MONTGOMERY & ASSOCIATES
Water Resource Consultants

DRAFT

March 7, 2025

Santa Cruz Mid-County Basin Water Year 2024 Annual Report

Prepared for:

SANTA CRUZ MID-COUNTY GROUNDWATER AGENCY

1970 Broadway, Suite 225, Oakland, CA
elmontgomery.com

MONTGOMERY & ASSOCIATES
Water Resource Consultants

BOARD DRAFT

March 7, 2025

Santa Cruz Mid-County Basin
Water Year 2024 Annual Report

Prepared for:

Santa Cruz Mid-County Groundwater Agency

Prepared by:

Montgomery & Associates

1970 Broadway, Suite 225, Oakland, California

Contents

Tables

Figures

Appendices

ACRONYMS & ABBREVIATIONS

AEM...............Airborne electromagnetic
AF ....acre feet
AFY................acre-feet per year
amsl................above mean sea level
ASR................Aquifer Storage and Recovery
Basin ....Santa Cruz Mid-County Basin
cfs...................cubic feet per second
County............County of Santa Cruz
CIMIS ....California Irrigation Management Information System
CWD ....Central Water District
DSWMAR......Distributed Storm Water Managed Aquifer Recharge
DWR ....California Department of Water Resources
EIR ....Environmental Impact Report
GSP ....Groundwater Sustainability Plan
MGA ....Santa Cruz Mid-County Groundwater Agency
mg/L...............milligrams per liter
MO ....measurable objective
Model ....Santa Cruz Mid-County Basin's integrated surface water/groundwater model
MT..................minimum threshold
NOAA............National Oceanic Atmospheric Administration
PRMS.............Precipitation Runoff Modeling System
PWS ....Pure Water Soquel Groundwater Replenishment and Seawater Intrusion Prevention Project
RMP ....representative monitoring point
SCWD………City of Santa Cruz Water Department
SCWWTF ......Santa Cruz Wastewater Treatment Facility
SGMA............Sustainable Groundwater Management Act
SMC ....sustainable management criteria
SqCWD..........Soquel Creek Water District
SWIP ....Seawater Intrusion Prevention
µg/L................micrograms per liter
WUF...............water use factor
WY ....Water Year (October 1 – September 30)

EXECUTIVE SUMMARY

The Santa Cruz Mid-County Groundwater Agency (MGA) is required to submit an annual report for the Santa Cruz Mid-County Basin (Basin) to the California Department of Water Resources (DWR) by April 1 of each year following the MGA's 2019 adoption of its Groundwater Sustainability Plan (GSP or Plan). DWR approved the GSP on June 3, 2021 (DWR, 2021). The first Periodic Evaluation of the implementation of the MGA's approved GSP was submitted to the Sustainable Groundwater Management Act (SGMA) Portal on January 30, 2025. The evaluation showed that the Basin is being managed sustainably under the existing GSP and no amendment to the Plan is necessary to achieve MGA's sustainability goals. This sixth annual report covers Water Year (WY) 2024 which is from October 1, 2023, to September 30, 2024.

As described in the GSP, DWR has designated the Basin as high priority in critical overdraft. High priority indicates that water users in the Basin have a high dependence on groundwater, and its critical overdraft designation is primarily because active seawater intrusion impacts its productive aquifers due to over pumping. The MGA's sustainability goal is to manage groundwater to ensure beneficial uses and users have access to a safe and reliable groundwater supply that meets current and future Basin demand without causing undesirable results in order to:

- Ensure groundwater is available for beneficial uses and a diverse population of beneficial users
- Protect groundwater supply against seawater intrusion
- Prevent groundwater overdraft within the Basin and resolve problems resulting from prior overdraft
- Maintain or enhance groundwater levels where groundwater dependent ecosystems exist
- Maintain or enhance groundwater contributions to streamflow
- Ensure operational flexibility within the Basin by maintaining a drought reserve
- Support reliable groundwater supply and quality to promote public health and welfare
- Account for changing groundwater conditions related to projected climate change and sea level rise in Basin planning and management
- Do no harm to neighboring groundwater basins in regional efforts to achieve groundwater sustainability

WY 2024 was a normal water year with precipitation that occurred late October through early May. While precipitation readily recharges groundwater in unconfined aquifers, coastal groundwater levels in the semi-confined to confined Purisima aquifers do not typically show a clear response to annual changes in recharge from precipitation because recharge areas are some distance from the coast. Instead, groundwater levels respond more directly to changes in groundwater extraction than precipitation. Even though WY 2024 groundwater extraction was the lowest on record, groundwater levels at most monitored wells increased only slightly or remained similar to the previous year. The normal precipitation year, however, did result in a substantial 2,475 acre-feet (AF) basin-wide increase of groundwater in storage, primarily in unconfined areas away from the coast.

Total water used in WY 2024 is 8,382 AF: 86% municipal use (7,200 AF), 7% private domestic use (591 AF), 3% institutional use (276 AF), and 4% agricultural use (315 AF). Groundwater supplied 56% (4,688 AF) of total water use with the remaining water coming from surface water sources outside of the Basin. The distribution of usage is similar to previous years.

The Basin continues to be in a state of overdraft thereby presenting a significant and unreasonable risk of seawater intrusion. There are undesirable results for seawater intrusion because 8 coastal representative monitoring points (RMPs) have 5-year moving average groundwater elevations below their respective MT groundwater elevation proxies. The 5-year moving average groundwater elevation below the MT at SP-5 is not considered an undesirable result because there are only 53 months of available data used to calculate the 5-year moving average. For these 8 RMPs—except SP-5 which was recently added to the MGA monitoring network—the 5-year moving averages remained similar to the previous year.

Chloride concentrations at 6 RMPs for seawater intrusion located in the southeastern portion of the Basin (Seascape area) exceeded MTs for seawater intrusion; 5 in the Purisima F unit and 1 in the Aromas. All 6 RMPs exceeded the MT in 2 or more of the last 4 consecutive samples, which constitutes an undesirable result for seawater intrusion. Increasing chloride trends in the RMPs indicate advancing movement of seawater intrusion. This condition triggers the early management action of reducing nearby municipal pumping, which was already low pre-dating the GSP. These additional reductions have been in place for several years with little effect. It is important to call out one RMP, SC-A2RA, that has undesirable results from increasing chloride concentrations even though it is meeting the proxy groundwater elevation measurable objective (MO). This indicates the proxy groundwater elevation MT and MO are not high enough to stop the advancement of seawater intrusion and they should be re-examined.

Based on recommendations from last year's annual report, the MGA is investigating potential causes of increasing chlorides in the Seascape area. Seawater intrusion within the Purisima F unit has been present prior to the first documented well log (Seascape well) identifying high salinity water in 1970. Airborne electromagnetic (AEM) data provided by DWR confirms seawater intrusion extending inland. Planned work in WY 2025 is to conduct a land-based or AEM survey to delineate the inland and lateral extent of seawater intrusion to better inform actions to protect the Basin from seawater intrusion and to sample private wells in the area to expand understanding of the chloride distribution.

In WY 2024, only 1 of 5 interconnected surface water RMPs had groundwater elevations below the groundwater elevation proxy MT. This is the same well where exceedances also occurred over the previous 3 years. Since undesirable results are defined as any depletion of interconnected surface water RMP having groundwater elevations below its MT, undesirable results for surface water depletion are occurring.

There are no MT exceedances or undesirable results for the chronic lowering of groundwater levels or groundwater quality degradation sustainability indicators. Net groundwater extraction remains greater than the sustainable yield in only the Aromas Red Sands aquifer group (1 of 3 aquifer groups).

Projects included in the GSP that recharge water or provide for alternative supplies are expected to reduce net groundwater pumping below sustainable yield and reduce undesirable results once they are implemented. Work to plan and implement these projects continued in WY 2024. The projects include the following:

- Pure Water Soquel (PWS) – Construction of 3 Seawater Intrusion Prevention (SWIP) wells and 9 monitoring wells have been completed by Soquel Creek Water District (SqCWD). Construction of treatment plants and pipelines is expected to be completed in WY 2025.
- Aquifer Storage and Recovery (ASR) – The SCWD continues to work with the California State Water Resources Control Board to finalize its water rights petition that will lead to phased implementation of full-scale ASR at the SCWD's existing Beltz wells. SCWD expects to receive final action on its water rights petition in early 2025. The SCWD is working on permanent modifications to convert the existing Beltz 12 well to a permanent ASR well, this project is on track to be completed in 2026. Beltz 8 design will be completed in 2025, and modifications will take place in 2027. The SCWD completed pilot testing in WY 2024 at a third existing extraction well (Beltz 9) for ASR use. The design phase for modifications to convert Beltz 9 into a permanent ASR well will occur in 2026.
- Water Transfers / In-Lieu Groundwater Recharge – an extension of the pilot project agreement between the SCWD and SqCWD runs through May 1, 2026.

1 INTRODUCTION

1.1 Purpose of Annual Report

This annual report is a requirement of Water Code §10733.6 and pertains to the Sustainable Groundwater Management Act (SGMA). As the groundwater sustainability agency for the Santa Cruz Mid-County Basin (Basin), the Santa Cruz Mid-County Groundwater Agency (MGA) is required to submit an annual report to the California Department of Water Resources (DWR) by April 1 of each year following the adoption of its Groundwater Sustainability Plan (GSP or Plan). The MGA Board of Directors unanimously adopted the final GSP after a public hearing on November 21, 2019. The GSP was submitted online to DWR on January 30, 2020, and posted for public comment by DWR on February 19, 2020. DWR approved the GSP on June 3, 2021. The first Periodic Evaluation of the implementation of the MGA's approved GSP was submitted to the SGMA Portal on January 30, 2025. The evaluation showed that the Basin is being managed sustainably under the existing GSP and that no amendment to the Plan is necessary to achieve MGA's sustainability goals.

The purpose of annual reports is to demonstrate to DWR during GSP implementation that progress is being made toward meeting interim milestones that are defined in the GSP and that lead to achieving groundwater sustainability. The content requirements of the annual report are outlined in §356.2 of the GSP Regulations.

This sixth annual report covers Water Year (WY) 2024 (October 1, 2023, through September 30, 2024) and includes a description of basin conditions through text, hydrographs, contour maps, estimation of change in groundwater in storage, and distribution of groundwater extraction across the Basin. A comparison of WY 2024 groundwater data against sustainable management criteria (SMC) is provided as a measure of the Basin's progress toward the sustainability goal that must be reached by January 2040.

1.2 Santa Cruz Mid-County Groundwater Sustainability Agency

The MGA was created in March 2016 under a Joint Exercise of Powers Agreement. The MGA is governed by an 11-member Board of Directors consisting of representatives from each member agency and private well representatives within the boundaries of the MGA. The MGA Board is composed of the following:

- Two representatives from the Central Water District (CWD) appointed by the CWD Board of Directors

- Two representatives from the City of Santa Cruz appointed by the City of Santa Cruz City Council
- Two representatives from the County of Santa Cruz (County) appointed by the County of Santa Cruz Board of Supervisors
- Two representatives from the Soquel Creek Water District (SqCWD) appointed by the SqCWD Board of Directors
- Three representatives of private well owners in the Basin appointed by majority vote of the 8 public agency MGA directors

In addition, an alternate representative for each member agency and for the private well owners are appointed to act in the absence of a representative at Board meetings.

The MGA's jurisdictional area coincides exactly with the Santa Cruz Mid-County Basin depicted on Figure 1.

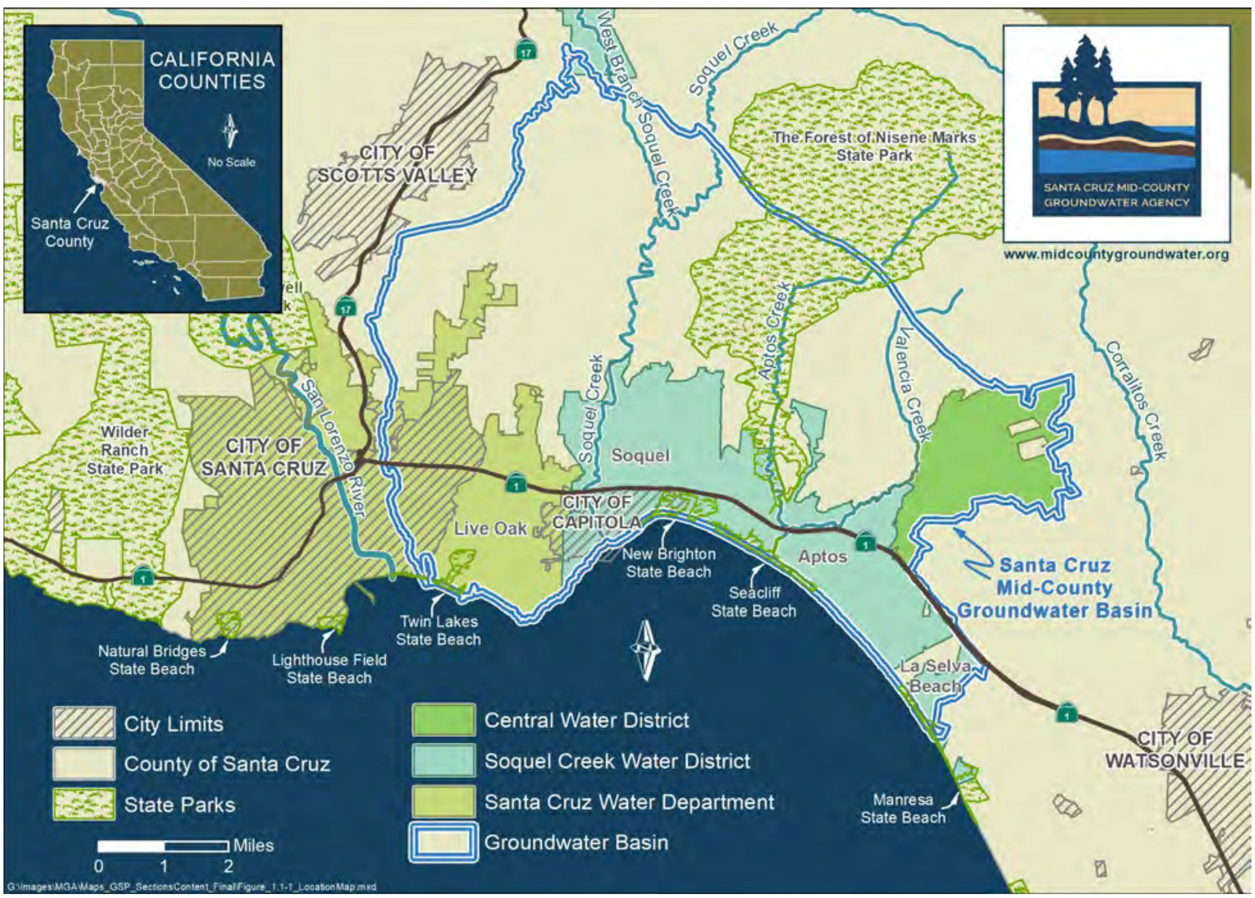


Figure 1. Santa Cruz Mid-County Basin Boundaries

1.3 Basin Description

The Santa Cruz Mid-County Basin is identified by DWR as Basin 3-001 in Bulletin 118 Update 2020 (DWR, 2020). The Basin extends from the Santa Cruz Mountains to the Pacific Ocean and from the edge of the City of Santa Cruz near Twin Lakes in the west to La Selva Beach in the east (Figure 1). The Basin includes portions of the City of Santa Cruz, the entire City of Capitola, and Santa Cruz County census designated places of Twin Lakes, Live Oak, Pleasure Point, Soquel, Seacliff, Aptos, and Rio Del Mar. The Basin also includes portions of Santa Cruz County unincorporated census designated places of Day Valley, Corralitos, Aptos Hills-Larkin Valley, and La Selva Beach (DWR, 2020).

The Basin boundary includes all areas where the stacked aquifer system of the Purisima Formation, Aromas Red Sands, and certain other Tertiary-age aquifer units underlying the Purisima Formation constitute the shared groundwater resource managed by the MGA. The Basin is defined by both geologic and jurisdictional boundaries. Basin boundaries to the west are primarily geologic. Basin boundaries to the east, adjacent to the Pajaro Valley Subbasin managed by Pajaro Valley Water Management Agency, are primarily jurisdictional.

As described in the GSP, DWR lists the Basin as a high priority basin in critical overdraft. The high priority designation indicates that water supply in the Basin has high dependence on groundwater. The Basin is listed in critical overdraft principally because active seawater intrusion impacts its productive aquifers as a result of historical over pumping of the aquifers.

2 BASIN CONDITIONS

2.1 Precipitation and Water Year Type

Precipitation reported at the National Oceanic and Atmospheric Administration (NOAA) Live Oak climate station in WY 2024 was 35.9 inches. This represents 120% of the 29.9 inches per year, long-term average annual precipitation since WY 1942. Figure 2 charts annual rainfall at the Santa Cruz Cooperative climate station and water year type from WY 1984 to WY 2021, and charts annual rainfall at the nearby Live Oak climate station and water year type from WY 2022 to WY 2024. The change in station occurred because the Santa Cruz Cooperative climate station stopped reporting data in April 2022. The annual average rainfall since WY 1984 of 29.3 inches shown on Figure 2 is less than the long-term average of 29.9 inches starting in WY 1942.

The water year type in the Santa Cruz area is based on a classification used by the City of Santa Cruz Water Department (SCWD). The classification uses total annual runoff in the San Lorenzo River—the SCWD's most important water source—measured at the Big Trees gage in the Santa Margarita Basin. Under this classification system, WY 2024 is classified as a normal year. It follows a wet year that was preceded by a normal year in WY 2022. The last dry and critically dry years were WY 2020-2021. Water year type is shown on Figure 2.

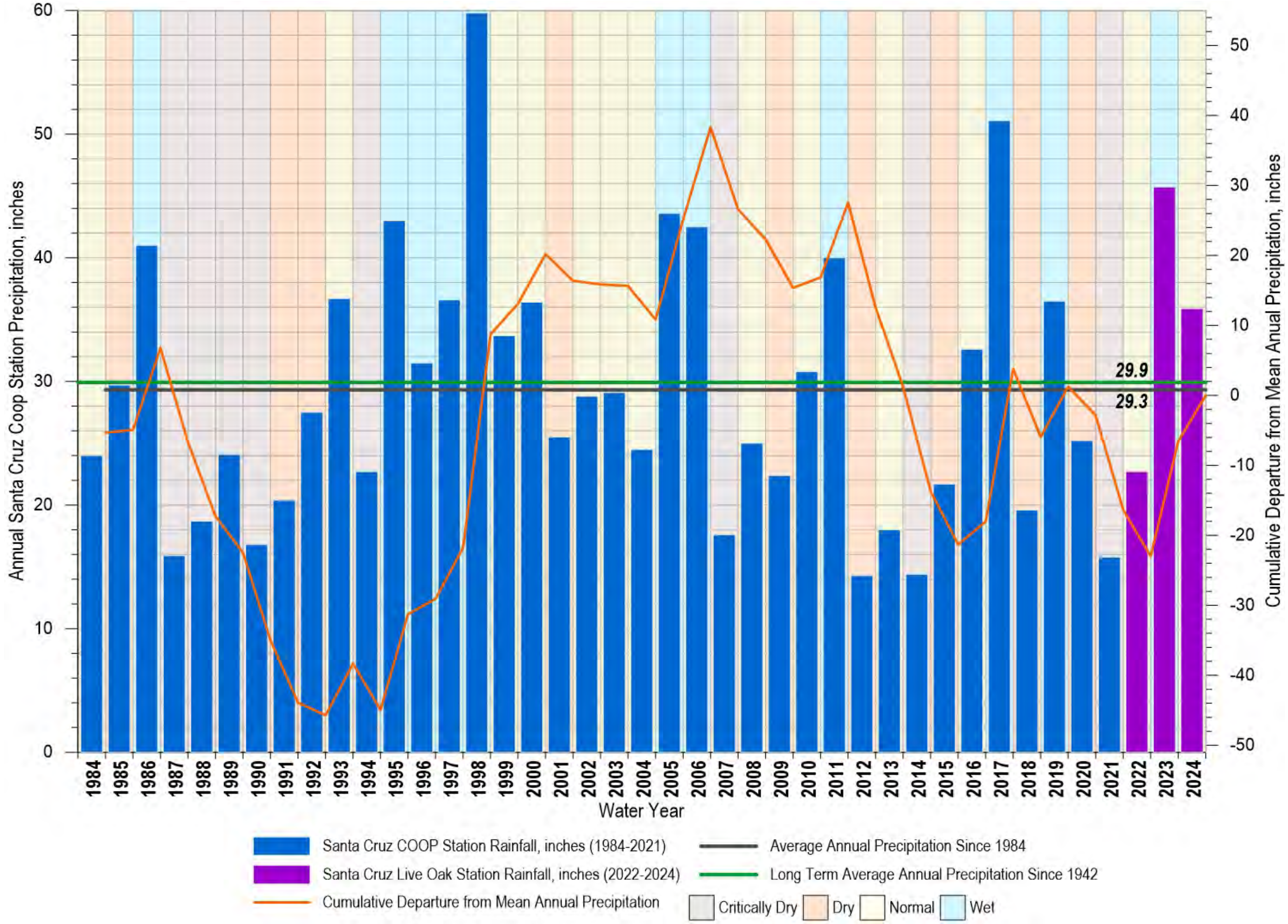


Figure 2. Annual Precipitation and Cumulative Change in Precipitation at Santa Cruz Cooperative and Live Oak Climate Station with Water Year Type

2.2 Surface Water Flow

High winter flows—particularly in February—combined with a significant recession period in the spring and summer, resulted in slightly higher-than-average cumulative streamflow in Soquel Creek for WY 2024, closely following historical patterns. Streamflow at the Soquel Creek at Soquel gage peaked multiple times between January 22, 2024, and March 30, 2024, with discharge reaching over 1,000 cubic feet per second (cfs) in January and February (Figure 3). After the March peak, streamflow gradually subsided for the remainder of the water year. Flows at the end of the water year were 2.73 cfs greater than the beginning of the water year. Monthly and cumulative mean streamflow for WY 2024 is compared to the 30-year (WY 1993 to WY 2023) monthly and cumulative average streamflow on Figure 4. Cumulative WY 2024 streamflow was 34,100 AF, which is about 110% of the 30-year cumulative average of 31,000 AF. The monthly streamflow was greater than average in every month from February through September.

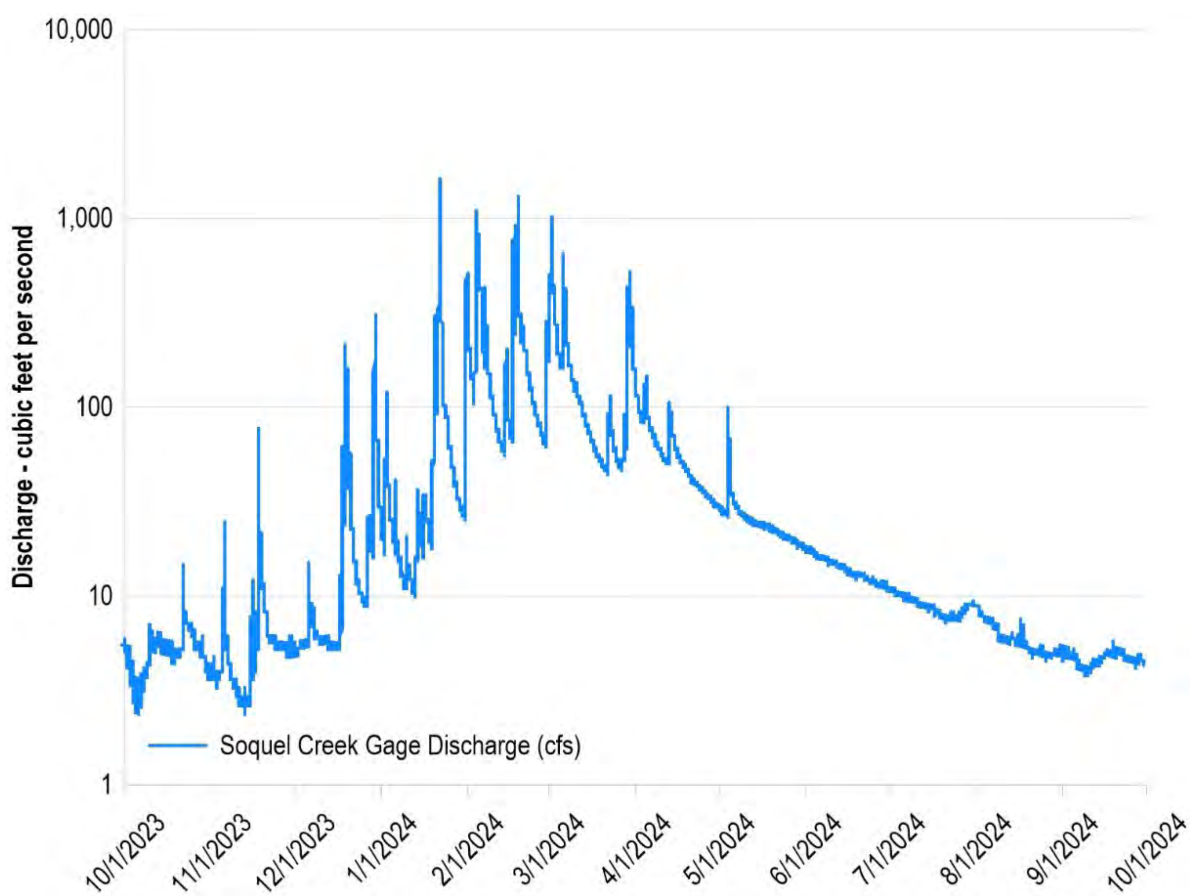


Figure 3. WY 2024 Streamflow at USGS Soquel Creek at Soquel Gage

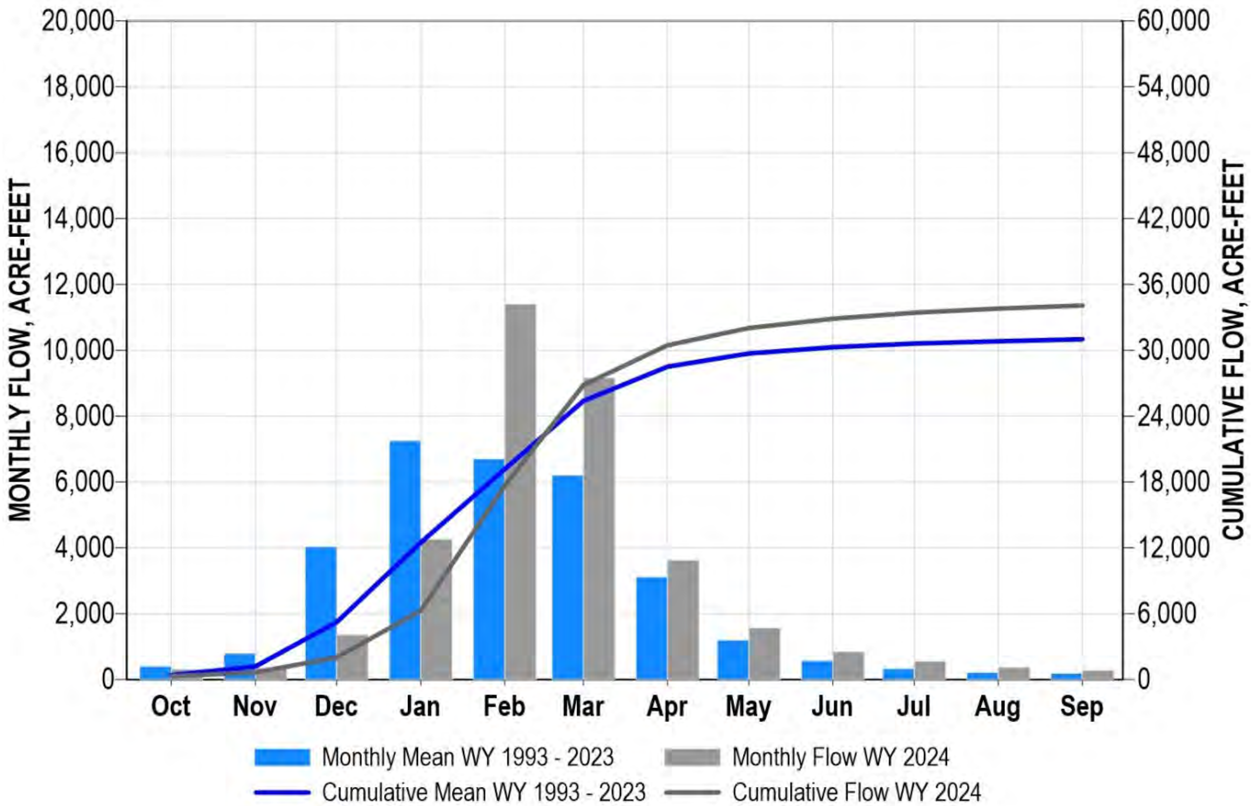


Figure 4. WY 2024 and 30-year Mean Monthly and Cumulative Runoff at USGS Soquel Creek at Soquel Streamflow Gage

2.3 Groundwater Elevations

Contour maps representing spring and fall groundwater elevations for WY 2024 in each principal aquifer are included on Figure 6 through Figure 17. Spring groundwater elevations represent seasonal high conditions while fall groundwater elevations represent seasonal low conditions.

The contour maps intend to represent average conditions for the spring and fall seasons in the aquifer units. Sustainability with respect to seawater intrusion is evaluated based on average groundwater elevations. Therefore, data used for the contour maps are based on the following:

- Average transducer groundwater elevations calculated over spring (March) or fall (September) from monitoring wells, where available.
- Manual monthly measurements from monitoring wells where transducer data are not available, which less comprehensively represent conditions over time but are the best available representation of seasonal average conditions in absence of transducer data.

- Groundwater elevations from monitoring wells adjacent to production wells. Using average groundwater elevations calculated from transducer data that include levels recorded when the adjacent production well is pumping is the best representation of conditions in the aquifer over this time period.
- Static groundwater elevations from production wells without adjacent monitoring wells. Pumping groundwater elevations from production wells are not representative of groundwater elevations in the aquifers due to pumping inefficiencies. Therefore, static groundwater elevations are preferable over pumping elevations but remain less representative than average groundwater elevations from adjacent monitoring wells. Static elevations are therefore the best available representation of seasonal average aquifer conditions for these locations without adjacent monitoring wells.

Contour maps include minimum threshold (MT) groundwater elevation proxies labeled in green text at representative monitoring points (RMPs) for seawater intrusion. RMPs with MT groundwater elevation proxies for seawater intrusion are included only for the principal aquifer unit where nearby municipal pumping takes place. This is because municipal pumping wells are assumed to be the deepest water supply wells in the coastal areas. Seawater intrusion MT groundwater elevation proxies are labeled for reference only as contours representing seasonal conditions cannot be used to evaluate exceedances of MT and undesirable results. For that purpose, 5-year moving average groundwater elevations at seawater intrusion RMPs are compared to the MT as described in Section 3.3.

Hydrographs updated through WY 2024 for RMPs and other monitoring network wells used to evaluate Basin conditions are provided in Appendix A. The hydrographs indicate the water year type and extend back through the full period of record for each well. MTs and measurable objectives (MOs) for RMPs are included on the hydrographs (Figures A-1 through A-41).

Hydrographs in Appendix A are grouped based on the sustainability indicator for which groundwater elevations are used as SMC as follows:

- Figures A-1 through A-17: Chronic Lowering of Groundwater Levels
- Figures A-18 through A-36: Seawater Intrusion Groundwater Elevation Proxies
- Figures A-37 through A-41: Depletion of Interconnected Surface Water Groundwater Elevation Proxies
- Figures A-42 through A-180: Wells in Monitoring Network not used as RMPs for Groundwater Elevations

WY 2024 is classified as a normal year, following a wet year that provided some relief from the 3 preceding years of average or below average rainfall that limited aquifer recharge. Coastal groundwater levels in the semi-confined to confined Purisima aquifers do not typically show a distinct response to annual changes in recharge because of their distance from recharge areas, depth, and confinement. Instead, groundwater levels in the Purisima aquifers respond more directly to changes in groundwater extraction than precipitation. A decade-long period (WY 2005-2014) of increasing groundwater levels corresponding with reduced extraction has been followed by a period of relatively stable and high groundwater levels during a period of historically low extraction (WY 2015-2020). Groundwater elevations then declined overall in WY 2021, potentially in response to increased extraction and continued dry conditions. In WY 2024, groundwater elevations at most wells increased slightly or remained similar to the previous year.

2.3.1 Aromas Red Sands

A hydrograph of seawater intrusion RMP SC-A3A is included to show representative groundwater conditions in the Aromas Red Sands. At SC-A3A, spring and fall groundwater elevations and the 5-year moving average are above the seawater intrusion MT, but below the seawater intrusion MO (Figure 5 and Appendix A Figure A-18). Contour maps for the Aromas Red Sands are shown on Figure 6 and Figure 7 for spring (March) and fall (September), respectively. Both spring and fall groundwater elevations, including CWD and SqCWD production wells, have stable groundwater elevations compared to last year. Spring and fall groundwater elevations are unavailable for SqCWD's Country Club Well as it remains out of service following the construction of the new Country Club 2 well. Spring and fall static groundwater elevations for CWD-A could not be collected because of nearby pumping from CWD-12.

Groundwater in the Aromas Red Sands generally flows toward the coast with local pumping effects at CWD's Rob Roy wellfield (CWD #4, CWD #10 and CWD #12) and SqCWD's Bonita and San Andreas production wells. Some inflows to the Basin are from the Pajaro Valley Subbasin inland of SqCWD's service area. Groundwater elevations in the Aromas Red Sands are above sea level with coastal elevations between 3 and 8 feet above sea level.

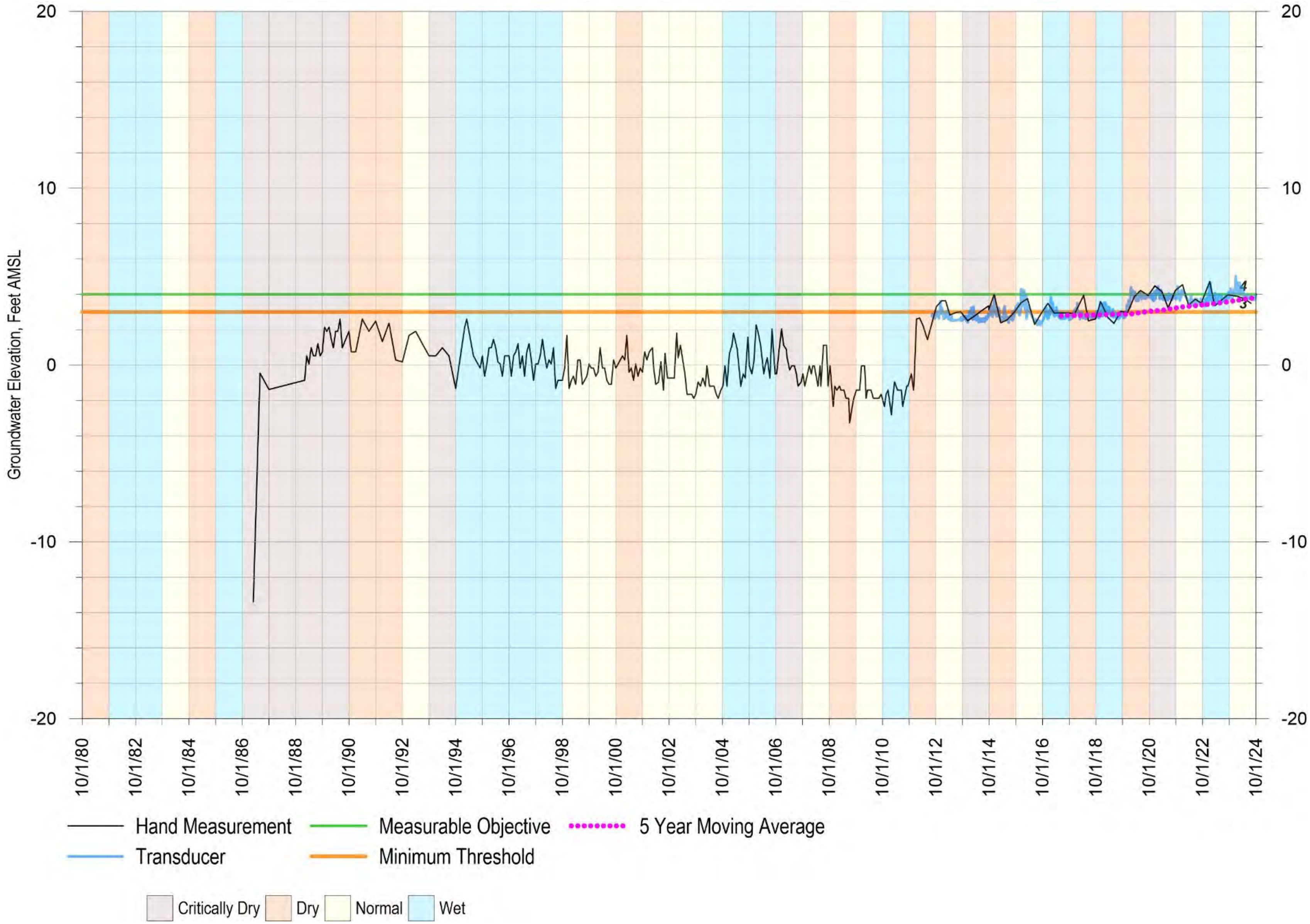


Figure 5. Representative Hydrograph of Aromas Red Sands Conditions at SC-A3A

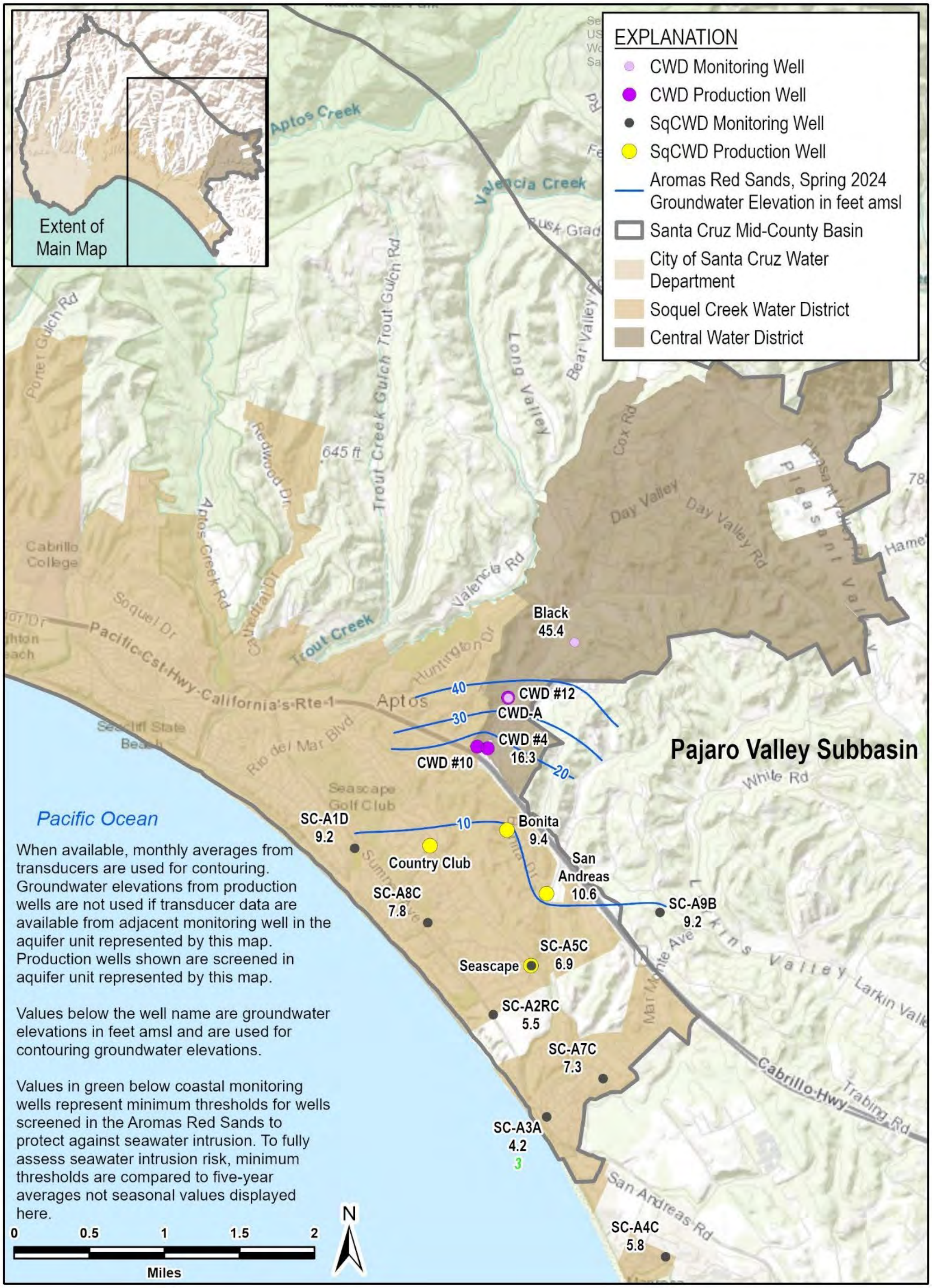


Figure 6. Aromas Red Sands Groundwater Elevations, Spring 2024

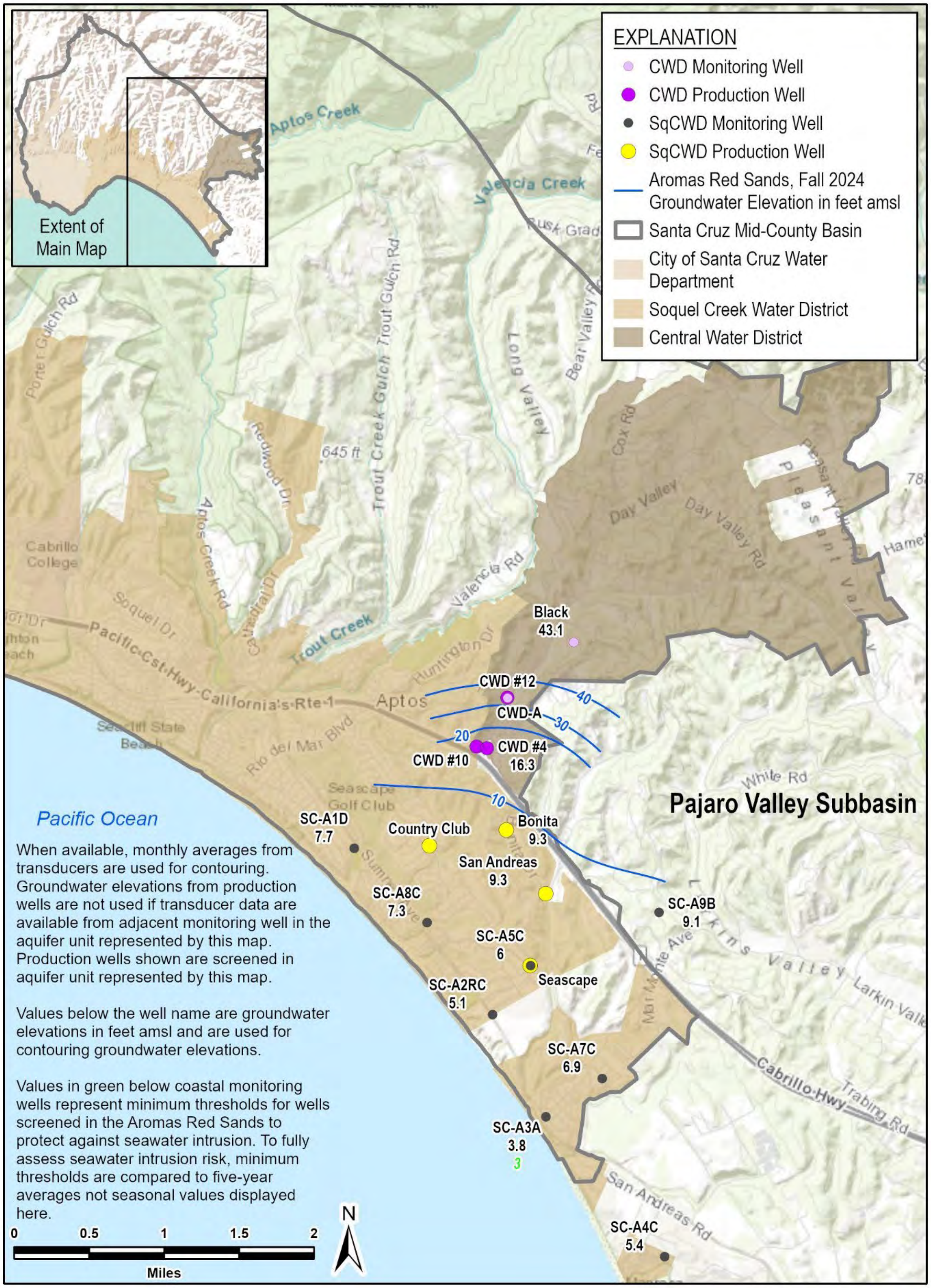


Figure 7. Aromas Red Sands Groundwater Elevations, Fall 2024

2.3.2 Purisima F and DEF Units

Contour maps for the Purisima F and DEF units are shown on Figure 8 and Figure 9 for spring (March) and fall (September), respectively. The contour maps show localized pumping depressions around production wells. Extraction from the T. Hopkins and Granite Way wells remained similar in WY 2024 compared to WY 2023 resulting in similar sized pumping depressions. Contours show groundwater in the Purisima F and DEF units generally flows at a gentle gradient toward the coast. With evidence of seawater intrusion advancing in the Seascape area, the seawater investigation will more closely examine groundwater flows in this area. There is also Purisima F and DEF units groundwater flow into the Basin from the Pajaro Valley inland of SqCWD's service area.

Groundwater elevations at most coastal wells generally increased or remained similar to the previous year. Seawater intrusion RMP in the Purisima F and DEF units have groundwater elevations and 5-year moving averages above respective seawater intrusion MTs at 3 of 4 RMP in the spring and fall. At seawater intrusion RMP SC-A8A, fall elevations are below the MT, while elevations are above the MT during spring (Appendix A Figure A-20). The annual minimum of the 5-year moving average groundwater elevation at SC-A8A remains below the MT.

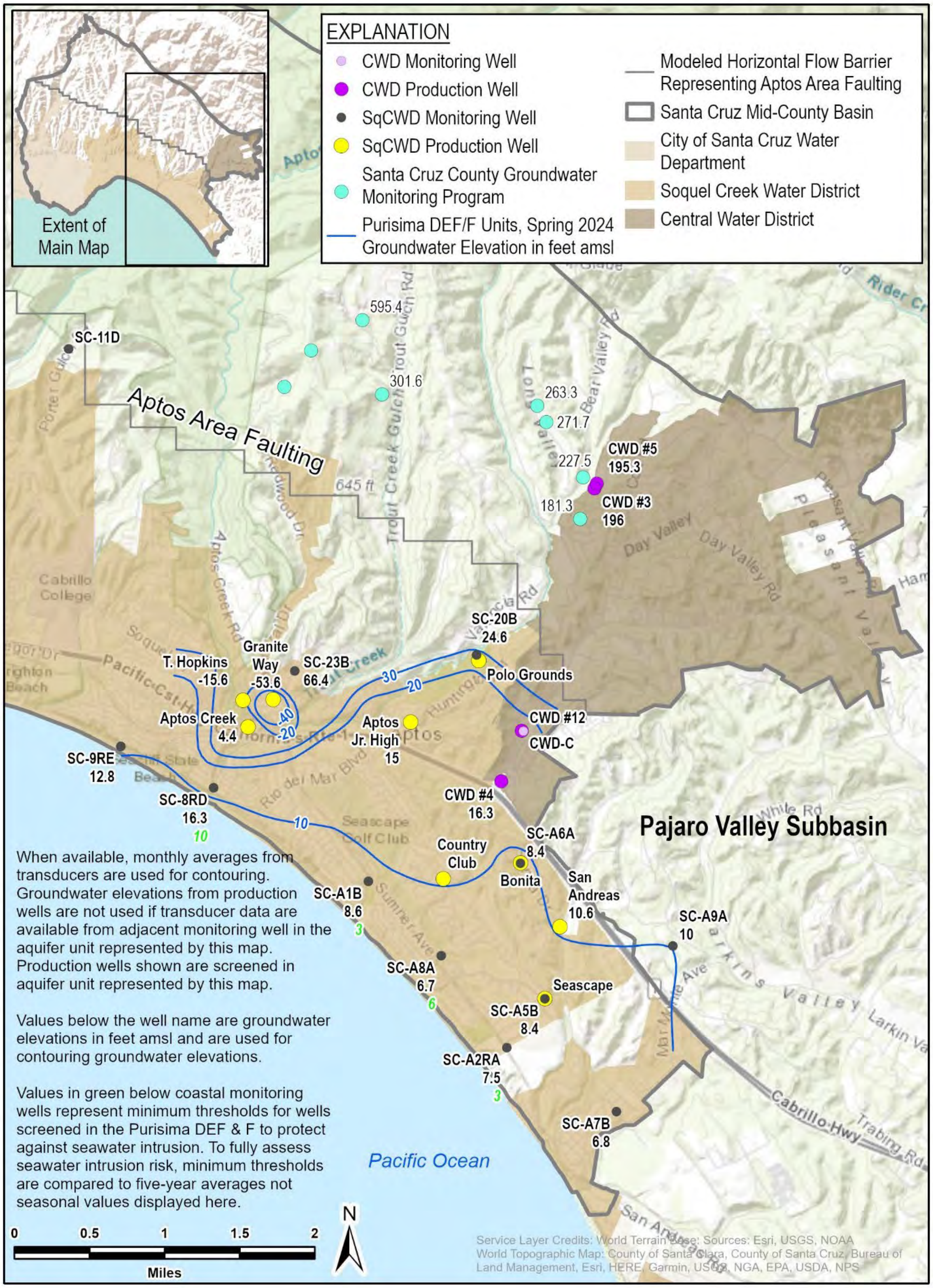


Figure 8. Purisima F and DEF Unit Groundwater Elevations, Spring 2024

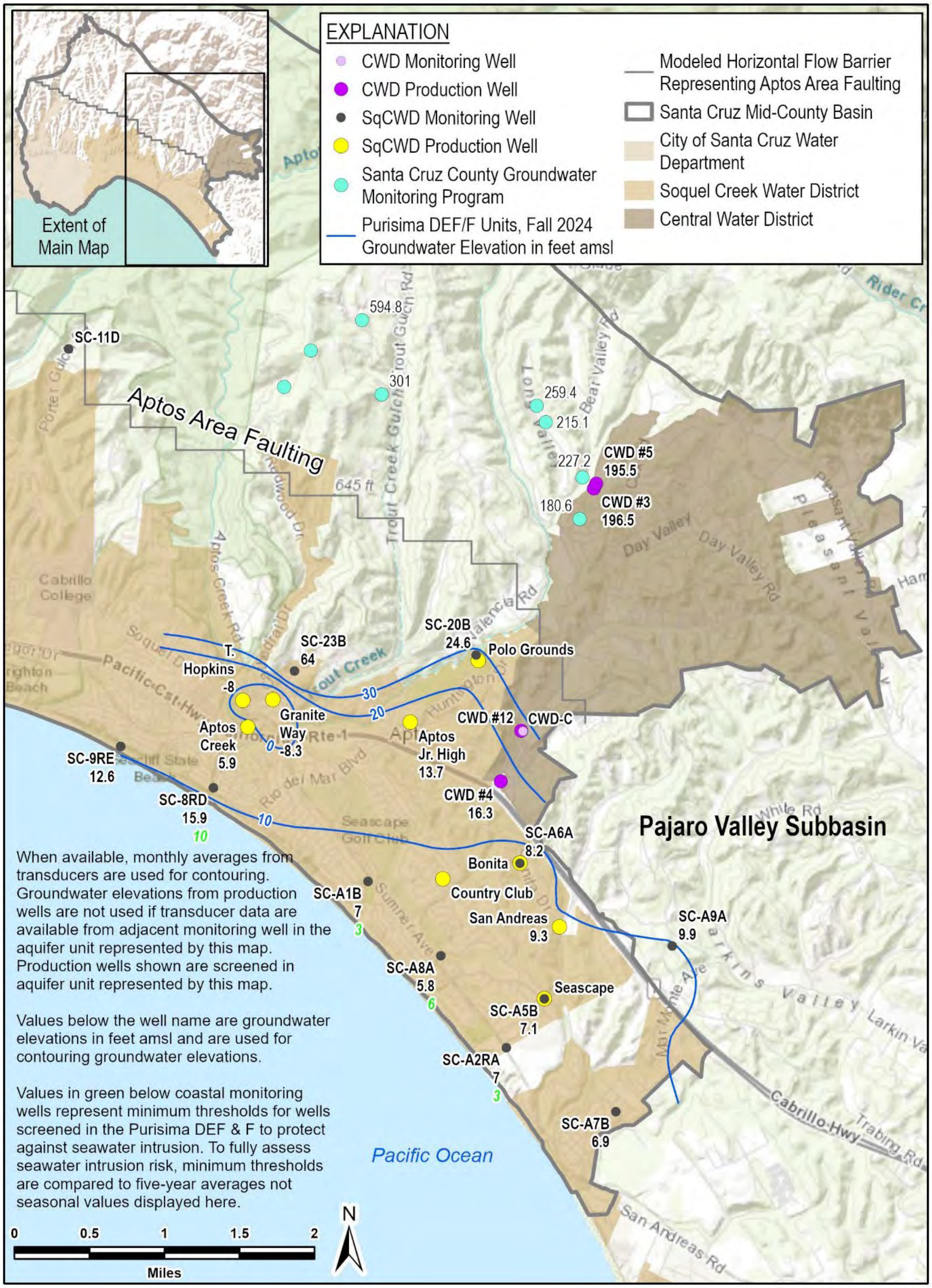


Figure 9. Purisima F and DEF Unit Groundwater Elevations, Fall 2024

2.3.3 Purisima BC Unit

Contour maps for the Purisima BC unit are shown on Figure 10 and Figure 11 for spring (March) and fall (September), respectively. The maps include the Twin Lakes Church seawater intrusion prevention (SWIP) recharge well and PWS monitoring wells screened in the Purisima BC unit. Both contour maps show a prominent pumping depression around SqCWD's Ledyard, Madeline, and Estates production wells. The pumping depression is more developed in the fall when demand is greatest. Contours indicate groundwater continues to flow from inland and the coast toward the pumping depression.

Spring and fall groundwater elevations at the 2 coastal Purisima BC unit RMP monitoring wells remained similar or increased in WY 2024. Although spring groundwater elevations at SC-9RC are above the MT, the 5-year moving average groundwater elevations at RMPs SC-9RC and SC-8RB remain below the proxy groundwater elevation for seawater intrusion MTs (Appendix A Figures A-23 and A-24).

2.3.4 Purisima A Unit

Contour maps for the Purisima A unit are shown on Figure 12 and Figure 13 for spring (March) and fall (September), respectively. Groundwater generally flows from inland toward the coast with localized pumping depressions around SqCWD and SCWD production wells. Pumping depressions are more defined in the fall when demand is greatest, particularly at SqCWD's Estates production well (Appendix A Figure A-63). Relatively lower groundwater elevations also occur at an inland location around the SC-10RA monitoring well (Appendix A Figure A-41), potentially caused by non-municipal pumping since there are no nearby municipal wells.

Coastal Purisima A unit RMPs Moran Lake Medium, Pleasure Point Medium, and SC-1A have spring and fall groundwater elevations and 5-year moving average groundwater elevations above seawater intrusion MTs. Groundwater elevations at RMPs, SC-3RA and SC-5RA, are above seawater intrusion MTs in both the spring and the fall (Appendix A Figures A-25 and A-26). However, while the 5-year moving average groundwater elevations at SC-5RA remain below the proxy groundwater elevations for seawater intrusion MTs, the 5-year moving average groundwater elevations at SC-3RA are now above the MT. Soquel Point Medium spring and fall groundwater elevations are now above the MT, however the 5-year moving average remains below the seawater intrusion MT.

In the spring, coastal groundwater elevations in the Purisima A unit in the Pleasure Point area, as shown in example hydrographs in Appendix A Figures A-27, A-28, and A-29, increased from the previous year (Figure 12 and Figure 13). This is likely due to managed aquifer recharge at Beltz #9, the Beltz wells were not pumped in January through April 2024, and the Garnet well was not pumped during the November through January period. Groundwater mounding around Beltz #9 is evident on the WY 2024 spring contour map.

In the fall, the increase in coastal groundwater elevations in the Purisima A unit in the Pleasure Point area is due to a 54% decrease (95.3 MG or 293 AF) in overall pumping at the Beltz wells compared to last water year. The increase in groundwater elevations at SqCWD coastal monitoring wells SC-5RA, SC-9RA, and SC-8RA to the east of SC-3RA in fall WY 2024 compared to fall WY 2023 is due to the SqCWD Tannery well not pumping during the June through September period.

The contour maps show SWIP recharge wells and PWS monitoring wells screened in the Purisima A unit. Since groundwater level data are already being collected for the PWS monitoring wells, they were used as control points for contouring. PWS is not yet operational, however managed recharge is planned to occur at the SWIP wells in WY 2025.

2.3.5 Purisima AA Unit

Contour maps for the Purisima AA unit are shown on Figure 14 and Figure 15 for spring (March) and fall (September), respectively. Groundwater generally flows from inland toward the coast with localized pumping depressions around SqCWD and SCWD production wells. Pumping depressions are more defined in the fall when demand is greatest, particularly at SqCWD's Main Street production well (Appendix A Figure A-68). Relatively lower groundwater elevations have typically occurred at an inland location around the SC-10RAA monitoring well (Appendix A Figure A-14), potentially caused by non-municipal pumping since there are no nearby municipal wells.

Coastal Purisima AA unit RMPs Moran Lake Deep and Pleasure Point Deep have spring and fall groundwater elevations and 5-year moving average groundwater elevations above seawater intrusion MTs. Groundwater elevations at RMP SC-3AA are above seawater intrusion MTs in the spring and below seawater intrusion MTs in the fall (Appendix A Figure A-34). The 5-year moving average groundwater elevations at SC-3AA are above the proxy groundwater elevations for seawater intrusion MT and below the MO, though only 23 months of data is currently available. Five-year moving average groundwater elevations in the Purisima AA unit RMP Soquel Point Deep continues to be below the seawater intrusion MT (Appendix A Figure A-32) while WY 2024 spring and fall groundwater elevations at Soquel Point Deep are above the seawater intrusion MT.

Coastal groundwater elevations in the Purisima AA units in the Pleasure Point area, as shown in example hydrographs in Appendix A Figures A-31 and A-32, increased from the previous year (Figure 14 and Figure 15). This is likely related to a 54% decrease (95.3 MG or 293 AF) in overall pumping at the Beltz wells compared to last water year.

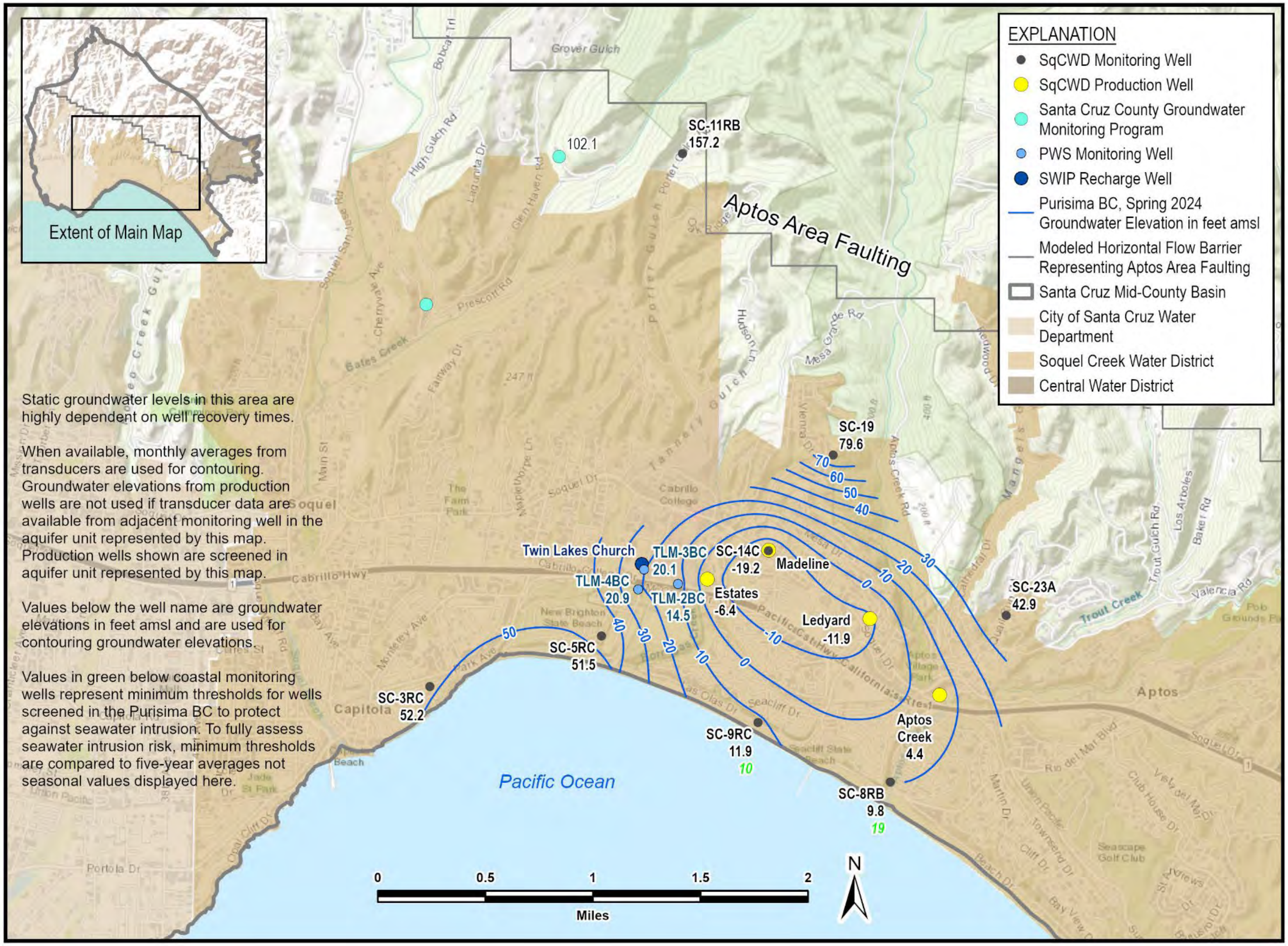


Figure 10. Purisima BC Unit Groundwater Elevations, Spring 2024

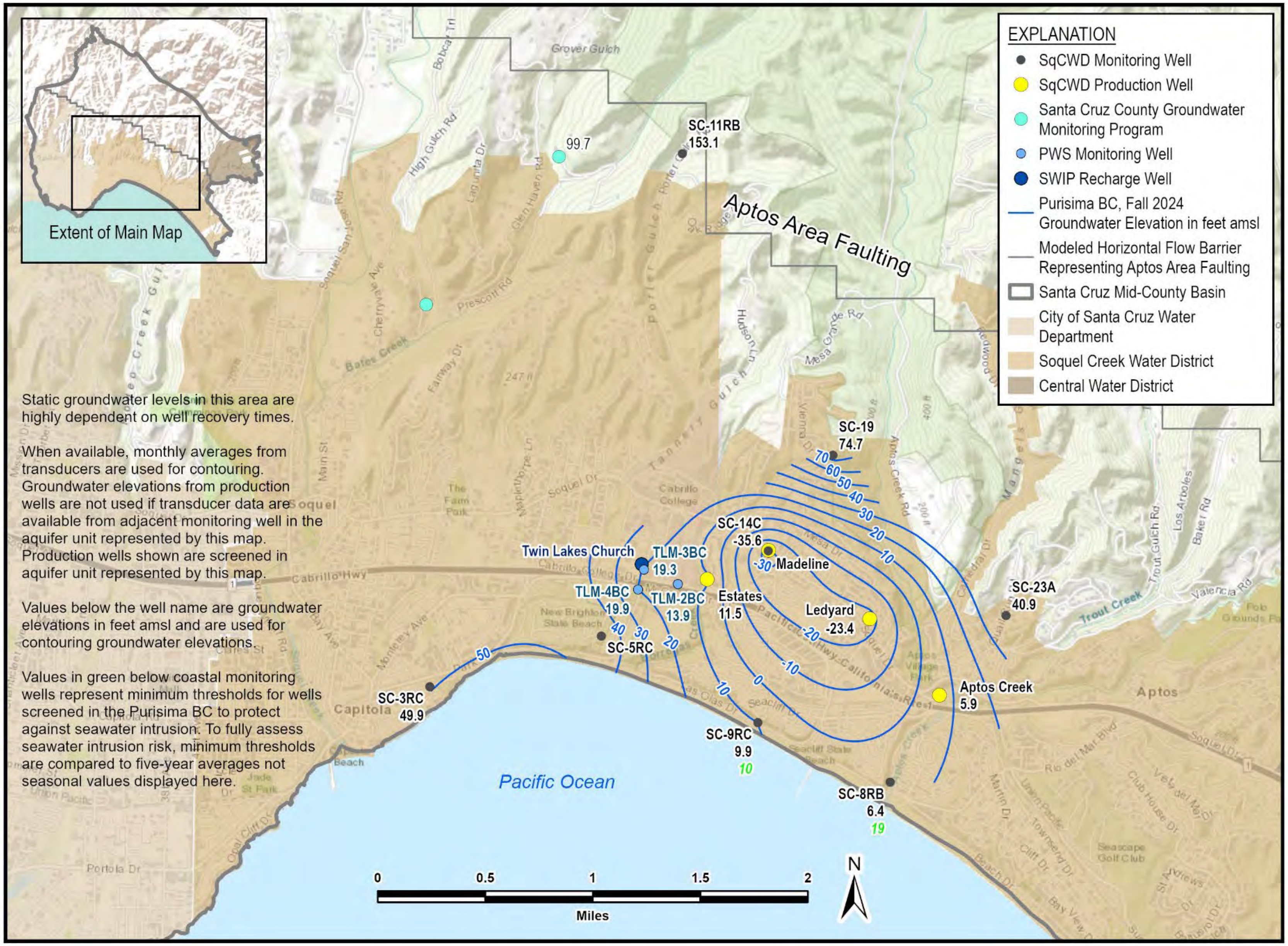


Figure 11. Purisima BC Unit Groundwater Elevations, Fall 2024

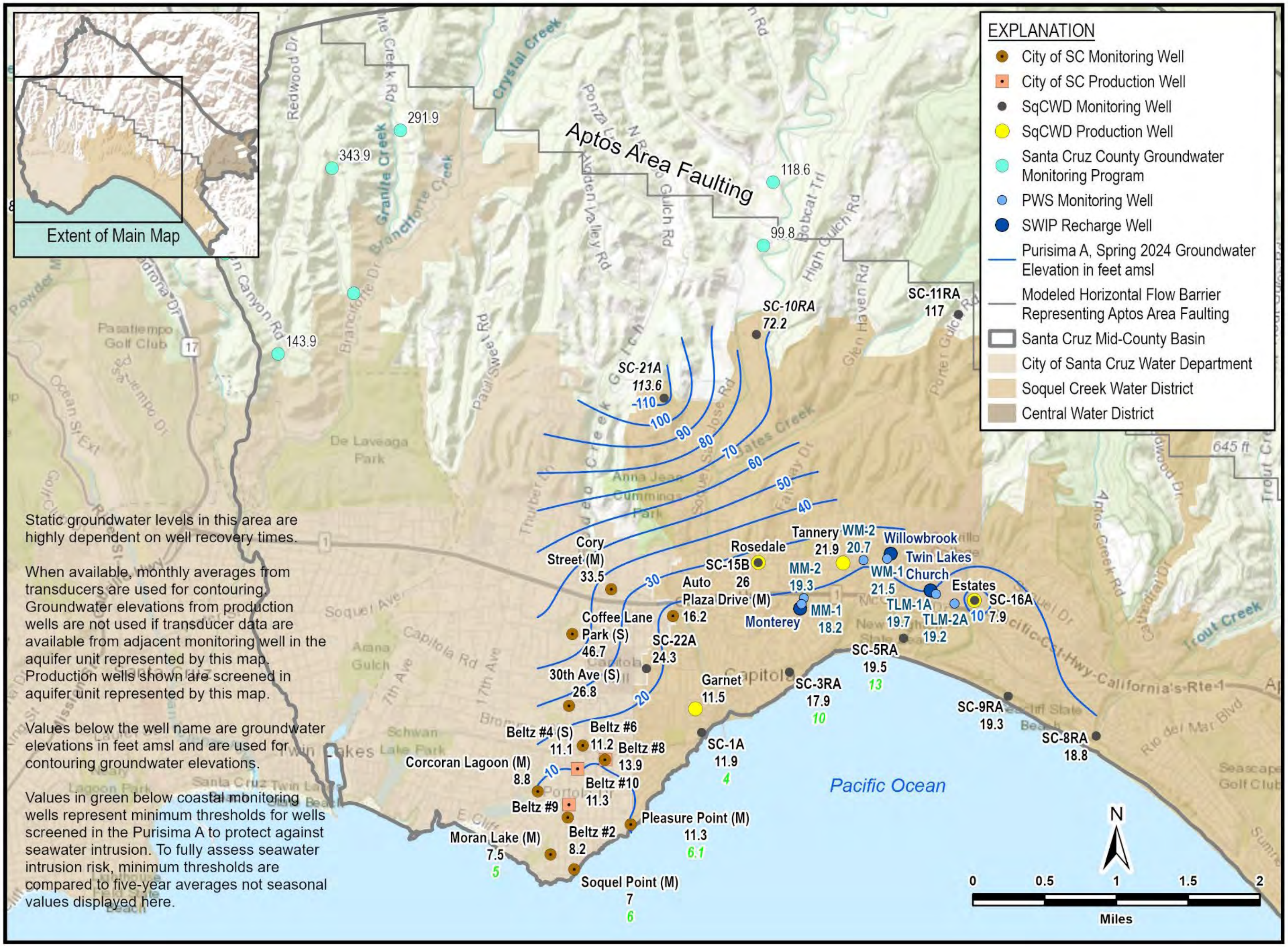


Figure 12. Purisima A Unit Groundwater Elevations, Spring 2024

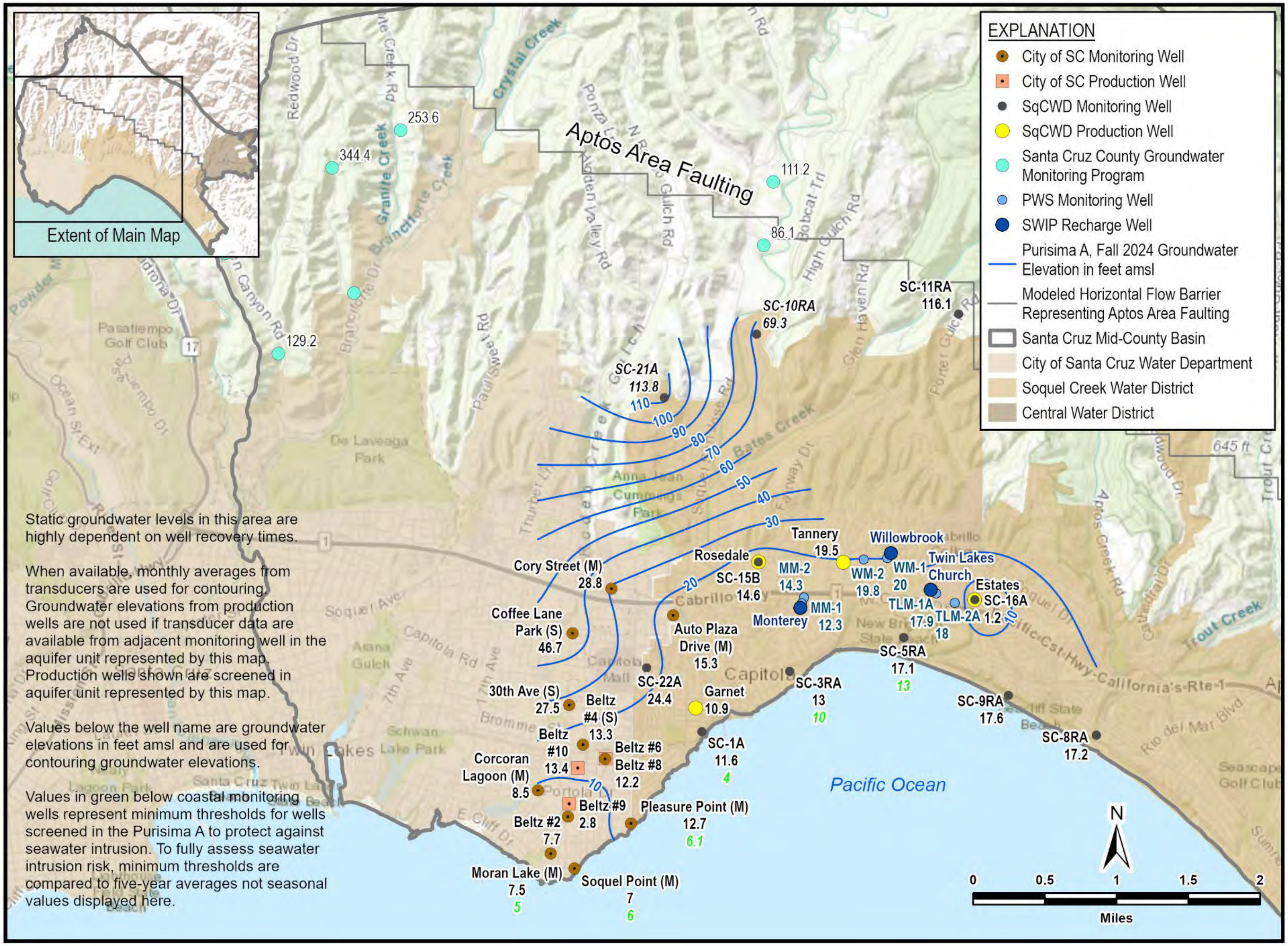


Figure 13. Purisima A Unit Groundwater Elevations, Fall 2024

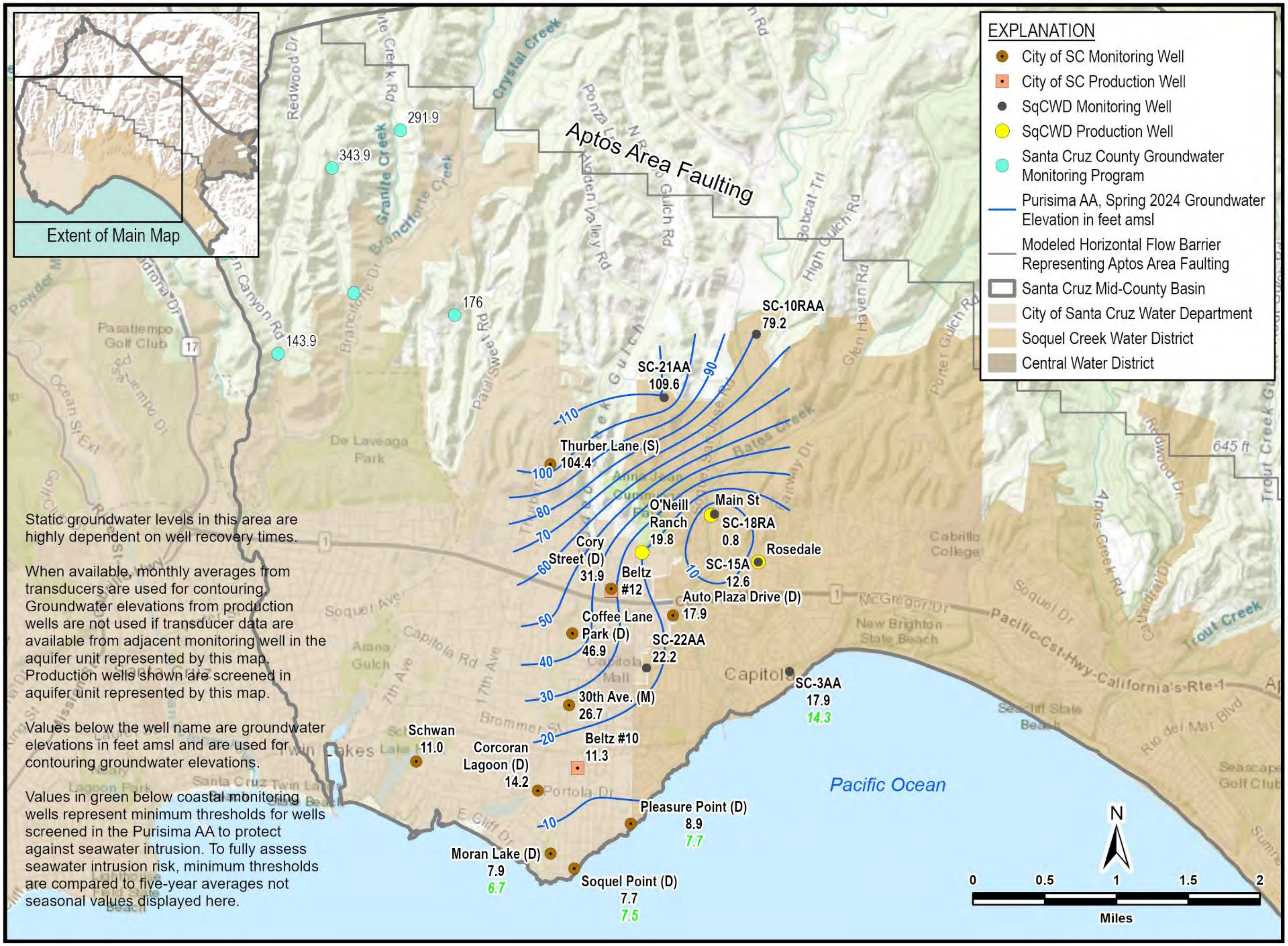


Figure 14. Purisima AA Unit Groundwater Elevations, Spring 2024

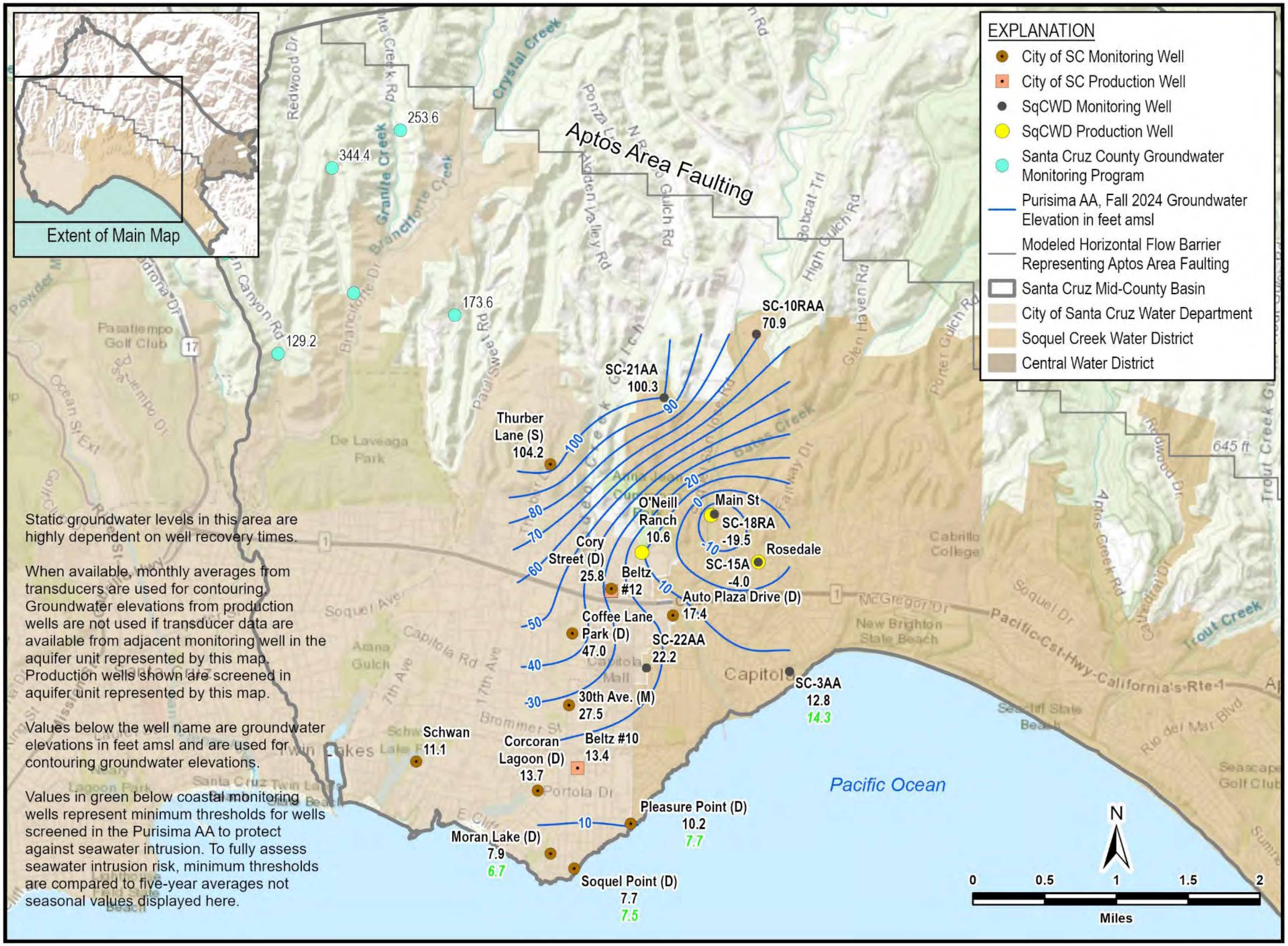


Figure 15. Purisima AA Unit Groundwater Elevations, Fall 2024

2.3.6 Tu Unit

Contour maps for the Tu unit are included on Figure 16 and Figure 17 for spring (March) and fall (September), respectively. Overall, groundwater flows toward the coast with localized spring and fall pumping depressions around SqCWD's Main Street municipal supply well.

The Tu unit contour maps show no groundwater mounding at Beltz #12 in WY 2024 because there was no ASR activity conducted at this well in WY 2024. As a result of there being no ASR, spring and fall groundwater elevations (Figure 16 and Figure 17) around Beltz #12 are significantly lower than last year.

Spring groundwater elevations at coastal Tu unit RMP SC-13A dropped by about 8 feet from last spring when there was recharge at Beltz #12, but elevations are still approximately 1 foot above its seawater intrusion MT (Appendix A Figure A-35). Fall groundwater elevations at SC-13A, when groundwater demand is greatest, are below the MT and slightly lower than the previous year. SC-13A's 5-year moving average groundwater elevation is below the MT.

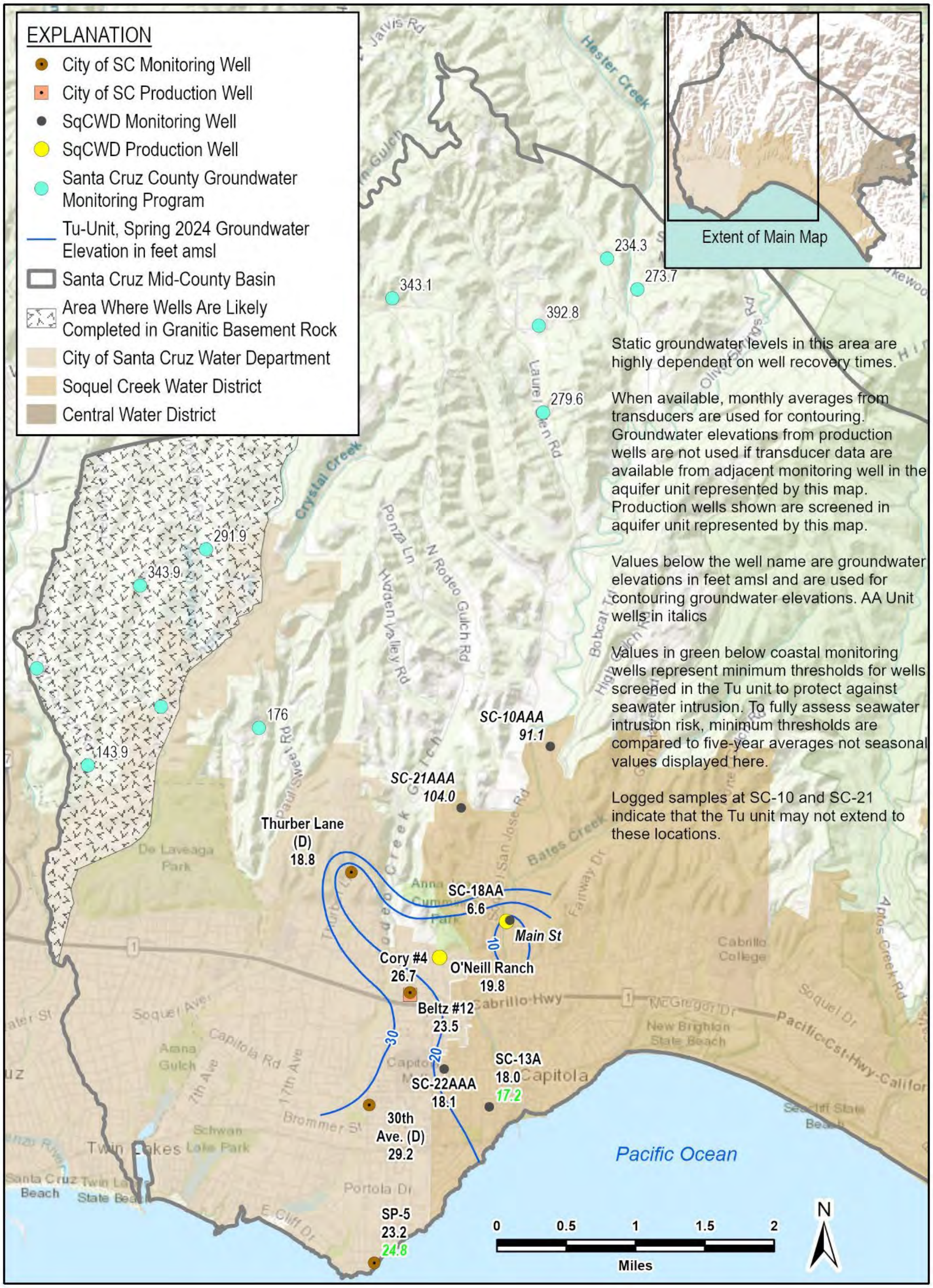


Figure 16.Tu Unit Groundwater Elevations, Spring 2024

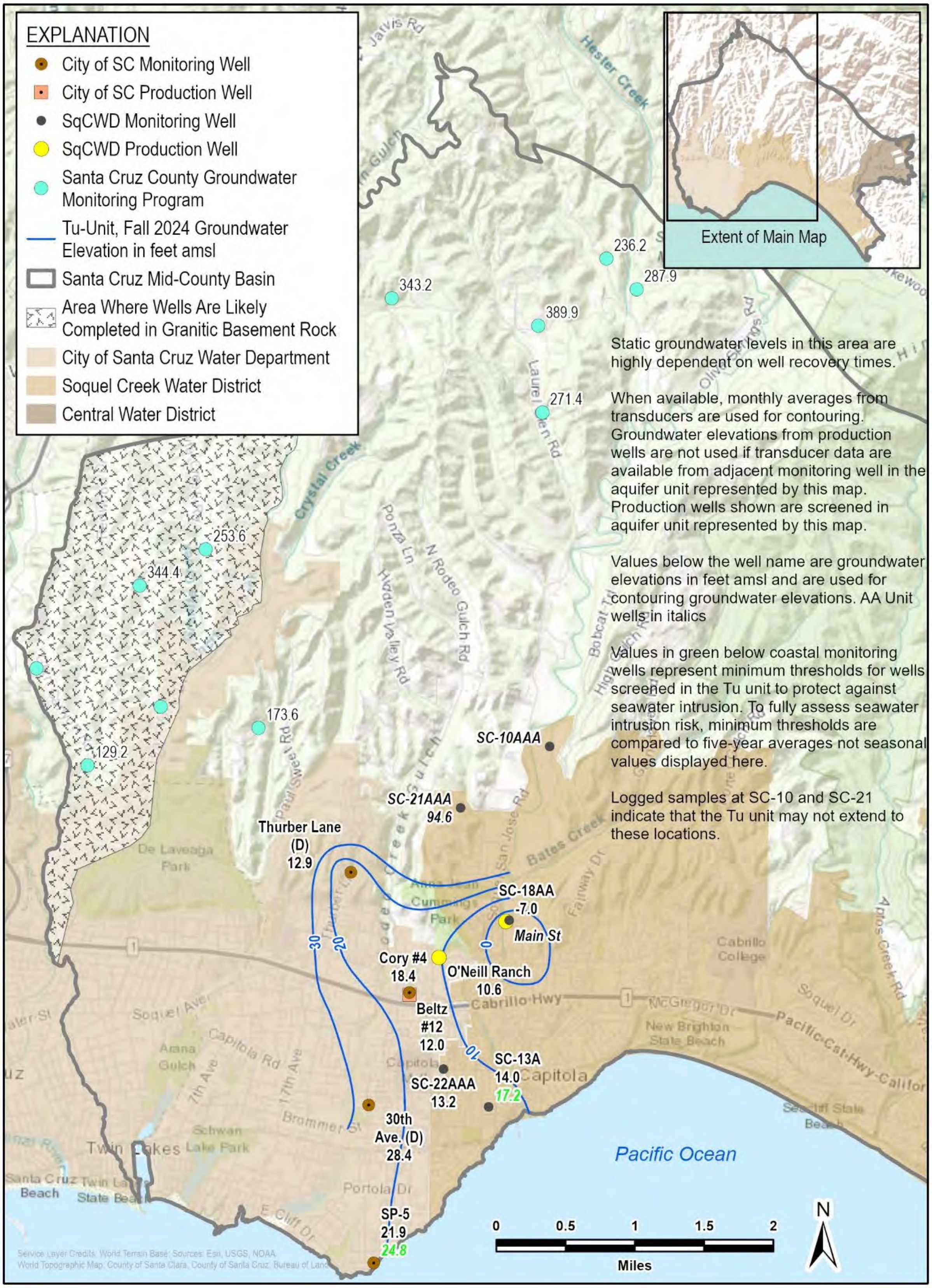


Figure 17.Tu Unit Groundwater Elevations, Fall 2024

2.4 Groundwater Extraction

The volume of groundwater extracted from the Basin in WY 2024 is included in Table 1. The table summarizes groundwater extractions by water use sector and aquifer group. The footnotes of Table 1 identifies the method of measurement and accuracy of measurements. Appendix 2-B of the GSP describes the methodology for estimates. Figure 18 shows the general location and volume of groundwater extractions by use type. To meet requirements for annual reports in the SGMA regulations, Table 1 and Figure 18 show all groundwater extracted including water recovered as part of ASR demonstration testing.

Table 1. Water Year 2024 Groundwater Extracted in the Santa Cruz Mid-County Basin

Water Use Sector	Aquifer Group			Total (AF)	Percentage
	Aromas Red Sands and Purisima F	Purisima DEF, BC, A and AA	Tu		
Private Domestic [a]	53	364	175	591	12%
Agricultural [b]	179	117	19	315	7%
Institutional [c]	188	81	7	276	6%
Municipal [d]	1,422	1,419	728	3,569	75%
Total	1,842	1,981	929	*4,751*	
Percentage	38.8%	41.7%	19.5%		

[a] Estimated based on change in population over the year and an annual water use factor (WUF) per connection determined from metered Small Water Systems applied to each residence outside of municipal water service areas (less accurate). WUF for WY 2024 is 0.26 AF per connection.
[b] Estimated based on irrigation demand determined using the GSFLOW model, crop acreage, and crop coefficient (less accurate).
[c] Most water systems in this category reported metered extractions to the County but timing of reporting is too late for inclusion into the Annual Report. Therefore, 2023 data are used for 2024 extractions (less accurate). The volumes from year to year generally do not vary significantly. Where data are not reported to the County, groundwater extraction is estimated based on historical water usage for facility use including an estimate of turf irrigation based on irrigation demand determined using the GSFLOW model, irrigation acreage, and turf's crop coefficient (less accurate)
[d] Direct measurement by meters (most accurate); includes 64 AF recovered under SCWD's Aquifer Storage and Recovery demonstration testing.

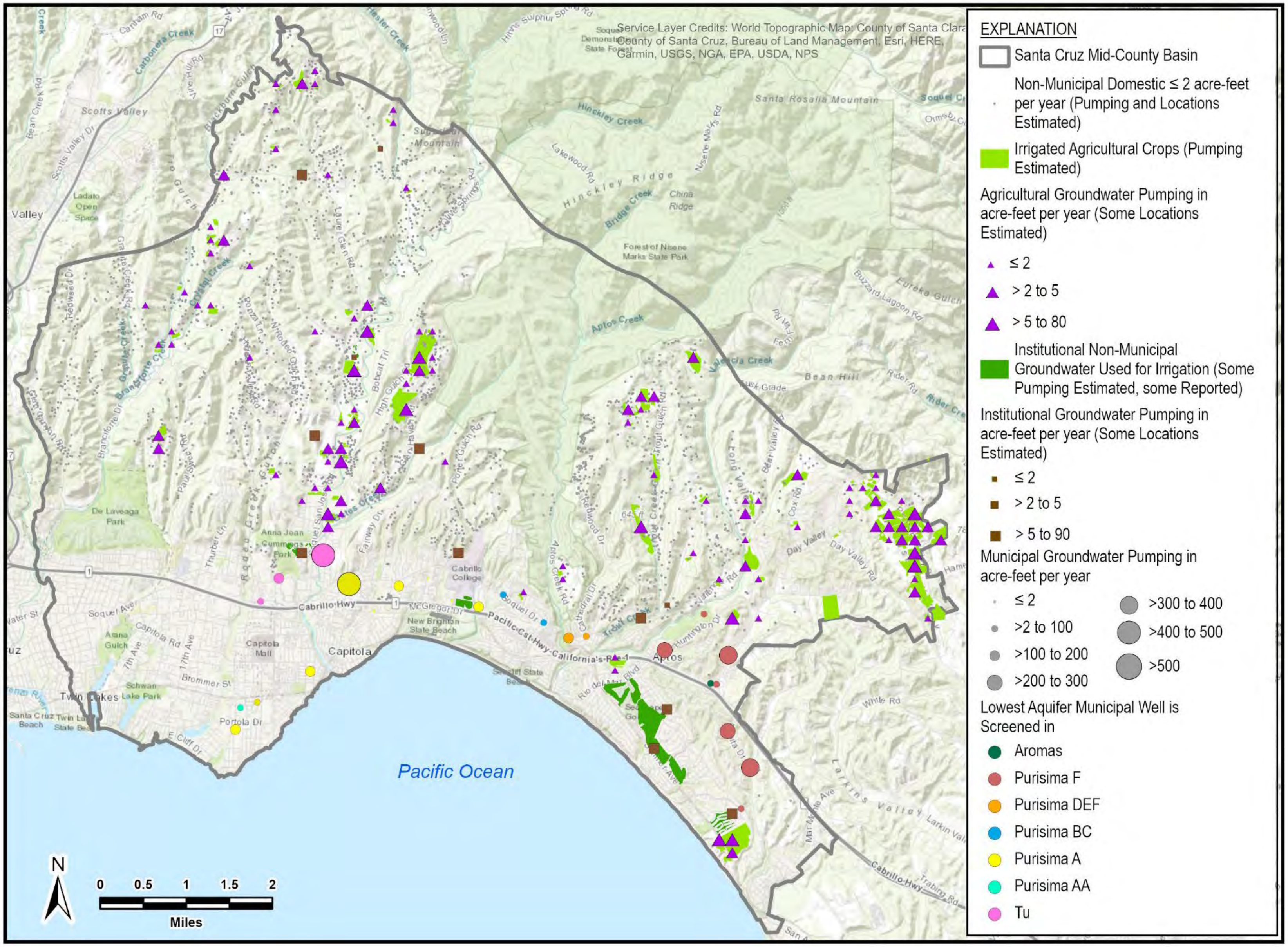


Figure 18. General Location of Water Year 2024 Groundwater Extracted in the Santa Cruz Mid-County Basin

WY 2024 groundwater extractions were the lowest on record; an estimated 150 AF less groundwater was extracted in WY 2024 compared to WY 2023. The Purisima DEF, BC, A, and AA units account for 42% of groundwater pumped in the Basin, the Aromas Red Sands and Purisima F units provide 39%, and the Tu unit provides 20% (Table 1). The 3 municipal water supply agencies extract an estimated 75% of all groundwater used in the Basin. For WY 2024, municipal extraction in Table 1 includes 64 AF recovered under SCWD's ASR demonstration testing program.

Unmetered domestic extraction is estimated to be 12% of groundwater extracted (Table 1). Estimated extractions are based on a water use factor (WUF) obtained from metered small water system water use for the year and change in population. According to estimates by the California Department of Finance, 2024's population in unincorporated areas of the County remained similar to the previous year. Groundwater extraction by small water systems is reported to the County. Estimates of extraction to meet landscape and agricultural irrigation demand are variable each year because they are modeled based on climate data.

2.5 Surface Water Supply Used for Groundwater Recharge or In-Lieu Use

When SCWD has excess surface water, it can be used in the Basin to (1) either transfer SCWD treated drinking water to SqCWD through a water transfer pilot test program to serve a portion of SqCWD's service area in-lieu of using groundwater, or (2) inject at SCWD ASR wells as part of pilot and demonstration testing. These projects are described in Sections 3.7.3 and 3.7.5.

Excess surface water was available for the ASR program which allowed for 64 AF to be used for SCWD's pilot testing of ASR that included storage of some of its surface water supply at the Beltz #9 well. No water was transferred from SCWD to SqCWD for in-lieu use under the water transfer pilot program. Table 2 summarizes WY 2024 surface water supply used in the Basin for ASR and in-lieu use.

Table 2. Water Year 2024 Surface Water Supply for Groundwater Recharge or In-Lieu Use

Purpose	Water User	Description	Total (AF) [a]
Aquifer Storage of Surface Water	City of Santa Cruz	ASR Pilot Testing	64
In-Lieu Use	Soquel Creek Water District	Water Transfer Pilot Testing	0
Total			64

[a] Direct measurement by meters

Aquifer storage and recovery volumes during SCWD pilot and demonstration testing are summarized in Table 3 by water year and aquifer unit, showing annual net storage and cumulative storage. The total cumulative ASR water stored in the Tu unit is 63 AF.

Table 3. City of Santa Cruz Water Department ASR Summary

Water Year	Purisima A/AA-Unit						Tu- Unit				Total Cumulative Storage
	Beltz #8 Injection/ Storage	Beltz #8 Extraction[1]	Beltz #9 Injection/ Storage	Beltz #9 Extraction[1]	Annual Net Storage	Cumulative Storage	Beltz #12 Injection/ Storage	Beltz #12 Extraction[a]	Annual Net Storage	Cumulative Storage	
	acre-feet										
2019	0	0	0	0	0	0	64	64	0	0	0
2020	11	11	0	0	0	0	0	0	0	0	0
2021	19	19	0	0	0	0	0	0	0	0	0
2022	110	110	0	0	0	0	153	132	21	21	21
2023	21	21	0	0	0	0	42	0	42	63	63
2024	0	0	64	64	0	0	0	0	0	63	63

[a] Total extraction includes recovery during testing and other periods.

2.6 Total Water Use

WY 2024 water use volumes in the Basin are included in Table 4. The table summarizes total water use by water use sector, water source type, and identifies the method of measurement. The groundwater portion of water use does not include water recovered as part of the SCWD's ASR pilot and demonstration study because it is considered surface water use.

Table 4. Water Year 2024 Water Use in the Santa Cruz Mid-County Basin

Water Use Sector	Groundwater Use[f]	Surface Water Use[a]	Total Water Use	Percentage of Basin Water Use
	AFY			
Private Domestic [b]	591	Unknown but minimal	591	7%
Agricultural [c]	315	0	315	4%
Institutional [d]	276	0	276	3%
Municipal [e]	3,506	3,694	7,200	86%
Total	4,688	3,694	8,382	
Percentage	56%	44%		

[a] All municipal surface water used in the Basin is sourced outside of the Basin.
[b] Estimated based on annual water WUF per connection determined from metered Small Water Systems and applied to each residence outside of municipal water service areas (less accurate). WUF for WY 2024 was 0.26 AF per connection.
[c] Estimated based on irrigation demand determined using the GSFLOW model, crop acreage, and crop coefficient (less accurate).
[d] Estimated based on historical water usage for facility use including an estimate of turf irrigation based on irrigation demand determined using the GSFLOW model, irrigation acreage, and turf's crop coefficient (less accurate).
[e] Direct measurement by meters (most accurate) for groundwater; estimated for surface water based on a proportion of metered consumption that falls within the Basin less net groundwater extracted at the Beltz wellfield.
[f] Groundwater use does not include ASR recovered surface water.

The accuracy of water use measurements is directly correlated with the method used to determine water use. Metered municipal data have the greatest accuracy while estimates of water use based on various assumptions (GSP Appendix 2-B) are less accurate. Although to the extent possible, reasonable checks are made to minimize order of magnitude inaccuracies.

Since WY 2015, total estimated water use has been lower than prior years (Table 5). As most of the water within the Basin is supplied by groundwater, reduced water use has resulted in less groundwater extracted from the Basin over the same period (Table 5). In WY 2024, groundwater from the Basin supplied 56% of water used; surface water from outside the Basin supplied 44%.

Table 5. Annual Water Use in the Santa Cruz Mid-County Basin

Water Year	Sources with the Basin: Groundwater Use AFY							Sources Outside of the Basin: Surface Water Use AFY			Total Water Use AFY
	Private Domestic Use [a]	Agricultural Use [b]	Institutional Use [c]	Central Water District [d] (Municipal Use)	City of Santa Cruz [d, e] (Municipal Use)	Soquel Creek Water District [d] (Municipal Use)	Total	City of Santa Cruz [f] (Municipal Use)	Soquel Creek Water District [d] (Municipal Use)	Total	
1985	980	352	408	394	181	4,319	6,634	6,413	0	6,413	13,047
1986	1,001	329	382	404	102	4,272	6,490	6,561	0	6,561	13,051
1987	1,022	398	445	444	526	5,235	8,070	6,415	0	6,415	14,485
1988	1,031	372	444	438	943	4,859	8,087	5,314	0	5,314	13,401
1989	1,004	355	410	406	756	4,797	7,728	4,993	0	4,993	12,721
1990	1,022	361	420	429	842	4,818	7,892	4,295	0	4,295	12,187
1991	1,012	349	397	426	254	4,703	7,141	4,628	0	4,628	11,769
1992	1,017	394	438	467	716	4,908	7,940	4,695	0	4,695	12,635
1993	1,025	331	390	481	260	4,863	7,350	5,191	0	5,191	12,541
1994	1,033	329	389	482	463	5,089	7,785	5,178	0	5,178	12,963
1995	1,036	273	334	459	212	4,855	7,169	5,564	0	5,564	12,733
1996	1,042	337	397	526	143	5,183	7,628	5,998	0	5,998	13,626
1997	1,035	386	442	604	245	5,571	8,283	6,381	0	6,381	14,664
1998	1,041	249	325	534	268	4,966	7,383	5,616	0	5,616	12,999
1999	1,048	304	363	539	359	5,211	7,824	5,829	0	5,829	13,653
2000	1,058	325	380	547	593	5,271	8,174	5,587	0	5,587	13,761
2001	1,044	337	383	557	95	5,175	7,591	6,157	0	6,157	13,748
2002	1,039	336	397	593	336	5,376	8,077	5,731	0	5,731	13,808
2003	1,031	327	390	584	416	5,332	8,080	5,653	0	5,653	13,733

Water Year	Sources with the Basin							Sources Outside of the Basin			Total Water Use AFY
	Groundwater Use AFY							Surface Water Use AFY			
	Private Domestic Use [a]	Agricultural Use [b]	Institutional Use [c]	Central Water District [d]	City of Santa Cruz [d, e]	Soquel Creek Water District [d]	Total	City of Santa Cruz [f]	Soquel Creek Water District [d]	Total	
				Municipal Use				Municipal Use			
2004	1,019	380	422	633	421	5,372	8,247	5,765	0	5,765	14,012
2005	937	275	330	514	316	4,544	6,916	5,459	0	5,459	12,375
2006	935	305	359	544	296	4,549	6,988	5,278	0	5,278	12,266
2007	933	362	408	596	420	4,626	7,345	5,054	0	5,054	12,399
2008	939	380	439	584	561	4,557	7,460	4,971	0	4,971	12,431
2009	874	371	416	594	582	4,162	6,999	4,254	0	4,254	11,253
2010	879	304	360	481	451	3,933	6,408	4,311	0	4,311	10,719
2011	882	270	311	487	637	4,011	6,598	3,931	0	3,931	10,529
2012	890	361	400	535	494	4,159	6,839	4,374	0	4,374	11,213
2013	828	423	326	559	515	4,218	6,869	4,560	0	4,560	11,429
2014	691	436	310	500	510	3,703	6,150	3,571	0	3,571	9,721
2015	553	431	300	391	613	3,154	5,442	3,222	0	3,222	8,664
2016	552	375	293	383	450	3,094	5,147	3,472	0	3,472	8,619
2017	600	218	288	383	463	3,169	5,121	3,726	0	3,726	8,847
2018	599	375	313	377	635	3,340	5,639	3,489	0	3,489	9,128
2019	595	336	308	385	83	3,019	4,726	3,794	165	3,959	8,685
2020	594	407	318	411	244	3,197	5,171	3,487	111	3,598	8,769
2021	586	371	265	406	724	3,262	5,614	2,954	0	2,954	8,568
2022	671	406	263	397	339	3,049	5,125	3,594	<1	3,594	8,719
2023	661	265	271	357	524	2,801	4,880	3,363	12	3,375	8,255

Water Year	Sources with the Basin							Sources Outside of the Basin			Total Water Use AFY
	Groundwater Use AFY							Surface Water Use AFY			
	Private Domestic Use [a]	Agricultural Use [b]	Institutional Use [c]	Central Water District [d]	City of Santa Cruz [d, e]	Soquel Creek Water District [d]	Total	City of Santa Cruz [f]	Soquel Creek Water District [d]	Total	
				Municipal Use				Municipal Use			
2024	591	315	276	375	188	2,942	4,687	3,694	0	3,694	8,381

[a] Estimated based on annual WUF per connection determined from metered Small Water Systems and applied to each residence outside of municipal water service areas (less accurate). WUF for WY 2024 was 0.26 AF per connection

[b] Estimated based on irrigation demand determined using the GSFLOW model, crop acreage, and crop coefficient (less accurate).

[c] Estimated based on historical water usage for facility use including an estimate of turf irrigation based on irrigation demand determined using the GSFLOW model, irrigation acreage, and turf's crop coefficient (less accurate).

[d] Direct measurement by meters (most accurate).

[e] Includes extraction exceeding injection/storage at any Beltz ASR well. Revised to subtract 110 AF of injection for Beltz #8 in WY 2022. Excludes 21 AF of injection at Beltz #8 for WY 2023; WY 2022 and WY 2023 does not include extraction for Beltz #12 because extraction did not exceed injection, Excludes 64 AF of injection at Beltz #9 for WY 2024.

[f] SCWD surface water use in the Basin is not directly metered since the City service area is also outside of the Basin. For purposes of reporting, surface water use in the Basin is estimated based on a proportion of metered consumption that falls within the Basin less SCWD groundwater use as described in footnote *e*.

2.7 Change of Groundwater in Storage

Change of groundwater in storage is estimated using water budget output calculated by the Basin's integrated surface water/groundwater GSFLOW model (Model). Appendix 2-D, 2-E, 2-F, and 2-G of the GSP describe development of the Model's historical period (WY 1985-2015). Each year, as part of Annual Report preparation, the Model is updated through the water year covered by the Annual Report. The Model currently simulates WY 1985-2024.

As described in Appendix 2-F, the entire Model area was calibrated using data from WY 1985 to 2015 to support GSP development. The Model has not been fully recalibrated through WY 2024. However, the following localized recalibration efforts have been undertaken to ensure new groundwater sustainability and management projects are accurately simulated in the model:

- A small portion of the Model near the Pure Water Soquel project was recalibrated based on information from pilot testing of the Twin Lakes Church SWIP recharge well (PWS, 2023).
- Simulated streambed conductivity was recalibrated to improve model accuracy at interconnected surface water RMP.
- The Model's simulation of groundwater elevations and surface water discharge was validated from WY 2015 to 2022 to support the Basin Optimization Study. This effort indicated that the Model's accuracy over WY 2015 to 2022 remained similar to the fully calibrated WY 1985 to 2015 period.

Each year the Model is updated with climate data, metered groundwater extraction, metered recharge, and estimates of non-metered pumping. Updates to these inputs for WY 2024 are detailed below.

Updated climate data included the following:

- Precipitation data from the Santa Cruz Co-op station sourced from NOAA. Missing data were filled using a regression from precipitation data from the De Laveaga California Irrigation Management Information System (CIMIS) station.
- Precipitation data from the Watsonville Waterworks station sourced from NOAA.
- Temperature data from the Santa Cruz Co-op station sourced from NOAA. Missing data were filled using a regression from temperature data from the Watsonville Waterworks station.
- Temperature data for the upper watershed location through December 2023 from DAYMET. Because DAYMET data are only available through December 2023,

January 2024 through September 2024 temperature data are derived from a regression of historical DAYMET data (1 km by 1 km grid) with coarser gridded (4 km by 4 km grid) Parameter-elevation Relationships on Independent Slopes Model (PRISM) data, which are available through September 2024.

Updated groundwater extraction data include the following:

- Metered municipal pumping and recharge volumes provided by CWD, SCWD, and SqCWD
- Domestic water use factor of 0.26 acre-feet per year (AFY) and population estimates
- Non-municipal irrigation demand estimated based on Precipitation Runoff Modeling System (PRMS) watershed simulation of potential and actual evapotranspiration with the Model using updated climate data

Based on the updated Model simulation through WY 2024, Figure 19 shows the annual groundwater budget for the Basin including annual change of groundwater in storage and cumulative change of groundwater in storage. Change in storage is presented as a line where negative numbers indicate a loss in storage and positive numbers indicate a gain in storage. WY 2024 had an increase of groundwater in storage of 2,475 AF that follows an even greater increase of 5,229 AF in WY 2022. Cumulative change of groundwater in storage had remained relatively stable from 2005 to 2022 but the last 2 years have had significant gains of groundwater in storage. Generally, since 2005, losses of groundwater in storage have occurred in dry and critically dry years with increases in wet years. The gain in WY 2024 was less than in WY 2023, but still the second largest increase since 2006. In this coastal basin, groundwater in storage increases are lessened by offshore flows. Offshore flows help prevent seawater intrusion but net offshore flows for the Basin do not necessarily prevent localized seawater intrusion.

Figure 20 through Figure 25 show the distribution of modeled WY 2024 change in storage across the Basin for the principal aquifer units: Aromas Red Sands, Purisima F/DEF units, Purisima BC unit, Purisima A unit, Purisima AA unit, and Tu unit. While these maps are required for the annual report, their main use is for evaluating how recharge over the water year has changed groundwater in storage in the unconfined areas of the Basin (Figure 20). WY 2024, while classified as a normal year, had above average recharge due to it following a very wet year which allows groundwater recharge to continue into the next year. Accordingly, groundwater in storage in the unconfined Aromas Red Sands aquifer experienced moderate increases in the central portion and southeastern portions of the Basin. These increases are largely due to recharge of the unconfined aquifer associated with above average precipitation.

For the other aquifers, areas with the greatest change in storage mostly correspond with where the aquifer outcrops at the surface. Large areas represented by uncolored cells indicate little change in stored groundwater across the Basin. The cells surrounding Beltz #9 in the Purisima A unit (Figure 23) exhibit storage increases in response to ASR injection demonstration operations. Decreases in storage near Beltz #12 in the Purisima AA unit (Figure 24) are a result of increased pumping at that well and the nearby SqCWD O’Neill well relative to the previous year. Storage decreases in the vicinity of these wells, in the Tu aquifer (Figure 25), are also due to increased pumping in these wells, which are screened in both the Purisima AA and the Tu unit.

Overall results from the Model simulation show substantial increases (in green and blue) and limited areas of decrease (in orange and red) of groundwater in storage, while large areas show minimal (no color) changes. This is consistent with WY 2024 Basin-wide storage changes depicted on Figure 19. In general, greater changes of groundwater in storage are limited to where aquifers are unconfined. Therefore, these maps do not fully represent groundwater conditions in the Basin as many of the SMC defining undesirable results relate to groundwater elevations in the confined areas of the aquifer units. In confined areas, groundwater elevations can change substantially with very small changes of groundwater in storage. For example, most RMP with groundwater elevation proxies for the seawater intrusion sustainability indicator are in confined units and therefore this indicator cannot be evaluated by these change in storage maps. The maps also do not always represent where more groundwater is extracted because 1) changes of groundwater in storage can be a relatively small contribution of flow to wells, and 2) changes in storage are strongly influenced by the local transmissivity of the aquifer unit.

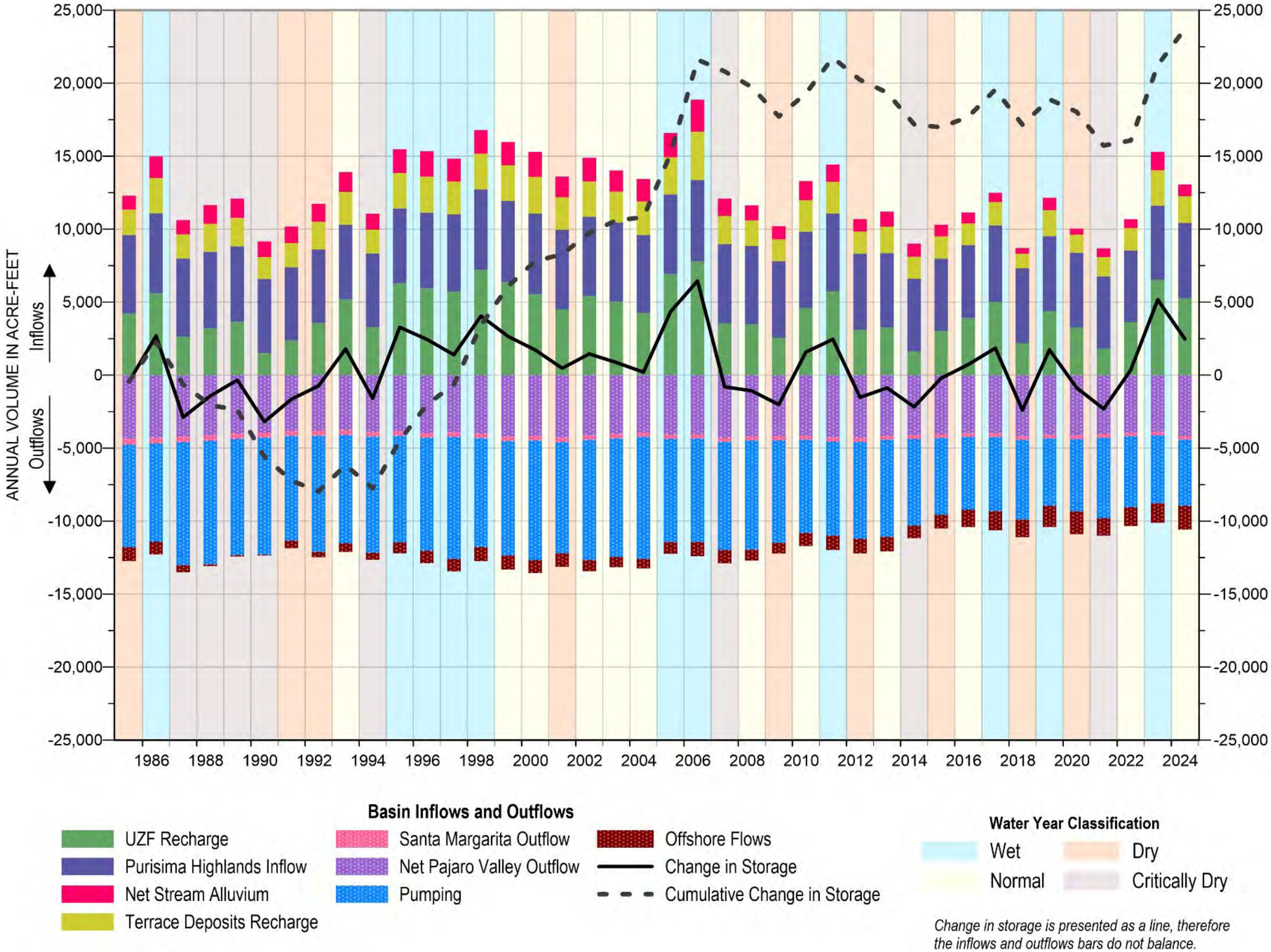


Figure 19. Annual Change in Groundwater in Storage for Santa Cruz Mid-County Basin

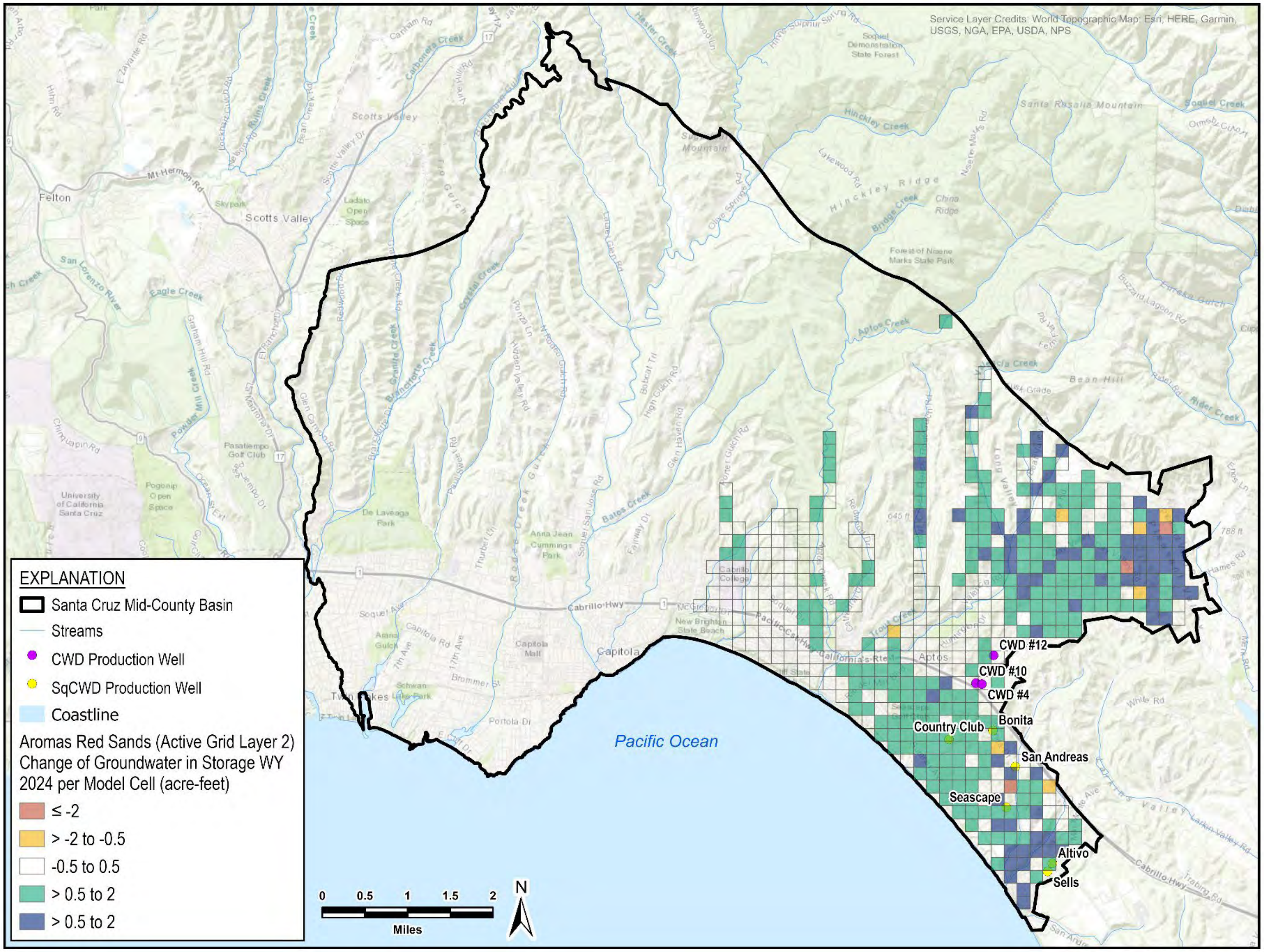


Figure 20. Water Year 2024 Change of Groundwater in Storage in Aromas Red Sands

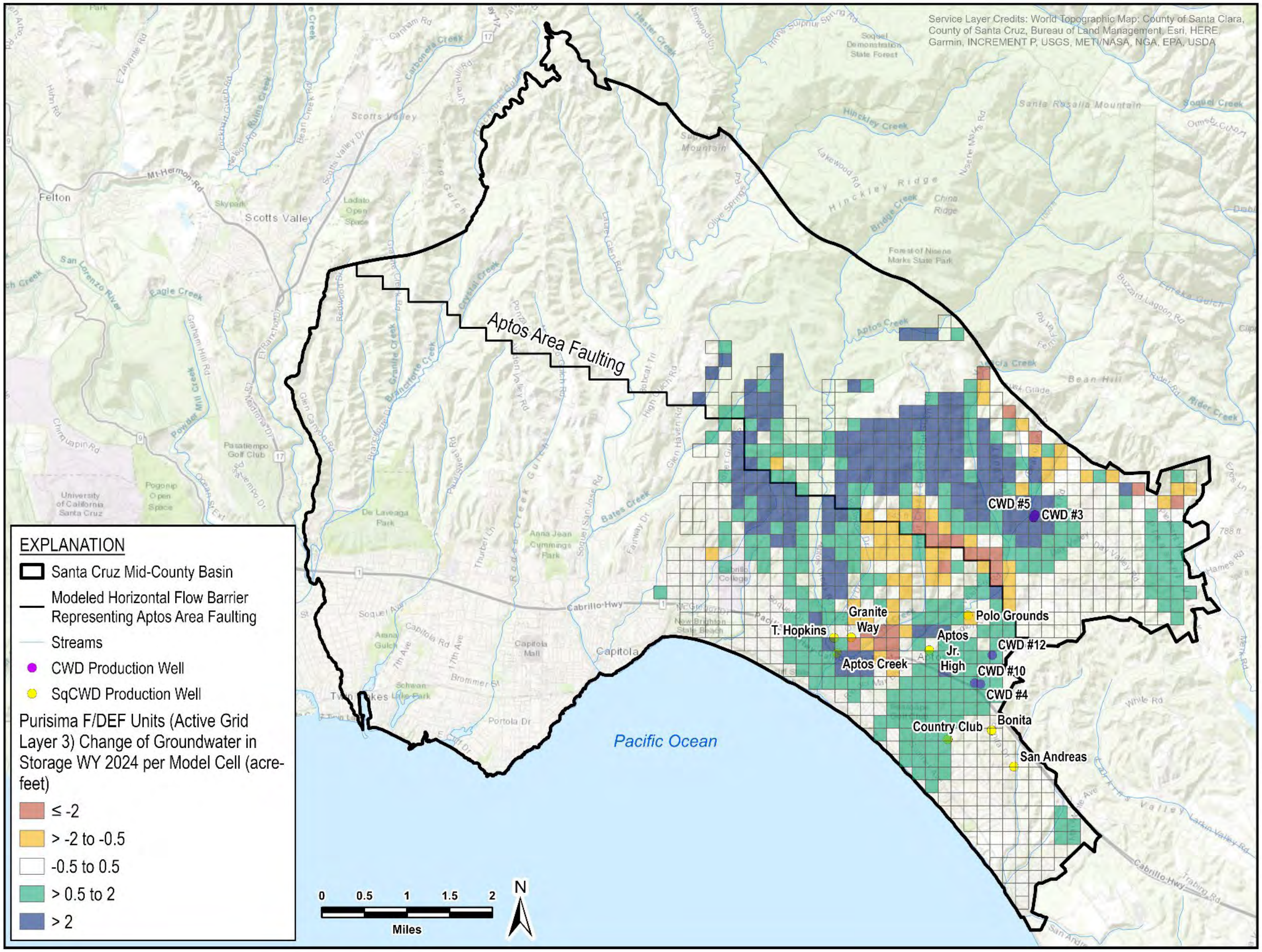


Figure 21. Water Year 2024 Change of Groundwater in Storage in Purisima F/DEF Units

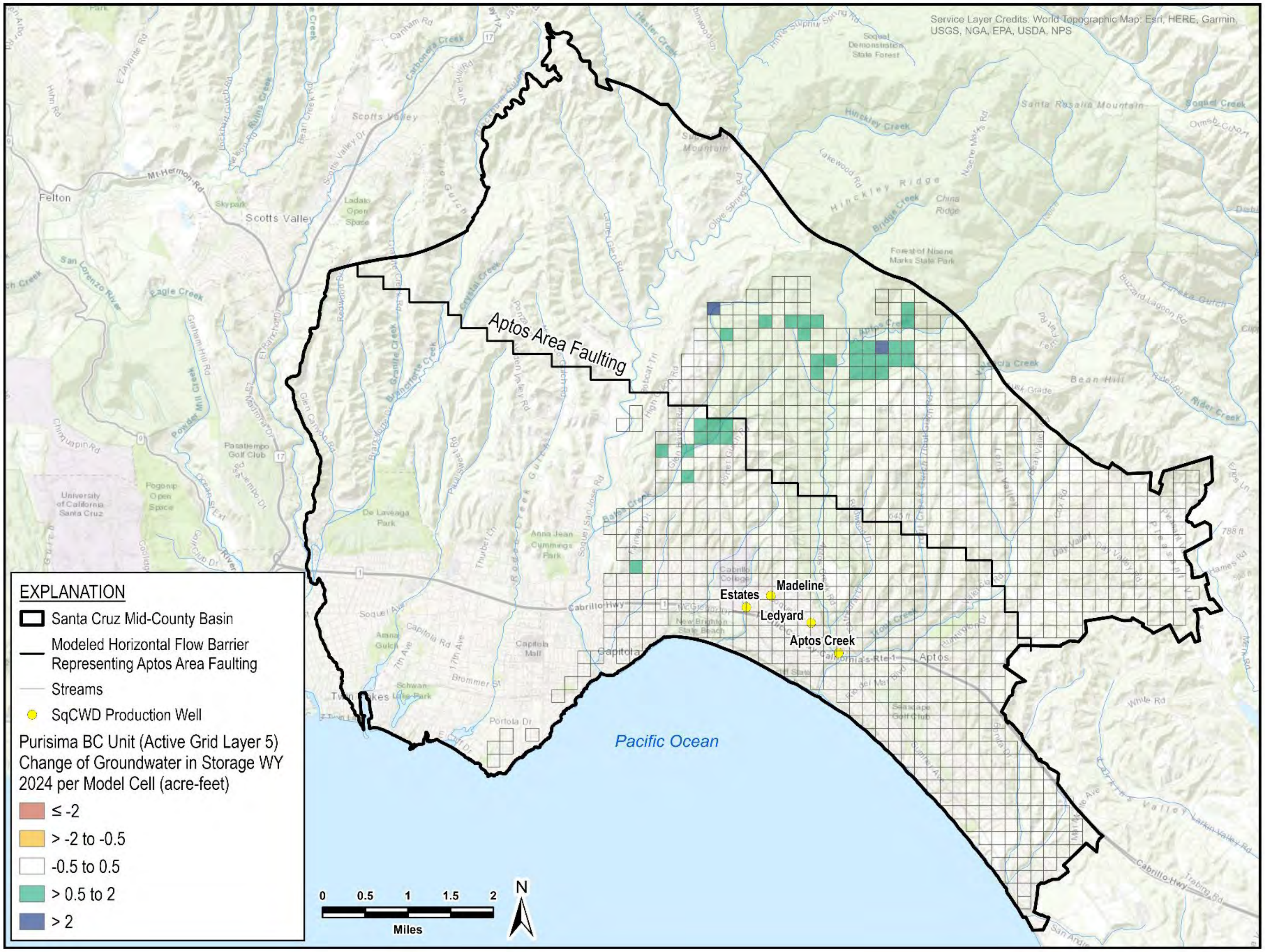


Figure 22. Water Year 2024 Change of Groundwater in Storage in Purisima BC Unit

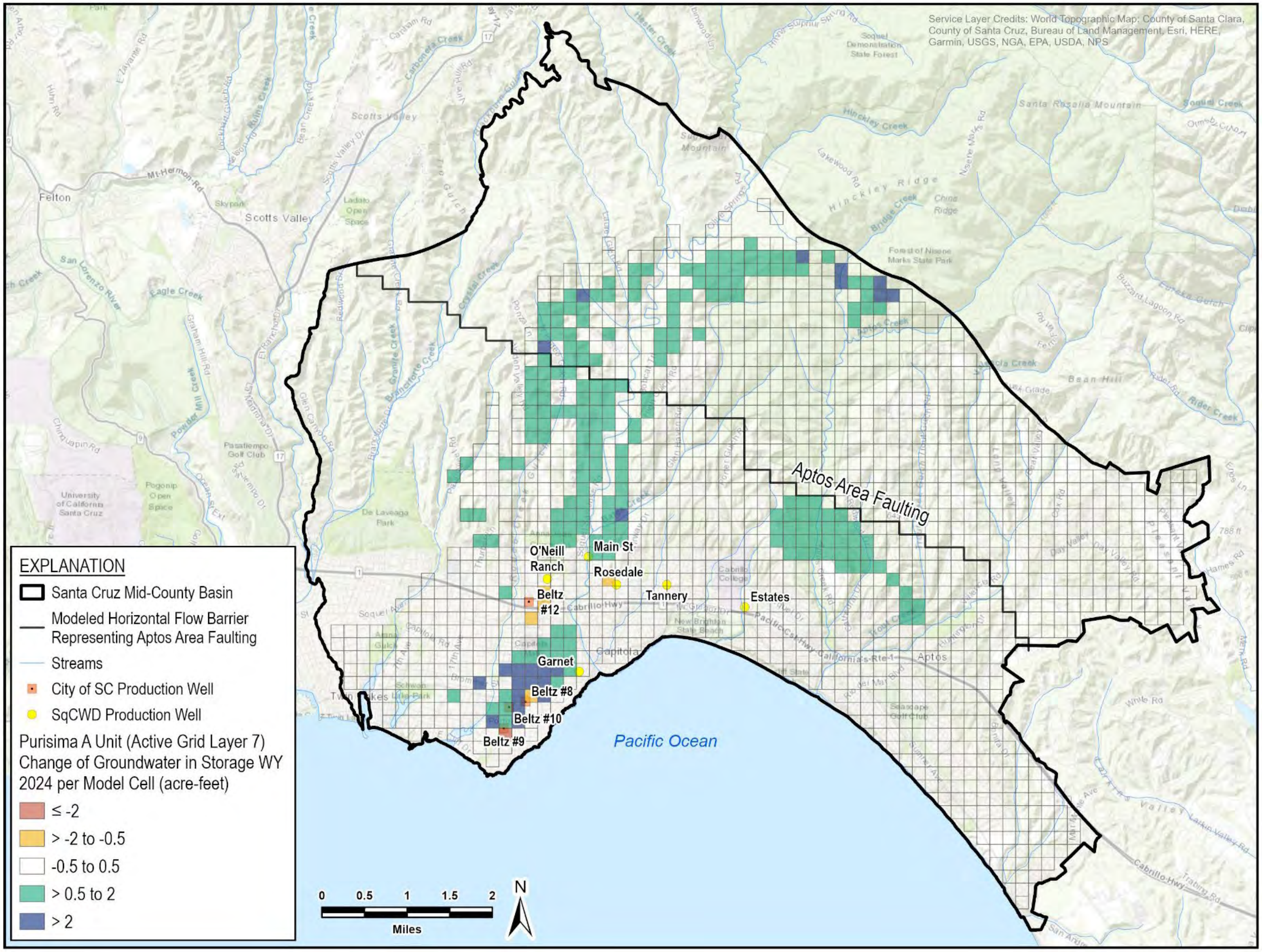


Figure 23. Water Year 2024 Change of Groundwater in Storage in Purisima A Unit

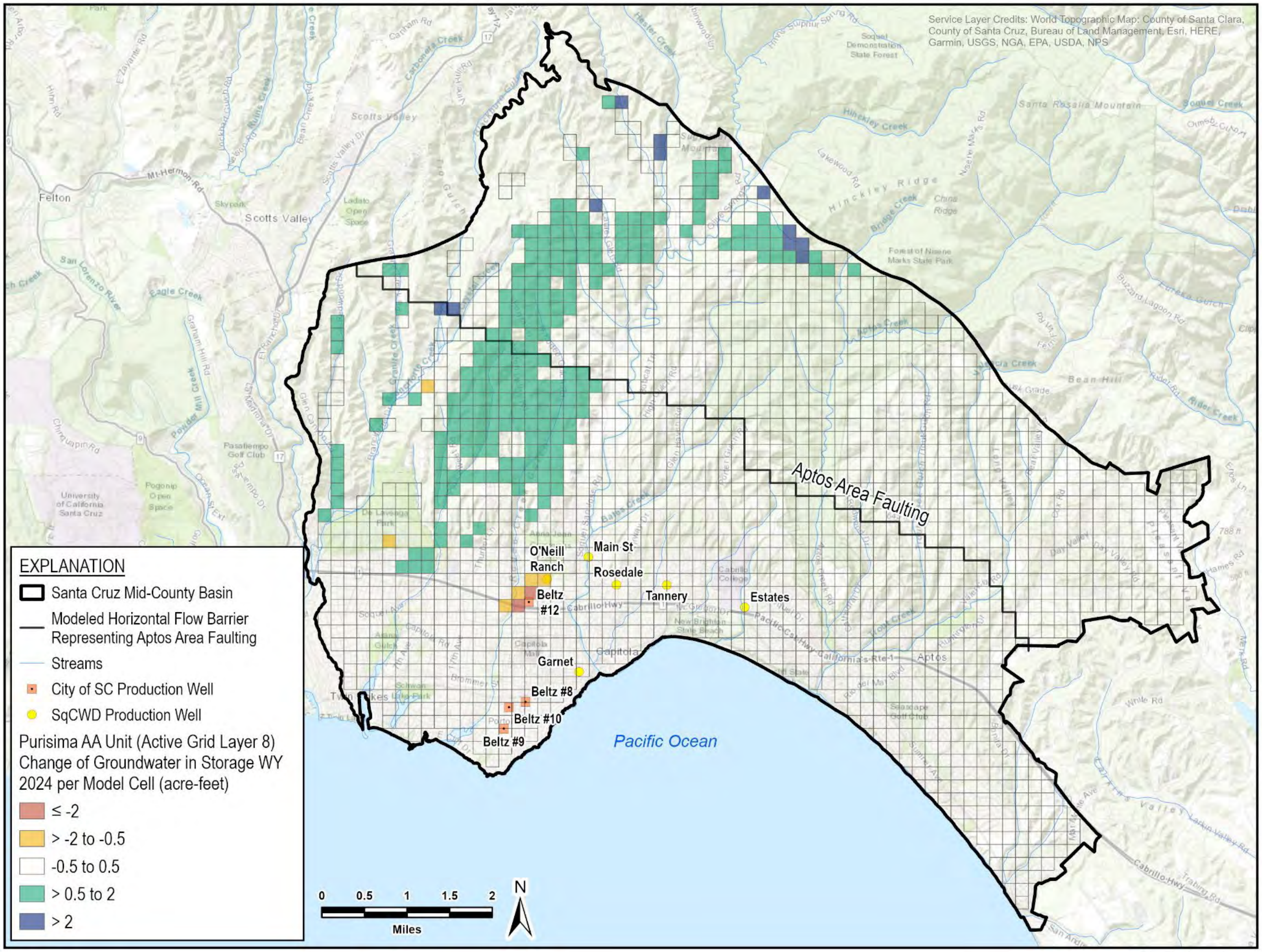


Figure 24. Water Year 2024 Change of Groundwater in Storage in Purisima AA Unit

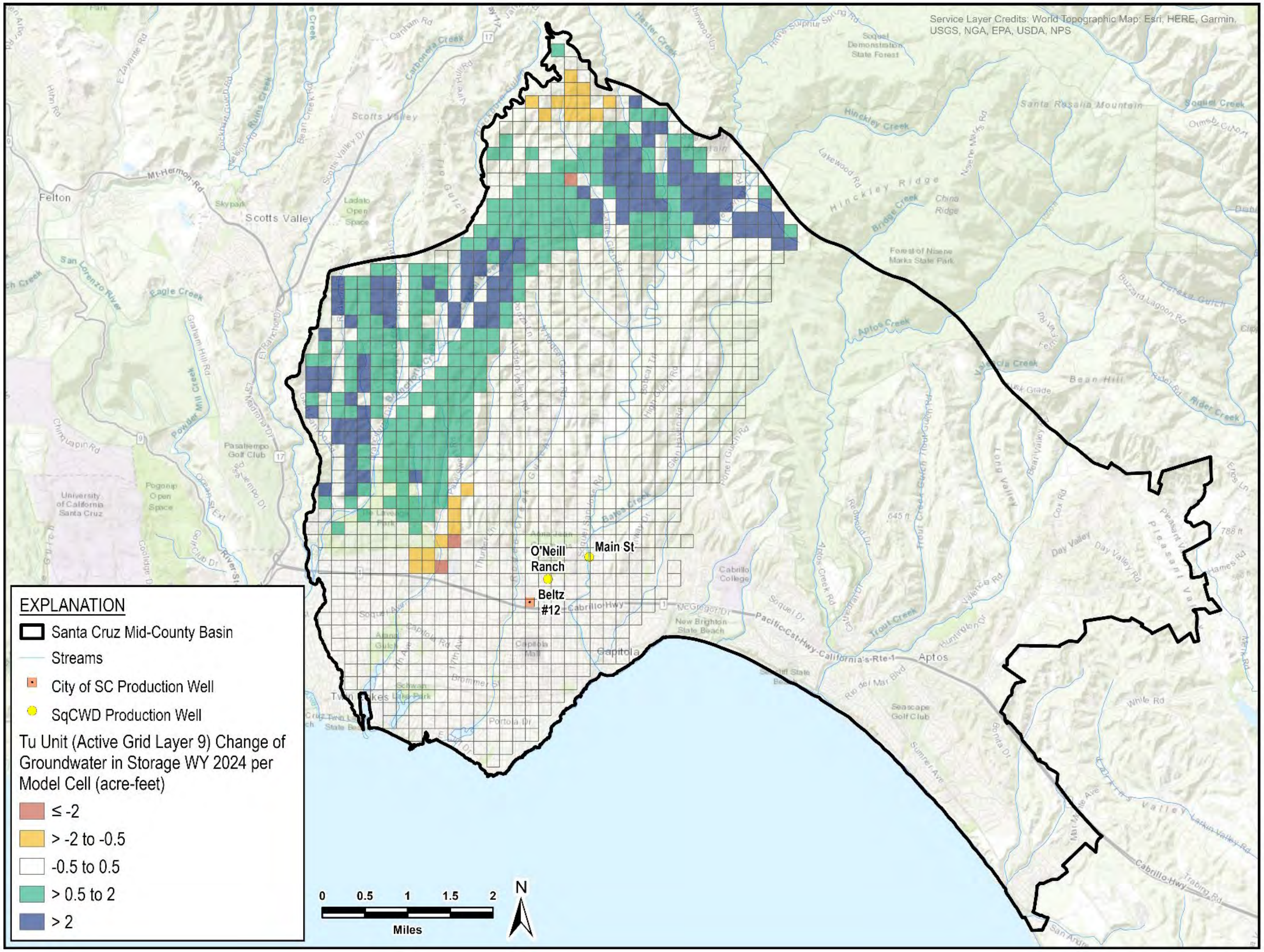


Figure 25. Water Year 2024 Change of Groundwater in Storage in Tu Unit

3 PROGRESS TOWARD IMPLEMENTING THE PLAN

This section evaluates progress toward achieving the GSP sustainability goal by comparing groundwater conditions in WY 2024 to SMC for each of the applicable sustainability indicators. The section concludes with an update on implementation of projects and management actions to achieve sustainability.

