2020 SANTA PAULA BASIN ANNUAL REPORT

United Water Conservation District
Professional Paper 2022-01
February 2022

PREPARED BY:

SANTA PAULA BASIN TECHNICAL ADVISORY COMMITTEE

Cover photo: South Mountain (background) and crops (foreground) in Santa Paula basin (photo taken by Kathleen Kuepper 2021)

DEDICATION

In memory of Frank Brommenschenkel (1944 - 2022), for his significant contribution to the health and welfare of the residents of Santa Paula Basin and beyond, resulting from his many successful efforts to ensure and improve Ventura County's water supplies.

2020 SANTA PAULA BASIN ANNUAL REPORT

(UWCD PROFESSIONAL PAPER 2022-01)

FOREWORD

In March 1996, the Superior Court of the State of California for the County of Ventura entered a stipulated judgment to establish pumping allocations and establish a management plan for the Santa Paula groundwater basin (*United Water Conservation District vs. City of San Buenaventura,* original March 7, 1996, amended August 24, 2010 [hereinafter "Judgment"]). Detailed background information on the Santa Paula basin settlement and pumping allocations are included in the Judgment. The Judgment recognized that all of the parties have an interest in the Santa Paula basin, and in the proper management and protection of both the quantity and quality of this significant water resource in Ventura County. Members of the Santa Paula Basin Pumpers Association (SPBPA) and the City of San Buenaventura exercise rights to pump groundwater from the basin for reasonable and beneficial uses. United Water Conservation District (UWCD) does not produce groundwater from the basin, but the basin is located within UWCD's service area and UWCD is authorized to engage in groundwater management and replenishment activities and to commence actions to protect the water supplies which are of common benefit to the lands within the UWCD or its inhabitants.

The Judgment provides for the creation of a Santa Paula basin Technical Advisory Committee (TAC) with equal representation from UWCD, the SPBPA, and the City of San Buenaventura. The TAC is charged with establishing a program to "monitor conditions in the basin, including but not necessarily limited to verification of future pumping amounts, measurements of groundwater levels, estimates of inflow to and outflow from the basin, increases and decreases in groundwater storage, and analyses of groundwater quality." The Judgment also allows for the development of a management plan for the operation of the basin and empowers the TAC to determine the safe yield of the basin.

The Judgment requires annual reports summarizing results of the monitoring program, and further specifically provides that "United Water Conservation District shall have the primary responsibility for collecting, collating, and verifying the data required under the monitoring program, and shall present the results thereof in annual reports to the Technical Advisory Committee." UWCD submits the draft annual reports to the TAC members for review, comment, and approval. The primary groundwater management objective in the Santa Paula basin is to ensure that production from the basin does not exceed the long-term sustainable yield of suitable-quality groundwater for current and anticipated future uses (i.e., municipal, domestic, agricultural, and industrial). The TAC's specialty studies, and annual monitoring reports provide data and analysis intended to support this objective.

In 2010 the Judgment was amended to join various pumpers that were not previously included as parties to the settlement, and to clarify certain provisions pertaining to shortage conditions, the responsibilities of the SPBPA and groundwater production by its members, and water-rights transfer procedures. Also in 2010, a Santa Paula basin TAC Working Group was established consisting of technical experts from UWCD, the SPBPA, and the City of San Buenaventura. Since its formation, the Working Group has completed a series of specialty studies to better understand the factors that affect safe yield in the Santa Paula basin, including a revised safe-yield study in 2017. In addition, the Working Group will continue to conduct future studies to complement the 2017 Safe-Yield Study, as requested by the TAC. The Working Group is currently evaluating metrics ("triggers") that will be used to evaluate whether and to what extent the basin might be negatively affected by future pumping and considering options to enhance safe yield of the basin.

In 2014, legislation (AB 1739, SB 1168 and SB 1319) was enacted by the State of California requiring every groundwater basin in California to be managed sustainably by the year 2042. These three bills are collectively known as the Sustainable Groundwater Management Act (SGMA). Groundwater basins that have had their water rights adjudicated, such as the Santa Paula basin, are exempt from some SGMA requirements but do have new requirements to report basin conditions to the California Department of Water Resources (DWR) annually. The data presented in this Annual Report will be submitted to DWR (using their online reporting tool) as required to meet the SGMA requirements for adjudicated basins.

2020 SANTA PAULA BASIN ANNUAL REPORT

(UWCD PROFESSIONAL PAPER 2022-01)

EXECUTIVE SUMMARY / STATUS OF BASIN

Below normal precipitation was widespread in California during 2020 with dry conditions throughout much of the state. Key hydrologic indicators for Santa Paula basin during water year (WY) and calendar year (CY) 2020 (the reporting period) are summarized and compared to long-term averages in Table 1, below. The annual rainfall total in Santa Paula for WY 2020 was 15.04 inches (measured at the Santa Paula-UWCD/Wilson Ranch gaging stations), which was about two inches below average during the period of record. The last nine years include the driest five consecutive years on record (2012-2016), and also include some of the driest years ever recorded. Annual discharges from the Santa Clara River at Freeman Diversion and Santa Paula Creek at Mupu Bridge during WY 2020 were both at about half of the average annual discharges during the period of record (Table 1).

The total groundwater pumpage from the Santa Paula basin during CY 2020 was 21,213 acre-feet (AF), which is less than the average throughout the period of record (CY 1980 to 2020) of 25,278 acre-feet per year (AF/yr), and less than the median pumping rate 25,824 AF/yr during the period of record. Approximately 5,000 AF of groundwater is estimated to have been imported in CY 2020 to the stipulated area of the Santa Paula basin Judgment, about 80 percent extracted from wells located east of the stipulated area (in the transition area between the Santa Paula and Fillmore basins), and 20 percent from wells in the Oxnard basin. Net imports of groundwater from the area just east of the stipulated area increased from an average of 217 AF/yr prior to CY 2011 to 4,068 AF/yr in CY 2020. The increase is primarily due to the use of the FICO #12 well located approximately 200 feet from the Santa Paula basin/Fillmore basin boundary. While the groundwater production is reported as an import, the impact on groundwater levels in the east Santa Paula basin is similar to previous pumping from proximate wells located within the basin.

Exports from the Santa Paula basin are more difficult to quantify than the imports. Approximately 1,000 AF of groundwater are estimated to have been exported to the Mound basin in CY 2020 from the Farmer's Irrigation Company (FICO) distribution system, which is supplied from wells in both the Santa Paula and Fillmore basins. The City of San Buenaventura's (Ventura) water-supply conveyance system distributes surface water and groundwater from various supply sources to customers in both the Santa Paula and Mound basins. Ventura has not determined the net volume of water exported from or imported to the Santa Paula basin via their conveyance system.

The groundwater-level index (GLI) for Santa Paula basin rose slightly from spring 2019 to spring 2020 (from 178.54 to 180.83 feet above mean sea level [ft msl], respectively). The trend has been mostly positive since 2016, with the 2020 GLI at about the average for the period of record, 180.63 ft msl.

This is the first year since 2012 that the GLI has been above 180 ft msl. The GLI is calculated as the average of groundwater elevations measured at nine wells in the basin that were selected based on their relatively long and continuous records, and their distribution across the basin. Comparison of groundwater elevation measurements at all wells across the basin from spring 2019 to spring 2020 indicates that, on average, groundwater levels rose by 5.29 ft within the limits of the unconsolidated alluvial deposits in Santa Paula basin, which is a greater increase than the GLI. The change in groundwater storage in the aquifer associated with this basin-wide groundwater level increase is calculated to be in the range from 70 to 700 AF, which may be within the margin of error for the method of analysis.

Table 1. Significant Hydrologic Indicators in Santa Paula Basin

Hydrologic Indicator	2020	Average During Period of Record	Median During Period of Record	Period of Record
Water-Year[a] Precipitation at Santa Paula (UWCD/Wilson Ranch)[b] (inches)	15.04	17.15	14.94	1890 through 2020
Calendar-Year Precipitation at Santa Paula (UWCD/Wilson Ranch)[b] (inches)	8.78	16.97	15.48	1890 through 2020
Water-Year Discharge in Santa Paula Creek at Mupu Bridge[b] (AF/yr)	9,758	17,811	8,351	1928 through 2020
Water-Year Discharge in Santa Clara River at Freeman Diversion[b] (AF/yr)	87,497	202,025	110,294	1956 through 2020
Calendar-Year Reported Groundwater Extractions in Santa Paula Basin (AF/yr)	21,213	25,278	25,824	1980 through 2020
Groundwater Level Index (ft msl)	180.83	180.63	181.62	1983 through 2020
Change in Groundwater Storage from Previous Year (AF)	70 to 700	Not applicable	Not applicable	Spring 2019 – Spring 2020

Notes:

[a] A water year (WY) is defined as the period from October 1 of the previous year through September 30 of the year indicated. For example, WY 2020 includes the period from 10/1/2019 through 9/30/2020.

[b] Locations and identification numbers for rain and stream gages are indicated on Figure 1.

Concentrations of selected major groundwater quality constituents (chloride, nitrate, total dissolved solids [TDS], and sulfate) in the Santa Paula basin during the reporting period remained within historical ranges. As noted in past annual reports, concentrations of chloride, TDS, and sulfate generally increase from east to west in the basin.   Hardness, alkalinity, iron, and manganese concentrations in groundwater in the Santa Paula basin during the reporting period also remained within the range of previously detected levels. Elevated hardness and alkalinity historically present in groundwater in the basin pose a “severe plugging hazard” to micro-irrigation systems, while iron and manganese pose a “moderate plugging hazard” according to guidelines developed by Pitts and Peterson (undated) and the University of California (2015).

This page intentionally blank.

2020 SANTA PAULA BASIN ANNUAL REPORT

(UWCD PROFESSIONAL PAPER 2022-01)

TABLE OF CONTENTS

LIST OF TABLES (tables are located at the page numbers indicated)

LIST OF FIGURES (figures are located following the "References" section of this report)

LIST OF APPENDICES (appendices are located following the figures)

2020 SANTA PAULA BASIN ANNUAL REPORT

(UWCD PROFESSIONAL PAPER 2022-01)

INTRODUCTION

This is the twenty-fourth annual report presenting key climatic, hydrologic, and hydrogeologic data to support management of groundwater resources in the Santa Paula basin. Relevant geographic features in and near the Santa Paula basin are shown on Figure 1. Data for calendar-year (CY) and water-year (WY) 2020 (the reporting period) are included in this report. This annual report provides the TAC, which consists of representatives from United Water Conservation District (UWCD), the City of San Buenaventura (Ventura), and the Santa Paula Basin Pumpers Association (SPBPA), with monitoring results and other data to be used for management of the basin in accordance with the 1996 Santa Paula basin stipulated judgment by the Superior Court of the State of California for the County of Ventura (*United Water Conservation District vs. City of San Buenaventura,* original March 7, 1996, amended August 24, 2010 [hereinafter "Judgment"]) and with requirements for adjudicated-basin reporting under the Sustainable Groundwater Management Act (SGMA). This annual report includes background on the hydrogeologic setting of the basin, together with annual precipitation, streamflow, surface water quality, production well installations and destructions, groundwater extractions and pumping allocations, groundwater levels, change in groundwater storage, and groundwater quality in the Santa Paula basin during the reporting period.

REPORT ORGANIZATION

The information presented in this annual report is organized as follows:

- Introduction—Describes the objectives and scope of the annual report, TAC specialty studies, and the methods used to collect the monitoring data presented.
- Description of Basin—Provides background information on the hydrogeologic setting of the Santa Paula basin.
- Data Summary and Evaluation—Presents the monitoring data collected during the current reporting period, including tables, graphs, and maps to aid in interpretation.
- Findings and Conclusions—Summarizes key findings from the reporting period and activities that provide information useful for managing groundwater resources in the Santa Paula basin.
- References—Lists the documents cited in this annual report.
- Appendices—Includes supplemental tables, graphs, and maps of selected historical and recent data that support the analyses presented in this annual report.

SANTA PAULA BASIN SPECIALTY STUDIES

The Santa Paula basin TAC completed several specialty studies intended to better understand water levels in the basin and to inform long-term basin management. Completion of these studies has advanced understanding of the hydrogeology and recharge mechanisms of the Santa Paula basin, in support of determination of safe yield. These studies are summarized below.

- Evaluation of spatial and temporal pumping trends in the basin (UWCD, 2011a).
- Selection of potential hydrologic base periods for safe-yield analysis, considering both rainfall and streamflow in Santa Paula basin (GEI Consultants, 2012a, 2012b, and 2015).
- Identification of crop changes over time (Frank B. and Associates, 2013a).
- Compilation of Santa Clara River infiltration data (UWCD, 2013a).
- Compilation of Santa Paula Creek infiltration data (UWCD, 2013b).
- Investigation of underflow between the Fillmore and Santa Paula basins (Bachman, 2015).
- Evaluation of groundwater confinement (Kenneth D. Schmidt and Associates, 2016).
- Evaluation of historical changes to the Santa Paula Creek channel and potential effects on basin recharge (Hopkins Groundwater Associates, 2018).

The following studies were also proposed by the Working Group in 2011 but have been “on hold” to date as a result of TAC consensus that these studies may not yield sufficient new and useful information to justify the cost and effort.

- Evaluate water level trends in both confined and unconfined parts of the Santa Paula basin.
- Investigate groundwater storage changes in Santa Paula basin.

The completed studies recommended by the Working Group provided supporting information to conduct an updated evaluation of safe yield in the Santa Paula basin. UWCD contracted technical consultants, Daniel B. Stephens & Associates, Inc. (DBS&A) and Richard C. Slade & Associates, LLC (RCS), in 2014 to assess the safe yield of the basin. After TAC review of draft and revised draft versions of the DBS&A and RCS safe-yield study in 2016, the final draft of the safe yield study was completed in 2017 (DBS&A and RCS, 2017). The safe-yield study determined that the average safe yield value during the hydrologic base period studied (1999-2012) was approximately 25,452 acre-feet per year (AF/yr). Basin pumping was similar with an average of 25,505 AF/yr groundwater pumped during the base period studied (1999-2012). While the TAC members do not all agree on the findings or methods of the Yield Study, the TAC members agree it provides further information, improving conceptual hydrogeologic understanding of the basin that can assist the TAC in basin management measures and future basin studies.

Concurrent with safe-yield study, the SPBPA commissioned a study to examine conceptual approaches to increasing the safe yield of the basin (Bachman, 2017). The yield-enhancement study concluded that options were available for increasing the safe yield of the basin, involving conservation efforts and shifting some pumping eastward within the basin. However, further evaluation will be needed to determine the effectiveness, environmental impacts, and cost of these measures. An important tool to aid in conducting such evaluations is UWCD's numerical groundwater flow model (the Ventura Regional Groundwater Flow Model [VRGWFM]), which was expanded into the river basins, Santa Paula, Fillmore and Piru, in 2020. In the interim, a technical working group was formed to develop a plan to identify negative impacts to groundwater conditions in the Santa Paula basin should they occur as a result of groundwater pumping.

DATA SOURCES

Sources of the monitoring data presented in this annual report are summarized in this section.

PRECIPITATION

Precipitation data for most rain gages in Ventura County are available from the Web-based "Hydrologic Data Server" maintained by the Ventura County Watershed Protection District (VCWPD), at http://www.vcwatershed.net/hydrodata. Precipitation was measured by UWCD at their offices in the City of Santa Paula from September 1960 through February 2020. However, from October 2010 through February 2020, data from a rain gage located on the roof of UWCD's office in downtown Santa Paula ("Santa Paula-UWCD") was not reviewed or reported by the VCWPD. UWCD continued to measure and record rainfall at this gage in a manner consistent with historical practices; these data are included in this annual report due to their long period of record and their use in many previous studies of the Santa Paula basin. UWCD moved out of their Santa Paula office in early 2020 and the last month of recorded rainfall using the office rain gage was February 2020. Starting in March, the rainfall measured and recorded at Santa Paula - Wilson Ranch rain gage is used to report rainfall in Santa Paula. Figures 2 and 3 show the rainfall record for Santa Paula using data from both rain gages in 2020.

SURFACE WATER FLOW AND QUALITY

UWCD calculates flow rates in the Santa Clara River (at the Freeman Division) by the sum of the flow rates for all flow paths over the Freeman Diversion Facility (flows over diversion dam, diversions, bypass flows). Flow rates at each flow path are measured using continuous flow measurement devices or using continuous level sensors with application of a stage-discharge rating curve. Continuous measurements were implemented between 2014 and 2017. All measurements are integrated in UWCD's Supervisory Control and Data Acquisition (SCADA) system.

Flow rates at other stream gages in the Santa Paula basin are downloaded from the VCWPD's Web-based "Hydrologic Data Server" (http://www.vcwatershed.net/hydrodata/). UWCD collects quarterly surface-water quality samples from the Santa Clara River (at Willard Road), Santa Paula Creek, and

Todd Barranca, and approximately biweekly samples (for an abbreviated analyte list) from the Santa Clara River at the Freeman Diversion. In addition, Canyon Irrigation Company has periodically collected samples for general-constituent analysis from Santa Paula Creek at the Harvey Diversion for many years and provides the data to UWCD.

Production Well Installations and Destructions

Information regarding production well installations and destructions in the Santa Paula basin are obtained from the VCWPD, which is the permitting agency for water wells in Ventura County.

Groundwater Extractions

Groundwater extractions are reported on semi-annual groundwater production statements filed with UWCD's Finance Department by individual pumpers, then are entered into a UWCD database. These production statements constitute all reported pumping from wells in the Santa Paula basin.

Groundwater Levels and Quality

UWCD's groundwater database includes historical groundwater-level data for approximately 150 wells in the Santa Paula basin; extensive records exist for about 90 of these wells. The groundwater-level database is a compilation of information supplied by several cooperating entities. Each of these entities has their own protocol for measuring water levels, and these protocols may vary over time. Other entities that may contribute groundwater-level data include the City of Santa Paula, Farmers Irrigation Company (FICO), Alta Mutual Water Company, the City of Ventura, and VCWPD.

Groundwater levels are normally measured in wells that are not pumping; these measurements are referred to as "static." For the purpose of evaluating trends in long-term groundwater levels, static groundwater level measurements are preferred. However, the groundwater level in a non-pumping well may remain depressed for some time due to residual drawdown in the well being monitored, or as a result of pumping interference from a nearby well. Although it is not possible to completely eliminate all effects of pumping when manually measuring groundwater levels in a developed groundwater basin, manual monitoring by UWCD is only conducted when the measured well is shut off and no nearby wells are known to be pumping. When groundwater levels are measured during the low-irrigation season (winter and early spring), potential pumping effects on the measurements are typically reduced.

In addition to manual measurements, 21 wells within the Santa Paula basin are equipped with automated groundwater level sensors (i.e., pressure transducers) and data loggers during the reporting period. The exact number of pressure transducers operating in wells in the Santa Paula basin can vary over time, as the transducers are damaged, replaced, or new ones purchased and installed. Wells are selected for pressure transducer installation to provide broad geographic coverage, and to provide data from each of the major hydrogeologic units. UWCD has the lead responsibility for the installation, maintenance, and downloading of the pressure transducers and data loggers, and for processing and analyzing the resulting data. The data loggers managed by UWCD are typically programmed to record water levels every four hours. Measurements at this frequency provide a detailed record of groundwater level changes over time. Many of the pressure transducers present in wells in the Santa Paula basin were first deployed by UWCD in spring 2011. Additional pressure transducer data (prior to spring 2011) exist for several wells in the Santa Paula basin during specific timeframes. The pressure transducer program is designed to provide more detailed information on timing and magnitude of seasonal and annual groundwater-level changes. UWCD will continue to coordinate with the TAC to identify data gaps that can be filled by installation of additional pressure transducers.

Most of the groundwater quality data available for the Santa Paula basin are provided by owners and/or operators of individual wells, including FICO, Limoneira, and Thermal Belt Mutual Water Company (merged with FICO). UWCD collects samples from its two clustered monitoring well sites SP-1 and SP-2 (nine individual wells) and from a few selected additional private wells in the basin. The VCWPD collects groundwater quality samples from several irrigation and water-supply wells in Santa Paula basin, and provides the data to UWCD. UWCD obtained groundwater quality data for City of Santa Paula and Ventura water-supply wells from the California Department of Public Health online database prior to CY 2015, and from the State Water Resources Control Board Division of Drinking Water (DDW) online database beginning in CY 2015.

DESCRIPTION OF BASIN

Key information regarding historical climate, surface water, and groundwater conditions in the Santa Paula basin are summarized in this section, to provide background information useful for interpreting data from the current reporting period.

LOCATION AND CLIMATE

The Santa Paula basin is located along the Santa Clara River, extending from near its confluence with Santa Paula Creek on the east to Ventura on the west, and from the Sulphur Mountain foothills on the north to South Mountain on the south, as shown on Figure 1. The Santa Paula groundwater basin was defined by John F. Mann Jr. and Associates (1959) as being coincident "with the alluvial and terrace deposits along the Santa Clara River." These groundwater basin extents (as defined by John F. Mann Jr. and Associates) are nearly coincident with the area of "unconsolidated deposits of the late Pleistocene and Holocene epochs" comprising the upper aquifer system as defined by Hanson and others (2003). This area is referred to herein as the "limits of unconsolidated alluvial deposits in Santa Paula basin" (Figure 1). This area is elongated in a northeast-southwest direction, approximately 10 miles long and 1.5 to 3.5 miles wide, with an area of approximately 13,000 acres. Within the basin, land-surface elevation ranges from approximately 130 feet above mean sea level (ft msl) in the Santa Clara River channel near Ventura, to 500 ft msl along Santa Paula Creek north of the City of Santa Paula.

The area stipulated in the Santa Paula basin Judgment ("stipulated area" or "settlement boundary") is larger than the 13,000-acre area of the unconsolidated alluvial deposits in Santa Paula basin, described above, because it includes outcrops of freshwater-bearing, semi-consolidated sedimentary rock of the San Pedro Formation (discussed in more detail below). The stipulated area is approximately coincident with the "Santa Paula sub-basin" defined by DWR in Bulletin 118. As part of the implementation of SGMA and the development of Groundwater Sustainable Agencies, DWR revised their Bulletin 118 groundwater basin boundaries during two separate rounds of modifications (2016 and 2018). For the Santa Paula basin, the eastern boundary with Fillmore basin and the western boundary with Mound and Oxnard basins were revised to align better with the Santa Paula settlement boundary (DWR, 2018). The stipulated area is approximately 10 miles long and 2 to 3.5 miles wide, with a surface area of 22,800 acres. In this report, the term "Santa Paula basin" refers to the area stipulated in the Judgment (the area within the "Santa Paula Settlement Boundary" on Figure 1).

The Santa Paula basin has a Mediterranean-type climate, with hot, dry summers (typically moderated by an onshore breeze from the Pacific Ocean) and mild winters, which is when most rainfall occurs in the basin. Historical precipitation data for the City of Santa Paula, in the eastern part of the basin, and for Saticoy, in the western part of the basin, are shown on Figures 2 and 3. Locations for selected rain gages in the Santa Paula basin are shown on Figure 1; data from these gages were selected for inclusion in this report primarily based on location (targeting wide spatial distribution across the basin), and secondarily on period of record.

The combined period of record for the Santa Paula-UWCD and Wilson Ranch gages are much longer (WY 1890 to present) than the combined period of record for the Saticoy Fire Station and County Yard gages (WY 1957 to present) or other rain gages in the basin. Therefore, precipitation data and summary statistics from the Santa Paula-UWCD and Wilson Ranch gages are generally used in this report for comparisons of long-term average annual rainfall to surface-water flows and groundwater elevation trends in the basin. Tabulated historical data from the Santa Paula-UWCD and Wilson Ranch rain gages are provided in Appendix A, Table A-1.

The average annual rainfall in the Saticoy area (recorded at the Saticoy Fire Station and County Yard gages) for WYs 1957 through 2020 is 16.1 inches, which is approximately 1.3 inches less than average annual rainfall recorded at the Santa Paula-UWCD and Wilson Ranch gages during the same period (17.4 inches). This difference likely results from the increasing land-surface elevation and narrowing of the basin eastward from Saticoy to Santa Paula.

SURFACE WATER

The major perennial streams in the Santa Paula basin include the Santa Clara River and Santa Paula Creek, which are described in more detail below.

SANTA CLARA RIVER

The Santa Clara River receives varying amounts of inflow from the following primary sources:

- rising groundwater at hydrogeologic constrictions, including one near the east boundary of the Santa Paula basin;
- ephemeral flows (typically following winter storms) in tributaries to the Santa Clara River (in addition to Santa Paula Creek, notable tributaries to the Santa Clara River within Santa Paula basin include: Fagan, Adams, Wheeler, and Aliso Creeks [John F. Mann & Associates, 1959]);
- surface water flows from upstream reaches of the Santa Clara River (in the Fillmore, Piru, and Eastern basins) that may reach the Santa Paula basin, particularly in wet years or following large winter storm events (Sespe Creek typically contributes the majority of flow in the Santa Clara River upstream from the Santa Paula basin); and
- conservation releases by UWCD from Lake Piru that continue as surface flows in the Santa Clara River through the Piru and Fillmore basins to reach the Santa Paula basin (however, from 2013 to 2016 and 2018 there were no conservation releases from Lake Piru due to low water conditions).

Discharge rates measured in the Santa Clara River within the Santa Paula basin have been highly variable through time, as is typical for streams in southern California that are dominated by ephemeral or seasonal intermittent flows. Historical annual discharge rates for the Santa Clara River at Freeman Diversion throughout the period of record (WY 1956 through WY 2020) are shown on Figure 4. Annual discharge data are tabulated in Table A-2 of Appendix A. The long-term average annual discharge rate for the Santa Clara River at the Freeman Diversion for the period of record is about 202,000 acre-feet per year (AF/yr), and the median annual discharge rate for the period of record is about 110,000 AF/yr. The maximum annual discharge in the Santa Clara River during the period of record was 1,154,000 AF (WY 2005), and the minimum was 5,825 AF (WY 2016).

Santa Paula basin contains diversions along the Santa Clara River, with most located on the south side of the Santa Clara River where groundwater production is more limited compared to the north side of the basin. Preliminary results from a draft TAC specialty study report prepared by Frank B & Associates (2013b) indicated that surface water is diverted from the Santa Clara River for irrigation use at four locations within the Santa Paula basin, all in the eastern part of the basin, where surface flow is perennial. The report included one location where diversion filings were not reported to the California State Water Resources Control Board; therefore, surface water use was estimated for the approximate irrigated area. The estimated total of diverted streamflow as of CY 2013 was 1,900 AF/yr. Reported monthly diversion data were obtained and reviewed by UWCD for the expansion of the Ventura Regional Groundwater Flow Model from California's State Water Resources Control Board's California Integrated Water Quality System (CIWQS) available to the public (https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/EWMenuPublic.jsp). Data show reported diversions from three main locations from the Santa Clara River in the Santa Paula basin from CY 1985 through 2015 have averaged approximately 870 AF/yr (UWCD, 2021).

SANTA PAULA CREEK

Santa Paula Creek receives varying amounts of inflow from the following primary sources:

- rising groundwater at a hydrogeologic constriction located near the northern limit of the alluvial basin-fill deposits along Santa Paula Creek north of the City of Santa Paula (Figure 1);
- perennial surface-water flows from the upper reaches of Santa Paula Creek (north of the Santa Paula basin) and from Mud Creek (the major tributary to Santa Paula Creek within the Santa Paula basin); and
- ephemeral flows (typically following winter storms) in smaller tributaries to Santa Paula Creek.

Similar to the Santa Clara River, discharge rates measured in Santa Paula Creek within the Santa Paula basin have been highly variable through time. Historical annual discharge rates for the period of record (WYs 1928 through 2020) at gaging stations located immediately upstream from the City of Santa Paula are shown on Figure 5; the location of the current gaging station on Santa Paula Creek ("Santa Paula Creek at Mupu Bridge") is shown on Figure 1. Annual discharge data are tabulated in Table A-3 of Appendix A. The long-term average annual discharge rate for Santa Paula Creek for the period of record is 17,811 AF/yr, and the median annual discharge rate for the period of record is 8,351 AF/yr. The maximum annual discharge in Santa Paula Creek during the period of record was 113,000 AF/yr (WY 1969), and the minimum was 990 AF/yr (WY 1951).

Canyon Irrigation Company operates the Harvey Diversion on Santa Paula Creek and distributes diverted surface water to their service area (approximately 784 acres). The diversion is located approximately 1,000 feet south of Steckel Park just below the United States Geological Survey (USGS) gaging station and just upstream of the confluence with Mud Creek. Beginning in 2001, Canyon Irrigation Company began distributing diverted water from the Harvey Diversion on Santa Paula Creek to FICO for conjunctive use across their service area (approximately 3,178 acres) located across much of the western portion of the Santa Paula basin. Reported diversions from the Santa Paula Creek during CY 2020 for both the Canyon Irrigation Company and FICO were 1,554 AF for irrigation uses in the basin.

GROUNDWATER

This section briefly summarizes hydrogeologic conditions in the Santa Paula basin, including freshwater-bearing strata, basin boundaries, sources of groundwater recharge and discharge, and historical groundwater elevation and quality trends.

A water budget is an accounting of all the water that flows into and out of a basin, describing the various sources of groundwater recharge and discharge. Several past studies have investigated water budget components within the Santa Paula basin. These investigations were efforts to better understand the quantity of water resources available for current use and future planning, and have provided estimated hydrologic components of the water budget over various periods of analysis. Data from previous studies are presented in this section along with the most recent water budget for Santa Paula basin estimated using the Ventura Regional Groundwater Flow Model (UWCD, 2021). A more thorough discussion of previous hydrologic investigations in the Santa Clara River Valley, including Santa Paula basin, can be found in the report, *Summary of Past Groundwater Models and Water Budgets for the Piru, Fillmore, and Santa Paula Groundwater Basins*, prepared by UWCD (UWCD, 2020).

FRESHWATER-BEARING STRATA

Ongoing displacement along the Oak Ridge Fault and other faults has created a deep basin in the valley of the Santa Clara River that has been filled with sedimentary deposits (Mann, 1959). Surface exposures of the major sedimentary units and faults in the basin are shown on Figure 6. The principal freshwater-bearing strata in the Santa Paula basin are described below from youngest [top] to oldest [bottom]:

- Holocene river and stream sediments deposited locally along the Santa Clara River and its tributaries;
- Holocene to Pleistocene alluvial fan deposits eroded from the uplifted mountain blocks;
- Pleistocene river deposits of the ancient Santa Clara River; and
- Pleistocene marine and continental (fluvial) gravel, sand, silt, and clay layers of the San Pedro Formation.

These freshwater-bearing strata overlie relatively low-permeability Pliocene and older rocks of the Santa Barbara and Pico Formations. In addition, a thick (100 feet or more) layer of fine-grained sediments (mostly clay and silt) occur in the upper 300 feet of sediments across much of the Santa Paula basin (Kenneth D. Schmidt and Associates, 2015). These fine-grained layers likely reduce the potential for groundwater recharge and can act as a confining aquitard where present.

These strata have been warped into a syncline that is oriented in a northeast-southwest direction along the center of the basin. Faults and low-permeability bedrock units exposed in the limbs of this syncline form the northern and southern boundaries of the Santa Paula basin. To the south, the Oak Ridge Fault forms a partial barrier to groundwater movement, and the poorly permeable Santa Barbara and Pico Formations are present at a shallow depth and in outcrops on South Mountain. To the north, the Santa Barbara and Pico Formations are exposed in outcrops throughout the Sulphur Mountain foothills and are not believed to transmit significant quantities of groundwater to the basin.

At its eastern boundary, the Santa Paula basin is in direct hydraulic communication with the Fillmore basin, which provides a significant amount of groundwater underflow to Santa Paula basin. The western boundary of the Santa Paula basin is more complex, with local uplift, artesian conditions, and faults that limit groundwater underflow across this boundary to some degree. Although there has been general agreement that a hydraulic connection existing between Santa Paula basin, the Oxnard basin, and the Mound basin, the degree of connection has been largely uncertain. Recently, estimated groundwater flow (underflow) between Santa Paula basin and the adjacent Mound and Oxnard basins has been further quantified using the Ventura Regional Groundwater Flow Model (UWCD, 2021).

Recharge

Significant sources of groundwater recharge to the Santa Paula basin include:

- percolation of surface water from the Santa Clara River (and Santa Paula Creek, prior to 1998 flood-control modifications of its channel);
- deep percolation of rainfall and irrigation water (often referred to as “return flows”) at land surface;
- percolation of treated water from the City of Santa Paula’s Water Recycling Facility;
- percolation from septic systems; and
- underflow from Fillmore basin.

Previous investigations of hydrogeologic conditions in the Santa Paula basin estimated that streamflow infiltration rates from the Santa Clara River ranged from approximately 4,100 AF/yr, an average for wet period (DWR, 1956) to 15,400 AF/yr (Mann, 1959), depending on annual surface flows and pre-existing conditions in the underlying alluvial aquifer. Qualitative results from a more recent study by the USGS using stable isotopes of hydrogen and oxygen combined with tritium analysis (Reichard and others, 1999) confirmed that the Santa Paula basin receives some recharge from the Santa Clara River. However, a TAC study completed by UWCD (2013a) concluded that surface water infiltration in the reach of the Santa Clara River from Willard Road to Orr Road is “limited both currently and historically.” This is consistent with the safe-yield study by DBS&A and RCS

(2017), which stated “the Santa Clara River is generally considered to receive groundwater discharge and not be a net source of groundwater recharge” within the Santa Paula basin (DBS&A and RCS, 2017). Dry-weather stream gaging during WY 2010 (a year of average precipitation) showed surface water flow losses between Willard Road and Orr Road ranged from 3.7 cubic feet per second (cfs) (approximately 2,600 AF/yr) to 12.6 cfs (approximately 9,100 AF/yr) (UWCD, 2013a). Measured river losses were slightly higher in summer 2010 than in summer 2011. During 2011, estimated percolation ranged from 8.6 cfs (approximately 6,200 AF/yr) to slightly gaining (negative percolation values) of Santa Clara River surface flow in the eastern Santa Paula basin (UWCD, 2013a). Data also suggest that the dry-weather gradient away from the river in the shallower zones may have induced a greater amount of recharge in the past when wells screened in the shallowest producing aquifer zones were in operation (UWCD, 2011a and 2013a). The reach of the Santa Clara River from Willard Road to Orr Road is where the river channel generally lies north of the trace of the Oak Ridge Fault and directly overlies highly permeable alluvial sedimentary deposits. West of Orr Road in the Santa Paula basin, the Santa Clara River crosses the Oak Ridge Fault and overlies low-permeability deposits of the Santa Barbara Formation.

Percolation of surface water from Santa Paula Creek has historically also been a source of recharge to the Santa Paula basin. However, in 1998 the U.S. Army Corps of Engineers (COE) straightened and compacted most of the reach of Santa Paula Creek that overlies Pleistocene and Holocene alluvial deposits in Santa Paula basin. Results from a TAC study conducted by UWCD (2013b) indicated that “recent measurements show little to no percolation in lower Santa Paula Creek, suggesting the COE flood control project in 1998 has impaired the ability of the creek to recharge the groundwater basin.” The safe-yield study by DBS&A and RCS (2017) used manual stream gage data from the TAC study (UWCD, 2013b) and Santa Paula Creek flow measurements recorded at Mupu Bridge to quantify total Santa Paula Creek percolation at 9.2 percent. Based on the percolation rate, the safe-yield study estimated Santa Paula Creek annual percolation over the 14-year hydrologic base period (WY 1999-2012) was an average of 1,105 AF/yr (DBS&A and RCS, 2017).

The estimated combined percolation of surface waters in Santa Paula basin from the Santa Clara River and Santa Paula Creek using the Ventura Regional Groundwater Flow Model averaged 2,165 AF/yr over the hydrologic base period (CY 1985 through 2015) (UWCD, 2021). The most recent estimate by UWCD is shown in Table 2 below, along with a summary of previous estimates of stream percolation in the Santa Paula basin. Later studies have incorporated more recent data and additional findings, showing similar, likely more accurate estimates of stream percolation in Santa Paula basin.

Table 2. Summary of Estimates from Previous Investigations Related to Average Annual Stream Percolation in Santa Paula Basin.

Average Stream Percolation (AF/yr)	Representative Years	Source	Notes
6,500	1937 - 1951	DWR, 1956	Rough estimation is calculated from subtracting surface water inflow and surface water outflow, Santa Paula basin.
15,420	1936 - 1957	Mann, 1959	Based on 60-year-old hydrologic conditions and a crude water-balance method; unlikely to be representative of current conditions.
16,800	1956 - 1990	Law/Crandall, 1993	Report notes that percolation of streamflow was difficult to calculate and subject to high uncertainty. The reported estimate includes 1,500 AF/yr of percolation in Santa Paula Creek (before it was channelized).
1,370	1996 - 2012	LWA and others, 2015	Report did not estimate percolation in the Santa Clara River. Most loss of surface flow in reach upstream of the Freeman Diversion was attributed to diversions.
1,105	1999 - 2012	DBS&A and RCS, 2017	Report did not calculate percolation in the Santa Clara River, stating, "limited available data suggests that groundwater discharging to the Santa Clara River in the west part of the basin may be the dominant interchange between surface water and groundwater".
2,165	1985 - 2015	UWCD, 2021	The estimate includes percolation for both the Santa Clara River and Santa Paula Creek.

Deep percolation (also referred to as direct infiltration) of rainfall and excess irrigation water is another potentially significant source of recharge to the Santa Paula basin. Early investigators have estimated annual deep percolation rates from rainfall ranging from 0 to 26,200 AF/yr, depending on annual rainfall in the basin (California Department of Public Works, 1934; California State Water Resources Board, 1956; John F. Mann Jr. and Associates, 1959). Since the time of those early recharge estimates, land use in the basin has changed extensively as a result of development and changes in agriculture; therefore, present recharge rates may be significantly different than in the past. Deep percolation of irrigation return flows likely also contributes recharge to the shallow aquifer in the basin, although it has not typically been quantified by previous investigators separately from deep percolation of rainfall. The safe-yield study by DBS&A and RCS (2017) estimated the average annual total deep percolation of precipitation and irrigation to be 10,428 AF/yr (during the period from 1999 through 2012), including 6,549 AF/yr from precipitation (63 percent) and 3,879 AF/yr from irrigation return flows (37 percent). Areal recharge, which includes total deep percolation of rainfall, irrigation and municipal/industrial return flows as well as percolation of treated wastewater, was estimated to be 15,796 AF/yr, on average, over the hydrologic base period (CY 1985 through 2015) using the Ventura Regional Groundwater Flow Model (UWCD, 2021). This is somewhat higher than what the

DBS&A and RCS study estimated (10,911 AF/yr, when the percolation of treated wastewater and septic systems [483 AF/yr] is added to their deep percolation rate). The quantity and areal extent of deep percolation of rainfall and irrigation water may be limited by the presence of shallow clay soils in some parts of the basin (Kenneth D. Schmidt and Associates, 2015). Spatial variability is also influenced by the presence of impervious surfaces in developed areas of the cities of Santa Paula and Ventura (DBS&A and RCS, 2017).

Effluent from the City of Santa Paula's Water Recycling Facility (SPWRF) discharged to percolation ponds at Todd Lane (Figure 1) is believed to contribute a modest quantity of groundwater recharge in the Santa Paula basin. The SPWRF facility is located near the Santa Clara River, where continuous low permeability confining units are mapped as thin to absent (DBS&A and RCS, 2017). Monitoring records indicate that all percolation pond water has readily recharged into the subsurface since the City started discharging wastewater into the percolation ponds in 2010. The required 5-foot vertical separation has always been maintained between the ponds and saturated groundwater (GSI, 2020). Recycled water was directed to the percolation ponds at an average rate of approximately 2,170 AF/yr from CY 2015 to 2020. Discharged recycled water reported in CY 2020 was 2,150 AF/yr, which was down from 2,400 AF/yr in CY 2017 (PERC, 2016 and 2017; American Water, 2018; Veolia, 2019, 2020, and 2021).

There is also a small wastewater treatment plant located in Santa Paula basin associated with the Todd Road County Jail (Todd Rd. Co. Jail WWTP). It is located north of the Santa Clara River downstream from the SPWRF. The wastewater discharge to percolation ponds at the Todd Rd. Co. Jail WWTP is minor, averaging 43 AF/yr annually from CY 2015 to 2020 (VCWWD, 2016, 2017, 2018, 2019, 2020, 2021).

The safe-yield study by DBS&A and RCS (2017) also evaluated groundwater recharge by septic systems. The study concluded that there were 464 approved septic systems within the basin and resulting recharge from all septic systems was 74 AF/yr (DBS&A and RCS, 2017).

Underflow of groundwater from the upgradient Fillmore basin is recognized as another significant source of recharge to the Santa Paula basin by previous workers (Kawano and Parsons, 1956; John F. Mann Jr. and Associates, 1959; California State Water Resources Board, 1956). The Lower Santa Clara River Salt and Nutrient Management Plan prepared by Larry Walker Associates (LWA) and others (2015) estimated the groundwater underflow into the Santa Paula basin at 16,990 AF/yr, based on results from the USGS regional groundwater model. Average flows for a wet, dry and average year were calculated and the distribution of flows between basins was applied based on the classification of WYs 1996-2012 (LWA and others, 2015). A TAC specialty study by Bachman, also completed in 2015, estimated that from 1947 through 2014, an average of 19,700 AF of groundwater underflow entered Santa Paula basin from Fillmore basin per year (Bachman, 2015). The safe-yield study by DBS&A and RCS (2017) calculated the average underflow to be 25,244 AF/yr. The calculation was based on three representative water years within the CY 1999 through 2012 hydrologic base period, including the median precipitation (year 2000), 75th percentile precipitation (year 2010) and the 25th percentile precipitation (year 2012). The difference between Bachman's and DBS&A and RCS's estimated underflow from Fillmore basin was attributed to Bachman's use of a lower hydraulic conductivity value for the San Pedro Formation and the assumption that hydraulic gradients in the San Pedro Formation were the same as gradients in the shallower alluvium (DBS&A and RCS, 2017). DBS&A and RCS stated the hydraulic conductivity applied for the San Pedro Formation in their study was based on cited observed test results and the hydraulic gradients for both the San Pedro Formation and alluvium were independently calculated (DBS&A and RCS, 2017). Using the Ventura Regional Groundwater Flow Model, UWCD estimated the groundwater underflow from Fillmore basin into the Santa Paula basin to be 17,965 AF/yr over the hydrologic base period (CY 1985 through 2015). Table 3 is a summary of estimates from previous studies related to average annual subsurface underflow into Santa Paula basin. Inspection of Table 3 indicates the most recent estimate of underflow into the Santa Paula basin from Fillmore basin by UWCD (2021) is similar to the estimate in the Lower Santa Clara River Salt and Nutrient Management Plan (LWA and others, 2015).

