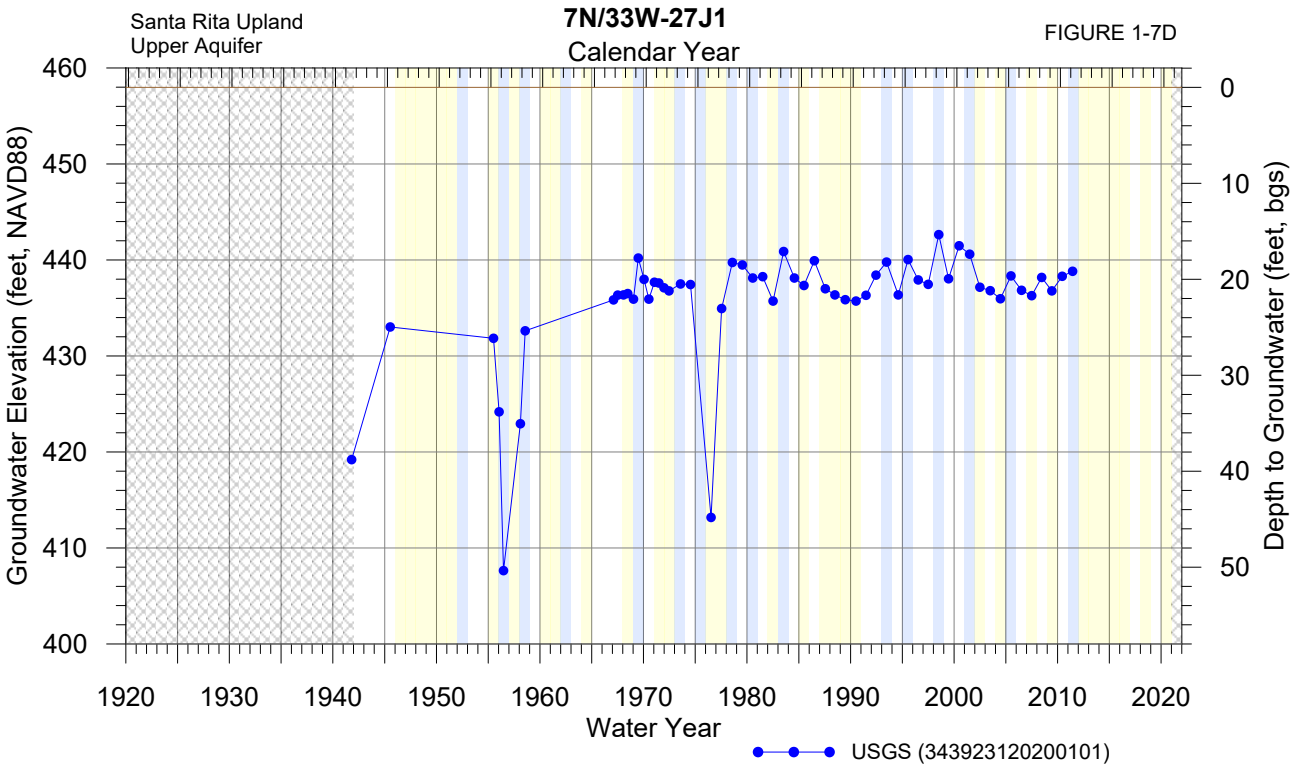
Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
SANTA RITA UPLAND

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\WMA 1-07AB Santa Rita Upland GWE.grf 1/13/2021 M. McCammon





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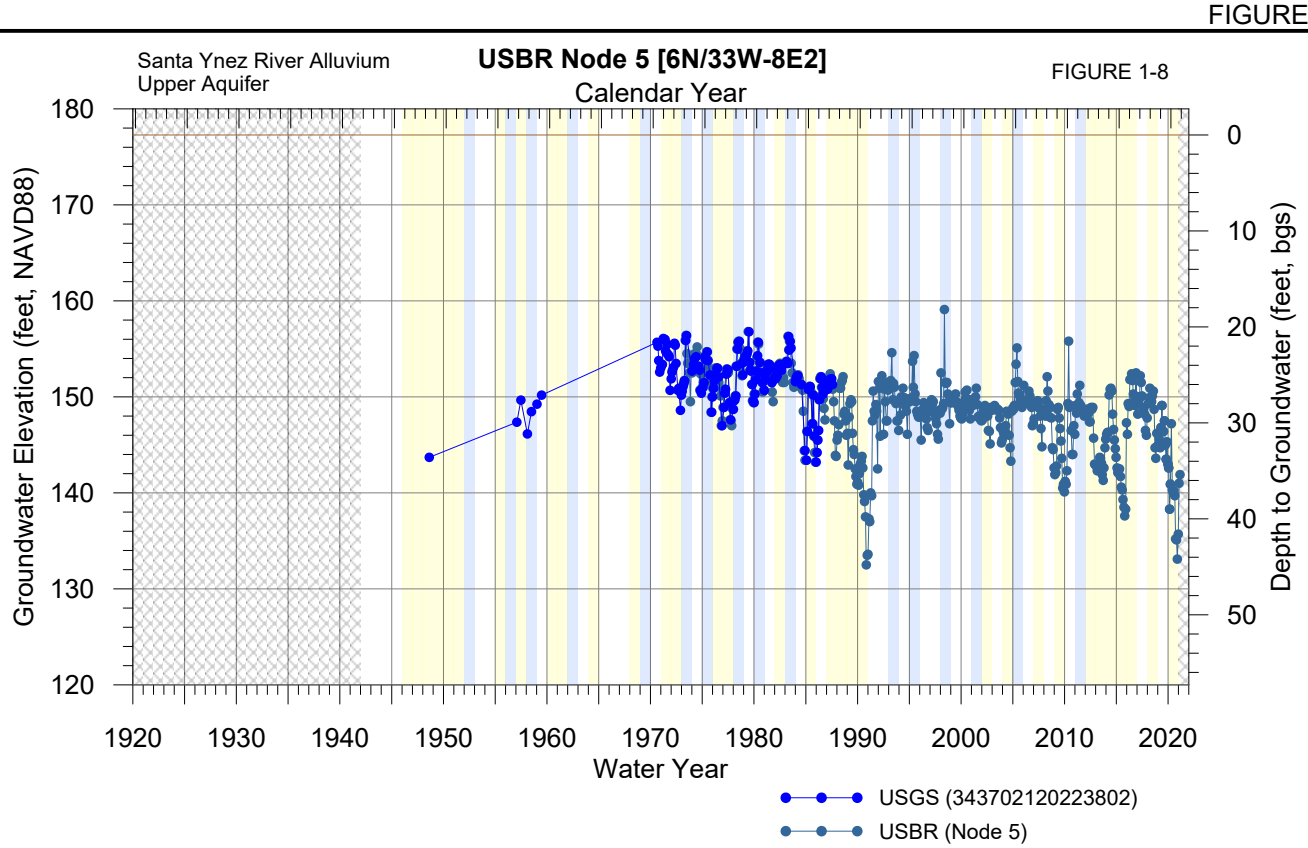
Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
SANTA RITA UPLAND

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\WMA 1-07CD Santa Rita Upland GWE.grf 1/13/2021 M. McCammon



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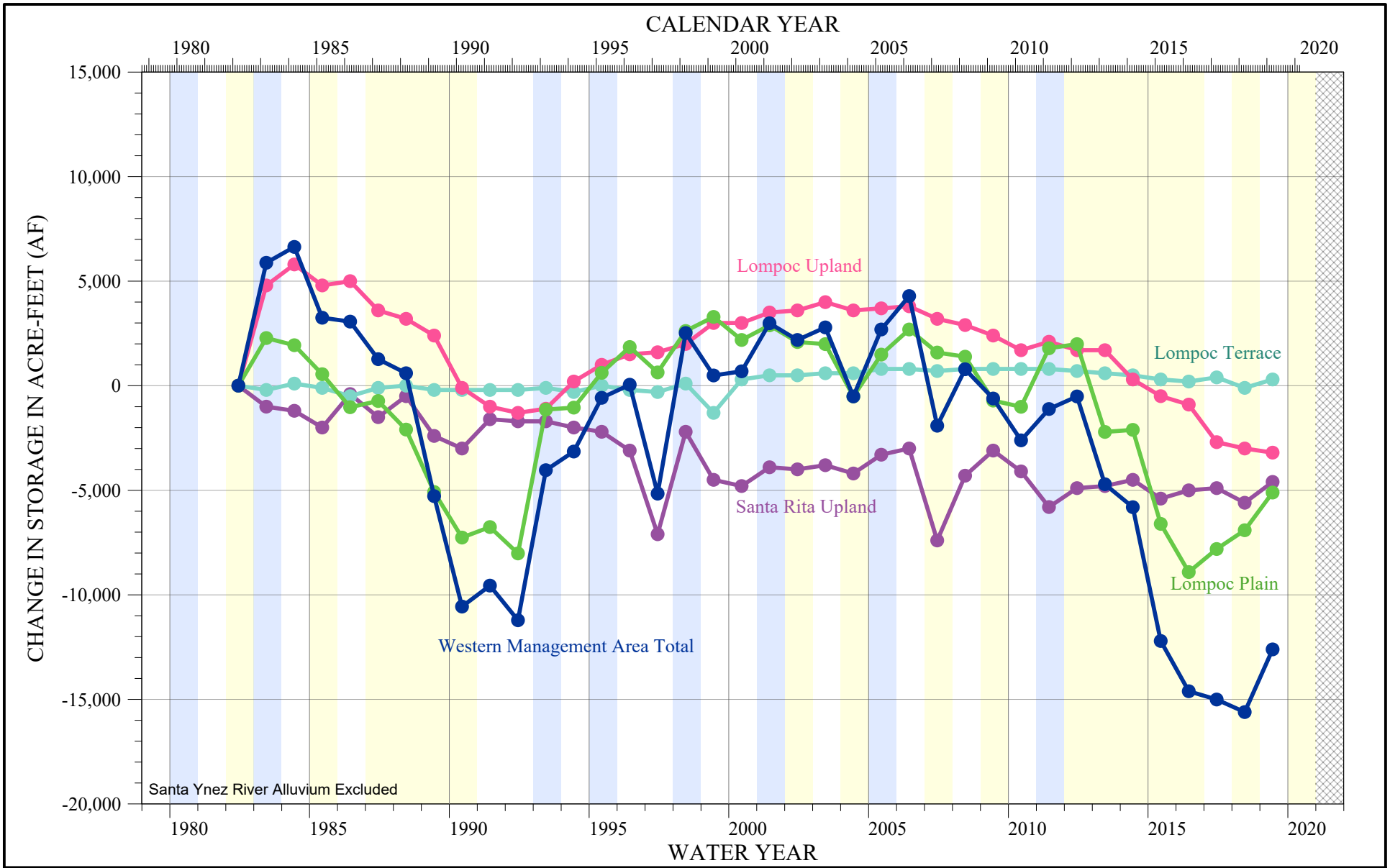
Groundwater Sustainability Agency

SELECTED HYDROGRAPH
SANTA YNEZ RIVER ALLUVIUM

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\WMA 1-08 Santa Ynez Alluvium GWE.grf 1/13/2021 M. McCammon



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Groundwater Sustainability Agency