3.1 Chronic Lowering of Groundwater Levels

Table 6 shows the status of SMC at RMPs for chronic lowering of groundwater levels. Sustainable management criteria for this indicator are met when groundwater elevations are at or above the criteria. Hydrographs for chronic lowering of groundwater levels RMPs (Appendix A Figures A-1 through A-17) show WY 2024 groundwater elevations above MTs at all RMPs, so there are no undesirable results for chronic lowering of groundwater levels. Groundwater elevations are below MOs for 15 of the 17 RMPs for this indicator. CWD-5 and Private Well #1 groundwater elevations rose above their MOs. Interim milestones are the same as the long-term MOs based on conditions prior to GSP development, so the goal is to meet MOs throughout the GSP implementation period.

Table 6. Chronic Lowering of Groundwater Levels Sustainable Management Criteria Compared to Representative Monitoring Point Groundwater Elevations

Representative Monitoring Point	Well Type	Aquifer	Minimum Threshold	Measurable Objective	Interim Milestone 2025	WY 2020	WY 2021	WY 2022	WY 2023	WY 2024
			Groundwater Elevation feet amsl			Minimum Average Monthly Groundwater Elevation feet amsl				
SC-A7C	Monitoring	Aromas	0	8	8	6.0	5.8	5.8	5.8	6.5
Private Well #2	Production	Purisima F	562	596	596	596.4	594.9	592.9	592.3	594.8
Black	Monitoring		10	41	41	46.1	44.1	44.8	40.3	40.4
CWD-5	Monitoring		140	194	194	195.1	194.2	193.8	193.8	195.2
SC-23C	Monitoring		15	49	49	45.8	44.5	44.3	44.5	44.3
SC-11RD	Monitoring	Purisima DEF	295	318	318	315.2	315.2	313.7	314.7	315.0
SC-23B	Monitoring		50	85	85	78.8	62.7	60.0	60.2	60.2
SC-11RB	Monitoring	Purisima BC	120	157	157	154.8	152.6	151.8	152.0	153.5
SC-19	Monitoring		56	95	95	78.4	78.5	73.3	74.2	74.2
SC-23A	Monitoring		0	44	44	38.8	39.6	39.8	39.4	41.0
Coffee Lane Shallow	Monitoring	Purisima A	27	47	47	44.7	44.8	43.9	43.9	45.6
SC-22A	Monitoring		2	24	24	22.2	22.4	21.6	22.2	23.4
SC-22AA	Monitoring	Purisima AA	0	22	22	20.3	20.7	19.4	20.1	21.1
SC-10RAA	Monitoring		35	76	76	69.3	69.1	68.2	70.8	70.6
Private Well #1	Production	Purisima AA/Tu	362	387	387	383.5	382.6	379.7	380.2	389.9
30th Ave Deep	Monitoring	Tu	0	30	30	27.4	21.3	21.8	26.3	27.9
Thurber Lane Deep	Monitoring		-10	33	33	19.1	-1.1	4.6	15.1	13.6

Minimum threshold not met
Minimum threshold achieved but measurable objective not met
Measurable objective met

3.2 Reduction of Groundwater in Storage

Table 7 shows the status of reduction of groundwater in storage SMC, which is based on sustainable yields for 3 aquifer groups estimated for the GSP. Sustainable management criteria for this indicator are met when net extraction (all groundwater extraction less injection) is at or below criteria for sustainable yields. Because sustainable yield is primarily based on eliminating critical overdraft related to seawater intrusion, a 5-year moving average net extraction is applied to be consistent with 5-year moving averages used for seawater intrusion MT groundwater elevation proxies. Five-year moving average net extraction below the MT is considered sustainable.

The Tu unit and the Purisima DEF, BC, A, and AA aquifer groups had 5-year average net extraction through WY 2024 less than the sustainable yield/MT. This is the first year that the 5-year average net extraction for the Purisima DEF, BC, A, and AA aquifer group was less than the sustainable yield/MT, likely due to reduced production at the Beltz wellfield. The 5-year average net extraction volumes for the Aromas Red Sands and Purisima F aquifer group is greater than the MT, which indicates undesirable results for this sustainability indicator. Net extraction needs to be reduced to or below MTs to eliminate undesirable results. Groundwater modeling, conducted as part of GSP development and more recently as part of an optimization study, shows that avoidance of undesirable results can be achieved when PWS is implemented. Implementation of PWS and ASR will help the Basin limit net extractions to the sustainable yield thus meeting MOs. The planned ASR project will benefit the Tu unit by prioritizing recharge in Tu unit screened ASR wells. Increased SqCWD pumping from Purisima A and BC aquifer units where PWS injection takes place will allow for reductions of SqCWD Tu unit pumping in the western portion of the Basin and from the Purisima F and Aromas Red Sands in the eastern portion of the Basin.

The interim milestone for 2025 was set based on planned schedule for implementation of projects and management actions to reduce net extraction to below sustainable yield. The 5-year net average extraction for all 3 aquifer groups through WY 2024 did not meet these interim milestones as planned projects and management actions have not been implemented yet.

The MO is based on annual net extraction that could occur while ensuring net annual groundwater extractions greater than the MT will not occur for any 1 of the 3 aquifer groups even if there were 4 subsequent years of maximum projected net groundwater extraction. Net extraction in WY 2024 did not meet MOs for the 3 aquifer groups and was greater than the MT for the Aromas Red Sands and Purisima F aquifer group.

Table 7. Reduction in Groundwater in Storage Sustainable Management Criteria Compared to Net Extraction

Aquifer Unit Group	Minimum Threshold	Interim Milestone 2025	WY 2020-2024	Measurable Objective	WY 2024
	Five-Year moving average Net Extraction AFY			Net Extraction AFY	
Aromas Red Sands and Purisima F	1,740	1,930	1,959	1,680	1,841
Purisima DEF, BC, A and AA	2,280	2,110	2,269	960	1,917
Tu	930	720	866	620	929

Minimum threshold not met	Measurable objective not met
Minimum threshold met	Measurable objective met

3.3 Seawater Intrusion

3.3.1 Chloride Concentrations

Table 8 shows the status of SMC for chloride concentrations compared to maximum concentrations for the past 5 years, including WY 2024. Sustainable management criteria for this indicator are met when chloride concentrations are at or below criteria concentrations. Any RMP with 2 or more of the last 4 consecutive quarterly samples greater than the MT constitutes an undesirable result for seawater intrusion.

There are 6 wells with 2 or more consecutive exceedances of MTs during WY 2024. These wells include 1 in the Aromas Red Sands, and 5 in the Purisima F unit:

- Chloride concentrations exceeded the MT in 2 of 4 consecutive samples: SC-A3A (Aromas Red Sands), SC-A8A (Purisima F unit), and SC-A5A (Purisima F unit).
- Chloride concentrations exceeded the MT in 3 of 4 consecutive samples: SC-A2RA (Purisima F unit).
- Chloride concentrations exceeded the MT in 4 of 4 consecutive samples: SC-A2RB and SC-A5B; both are Purisima F unit monitoring wells.

Undesirable results are occurring for the first time in monitoring wells SC-A3A and SC-A2RA. Undesirable results have been occurring at SC-A8A and SC-A5A for 2 consecutive years, and have been occurring at SC-A2RB and SC-A5B for 4 or more consecutive years.

There were some notable changes in chloride concentrations in monitoring wells with existing seawater intrusion:

- SC-A3A in the Aromas Red Sands increased 5,900 milligrams per liter (mg/L) to above the MT for the first time.

- SC-A3B in the Aromas Red Sands decreased 530 mg/L and dropped below the MO for the first time.
- SC-A8A in the Purisima F unit increased 1,590 mg/L and remains above the MT.
- SC-A2RA in the Purisima F unit increased 1,800 mg/L and remains above the MT.
- SC-A2RB, SC-A5A, and SC-A5B all in the Purisima F unit had slight increases in chloride concentrations and remain above their respective MTs.

In previous years and in WY 2024, increasing chloride concentrations above the MT have been observed in 5 Purisima F unit RMPs (SC-A5A, SC-A5B, SC-A8A, SC-A2RA, and SC-A2RB) all in the Seascape area. In the future, SqCWD plans to further reduce pumping from the Aromas Red Sands aquifer such as at the Seascape and San Andreas wells with the operation of PWS to help mitigate advancement of seawater intrusion. This year, chloride concentrations also increased above the MT in one of the Aromas Red Sands RMP, SC-A3A, in La Selva Beach. The MT exceedances were noted in January and April 2024, but the chloride concentration dropped to near its MO by July 2024 (Appendix B Figure B-1). MGA will continue to monitor results in this well and consider additional study in the vicinity if the MT exceedance occurs again or if a more definitive increasing chloride concentration is observed.

Other than the San Andreas and Seascape water supply wells and SC-A1B, the other 5 of 8 Purisima F unit RMPs have not achieved MOs; however, 2 of 3 Aromas Red Sands RMPs have achieved MOs. All RMPs in the deeper Purisima units met MOs, except at Soquel Point Deep and SC-3AA in the Purisima AA unit, and SP-5 in the Tu unit. Interim milestones are the same as MOs for chloride concentrations.

Figure 26 shows maximum chloride concentrations mapped with the chloride isocontour established as a MT in the GSP. For this annual report, a Tu unit 250 mg/L MT chloride isocontour has been added to Figure 26. Appendix B includes chemographs for chloride concentrations at coastal monitoring wells; SC-3AA and SP-5 are now included in Appendix B chemographs.

The MGA continues to investigate potential causes of increasing chlorides in the Seascape area (M&A, 2024). Seawater intrusion within the Purisima F unit has been present prior to the first documented well log (Seascape well) identifying high salinity water in 1970. AEM data collected by DWR in 2022 confirms seawater intrusion extending inland. The poor groundwater quality at depth forced water supply and agricultural wells in the area to be completed shallower than planned, typically in the Aromas Red Sands. Planned work in WY 2025 is to sample private wells in the area to expand understanding of chloride distribution and to conduct a land-based or AEM survey to delineate the inland and lateral extent of seawater intrusion to better inform actions to protect the Basin from seawater intrusion.

Table 8. Chloride Concentrations Adjacent to 250 mg/L Chloride Isocontour for Seawater Intrusion

Representative Monitoring Point	Aquifer	Minimum Threshold	Measurable Objective	Interim Milestone 2025	WY 2020	WY 2021	WY 2022	WY 2023	WY 2024
		Maximum Chloride Concentration, mg/L							
Coastal Monitoring Wells – Intruded (undesirable results if > minimum threshold in >=2 of 4 consecutive quarterly samples)									
SC-A3A	Aromas	22,000	17,955	17,955	18,500	18,600	19,200	18,400	24,300*
SC-A3B	Aromas	4,330	676	676	767	1,070	871	876	346
SC-A8A	Purisima F	8,000	7,258	7,258	7,670	7,710	9,770	9,310*	10,900*
SC-A2RA	Purisima F	18,480	14,259	14,259	15,000	15,200	15,400	20,300	22,100*
SC-A2RB	Purisima F	470	355	355	564*	480*	522*	584*	593*
Moran Lake Med	Purisima A	700	147	147	53	47	46	47	47
Soquel Point Med	Purisima A	1,300	1,104	1,104	1,200	1,200	1,200	1,100	1,000
Coastal Monitoring Wells - Unintruded (undesirable results if > 250 mg/L in >=2 of 4 consecutive quarterly samples)									
SC-A8B	Aromas	250	100	100	35	53	43	36	34
SC-A1B	Purisima F	250	100	100	29	28	28	28	28
SC-A1A	Purisima DEF	250	100	100	29	28	28	29	28
SC-8RD	Purisima DEF	250	100	100	21	20	21	21	21
SC-9RC	Purisima BC	250	100	100	32	31	31	32	32
SC-8RB	Purisima BC	250	100	100	15	13	18	14	14
Pleasure Point Medium	Purisima A	250	100	100	36	NS**	NS**	NS**	NS**
SC-1A	Purisima A	250	100	100	49	48	47	48	54
SC-5RA	Purisima A	250	100	100	57	56	56	59	59
SC-3RA	Purisima A	250	100	100	51	40	50	60	60
Moran Lake Deep	Purisima AA	250	100	100	66	66	67	69	68
Pleasure Point Deep	Purisima AA	250	100	100	22	22	24	26	25
Soquel Point Deep	Purisima AA	250	100	100	170	160	170	170	170
SC-3AA[1]	Purisima AA	250	100	100	NS	NS	NS	108	108
SC-13A	Tu	250	100	100	NS	62	66	69	75

Representative Monitoring Point	Aquifer	Minimum Threshold	Measurable Objective	Interim Milestone 2025	WY 2020	WY 2021	WY 2022	WY 2023	WY 2024
		Maximum Chloride Concentration, mg/L							
SP-5[1]	Tu	250	100	100	100	100	210	110	110
Inland Monitoring Well- Intruded (undesirable results if > minimum threshold in >=2 of 4 consecutive quarterly samples)									
SC-A5A	Purisima F	9,800	8,575	8,575	10,800*	9,240	11,400	13,100*	13,700*
Inland Production and Monitoring Wells- Unintruded (undesirable results if > 150 mg/L in >=2 of 4 consecutive quarterly samples)									
SC-A5B	Purisima F	150	100	100	133	173*	164*	195*	227*
San Andreas PW	Purisima F	150	100	100	22	22	21	22	22
Seascape PW	Purisima F	150	100	100	19	17	18	18	18
T. Hopkins PW	Purisima DEF	150	100	100	50	25	45	60	NS
Estates PW	Purisima BC & A	150	100	100	48	13	45	47	48
Ledyard PW	Purisima BC	150	100	100	35	12	42	38	36
Garnet PW	Purisima A	150	100	100	85	86	86	88	88
Beltz #2	Purisima A	150	100	100	69	68	64	66	64
Beltz #8 PW	Purisima A	150	100	100	53	52	48	49	NS
SC-22AA	Purisima AA	150	100	100	41	39	39	39	40
Corcoran Lagoon Deep	Purisima AA	150	100	100	23	23	NS	27	29
Schwan Lake	Purisima AA	150	100	100	97	93	93	98	96

Minimum threshold not met

Minimum threshold achieved but measurable objective not met

Measurable objective met

NS = not sampled

NS** = not sampled due to stuck sampling equipment

* = Undesirable Result

1 = Added in WY 2024 in accordance with the 2025 Periodic Evaluation

Figure 26. Water Year 2024 Maximum Chloride Concentration Map Compared to Minimum Threshold Isocontour

3.3.2 Groundwater Elevation Proxies

Table 9 lists groundwater elevation proxies used for seawater intrusion SMC. These groundwater elevations are protective elevations estimated to prevent further seawater intrusion over the long-term. Sustainable management criteria for this indicator are met at a specific RMP when 5-year moving average groundwater elevations are at or above the groundwater elevation proxy for the RMP. Two new coastal RMP were added to the MGA groundwater levels network: SC-3AA in the Purisima AA unit and SP-5 in the Tu unit.

Hydrographs for seawater intrusion groundwater elevation proxy RMPs (Figures A-18 through A-36) show 5-year moving averages in comparison to groundwater elevation proxies for seawater intrusion SMC. Annual minimums of the 5-year moving averages for groundwater elevations in the Tu, Purisima AA, A, BC, and DEF unit coastal RMPs were within 6 inches of the previous year except for SC-5RA and SC-3RA which were higher by 1.5 feet and 1 foot, respectively. The Purisima F unit and Aromas Red Sands coastal monitoring wells have stable 5-year moving average groundwater elevations that only changed by two tenths of a foot from the previous year. The 5-year moving average groundwater elevation in SC-A3A in the Aromas Red Sands has remained above its MT for a fourth consecutive year.

Coastal RMPs with 5-year moving average groundwater elevations below MTs include the following:

- SC-A8A (one of 3 Purisima F unit RMPs)
- SC-9RC and SC-8RB in the Purisima BC unit:
- SC-5RA and Soquel Point Medium (2 of 6 Purisima A unit RMPs)
- Soquel Point Deep (1 of 3 Purisima AA unit RMPs)
- SC-13A and SP-5 (both Tu unit RMPs): the 5-year moving average groundwater elevation below the MT at SP-5 is not considered an undesirable result because there are only 53 months of available data used to calculate the 5-year moving average.

Since there are RMPs with 5-year moving average groundwater elevations below MTs, undesirable results for seawater intrusion continue to occur and the Basin remains in a state of critical overdraft. For RMPs with undesirable results, the 5-year moving groundwater elevation averages generally remained close to WY 2023 elevations or had slight increases, except for SC-13A which decreased slightly. MOs for groundwater elevation proxies are met at several RMPs screened in the Purisima F, DEF, and A units, including SC-A2RA in the Seascape area. It is important to acknowledge that because undesirable results from chloride concentrations are occurring in SC-A2RA, its groundwater elevation proxy MTs and MOs are not high enough to stop the advancement of seawater intrusion and they should be re-examined.

Interim milestones for WY 2025 are based on modeled groundwater elevations simulated with a project start date of WY 2023, which was too optimistic since PWS will only start operating in WY 2025. Table 9 shows that 13 of 17 RMPs have groundwater elevations higher than WY 2025 interim milestones. The 4 RMPs with groundwater elevations below their 2025 interim milestones are SC-8RB, SC-5RA, Soquel Point Medium, and Soquel Point Deep (Table 9). The 3 RMPs that have groundwater elevation MT exceedances but are above 2025 interim milestones are SC-A8A, SC-9RC, and SC-13A.

Table 9. Groundwater Elevation Proxies for Seawater Intrusion

Representative Monitoring Point	Aquifer	Minimum Threshold	Measurable Objective	Interim Milestone 2025	WY 2020	WY 2021	WY 2022	WY 2023	WY 2024
		Groundwater Elevation feet amsl			Annual Minimum of 5-Year Moving Average Groundwater Elevation, feet amsl				
SC-A3A	Aromas	3	4	3	2.9	3.1	3.2	3.4	3.6
SC-A1B	Purisima F	3	5	3	7.5	7.4	7.3	7.3	7.3
SC-A8A	Purisima F	6	7	4.5	5.3	5.0	5.0	5.0	5.2
SC-A2RA	Purisima F	3	4	3	6.5	6.6	6.6	6.6	6.6
SC-8RD	Purisima DEF	10	11	10	12.6	13.9	14.0	14.3	14.7
SC-9RC	Purisima BC	10	11	4.6	8.9	9.6	8.2	8.1	8.2
SC-8RB	Purisima BC	19	20	8.4	5.8	5.2	4.9	4.9	5.1
SC-5RA	Purisima A	13	15	13	9.3	10.2	10.1	10.2	11.8
SC-3RA	Purisima A	10	12	10	11.7	11.5	11.3	11.3	12.3
SC-1A	Purisima A	4	6	4	9.7	10.4	10.6	10.7	10.8
Moran Lake Medium	Purisima A	5	6.8	5	5.9	6.2	6.4	6.3	6.4
Soquel Point Medium	Purisima A	6	7.1	6	5.7	5.9	5.9	5.8	5.8
Pleasure Point Medium	Purisima A	6.1	6.5	6.1	7.9	9.3	10.2	9.9	9.9
Moran Lake Deep	Purisima AA	6.7	16	6.7	6.8	7.0	7.2	7.1	7.2
Soquel Point Deep	Purisima AA	7.5	16	7.5	6.3	6.8	6.9	6.9	7.0
Pleasure Point Deep	Purisima AA	7.7	16	7.7	8.7	10.1	10.9	10.6	10.2
SC-3AA[1]	Purisima AA	14.3	20.2	19.1	NA	NA	NA	NA	15.1[a]
SC-13A	Tu	17.2	19	8.3	14.8	15.1	15.4	16.5	16.2
SP-5[1]	Tu	24.8	24.8	22.7	NA	NA	NA	NA	22.3[b]

Minimum threshold not met (red)
Minimum threshold achieved but measurable objective not met (yellow)
Measurable objective met (green)

[a] = 23 months of data
[b] = 53 months of data
[1] = Added in WY 2024 in accordance with the 2025 Periodic Evaluation

3.3.3 Seawater Intrusion Triggers

Although not required by the SGMA regulations, the GSP includes triggers for early management actions to prevent significant and unreasonable seawater intrusion, the indicator for which the Basin is in critical overdraft. Chloride concentration triggers are exceeded when annual average concentrations exceed the 2013-2017 average concentration (i.e., MO) and show an increasing trend. There are 10 wells with annual average chloride concentrations above MOs:

- RMP in the southeastern portion of the Basin
  - SC-A3A (Aromas Red Sands; Appendix B; Figure B-1)
  - SC-A8A (Purisima F unit; Appendix B; Figure B-3)
  - SC-A2RA (Purisima F unit; Appendix B; Figure B-4)
  - SC-A2RB (Purisima F unit; Appendix B; Figure B-5)
  - SC-A5A (Purisima F Unit; Appendix B; Figure B-24)
  - SC-A5B (Purisima F Unit; Appendix B; Figure B-25).
- RMP in the western portion of the Basin
  - Soquel Point Medium (Purisima A unit; Appendix B; Figure B-7)
  - Soquel Point Deep (Purisima AA unit; Appendix B; Figure B-20)
  - SC-3AA (Purisima AA unit; Appendix B; Figure B-21)
  - SP-5 (Tu unit; Appendix B; Figure B-23)

Of those 10 wells, SC-A5Aand SC-A2RB—both in the Purisima F unit in the southeast portion of the Basin—have increasing chloride trends. This indicates advancement of seawater intrusion that may lead to undesirable results and therefore warrants early management action. The GSP recommends reducing extractions from the nearest municipal well as an early management action. SqCWD's Seascape well—screened in the overlying Aromas Red Sands—is the nearest municipal well as it is on the same site as SC-A5B and SC-A5A. Groundwater extraction at the Seascape well has been limited to less than 50 AFY since 2015, which is much less than previous years, and is consistent with sustainable pumping described in the GSP.

As described in Section 3.3.1, the MGA is investigating the cause of increasing chlorides in this area and has identified local private irrigation wells pumping in the Aromas Red Sands in addition to nearby SqCWD municipal wells that may be changing local groundwater flow dynamics in such a way to cause vertical migration of deeper seawater intrusion. Over the next year, the MGA will continue to collect additional data to better inform actions to protect the Basin from seawater intrusion impacts.

The GSP also includes triggers for groundwater elevation proxies which are at lower elevations than MTs. These triggers are evaluated using 30-day average elevations, rather than the 5-year moving average, to prompt a management action on a shorter time scale. In WY 2024, none of the monitoring wells with SMC for groundwater elevation as a proxy for seawater intrusion had 30-day moving average elevations below trigger levels set at 2 feet amsl.

3.4 Groundwater Quality

Table 10 shows SMC compared to WY 2024 maximum concentrations at RMPs for the degraded groundwater quality indicator. Sustainable management criteria are met when concentrations are at or below criteria. MTs are based on drinking water standards for each constituent of concern. Maximum concentrations at RMPs are also compared to MOs specific to each well based on average WY 2013-2017 concentrations. Interim milestones for groundwater quality are the same as MOs. Exceedances of MT (red shading in the table) for chloride and total dissolved solids are related to seawater intrusion and addressed by that indicator.

In WY 2024, iron and manganese concentrations at several RMPs are greater than MOs that are set higher than MTs. The reason MOs are higher than MTs is because MOs are set at average WY 2013-2017 concentrations, which due to naturally high iron and manganese concentrations are often higher than the drinking water standard used for the MTs. Concentrations above MOs indicate an increase in concentration since WY 2013-2017. Iron and manganese MT exceedances are not considered an undesirable result because it is a pre-existing natural condition not associated with pumping or managed aquifer recharge.

The Rosedale 2 production well had 2 trace detections of 0.64 and 0.43 micrograms per liter (µg/L) of MTBE , which are well below the primary drinking water standard of 13 µg/L. There were no other detections of organic compounds, including 1,2,3-TCP, in any active municipal extraction wells in the Basin.

Table 10. Water Year 2024 Groundwater Quality

Aquifer	Representative Monitoring Point	Total Dissolved Solids mg/L	Chloride mg/L	Iron µg/L[a]	Manganese µg/L[a]	Arsenic µg/L	Chromium (Total) µg/L	Nitrate as Nitrogen mg/L	Organic Compound Detects µg/L
	Minimum Threshold	1,000	250	300	50	10	50	10	
		Water Year 2023 Maximum Concentration							
Aromas	CWD-10 PW	NA	NA	NA	NA	NA	NA	6.0	ND
	SC-A1C	344.0	32.0	NA	NA	NA	NA	NA	NA
	SC-A2RC	136.0	39.0	NA	NA	NA	NA	NA	NA
	SC-A3A	32,600.0	24,300.0	NA	NA	NA	NA	NA	NA
	SC-A3C	108.0	54.0	NA	NA	NA	NA	NA	NA
	SC-A8B	270.0	34.0	NA	NA	NA	NA	NA	NA
	SC-A8C	270.0	37.0	NA	NA	NA	NA	NA	NA
Aromas/ Purisima F	Polo Grounds PW	254.0	23.0	22.0	188.0	ND	ND	0.1	ND
	Aptos Jr. High 2 PW	288.0	33.0	12.0	315.0	ND	ND	ND	ND
	Country Club PW [a]	NA	NA	NA	NA	NA	NA	NA	NA
	Bonita PW	296.0	30.0	ND	ND	ND	11.7	3.4	ND
	San Andreas PW	230.0	22.0	ND	9.0	ND	14.1	1.6	ND
	Seascape PW	210.0	18.0	ND	ND	ND	13.6	1.0	ND
Purisima F	CWD-4 PW	NA	NA	NA	NA	NA	NA	5.0	ND
	CWD-12 PW	NA	NA	NA	NA	NA	NA	1.4	ND
	SC-A2RA	30,500.0	22,100.0	512.0	691.0	NA	NA	NA	NA
	SC-A8A	18,200.0	10,900.0	453.0	3,810.0	NA	NA	NA	NA
Purisima DEF	SC-8RD	334.0	21.0	ND	ND	NA	NA	ND	NA
	SC-9RE	528.0	48.9	78.0	54.0	NA	NA	ND	NA
	SC-A1A	217.0	28.0	NA	NA	NA	NA	NA	NA
	T. Hopkins PW	NA	NA	NA	NA	3.5	NA	ND	ND
	Granite Way PW	284.0	27.0	19.0	15.0	0.9	ND	ND	ND
Purisima BC	Madeline 2 PW	426.0	35.5	271.0	9.0	0.5	1.2	ND	ND

Aquifer	Representative Monitoring Point	Total Dissolved Solids mg/L	Chloride mg/L	Iron µg/L[a]	Manganese µg/L[a]	Arsenic µg/L	Chromium (Total) µg/L	Nitrate as Nitrogen mg/L	Organic Compound Detects µg/L
	Minimum Threshold	1,000	250	300	50	10	50	10	
		Water Year 2023 Maximum Concentration							
Purisima A	Aptos Creek PW	NA	NA	NA	NA	NA	NA	NA	NA
	Ledyard PW	362.0	36.0	77.0	11.0	0.9	1.1	ND	ND
	SC-23A	254.0	20.1	ND	ND	NA	NA	ND	NA
	SC-8RB	508.0	14.0	23.0	ND	NA	NA	ND	NA
	SC-9RC	418.0	32.0	ND	ND	NA	NA	ND	NA
	30th Ave Shallow	770.0	53.0	120.0	1,300.0	NA	NA	ND	NA
	Pleasure Point Shallow	260.0	34.0	86.0	100.0	NA	NA	ND	NA
	Estates PW	470.0	48.4	200.0	98.0	0.6	0.8	ND	ND
	Garnet PW	672.0	87.8	1,460.0	446.0	0.9	1.1	ND	ND
	Tannery 2 PW	560.0	63.0	239.0	154.0	0.7	0.8	ND	ND
	Rosedale 2 PW	486.0	46.5	736.0	284.0	0.6	0.9	ND	0.6 (MTBE)
	Beltz #8 PW	NA	43.0	980.0	270.0	2.0	ND	ND	ND
	Beltz #9 PW	490.0	51.0	88.0	140.0	0.8	ND	ND	ND
	SC-3RC	420.0	48.9	181.0	35.0	NA	NA	ND	NA
	SC-5RA	590.0	59.0	66.0	176.0	NA	NA	ND	NA
	SC-9RA	374.0	15.2	209.0	10.0	NA	NA	ND	NA
	SC-10RA	540.0	47.9	736.0	780.0	NA	NA	ND	NA
	SC-22A	368.0	18.0	419.0	556.0	NA	NA	ND	NA
Purisima A/AA	Beltz #10 PW	NA	82.0	1,300.0	390.0	2.9	ND	NA	NA
Purisima AA	SC-10RAA	248.0	10.2	179.0	74.0	NA	NA	ND	NA
	SC-22AAA	596.0	63.0	26.0	44.0	NA	NA	ND	NA
	Coffee Lane Deep	960.0	48.0	ND	130.0	NA	NA	NA	NA
	Pleasure Point Deep	620.0	25.0	620.0	220.0	NA	NA	ND	NA
	Thurber Lane Shallow	Well not sampled since 2006							

Aquifer	Representative Monitoring Point	Total Dissolved Solids mg/L	Chloride mg/L	Iron µg/L[a]	Manganese µg/L[a]	Arsenic µg/L	Chromium (Total) µg/L	Nitrate as Nitrogen mg/L	Organic Compound Detects µg/L
	Minimum Threshold	1,000	250	300	50	10	50	10	
		Water Year 2023 Maximum Concentration							
Purisima AA/Tu	Schwan Lake	400.0	96.0	320.0	120.0	NA	NA	NA	NA
	O'Neill Ranch PW	442.0	59.0	1,000.0	441.0	0.5	0.5	ND	ND
	Main Street PW	336.0	28.4	102.0	26.0	ND	0.6	ND	ND
	Beltz #12 PW	NA	NA	NA	NA	NA	NA	NA	NA
Tu	SC-18RAA	256.0	17.5	44.0	19.0	NA	NA	ND	NA
	Thurber Lane Deep	Well not sampled since 2006							

Maximum concentration between minimum threshold and measurable objective not met (see note b below)	NA = not analyzed
Minimum threshold met but measurable objective not met in wells with MO less than MT	ND = non-detect at the reporting limit
Measurable objective met	

Note: Water quality data are compared to MOs based on 2013-2017 average concentrations that are constituent and well specific. Refer to the GSP to see well specific MOs.
[a] No Data from Country Club #2 PW because it has not yet been put into service.
[b] Values in **bold** indicate where MO is higher than MT due to natural causes. In these cases, concentrations higher than the MT are not undesirable results.

3.5 Subsidence

As described in the GSP, subsidence is not applicable in the Santa Cruz Mid-County Basin as an indicator of groundwater sustainability.

3.6 Interconnected Surface Water

Table 11 shows groundwater elevation proxies for SMC at RMPs for depletion of interconnected surface water. Sustainable management criteria for this indicator are met when groundwater elevations are at or above proxy elevations.

Hydrographs for 5 depletion of interconnected surface water groundwater elevation proxy RMPs are shown on Figures A-37 through A-41; Appendix A. Of the 5 RMPs, the Balogh monitoring well is the only RMP with minimum average monthly groundwater elevations below its MT groundwater elevation proxy. The other 4 shallow RMPs along Soquel Creek have minimum average monthly groundwater elevations above MT groundwater elevation proxies. Since undesirable results are defined as any depletion of interconnected surface water RMP having groundwater elevations below its MT, undesirable results for surface water depletion are occurring. The Wharf Road monitoring well is the only RMP with groundwater elevations above the MO.

Pure Water Soquel replenishment of the Purisima A unit is expected to benefit the streamflow depletion sustainability indicator by raising shallow groundwater levels along Soquel Creek. Without PWS, simulated monthly groundwater levels are projected to be below the MT at most of the shallow wells. With the PWS project, shallow groundwater levels are projected to rise to MOs and remain above MTs to prevent undesirable results for surface water depletions. The expected benefits are maintained when combining SCWD’s ASR project to PWS. In addition, shallow groundwater levels rise to MOs at the RMP for interconnected surface water depletion.

Table 11. Groundwater Elevation Proxy for Depletion of Interconnected Surface Water

Well Name	Aquifer	Minimum Threshold	Measurable Objective	Interim Milestone 2025	WY 2020	WY 2021	WY 2022	WY 2023	WY 2024
		Groundwater Elevation feet amsl			Minimum Average Monthly Groundwater Elevation feet amsl				
Balogh	Shallow Groundwater	29.1	30.6	29.1	29.1	28.7	28.7	28.8	28.7
Main St. Shallow		22.4	25.3	20.7	22.8	22.3	22.6	22.4	23.9
Wharf Road		11.9	12.1	11.3	12.4	12.0	12.1	12.1	12.7
Nob Hill		8.6	10.3	7.3	5.5	8.2	9.0	8.9	9.2
SC-10RA	Purisima A	68	70	68	69.0	69.9	68.9	69.0	69.3

Minimum threshold not met

Minimum threshold achieved but measurable objective not met

Measurable objective met

3.7 Update on Project and Management Action Implementation

Below are WY 2024 updates on projects and management actions planned or in the process of being implemented.

3.7.1 Implementation Funding

In May 2022, the MGA was awarded a $7.6 million Sustainable Groundwater Management Implementation Round 1 Grant. Projects to be funded by the grant are directly focused on addressing groundwater sustainability. Projects funded are summarized in Table 12.

Table 12. SGMA Implementation Grant Round 1 Funding Projects

SGMA Implementation Grant Round 1 Component	Status
Inland groundwater pumping optimization to effectively redistribute SqCWD groundwater pumping away from the coast and add a new SqCWD inland production well	Pumping optimization planning is included in the regional optimization study included in the last row of this table. A new inland production well at Cunnison Lane will be completed and equipped in WY 2025
Include Beltz #8 as an additional ASR well in the SCWD's ASR program	See Section 3.7.3
Increase the intertie capacity between SqCWD's subarea 1 and subarea 2 to mitigate the bottleneck caused by undersized pipe thereby improving water reliability	Construction started August 2023 Put into service December 2023
A regional water resources optimization study for Group 1 and 2 projects and management actions identified in the GSP	Study is underway and expected to be completed in April 2025. See Section 3.7.4

3.7.2 Pure Water Soquel

The PWS project will recharge purified recycled water at 3 SWIP wells to replenish the aquifer and aid in raising groundwater levels above seawater intrusion MTs. The project, which is being constructed to produce up to 1,500 AFY of purified water, has completed California Environmental Quality Act environmental review with a certified Environmental Impact Report (EIR). Planned completion of construction and start-up is anticipated in WY 2025.

Project components include the following:

- Three SWIP wells – Twin Lakes, Willowbrook, and Monterey will be used to recharge Purisima A and BC aquifers with purified recycled water.

- Nine Monitoring wells – Monitoring wells have been strategically constructed adjacent to the SWIP wells. These will monitor groundwater quality and levels throughout the operation of Pure Water Soquel.
- Conveyance – The project involves the construction of approximately 8 miles of pipelines. These pipelines will transport water to and from the Santa Cruz Wastewater Treatment Facility to the Chanticleer Water Purification Center and convey purified water from the Purification Center to the SWIP wells for aquifer recharge. The pipelines are designed for potential future expansion, doubling the current design capacity if needed.
- Treatment facilities – 2 new water treatment facilities are being built. One is a recycled water treatment facility, and the other is a water purification center.
  - New Recycled Water Facility: Located at the Santa Cruz Wastewater Treatment Facility, this facility includes a source water pump station and brine return pipeline to support the new Water Purification Center; a Pacific Gas and Electric metering enclosure near Bay Street and California Street, a radio communication pole, and a tertiary treatment system (cloth filter and UV system). It will produce recycled water for on-site use, a future construction water fill station, and irrigation at a nearby park.
  - New Water Purification Center: Situated at the corner of Soquel Avenue and Chanticleer Avenue in the Live Oak area, this center will use a state-of-the-art, 3-step advanced purification process: microfiltration, reverse osmosis, and ultraviolet light with advanced oxidation and ozone pre-treatment. The purified water will be pumped to the SWIP wells for underground recharge of the groundwater basin. The center will also feature an educational learning center.

SqCWD maintains an informative outreach and education program specific to PWS that includes a dedicated section on its website[1] and periodically includes PWS Project updates in the SqCWD's monthly email blast. Weekly construction updates are also available on the District's website[2]:

The PWS project is needed to increase coastal groundwater levels to elevations protective of seawater intrusion. Predictive groundwater modeling during GSP development indicated that demand management and water conservation on their own would not achieve MT protective elevations or MOs for the seawater intrusion sustainability indicator. As predicted, some coastal

[1] https://www.soquelcreekwater.org/pws
[2] https://www.soquelcreekwater.org/256/Construction-Updates

groundwater levels are still below MTs; therefore, recharging groundwater continues to be the planned approach to increase coastal groundwater levels.

Table 13 summarizes construction progress of PWS components for WY 2024 and prior years. Construction of all PWS components is expected to be completed in calendar year 2025. Start-up testing of SWIP recharge wells is scheduled in early 2025.

Table 13. Status of Pure Water Soquel Project Construction

Project Component	Completed in Prior Water Years	Water Year 2024 Progress
3 SWIP wells	1. Twin Lakes Church Well constructed and developed in WY 2019, redeveloped in WY 2020 2. Willowbrook Well started construction in WY 2020; completed construction and development in WY 2021 3. Monterey Well constructed and developed in WY 2021	Aboveground site infrastructure improvements completed in WY 2024. Start-up testing scheduled to start in early 2025.
9 SWIP monitoring wells	All 9 SWIP monitoring wells were constructed and developed in WY 2022 Twin Lakes Church SWIP monitoring wells: TLM-1A, TLM-2A, TLM-2BC, TLM-3BC, & TLM-4BC Willowbrook SWIP monitoring wells: WM-1 and WM-2 Monterey SWIP monitoring wells: MM-1 and MM-2	Completed background groundwater quality sampling, consisting of 4 quarters of sampling at 8 of the 9 monitoring wells (excluding TLM-2BC where background sampling is not required by the GRRP permit)
Conveyance pipelines	Construction of the conveyance pipelines started in May 2021.	Pipeline construction continued in WY 2024 and will be completed in WY 2025
Treatment facilities	Construction of the treatment facilities at the Santa Cruz Wastewater Treatment Facility (SCWWTF) and the Water Purification Center at Chanticleer site started in WY 2022.	Construction at both facility sites continued in WY 2024 and will be completed in WY 2025

3.7.3 Aquifer Storage and Recovery

Aquifer Storage and Recovery (ASR) is being evaluated by SCWD as a multi-benefit water supply reliability project. The primary purpose of the ASR project is to store drinking water in the Basin to provide a drought supply for SCWD's service area. The ASR project is expected to also contribute to Basin sustainability. The SCWD continues to work with the California State Water Resources Control Board to finalize its water rights petition for a modification to an existing right that will lead to phased implementation of full-scale ASR at the SCWD's existing

Beltz wells. SCWD expects to receive final action on its water rights petition in early 2025. Work to convert the Beltz 12 well to a permanent ASR well is on track to be completed in calendar year 2026. The Beltz 8 design will be completed in 2025, and modifications will take place in 2027. The SCWD completed pilot testing at Beltz 9 in WY 2024. A design phase for modifications to convert Beltz 9 into a permanent ASR well will occur in 2026.

3.7.4 Optimization Study

SCWD and SqCWD are currently collaborating on the Basin Optimization Study. The study uses the Santa Cruz Mid-County Basin GSFLOW groundwater model to iteratively simulate scenarios and water resources projects. The overarching goal of the study is to identify projects and management alternatives that help meet the water supply needs of SCWD and SqCWD while maintaining GSP sustainability goals. The work started in January 2023 with anticipated completion by June 2025.

Work conducted at the time of this report includes:

- Validating simulated groundwater levels and stream flow in the uncalibrated 2015-2022 period
- Model calibration near SCWD's Beltz wells over the 2015-2022 period to ensure accurate simulation of recent ASR pilot testing, and calibration of simulated streambed conductivity to improve model accuracy at ISW RMP
- Iterative simulation of diverse projects and management actions to identify 4 feasible and sustainable alternatives that improve SCWD and SqCWD supply, with model simulations guided by machine learning guided optimization
- Hydraulic modeling for the 4 selected alternatives to predict the impact of pumping operations and transfers associated with each supply alternative on local distribution systems, including required upgrades for pump stations and the O'Neill intertie linking the 2 agencies
- Distribution system water quality modeling to ensure compatibility of water transferred between SCWD and SqCWD
- Economic and financial analysis/needs assessment analysis to inform the costs and benefits of chosen alternatives

Work described in the last bullet above is currently underway. The completed study will recommend several feasible and sustainable project and management action alternatives that will inform future long-term operations and provide shared regional benefits.

3.7.5 Water Transfers / In-Lieu Groundwater Recharge

As described in the GSP, a water transfer pilot test has been underway for a number of years. The water transfer involves SCWD delivering treated surface water to SqCWD to serve a portion of SqCWD's service area. Currently, an extension of the pilot project agreement allows for transfers through May 1, 2026. There was no water transferred to SqCWD in WY 2024.

Longer-term implementation of water transfers will require a new agreement, including compliance with Proposition 218 requirements to set the cost of service for water delivered and, depending on the annual quantity transferred, waiting for resolution of the places of use changes of the SCWD's San Lorenzo River water rights.

3.7.6 Distributed Storm Water Managed Aquifer Recharge

The County continues to operate 2 Distributed Storm Water Managed Aquifer Recharge (DSWMAR) projects, 1 in Aptos at Polo Grounds County Park, and another in Live Oak at Brommer Street Park. The dry wells recharging stormwater are not currently instrumented. Total estimated average recharge is 20 AFY. A plan for development at additional DSWMAR project sites is not available and continues to be speculative at this time.

3.8 Update on Monitoring Network

3.8.1 Improvement of Monitoring Network

Table 14 summarizes when data gap monitoring features were installed and Figure 27 shows the location of all features added to the monitoring network.

Table 14. Status of Monitoring Features Identified as Data Gaps in the Groundwater Sustainability Plan

Monitoring Feature	Status
Deep Tu unit well (SP-5) near Soquel Point	Completed in WY 2020
Deep Purisima AA unit well near SC-3A	Well SC-3AA installed in WY 2022
7 shallow streamflow interaction monitoring wells	6 shallow wells installed in 2022 1 well installed in January 2024
6 stream gages	6 gages installed (see Figure 27) Rating curves established in WY 2023

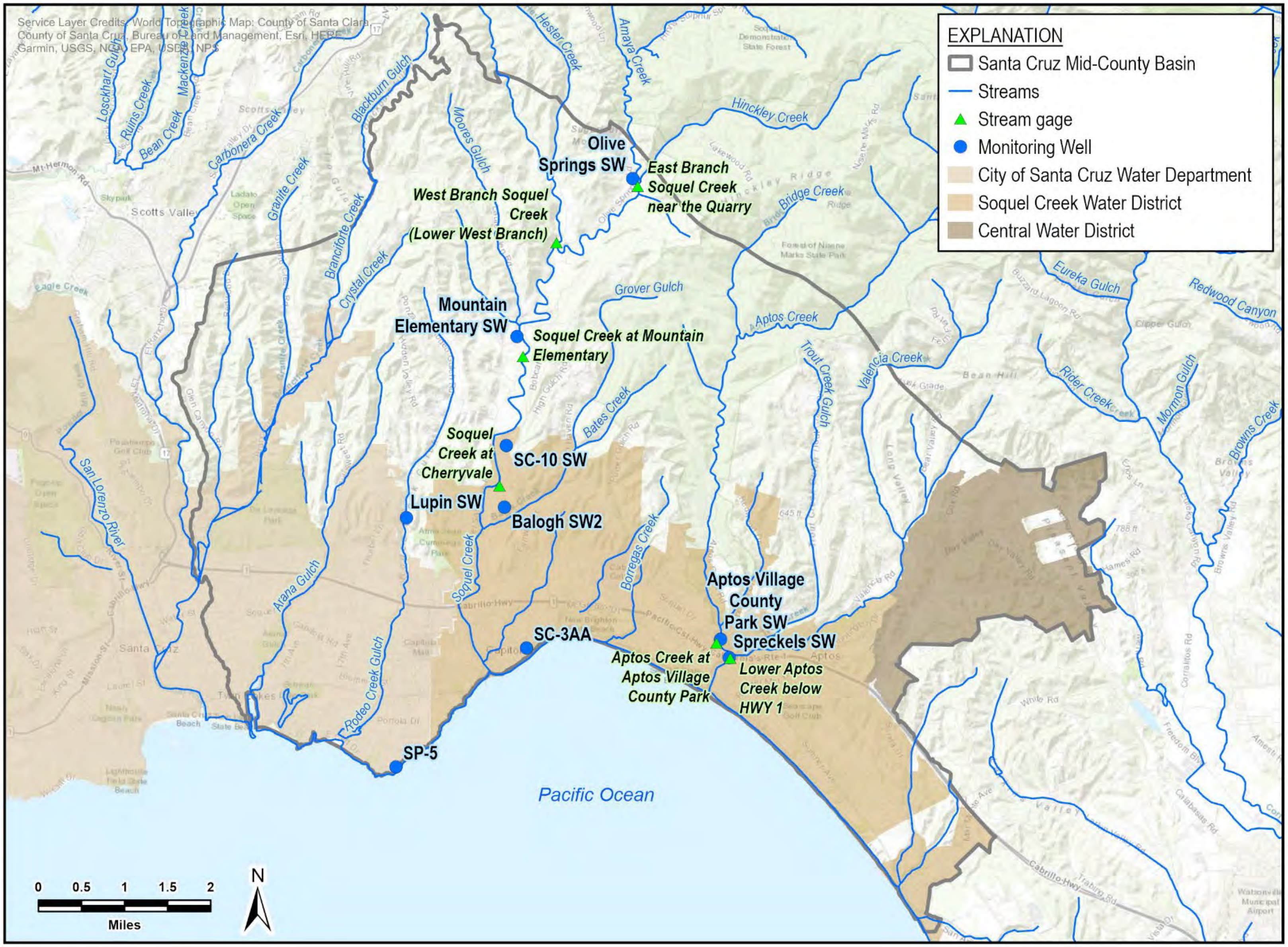


Figure 27. Monitoring Wells and Stream Gages Installed to Address 2020 GSP Data Gaps

3.8.2 Other Monitoring Network Changes

There are 8 wells in the 2020 GSP monitoring network that cannot be used to collect groundwater levels. Two of those wells have been removed from the MGA groundwater level monitoring network as described in the 2025 Periodic Evaluation:

- SC-A7A in the Purisima F Unit has not been included in the MGA Annual Reports since Water Year 2021. It can no longer be used to collect groundwater level measurements because it likely has a broken seal and does not provide reliable data. SC-A7B also screened in the Purisima F unit can be used in its place to collect groundwater level data.
- SC-14B in the Purisima BC unit. SqCWD has not been able to measure depth to water since 2018 due to stuck airline. SC-14C also screened in the Purisima BC unit can be used in its place to collect groundwater level data.

The other 6 wells tentatively remain in the network even though they are currently inaccessible. SqCWD will try to remove airline equipment stuck in these wells and if successful, SqCWD will resume data collection. The monitoring wells of concern are:

- Purisima A unit wells: SC-14A and SC-17A
- Purisima BC unit: SC-16B and SC-17B
- Purisima DEF unit: SC-17C and SC-17D

A full re-evaluation of MGA monitoring networks was conducted for the 2025 Periodic Evaluation. This re-evaluation confirmed confirm the MGA monitoring networks are providing the quantity and quality of data necessary to monitor groundwater conditions in the Basin during GSP implementation.

Monitoring networks used to evaluate Basin conditions have been expanded to fill all GSP-identified data gaps. Additional new monitoring wells associated with the PWS and ASR projects supplement the existing networks and provide a means for monitoring project performance.

During the evaluation cycle, 19 new dedicated monitoring wells were added to the Basin’s groundwater level and quality monitoring networks. Two of these new wells were established as deep RMPs.

3.9 Data Management System

The MGA has a regional data management system (DMS) with a public portal, based on Kister’s WISKI platform. The DMS contains groundwater level, groundwater quality, groundwater extraction, and stream flow data for wells and creeks in the Santa Cruz Mid-County Basin and Santa Margarita Basin.

Website to access public portal: https://sccwaterdata.us/#/html/home

3.10 Planned Studies for WY 2025

The MGA plans to conduct the following studies in WY 2025:

- Continuation of the Seascape seawater intrusion investigation to determine the extent and causes of seawater intrusion. This information will be used to inform management actions needed to stop inland advancement of seawater.
- Mid-County Basin GSFLOW model improvements that include revising model layers to improve simulation of the Purisima DEF unit and incorporating AEM data to improve conceptual and numerical model geometry. The revised GSFLOW model will be assessed to determine the revised model's numerical stability and model calibration. A report documenting the GSFLOW model revisions and status related to numerical stability and model calibration will provide recommendations for addressing issues related to model layering such as numerical instability prior to future calibration efforts.

4 REFERENCES

California Department of Water Resources (DWR), 2020. DWR Bulletin 118 Update 2020. Accessed on March 3, 2022 at https://data.cnra.ca.gov/dataset/calgw_update2020

_____, 2021. Santa Cruz Mid-County Groundwater Agency Groundwater Sustainability Plan Determination. Accessed on March 3, 2022 at https://sgma.water.ca.gov/portal/service/gspdocument/download/4472

Santa Cruz Mid-County Groundwater Agency (MGA), 2019. Santa Cruz Mid-County Basin Groundwater Sustainability Plan. November.

_____, 2025. Santa Cruz Mid-County Basin Groundwater Sustainability Plan 2025 Periodic Evaluation. January.

Montgomery & Associates (M&A), 2023. Groundwater Model Validation for Optimization Study. Draft Technical Memorandum prepared for City of Santa Cruz Water Department. May, 2023.

_____, 2024. Seascape Area Chloride Investigation. Draft February.

Pure Water Soquel (PWS), 2023. Pure Water Soquel Engineering Report. March, 2023.

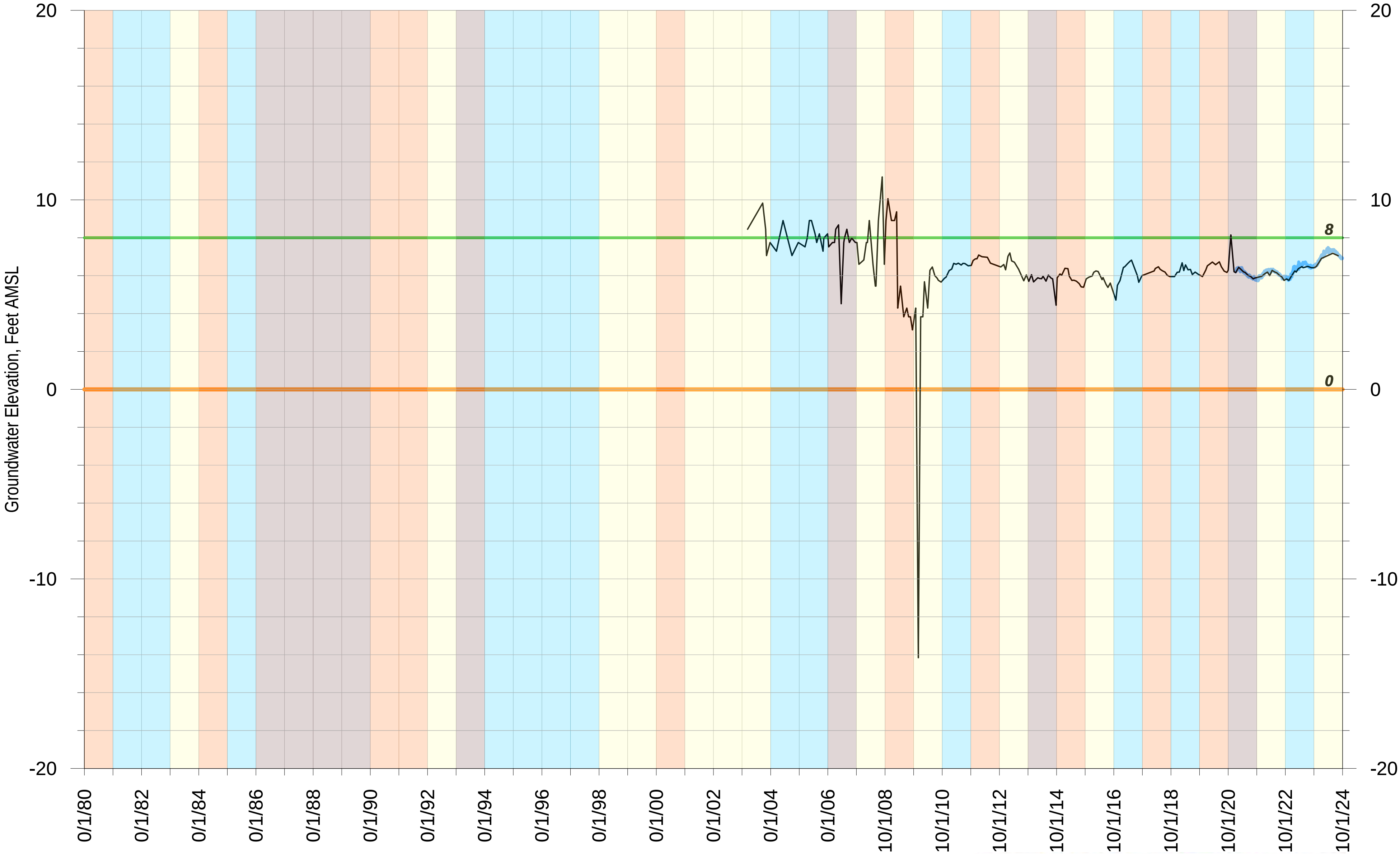
Appendix A

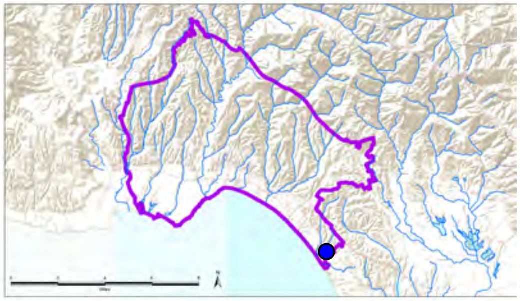
Well Hydrographs

SC-A7C at Sells
Aquifer Screened: Aromas

Appendix A

FIGURE A-1

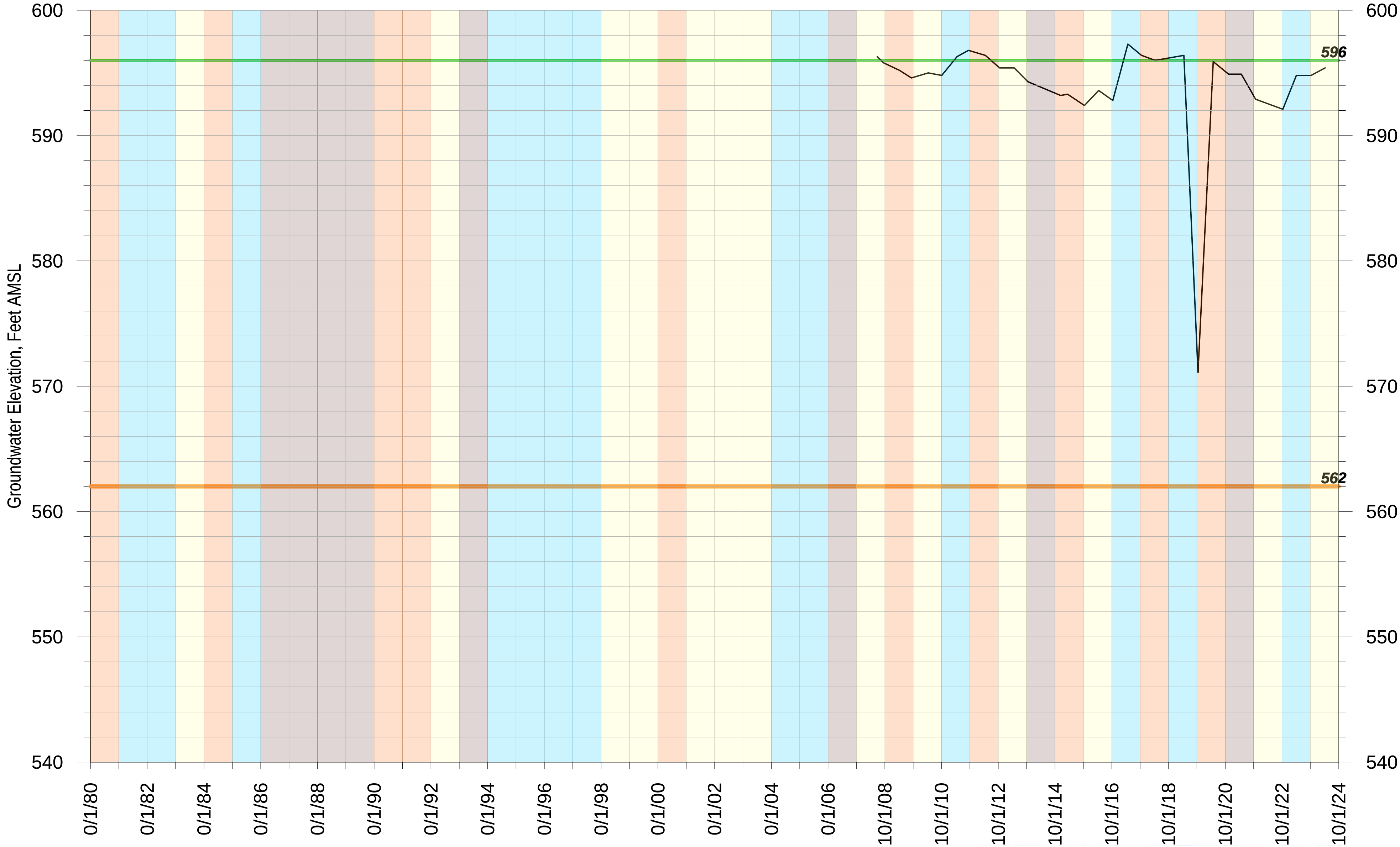




MONTGOMERY & ASSOCIATES

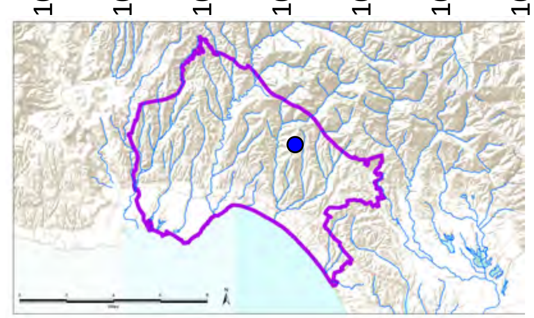
Private Well 2
Aquifer Screened:

Appendix A
FIGURE A-2



Hand Measurement — Measurable Objective — Minimum Threshold

Critically Dry | Dry | Normal | Wet

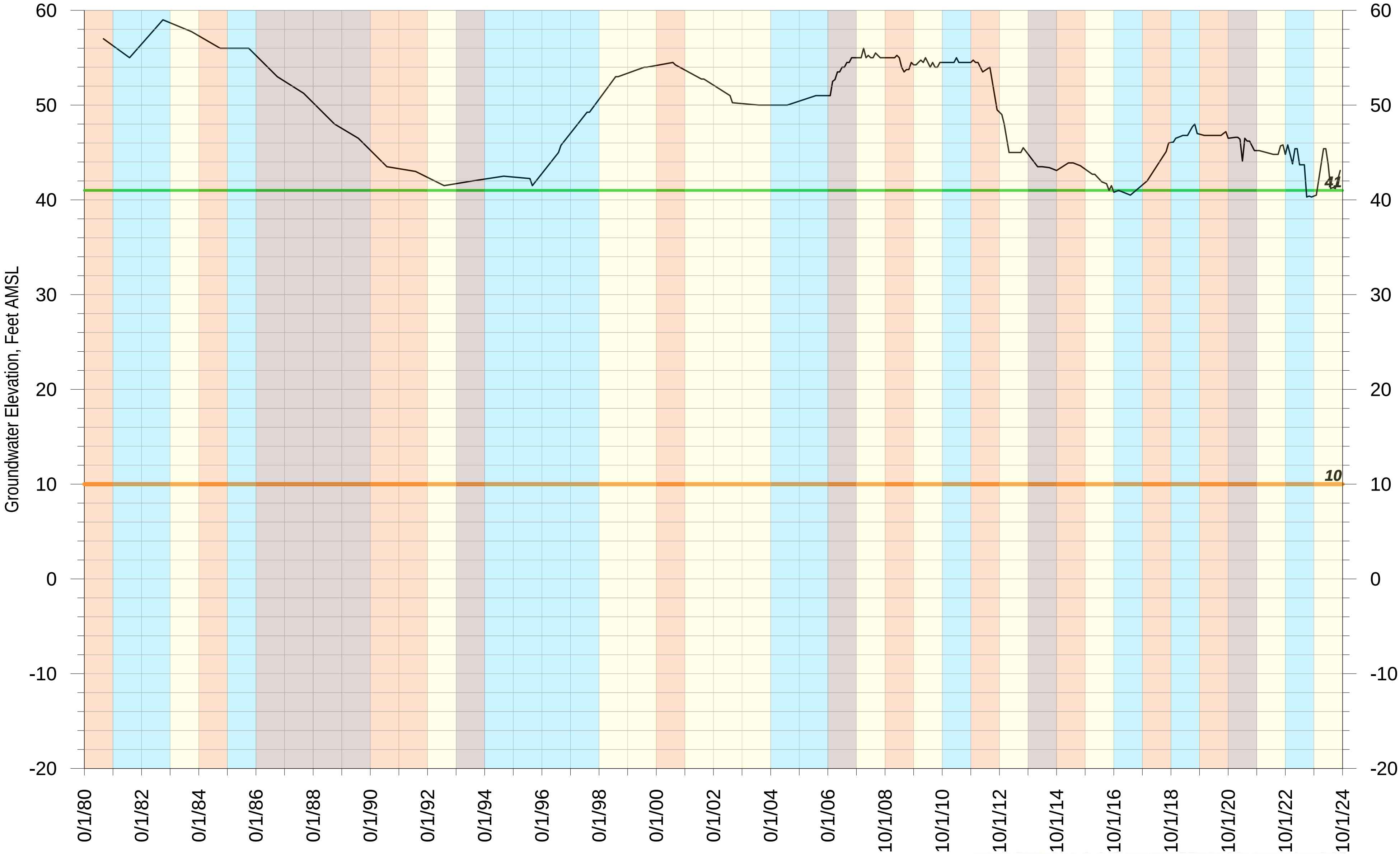


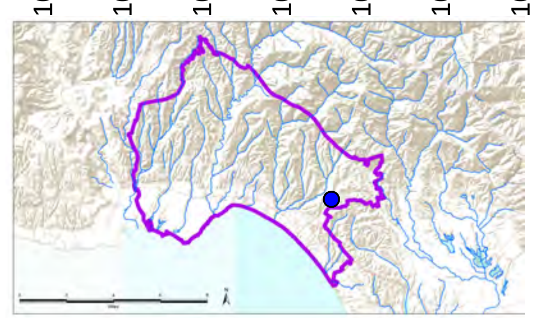
MONTGOMERY & ASSOCIATES

Black
Aquifer Screened: Purisima F

Appendix A

FIGURE A-3

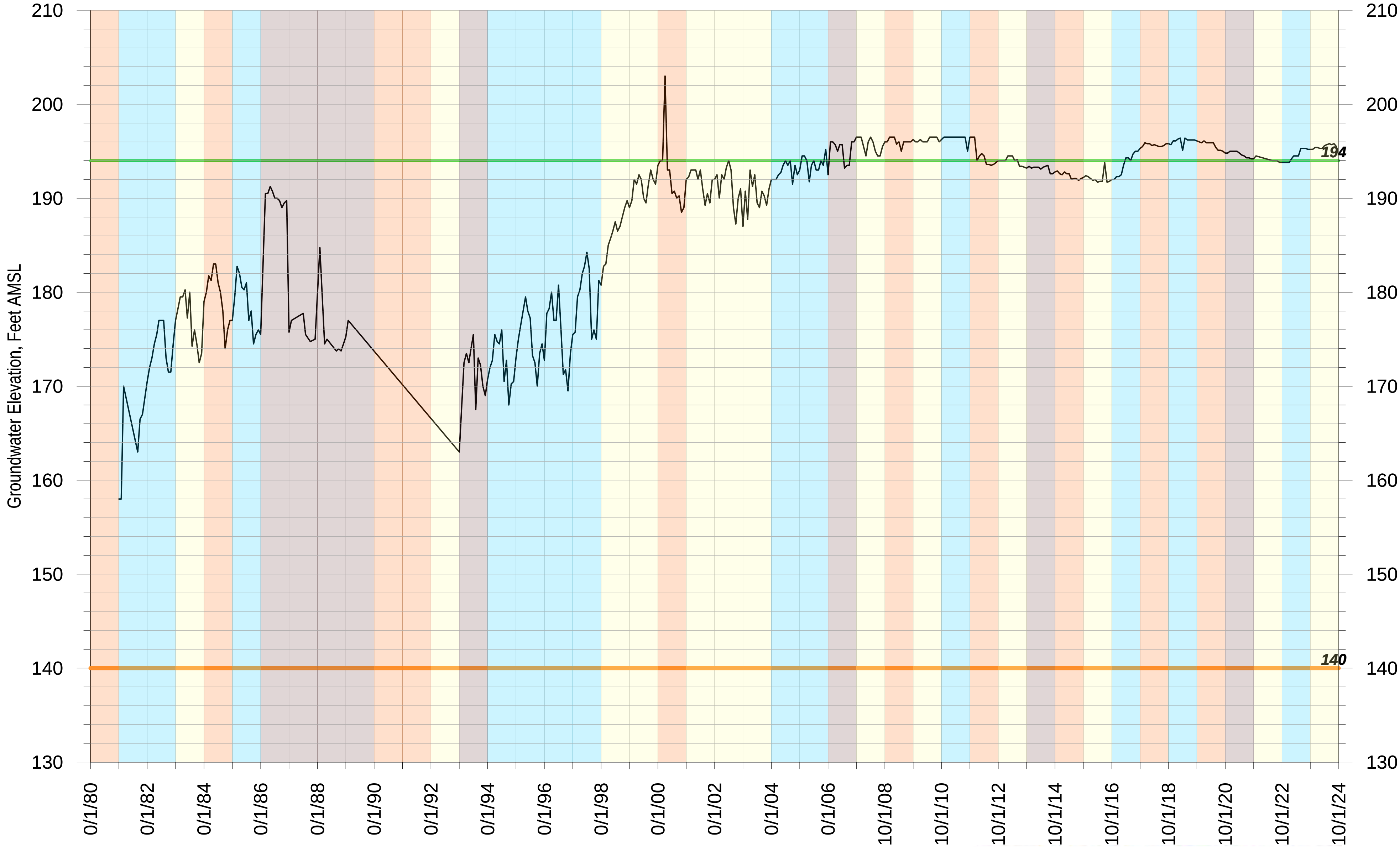




MONTGOMERY
& ASSOCIATES

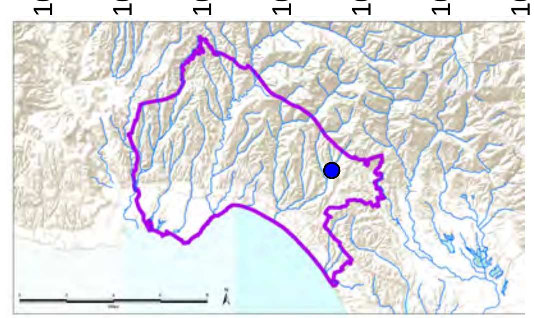
CWD-5
Aquifer Screened: Purisima F

Appendix A
FIGURE A-4



Hand Measurement Measurable Objective Minimum Threshold

Critically Dry Dry Normal Wet

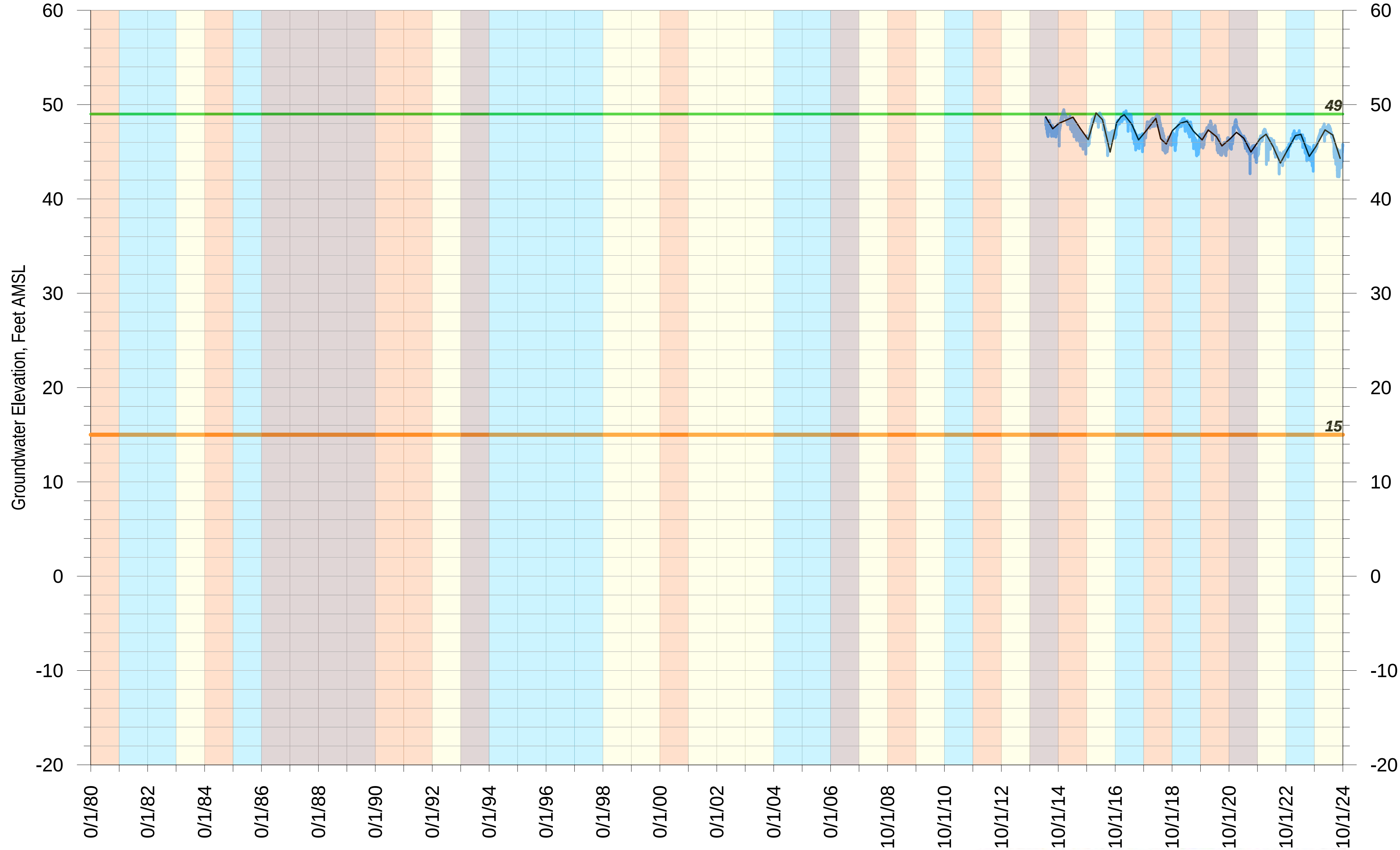


MONTGOMERY
& ASSOCIATES

SC-23C at Quail Run
Aquifer Screened: Purisima F

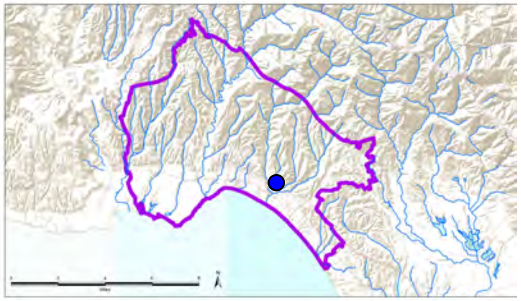
Appendix A

FIGURE A-5



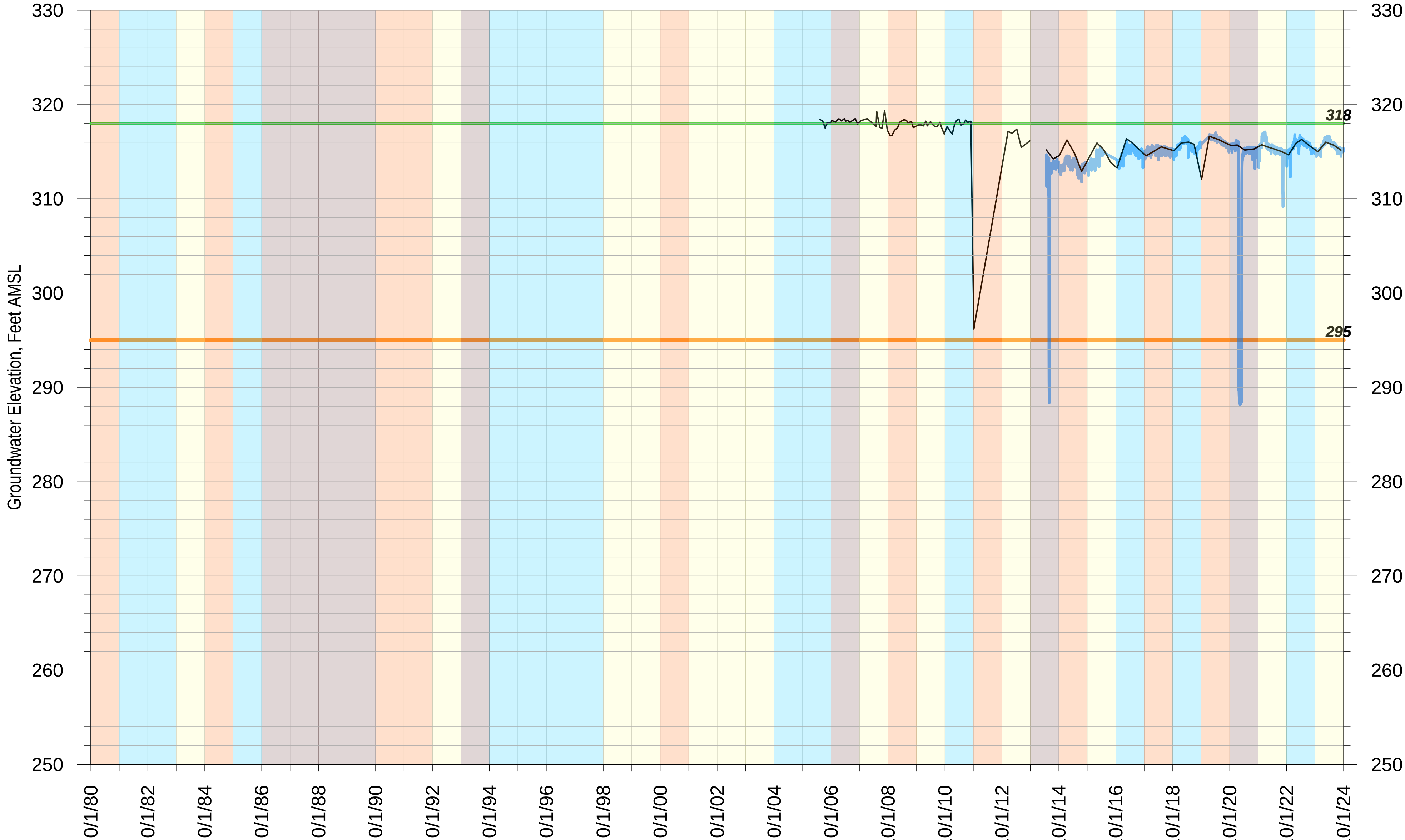
Hand Measurement — Measurable Objective — Minimum Threshold
Transducer

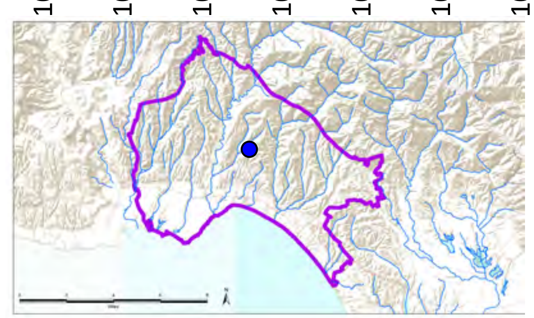
Critically Dry | Dry | Normal | Wet



MONTGOMERY & ASSOCIATES

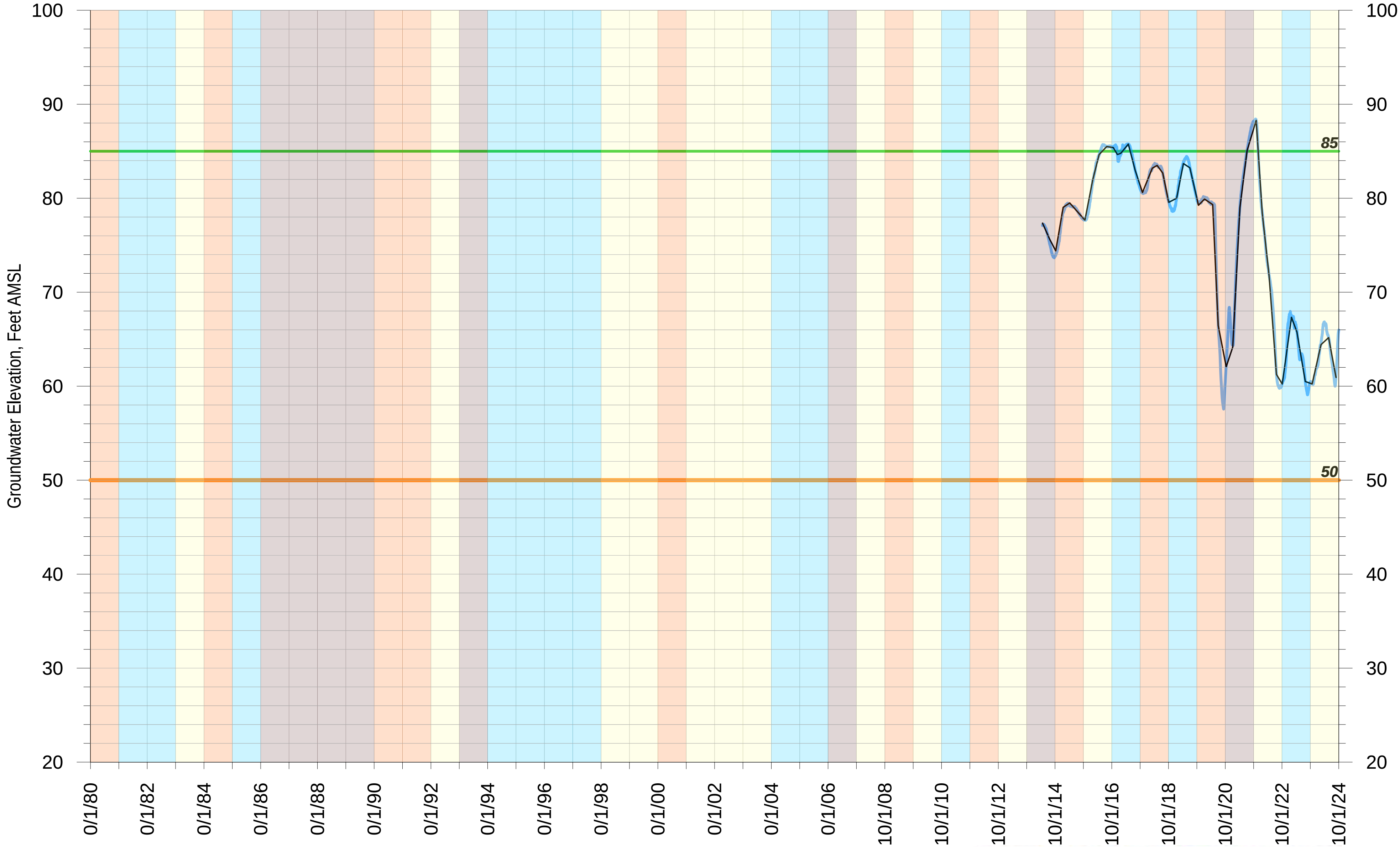
SC-11D & SC-11RD at Porter Gulch
Aquifer Screened: Purisima DEF





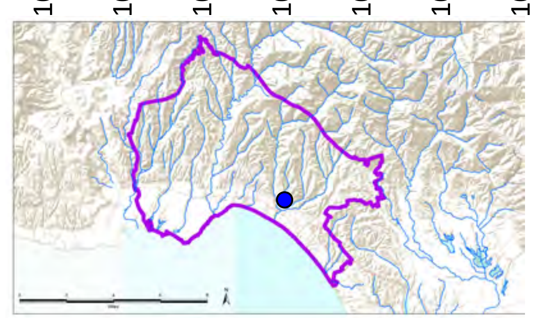
MONTGOMERY & ASSOCIATES

SC-23B at Quail Run
Aquifer Screened: Purisima DEF



Hand Measurement · Measurable Objective · Minimum Threshold
Transducer

Critically Dry · Dry · Normal · Wet

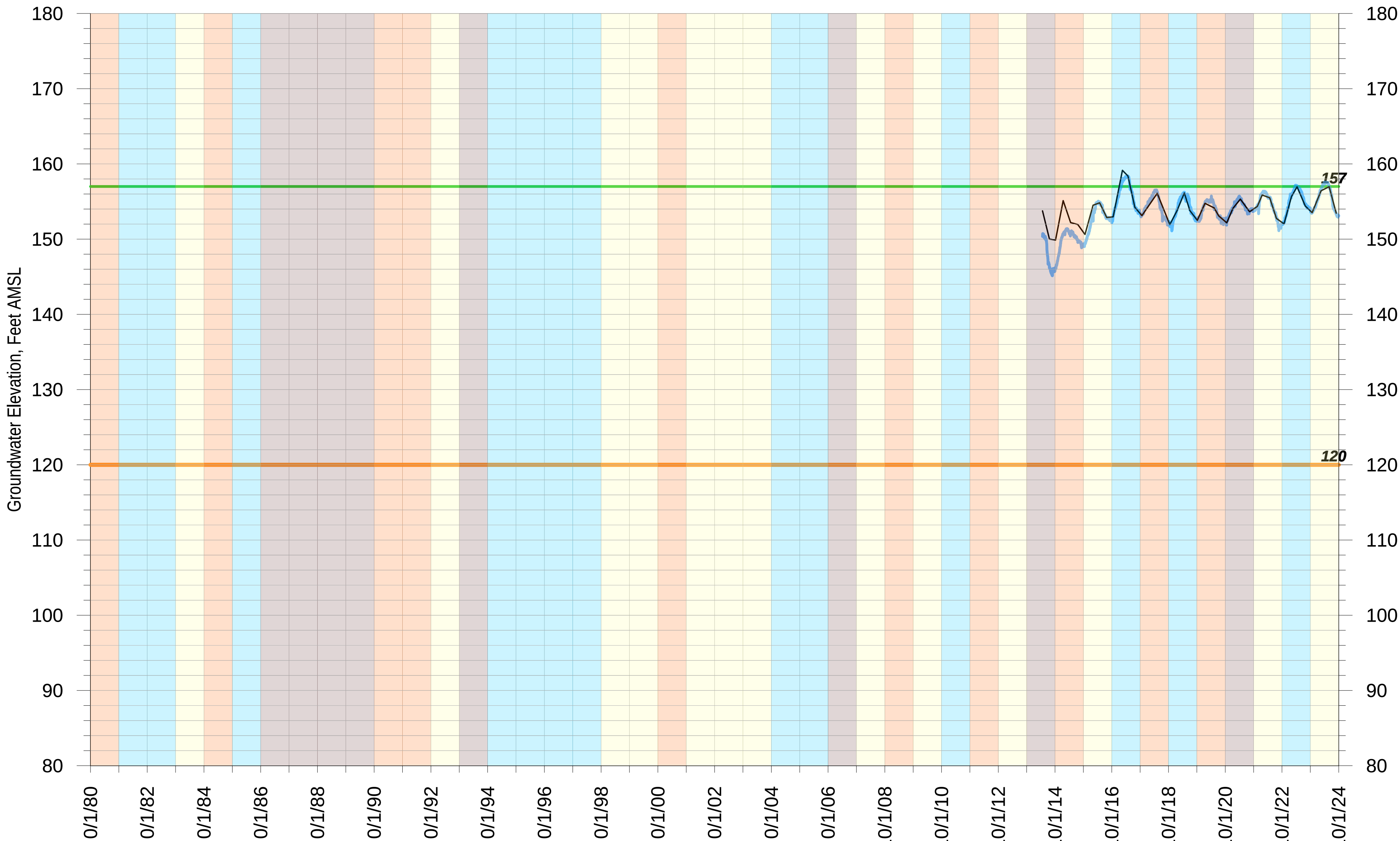


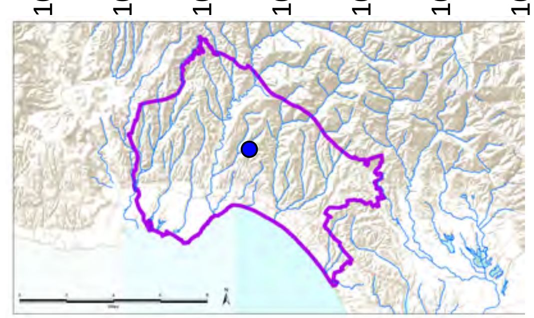
MONTGOMERY & ASSOCIATES

SC-11B at Porter Gulch
Aquifer Screened: Purisima BC

Appendix A

FIGURE A-8



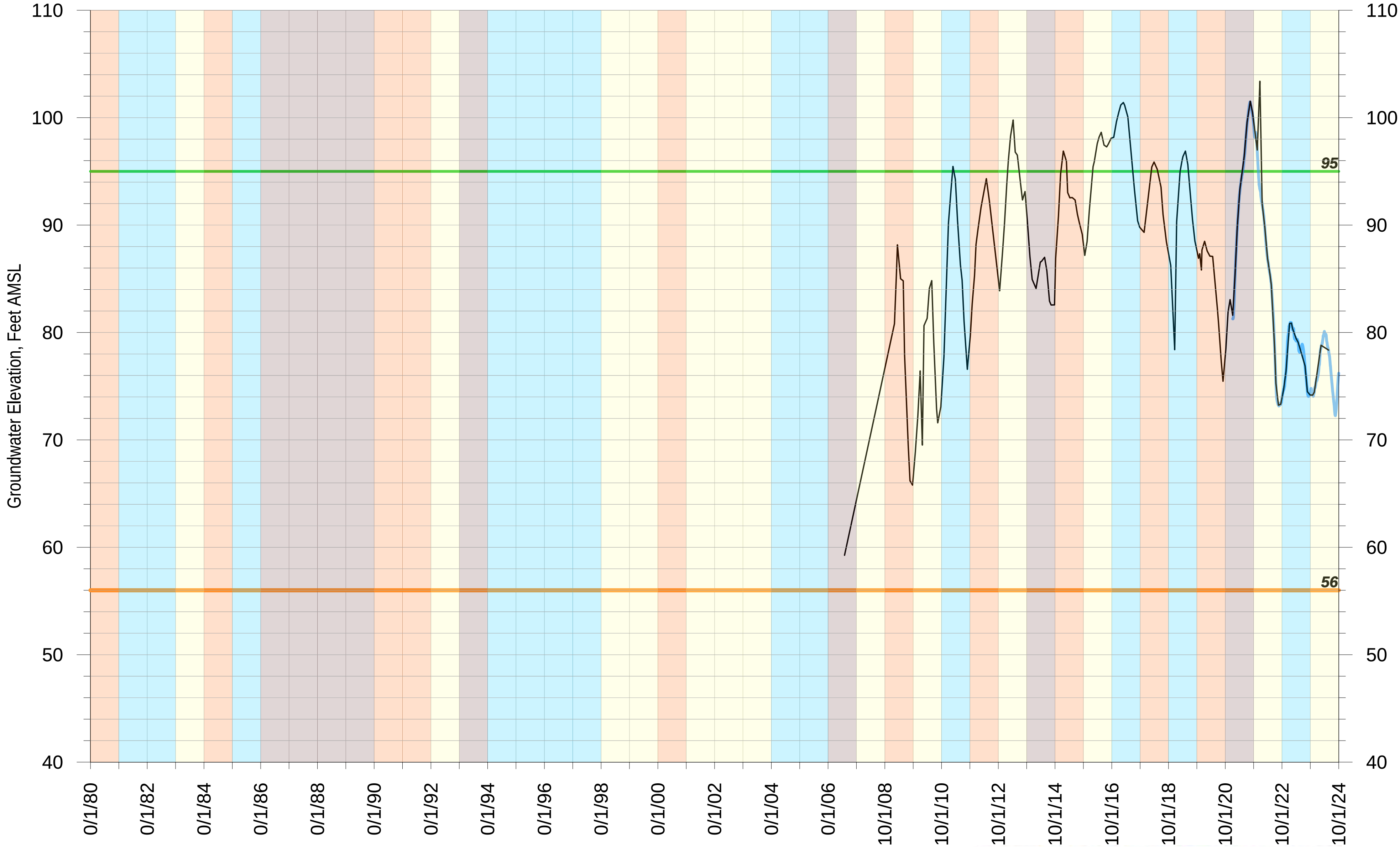


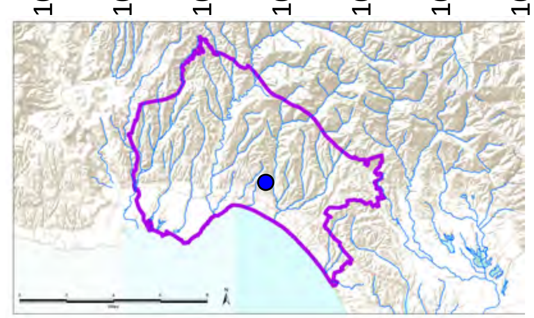
MONTGOMERY & ASSOCIATES

SC-19 at Austrian
Aquifer Screened: Purisima BC

Appendix A

FIGURE A-9

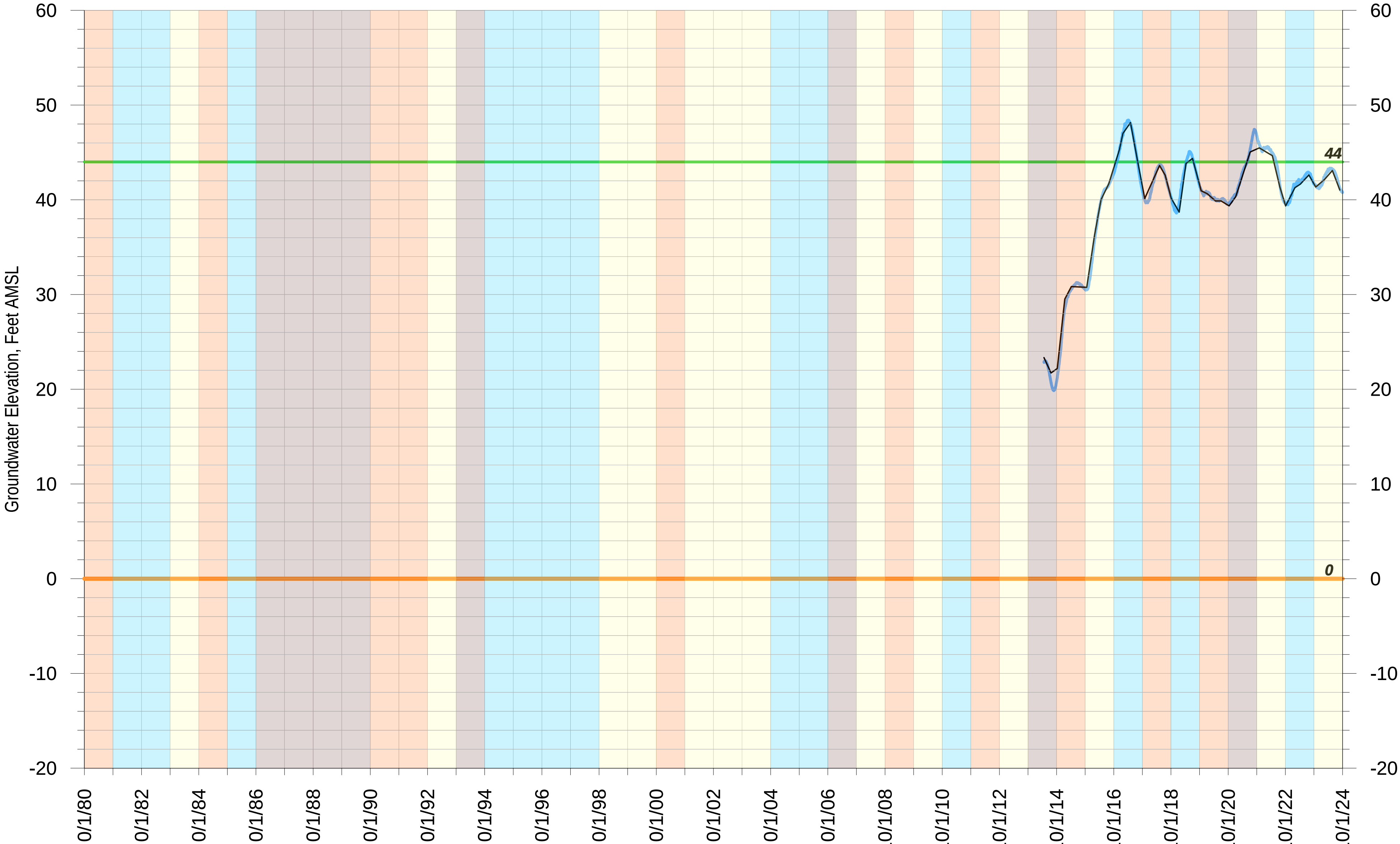


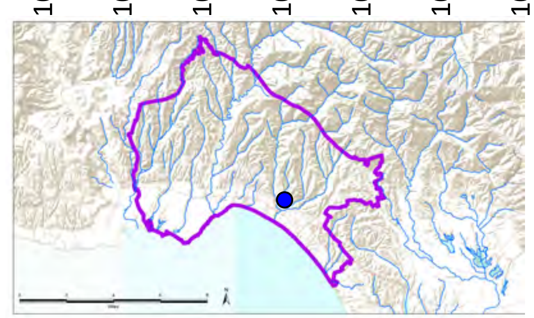


MONTGOMERY & ASSOCIATES

SC-23A at Quail Run
Aquifer Screened: Purisima BC

Appendix A
FIGURE A-10



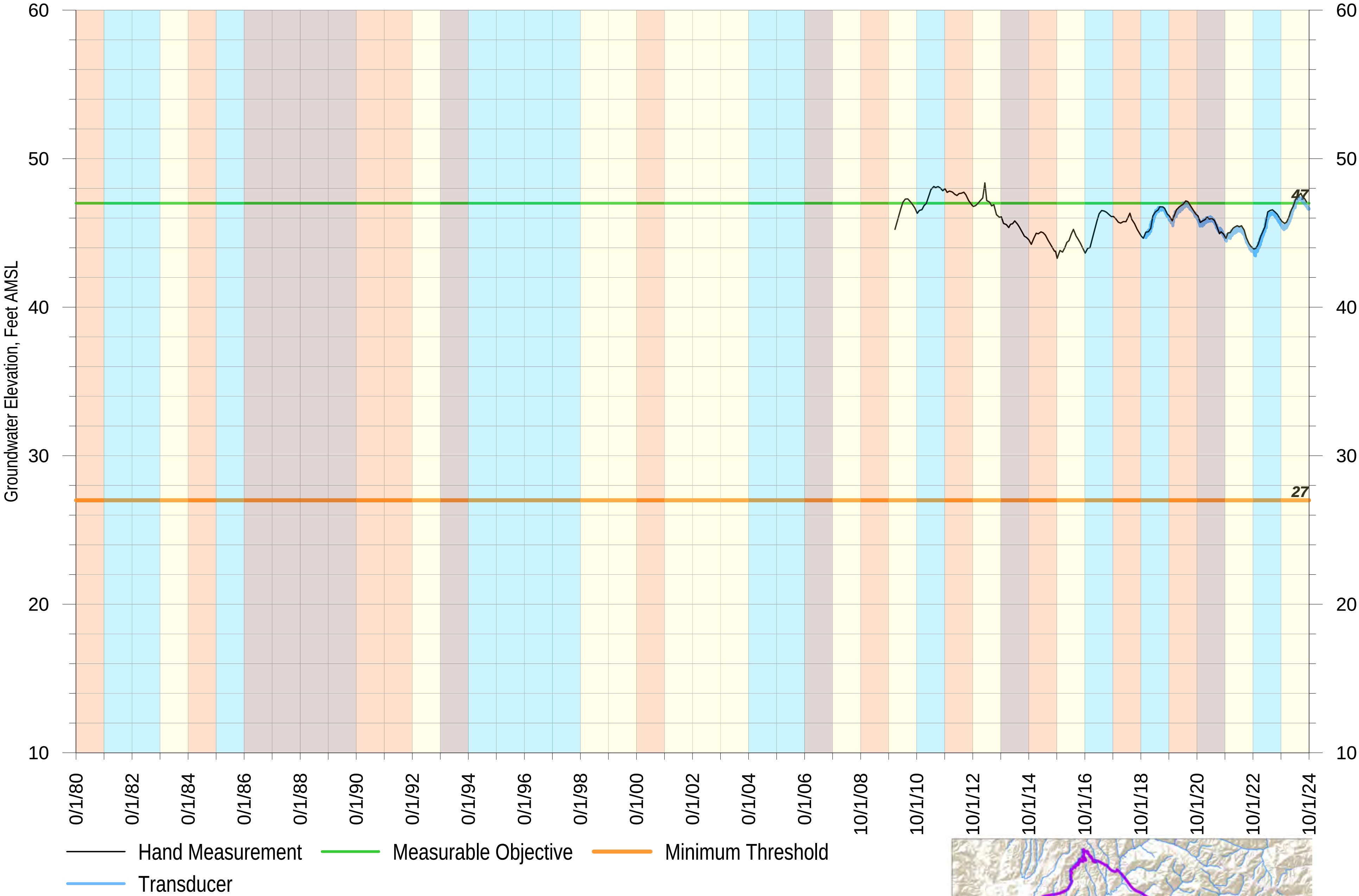


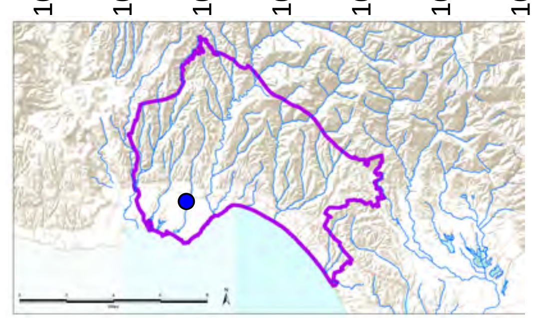
MONTGOMERY
& ASSOCIATES

Coffee Lane Shallow
Aquifer Screened: Purisima A

Appendix A

FIGURE A-11



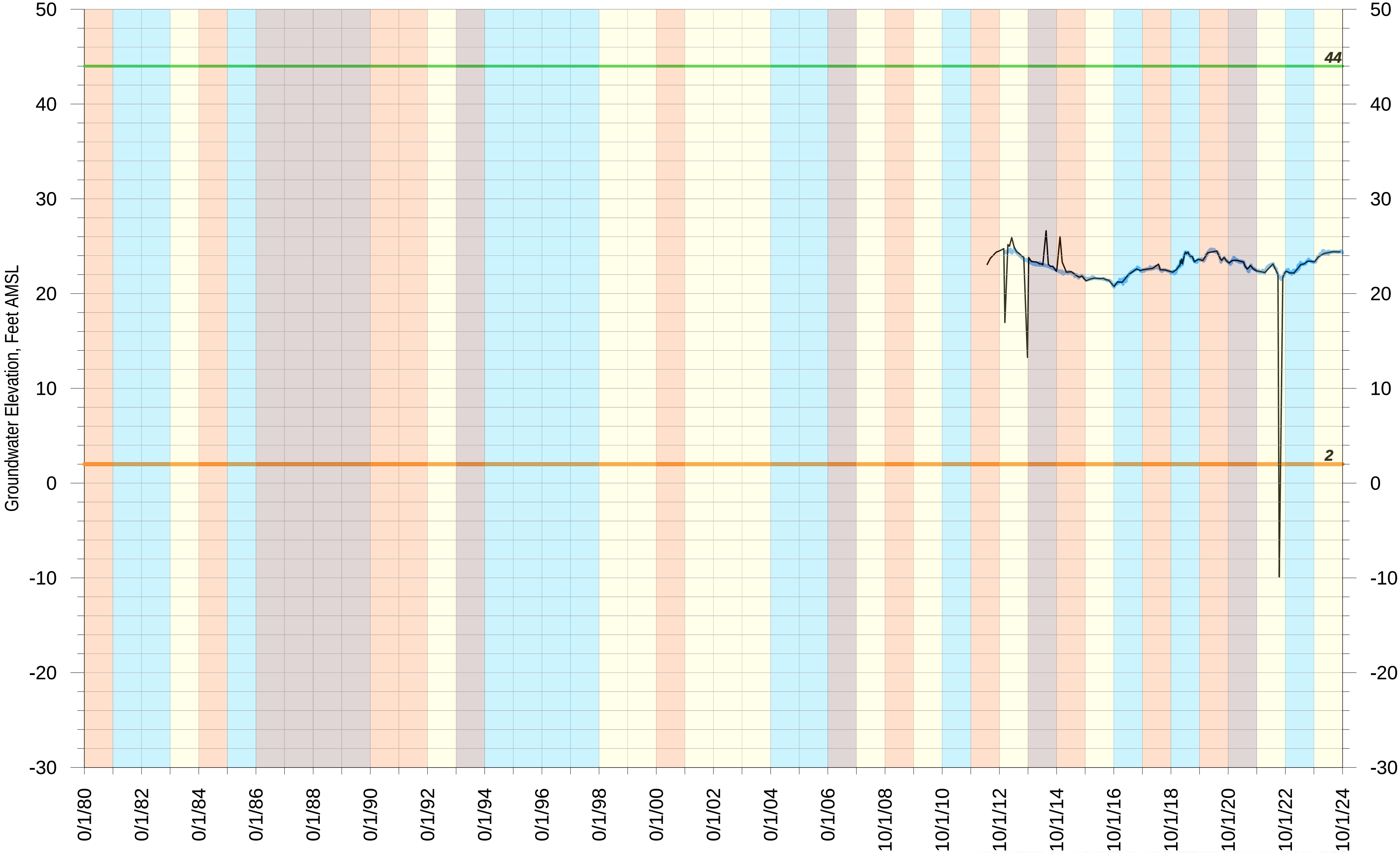


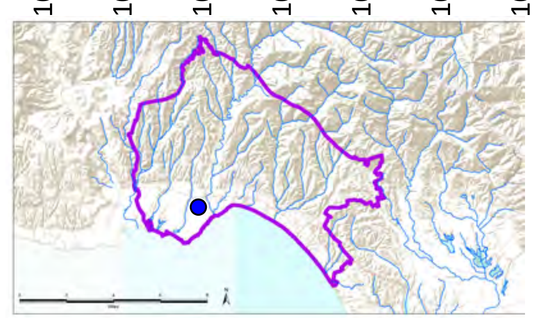
MONTGOMERY
& ASSOCIATES

SC-22A at 41st Ave
Aquifer Screened: Purisima A

Appendix A

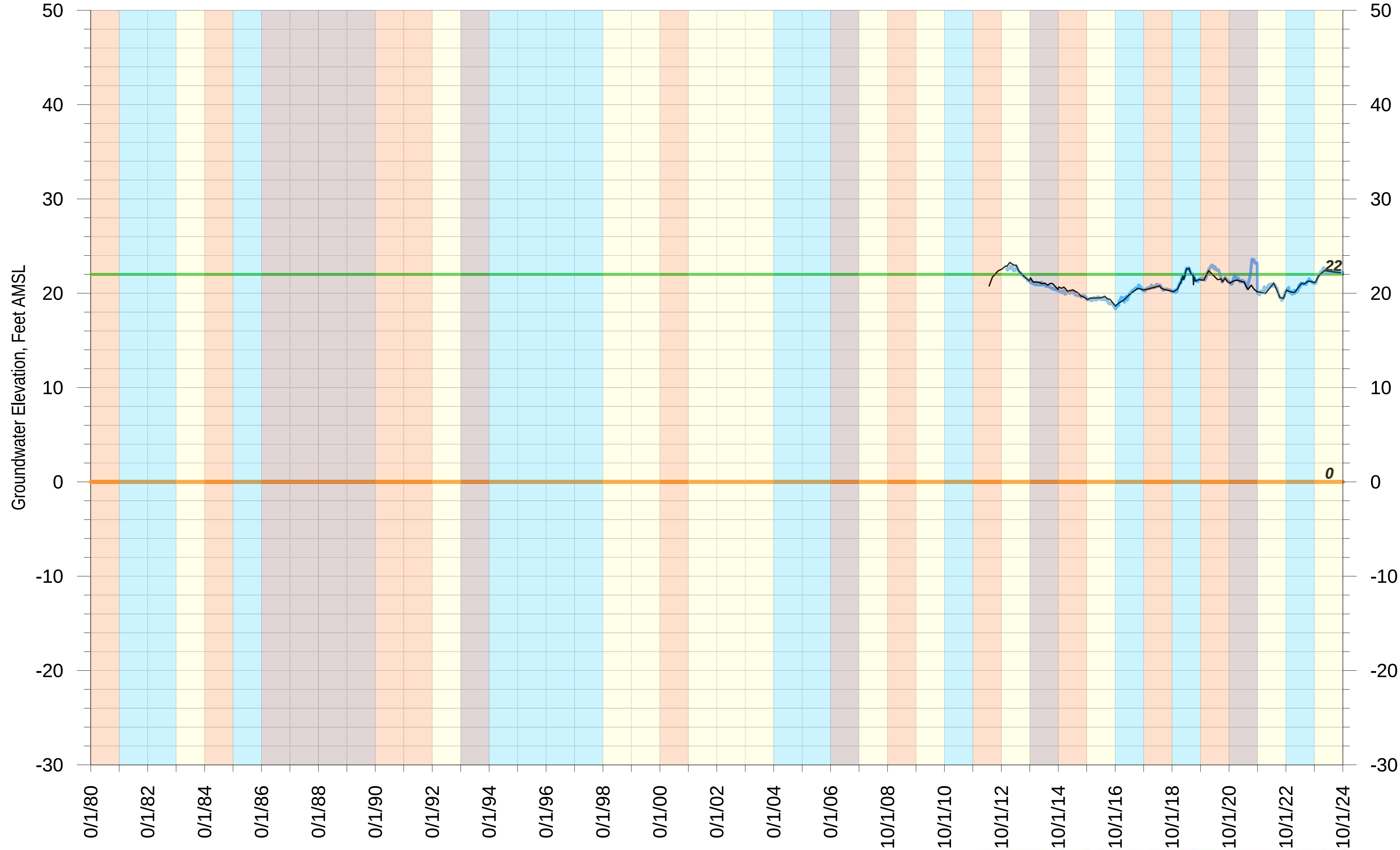
FIGURE A-12

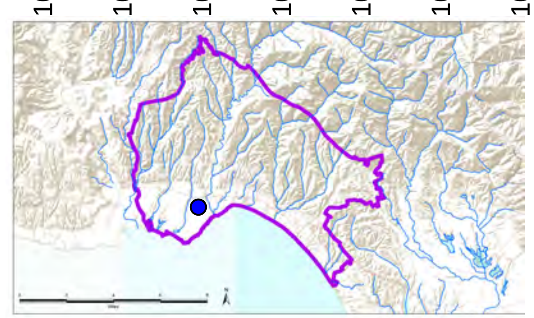




MONTGOMERY & ASSOCIATES

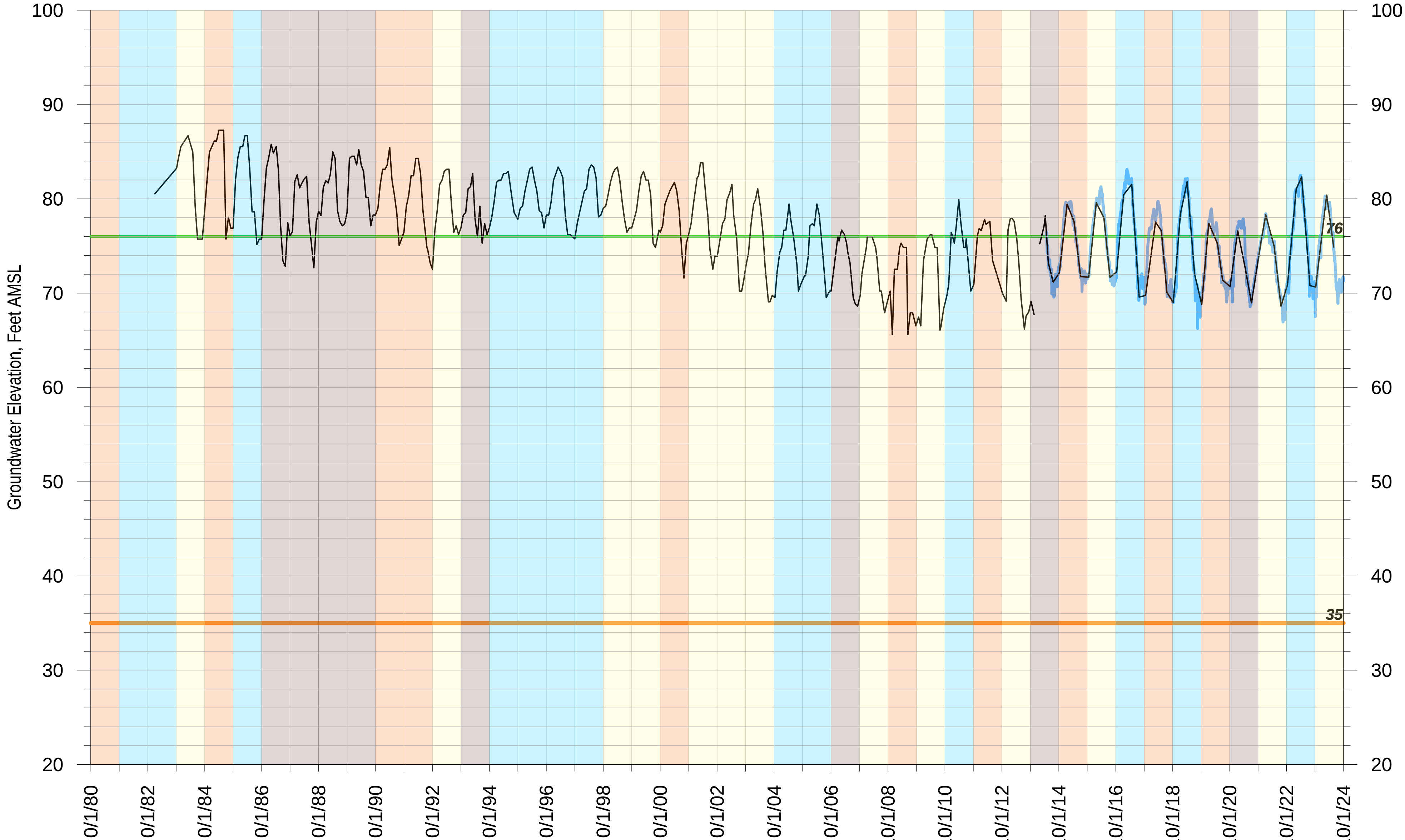
SC-22AA at 41st Ave
Aquifer Screened: Purisima AA

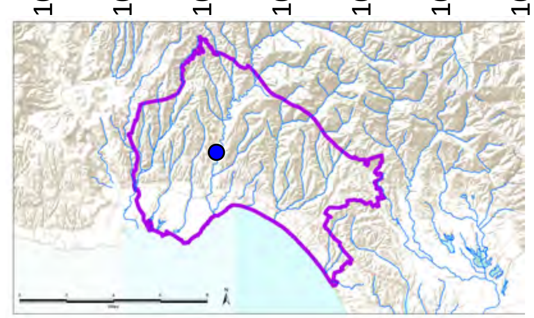




MONTGOMERY & ASSOCIATES

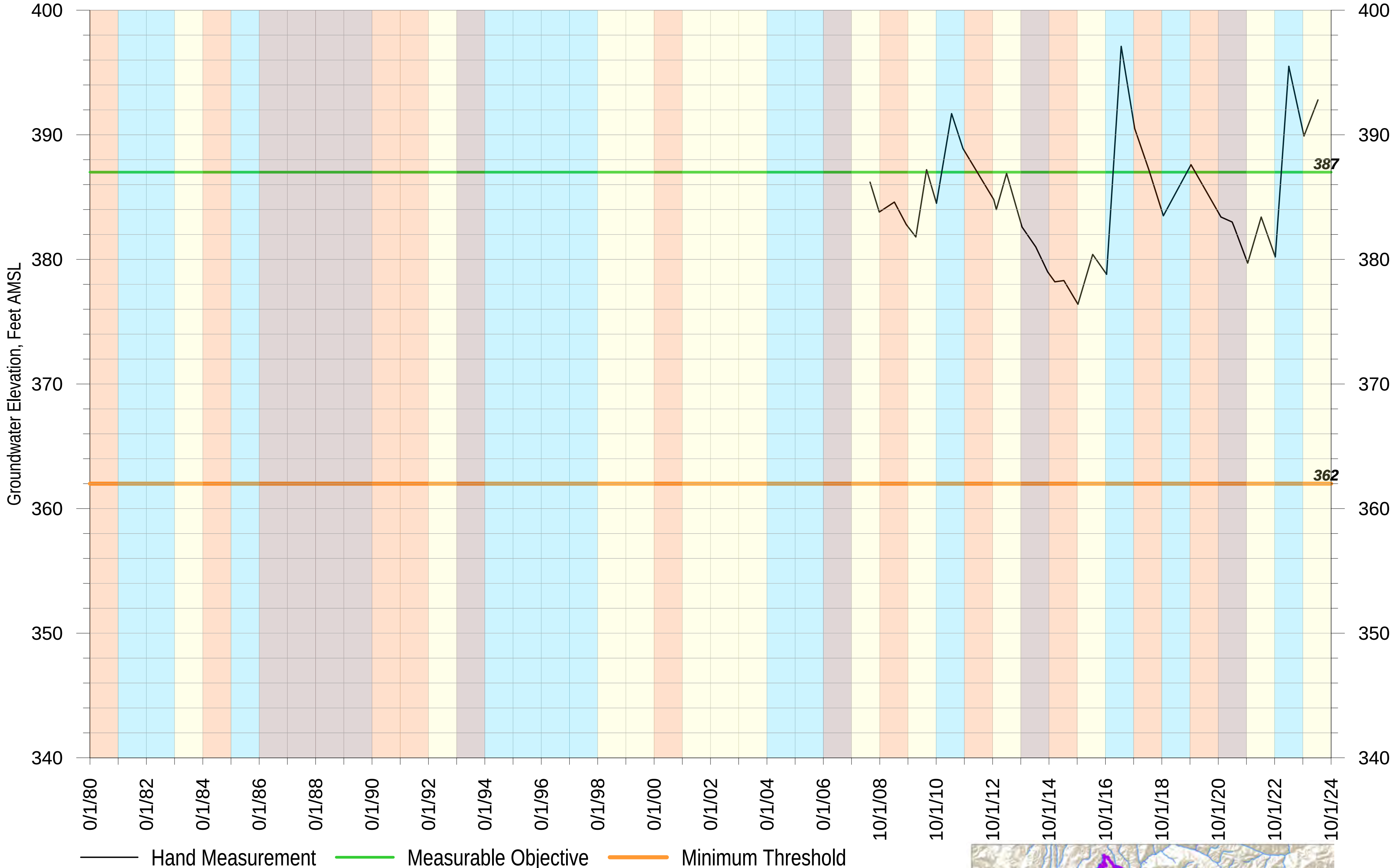
SC-10AA & SC-10RAA at Cherryvale
Aquifer Screened: Purisima AA

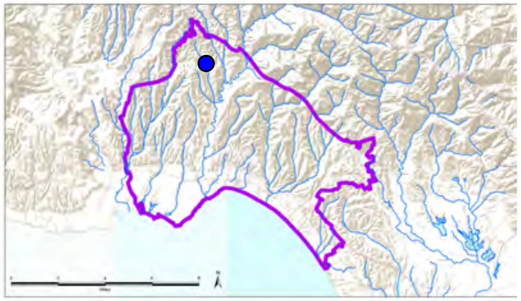




MONTGOMERY & ASSOCIATES

Private Well 1
Aquifer Screened:



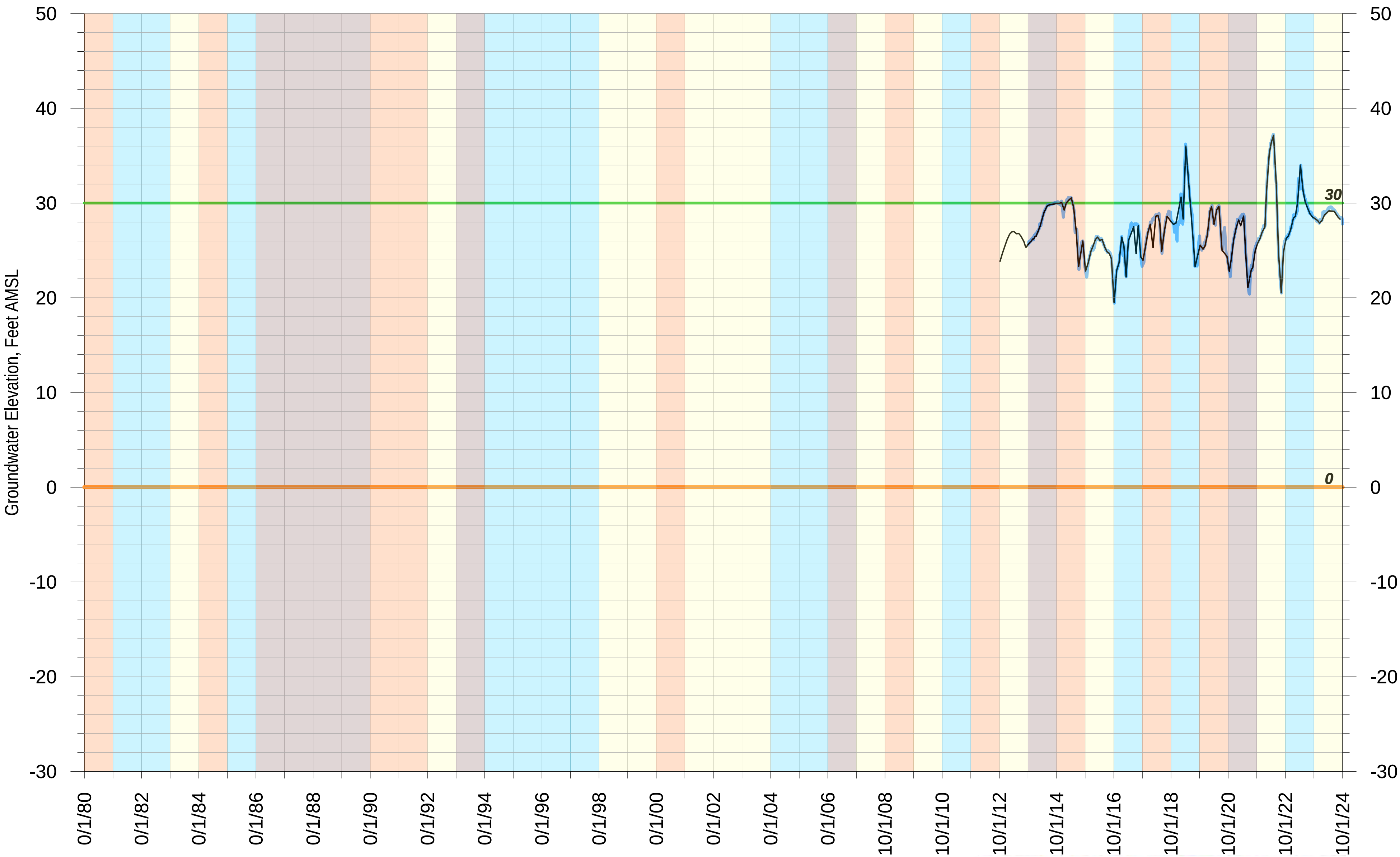


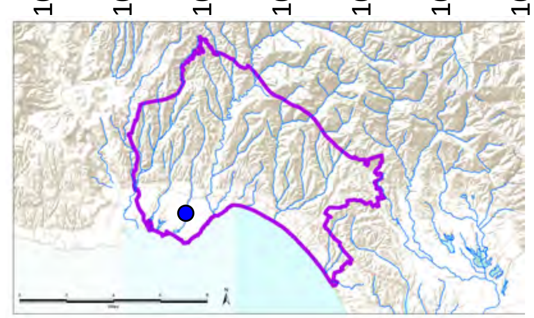
MONTGOMERY
& ASSOCIATES

30th Ave Deep
Aquifer Screened: Tu

Appendix A

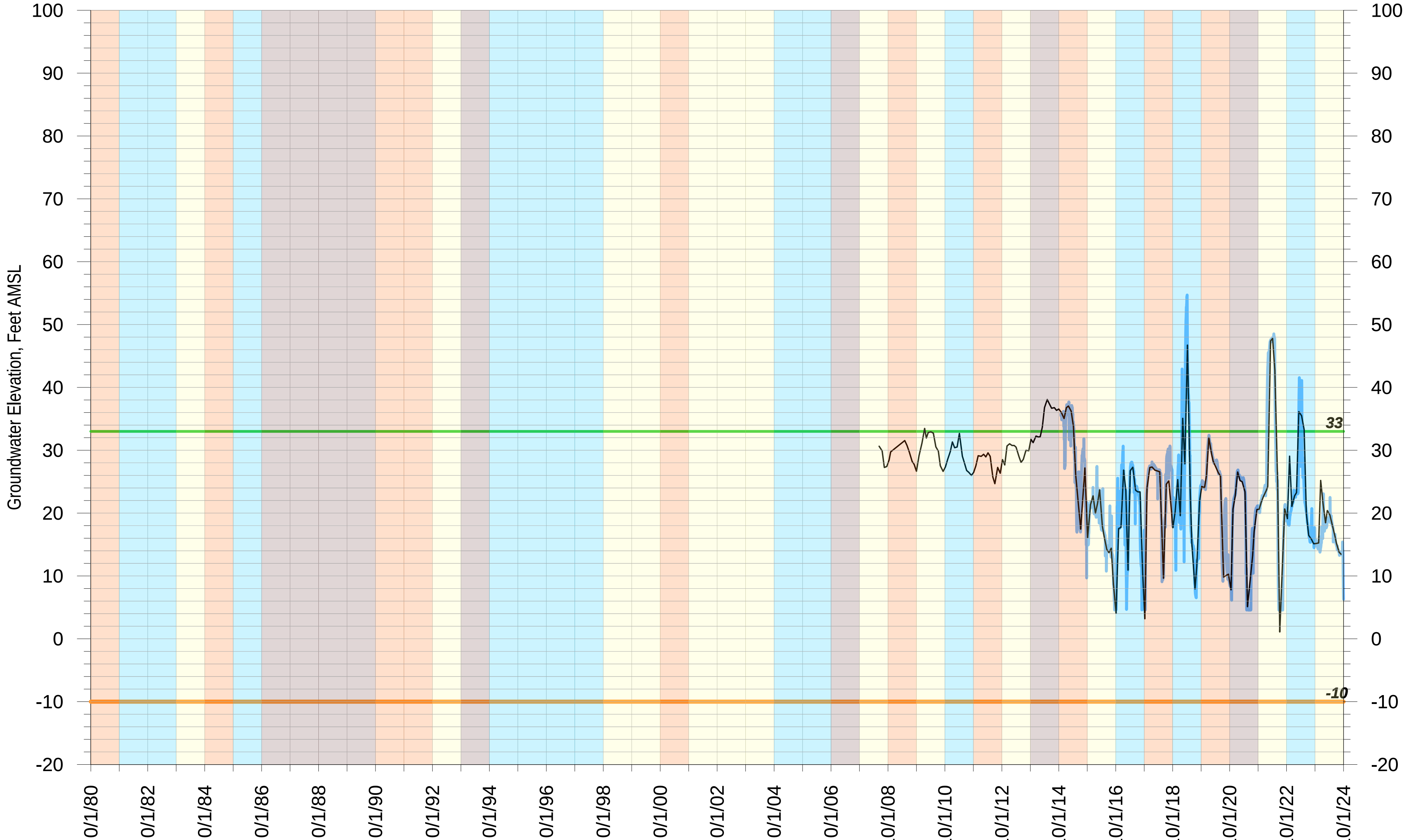
FIGURE A-16

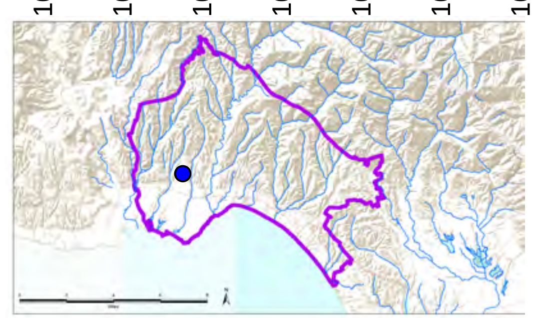




MONTGOMERY & ASSOCIATES

Thurber Deep
Aquifer Screened: Tu



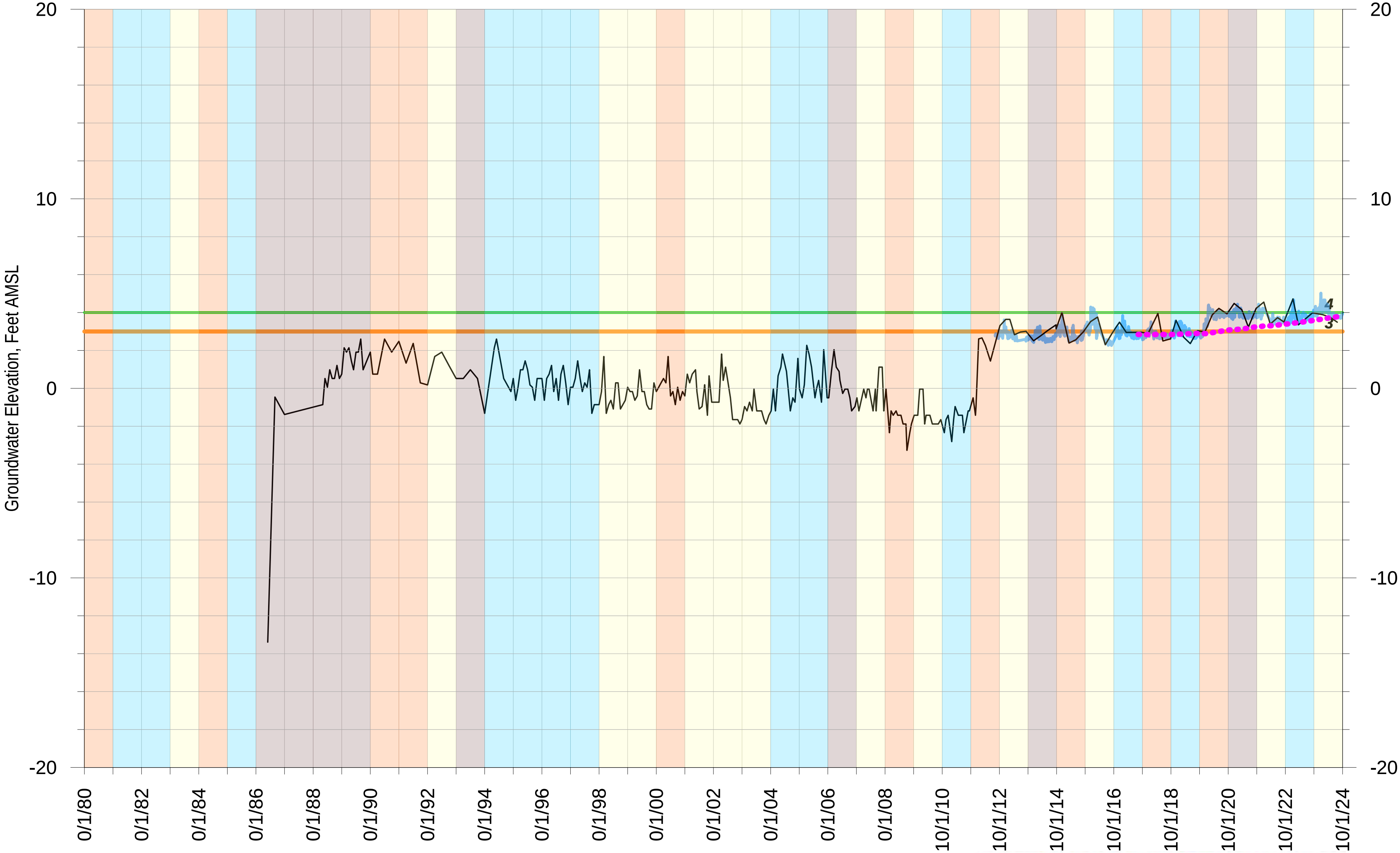


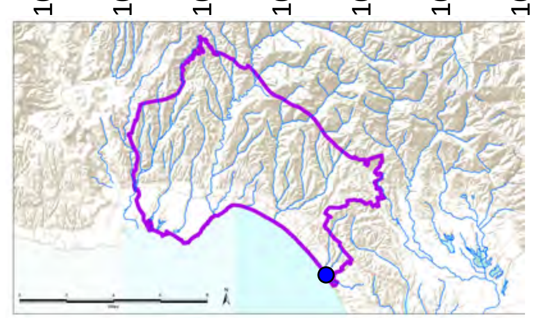
MONTGOMERY & ASSOCIATES

SC-A3A at Playa Vista
Aquifer Screened: Aromas

Appendix A

FIGURE A-18



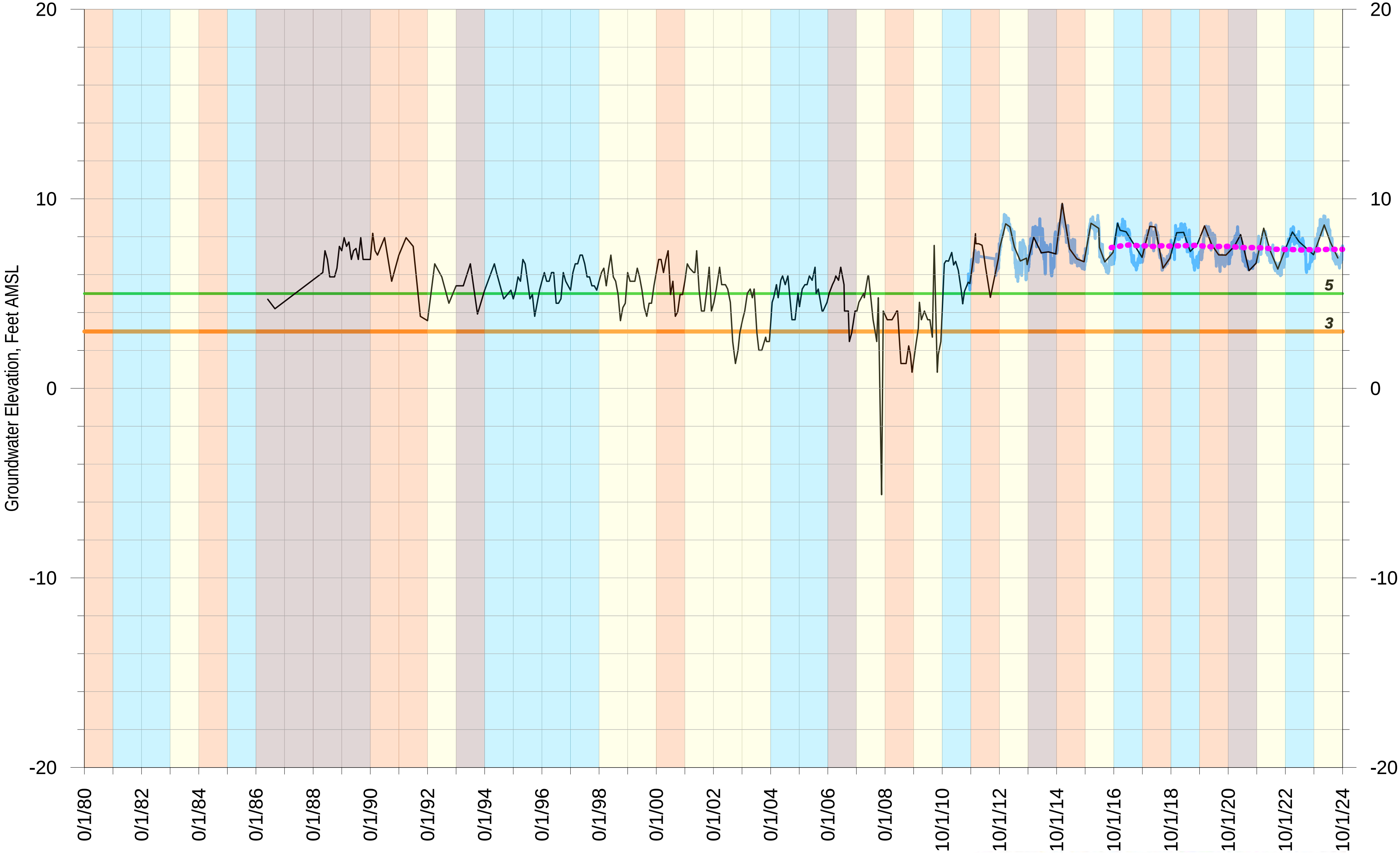


MONTGOMERY
& ASSOCIATES

SC-A1B at Cliff Drive
Aquifer Screened: Purisima F

Appendix A

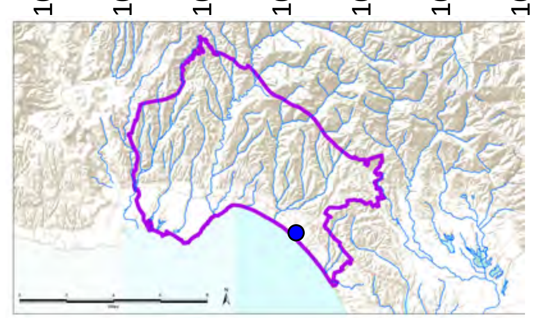
FIGURE A-19



Hand Measurement
Transducer
Measurable Objective
Minimum Threshold
5 Year Moving Average