Table 3. Summary of Estimates from Previous Investigations Related to Average Annual Subsurface Underflow into Santa Paula Basin (UWCD, 2020).

Inflow (AF/yr)	Representative Years	Source
11,500	1936 - 1951	DWR, 1956
5,400	1936 - 1957	Mann, 1959
3,900	1956 - 1990	Law/Crandall, 1993
16,990	1996 - 2012	LWA and others, 2015
19,700	1947 - 2014	Bachman, 2015*
25,244	1999 - 2012	DBS&A and RCS, 2017**
17,965	1985 - 2015	UWCD, 2021

*Representative years weighted using wet (2005), average (2010), and dry (2012) years, respectively, using spring and fall conditions for each.

**Average value derived from representative median (2000), 75th percentile (2010), and 25th percentile (2012) water years, respectively, based on precipitation from rain gages located in Saticoy and Ventura over the hydrologic base period of 1999 - 2012. Minimum value reported was 22,320 AF/yr and maximum value reported was 30,909 AF/yr.

DISCHARGE

Significant groundwater discharges from the Santa Paula basin include:

- withdrawals from water-supply wells;
- underflow to the Mound and Oxnard (Forebay area) basins; and
- rising groundwater and evapotranspiration in the Santa Clara River channel.

Pumping from wells (primarily for irrigation, municipal, and industrial uses) is the largest source of groundwater discharge from the Santa Paula basin. Approximately 12,000 acres of lemons, avocados, strawberries, row crops, and nurseries in the Santa Paula basin are irrigated by groundwater, and the cities of Santa Paula and Ventura both operate municipal water-supply wells in the basin. Reported groundwater extractions from the Santa Paula basin during the period of record (CYs 1980 through 2020) are summarized in Table 4 and shown on Figure 7. The extractions ranged from a low of 16,710 AF in 1983 (a very "wet" year with respect to precipitation) to a high of 33,453 AF in 1990 (the peak of an exceptional drought in the basin).

Table 4. Historical Santa Paula Basin Groundwater Extractions

Calendar Year	Groundwater Extractions (AF)	Calendar Year	Groundwater Extractions (AF)	Calendar Year	Groundwater Extractions (AF)
1980	26,820	1995	25,042	2010	23,115
1981	27,545	1996	26,008	2011	24,202
1982	22,925	1997	28,961	2012	25,824
1983	16,710	1998	21,622	2013	26,485
1984	29,455	1999	27,700	2014	27,437
1985	26,533	2000	26,798	2015	25,856
1986	21,617	2001	22,530	2016	25,363
1987	24,852	2002	27,259	2017	21,889
1988	25,370	2003	22,280	2018	22,881
1989	29,362	2004	27,306	2019	17,238
1990	33,453	2005	24,700	2020	21,213
1991	27,056	2006	24,830		
1992	24,355	2007	28,077		
1993	26,998	2008	26,686	***Average***	***25,278***
1994	26,244	2009	25,820	***Median***	***25,824***

Note: The groundwater extractions shown on this table are based on semi-annual groundwater production statements submitted to UWCD's Finance Department.

At the western boundary of the Santa Paula basin, groundwater flows from the Santa Paula basin into the adjacent Mound and Oxnard (Forebay) basins. The Lower Santa Clara River Salt and Nutrient Management Plan by LWA and others (2015) estimated underflow from the Santa Paula basin at 9,100 AF/yr, based on results from the USGS regional groundwater model. Subsurface flow was estimated from Santa Paula basin to Oxnard basin (Forebay) to be 8,090 AF/yr and to Mound basin to be 1,010 AF/yr. Average flows for a wet, dry and average year were calculated and the distribution of flows between basins was applied based on the classification of WY 1996-2012 (LWA and others, 2015). The safe-yield study by DBS&A and RCS (2017) calculated the average annual groundwater underflow at the western boundary of the Santa Paula basin to be approximately 7,349 AF/yr. The calculation was based on three representative precipitation water years within the CY 1999 through 2012 hydrologic base period, including the median precipitation (CY 2000), 75th percentile precipitation (CY 2010) and the 25th percentile precipitation (CY 2012). This was a general estimate, and the specific quantities of groundwater underflow into Mound basin versus Oxnard basin was not determined. This estimate of underflow from the western Santa Paula basin boundary was calculated using groundwater flow through the shallower alluvial sediments and not the San Pedro Formation. The Country Club Fault and the Oak Ridge fault zone form partial barriers to groundwater flow in the San Pedro Formation. Based on the hydrologic interpretation and uncertainties related to calculating lateral groundwater underflow, the DBS&A and RCS (2017) safe-yield study assumed that "even if water does move through the fault boundary within the San Pedro Formation, the volume is likely small in comparison to the volume that moves through the more highly permeable alluvial sediments."

Using the Ventura Regional Groundwater Flow Model, UWCD estimated groundwater underflow from Santa Paula to be 8,308 AF/yr over the hydrologic base period (CY 1985 through 2015). Subsurface flow was estimated from Santa Paula basin to adjacent Oxnard basin (Forebay) to be 2,300 AF/yr and to adjacent Mound basin to be 6,008 AF/yr (UWCD, 2021). Table 5 is a summary of estimates from previous studies of average annual subsurface underflow out of Santa Paula basin. Inspection of Table 5 indicates the most recent estimate of underflow from Santa Paula basin by UWCD (2021) is similar to the estimate in the Lower Santa Clara River Salt and Nutrient Management Plan (LWA and others, 2015).

Table 5. Summary of Estimates from Previous Investigations Related to Average Annual Subsurface Underflow out of Santa Paula Basin (UWCD, 2020).

Outflow (AF/yr)	Representative Years	Source
7,200	1936 - 1951	DWR, 1956
1,800	1936 - 1957	Mann, 1959
1,800	1956 - 1990	Law/Crandall, 1993
9,100	1996 - 2012	LWA and others, 2015
7,350	1999 - 2012	DBS&A and RCS, 2017**
8,308	1985 - 2015	UWCD, 2021

**Average value derived from representative median (2000), 75th percentile (2010), and 25th percentile (2012) water years, respectively, based on precipitation from rain gages located in Saticoy and Ventura over the hydrologic base period of 1999 – 2012.

A potentially significant quantity of groundwater discharges to surface flows in the Santa Clara River from the Fillmore basin; this “rising groundwater” has been observed in the river near the western end of the Fillmore basin and the eastern boundary of the Santa Paula basin upstream of the confluence of Santa Paula Creek. However, some of the surface flows resulting from rising groundwater percolate back down through the river channel farther downstream, to recharge groundwater in the reach upstream of the Freeman Diversion (UWCD, 2013a). Groundwater present within the upper several feet of soil along the Santa Clara River is also subject to the combined effects of evaporation and transpiration (through uptake in the root zone of phreatophytes). These processes are referred to collectively as evapotranspiration. The net quantity of groundwater lost to surface water flows and evapotranspiration likely varies depending on seasonal and annual rainfall in the basin, the extent of riparian vegetation, and the depth to the water table in the vicinity of the river.

The safe-yield study by DBS&A & RCS (2017) estimated the combined discharge of groundwater to the Santa Clara River and evapotranspiration to be approximately 4,460 AF/yr over the 14-year hydrologic base period (WY 1999-2012). More recently, UWCD (2021) estimated 8,690 AF/yr total for rising groundwater discharging to the Santa Clara River (6,399 AF/yr) and evapotranspiration (2,291 AF/yr) using the Ventura Regional Groundwater Flow Model over the hydrologic base period (CY 1985 through 2015).

IMPORTS AND EXPORTS

In addition to the primary sources of groundwater recharge and discharge described above, significant quantities of groundwater are imported to and exported from the Santa Paula basin. Much of the imported groundwater is used to irrigate crops, and a portion of that irrigation water may recharge the underlying aquifer via return flows. However, considering improvements in irrigation efficiency of applied water, the annual volume of return flows likely has changed considerably over the years.

Water is imported to the Santa Paula basin from both the Fillmore basin in the east and the Oxnard basin in the southwest. Water imports and exports are summarized in Table 6 below, and the changes in import and export quantities from CYs 2010 through 2020 are graphically illustrated on Figure 8. Historically, groundwater pumped from wells 03N21W01N02S (Teague #6) and 03N21W12F07S (FICO #12), which are located in the Fillmore basin approximately 1,500 and 200 feet east of the boundary with the Santa Paula basin, respectively, has been conveyed westward into Santa Paula basin, where it was used for irrigation. Groundwater produced by FICO #12 is transported to the west end of the Santa Paula basin via pipeline. Well Teague #6 was destroyed in 2017. However, prior to destruction, groundwater produced by Teague #6 was used nearby in the immediate vicinity of the well, east of Santa Paula Creek. Limoneira staff reported that approximately 60% of the groundwater pumped from the Teague #6 well was used for irrigation in the stipulated area of the Santa Paula basin; the remaining 40% was used on land east of the stipulated area in Fillmore basin (Gunderson, 2015). In CY 2020, the reported pumpage from FICO #12 well was 4,068 AF. While the groundwater production from FICO #12 is reported as an import, the impact on groundwater levels in the east Santa Paula basin are similar to historical pumping from proximate wells located within the basin.

Much of the groundwater pumped from wells 02N22W11A01S (Alta #3), 02N22W02R06S (Alta #13) and 02N22W02R05S (Alta #11), which are located in the Forebay area of the Oxnard basin approximately 970 feet south of the boundary with the Santa Paula basin, has been conveyed northward into Santa Paula basin and beyond, in the service area of the Alta Mutual Water Company, where it is also used for irrigation. Well 02N22W11A01S (Alta #3) was destroyed in 2017 and replaced with well Alta #13. In CY 2020, the combined reported pumpage from Alta #13 and Alta #11 wells was 1,684 AF. Approximately two-thirds of the acreage irrigated by Alta #3 (prior to destruction), Alta #13 and Alta #11 wells lies within Santa Paula basin; therefore, it was assumed that 67% of the pumpage from these wells was imported to the Santa Paula basin from the Oxnard basin.

Some of the groundwater pumped from wells in the east part of Santa Paula basin is exported westward to the Mound basin. Approximately 932 AF of water from FICO's water-distribution system in Santa Paula basin were exported to the Mound basin for irrigation use in CY 2020, with production from both the Santa Paula basin and the Fillmore basin.

Ventura pumped a total of 2,544 AF of groundwater from wells 02N22W02K09S (Saticoy #2) and 02N22W02H02S (Saticoy #3) during CY 2020 for municipal and industrial use within their service area, which overlies portions of the Santa Paula, Mound, Oxnard, and Lower Ventura River basins. Groundwater from these two wells is blended with other supply sources and distributed throughout the City, including to other basins. Specific volumes of groundwater exported from these wells to other basins, and imported from other sources to the Santa Paula basin, is variable and is undetermined. However, the estimated water use by the City within Santa Paula basin is estimated to currently be in the same order of magnitude as the annual extractions from the Saticoy #2 and #3 wells. Therefore, the net import or export of water by the City to/from Santa Paula basin is assumed to be relatively small.

Inspection of Figure 8 indicates that significantly more groundwater was imported into the stipulated area of Santa Paula basin from the Fillmore basin starting in CY 2012 compared to previous years, while imports from the Oxnard basin have remained relatively stable in comparison. Net imports of groundwater from the area just east of the stipulated area increased from an average of 217 AF/yr prior to CY 2011 to 4,068 AF/yr in CY 2020. The increase is primarily due to the use of FICO #12 well located approximately 200 feet from the Santa Paula basin/Fillmore basin boundary.

Water produced from the City of Ventura's Saticoy Wells #2 and #3 is used throughout the City's water service area. The total volume of water pumped from the aging and failing Saticoy Well #2 and Saticoy Well #3 in CY 2020 was 2,544 AF, more than double the volume pumped from Saticoy Well #2 during each of the previous 7 years, since CY 2007 (ranging from 402 AF in CY 2010 to 986 AF in CY 2008). Saticoy Well #3 was completed in CY 2015 and is the primary source of water supply. Saticoy Well #2 was rehabilitated and is maintained as a backup well.

Table 6. Summary of Groundwater Extractions, Imports, and Exports in Santa Paula Basin, CY 2020

Description	Volume (AF)
Reported groundwater extractions from wells in the Santa Paula basin stipulated area	21,213
Estimated groundwater imports from Fillmore basin (FICO #12)	+4,068
Estimated groundwater imports from Oxnard basin (assume 67% of total pumpage from Alta #13 and Alta #11)	+1,128
Estimated water exports to Mound basin via the FICO distribution system	-932
Estimated net groundwater use in Santa Paula basin (sum of extractions plus imports, less exports)	**= 25,477***

** Does not include potential imports/exports by Ventura to/from other supply sources. Specific volumes of groundwater exported from Ventura's wells in Santa Paula basin, and imported from other sources to the Santa Paula basin, are variable and undetermined. However, the net import or export of water by Ventura to/from Santa Paula basin can be assumed to be relatively small compared to the overall water budget.*

LEVELS AND TRENDS

Groundwater levels in the majority of wells throughout the basin show a seasonal variation in the range of 10 to 20 feet. Longer-term groundwater level trends are summarized through the use of a "Groundwater Level Index" (GLI). The GLI is calculated as the average of spring-high groundwater elevations measured at nine key wells selected for their relatively long record and their geographic distribution across the basin. It should be noted that calculation of the GLI has been affected since one of the index wells, well 03N21W34R01S, was destroyed in 2017. Due to its location in the western part of Santa Paula basin, well 03N21W34R01S typically had lower groundwater elevations than most of the other index wells. Therefore, the average groundwater elevation for the remaining eight wells is higher than the average when well 03N21W34R01S was included. This artifact likely accounted for approximately 5 feet of the apparent increase in GLI between 2016 and 2017.

The GLIs for WYs 1983 through 2020 are shown on Figure 9, together with the cumulative departure from average precipitation over the same period at Santa Paula-UWCD/Wilson Ranch. Following are the major trends apparent based on inspection of Figure 9:

a. **WYs 1983 to 1991** – a declining GLI caused by a major drought, as indicated by the increasingly negative cumulative departure from average precipitation during that period;
b. **WYs 1991 to 1998** – a rising GLI corresponding to a period of above-average precipitation (cumulative departure from average precipitation shifts from negative to positive);
c. **WYs 1998 to 2011** – an overall gradual decline in the GLI, despite a net positive cumulative departure from average precipitation during this period (partial rebounds in the GLI are apparent during the particularly wet WYs 2005 and 2011);
d. **WYs 2011 to 2016** – a steep decline in the GLI, corresponding to below-average precipitation since WY 2012, including the driest five consecutive years on record (2012-2016) combined with no conservation releases from Lake Piru (2013-2016); and
e. **WYs 2016 to 2020** – a rising GLI, despite a somewhat stable cumulative departure from average precipitation with slight fluctuations during this period (small rebounds in the cumulative departure from above average precipitation are apparent during WYs 2017 and 2019).

QUALITY

Groundwater quality generally degrades from east to west in the Santa Paula basin, with higher chloride, sulfate, and TDS concentrations detected in water samples obtained from wells located west of Peck Road. Deeper wells in the basin tend to have elevated iron and manganese concentrations, and both the City of Santa Paula and Ventura operate treatment facilities to reduce these constituents in delivered municipal water. Reported nitrate concentrations from wells throughout the basin are generally low to moderate. Individual constituent concentrations vary with groundwater elevation changes in some wells. Detailed characterizations of groundwater quality in the Santa Paula basin can be found in the update of the Water Quality Control Plan (Basin Plan) for the Piru, Sespe, and Santa Paula Hydrologic Areas (California Department of Water Resources, 1989) and in the Lower Santa Clara River Salt and Nutrient Management Plan (Larry Walker Associates, 2015).

SUMMARY AND EVALUATION OF 2020 DATA

Monitoring data relevant to evaluation of groundwater conditions in the Santa Paula basin during the reporting period are summarized in this section and compared to long-term trends, where appropriate.

PRECIPITATION

Monthly precipitation at four selected rain gages distributed across Santa Paula basin during the reporting period are shown on Figure 10. Rainfall measurement at the Santa Paula-UWCD rain gage was discontinued following February 2020. The Santa Paula-UWCD rainfall record has been combined with the Santa Paula-Wilson Ranch rain gage record to report average monthly rainfall measurements at Santa Paula (1890 through 2020). The combined annual precipitation measured at the Santa Paula-UWCD and Santa Paula-Wilson Ranch rain gages during WY 2020 was 15.04 inches. This total is approximately 88 percent of the long-term average annual precipitation of 17.15 inches for WYs 1890 through 2020, and about equal with the long-term median annual precipitation of 14.94 inches. Despite below-average rainfall for WY 2020 overall, above-average monthly rainfall was recorded during November and December 2019 as well as March and April 2020 (Figure 10).

Precipitation at the Santa Paula-UWCD/Wilson Ranch rain gages during CY 2020 was 8.78 inches, which is 52 percent of the average annual precipitation and 57 percent of the median annual precipitation for CYs 1890 through 2020. This difference between WY and CY annual precipitation totals at Santa Paula during 2020 is a result of 50 percent of the rainfall reported in Santa Paula basin during WY 2020 occurring during November and December of CY 2019 (Figure 10).

Annual rainfall reported by the VCWPD at other selected locations in Santa Paula basin during WY 2020 were also below-average, including:

- Saticoy County Yard—13.30 inches (average of 16.10 inches);
- Wheeler Canyon—15.58 inches (average of 21.82 inches).

SURFACE WATER FLOWS

Daily streamflow rates measured in the Santa Clara River (at Freeman Diversion) and Santa Paula Creek (at Mupu Bridge) during CY and WY 2020 are shown on Figure 11. Flow rates in the Santa Clara River during the reporting period were typically 2 to 10 times greater than flow rates in Santa Paula Creek. However, in the past, the flow rate in Santa Paula Creek has occasionally equaled or exceeded the flow rate measured or estimated in the Santa Clara River.

The annual discharge measured in the Santa Clara River at Freeman Diversion during WY 2020 was 87,497 AF; the long-term average annual discharge is 202,025 AF/yr and the median annual discharge is 110,294 AF/yr for the period of record (WYs 1956 through 2020). Annual discharge in the Santa Clara River during WY 2020 decreased by nearly 60% from the annual discharge measured the previous year, WY 2019, with 205,642 AF.

The annual discharge measured in Santa Paula Creek at Mupu Bridge during WY 2020 was 9,758 AF. The long-term average annual discharge in Santa Paula Creek at Mupu Bridge (or at preceding gaging stations nearby on Santa Paula Creek) is 17,811 AF/yr, and the median annual discharge is 8,351 AF/yr for the period of record (WYs 1928 through 2020). Similar to the Santa Clara River, annual discharge in Santa Paula Creek in WY 2020 decreased by nearly 60% from the annual discharge measured the previous year, WY 2019 (22,518 AF).

SURFACE WATER QUALITY

Minimum, maximum, and average concentrations of selected major water quality constituents (chloride, nitrate, TDS, and sulfate) detected in surface water samples from the Santa Clara River at Freeman Diversion during CY 2020 are summarized in Table 7, below. Concentrations of these constituents detected throughout the historical record (CYs 1925 to 2020) are shown on Figure 12. Table 7 indicates that average concentrations of chloride, nitrate TDS and sulfate detected in Santa Clara River during CY 2020 were lower than long-term average concentrations. Inspection of Figure 12 indicates that concentrations of the major water quality constituents began to increase in CY 2012, reaching record highs during CY 2014 and CY 2018, likely the result of drought conditions. Concentrations declined in CY 2020, following CY 2019 which recorded above average rainfall, and are similar compared to those detected during the previous decade, prior to the current drought. Figure 13 compares chloride, nitrate, TDS, and sulfate concentrations with streamflow at the Santa Clara River at Freeman Diversion during CY 2020. UWCD (1996) identified a strong correlation between low flows and increased concentrations of sulfate, chloride and TDS in the Santa Clara River. This relationship is discernible in the CY 2020 data, as well (Figure 13). Excluding the period of the current drought starting in 2012, the overall concentration trends for sulfate, chloride, TDS, and nitrate in the Santa Clara River appear to be stable to downward since the 1960s (Figure 12).

Minimum, maximum, and average concentrations of selected major water quality constituents (chloride, nitrate, TDS, and sulfate) detected in surface water samples from Santa Paula Creek near Santa Paula during CY 2020 are summarized in Table 8, below. Concentrations of these constituents detected throughout the historical record (CYs 1980 to 2020) are shown on Figure 14. Table 8 indicates that average concentrations of chloride and sulfate detected in Santa Paula Creek during CY 2020 were lower than long-term average concentrations, and average concentrations of nitrate and TDS higher than long-term average concentrations. Inspection of Figure 14 indicates that concentrations of major water quality constituents began to increase in CY 2012, reaching record highs from CY 2014 through CY 2016, likely the result of drought conditions. Similar to the Santa Clara River, concentrations of these constituents in Santa Paula Creek declined in CY 2020.

Table 7. Summary of Major Surface Water Quality Parameters in Santa Clara River at Freeman Diversion, CY 2020

Statistic	Concentration (mg/L)			
	Chloride	Nitrate[a]	TDS	Sulfate
CY 2020 Minimum	25	2.7	660	273
CY 2020 Maximum	92	10.6	1,500	677
CY 2020 Average	69	4.8	1,130	478
Long-Term Average[b]	64	5.9	1,143	530

Notes:

[a] As nitrate

[b] Includes reported data in UWCD's database from the entire period of record: CY 1925 to present for chloride, TDS, and sulfate; CY 1936 to present for nitrate.

Table 8. Summary of Major Surface Water Quality Parameters in Santa Paula Creek near Santa Paula, CY 2020

Statistic	Concentration (mg/L)			
	Chloride	Nitrate[a]	TDS	Sulfate
CY 2020 Minimum	15	3.8	570	231
CY 2020 Maximum	76	33.4	1,330	546
CY 2020 Average	41	13.4	875	360
Long-Term Average[b]	45	10.6	859	379

Notes:

[a] As nitrate

[b] Includes reported data in UWCD's database from the entire period of record: CY 1980 to present for hardness, sulfate and chloride; CY 1981 to present for nitrate.

PRODUCTION WELL INSTALLATIONS AND DESTRUCTIONS

One production well was destroyed within the Santa Paula basin during CY 2020; this well is listed in Table 9, below.

Table 9. Production Well Installations and Destructions During CY 2020

Production Wells Destroyed	Production Wells Drilled
02N22W02C01S	None reported

GROUNDWATER EXTRACTION AND PUMPING ALLOCATIONS

Annual groundwater extractions (pumping) reported for wells within the Santa Paula basin settlement boundary throughout the period of record are summarized in Table 4, and illustrated on Figure 7. The total volume of reported groundwater extractions in 2020 (21,213 AF) was less than the long-term average (CYs 1980 through 2020) of 25,278 AF/yr. Review of pumping data available in UWCD's database for each half of CY 2020 indicates that reported groundwater extractions in the first half of CY 2020, in particular, were below average. Rainfall in December 2019 was well above normal (Figure 10), and above average rainfall during November, March and April likely reduced irrigation demand during this period.

The Judgment governs groundwater production on a seven-year rolling average, which allows parties to produce more or less than their allocation in any particular year so long as their rolling seven-year average does not exceed their allocation. Appendix D summarizes groundwater extractions for the past seven years (CYs 2014 through 2020), as well as Individual Party Allocations (IPAs) for the SPBPA (with transfers, de minimis parties, non parties) and the City of Ventura.

The Judgment also allows for "de minimis" production by landowners that are not allocated an IPA, which allows them to produce groundwater for uses on their overlying property, so long as such use does not exceed 5 AF in any given year. In CY 2020, there were six de minimis producers, which are identified together with their actual CY 2020 production in Appendix D, Table D-2.

The total combined pumping allocations of the SPBPA (party and non-party) and the City of San Buenaventura are now at 30,771.6 AF/yr. Amendments to the Judgment in 2010 provided the SPBPA with an additional 280.2 AF/yr of allocation, which was granted to pumpers that were not previously parties to, or identified within, the Judgment. The current allocations were calculated and granted using the lesser of the following two options: 1) the average production reported to UWCD from CYs

2002 through 2008; or 2) the average production reported to UWCD prior to the Judgment (CYs 1989 to 1995). Through CY 2020, an additional 345.9 AF/yr of SPBPA allocation has been transferred to Ventura to accommodate new water demands on its system that result from agricultural land conversion to municipal land uses.

The SPBPA's CY 2020 allocations were 27,425.7 AF/yr (excluding non-parties) distributed among its members, with a seven-year rolling-average surplus of 6,915.2 AF (also excluding non-parties) from pumping below the allocation. Some parties have exceeded their 7-year-average IPAs, but the total volume of groundwater used by the SPBPA members is well below the SPBPA's seven-year-rolling-average allocation, resulting in the surplus noted above. Ventura's CY 2020 allocations were 3,000 AF/yr plus 345.9 AF/yr of prior SPBPA allocation, with a seven-year rolling average surplus of 763.0 AF from pumping below its allocation.

Reported groundwater extractions from the Santa Paula basin during CY 2020 by the City of San Buenaventura, members of the SPBPA, and other pumpers are summarized in Table 10, below, and graphically illustrated on Figure 8. The distribution of groundwater extractions across the basin during CY 2020 is shown on Figure 15.

Table 10. Summary of Groundwater Extractions During CY 2020

Pumper	Extractions (AF)
City of San Buenaventura[a]	2,698
SPBPA Pumpers with Individual Party Allocations (adjusted by SPBPA)[b]	18,479
SPBPA Pumpers with Individual Party Allocations (reported to UWCD)[c]	18,479
Non-stipulated Parties[b]	14
De Minimis Pumpers[b]	21
Total extractions (adjusted by SPBPA[b] / reported to UWCD[c])	21,213 / 21,213

Notes:

[a] Includes pumping from well 02N/22W-03E01S (Appendix D, Table D-5)

[b] From Appendix D compiled by SPBPA

[c] From UWCD Finance Department records

GROUNDWATER LEVELS

Groundwater elevations were monitored during CY 2020 at selected wells in and adjacent to the Santa Paula basin, as shown on Figure 16. Groundwater elevation hydrographs for selected wells are shown in Appendix B. Two hydrographs are included for each well at different scales, as follows:

- The first hydrograph for each well is scaled with a consistent vertical axis range of -60 to 380 feet so that, for most wells, the relationships between static groundwater levels, top and bottom of well screens, and reference points (RPs) at different wells in the basin can be visually compared. These hydrographs also include a consistent horizontal axis of CYs 1922 to 2030 for long-term data sets, or CYs 1972 to 2026 for short-term data sets. The information provided in these hydrographs displays the relationship between the (static) water level variations and the production zones of wells in the basin. These plots include annotations regarding the RP and depth of the well screen (which is indicated in parentheses to the right of the well number).

- The second hydrograph for each well is scaled to allow easier comparison of the magnitude of the static groundwater level changes in the wells. The vertical axis range of 80 feet captures the range of water levels on an expanded scale for visual inspection of groundwater level trends and comparison between wells.

Groundwater elevation contour maps for spring and fall of CY 2020 in Santa Paula basin are shown on Figures 17 and 18. The contours were interpolated using groundwater elevation data from wells in the Santa Paula basin and in the adjacent, hydraulically-connected Fillmore, Mound, and Oxnard basins. The contours represent lines of equal groundwater elevation (total hydraulic head), and generally define the water table (in unconfined portions of the aquifer) or potentiometric surface (in confined portions of the aquifer). Most of the groundwater elevations used for contouring were measured at long-screened wells with total depths greater than 100 feet. The screened interval contoured at UWCD's cluster monitor well sites SP-1 and SP-2 are 370 to 390 feet, and 290 to 310 feet, respectively. Groundwater elevations measured at shallow wells in these clusters are typically 10 to 30 feet higher than groundwater elevations in the deeper aquifer, indicating a strong downward hydraulic gradient in this area, particularly during periods of drought. Groundwater elevations measured at shallow versus deep wells are not contoured independently in this annual report.

The groundwater elevation contour maps (Figures 17 and 18) depict a general northeast to southwest hydraulic gradient along the axis of the basin. A notable deviation from this pattern occurs at the southwest margin of the Santa Paula basin, where a steepening of the hydraulic gradient occurs (indicated by closely-spaced groundwater elevation contours). This steepening likely indicates a zone of relatively low transmissivity caused by a partial barrier to groundwater flow, such as a fault. Local-scale variations in the hydraulic gradient can result from cones of depression created by pumping wells, or from transient (short-term) changes in groundwater levels occurring at wells at approximately the same time that groundwater levels were measured, yielding a measurement that is not representative of seasonal average conditions (for example, if a nearby production well began or ceased pumping shortly before the water-level measurement was made).

CHANGE IN GROUNDWATER STORAGE

Geostatistical analysis of groundwater-elevation changes within the limits of the unconsolidated alluvial deposits in Santa Paula basin between spring of 2019 (UWCD, 2021) and spring of 2020 (Figure 17; Appendix C) indicates that, on average, groundwater levels rose by 5.29 ft within the aquifers (Figure 19). This increase is somewhat greater than the calculated increase in GLI over the same period (2019-2020) of 2.29 ft. More data points are used for the geostatistical analysis than for the GLI calculation; therefore, the geostatistical analysis likely is more representative of basin wide groundwater-elevation and storage changes from year to year.

The magnitude of the geostatistically-calculated change in storage was based solely on data from wells where groundwater levels were measured both during spring 2019 and spring 2020 in and adjacent to Santa Paula basin. The Kriging method was used to interpolate the estimated groundwater elevation changes across the area of the unconsolidated alluvial deposits in and adjacent to Santa Paula basin. Areas outside of the basin were then "blanked," removing them from the calculation of average groundwater level change. The area of the unconsolidated alluvial deposits within Santa Paula basin is approximately 13,000 acres, and the average storage coefficient for the aquifer, which is mostly confined, is estimated to be in the range from 0.001 to 0.01. Based on these known data and estimated parameters, the calculated change in groundwater storage within the area of the unconsolidated alluvial deposits between spring 2019 and spring 2020 is an increase of approximately 70 to 700 AF, which may be within the margin of error for the method of analysis.

GROUNDWATER QUALITY

Minimum, maximum, and long-term average concentrations of selected major water-quality constituents (sulfate, chloride, nitrate and TDS) detected in groundwater samples during CY 2020 are summarized in Table 11, and are discussed in more detail in the following subsections.

NITRATE

The average nitrate concentration (as NO_3) for groundwater samples obtained from Santa Paula basin in CY 2020 and reported to UWCD (Table 11) was below the long-term average of 10.2 mg/L. The California Regional Water Quality Control Board—Los Angeles Region (LARWQCB), established a water quality objective (WQO) for nitrate (as NO_3) in Santa Paula basin of 45 mg/L (LARWQCB, 1994), which is also the State Primary MCL for nitrate in public drinking-water systems. Maximum nitrate concentrations reported for wells in the Santa Paula basin during CY2020 are mapped on Figure 20. There were no samples from CY 2020 that contained nitrate concentrations greater than 45 mg/L, out of 37 samples analyzed for nitrate.

Table 11. Summary of Major Groundwater Quality Parameters, CY 2020

Statistic	Concentration (mg/L)			
	Chloride	**Nitrate[a]**	**TDS**	**Sulfate**
CY 2020 Minimum	37.0	ND	620	311
CY 2020 Maximum	326	35.5	4,290	2,050
CY 2020 Average	72.1	7.2	1,290	548
Long-Term Average[b]	69.8	10.2	1,308	541
Primary MCL	none	45	none	none
Secondary MCLR-“Recommended”	250	none	500	250
Secondary MCLR-“Upper”	500	none	1,000	500
Water Quality Objectives (East/West of Peck Rd.)	100/110	45/45	1,200/2,000	600/800

Notes:

ND = not detected
MCL = Maximum Contaminant Level
MCLR = Maximum Contaminant Level Range

[a] As NO_3.

[b] Includes reported data in UWCD’s database from the entire period of record: CY 1903 to present for chloride, TDS, and sulfate; CY 1923 to present for nitrate.

CHLORIDE

The average chloride concentrations for groundwater samples obtained from Santa Paula basin in CY 2020 and reported to UWCD (Table 11) were slightly greater than the long-term average of 69.8 mg/L. LARWQCB’s WQOs for chloride in Santa Paula basin are 100 mg/L east of Peck Road and 110 mg/L west of Peck Road (LARWQCB, 1994); these WQOs are less than the State “Recommended” and “Upper” Secondary Maximum Contaminant Level Ranges (MCLRs) for chloride in public water supplies of 250 and 500 mg/L, respectively. All but three chloride concentrations detected in the basin during the reporting period were below the WQOs, and all were below the “Upper” Secondary MCLR. In a 1959 evaluation of the quality of irrigation waters in Ventura County, the California Department of Water Resources classified water with less than 5 milliequivalents per liter of chloride (equal to 177 mg/L chloride) as “Class 1 – Excellent to Good” for agricultural purposes (California Department of Water Resources, 1959). A more recent literature review indicated that some sensitive crops, such as avocados and strawberries, may experience impaired yields when the chloride concentration of irrigation water exceeds 117 mg/L (CH2M HILL, 2005).

Maximum-detected chloride concentrations reported for wells in the Santa Paula basin during CY 2020 are mapped on Figure 21. Maximum chloride concentrations generally increase from east to west in the basin, with two notable exceptions. One is the shallow-screened (50 to 70 ft bgs) well in UWCD's monitoring well cluster SP-2, in Santa Paula at Teague Park, where chloride concentrations are commonly the highest detected in the basin and reflective of the typical lower quality of shallow groundwater in the basin. The other is a shallow (100 ft bgs) well located southwest (and hydraulically downgradient) of the City of Santa Paula Water Recycling Facility percolation ponds. Chloride concentrations detected in weekly grab samples of effluent discharged from the facility during CY 2020 averaged 118.88 mg/l (Veolia, 2021).

SULFATE

The average sulfate concentrations for groundwater samples obtained from Santa Paula basin in CY 2020 and reported to UWCD (Table 11) were slightly greater than the long-term average of 541 mg/L. LARWQCB's (1994) WQOs for sulfate in Santa Paula basin are 600 mg/L east of Peck Road and 800 mg/L west of Peck Road; these WQOs are greater than the State "Recommended" and "Upper" Secondary MCLRs for sulfate in community water systems of 250 and 500 mg/L, respectively, and were selected based on water quality conditions present within the basin as of 1994. The majority of sulfate concentrations detected in groundwater samples were less than the WQOs.

Maximum-detected sulfate concentrations reported for wells in the Santa Paula basin during CY 2020 are mapped on Figure 22. Maximum sulfate concentrations detected in groundwater generally increase from east to west in the basin; however, the highest sulfate concentrations in the basin commonly are detected at the shallow-screened (50 to 70 ft bgs) well in UWCD's monitoring well cluster SP-2, in Santa Paula at Teague Park. As noted previously, shallow groundwater (which is intercepted by this well) is typically of lower quality than deeper groundwater in much of the basin.

TDS

The average TDS concentrations for groundwater samples obtained from Santa Paula basin in CY 2020 and reported to UWCD (Table 11) were slightly less than the long-term average of 1,308 mg/L. LARWQCB's WQOs for TDS in Santa Paula basin are 1,200 mg/L east of Peck Road and 2,000 mg/L west of Peck Road; these WQOs are greater than the State "Recommended" and "Upper" Secondary MCLRs for TDS in public water supplies of 500 and 1,000 mg/L, respectively. The majority of groundwater samples obtained from the basin in CY 2020 contained TDS concentrations below the WQOs; however, TDS concentrations in excess of the WQOs were detected in several wells, located both east and west of Peck Road.

Maximum TDS concentrations reported for wells in the Santa Paula basin during CY 2020 are mapped on Figure 23. TDS concentrations should be approximately equal to the sum of concentrations of ionic species in solution. In the Santa Paula basin, sulfate is generally the dominant dissolved anion in groundwater; therefore, the distribution of TDS in the basin tends to reflect the distribution of sulfate. Similar to sulfate, TDS concentrations generally increase from east to west in the basin; however, also similar to sulfate, the highest TDS concentrations in the basin commonly occur at the shallow-screened (50 to 70 ft bgs) well in UWCD's monitoring well cluster SP-2, in Santa Paula at Teague Park. Again, shallow groundwater (which is intercepted by this well) is typically of lower quality than deeper groundwater in much of the basin.

Hardness, Alkalinity, Iron and Manganese

High concentrations of hardness, alkalinity, iron, and manganese can limit the suitability of water for some domestic purposes and accelerate plugging of micro-irrigation systems, which are commonly used in the Santa Paula basin to improve efficiency of irrigation. Pitts and Peterson (undated), as part of their mobile irrigation laboratory work with the Cachuma Resource Conservation District, proposed water quality criteria for plugging-hazard potential associated with use of groundwater in drip-irrigation systems in Santa Barbara County. The University of California Division of Agriculture and Natural Resources has similar criteria for determining the clogging potential of irrigation water (University of California, 2015). Minimum, maximum, and long-term average concentrations of these groundwater constituents detected in groundwater samples in the Santa Paula basin during CY 2020 are summarized in Table 12, together with Secondary MCLs for iron and manganese, and the micro-irrigation plugging hazard criteria developed by Pitts and Peterson and the University of California.

Most of the iron concentrations detected in groundwater samples from the Santa Paula basin in CY 2020 (Table 12) were less than the Secondary MCL of 0.3 mg/L. However, the vast majority of manganese concentrations detected in the basin exceeded the Secondary MCL of 0.05 mg/L. Iron and manganese occur naturally in groundwater, and the elevated concentrations detected in the Santa Paula basin are thought to be a result of local geochemical conditions rather than man-made sources (e.g. mining or heavy industry). Treatment to remove iron or manganese from groundwater is performed by municipal water purveyors in the Santa Paula basin where needed to achieve Secondary MCLs in delivered water. Nearly all of the detected concentrations of hardness and alkalinity in the Santa Paula basin during CY 2020 exceeded the Pitts and Peterson and the University of California criteria for a "severe plugging hazard," and many of the iron and manganese concentrations exceeded the criteria for a "moderate plugging hazard."

Table12. Summary of Hardness, Alkalinity, Iron, and Manganese in Groundwater in the Santa Paula Basin, CY 2020

Statistic		Concentration (mg/L)			
		Hardness[a]	Alkalinity[a]	Iron	Manganese
CY 2020 Minimum		417	200	ND	ND
CY 2020 Maximum		1,270	400	0.810	0.730
CY 2020 Average		646	263	0.075	0.233
Long-Term Average[b]		646	269	0.146	0.244
Secondary MCL		NA	NA	0.3	0.05
Pitts and Peterson Plugging Hazard Potential	Moderate	150-300	100-200	0.1 - 1.0	0.1 - 1.0
	Severe	>300	>200	>1.0	>1.0
Univ. of Calif. Clogging Potential	Moderate	NA	100	0.2 - 1.5	0.1 - 1.5
	Severe	NA	NA	>1.5	>1.5

Notes:
ND = not detected
NA = not applicable or not reported
> = greater than the value shown
[a] As calcium carbonate ($CaCO_3$).
[b] Includes reported data in UWCD's database from the entire period of record: CY 1929 to present for hardness and alkalinity; CY 1937 to present for iron and manganese.

FINDINGS AND CONCLUSIONS

Review of data obtained from Santa Paula basin monitoring programs indicate that:

a. Total precipitation measured at the Santa Paula-UWCD/Wilson Ranch rain gages during WY 2020 was 15.04 inches. This total is approximately 88 percent of the long-term average annual precipitation of 17.15 inches. The 4-year moving-average precipitation rate of 16.94 inches per year (for the year ending in WY 2020) is about equal to the average 4-year moving-average precipitation of 17.09 inches for WYs 1890 through 2020. Precipitation totals for other rain gages in the Santa Paula basin during the reporting period were also below average.

b. The annual discharge measured in the Santa Clara River at Freeman Diversion during WY 2020 was 87,497 AF. Discharge in WY 2020 was less than half of the long-term average annual discharge of 202,025 AF/yr for the period of record (WYs 1956 through 2020).

c. The annual discharge measured in Santa Paula Creek at Mupu Bridge during WY 2020 was 9,758 AF. Discharge in WY 2020 was about 55 percent of the long-term average annual discharge in Santa Paula Creek at 17,811 AF/yr, for the period of record (WYs 1928 through 2020).

d. Average concentrations of chloride, sulfate, TDS, and nitrate detected in surface water samples from the Santa Clara River in CY 2020 were lower than long-term average concentrations. Concentrations of the major water quality constituents began to increase in CY 2012, reaching record highs during CY 2014 and CY 2018. However, concentrations declined in CY 2020, and are similar compared to those detected during the previous decade, prior to the current drought. Excluding the current drought period, the overall concentration trends for sulfate, chloride, TDS, and nitrate in the Santa Clara River have been stable to downward since the 1960s.

e. Average concentrations of chloride and sulfate detected in surface water samples from Santa Paula Creek in CY 2020 were lower than long-term average concentrations, and TDS and nitrate were higher than long-term average concentrations. Concentrations of major water quality constituents began to increase in CY 2012, reaching record highs from CY 2014 through CY 2016. However, concentrations declined in CY 2020, following CY 2019 which recorded above average rainfall.

f. The total volume of groundwater extracted from Santa Paula basin during CY 2020 was 21,213 AF, less than the long-term average (CYs 1980 through 2020) of 25,278 AF/yr, and below the total of allocations under the Judgment (currently 30,812 AF/yr).

g. Net imports of groundwater from the area just east of the stipulated area increased from an average of 217 AF/yr prior to CY 2011 to 4,068 AF/yr in CY 2020. This increase is primarily due to the use of the FICO #12 well located approximately 200 feet from the Santa Paula basin/Fillmore basin boundary. While the groundwater production is reported as an import, the impact on groundwater levels in the east Santa Paula Basin is similar to historical pumping from proximate wells located within the basin.

h. Average groundwater levels in the Santa Paula basin, represented by the GLI, appear to have risen by 2.29 ft between spring 2019 and spring 2020, corresponding to above average monthly rainfall recorded during November and December 2019 and March and April 2020 as well as below average pumping during the same time period.

i. As in past years, a general northeast to southwest hydraulic groundwater gradient exists along the axis of the basin, with steeper gradients along the southwest and west boundaries of the basin.

j. Geostatistical analysis of groundwater-elevation changes within the unconsolidated alluvial deposits in Santa Paula basin indicates that groundwater levels rose by an average of 5.29 ft between spring 2019 and spring 2020. The calculated change in groundwater storage within the aquifer from spring 2019 to spring 2020 is in the range of 70 to 700 AF, which may be within the margin of error for the method of analysis.

k. Basin-wide average concentrations of chloride and sulfate during the reporting period were greater than long-term basin-wide averages. Average concentrations of nitrate and TDS were less than the long-term basin-wide averages. As noted in past years, concentrations of chloride, sulfate, and TDS generally increase from east to west in the basin.

l. Basin-wide groundwater hardness, alkalinity, iron, and manganese concentrations during the reporting period remained within the range of previously detected levels. Elevated hardness and alkalinity pose a “severe plugging hazard” to micro-irrigation systems in the basin, while iron and manganese concentrations pose a “moderate plugging hazard,” according to guidelines developed by Pitts and Peterson and the University of California.

m. The most recent water budget for Santa Paula basin prepared by UWCD using the Ventura Regional Groundwater Flow Model estimated largely similar quantities of the major recharge and discharge components as previous studies, including the safe-yield study by DBS&A and RCS (2017).