CUMULATIVE CHANGE IN GROUNDWATER STORAGE BY SUBAREA, RELATIVE TO MARCH 1982

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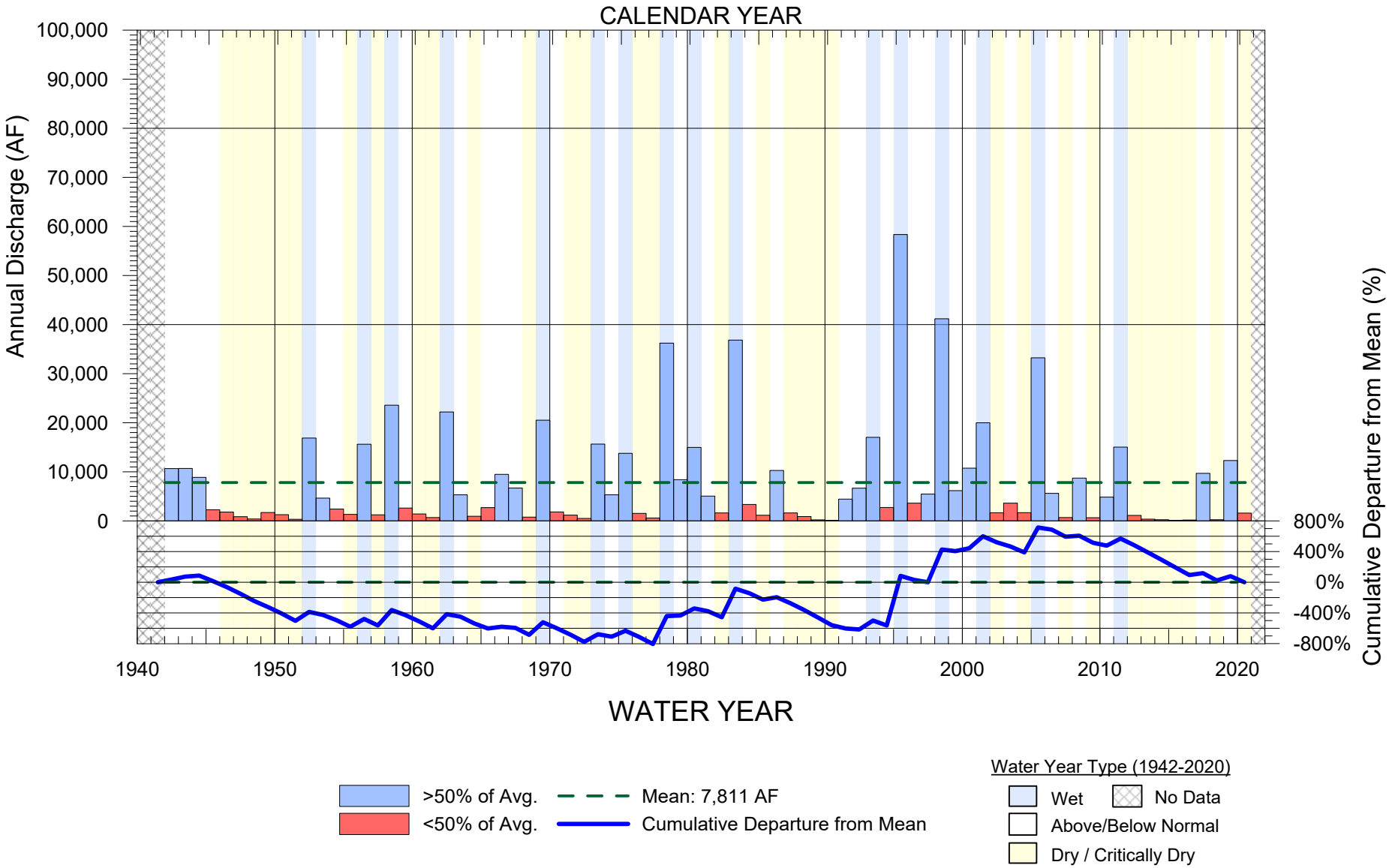
1/21/2021

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Sources: Stetson (2020) Forty-Second Annual Engineering and Survey Report On Water Supply Conditions Of The Santa Ynez River Water Conservation District 2019-2020
USBR Cachuma Project Reports

FIGURE 2-1

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Storage-COMPLETE\WMA 2-01_Dewatered_Storage_v5.grf 1/21/2021 M. McCammon



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11132500 SALSIPUEDES CREEK CREEK NEAR LOMPOC
CUMULATIVE DEPARTURE FROM MEAN AND
PERIOD OF RECORD (WY 1942 - 2020)

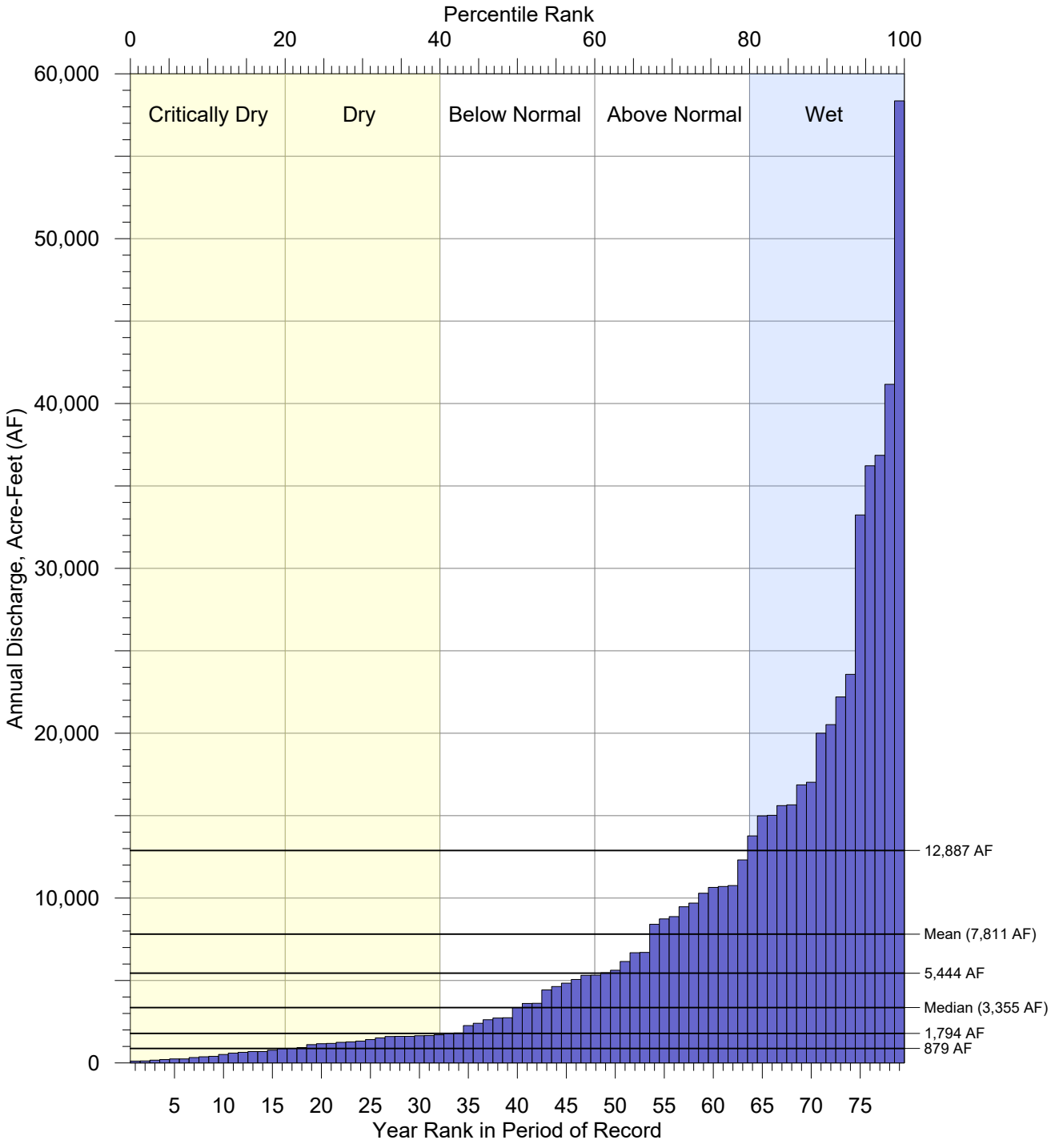
DRAFT
1/6/2021

Sources: USGS (2020) streamflow data

FIGURE 2-2

I:\DATA\2710\Analyses\2020-11 SW Flow Statistics\Salispuedes_CDM.grf 1/6/2021 M. McCammon

FIGURE 2-3



Data Source: USGS (2020) streamflow data

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WATER YEAR TYPE
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

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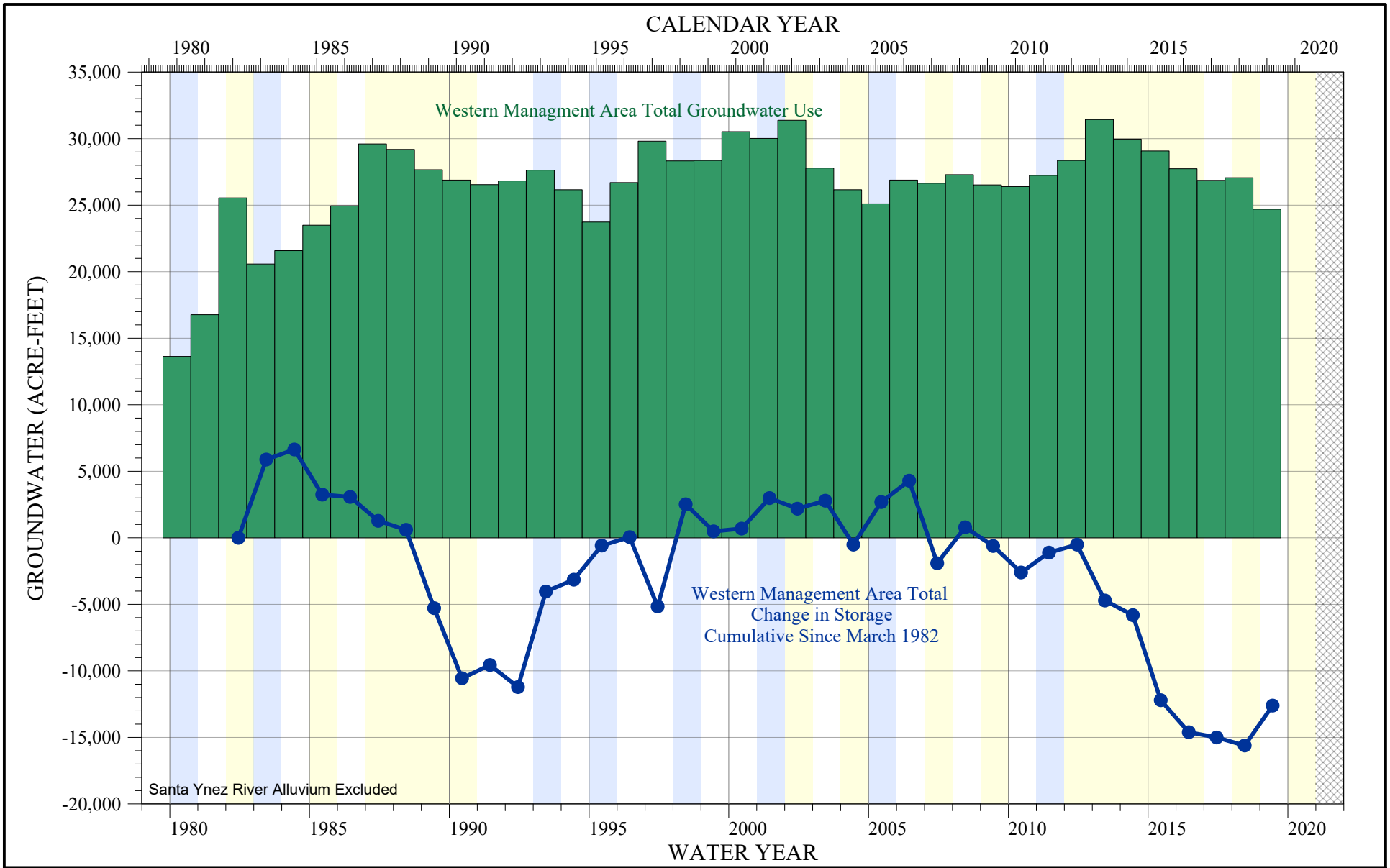
1/6/2021

I:\DATA\2710\Analyses\2020-11 SW Flow Statistics\Salispuedes_Year_type.grf 1/6/2021 M. McCammon



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Western Management Area
Groundwater Sustainability Agency