Critically Dry
Dry
Normal
Wet

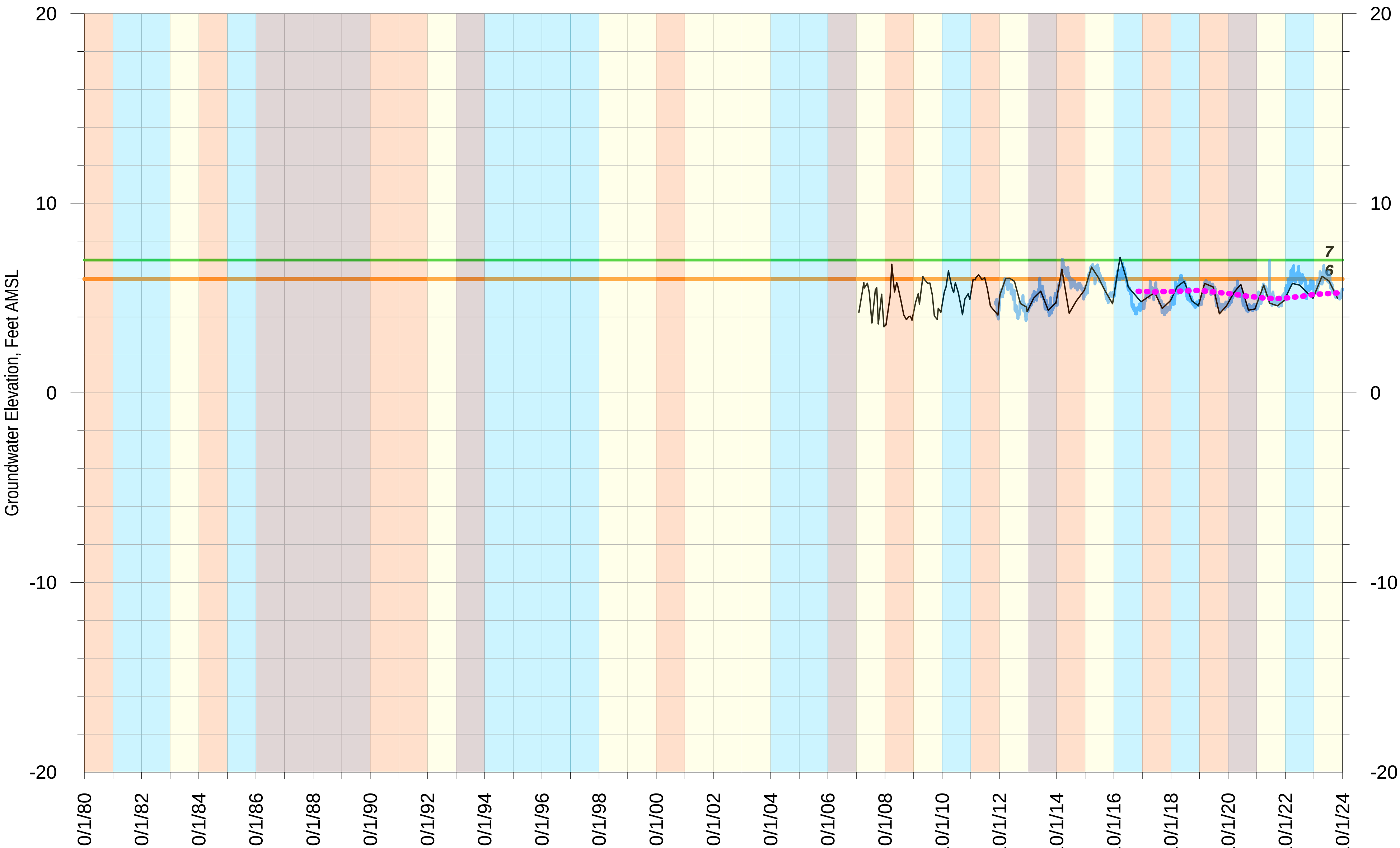
MONTGOMERY & ASSOCIATES

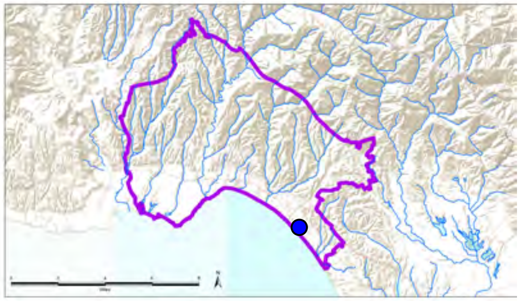


SC-A8A at Dolphin
Aquifer Screened: Purisima F

Appendix A

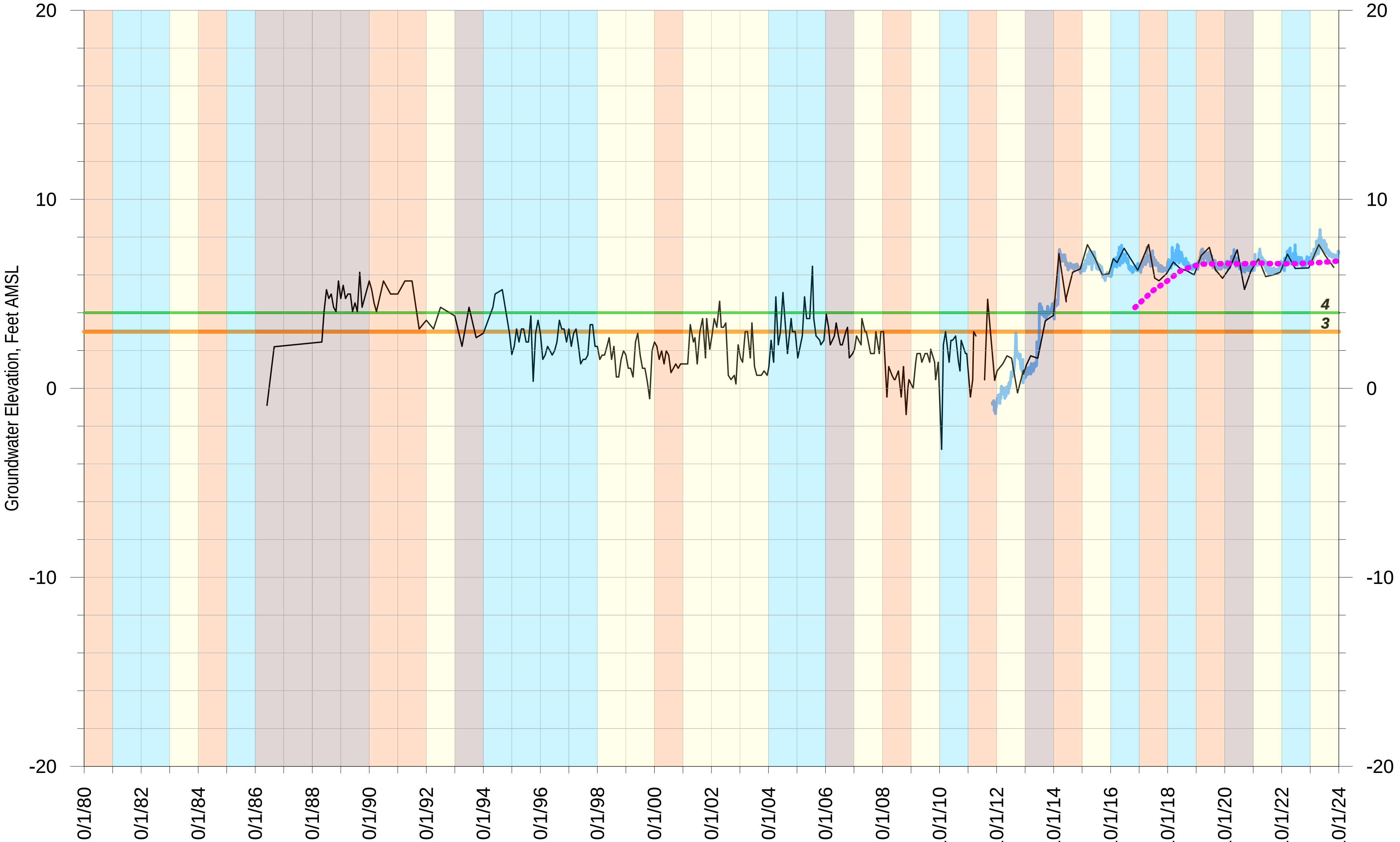
FIGURE A-20

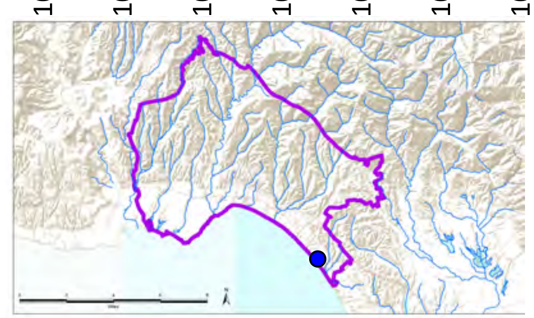




MONTGOMERY
& ASSOCIATES

SC-A2A & SC-A2RA at Sumner
Aquifer Screened: Purisima F



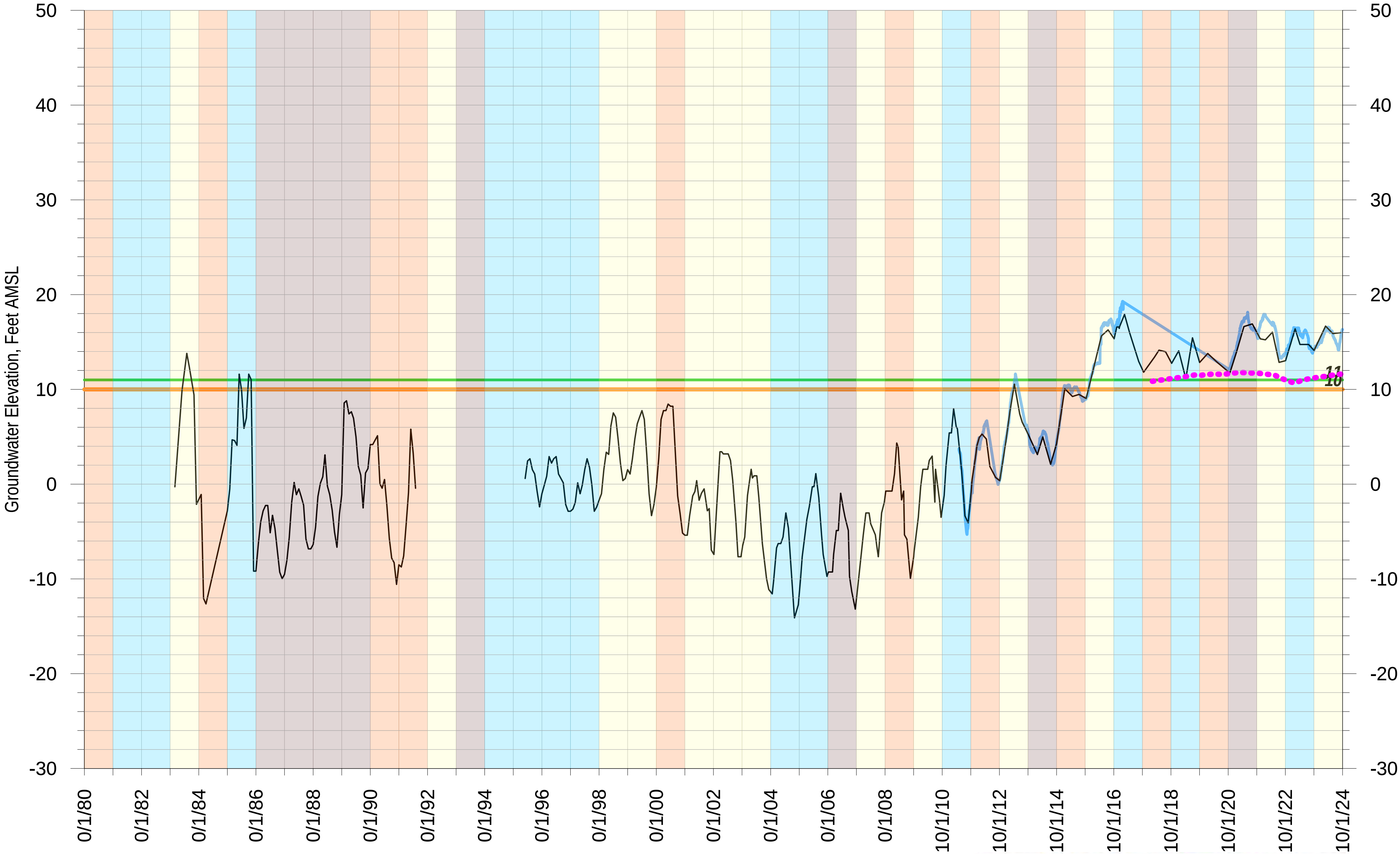


MONTGOMERY
& ASSOCIATES

SC-8D & SC-8RD at Aptos Creek
Aquifer Screened: Purisima DEF

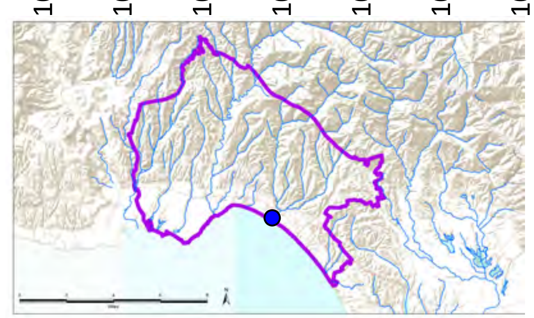
Appendix A

FIGURE A-22

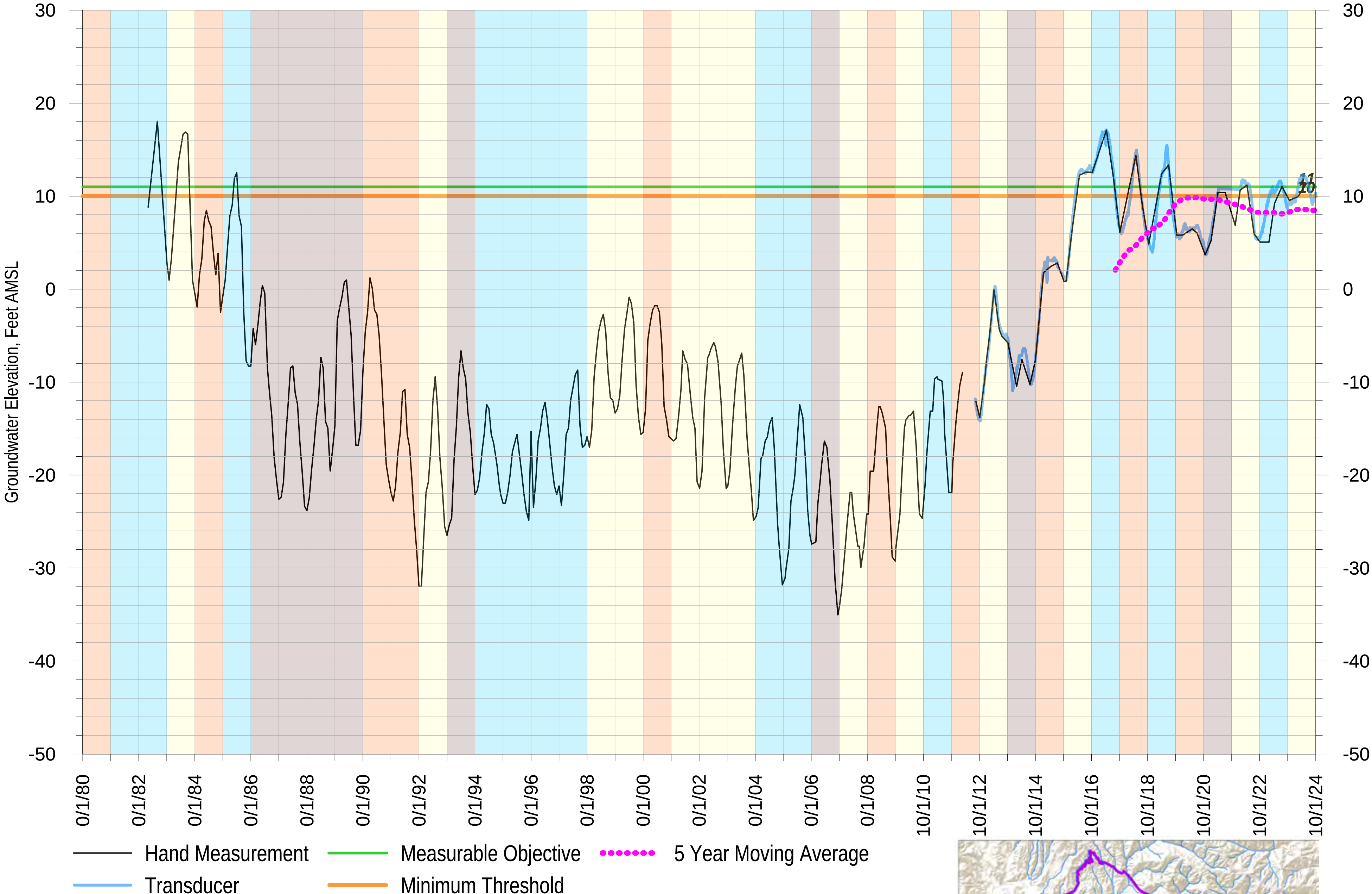


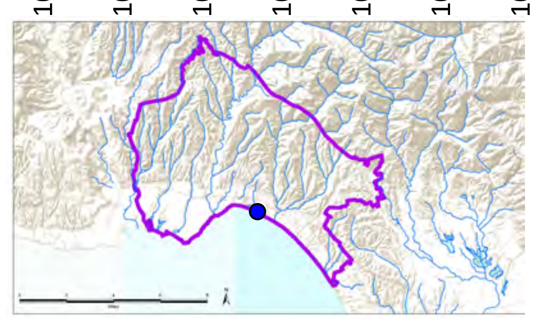
Hand Measurement
Transducer
Measurable Objective
Minimum Threshold
5 Year Moving Average

Critically Dry
Dry
Normal
Wet



SC-9C & SC-9RC at Seacliff
Aquifer Screened: Purisima BC



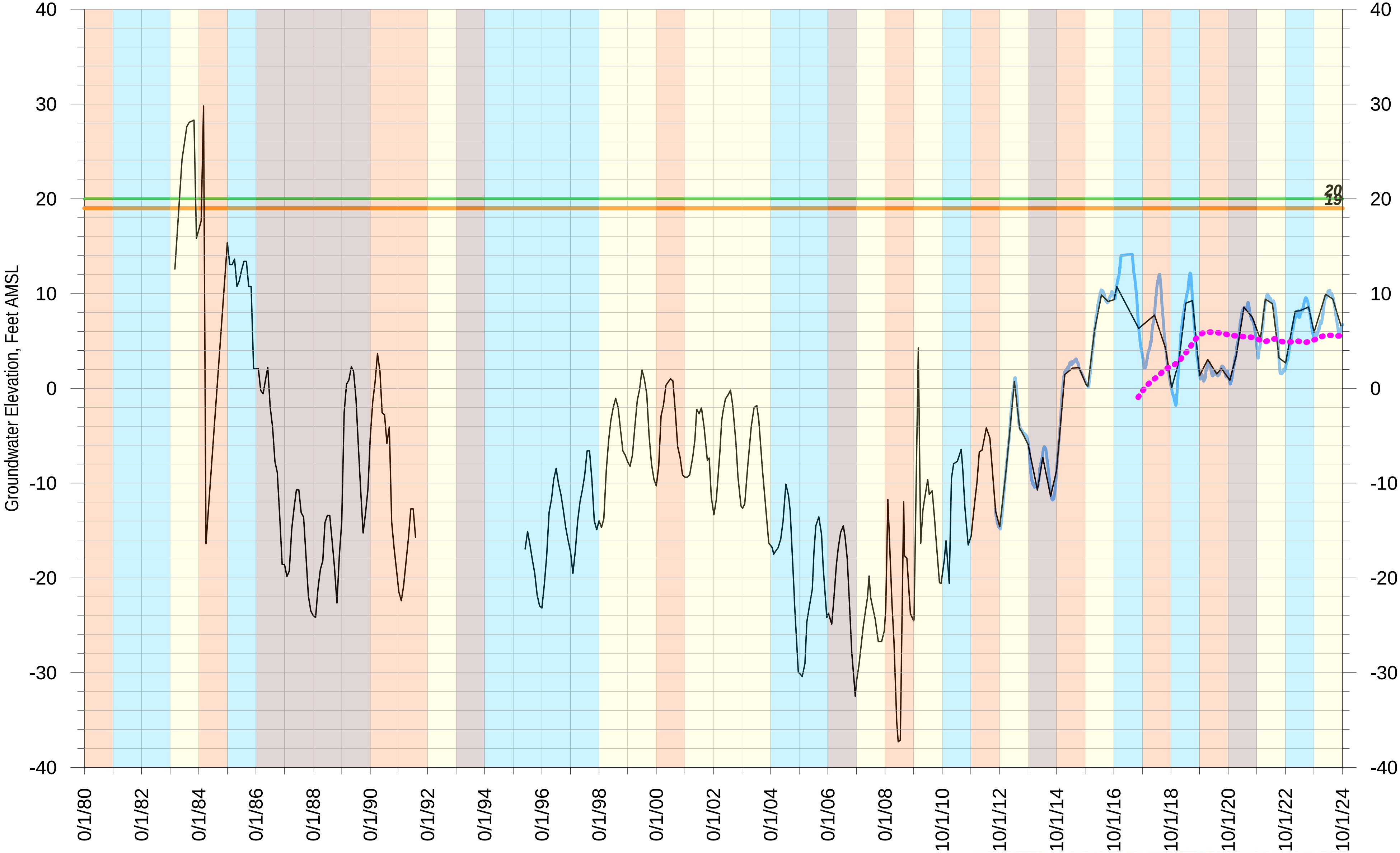


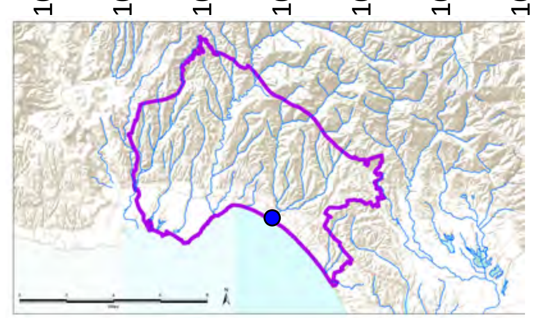
MONTGOMERY & ASSOCIATES

SC-8B & SC-8RB at Aptos Creek
Aquifer Screened: Purisima BC

Appendix A

FIGURE A-24

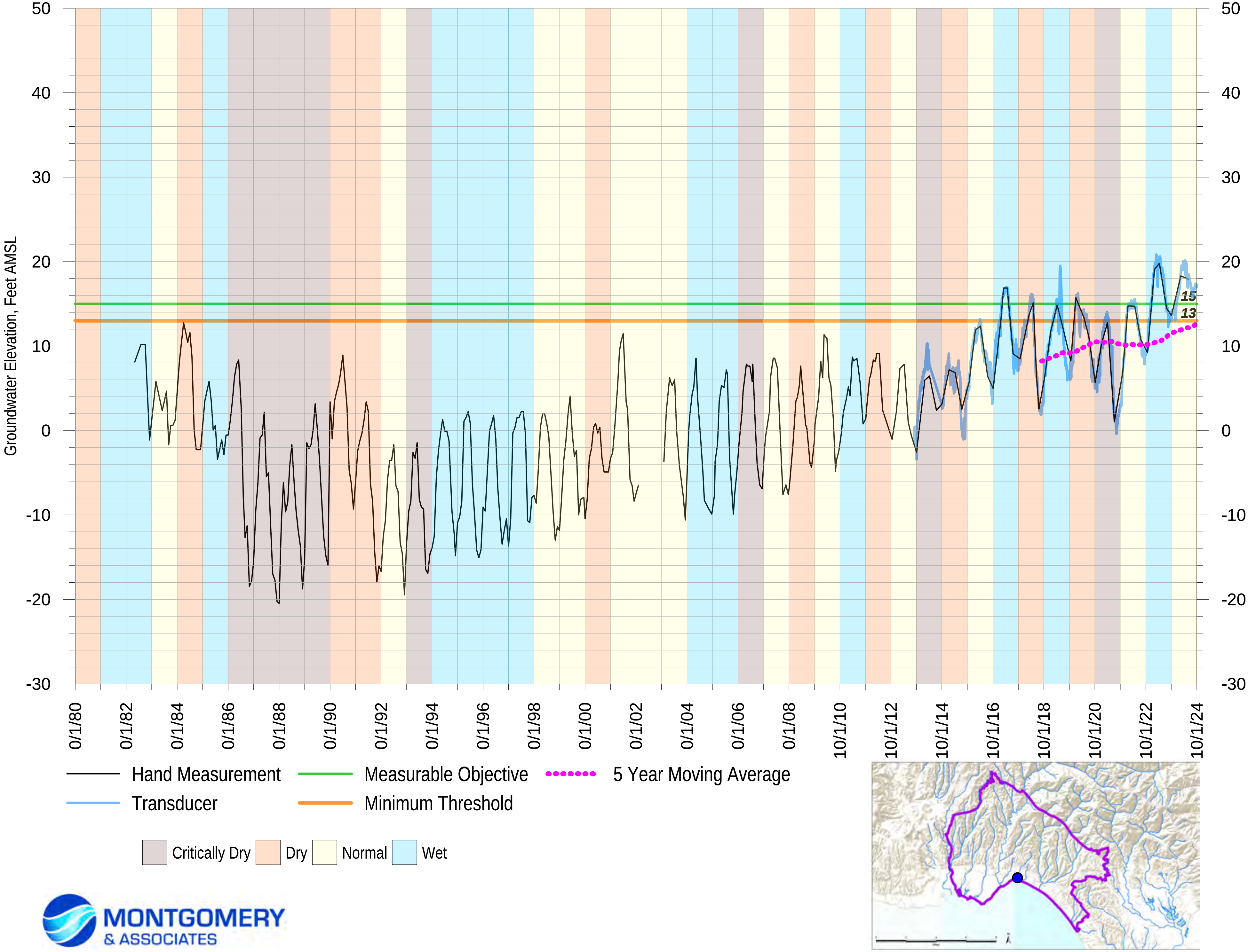




MONTGOMERY & ASSOCIATES

SC-5A & SC-5RA at New Brighton
Aquifer Screened: Purisima A

Appendix A
FIGURE A-25

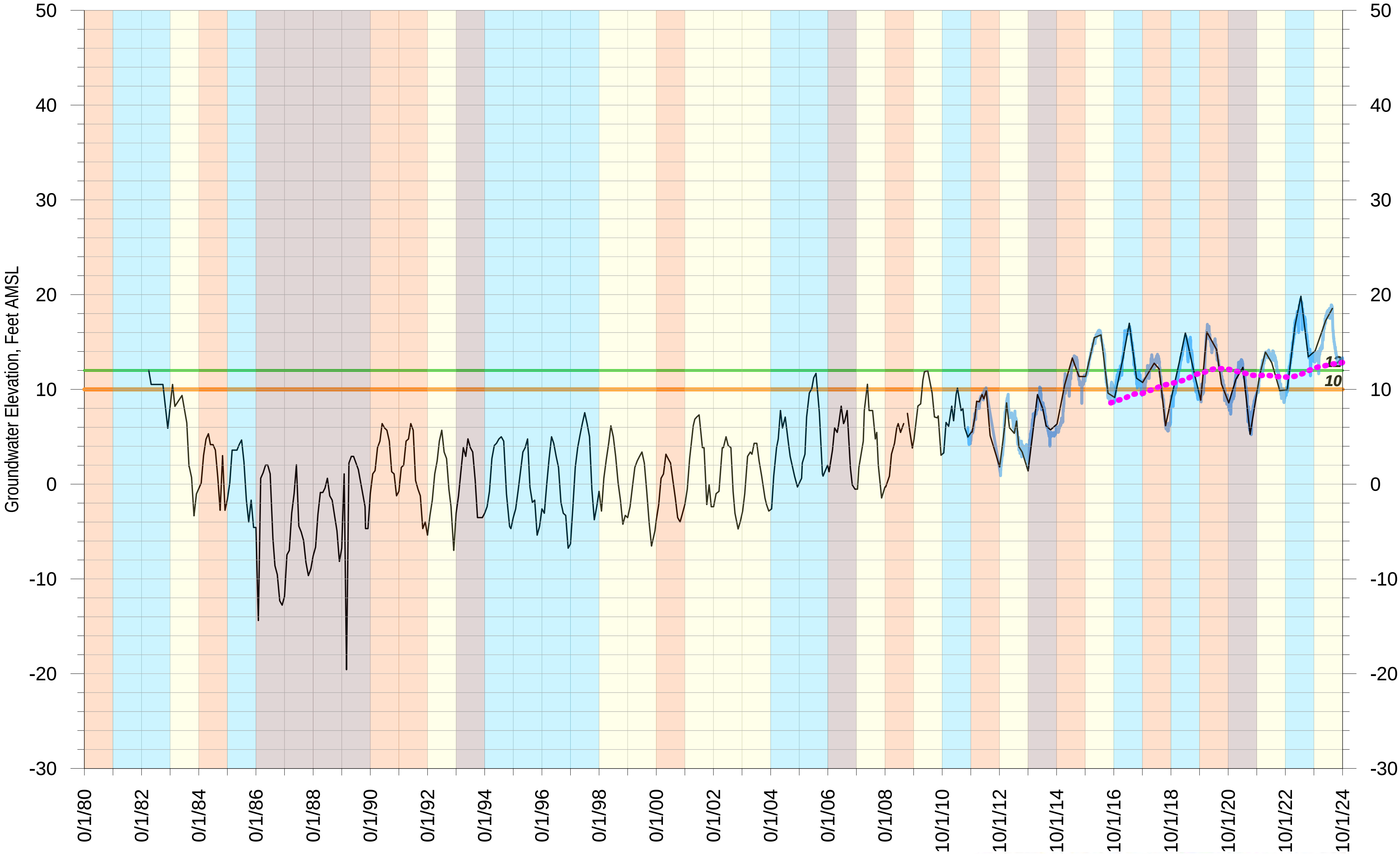


MONTGOMERY & ASSOCIATES

SC-3A & SC-3RA at Escalona
Aquifer Screened: Purisima A/AA

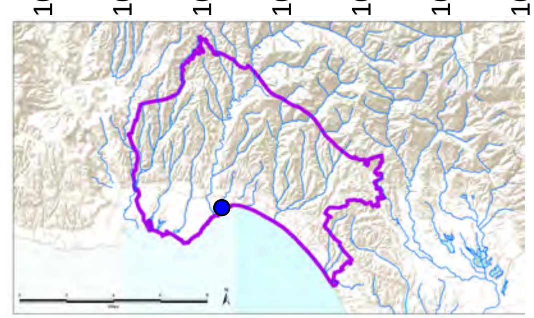
Appendix A

FIGURE A-26



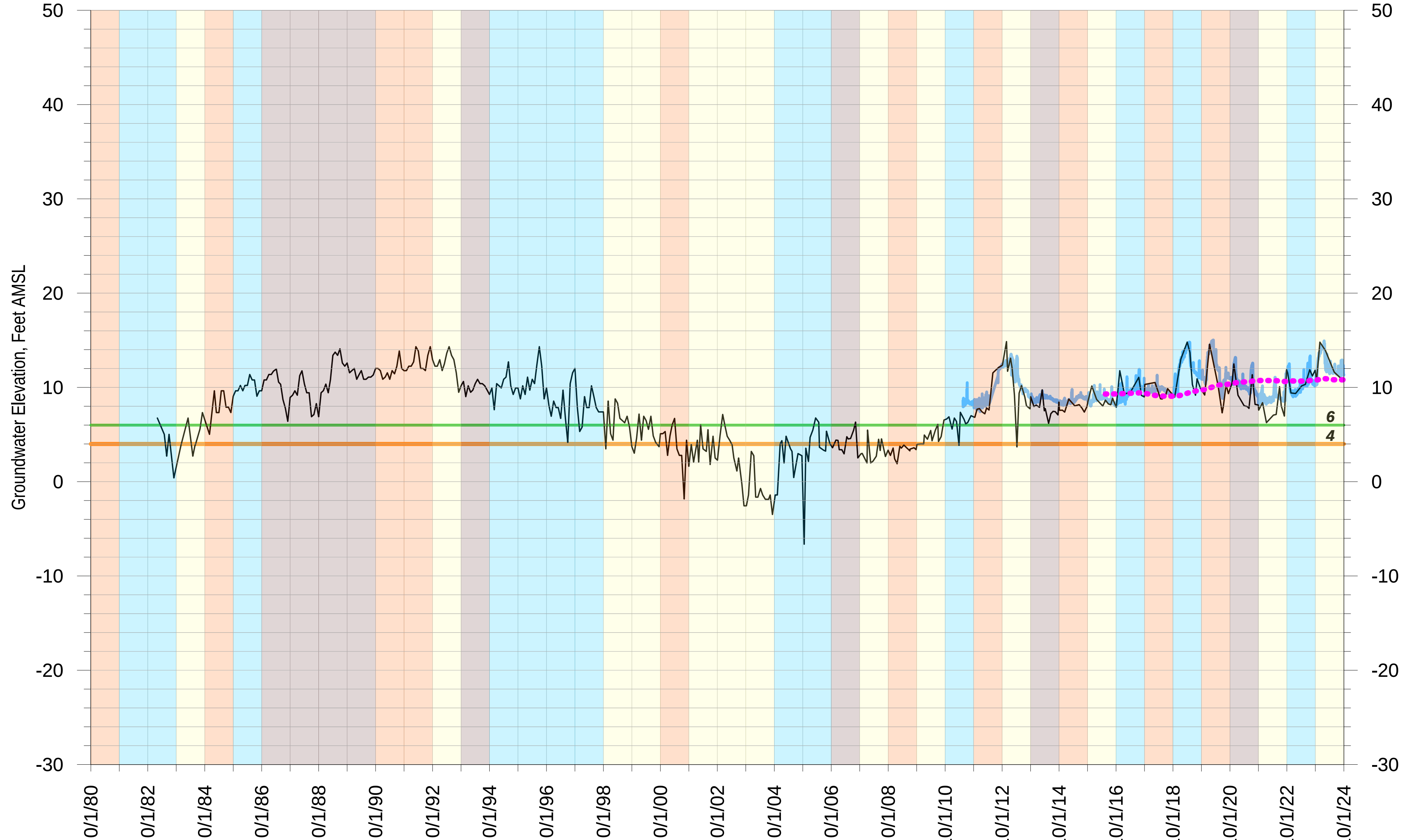
Hand Measurement
Transducer
Measurable Objective
Minimum Threshold
5 Year Moving Average

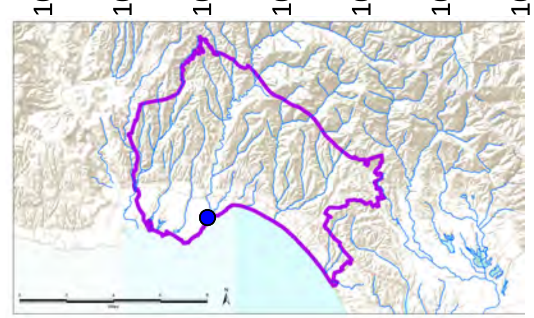
Critically Dry
Dry
Normal
Wet



MONTGOMERY
& ASSOCIATES

SC-1A at Prospect
Aquifer Screened: Purisima A



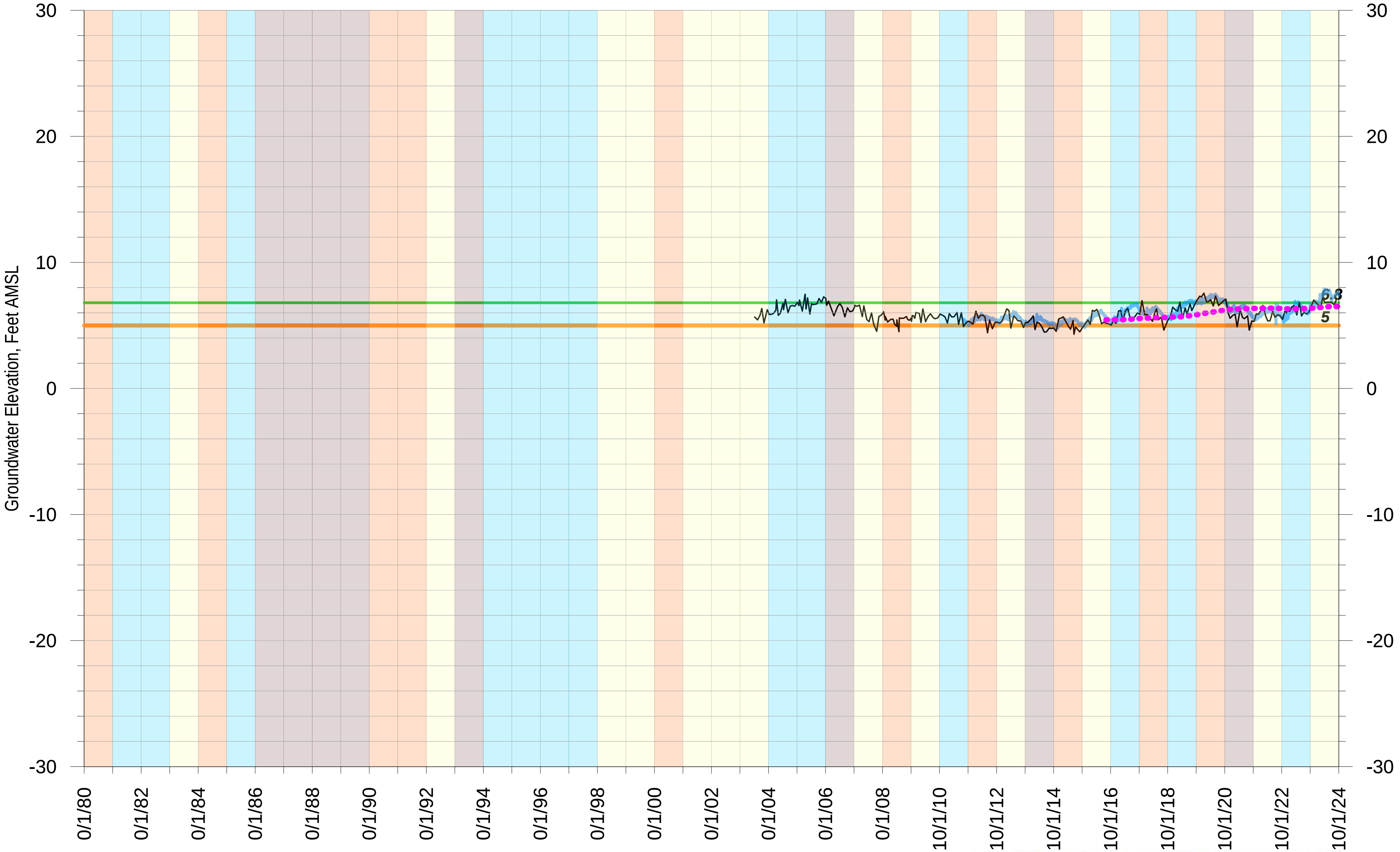


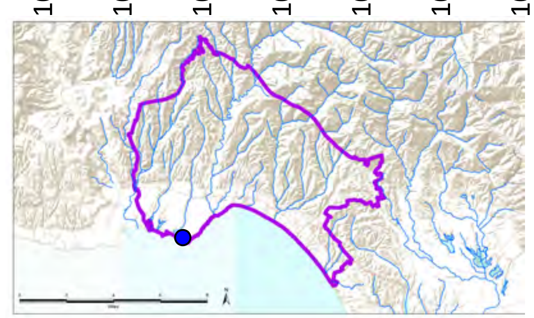
MONTGOMERY & ASSOCIATES

Moran Lake Medium
Aquifer Screened: Purisima A

Appendix A

FIGURE A-28



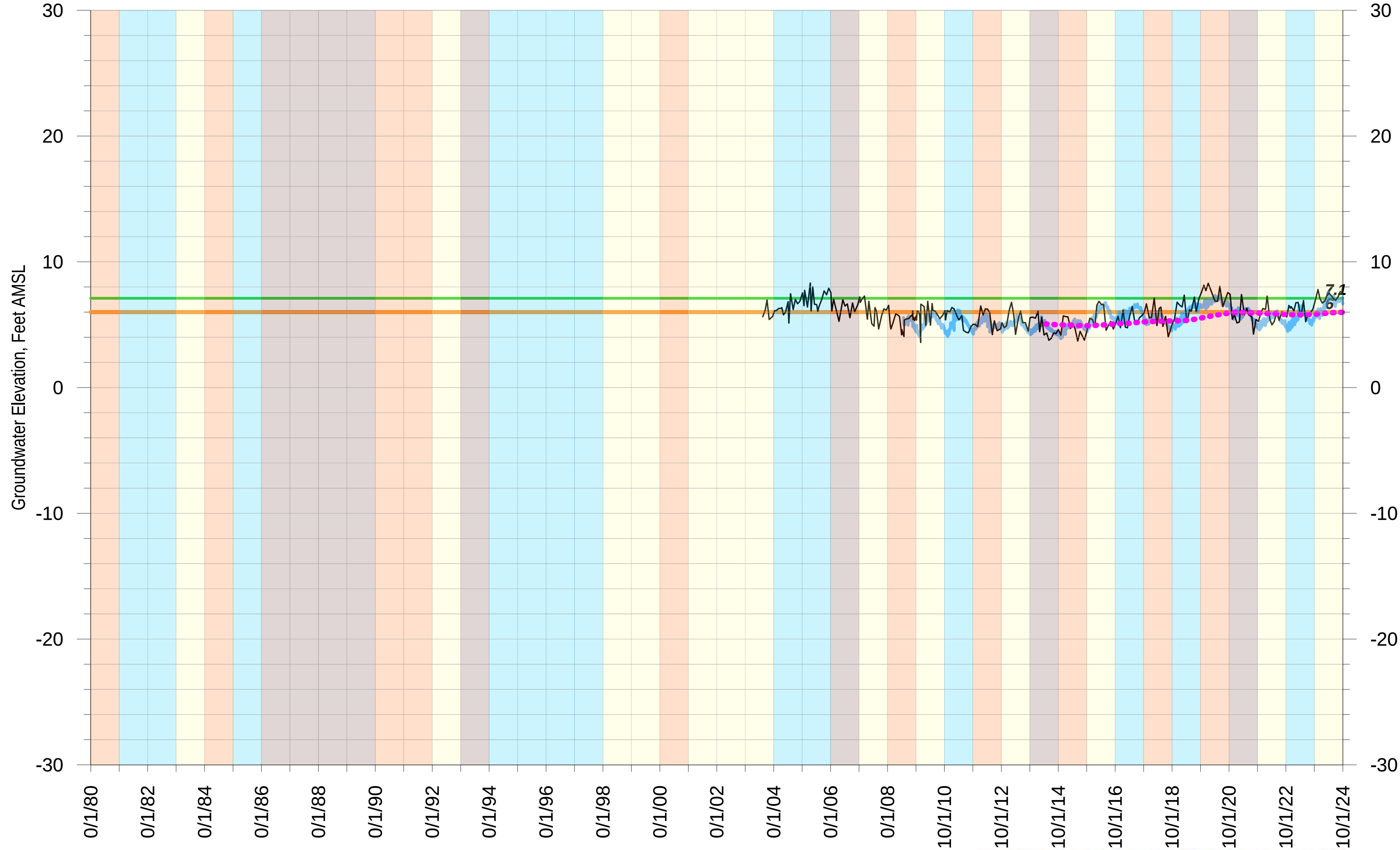


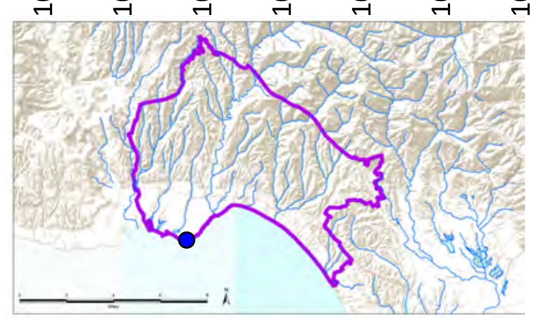
MONTGOMERY
& ASSOCIATES

Soquel Point Medium
Aquifer Screened: Purisima A

Appendix A

FIGURE A-29

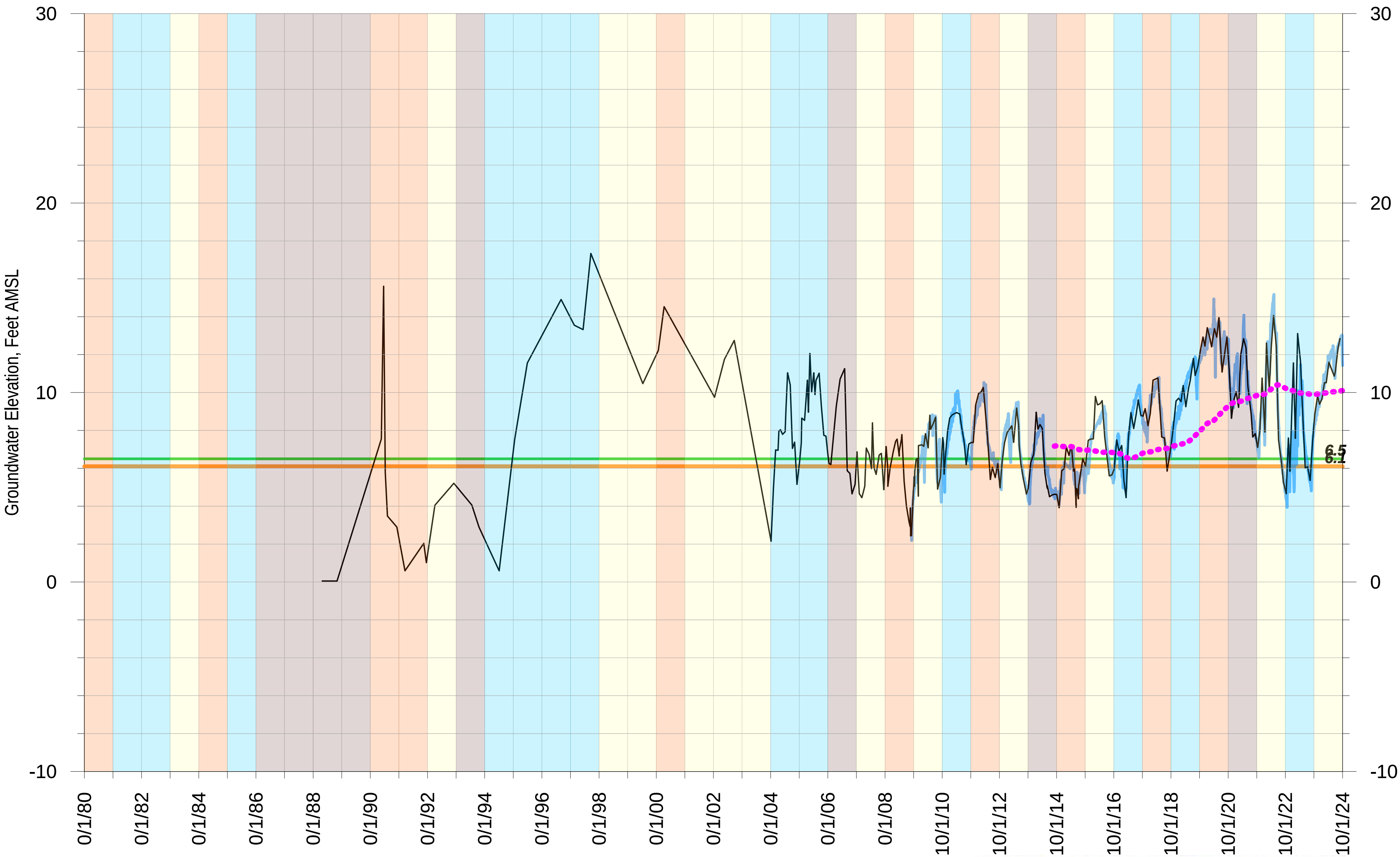


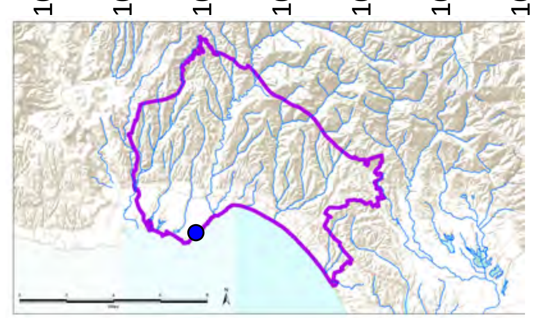


MONTGOMERY & ASSOCIATES

Pleasure Point Medium
Aquifer Screened: Purisima A

Appendix A
FIGURE A-30

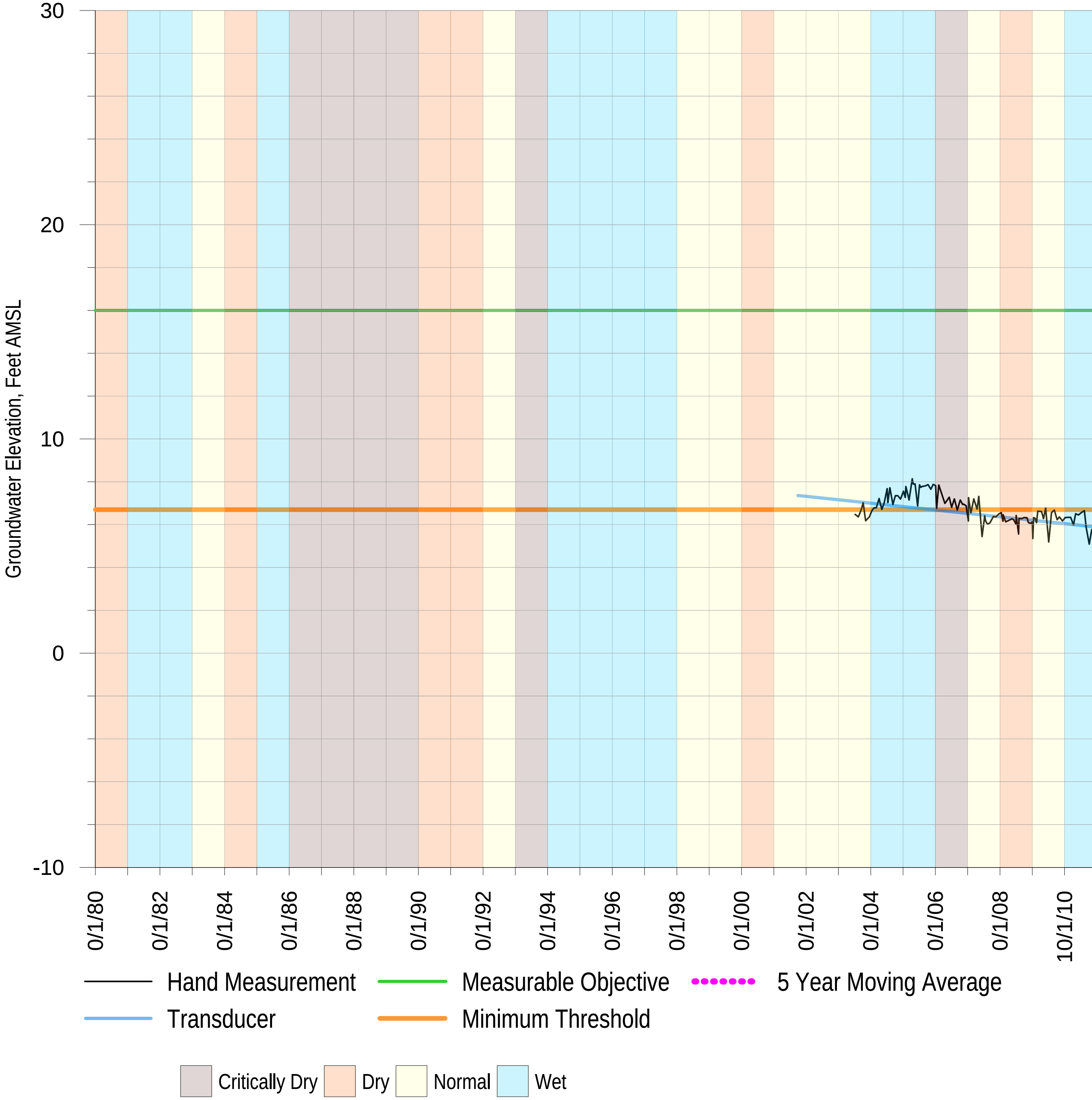


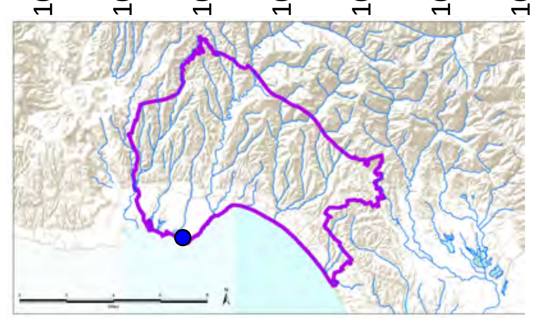


MONTGOMERY & ASSOCIATES

Moran Lake Deep
Aquifer Screened: Purisima AA

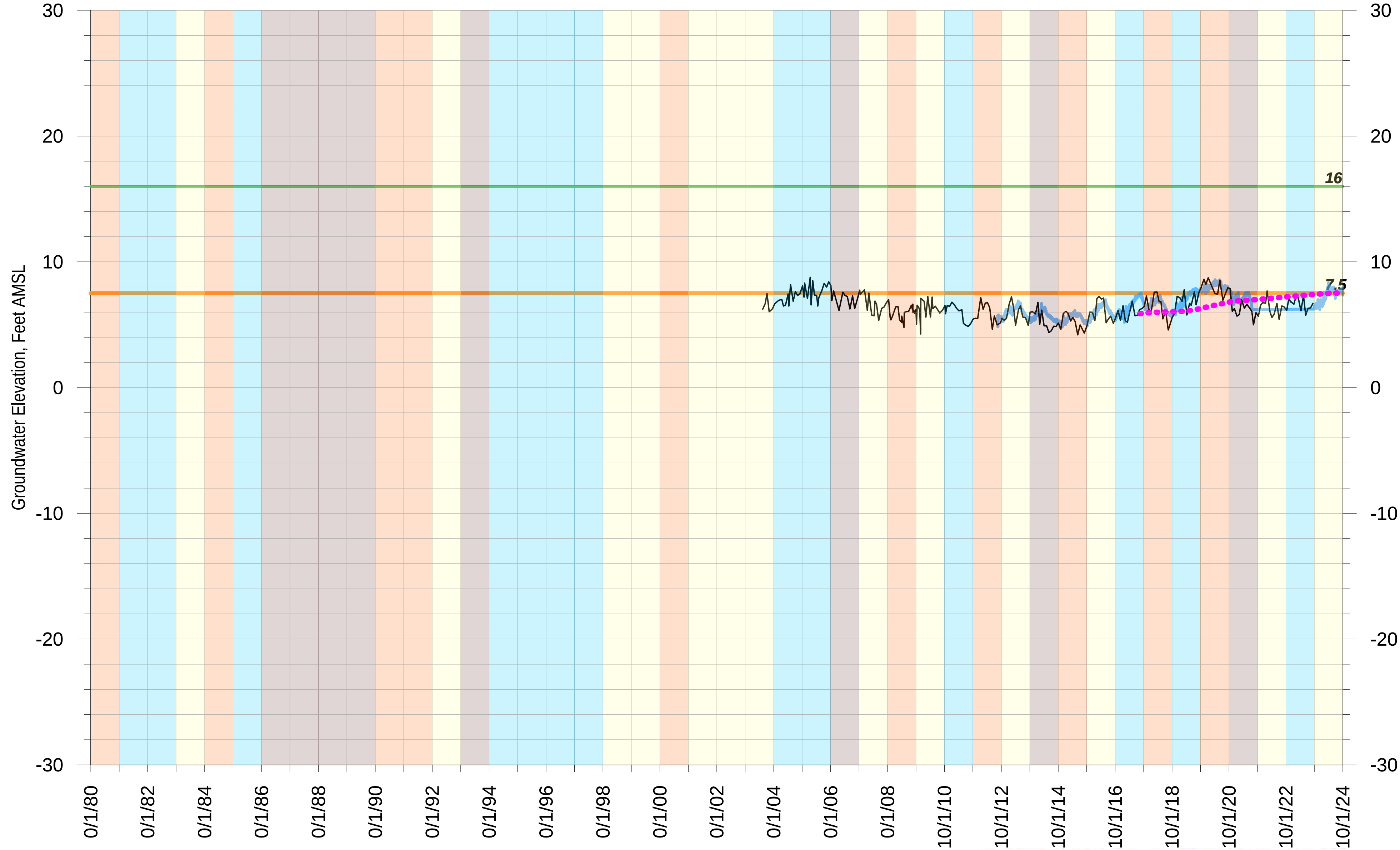
Appendix A
FIGURE A-31

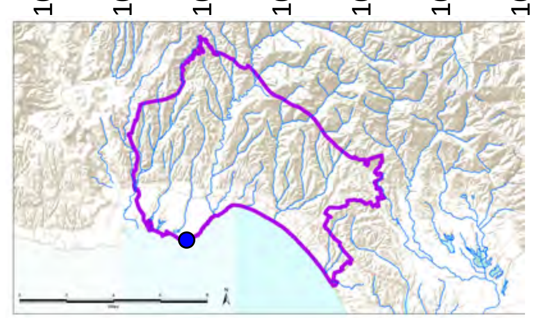




Soquel Point Deep
Aquifer Screened: Purisima AA

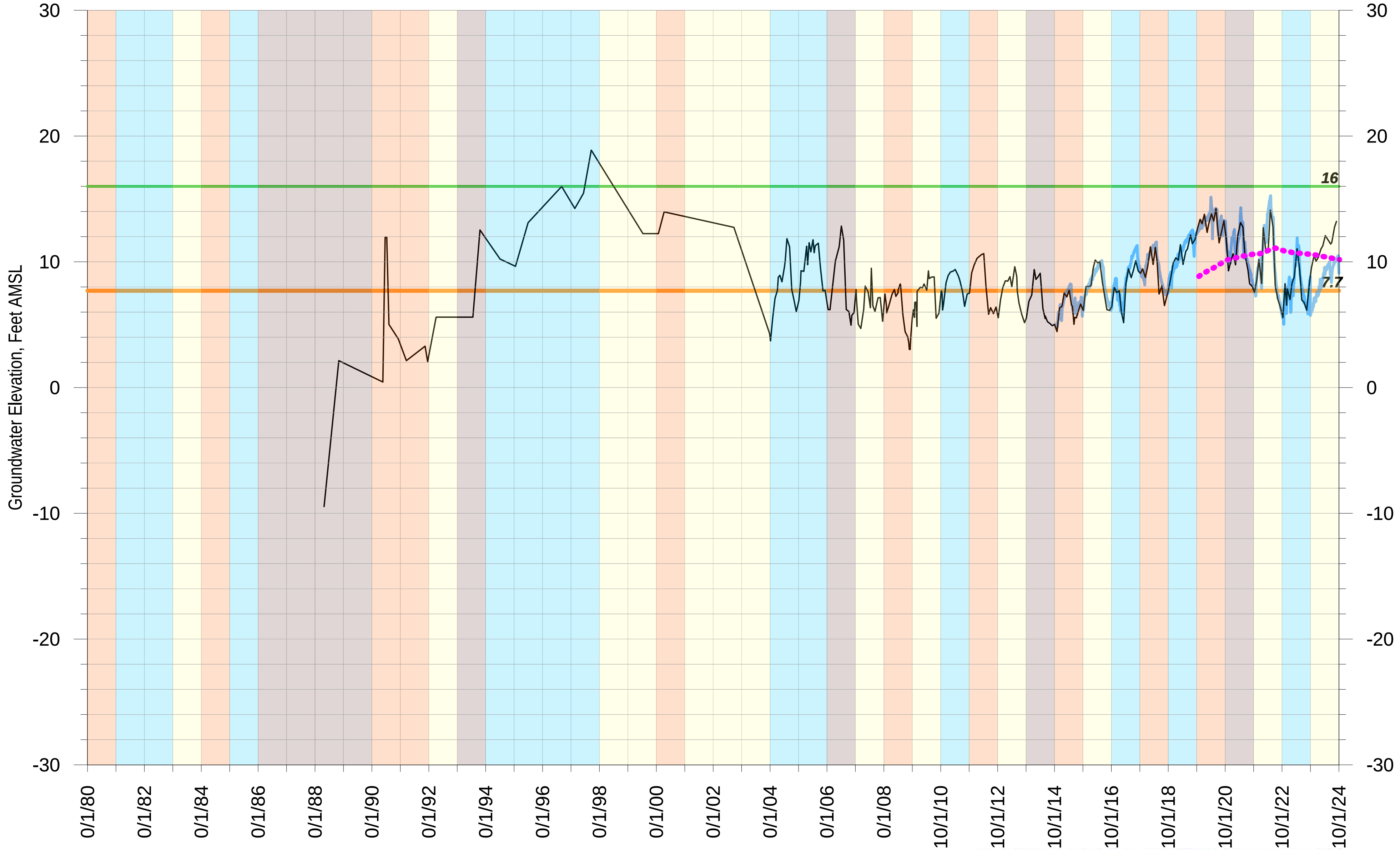
Appendix A
FIGURE A-32





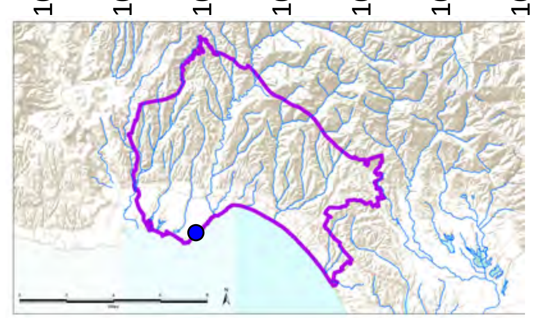
MONTGOMERY
& ASSOCIATES

Pleasure Point Deep
Aquifer Screened: Purisima AA



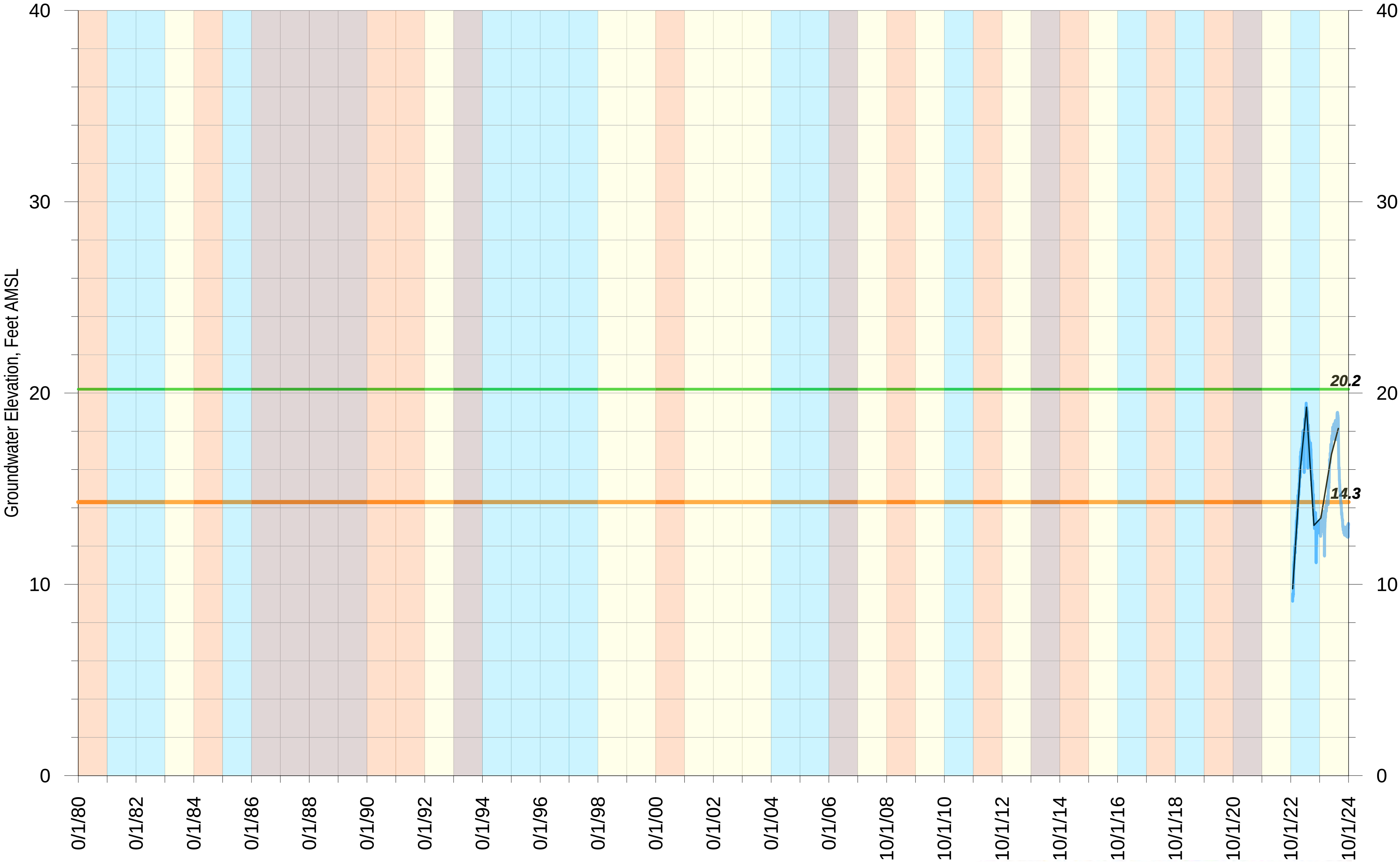
Hand Measurement
Measurable Objective
5 Year Moving Average
Transducer
Minimum Threshold

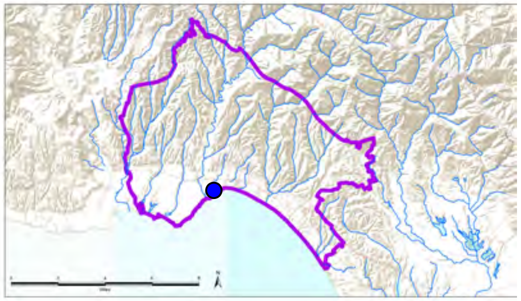
Critically Dry
Dry
Normal
Wet



MONTGOMERY & ASSOCIATES

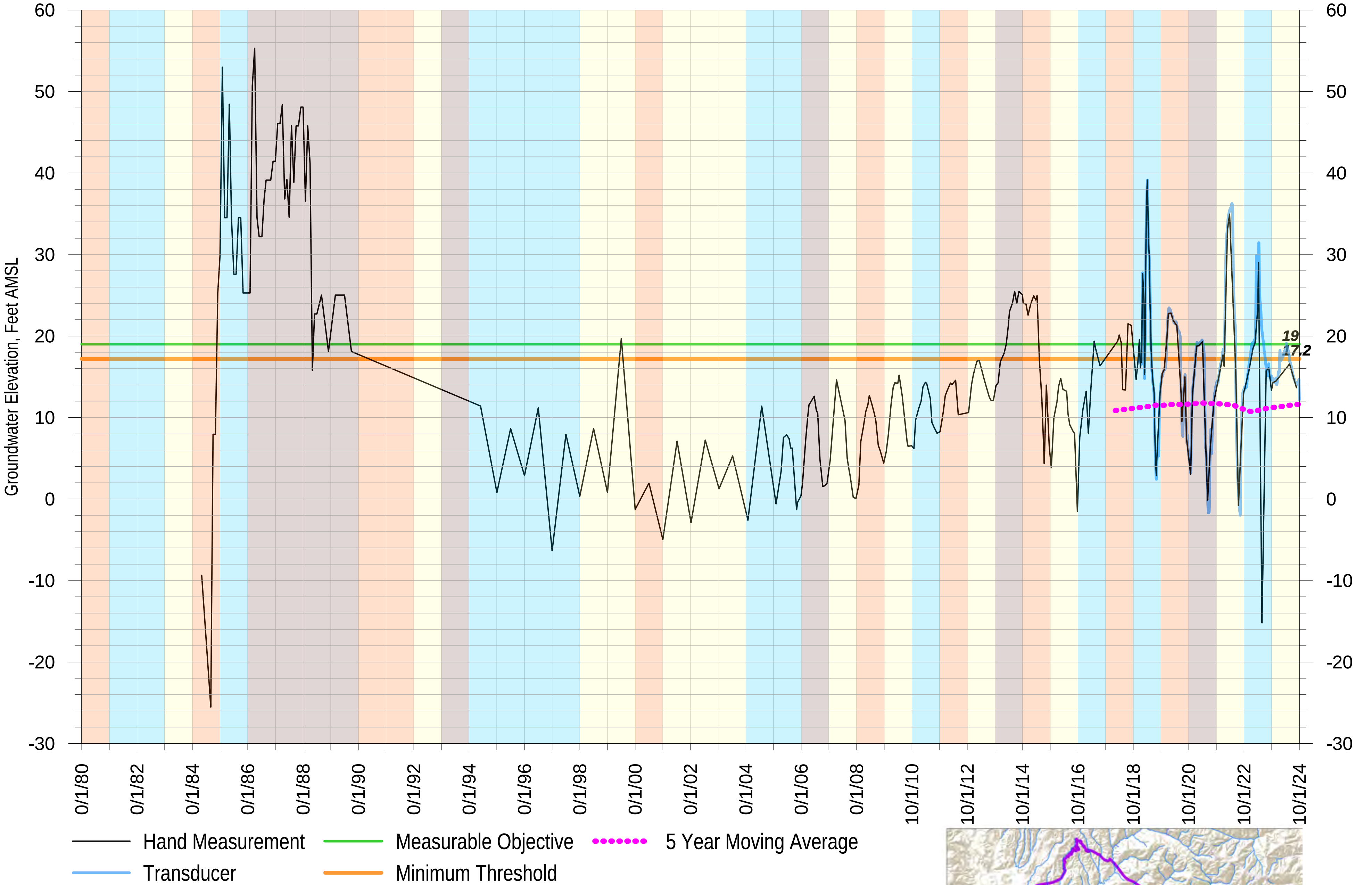
SC-3AA at Escalona
Aquifer Screened: Purisima AA

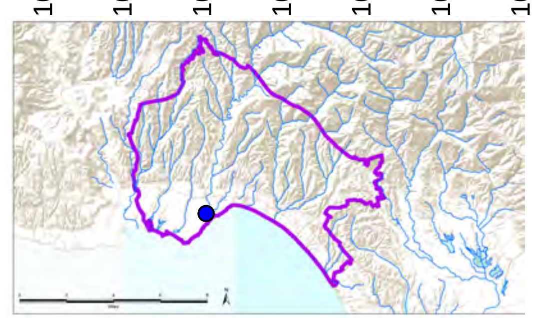




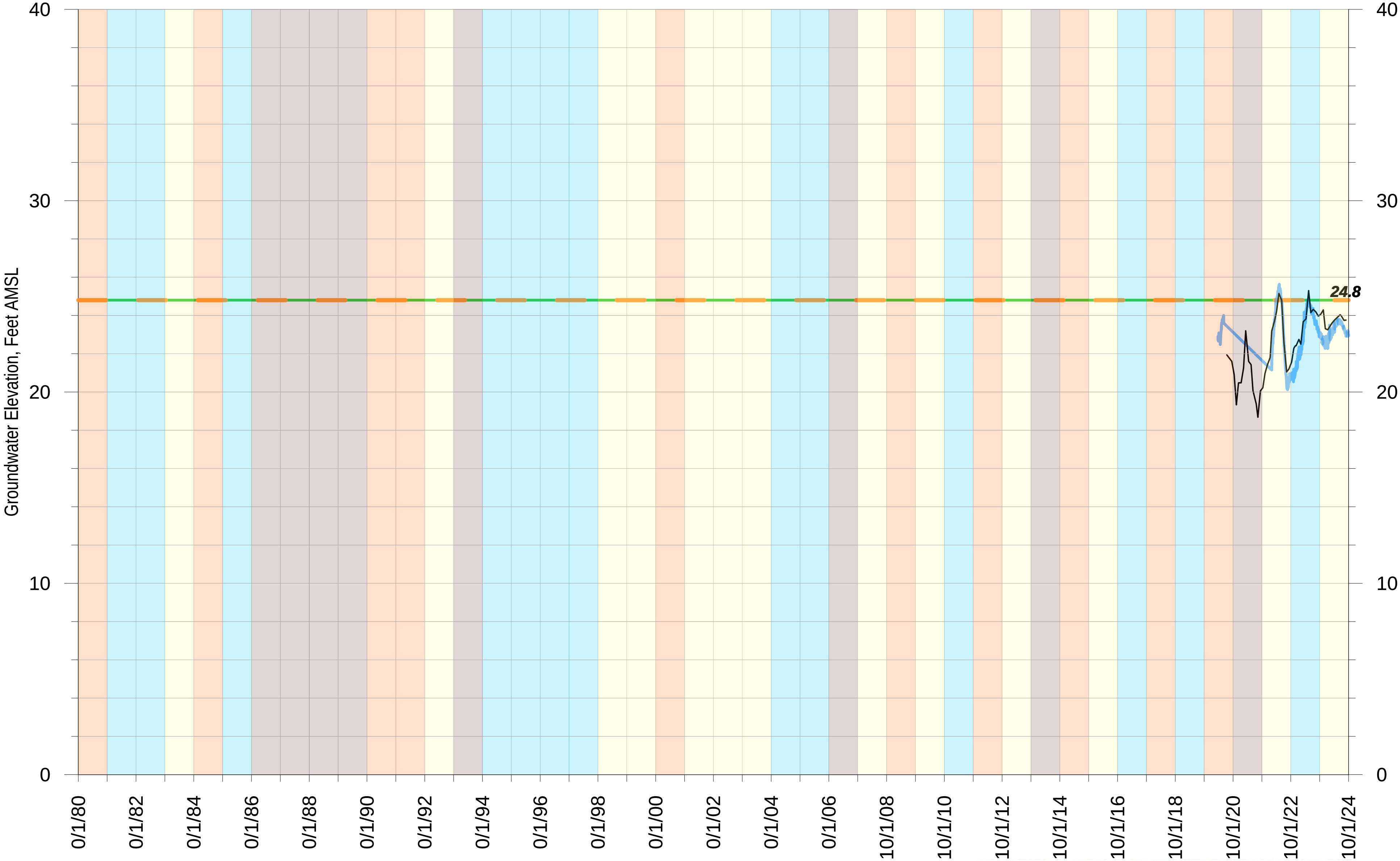
MONTGOMERY & ASSOCIATES

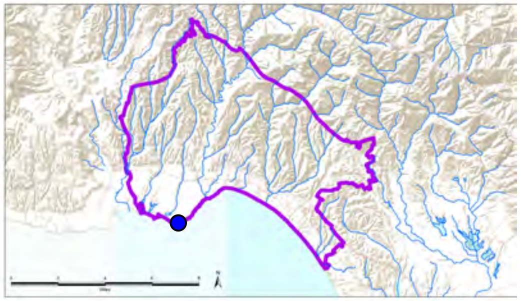
SC-13A at Garnet
Aquifer Screened: Tu





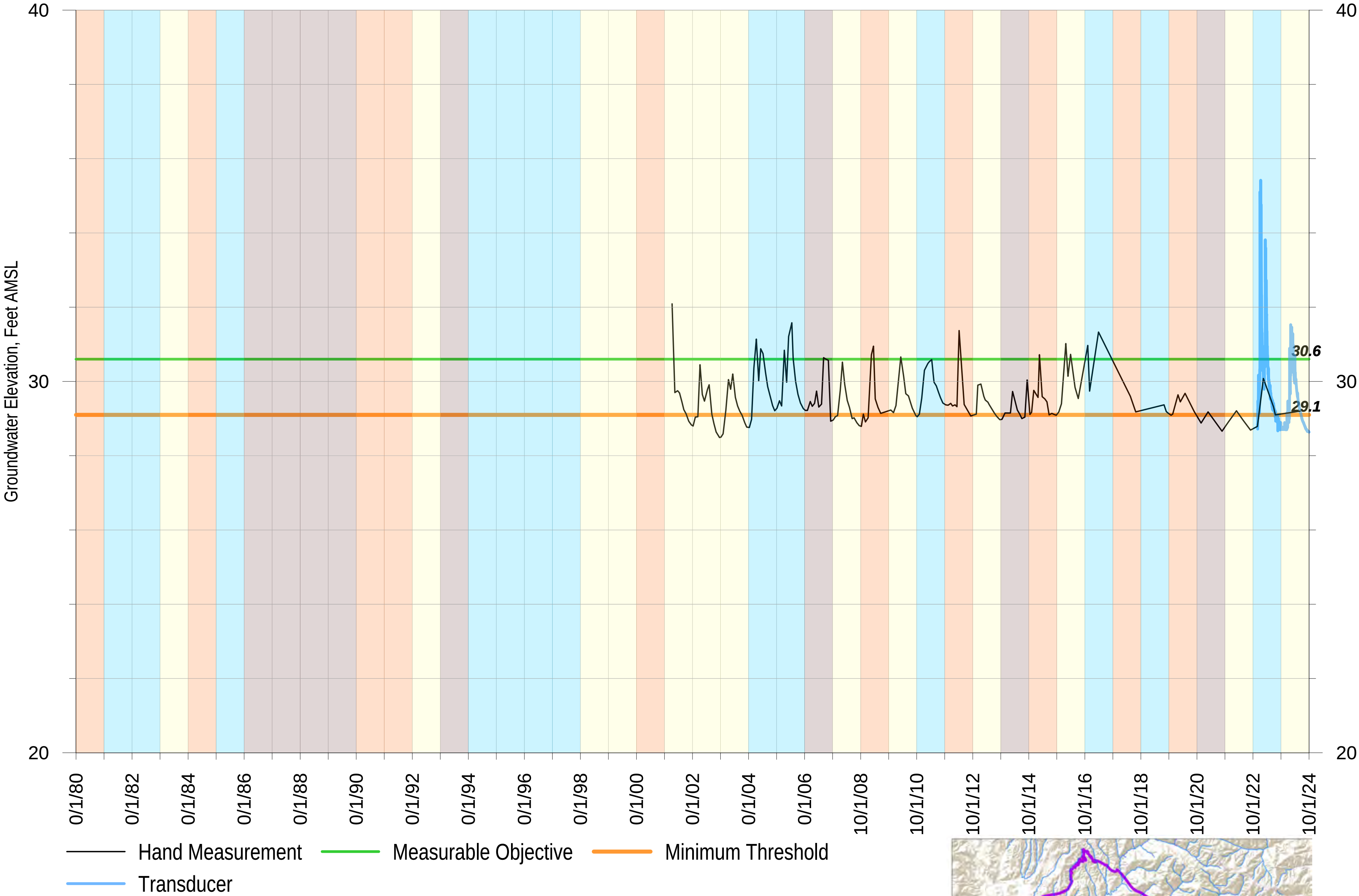
SP-5 at Soquel Point
Aquifer Screened: Tu

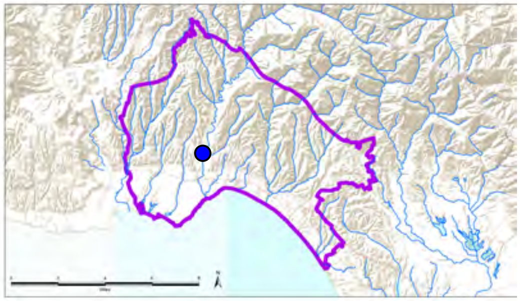




Balogh Shallow Well
Aquifer Screened: Shallow Well for Surface Water Interactions

Appendix A
FIGURE A-37

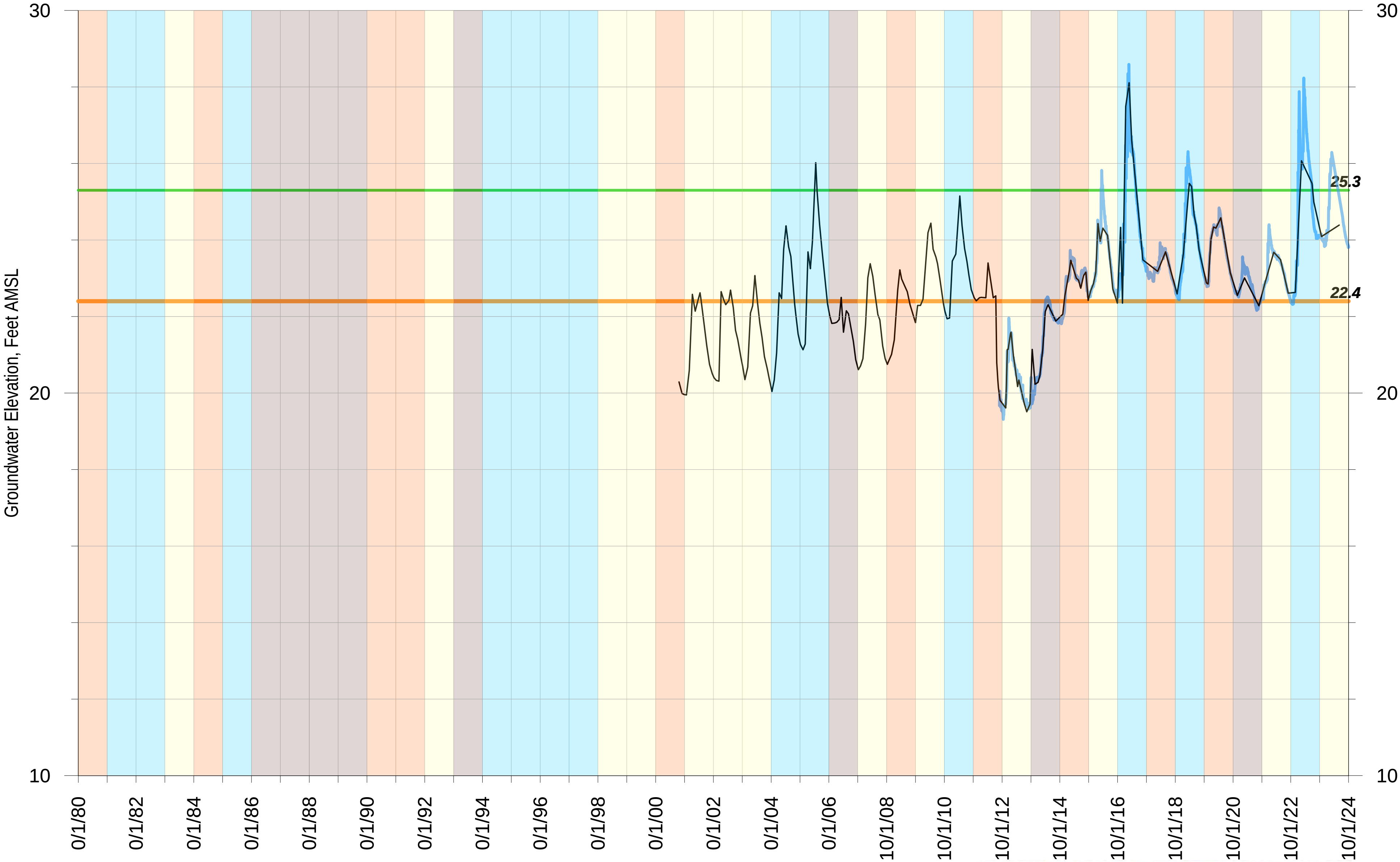


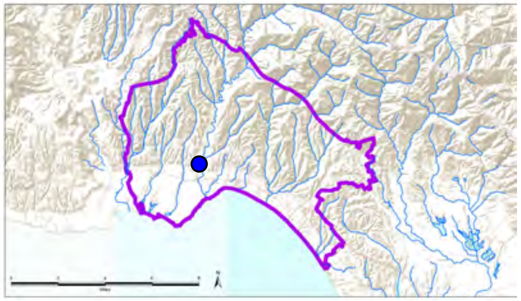


MONTGOMERY & ASSOCIATES

Main Street Shallow Well 1
Aquifer Screened: Shallow Well for Surface Water Interactions

Appendix A
FIGURE A-38





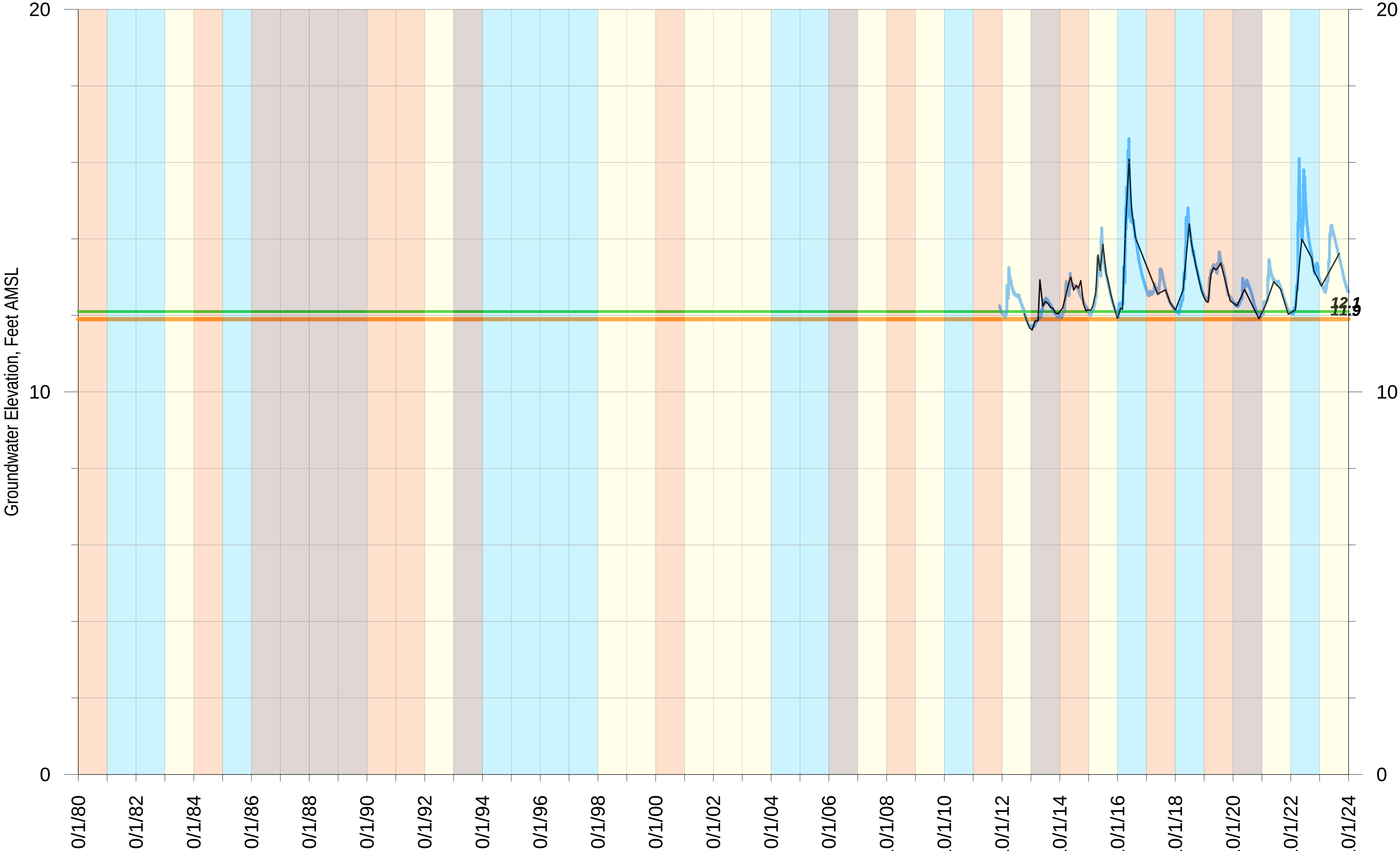
MONTGOMERY & ASSOCIATES

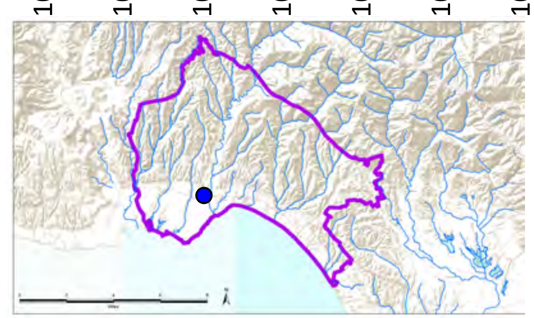
Soquel Wharf Shallow Well

Aquifer Screened: Shallow Well for Surface Water Interactions

Appendix A

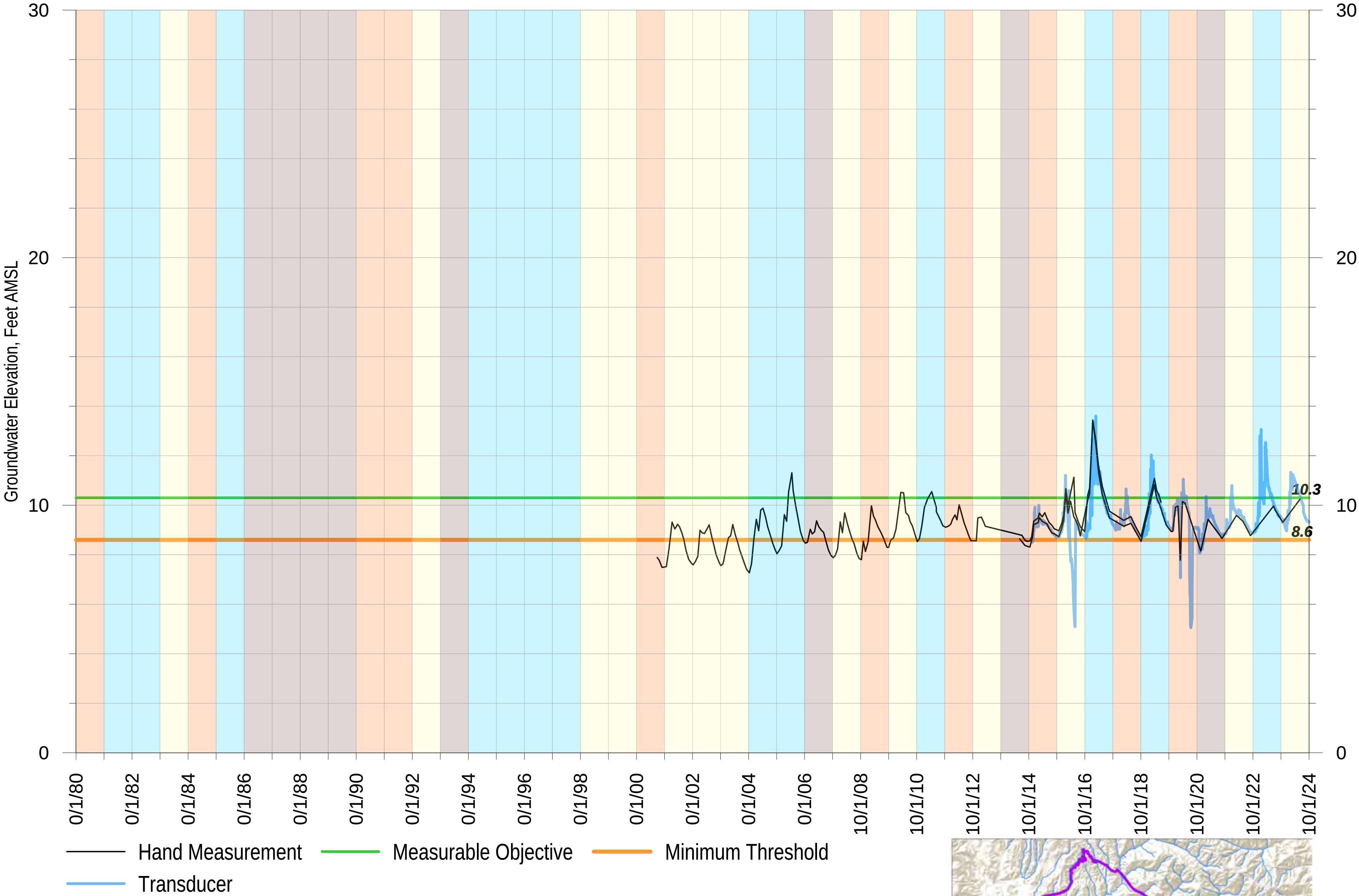
FIGURE A-39

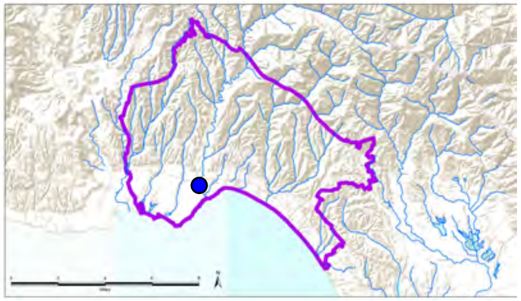




MONTGOMERY & ASSOCIATES

Nob Hill Shallow Well 1 & Nob Hill Shallow Well 2
Aquifer Screened: Shallow Well for Surface Water Interactions



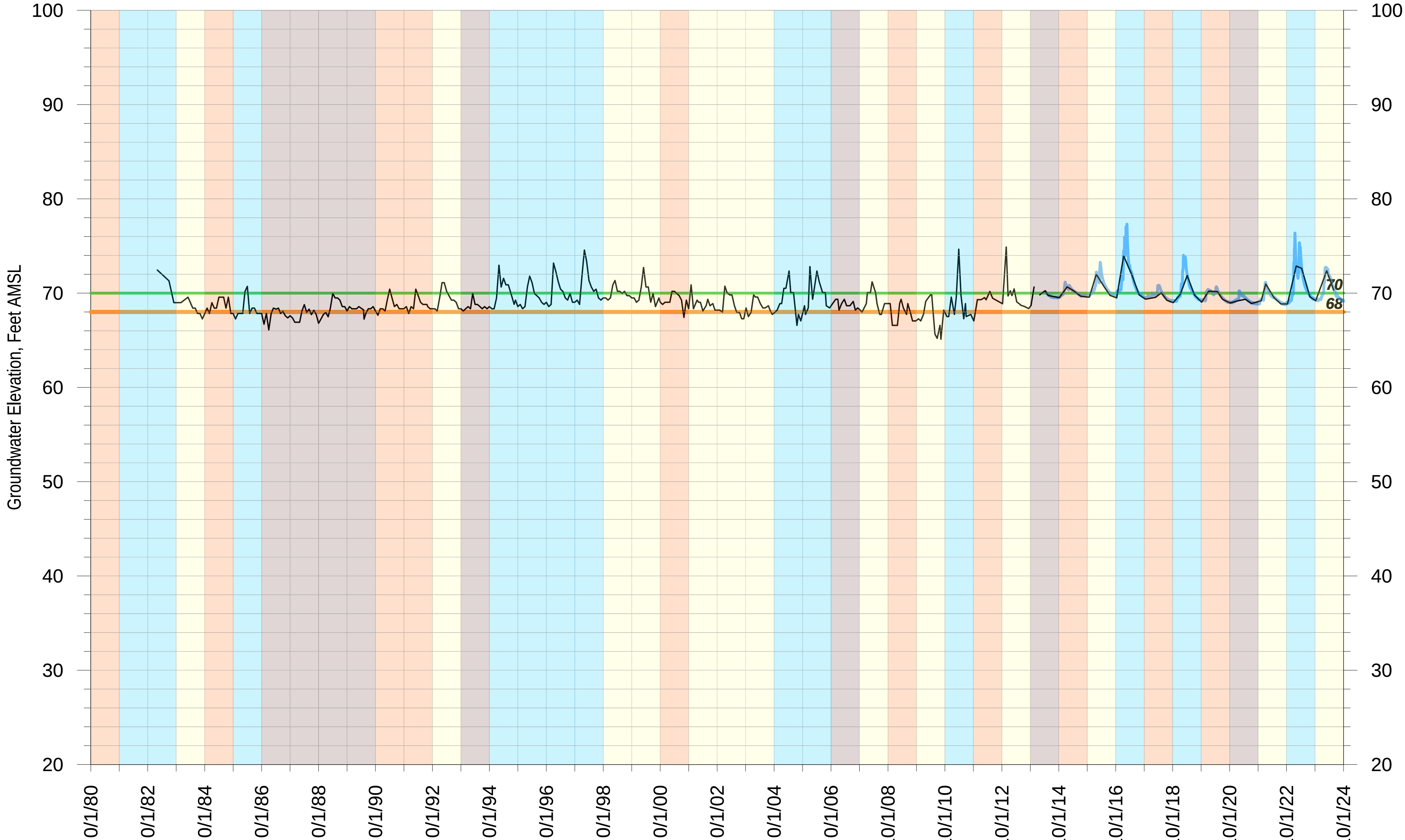


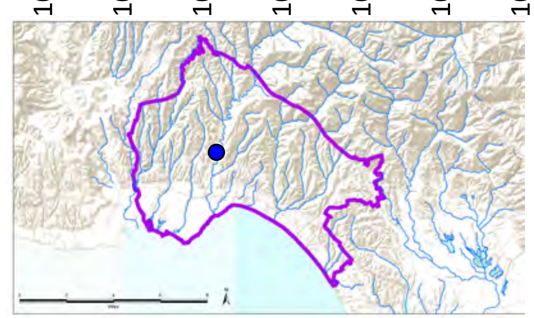
MONTGOMERY & ASSOCIATES

SC-10A & SC-10RA at Cherryvale
Aquifer Screened: Purisima A

Appendix A

FIGURE A-41

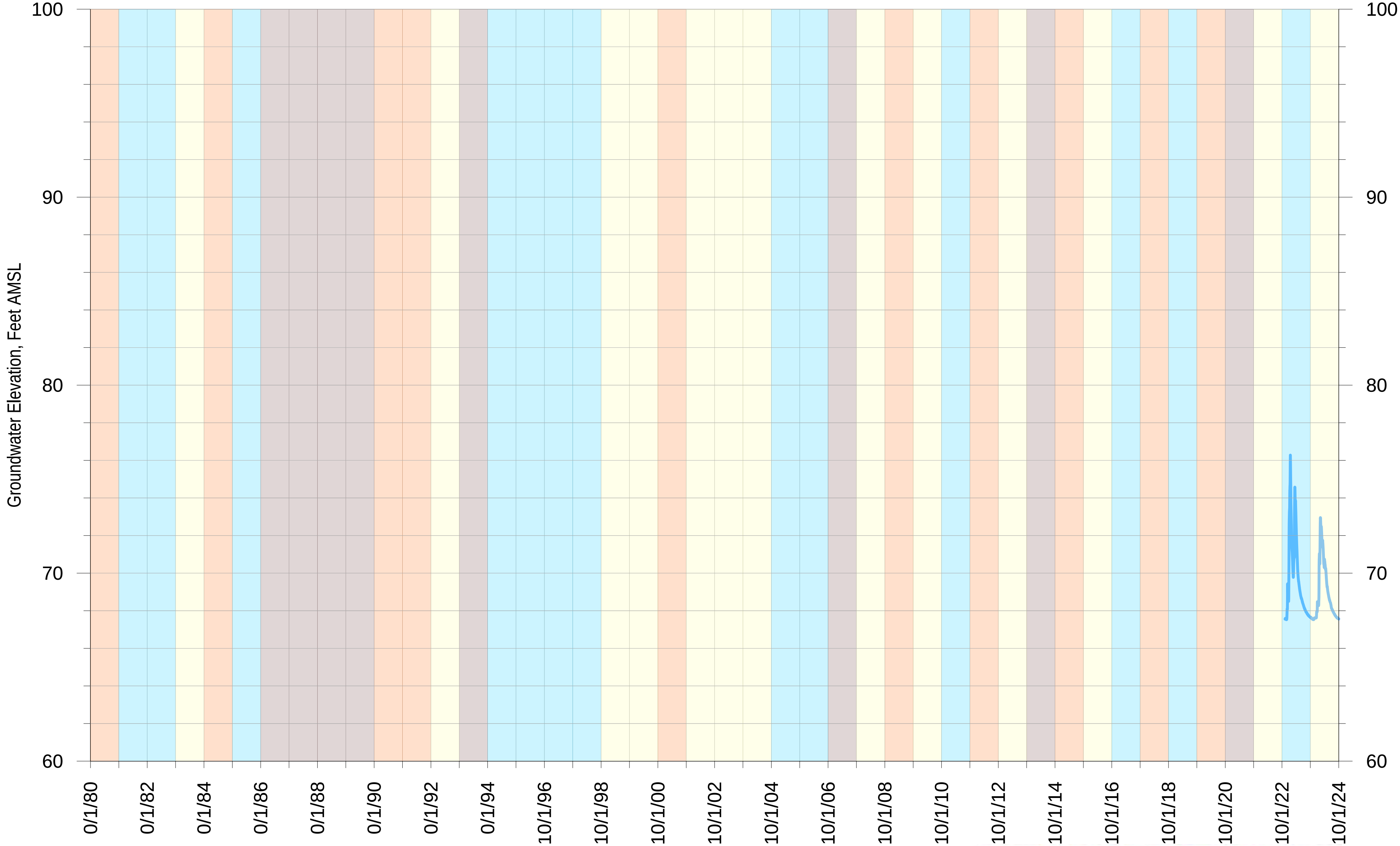


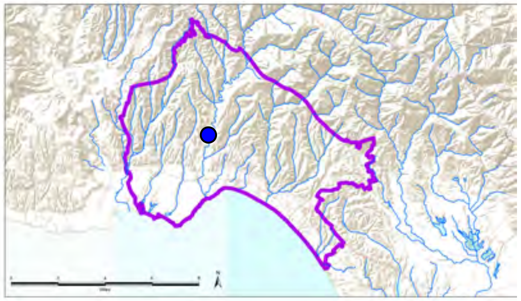


MONTGOMERY & ASSOCIATES

SC-10 Shallow Well
Aquifer Screened: Shallow Well for Surface Water Interactions

Appendix A
FIGURE A-42





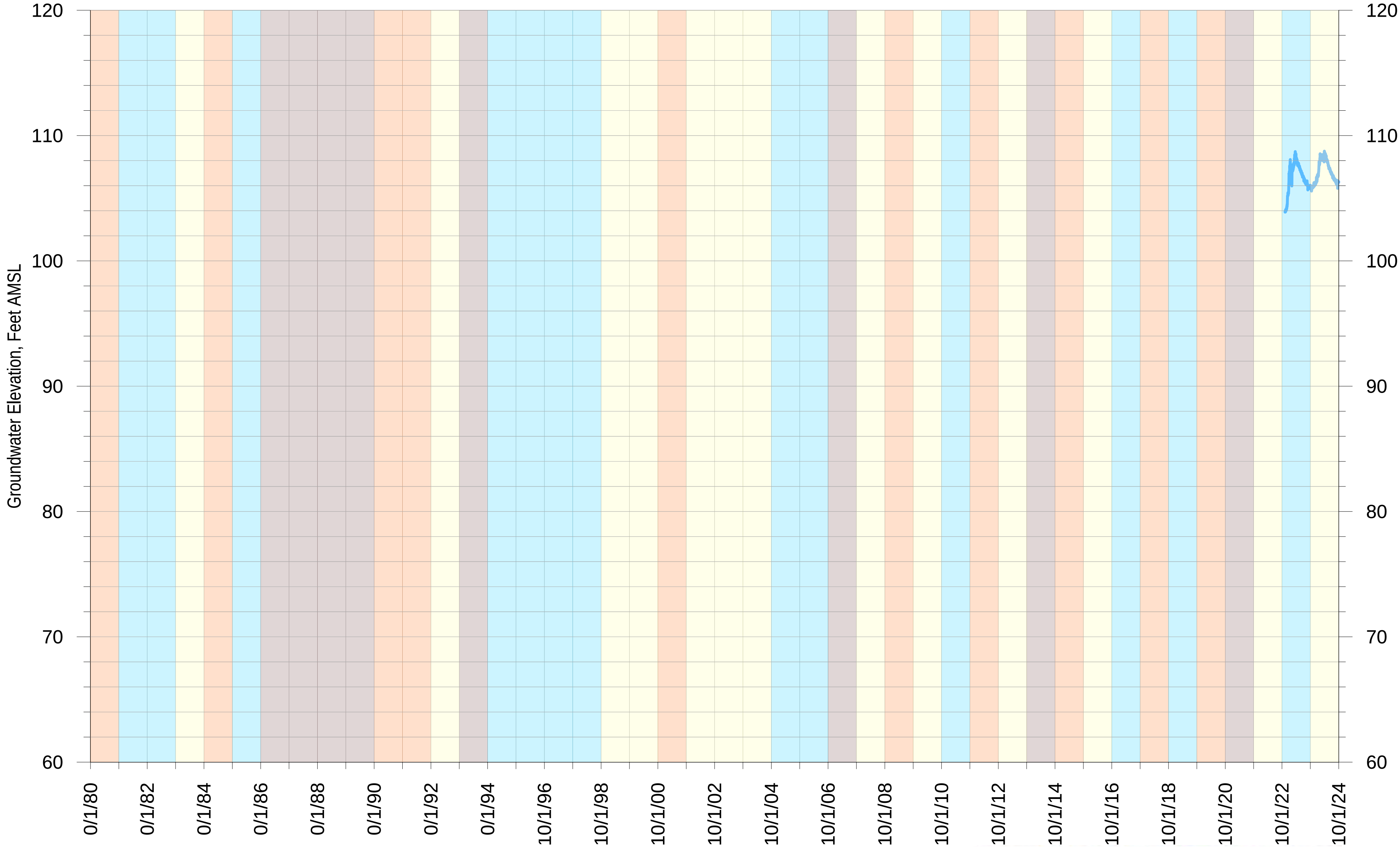
MONTGOMERY & ASSOCIATES

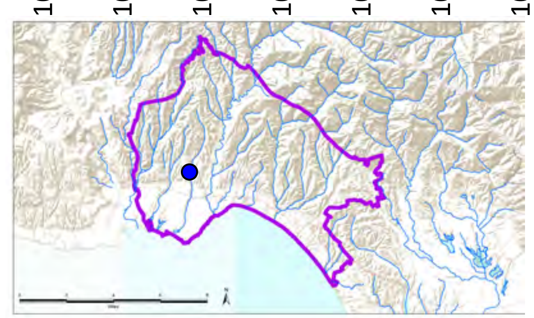
Lupin Shallow Well

Aquifer Screened: Shallow Well for Surface Water Interactions

Appendix A

FIGURE A-43



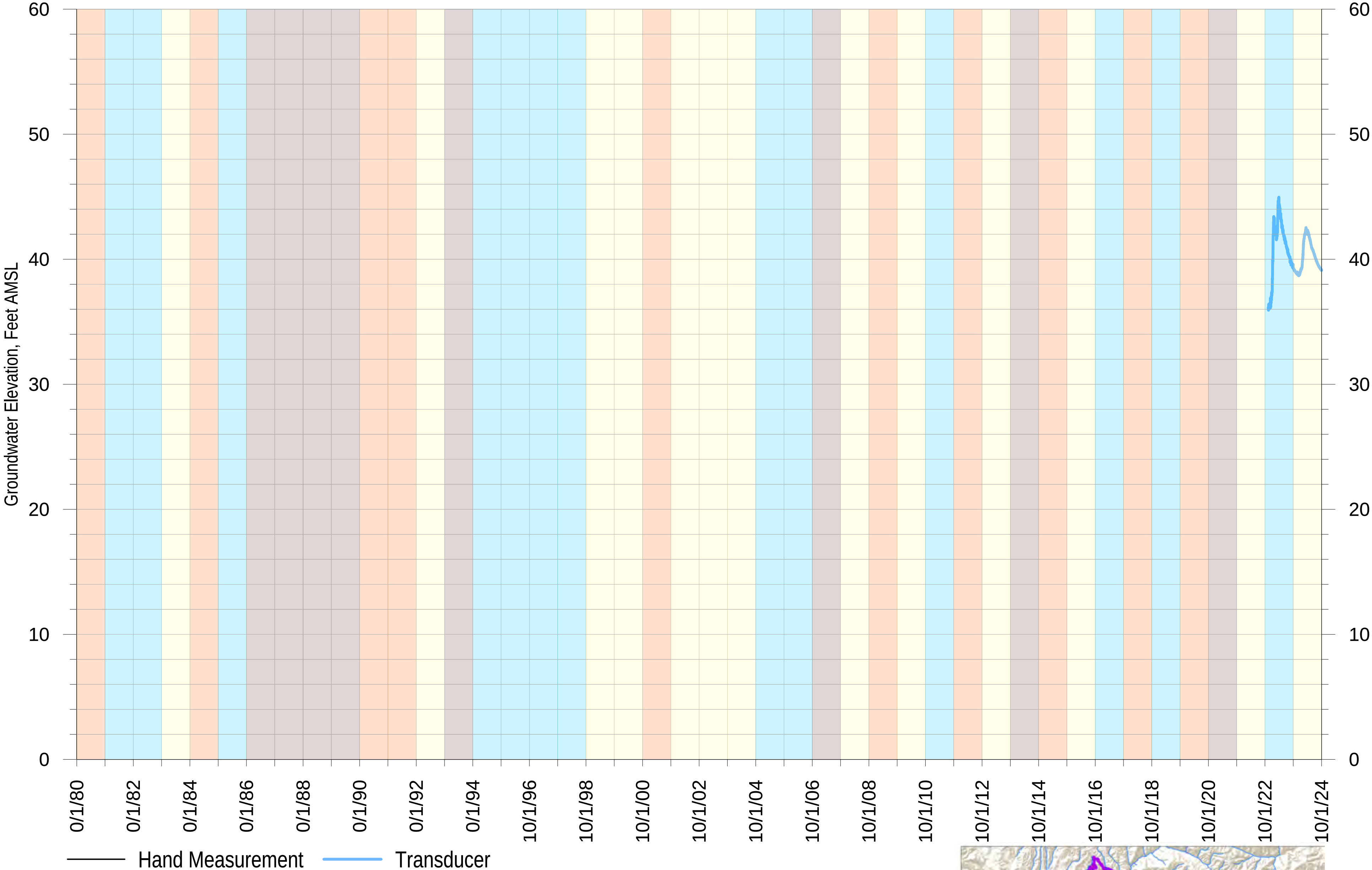


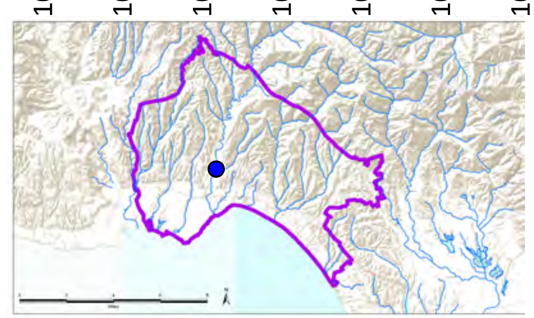
MONTGOMERY & ASSOCIATES

Balogh Shallow Well 2
Aquifer Screened: Shallow Well for Surface Water Interactions

Appendix A

FIGURE A-44

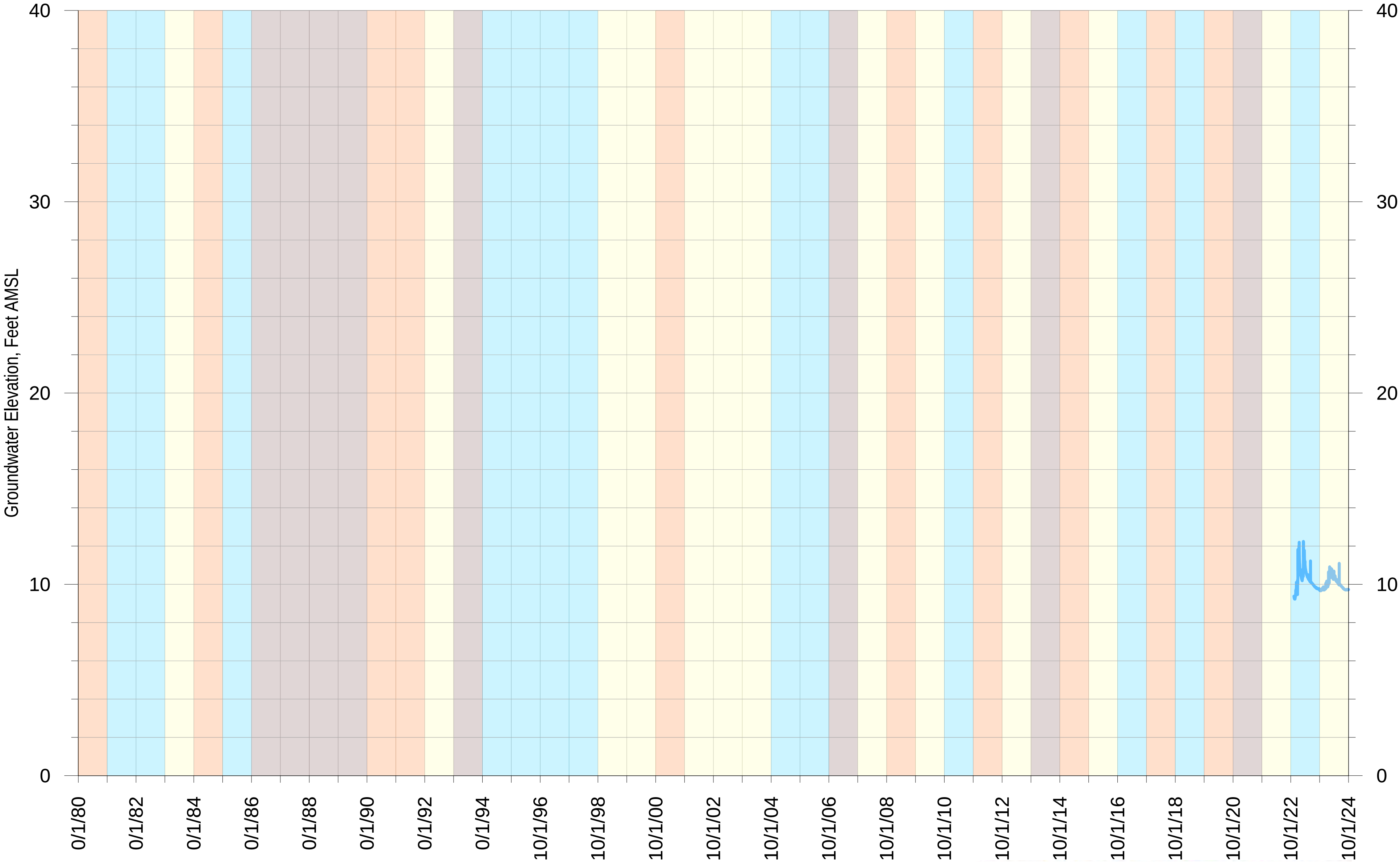


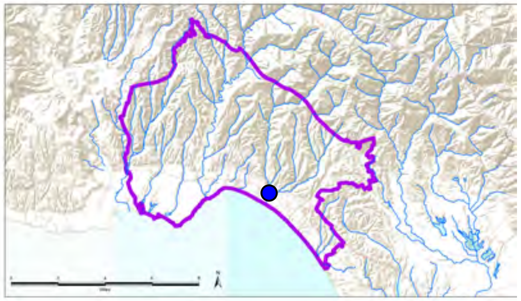


MONTGOMERY & ASSOCIATES

Spreckles Shallow Well

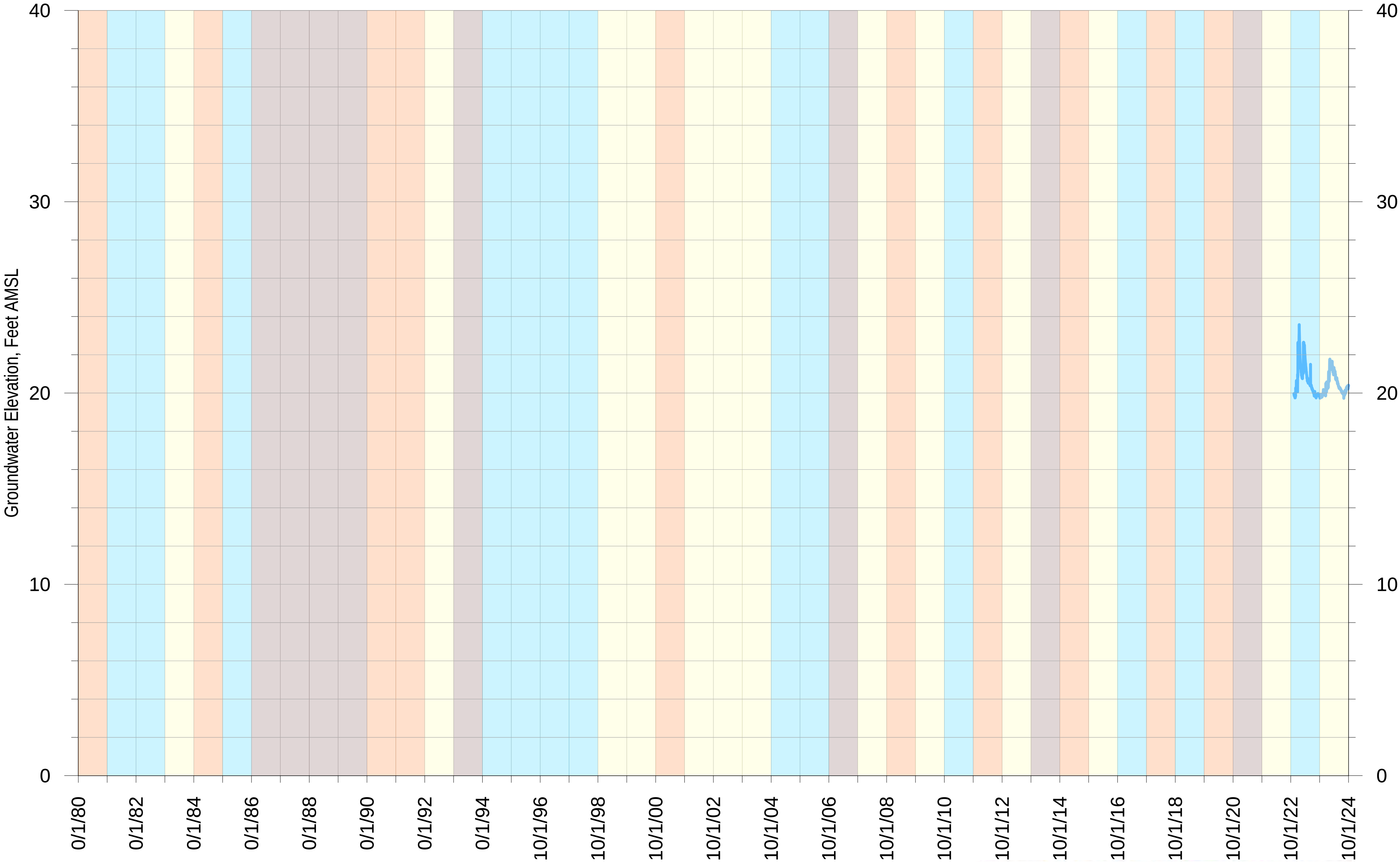
Aquifer Screened: Shallow Well for Surface Water Interactions

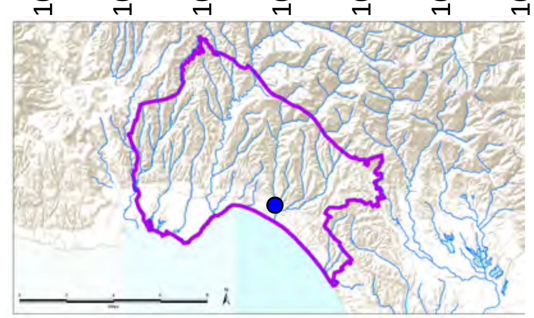




MONTGOMERY & ASSOCIATES

Aptos Village County Park Shallow Well
Aquifer Screened: Shallow Well for Surface Water Interactions

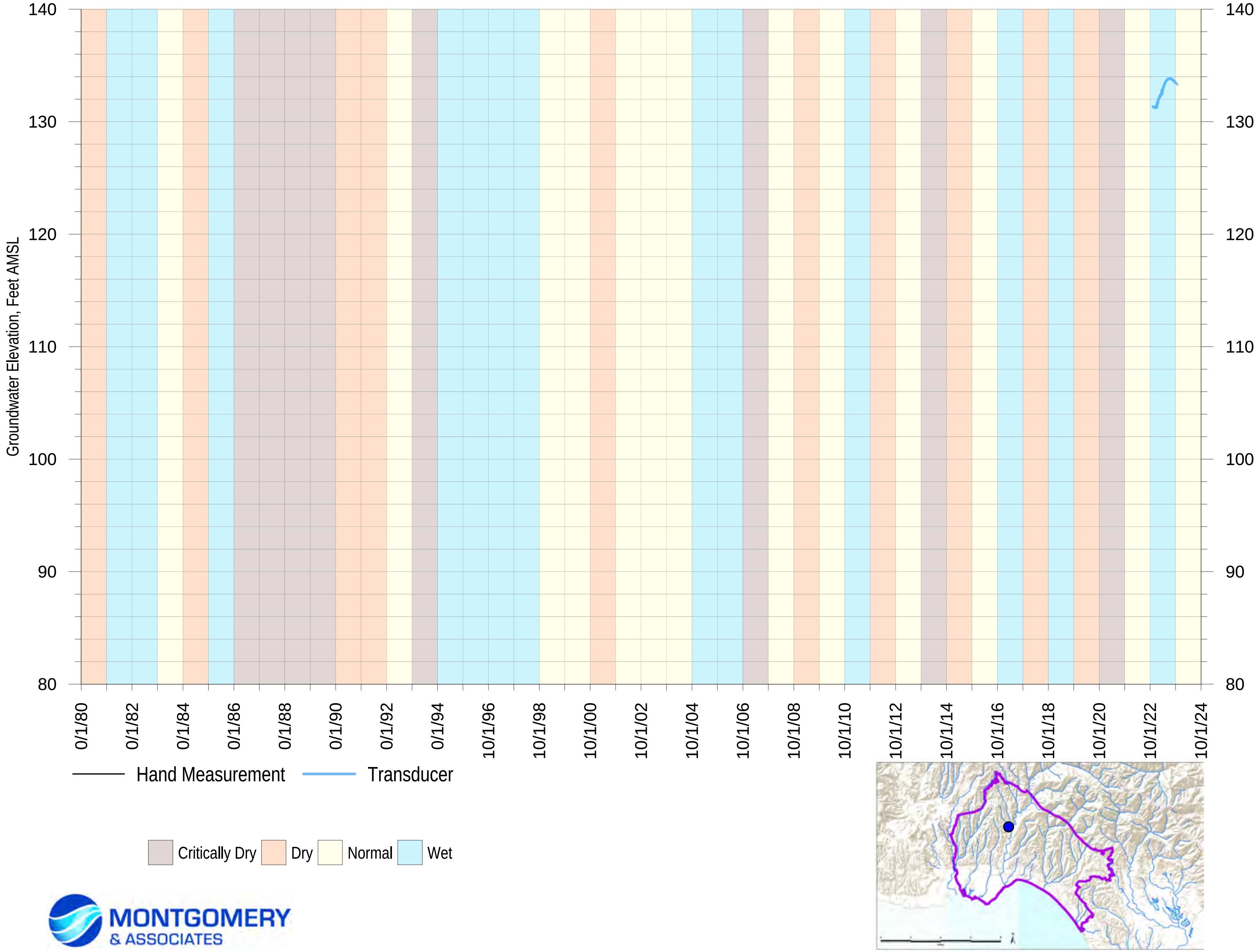




MONTGOMERY & ASSOCIATES

Mountain Elementary Shallow Well
Aquifer Screened: Shallow Well for Surface Water Interactions