This page intentionally blank.

REFERENCES

AECOM, 2010, Santa Paula Creek Recharge Study (prepared for United Water Conservation District).

American Water, 2018, Santa Paula Water Recycling Facility—2017 Annual Water Discharge Monitoring Report.

Bachman, 2015, Memorandum—Underflow Between Fillmore and Santa Paula Basins, dated September 15, 2015.

Bachman, 2017, Evaluation of Groundwater Sustainability Improvement Projects, Santa Paula Basin, dated September 2017.

California Department of Public Works, Division of Water Resources (DWR) 1934, Ventura County Investigation, Bulletin 46.

California State Water Resources Board (DWR), 1953, revised 1956, Ventura County Investigation, Volume I, Bulletin 12.

California Department of Water Resources (DWR), 1959, Evaluating the Quality of Irrigation Waters in Ventura County, Bulletin No. 75 (Appendix F).

California Department of Water Resources (DWR), 1989, Update of Basin Plan for Piru, Sespe, and Santa Paula Hydrologic Areas.

California Department of Water Resources (DWR), 2003, California's Groundwater: Bulletin 118, Update 2003.

California Department of Water Resources (DWR), 2018, Basin Boundary Modification 2018 Final, for Mound, Oxnard and Santa Paula basins available at https://s33630.pcdn.co/wp-content/uploads/2019/02/Mound-Basin-BBM-FINAL.pdf and Piru, Fillmore and Santa Paula basins available at https://s29420.pcdn.co/wp-content/uploads/2019/02/Fillmore-Piru-Basins-BBM-FINAL.pdf.

California Regional Water Quality Control Board, Los Angeles Region, 1994, Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

CH2M HILL, 2005, Literature Review Evaluation, Upper Santa Clara River Chloride TMDL Collaborative Process (technical study funded by the Sanitation Districts of Los Angeles County).

Daniel B Stephens & Associates, Inc. and Richard C. Slade & Associates, LLC (DBS&A and RCS), 2017, Santa Paula Basin Hydrogeologic Characterization and Safe Yield Study, Ventura County California, dated May 25, 2017.

Frank B & Associates, 2013a, Task No. 5: Crop Changes Over Time-Santa Paula Groundwater Basin.

Frank B & Associates, 2013b, Task No. 12 (draft): Alluvial Pumping & Surface Diversions Outside of Judgment Authority.

GEI Consultants, 2012a, Memorandum—Santa Paula Basin: Rainfall, dated January 18, 2012.

GEI Consultants, 2012b, Memorandum—Santa Paula Basin: Streamflow, dated January 19, 2012.

GEI Consultants, 2015, Responses to Comments on Draft GEI Memoranda, dated November 13, 2015.

GSI Water Solutions (GSI), 2020, Santa Paula Water Recycling Facility Quarterly Report of Groundwater Level and Percolation Pond Discharge Data, October to December 2020.

Gunderson, Gus (Limoneira Company), 2015, personal communication via telephone on November 10, 2015.

Hanson, R.T., Martin, P. and Koczot, K.M., 2003, Simulation of Ground-Water/Surface-Water Flow in the Santa Clara –Calleguas Ground-Water Basin, Ventura County, California, U.S. Geological Survey, Water-Resources Investigations Report 02-4136, 157p.

Hopkins Groundwater Consultants, Inc., 2018, Preliminary Evaluation of Historical Changes to the Santa Paula Creek Channel and Potential Effects on Santa Paula Groundwater Basin Recharge, Santa Paula, California. February.

Kenneth D. Schmidt and Associates, 2015, Confining Bed Evaluation for Santa Paula Basin—Revised Draft Report, January.

Kawano, R.Y. and Parsons, John K., 1956, Supplement No. 1 to the 1951-53 Report on Hydrologic Investigation of the Water Resources of the United Water Conservation District.

Larry Walker Associates, Hydrometrics WRI, Carollo, Rincon Consultants, and Dr. Norm Brown (LWA and others), 2015, Lower Santa Clara River Salt and Nutrient Management Plan (work directed by Ventura County Watershed Protection District).

Law/Crandall, 1993. *Water Resources Evaluation, Santa Paula Ground Water Basin, Ventura County, California.* March.

Mann, John F. Jr. (Mann), 1959. A Plan for Ground Water Management. Prepared for United Water Conservation District. September.

Mound Basin Groundwater Sustainability Agency (MBGSA), n.d., Basin Boundary Modification available at https://www.moundbasingsa.org/basin-boundary-modification/.

PERC Water (PERC), 2016, Santa Paula Water Recycling Facility—2015 Annual Water Discharge Monitoring Report. January.

PERC Water (PERC), 2017, Santa Paula Water Recycling Facility—2016 Annual Water Discharge Monitoring Report. January.

Pitts, Donald J., and Peterson, Kevin, undated, Maintaining a Plug-Free Micro-Irrigation System, Cachuma Resource Conservation District.

Reichard, Eric G., Crawford, Steven M., Schipke-Paybins, Katherine, Martin, Peter, Land, Michael, and Nishikawa, Tracy, 1999, Evaluation of Surface-Water/Groundwater Interactions in the Santa Clara River Valley, Water-Resources Investigations Report 98-4208.

Santa Paula Basin Experts Group, July 2003, Investigation of Santa Paula Basin Yield (prepared for Santa Paula Basin Technical Advisory Committee).

State Water Resources Control Board (SWRCB), n.d., California Integrated Water Quality System available at https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/EWMenuPublic.jsp.

Superior Court of the State of California for the County of Ventura, 2010, Judgment, Case No. 115611: *United Water Conservation District vs. City of San Buenaventura*, Original March 7, 1996, Amended August 24, 2010.

United Water Conservation District (UWCD), 1996, Water Quality of the Santa Clara River and the Montalvo and Oxnard Plain Groundwater Basins.

United Water Conservation District (UWCD), 2011a, Santa Paula Basin Pumping Trends Effects and Assessments, United Water Conservation District Open-File Report 2010-03.

United Water Conservation District (UWCD), 2013a, Percolation of Santa Clara River Flow within the Santa Paula Basin, United Water Conservation District Open-File Report 2013-01.

United Water Conservation District (UWCD), 2013b, SP Creek Percolation: An Update, United Water Conservation District Open-File Report 2013-02.

United Water Conservation District (UWCD), 2013c, Santa Paula Basin Groundwater Elevation Trend Assessment, United Water Conservation District Open-File Report 2013-03.

United Water Conservation District (UWCD), 2020, Summary of Past Groundwater Models and Water Budgets for the Piru, Fillmore, and Santa Paula Groundwater Basins, United Water Conservation District Open-File Report 2020-02.

United Water Conservation District (UWCD), 2021, Ventura Regional Groundwater Flow Model Expansion and Updated Hydrogeologic Conceptual Model for the Piru, Fillmore and Santa Paula Groundwater Basins, United Water Conservation District Open-File Report 2021-01.

University of California, 2015, Maintenance of Microirrigation Systems, Division of Agriculture and Natural Resources webpage edited by Lawrence J. Schwankl, Ph.D. (http://micromaintain.ucanr.edu/Prediction/Source/Groundwater/Assessing_Water_Quality_II-50a/)

Ventura County Waterworks Districts (VCWWD), 2016, Todd Road County Jail Wastewater Treatment Plant – 2015 Annual Monitoring Report. January.

Ventura County Waterworks Districts (VCWWD), 2017, Todd Road County Jail Wastewater Treatment Plant – 2016 Annual Monitoring Report. January.

Ventura County Waterworks Districts (VCWWD), 2018, Todd Road County Jail Wastewater Treatment Plant – 2017 Annual Monitoring Report. January.

Ventura County Waterworks Districts (VCWWD), 2019, Todd Road County Jail Wastewater Treatment Plant – 2018 Annual Monitoring Report. January.

Ventura County Waterworks Districts (VCWWD), 2020, Todd Road County Jail Wastewater Treatment Plant – 2019 Annual Monitoring Report. January.

Ventura County Waterworks Districts (VCWWD), 2021, Todd Road County Jail Wastewater Treatment Plant – 2020 Annual Monitoring Report. January.

Veolia North America (Veolia), 2019, Santa Paula Water Recycling Facility —2018 Annual Water Discharge Monitoring Report.

Veolia North America (Veolia), 2020, Santa Paula Water Recycling Facility —2019 Annual Water Discharge Monitoring Report.

Veolia North America (Veolia), 2021, Santa Paula Water Recycling Facility —2020 Annual Water Discharge Monitoring Report.

This page intentionally blank.

FIGURES

This page intentionally blank.

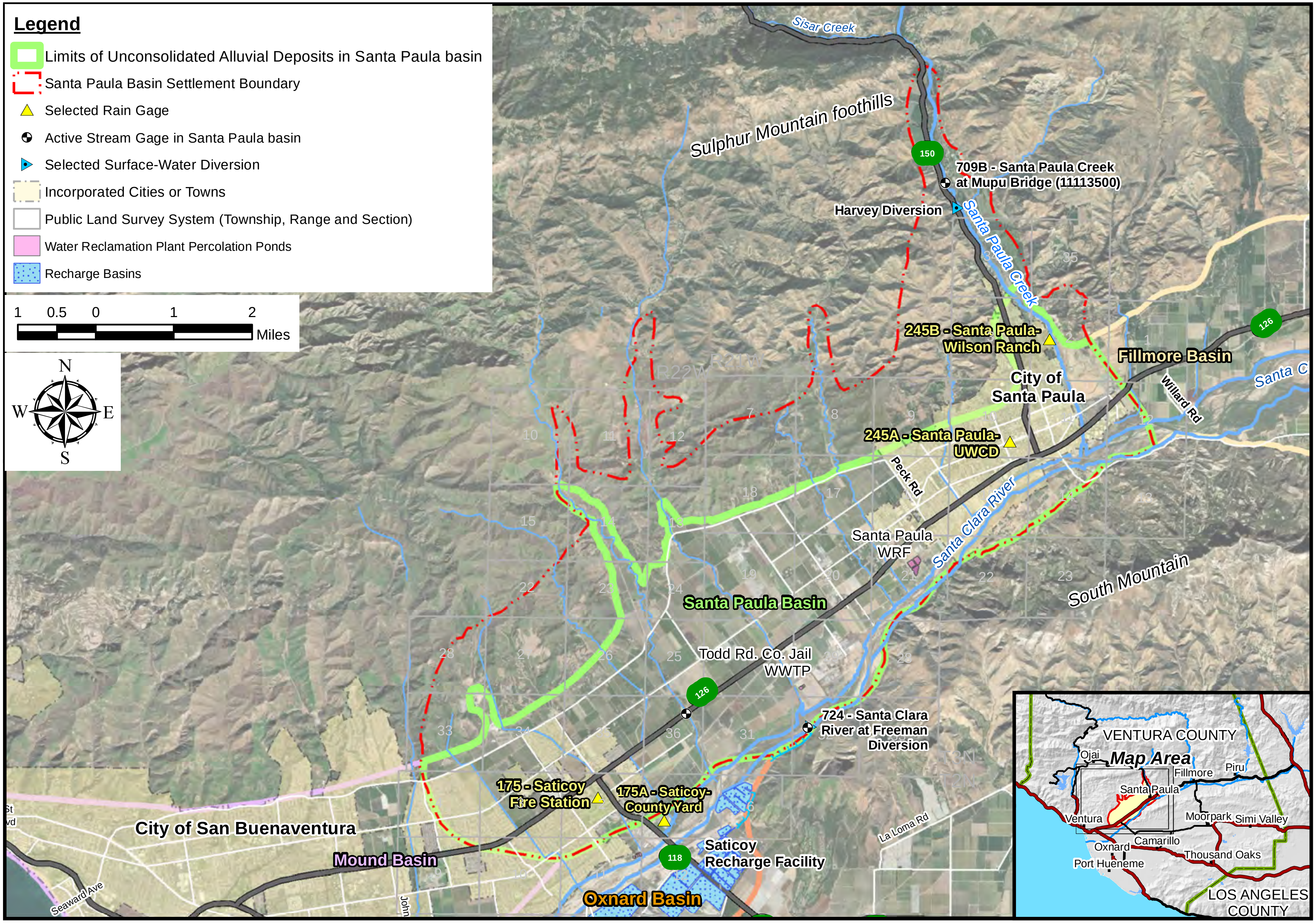


Figure 1. Santa Paula Basin Location Map

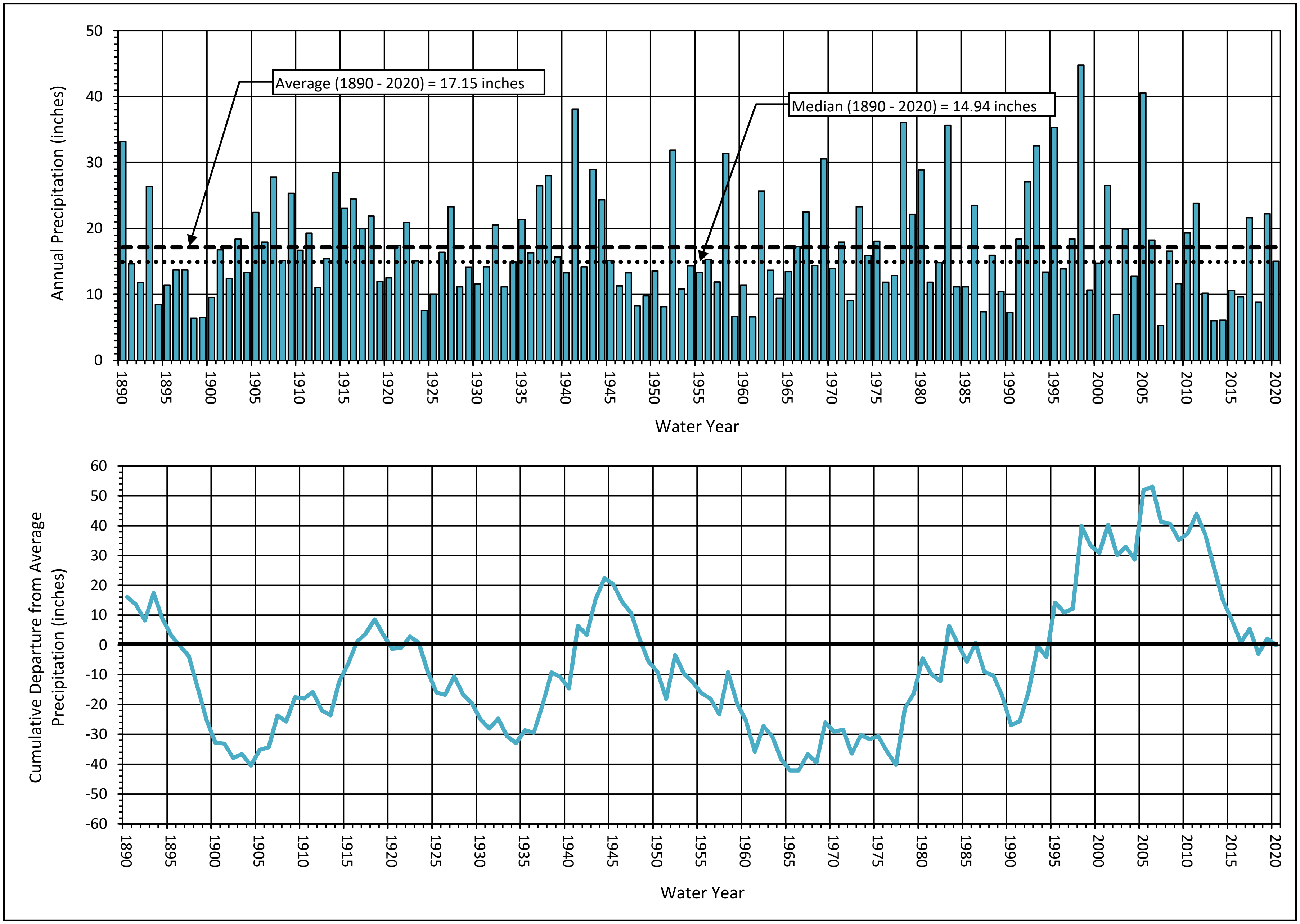


Figure 2. Annual Precipitation at Santa Paula and Cumulative Departure from Average, WYs 1890 through 2020

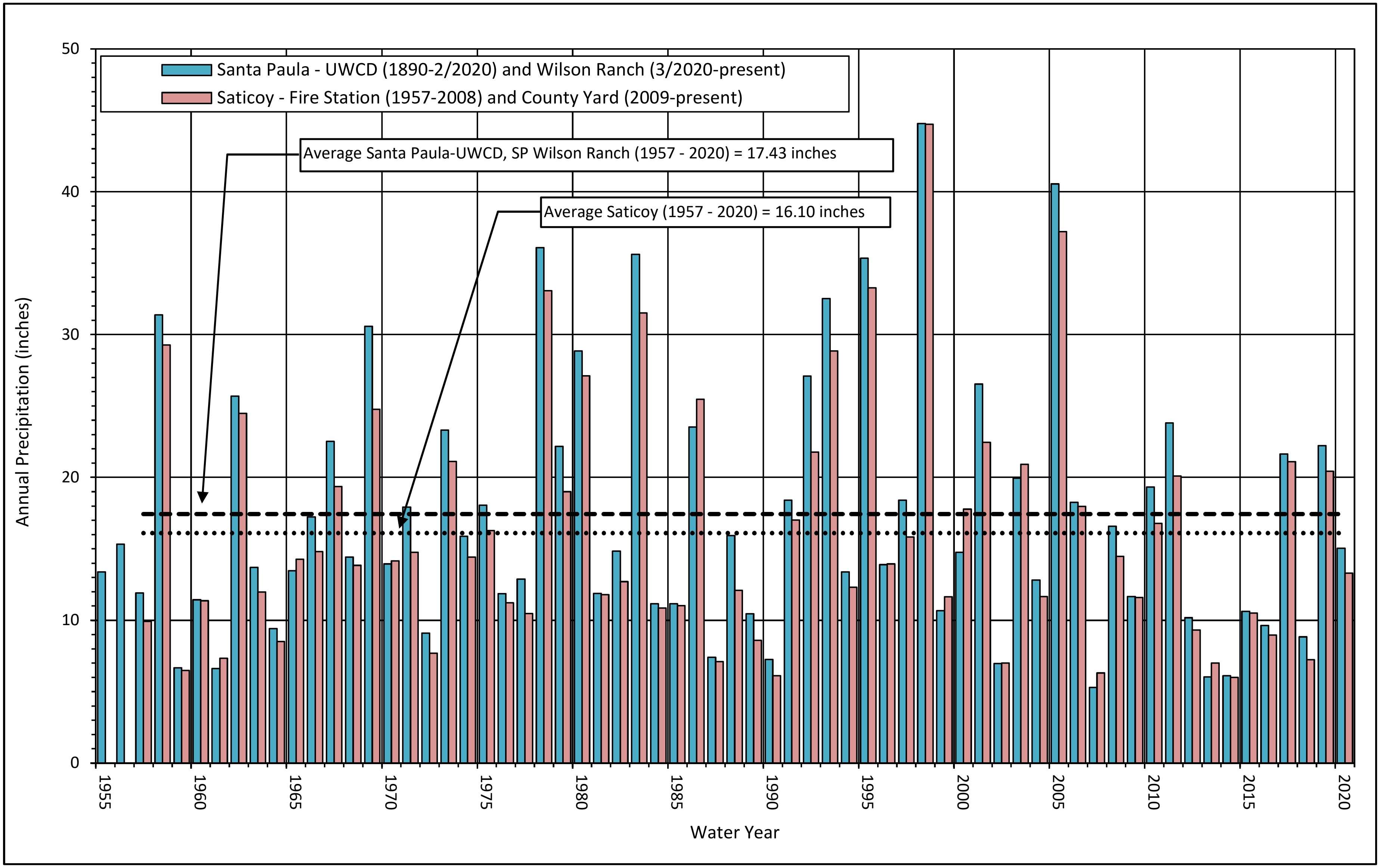


Figure 3. Annual Precipitation at Saticoy and Santa Paula, WYs 1955 through 2020

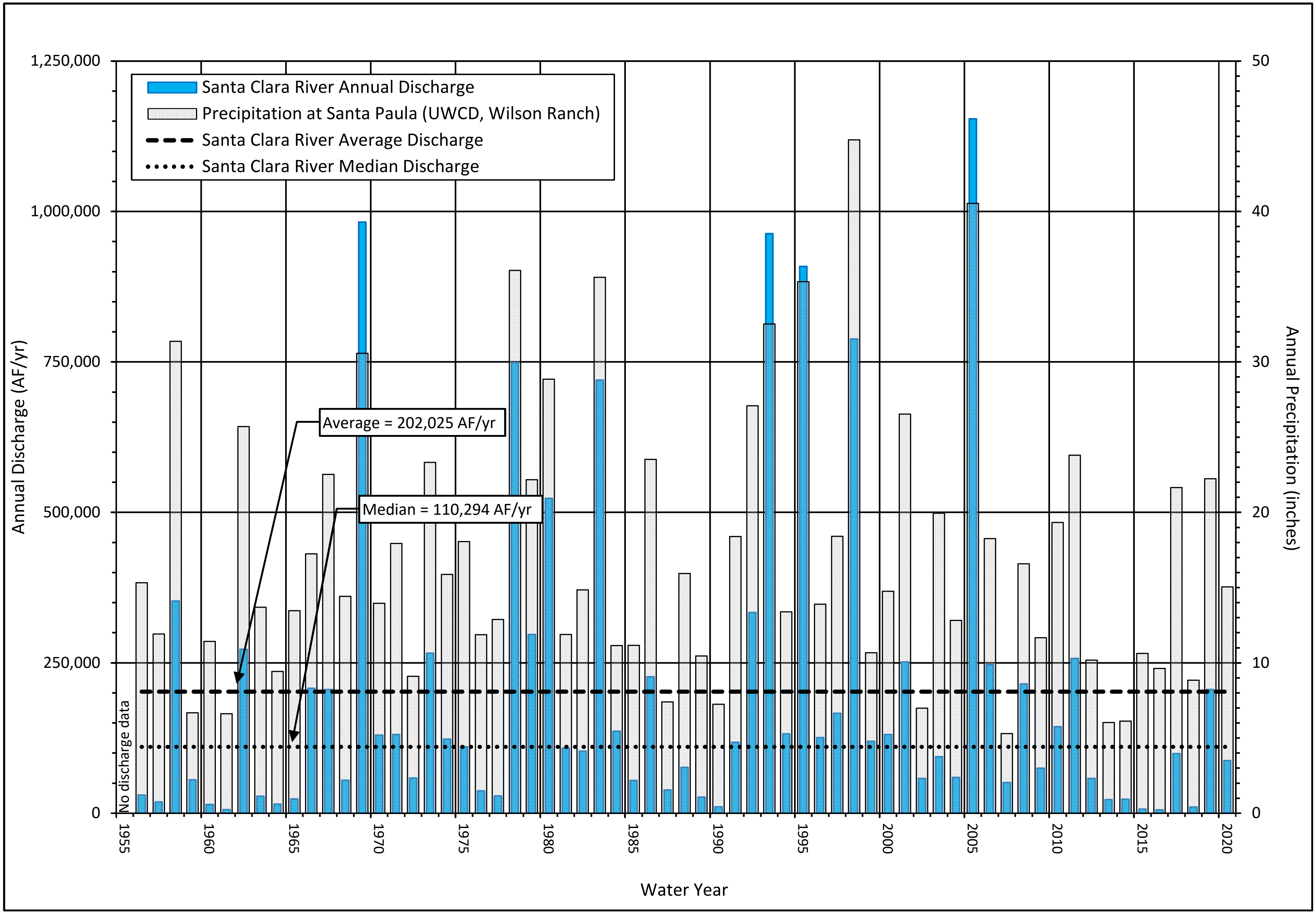


Figure 4. Annual Discharge of Santa Clara River at the Freeman Diversion, WYs 1956 through 2020

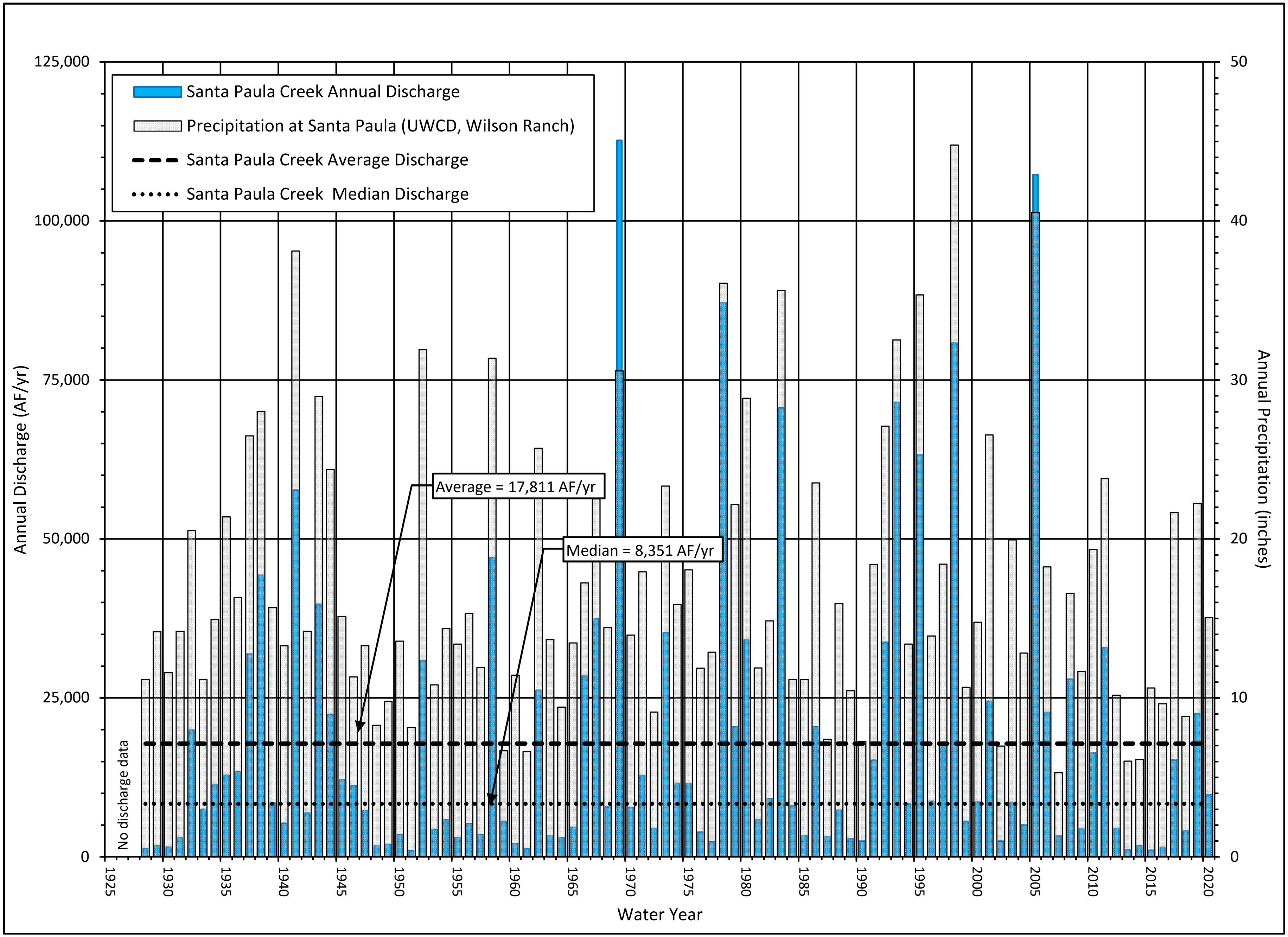


Figure 5. Annual Discharge of Santa Paula Creek Near Santa Paula, WYs 1928 through 2020

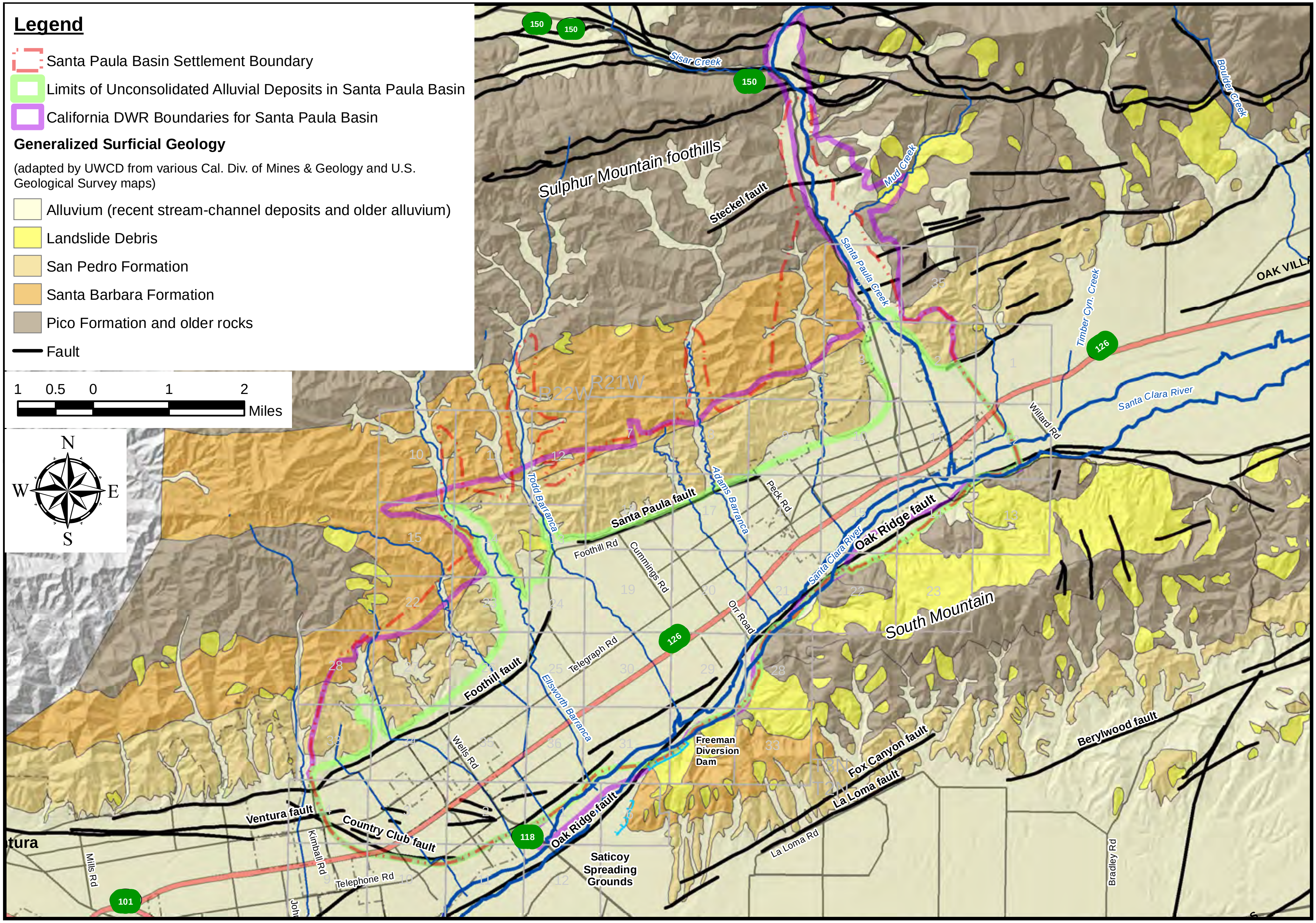


Figure 6. Generalized Geologic Map of Santa Paula Basin

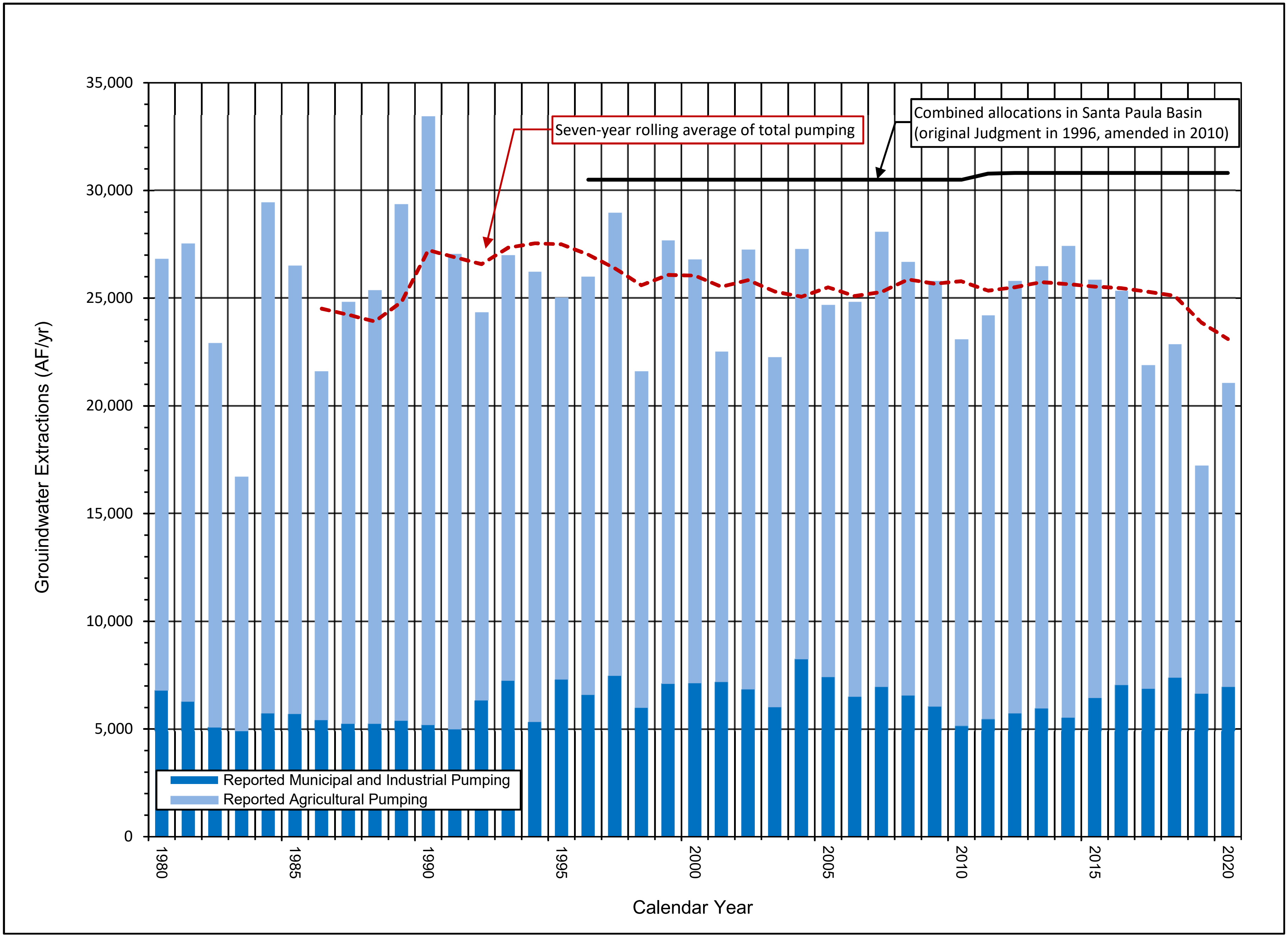


Figure 7. Historical Annual Groundwater Extractions from Santa Paula Basin, CYs 1980 through 2020

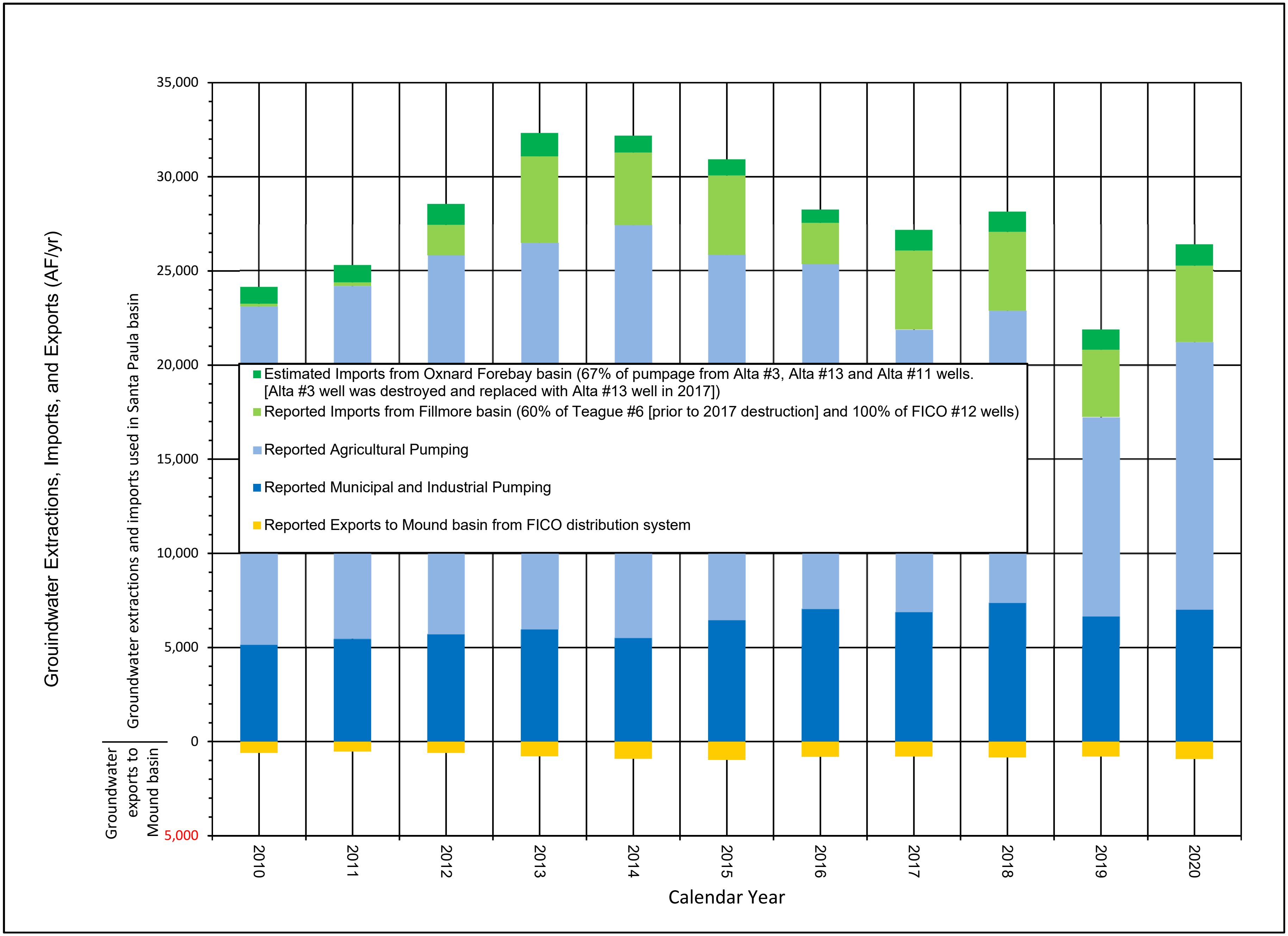


Figure 8. Annual Groundwater Extractions, Imports, and Exports from Santa Paula Basin, CYs 2010 through 2020