CHANGE IN STORAGE AND USE

DRAFT
1/21/2021

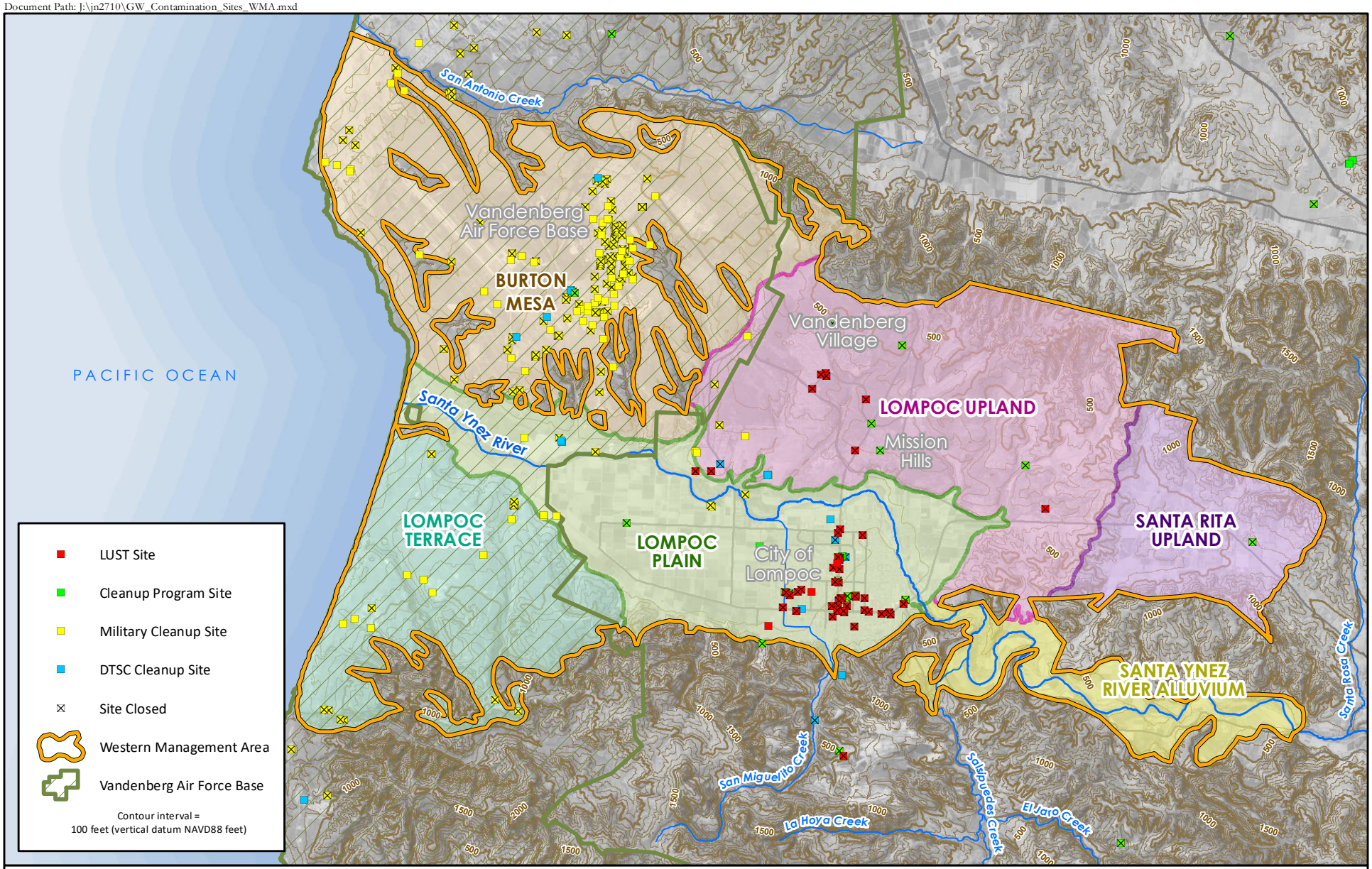
Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Sources: Stetson (2020) Forty-Second Annual Engineering and Survey Report On Water Supply Conditions Of The Santa Ynez River Water Conservation District 2019-2020

FIGURE 2-4

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\GW_Storage-COMPLETE\WMA 2-04_Dewatered_Comparsion_v5.grf 1/21/2021 M. McCammon

Document Path: J:\jn2710\GW_Contamination_Sites_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

LOCATION OF POTENTIAL POINT SOURCES OF GROUNDWATER CONTAMINANTS

WESTERN MANAGEMENT AREA

DRAFT

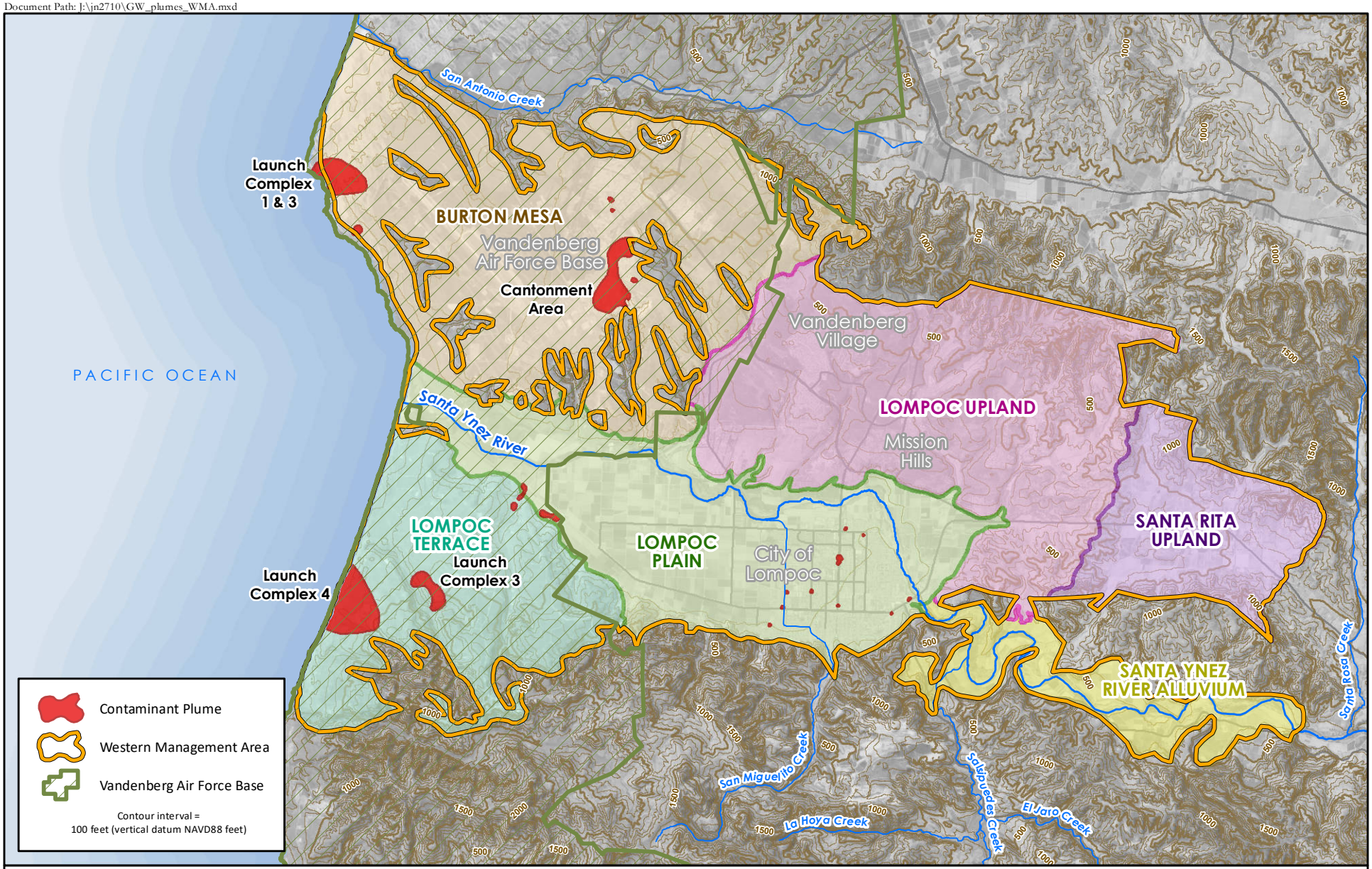
0 1 2 Miles

Sources:
Waterboard, 2020
USGS National Elevation Dataset, 2002
NAIP (2018)

N

FIGURE 3-1

Document Path: J:\jn2710\GW_plumes_WMA.mxd



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Groundwater Sustainability Agency

GROUNDWATER PLUMES
WESTERN MANAGEMENT AREA

DRAFT

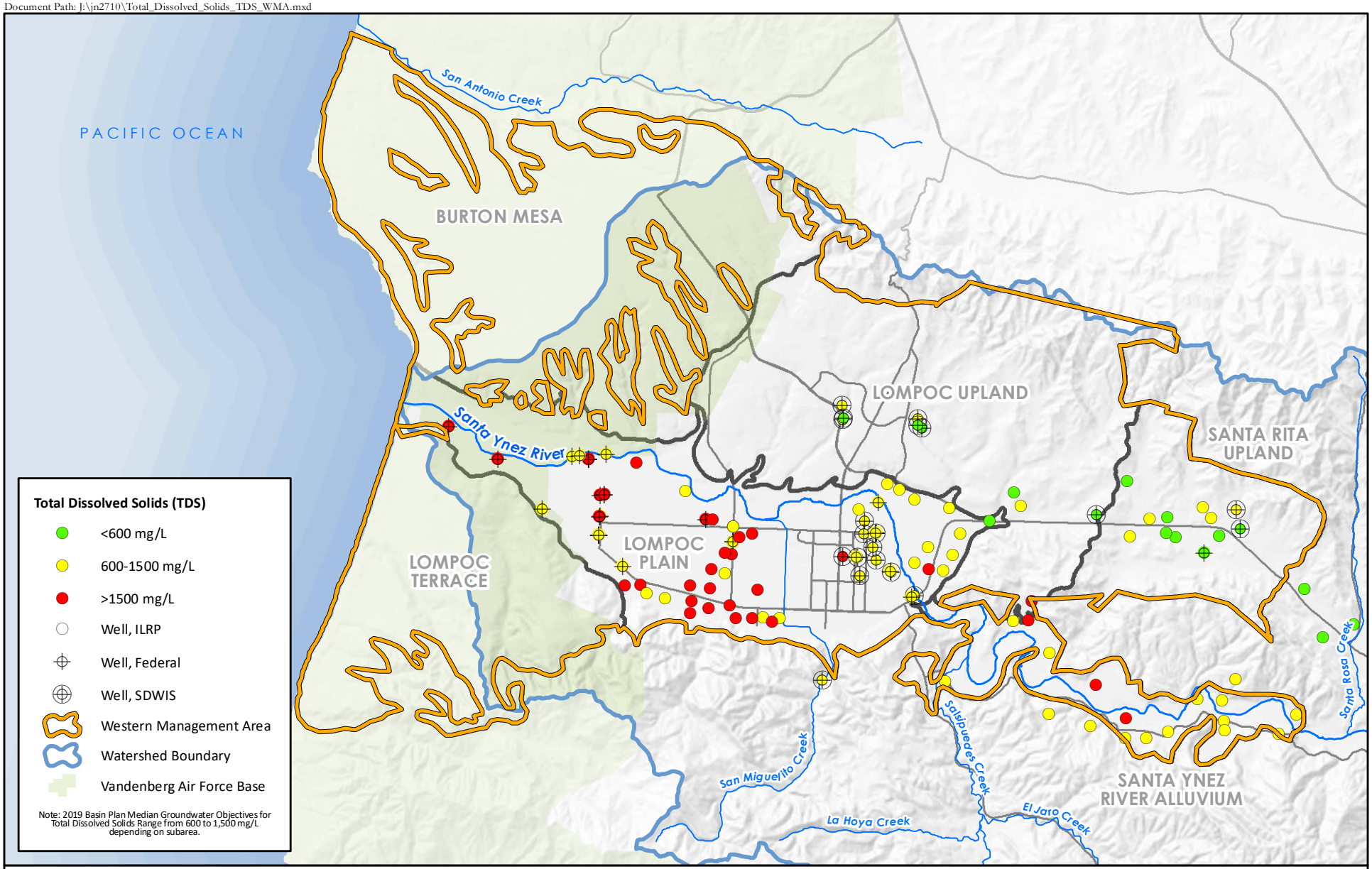
0 1 2 Miles

Sources:
Waterboard, 2020
USGS National Elevation Dataset, 2002
NAIP (2018)