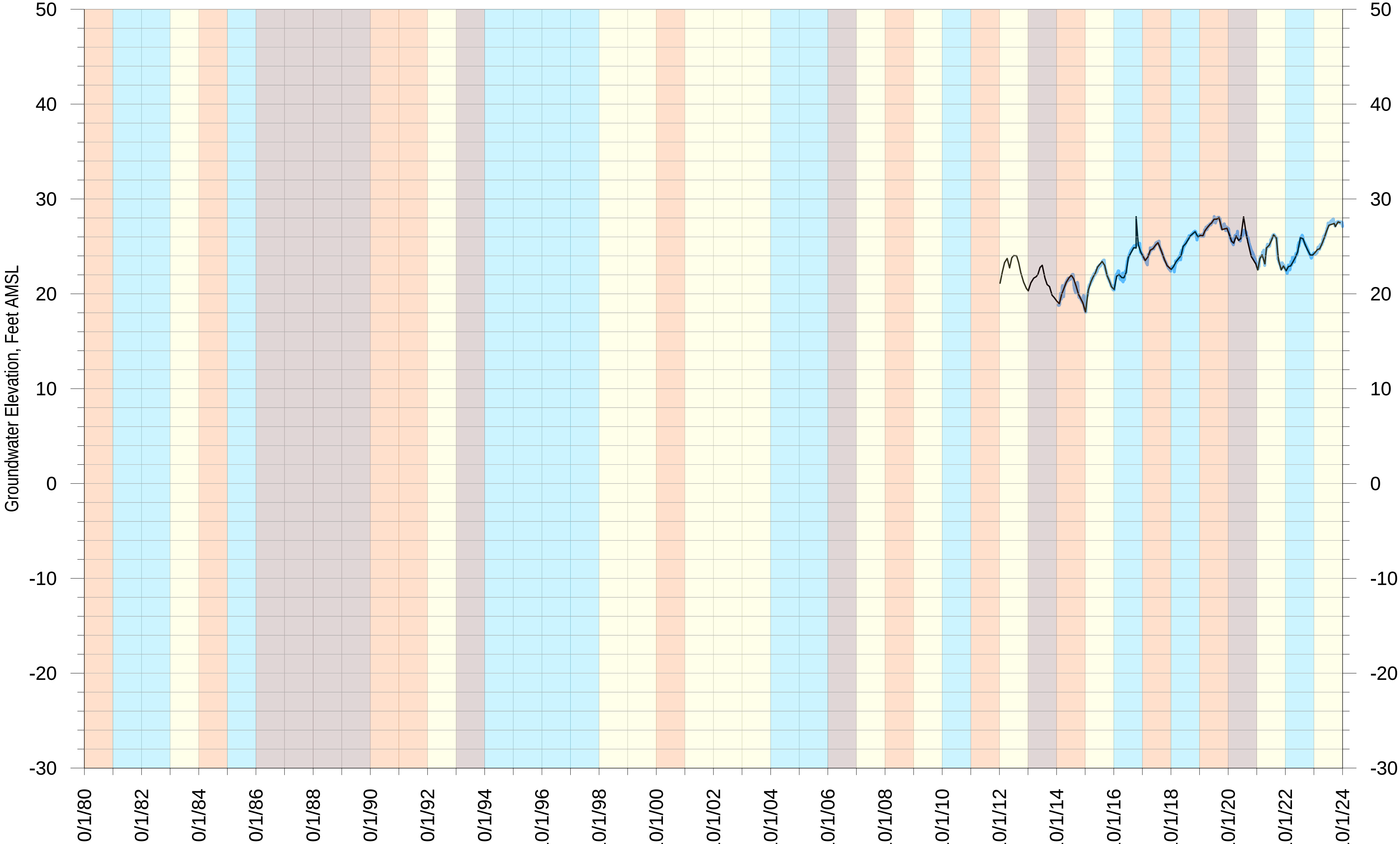
Appendix A
FIGURE A-47

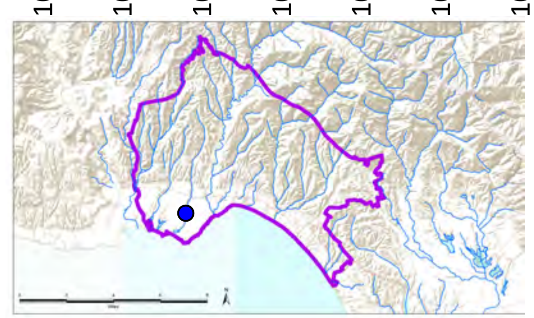


MONTGOMERY & ASSOCIATES

30th Ave Shallow
Aquifer Screened: Purisima A

Appendix A
FIGURE A-48



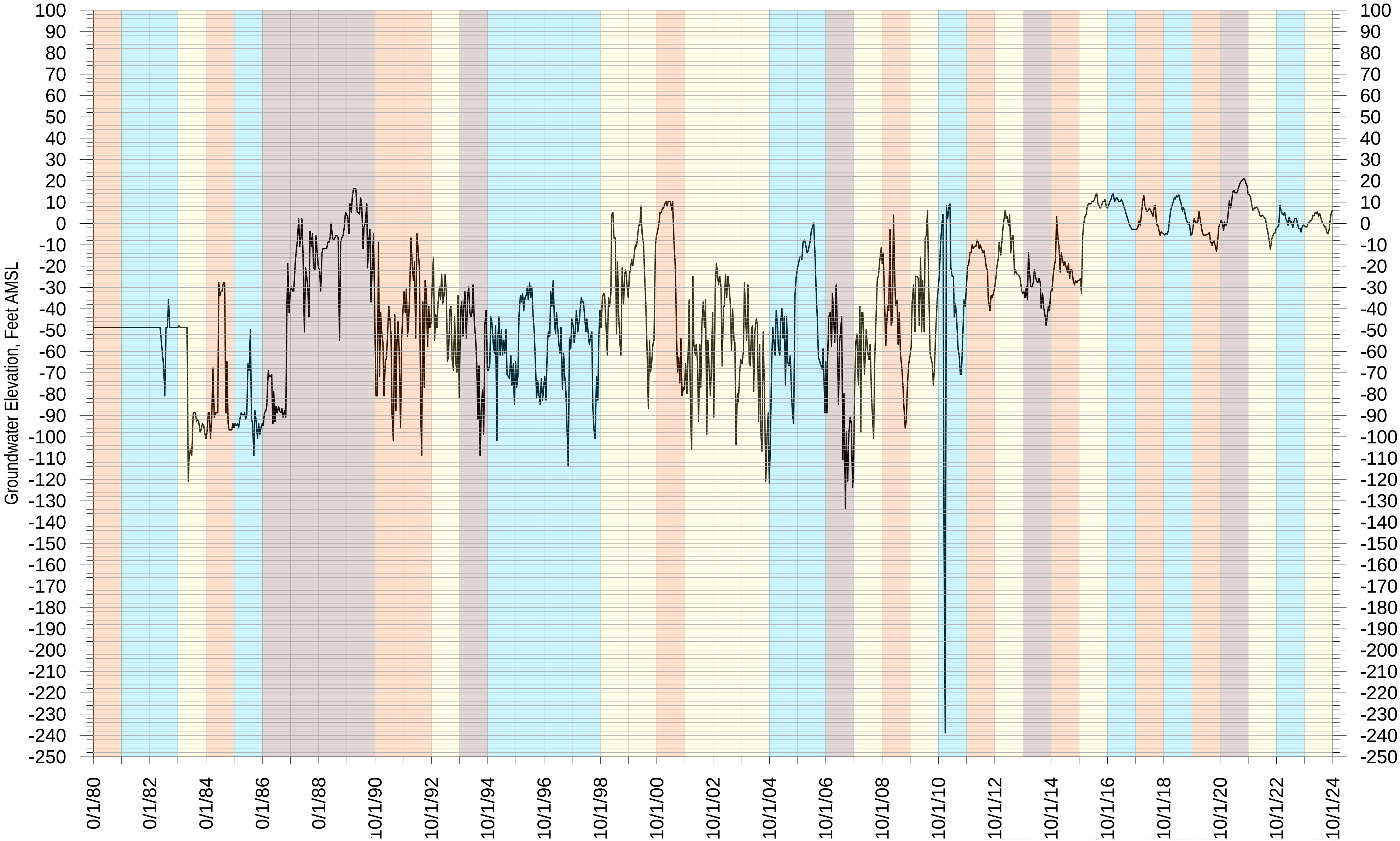


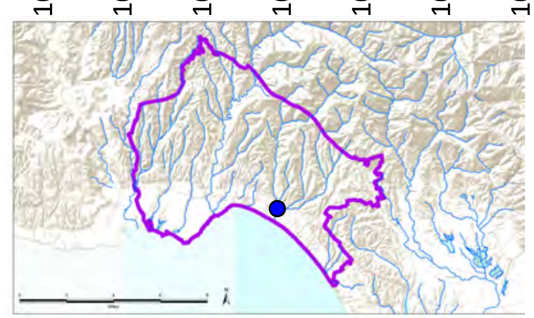
MONTGOMERY & ASSOCIATES

Aptos Creek PW
Aquifer Screened: Purisima BC

Appendix A

FIGURE A-49



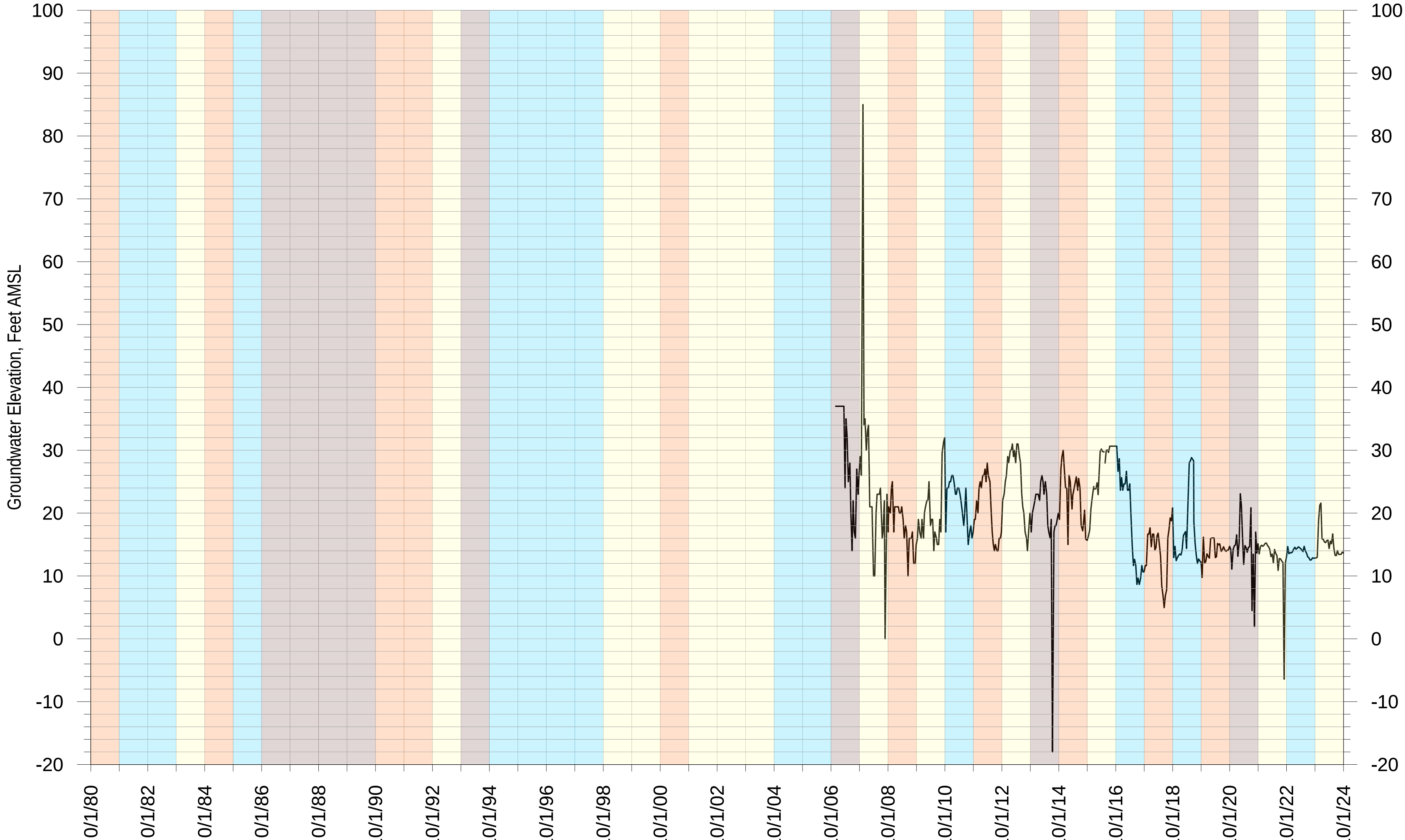


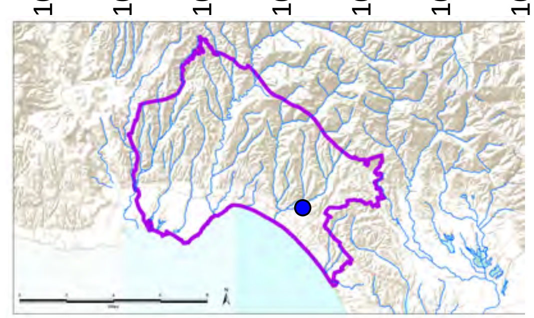
MONTGOMERY & ASSOCIATES

Aptos Jr High & Aptos Jr High 2 PW
Aquifer Screened: Purisima F

Appendix A

FIGURE A-50

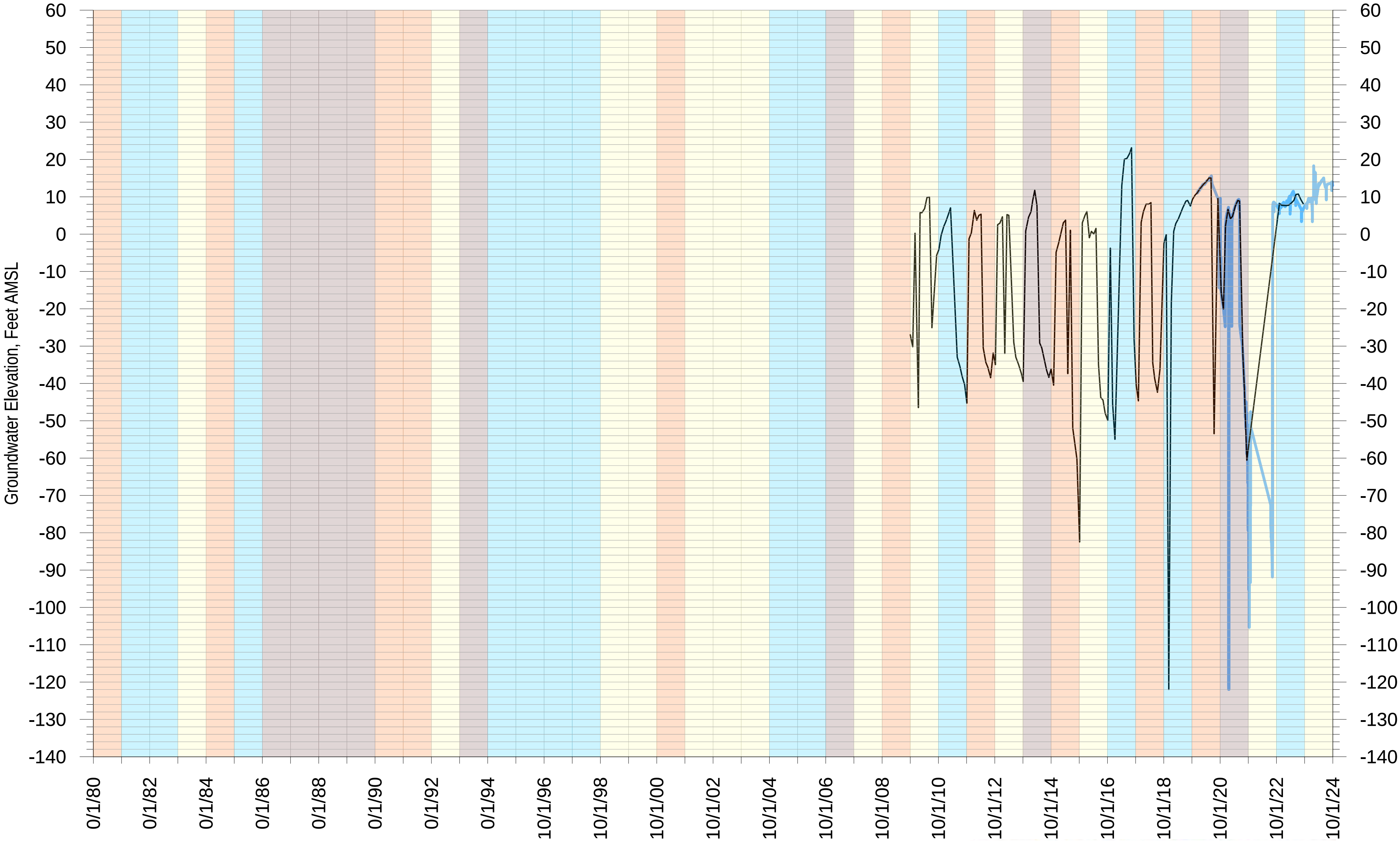




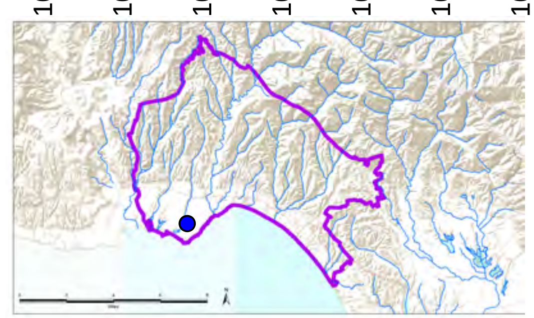
MONTGOMERY & ASSOCIATES

Beltz 10 PW
Aquifer Screened: Purisima A/AA

Appendix A
FIGURE A-51



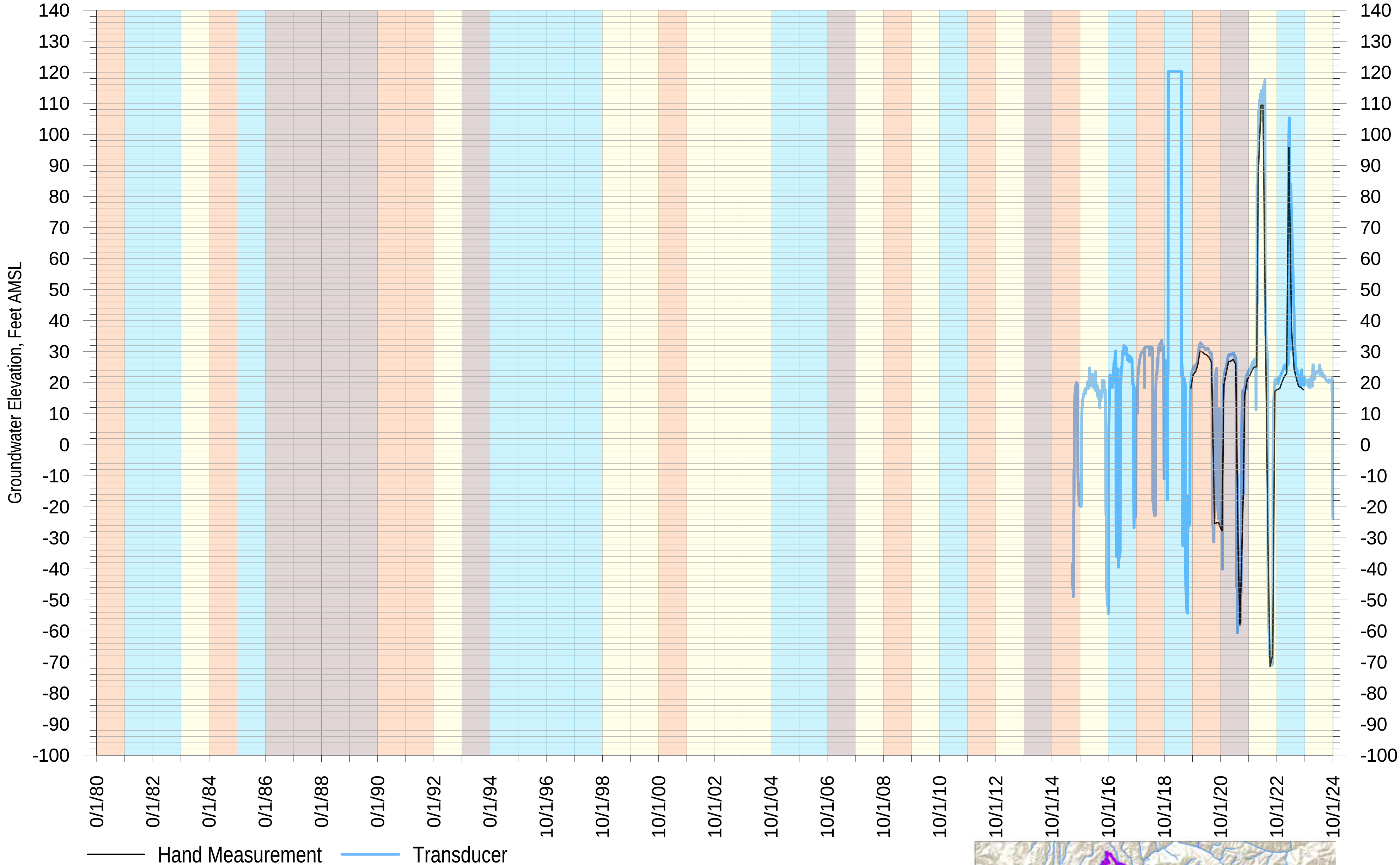
Hand Measurement Transducer

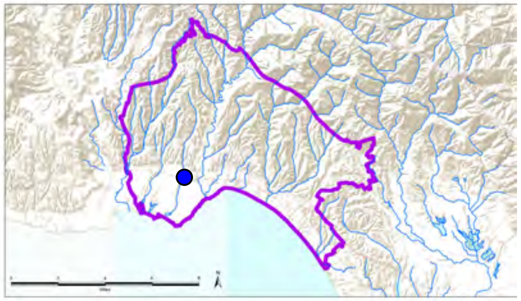


Critically Dry Dry Normal Wet

MONTGOMERY & ASSOCIATES

Beltz 12 PW
Aquifer Screened: Purisima AA/Tu





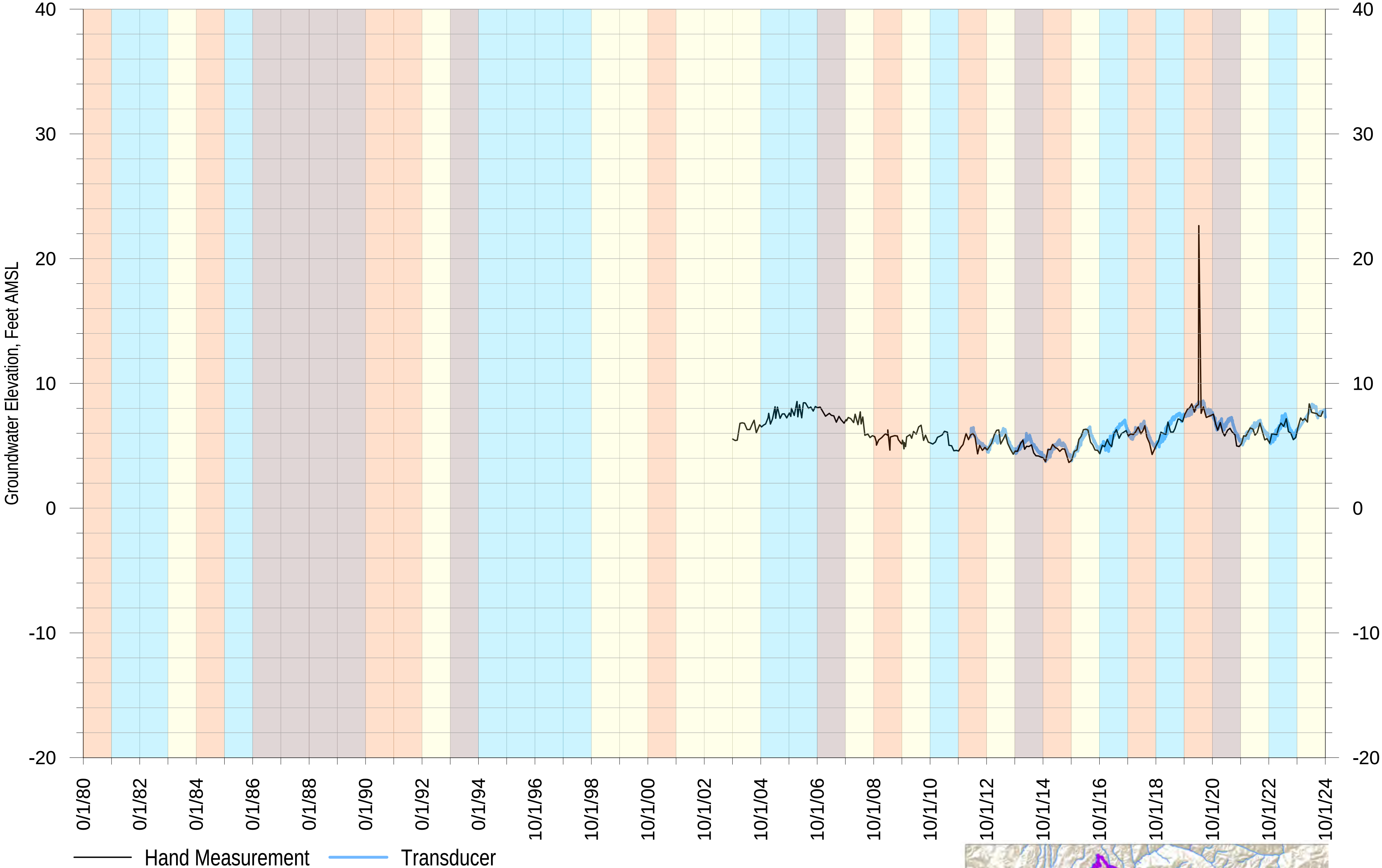
MONTGOMERY
& ASSOCIATES

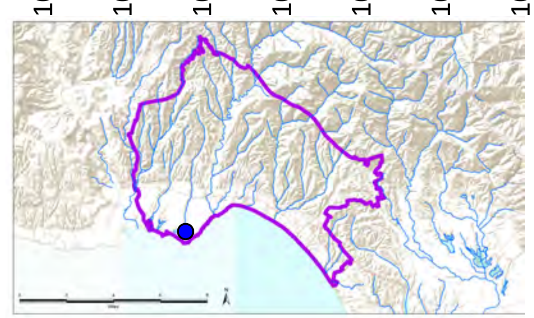
Beltz 2

Aquifer Screened: Purisima A

Appendix A

FIGURE A-53





Critically Dry Dry Normal Wet

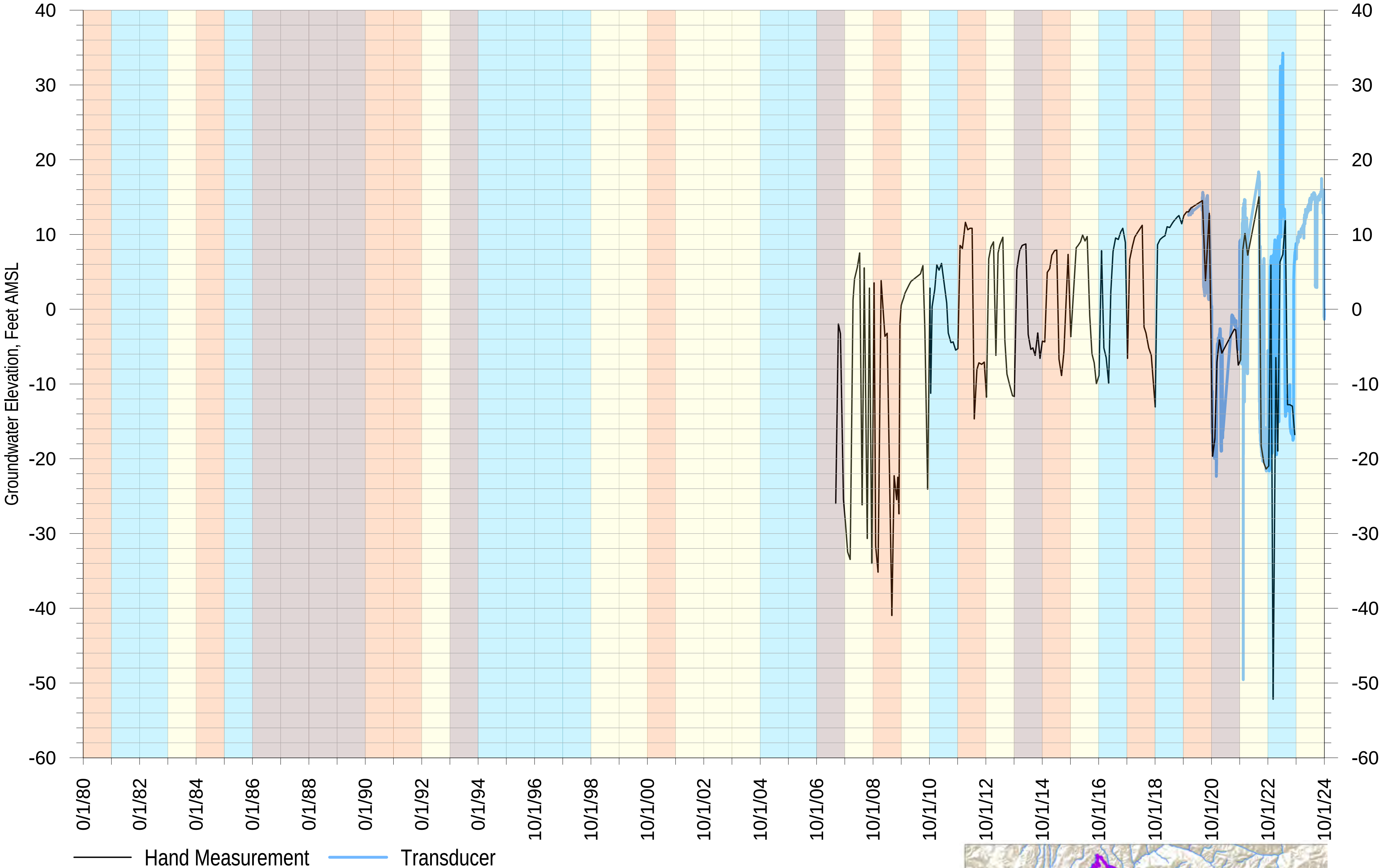
MONTGOMERY & ASSOCIATES

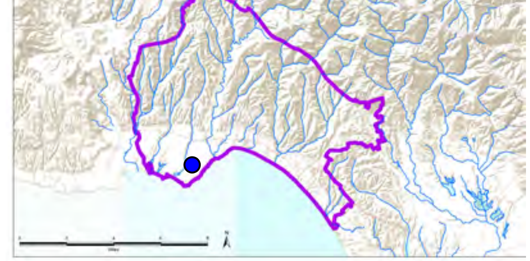
Beltz 8 PW

Aquifer Screened: Purisima A

Appendix A

FIGURE A-54





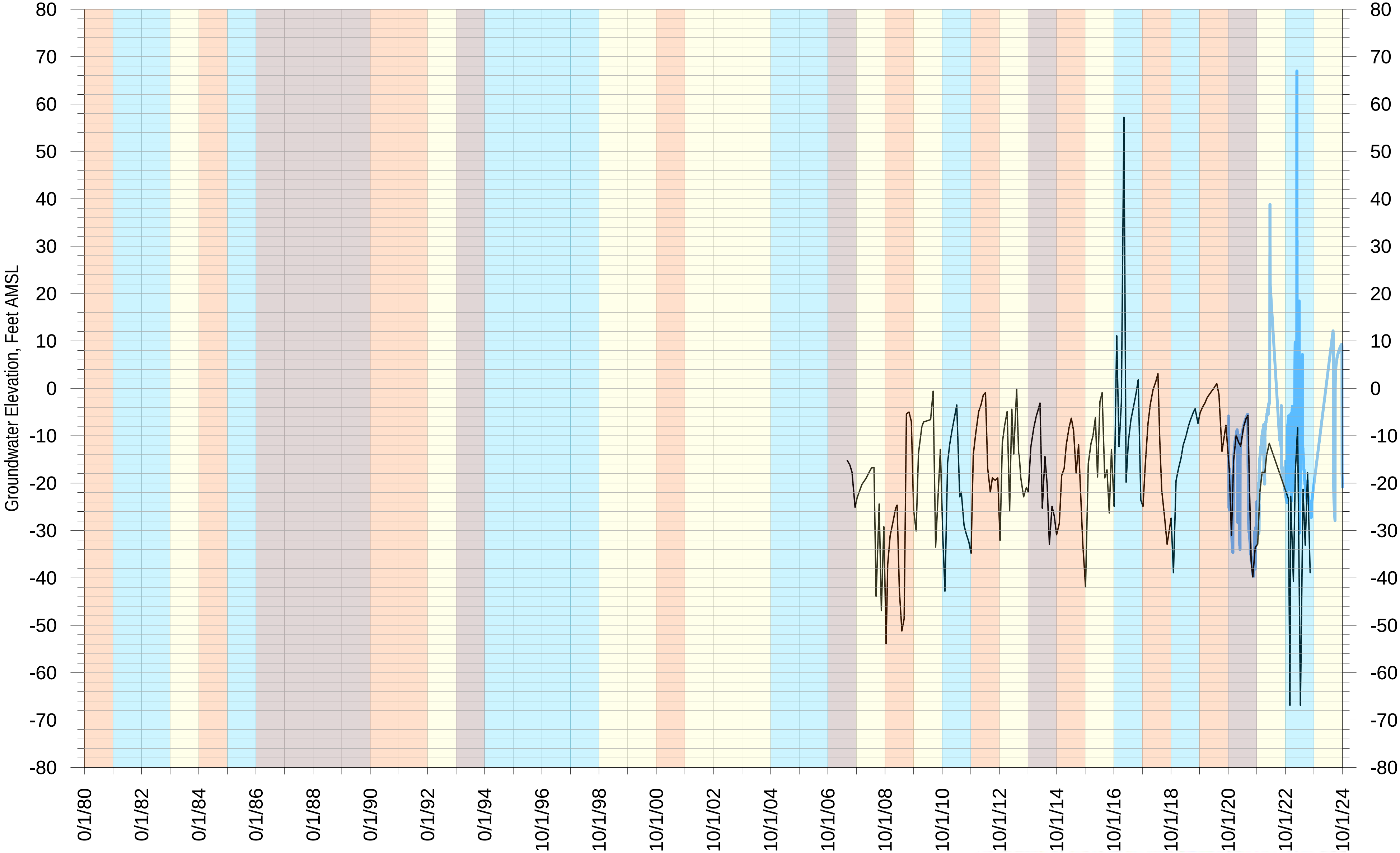
MONTGOMERY & ASSOCIATES

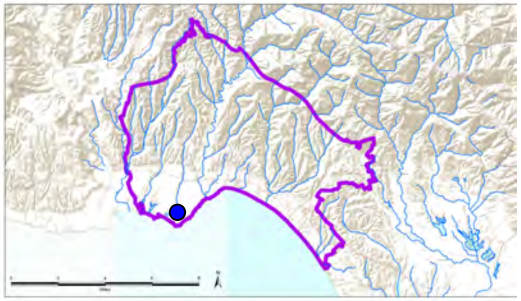
Beltz 9 PW

Aquifer Screened: Purisima A

Appendix A

FIGURE A-55





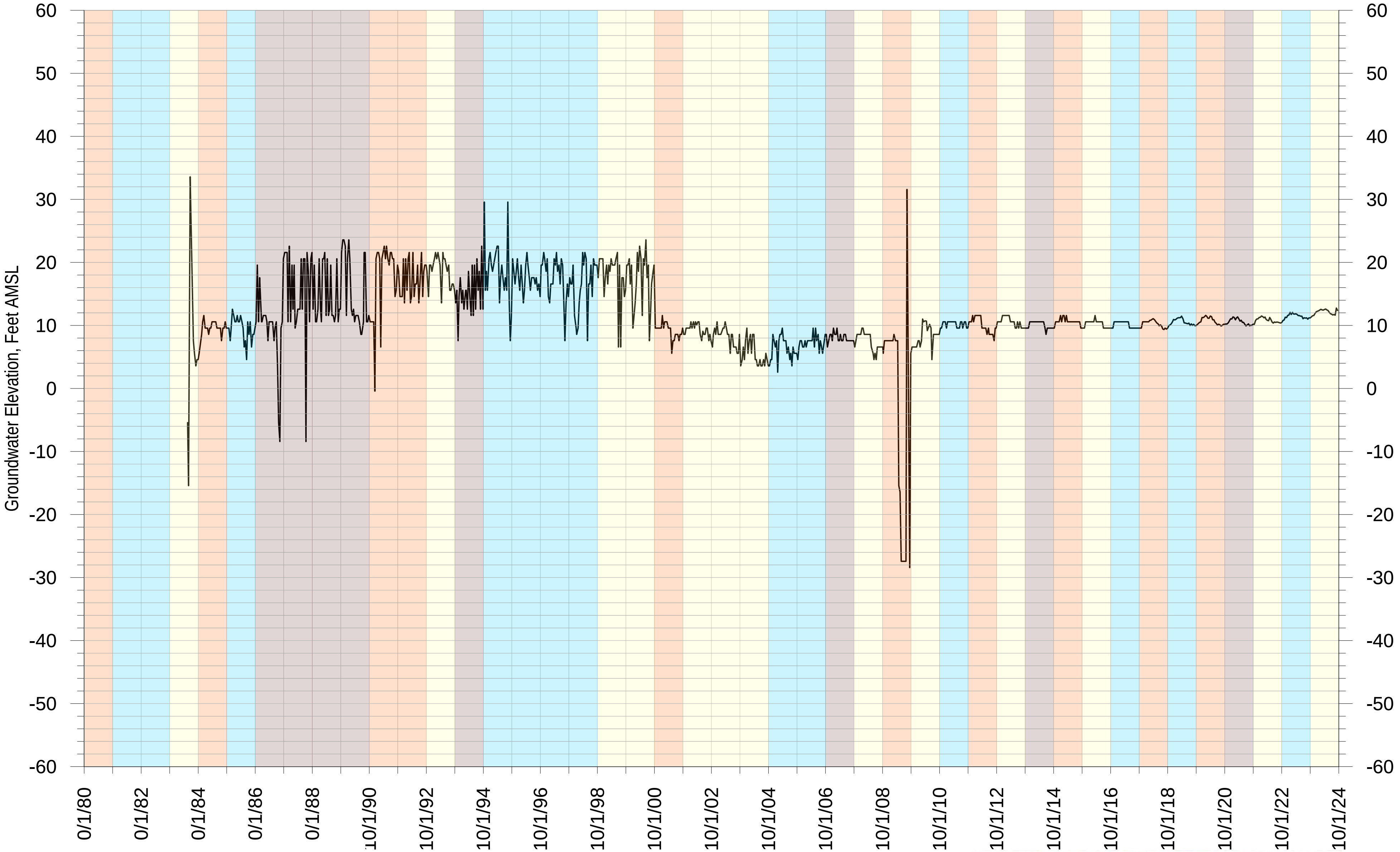
MONTGOMERY & ASSOCIATES

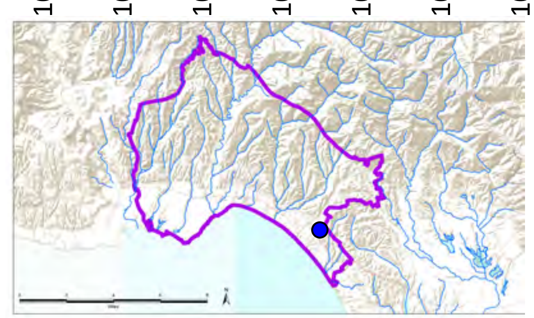
Bonita PW

Aquifer Screened: Aromas/ Purisima F

Appendix A

FIGURE A-56



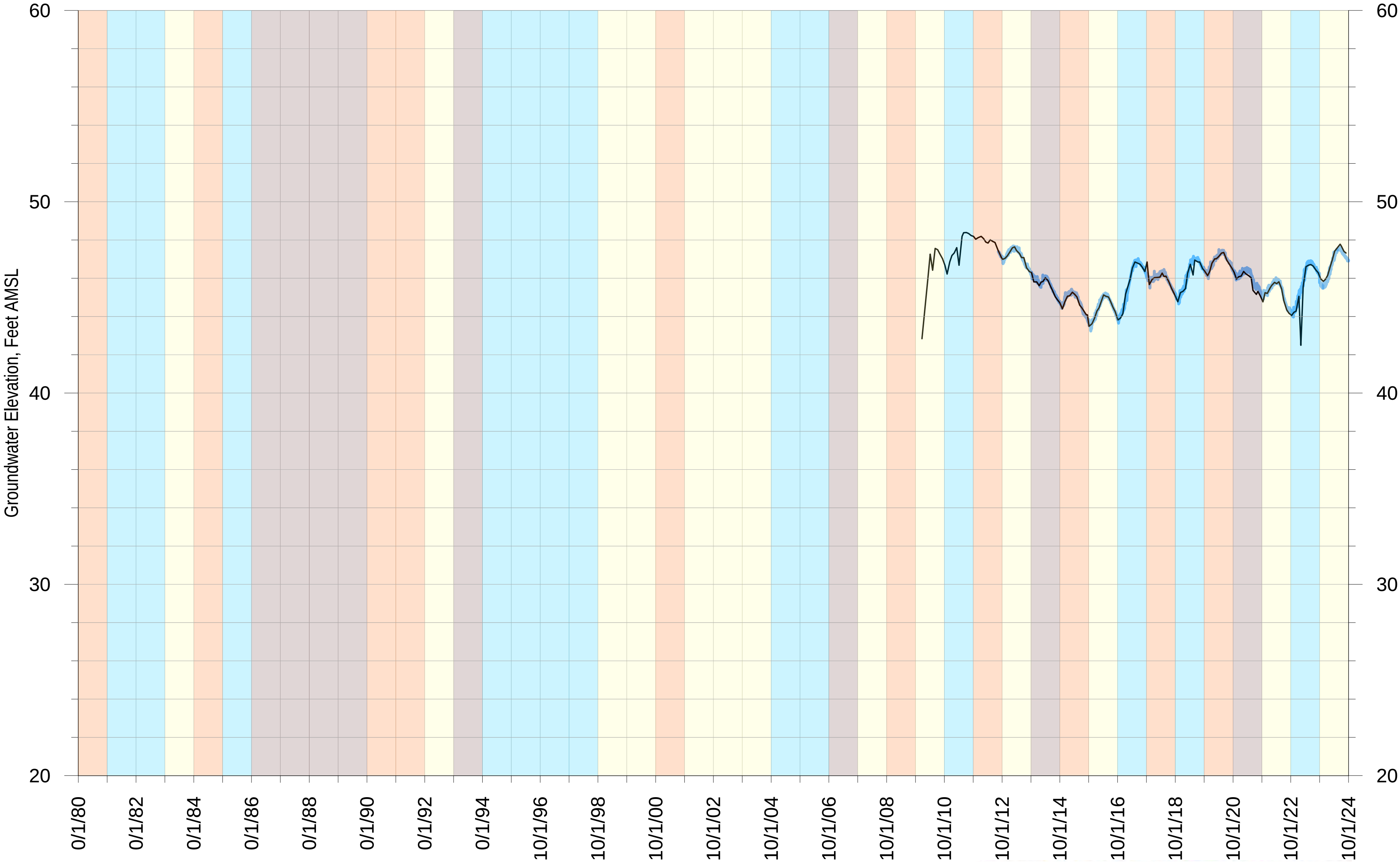


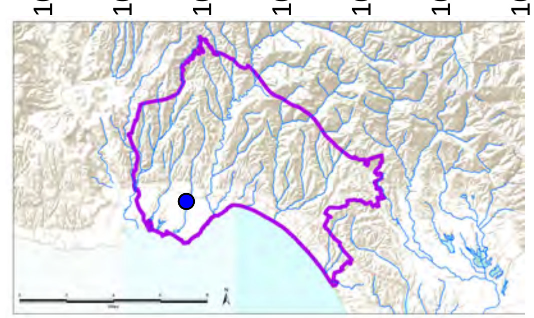
MONTGOMERY & ASSOCIATES

Coffee Lane Deep
Aquifer Screened: Purisima AA

Appendix A

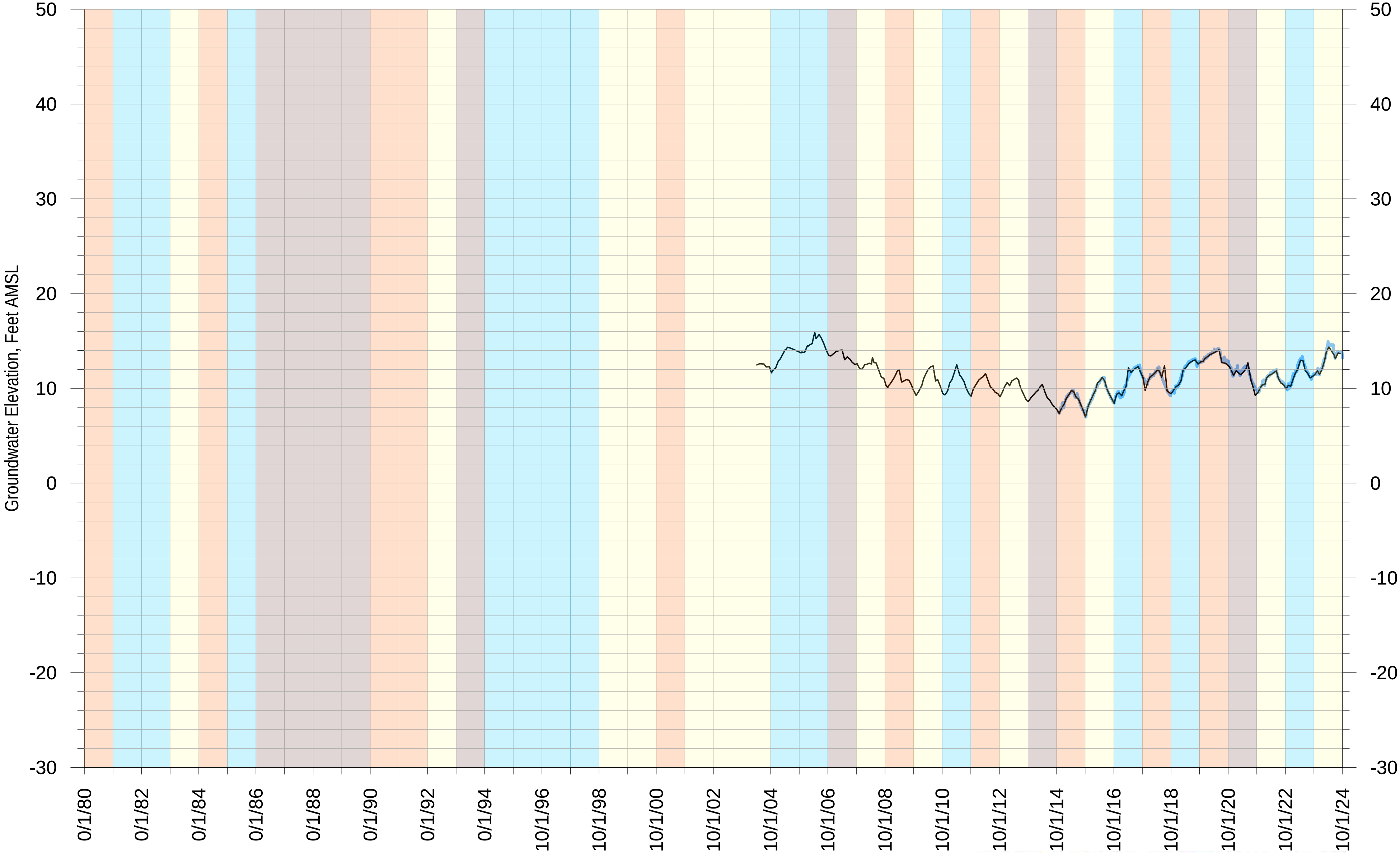
FIGURE A-57

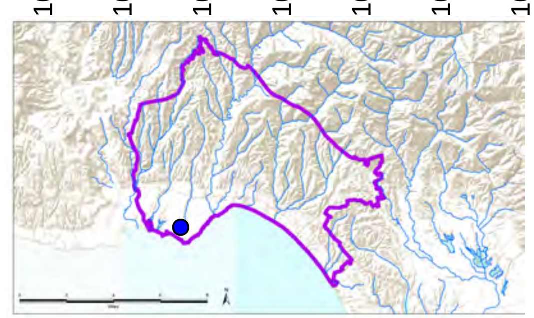




MONTGOMERY & ASSOCIATES

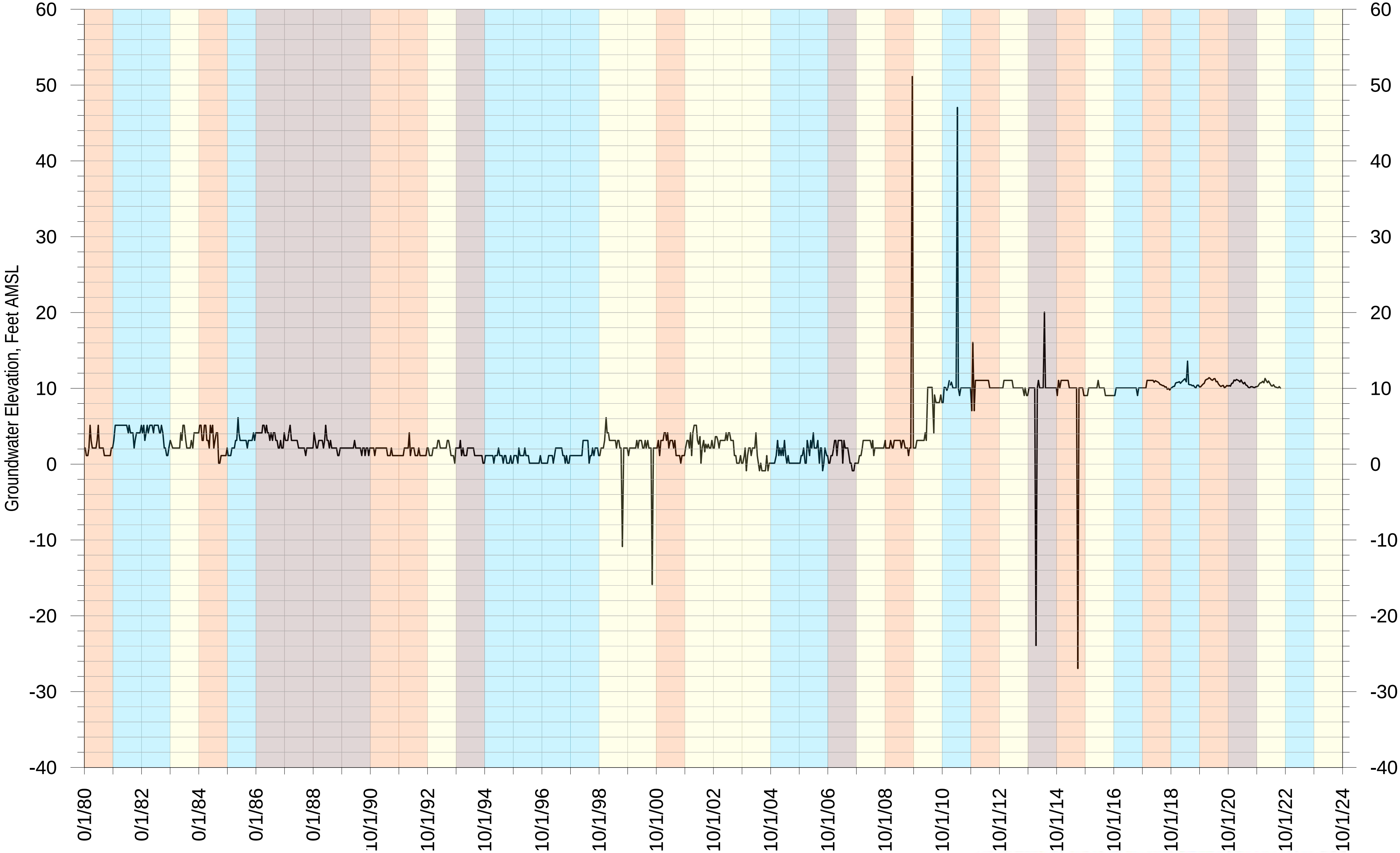
Corcoran Deep
Aquifer Screened: Purisima AA

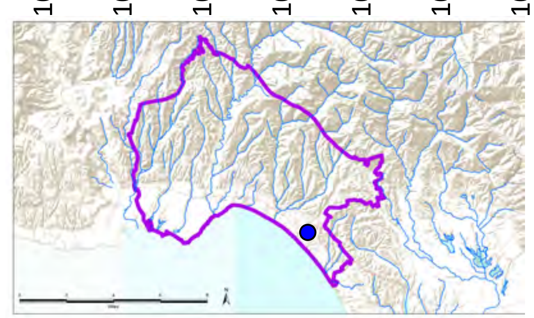




MONTGOMERY & ASSOCIATES

Country Club PW & Country Club 2 PW
Aquifer Screened: Aromas/ Purisima F





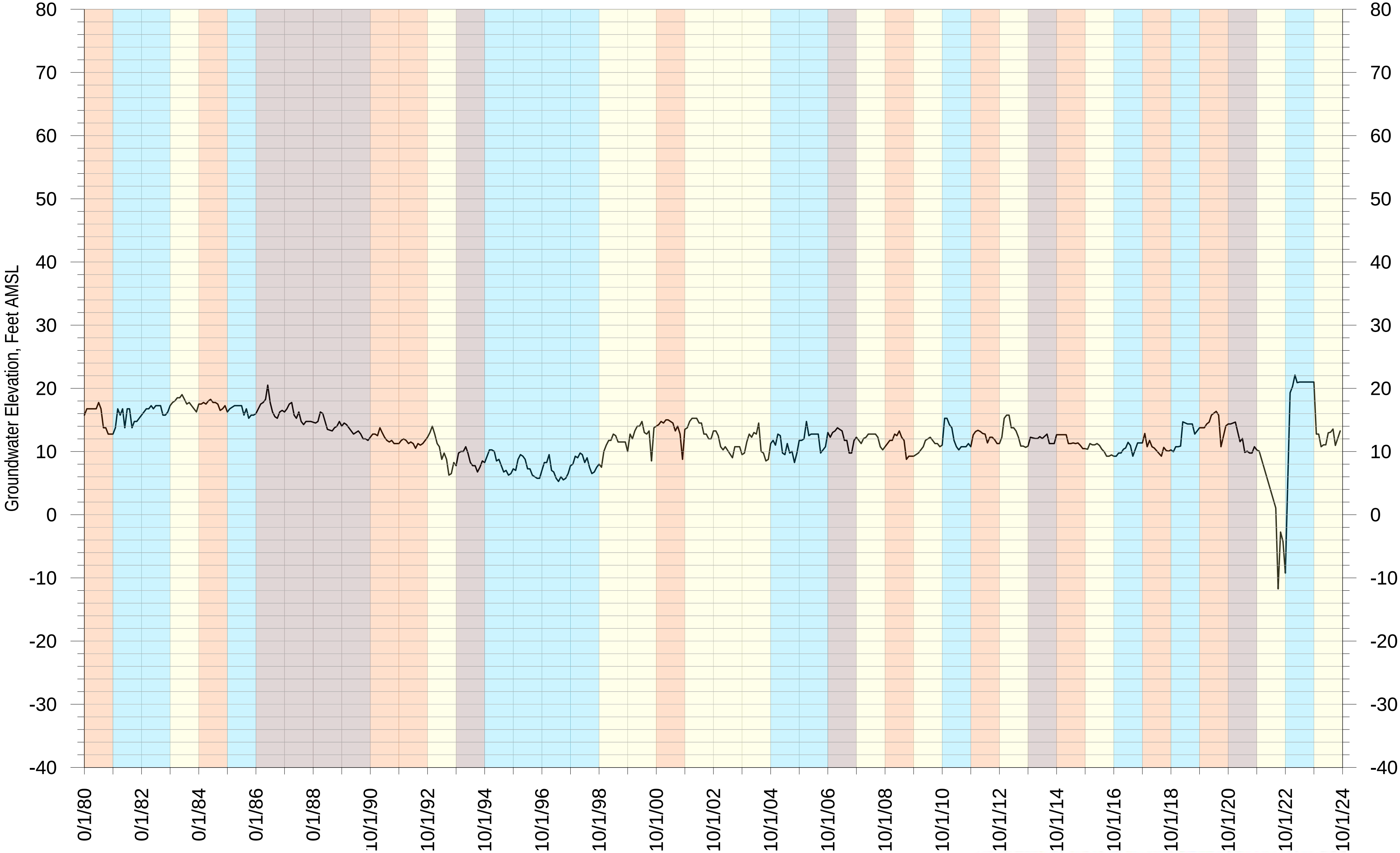
MONTGOMERY & ASSOCIATES

CWD-10 PW

Aquifer Screened: Aromas

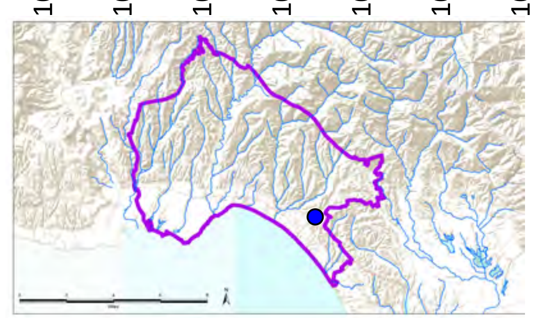
Appendix A

FIGURE A-60



Hand Measurement

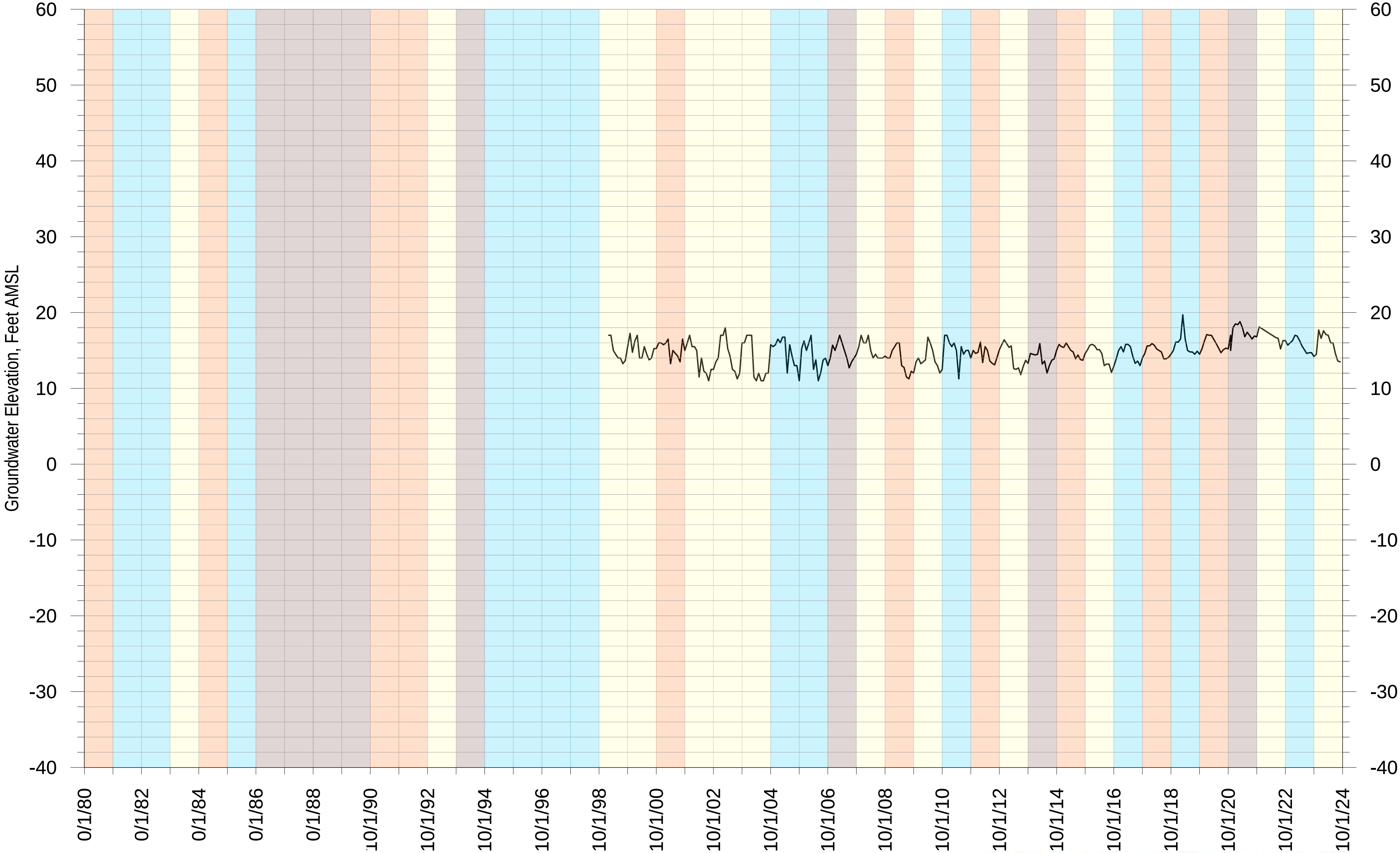
Critically Dry | Dry | Normal | Wet

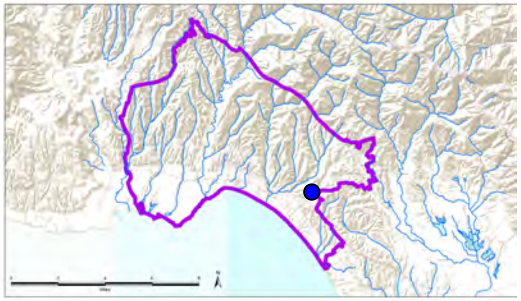


MONTGOMERY & ASSOCIATES

CWD-12 PW

Aquifer Screened: Aromas/ Purisima F





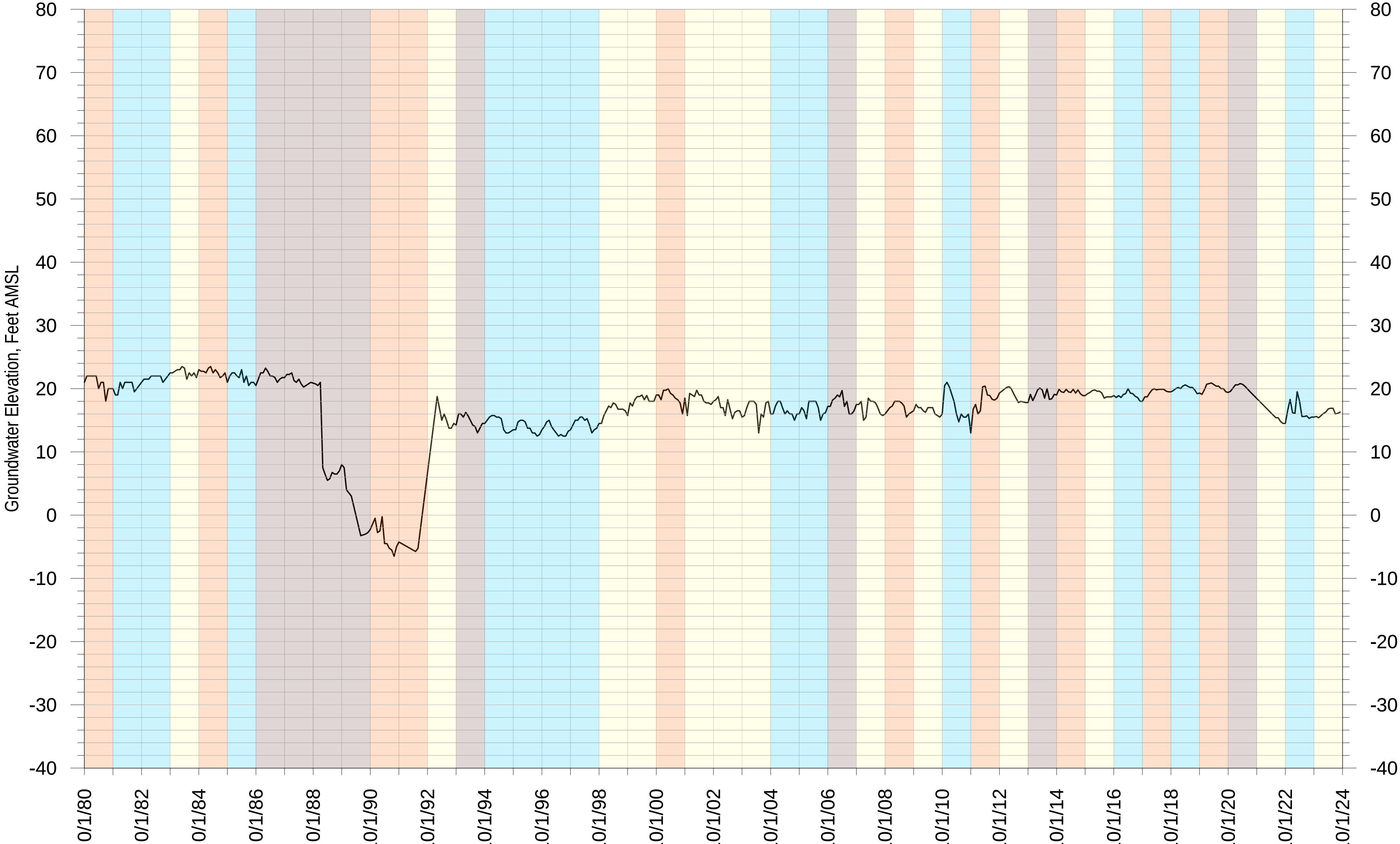
MONTGOMERY & ASSOCIATES

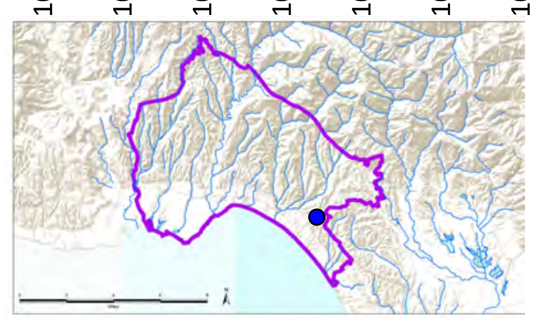
CWD-4 PW

Aquifer Screened: Aromas/ Purisima F

Appendix A

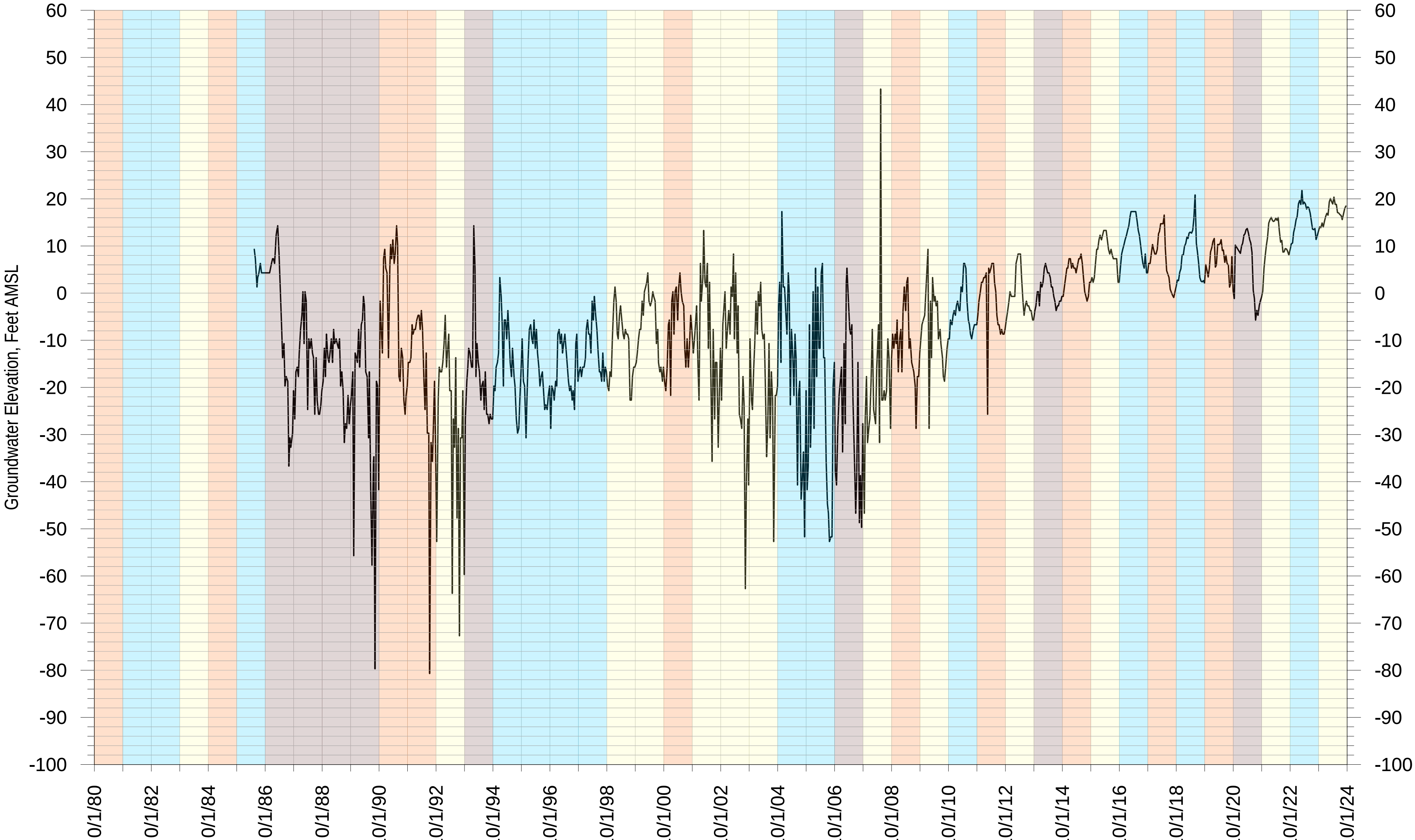
FIGURE A-62

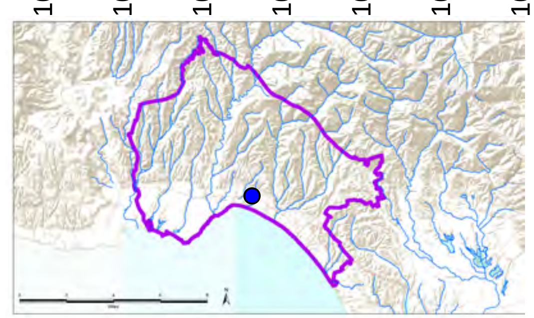




MONTGOMERY & ASSOCIATES

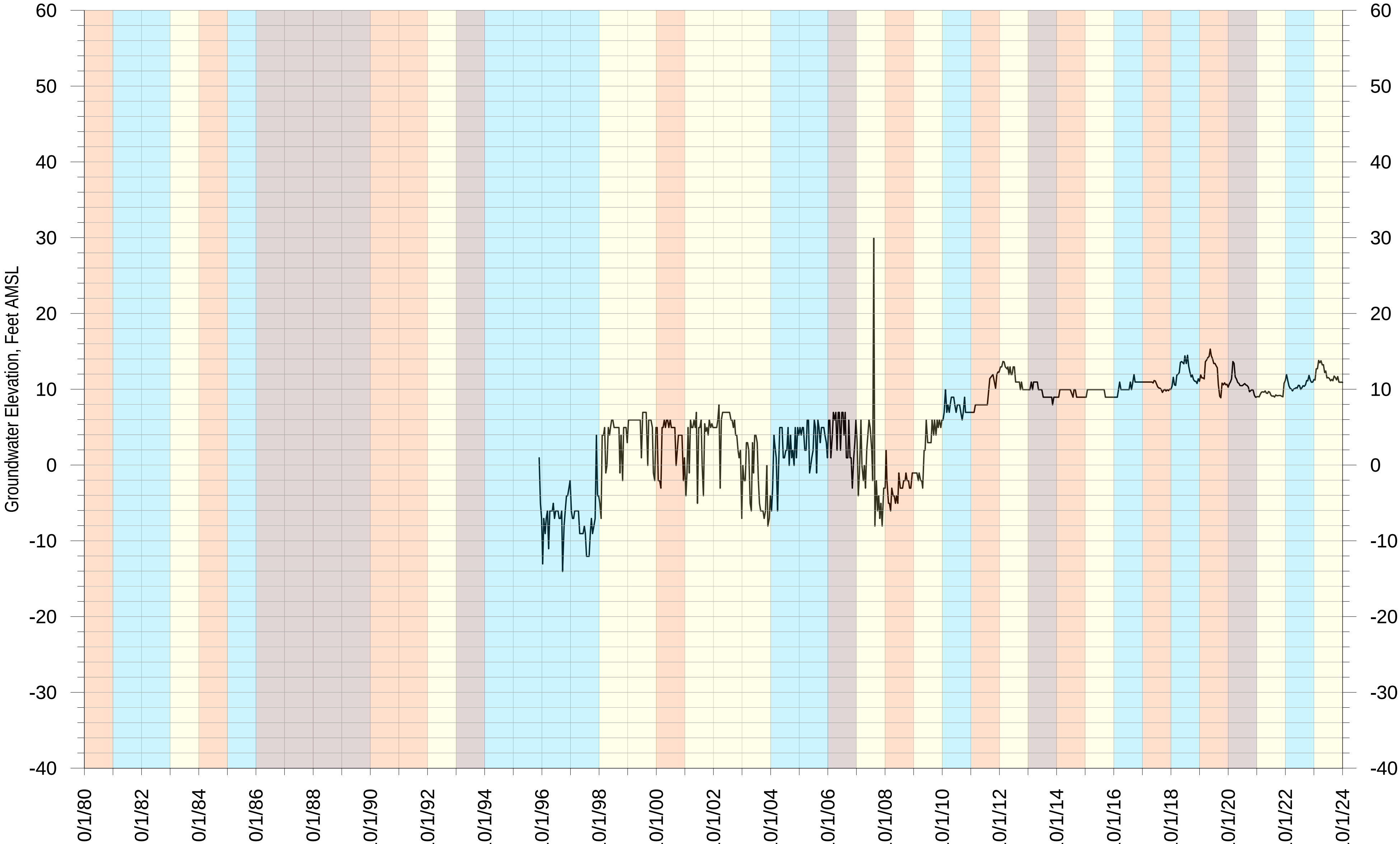
Estates
Aquifer Screened: Purisima A

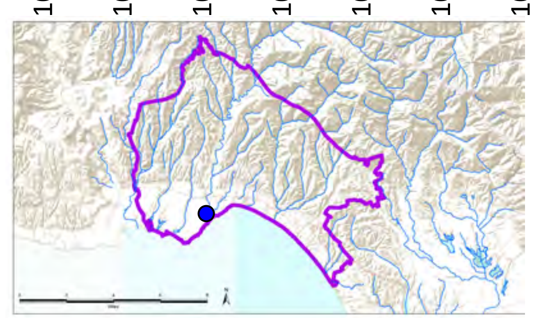




MONTGOMERY & ASSOCIATES

Garnet
Aquifer Screened: Purisima A





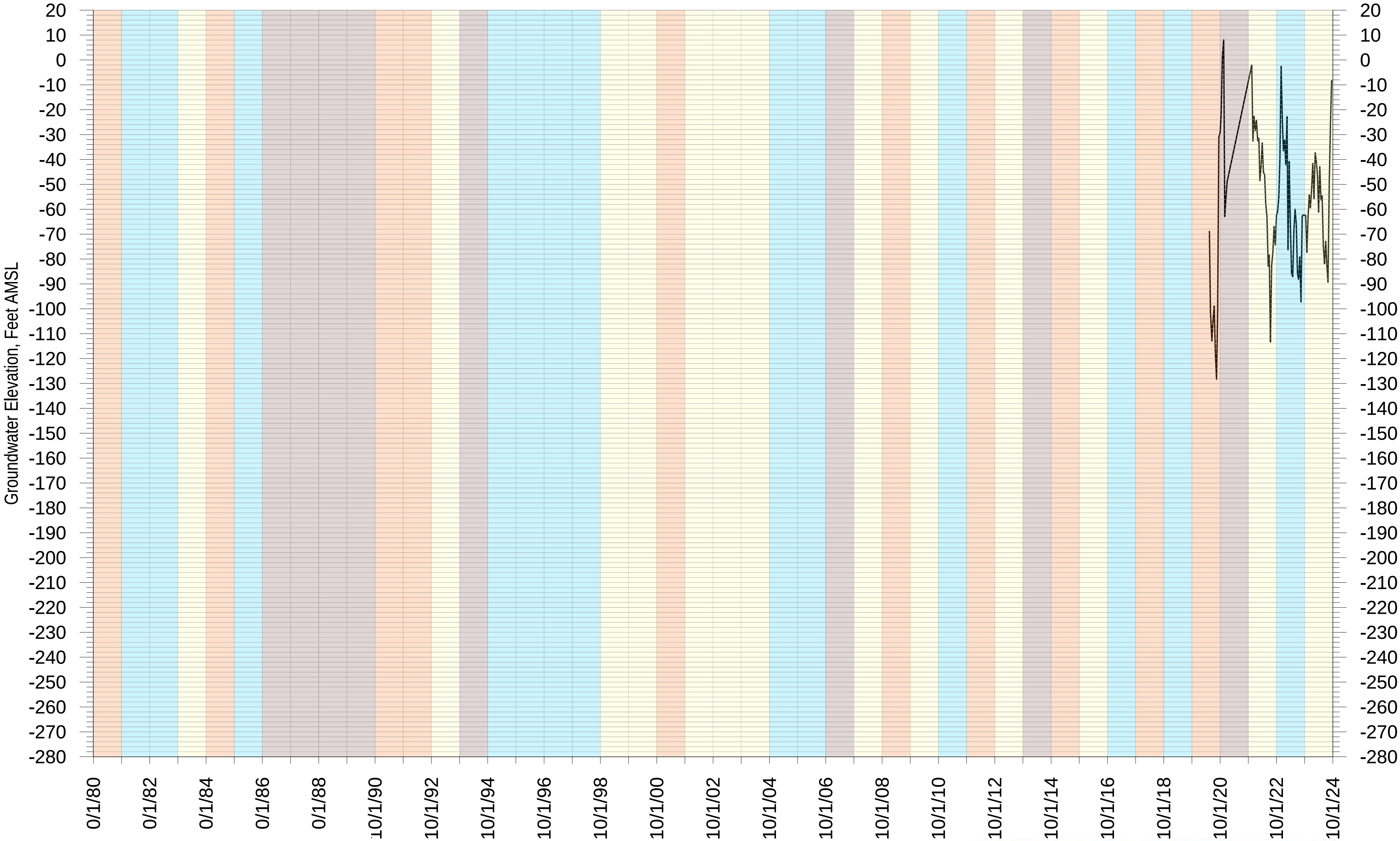
MONTGOMERY & ASSOCIATES

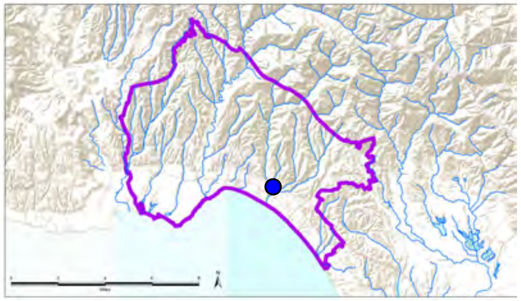
Granite Way PW

Aquifer Screened: Purisima DEF

Appendix A

FIGURE A-65



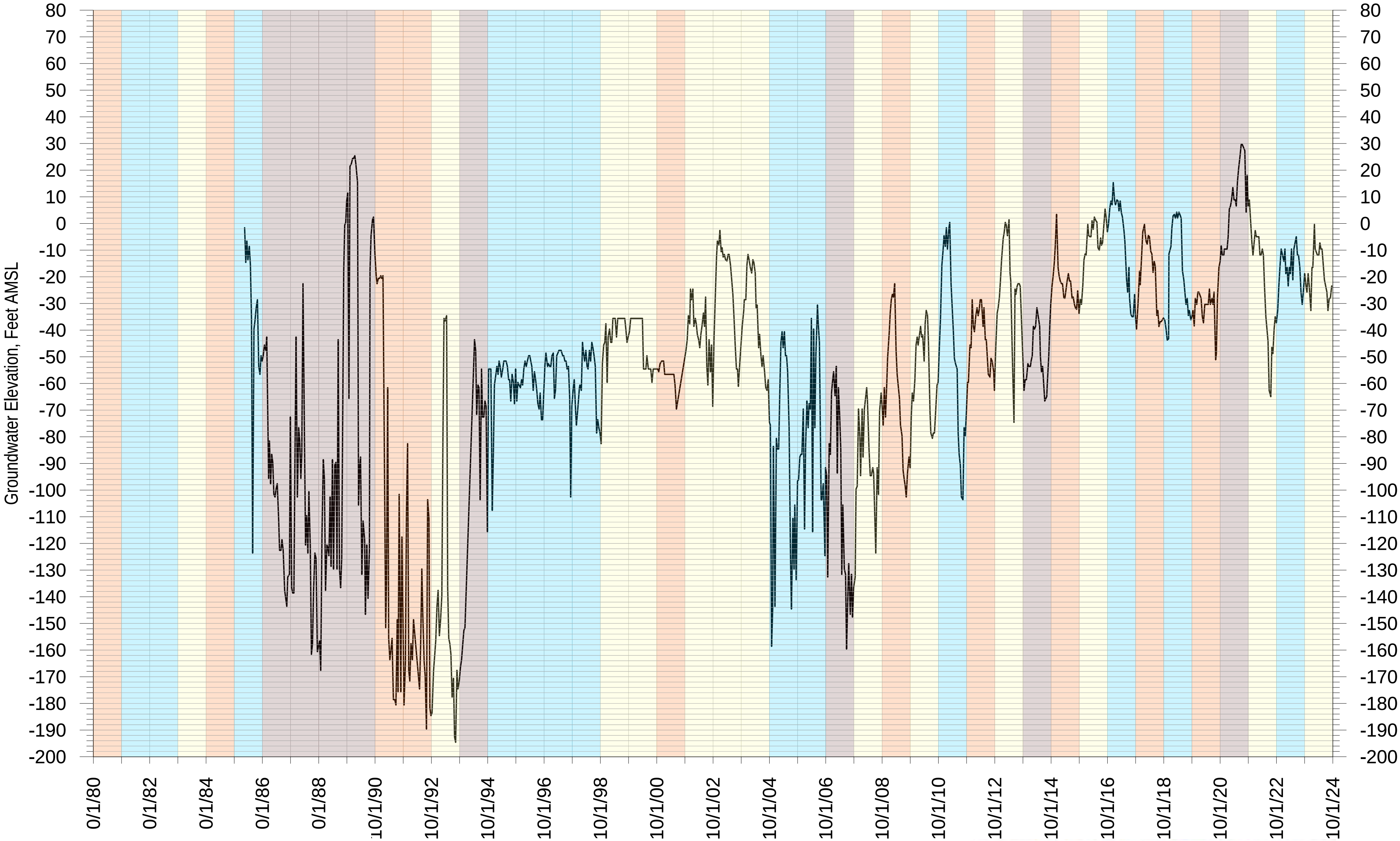


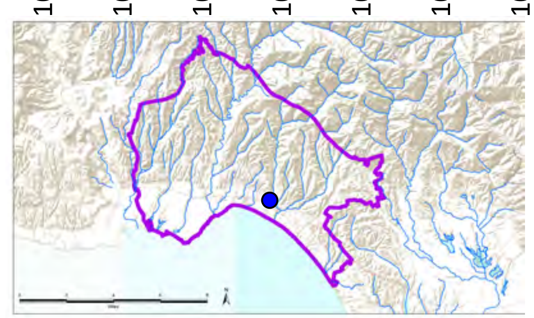
Ledyard

Aquifer Screened: Purisima BC

Appendix A

FIGURE A-66



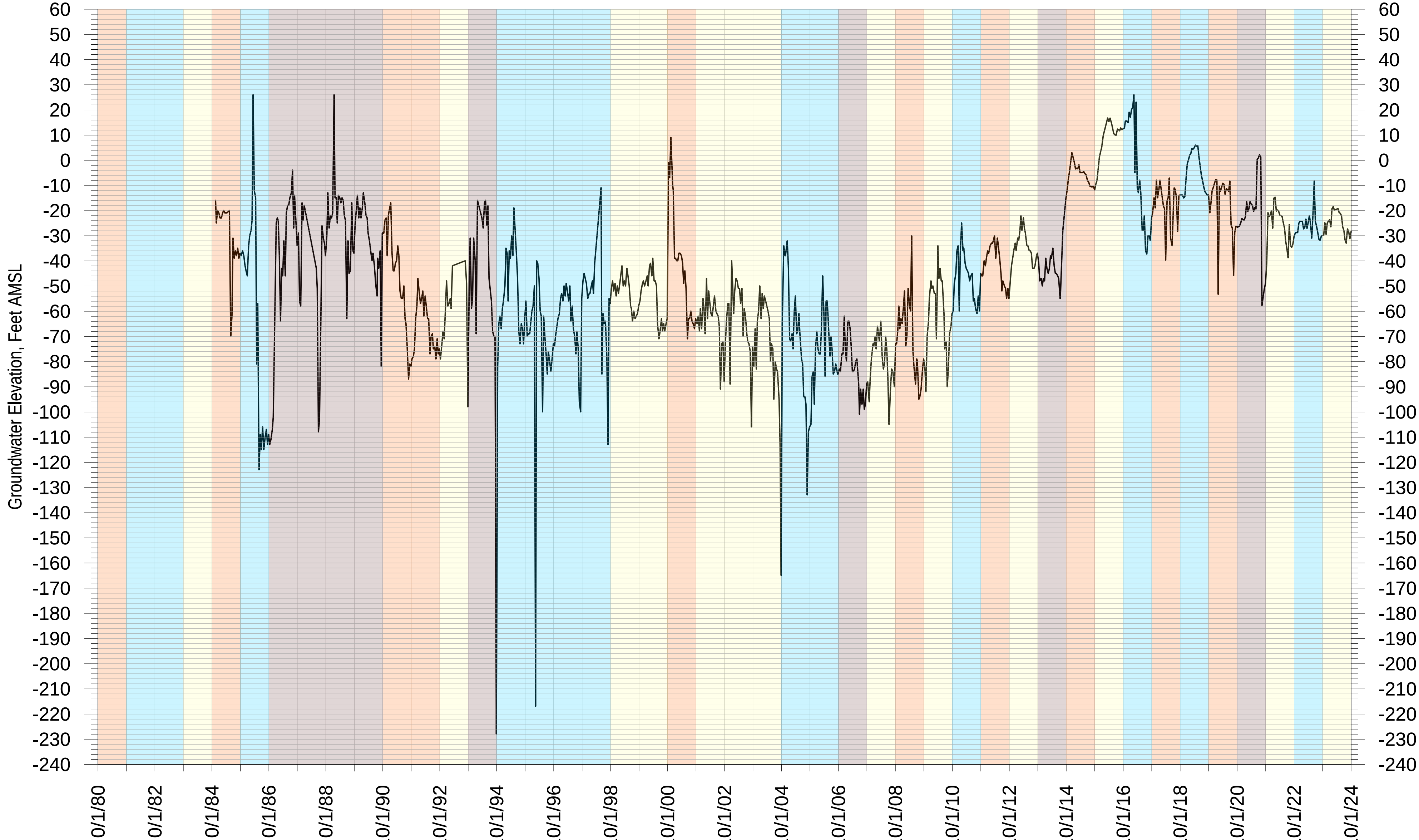


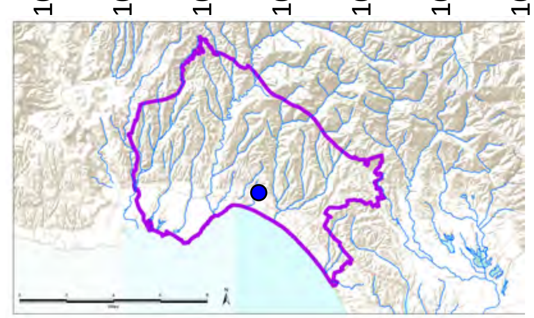
MONTGOMERY & ASSOCIATES

Madeline PW
Aquifer Screened: Purisima BC

Appendix A

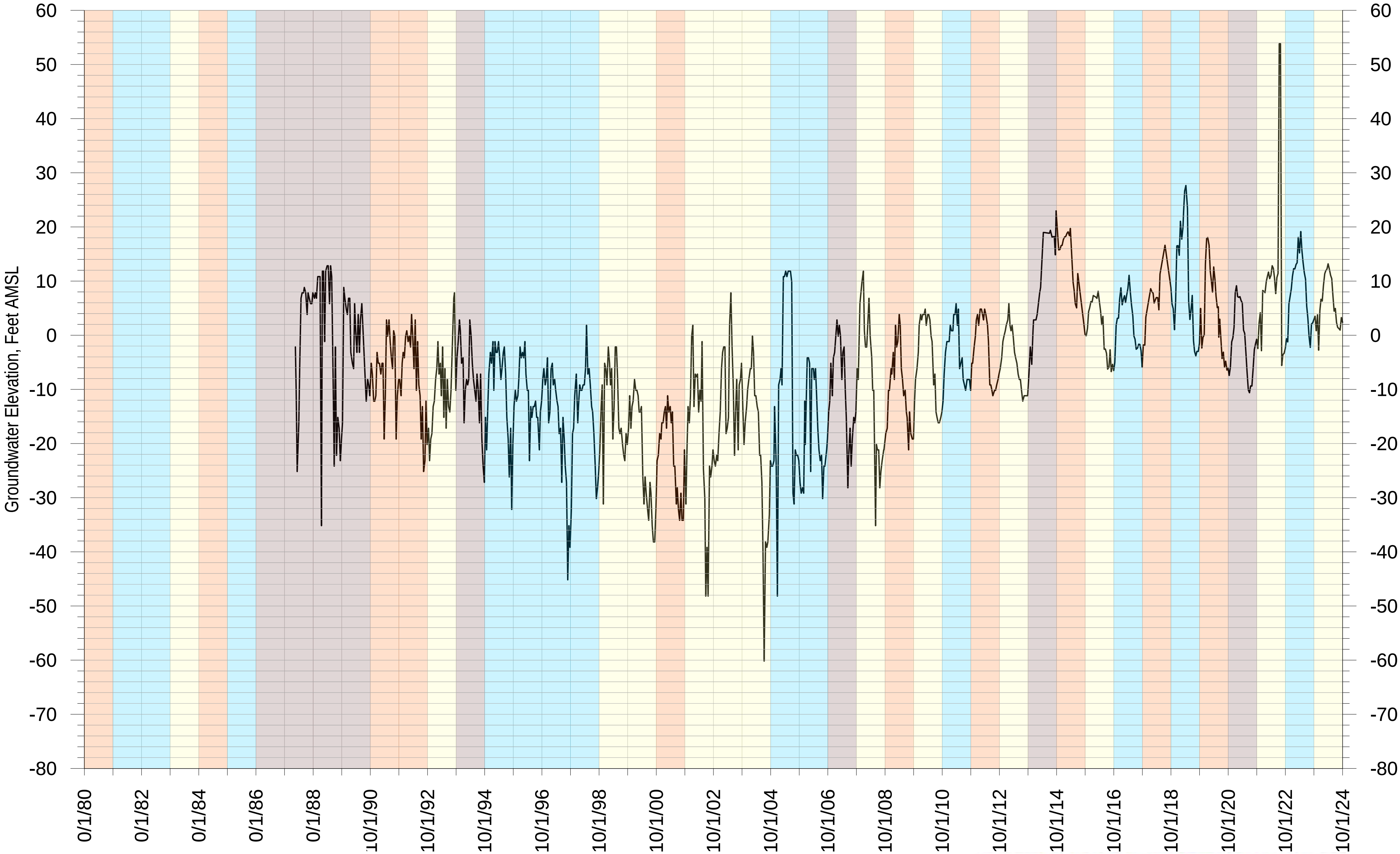
FIGURE A-67

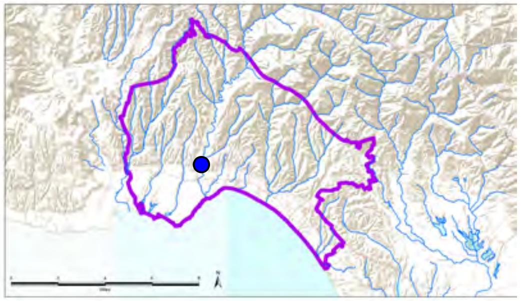




MONTGOMERY
& ASSOCIATES

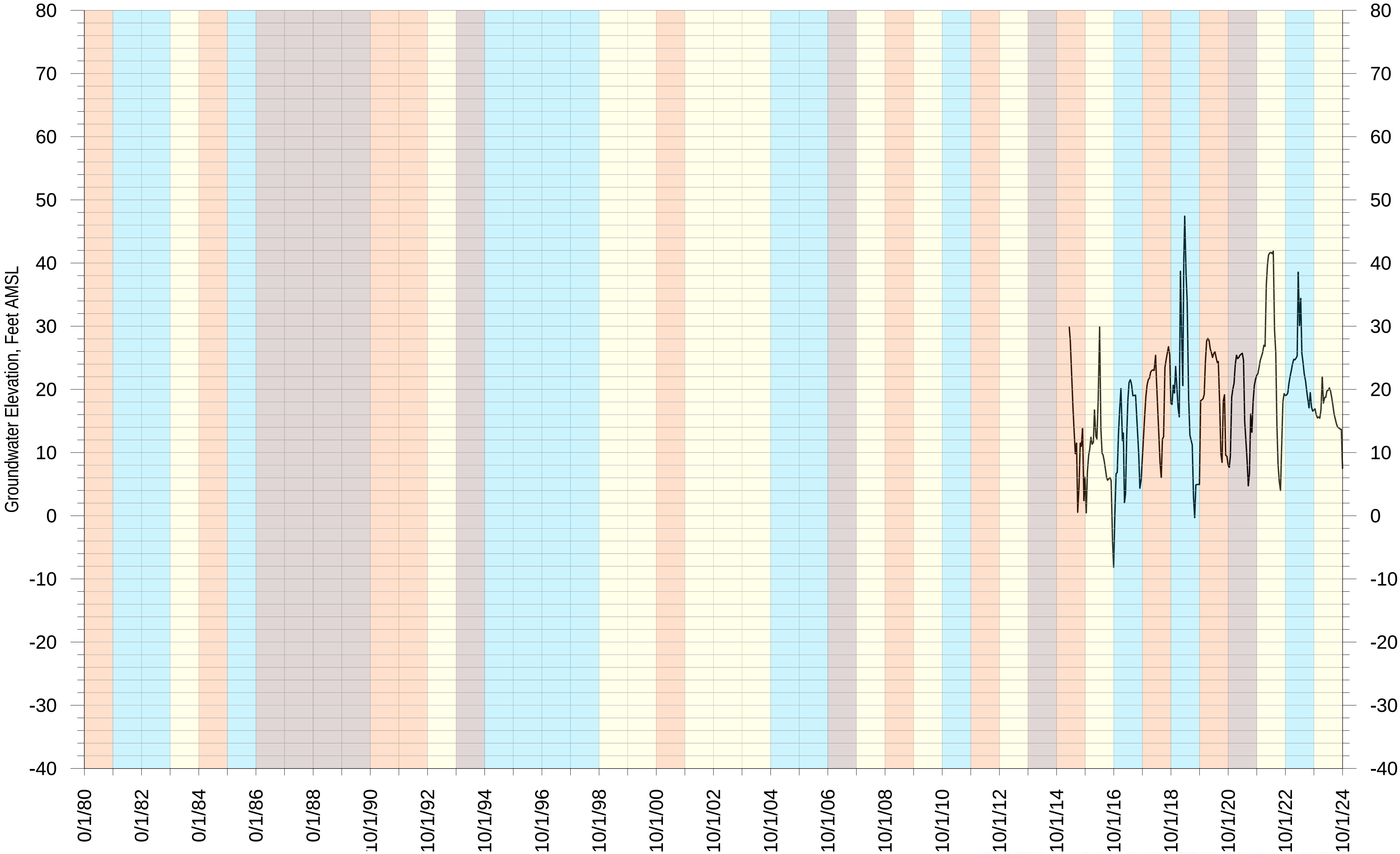
Main Street PW
Aquifer Screened: Purisima AA/Tu

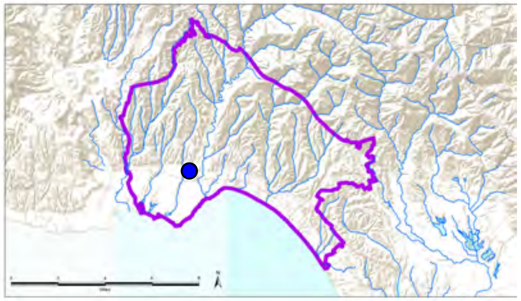




MONTGOMERY & ASSOCIATES

O'Neill Ranch PW
Aquifer Screened: Purisima AA/Tu



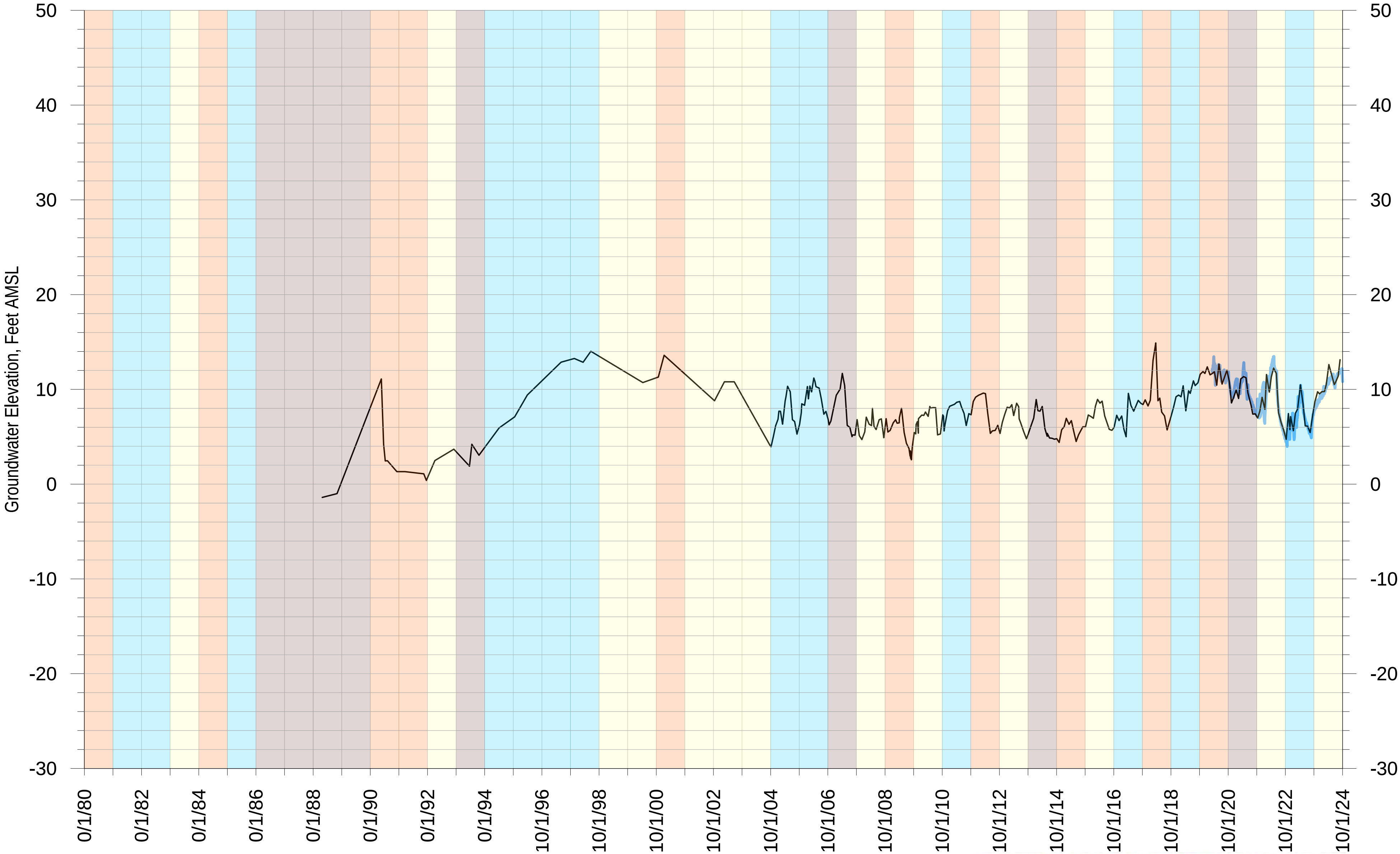


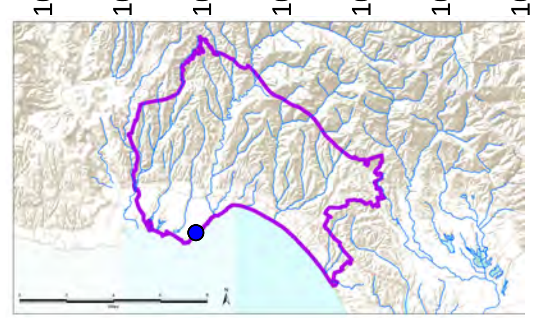
MONTGOMERY & ASSOCIATES

Pleasure Point Shallow
Aquifer Screened: Purisima A

Appendix A

FIGURE A-70

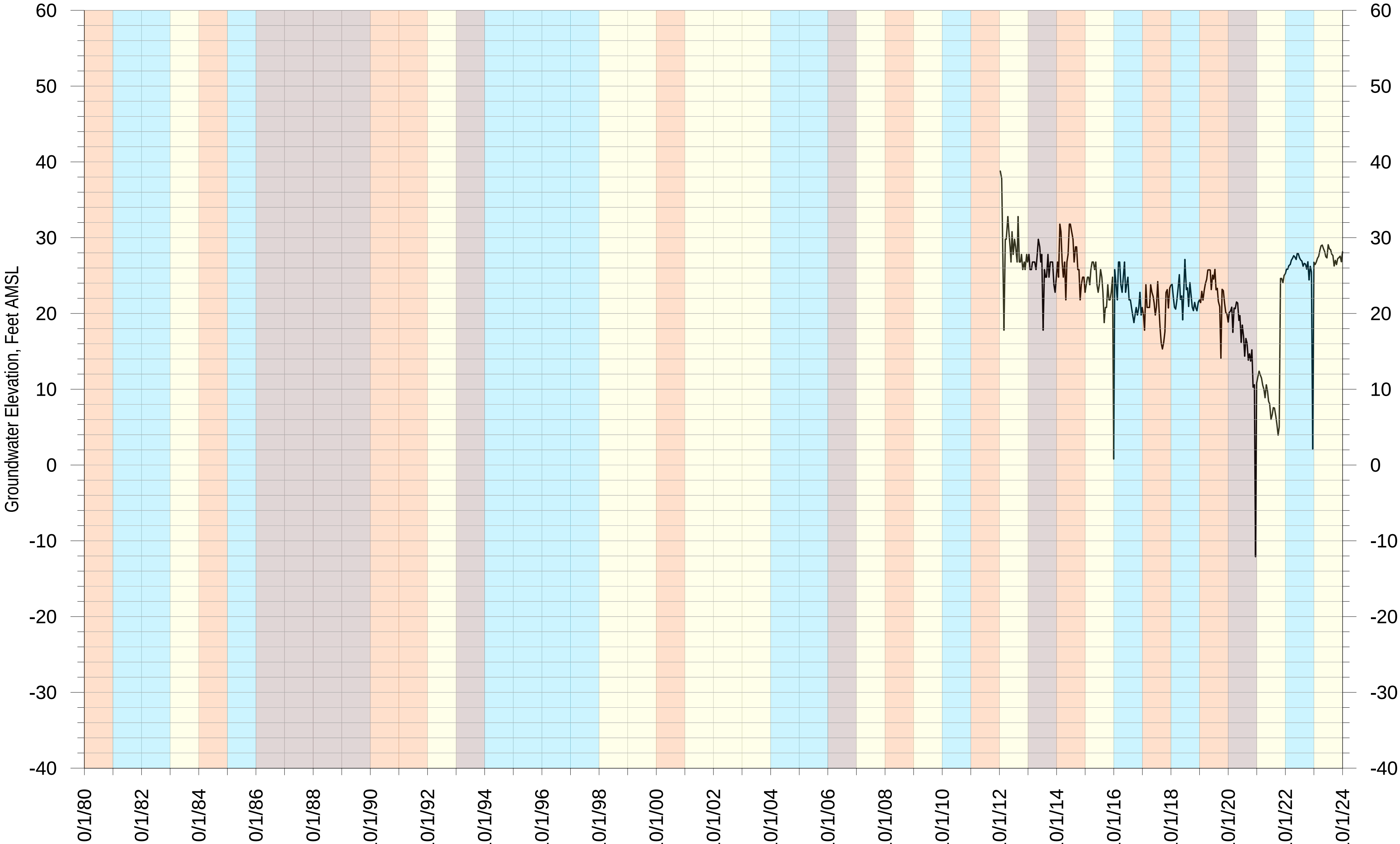


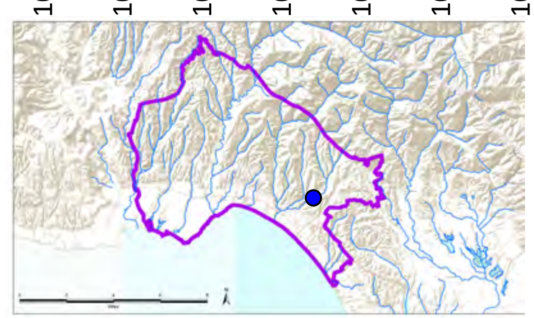


MONTGOMERY
& ASSOCIATES

Polo Grounds PW
Aquifer Screened: Aromas/ Purisima F

Appendix A
FIGURE A-71

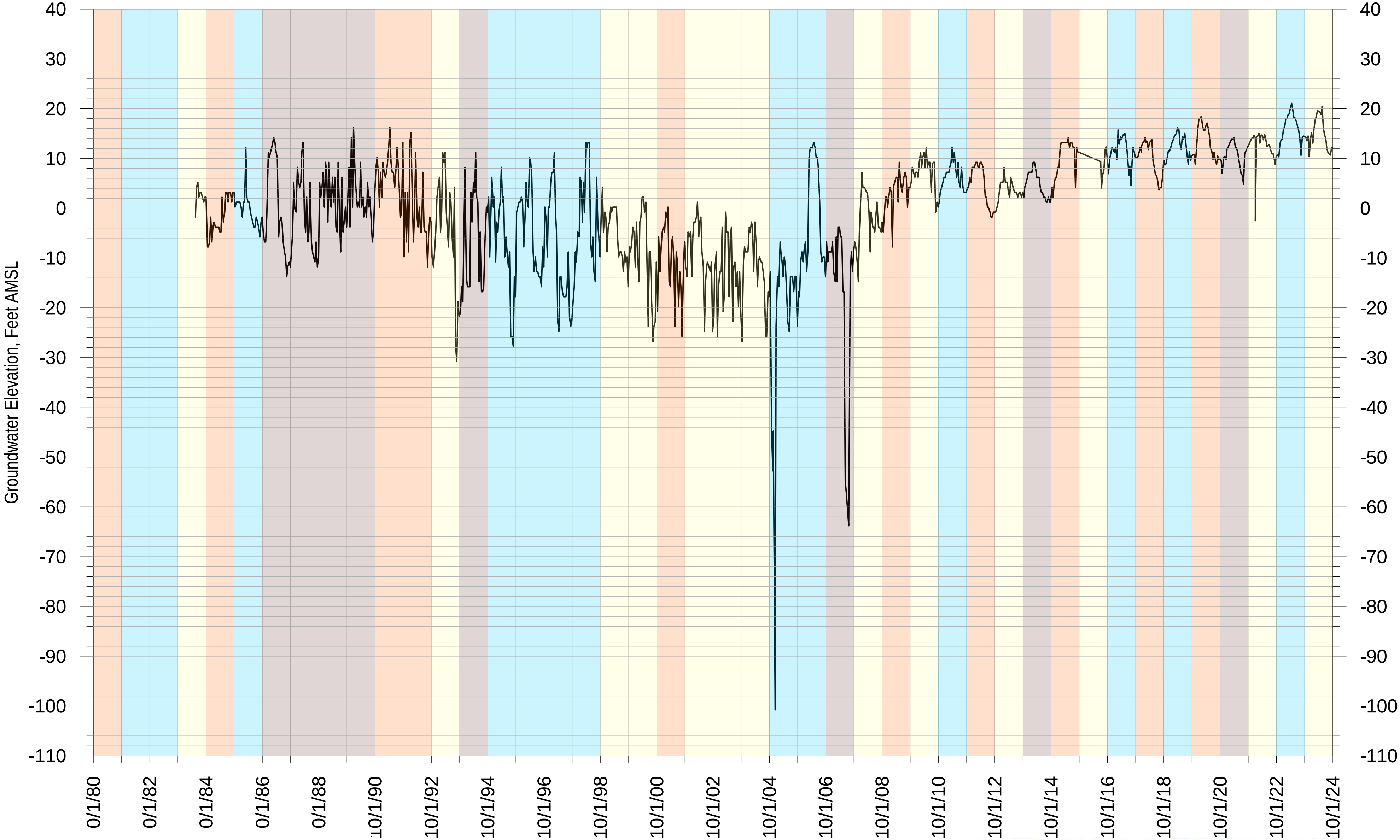


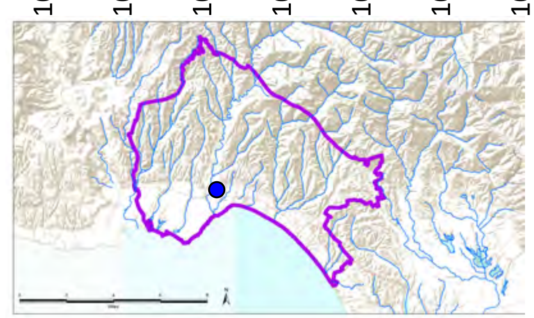


MONTGOMERY
& ASSOCIATES

Rosedale PW
Aquifer Screened: Purisima A

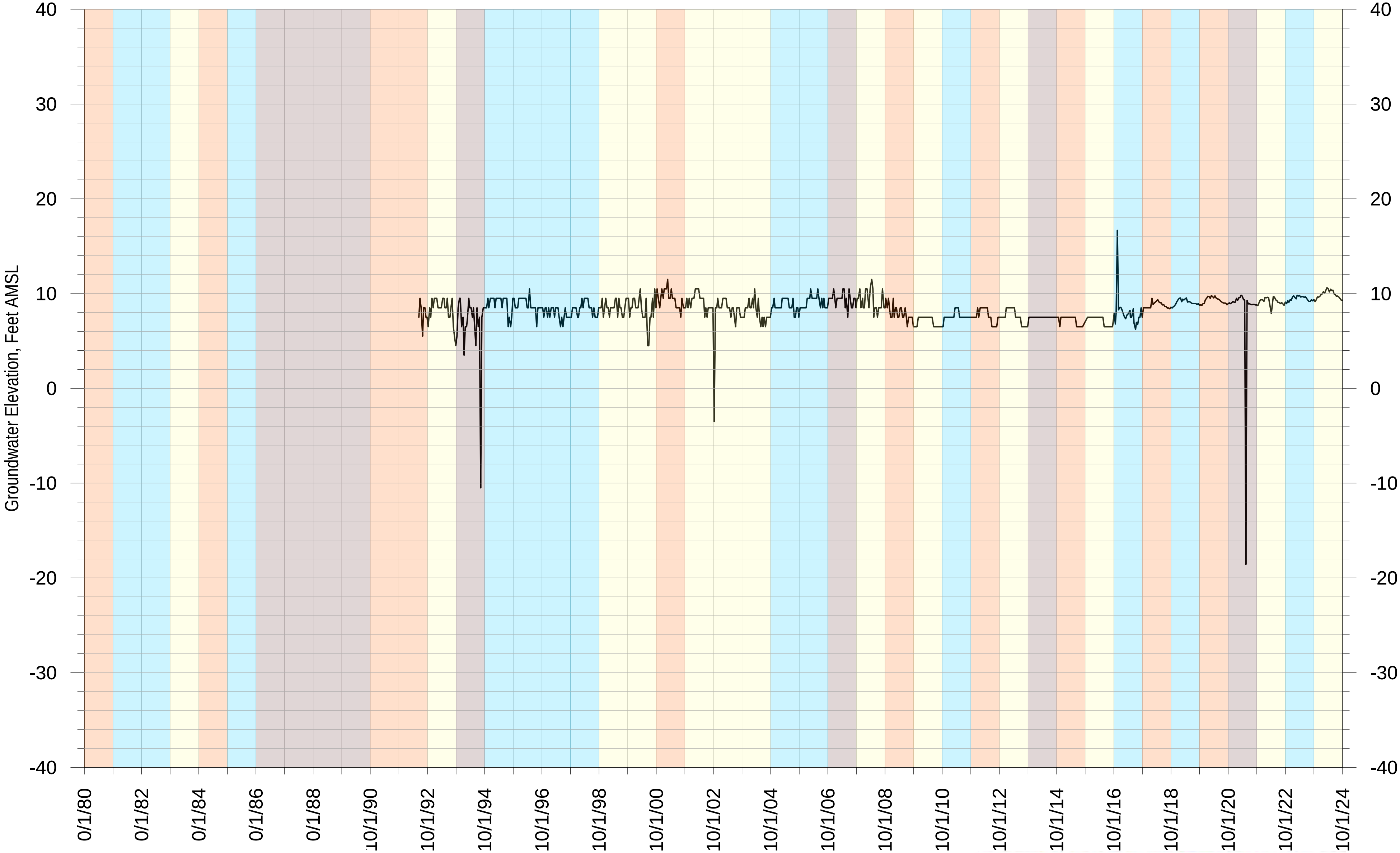
Appendix A
FIGURE A-72

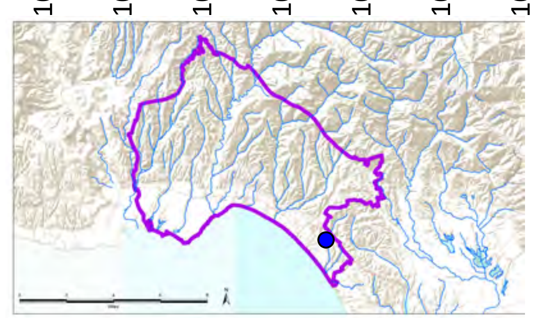




MONTGOMERY
& ASSOCIATES

San Andreas PW
Aquifer Screened: Aromas/ Purisima F

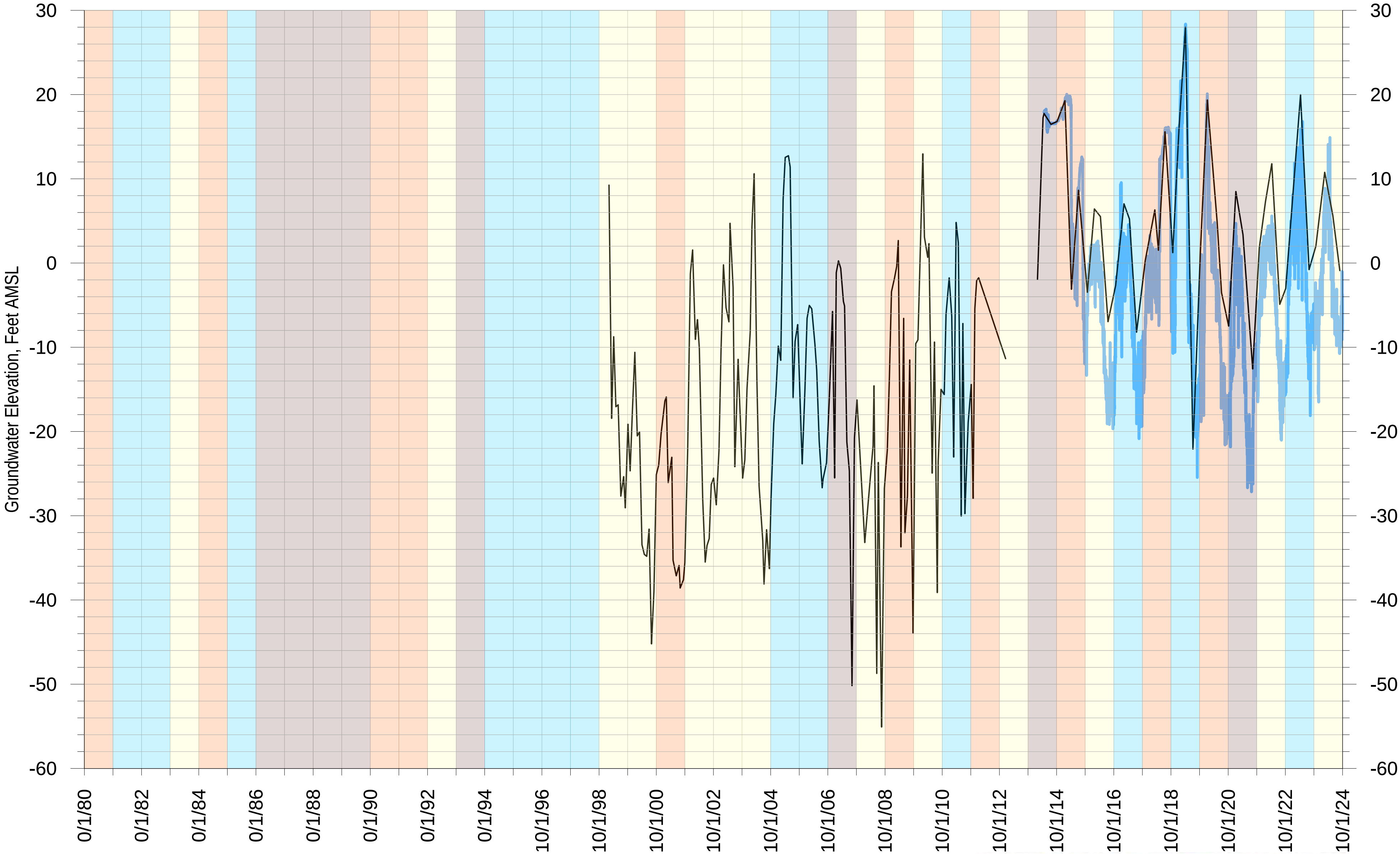


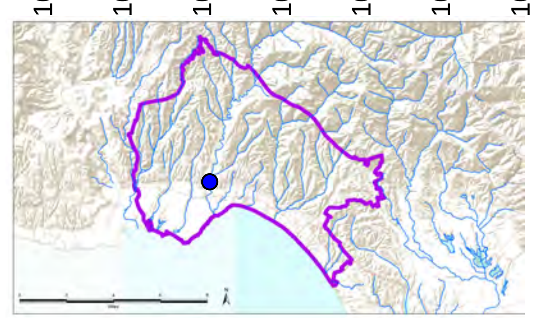


MONTGOMERY & ASSOCIATES

SC-18AA & SC-18RAA at Main Street
Aquifer Screened: Tu

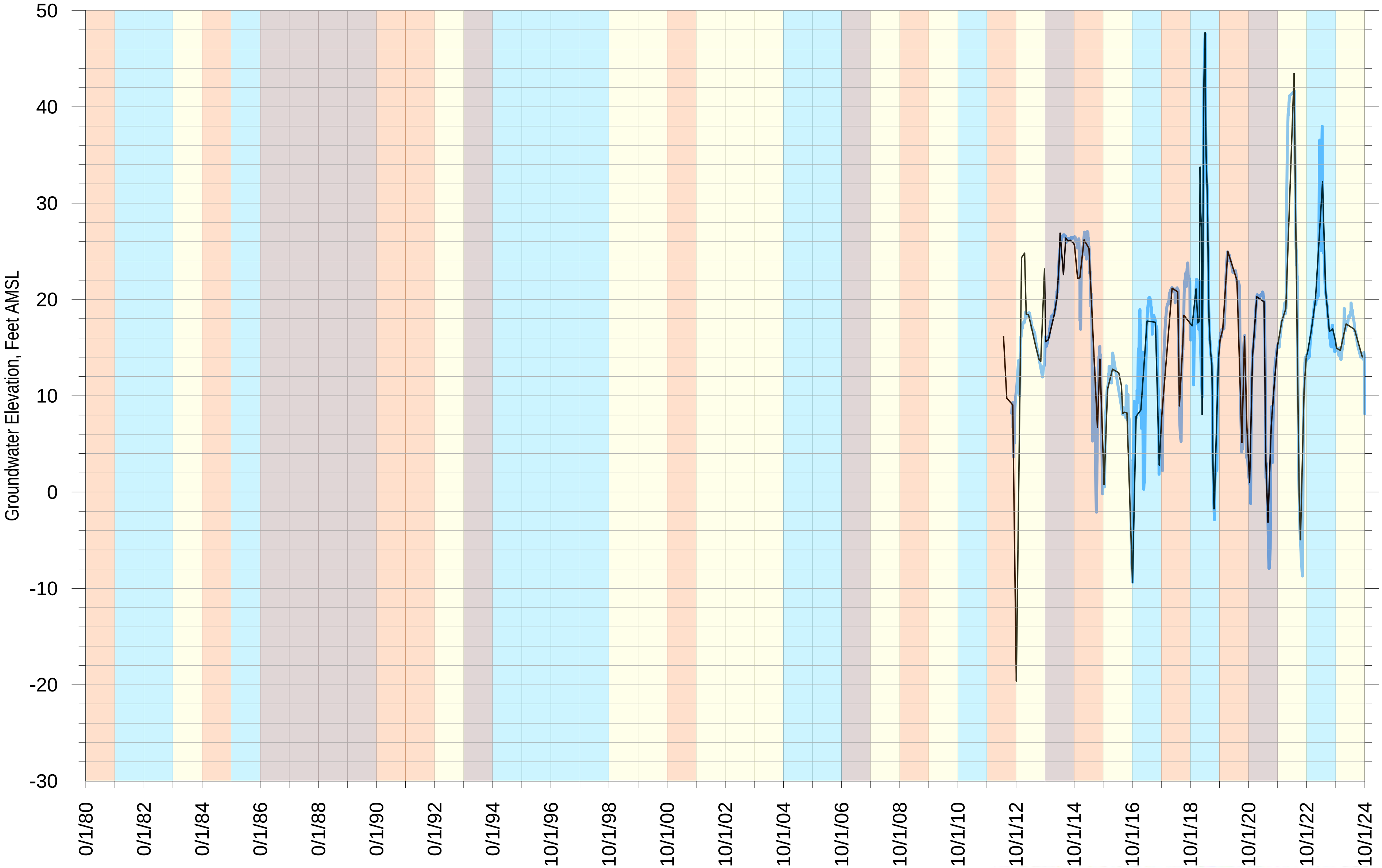
Appendix A
FIGURE A-74

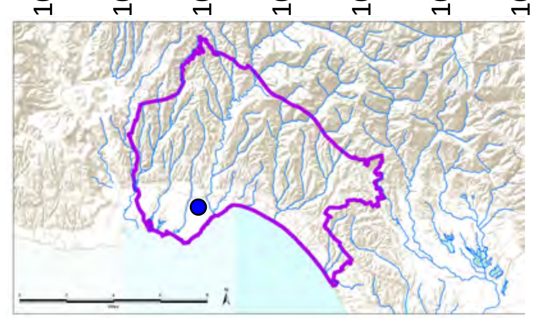




MONTGOMERY
& ASSOCIATES

SC-22AAA at 41st Ave
Aquifer Screened: Purisima AA



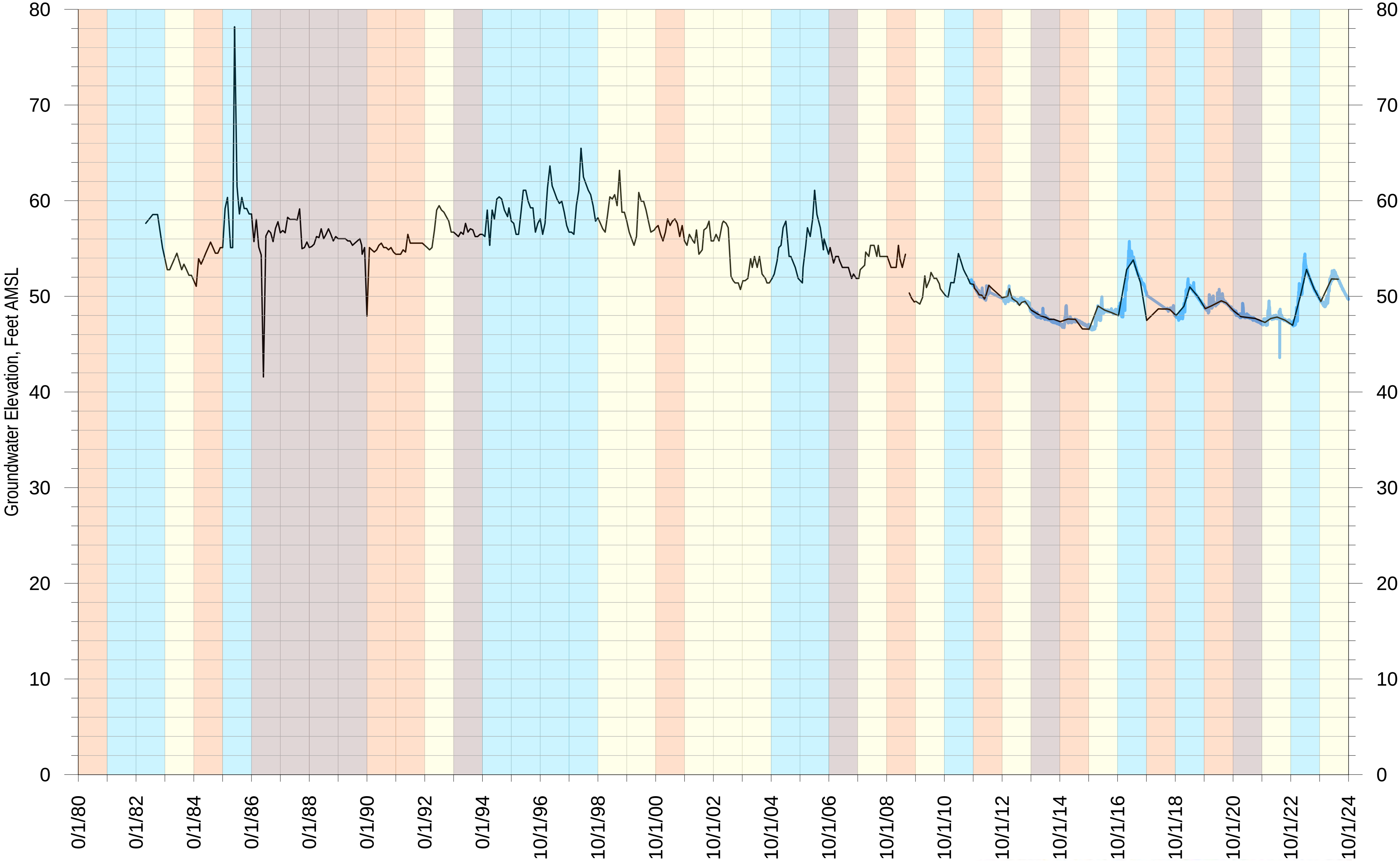


MONTGOMERY & ASSOCIATES

SC-3C & SC-3RC at Escalona
Aquifer Screened: Purisima BC

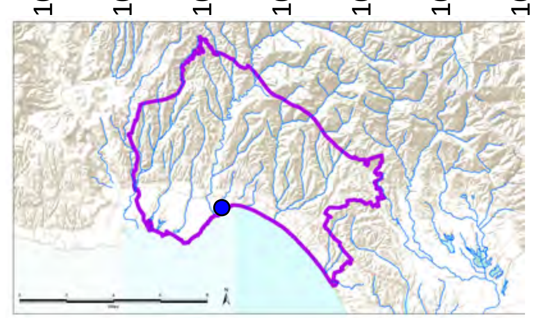
Appendix A

FIGURE A-76



Hand Measurement   Transducer

Critically Dry   Dry   Normal   Wet

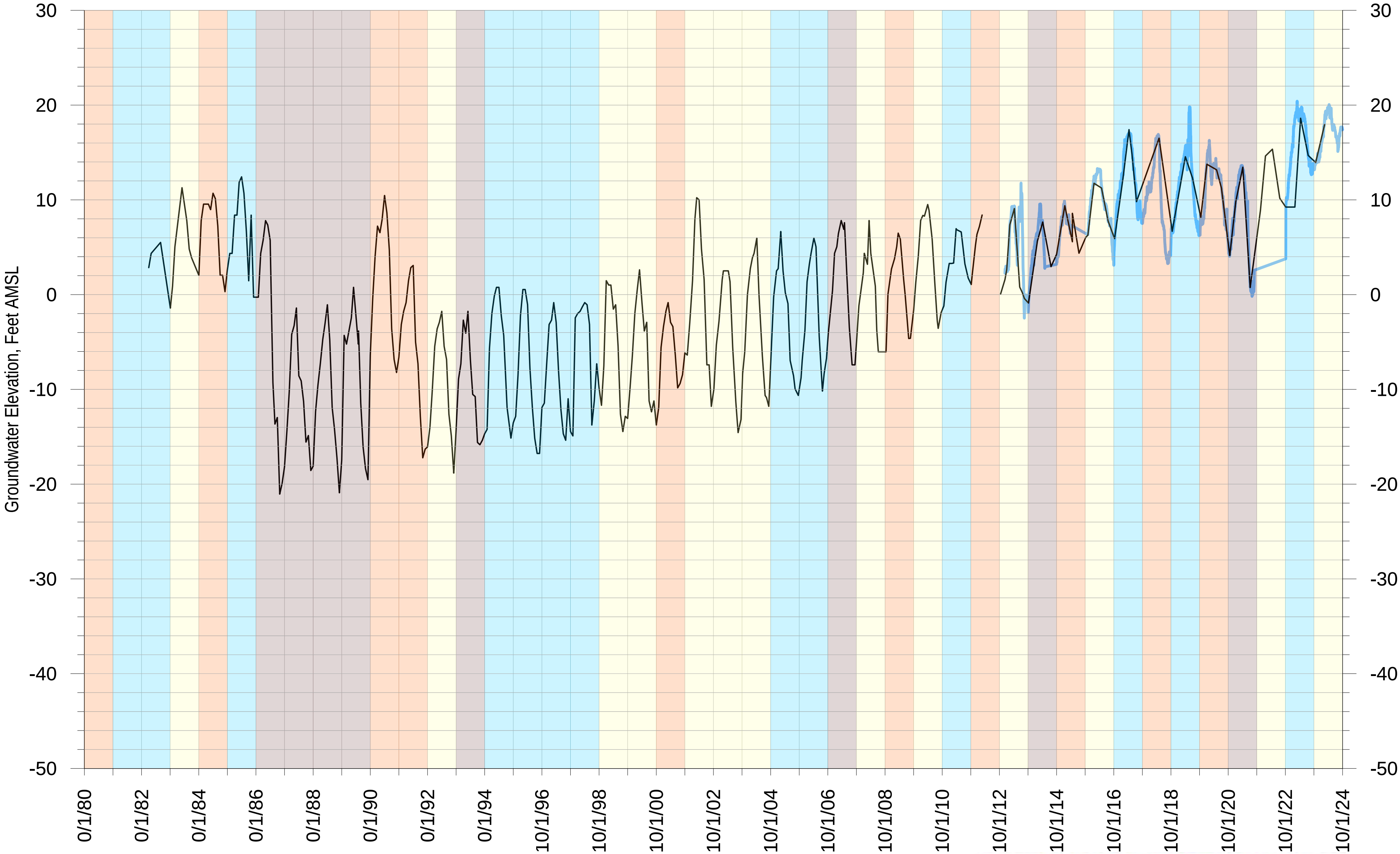


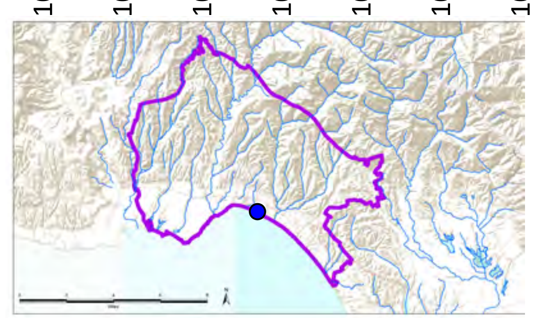
MONTGOMERY
& ASSOCIATES

SC-9A & SC-9RA at Seacliff
Aquifer Screened: Purisima A

Appendix A

FIGURE A-77



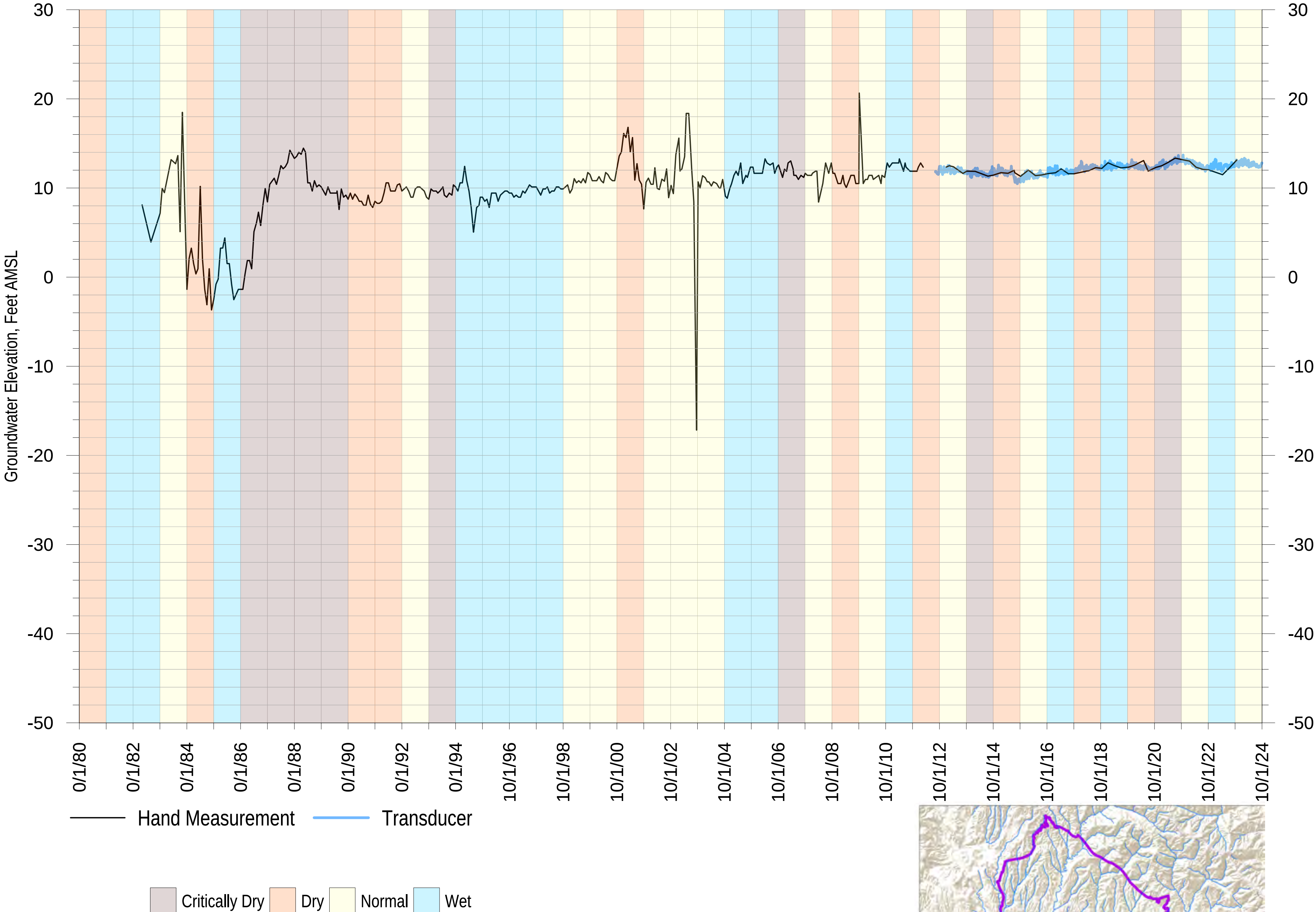


MONTGOMERY
& ASSOCIATES

SC-9E & SC-9RE at Seacliff
Aquifer Screened: Purisima DEF

Appendix A

FIGURE A-78



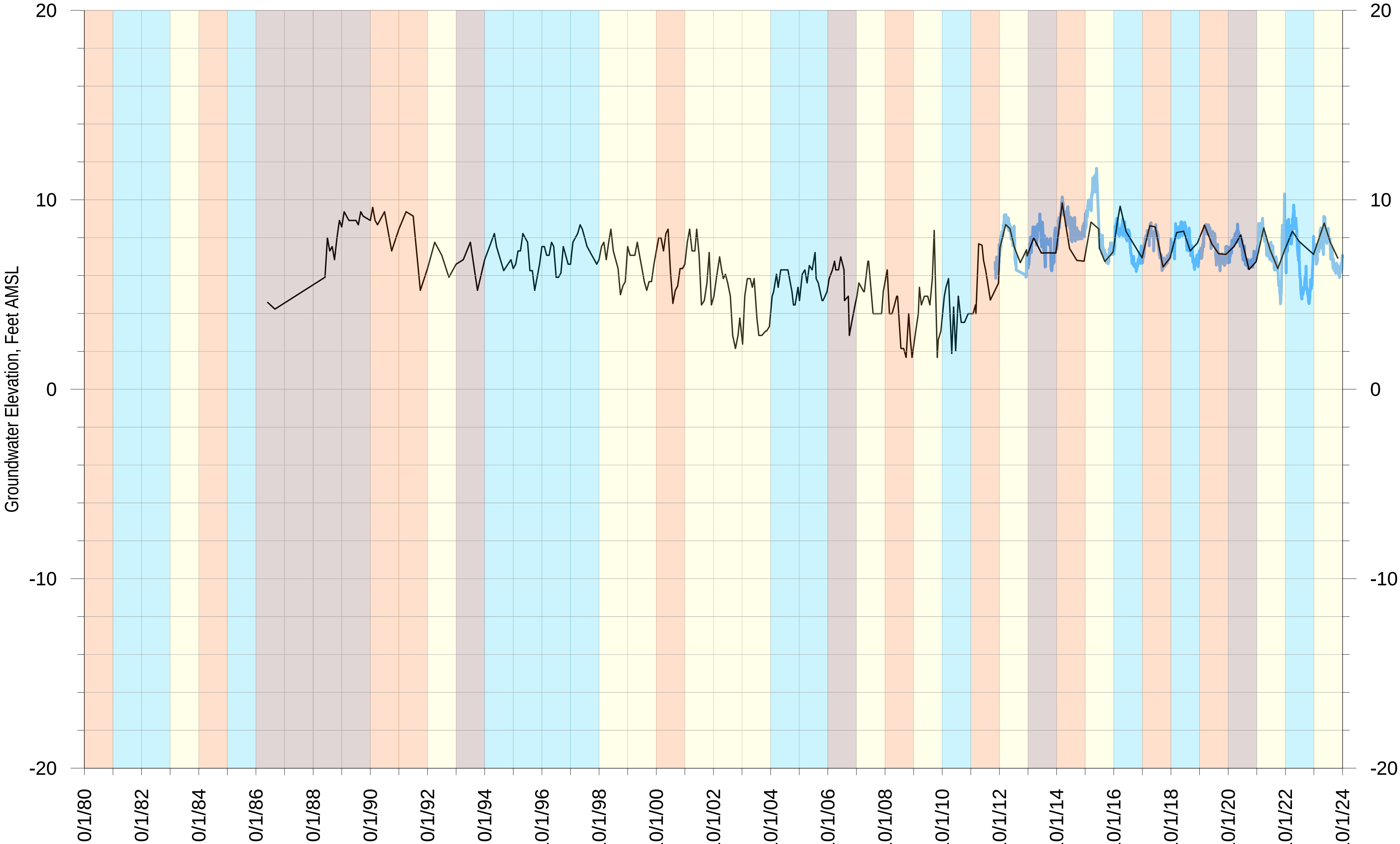
MONTGOMERY & ASSOCIATES

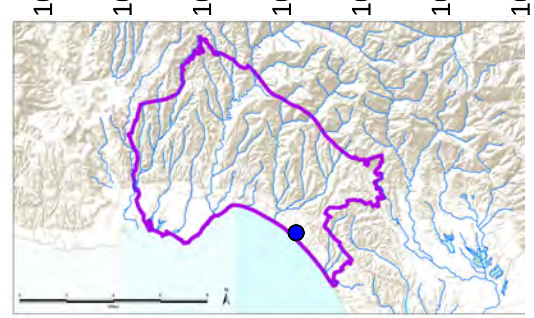
SC-A1A at Cliff Drive

Aquifer Screened: Purisima DEF

Appendix A

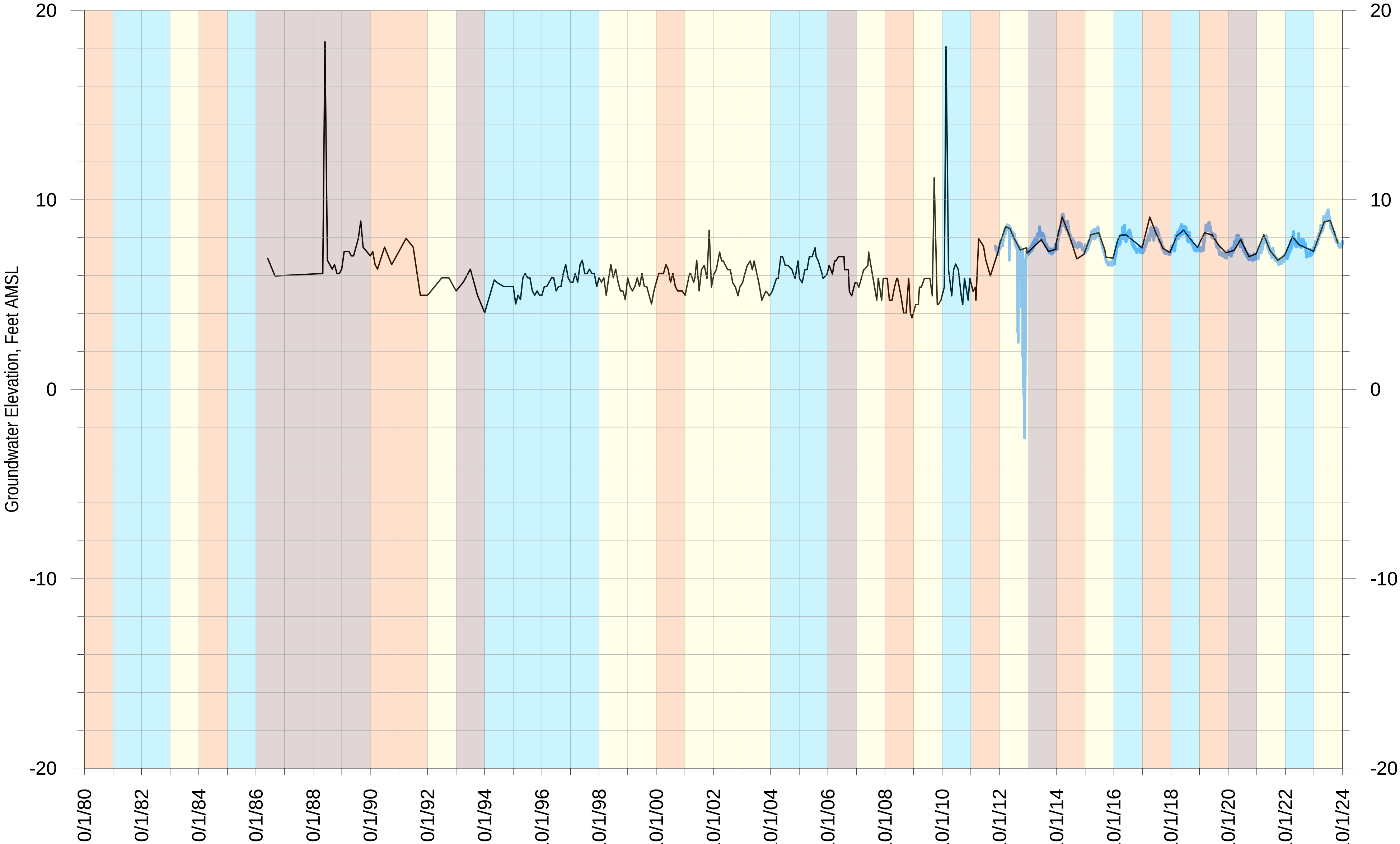
FIGURE A-79

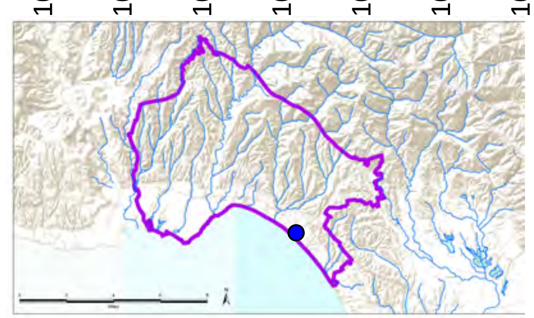




MONTGOMERY & ASSOCIATES

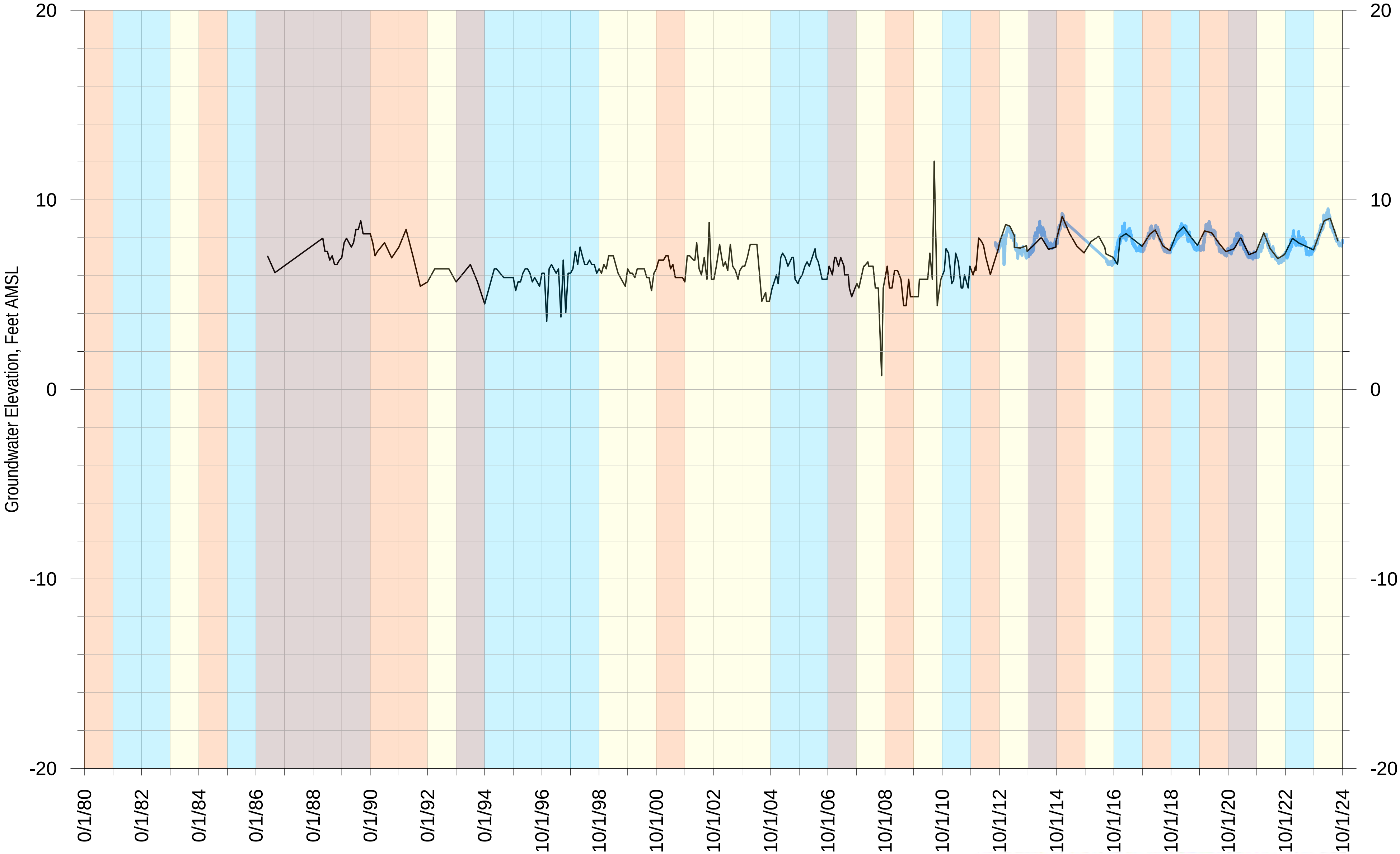
SC-A1C at Cliff Drive
Aquifer Screened: Aromas

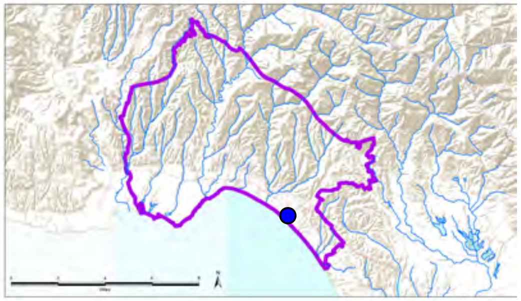




MONTGOMERY
& ASSOCIATES

SC-A1D at Cliff Drive
Aquifer Screened: Aromas



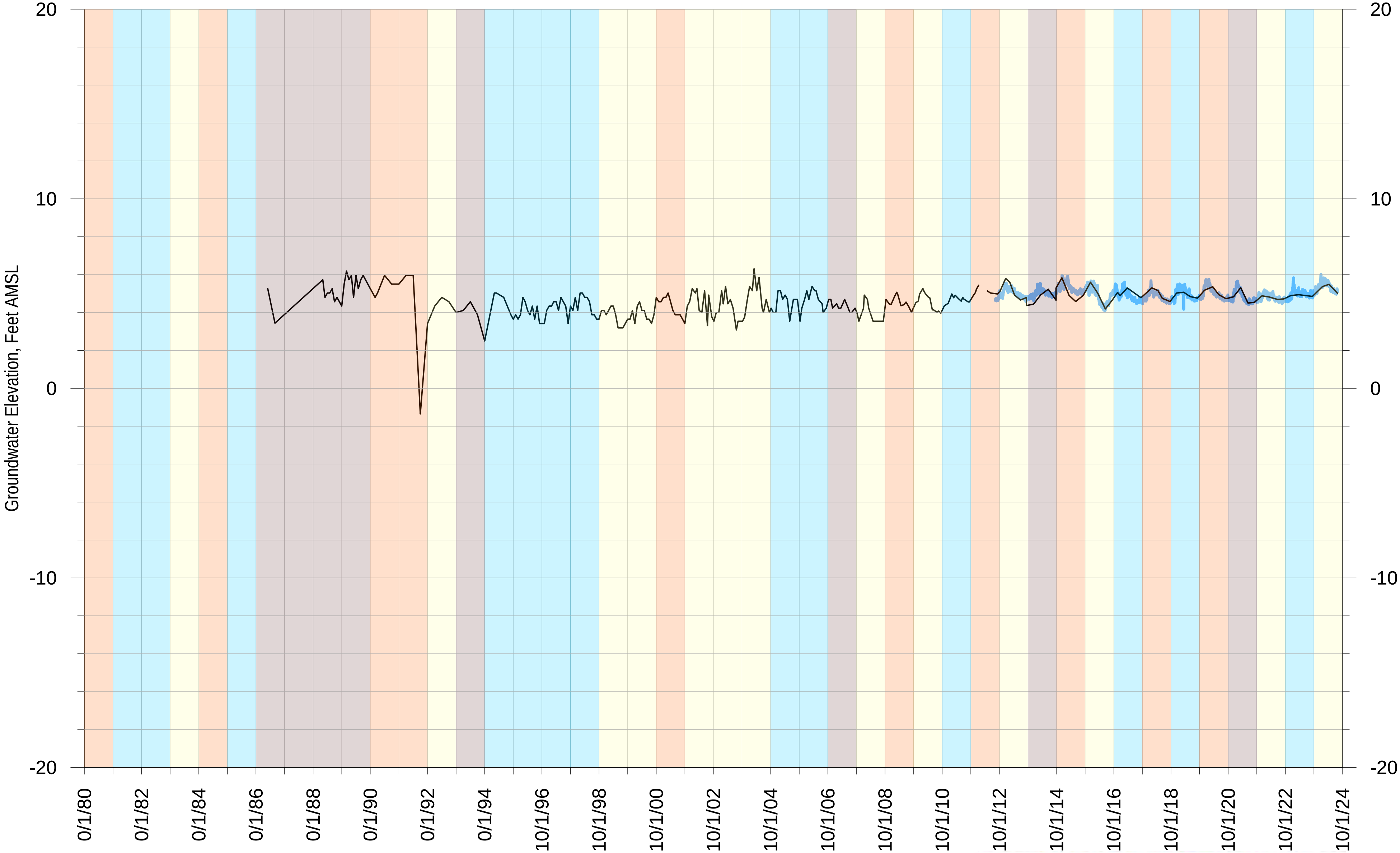


MONTGOMERY
& ASSOCIATES

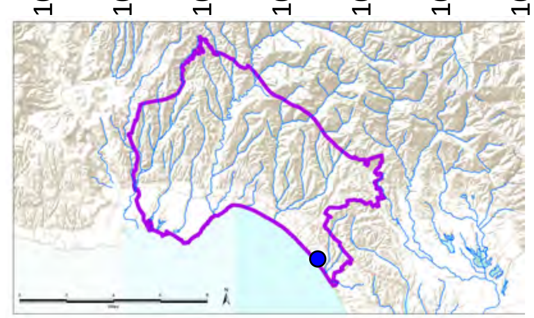
SC-A2C & SC-A2RC at Sumner
Aquifer Screened: Aromas