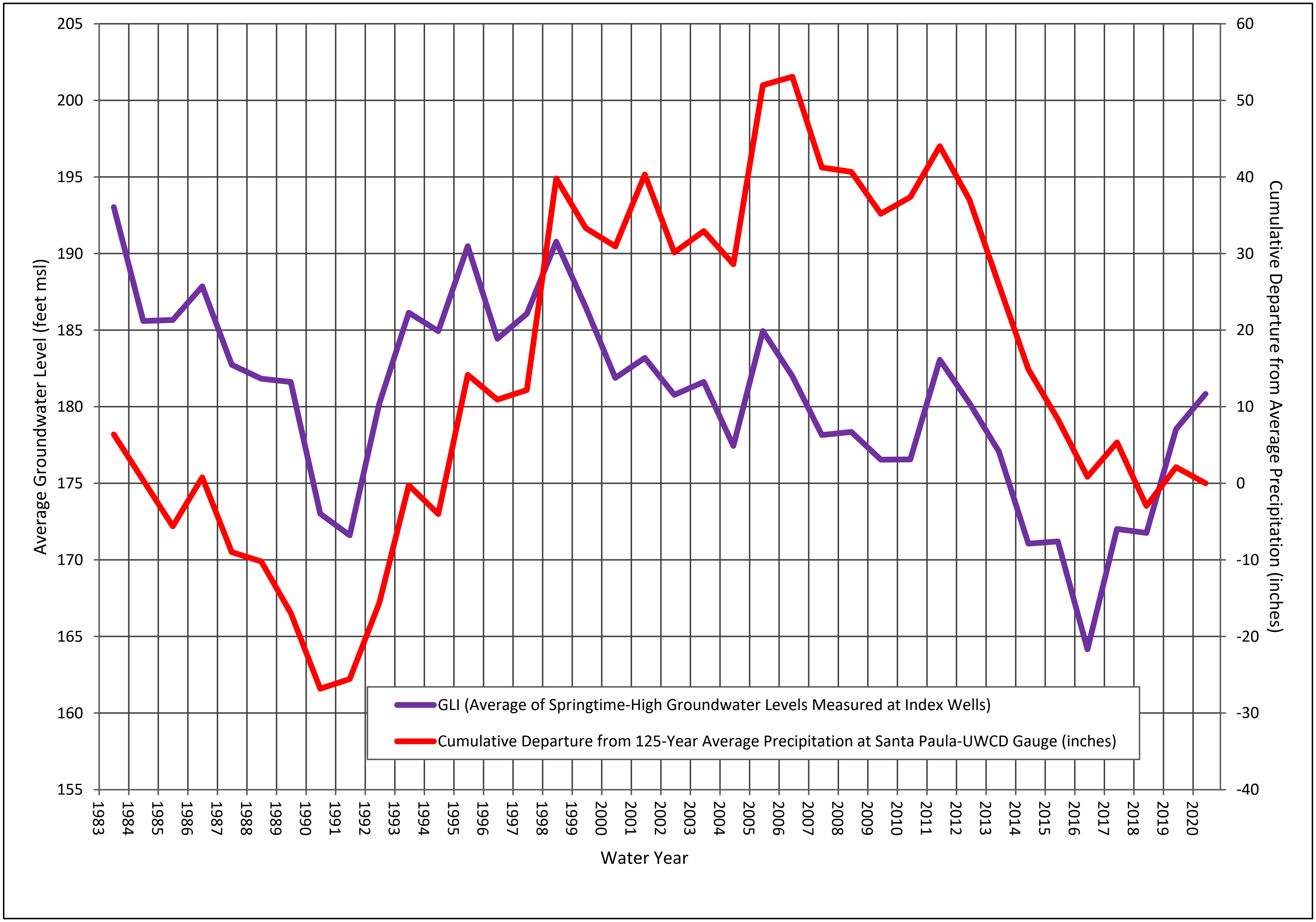


Figure 9. Groundwater Level Index and Cumulative Departure from Average Precipitation in Santa Paula Basin, WYs 1983 through 2020

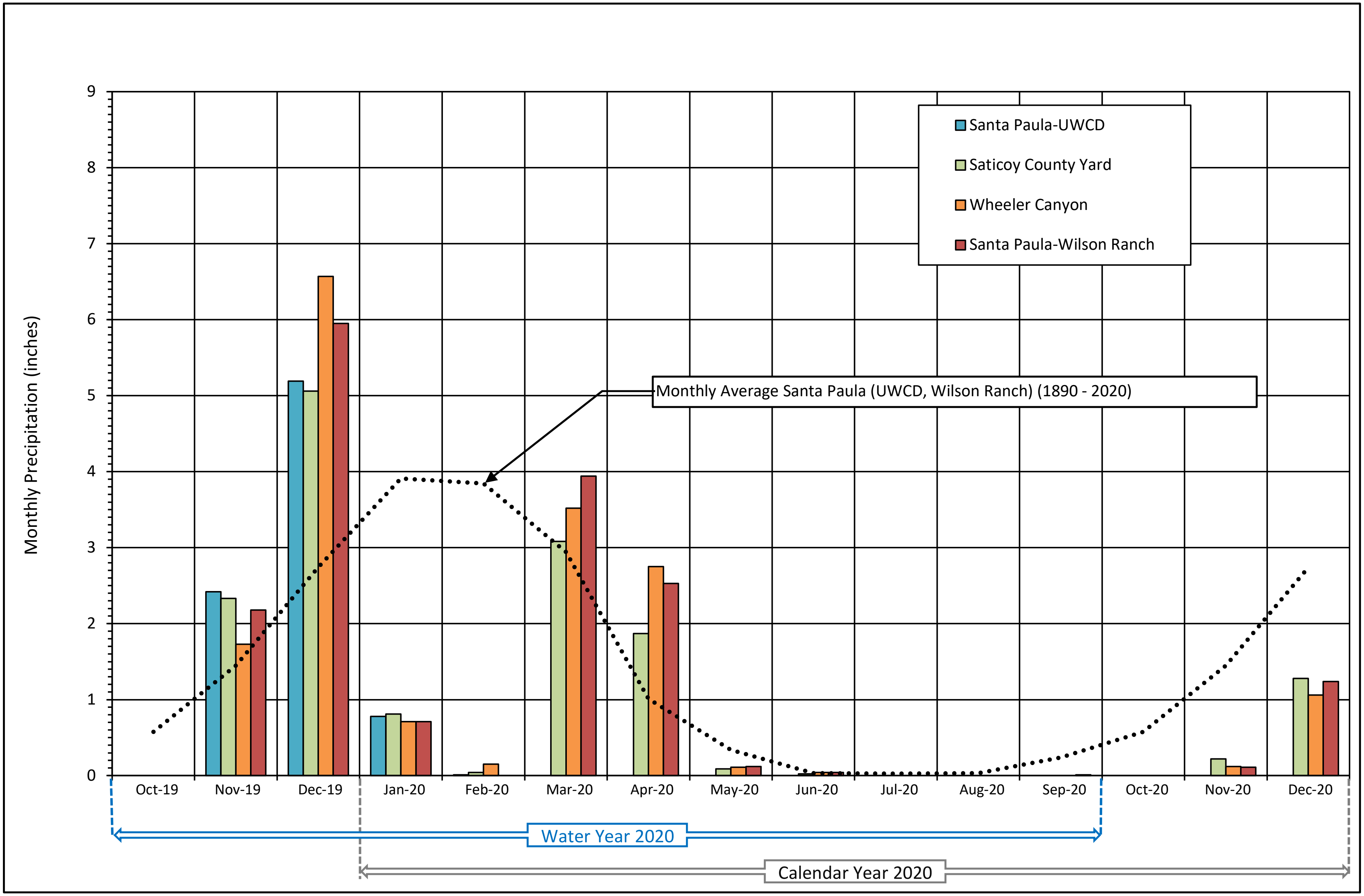


Figure 10. Monthly Precipitation in Santa Paula Basin, WY and CY 2020

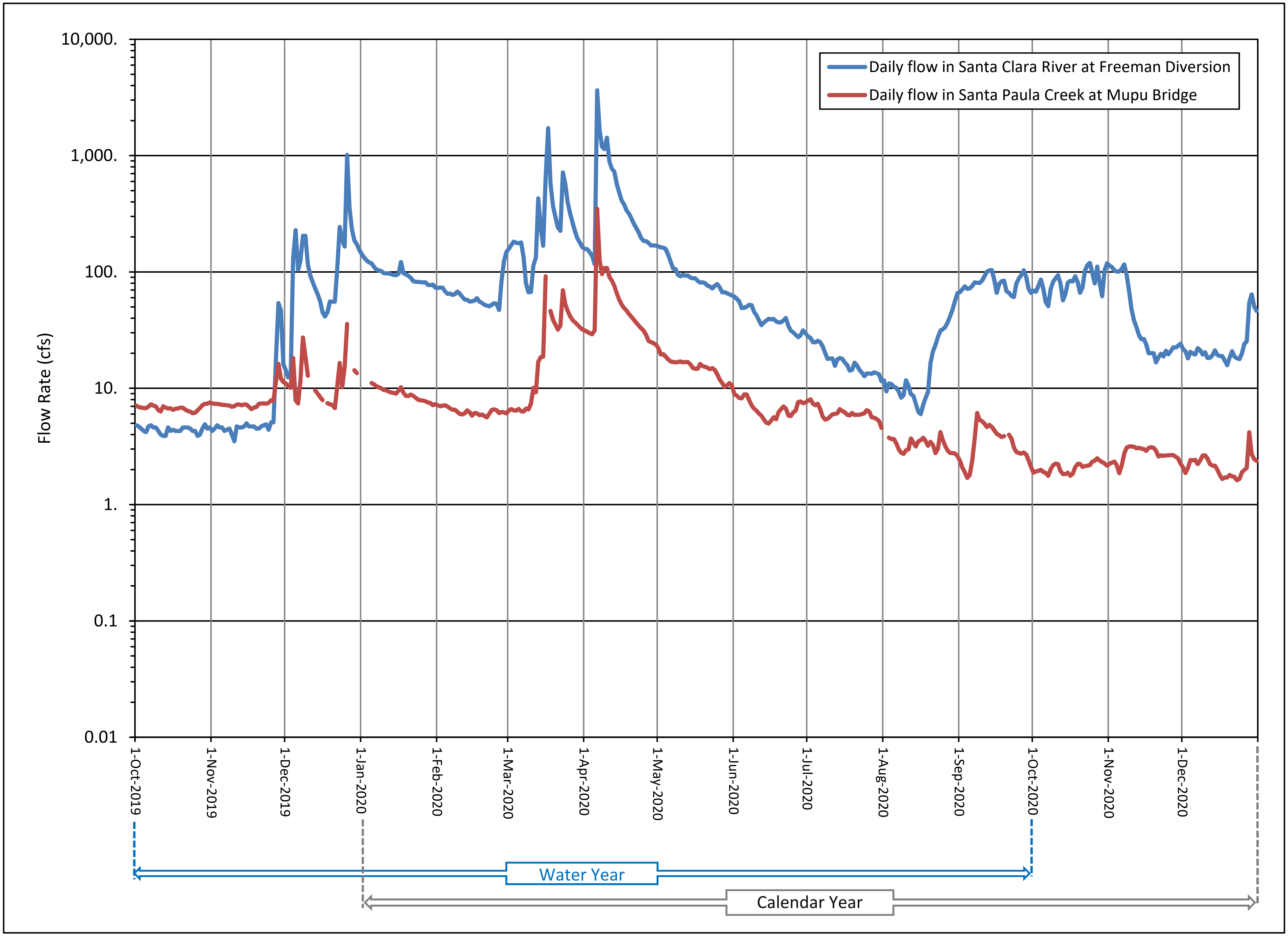


Figure 11. Daily Streamflow in Santa Paula Creek and Santa Clara River, WY and CY 2020

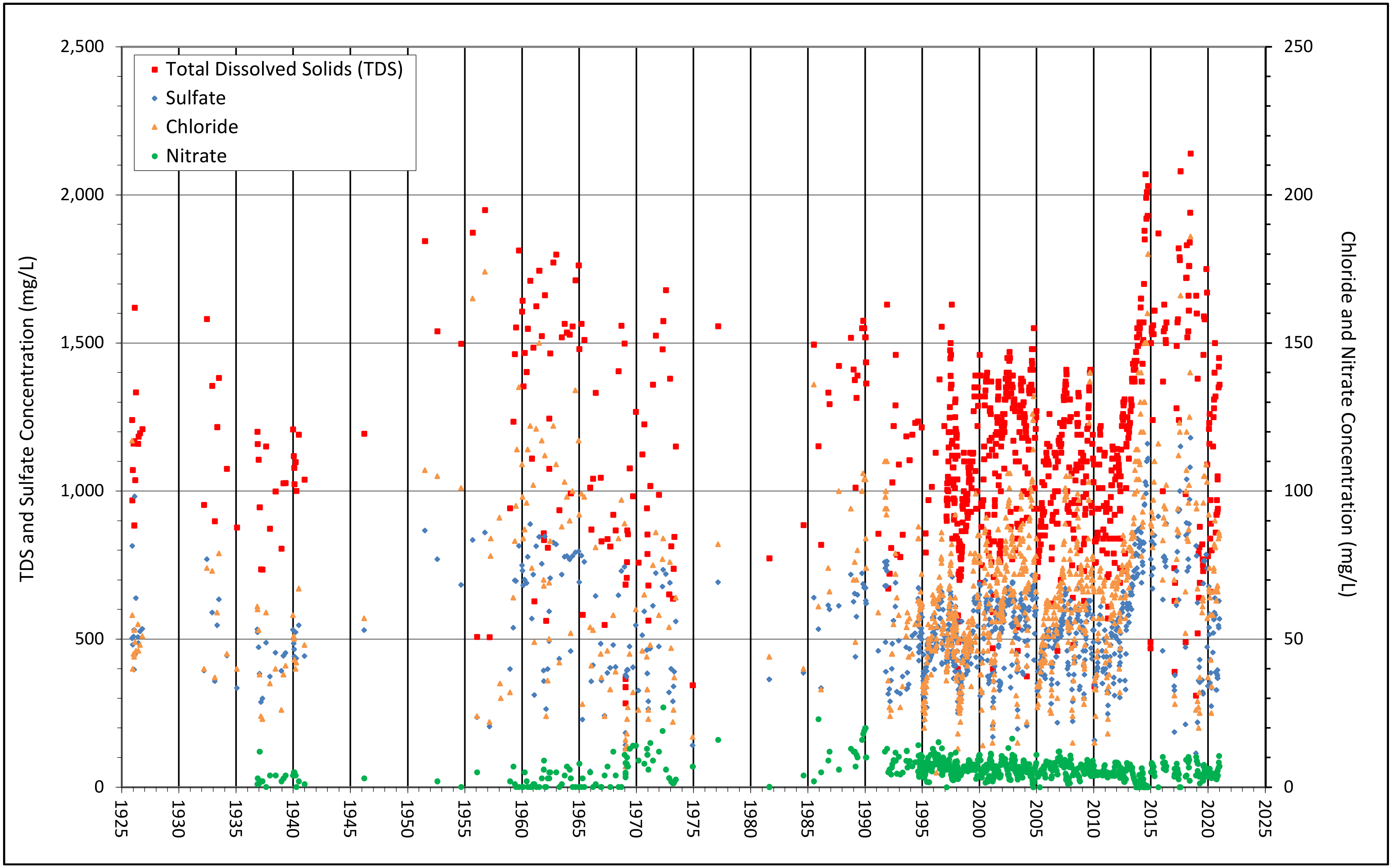


Figure 12. Concentrations of Selected Major Surface Water Quality Parameters in the Santa Clara River at Freeman Diversion, CYs 1925 through 2020

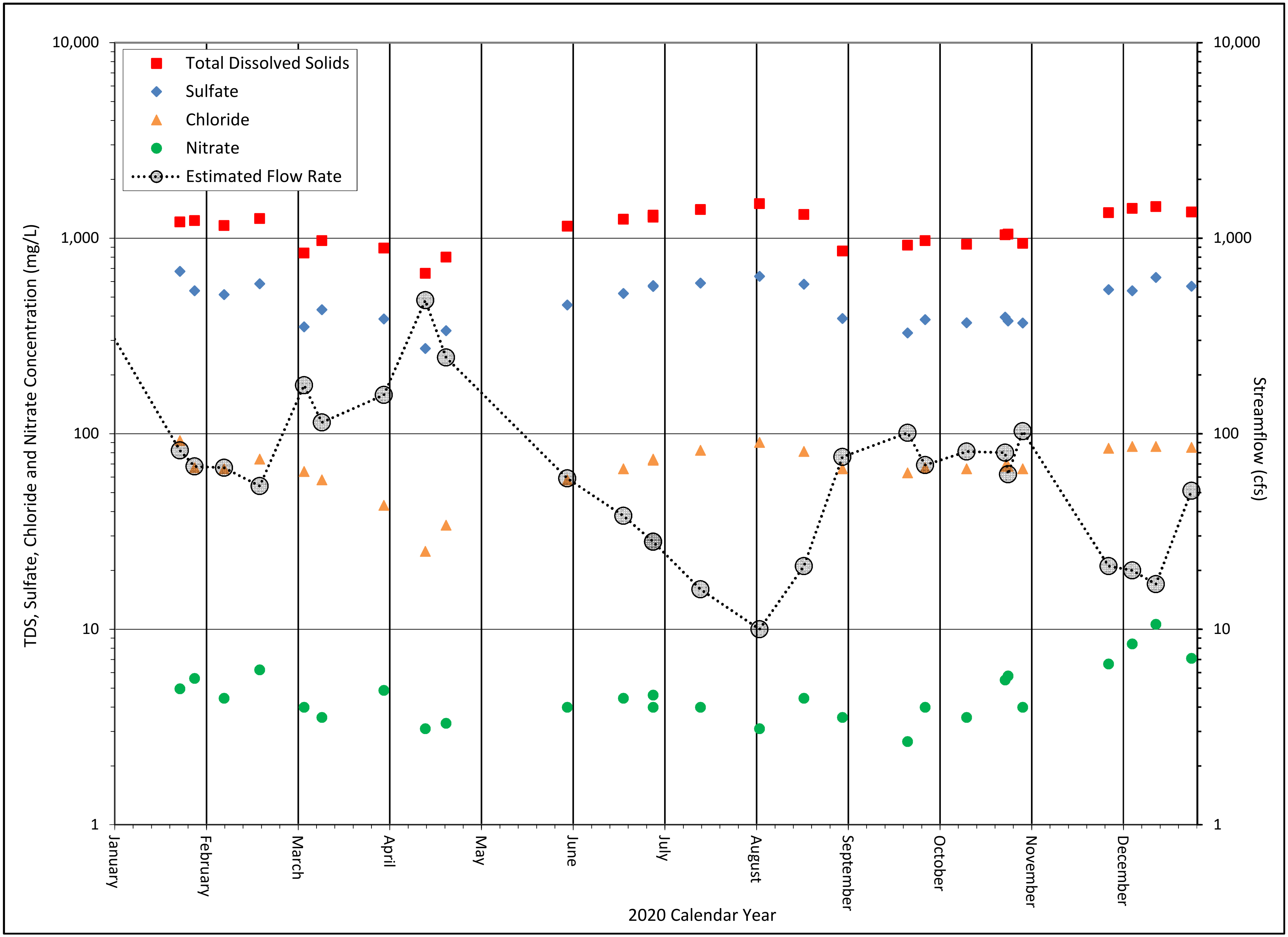


Figure 13. Water Quality and Streamflow in Santa Clara River at the Freeman Diversion, CY 2020

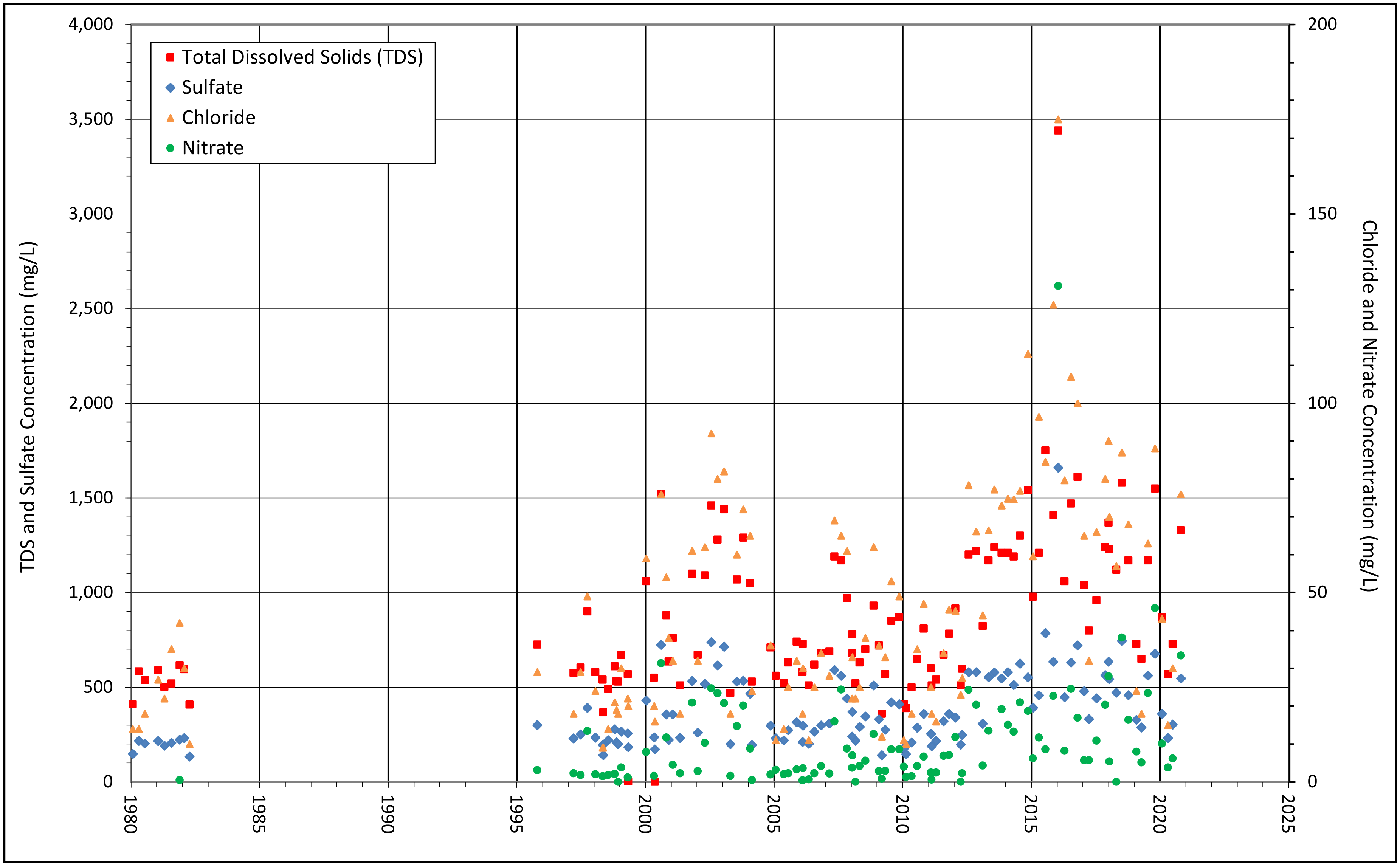


Figure 14. Concentrations of Selected Major Suface Water Quality Parameters in Santa Paula Creek Near Santa Paula, CYs 1980 through 2020

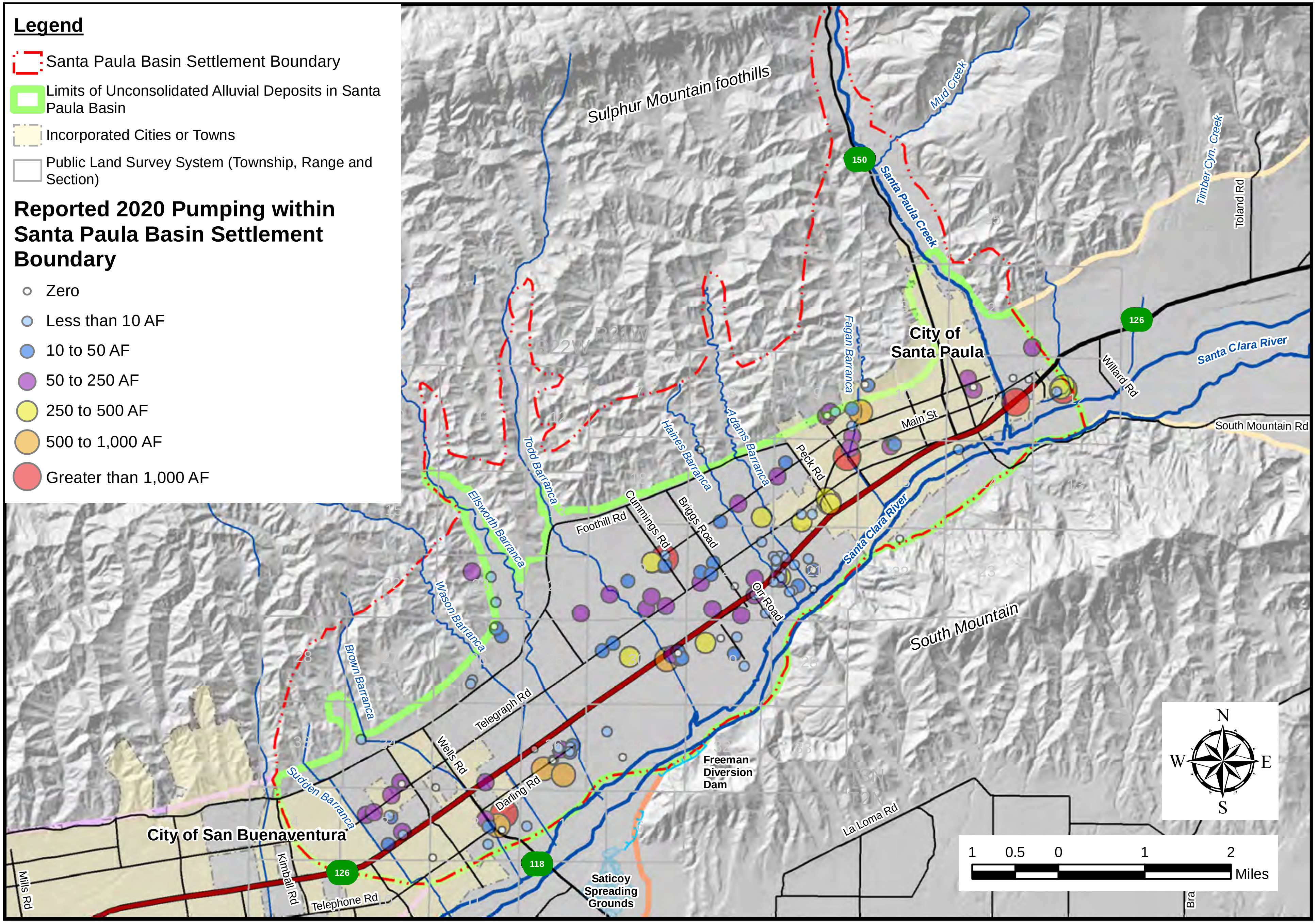


Figure 15. Santa Paula Basin Groundwater Extractions by Well, CY 2020

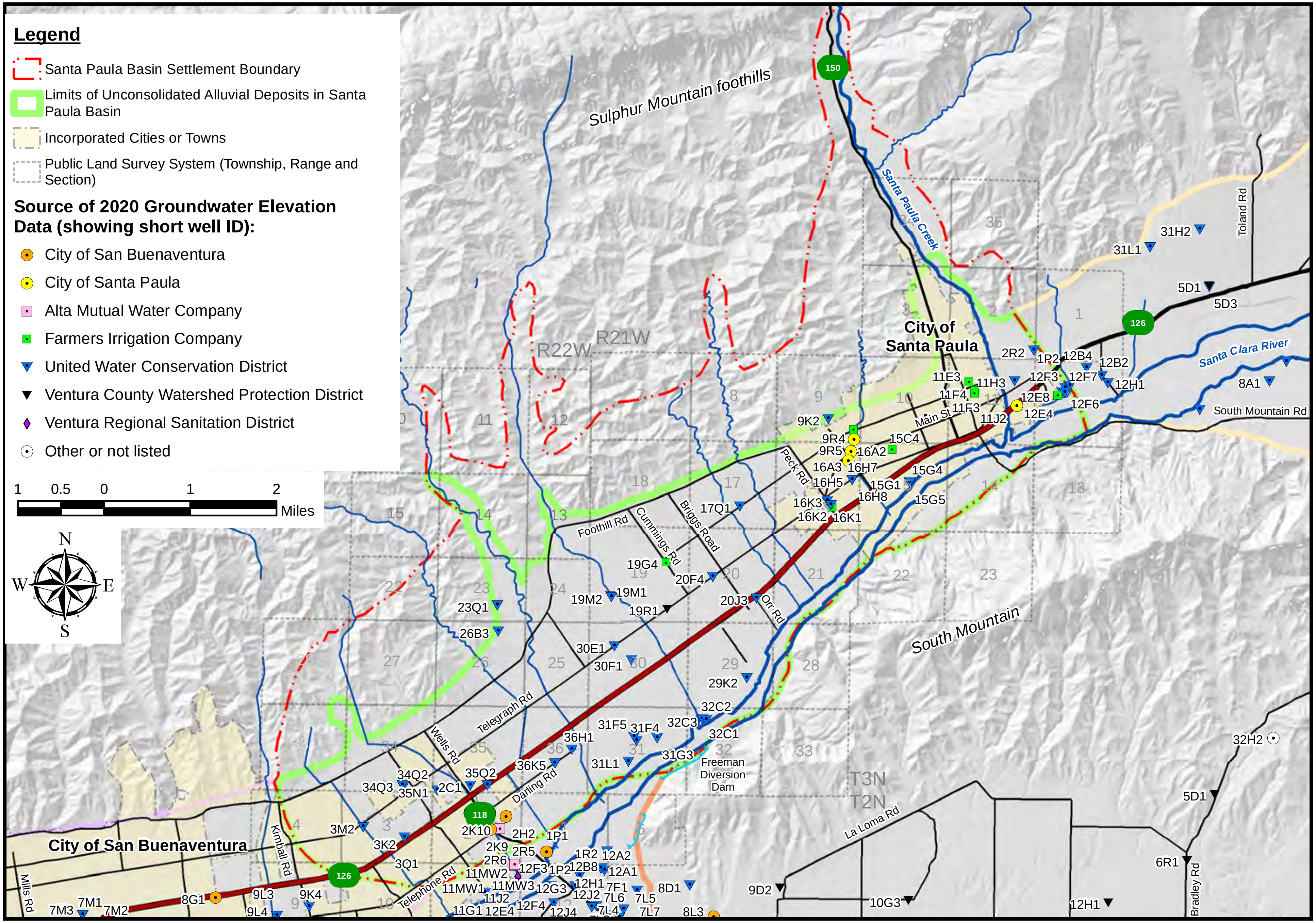


Figure 16. Locations of Wells used to Monitor Groundwater Levels in and Adjacent to Santa Paula Basin, CY 2020

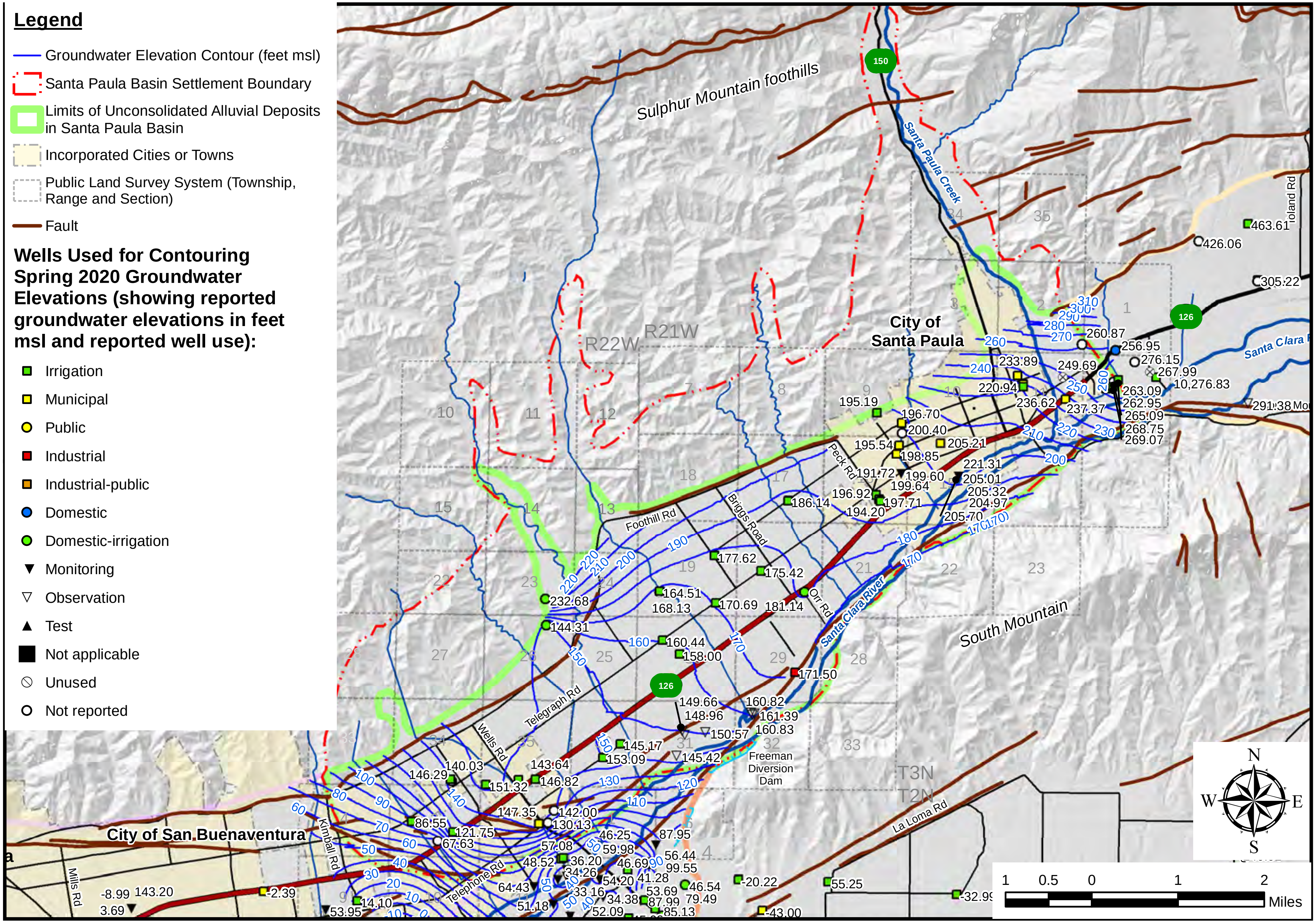


Figure 17. Santa Paula Basin Groundwater Elevation Contours, Spring 2020

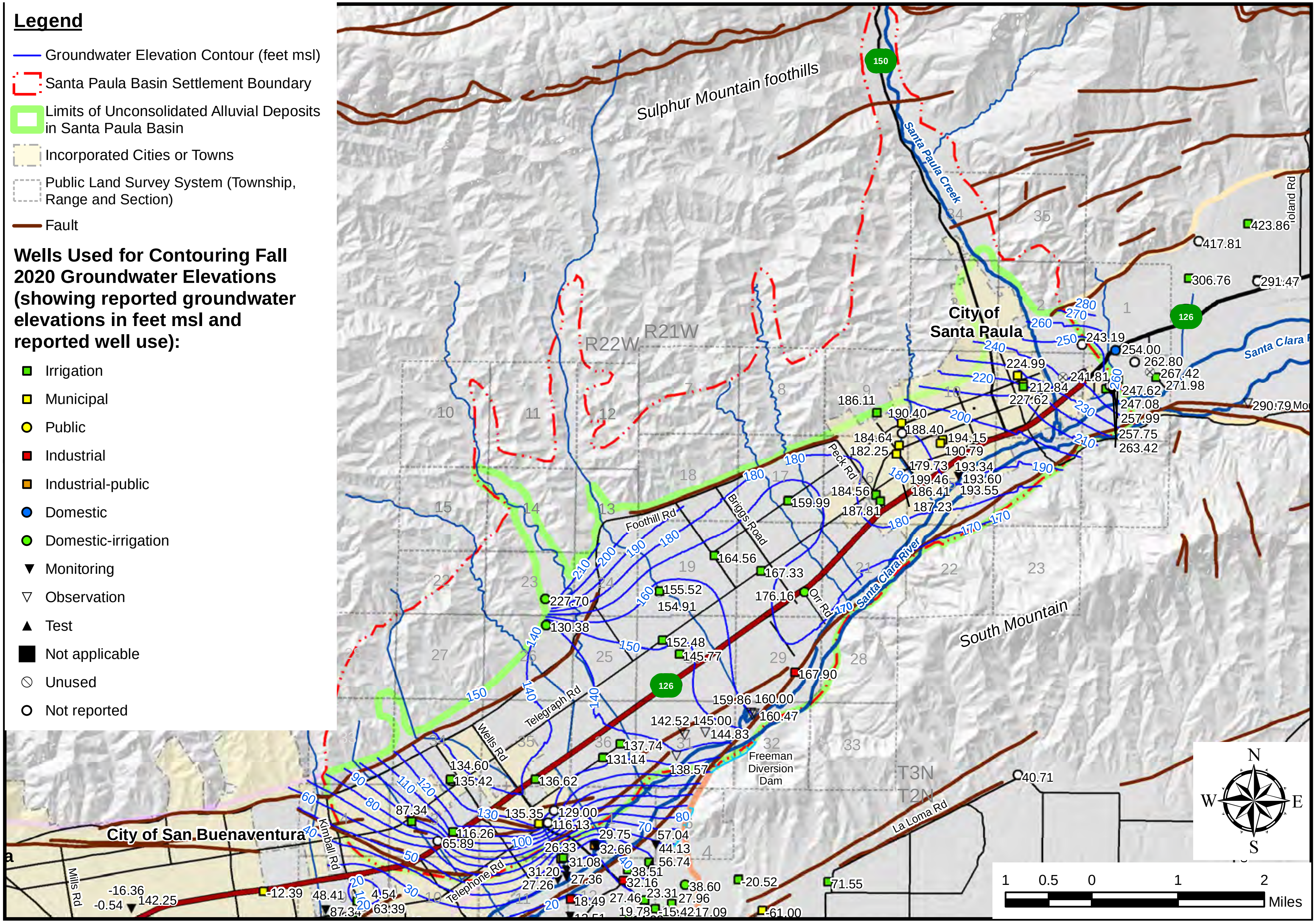


Figure 18. Santa Paula Basin Groundwater Elevation Contours, Fall 2020

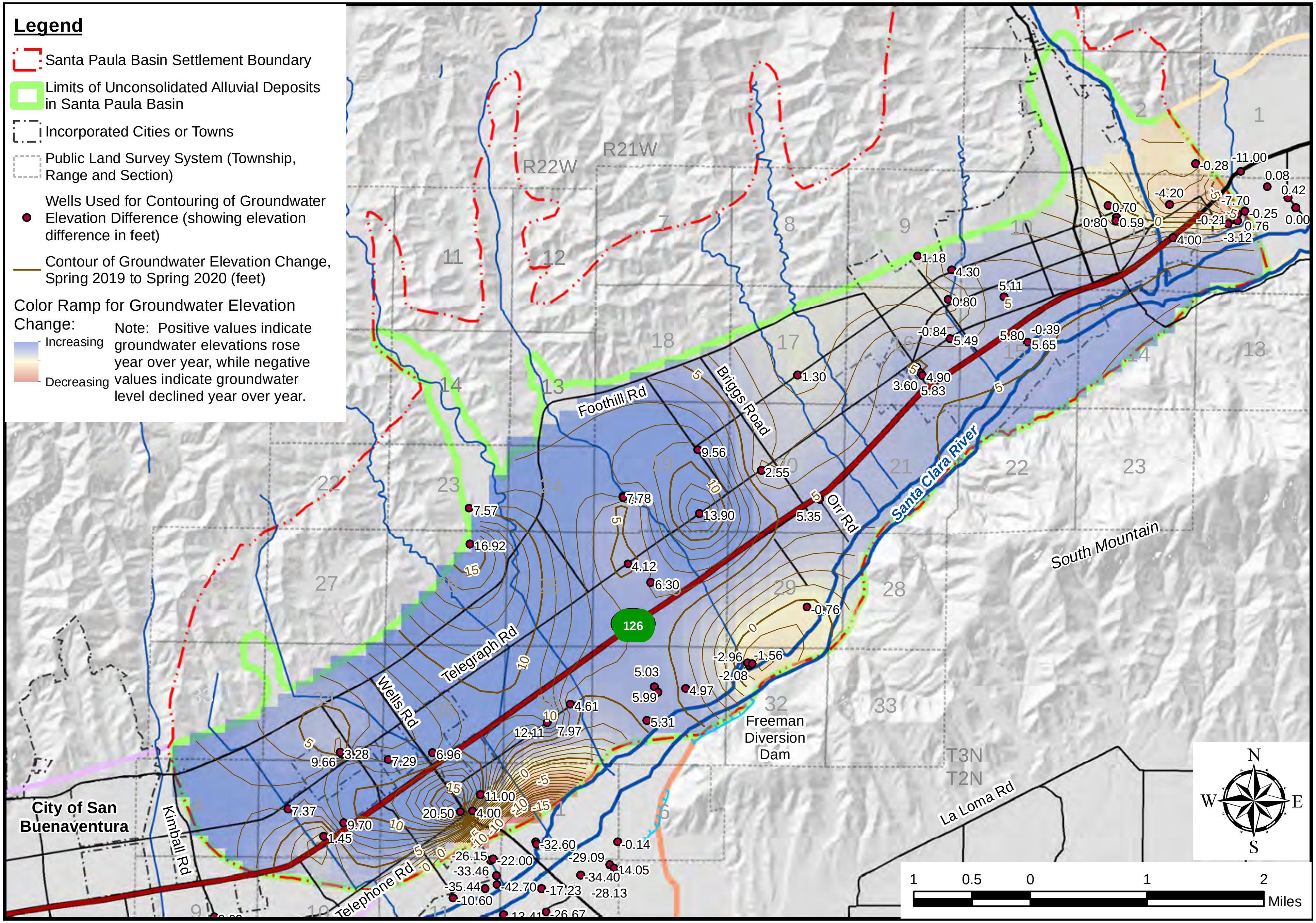


Figure 19. Change in Groundwater Elevation in Unconsolidated Alluvial Deposits of Santa Paula Basin, Spring 2019 to Spring 2020