N

FIGURE 3-2

Document Path: J:\jn2710\Total_Dissolved_Solids_TDS_WMA.mxd



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SALINITY - TOTAL DISSOLVED SOLIDS
AVERAGE WY 2015 - 2018
WESTERN MANAGEMENT AREA

DRAFT

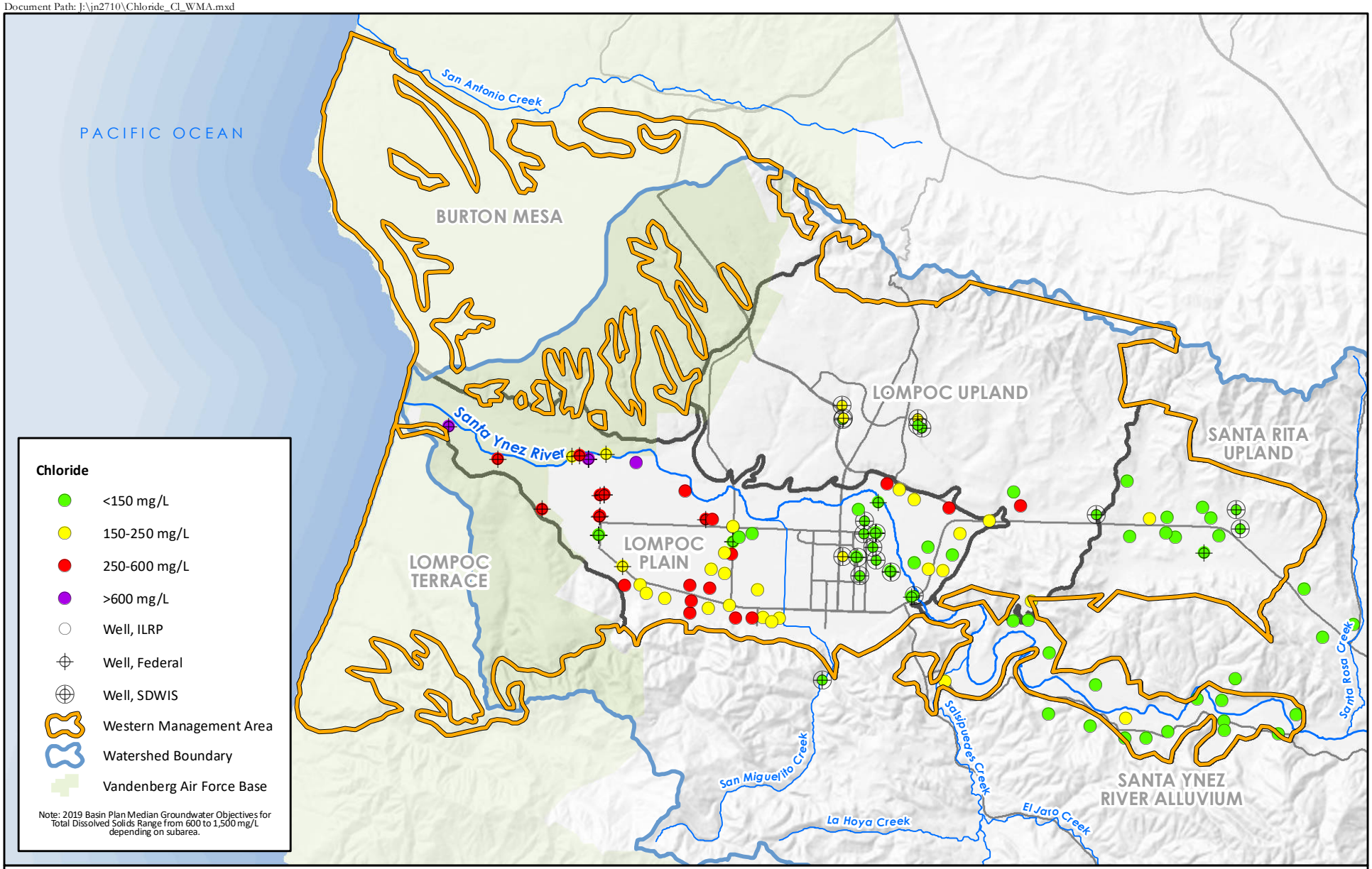
0 1 2 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 3-3

Document Path: J:\jn2710\Chloride_Cl_WMA.mxd



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Groundwater Sustainability Agency

CHLORIDE (CL)
AVERAGE WY 2015 - 2018
WESTERN MANAGEMENT AREA

DRAFT

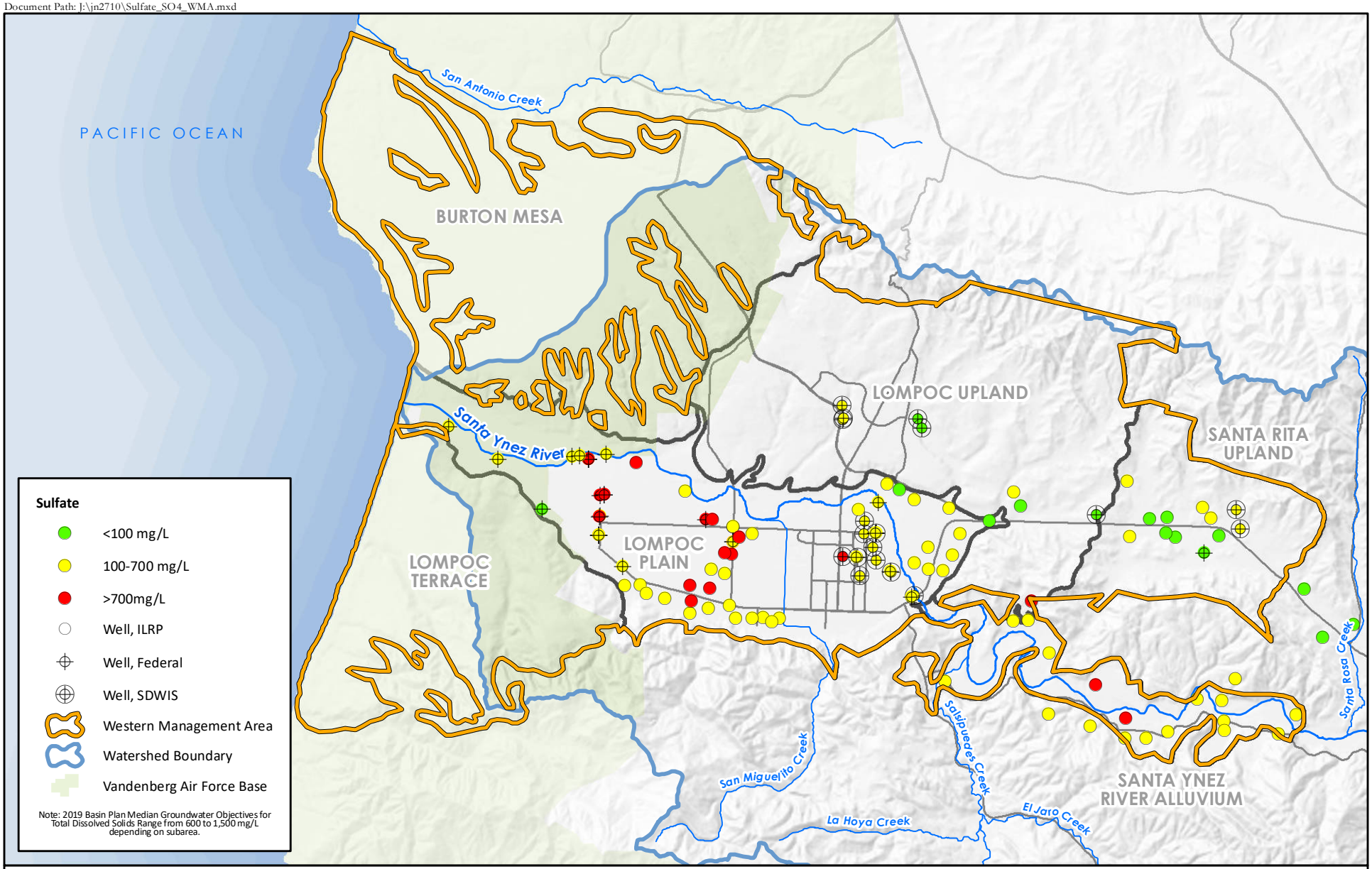
0 1 2 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 3-4

Document Path: J:\jn2710\Sulfate_SO4_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

SULFATE (SO4)
AVERAGE WY 2015 - 2018
WESTERN MANAGEMENT AREA

DRAFT

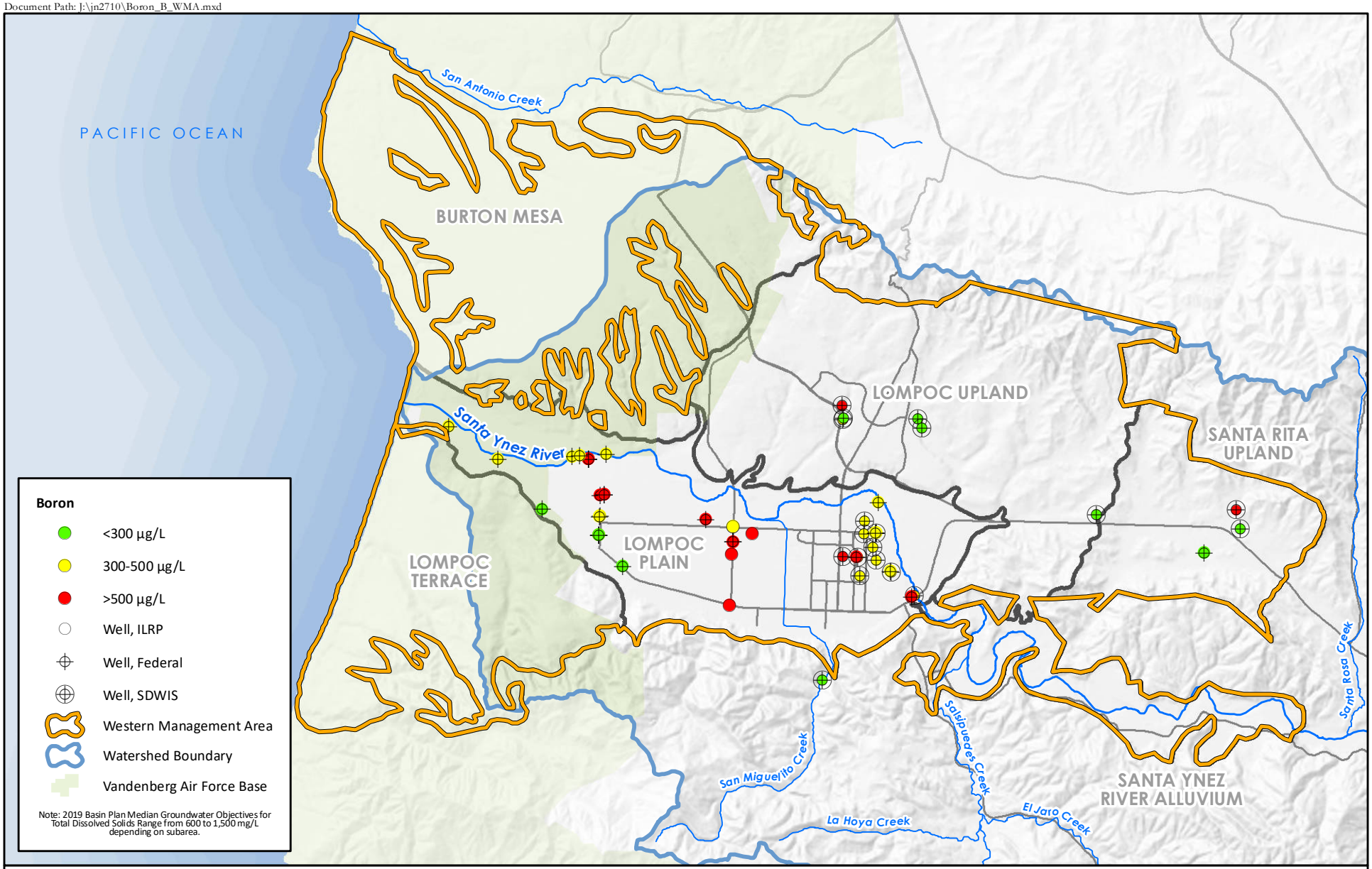
0 1 2 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 3-5