Appendix A

FIGURE A-82



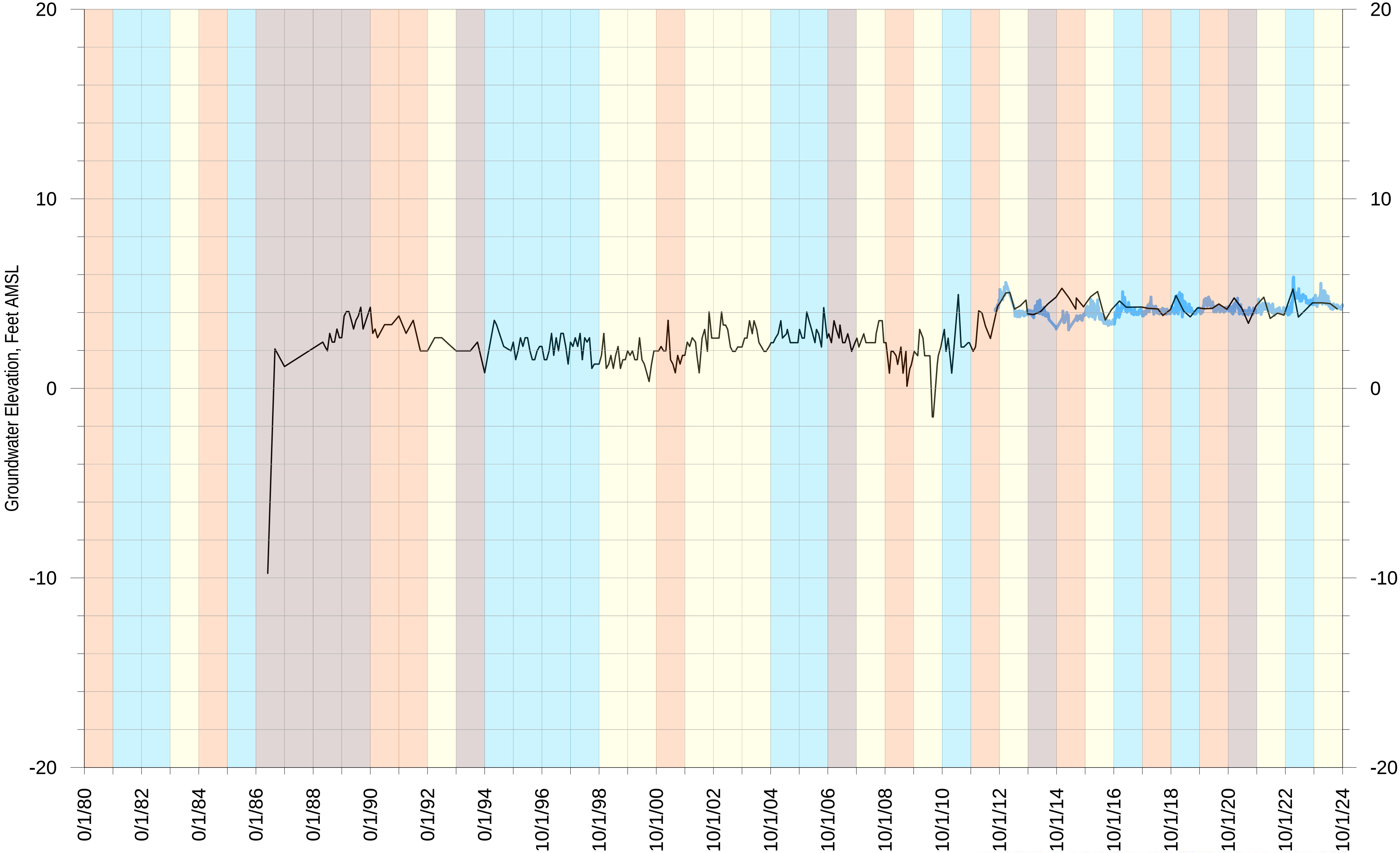
Hand Measurement — Transducer

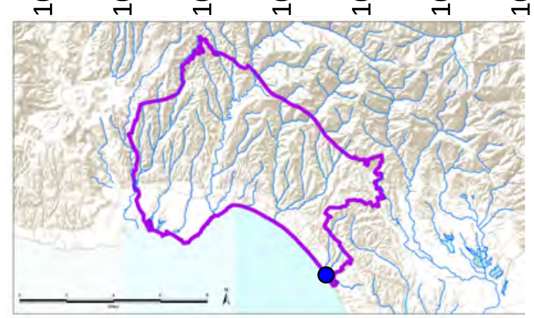


Critically Dry | Dry | Normal | Wet

MONTGOMERY & ASSOCIATES

SC-A3B at Playa Vista
Aquifer Screened: Aromas

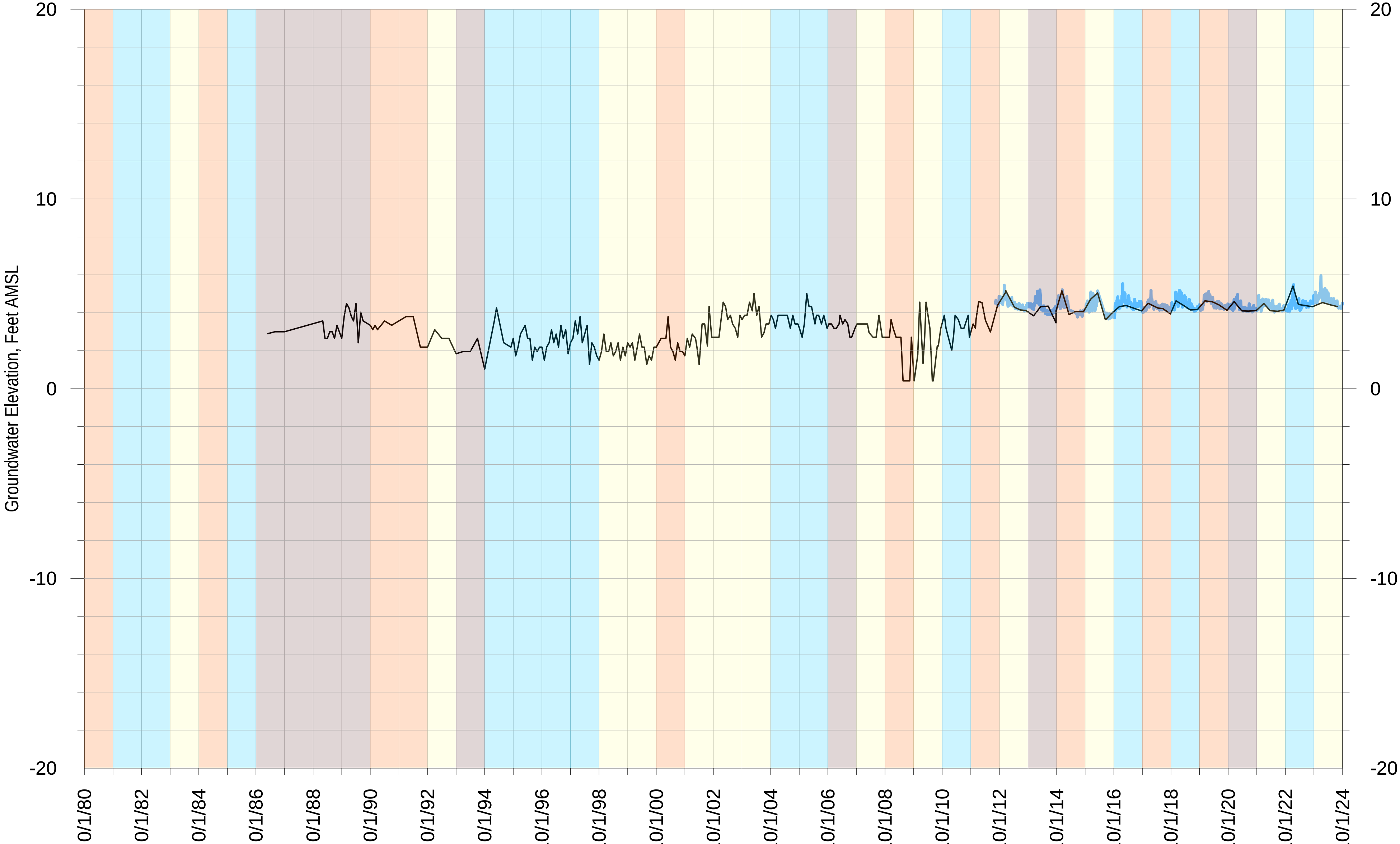


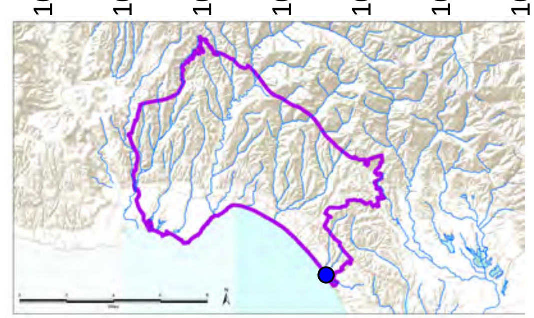


SC-A3C at Playa Vista
Aquifer Screened: Aromas

Appendix A

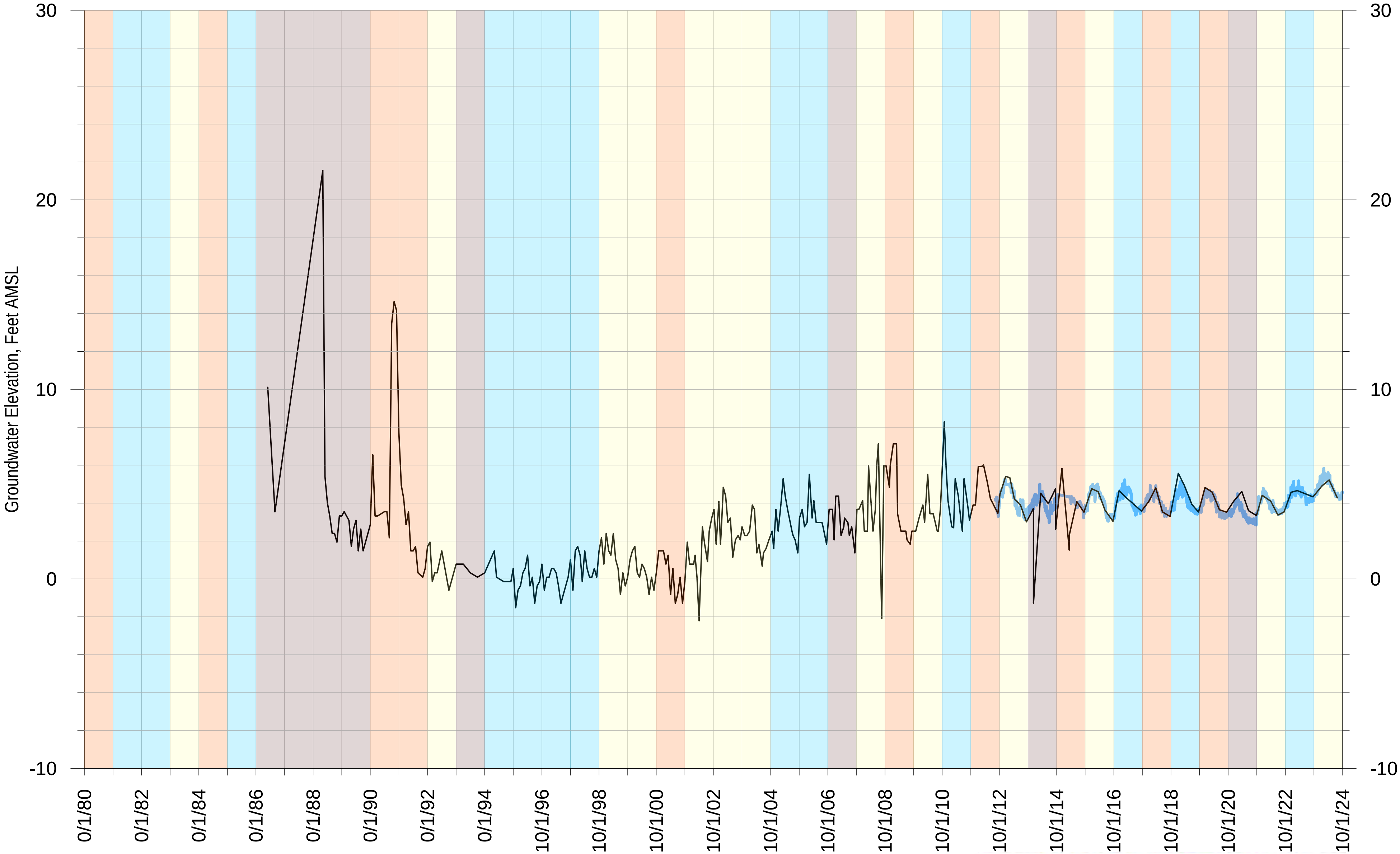
FIGURE A-84

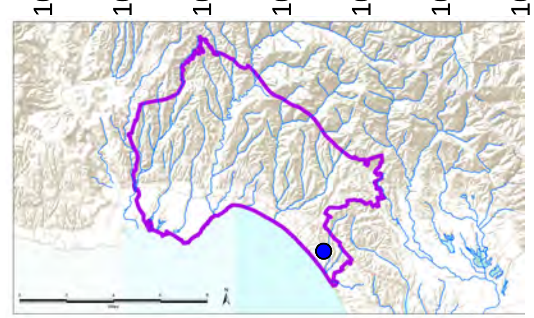




MONTGOMERY
& ASSOCIATES

SC-A5A at Seascape
Aquifer Screened: Purisima F



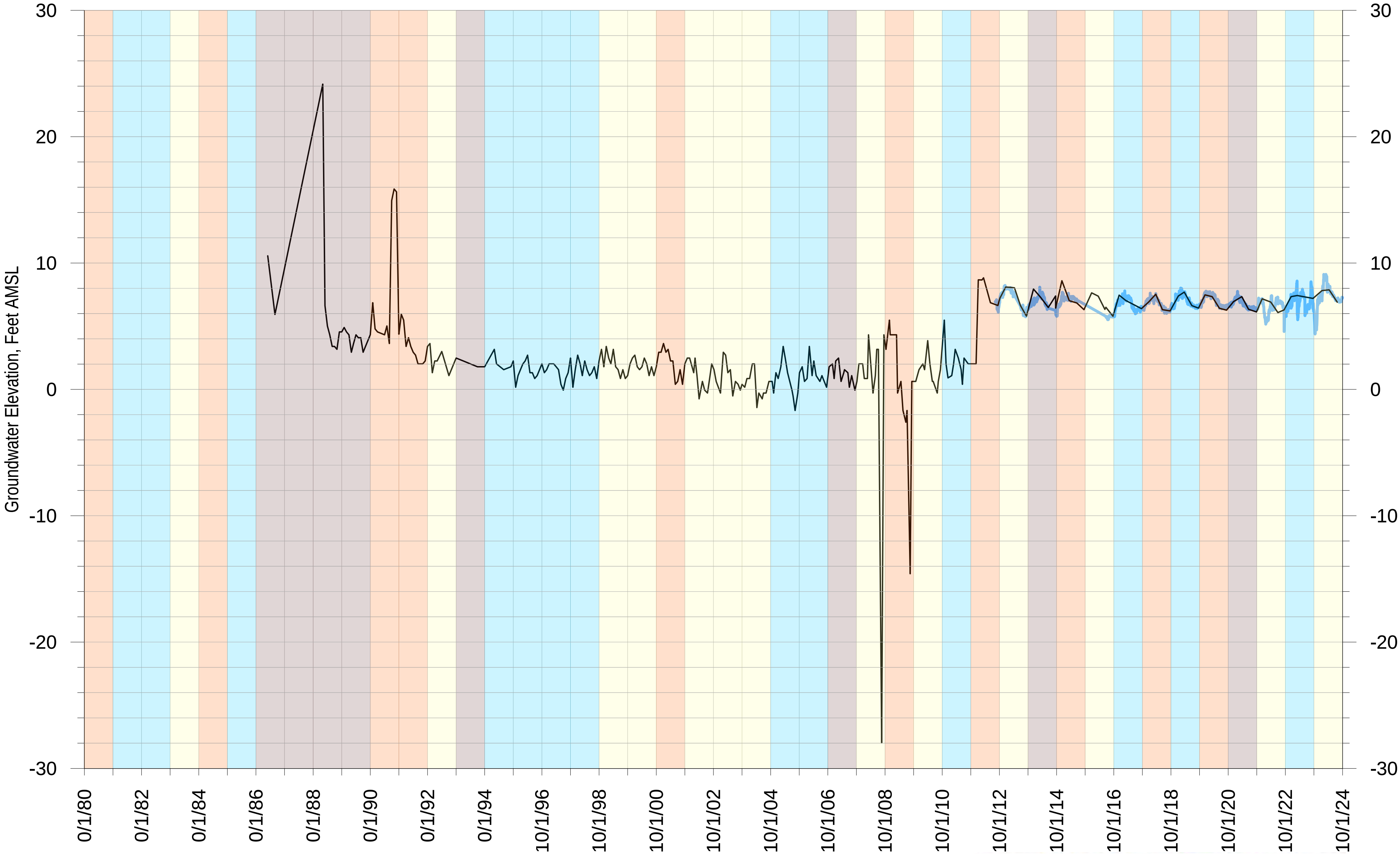


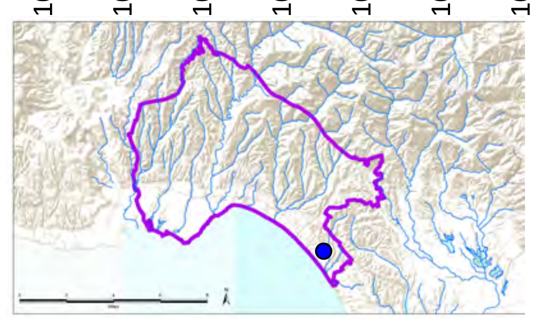
MONTGOMERY & ASSOCIATES

SC-A5B at Seascape
Aquifer Screened: Purisima F

Appendix A

FIGURE A-86

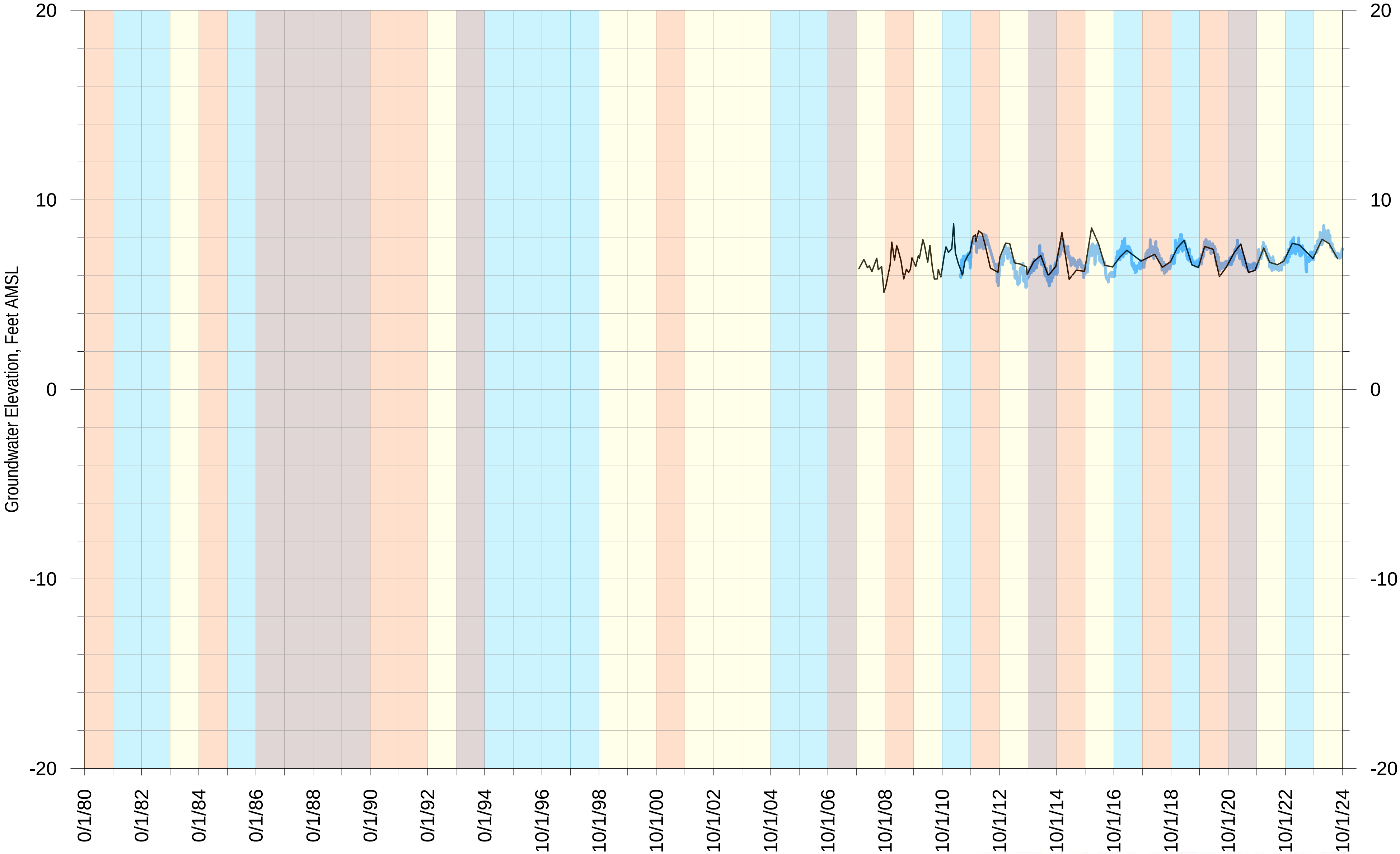


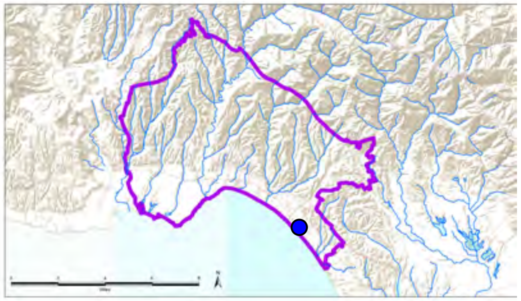


MONTGOMERY & ASSOCIATES

SC-A8B at Dolphin
Aquifer Screened: Aromas

Appendix A
FIGURE A-87

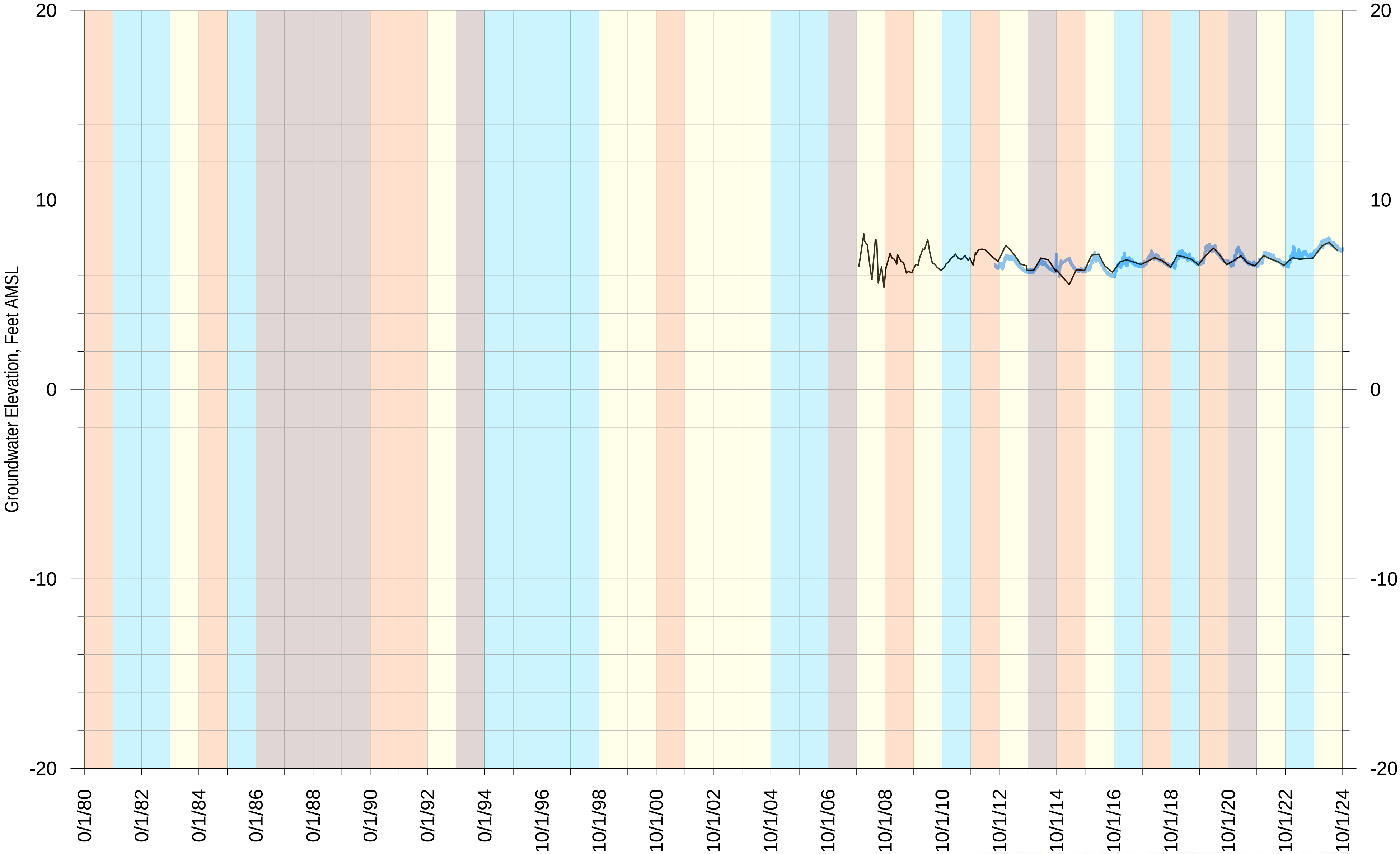


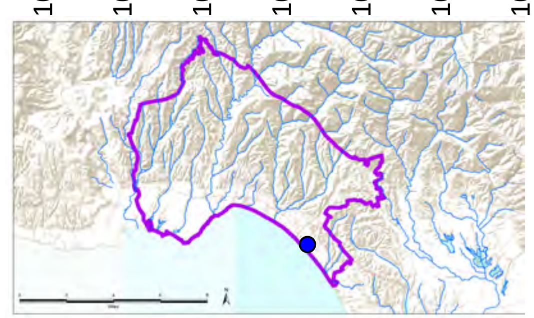


MONTGOMERY & ASSOCIATES

SC-A8C at Dolphin
Aquifer Screened: Aromas

Appendix A
FIGURE A-88



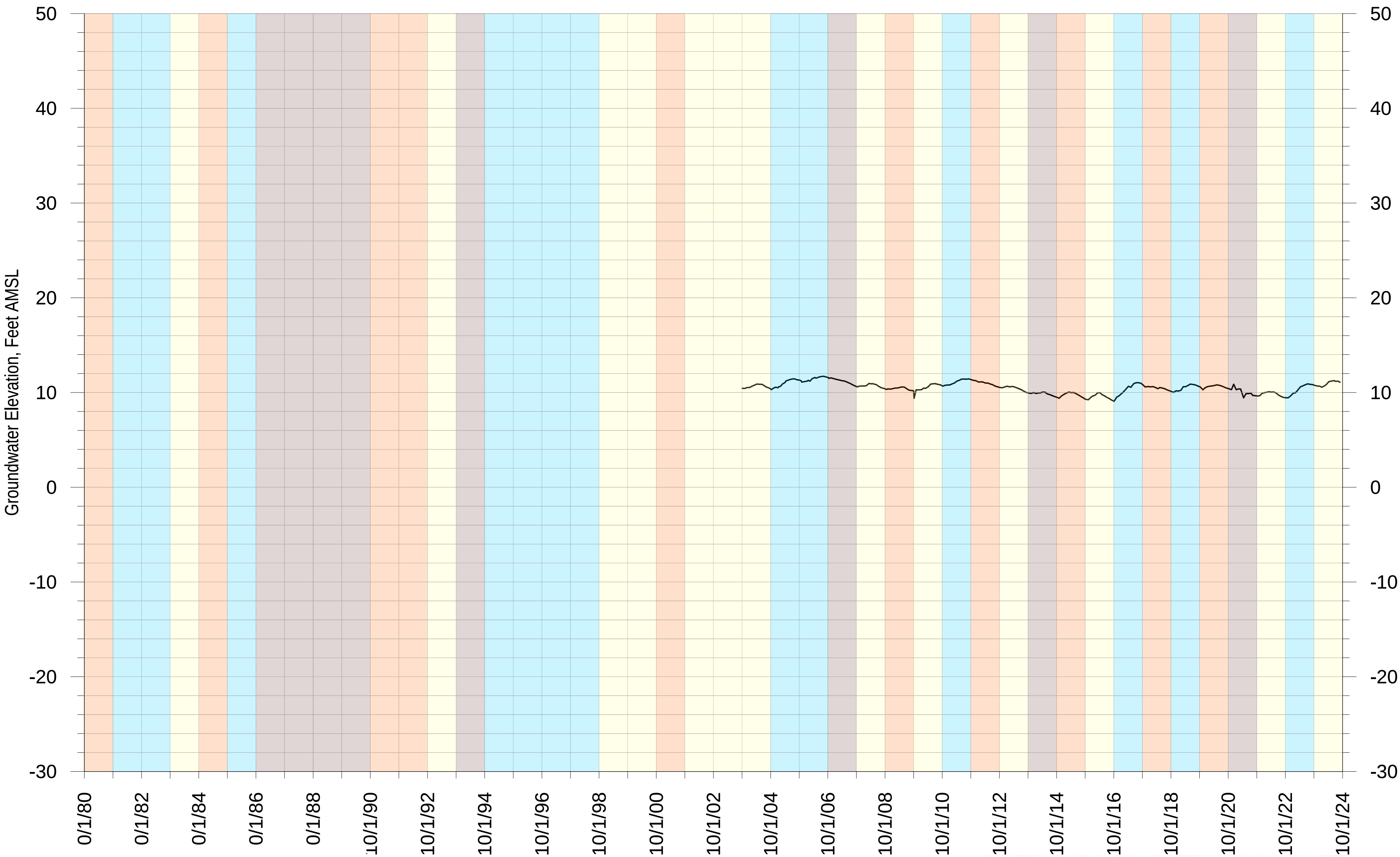


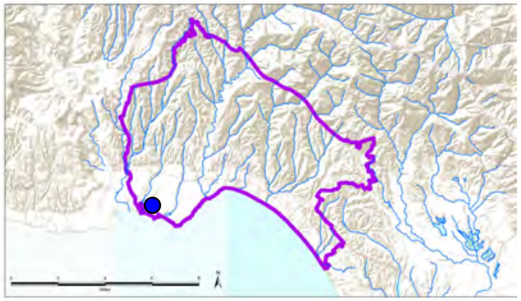
MONTGOMERY & ASSOCIATES

Schwan
Aquifer Screened: Purisima AA

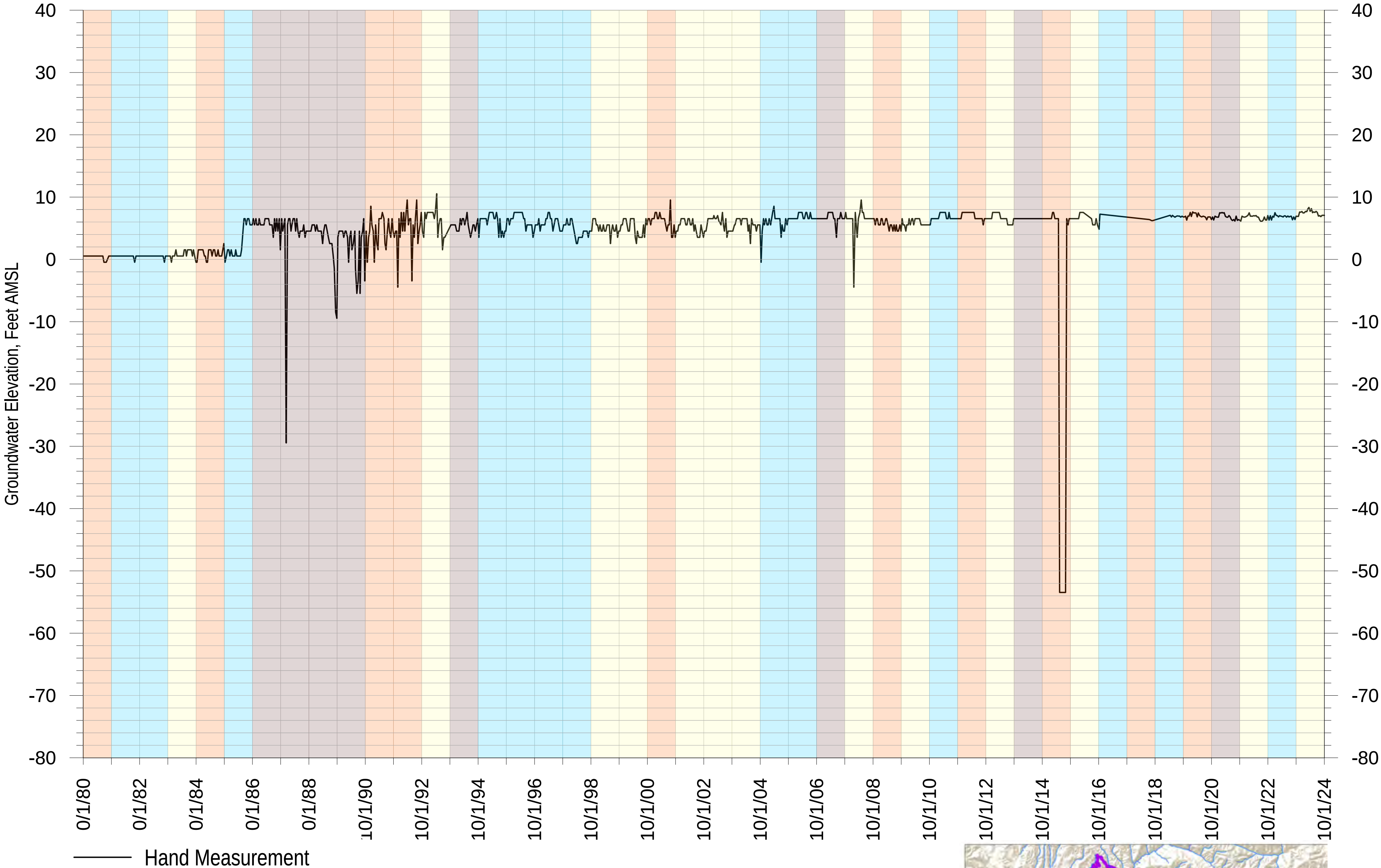
Appendix A

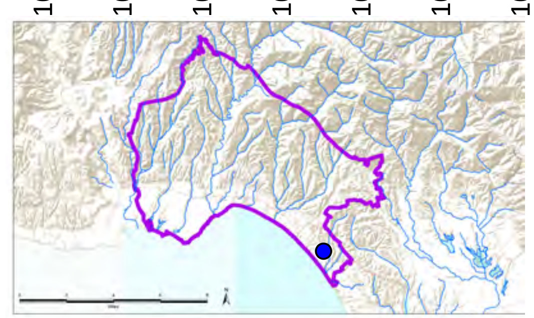
FIGURE A-89





Seascape PW
Aquifer Screened: Aromas/ Purisima F



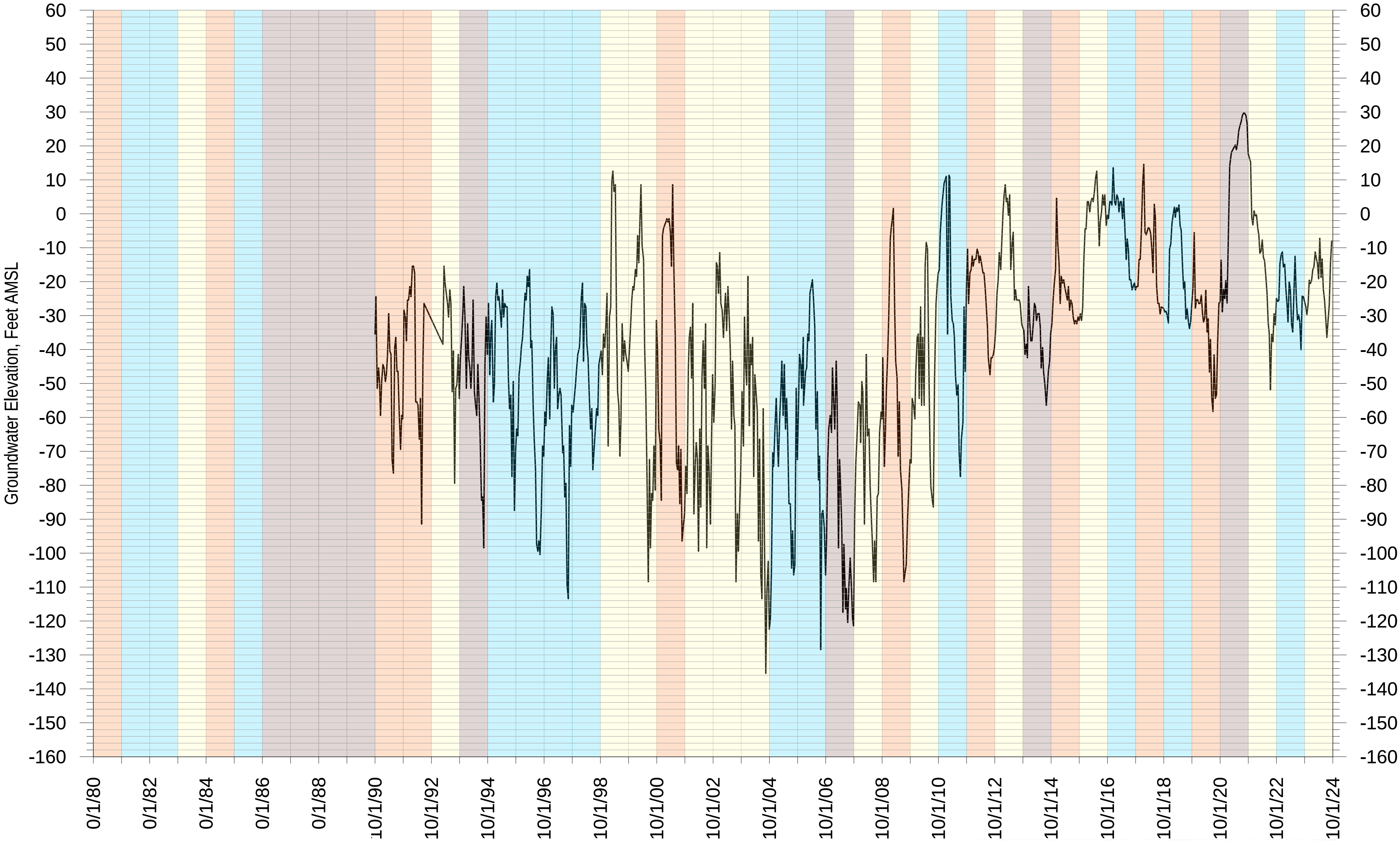


MONTGOMERY
& ASSOCIATES

T.Hopkins PW
Aquifer Screened: Purisima DEF

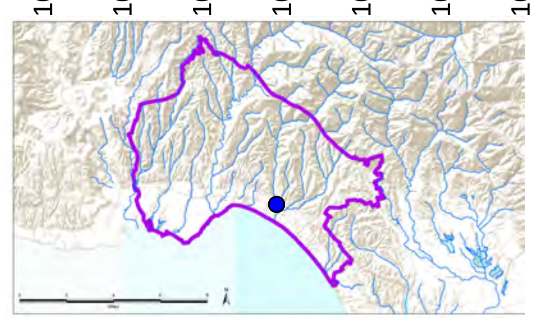
Appendix A

FIGURE A-91



Hand Measurement

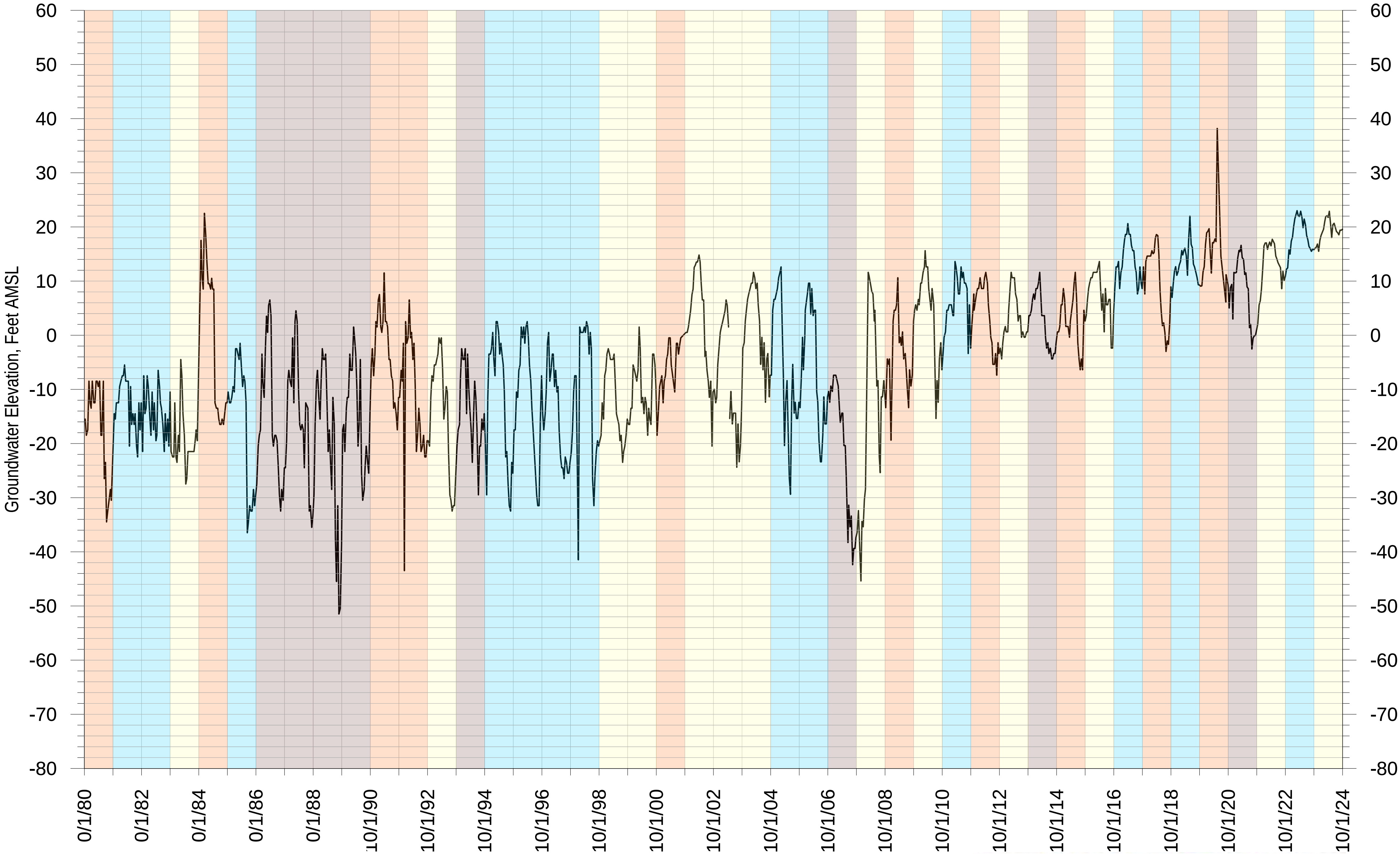
Critically Dry Dry Normal Wet

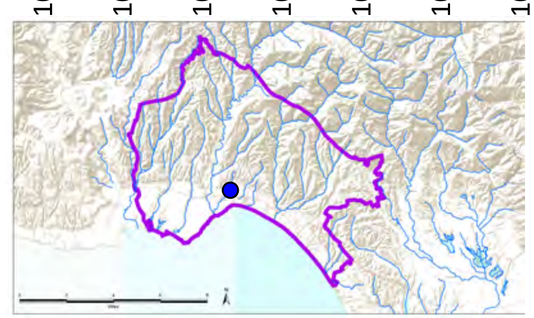


MONTGOMERY & ASSOCIATES

Tannery & Tannery 2 PW
Aquifer Screened: Purisima A

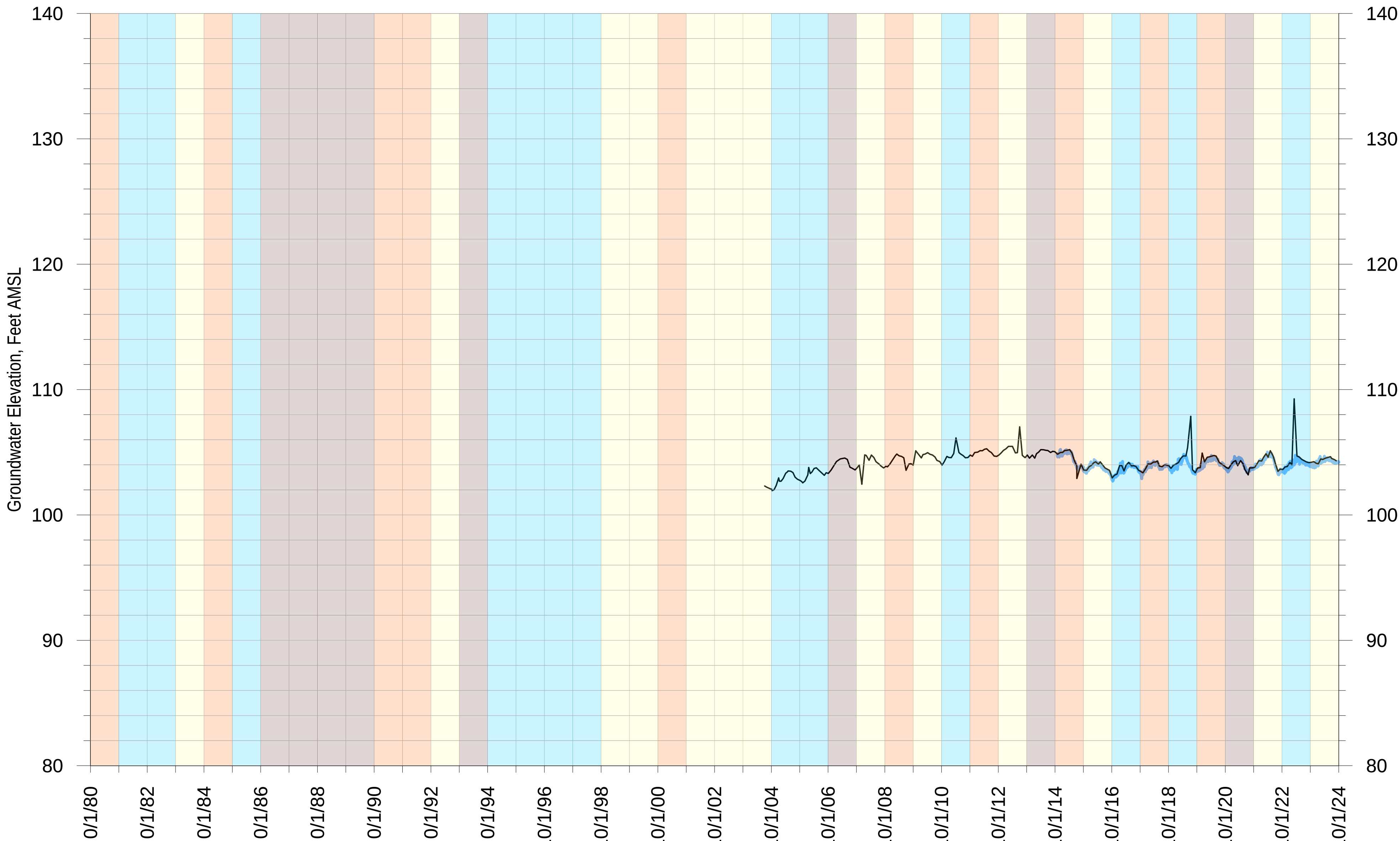
Appendix A
FIGURE A-92

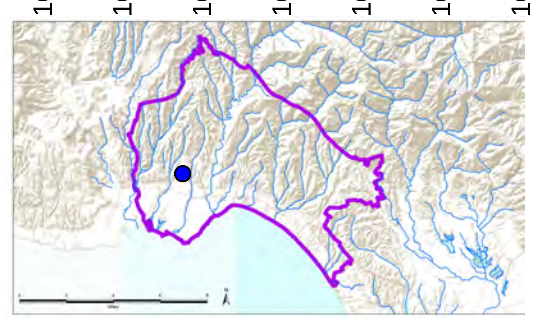




MONTGOMERY
& ASSOCIATES

Thurber Shallow
Aquifer Screened: Purisima AA

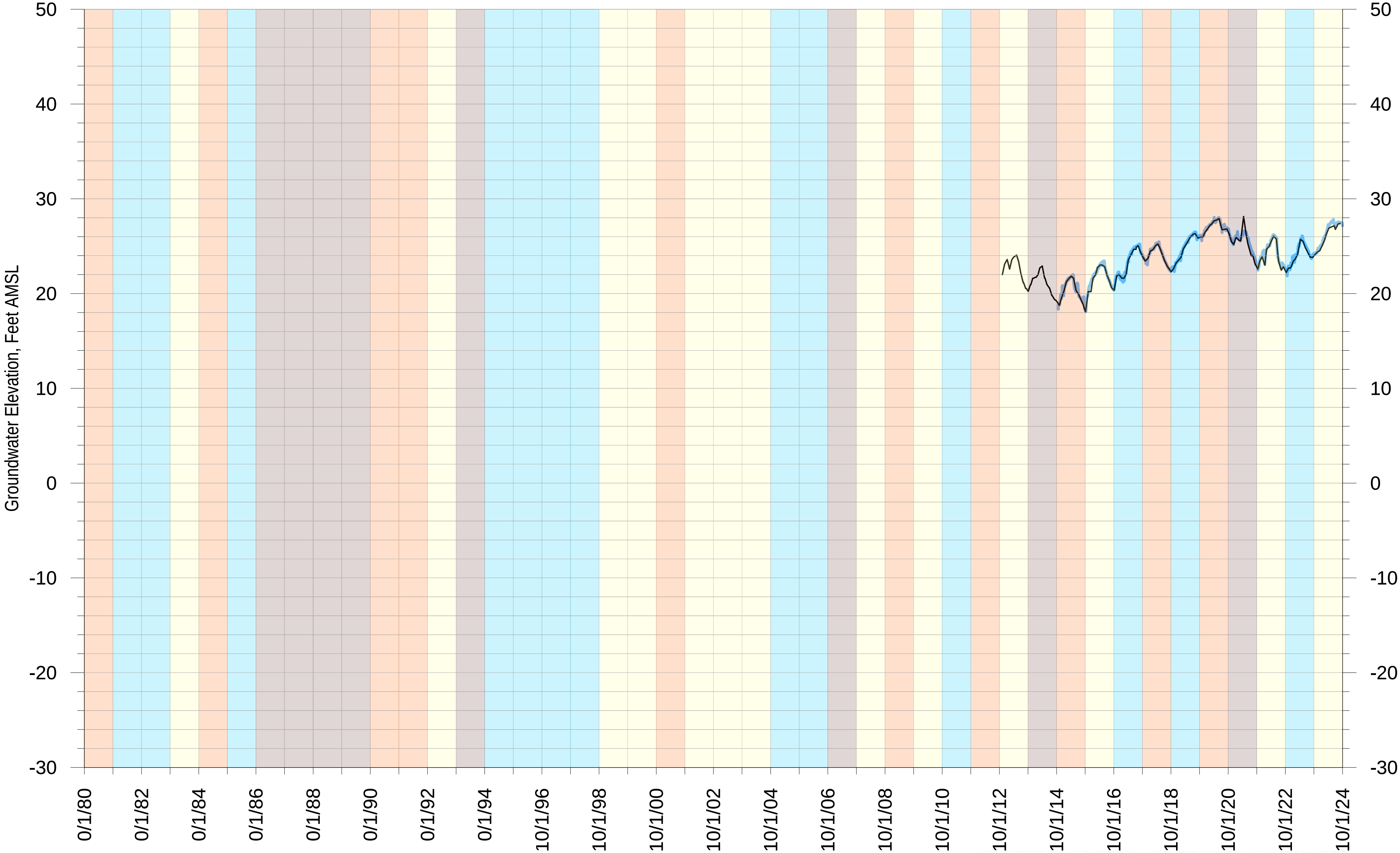




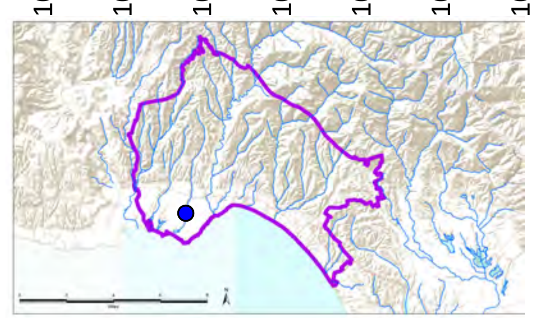
MONTGOMERY
& ASSOCIATES

30th Ave Medium

Aquifer Screened: Purisima AA



Hand Measurement
Transducer



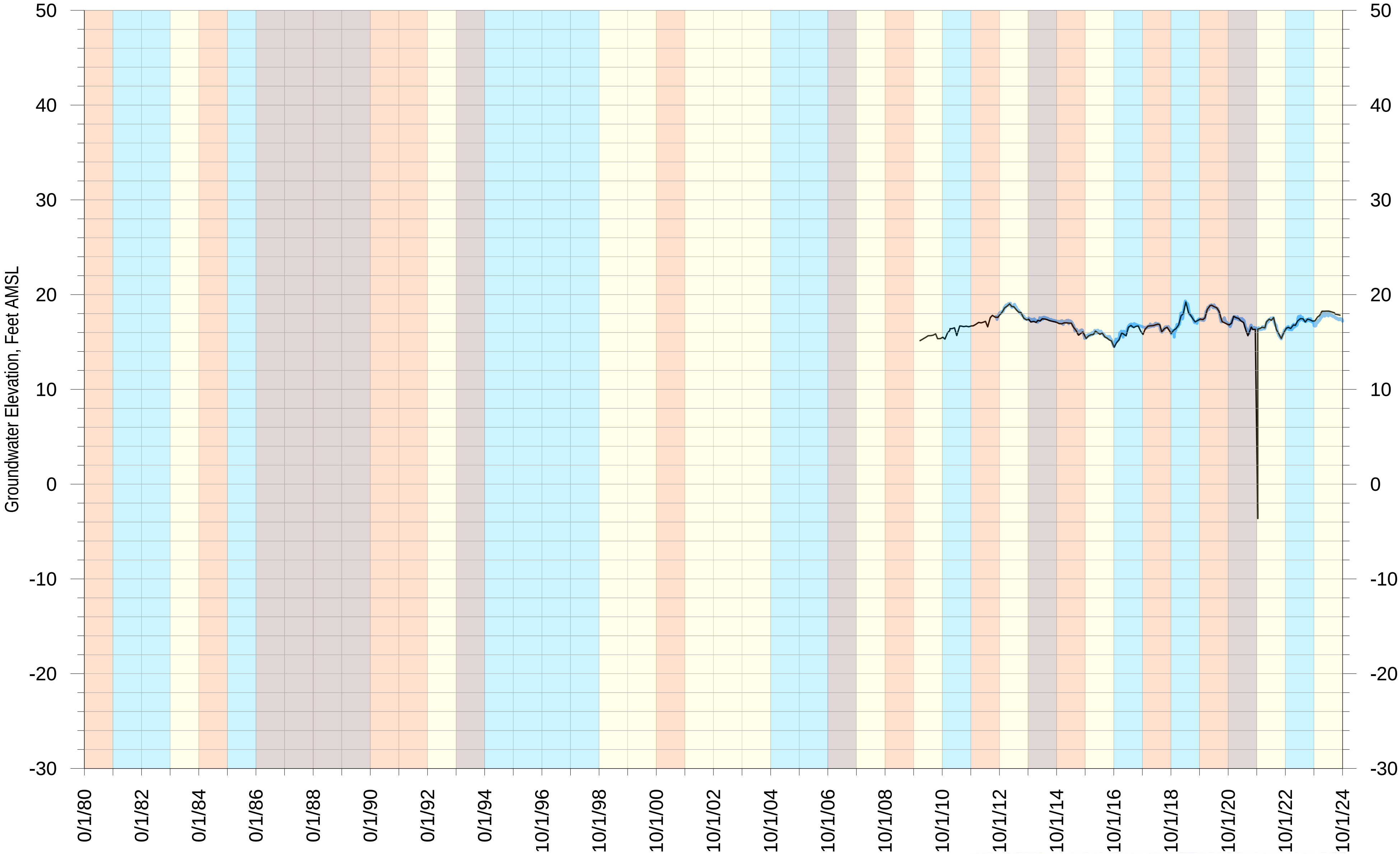
Critically Dry
Dry
Normal
Wet

MONTGOMERY & ASSOCIATES

Auto Plaza Deep
Aquifer Screened: Purisima AA

Appendix A

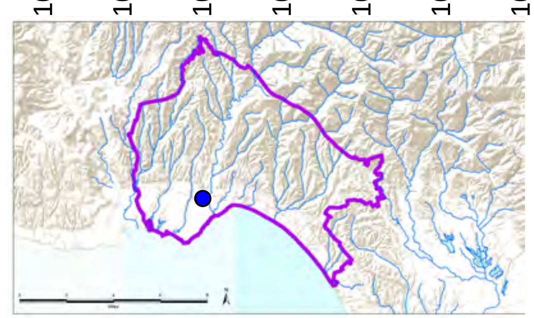
FIGURE A-95



Hand Measurement
Transducer

Critically Dry
Dry
Normal
Wet

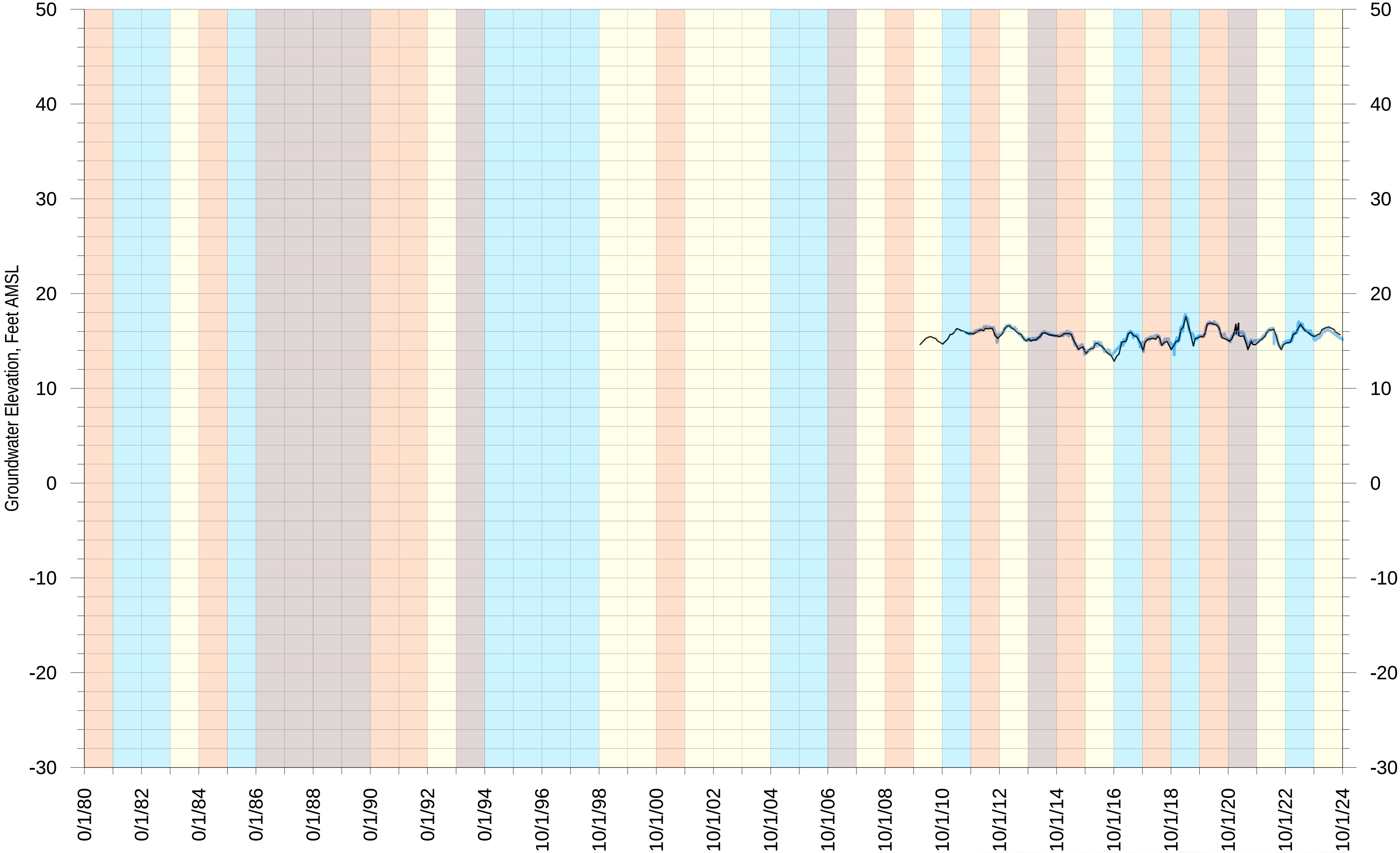
MONTGOMERY & ASSOCIATES

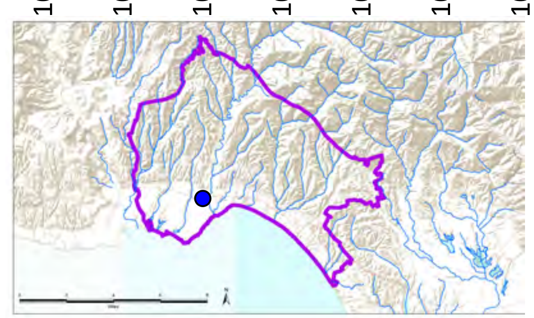


Auto Plaza Medium
Aquifer Screened: Purisima A

Appendix A

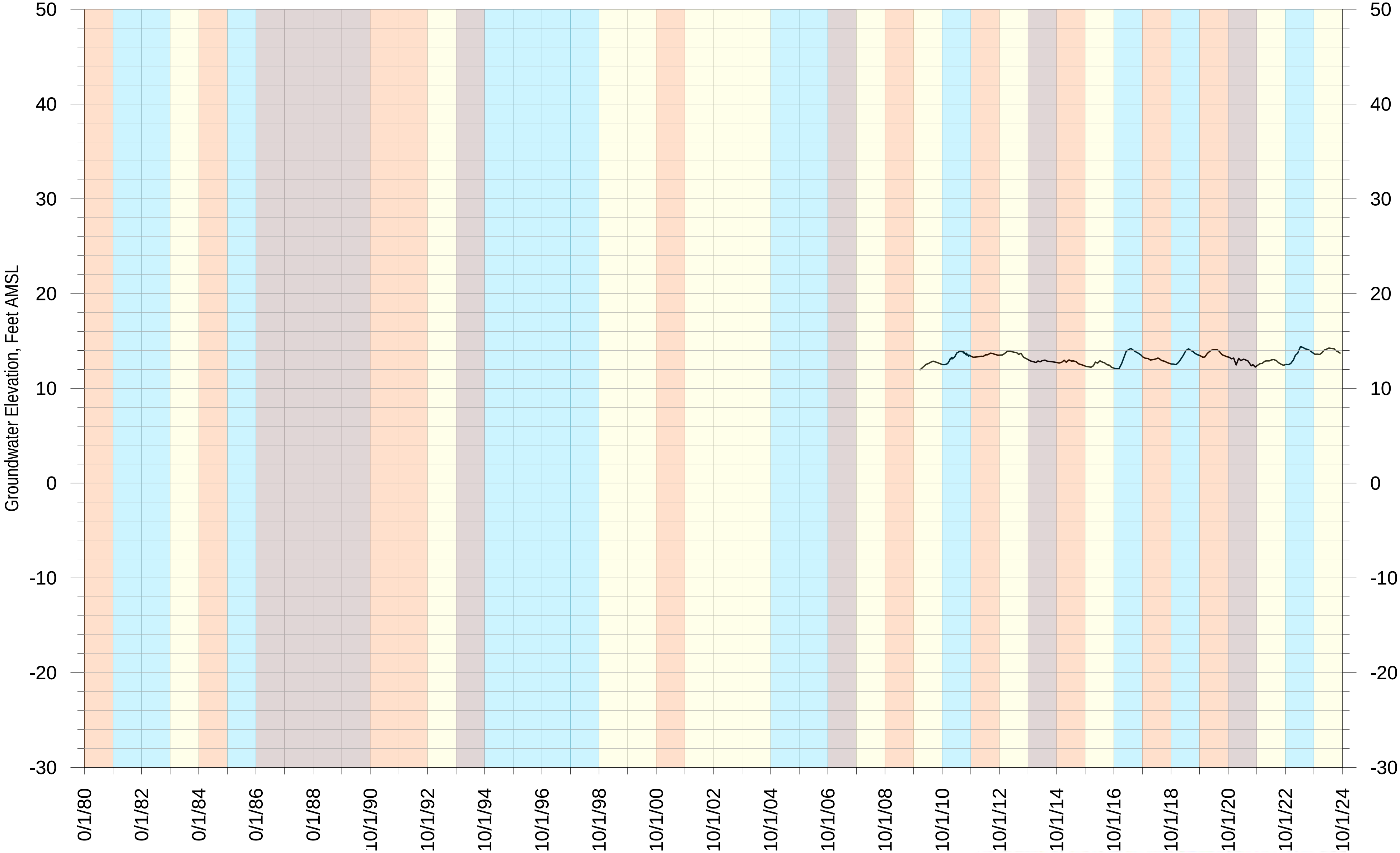
FIGURE A-96

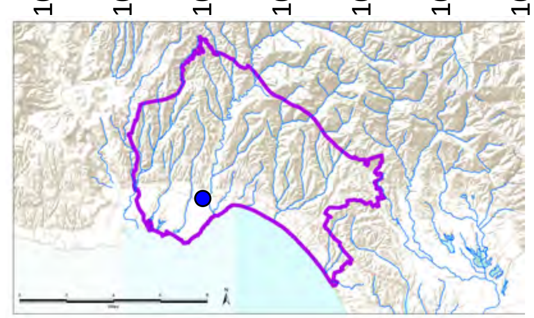




MONTGOMERY & ASSOCIATES

Auto Plaza Shallow
Aquifer Screened: Purisima A

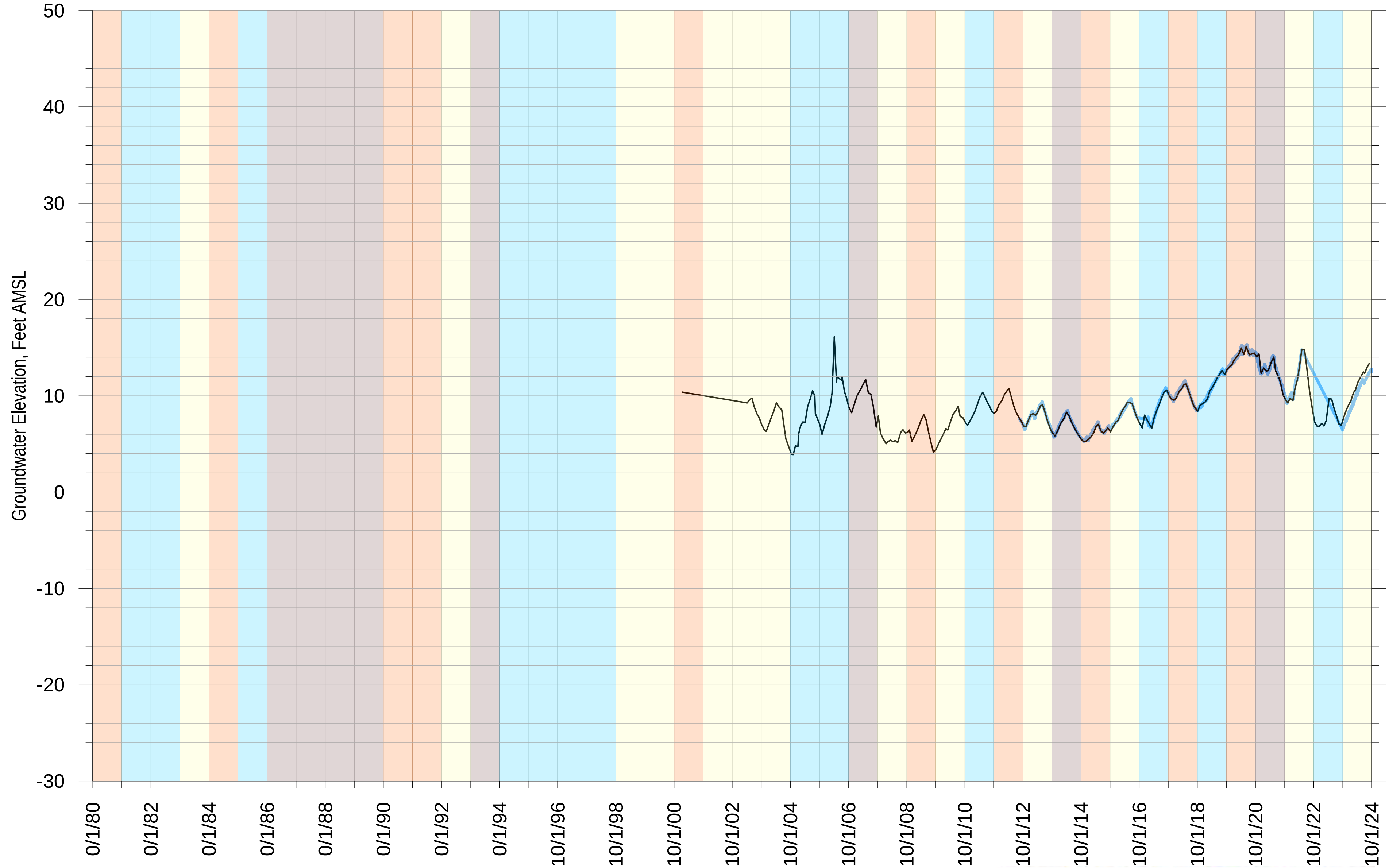




MONTGOMERY
& ASSOCIATES

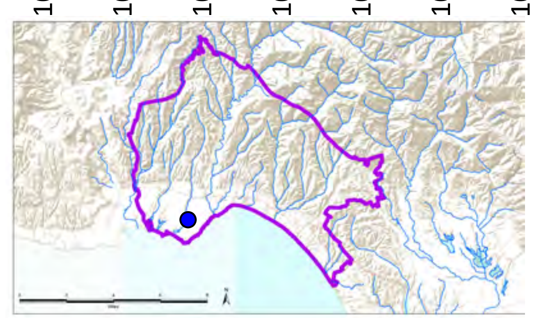
Beltz 4 Deep
Aquifer Screened: Purisima A

Appendix A
FIGURE A-98



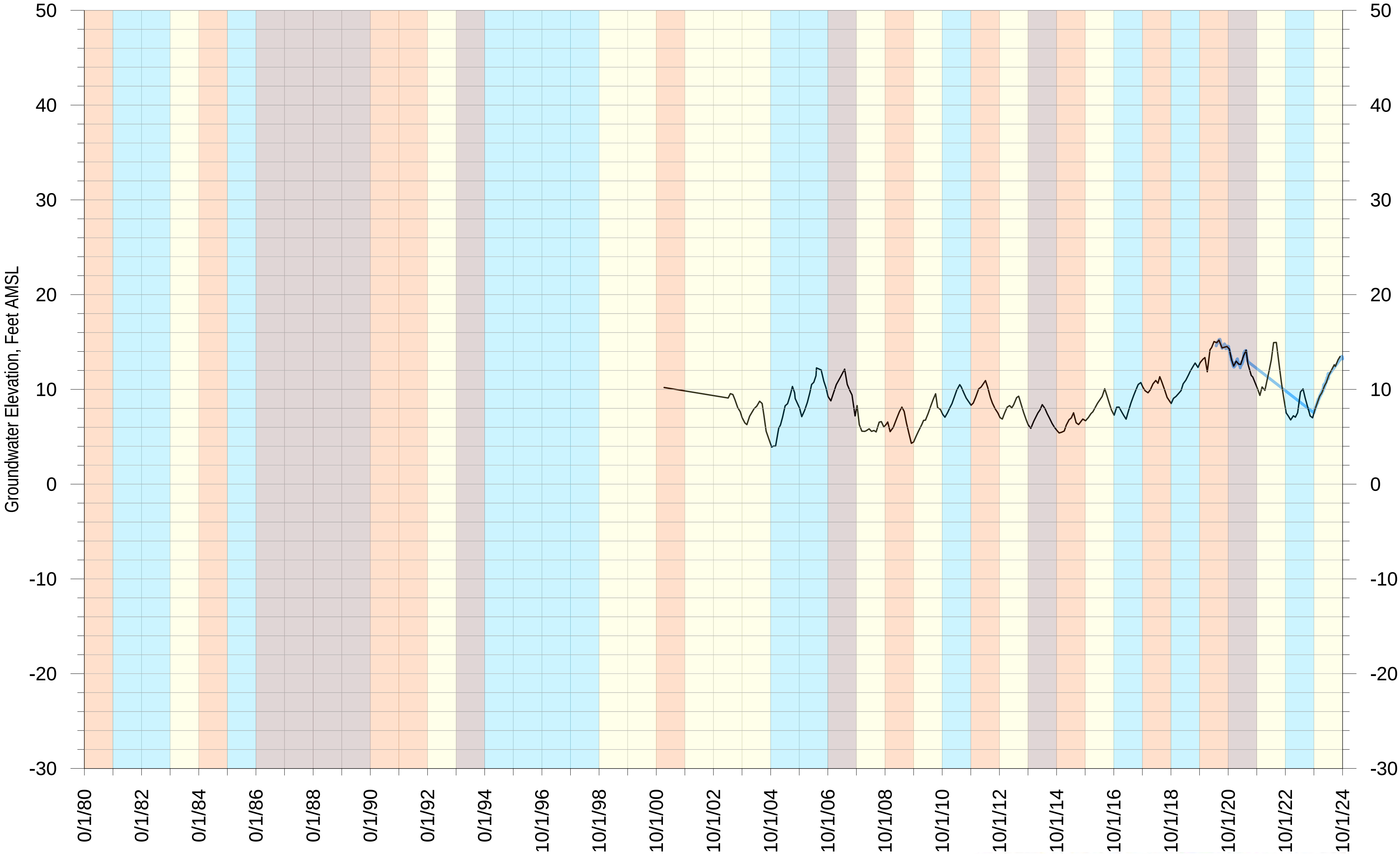
Hand Measurement — Transducer

Critically Dry | Dry | Normal | Wet



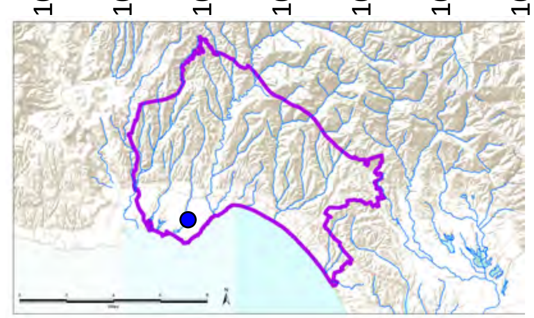
MONTGOMERY & ASSOCIATES

Beltz 4 Shallow
Aquifer Screened: Purisima A



Hand Measurement — Transducer

Critically Dry — Dry — Normal — Wet

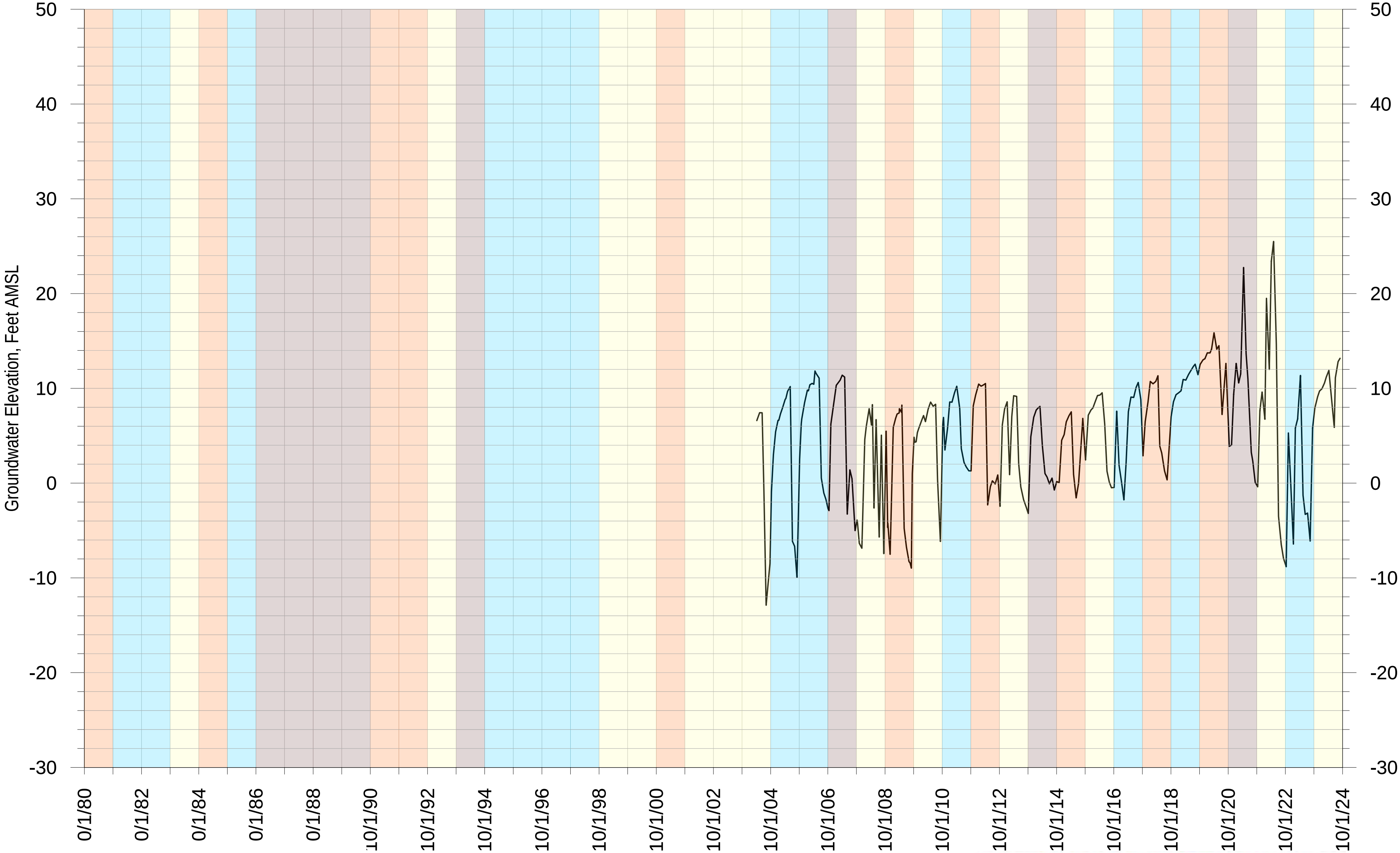


MONTGOMERY & ASSOCIATES

Beltz 6
Aquifer Screened: Purisima A

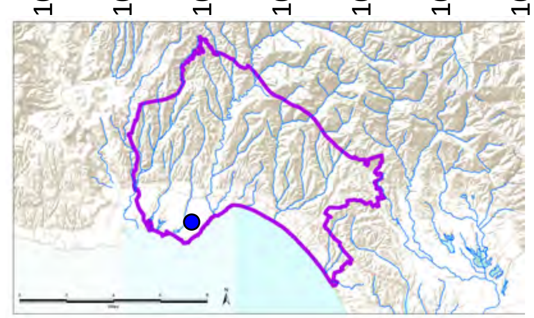
Appendix A

FIGURE A-100



Hand Measurement

Critically Dry | Dry | Normal | Wet



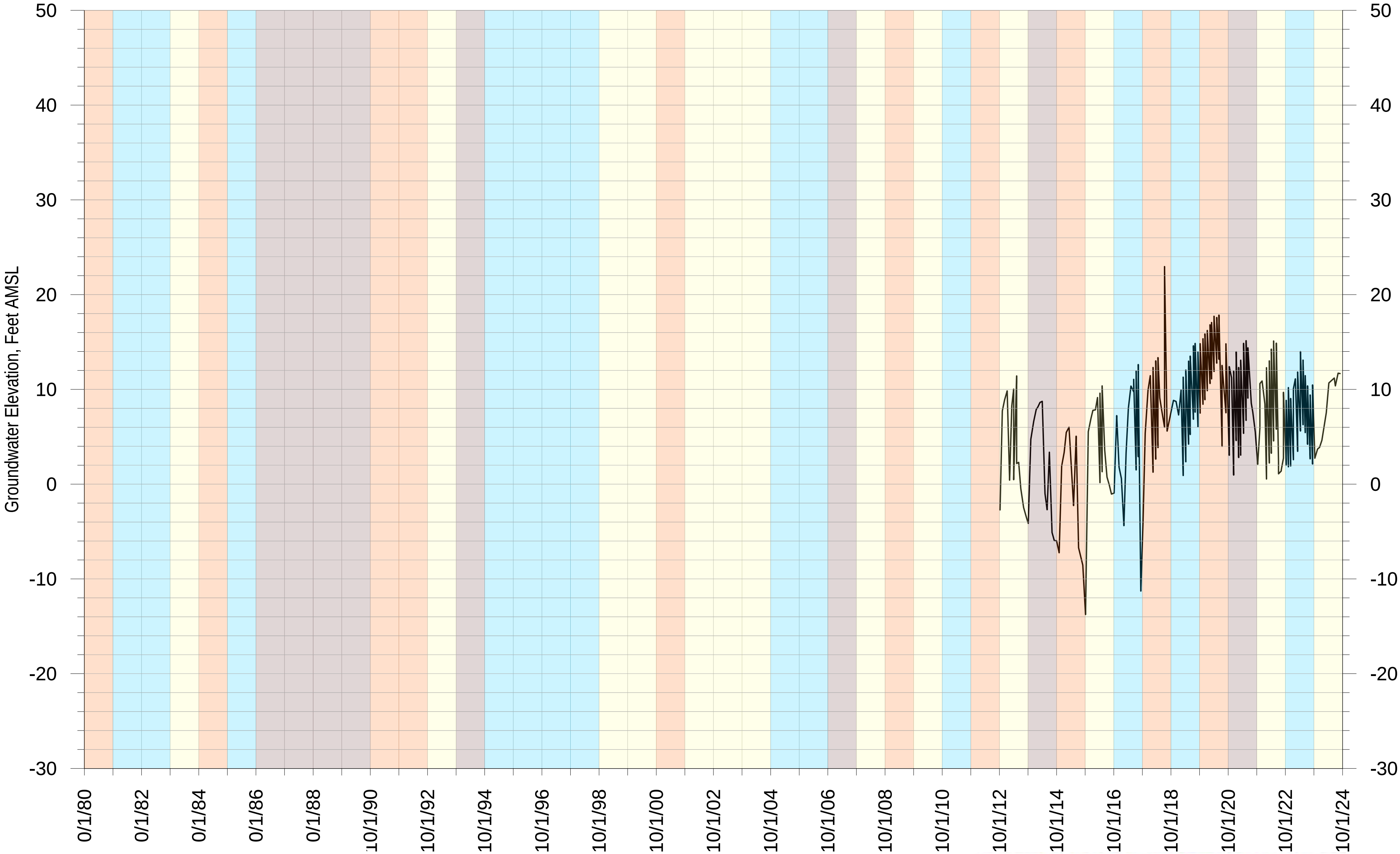
MONTGOMERY & ASSOCIATES

Beltz 7 Deep

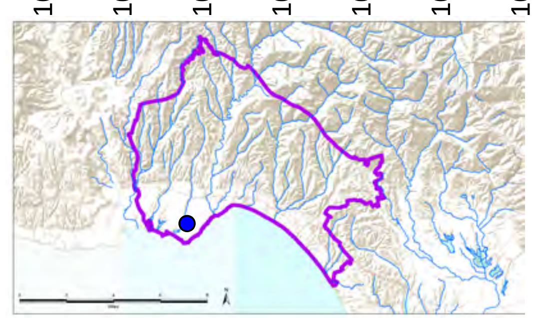
Aquifer Screened: Purisima A/AA

Appendix A

FIGURE A-101



Hand Measurement



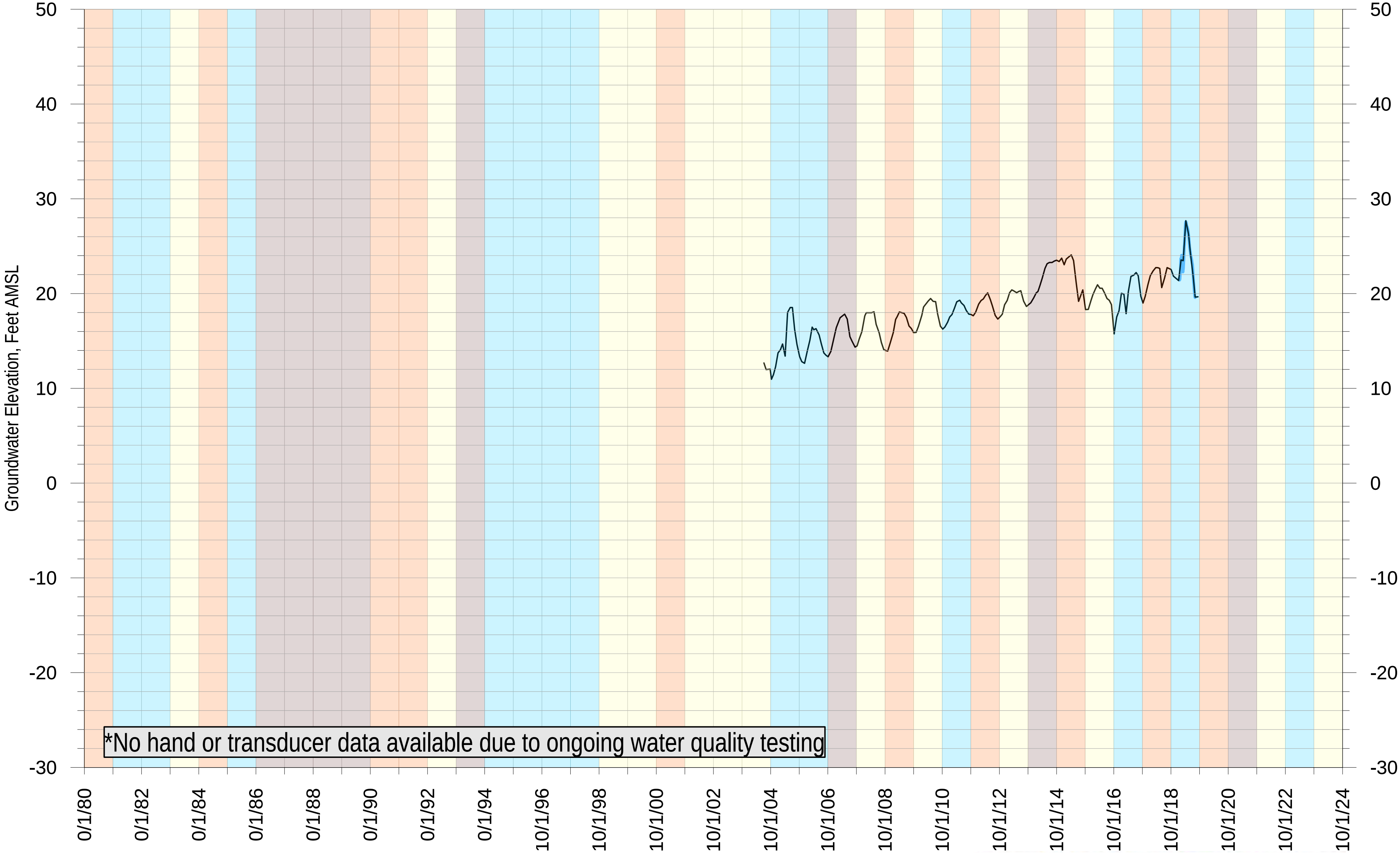
Critically Dry | Dry | Normal | Wet

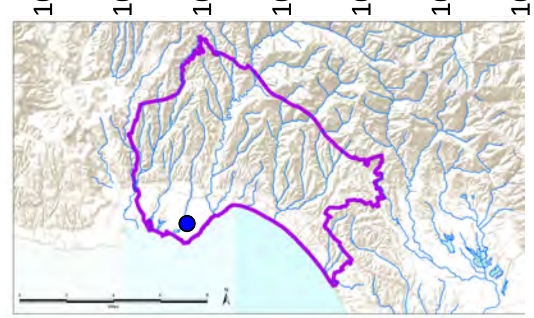
MONTGOMERY & ASSOCIATES

Beltz 7 Santa Margarita Test Well
Aquifer Screened: Tu

Appendix A

FIGURE A-102



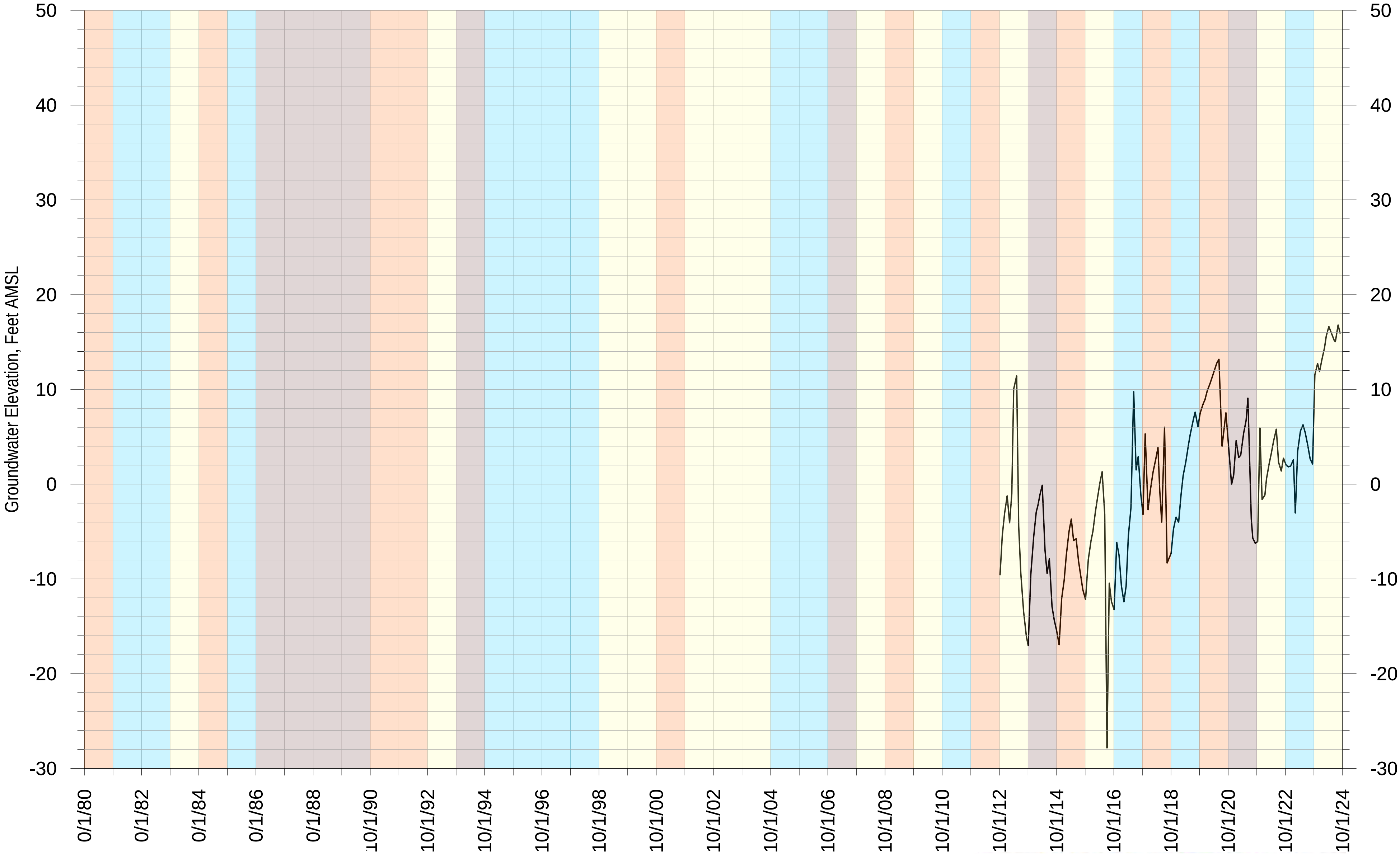


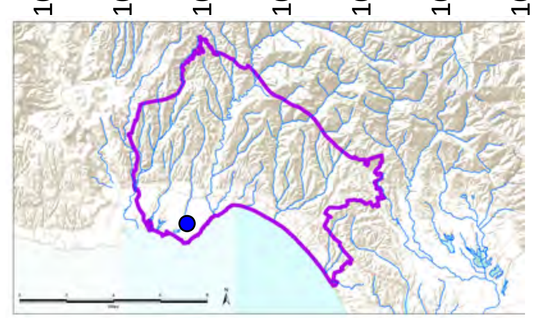
MONTGOMERY
& ASSOCIATES

Beltz 7 Shallow
Aquifer Screened: Purisima A

Appendix A

FIGURE A-103



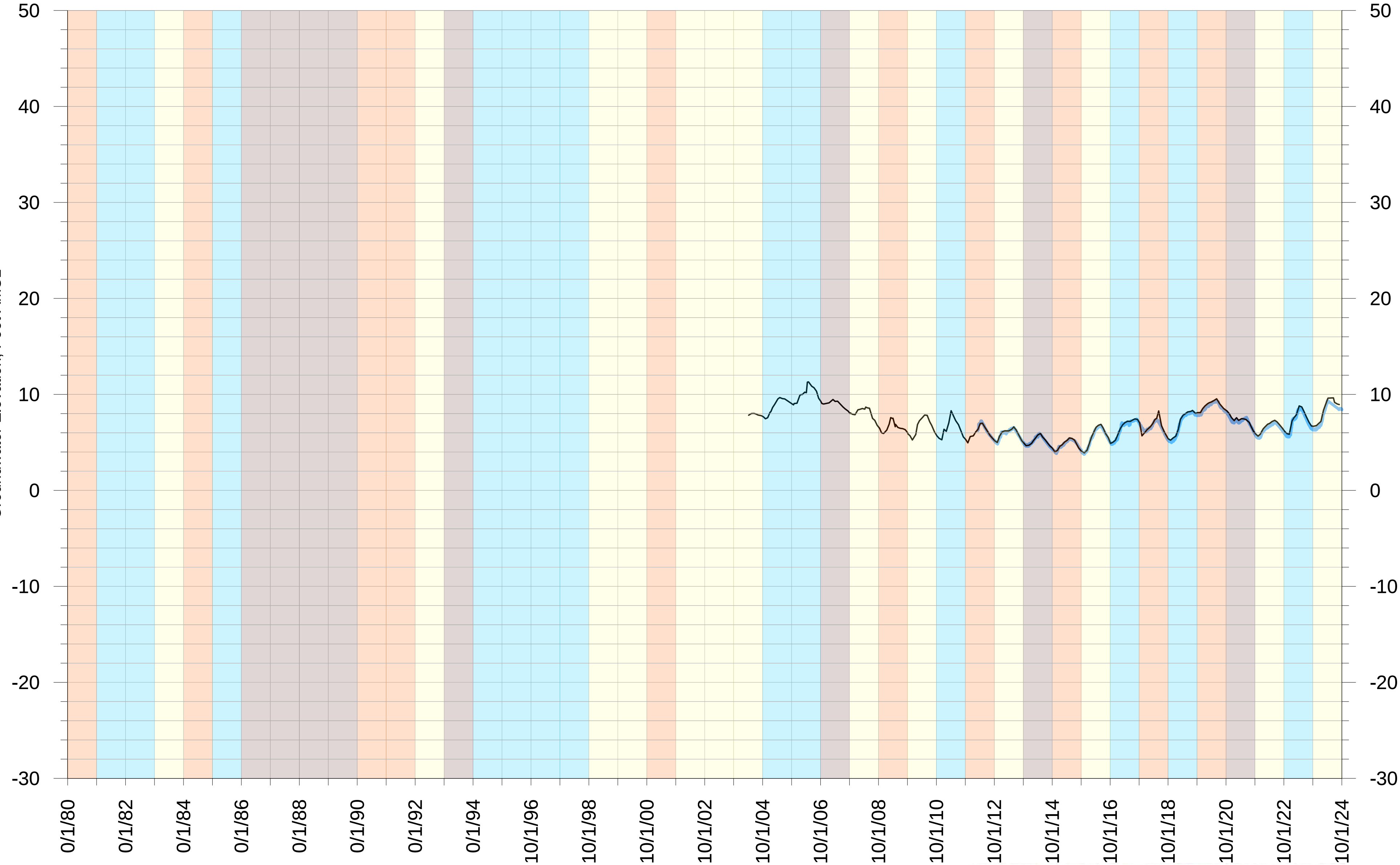


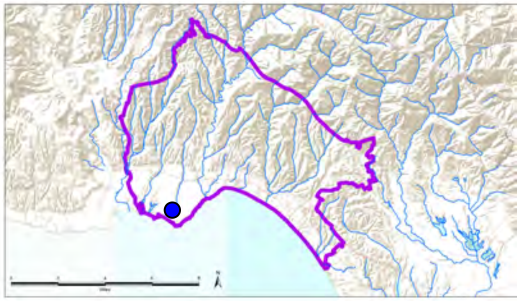
MONTGOMERY & ASSOCIATES

Corcoran Medium
Aquifer Screened: Purisima A

Appendix A

FIGURE A-104



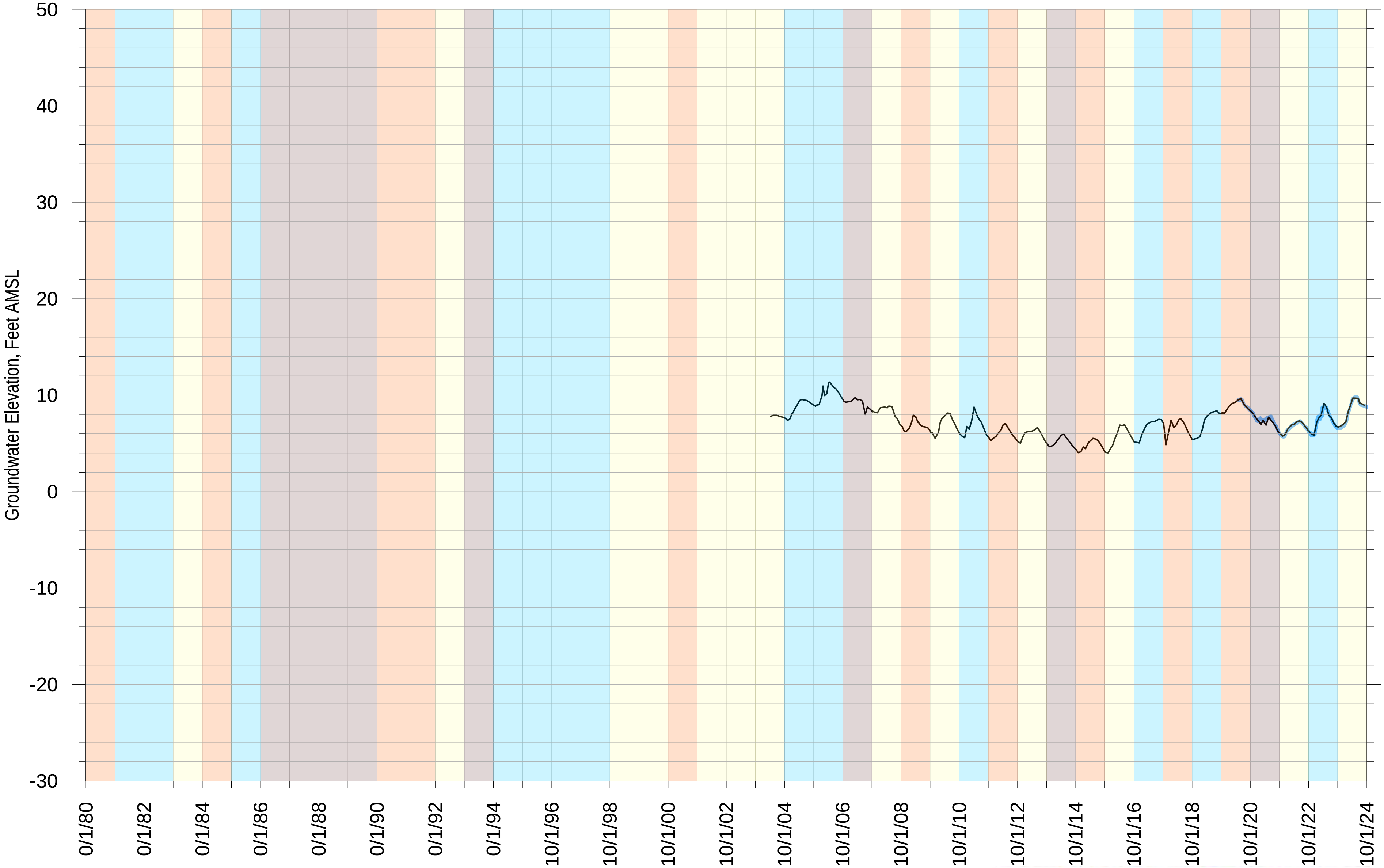


MONTGOMERY & ASSOCIATES

Corcoran Shallow
Aquifer Screened: Purisima A

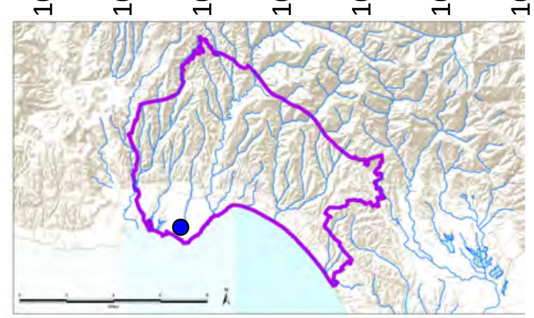
Appendix A

FIGURE A-105

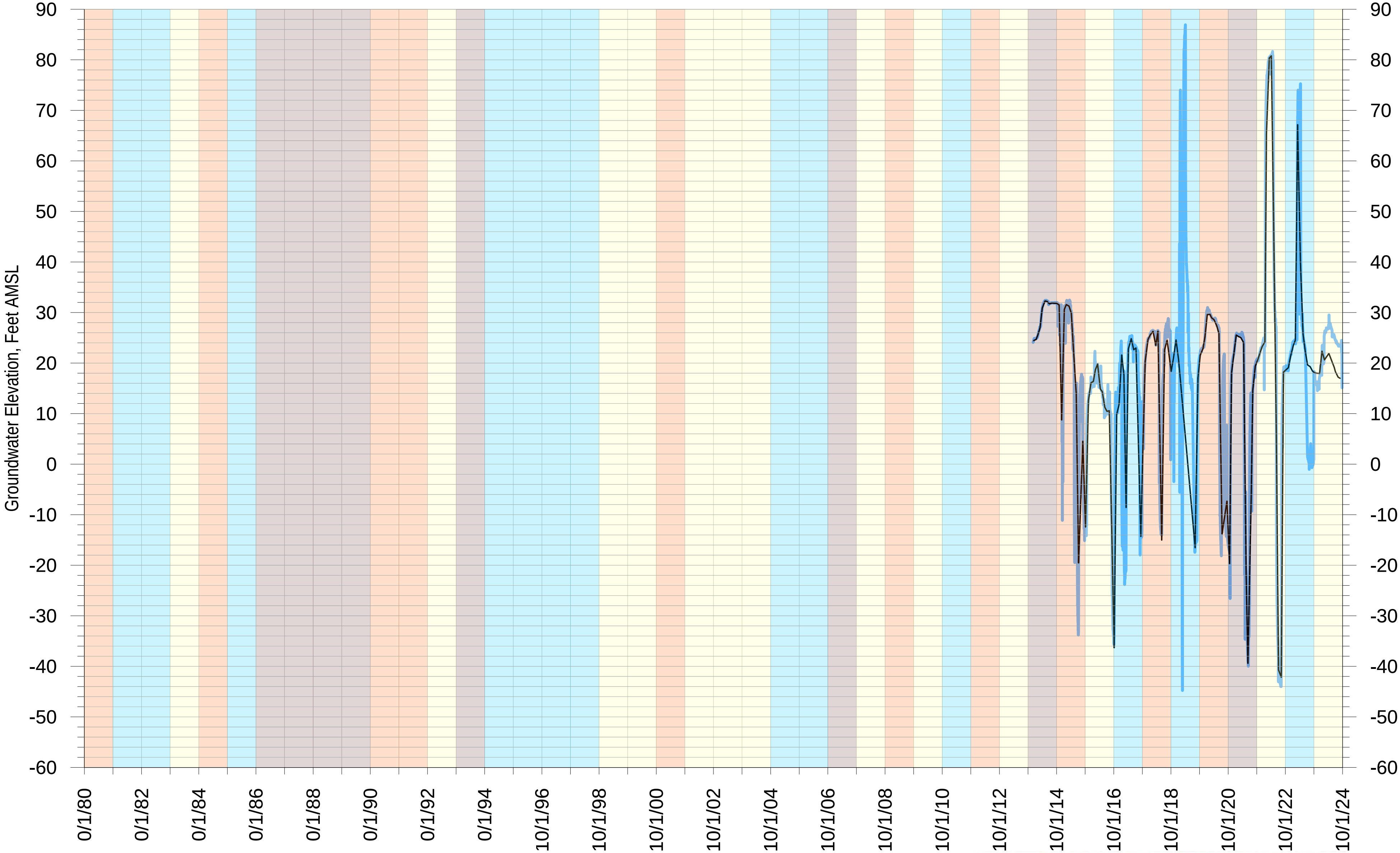


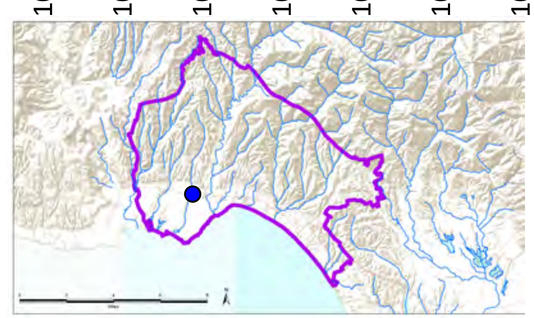
Hand Measurement   Transducer

Critically Dry   Dry   Normal   Wet



Cory 4
Aquifer Screened: Tu



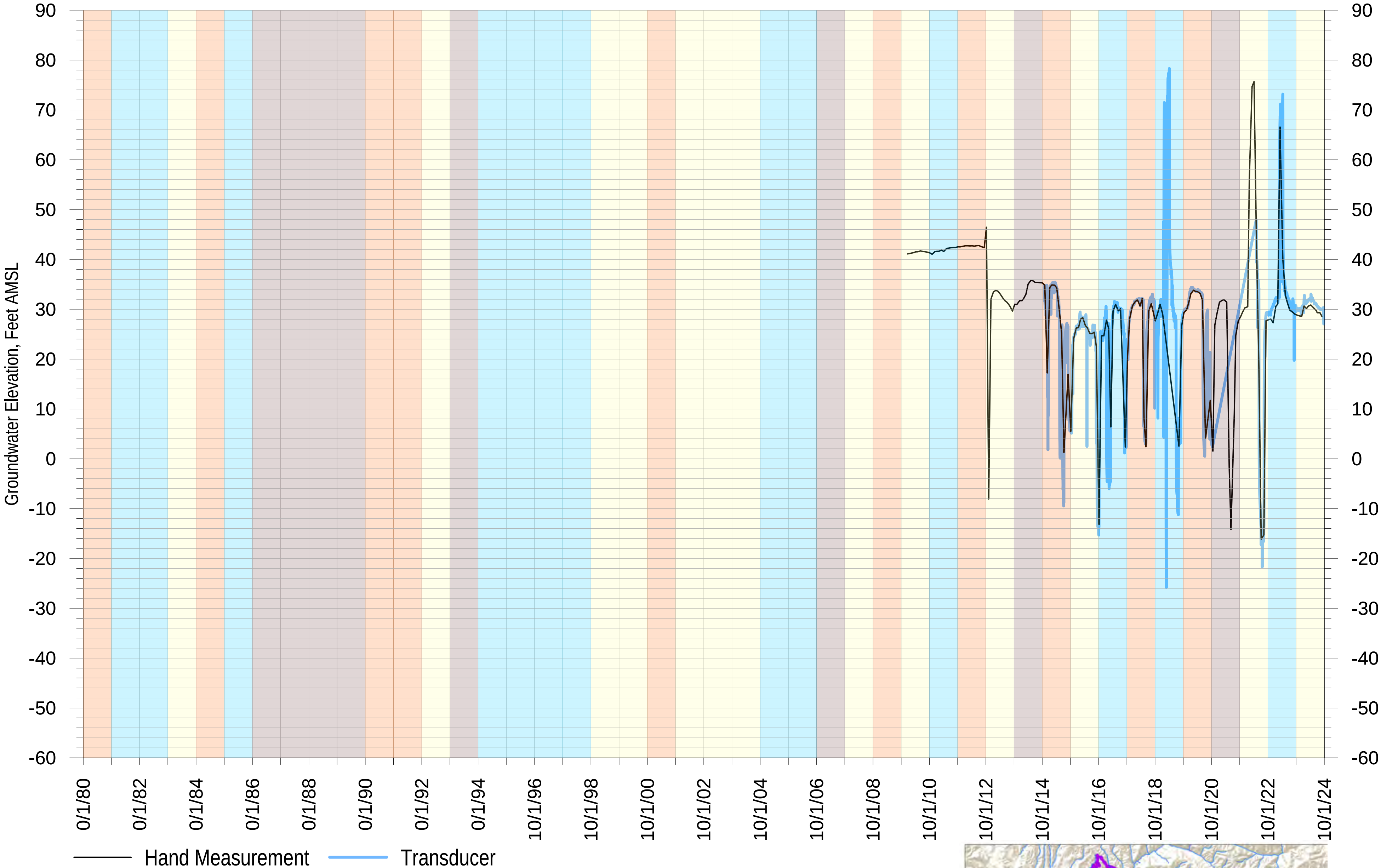


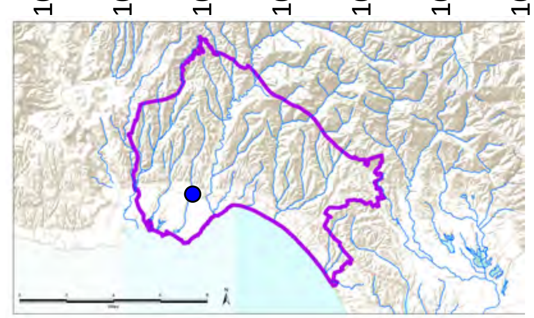
MONTGOMERY
& ASSOCIATES

Cory Deep
Aquifer Screened: Purisima AA

Appendix A

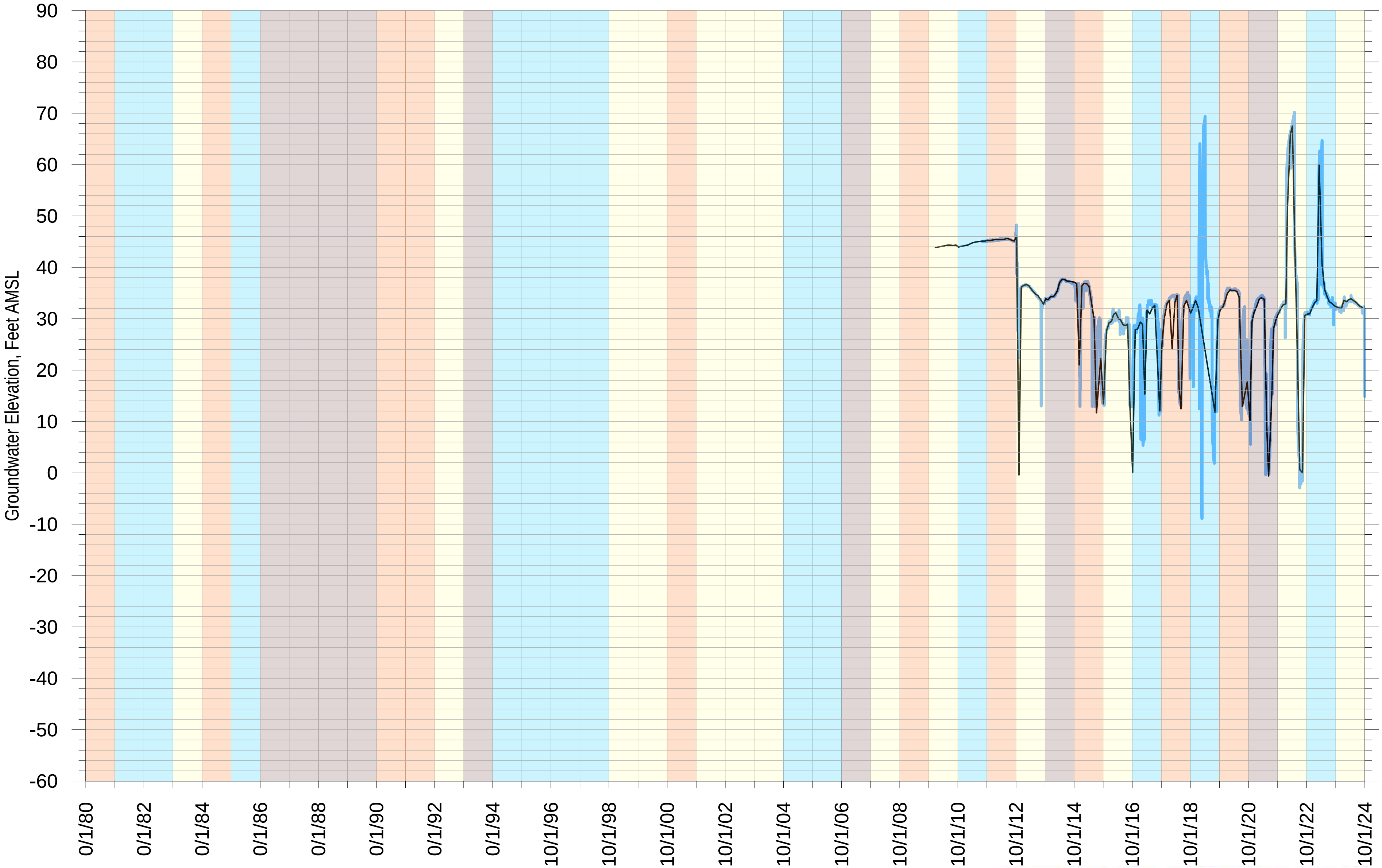
FIGURE A-107

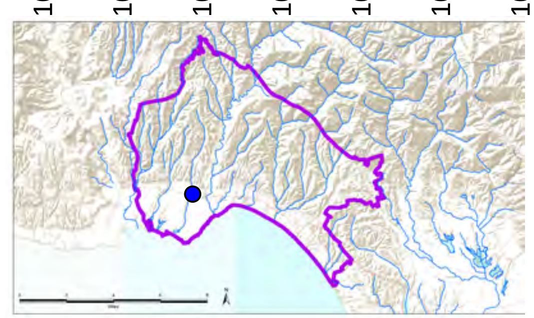




MONTGOMERY & ASSOCIATES

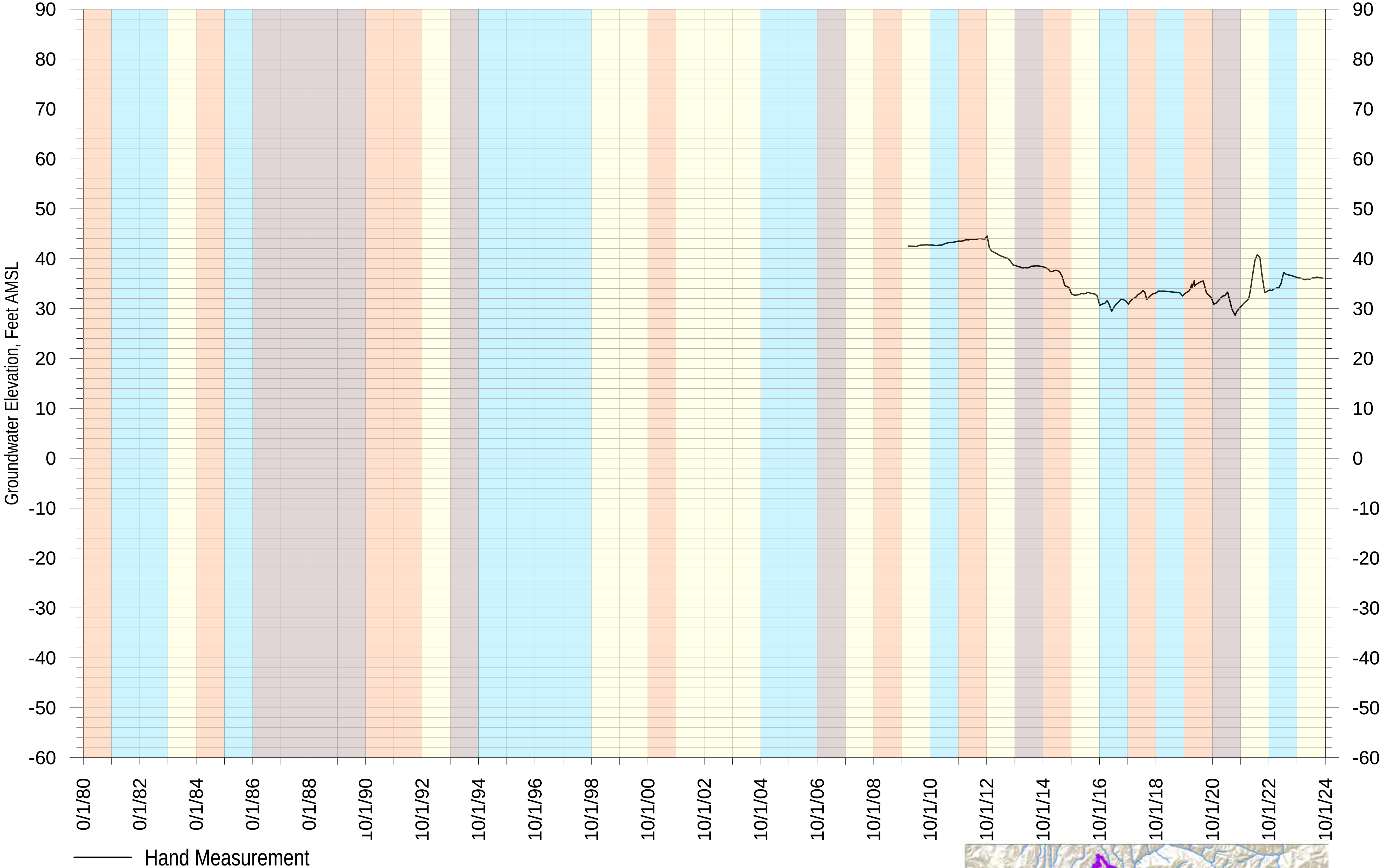
Cory Medium
Aquifer Screened: Purisima A

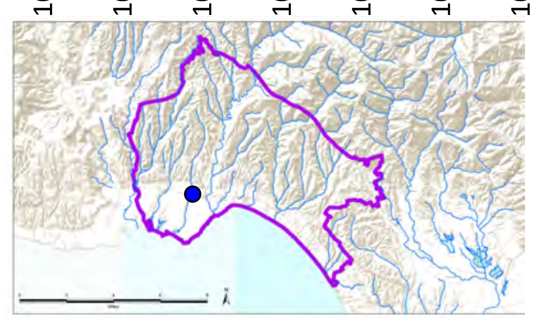




MONTGOMERY
& ASSOCIATES

Cory Shallow
Aquifer Screened: Purisima A

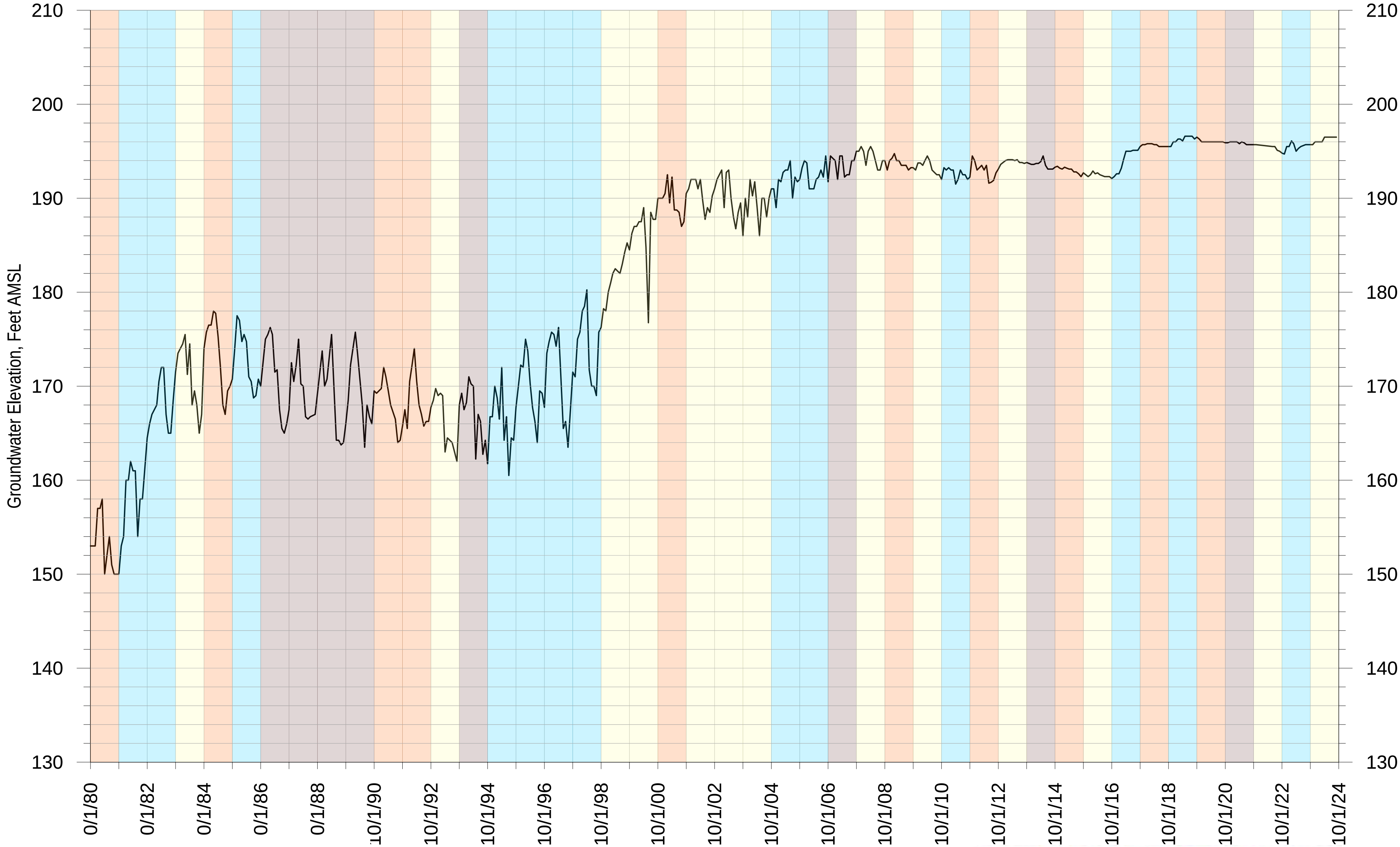




MONTGOMERY
& ASSOCIATES

CWD-3
Aquifer Screened: Purisima F

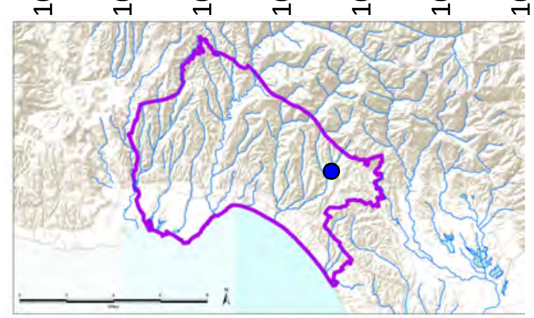
Appendix A
FIGURE A-110



Hand Measurement

Critically Dry | Dry | Normal | Wet

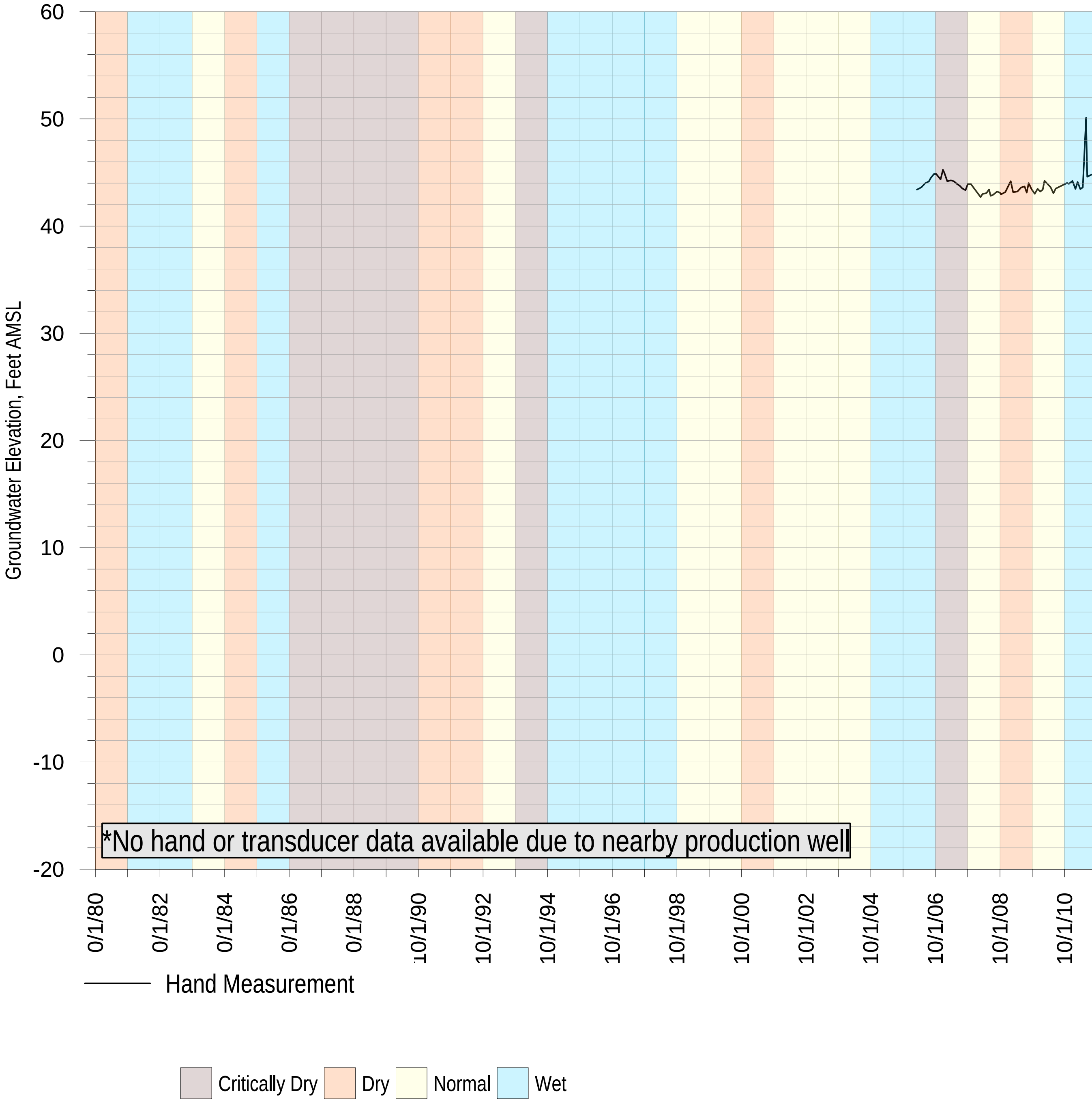
MONTGOMERY & ASSOCIATES

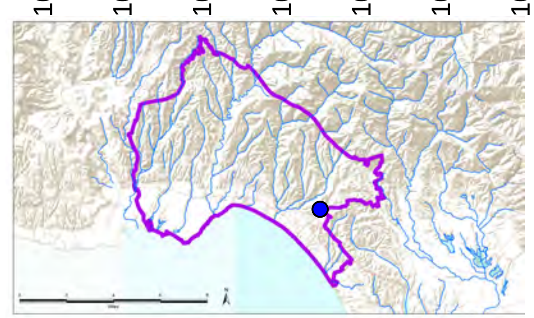


CWD-12A
Aquifer Screened: Aromas

Appendix A

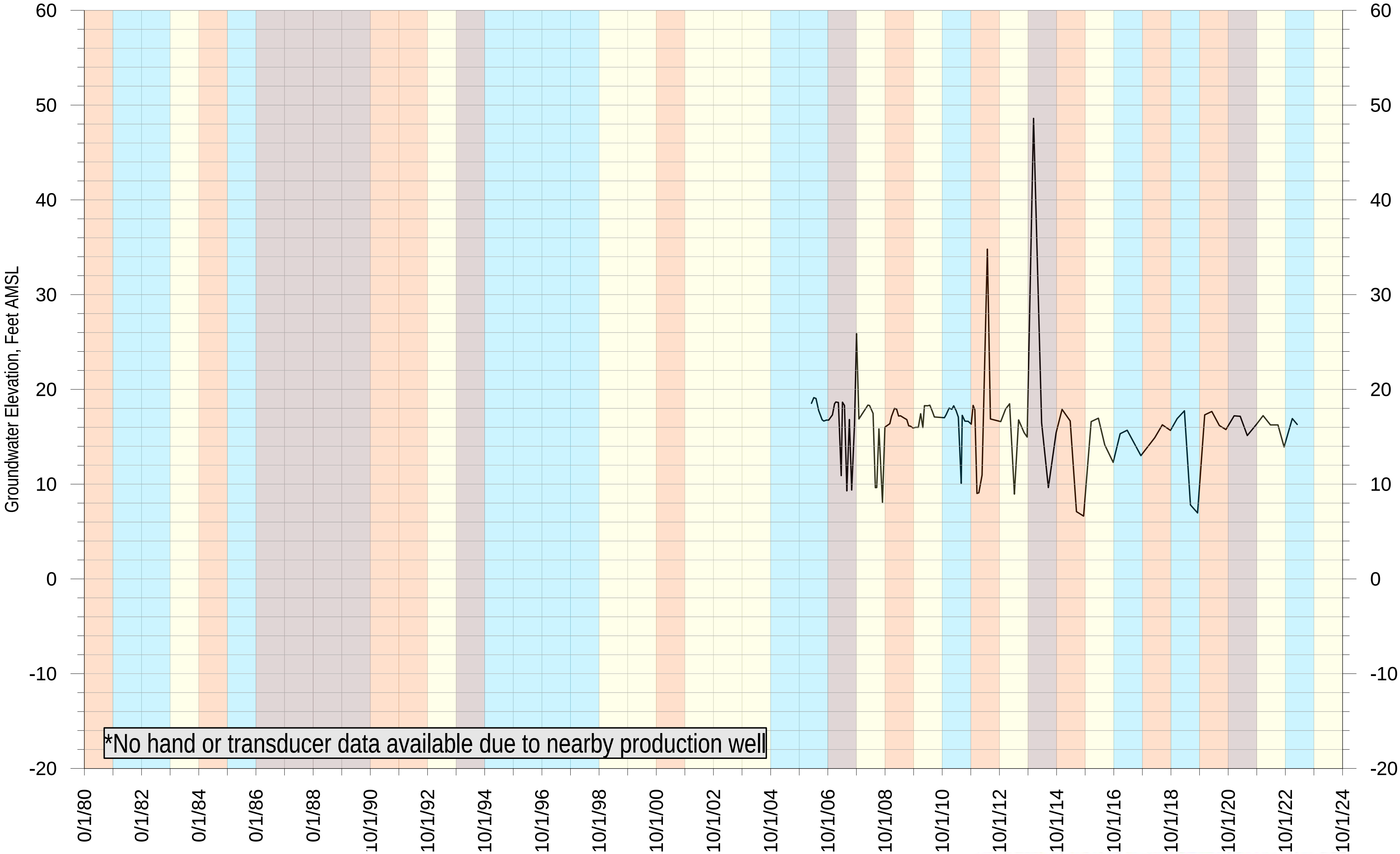
FIGURE A-111

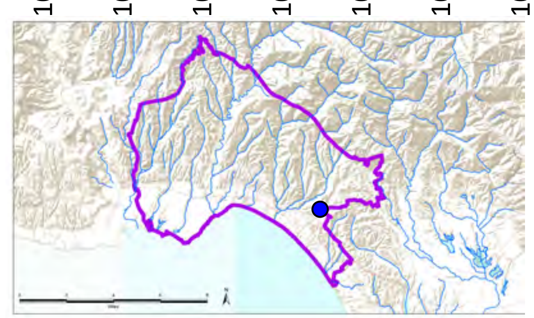




CWD-12B
Aquifer Screened: Aromas

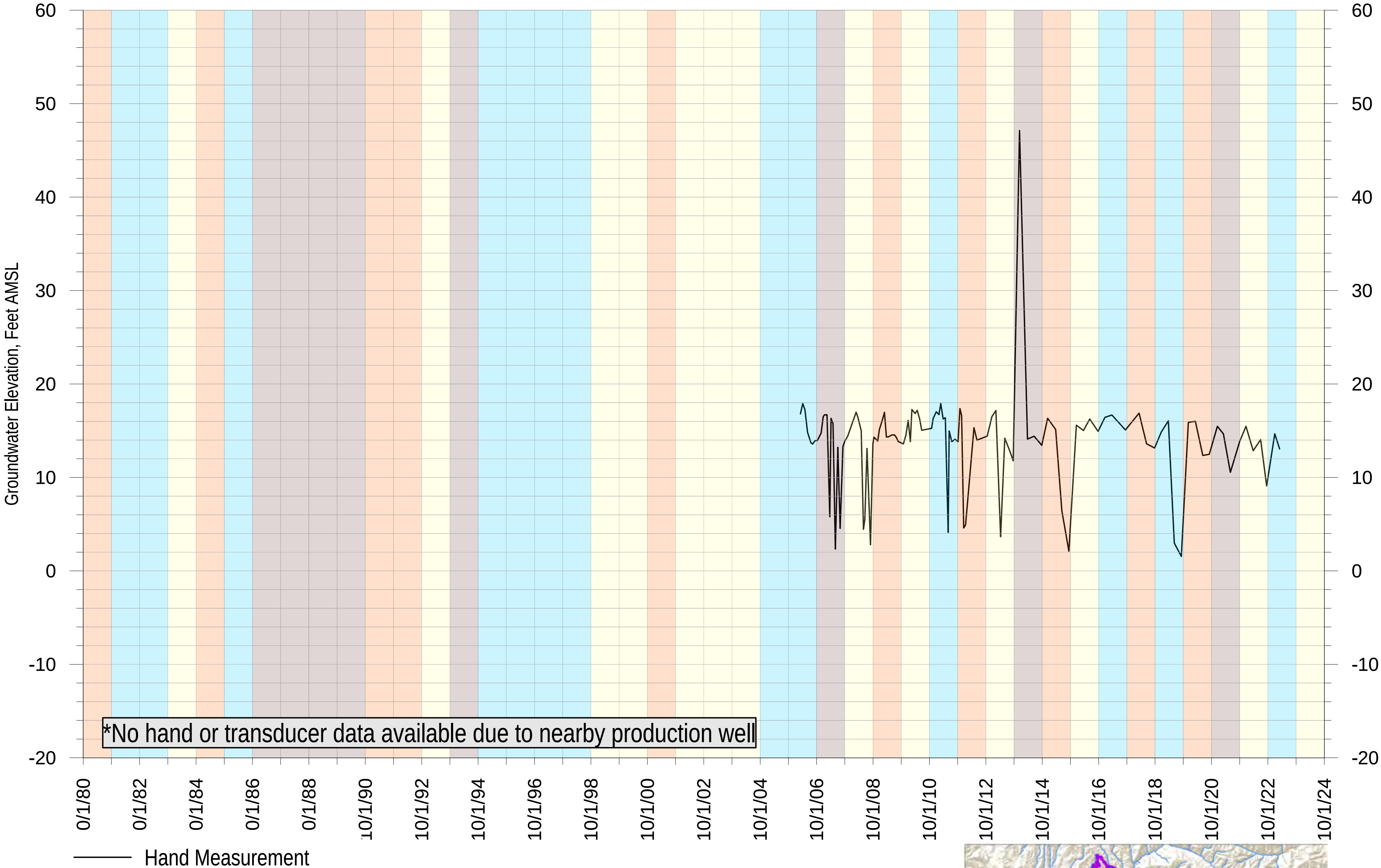
Appendix A
FIGURE A-112

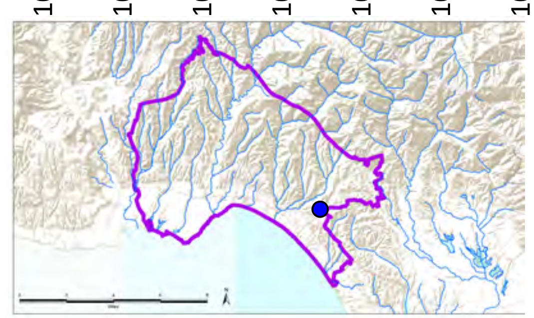




MONTGOMERY & ASSOCIATES

CWD-12C
Aquifer Screened: Purisima F



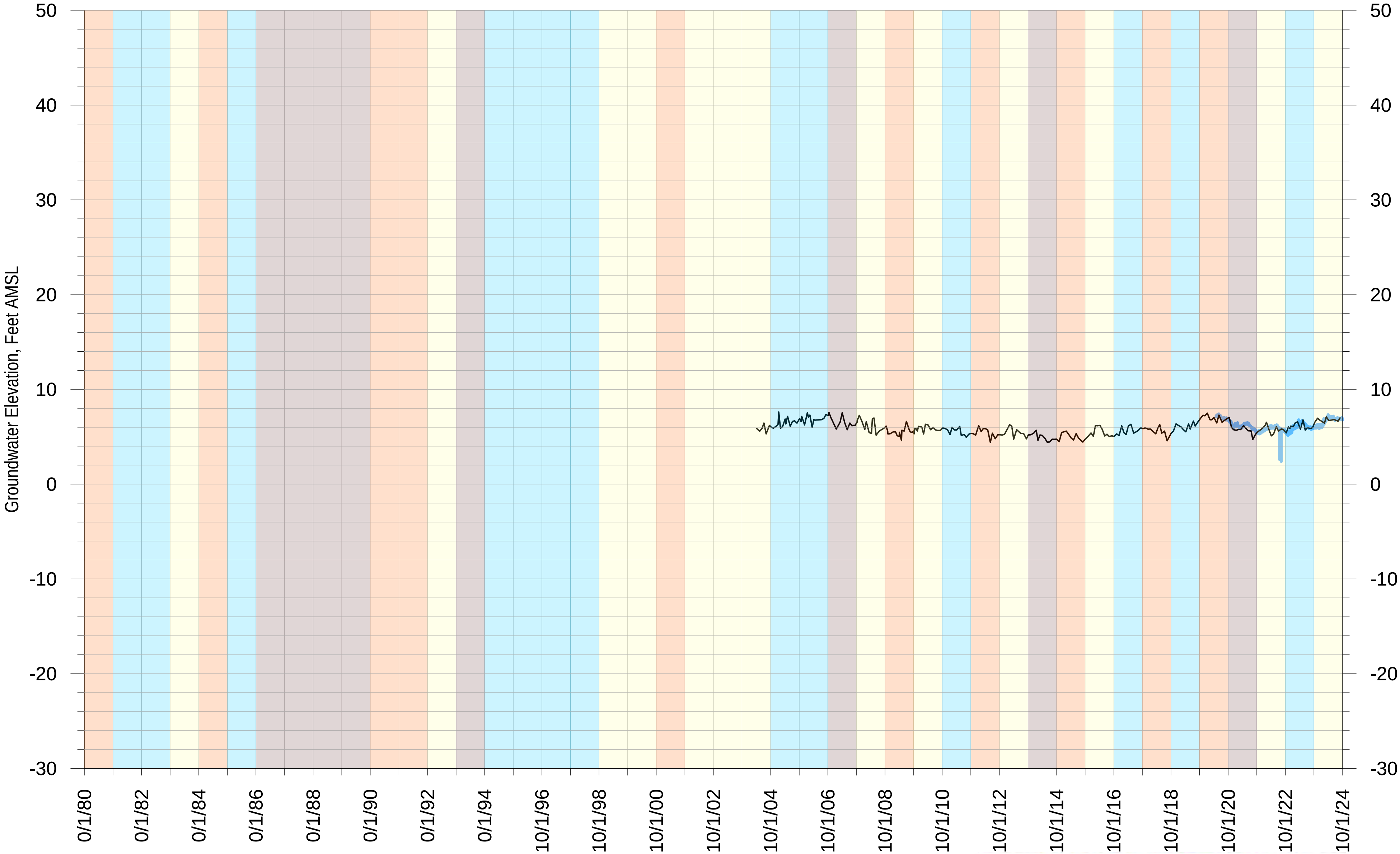


MONTGOMERY & ASSOCIATES

Moran Lake Shallow
Aquifer Screened: Purisima A

Appendix A

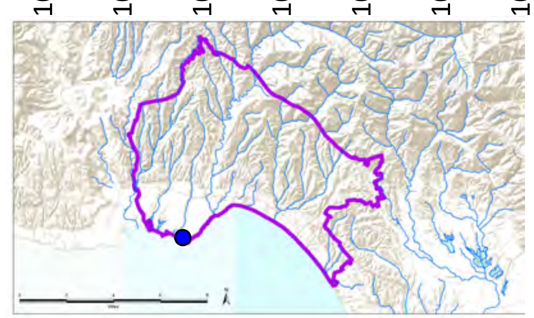
FIGURE A-114



Hand Measurement — Transducer

Critically Dry | Dry | Normal | Wet

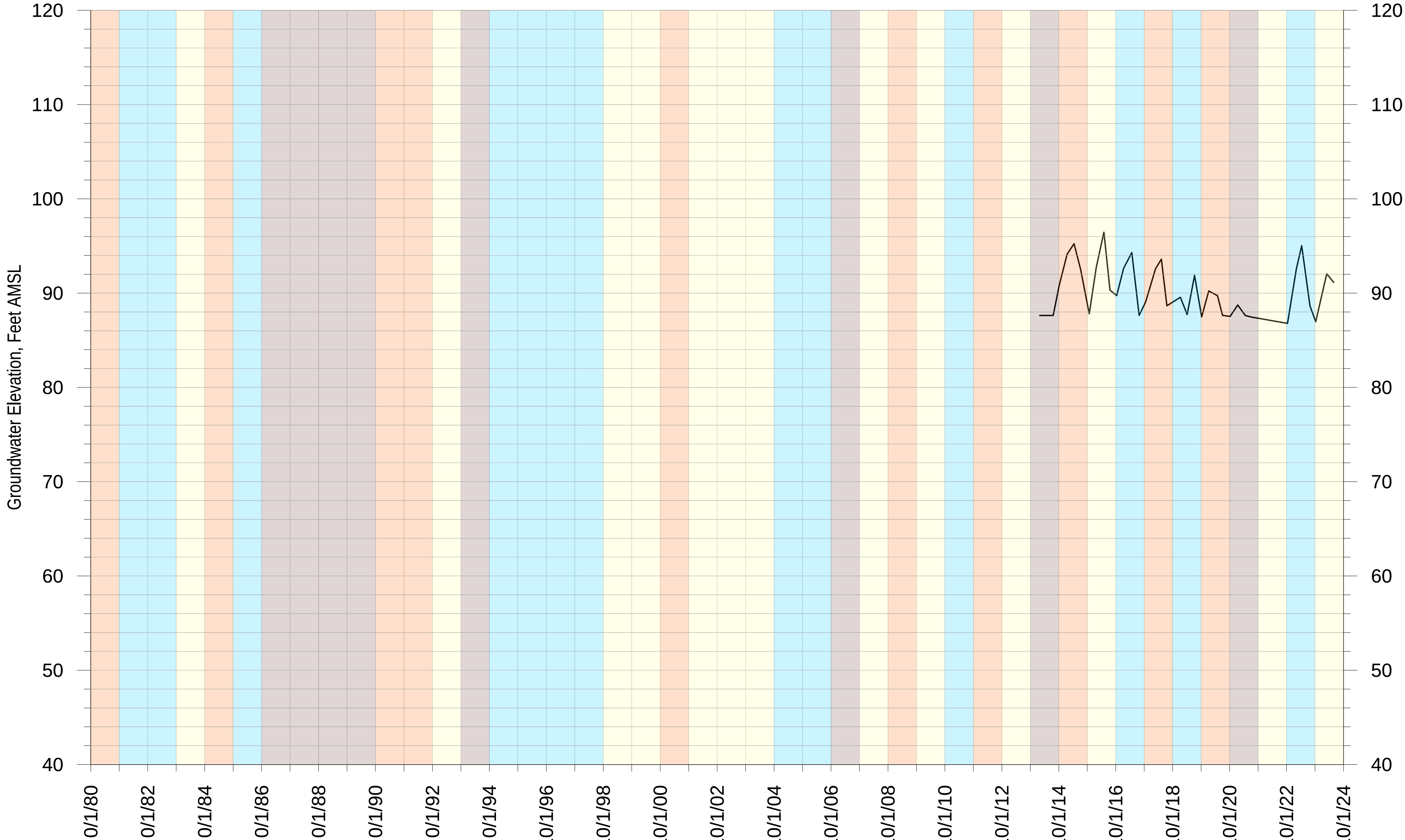
MONTGOMERY & ASSOCIATES

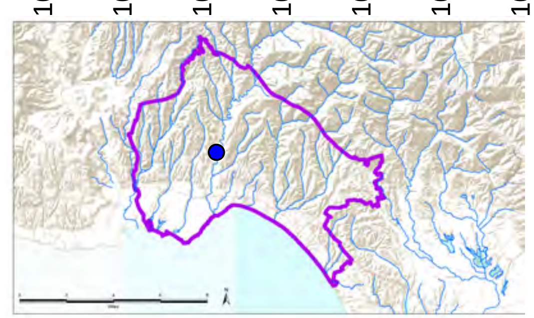


SC-10AAA at Cherryvale
Aquifer Screened: Tu

Appendix A

FIGURE A-115

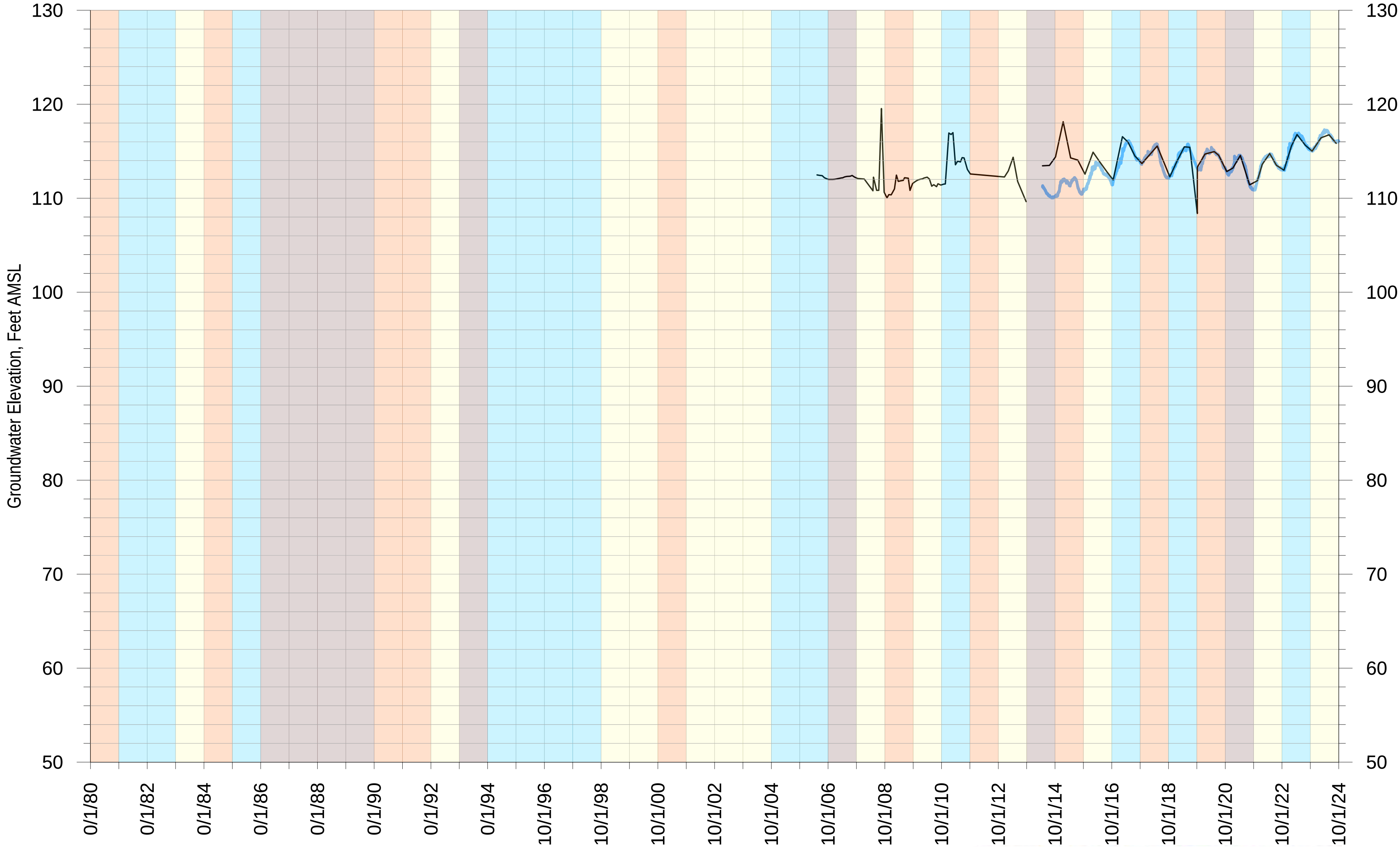




MONTGOMERY
& ASSOCIATES

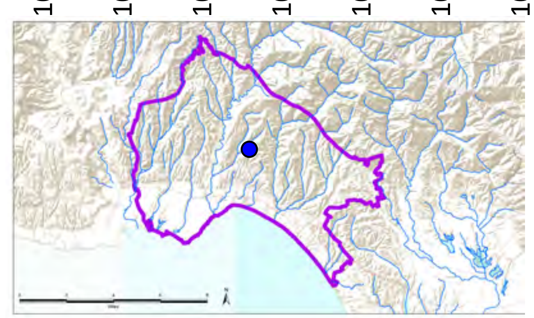
SC-11A & SC-11RA at Porter Gulch
Aquifer Screened: Purisima A/AA