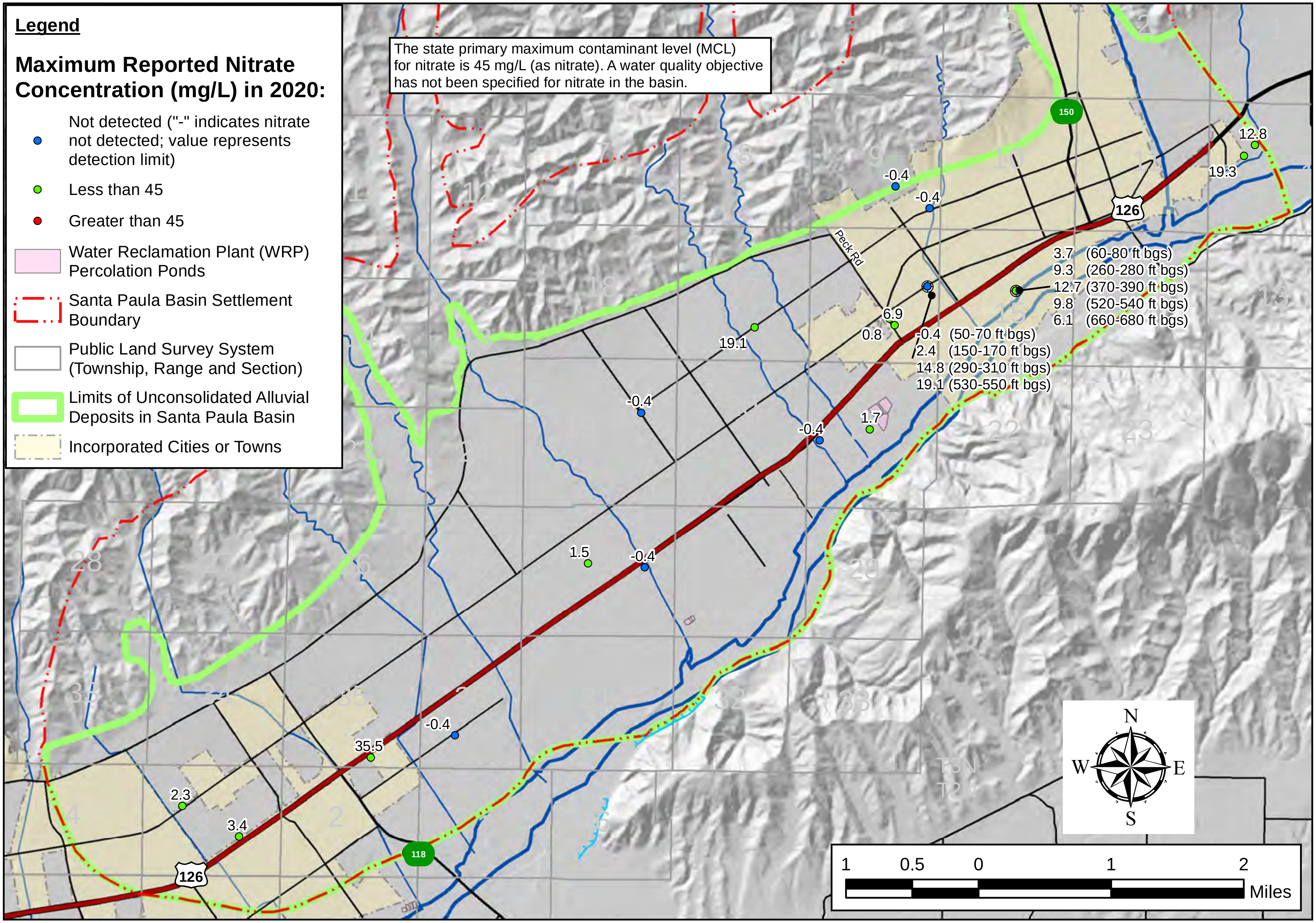


Figure 20. Maximum Reported Nitrate Concentrations in Groundwater, CY 2020

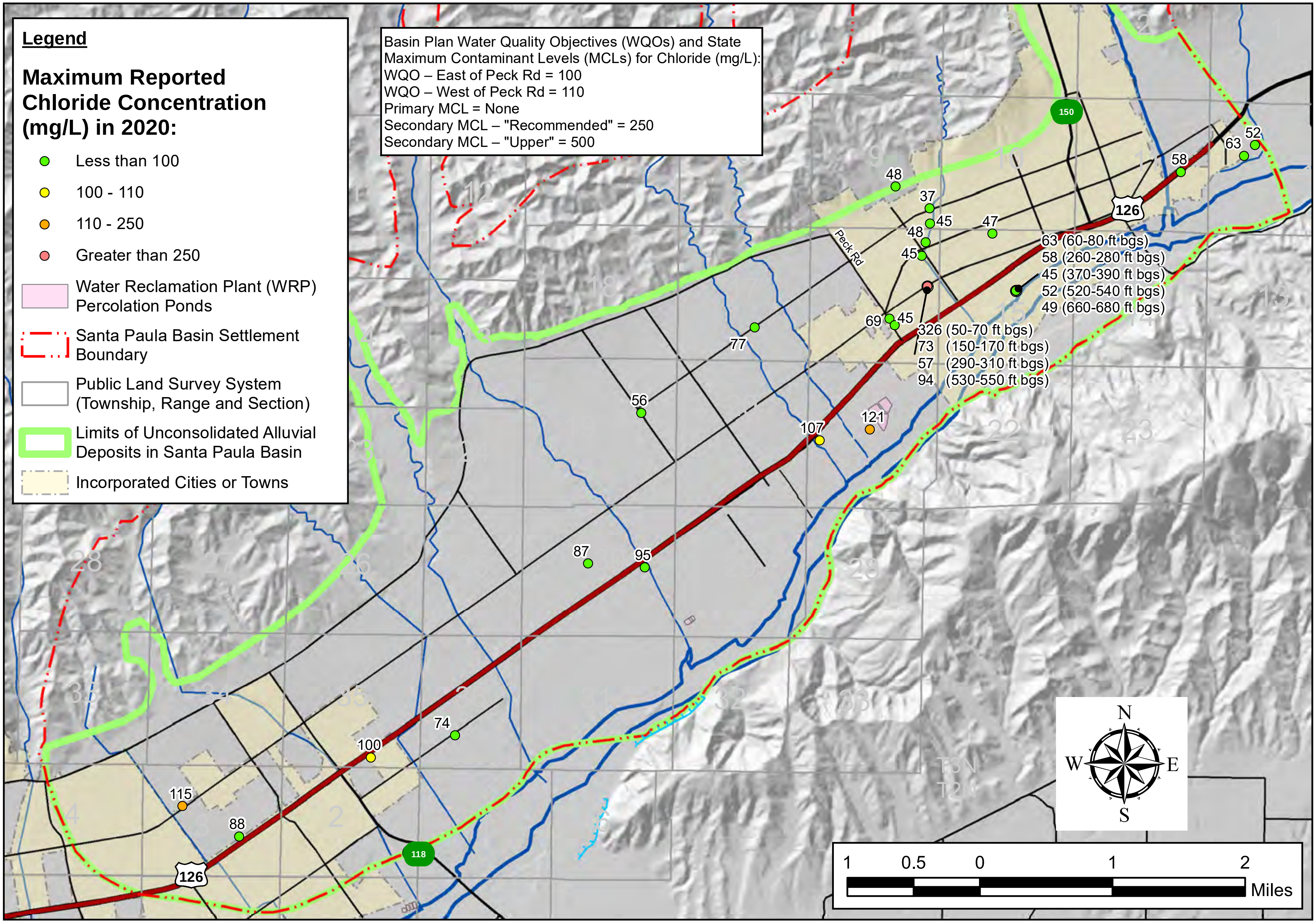


Figure 21. Maximum Reported Chloride Concentrations in Groundwater, CY 2020

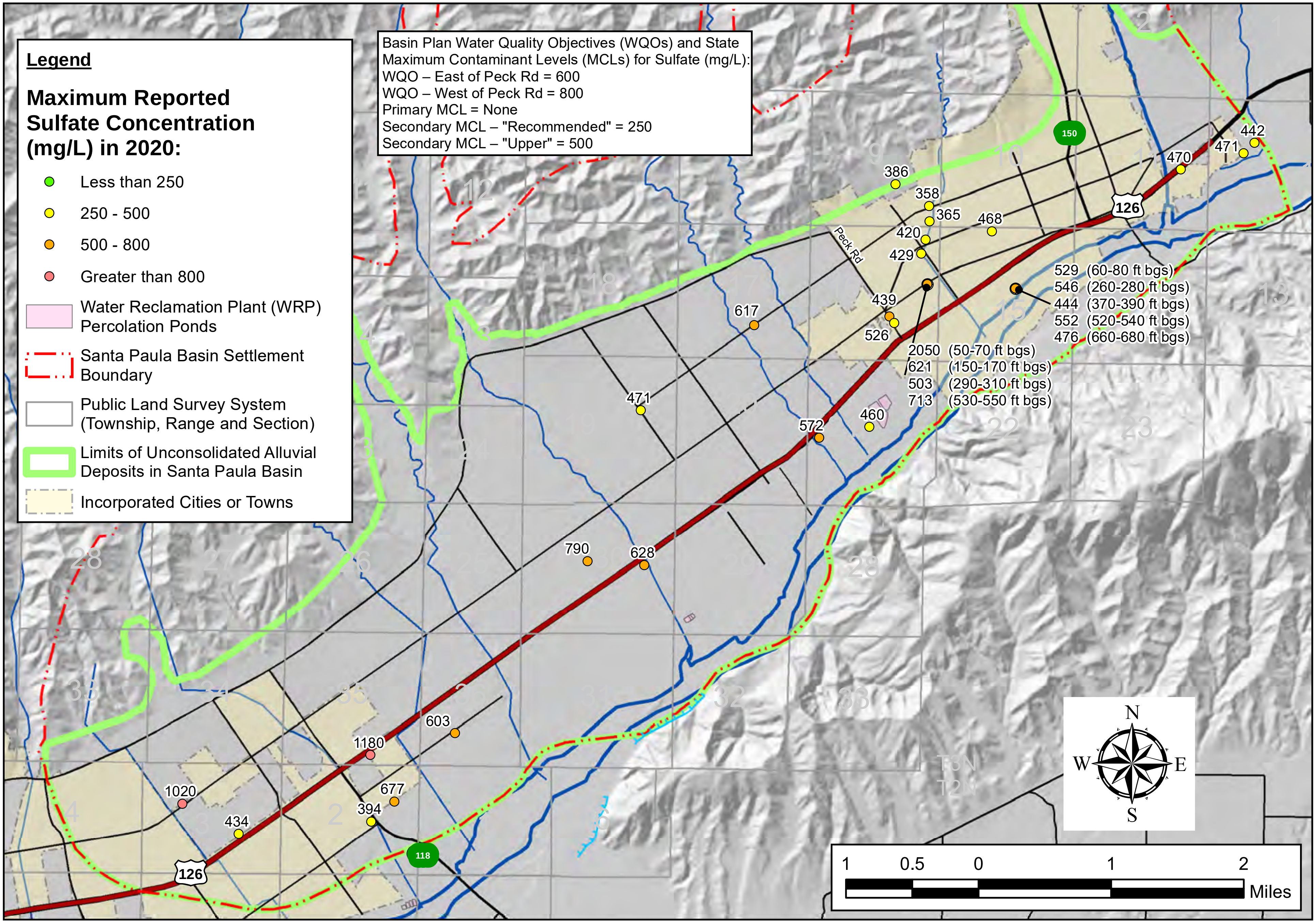


Figure 22. Maximum Reported Sulfate Concentrations in Groundwater, CY 2020

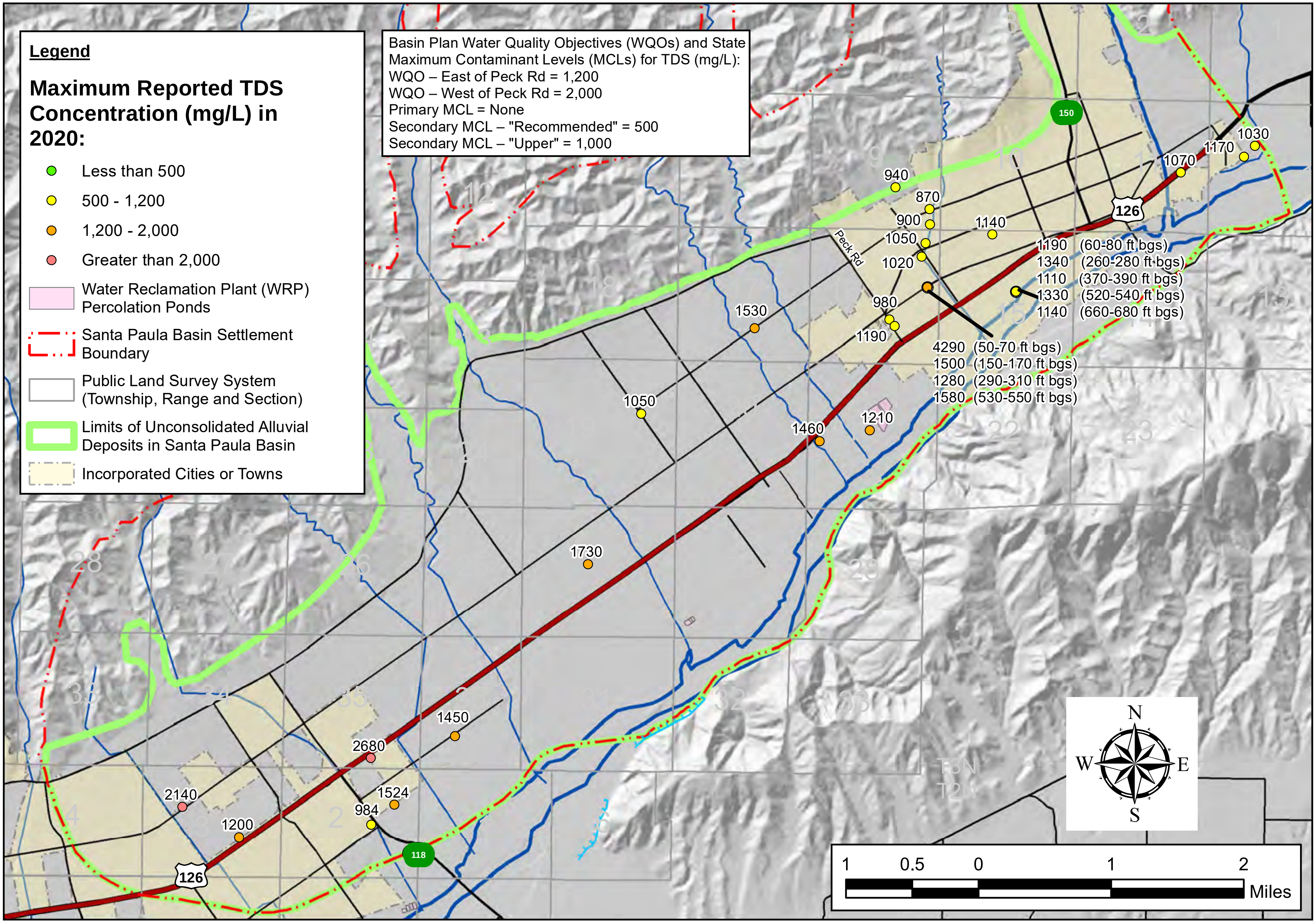


Figure 23. Maximum Reported Total Dissolved Solids (TDS) Concentrations in Groundwater, CY 2020

This page intentionally blank.

APPENDIX A - Historical Precipitation and Streamflow Tables

This page intentionally blank.

APPENDIX A - Table A-1. Santa Paula - UWCD Historical Precipitation

WATER YEAR (WY)	MONTHLY PRECIPITATION (inches)												WATER YEAR PRECIPITATION (inches)	WY CUMULATIVE DEPARTURE (inches)	CALENDAR YEAR PRECIPITATION (inches)
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP			
1890	6.30	1.81	16.55	5.40	2.00	0.47	0.05	0.00	0.00	0.00	0.00	0.62	33.20	16.05	11.46
1891	0.00	0.34	2.58	0.48	8.73	1.40	0.82	0.13	0.00	0.00	0.00	0.19	14.67	13.57	13.27
1892	0.00	0.00	1.52	0.70	3.99	3.24	0.54	1.80	0.00	0.00	0.00	0.00	11.79	8.21	24.31
1893	0.56	7.30	6.18	2.30	2.81	6.81	0.40	0.00	0.00	0.00	0.00	0.00	26.36	17.42	17.03
1894	0.87	0.20	3.64	1.04	0.55	0.42	0.23	0.46	0.00	0.10	0.00	0.98	8.49	8.75	5.05
1895	0.14	0.18	0.95	5.42	0.00	4.77	0.00	0.00	0.00	0.00	0.00	0.00	11.46	3.06	10.19
1896	0.00	0.00	0.00	5.03	4.98	3.24	0.00	0.00	0.00	0.00	0.00	0.45	13.70	-0.39	13.70
1897	0.00	0.00	0.00	5.03	4.98	3.24	0.00	0.00	0.00	0.00	0.00	0.45	13.70	-3.84	14.87
1898	1.17	0.00	0.00	0.92	0.70	1.55	0.00	1.22	0.00	0.00	0.00	0.86	6.42	-14.57	5.59
1899	0.08	0.00	0.26	3.44	0.00	2.41	0.35	0.00	0.00	0.00	0.00	0.00	6.54	-25.18	10.87
1900	1.84	1.17	1.66	1.67	0.00	1.36	0.38	1.49	0.00	0.00	0.00	0.00	9.57	-32.76	9.61
1901	0.00	4.71	0.00	4.57	4.34	0.42	0.91	1.14	0.00	0.00	0.00	0.71	16.80	-33.11	14.87
1902	2.24	0.54	0.00	1.30	4.49	3.31	0.50	0.00	0.00	0.00	0.00	0.00	12.38	-37.88	15.38
1903	0.00	4.75	1.03	1.66	1.98	6.23	2.65	0.10	0.00	0.00	0.00	0.00	18.40	-36.64	12.62
1904	0.00	0.00	0.00	0.31	3.83	5.94	1.46	0.00	0.00	0.00	0.00	1.82	13.36	-40.43	15.92
1905	0.38	0.00	2.18	2.54	8.02	5.50	0.67	3.15	0.00	0.00	0.00	0.00	22.44	-35.14	21.38
1906	0.00	1.50	0.00	3.35	3.60	9.03	0.40	0.05	0.00	0.00	0.00	0.00	17.93	-34.36	22.68
1907	0.00	0.00	6.25	13.23	1.95	6.22	0.18	0.00	0.00	0.00	0.00	0.00	27.83	-23.68	24.88
1908	2.72	0.00	0.58	5.73	4.56	0.05	0.94	0.00	0.00	0.00	0.00	0.55	15.13	-25.70	15.48
1909	0.15	2.40	1.10	10.88	5.94	4.88	0.00	0.00	0.00	0.00	0.00	0.00	25.35	-17.50	30.46
1910	0.13	1.36	7.27	2.82	0.00	2.36	0.00	0.00	0.00	0.00	0.00	2.78	16.72	-17.93	9.23
1911	0.62	0.33	0.32	9.54	2.88	5.53	0.00	0.00	0.00	0.00	0.00	0.07	19.29	-15.79	19.23
1912	0.00	0.00	1.21	0.18	0.00	7.17	1.67	0.84	0.00	0.00	0.00	0.00	11.07	-21.88	10.53
1913	0.56	0.11	0.00	3.79	9.51	0.00	0.47	0.00	0.47	0.00	0.50	0.00	15.41	-23.62	20.16
1914	0.00	3.09	2.33	12.73	8.40	0.66	0.76	0.51	0.00	0.00	0.00	0.00	28.48	-12.29	27.67
1915	0.15	0.13	4.33	5.38	9.30	0.98	1.16	1.69	0.00	0.00	0.00	0.00	23.12	-6.32	21.79
1916	0.00	0.68	2.60	18.17	1.07	0.53	0.00	0.00	0.00	0.00	0.00	1.44	24.49	1.02	30.00
1917	2.36	0.00	6.43	3.24	7.24	0.12	0.37	0.19	0.00	0.00	0.00	0.00	19.95	3.82	11.46
1918	0.00	0.30	0.00	0.26	13.00	6.28	0.00	0.00	0.00	0.26	0.00	1.78	21.88	8.55	25.76
1919	0.00	3.01	1.17	1.33	1.89	2.65	0.00	0.22	0.00	0.00	0.00	1.71	11.98	3.38	10.43
1920	0.33	0.12	2.18	0.41	2.93	5.74	0.82	0.00	0.00	0.00	0.00	0.00	12.53	-1.24	13.39
1921	0.30	1.86	1.33	6.60	1.02	1.99	0.23	3.95	0.00	0.00	0.00	0.17	17.45	-0.95	24.96
1922	0.34	0.00	10.66	4.55	3.43	1.49	0.00	0.46	0.00	0.00	0.00	0.00	20.93	2.83	19.00
1923	0.43	1.63	7.01	1.86	1.03	0.00	2.97	0.00	0.00	0.00	0.00	0.14	15.07	0.75	6.76
1924	0.72	0.00	0.04	1.94	0.18	3.46	1.23	0.00	0.00	0.00	0.00	0.00	7.57	-8.83	10.03
1925	1.02	1.12	1.08	0.31	1.25	2.25	2.02	0.88	0.08	0.00	0.00	0.00	10.01	-15.97	10.72
1926	0.81	0.89	2.23	2.04	4.42	0.12	5.72	0.16	0.02	0.00	0.00	0.00	16.41	-16.71	19.38
1927	0.13	5.49	1.28	1.89	10.66	2.34	1.53	0.00	0.00	0.00	0.00	0.00	23.32	-10.54	22.17
1928	1.84	1.27	2.64	0.00	2.27	2.25	0.29	0.59	0.00	0.00	0.00	0.00	11.15	-16.54	10.79
1929	0.06	2.04	3.29	2.47	2.10	1.51	1.89	0.00	0.12	0.00	0.00	0.69	14.17	-19.52	8.78
1930	0.00	0.00	0.00	6.58	0.92	3.14	0.17	0.76	0.00	0.00	0.00	0.02	11.59	-25.09	14.29
1931	0.02	2.68	0.00	3.94	4.09	0.00	2.00	1.25	0.00	0.00	0.21	0.00	14.19	-28.05	25.40
1932	0.05	3.13	10.73	5.78	0.09	0.54	0.02	0.05	0.00	0.00	0.00	0.15	20.54	-24.66	7.77
1933	0.24	0.00	0.90	8.84	0.00	0.23	0.32	0.13	0.40	0.00	0.09	0.00	11.15	-30.66	17.31
1934	0.44	0.00	6.86	3.19	3.85	0.00	0.00	0.00	0.00	0.52	0.00	0.08	14.94	-32.87	17.18
1935	1.62	3.16	4.76	3.97	0.82	3.31	3.50	0.00	0.00	0.00	0.25	0.00	21.39	-28.63	15.08
1936	0.37	1.12	1.74	0.17	10.32	1.91	0.69	0.00	0.00	0.00	0.00	0.00	16.32	-29.46	23.60
1937	4.16	0.00	6.35	3.24	7.93	4.48	0.12	0.21	0.00	0.00	0.00	0.00	26.49	-20.12	20.90
1938	0.00	0.00	4.92	0.87	9.49	11.17	1.23	0.09	0.00	0.00	0.00	0.25	28.02	-9.25	30.09
1939	0.00	0.00	6.99	2.95	1.33	2.29	0.53	0.00	0.00	0.00	0.00	1.59	15.68	-10.73	10.22
1940	0.00	0.31	1.22	3.57	5.24	0.73	2.22	0.00	0.00	0.00	0.00	0.00	13.29	-14.59	21.02
1941	1.80	0.15	7.31	5.97	10.52	8.70	3.66	0.00	0.00	0.00	0.00	0.00	38.11	6.37	36.80
1942	1.01	0.44	6.50	0.47	0.54	1.91	3.32	0.00	0.00	0.00	0.00	0.00	14.19	3.41	8.50
1943	1.07	0.19	1.00	16.53	2.96	6.42	0.81	0.00	0.00	0.00	0.00	0.00	28.98	15.24	34.96
1944	0.14	0.20	7.90	1.44	10.02	3.49	1.18	0.00	0.00	0.00	0.00	0.00	24.37	22.46	20.28
1945	0.00	3.13	1.02	0.02	5.69	5.27	0.00	0.00	0.00	0.00	0.00	0.00	15.13	20.44	16.79
1946	1.00	0.26	4.55	0.25	1.45	3.59	0.22	0.00	0.00	0.00	0.00	0.00	11.32	14.61	16.83

APPENDIX A - Table A-1. Santa Paula - UWCD Historical Precipitation

WATER YEAR (WY)	MONTHLY PRECIPITATION (inches)												WATER YEAR PRECIPITATION (inches)	WY CUMULATIVE DEPARTURE (inches)	CALENDAR YEAR PRECIPITATION (inches)
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP			
1947	0.45	7.21	3.66	0.46	0.29	0.62	0.08	0.06	0.03	0.00	0.43	0.00	13.29	10.75	3.30
1948	0.05	0.00	1.28	0.00	1.22	3.83	1.79	0.06	0.04	0.00	0.00	0.00	8.27	1.86	10.18
1949	0.00	0.00	3.24	2.39	1.43	1.54	0.07	1.06	0.06	0.00	0.00	0.00	9.79	-5.50	12.06
1950	0.00	1.18	4.33	3.17	2.59	0.93	1.11	0.00	0.00	0.02	0.00	0.24	13.57	-9.08	9.61
1951	0.45	0.94	0.16	2.53	1.32	0.86	1.89	0.00	0.00	0.00	0.00	0.00	8.15	-18.08	14.92
1952	0.88	2.47	4.97	12.29	0.10	9.52	1.68	0.00	0.00	0.00	0.00	0.00	31.91	-3.32	31.27
1953	0.00	3.38	4.30	1.33	0.00	0.55	1.26	0.00	0.00	0.00	0.00	0.00	10.82	-9.65	5.34
1954	0.00	2.13	0.07	4.85	3.38	3.56	0.38	0.00	0.00	0.00	0.00	0.00	14.37	-12.43	14.21
1955	0.00	0.93	1.11	5.25	1.56	0.33	2.24	1.94	0.00	0.00	0.02	0.00	13.38	-16.20	15.84
1956	0.00	1.38	3.12	6.98	0.72	0.00	2.18	0.95	0.00	0.00	0.00	0.00	15.33	-18.02	11.09
1957	0.01	0.00	0.25	5.75	1.88	2.07	1.17	0.62	0.16	0.00	0.00	0.00	11.91	-23.27	19.05
1958	2.48	0.53	4.39	2.82	7.27	8.14	5.48	0.00	0.00	0.00	0.00	0.26	31.37	-9.05	24.09
1959	0.05	0.07	0.00	2.07	3.91	0.00	0.55	0.00	0.00	0.00	0.00	0.02	6.67	-19.53	8.03
1960	0.09	0.00	1.39	3.95	2.80	0.50	2.70	0.00	0.00	0.00	0.00	0.00	11.43	-25.25	14.75
1961	0.00	4.27	0.53	1.24	0.00	0.49	0.02	0.00	0.00	0.00	0.03	0.04	6.62	-35.78	6.45
1962	0.00	3.57	1.06	2.46	17.26	1.27	0.00	0.07	0.01	0.00	0.00	0.00	25.70	-27.23	21.42
1963	0.31	0.00	0.04	0.69	8.04	0.00	2.47	0.11	0.49	0.00	0.17	1.37	13.69	-30.69	17.18
1964	0.46	3.30	0.08	2.68	0.00	2.00	0.76	0.02	0.11	0.00	0.01	0.00	9.42	-38.42	12.09
1965	0.66	1.30	4.55	0.54	0.07	1.08	4.94	0.00	0.01	0.02	0.11	0.18	13.46	-42.11	21.51
1966	0.00	9.60	4.96	1.52	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.09	17.24	-42.03	12.76
1967	0.20	3.62	6.26	4.58	0.24	2.24	5.02	0.04	0.00	0.00	0.00	0.32	22.52	-36.66	20.04
1968	0.00	6.39	1.21	0.99	1.24	3.47	0.90	0.03	0.00	0.00	0.19	0.00	14.42	-39.39	9.78
1969	0.80	0.68	1.48	17.95	7.75	0.85	0.96	0.01	0.00	0.09	0.00	0.01	30.58	-25.96	29.49
1970	0.00	1.79	0.08	2.34	3.70	6.04	0.00	0.00	0.00	0.00	0.00	0.00	13.95	-29.16	26.49
1971	0.02	7.09	7.30	1.01	0.71	0.69	0.59	0.51	0.00	0.00	0.00	0.01	17.93	-28.38	12.09
1972	0.11	0.43	8.03	0.12	0.26	0.00	0.08	0.04	0.04	0.00	0.00	0.00	9.11	-36.42	6.35
1973	0.31	4.57	0.93	5.89	9.00	2.61	0.00	0.01	0.00	0.00	0.00	0.00	23.32	-30.25	20.81
1974	0.24	1.95	1.11	9.52	0.06	2.93	0.07	0.00	0.00	0.00	0.00	0.00	15.88	-31.52	20.67
1975	1.03	0.10	6.96	0.00	3.86	4.59	1.46	0.00	0.00	0.00	0.00	0.06	18.06	-30.62	10.22
1976	0.18	0.00	0.07	0.00	5.33	1.39	0.72	0.02	0.10	0.01	0.00	4.05	11.87	-35.90	12.49
1977	0.00	0.22	0.65	6.74	0.21	2.04	0.00	2.03	0.00	0.00	0.99	0.00	12.88	-40.17	16.72
1978	0.03	0.15	4.53	8.11	8.54	11.57	2.25	0.00	0.00	0.00	0.00	0.90	36.08	-21.24	35.90
1979	0.18	2.03	2.32	6.37	3.97	7.17	0.00	0.02	0.02	0.00	0.00	0.09	22.17	-16.22	20.74
1980	0.46	0.83	1.81	8.32	12.95	3.82	0.41	0.23	0.00	0.00	0.00	0.02	28.85	-4.52	27.02
1981	0.00	0.00	1.27	2.26	1.58	6.07	0.68	0.02	0.00	0.00	0.00	0.00	11.88	-9.79	13.87
1982	0.50	2.20	0.56	2.55	0.58	5.66	1.93	0.00	0.00	0.00	0.00	0.86	14.84	-12.10	19.22
1983	0.53	4.53	2.58	9.52	5.35	6.76	4.27	0.10	0.00	0.00	0.97	1.02	35.63	6.38	38.31
1984	2.96	3.36	4.00	0.00	0.00	0.37	0.09	0.00	0.00	0.00	0.04	0.33	11.15	0.37	7.84
1985	0.22	2.86	3.93	1.84	1.06	1.18	0.00	0.01	0.00	0.02	0.00	0.04	11.16	-5.62	8.91
1986	0.43	3.62	0.71	3.60	8.72	4.59	1.21	0.00	0.00	0.00	0.00	0.65	23.53	0.76	20.74
1987	0.03	1.64	0.30	1.85	1.02	2.16	0.21	0.02	0.05	0.09	0.00	0.03	7.40	-8.99	12.73
1988	1.48	1.18	4.64	2.63	2.07	0.67	3.22	0.00	0.04	0.00	0.00	0.00	15.93	-10.21	13.98
1989	0	1.08	4.27	0.49	3.50	0.80	0.04	0.22	0.00	0.00	0.00	0.05	10.45	-16.91	5.90
1990	0.27	0.43	0.10	2.74	2.49	0.00	0.44	0.74	0.00	0.00	0.04	0.00	7.25	-26.81	7.03
1991	0.00	0.52	0.06	1.18	2.87	13.64	0.04	0.00	0.03	0.00	0.01	0.05	18.40	-25.56	22.49
1992	0.40	0.17	4.10	2.48	12.51	7.02	0.04	0.01	0.00	0.36	0.00	0.00	27.09	-15.62	29.10
1993	1.65	0.00	5.03	10.62	10.66	3.77	0.00	0.14	0.65	0.00	0.00	0.00	32.52	-0.26	28.59
1994	0.28	0.79	1.68	0.60	6.29	2.98	0.31	0.35	0.00	0.00	0.00	0.11	13.39	-4.02	13.85
1995	0.98	1.05	1.18	19.87	1.34	9.02	0.47	1.04	0.37	0.02	0.00	0.00	35.34	14.17	34.32
1996	0.00	0.15	2.04	1.04	7.85	2.04	0.50	0.28	0.00	0.00	0.00	0.00	13.90	10.92	23.11
1997	2.47	2.57	6.36	6.67	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.12	18.41	12.18	16.10
1998	0.00	2.31	6.78	2.79	20.13	3.87	2.03	6.04	0.01	0.00	0.00	0.81	44.77	39.80	37.13
1999	0.00	0.83	0.62	2.44	1.02	2.65	2.56	0.00	0.38	0.00	0.00	0.17	10.67	33.32	9.98
2000	0.00	0.76	0	1.92	6.76	2.56	2.61	0.00	0.00	0.00	0.00	0.15	14.76	30.93	15.48
2001	1.47	0.00	0.01	7.02	9.21	7.10	1.73	0.00	0.00	0.00	0.00	0.00	26.54	40.31	30.06
2002	0.27	3.21	1.52	1.02	0.38	0.37	0.07	0.09	0.00	0.00	0.00	0.05	6.98	30.14	10.48
2003	0.00	5.22	3.28	0.00	4.75	3.53	1.77	1.30	0.09	0.00	0.00	0.00	19.94	32.93	16.02

APPENDIX A - Table A-1. Santa Paula - UWCD Historical Precipitation

WATER YEAR (WY)	MONTHLY PRECIPITATION (inches)												WATER YEAR PRECIPITATION (inches)	WY CUMULATIVE DEPARTURE (inches)	CALENDAR YEAR PRECIPITATION (inches)
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP			
2004	0.00	2.73	1.85	0.64	6.78	0.49	0.33	0.00	0.00	0.00	0.00	0.00	12.82	28.60	18.63
2005	4.74	0.03	5.62	15.85	10.56	2.53	0.80	0.25	0.00	0.00	0.00	0.16	40.54	51.99	32.37
2006	1.00	0.70	0.52	3.41	3.58	4.00	3.87	1.17	0.00	0.00	0.00	0.00	18.25	53.09	17.29
2007	0.27	0.10	0.89	2.04	0.79	0.07	0.84	0.00	0.00	0.00	0.00	0.30	5.30	41.23	7.90
2008	0.26	0.15	3.45	10.78	1.85	0.00	0.05	0.04	0.00	0.00	0.00	0.00	16.58	40.66	17.43
2009	0.10	2.34	2.27	0.81	5.45	0.57	0.12	0.00	0.01	0.00	0.00	0.00	11.67	35.18	13.07
2010	2.66	0.00	3.45	7.29	3.51	0.41	1.87	0.13	0.00	0.01	0.00	0.00	19.33	37.36	26.01
2011	2.11	1.07	9.61	0.30	3.64	6.03	0.00	0.89	0.14	0.00	0.00	0.01	23.80	44.01	14.62
2012	1.58	1.87	0.16	1.35	0.03	2.93	2.20	0.00	0.00	0.00	0.05	0.01	10.18	37.04	10.22
2013	0.00	1.60	2.05	1.25	0.09	0.90	0.02	0.11	0.00	0.01	0.00	0.00	6.03	25.92	3.28
2014	0.02	0.56	0.32	0.00	3.32	1.83	0.03	0.03	0.00	0.00	0.01	0.00	6.12	14.89	9.83
2015	0.00	0.85	3.76	1.63	0.63	0.62	0.21	0.37	0.10	1.63	0.00	0.83	10.63	8.37	6.51
2016	0.04	0.02	0.43	5.43	0.45	2.93	0.22	0.11	0.00	0.00	0.00	0.00	9.63	0.84	14.06
2017	0.73	0.62	3.57	7.69	8.40	0.37	0.13	0.11	0.00	0.00	0.00	0.03	21.65	5.34	16.73
2018	0.00	0.00	0.00	2.24	0.06	6.48	0.01	0.05	0.00	0.00	0.00	0.00	8.84	-2.97	12.66
2019	0.24	2.14	1.44	8.35	6.26	2.57	0.02	1.21	0.00	0.00	0.00	0.00	22.23	2.11	26.02
2020	0.00	2.42	5.19	0.78	0.01	3.94	2.53	0.12	0.04	0.00	0.00	0.01	15.04	0.00	8.78
2021	0.00	0.11	1.24												
AVERAGE:	**0.57**	**1.45**	**2.74**	**3.91**	**3.85**	**2.94**	**1.01**	**0.34**	**0.03**	**0.02**	**0.03**	**0.24**	**17.15**	**---**	**16.97**
MEDIAN:	**0.18**	**0.79**	**1.68**	**2.53**	**2.81**	**2.25**	**0.50**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**14.94**	**---**	**15.48**

APPENDIX A - Table A-2. Santa Clara River at Freeman Diversion Historical Annual Streamflow

WATER YEAR	ACRE-FEET	WATER YEAR	ACRE-FEET	WATER YEAR	ACRE-FEET	WATER YEAR	ACRE-FEET
1956	30,140	**1973**	265,962	**1990**	10,787	**2007**	51,065
1957	18,668	**1974**	123,279	**1991**	117,639	**2008**	214,847
1958	352,671	**1975**	110,294	**1992**	333,441	**2009**	74,645
1959	55,462	**1976**	37,116	**1993**	963,059	**2010**	143,938
1960	14,557	**1977**	28,818	**1994**	131,823	**2011**	257,205
1961	6,209	**1978**	748,780	**1995**	908,663	**2012**	57,761
1962	272,542	**1979**	297,212	**1996**	125,982	**2013**	22,696
1963	28,495	**1980**	523,154	**1997**	166,052	**2014**	23,213
1964	15,345	**1981**	108,357	**1998**	788,007	**2015**	6,670
1965	23,696	**1982**	103,255	**1999**	119,559	**2016**	5,825
1966	207,602	**1983**	719,692	**2000**	130,933	**2017**	98,843
1967	205,577	**1984**	136,205	**2001**	251,235	**2018**	10,116
1968	54,656	**1985**	54,431	**2002**	58,072	**2019**	205,642
1969	982,425	**1986**	226,857	**2003**	93,844	**2020**	87,497
1970	129,540	**1987**	38,796	**2004**	59,397		
1971	130,717	**1988**	76,426	**2005**	1,153,883	**AVERAGE**	202,025
1972	58,807	**1989**	26,610	**2006**	246,950	**MEDIAN**	110,294

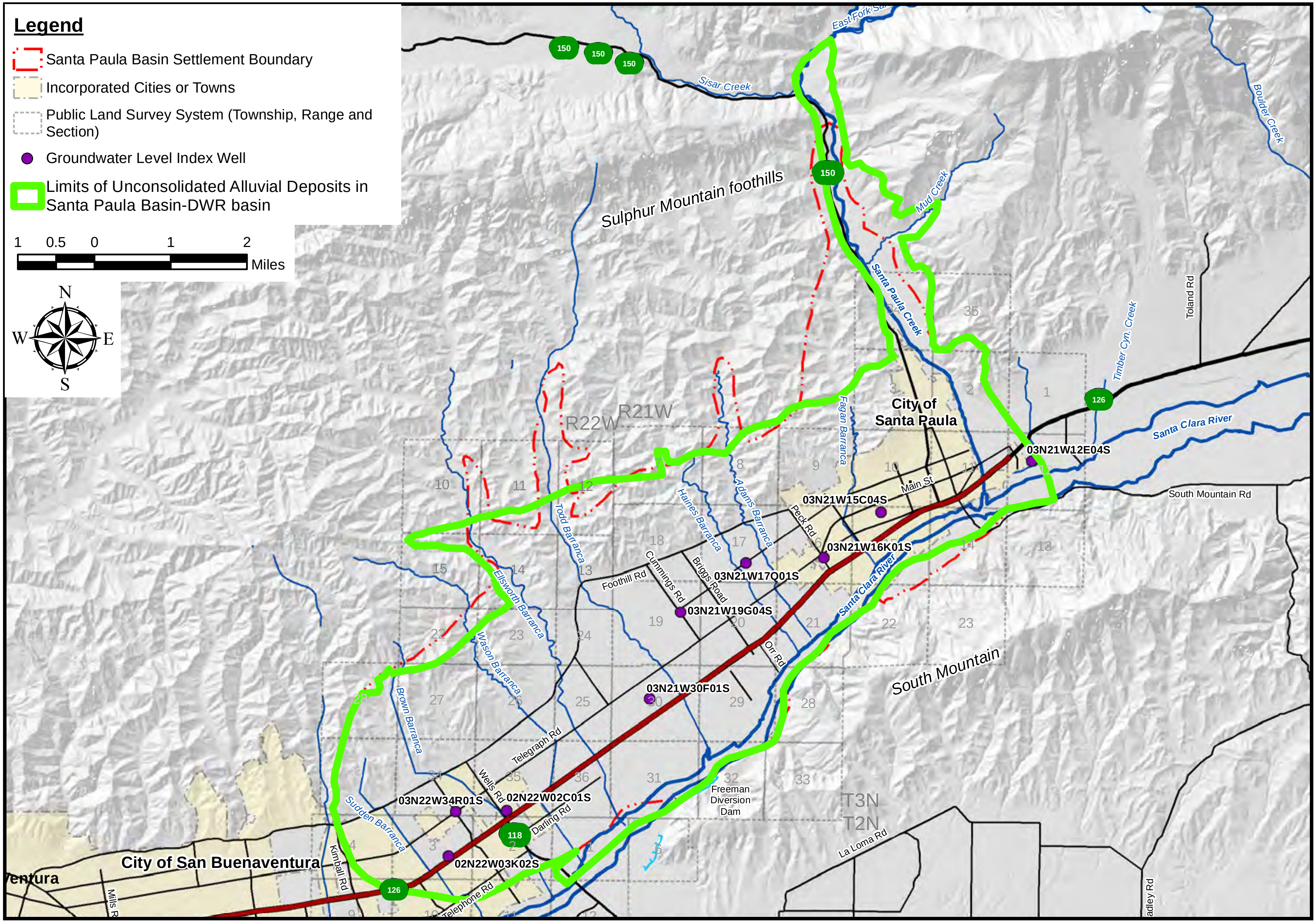
APPENDIX A - Table A-3. Santa Paula Creek Historical Annual Streamflow

WATER YEAR	ACRE-FEET	WATER YEAR	ACRE-FEET	WATER YEAR	ACRE-FEET	WATER YEAR	ACRE-FEET
1928	1,332	**1952**	30,882	**1976**	3,906	**2000**	8,609
1929	1,801	**1953**	4,340	**1977**	2,361	**2001**	24,461
1930	1,554	**1954**	5,861	**1978**	87,150	**2002**	2,513
1931	3,014	**1955**	3,012	**1979**	20,453	**2003**	8,563
1932	19,958	**1956**	5,257	**1980**	34,108	**2004**	5,054
1933	7,485	**1957**	3,527	**1981**	5,818	**2005**	107,309
1934	11,353	**1958**	47,074	**1982**	9,177	**2006**	22,708
1935	12,830	**1959**	5,593	**1983**	70,594	**2007**	3,305
1936	13,444	**1960**	2,123	**1984**	8,017	**2008**	27,945
1937	31,909	**1961**	1,254	**1985**	3,394	**2009**	4,393
1938	44,310	**1962**	26,203	**1986**	20,486	**2010**	16,342
1939	8,465	**1963**	3,340	**1987**	3,179	**2011**	32,887
1940	5,297	**1964**	3,026	**1988**	7,361	**2012**	4,465
1941	57,682	**1965**	4,665	**1989**	2,893	**2013**	1,168
1942	6,882	**1966**	28,458	**1990**	2,485	**2014**	1,788
1943	39,739	**1967**	37,423	**1991**	15,214	**2015**	1,028
1944	22,425	**1968**	7,866	**1992**	33,768	**2016**	1,502
1945	12,172	**1969**	112,696	**1993**	71,474	**2017**	15,226
1946	11,194	**1970**	7,779	**1994**	8,351	**2018**	4,063
1947	7,295	**1971**	12,795	**1995**	63,209	**2019**	22,518
1948	1,715	**1972**	4,492	**1996**	8,752	**2020**	9,758
1949	1,965	**1973**	35,236	**1997**	18,015		
1950	3,492	**1974**	11,552	**1998**	80,799	**AVERAGE**	17,811
1951	992	**1975**	11,506	**1999**	5,562	**MEDIAN**	8,351

This page intentionally blank.