Document Path: J:\jn2710\Boron_B_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

BORON (B)
AVERAGE WY 2015 - 2018
WESTERN MANAGEMENT AREA

DRAFT

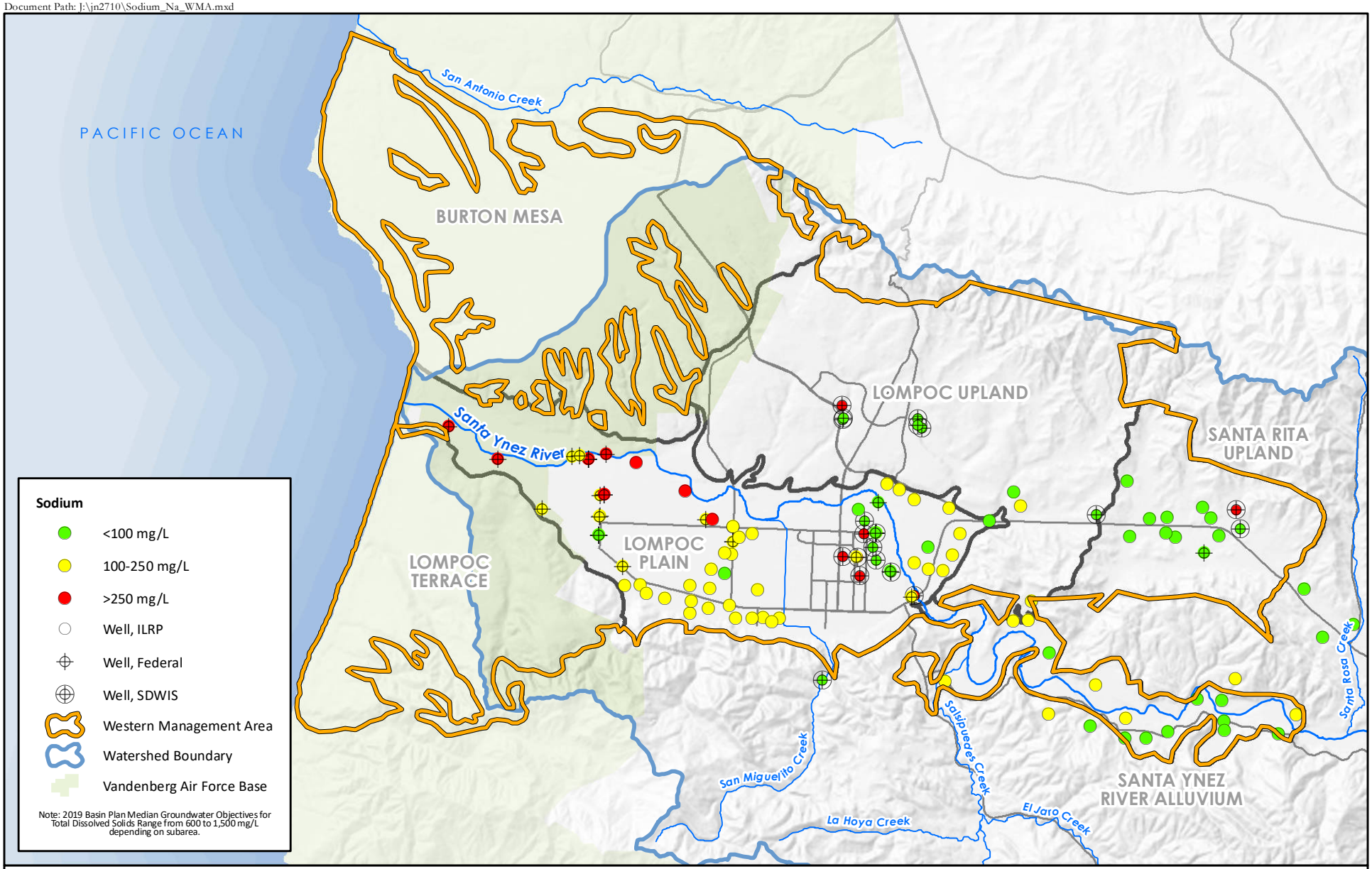
0 1 2 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 3-6

Document Path: J:\jn2710\Sodium_Na_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

SODIUM (NA)
AVERAGE WY 2015 - 2018
WESTERN MANAGEMENT AREA

DRAFT

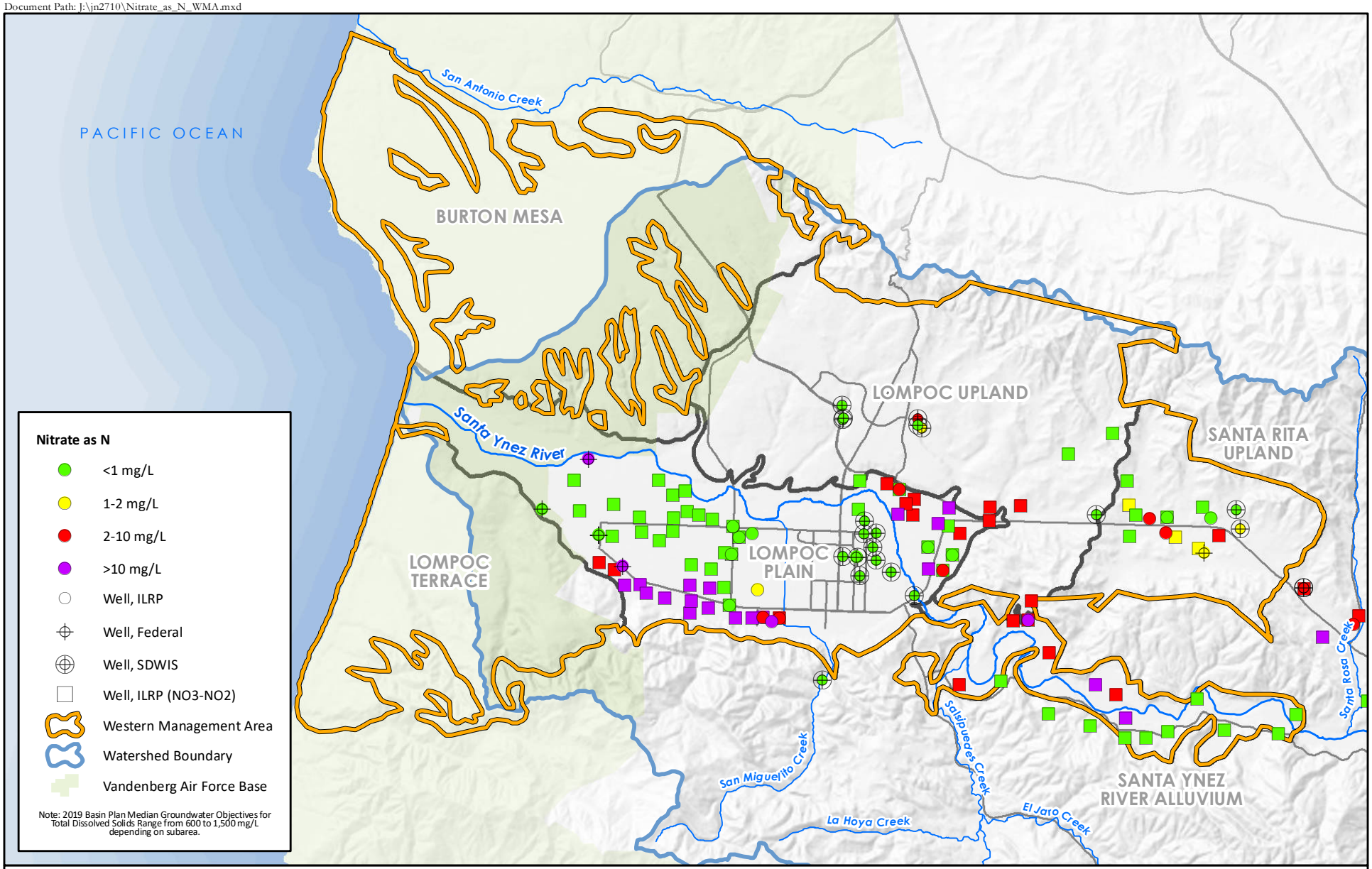
0 1 2 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 3-7

Document Path: J:\jn2710\Nitrate_as_N_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

NITRATE AS NITROGEN (NO3 AS N)
AVERAGE WY 2015 - 2018
WESTERN MANAGEMENT AREA

DRAFT

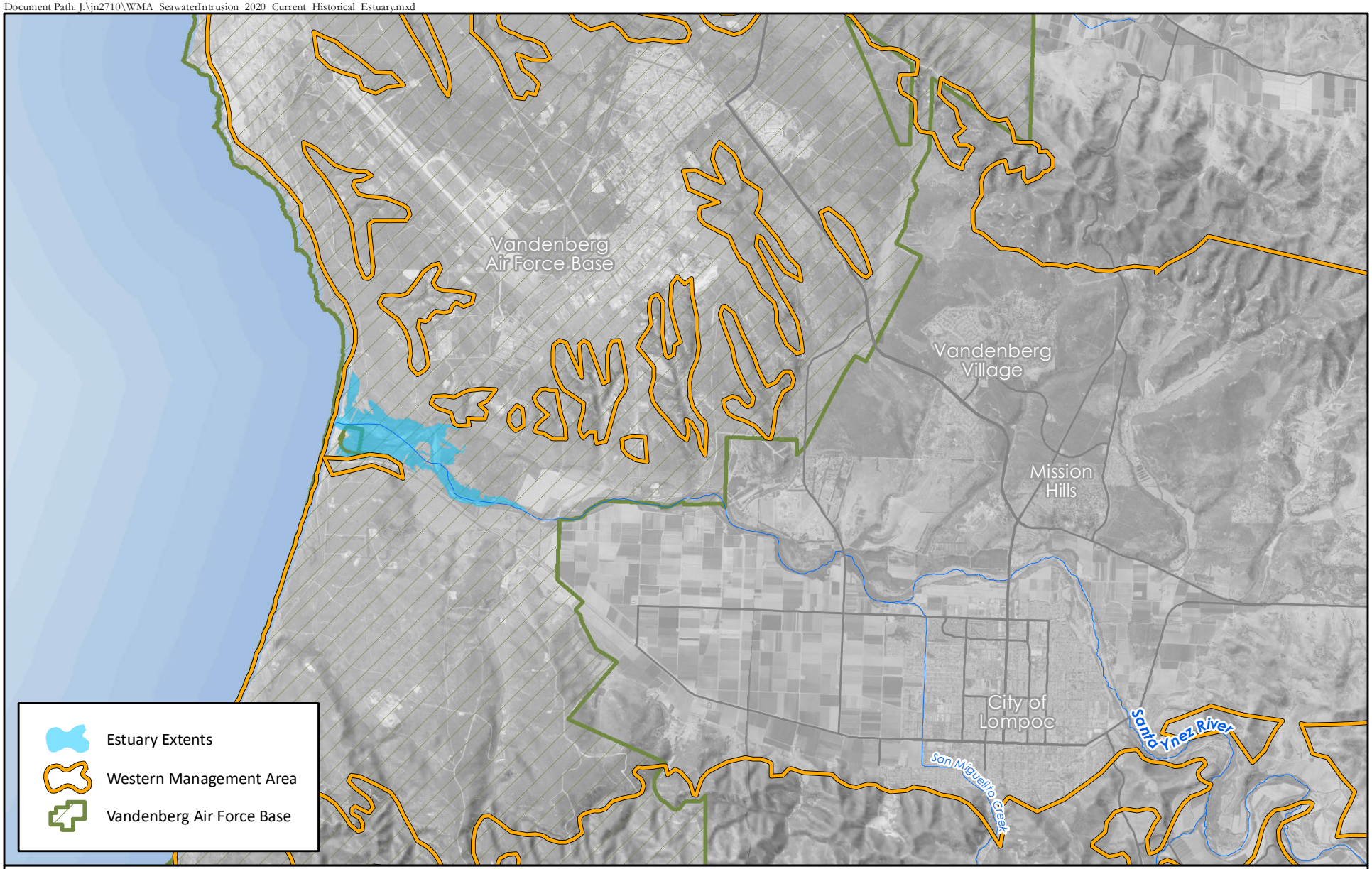
0 1 2 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 3-8