Appendix A
FIGURE A-116



Hand Measurement   Transducer

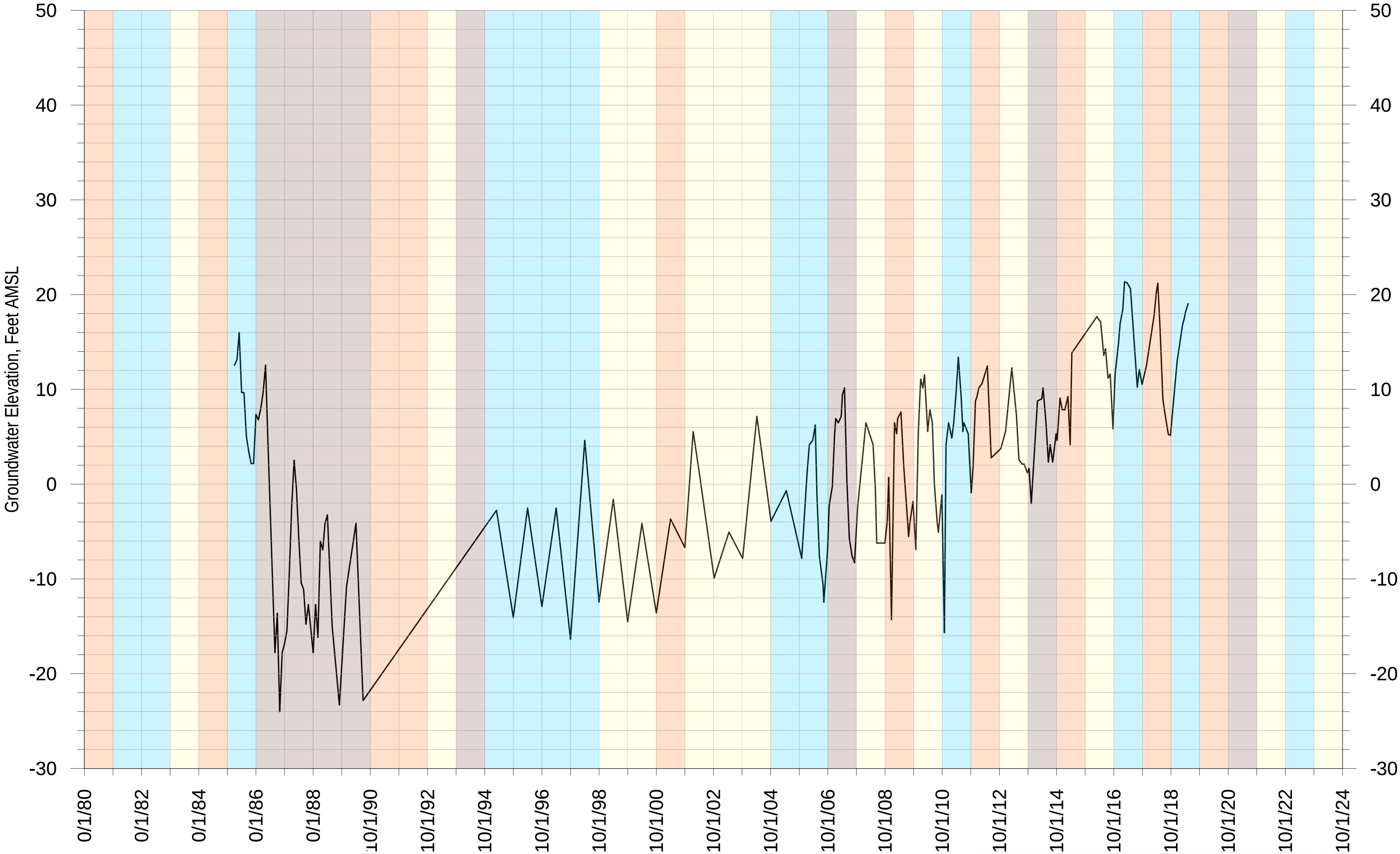
Critically Dry   Dry   Normal   Wet

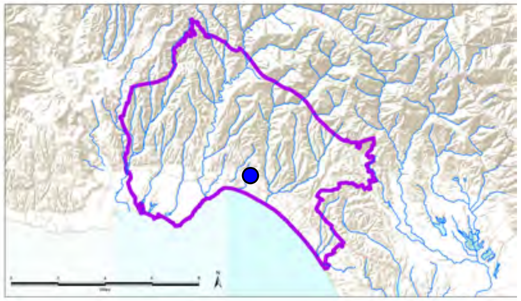


SC-14A at Madeline
Aquifer Screened: Purisima A/AA

Appendix A

FIGURE A-117



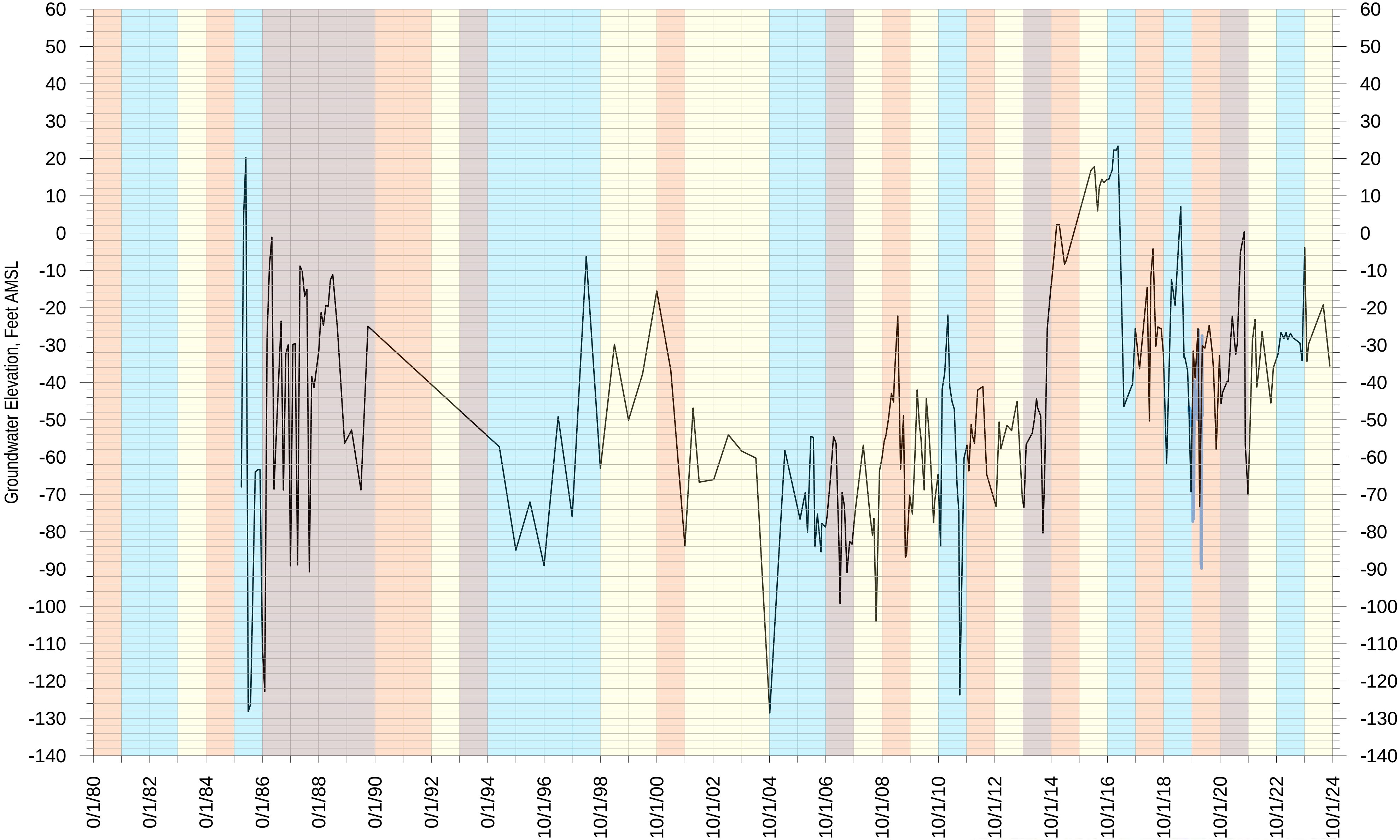


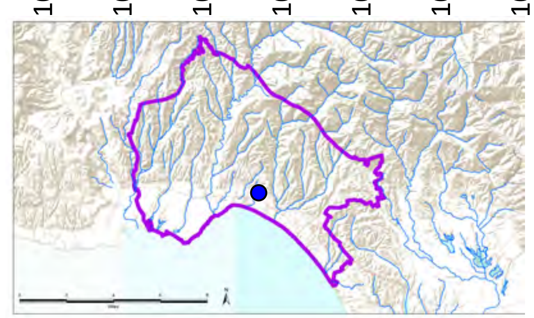
MONTGOMERY & ASSOCIATES

SC-14C at Madeline
Aquifer Screened: Purisima BC

Appendix A

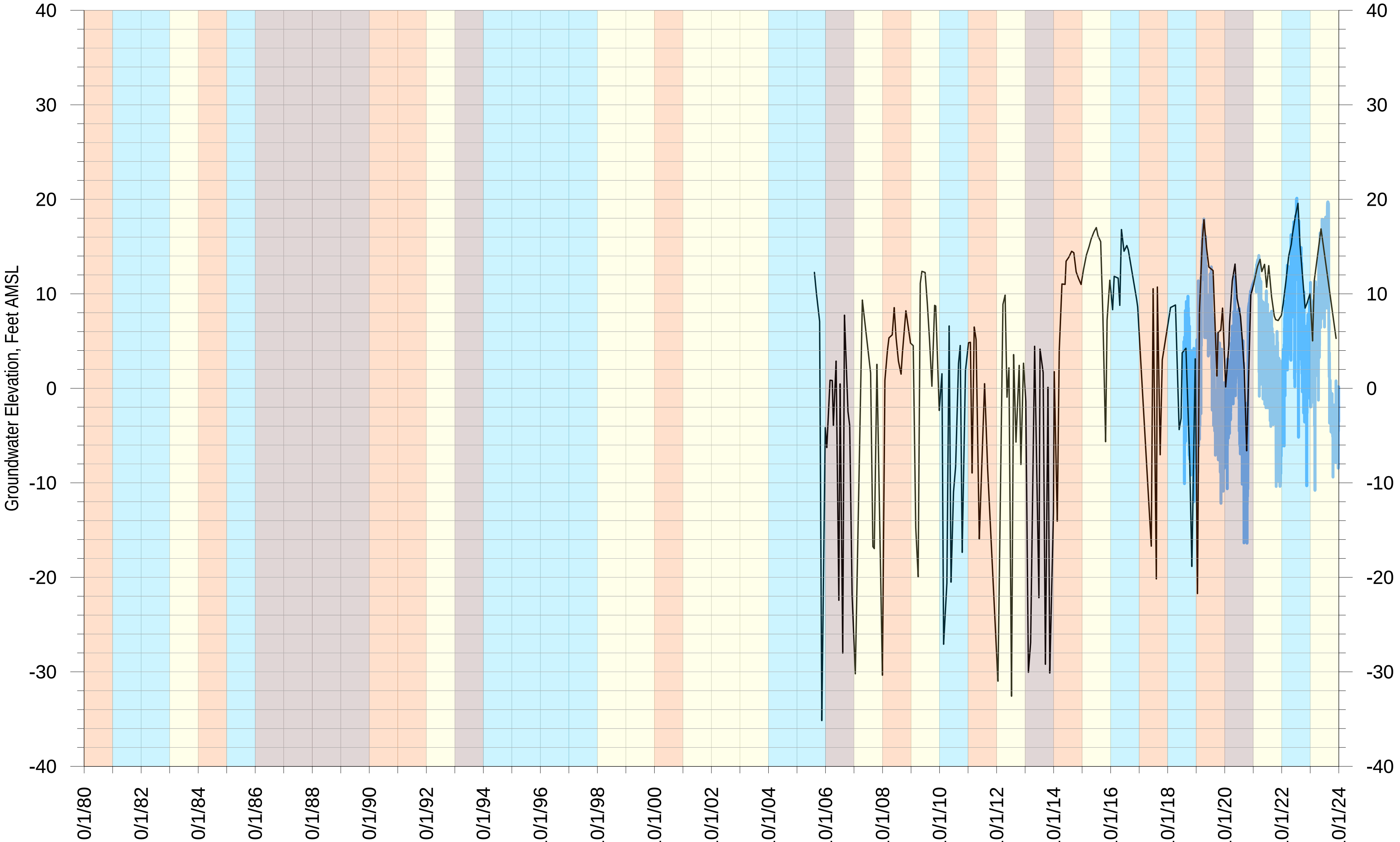
FIGURE A-118

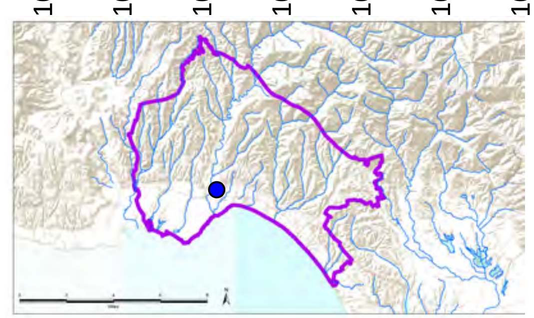




MONTGOMERY & ASSOCIATES

SC-15A at Rosedale
Aquifer Screened: Purisima AA



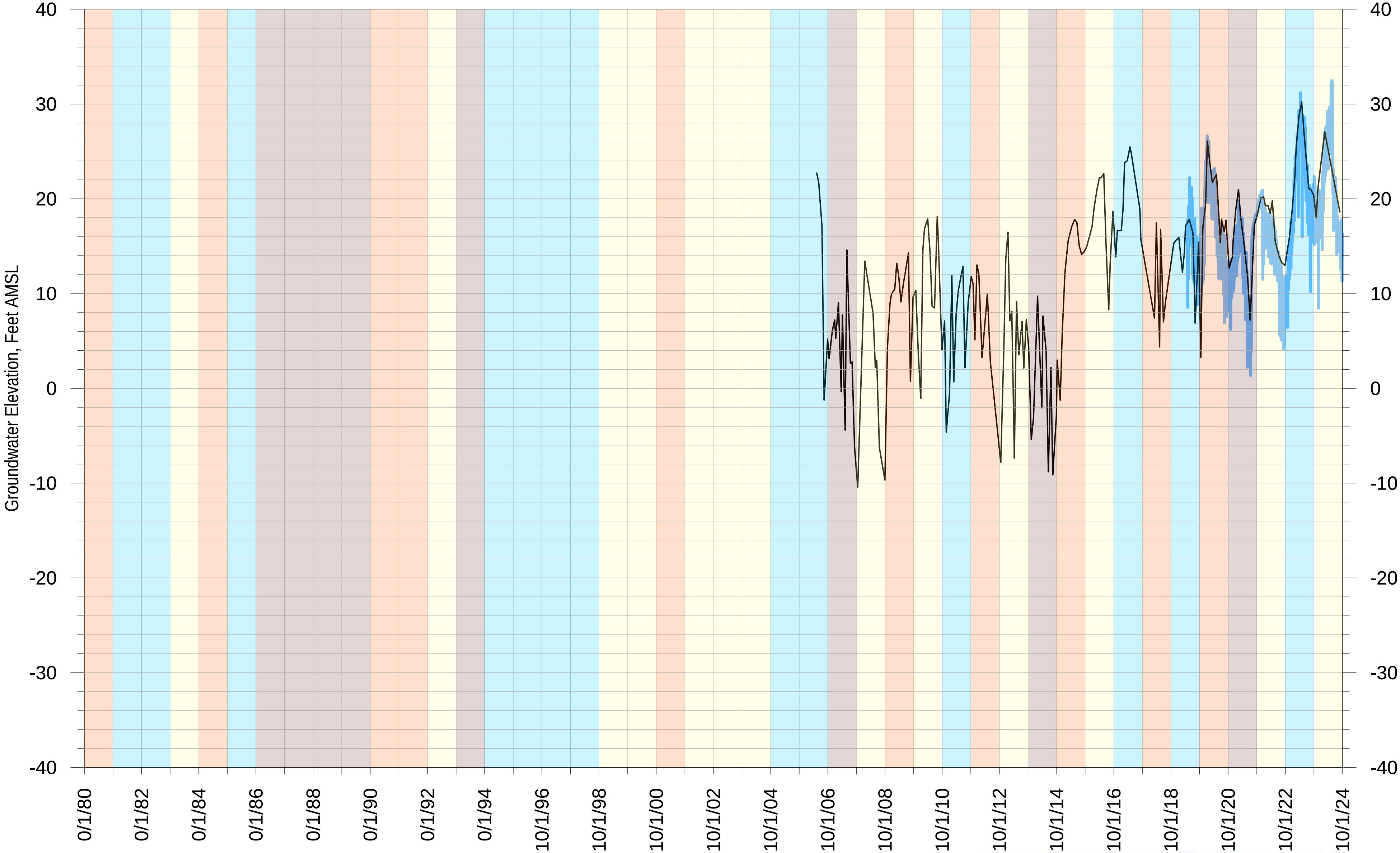


MONTGOMERY & ASSOCIATES

SC-15B at Rosedale
Aquifer Screened: Purisima A

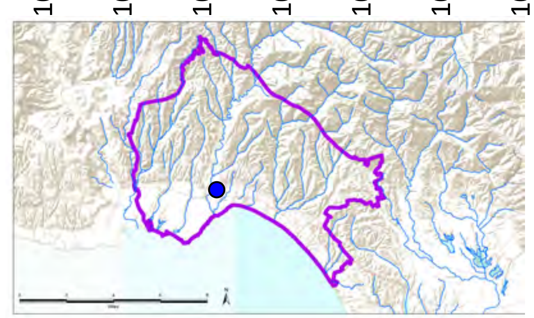
Appendix A

FIGURE A-120



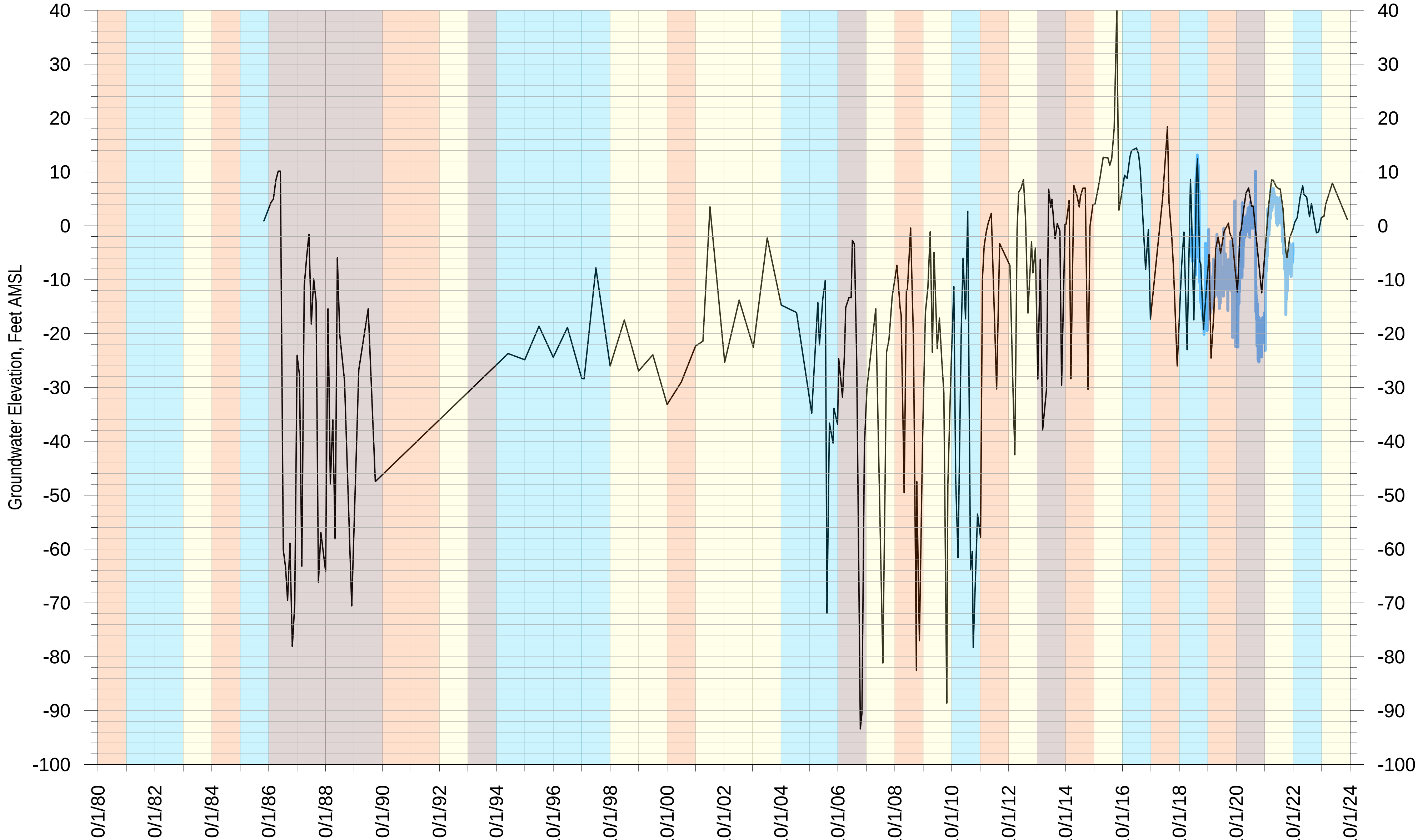
Hand Measurement — Transducer

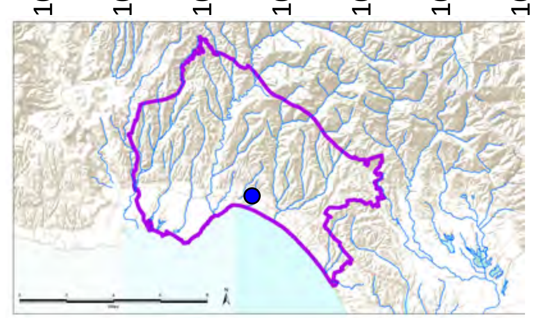
Critically Dry | Dry | Normal | Wet



SC-16A at Estates

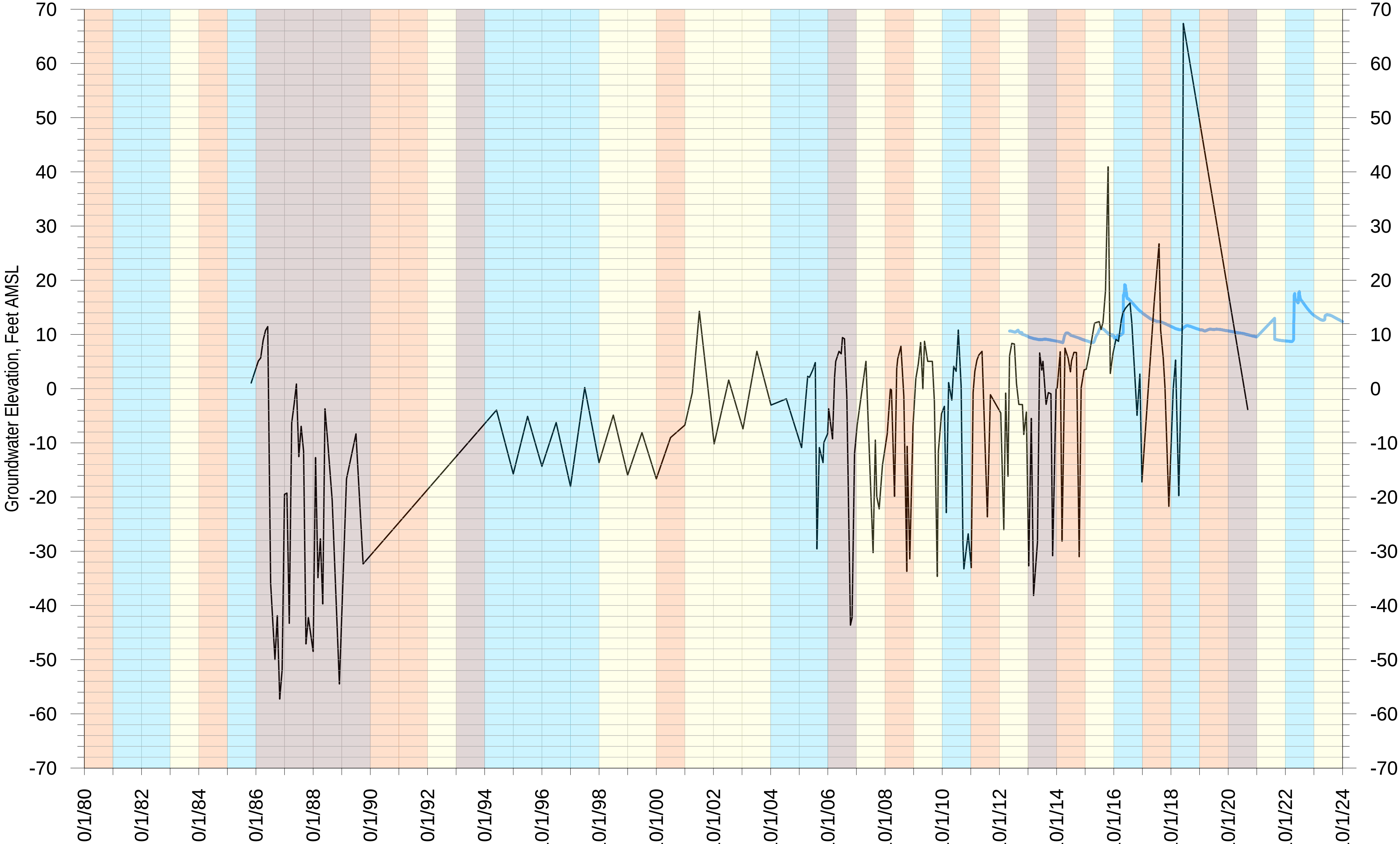
Aquifer Screened: Purisima A/AA

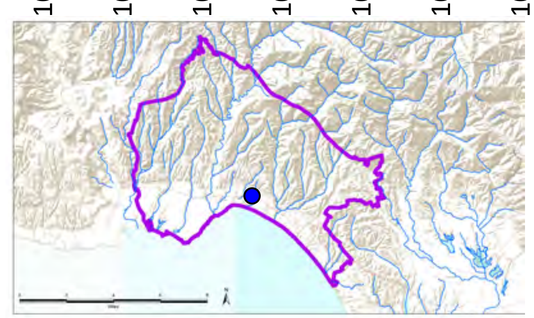




MONTGOMERY & ASSOCIATES

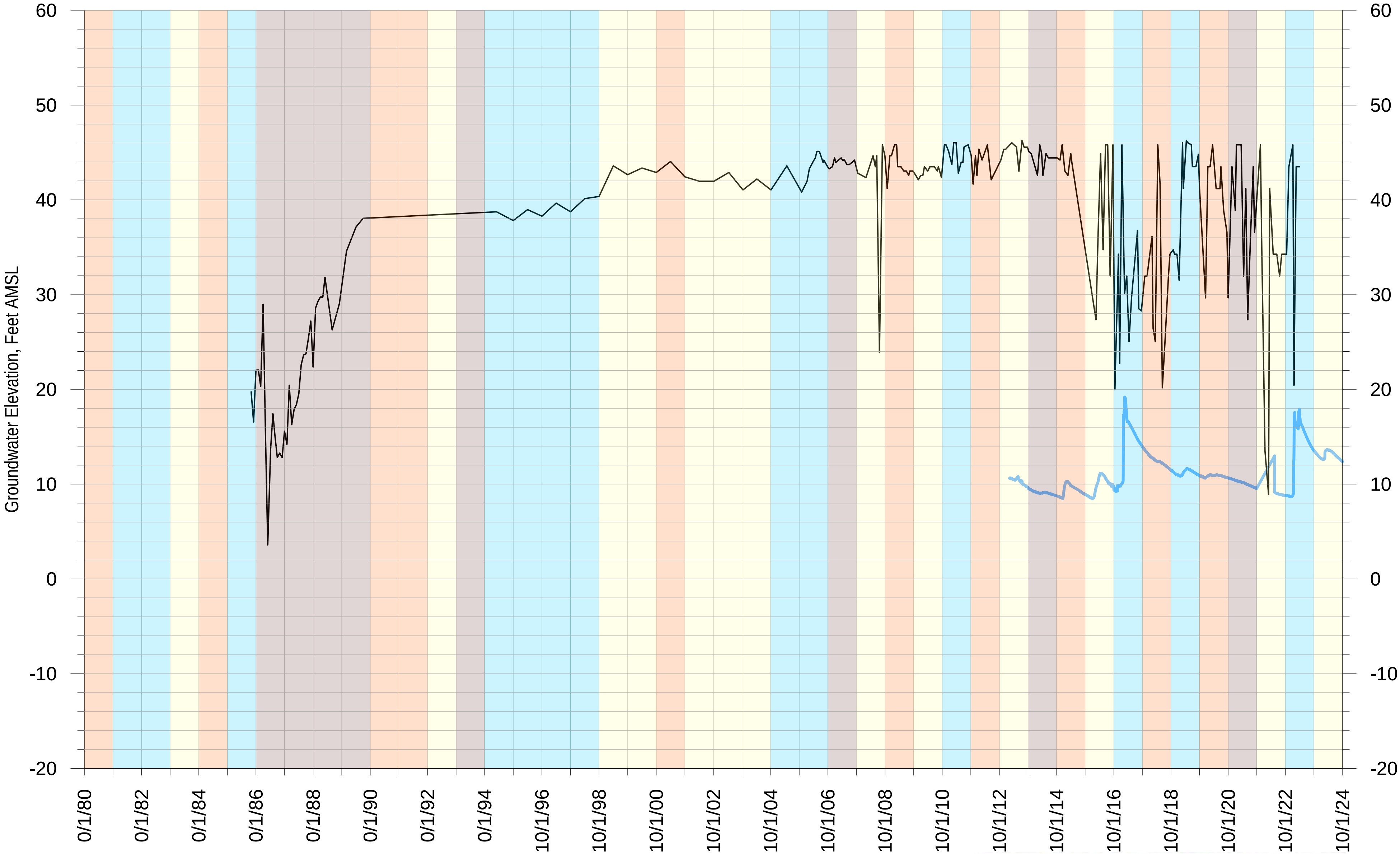
SC-16B at Estates
Aquifer Screened: Purisima BC

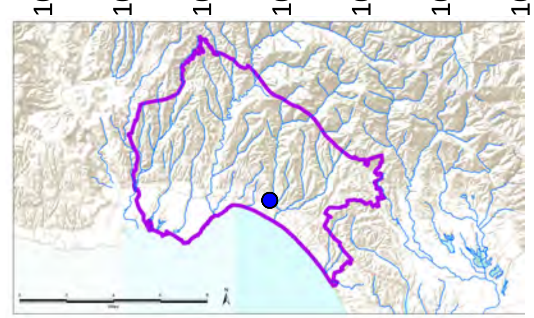




MONTGOMERY & ASSOCIATES

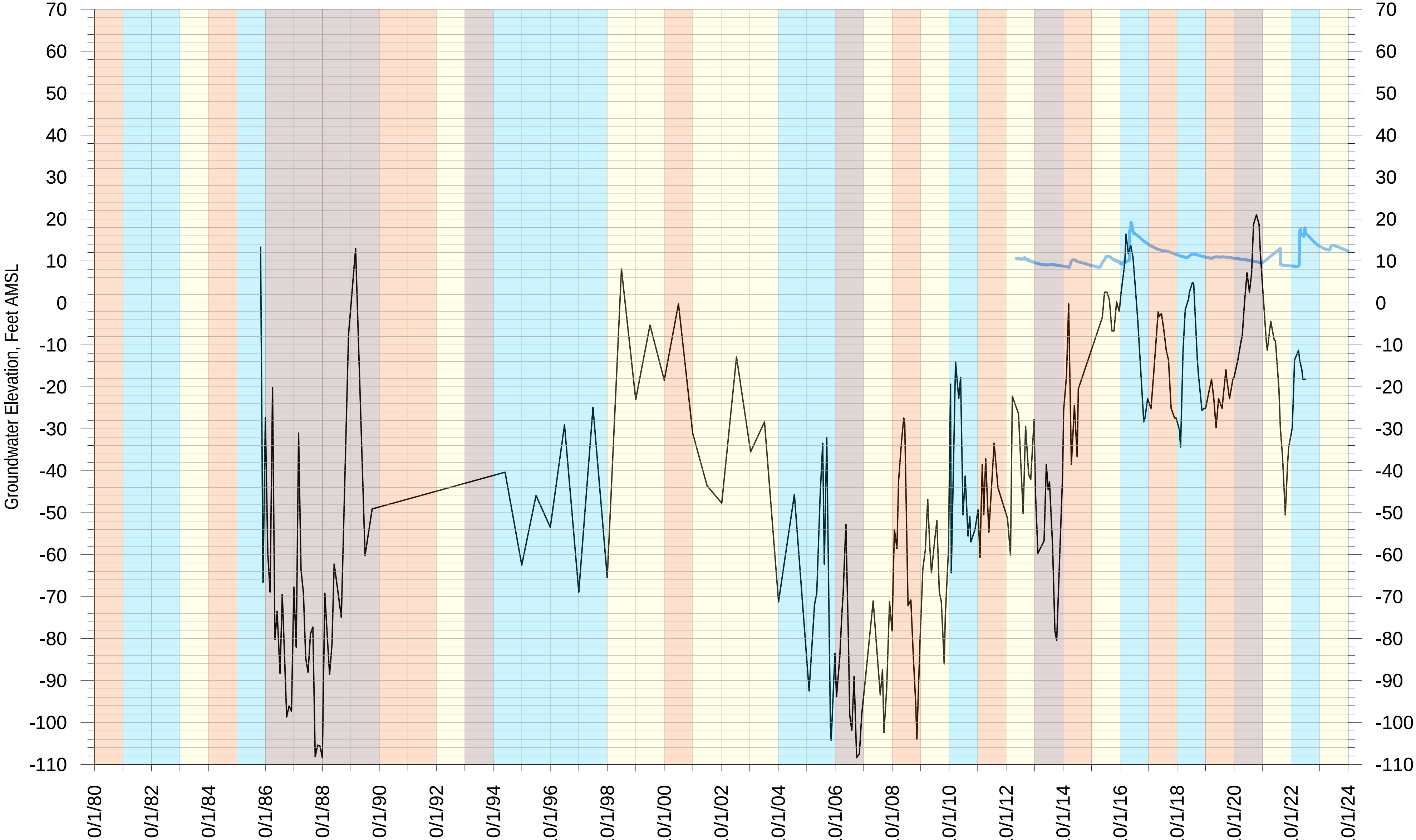
SC-17A at Ledyard
Aquifer Screened: Purisima A

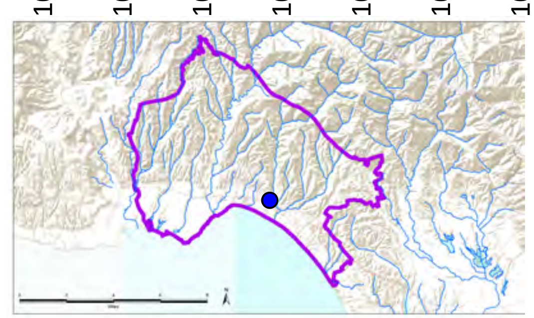




MONTGOMERY & ASSOCIATES

SC-17C at Ledyard
Aquifer Screened: Purisima DEF



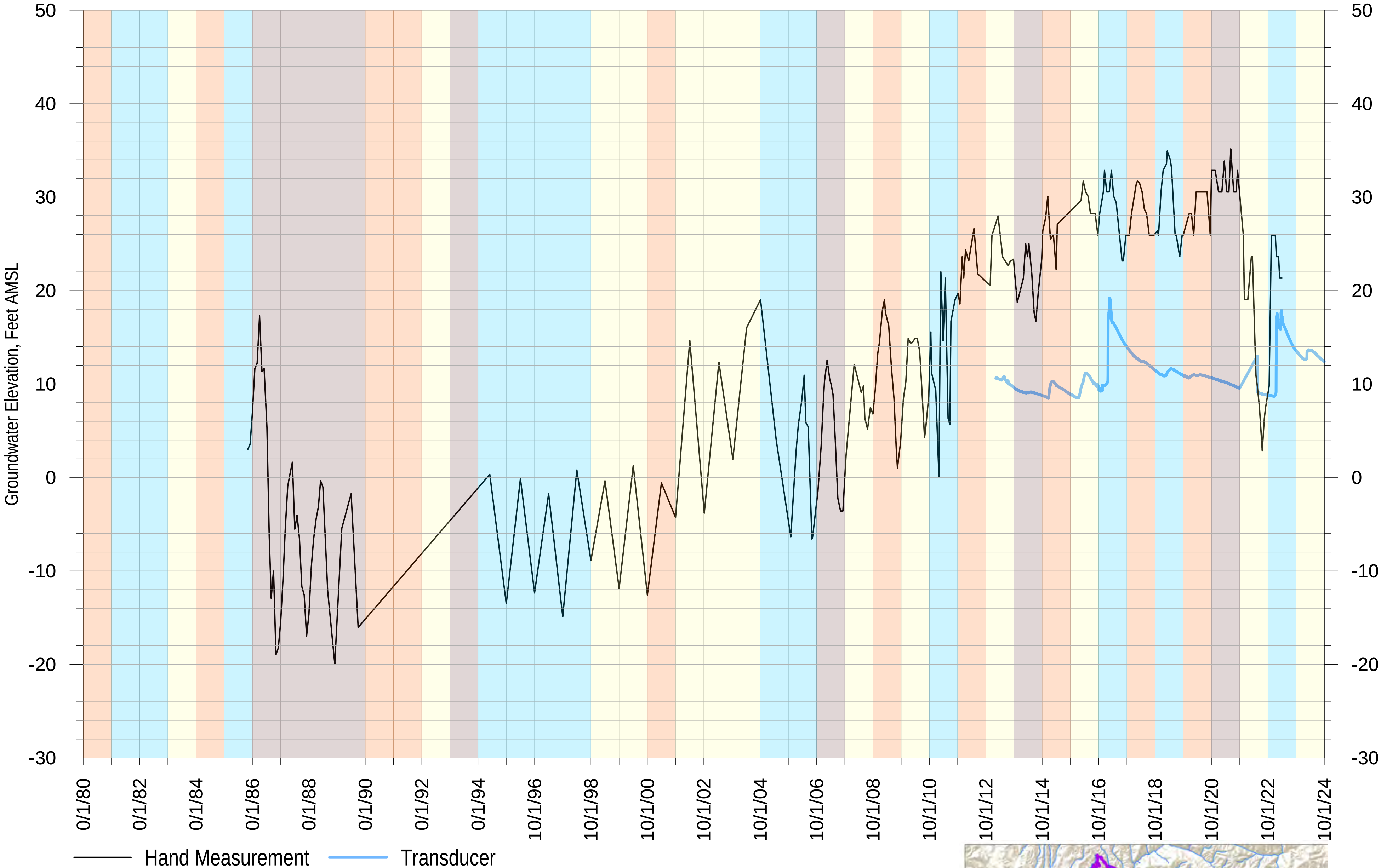


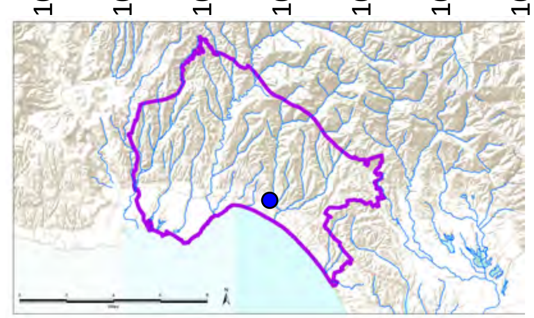
MONTGOMERY
& ASSOCIATES

SC-17D at Ledyard
Aquifer Screened: Purisima DEF

Appendix A

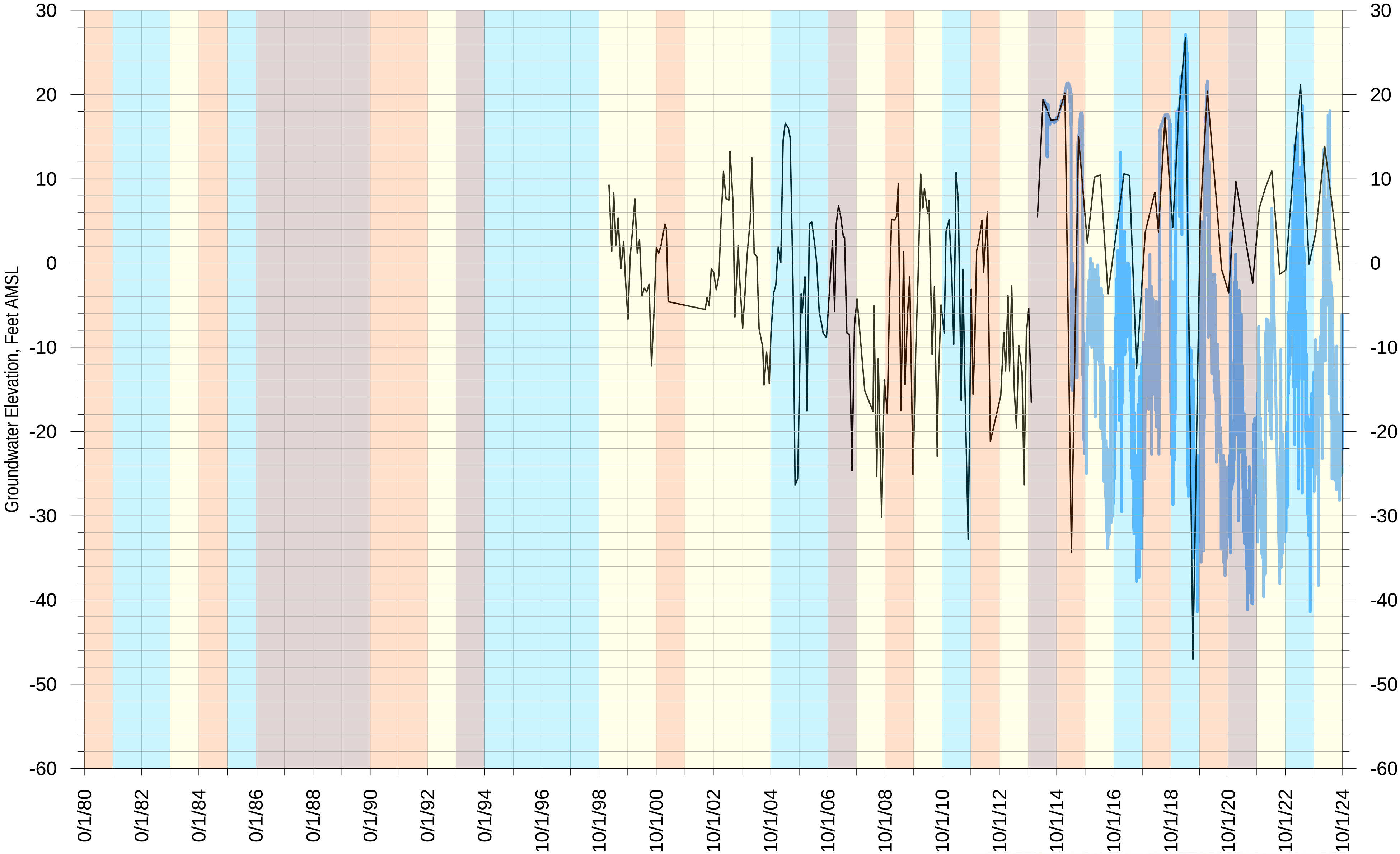
FIGURE A-125

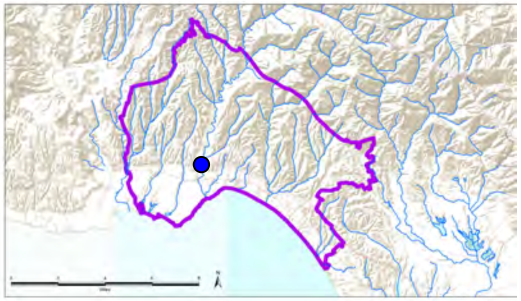




MONTGOMERY & ASSOCIATES

SC-18A & SC-18RA at Main Street
Aquifer Screened: Purisima AA



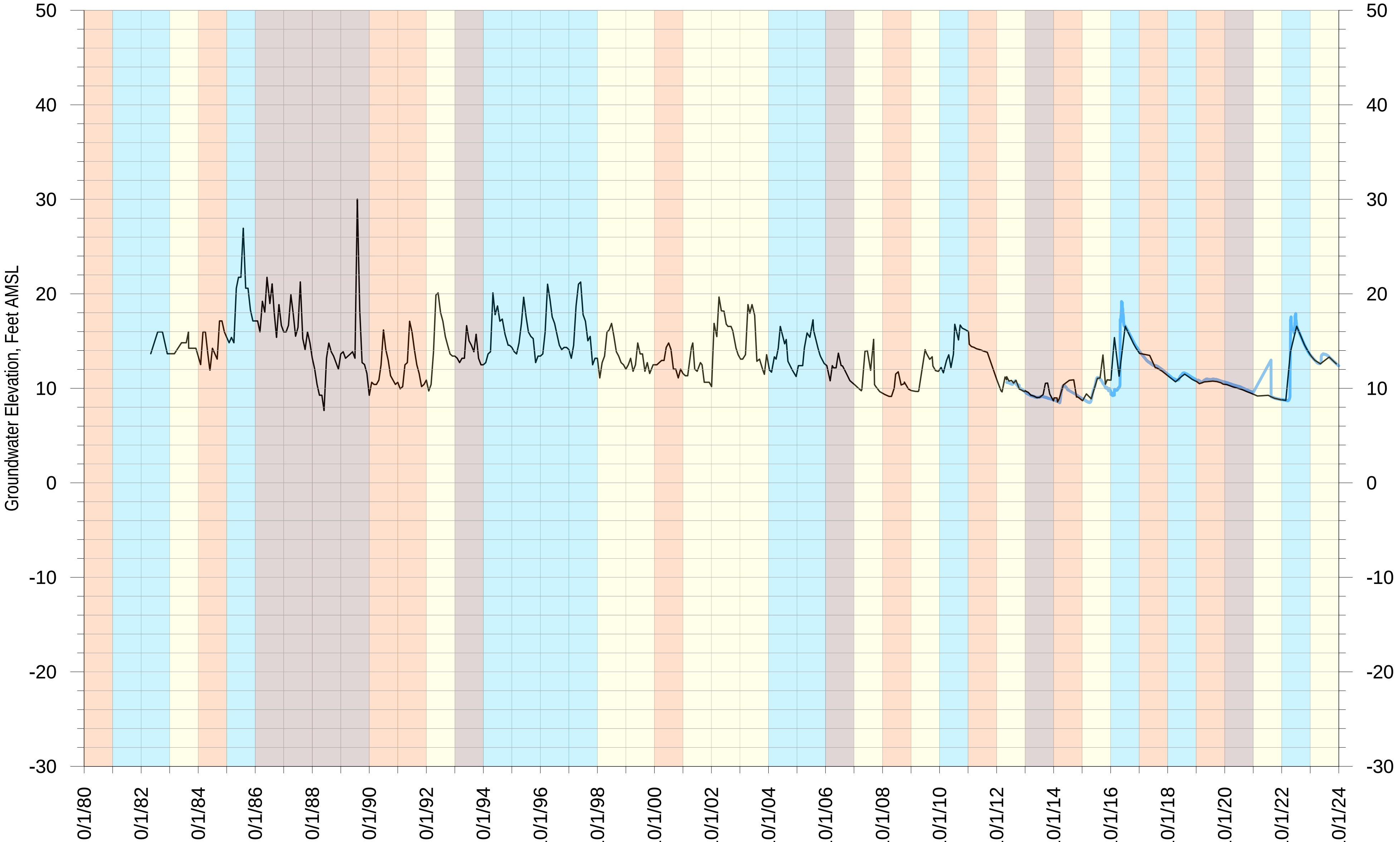


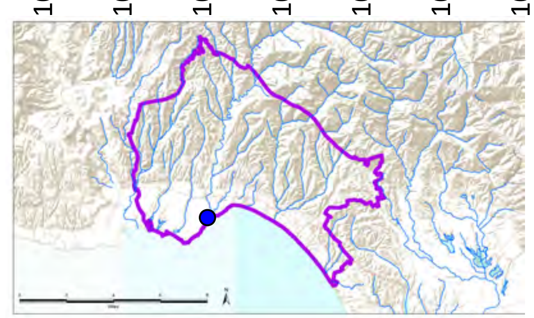
MONTGOMERY & ASSOCIATES

SC-1B at Prospect
Aquifer Screened: Purisima BC

Appendix A

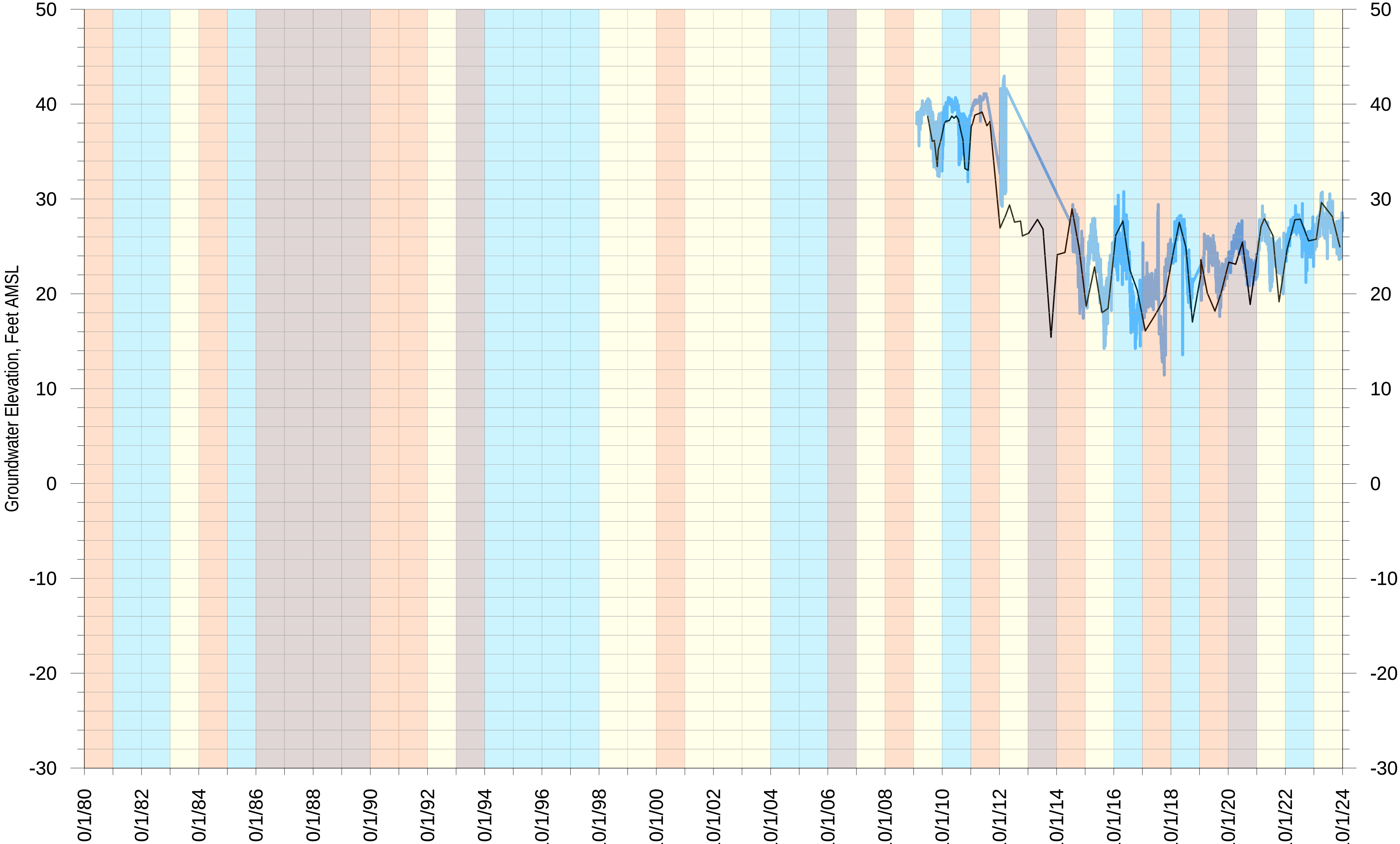
FIGURE A-127

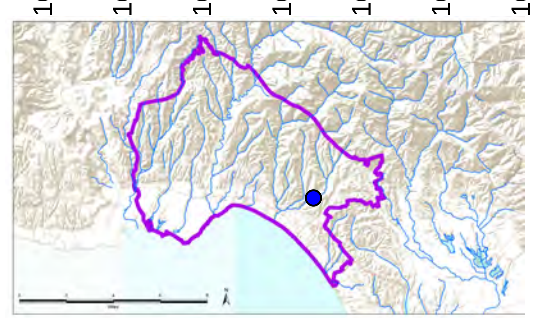




MONTGOMERY
& ASSOCIATES

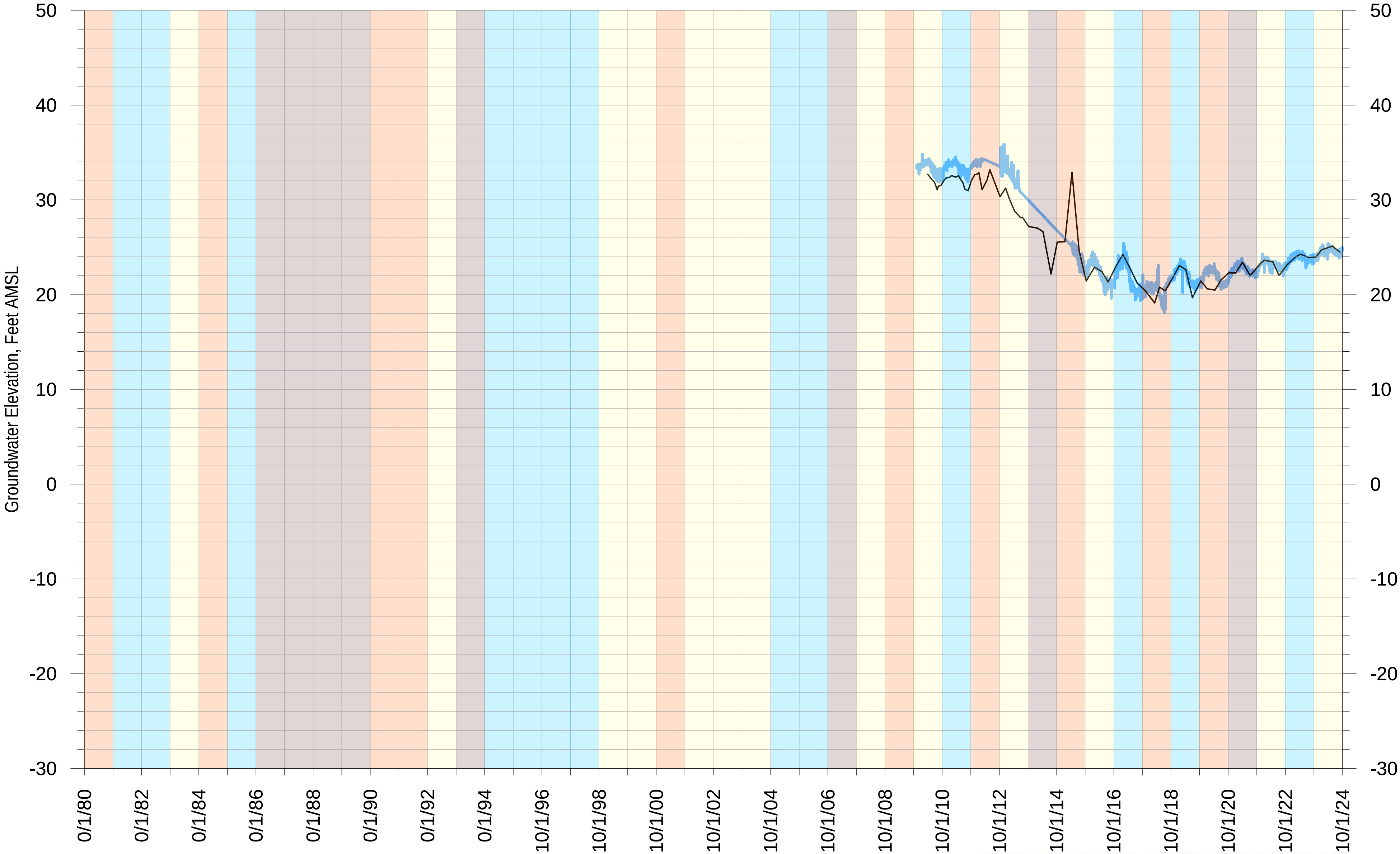
SC-20A at Polo Grounds
Aquifer Screened: Purisima F

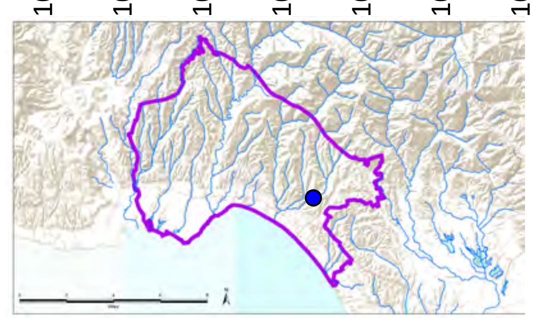




MONTGOMERY & ASSOCIATES

SC-20B at Polo Grounds
Aquifer Screened: Purisima F



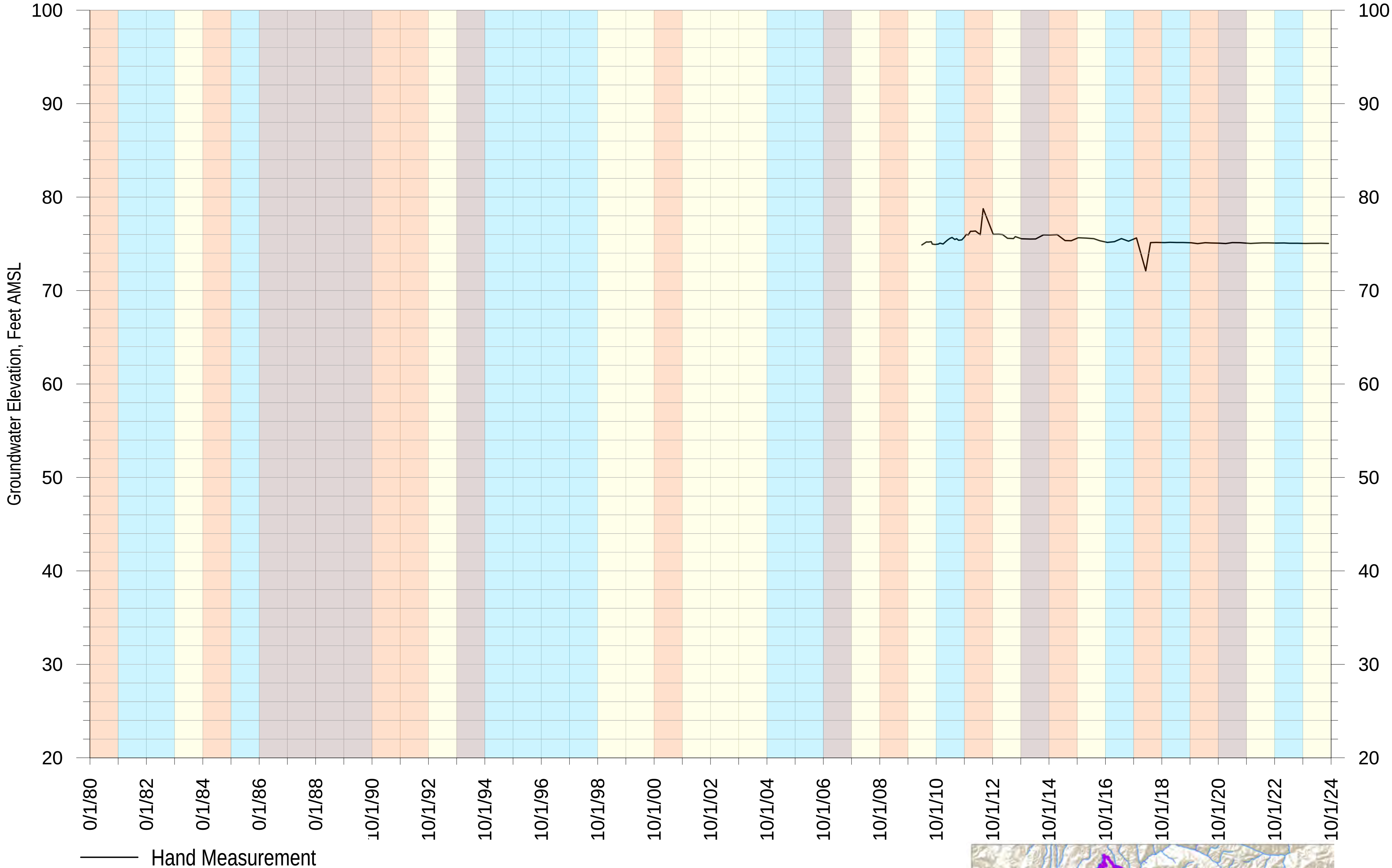


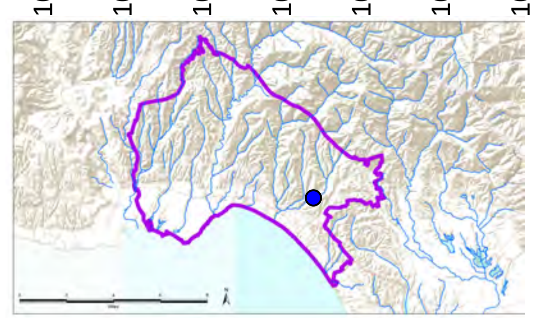
MONTGOMERY & ASSOCIATES

SC-20C at Polo Grounds
Aquifer Screened: Purisima F

Appendix A

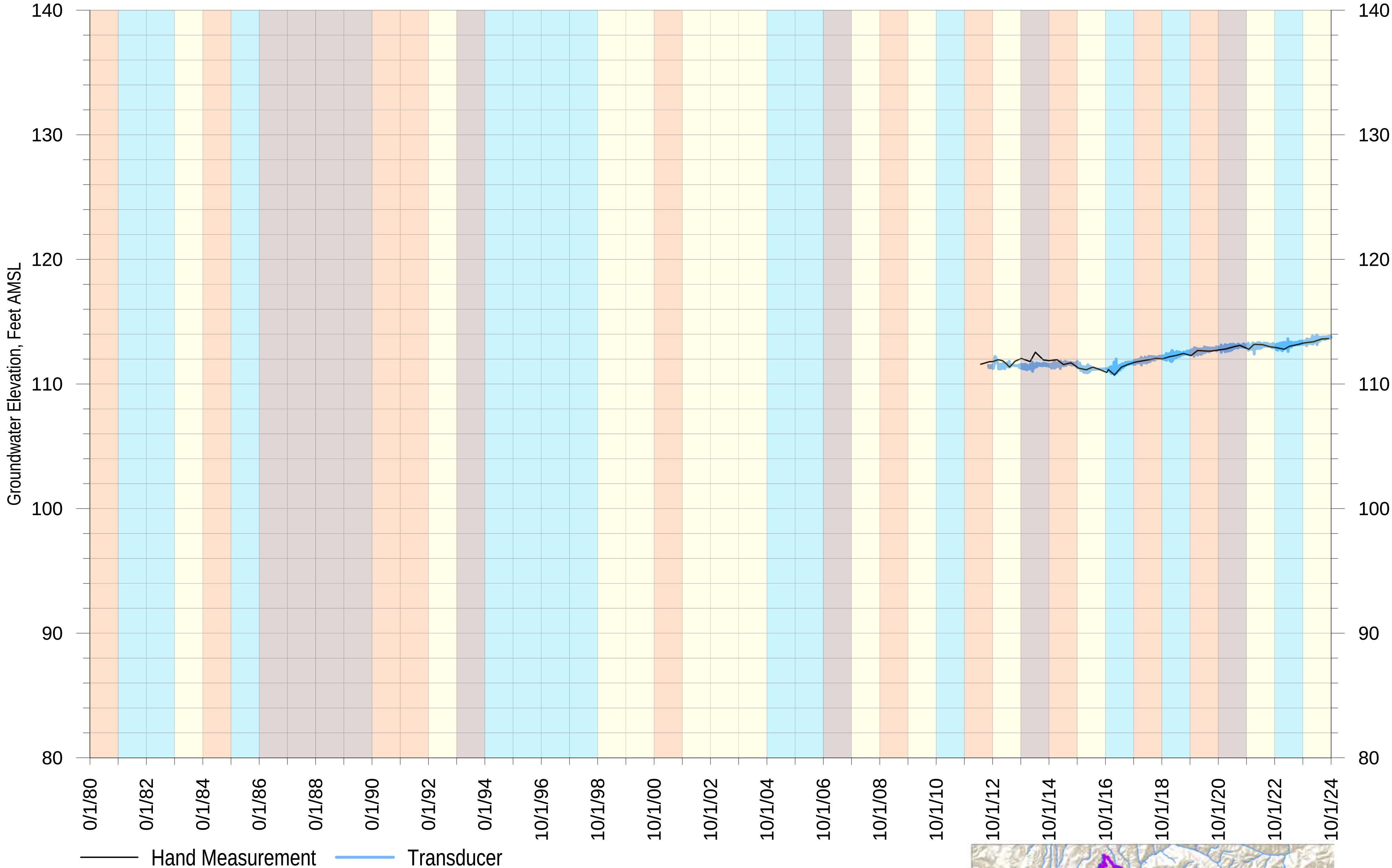
FIGURE A-130

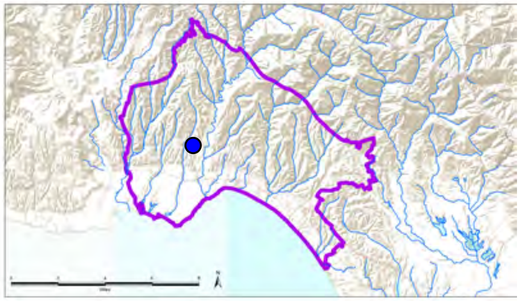




MONTGOMERY
& ASSOCIATES

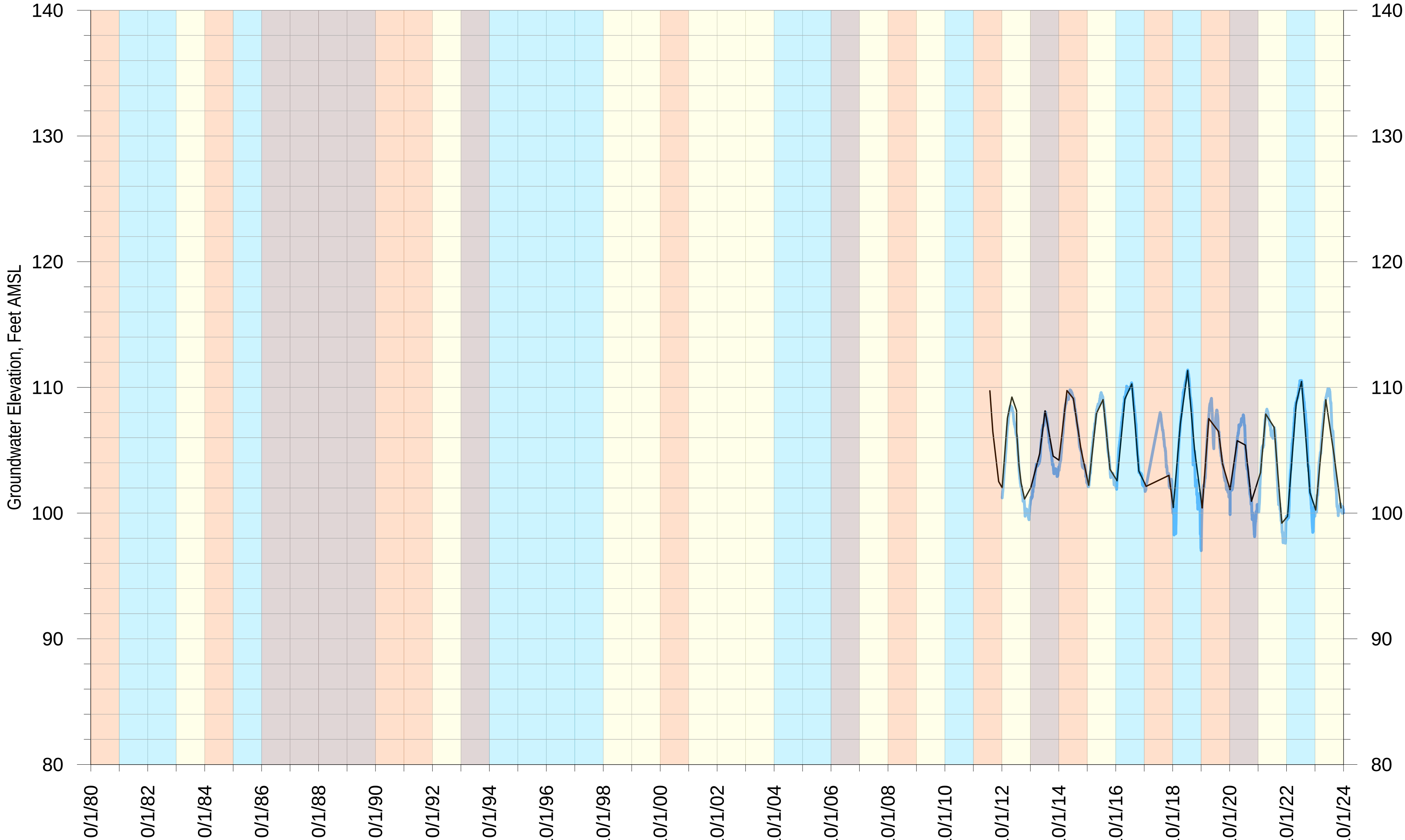
SC-21A at Cornwell
Aquifer Screened: Purisima A

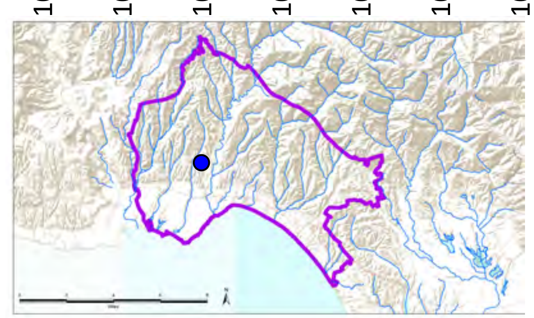




MONTGOMERY & ASSOCIATES

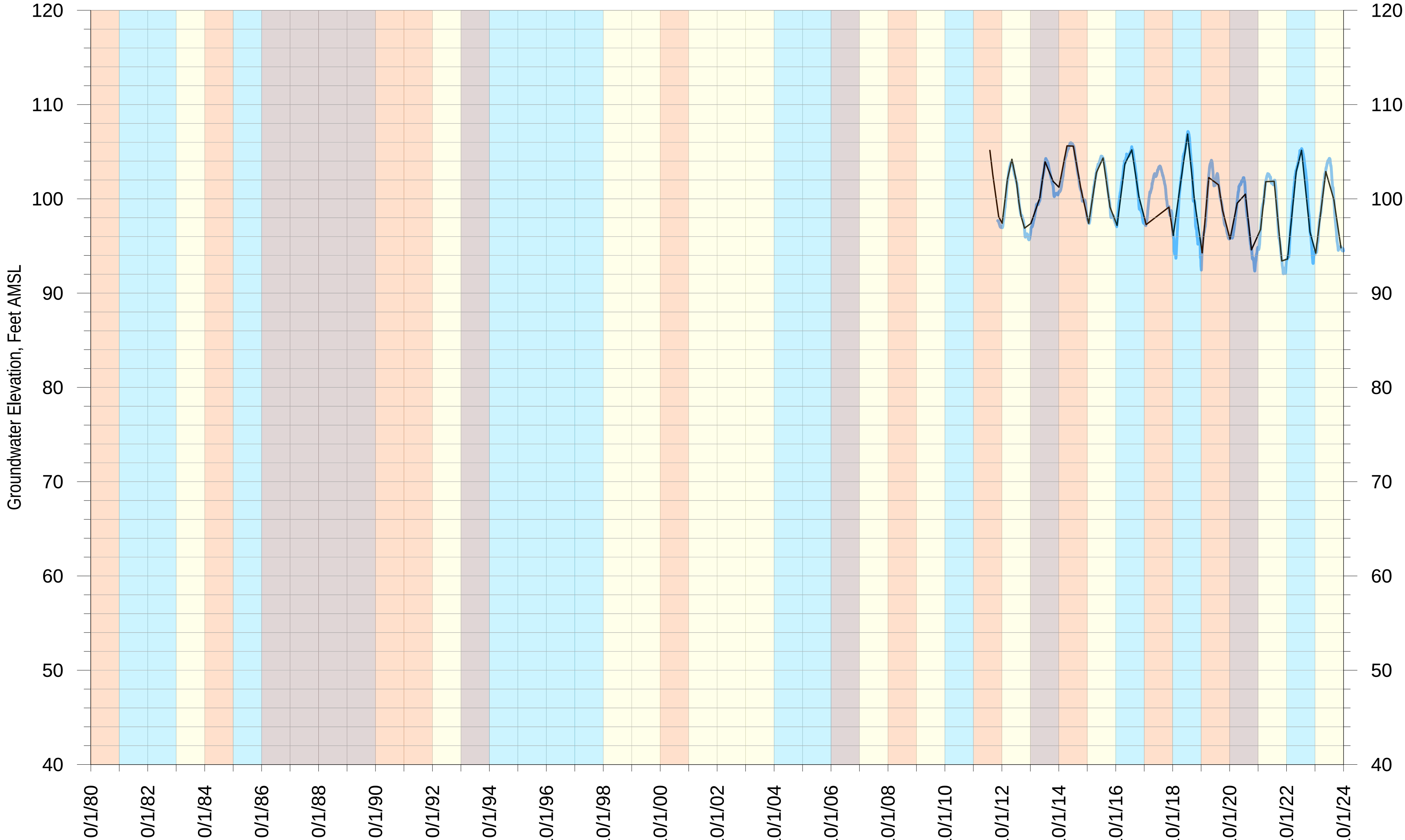
SC-21AA at Cornwell
Aquifer Screened: Purisima AA

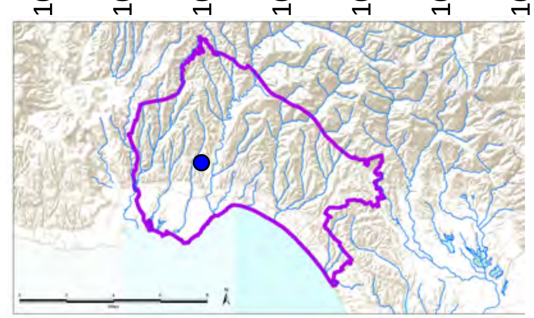




MONTGOMERY
& ASSOCIATES

SC-21AAA at Cornwell
Aquifer Screened: Purisima AA



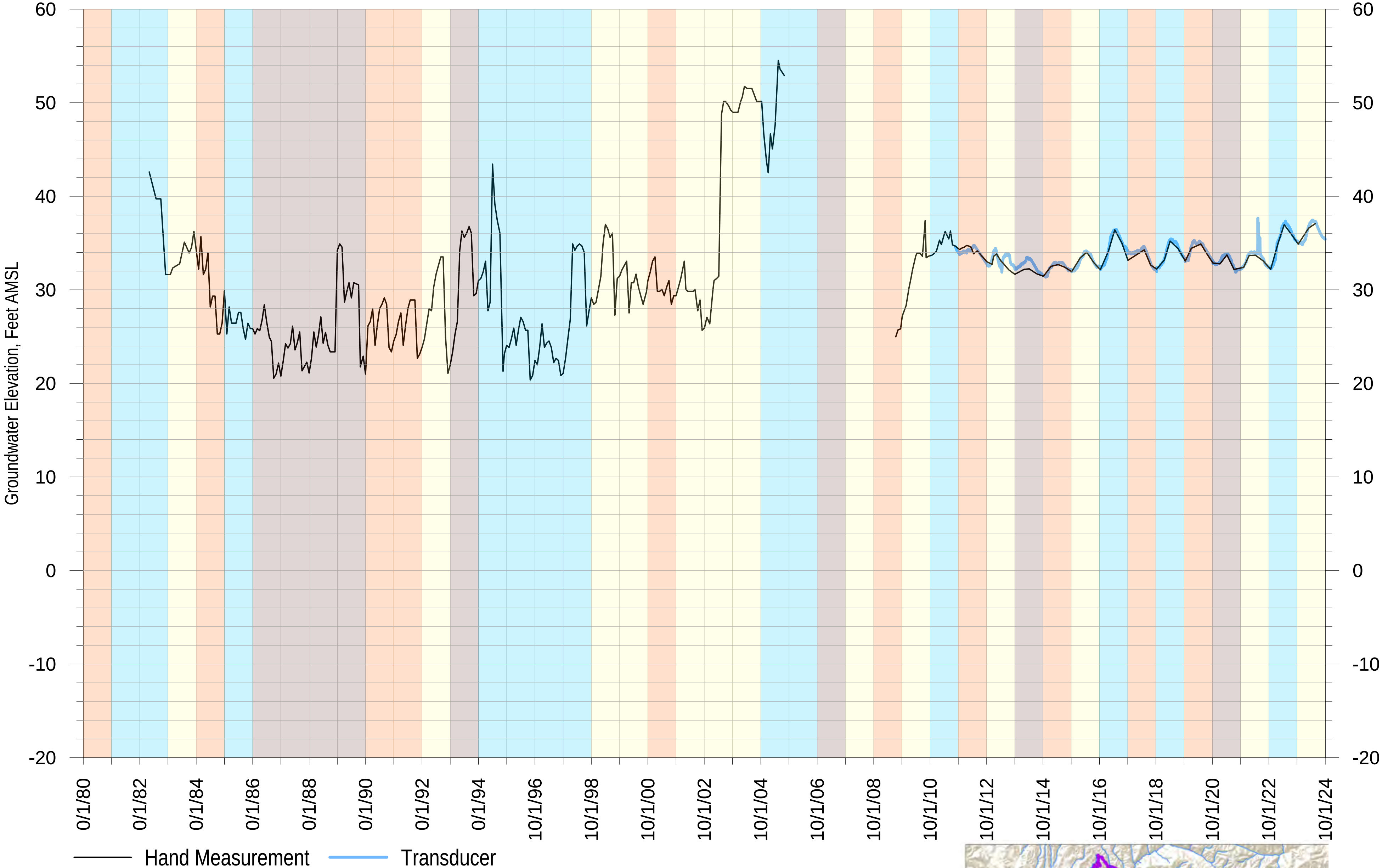


MONTGOMERY & ASSOCIATES

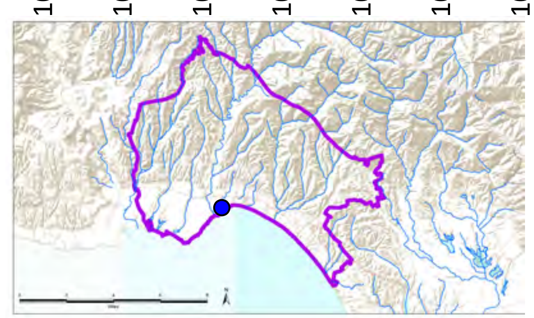
SC-3B & SC-3RB at Escalona
Aquifer Screened: Purisima B

Appendix A

FIGURE A-134



Critically Dry | Dry | Normal | Wet

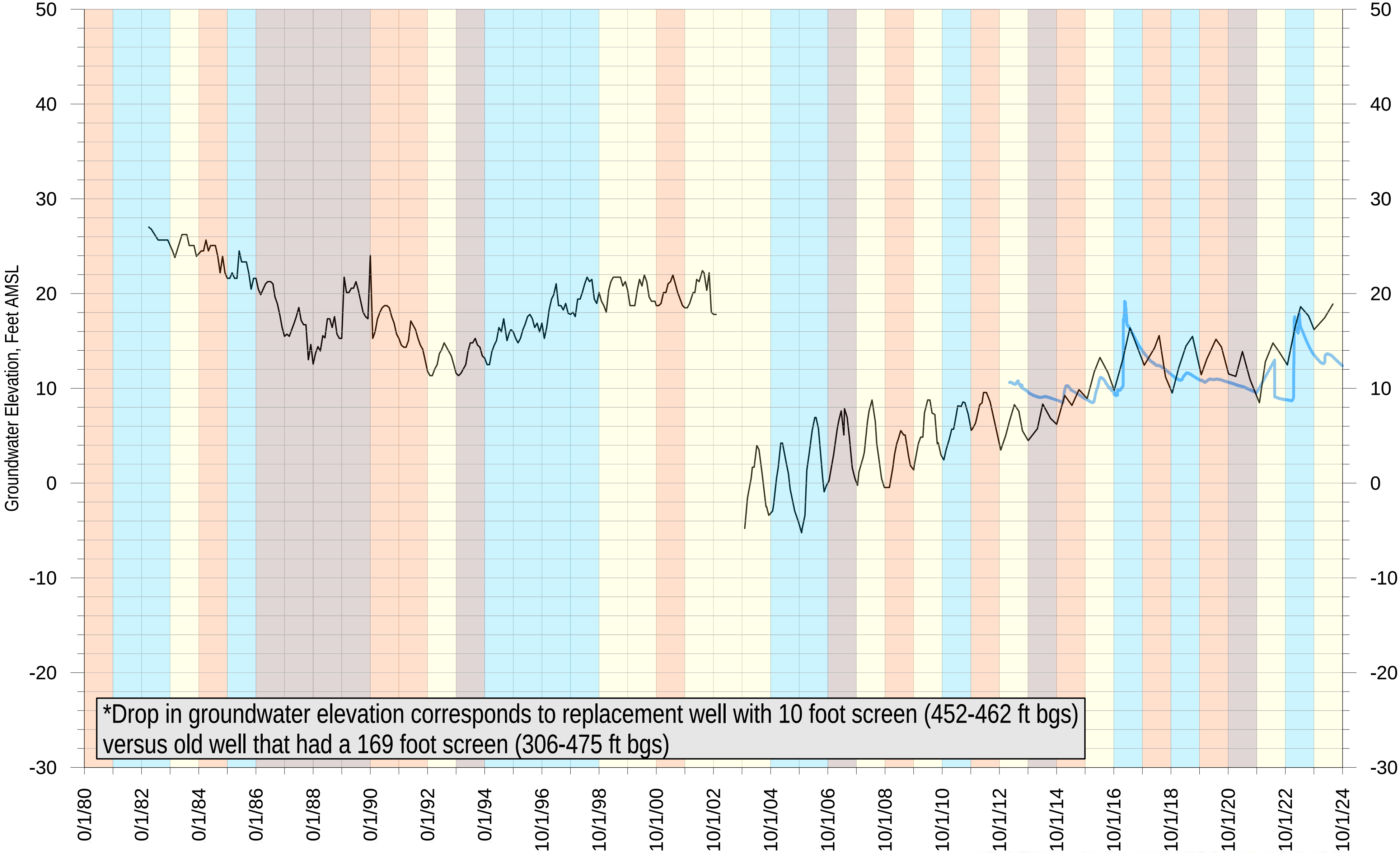


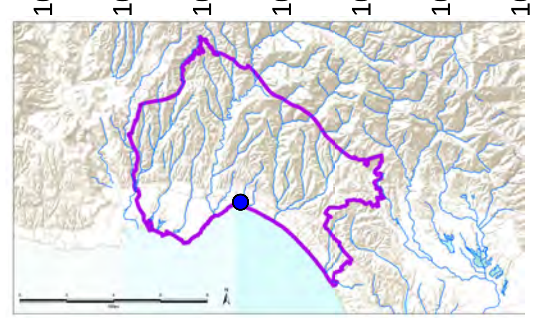
MONTGOMERY & ASSOCIATES

SC-5B & SC-5RB at New Brighton
Aquifer Screened: Purisima B

Appendix A

FIGURE A-135

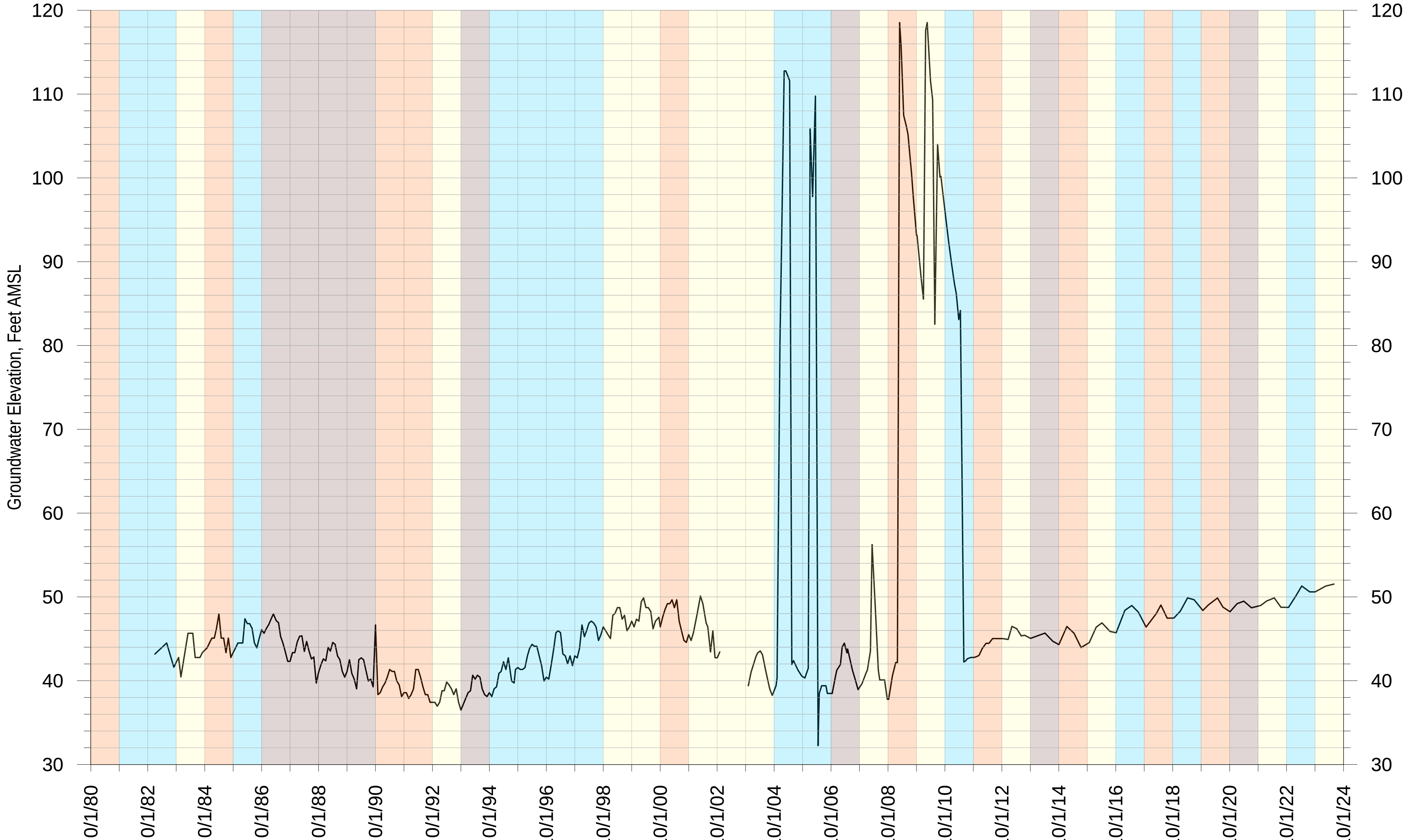


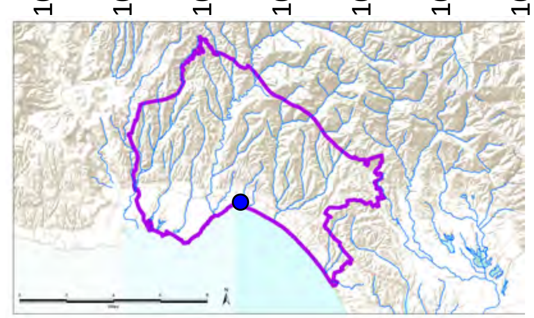


MONTGOMERY & ASSOCIATES

SC-5C & SC-5RC at New Brighton
Aquifer Screened: Purisima BC

Appendix A
FIGURE A-136

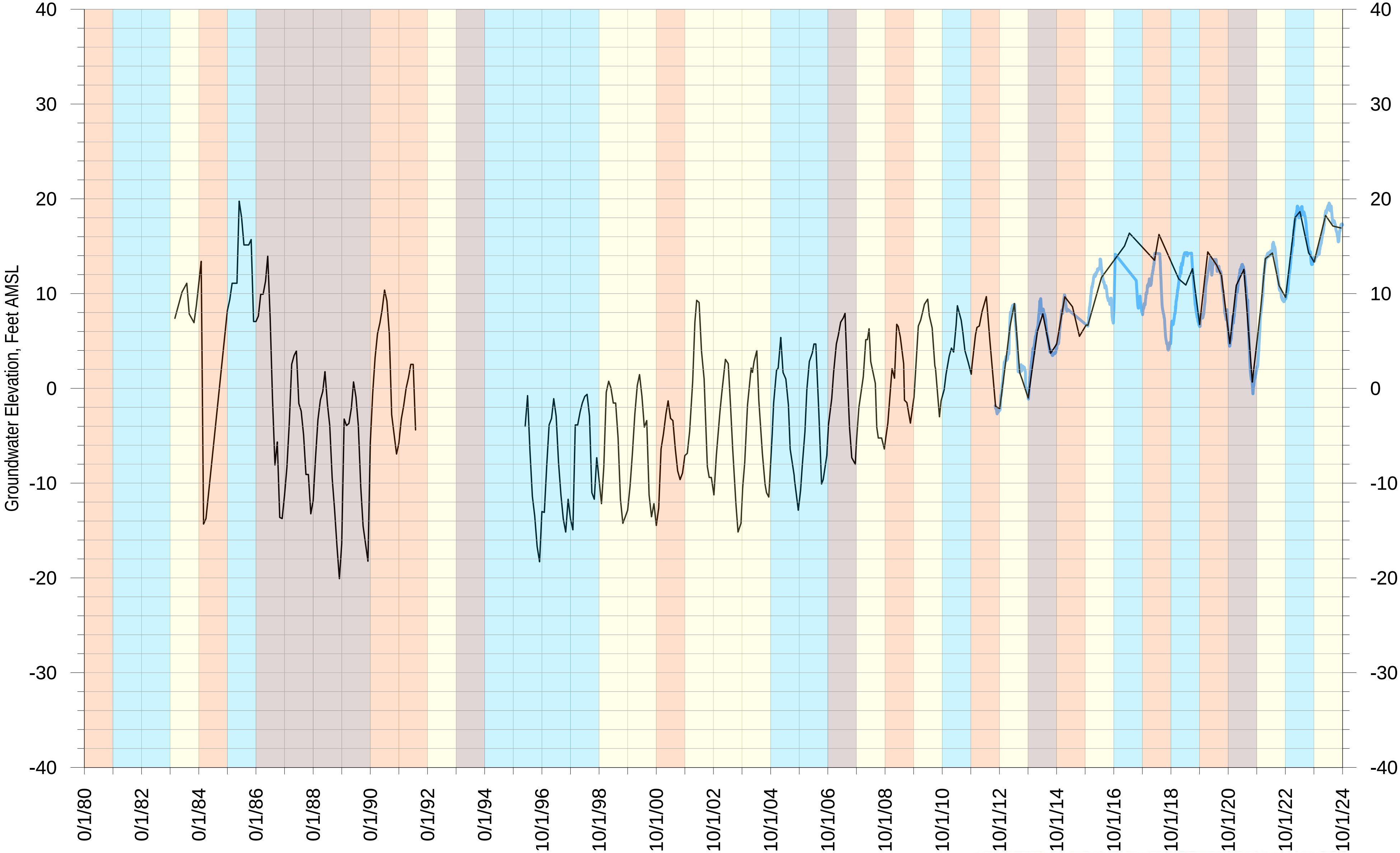


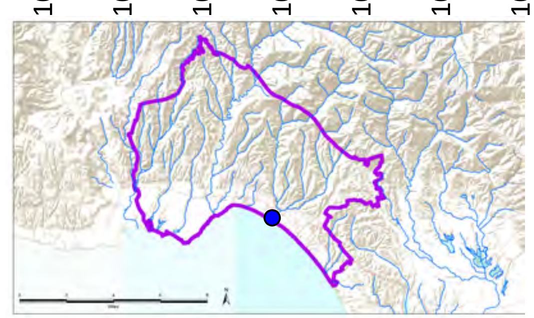


MONTGOMERY
& ASSOCIATES

SC-8A & SC-8RA at Aptos Creek

Aquifer Screened: Purisima A



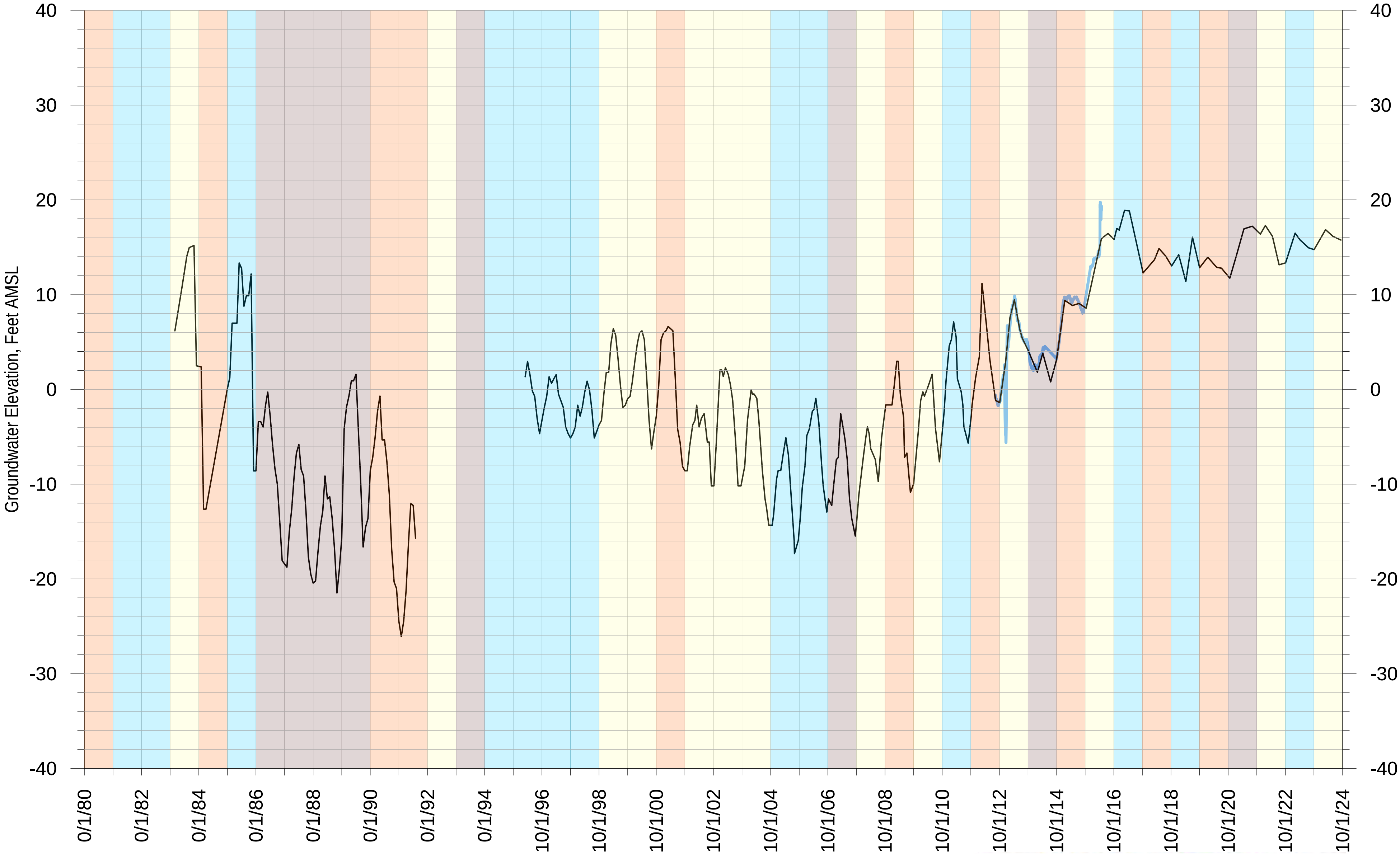


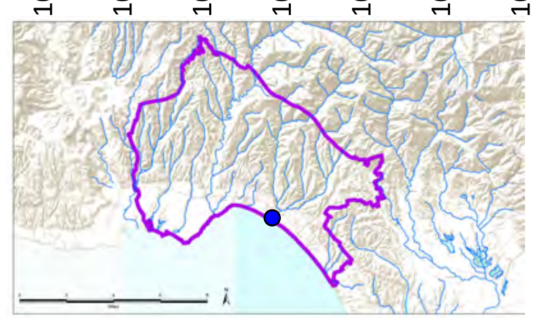
MONTGOMERY & ASSOCIATES

SC-8C & SC-8RC at Aptos Creek
Aquifer Screened: Purisima BC

Appendix A

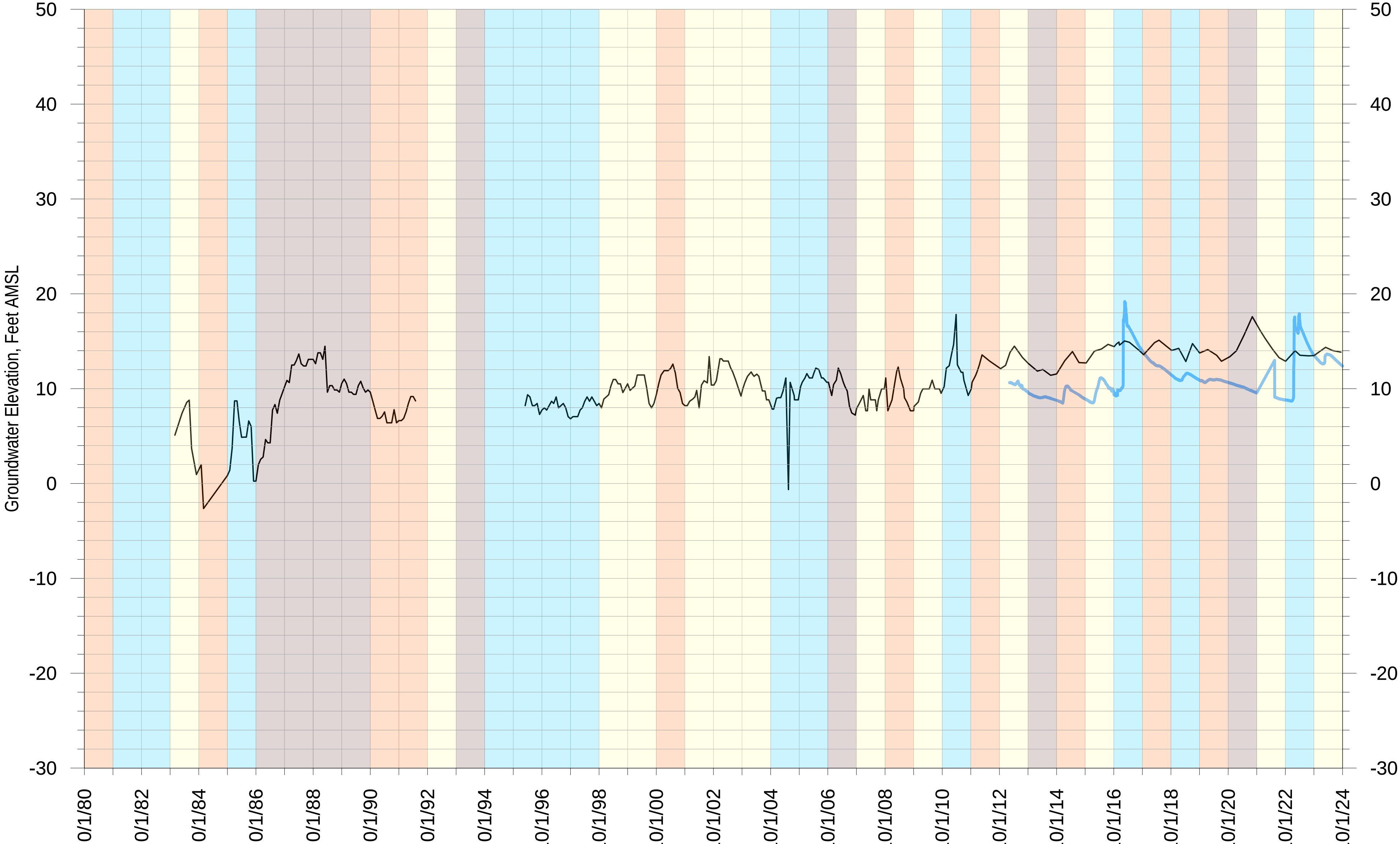
FIGURE A-138

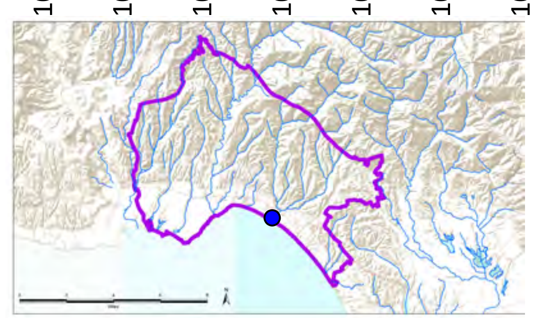




MONTGOMERY & ASSOCIATES

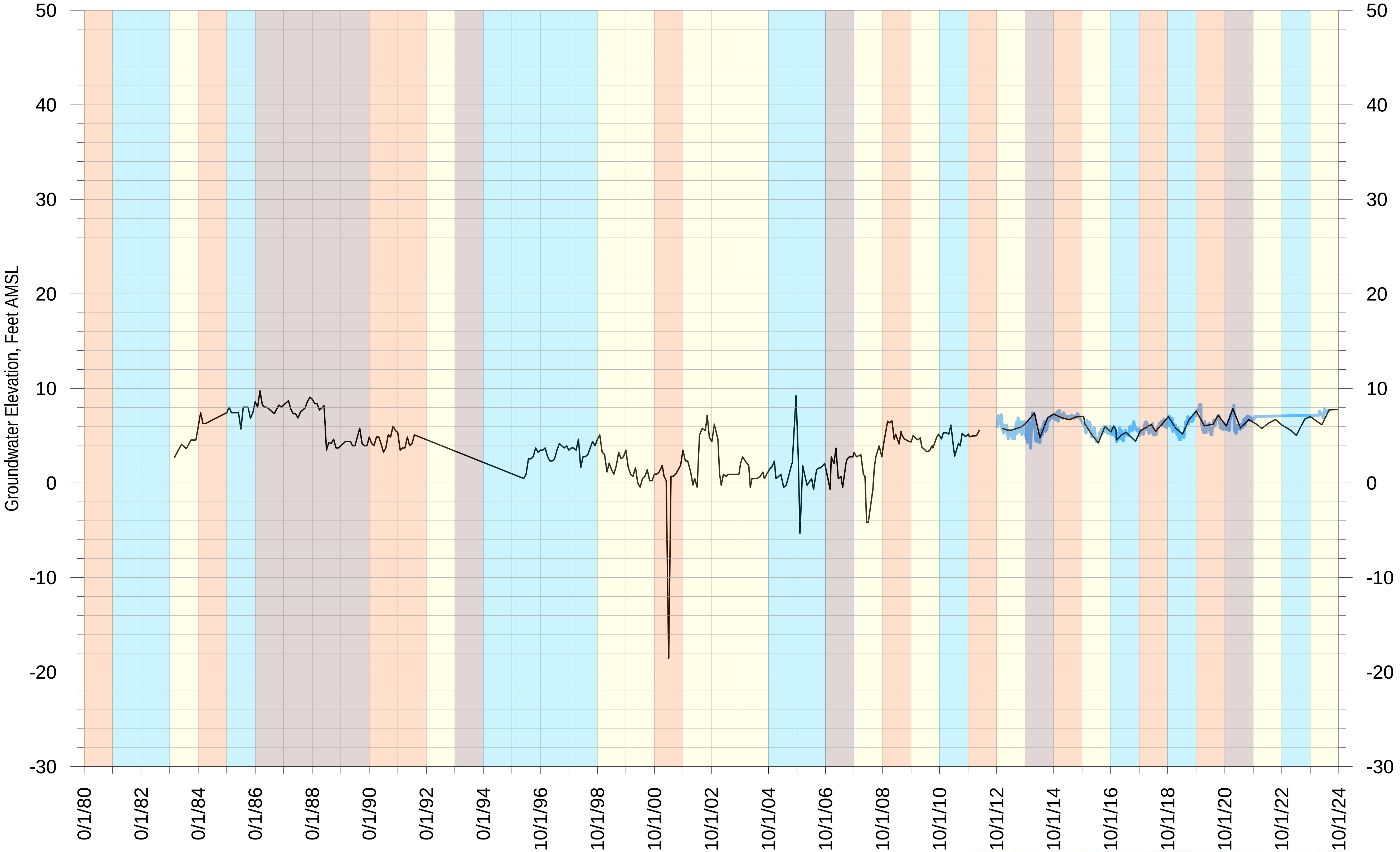
SC-8E & SC-8RE at Aptos Creek
Aquifer Screened: Purisima DEF

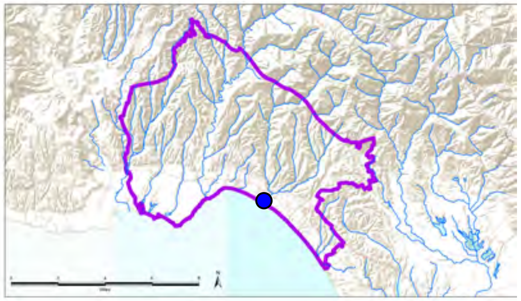




MONTGOMERY
& ASSOCIATES

SC-8F & SC-8RF at Aptos Creek
Aquifer Screened: Purisima F



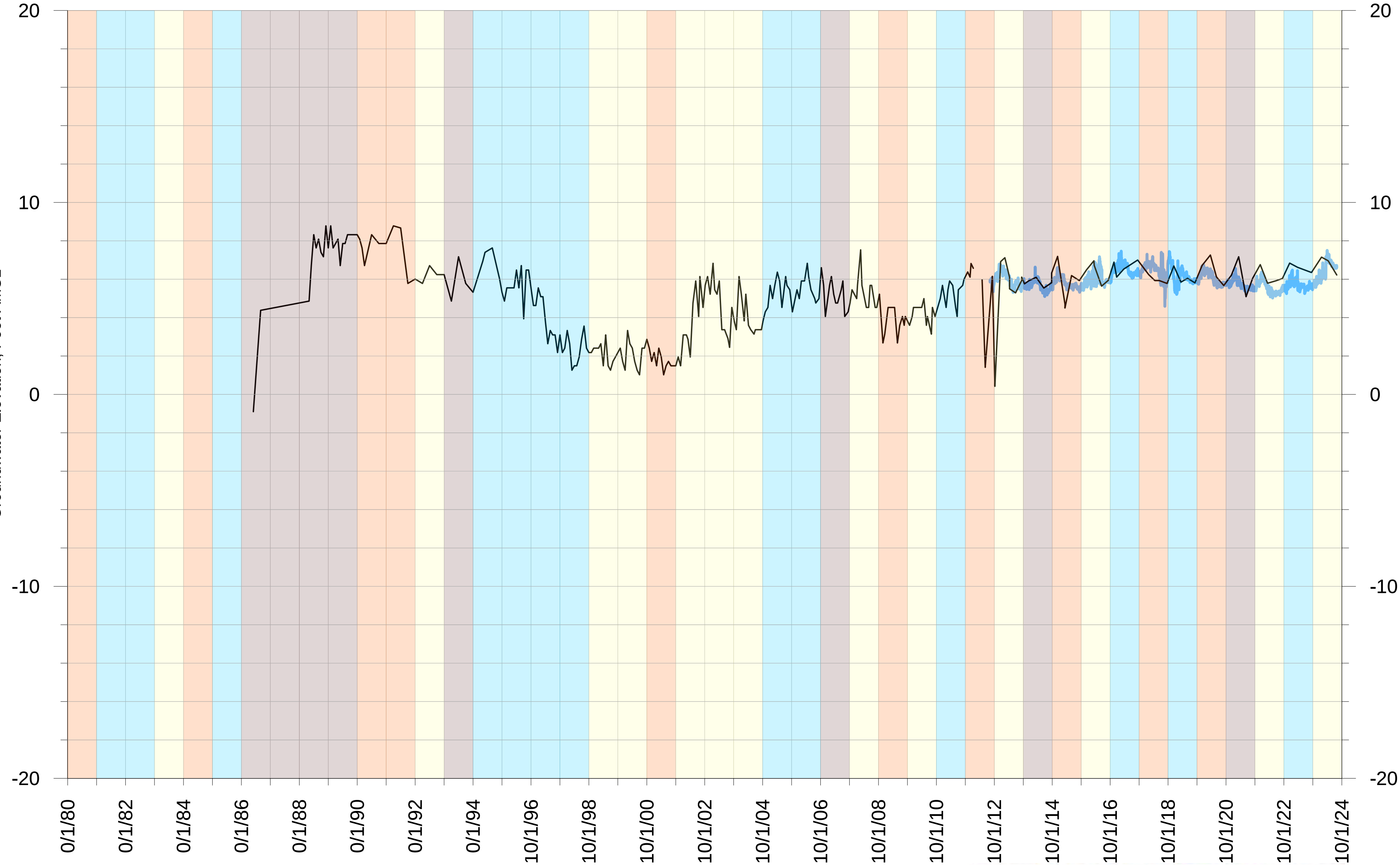


MONTGOMERY & ASSOCIATES

SC-A2B & SC-A2RB at Sumner
Aquifer Screened: Purisima F

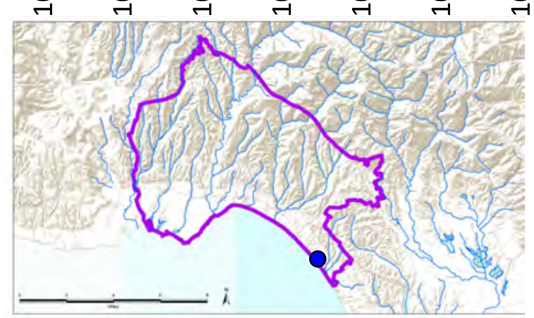
Appendix A

FIGURE A-141



Hand Measurement — Transducer

Critically Dry — Dry — Normal — Wet

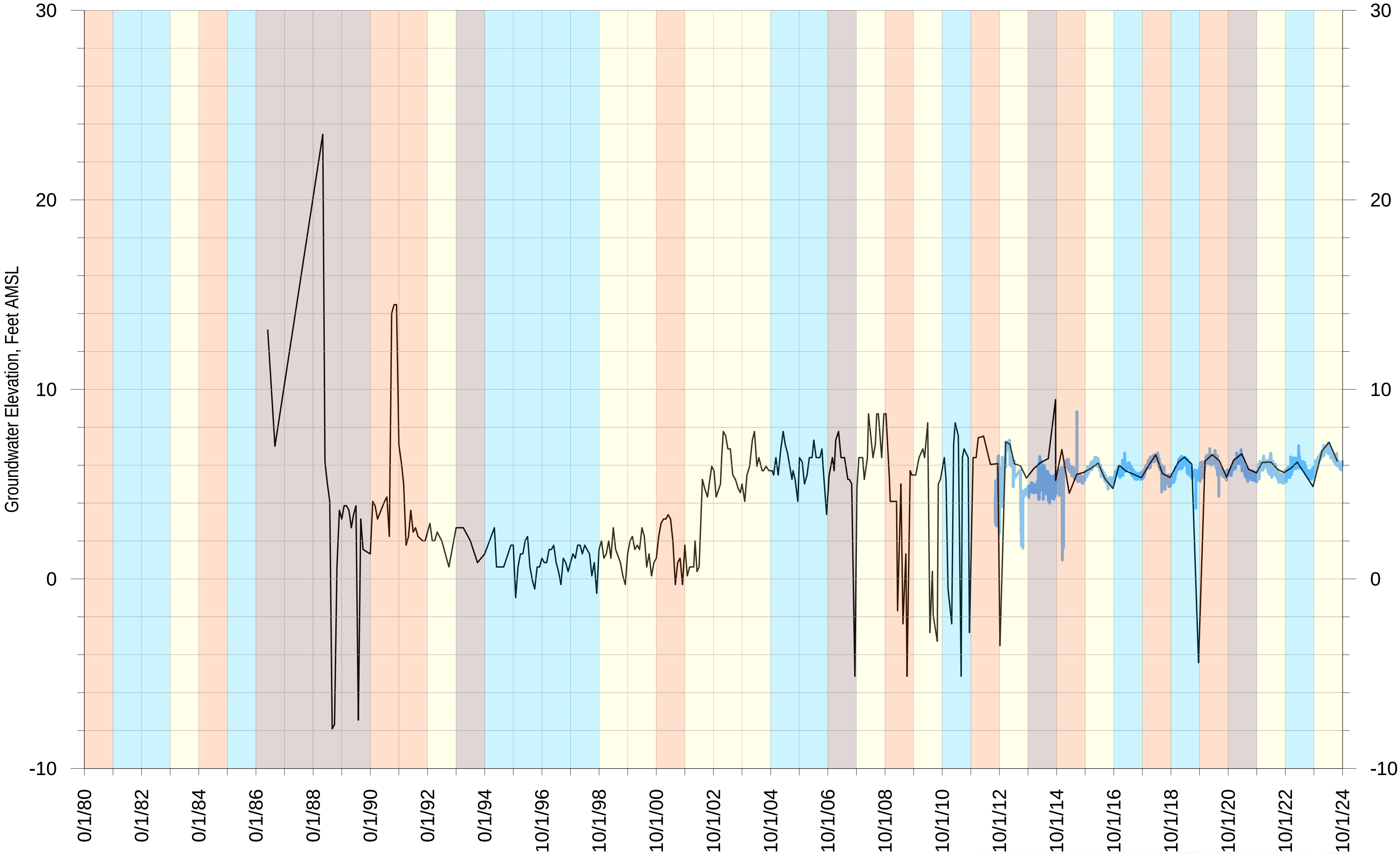


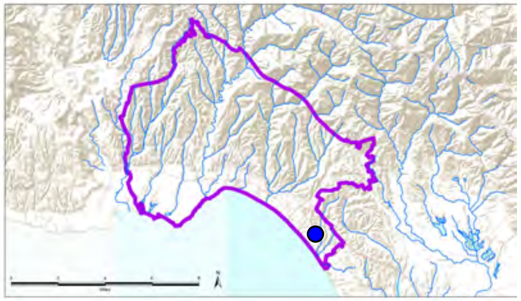
MONTGOMERY & ASSOCIATES

SC-A5C at Seascape
Aquifer Screened: Aromas

Appendix A

FIGURE A-142



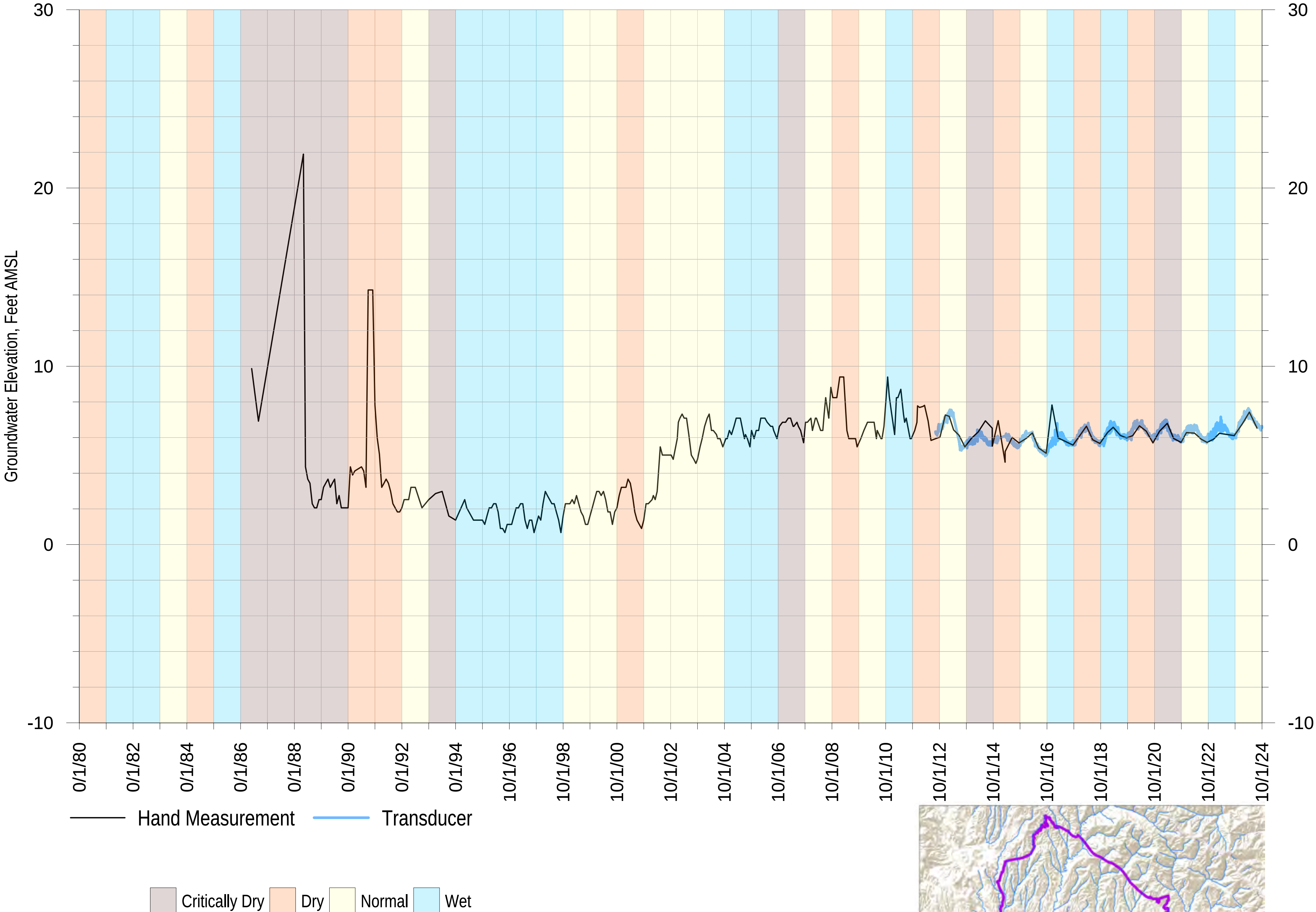


MONTGOMERY & ASSOCIATES

SC-A5D at Seascape
Aquifer Screened: Aromas

Appendix A

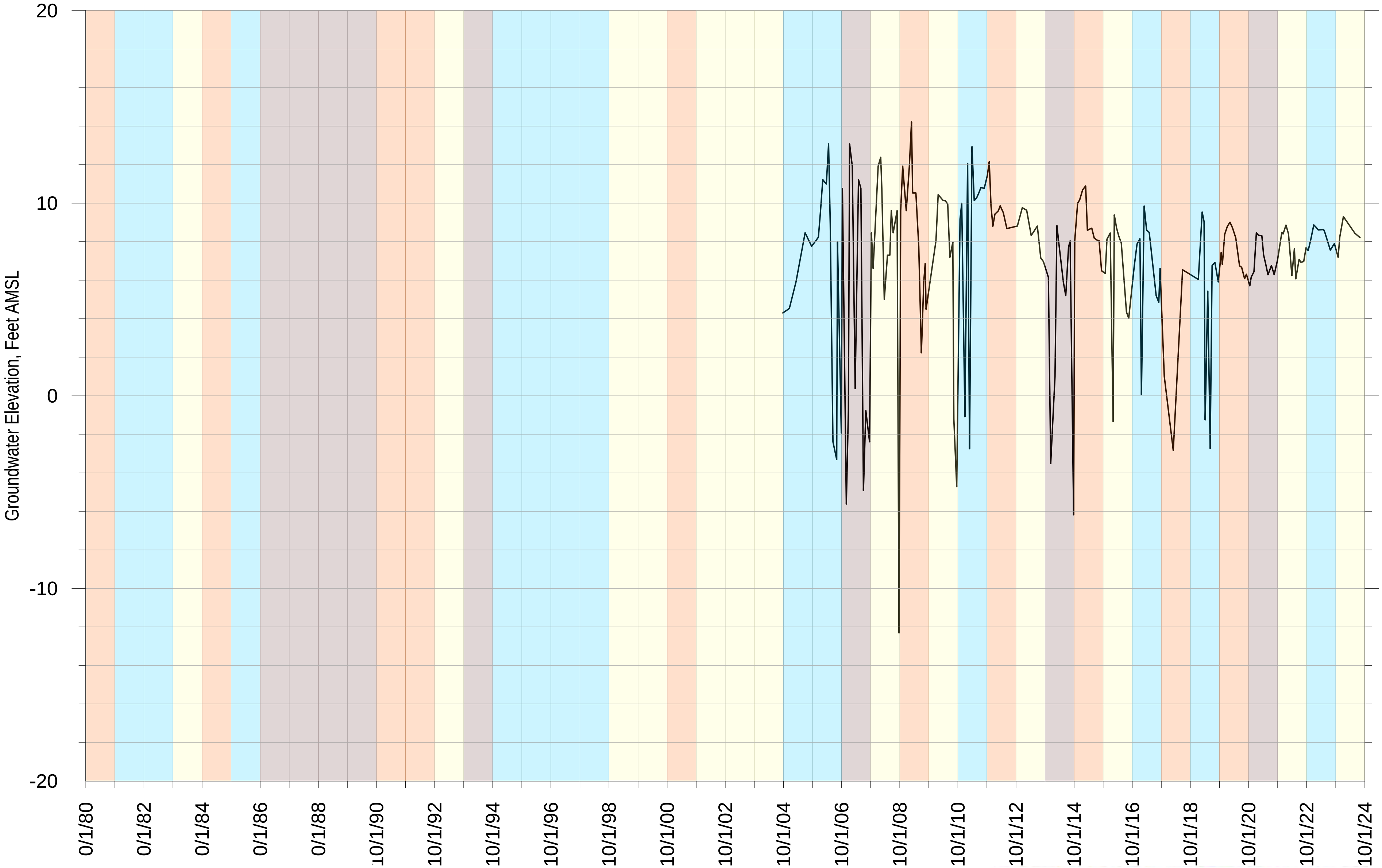
FIGURE A-143



MONTGOMERY
& ASSOCIATES

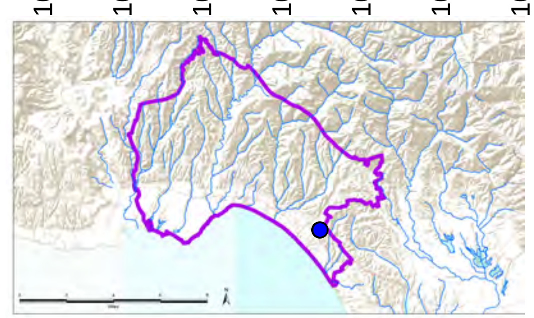
SC-A6A at Bonita
Aquifer Screened: Purisima F