APPENDIX B - Groundwater Elevation Hydrographs and Map of Index Well Locations

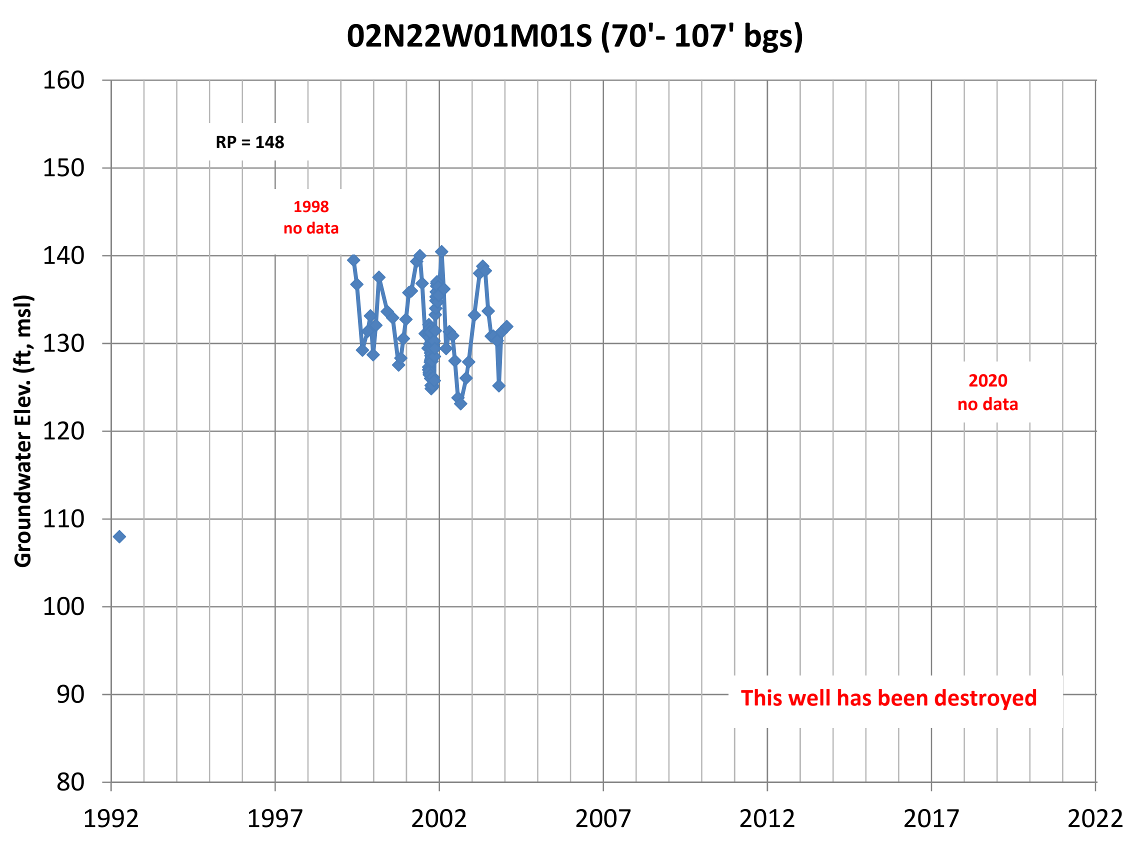
This page intentionally blank.

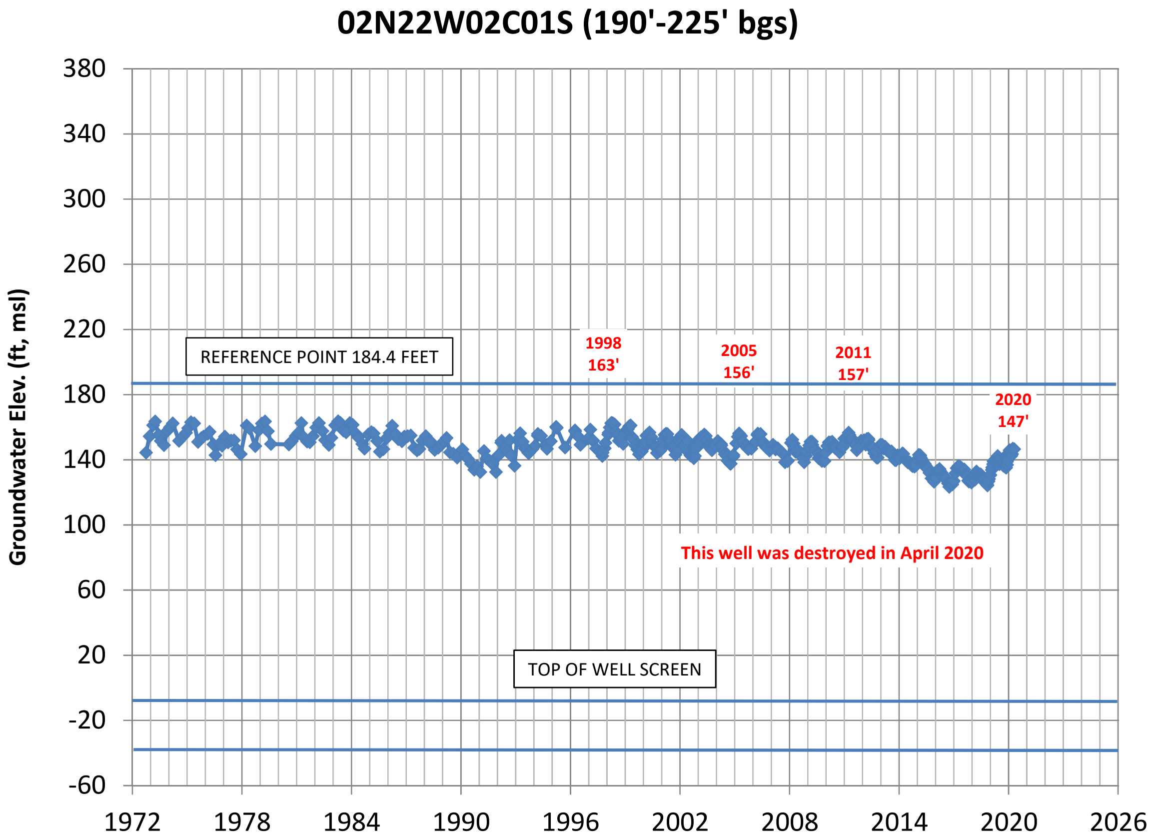


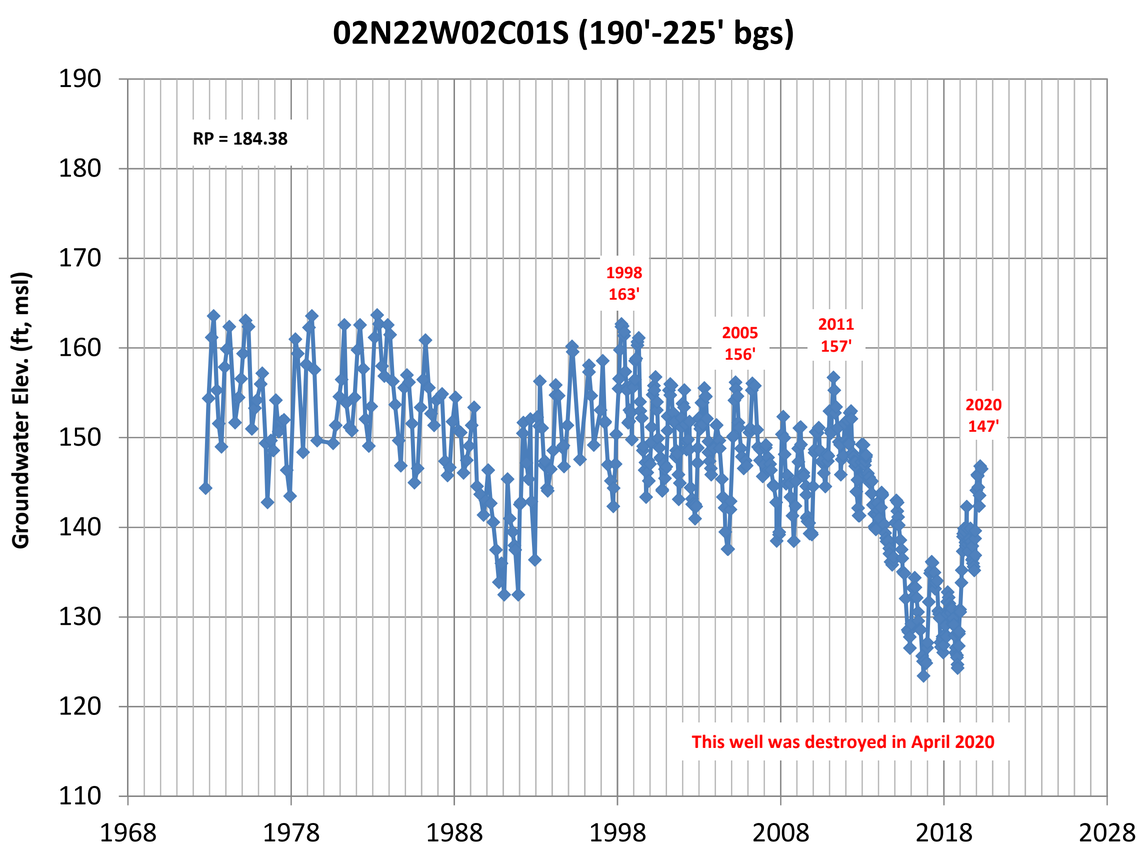
Location of Santa Paula Basin Groundwater Level Index Wells

This page intentionally blank.

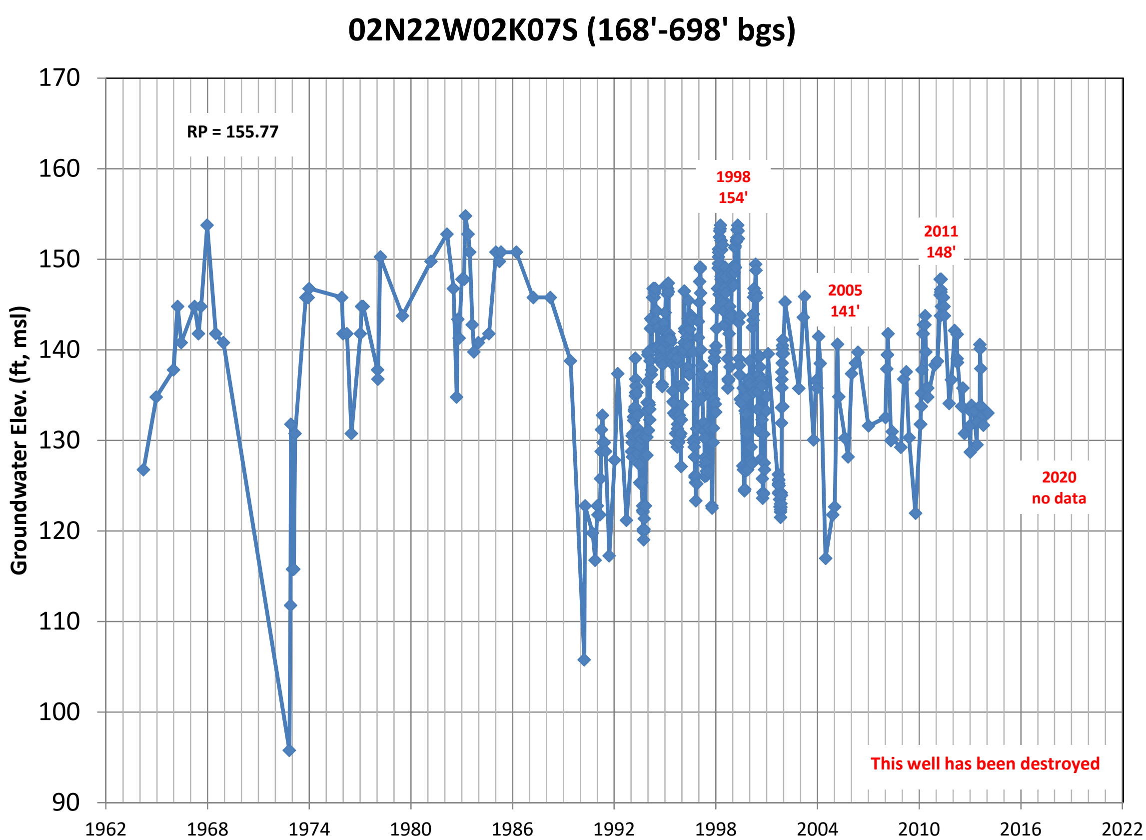
Intentionally Left Blank

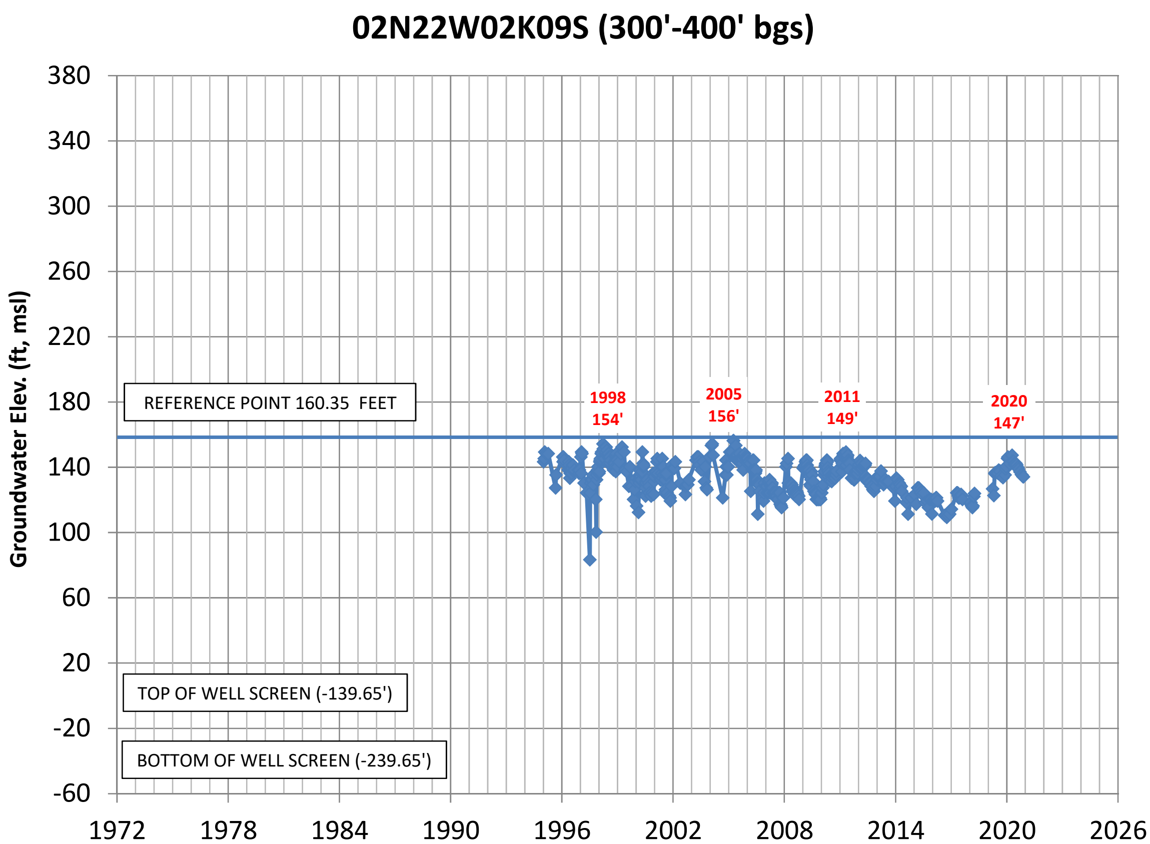



02N22W02C01S (190'-225' bgs)
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026
REFERENCE POINT 184.4 FEET
1998
163'
2005
156'
2011
157'
2020
147'
This well was destroyed in April 2020
TOP OF WELL SCREEN

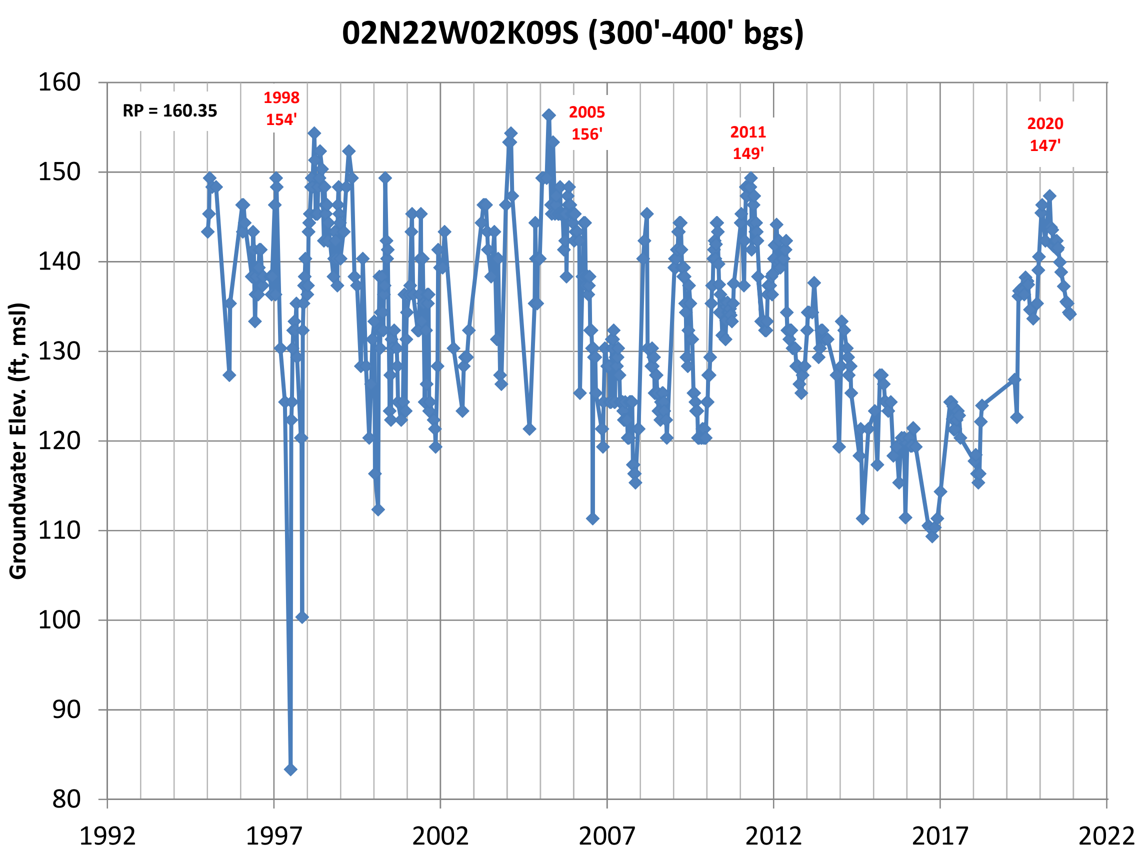

02N22W02C01S (190'-225' bgs)
Groundwater Elev. (ft, msl)
190
180
170
160
150
140
130
120
110
1968
1978
1988
1998
2008
2018
2028
RP = 184.38
1998
163'
2005
156'
2011
157'
2020
147'
This well was destroyed in April 2020

Intentionally Left Blank

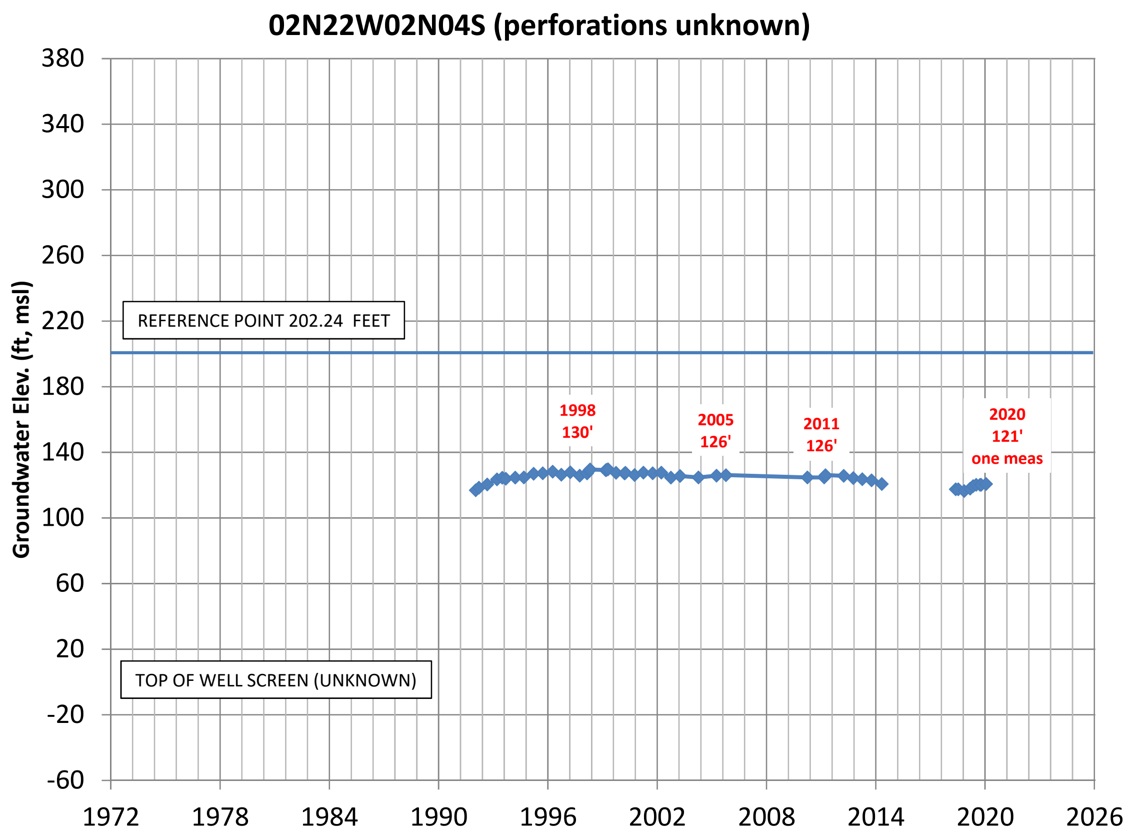


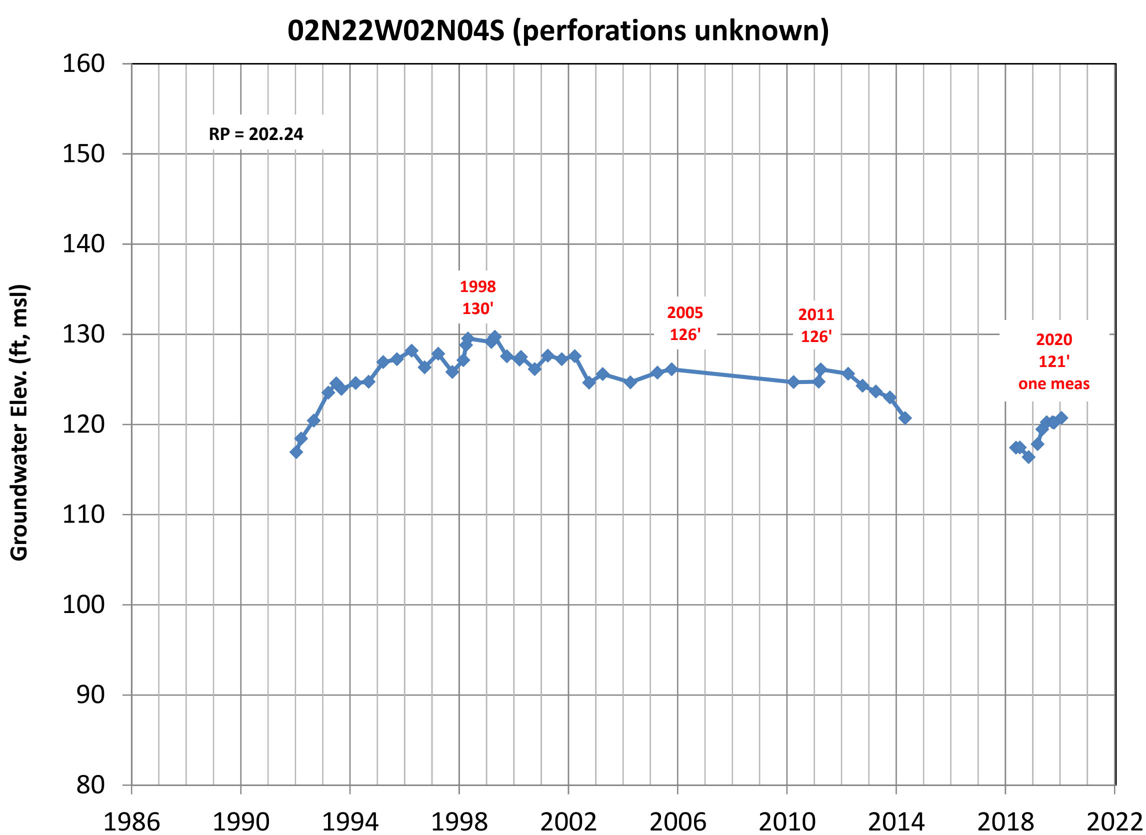


02N22W02K09S (300'-400' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 160.35 FEET
TOP OF WELL SCREEN (-139.65')
BOTTOM OF WELL SCREEN (-239.65')
1998
154'
2005
156'
2011
149'
2020
147'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

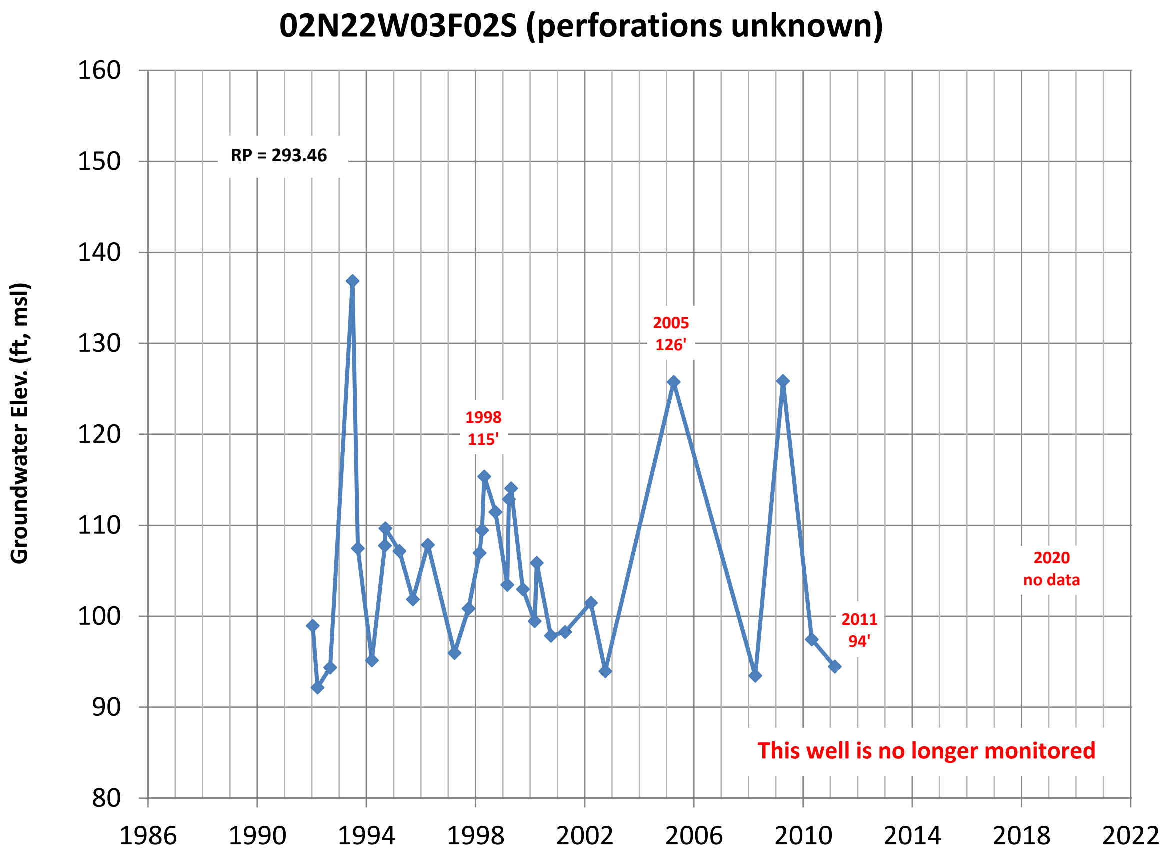


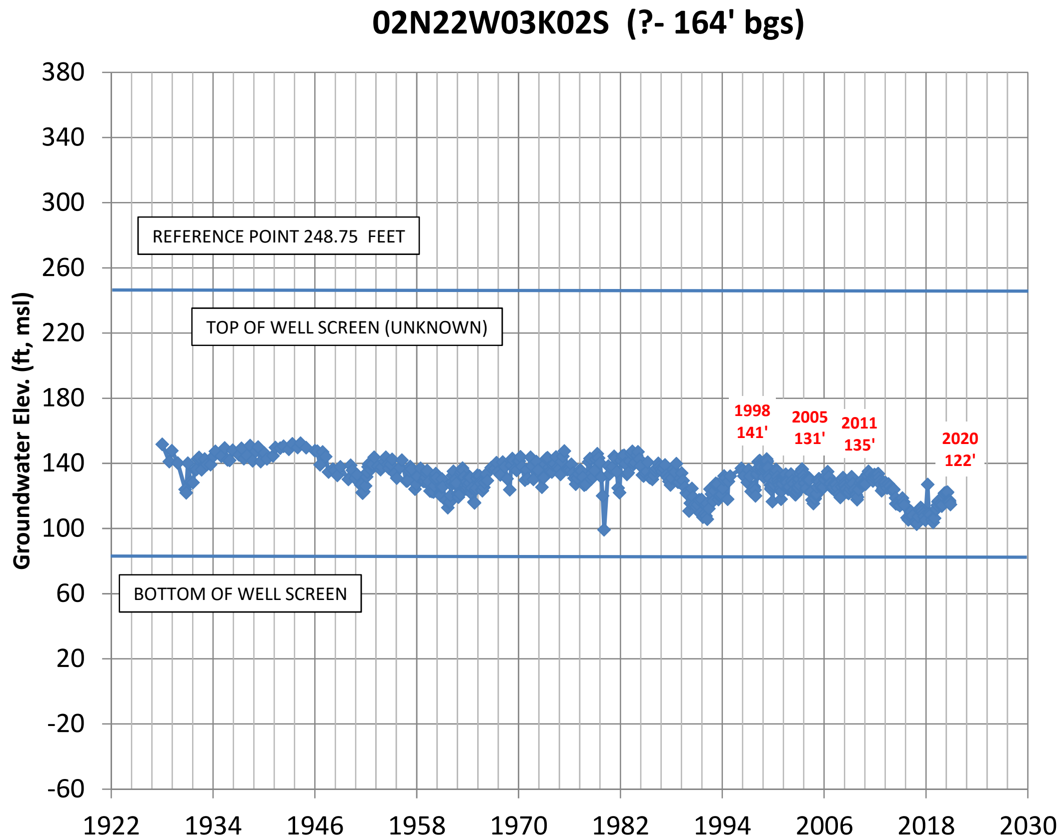
02N22W02K09S (300'-400' bgs)
Groundwater Elev. (ft, msl)
RP = 160.35
1998
154'
2005
156'
2011
149'
2020
147'
160
150
140
130
120
110
100
90
80
1992
1997
2002
2007
2012
2017
2022

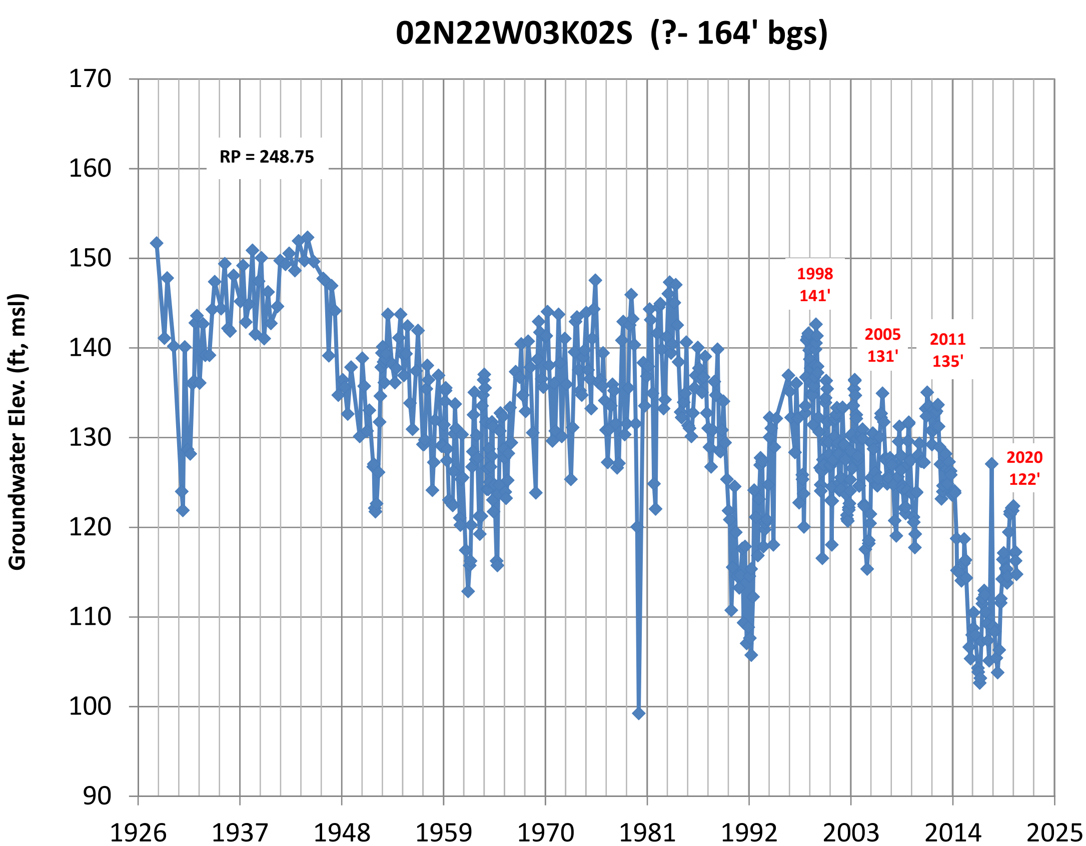

02N22W02N04S (perforations unknown)
Groundwater Elev. (ft, msl)
REFERENCE POINT 202.24 FEET
TOP OF WELL SCREEN (UNKNOWN)
1998
130'
2005
126'
2011
126'
2020
121'
one meas
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


02N22W02N04S (perforations unknown)
Groundwater Elev. (ft, msl)
RP = 202.24
1998
130'
2005
126'
2011
126'
2020
121'
one meas
160
150
140
130
120
110
100
90
80
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022

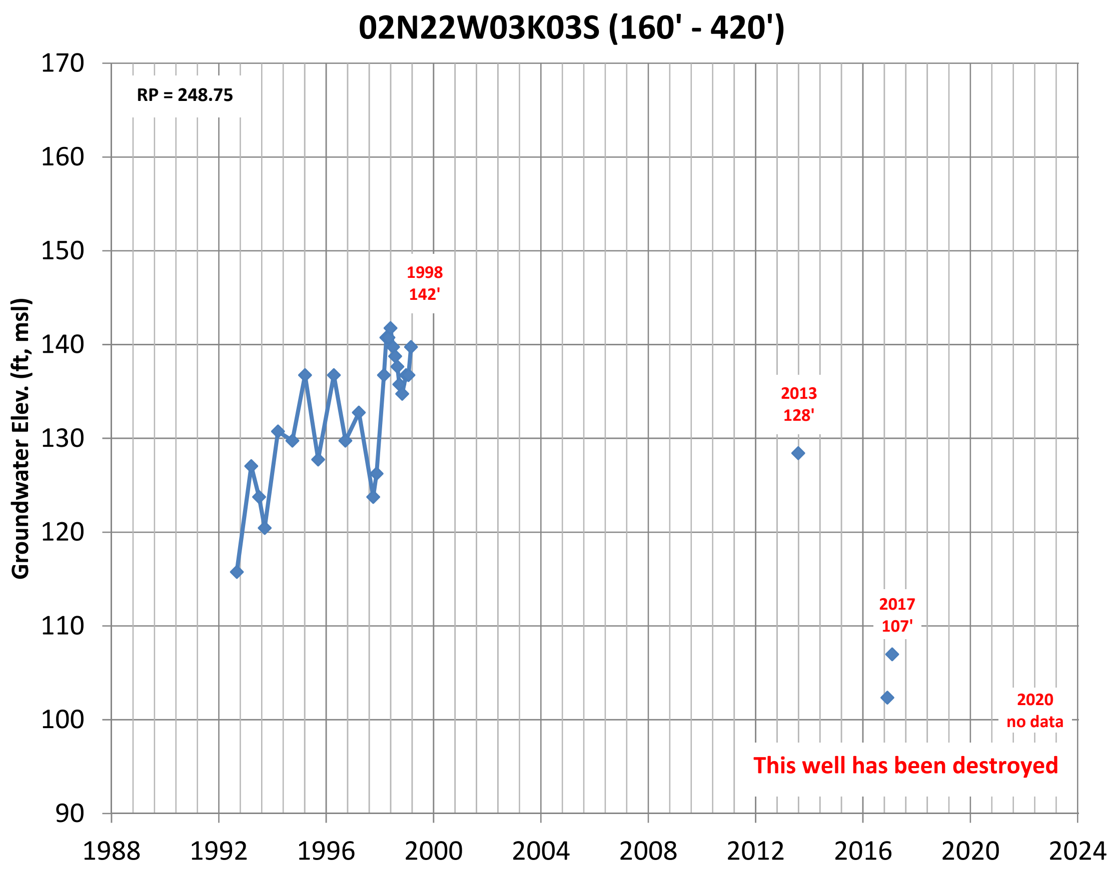
Intentionally Left Blank

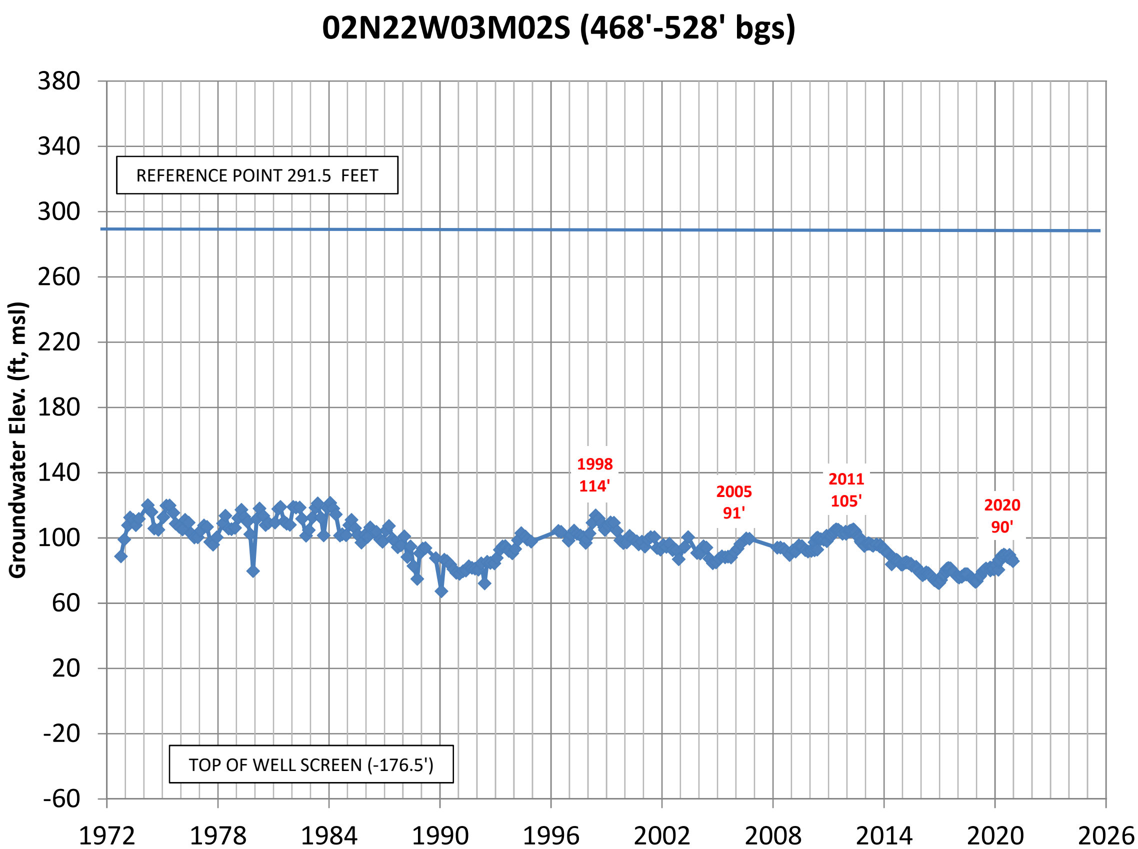


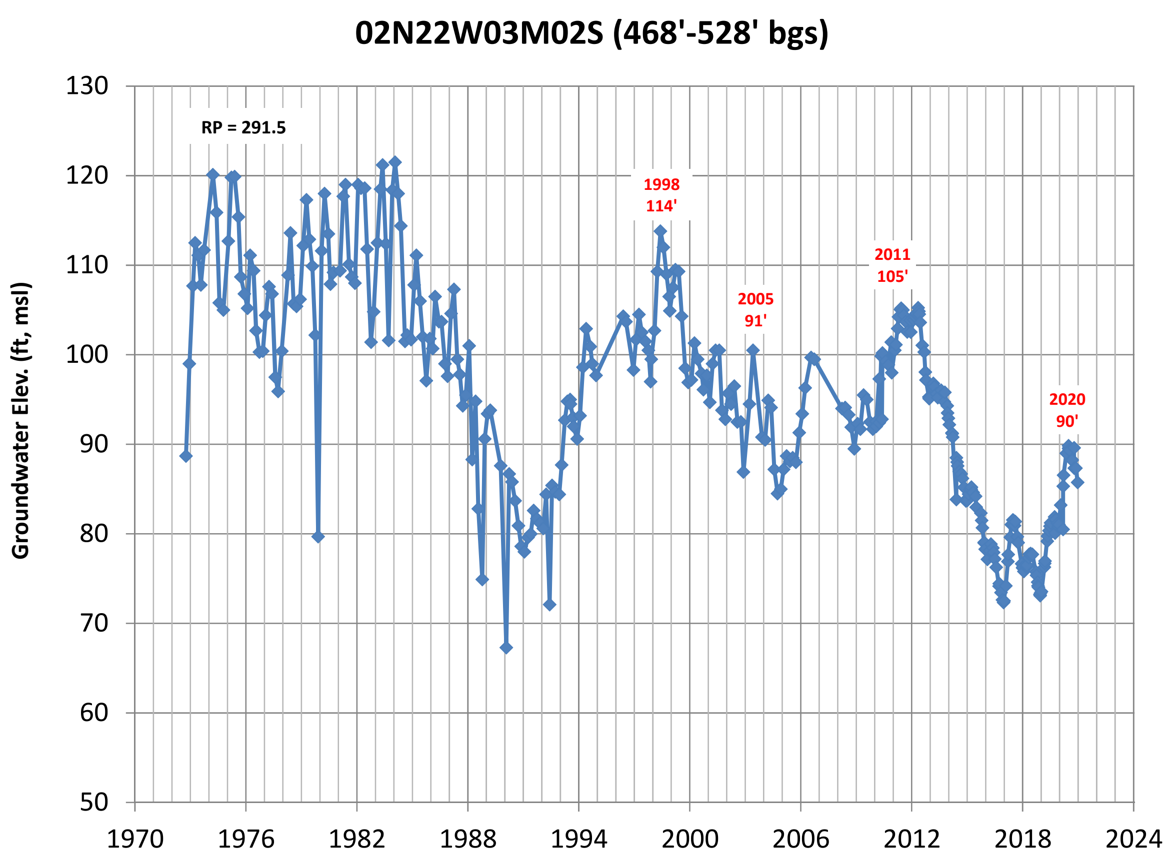

02N22W03K02S (?- 164' bgs)
380
340
300
260
220
180
140
100
60
20
-20
-60
1922
1934
1946
1958
1970
1982
1994
2006
2018
2030
Groundwater Elev. (ft, msl)
REFERENCE POINT 248.75 FEET
TOP OF WELL SCREEN (UNKNOWN)
BOTTOM OF WELL SCREEN
1998
141'
2005
131'
2011
135'
2020
122'