Document Path: J:\jn2710\WMA_SeawaterIntrusion_2020_Current_Historical_Estuary.mxd



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CURRENT AND HISTORICAL ESTUARY EXTENT
SANTA YNEZ RIVER

DRAFT

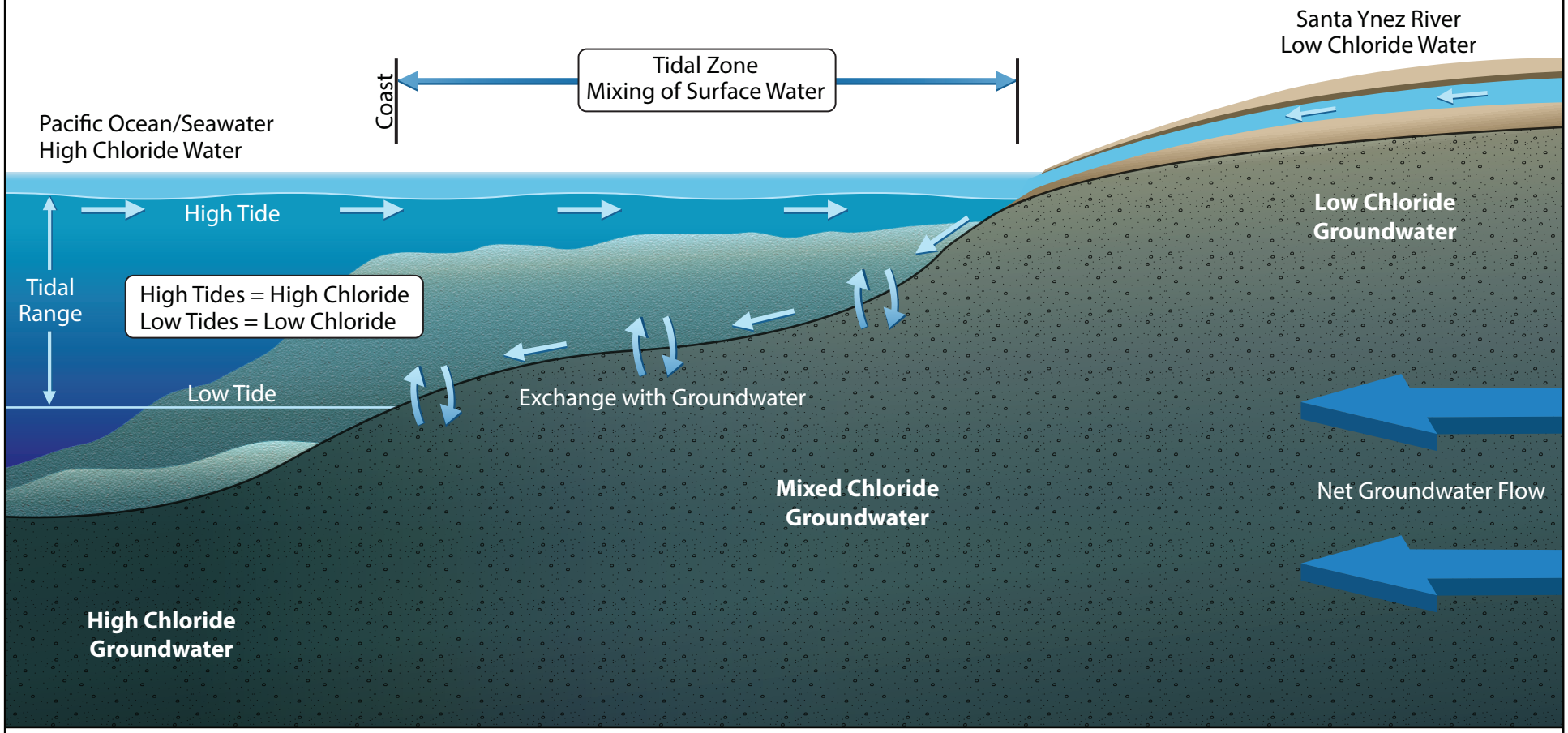
0 0.75 1.5 Miles

N

Sources:
Pacific States Marine Fisheries Commission (2018)
NAIP (2018)

FIGURE 4-1

Santa Ynez Estuary
Conceptual Model



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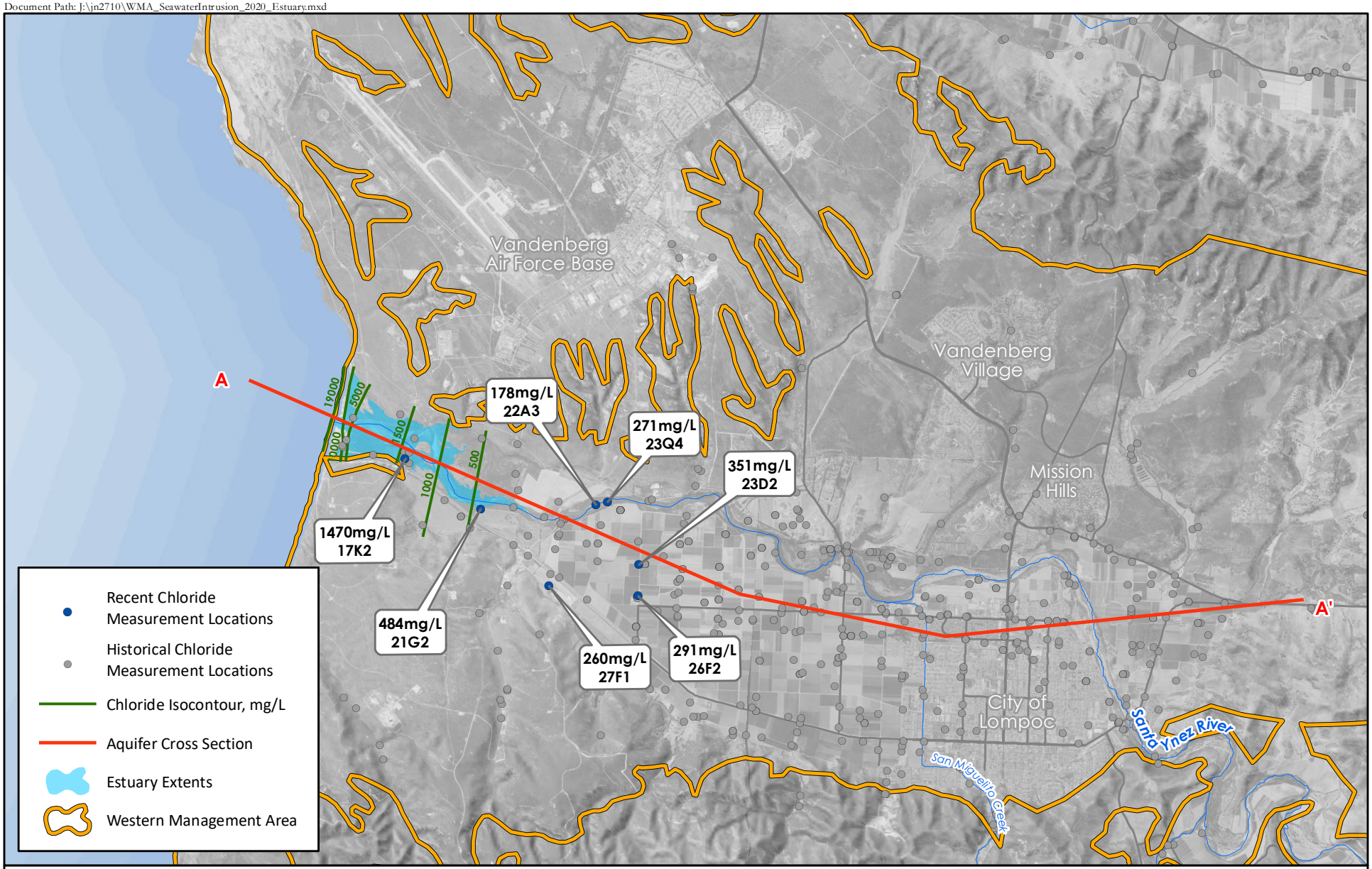
Western Management Area
Conceptual Model of Mixing in
Santa Ynez River Estuary

FIGURE 4-2

Document Path: J:\jn2710\WMA_SeawaterIntrusion_2020_Estuary.mxd



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SEAWATER INTRUSION
ISOCONTOUR OF CHLORIDE ADVANCEMENT
2020

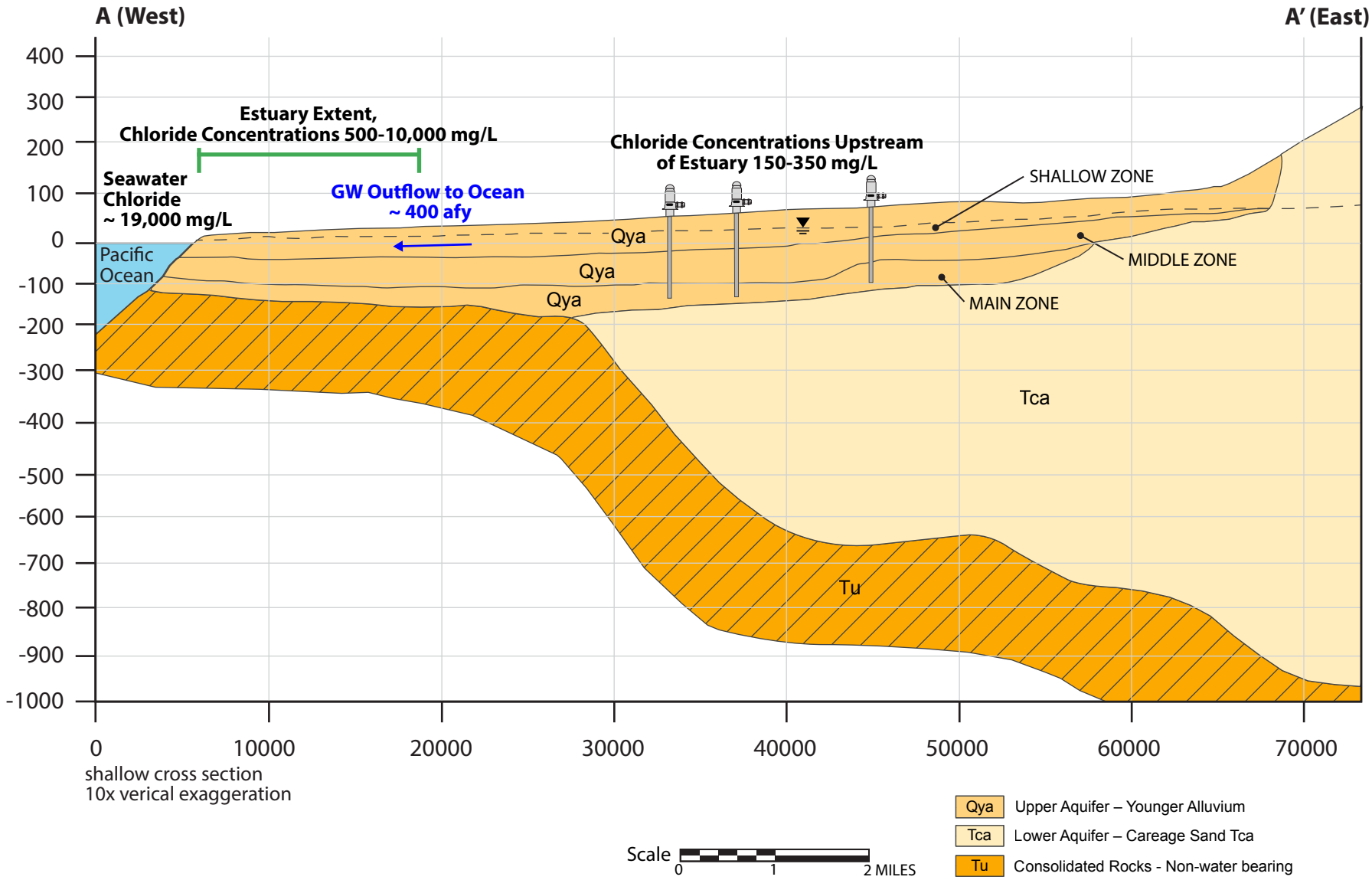
DRAFT

0 0.75 1.5 Miles

N

Sources:
Pacific States Marine Fisheries Commission (2018)
West Yost and Associates (2012);
USGS NWIS (2020); NAIP (2018)

FIGURE 4-3



Cross sections based on City of Lompoc Groundwater Management Plan (West Yost, 2013); Originally based on United States Geological Survey, Bright and Others, 1992 (Plate 1).