Appendix A
FIGURE A-144



Hand Measurement

Critically Dry
Dry
Normal
Wet

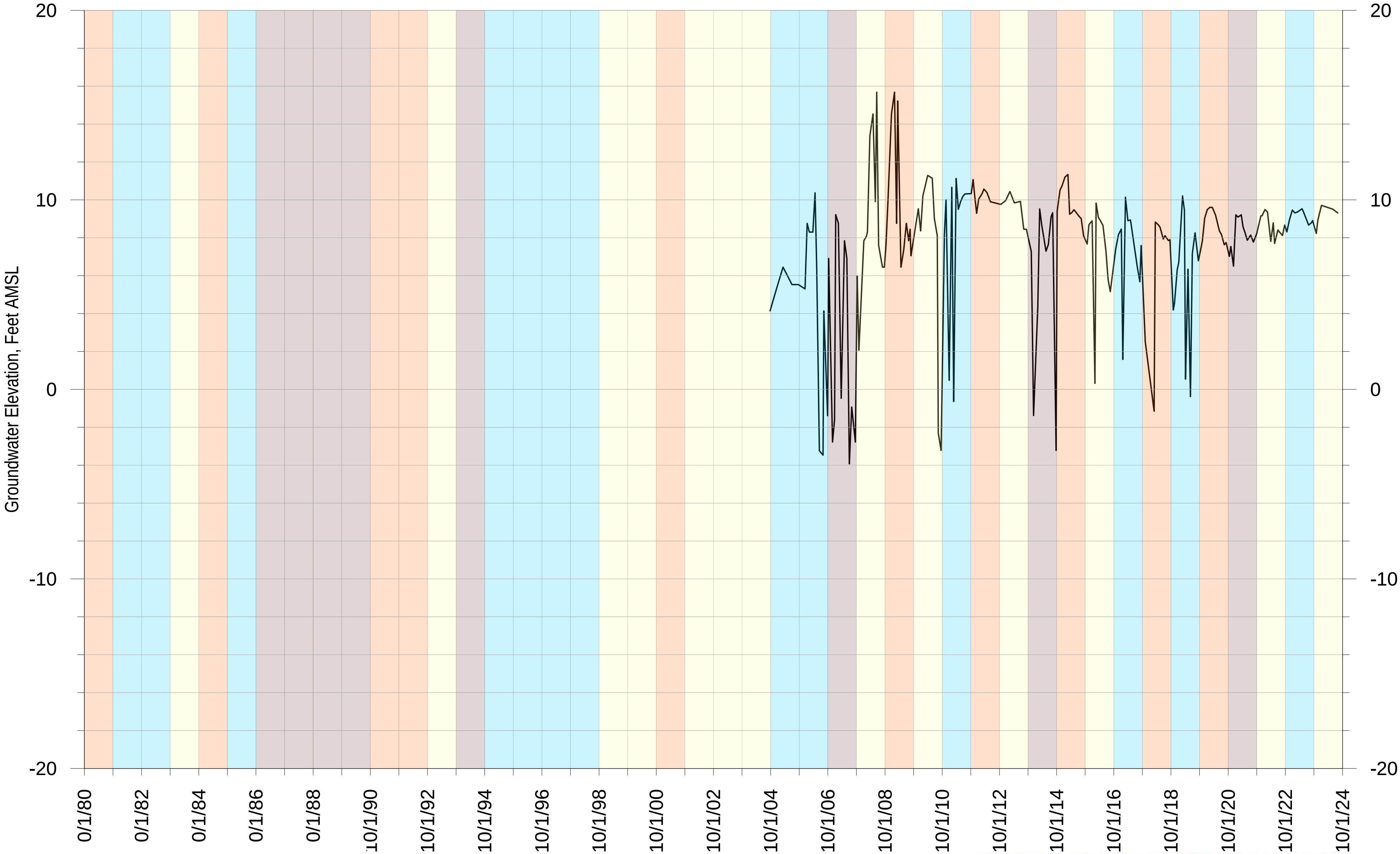


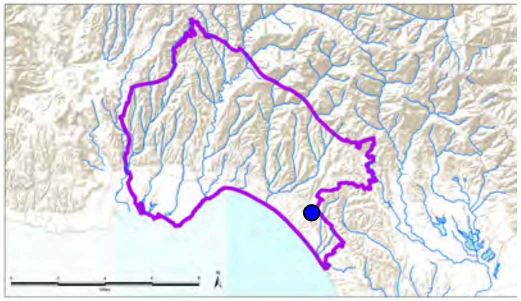
MONTGOMERY & ASSOCIATES

SC-A6B at Bonita
Aquifer Screened: Purisima F

Appendix A

FIGURE A-145



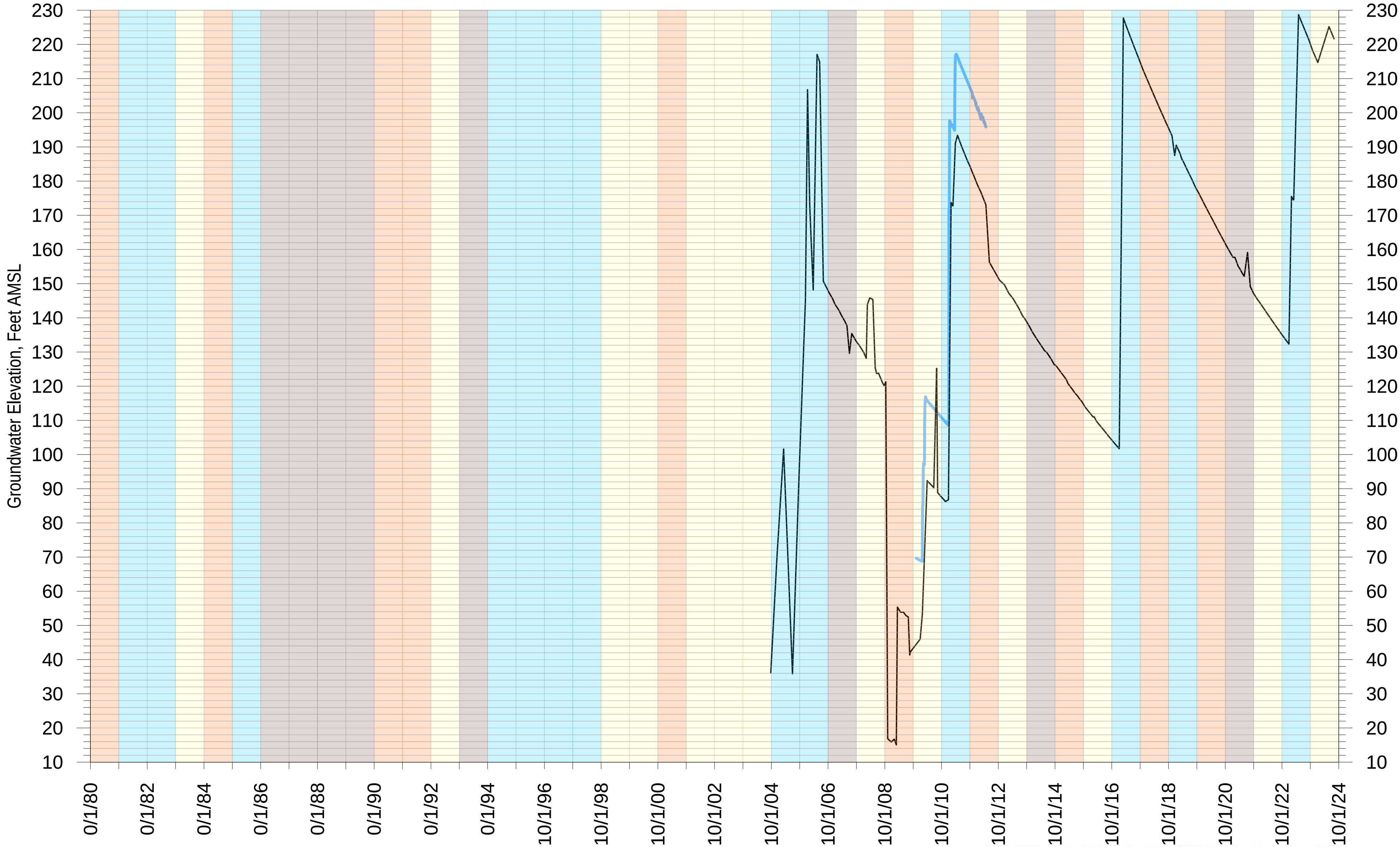


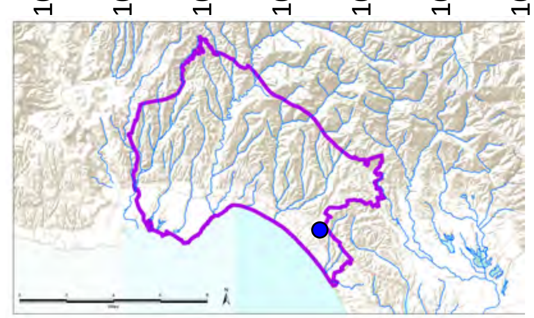
MONTGOMERY & ASSOCIATES

SC-A6C at Bonita
Aquifer Screened: Aromas

Appendix A

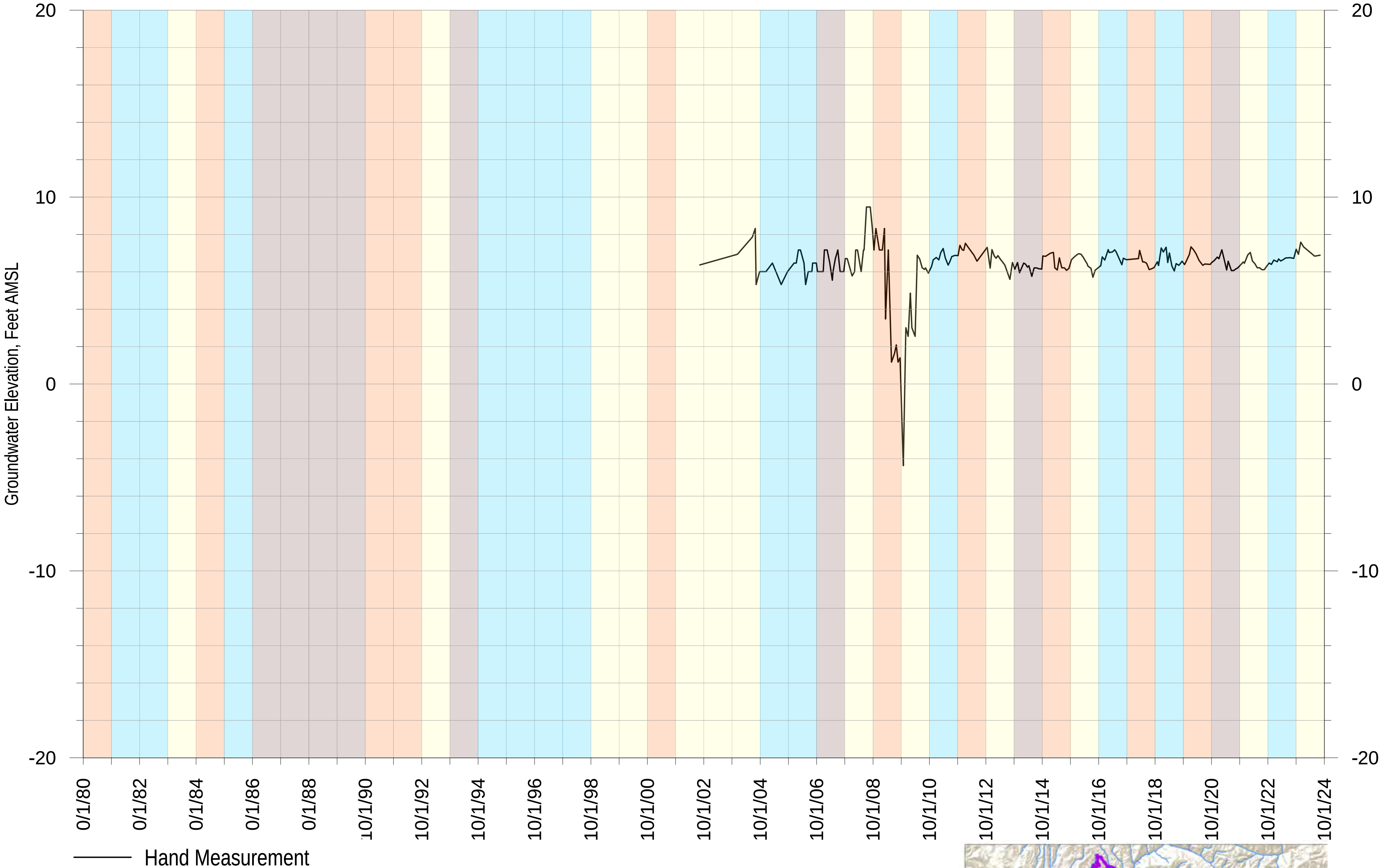
FIGURE A-146

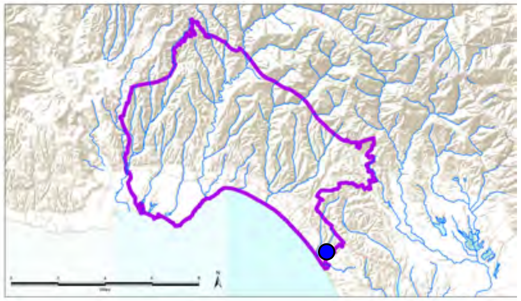




MONTGOMERY & ASSOCIATES

SC-A7B at Sells
Aquifer Screened: Purisima F





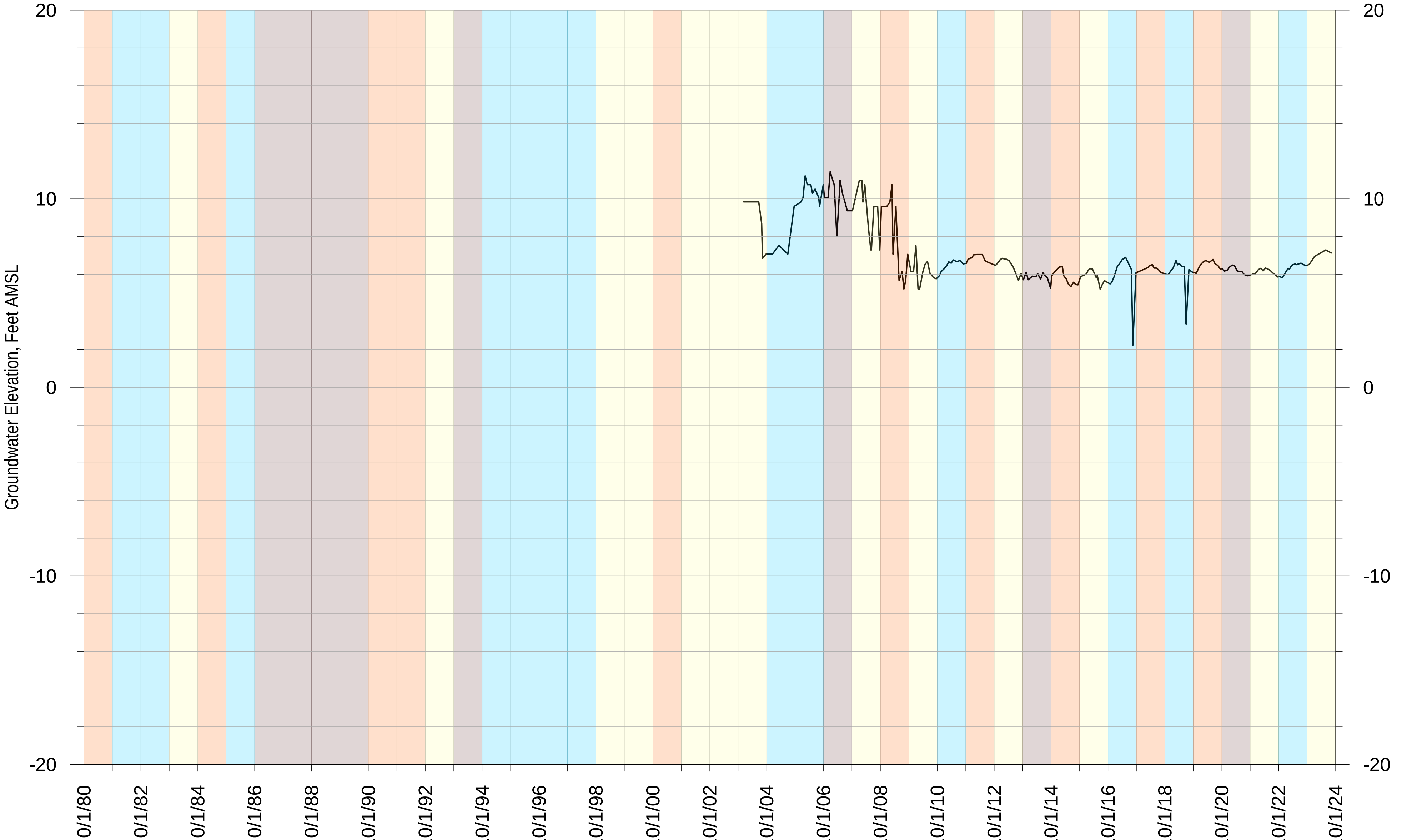
MONTGOMERY & ASSOCIATES

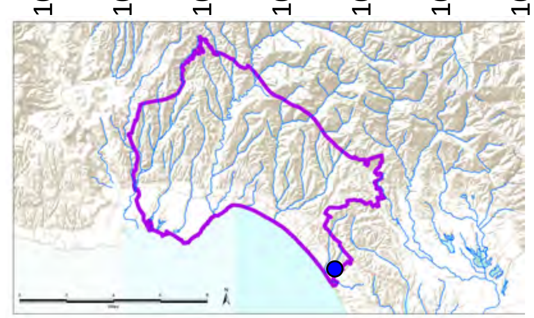
SC-A7D at Sells

Aquifer Screened: Aromas

Appendix A

FIGURE A-148



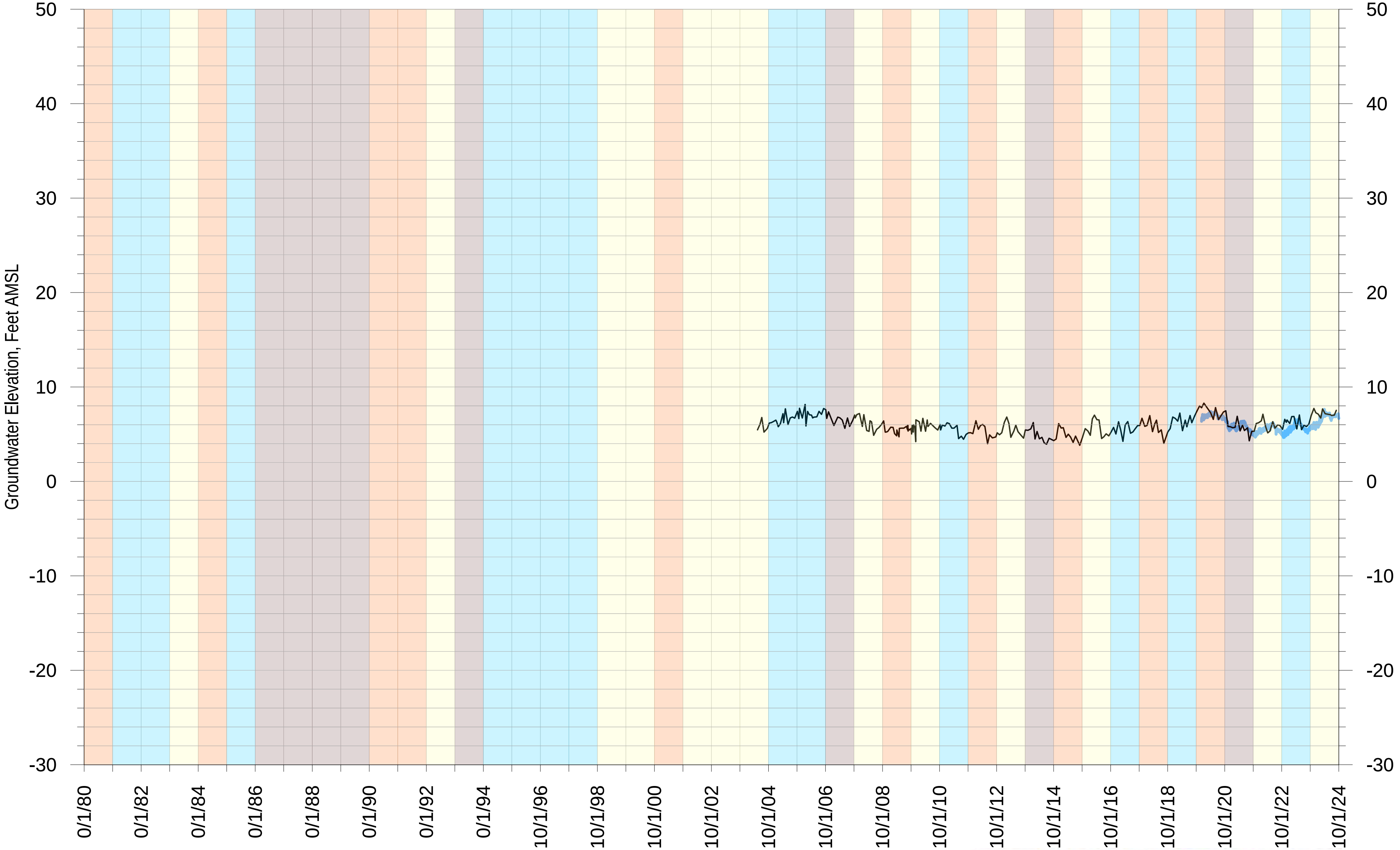


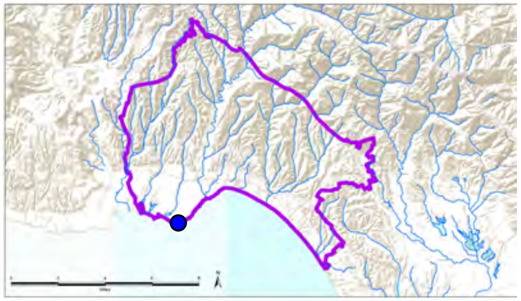
MONTGOMERY & ASSOCIATES

Soquel Point Shallow
Aquifer Screened: Purisima A

Appendix A

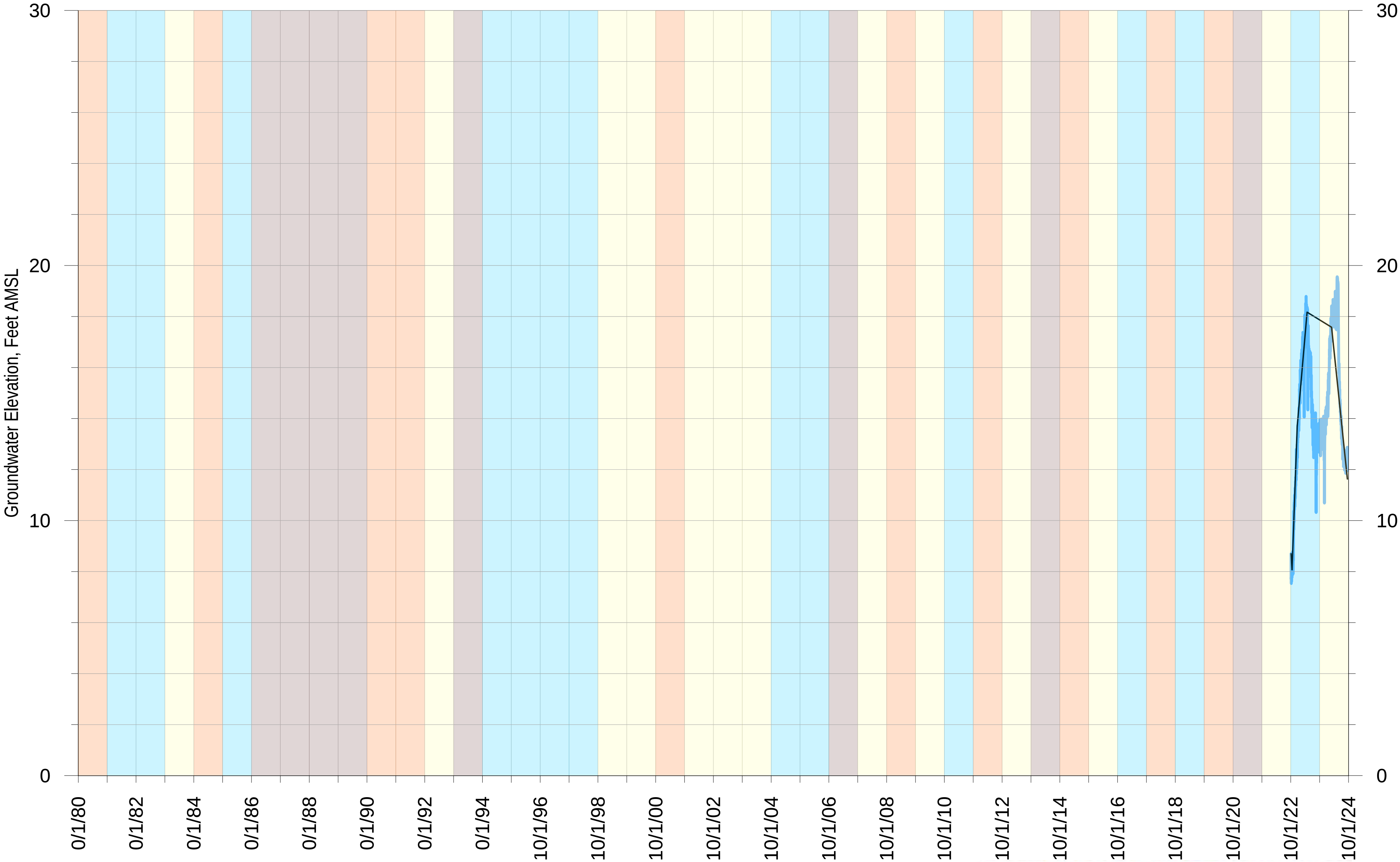
FIGURE A-149

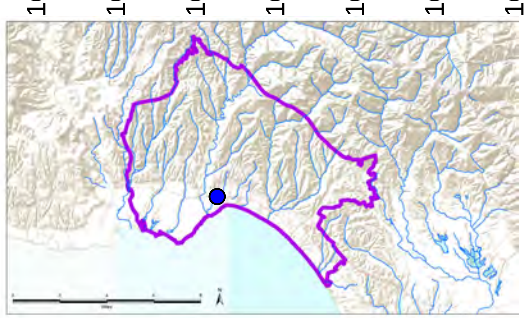




MONTGOMERY & ASSOCIATES

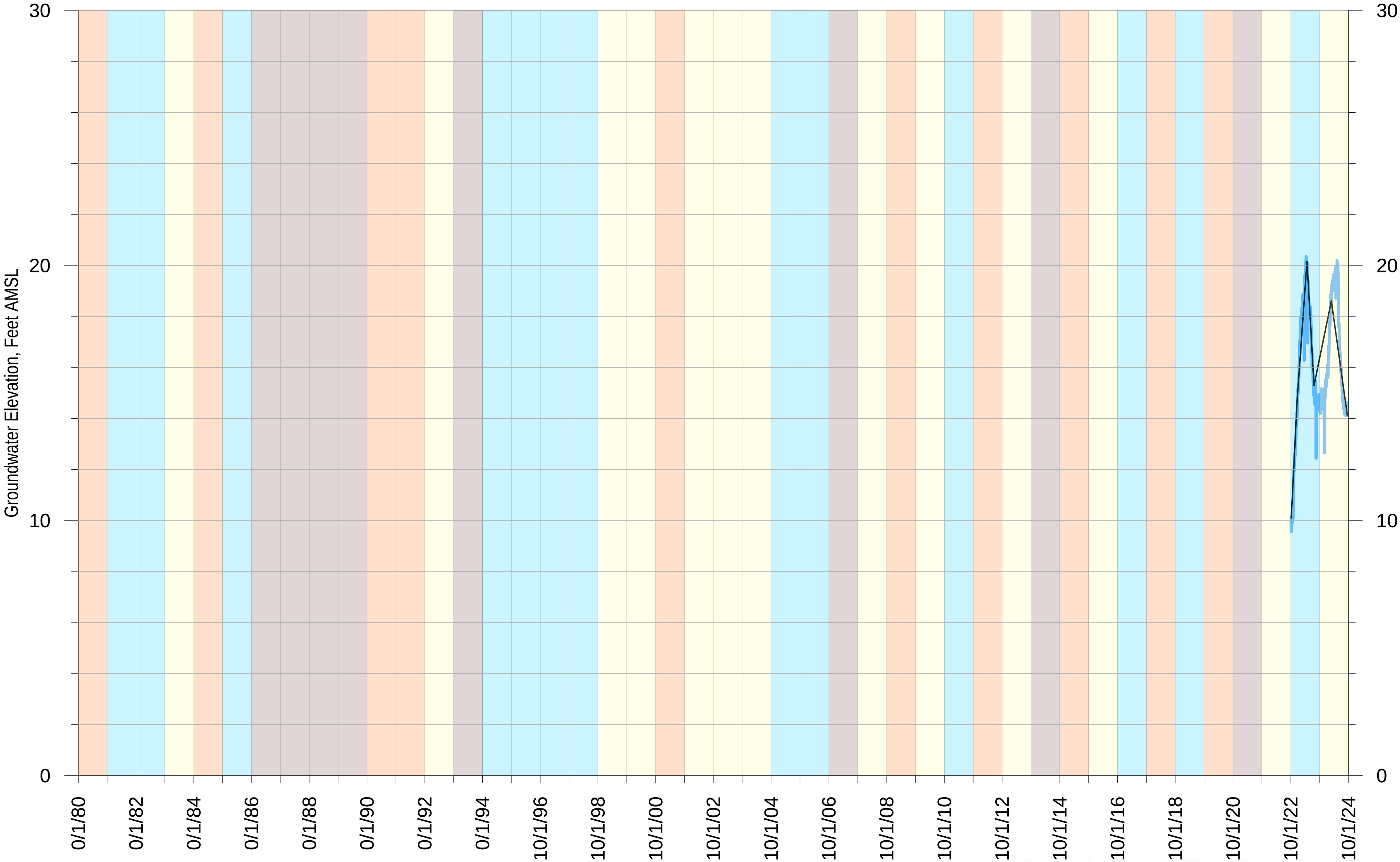
MM-1
Aquifer Screened: Purisima A

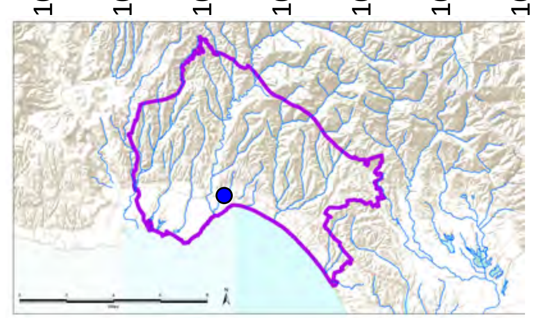




MONTGOMERY
& ASSOCIATES

MM-2
Aquifer Screened: Purisima A

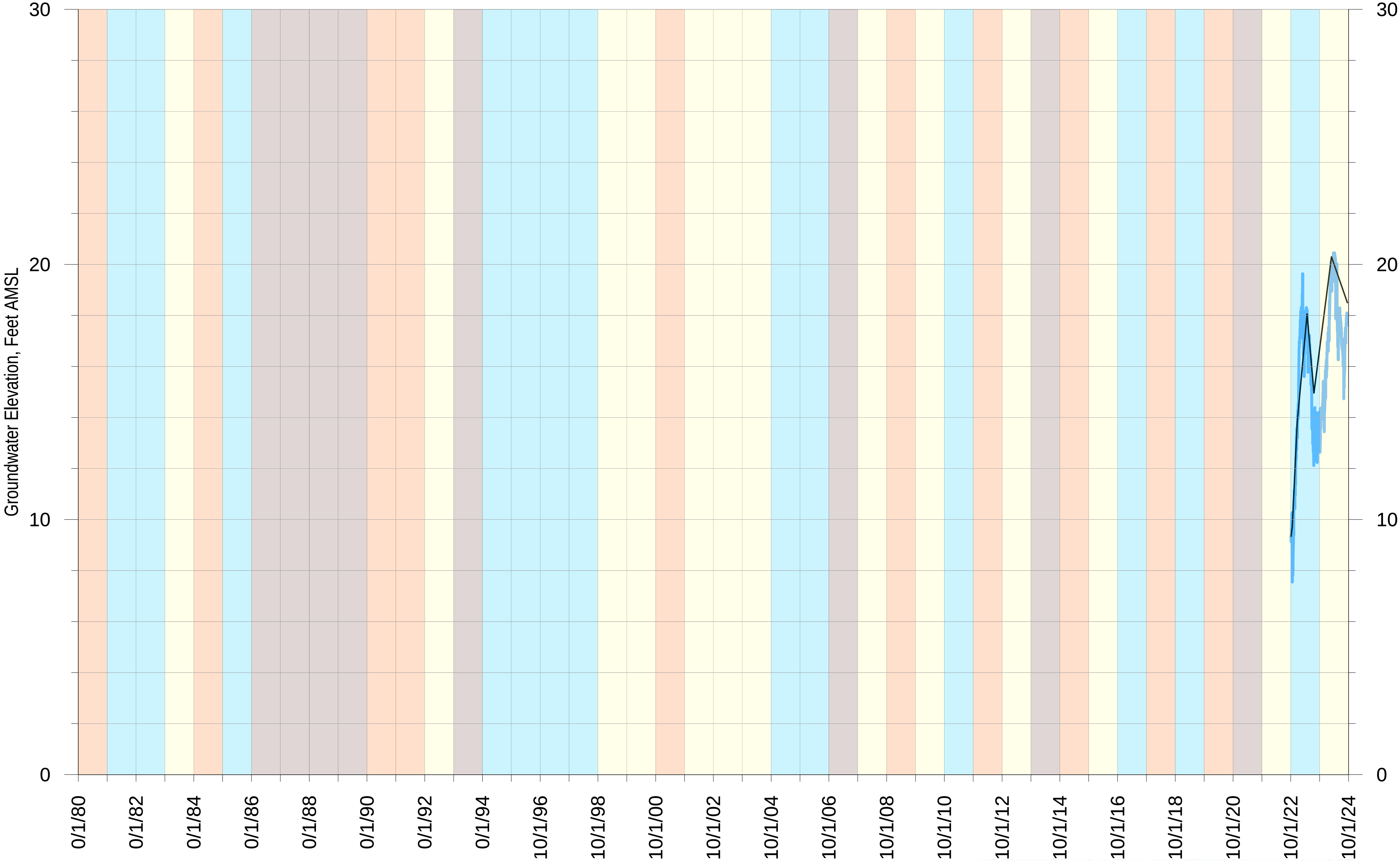


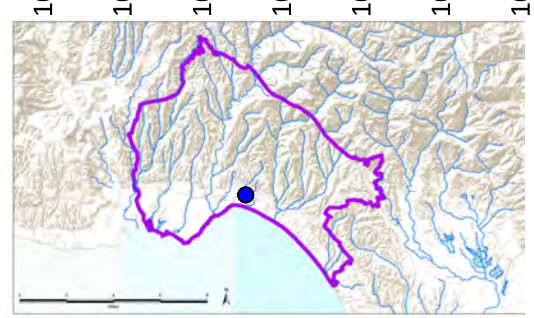


MONTGOMERY & ASSOCIATES

TLM-1A
Aquifer Screened: Purisima A, Purisima BC

Appendix A
FIGURE A-152



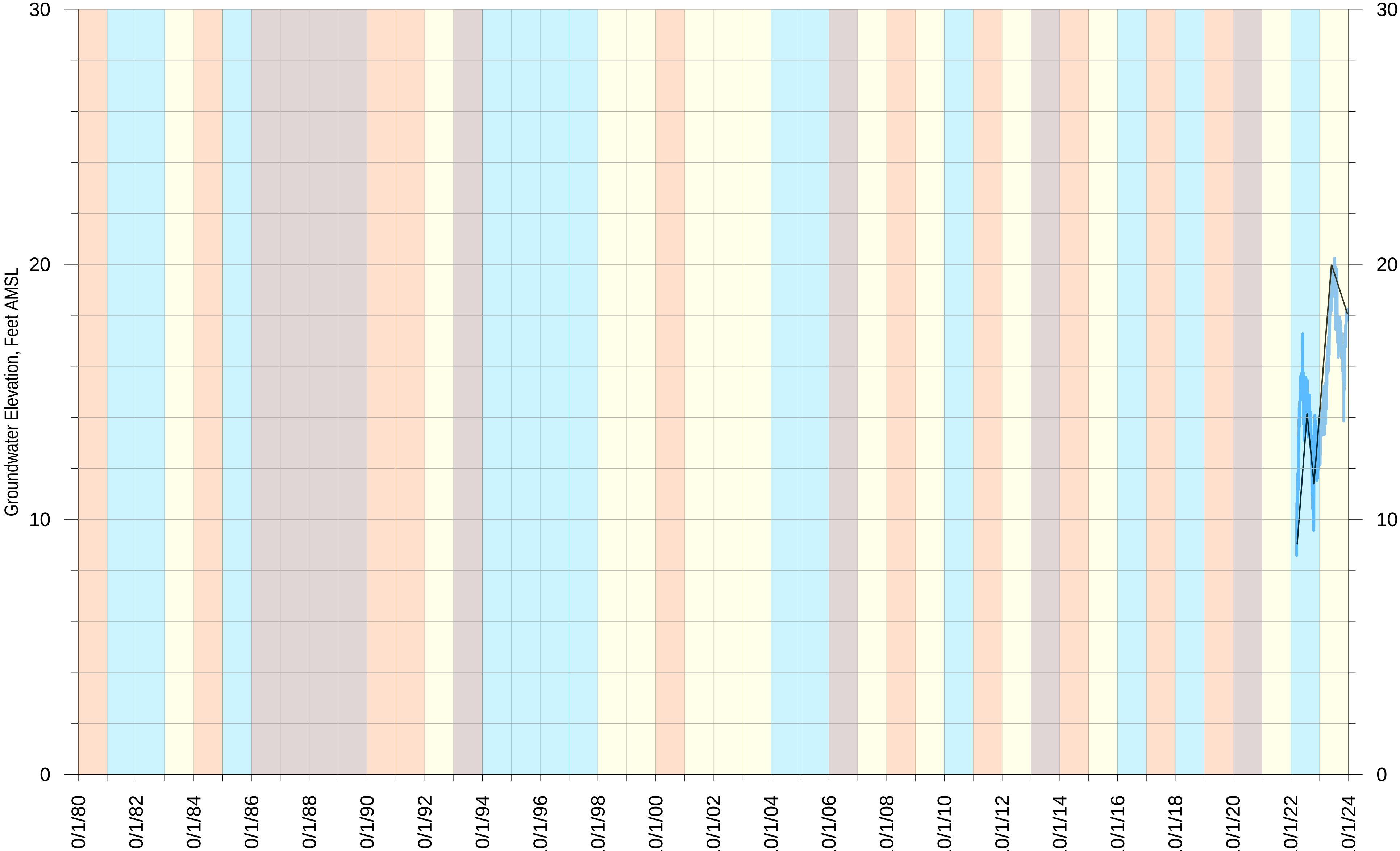


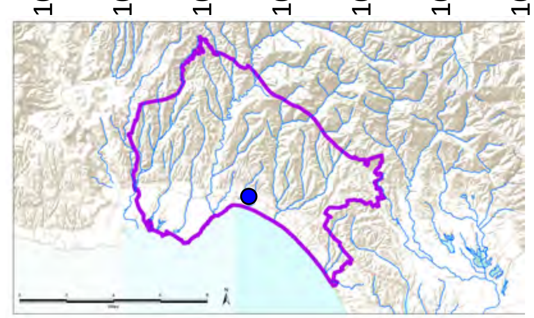
MONTGOMERY
& ASSOCIATES

TLM-2A
Aquifer Screened: Purisima A

Appendix A

FIGURE A-153

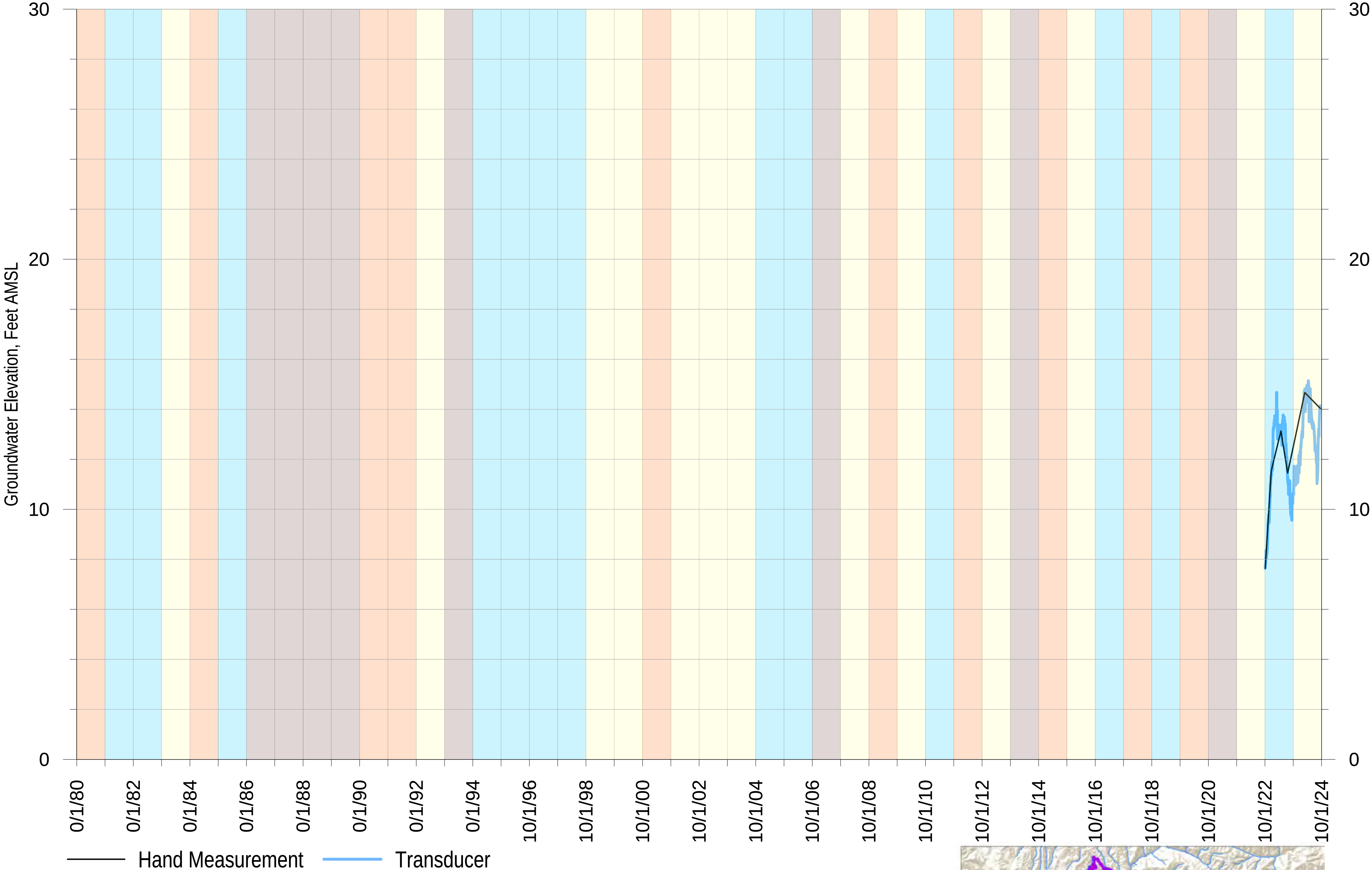


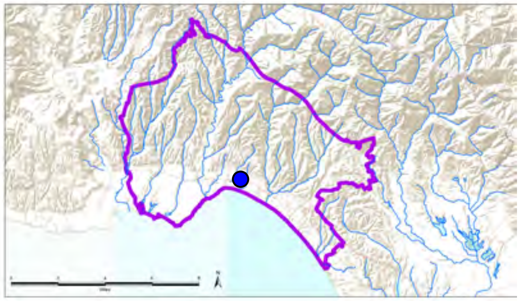


TLM-2BC
Aquifer Screened: Purisima BC

Appendix A

FIGURE A-154



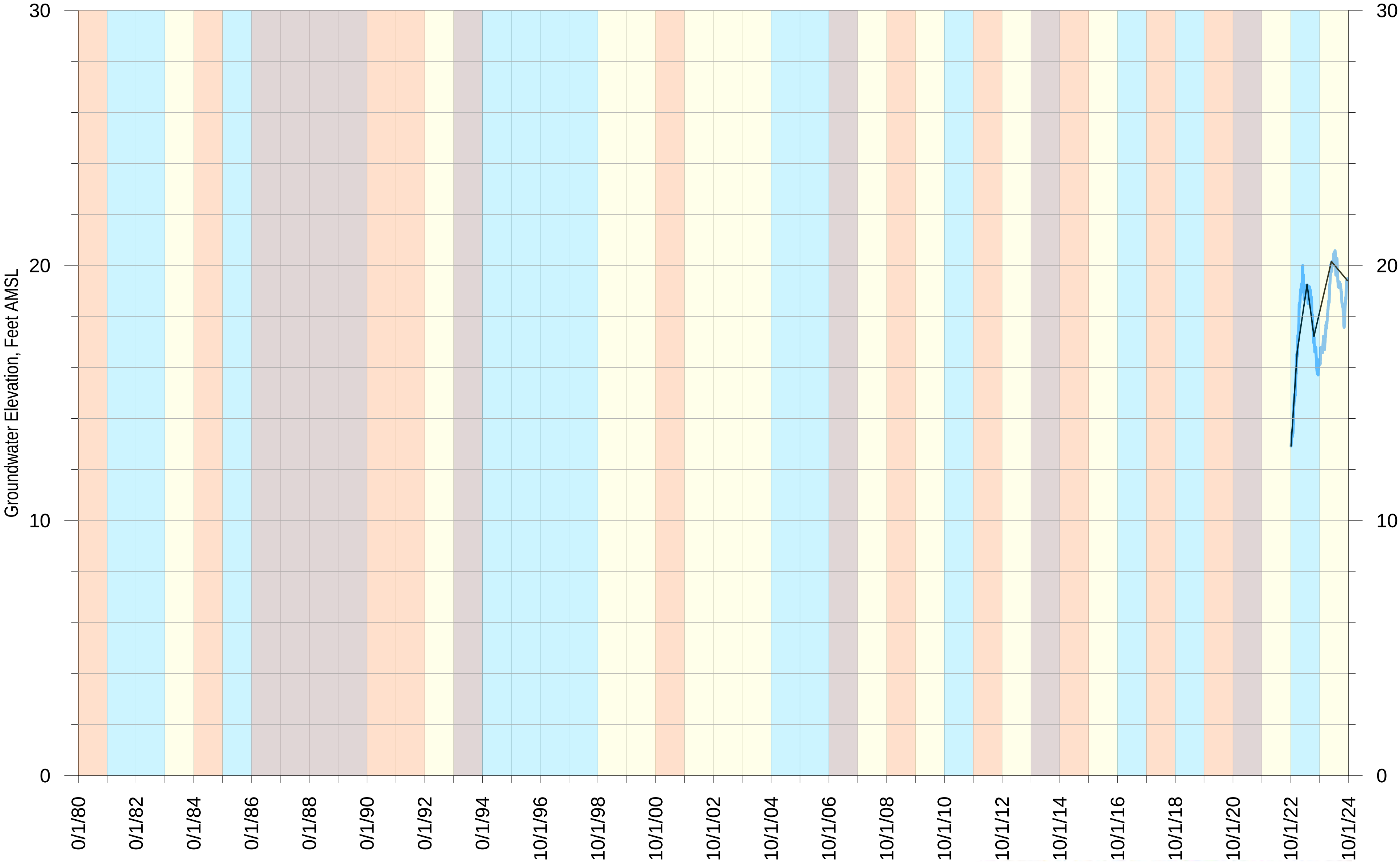


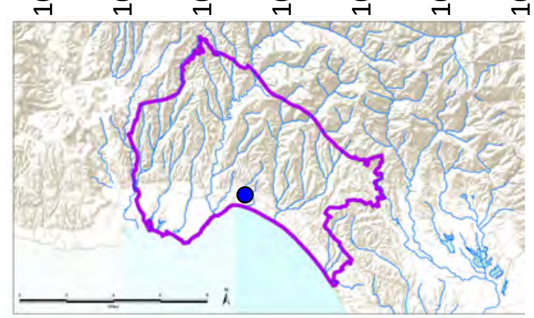
MONTGOMERY & ASSOCIATES

TLM-3BC
Aquifer Screened: Purisima BC

Appendix A

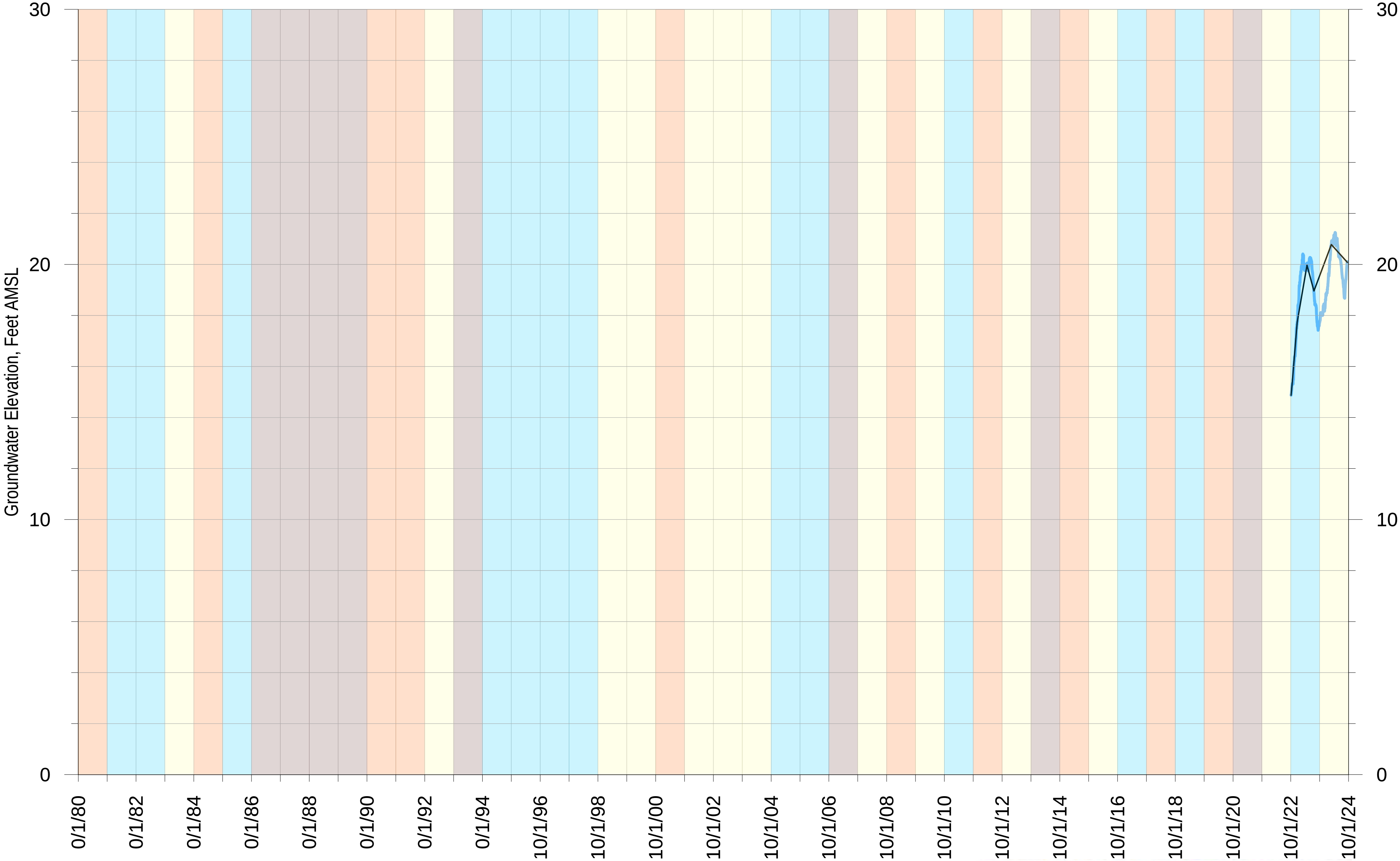
FIGURE A-155

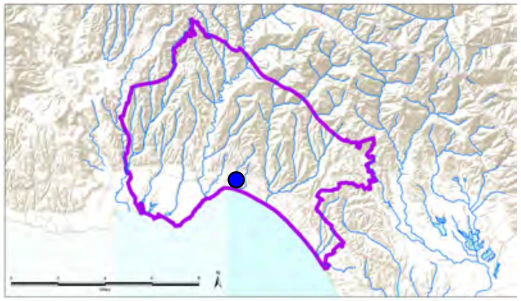




MONTGOMERY
& ASSOCIATES

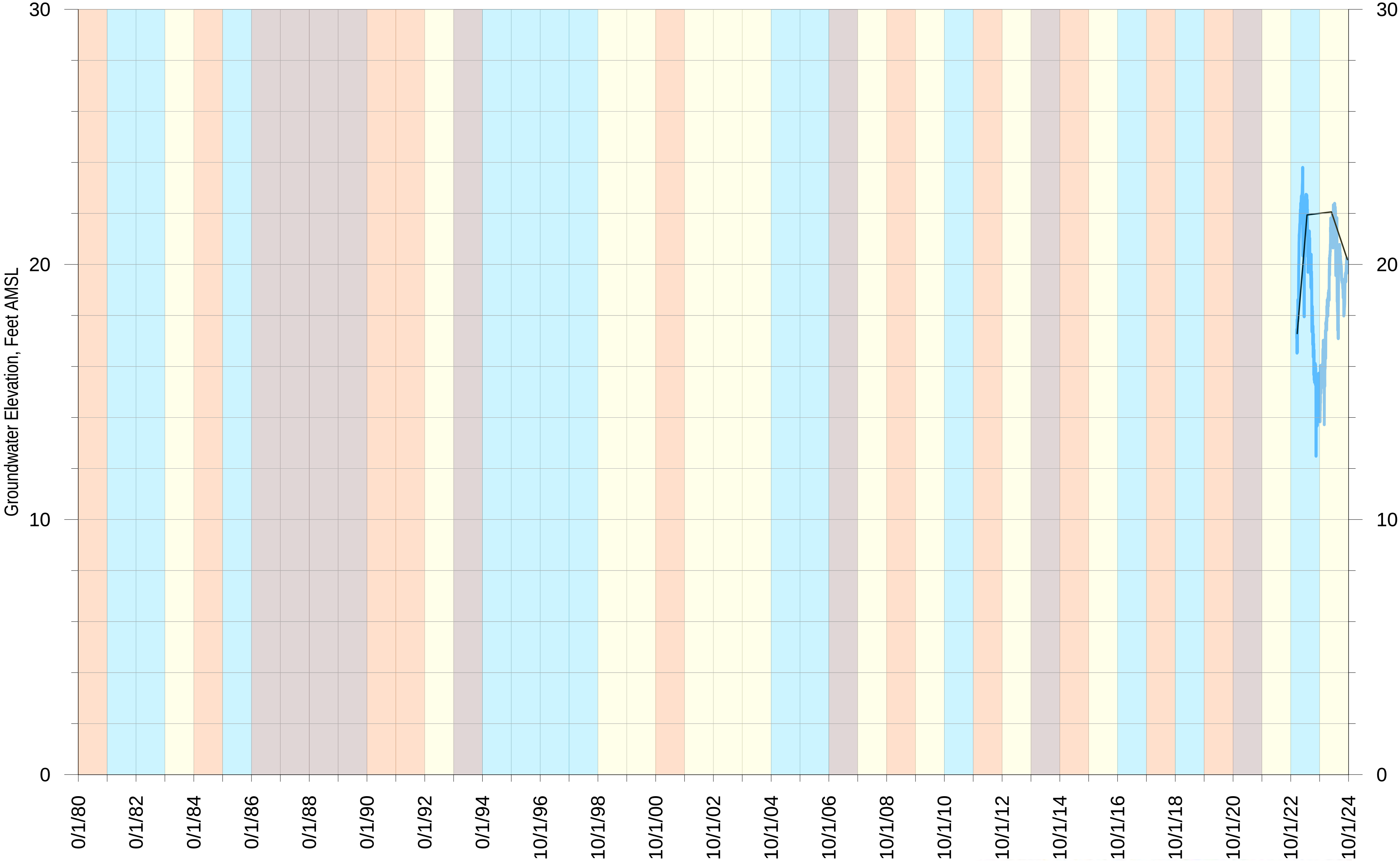
TLM-4BC
Aquifer Screened: Purisima BC

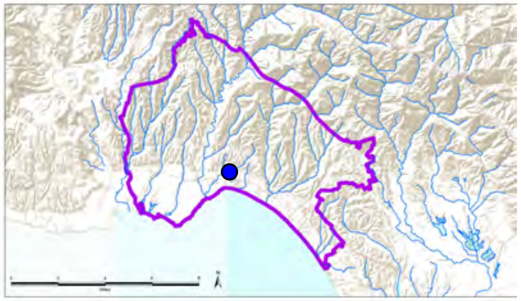




MONTGOMERY
& ASSOCIATES

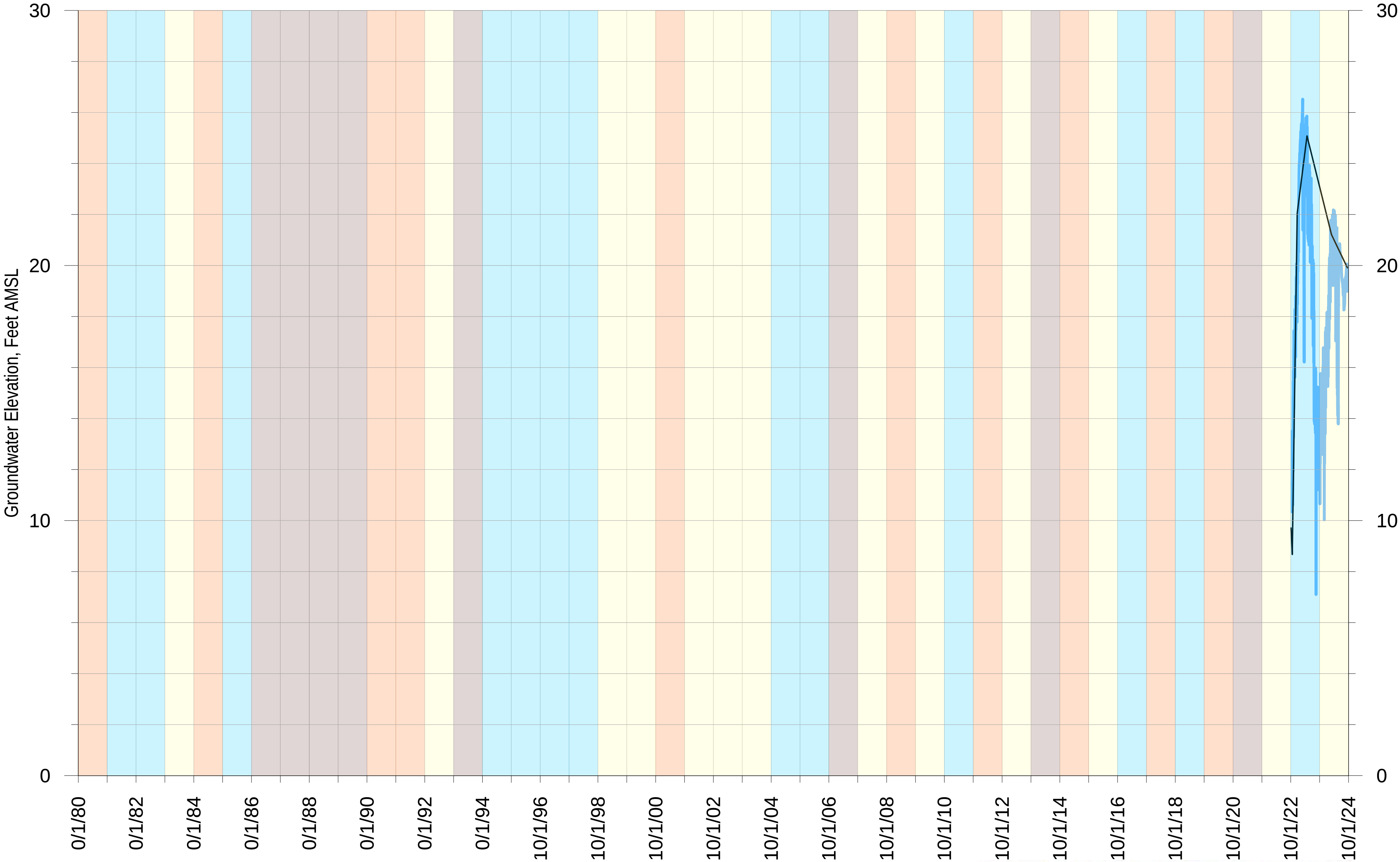
WM-1
Aquifer Screened: Purisima A

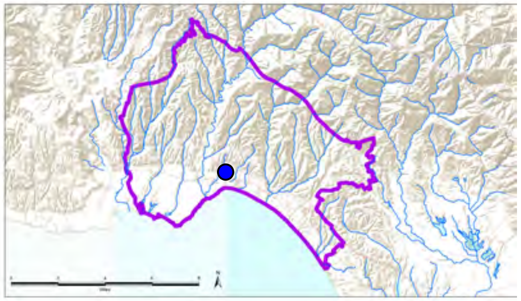




MONTGOMERY & ASSOCIATES

WM-2
Aquifer Screened: Purisima A





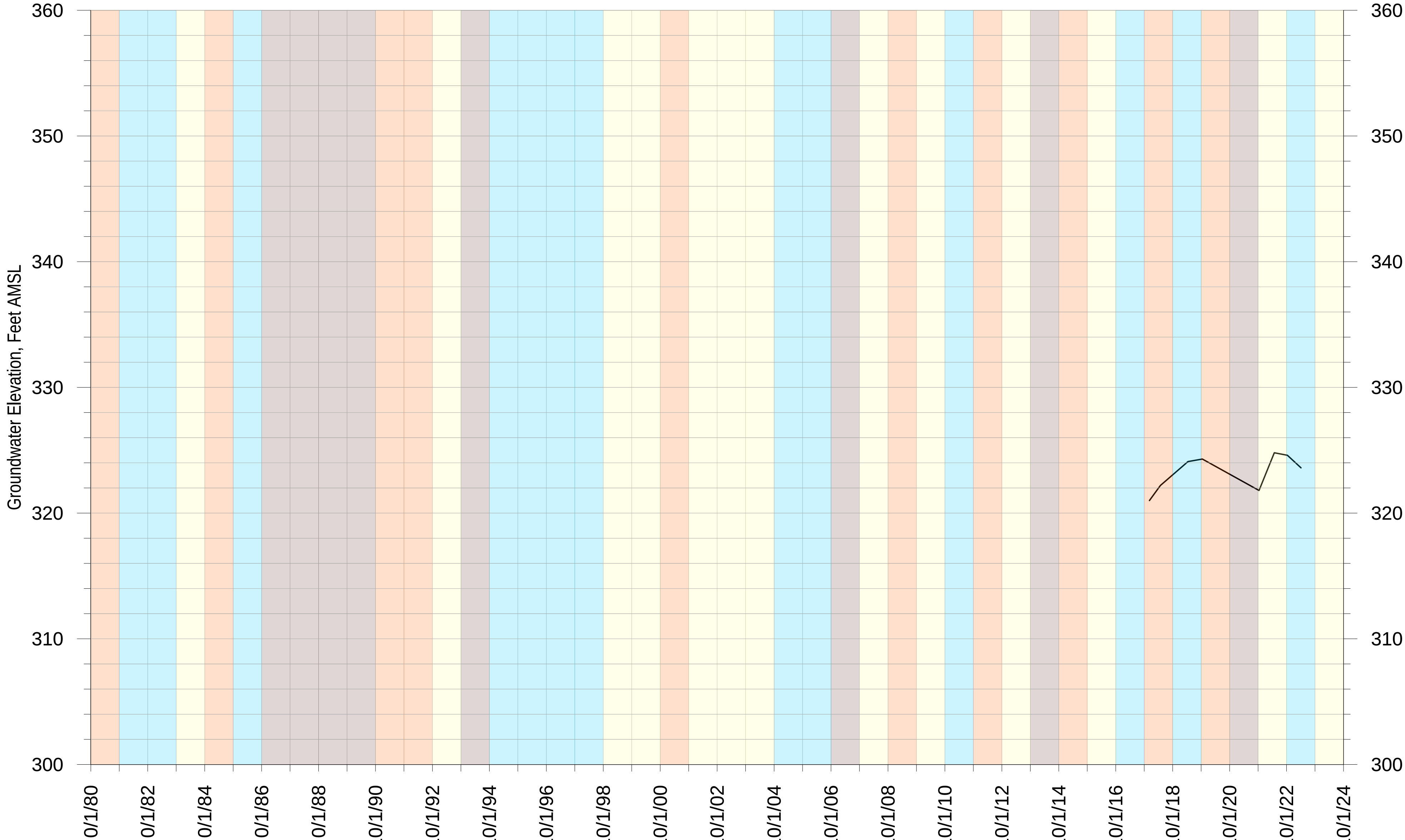
MONTGOMERY & ASSOCIATES

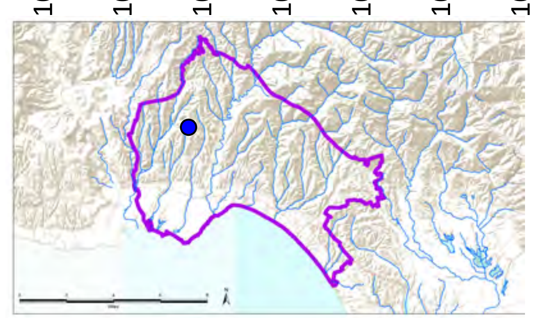
Private Well 3

Aquifer Screened: Purisima B

Appendix A

FIGURE A-159

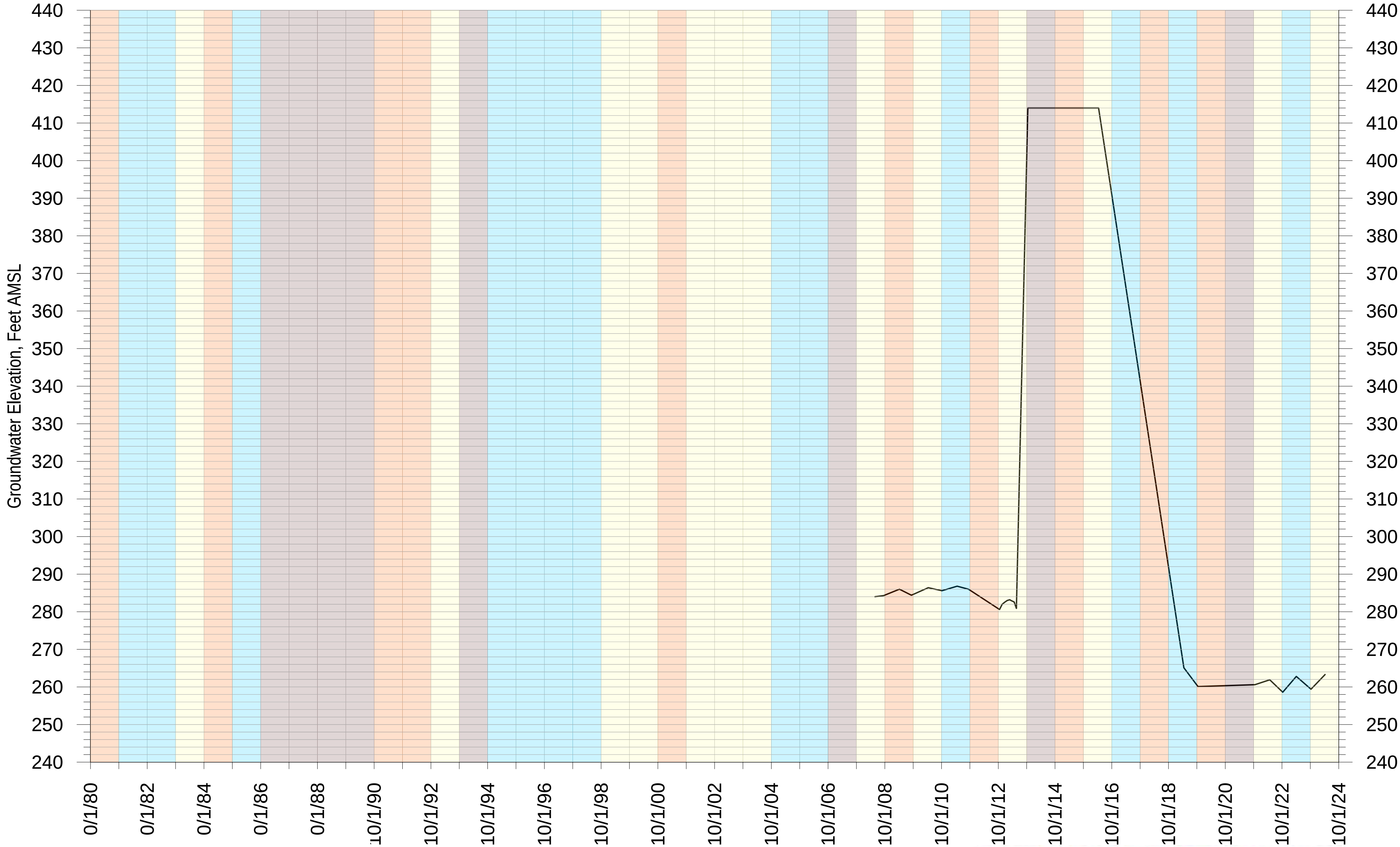


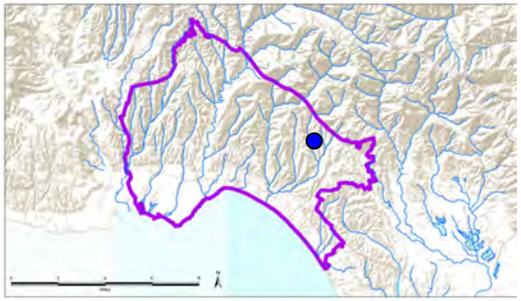


Private Well 5
Aquifer Screened: Purisima F

Appendix A

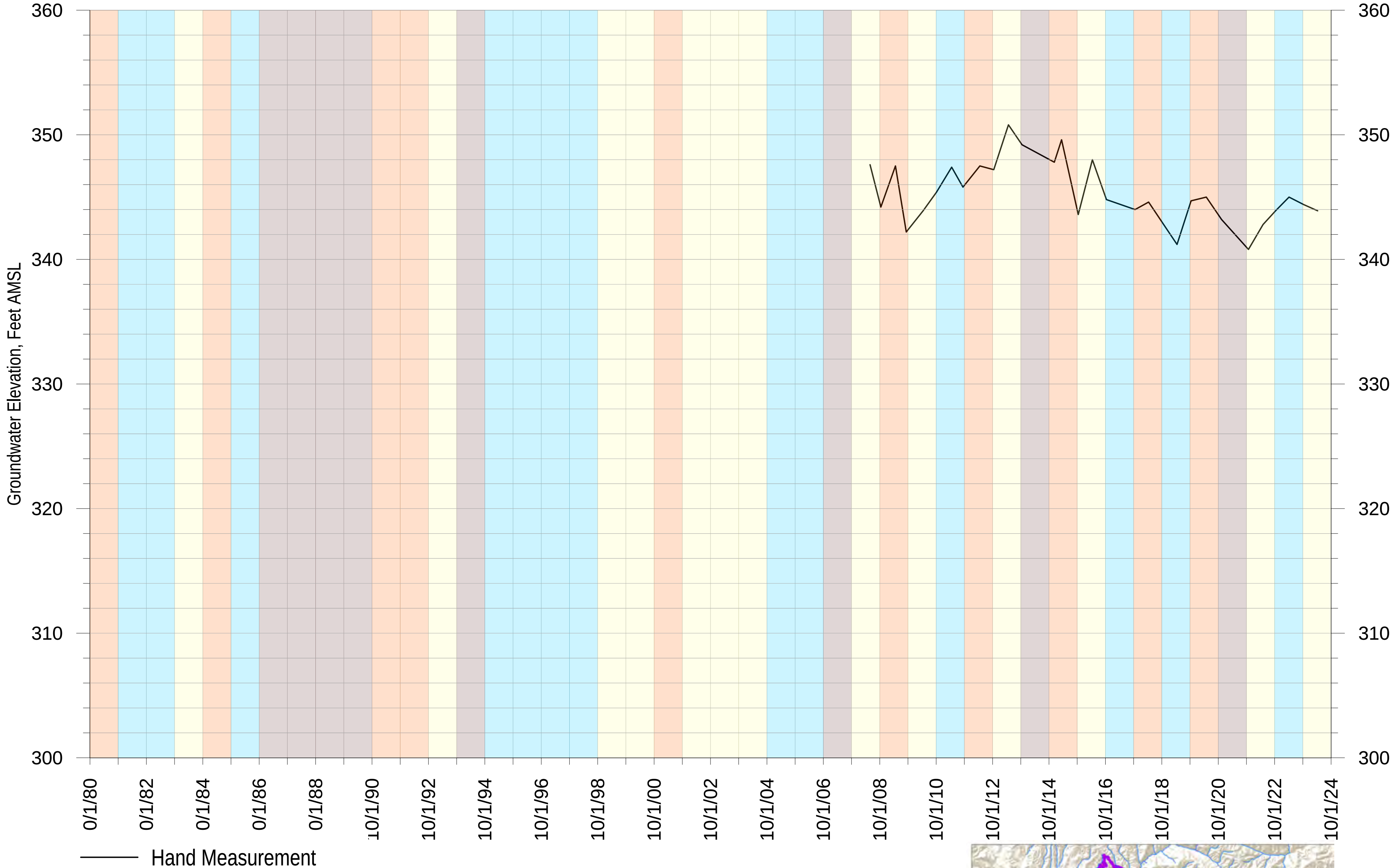
FIGURE A-160

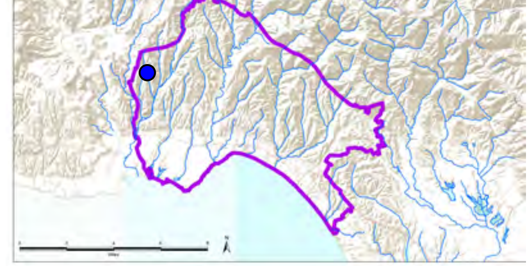




MONTGOMERY & ASSOCIATES

Private Well 6
Aquifer Screened: Granite

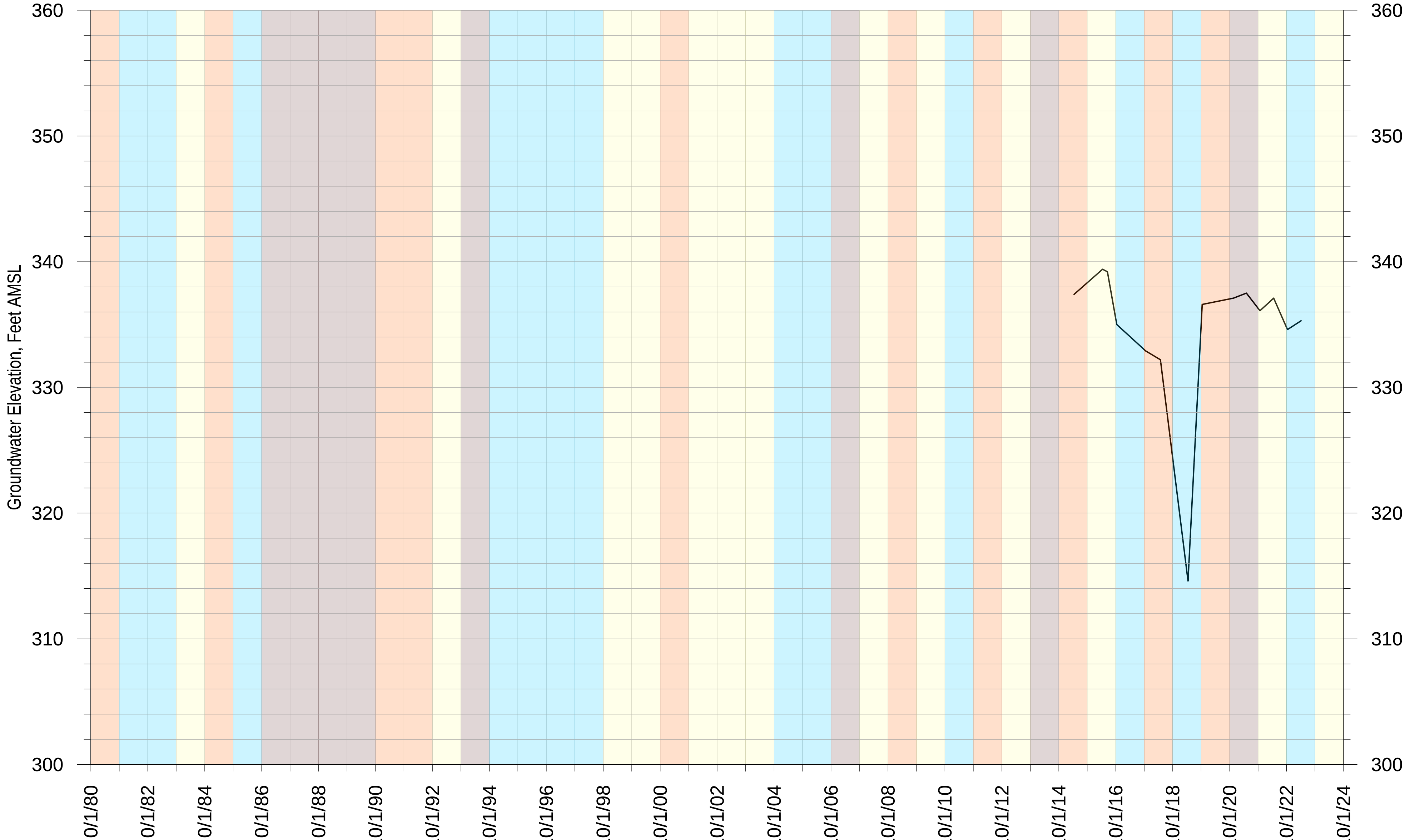


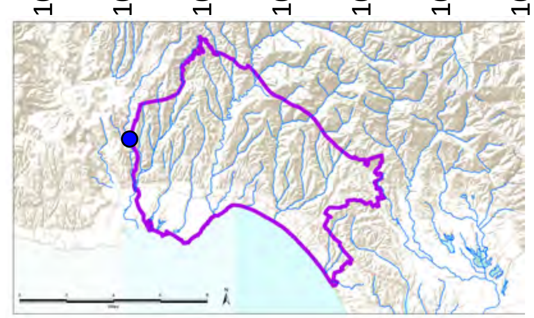


MONTGOMERY & ASSOCIATES

Private Well 7
Aquifer Screened: Granite

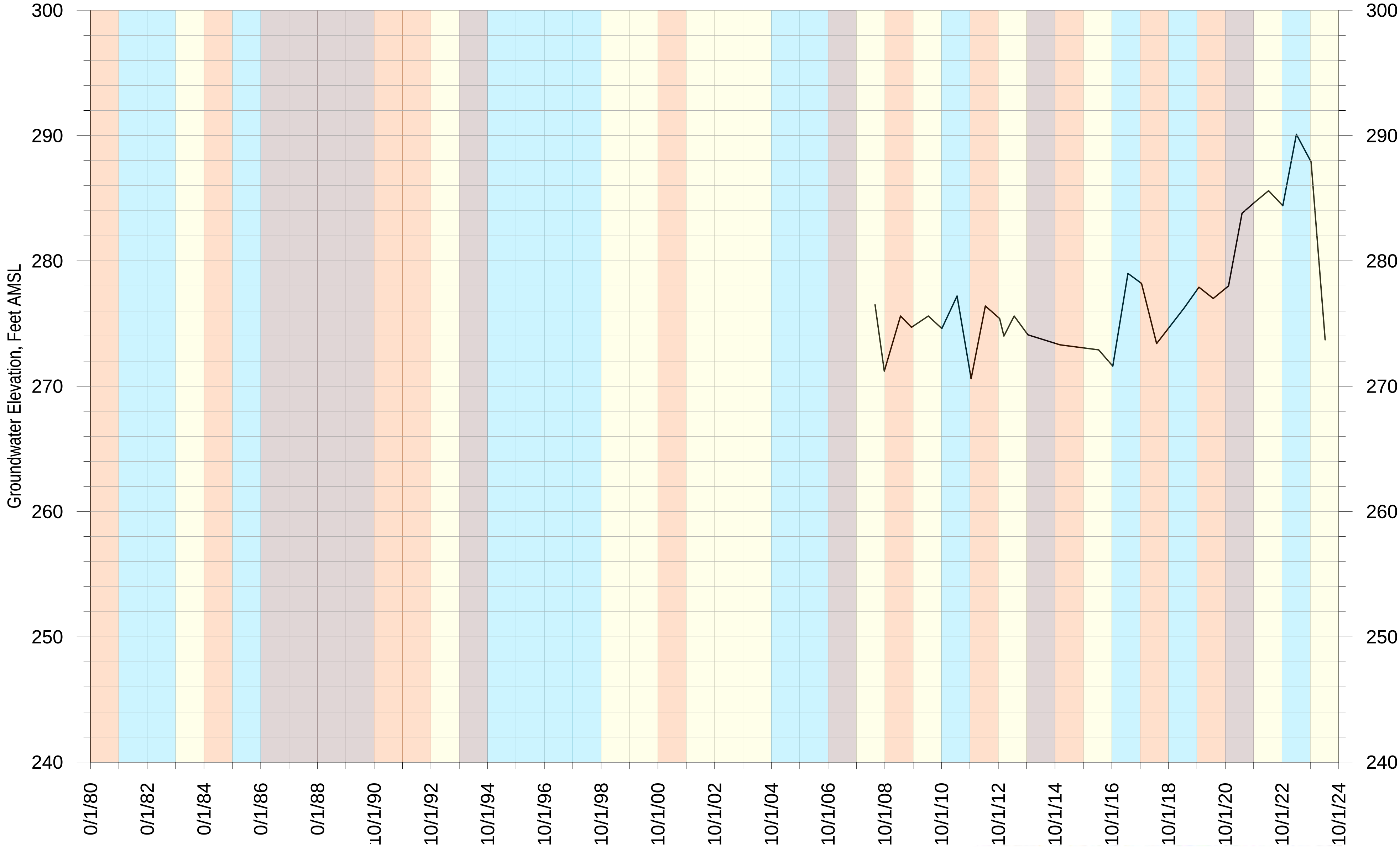
Appendix A
FIGURE A-162

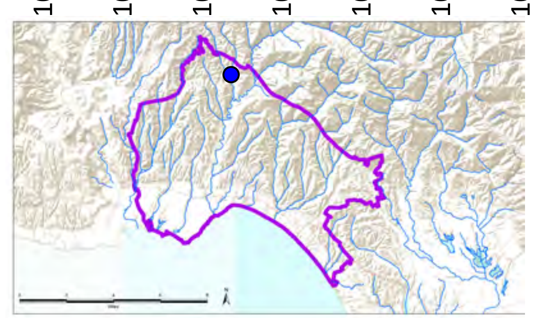




MONTGOMERY
& ASSOCIATES

Private Well 8
Aquifer Screened: Purisima AA/Tu

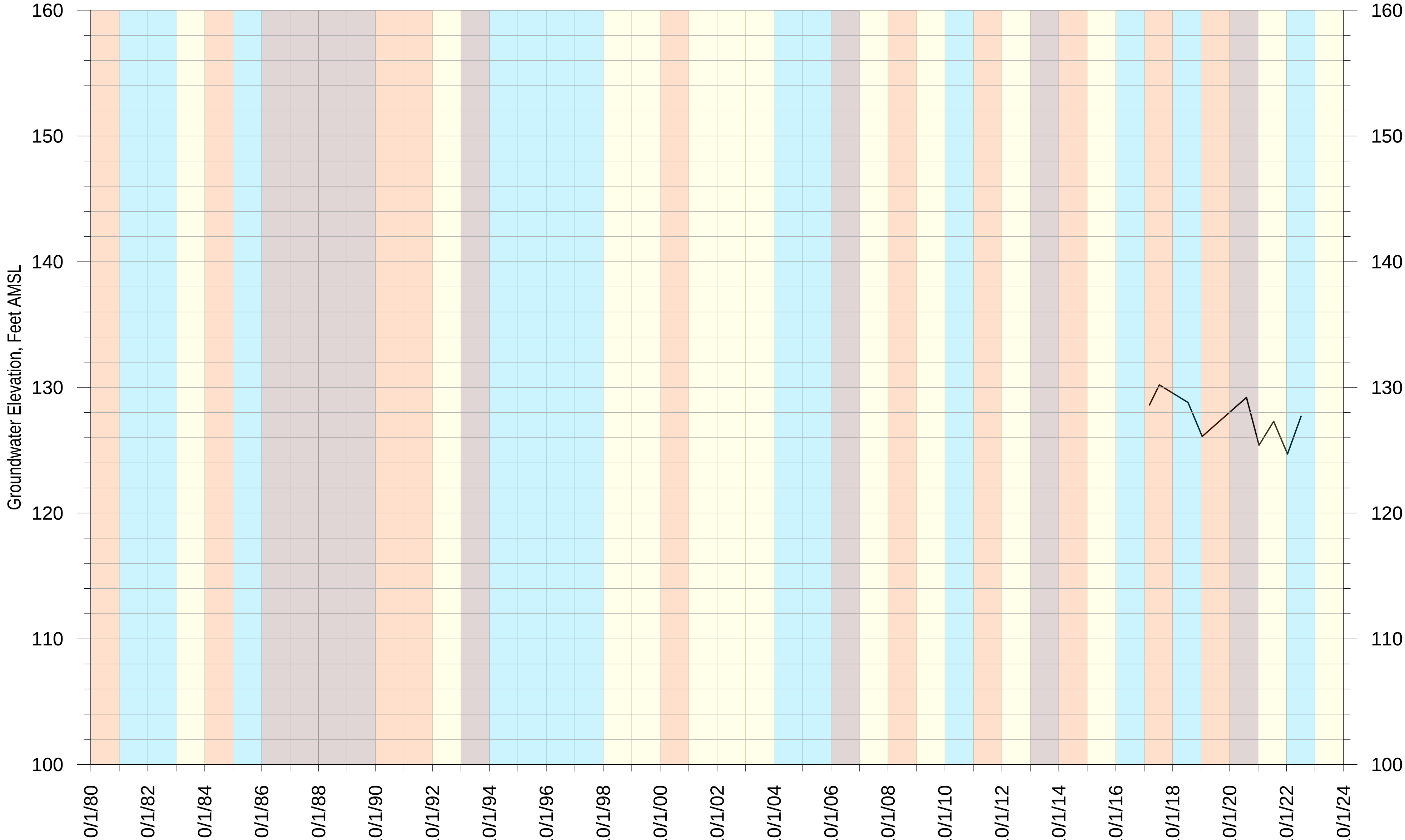


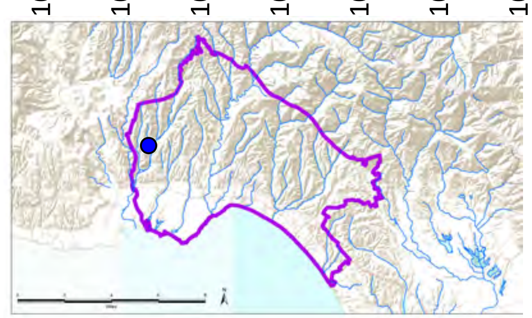


MONTGOMERY
& ASSOCIATES

Private Well 10
Aquifer Screened: Granite

Appendix A
FIGURE A-164



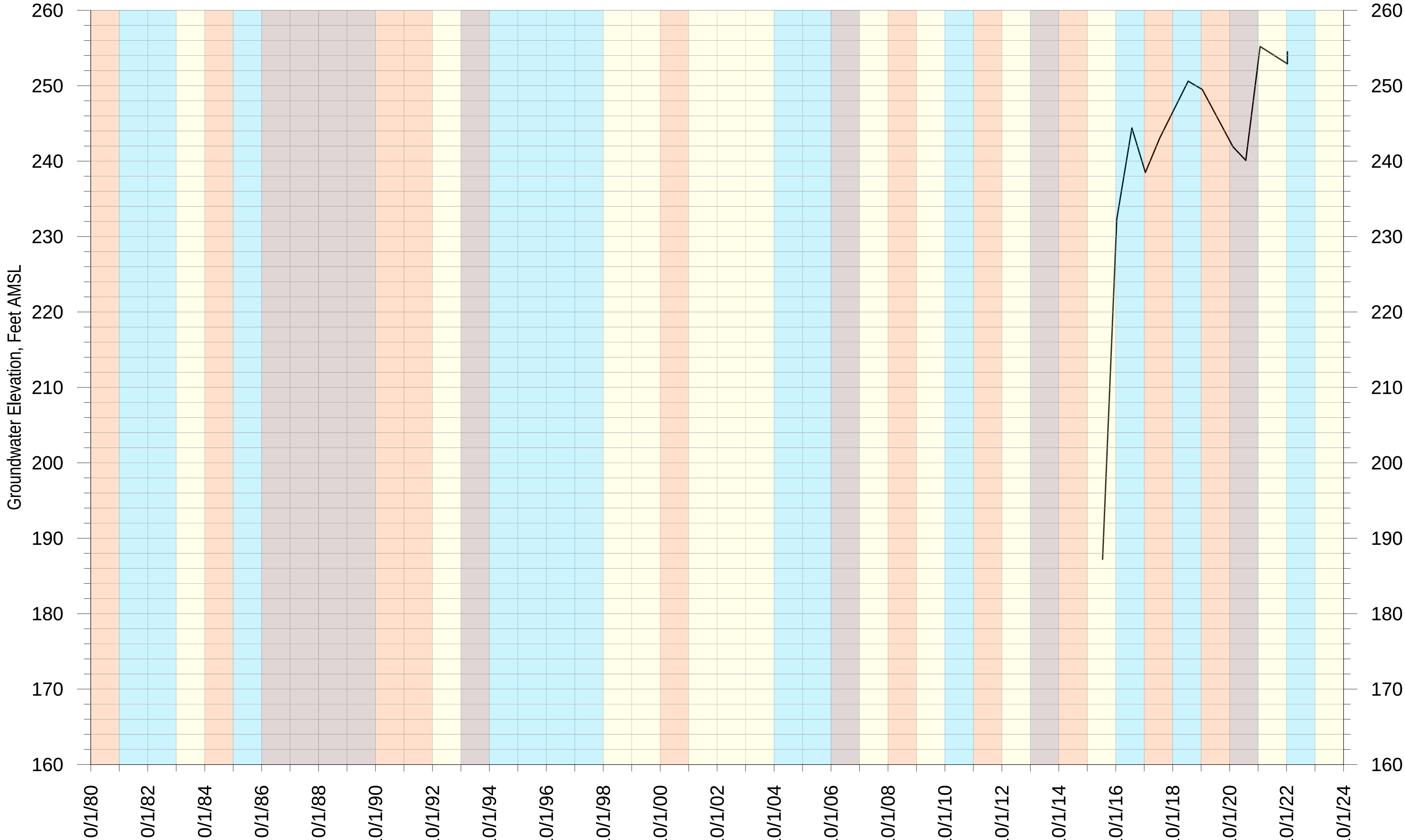


MONTGOMERY & ASSOCIATES

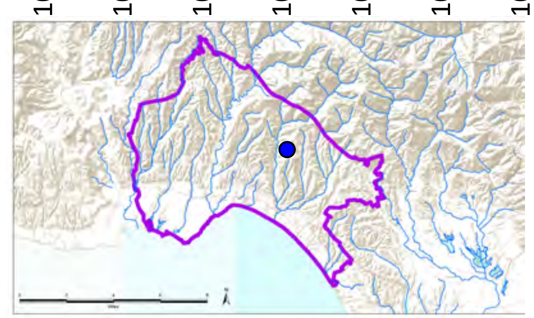
Private Well 11
Aquifer Screened: Purisima F

Appendix A

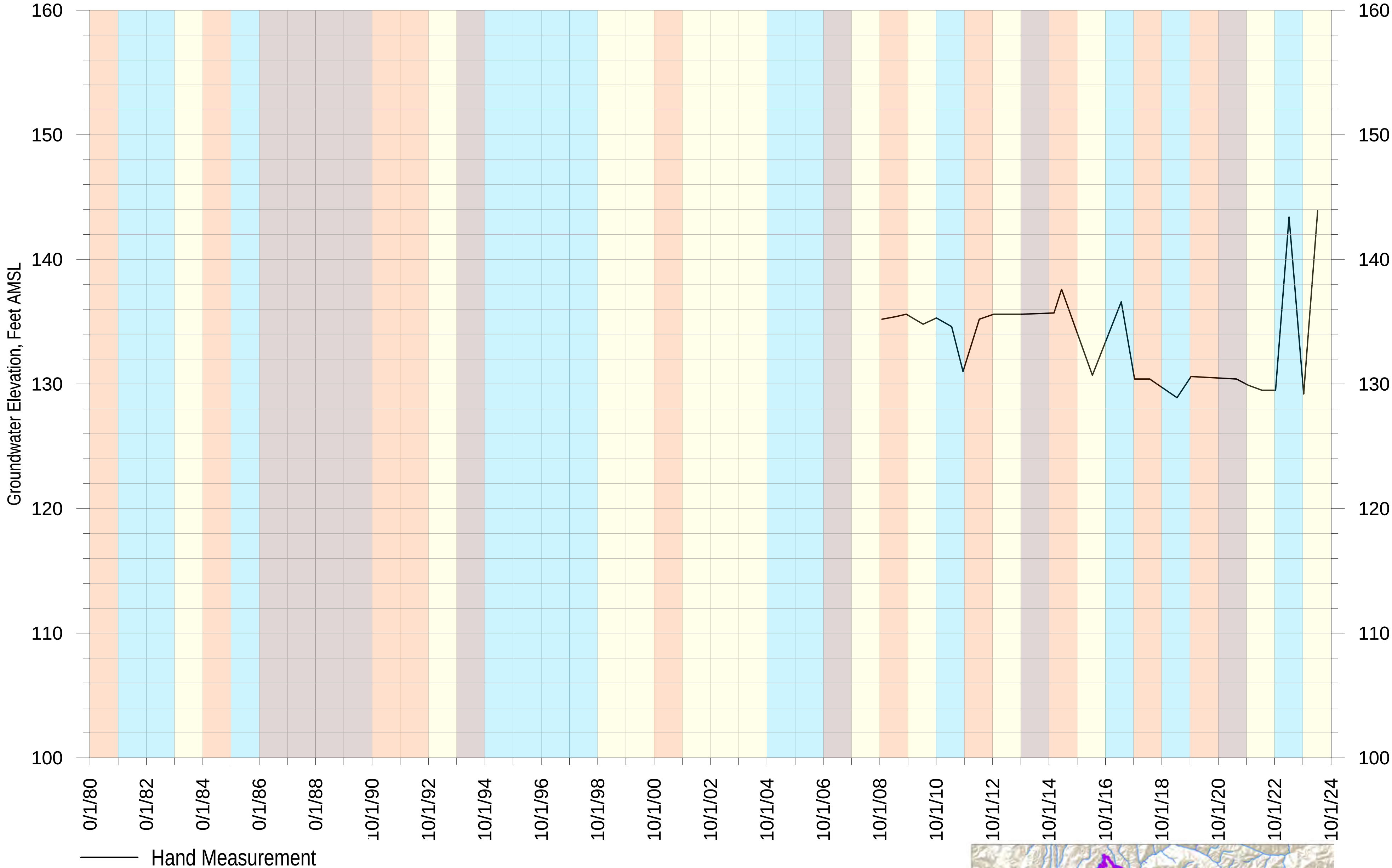
FIGURE A-165

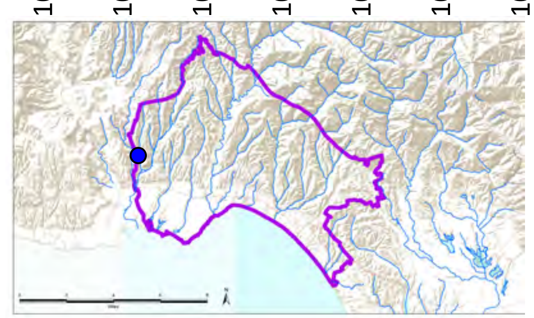


MONTGOMERY & ASSOCIATES



Private Well 13
Aquifer Screened: Granite



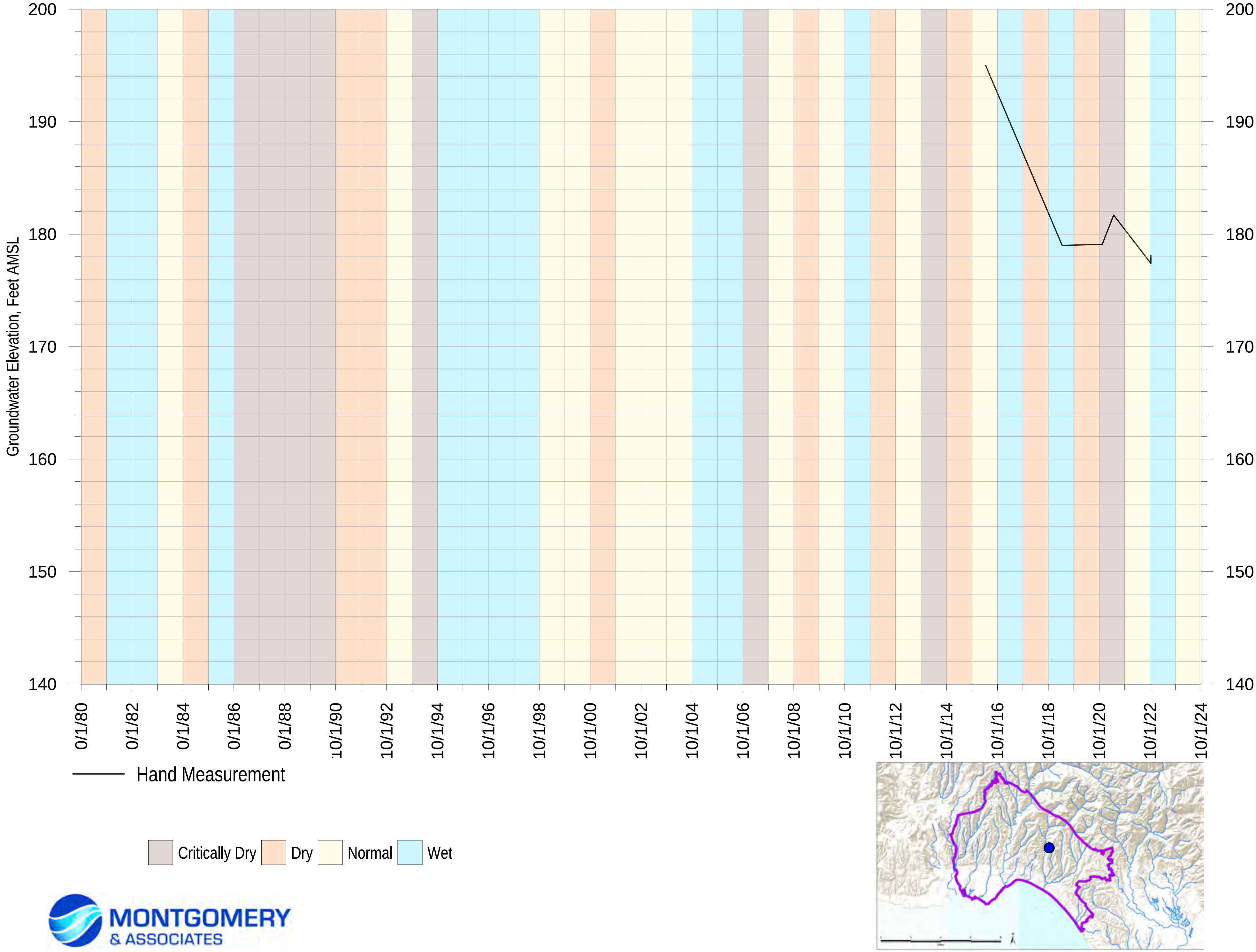


MONTGOMERY
& ASSOCIATES

Private Well 14
Aquifer Screened: Purisima F

Appendix A

FIGURE A-167

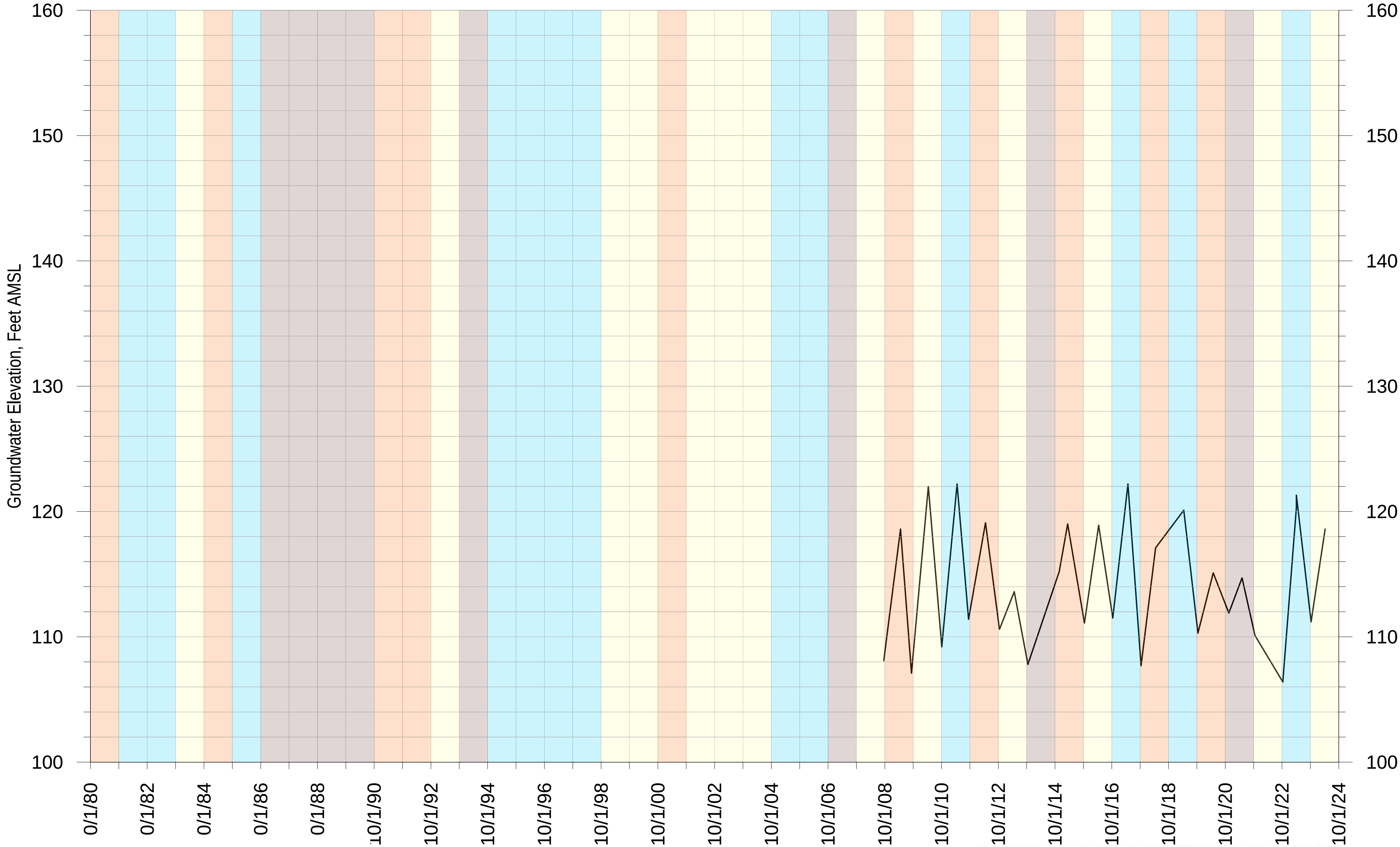


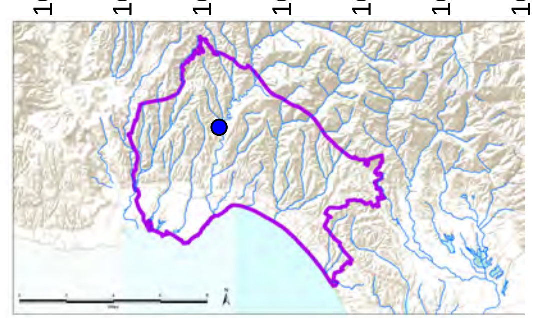
MONTGOMERY & ASSOCIATES

Private Well 15
Aquifer Screened: Purisima A

Appendix A

FIGURE A-168

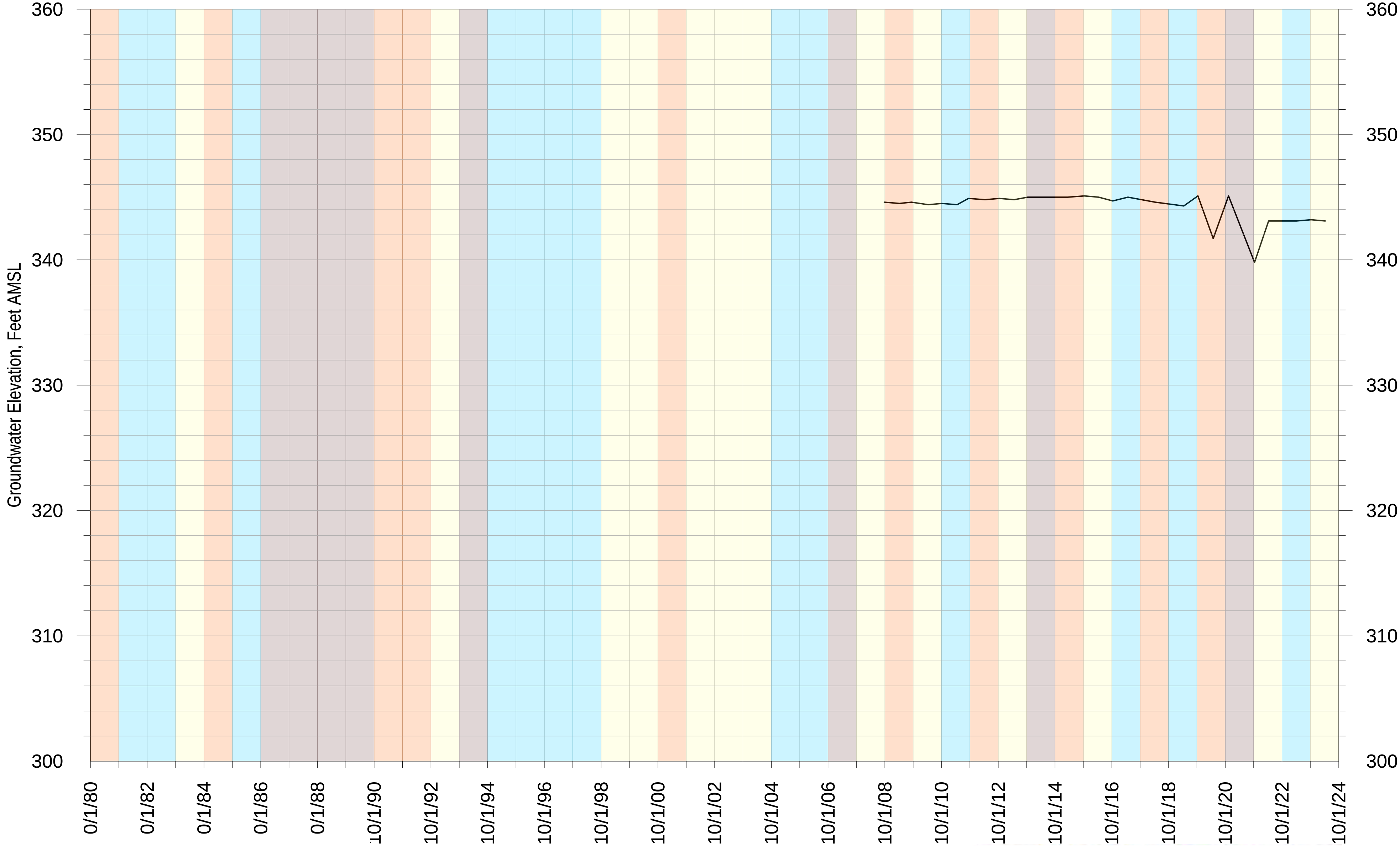


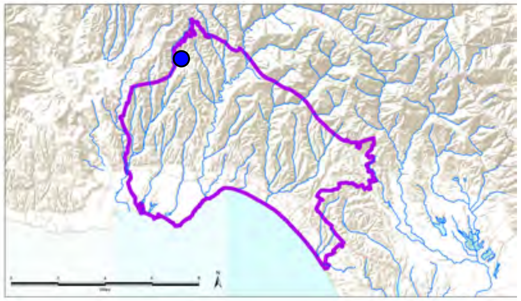


MONTGOMERY & ASSOCIATES

Private Well 16
Aquifer Screened: Purisima AA/Tu

Appendix A
FIGURE A-169

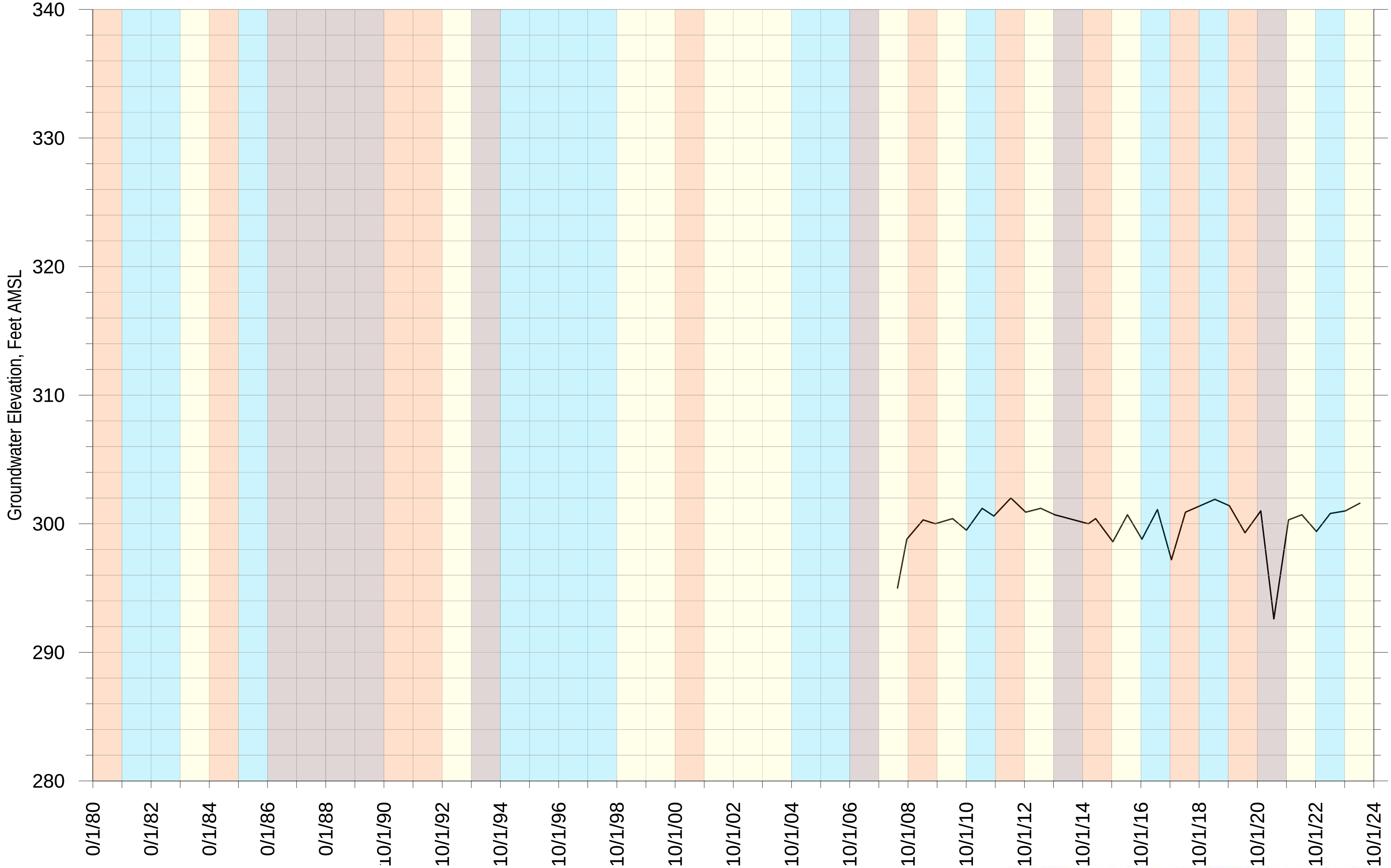


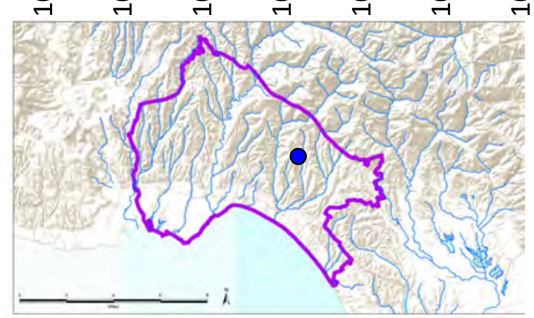


Private Well 17
Aquifer Screened: Purisima F

Appendix A

FIGURE A-170



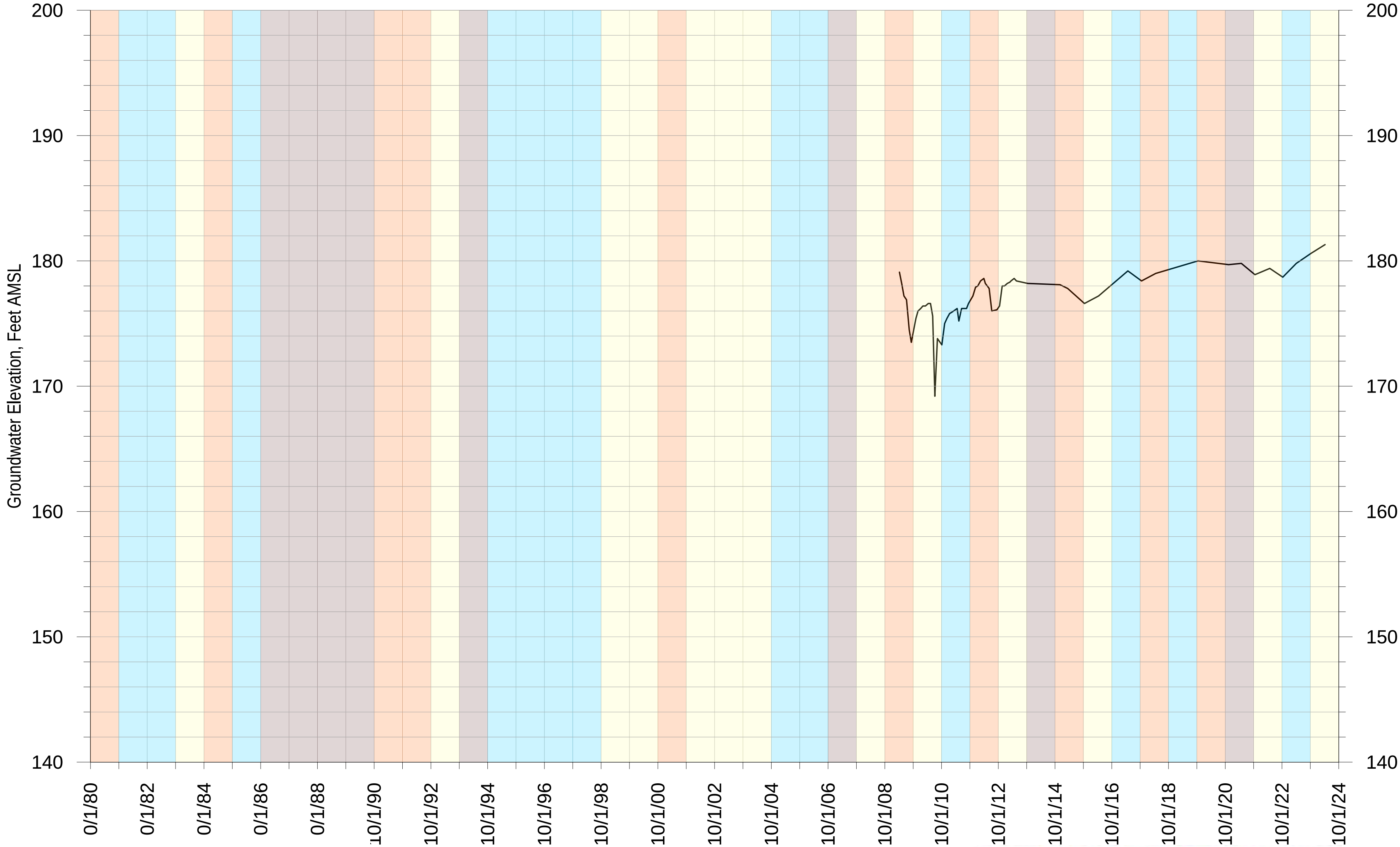


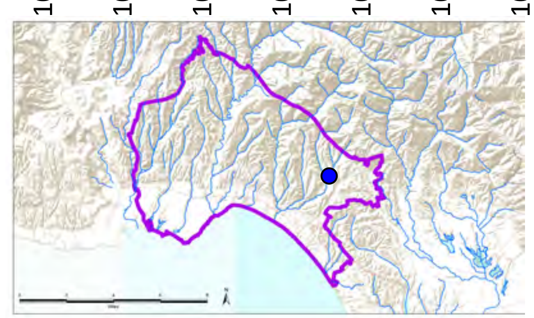
MONTGOMERY
& ASSOCIATES

Private Well 18
Aquifer Screened: Purisima F

Appendix A

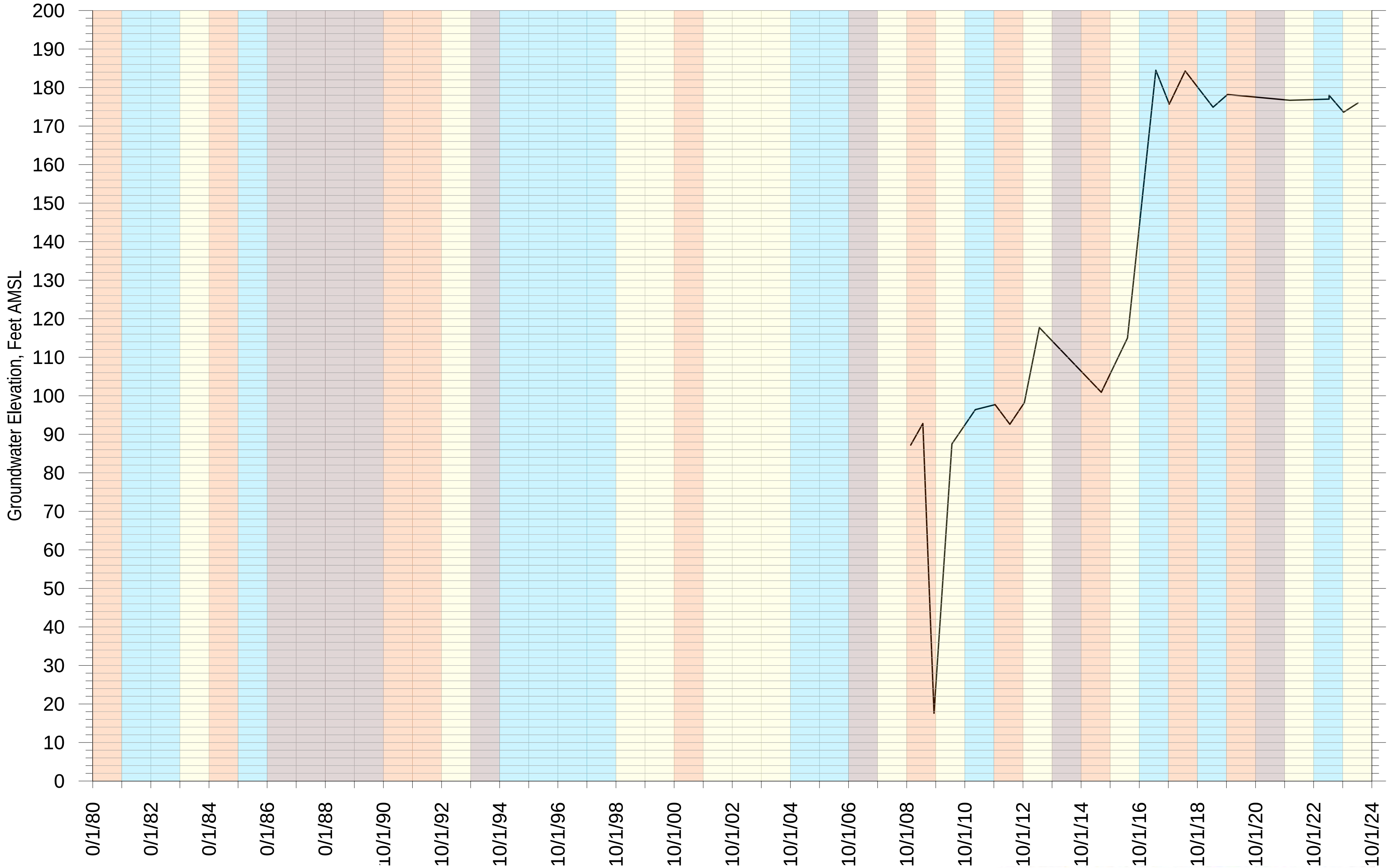
FIGURE A-171





Private Well 19

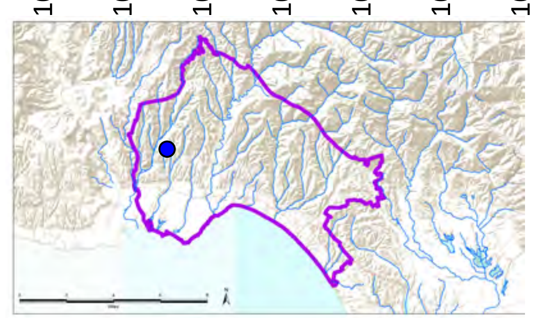
Aquifer Screened: Purisima AA/Tu

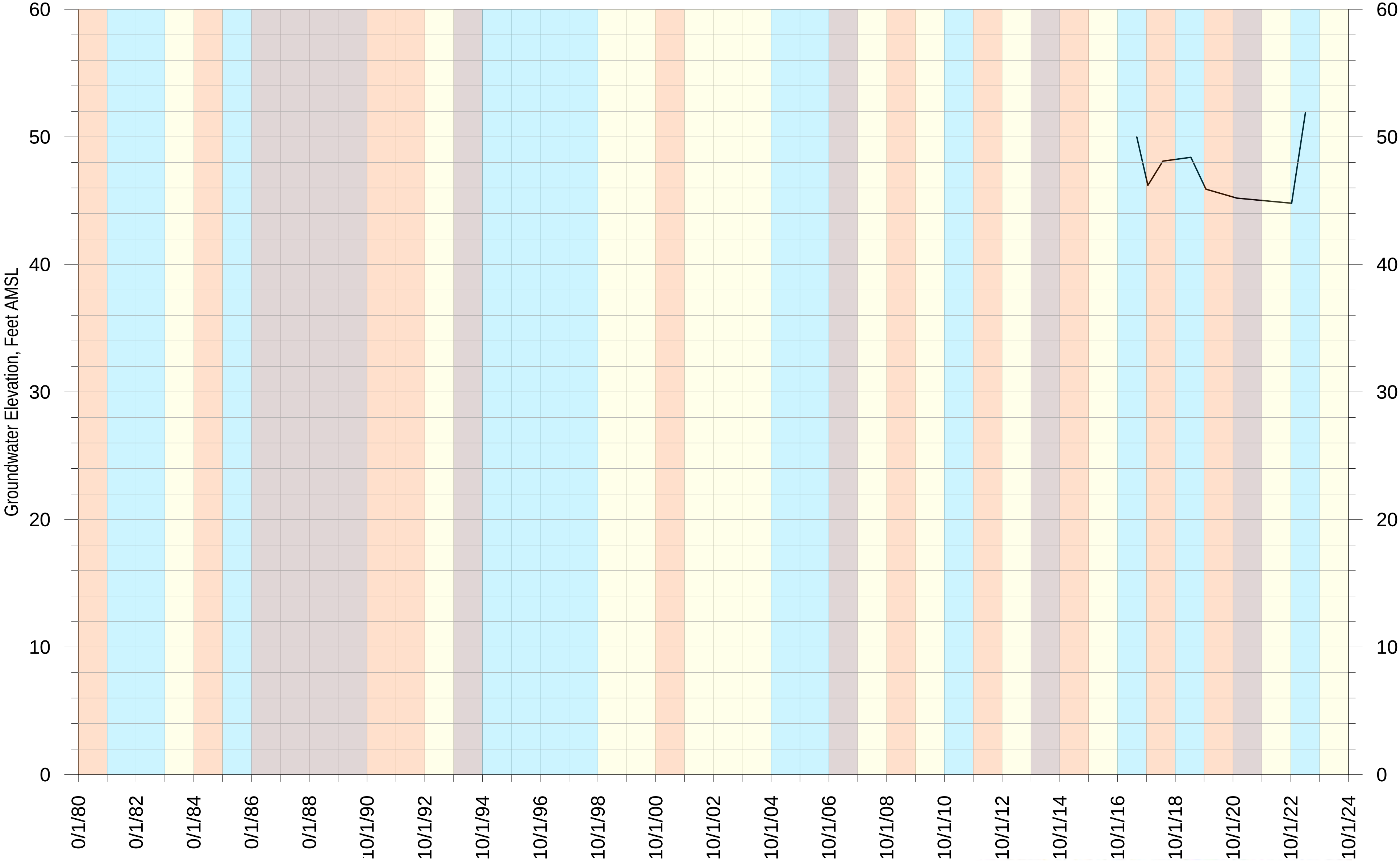


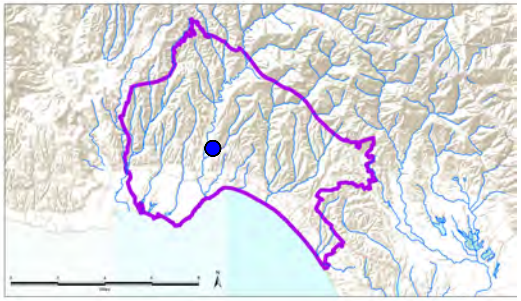
Hand Measurement

Critically Dry | Dry | Normal | Wet

MONTGOMERY & ASSOCIATES





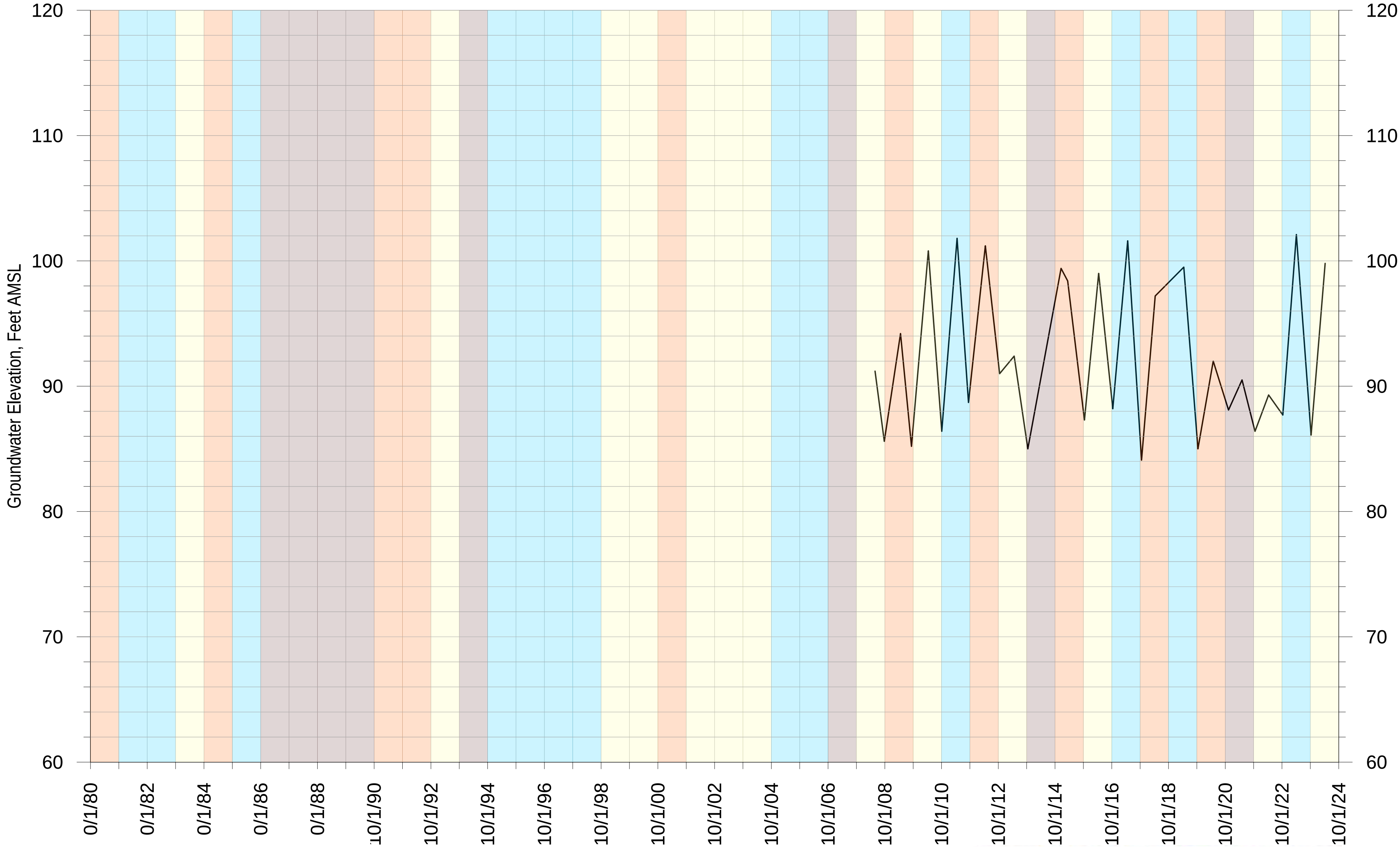


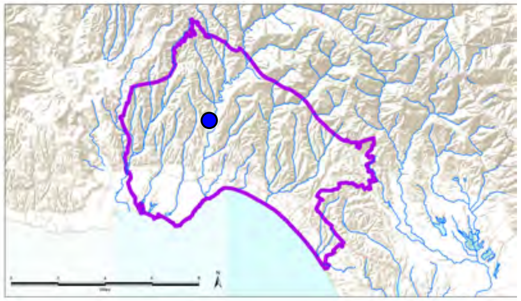
MONTGOMERY & ASSOCIATES

Private Well 21
Aquifer Screened: Purisima A

Appendix A

FIGURE A-174



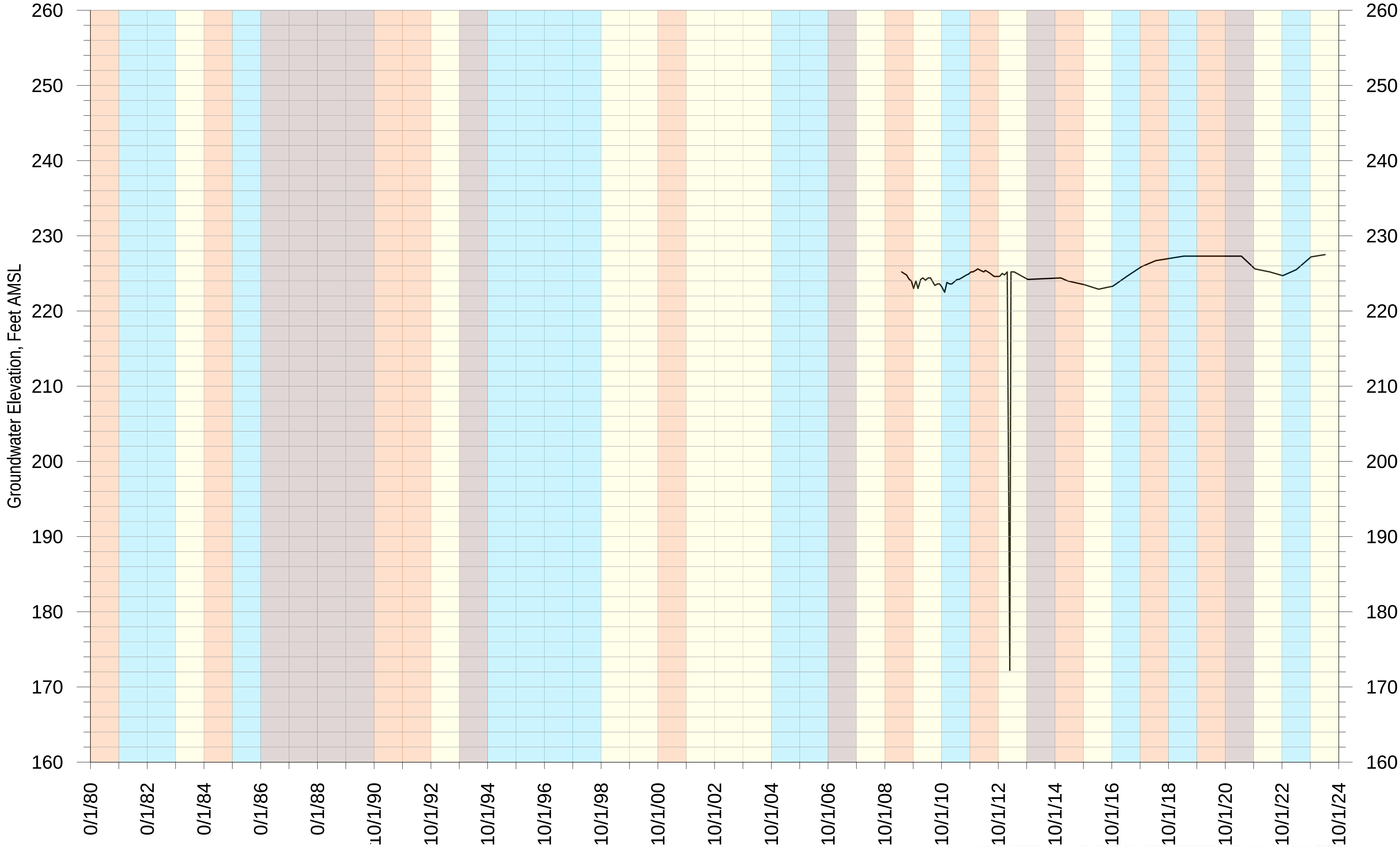


MONTGOMERY
& ASSOCIATES

Private Well 22
Aquifer Screened: Purisima F

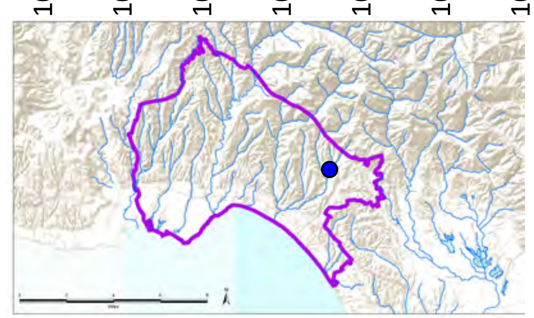
Appendix A

FIGURE A-175

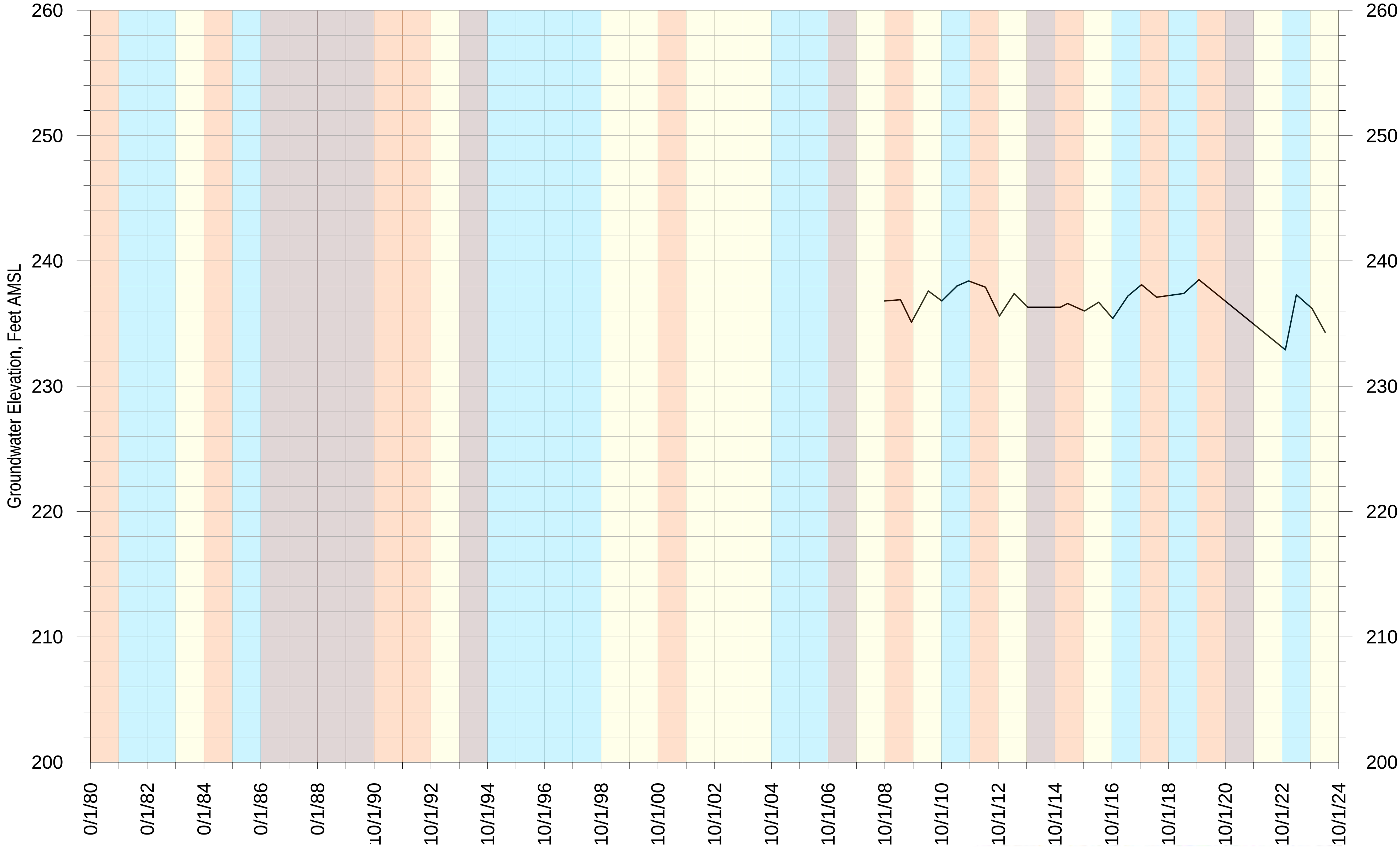


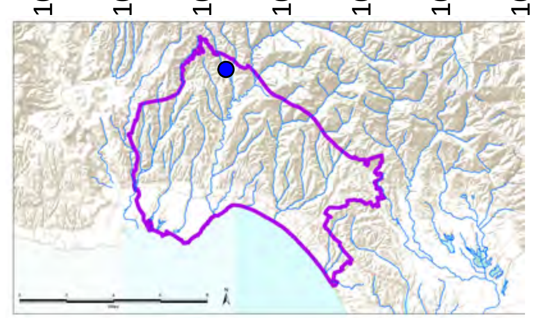
Hand Measurement

Critically Dry | Dry | Normal | Wet



Private Well 23
Aquifer Screened: Purisima AA/Tu

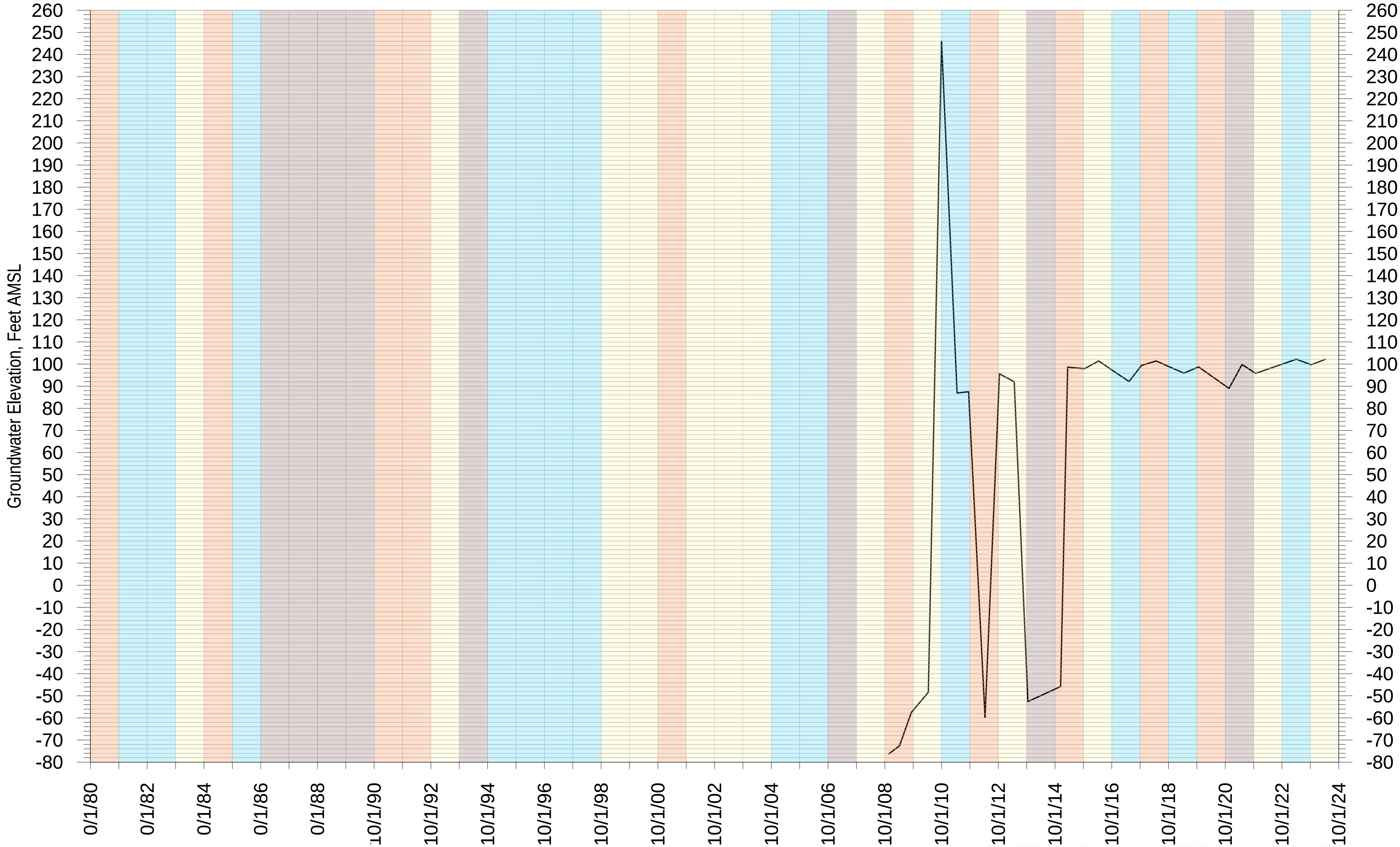


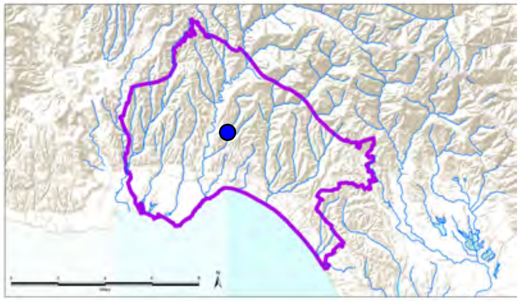


Private Well 24
Aquifer Screened: Purisima BC

Appendix A

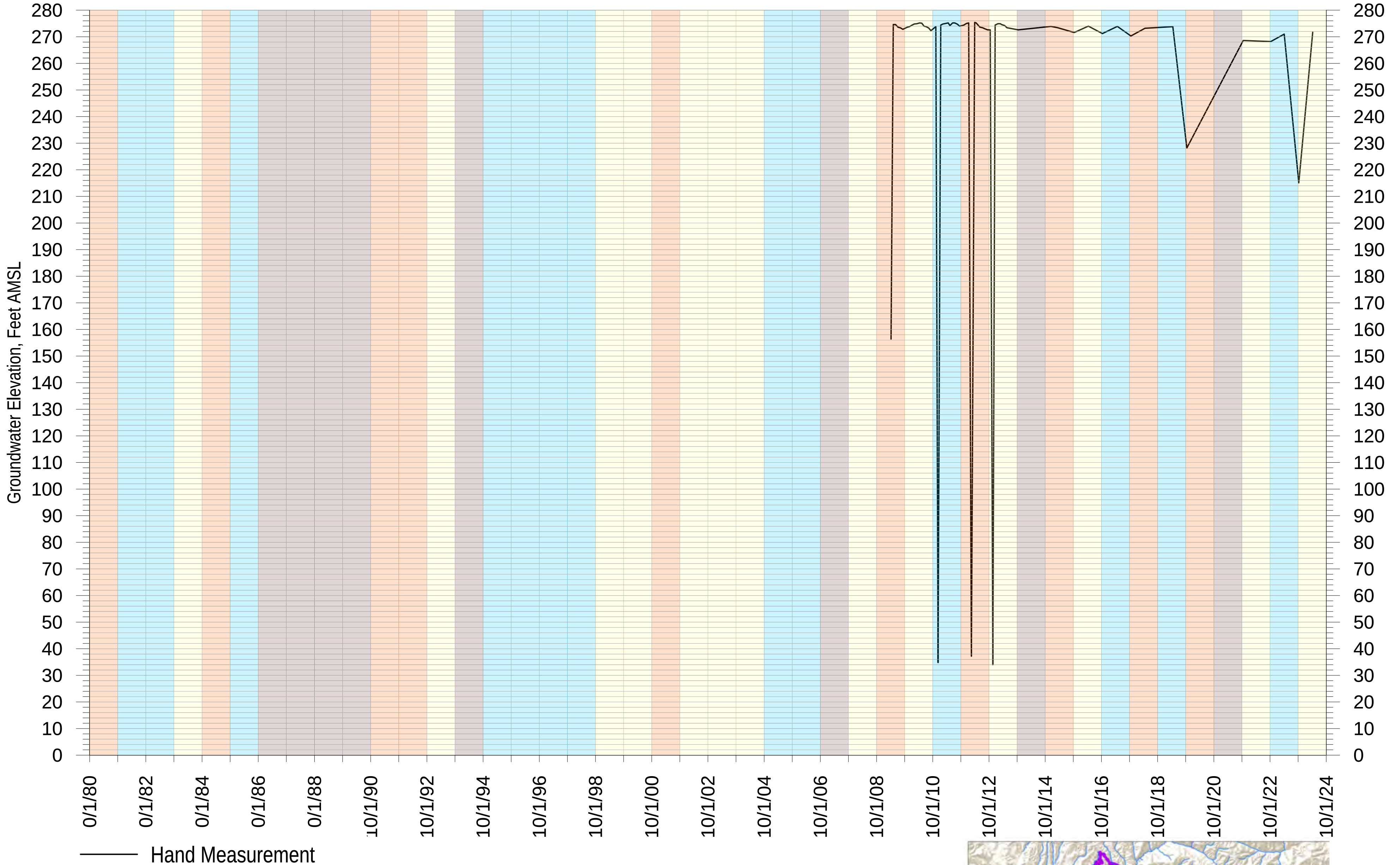
FIGURE A-177

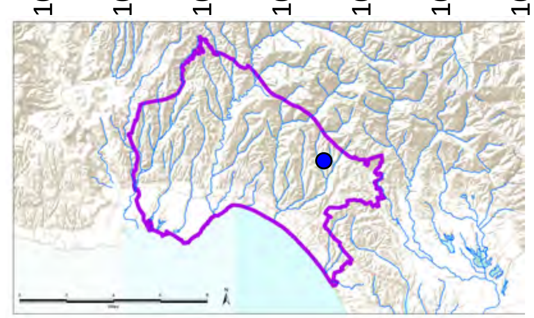




MONTGOMERY & ASSOCIATES

Private Well 25
Aquifer Screened: Purisima F





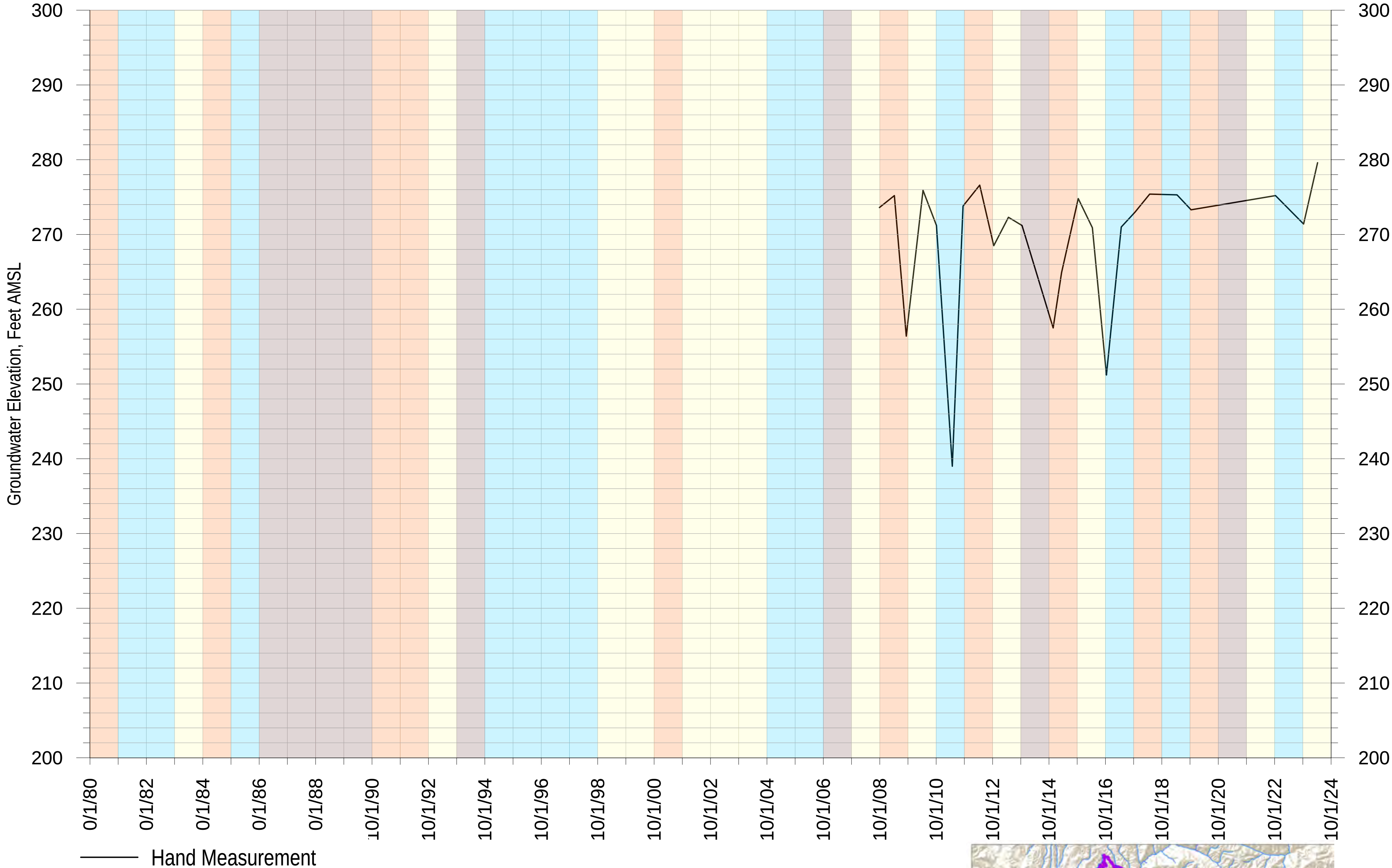
Critically Dry | Dry | Normal | Wet

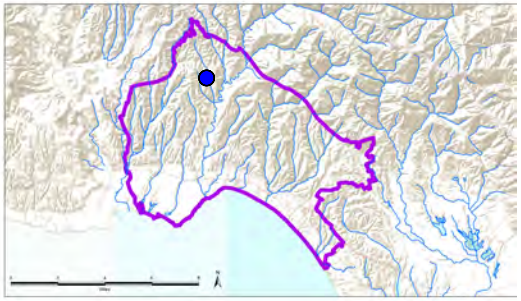
MONTGOMERY
& ASSOCIATES

Private Well 26
Aquifer Screened: Purisima AA/Tu

Appendix A

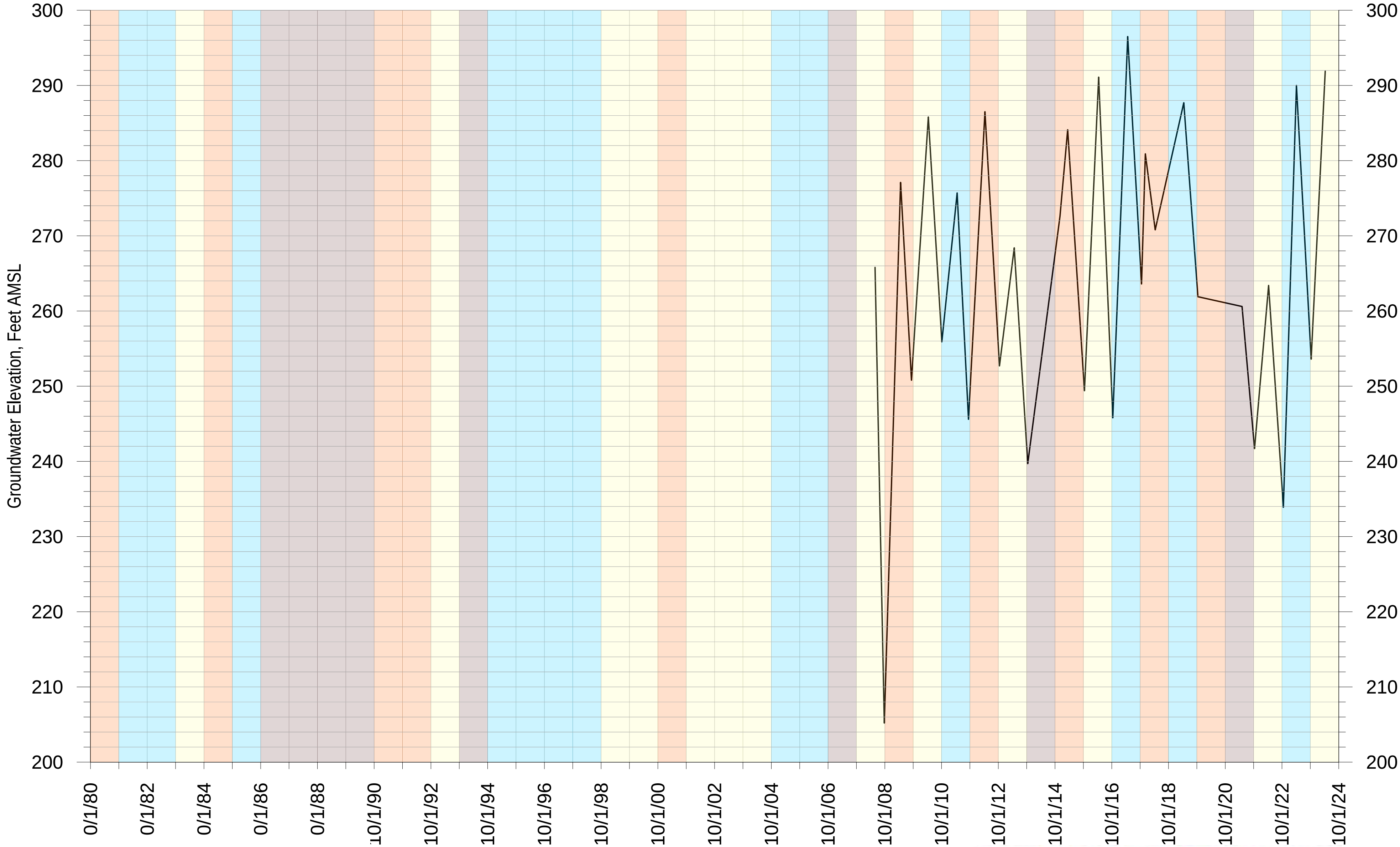
FIGURE A-179

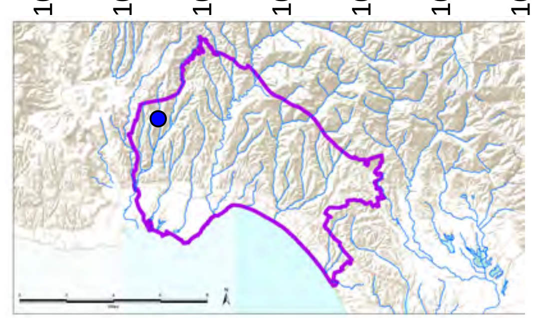




MONTGOMERY & ASSOCIATES

Private Well 27
Aquifer Screened: Granite



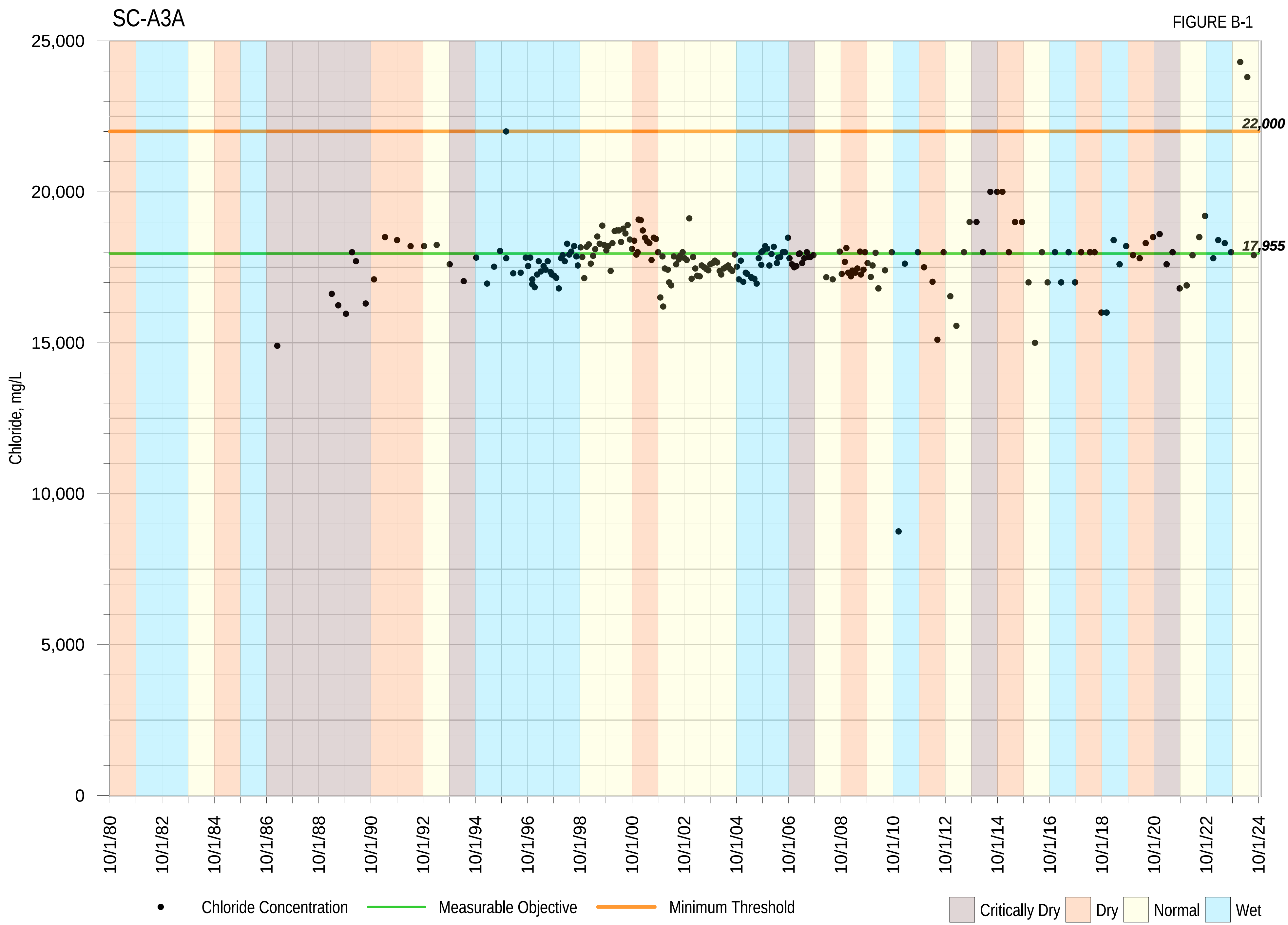


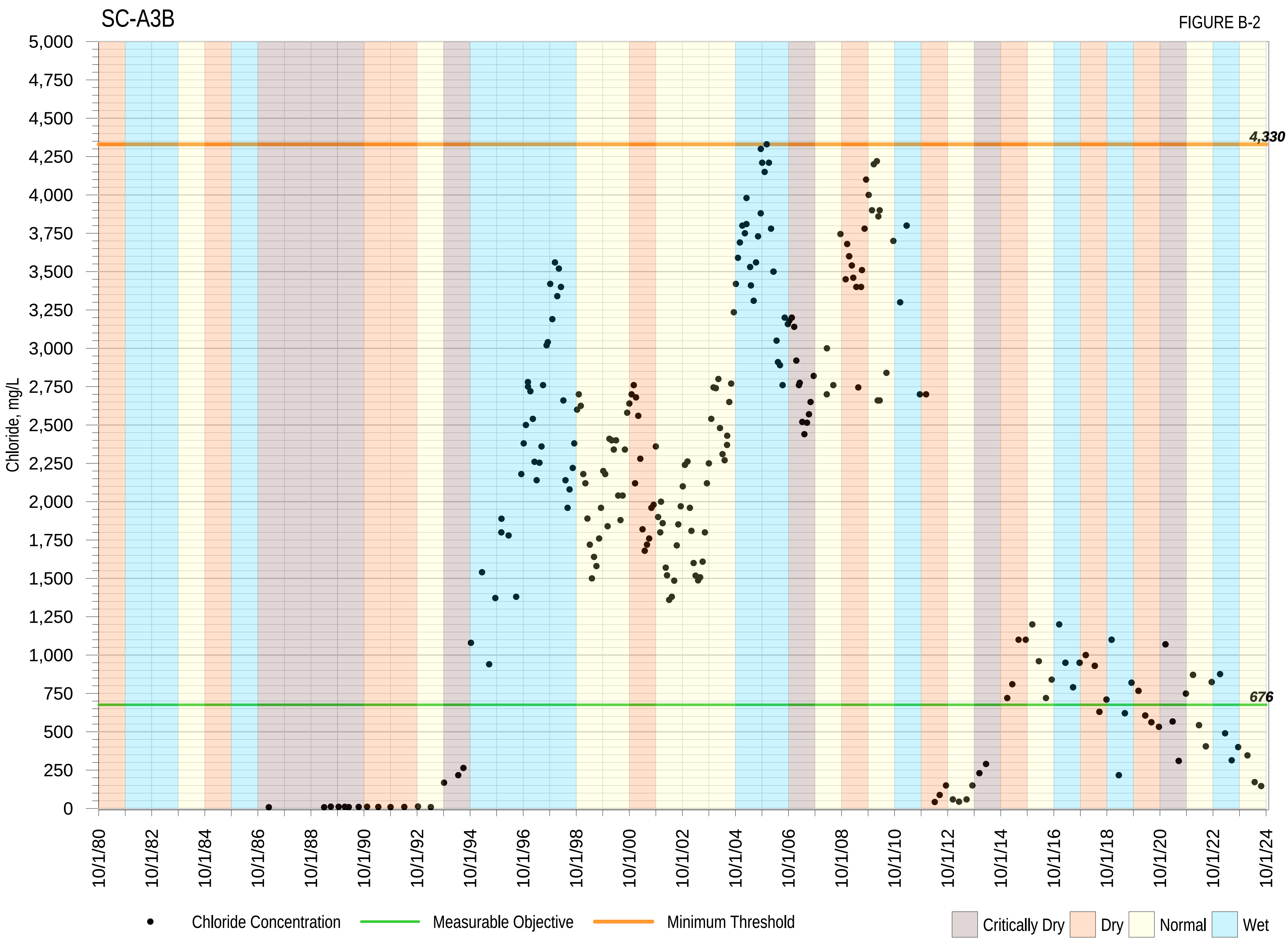
MONTGOMERY & ASSOCIATES

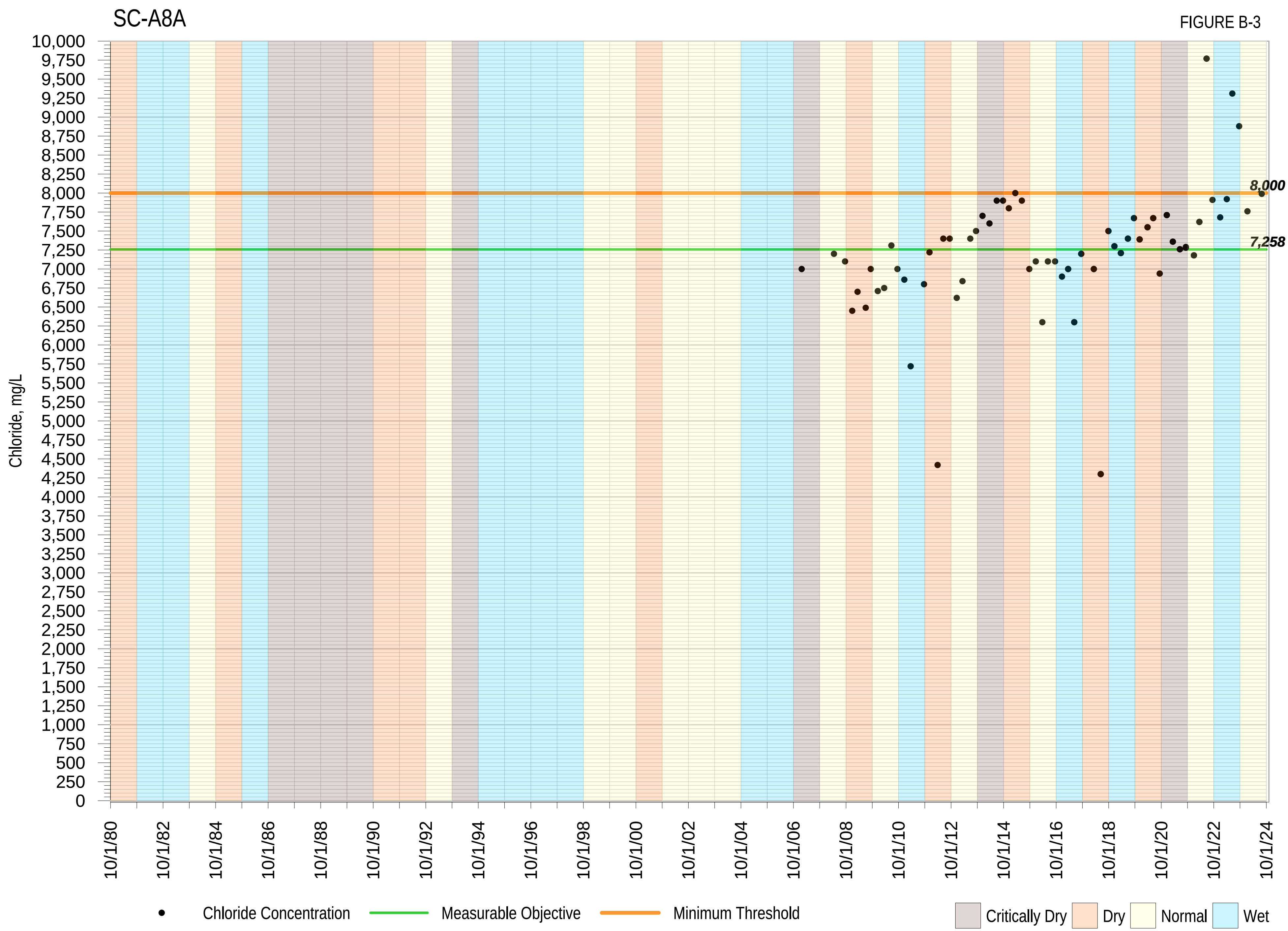
Appendix B

Coastal Monitoring Well Chemographs

FIGURE B-1

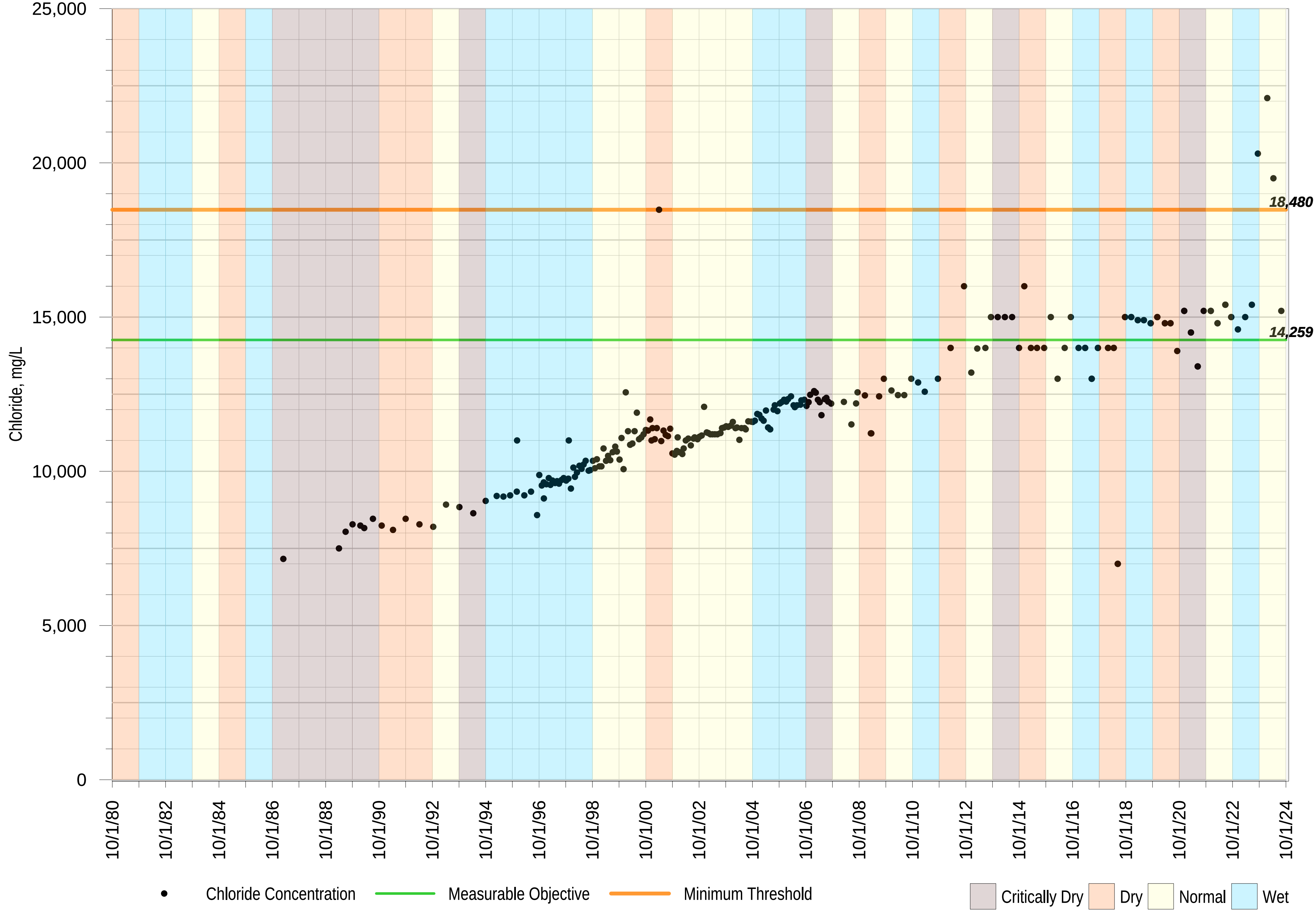

SC-A3A
25,000
20,000
15,000
10,000
5,000
0
Chloride, mg/L
22,000
17,955
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