02N22W03K02S (?- 164' bgs)
170
160
150
140
130
120
110
100
90
1926
1937
1948
1959
1970
1981
1992
2003
2014
2025
Groundwater Elev. (ft, msl)
RP = 248.75
1998
141'
2005
131'
2011
135'
2020
122'

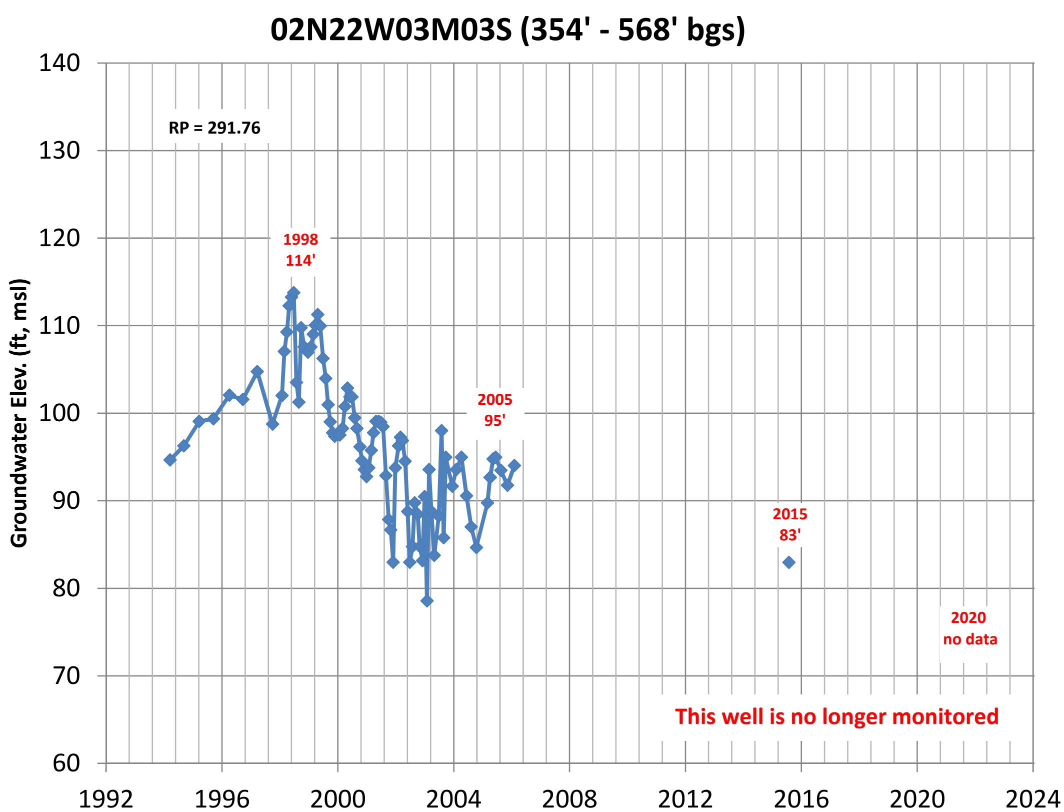
Intentionally Left Blank

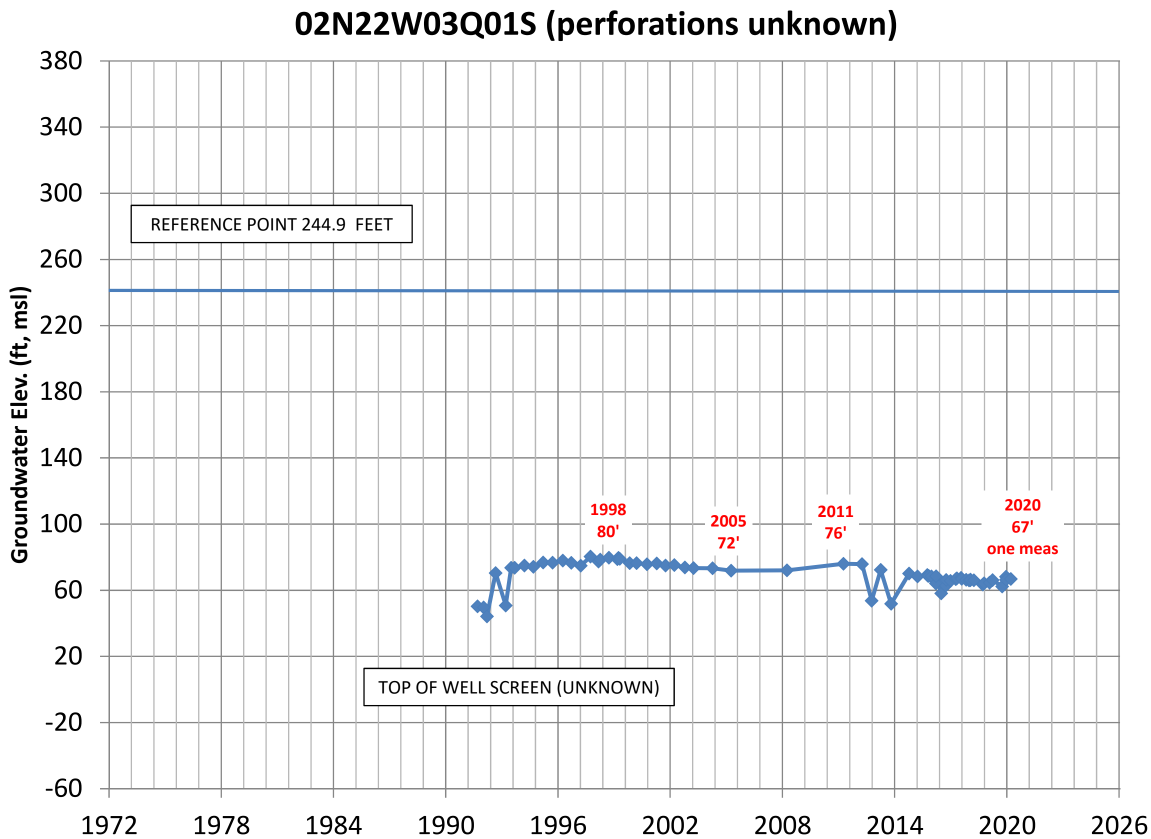


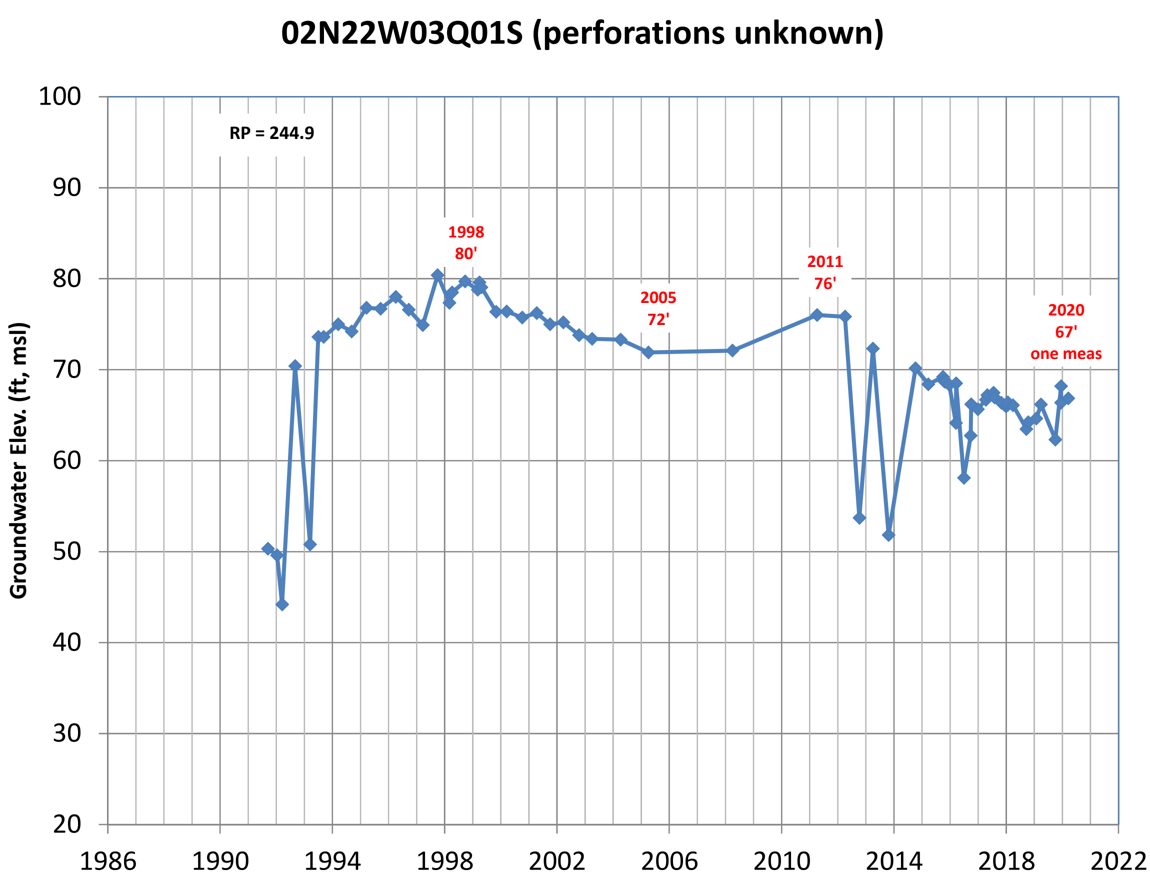

02N22W03M02S (468'-528' bgs)
REFERENCE POINT 291.5 FEET
TOP OF WELL SCREEN (-176.5')
Groundwater Elev. (ft, msl)
1998
114'
2005
91'
2011
105'
2020
90'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

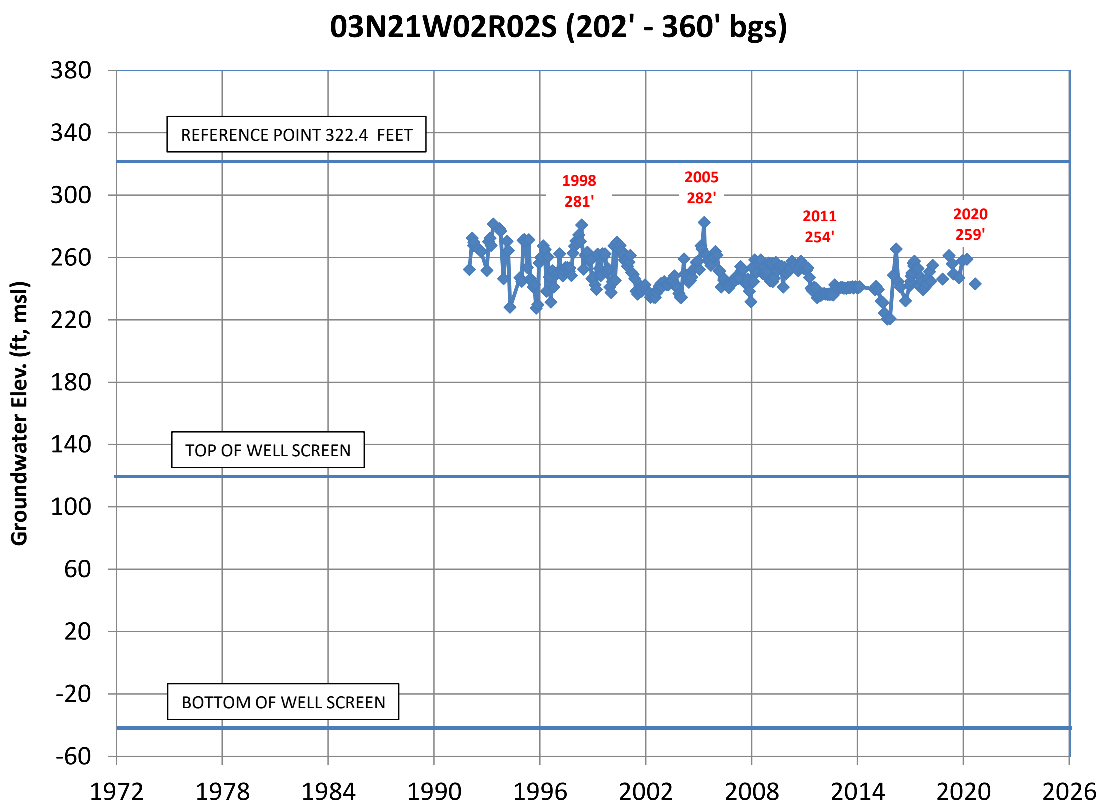

02N22W03M02S (468'-528' bgs)
RP = 291.5
Groundwater Elev. (ft, msl)
1998
114'
2005
91'
2011
105'
2020
90'
130
120
110
100
90
80
70
60
50
1970
1976
1982
1988
1994
2000
2006
2012
2018
2024

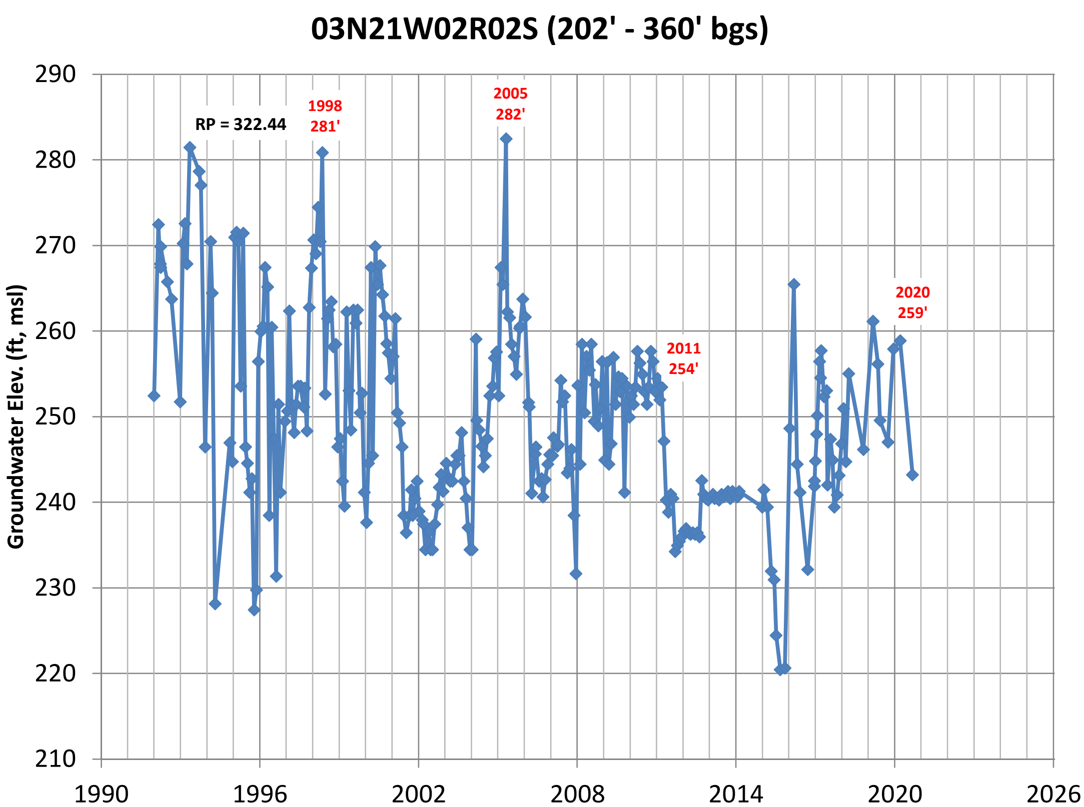
Intentionally Left Blank

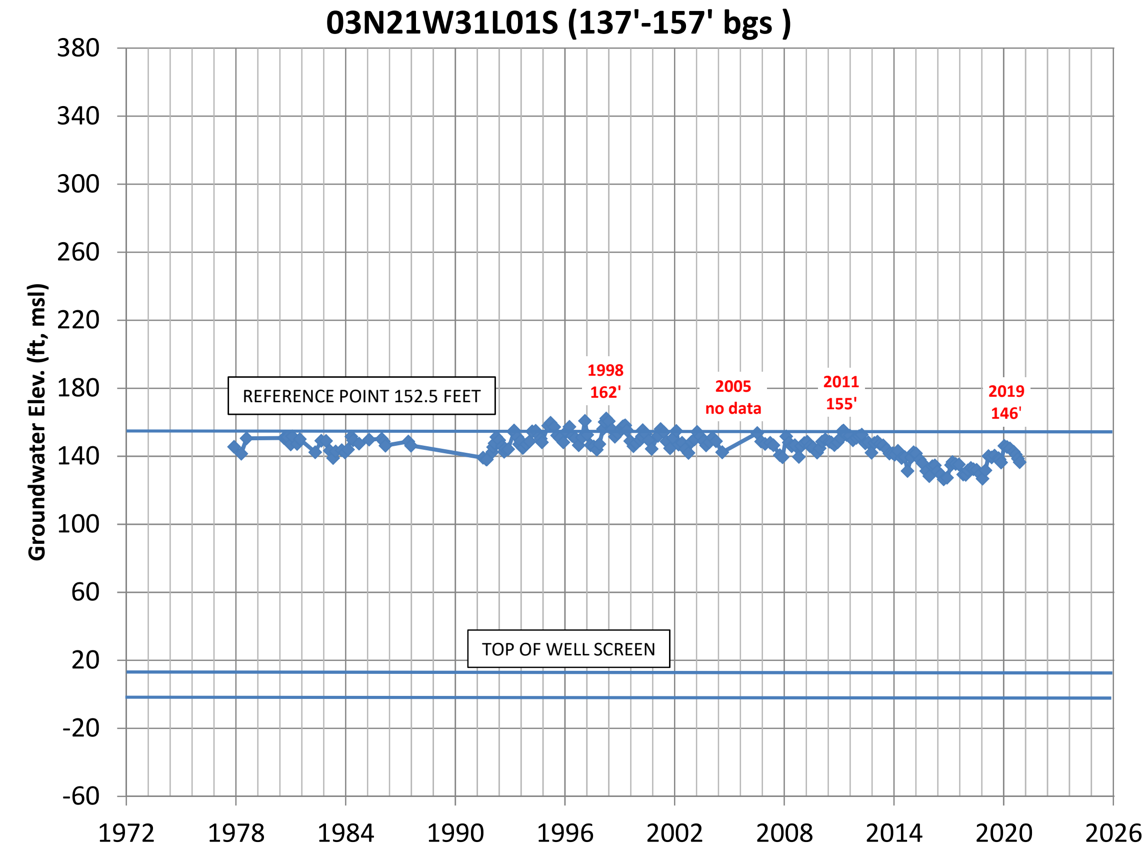


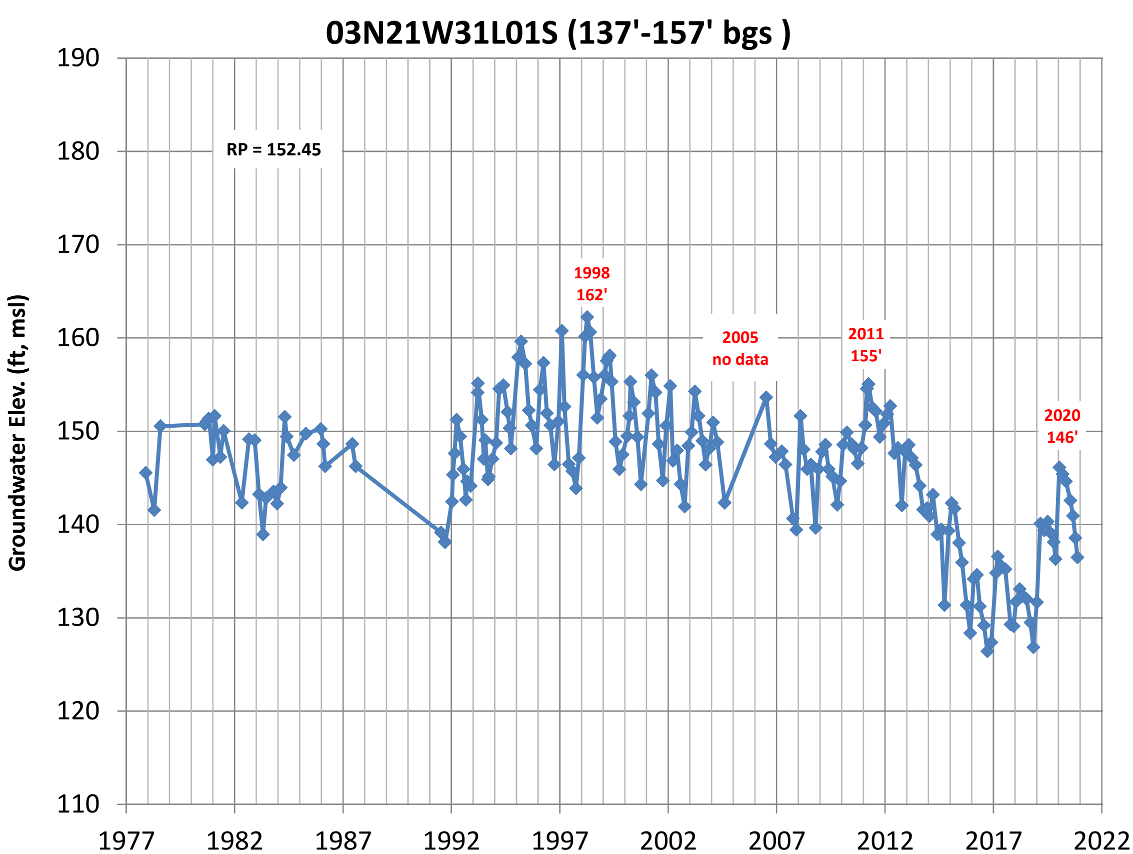

02N22W03Q01S (perforations unknown)
REFERENCE POINT 244.9 FEET
TOP OF WELL SCREEN (UNKNOWN)
1998
80'
2005
72'
2011
76'
2020
67'
one meas
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

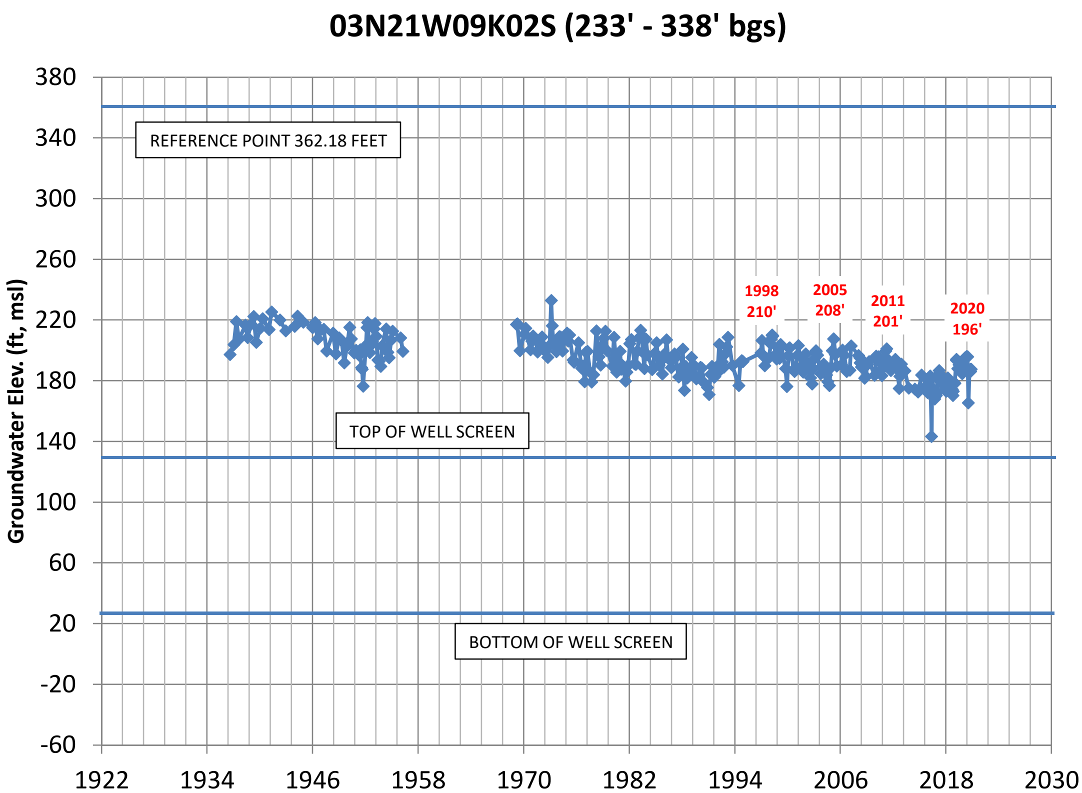

02N22W03Q01S (perforations unknown)
RP = 244.9
1998
80'
2005
72'
2011
76'
2020
67'
one meas
Groundwater Elev. (ft, msl)
100
90
80
70
60
50
40
30
20
1986
1990
1994
1998
2002
2006
2010
2014
2018
2022

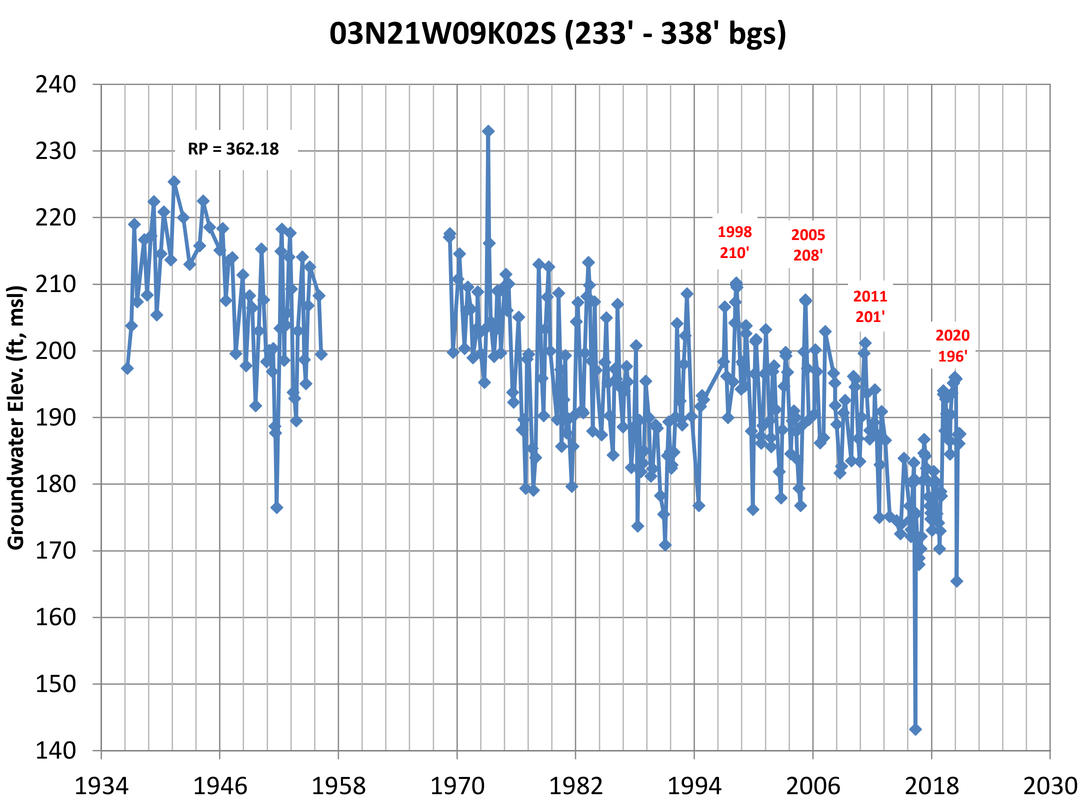

03N21W02R02S (202' - 360' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 322.4 FEET
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
1998
281'
2005
282'
2011
254'
2020
259'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

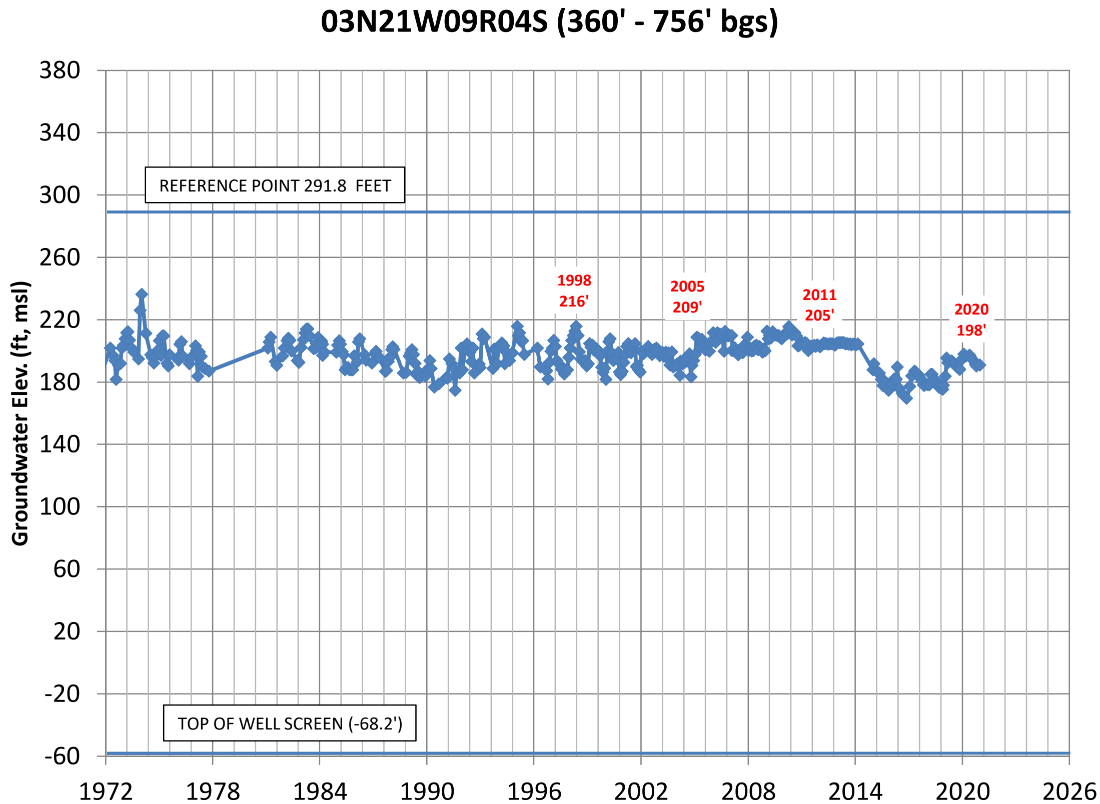

03N21W02R02S (202' - 360' bgs)
Groundwater Elev. (ft, msl)
RP = 322.44
1998
281'
2005
282'
2011
254'
2020
259'
290
280
270
260
250
240
230
220
210
1990
1996
2002
2008
2014
2020
2026


03N21W31L01S (137'-157' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 152.5 FEET
1998
162'
2005
no data
2011
155'
2019
146'
TOP OF WELL SCREEN
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

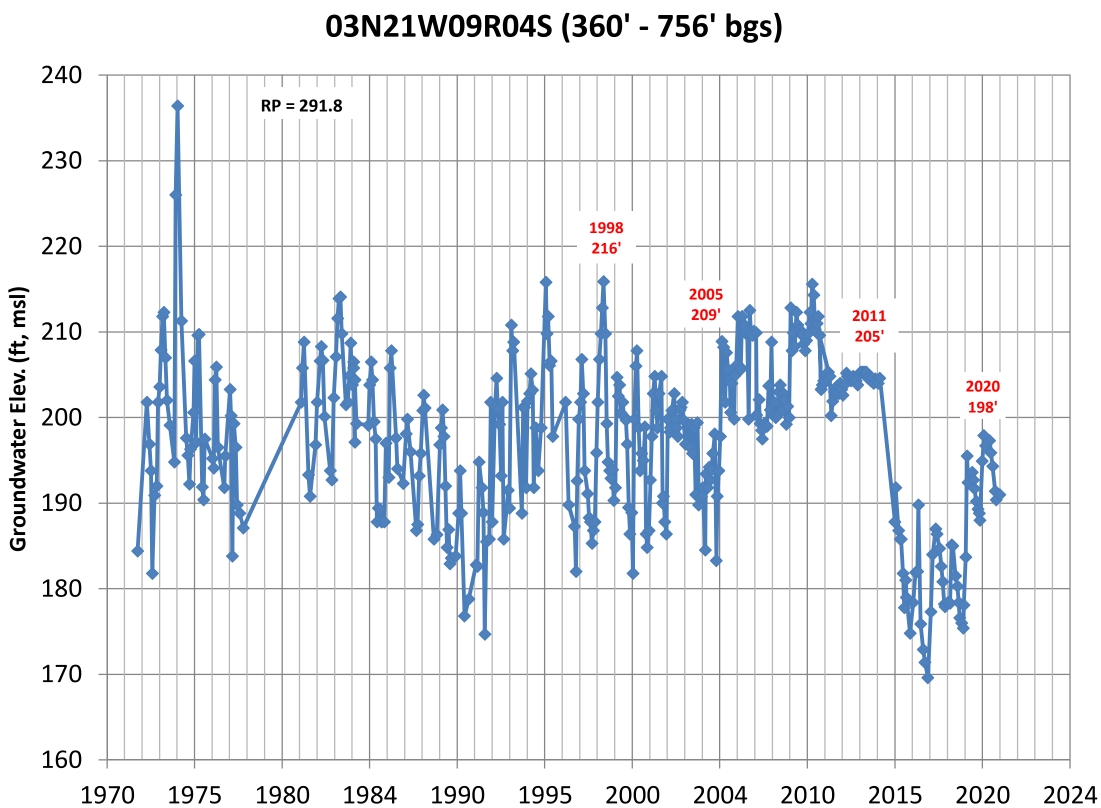

03N21W31L01S (137'-157' bgs)
Groundwater Elev. (ft, msl)
RP = 152.45
1998
162'
2005
no data
2011
155'
2020
146'
190
180
170
160
150
140
130
120
110
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022


03N21W09K02S (233' - 338' bgs)
REFERENCE POINT 362.18 FEET
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
1998
210'
2005
208'
2011
201'
2020
196'
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1922
1934
1946
1958
1970
1982
1994
2006
2018
2030

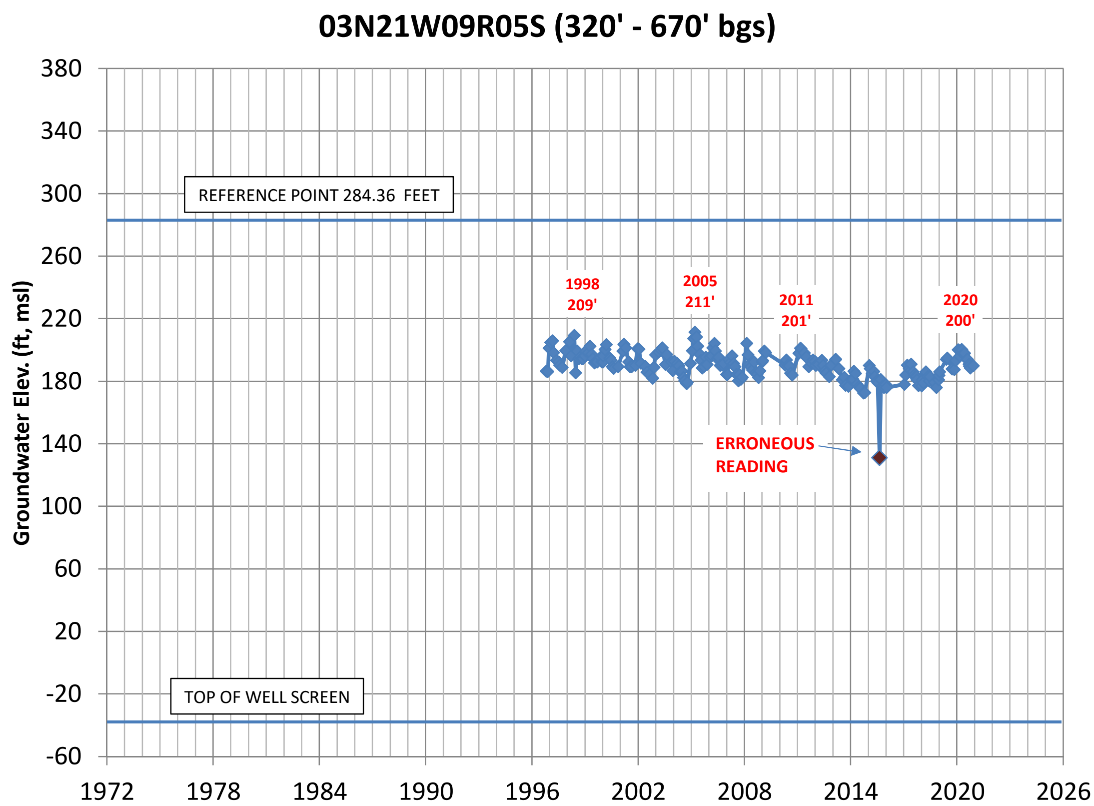

03N21W09K02S (233' - 338' bgs)
RP = 362.18
1998
210'
2005
208'
2011
201'
2020
196'
Groundwater Elev. (ft, msl)
240
230
220
210
200
190
180
170
160
150
140
1934
1946
1958
1970
1982
1994
2006
2018
2030

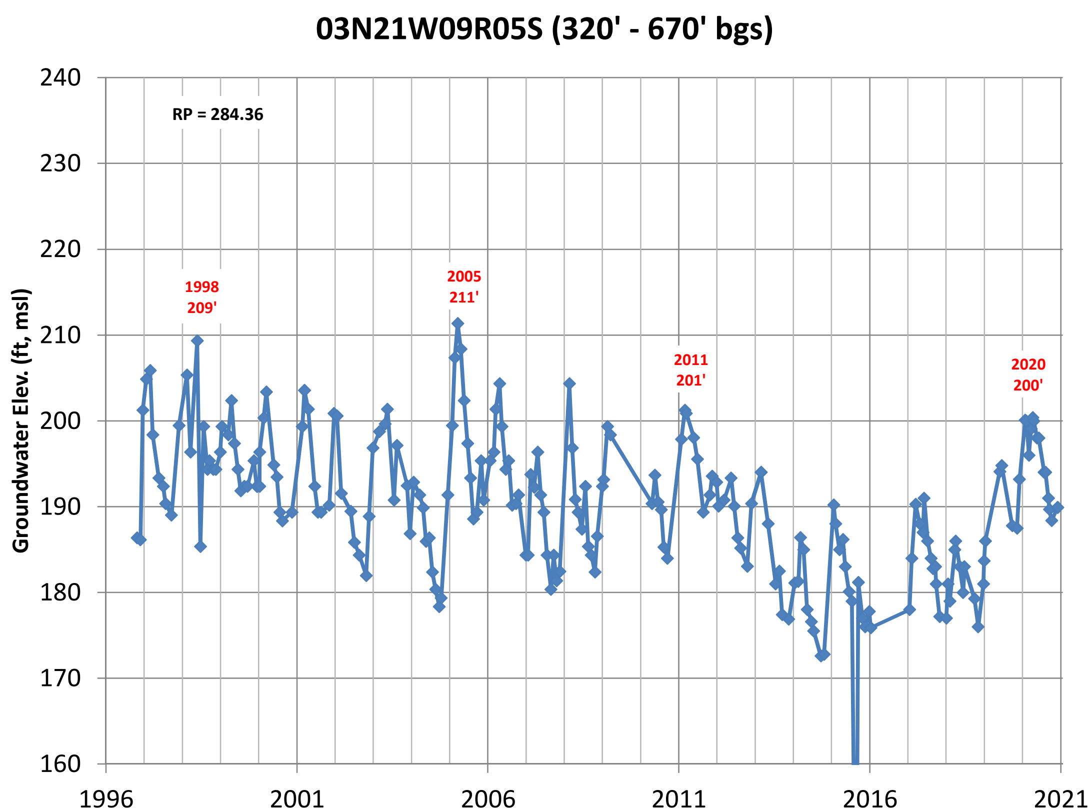


03N21W09R04S (360' - 756' bgs)
REFERENCE POINT 291.8 FEET
TOP OF WELL SCREEN (-68.2')
Groundwater Elev. (ft, msl)
1998
216'
2005
209'
2011
205'
2020
198'