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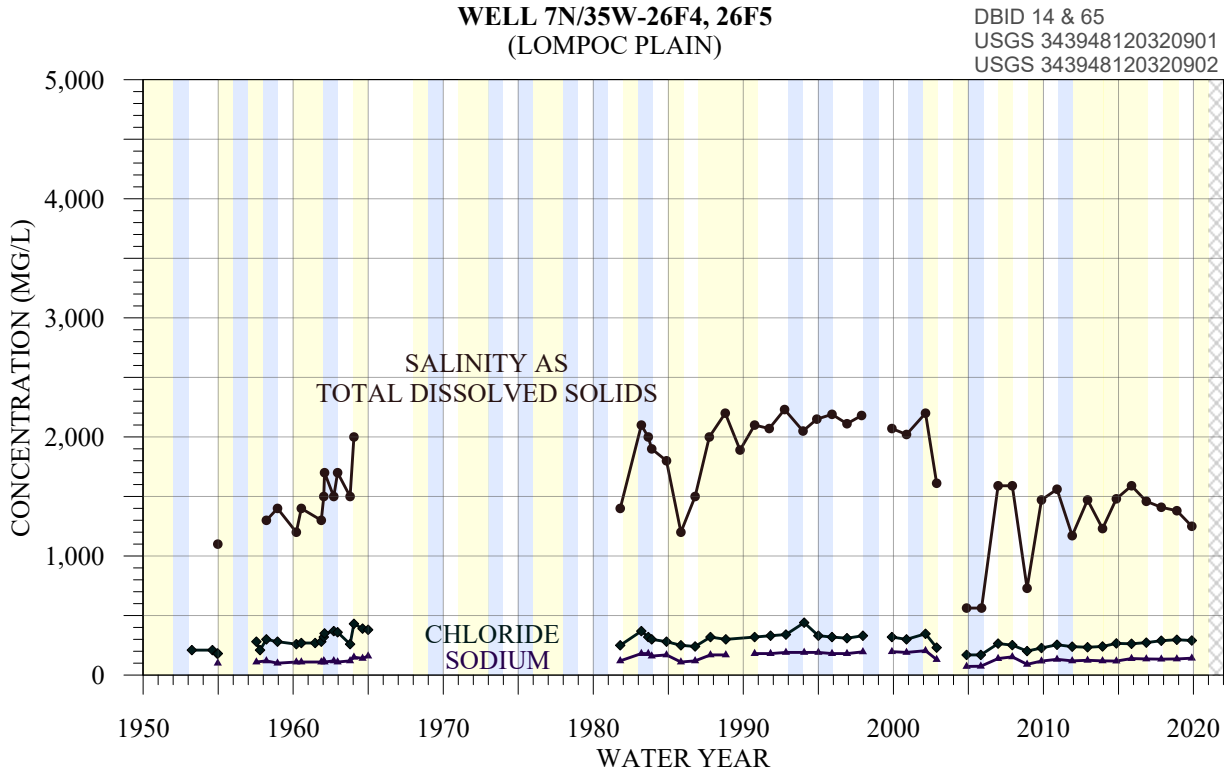
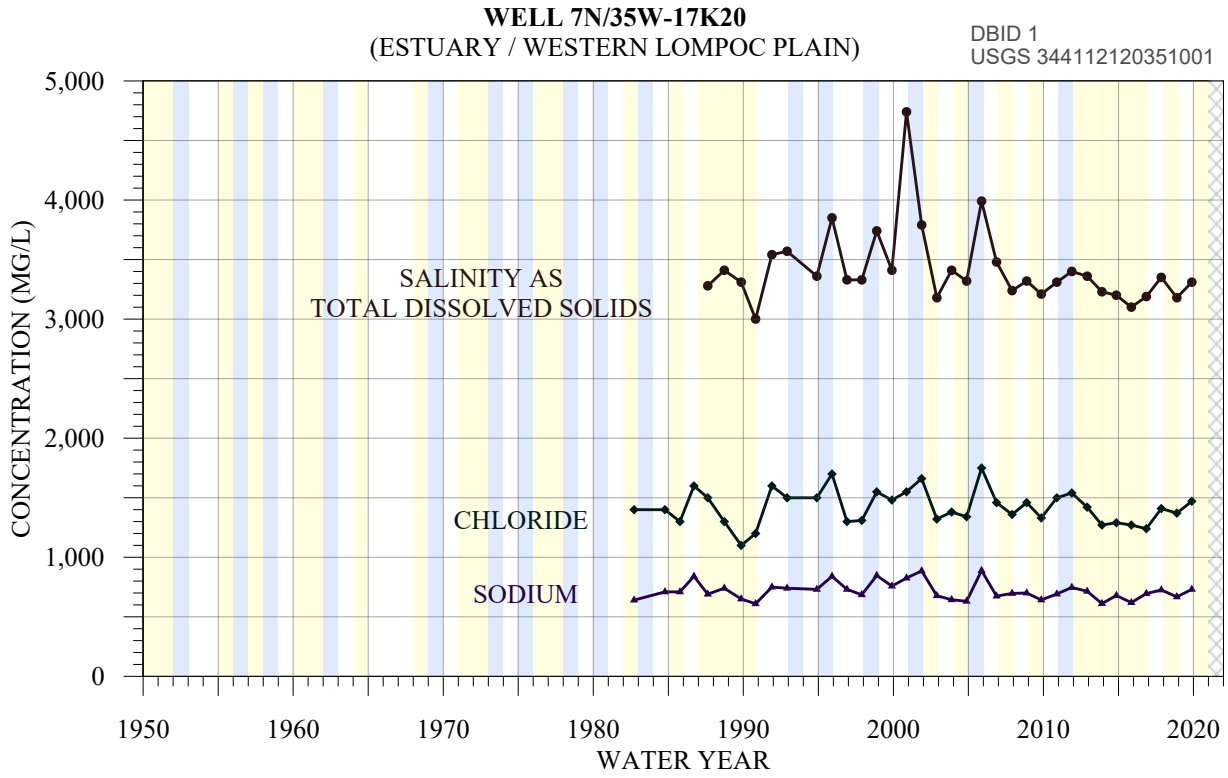
Western Management Area Aquifer Cross-section A-A'
Upper Aquifer Chloride Concentration
Near and Upstream of Estuary

FIGURE 4-4

FIGURE 4-5





DRAFT
12/16/2020

Data Source: USGS (2019) water quality data.

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MAJOR WATER QUALITY TRENDS
SELECTED WELLS
LOMPOC PLAIN SUBAREA

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

- TDS
- Chloride
- Sodium

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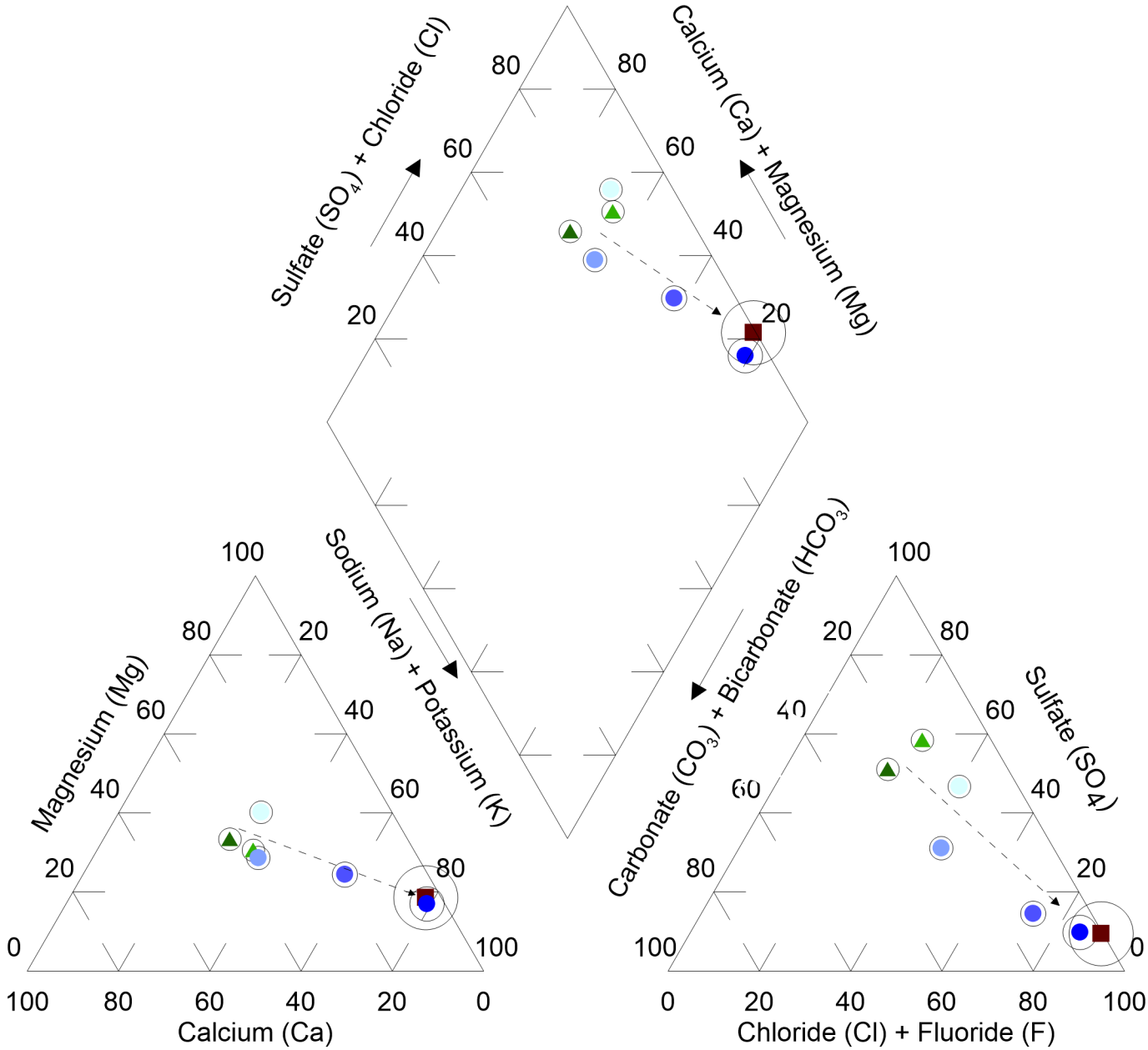

Symbol		USGS ID	Location	Sample Date
▲	Plain SW	11135000	Santa Ynez River Lompoc	1/3/1980
▲	Plain SW	11135000	Santa Ynez River Pine Creek	12/19/1983
■	Ocean	-----	Sea Water Composition	----------
●	Plain GW	343948120320901	Well 7N/35W-26F4	8/21/2019
●	Estuary GW	344041120341101	Well 7N/35W-21G2	8/13/2019
●	Estuary GW	344112120351001	Well 7N/35W-17K20	8/20/2019
●	Coast GW	344135120355201	Well 7N/35W-18H1	8/30/1963

Outer Circle is proportional to measured Total Dissolved Solids.

Data Source: USGS (2020) data and Hem (1985).