SC-A3B
FIGURE B-2
Chloride, mg/L
5,000
4,750
4,500
4,250
4,000
3,750
3,500
3,250
3,000
2,750
2,500
2,250
2,000
1,750
1,500
1,250
1,000
750
500
250
0
4,330
676
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


SC-A8A
FIGURE B-3
Chloride, mg/L
10,000
9,750
9,500
9,250
9,000
8,750
8,500
8,250
8,000
7,750
7,500
7,250
7,000
6,750
6,500
6,250
6,000
5,750
5,500
5,250
5,000
4,750
4,500
4,250
4,000
3,750
3,500
3,250
3,000
2,750
2,500
2,250
2,000
1,750
1,500
1,250
1,000
750
500
250
0
8,000
7,258
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

SC-A2A & SC-A2RA

FIGURE B-4



SC-A2B & SC-A2RB

FIGURE B-5

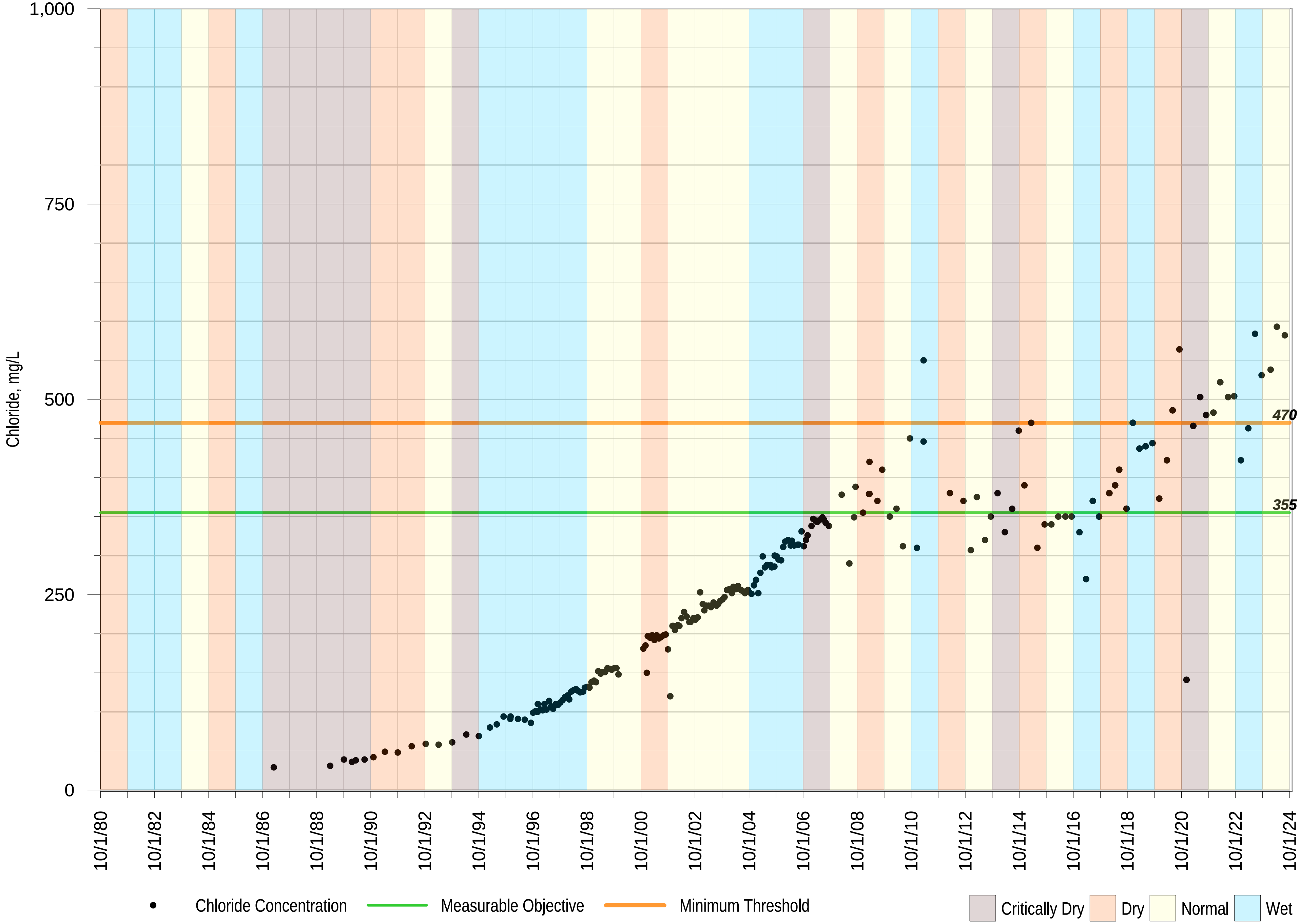
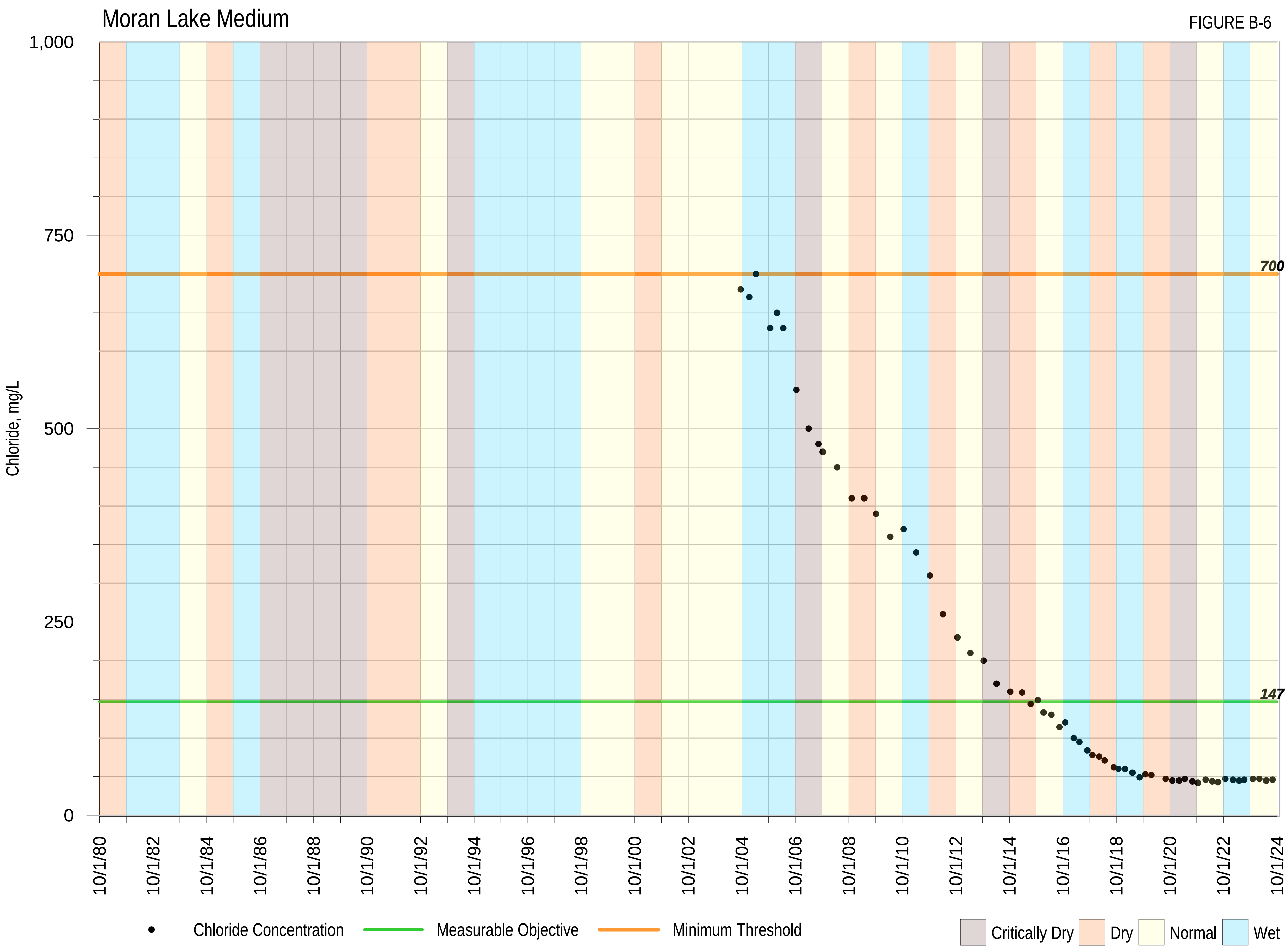
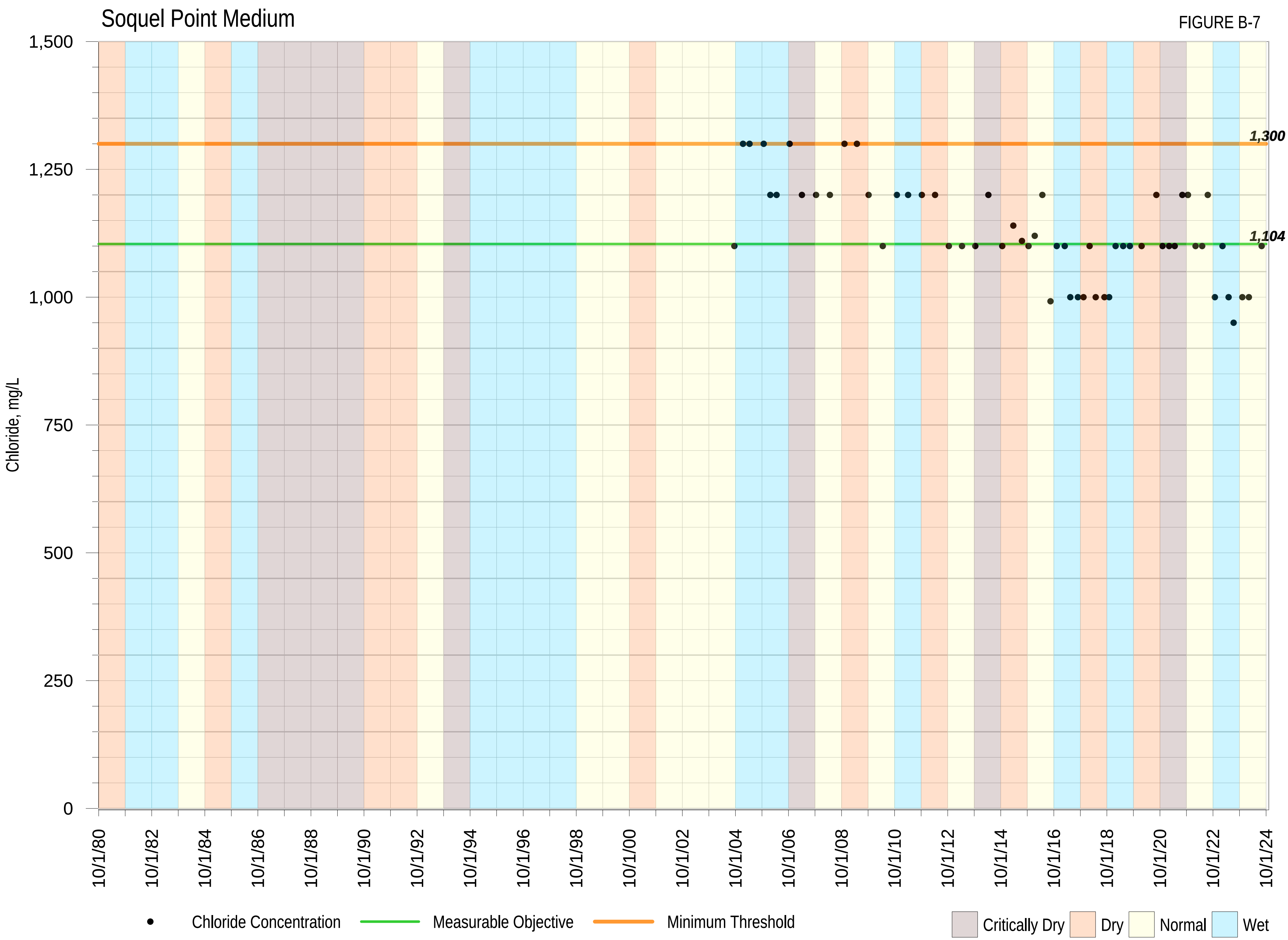
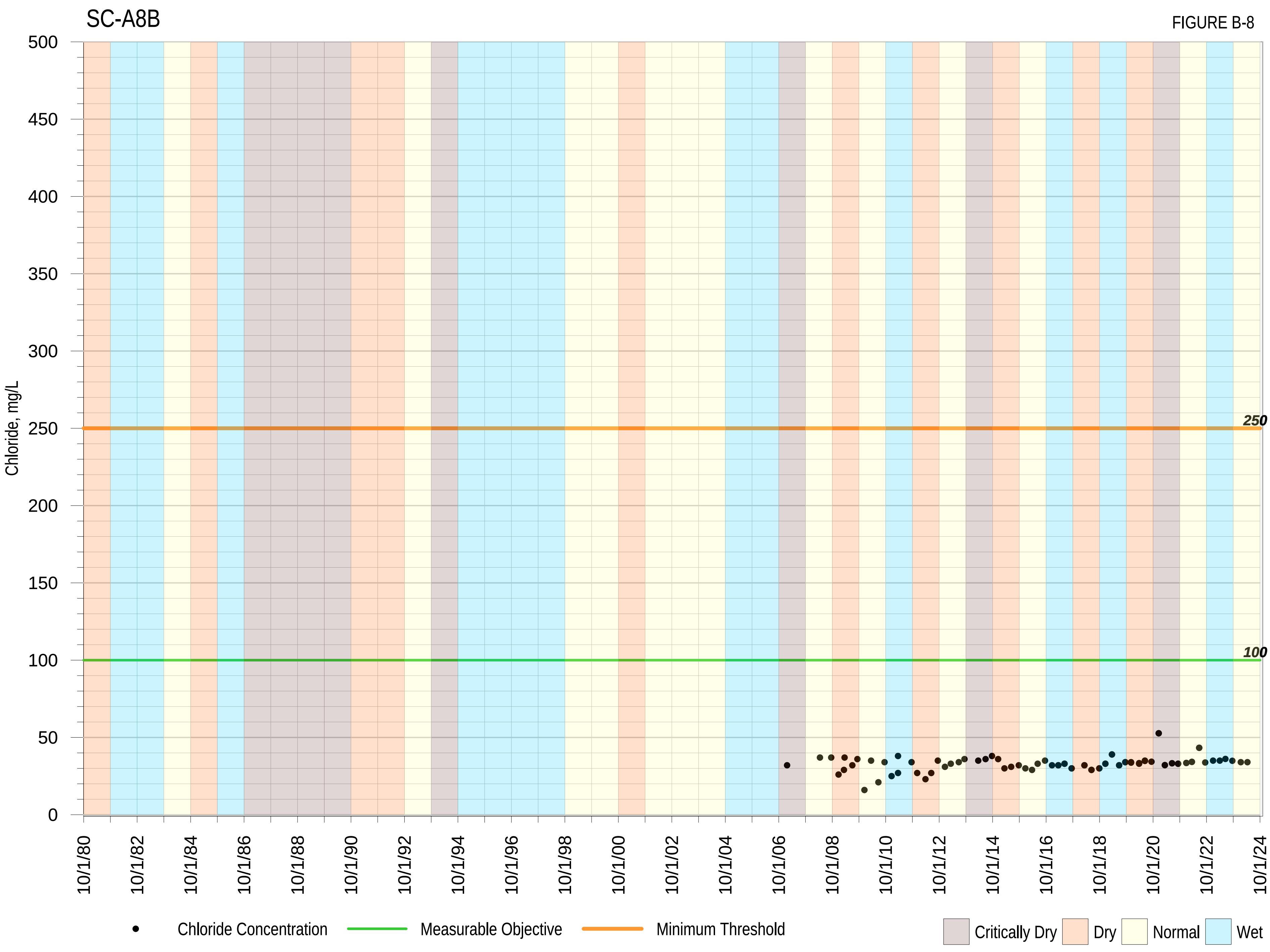


FIGURE B-6

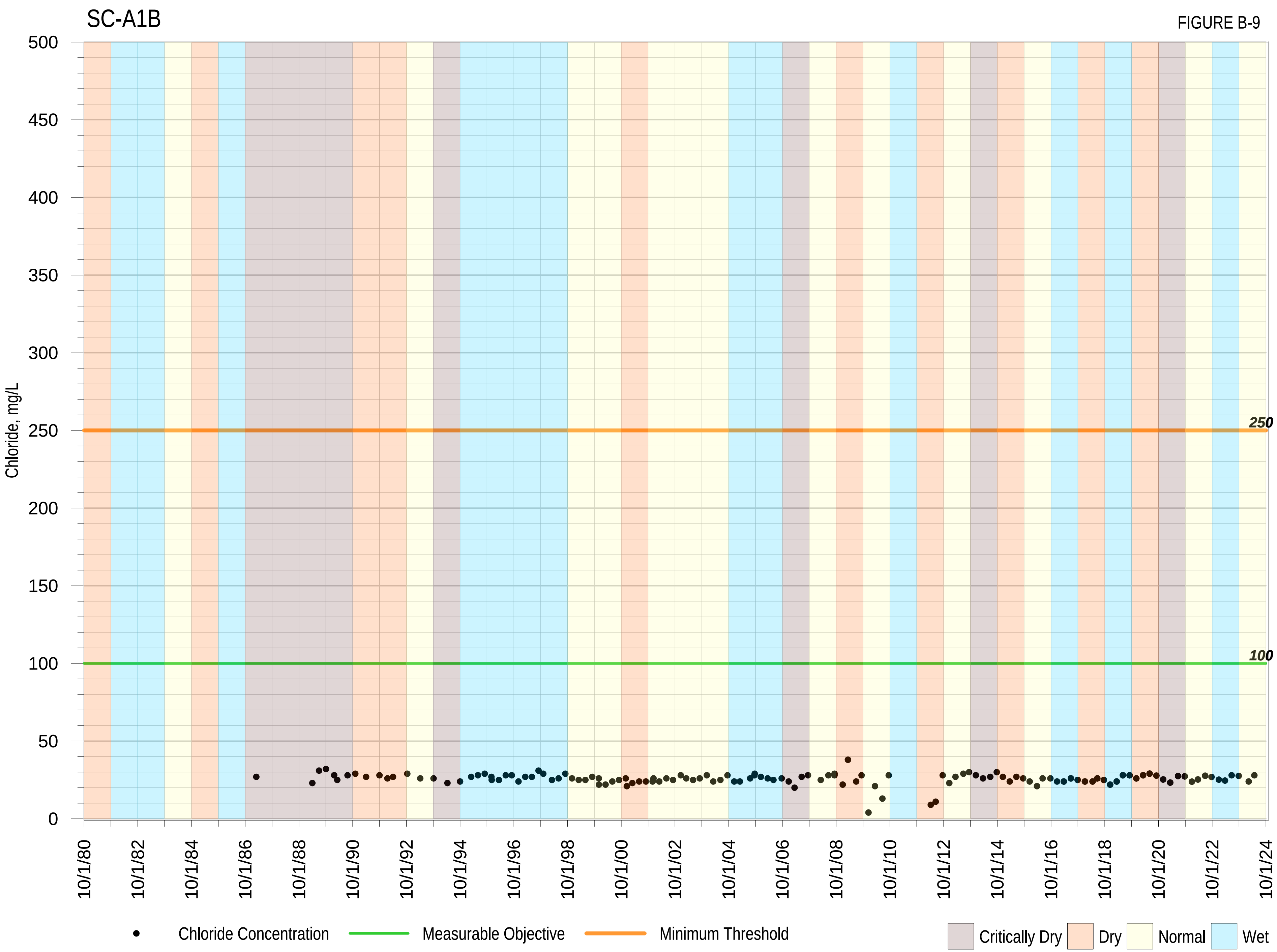

Moran Lake Medium
Chloride, mg/L
1,000
750
500
250
0
700
147
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


Soquel Point Medium
FIGURE B-7
Chloride, mg/L
1,500
1,250
1,000
750
500
250
0
1,300
1,104
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

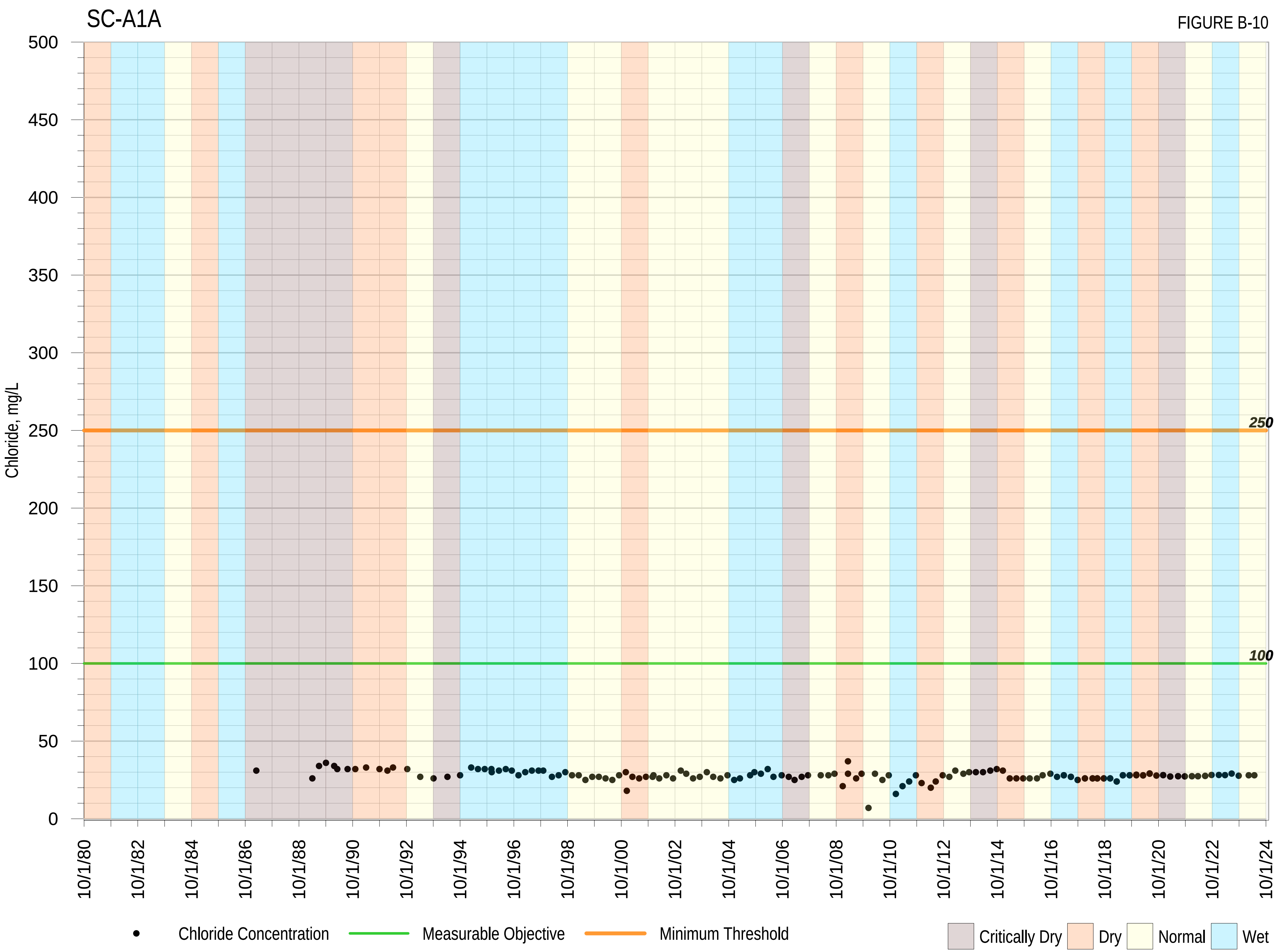
Appendix B

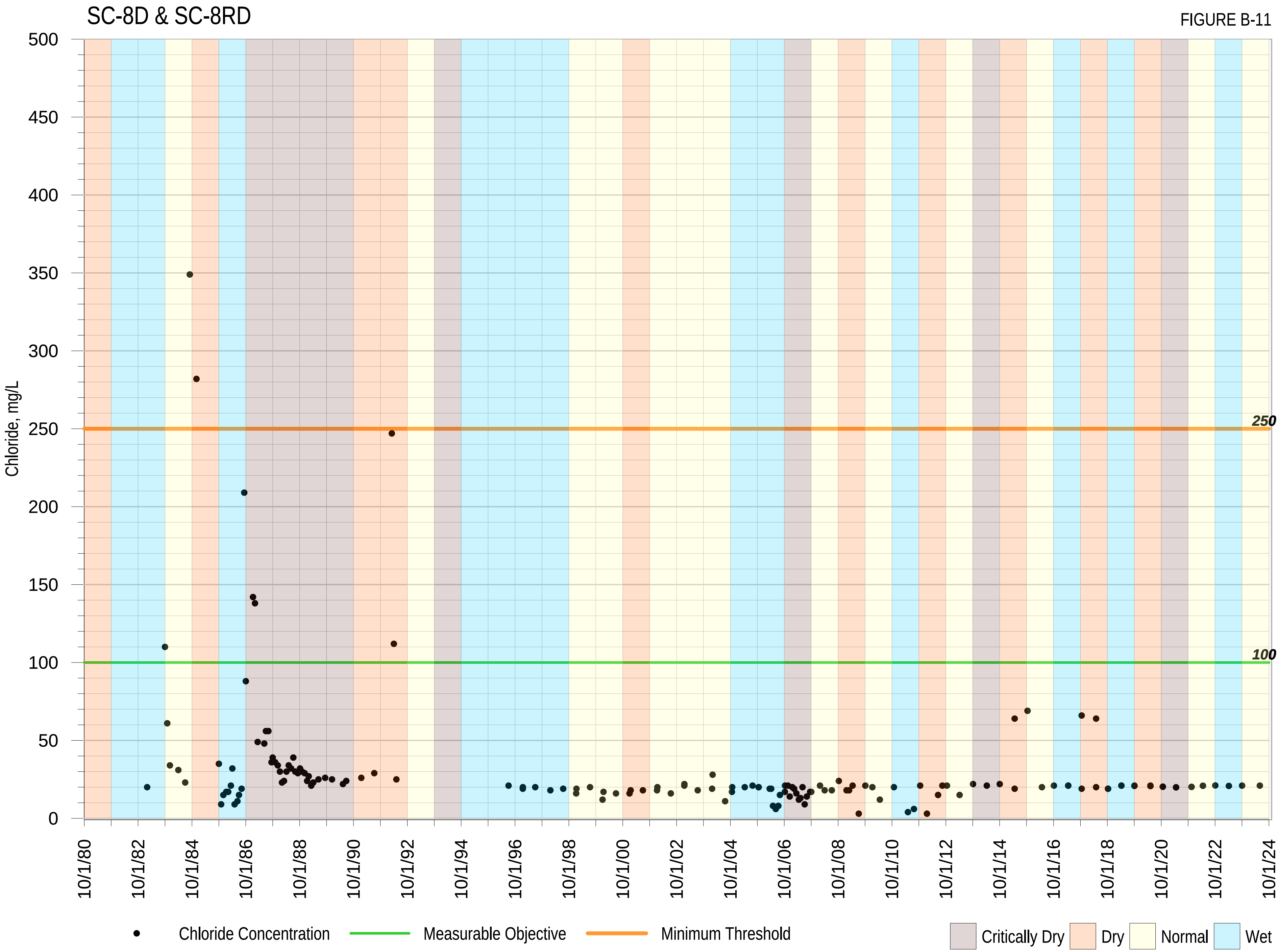


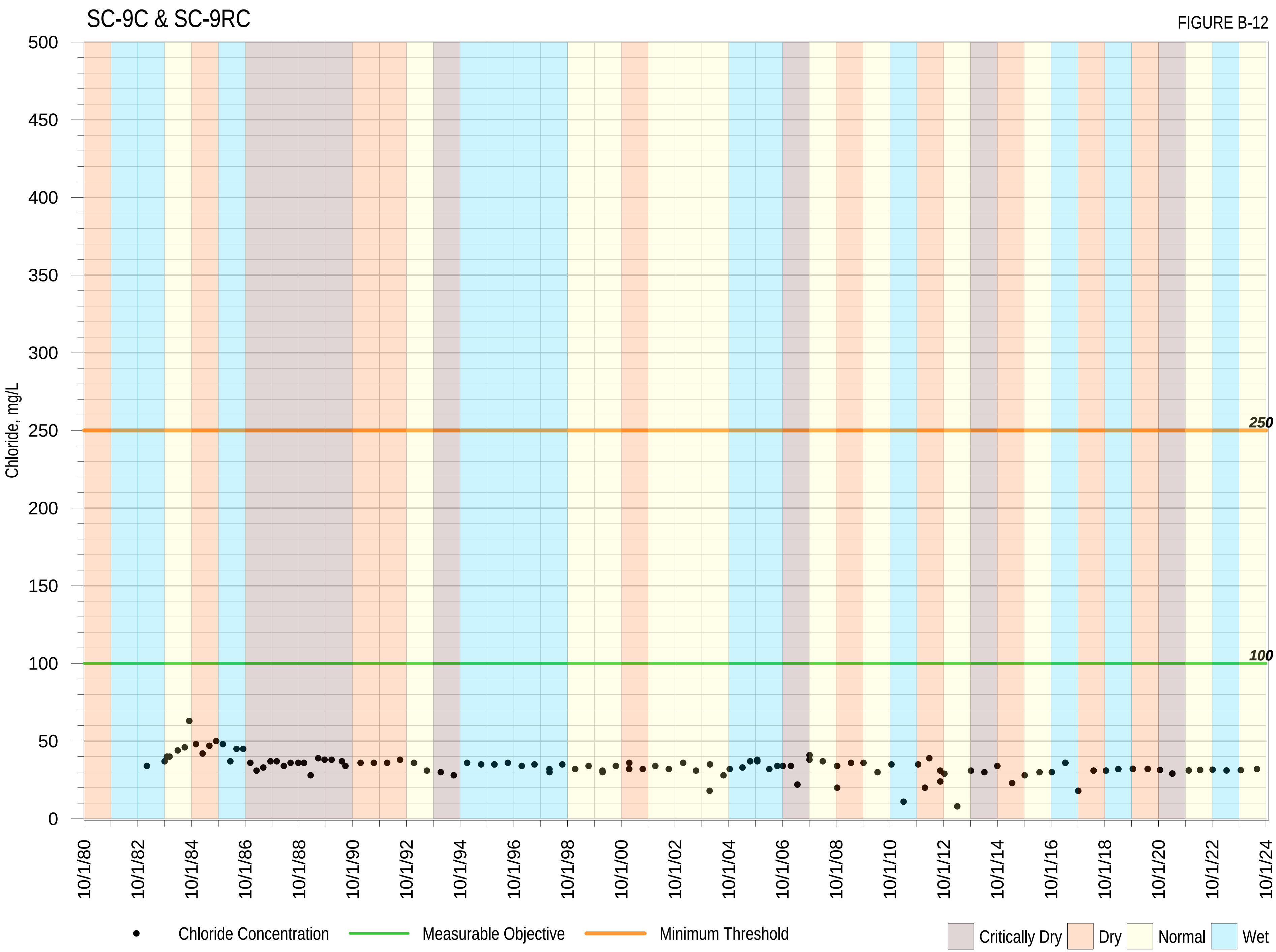
SC-A8B
FIGURE B-8
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet



SC-A1B
FIGURE B-9
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

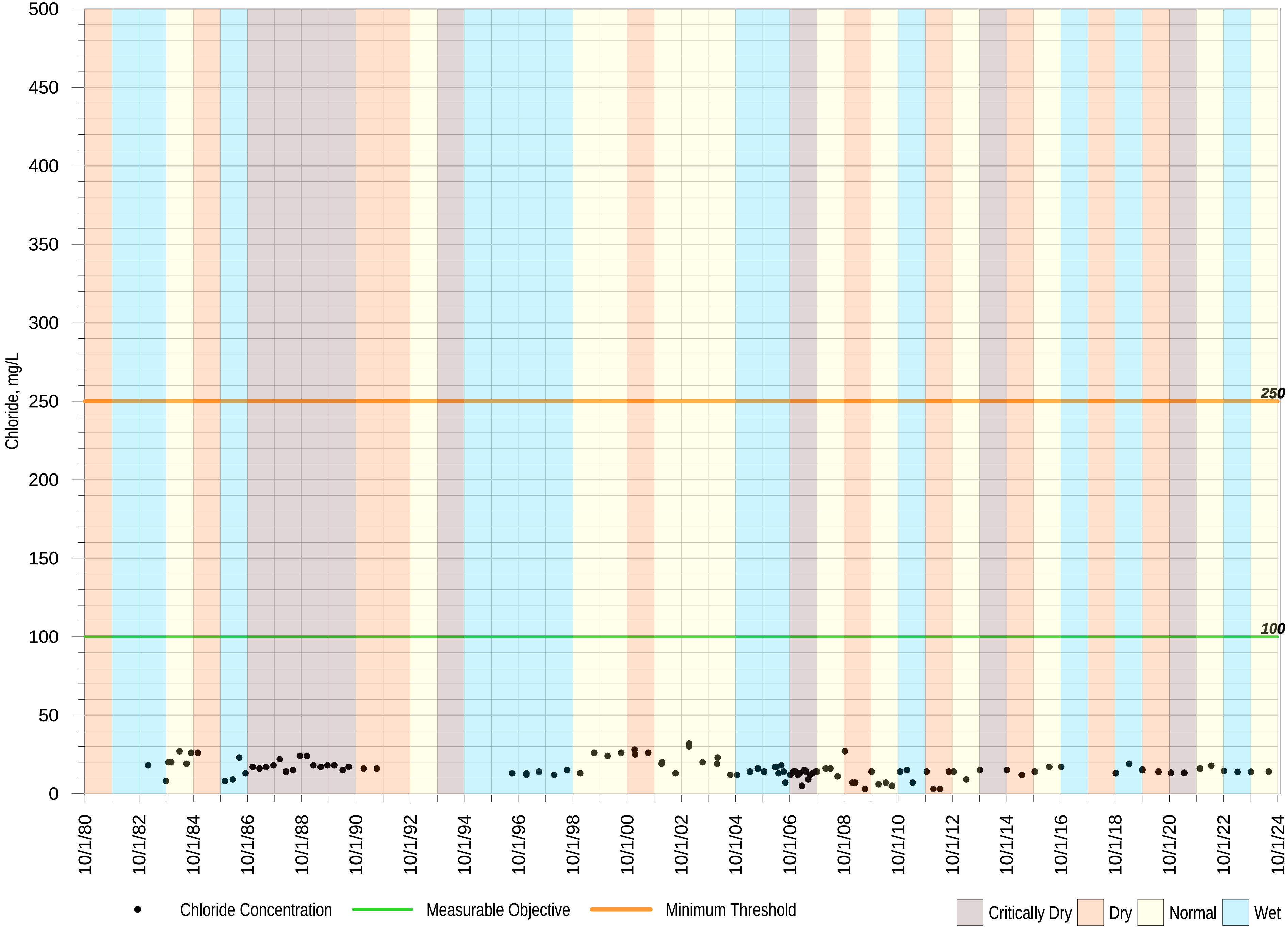

SC-A1A
FIGURE B-10
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


SC-8D & SC-8RD
FIGURE B-11
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


SC-9C & SC-9RC
FIGURE B-12
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

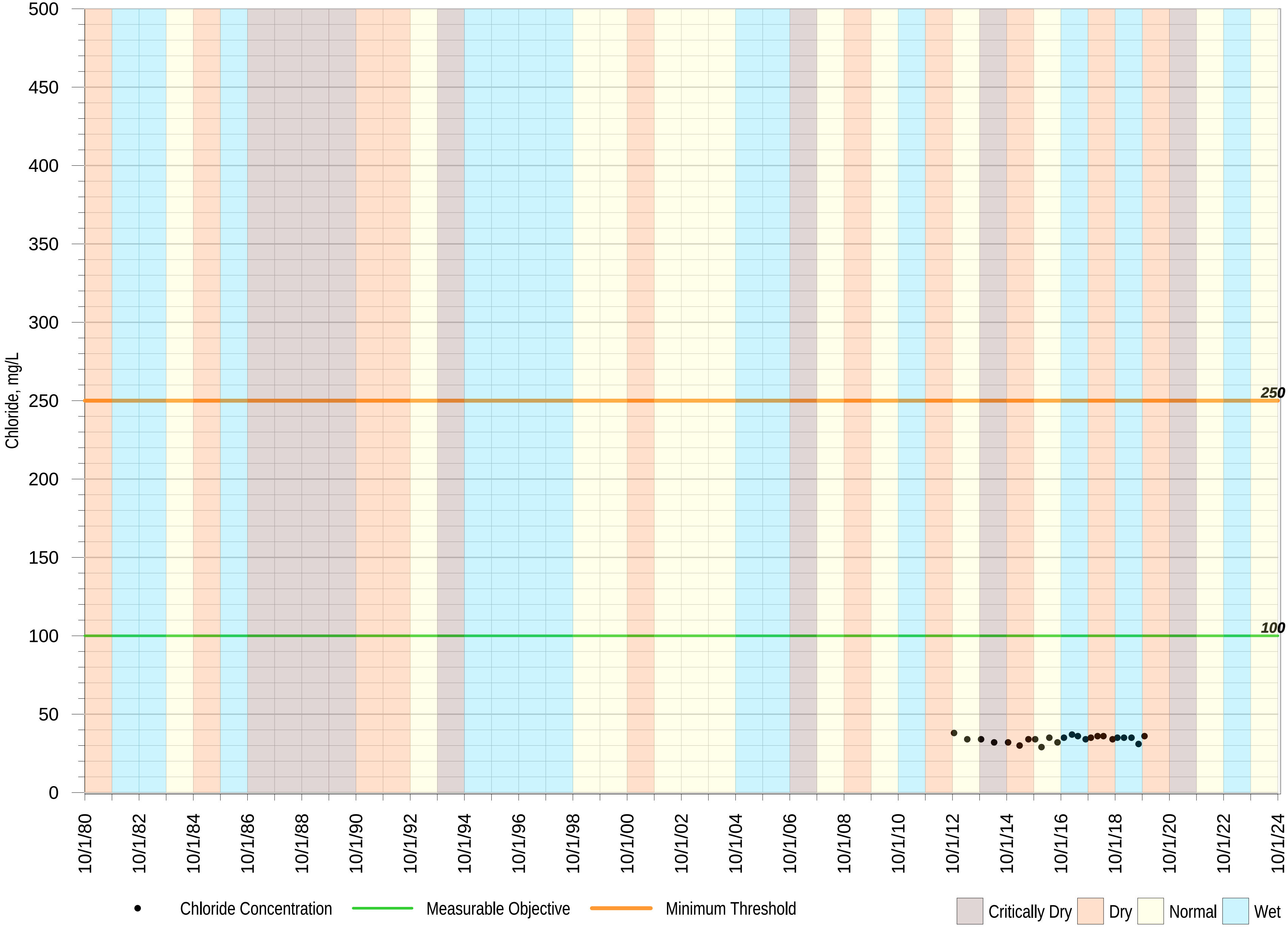
SC-8B & SC-8RB

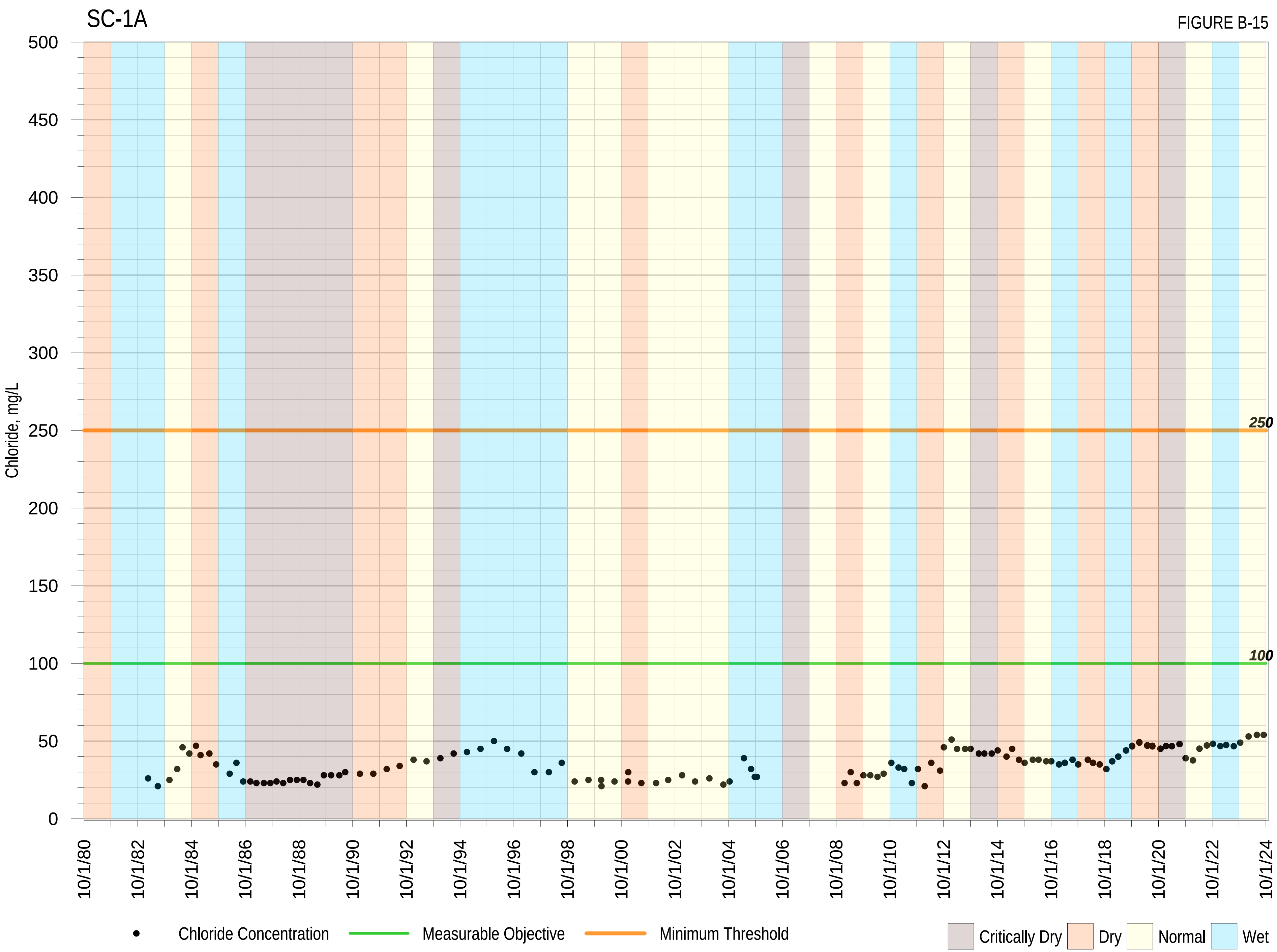
FIGURE B-13



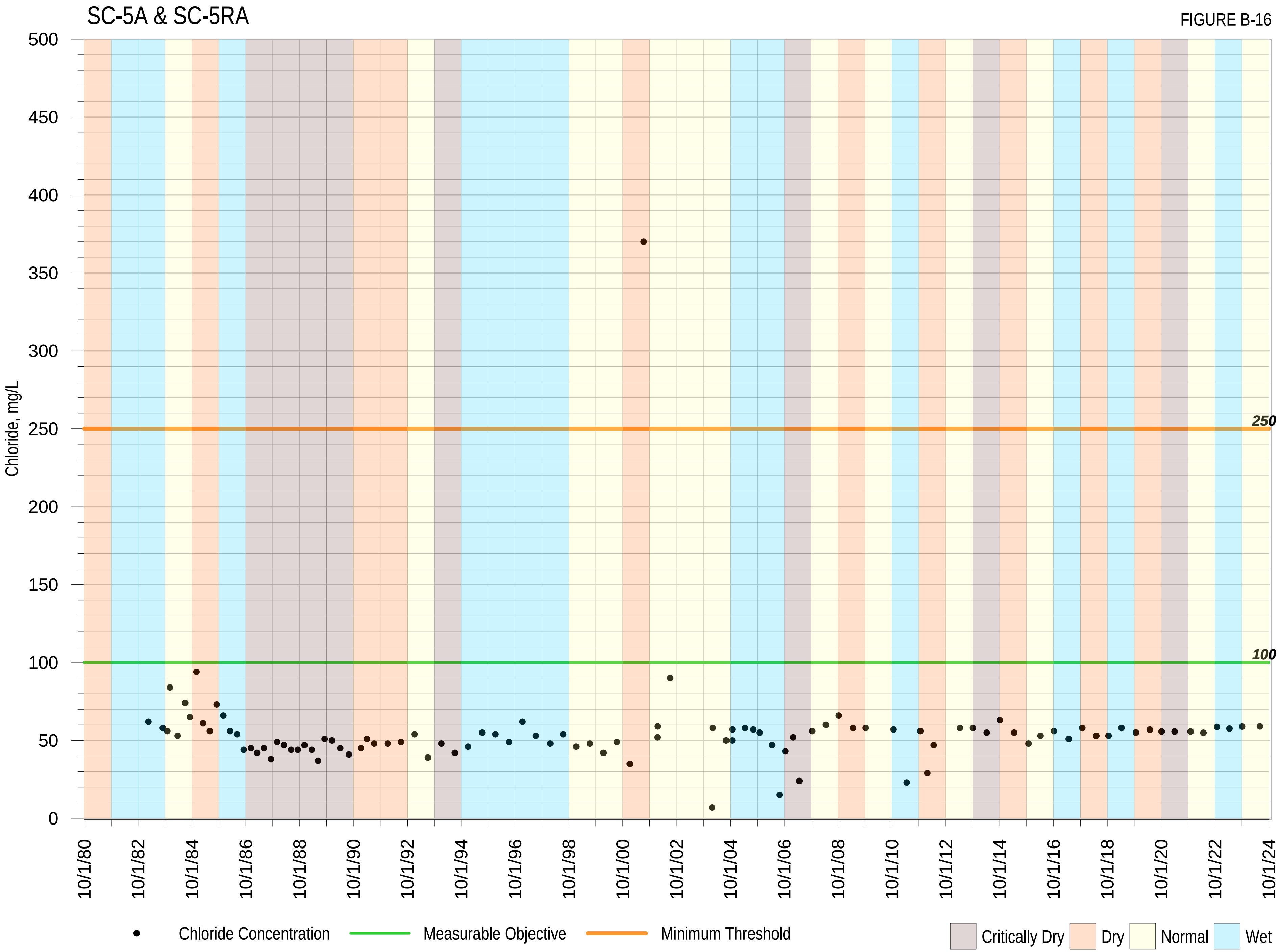
Pleasure Point Medium

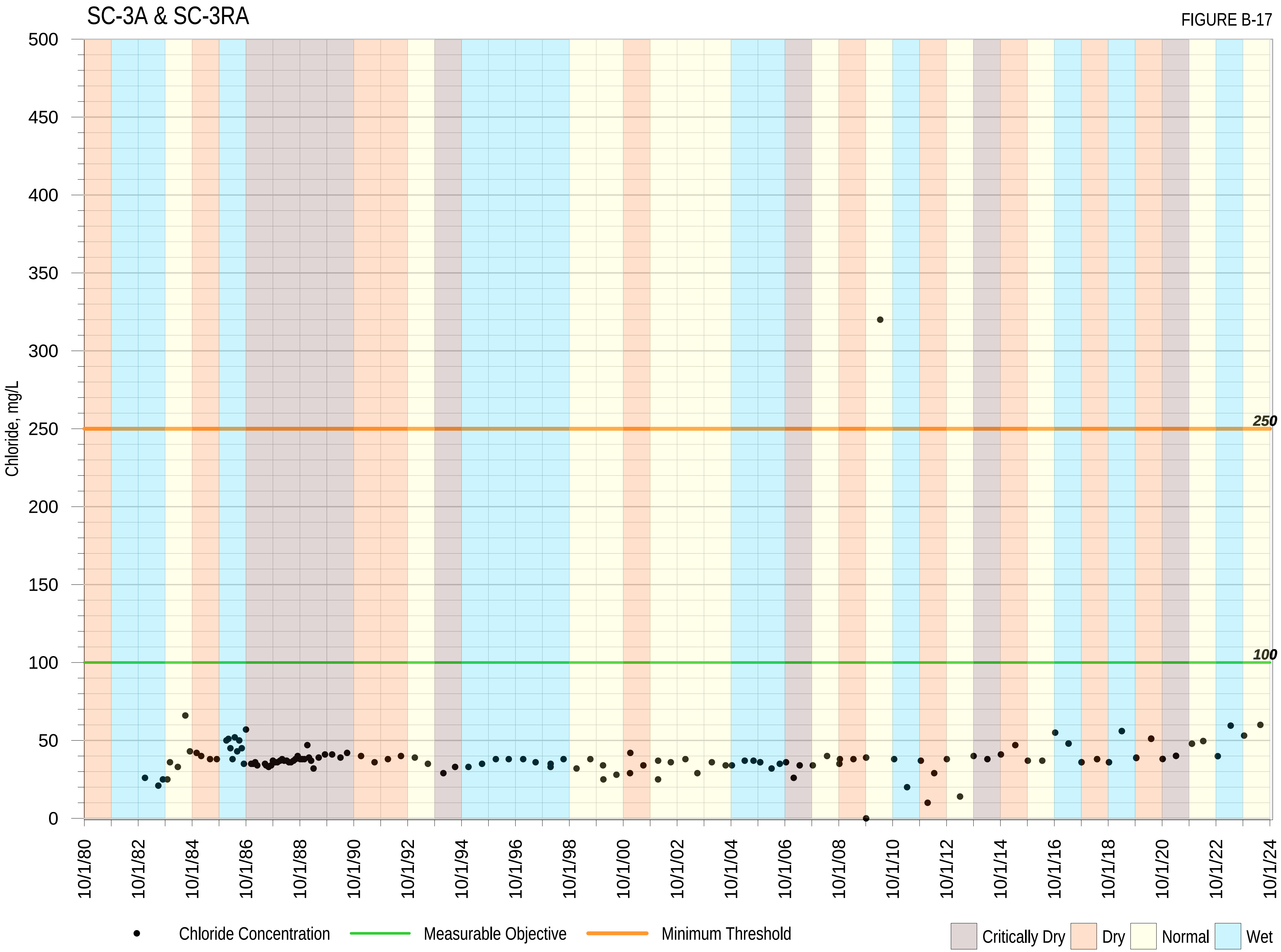
FIGURE B-14




SC-1A
FIGURE B-15
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

MONTGOMERY & ASSOCIATES




SC-3A & SC-3RA
FIGURE B-17
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

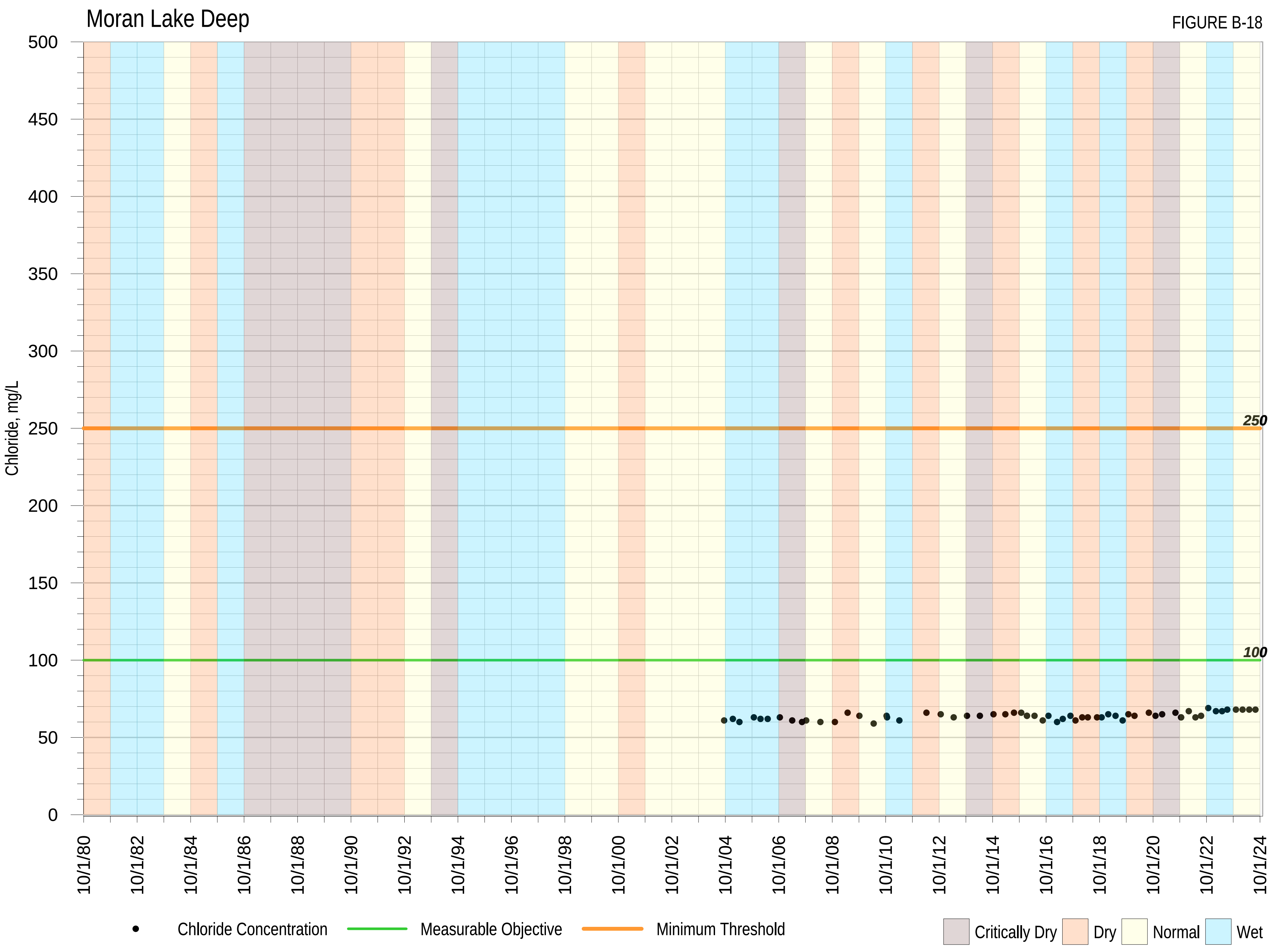
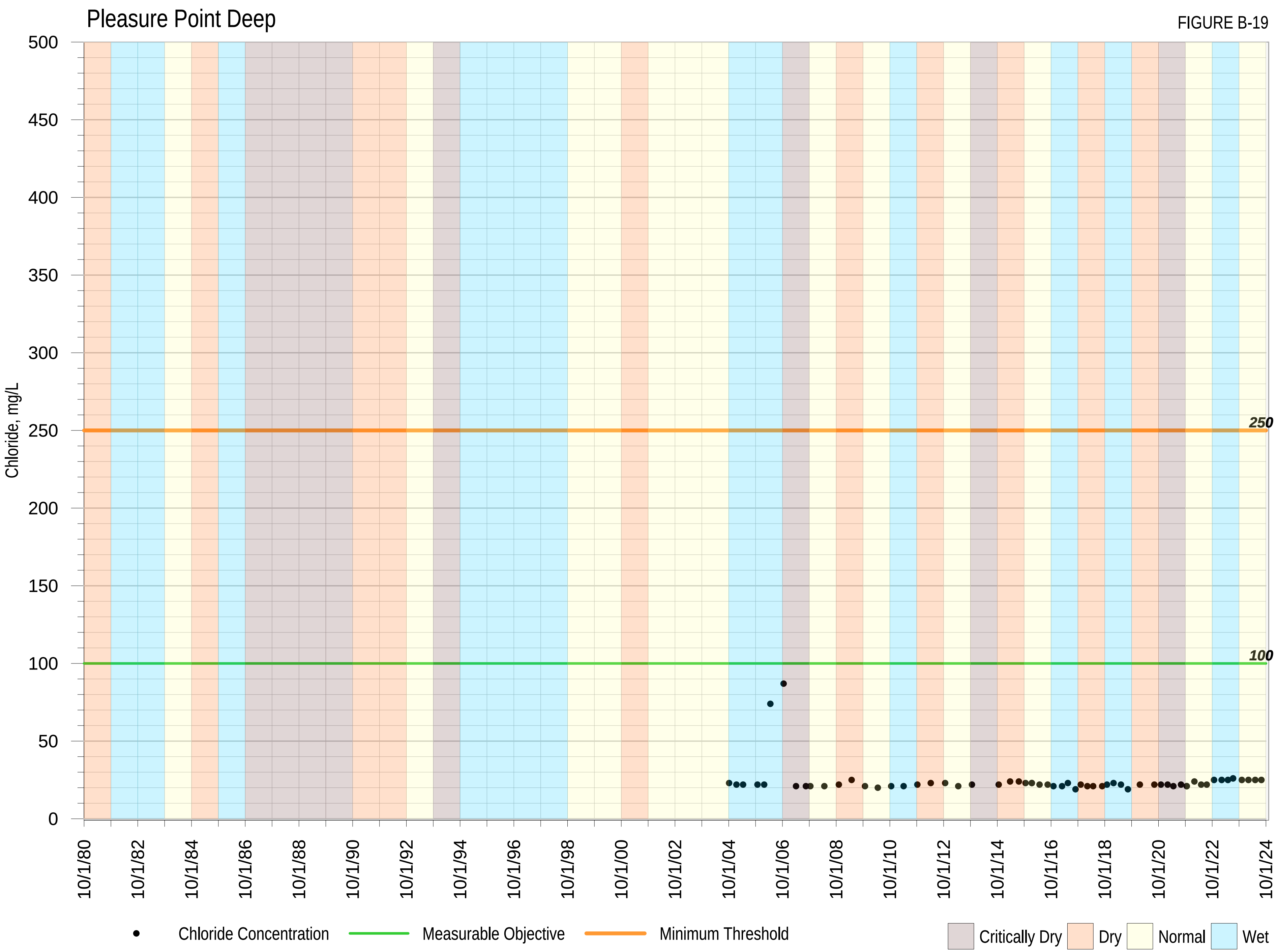

Moran Lake Deep
FIGURE B-18
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

FIGURE B-19


Pleasure Point Deep
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

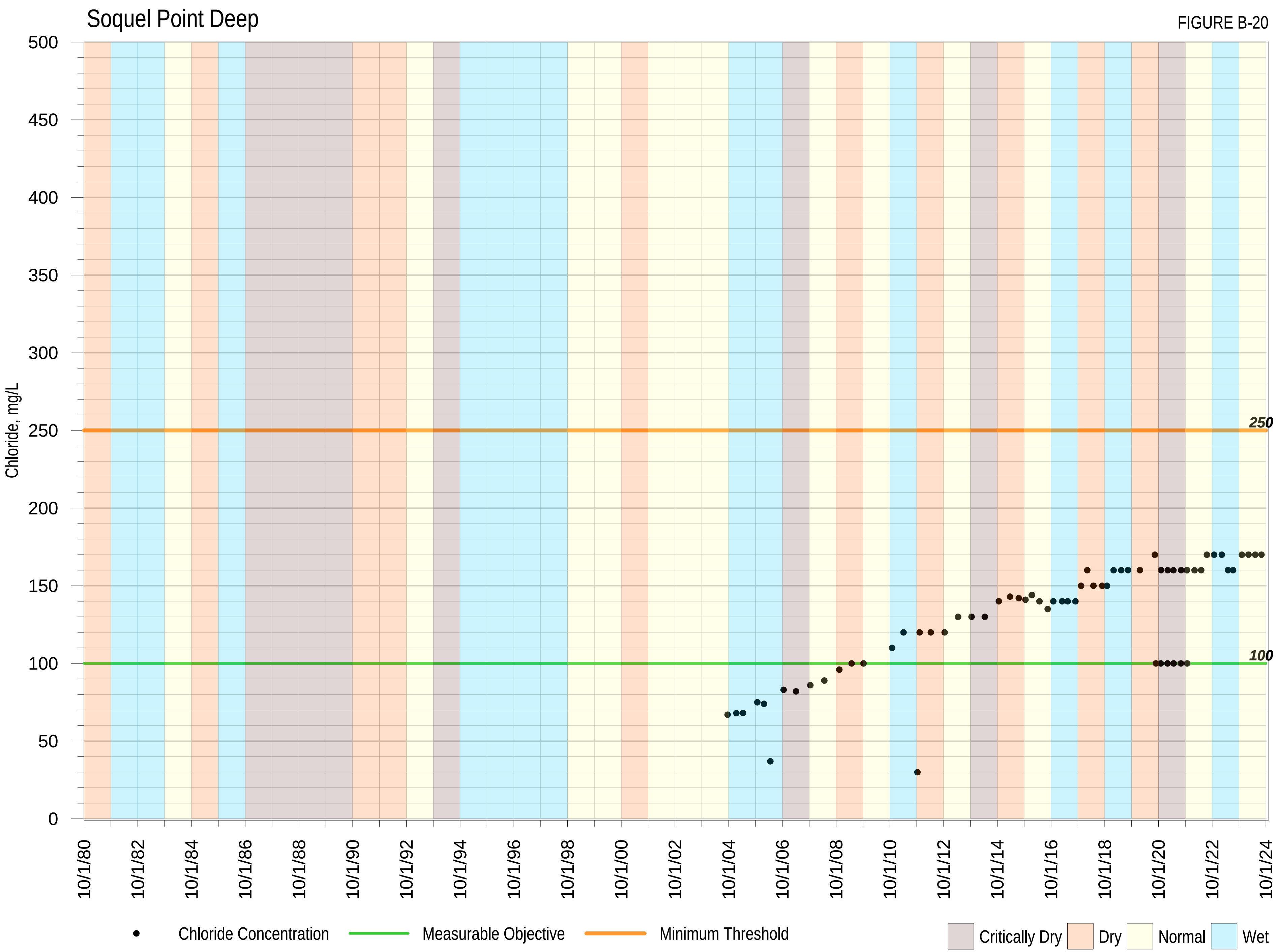
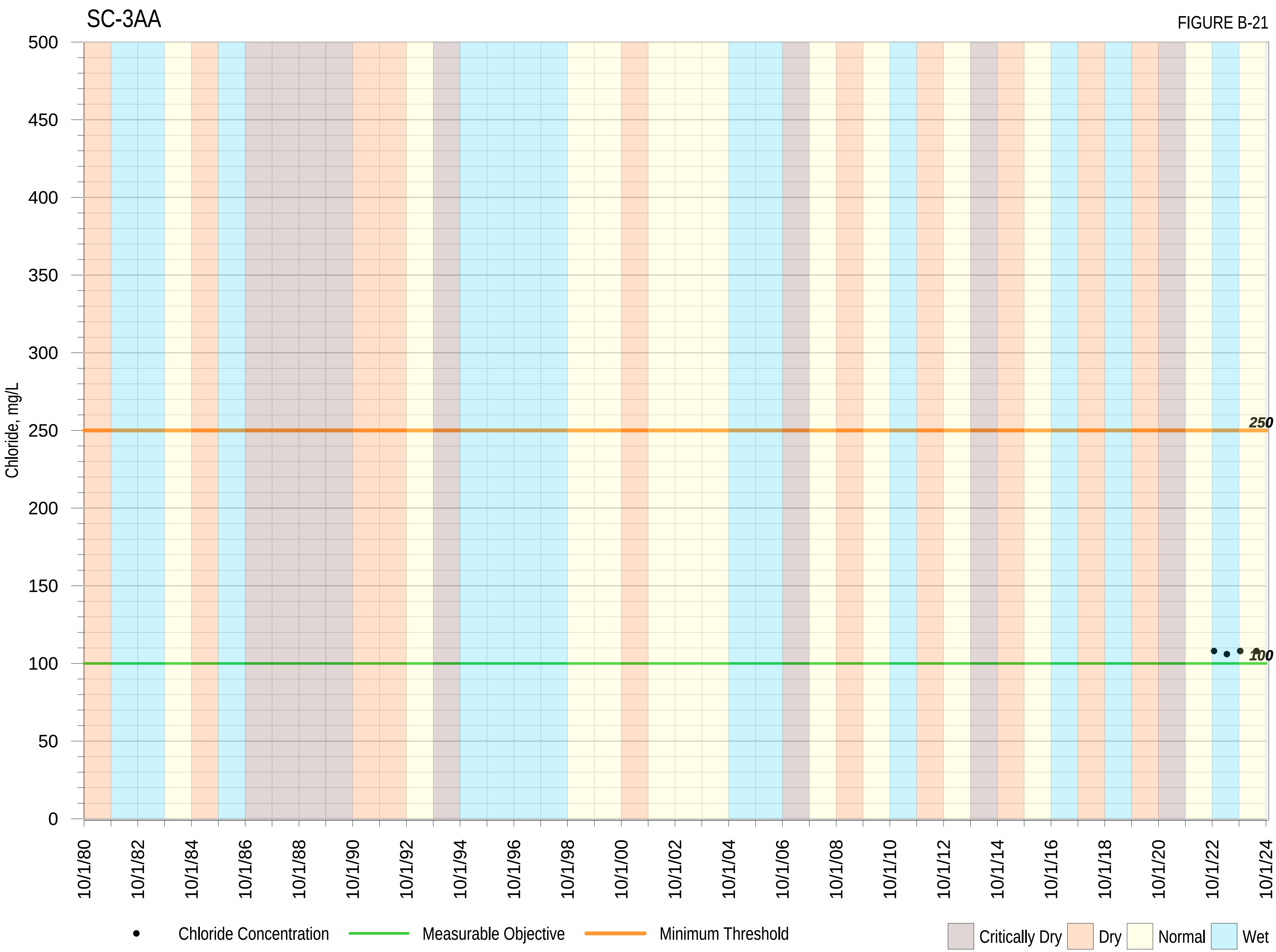
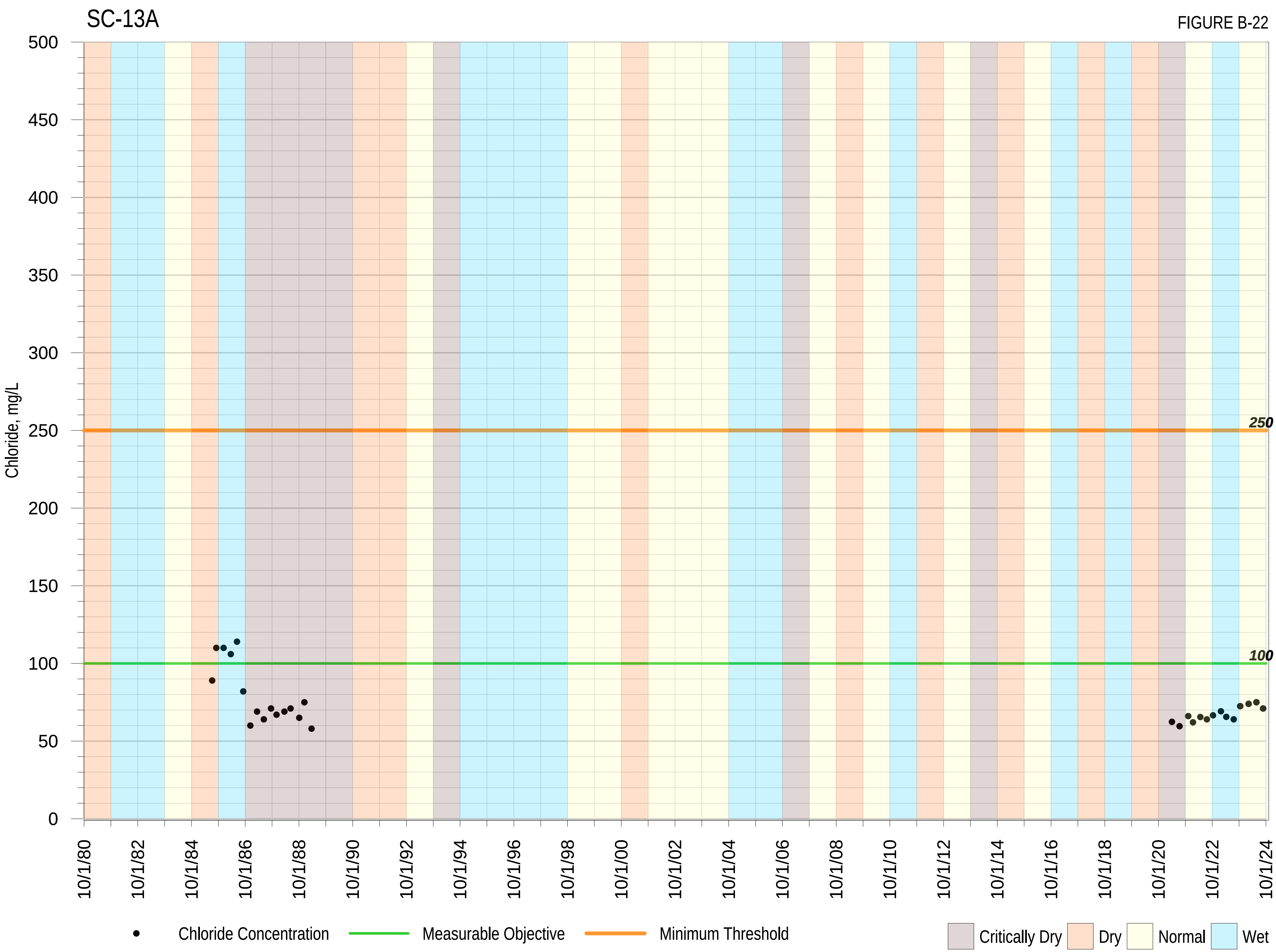

Soquel Point Deep
FIGURE B-20
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

FIGURE B-21


SC-3AA
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


SC-13A
FIGURE B-22
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
250
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

SP-5

FIGURE B-23

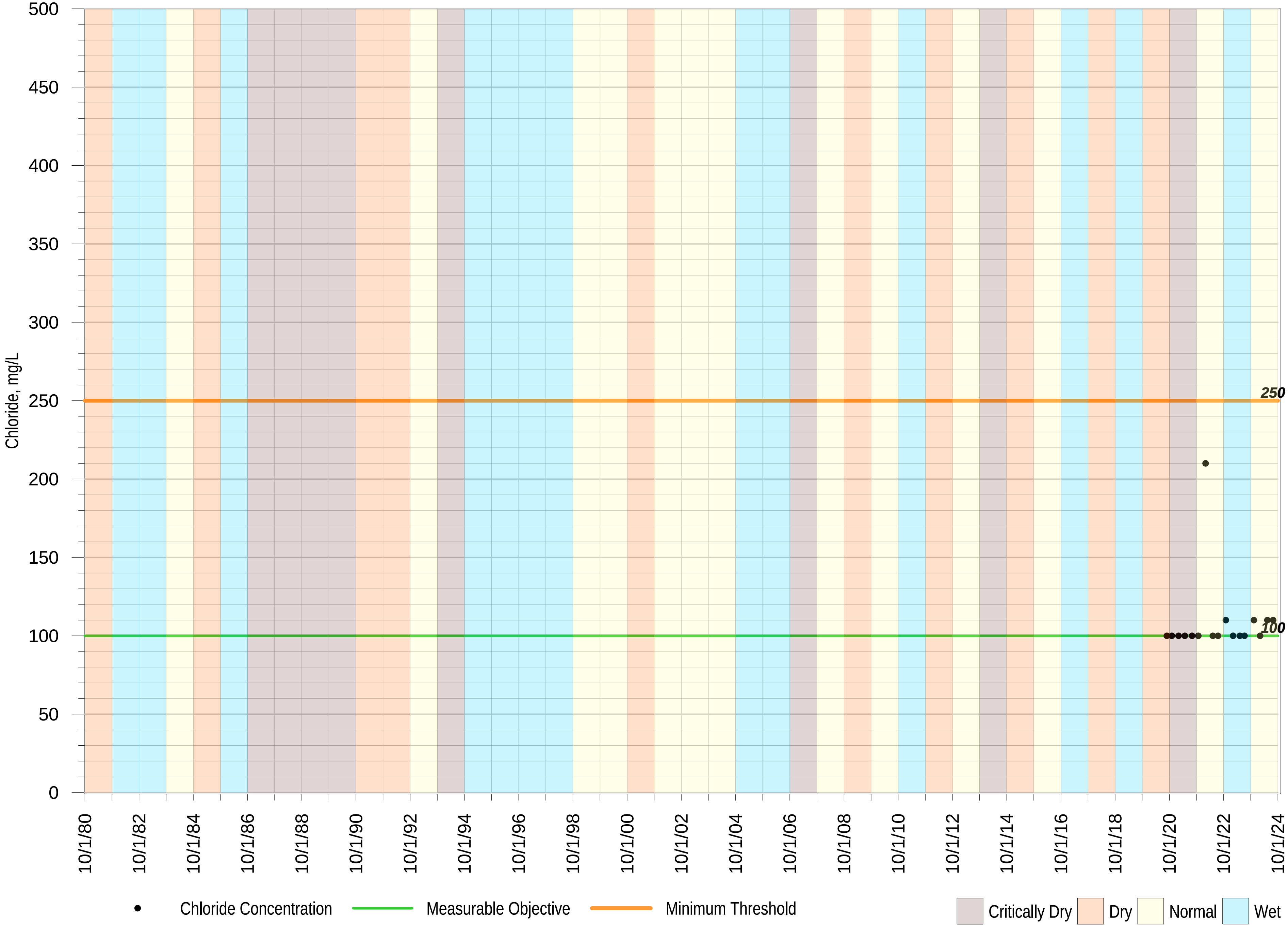


FIGURE B-24

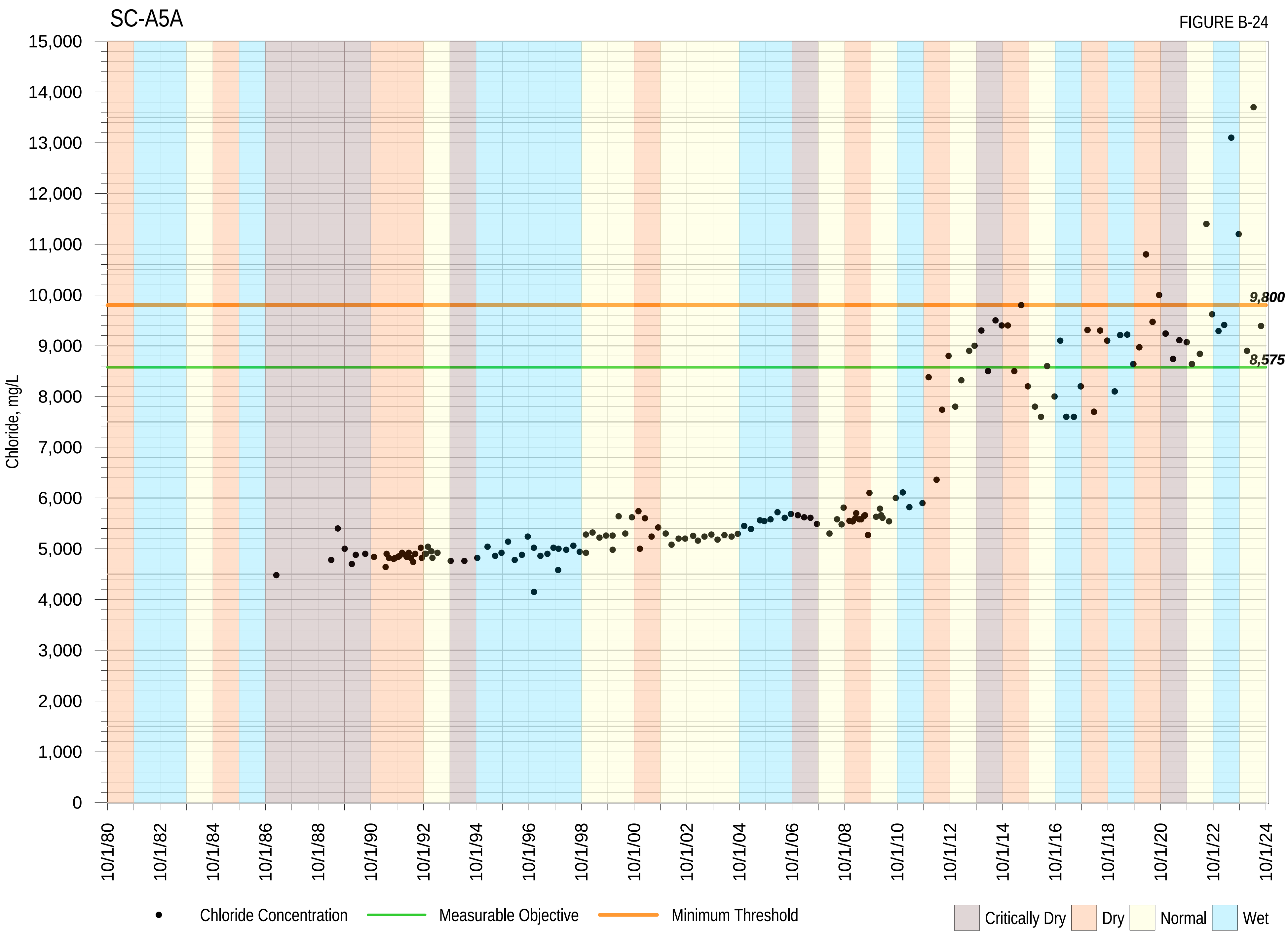
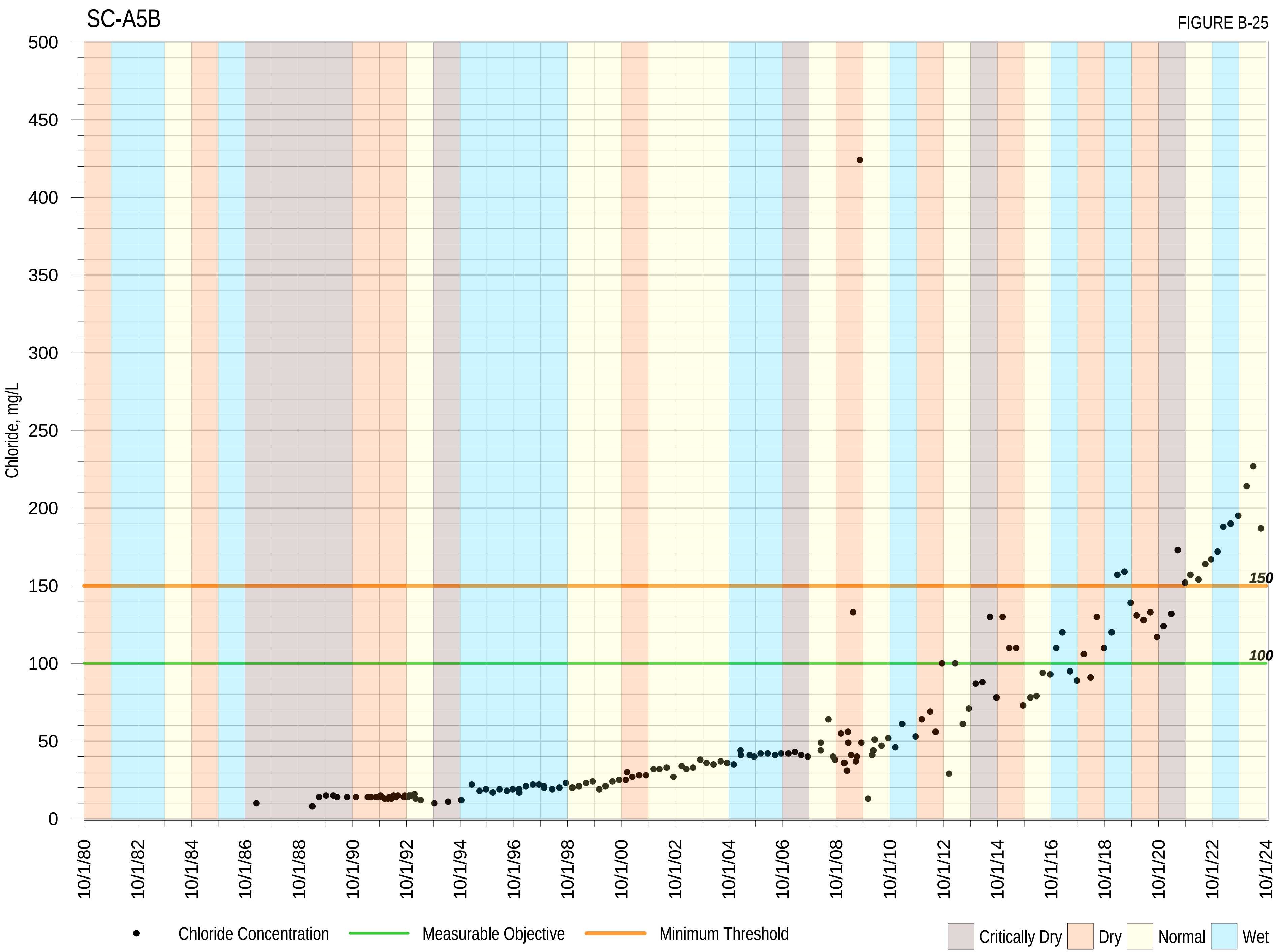
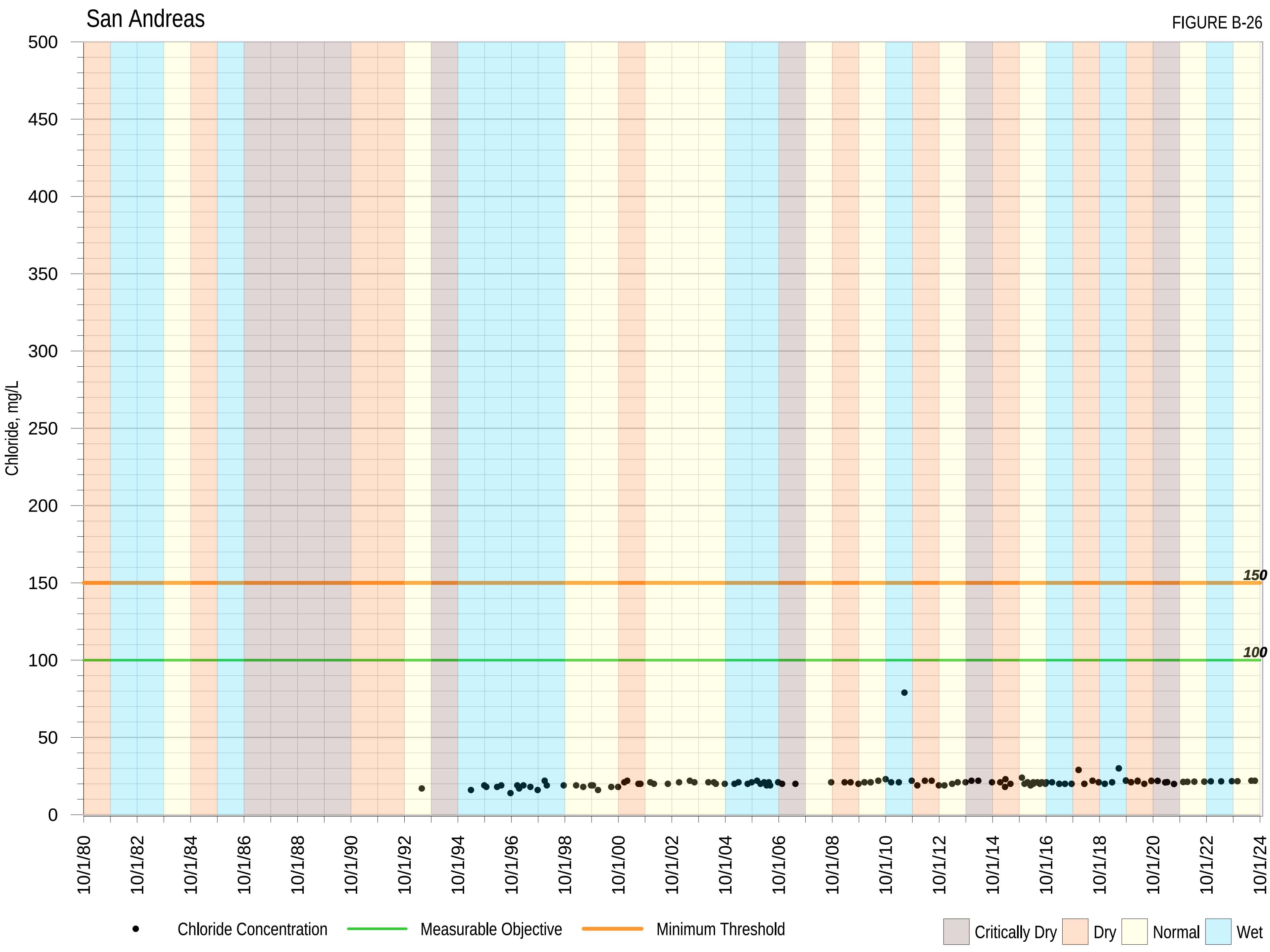
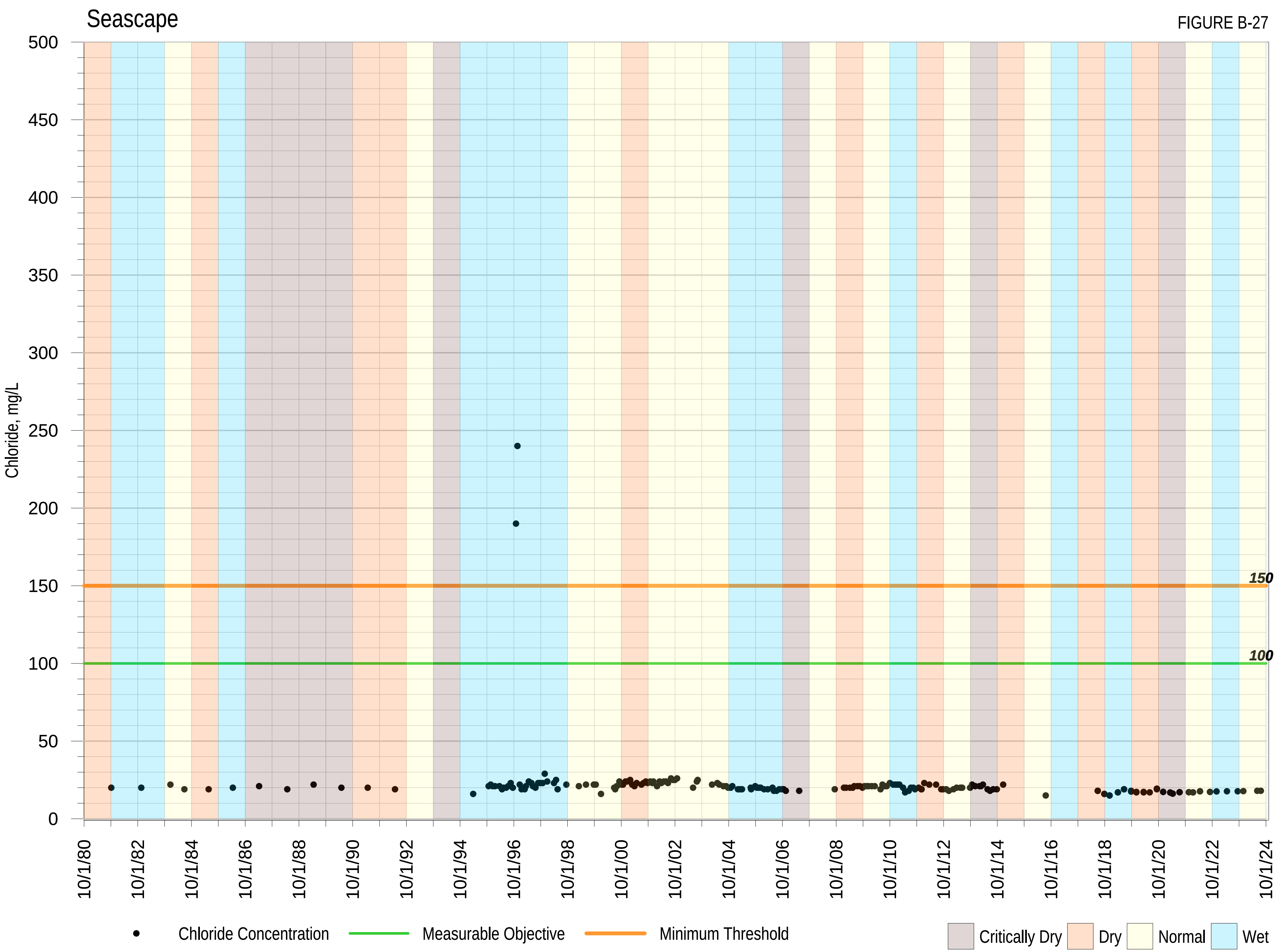
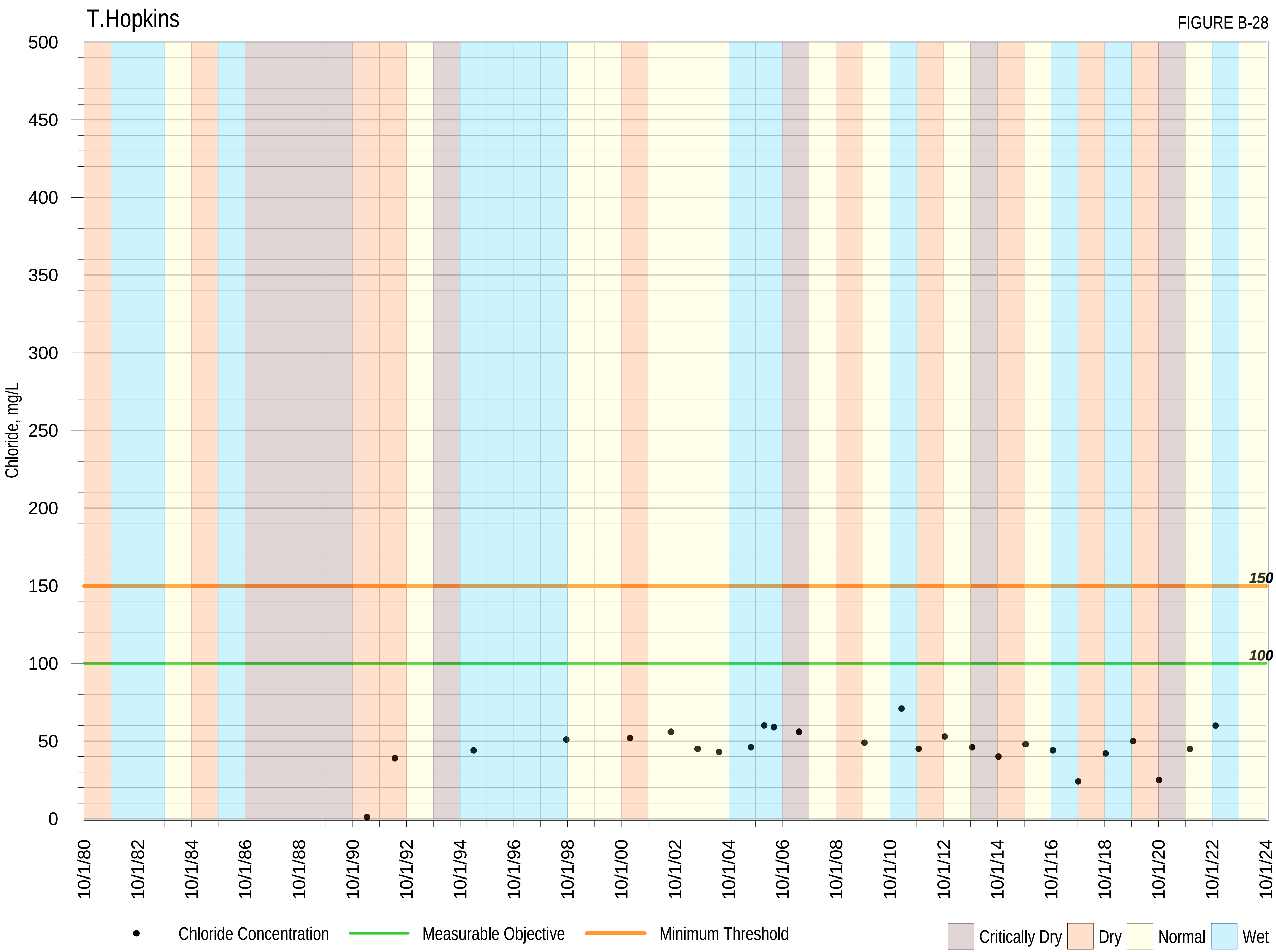

SC-A5A
Chloride, mg/L
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
9,800
8,575
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

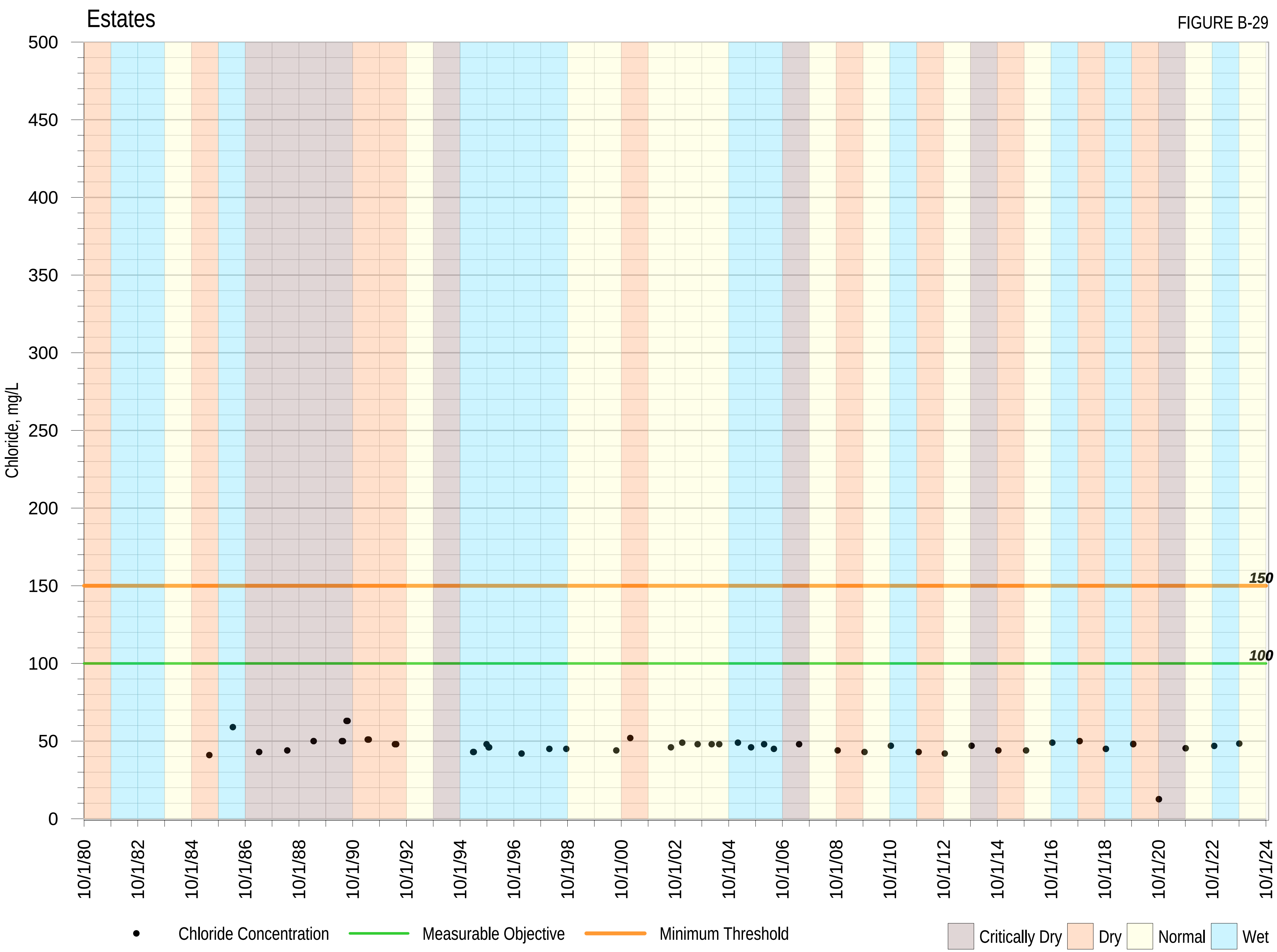
FIGURE B-25

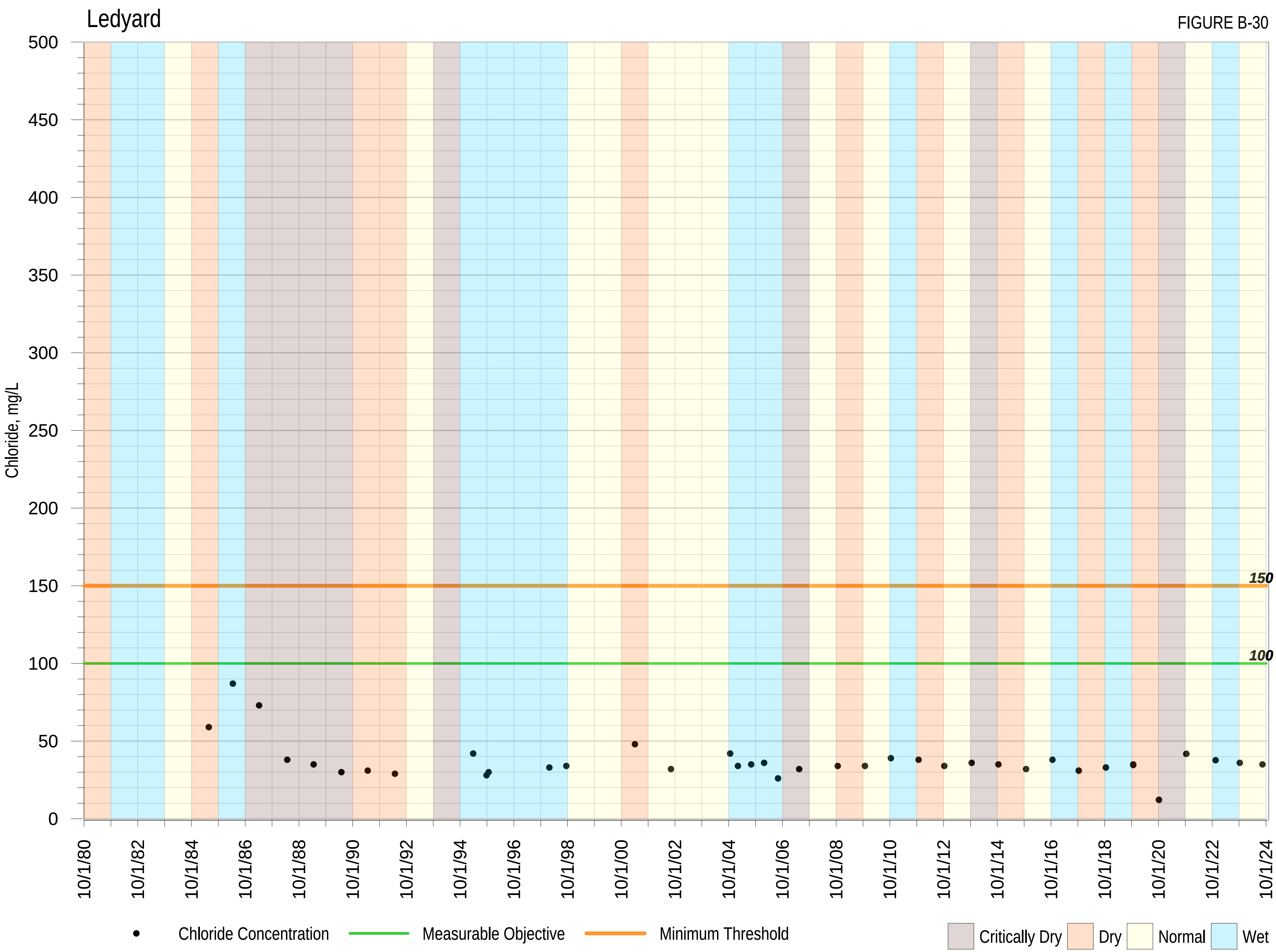

SC-A5B
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

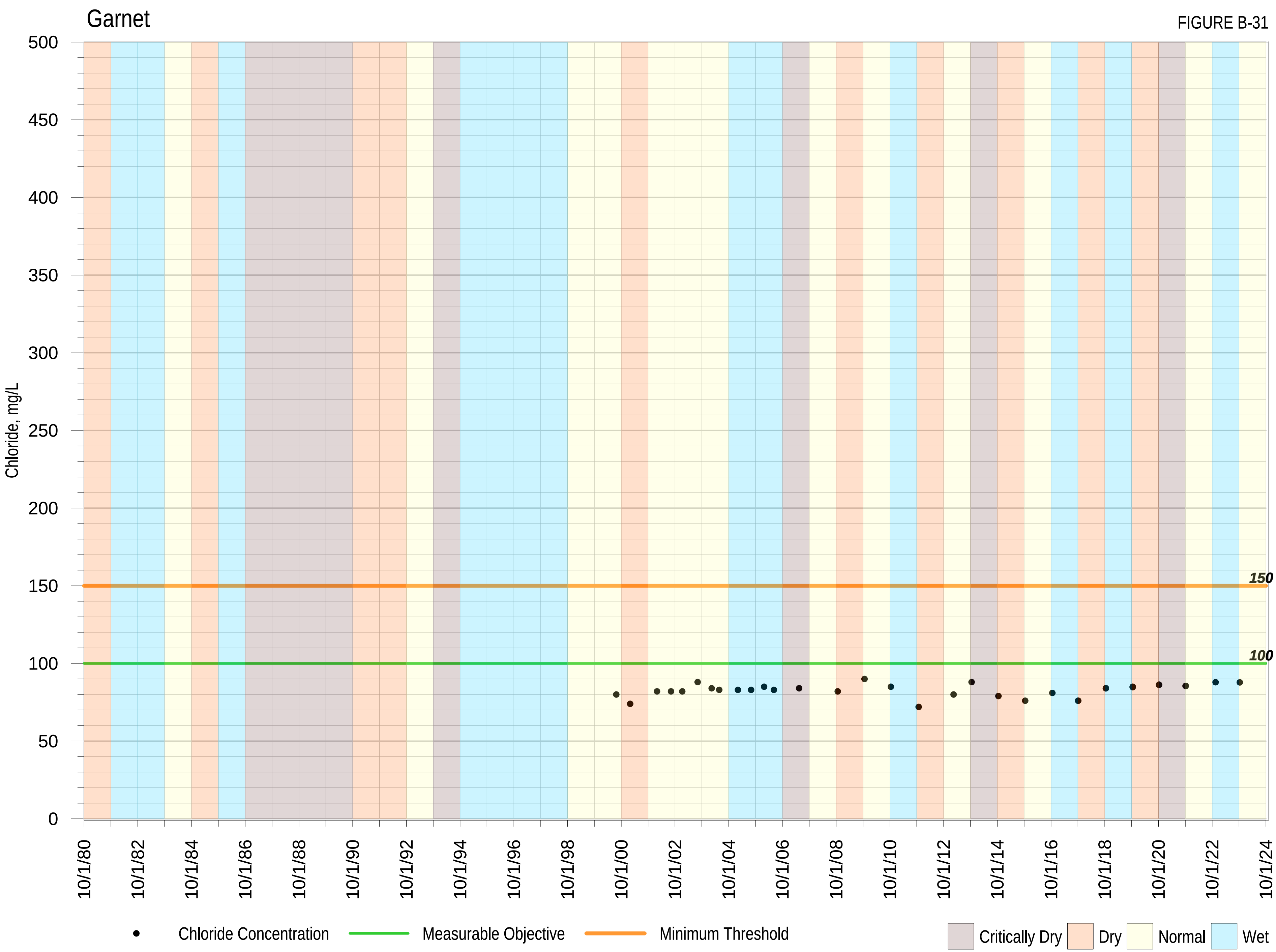

San Andreas
FIGURE B-26
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

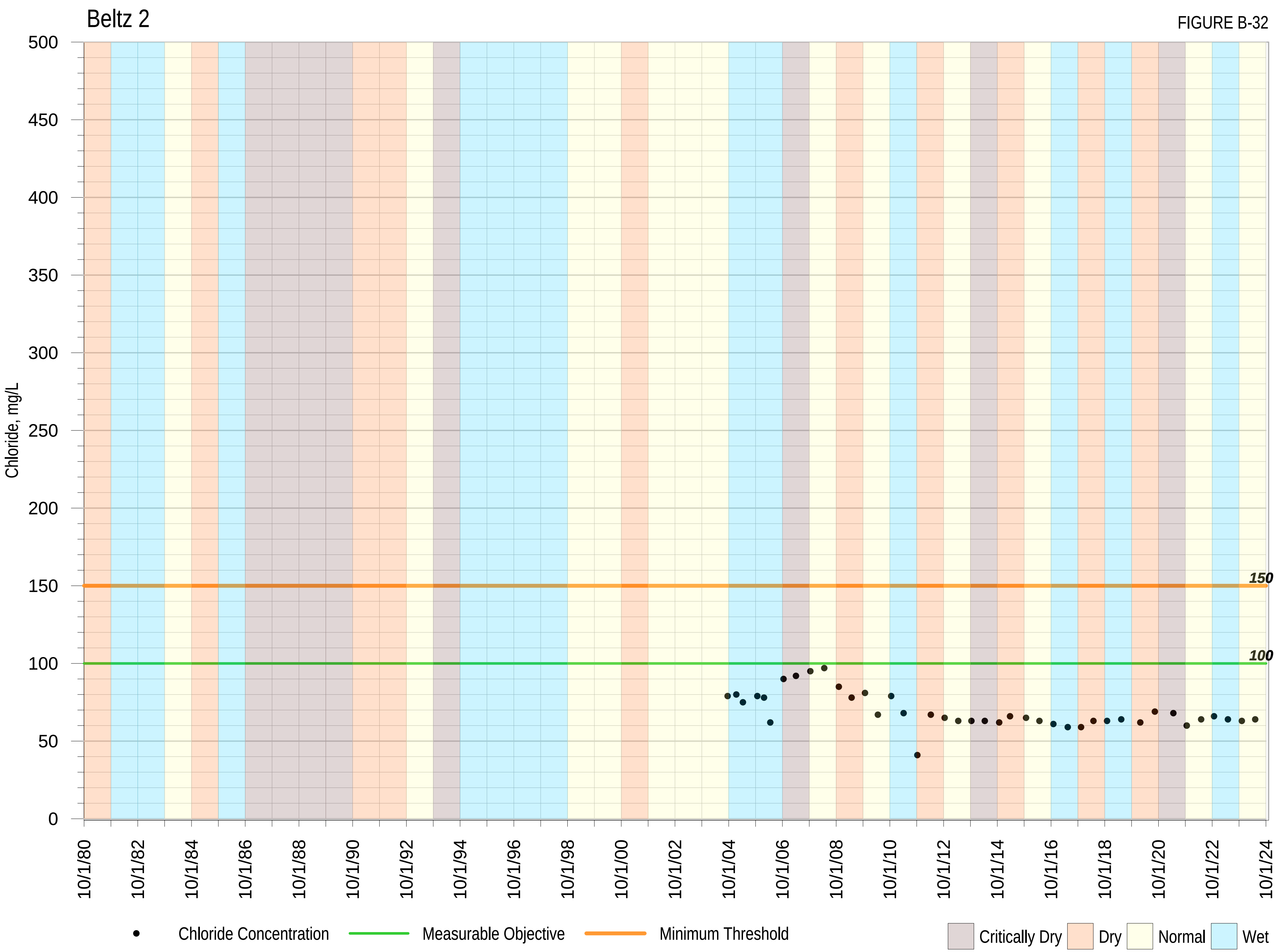

Seascape
FIGURE B-27
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

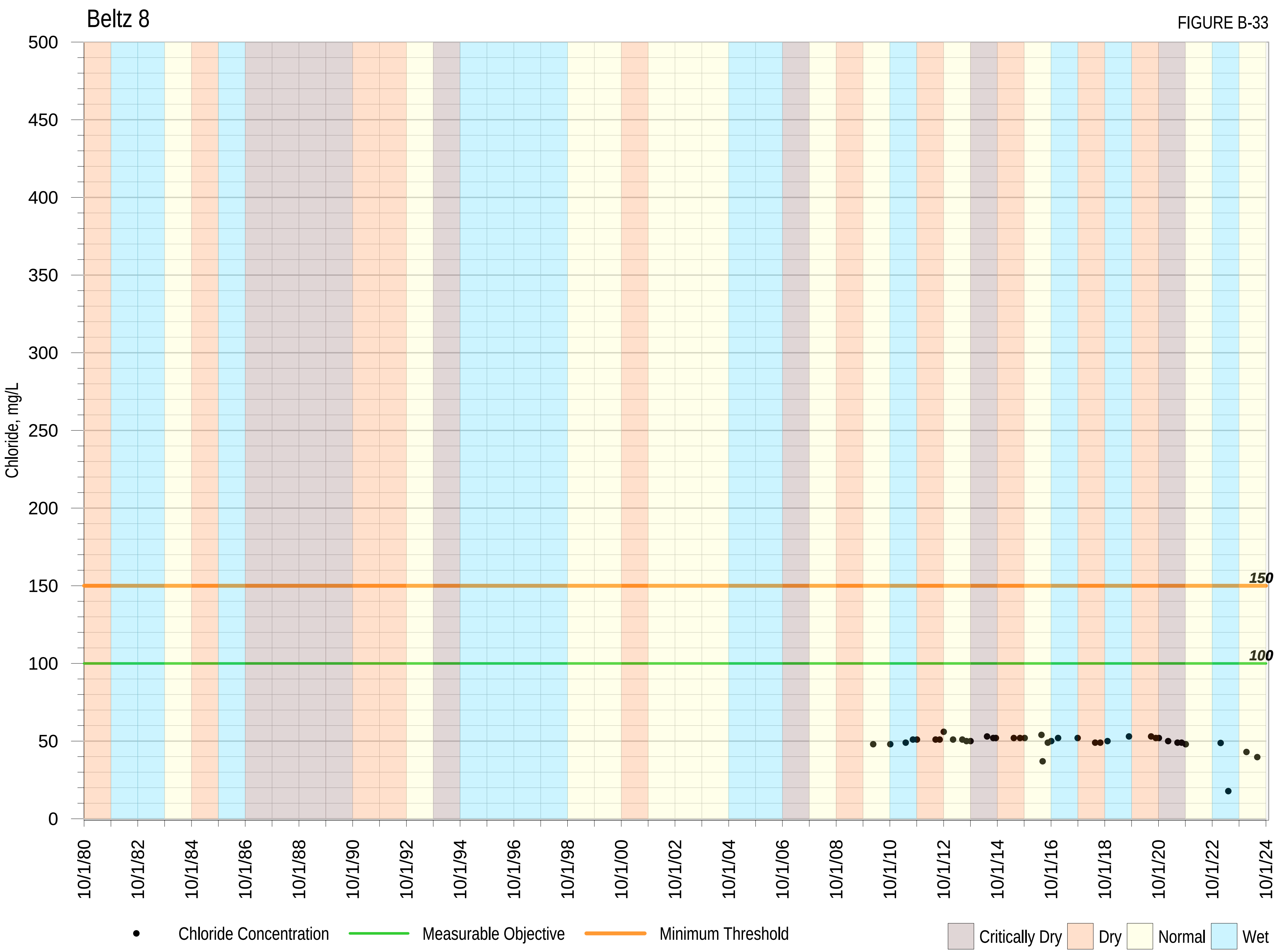

T.Hopkins
FIGURE B-28
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

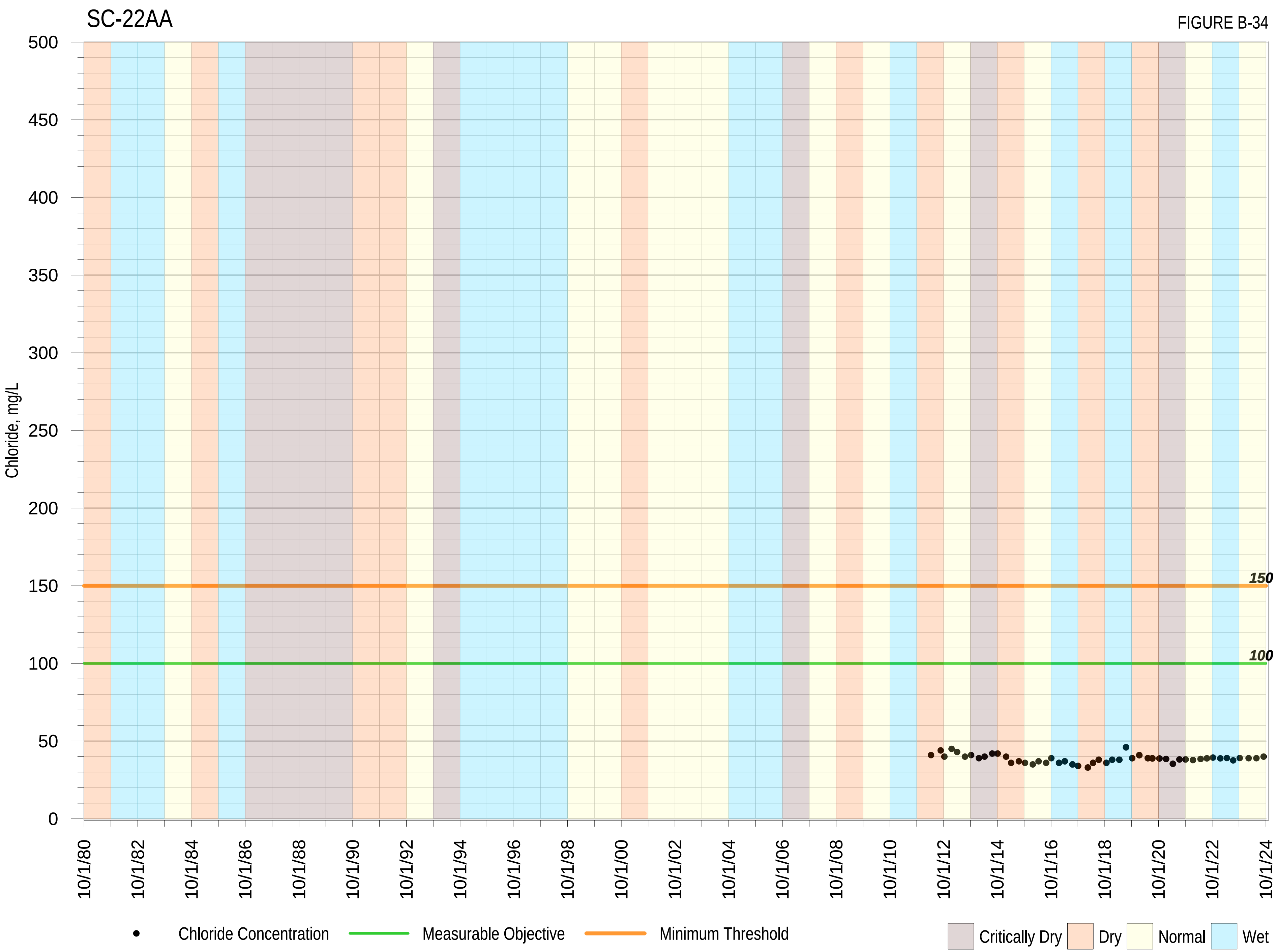

Estates
FIGURE B-29
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

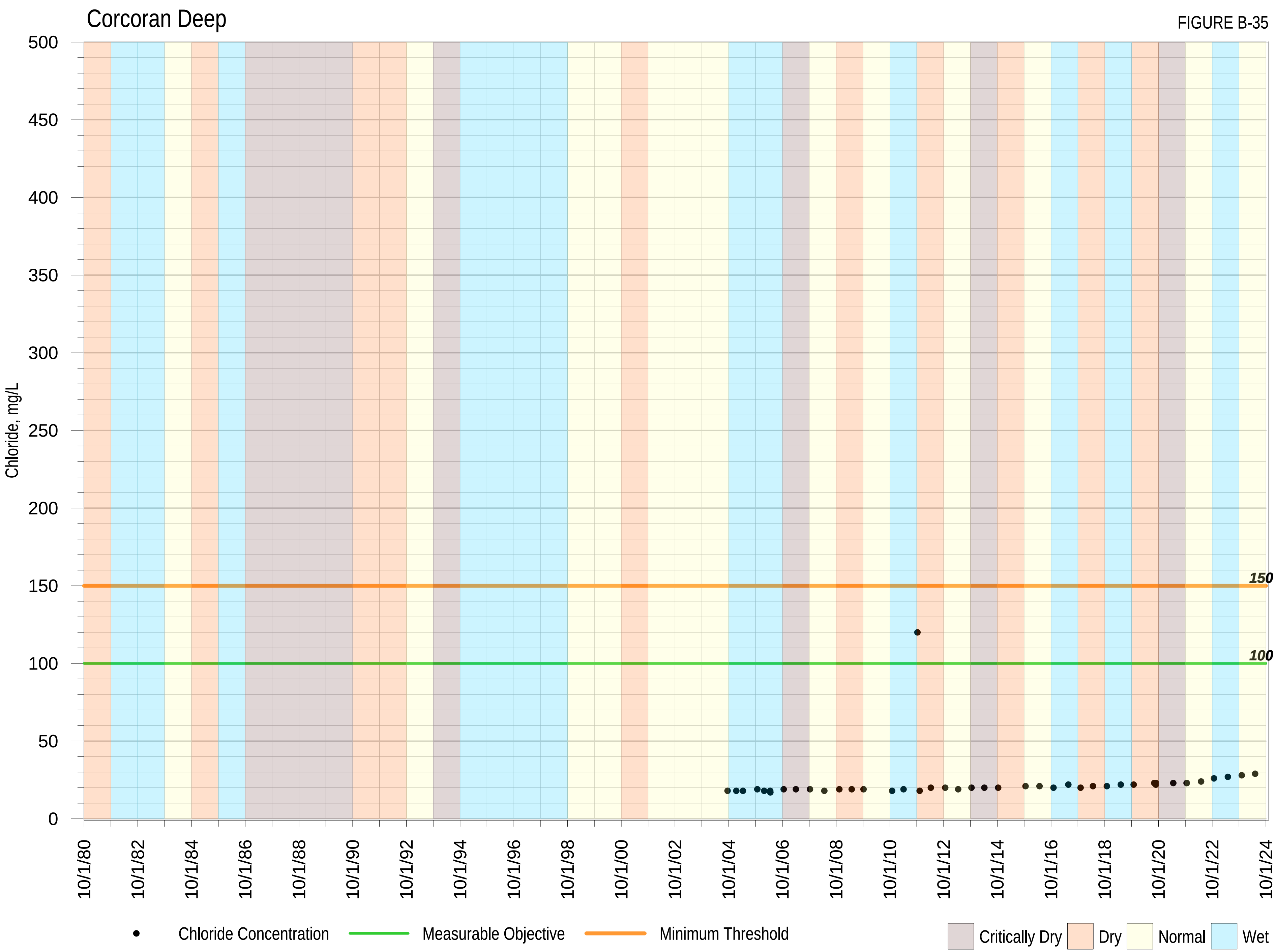

Ledyard
FIGURE B-30
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet

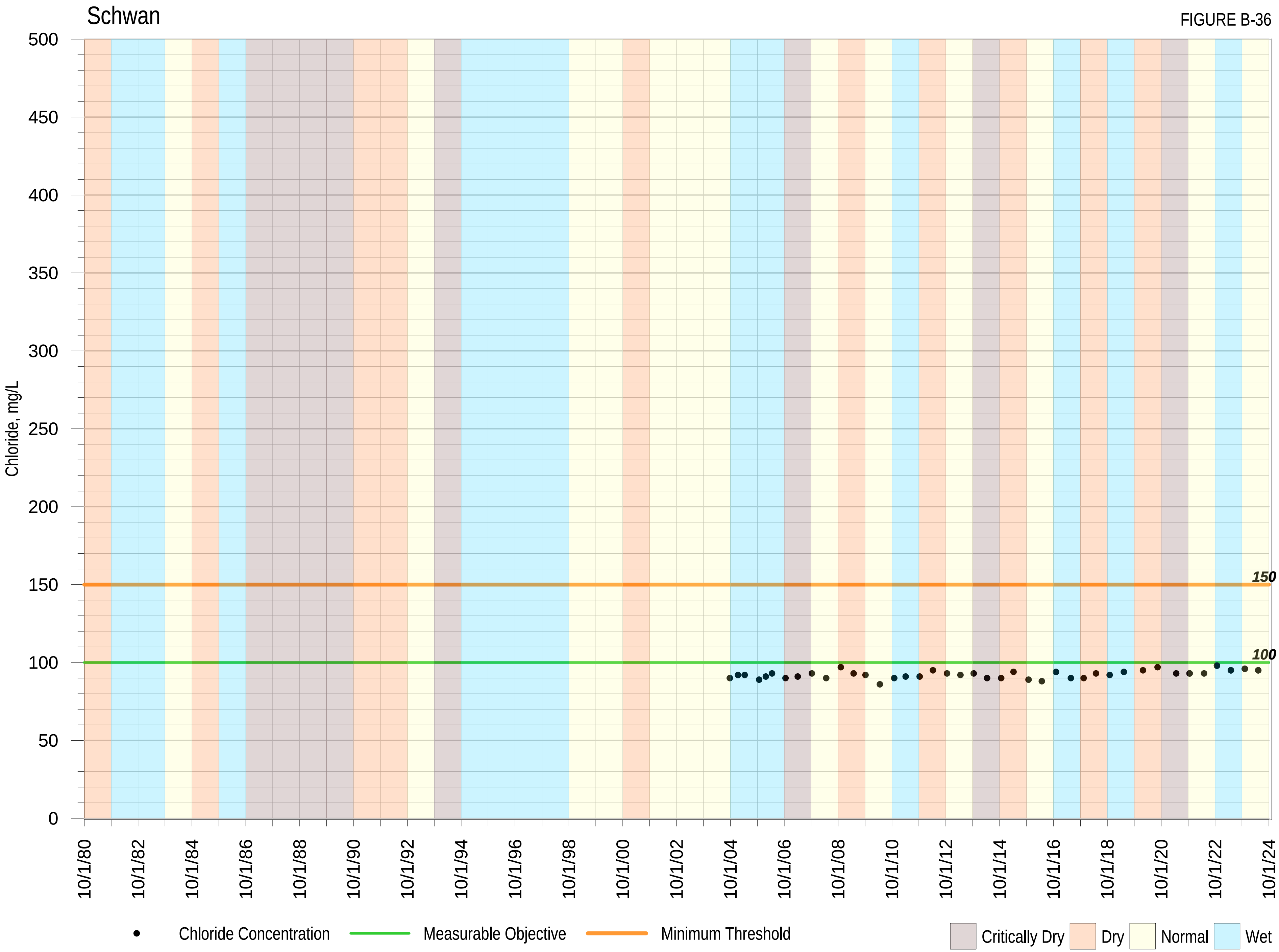

Garnet
FIGURE B-31
Chloride, mg/L
0
50
100
150
200
250
300
350
400
450
500
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


Beltz 2
FIGURE B-32
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


Beltz 8
FIGURE B-33
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


SC-22AA
FIGURE B-34
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


Corcoran Deep
FIGURE B-35
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet


Schwan
FIGURE B-36
Chloride, mg/L
500
450
400
350
300
250
200
150
100
50
0
150
100
10/1/80
10/1/82
10/1/84
10/1/86
10/1/88
10/1/90
10/1/92
10/1/94
10/1/96
10/1/98
10/1/00
10/1/02
10/1/04
10/1/06
10/1/08
10/1/10
10/1/12
10/1/14
10/1/16
10/1/18
10/1/20
10/1/22
10/1/24
Chloride Concentration
Measurable Objective
Minimum Threshold
Critically Dry
Dry
Normal
Wet