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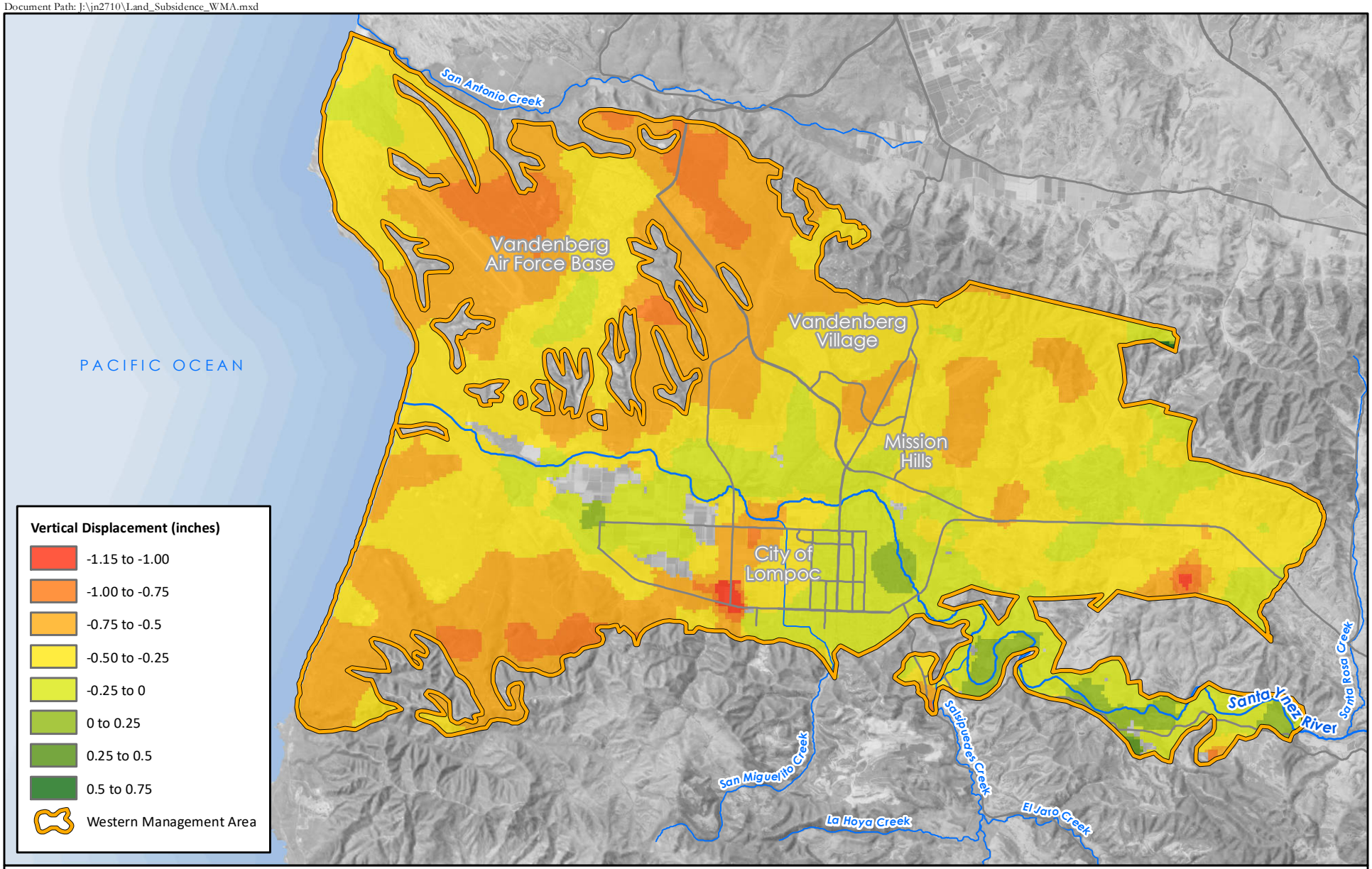
LOWER SANTA YNEZ RIVER
PIPER DIAGRAM
WATER QUALITY INFLUENCE FROM
SEA WATER INTRUSION

DRAFT
12/16/2020

I:\DATA\2710\Reports - Tech Memo\2020 Groundwater_Conditions_Memo\TOPICS\WQ_Seawater-COMPLETE\Piper_Graphs\WMA 4-03 Lower Santa Ynez River Piper.grf 12/16/2020 M. McCammon

Document Path: J:\jn2710\Land_Subsidence_WMA.mxd



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LAND SUBSIDENCE
JANUARY 2015 TO SEPTEMBER 2019
INSAR DATA
WITHIN WESTERN MANAGEMENT AREA

DRAFT

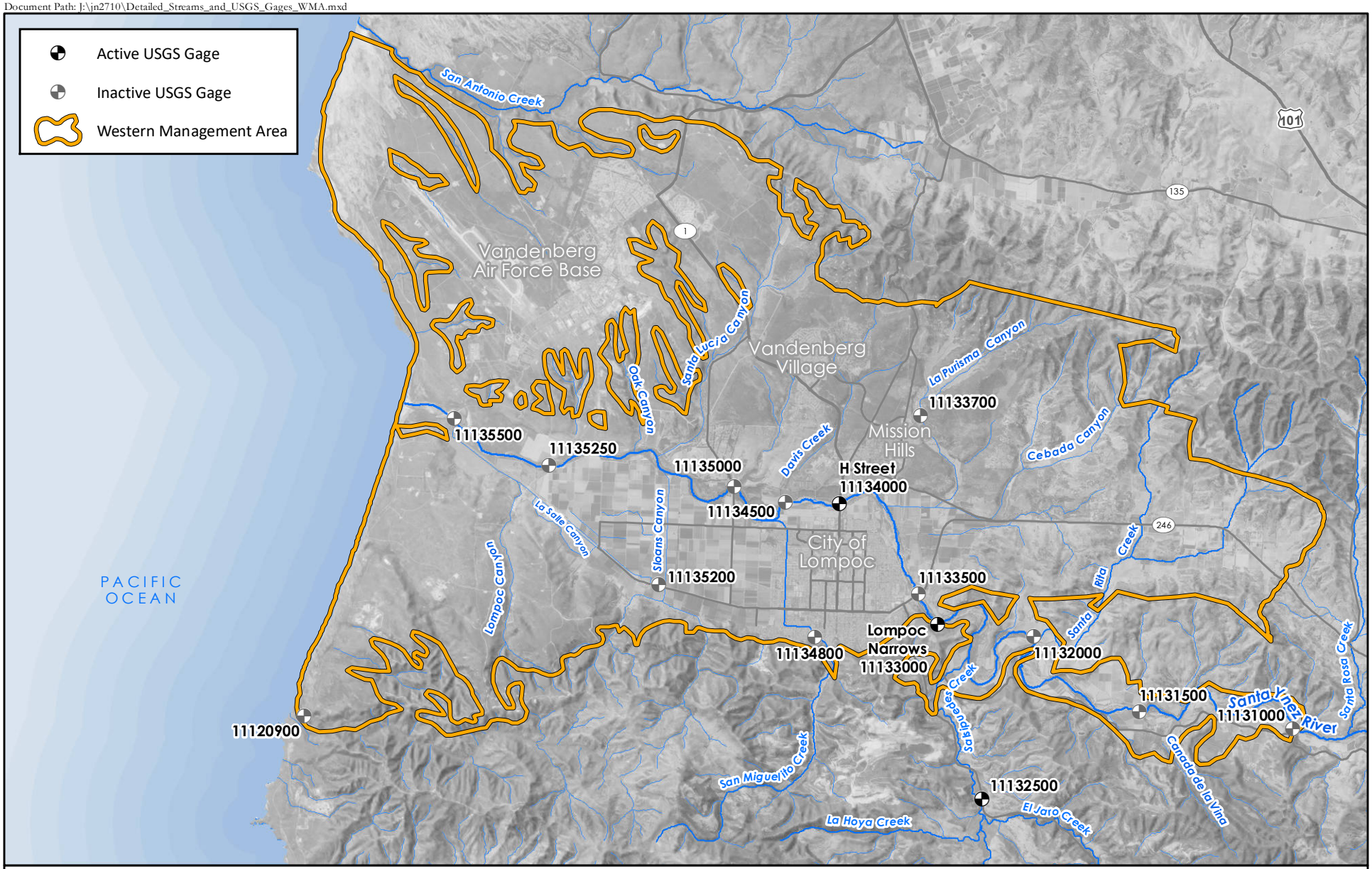
0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018)
Dudek (2020), DWR (2020)

N

FIGURE 5-1

Document Path: J:\jn2710\Detailed_Streams_and_USGS_Gages_WMA.mxd



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DETAILED STREAMS AND USGS GAGES
WESTERN MANAGEMENT AREA

DRAFT

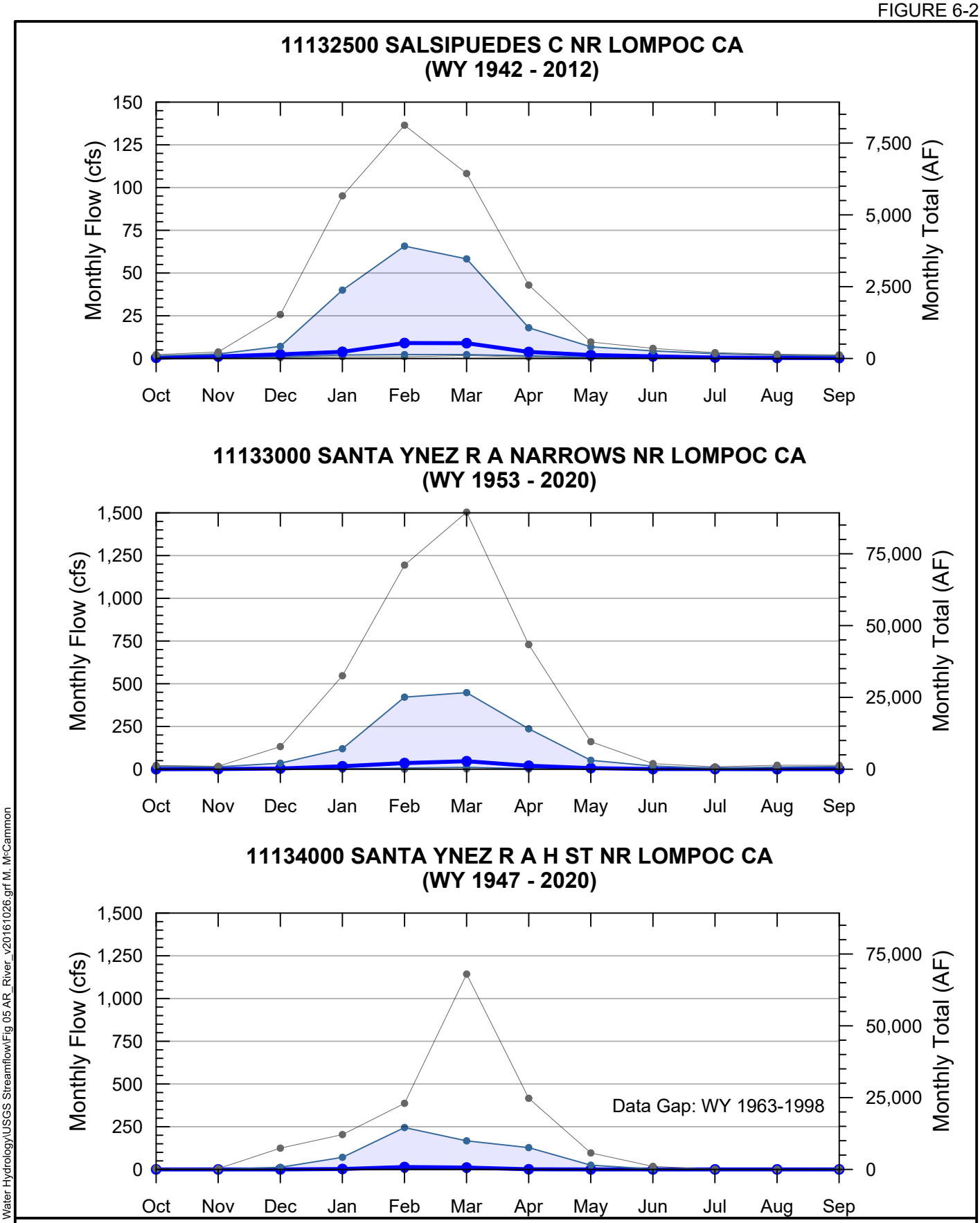
0 1 2 Miles

Source:
USGS Gages 2011

N

FIGURE 6-1

FIGURE 6-2



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MONTHLY FLOW STATISTICS
SANTA YNEZ RIVER

Data Source: USGS (2020) streamflow data

Percentile
10%
20%
50%
80%
90%
Zone from 20%-80%

I:\DATA\2564\Data\Surface Water Hydrology\USGS Streamflow\Fig 05 AR_River_v20161026.grf M. McCammon