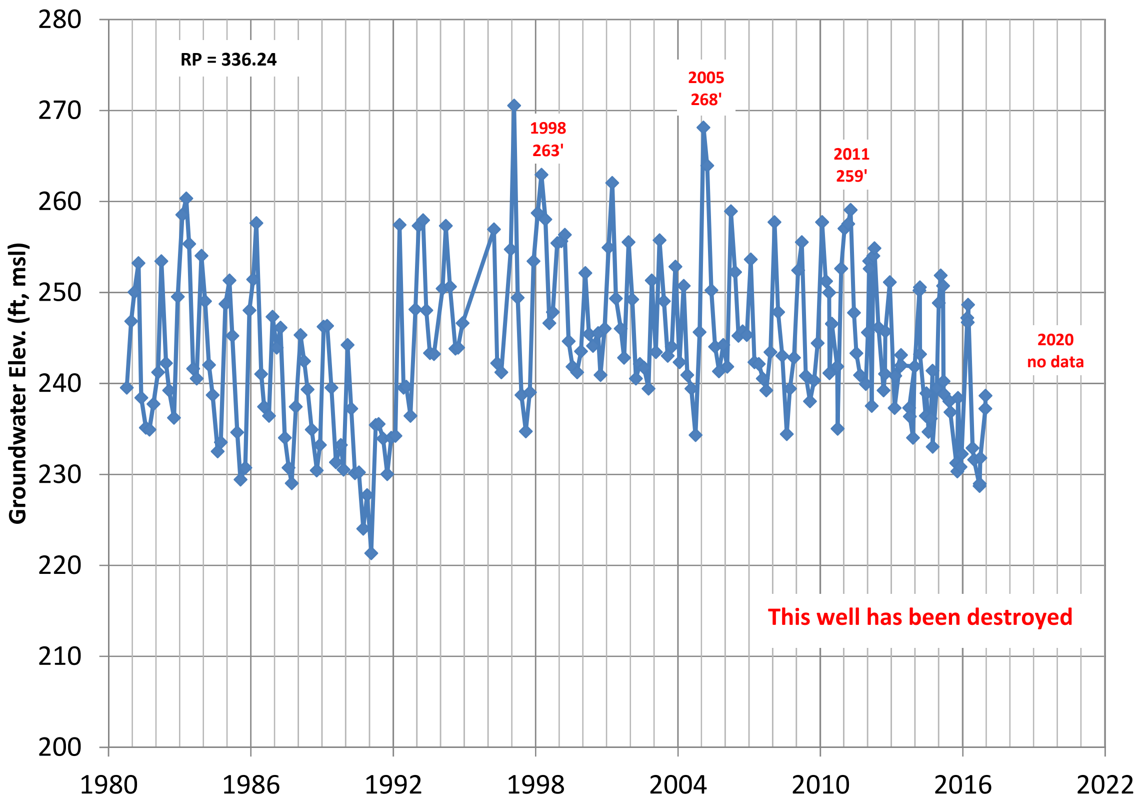
03N21W09R04S (360' - 756' bgs)
RP = 291.8
Groundwater Elev. (ft, msl)
1998
216'
2005
209'
2011
205'
2020
198'

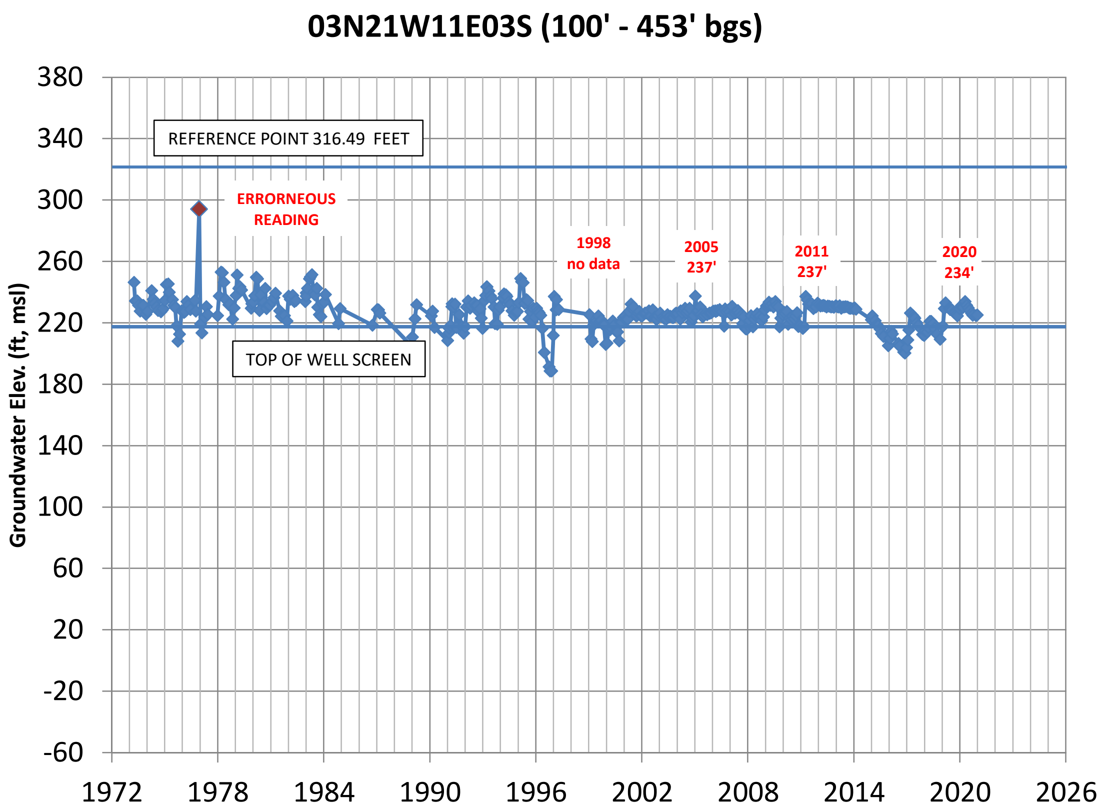

03N21W09R05S (320' - 670' bgs)
REFERENCE POINT 284.36 FEET
TOP OF WELL SCREEN
1998
209'
2005
211'
2011
201'
2020
200'
ERRONEOUS
READING
Groundwater Elev. (ft, msl)

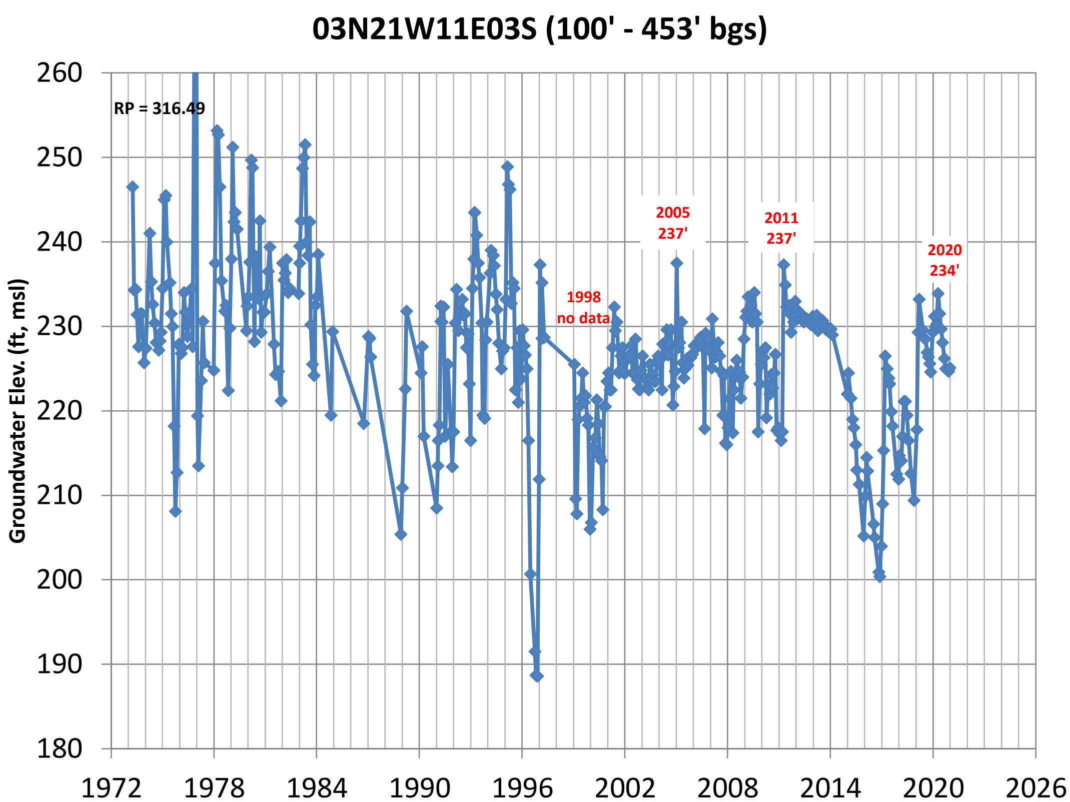

03N21W09R05S (320' - 670' bgs)
RP = 284.36
1998
209'
2005
211'
2011
201'
2020
200'
Groundwater Elev. (ft, msl)

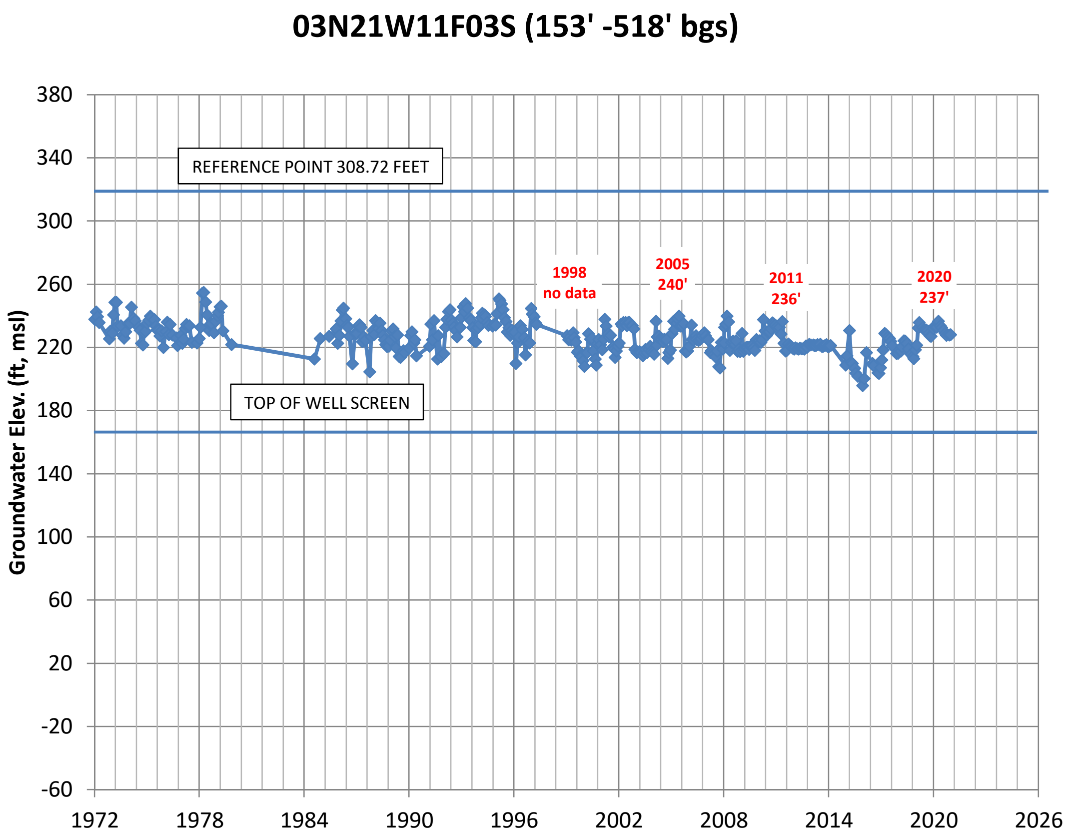
Intentionally Left Blank

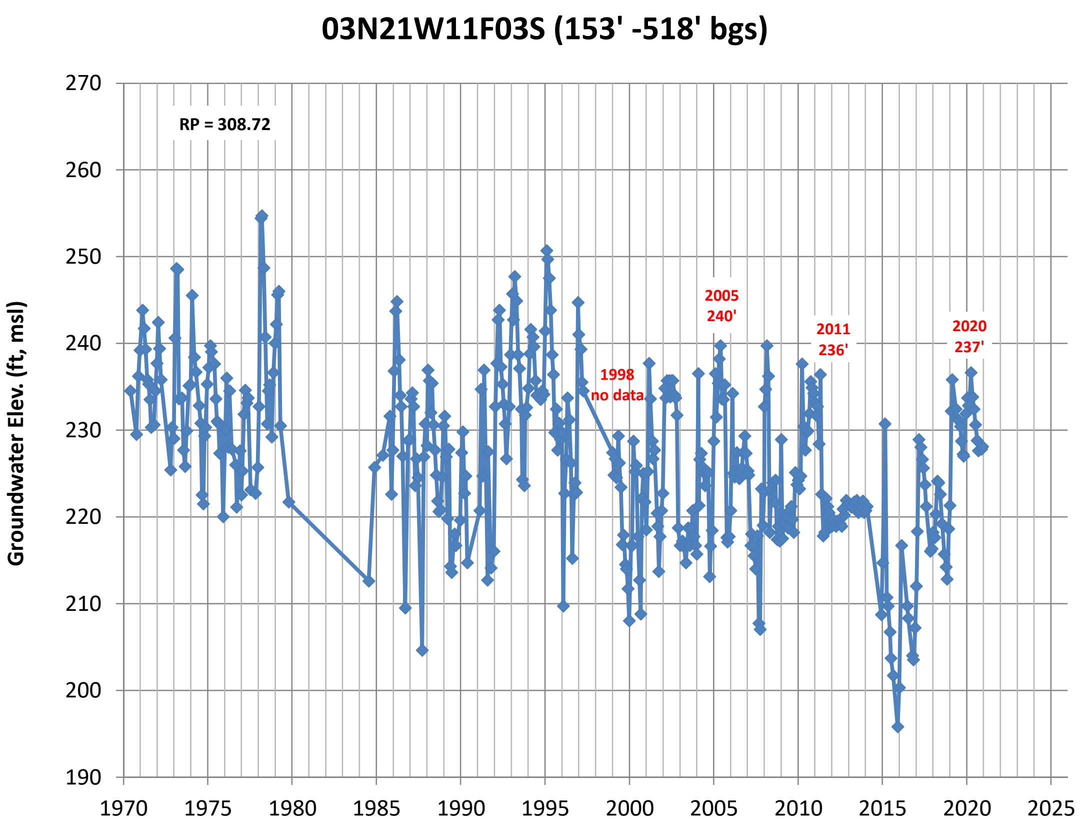
03N21W11B01S (perforations unknown)

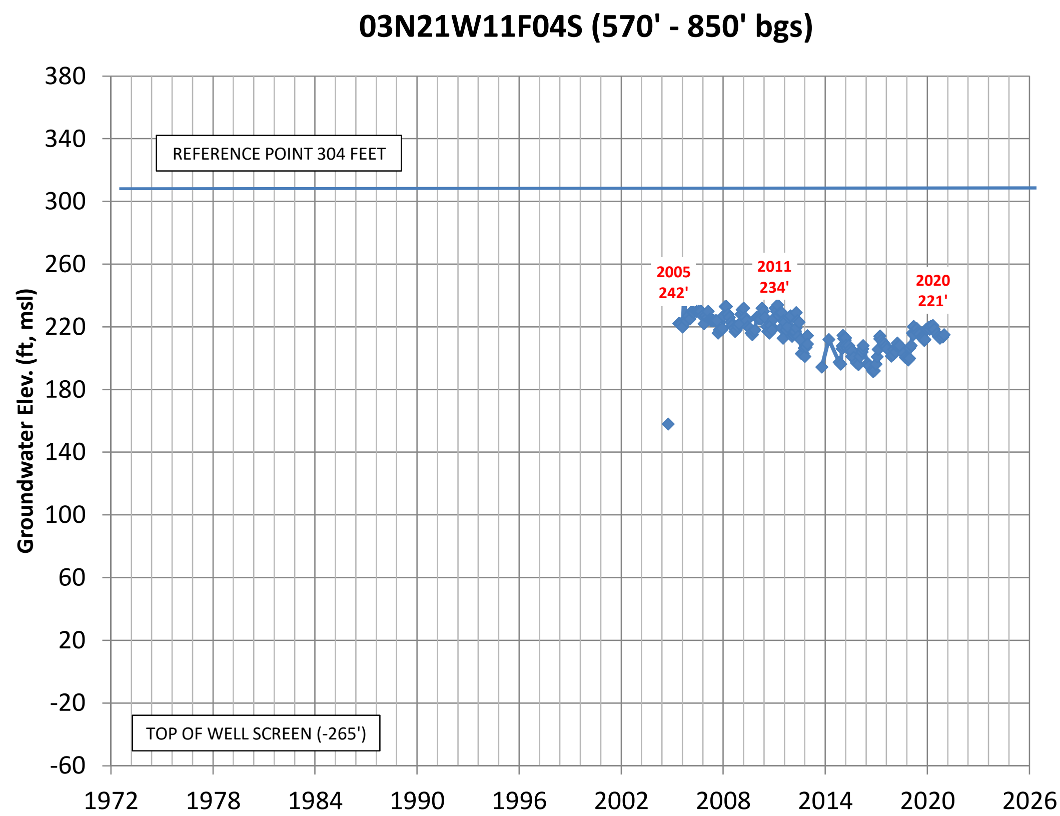


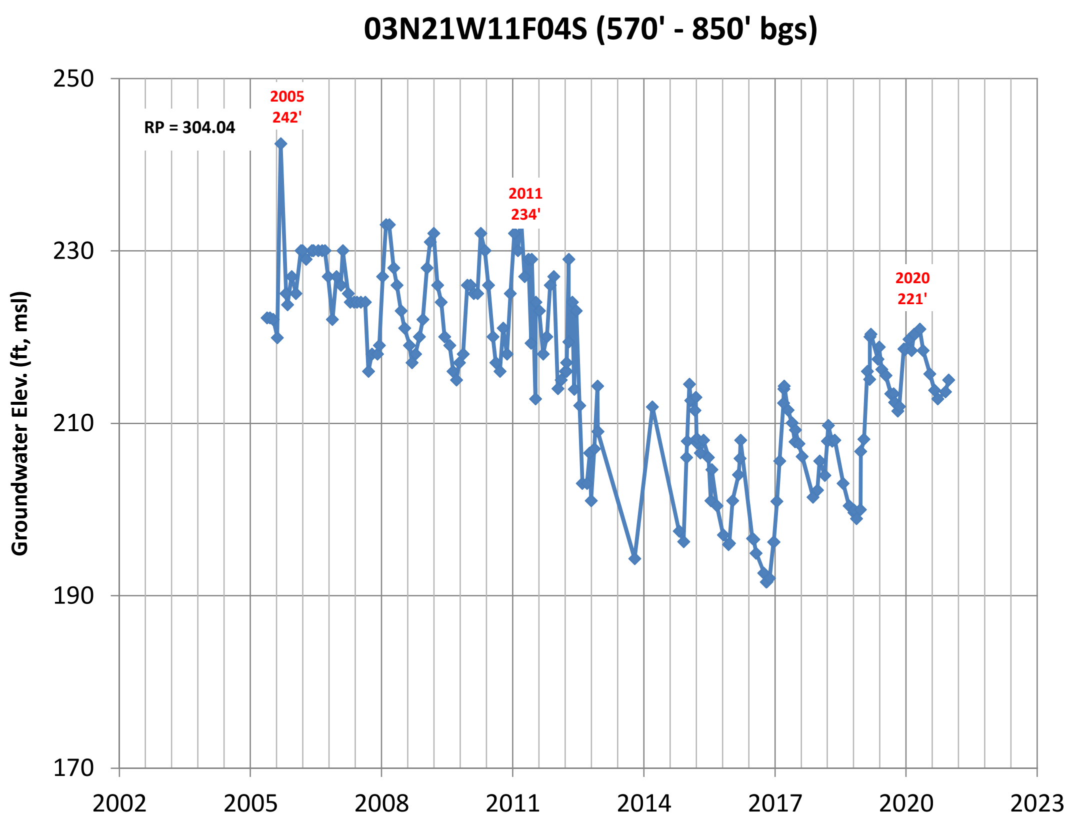

03N21W11E03S (100' - 453' bgs)
REFERENCE POINT 316.49 FEET
ERRORNEOUS
READING
1998
no data
2005
237'
2011
237'
2020
234'
TOP OF WELL SCREEN
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

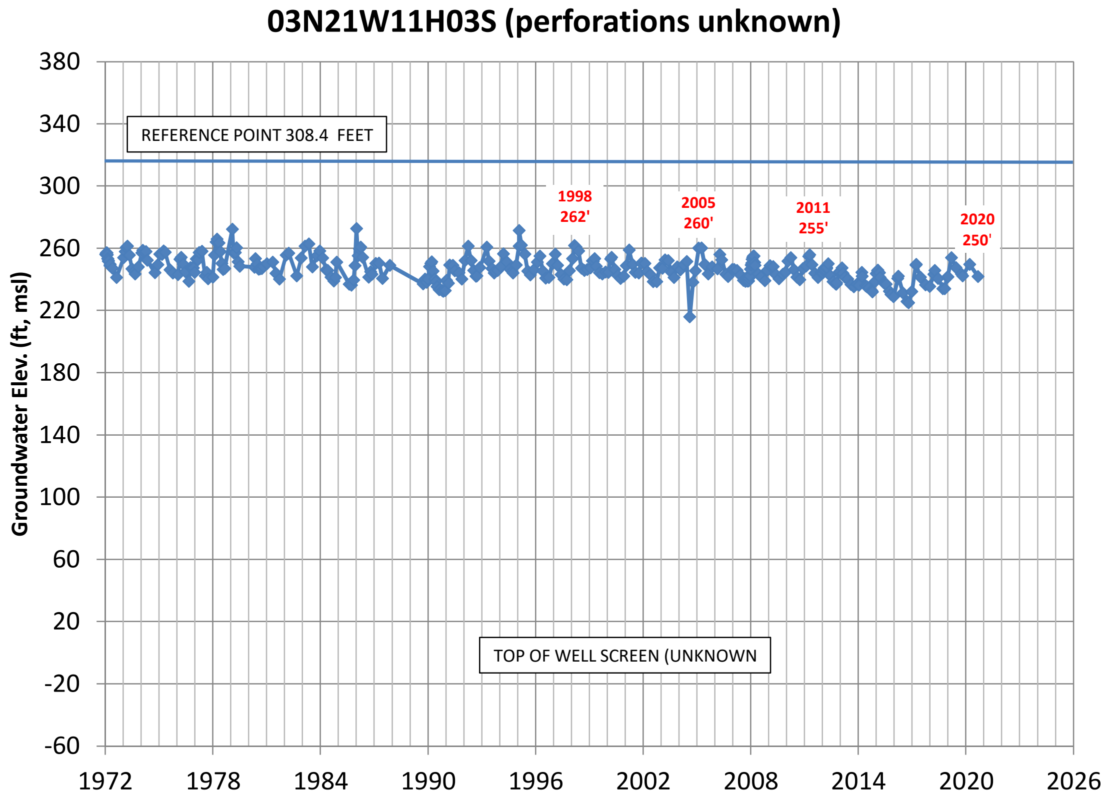

03N21W11E03S (100' - 453' bgs)
RP = 316.49
2005
237'
2011
237'
2020
234'
1998
no data
Groundwater Elev. (ft, msl)
260
250
240
230
220
210
200
190
180
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

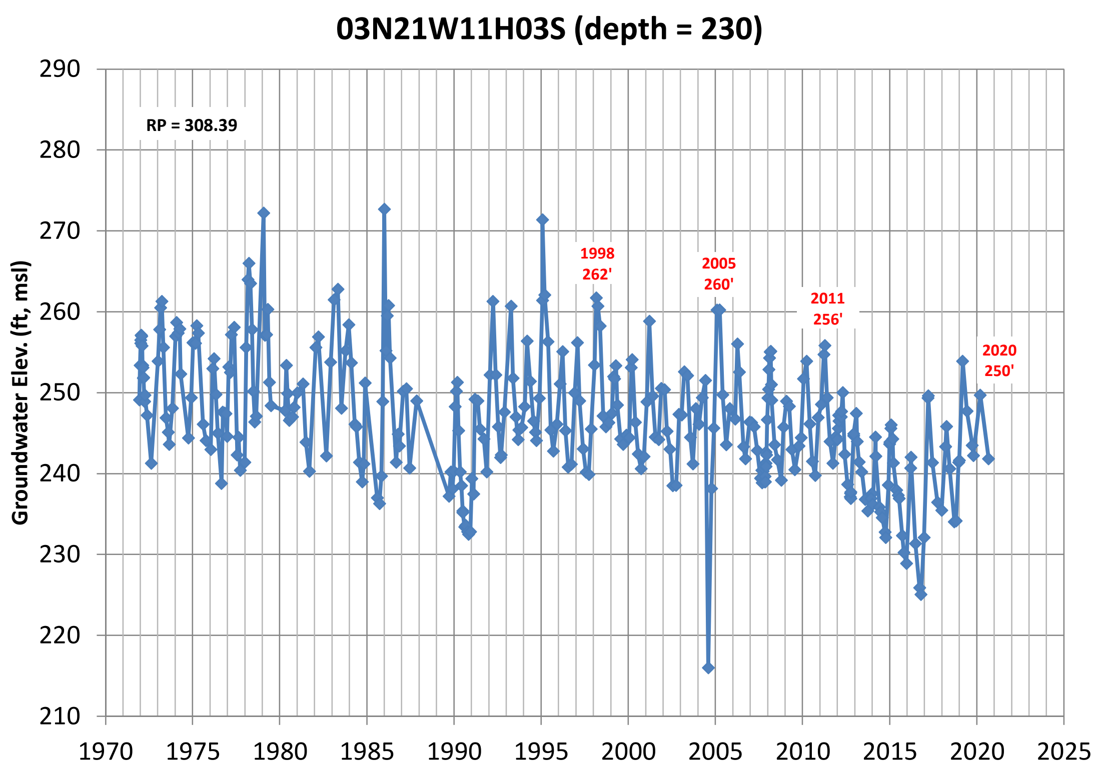

03N21W11F03S (153' -518' bgs)
REFERENCE POINT 308.72 FEET
TOP OF WELL SCREEN
1998
no data
2005
240'
2011
236'
2020
237'
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W11F03S (153' -518' bgs)
RP = 308.72
1998
no data
2005
240'
2011
236'
2020
237'
Groundwater Elev. (ft, msl)
270
260
250
240
230
220
210
200
190
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

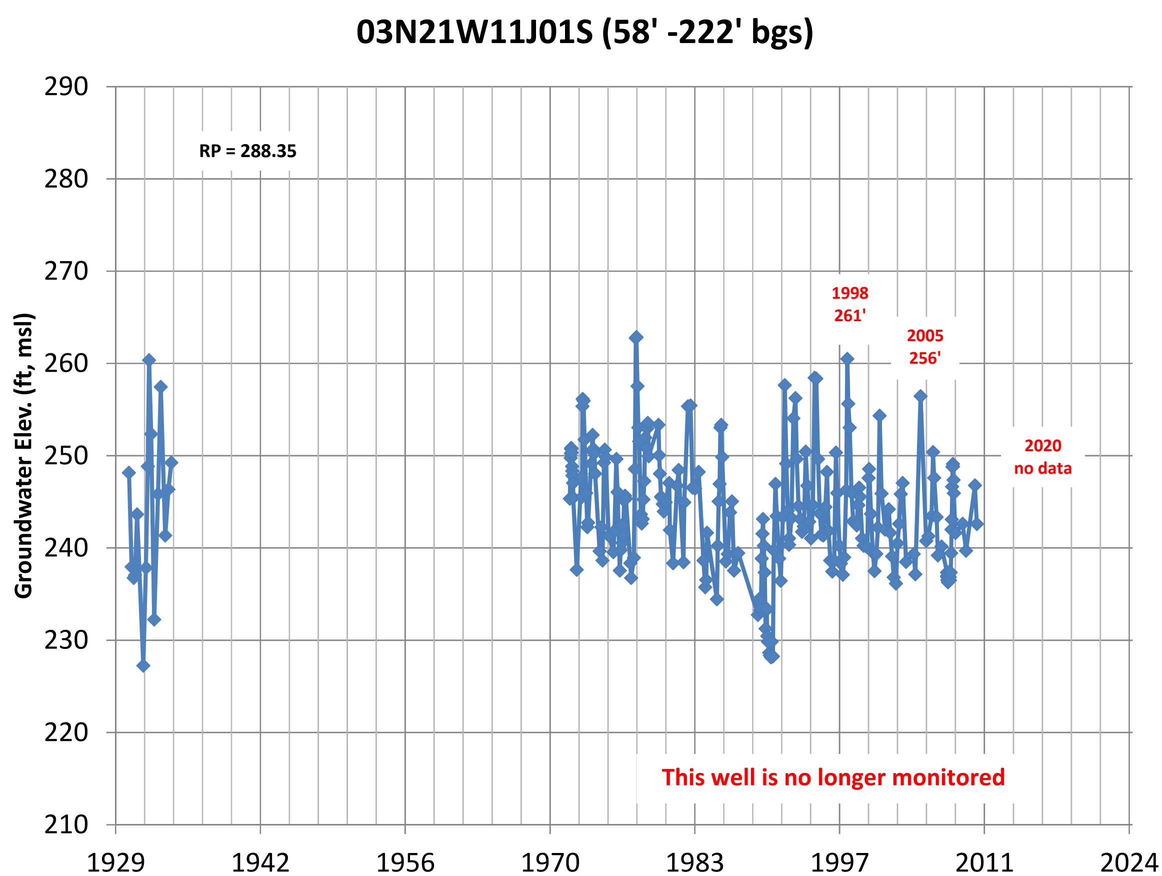

03N21W11F04S (570' - 850' bgs)
REFERENCE POINT 304 FEET
TOP OF WELL SCREEN (-265')
2005
242'
2011
234'
2020
221'
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W11F04S (570' - 850' bgs)
RP = 304.04
2005
242'
2011
234'
2020
221'
Groundwater Elev. (ft, msl)
250
230
210
190
170
2002
2005
2008
2011
2014
2017
2020
2023

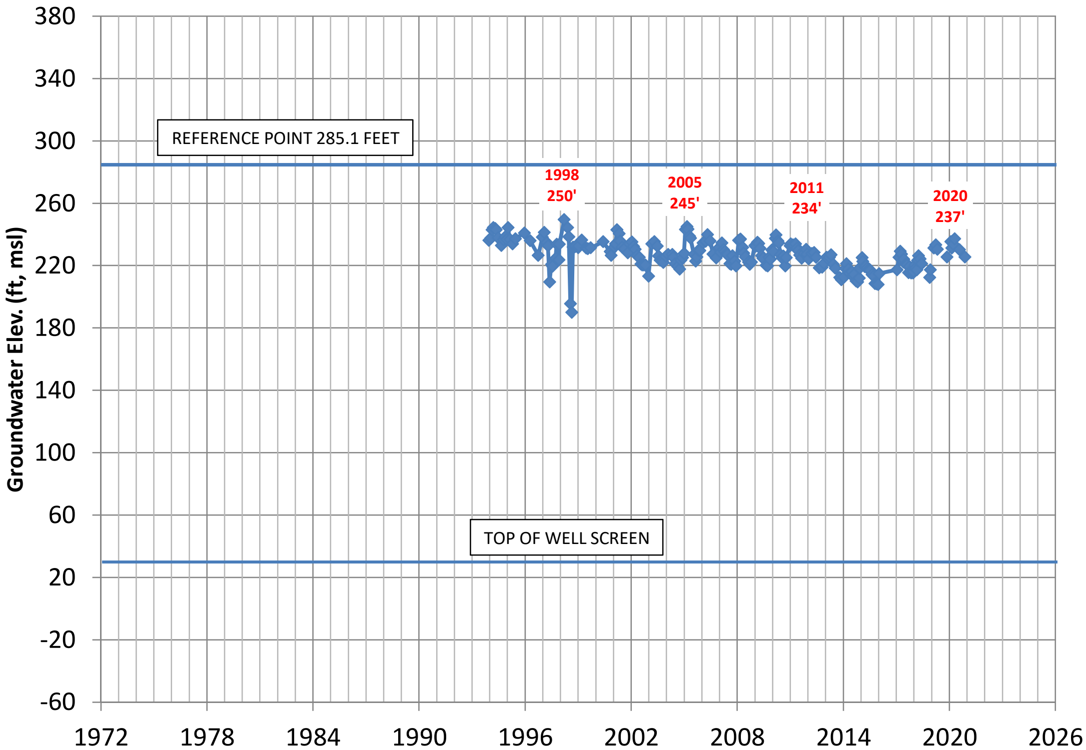

03N21W11H03S (perforations unknown)
REFERENCE POINT 308.4 FEET
1998
262'
2005
260'
2011
255'
2020
250'
TOP OF WELL SCREEN (UNKNOWN
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W11H03S (depth = 230)
RP = 308.39
1998
262'
2005
260'
2011
256'
2020
250'
Groundwater Elev. (ft, msl)
290
280
270
260
250
240
230
220
210
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025

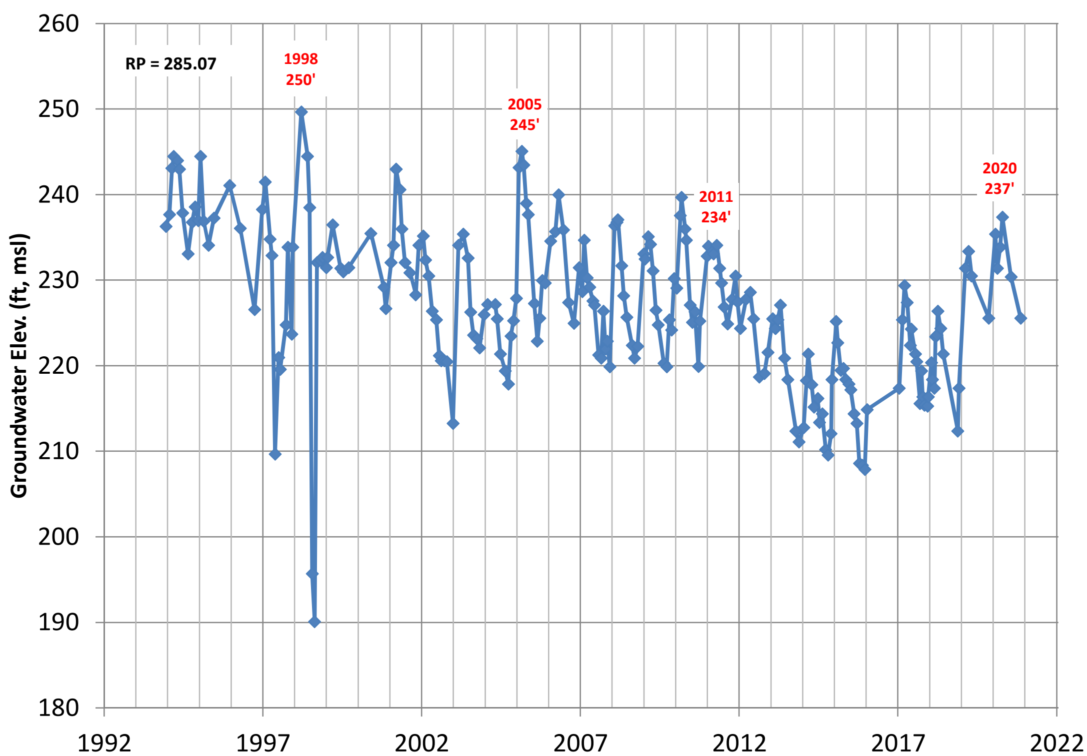
Intentionally Left Blank

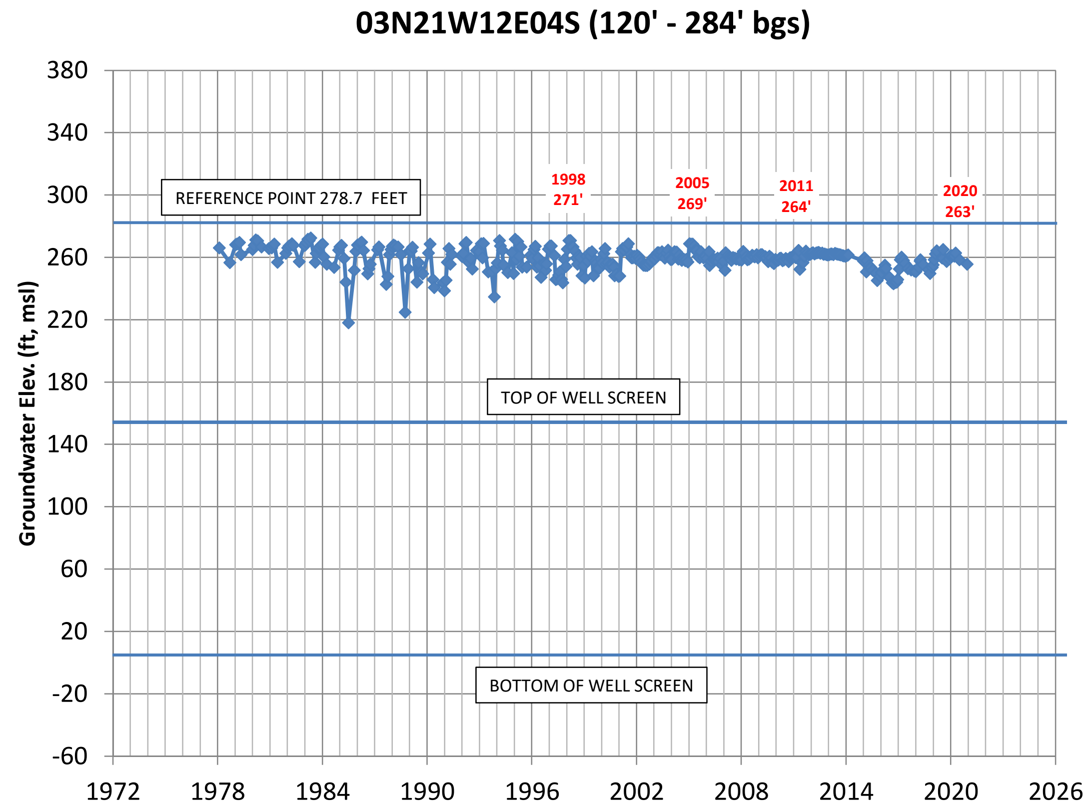


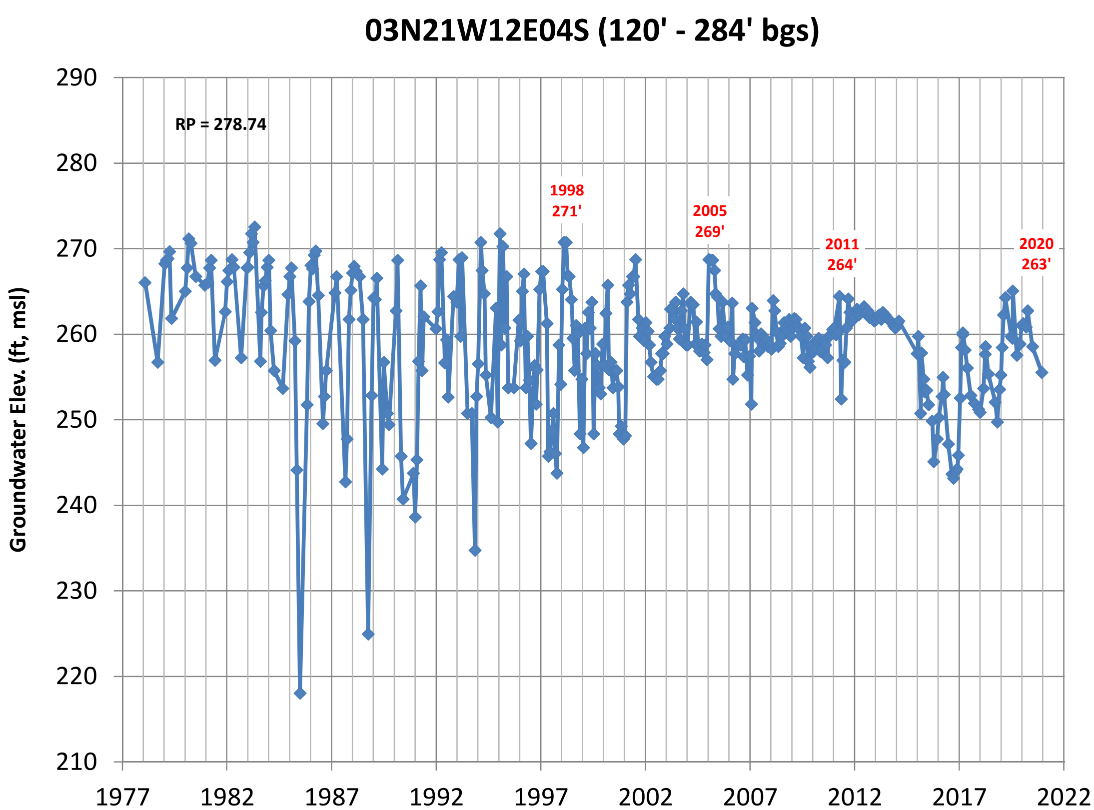
03N21W11J02S (260' - 770' bgs)

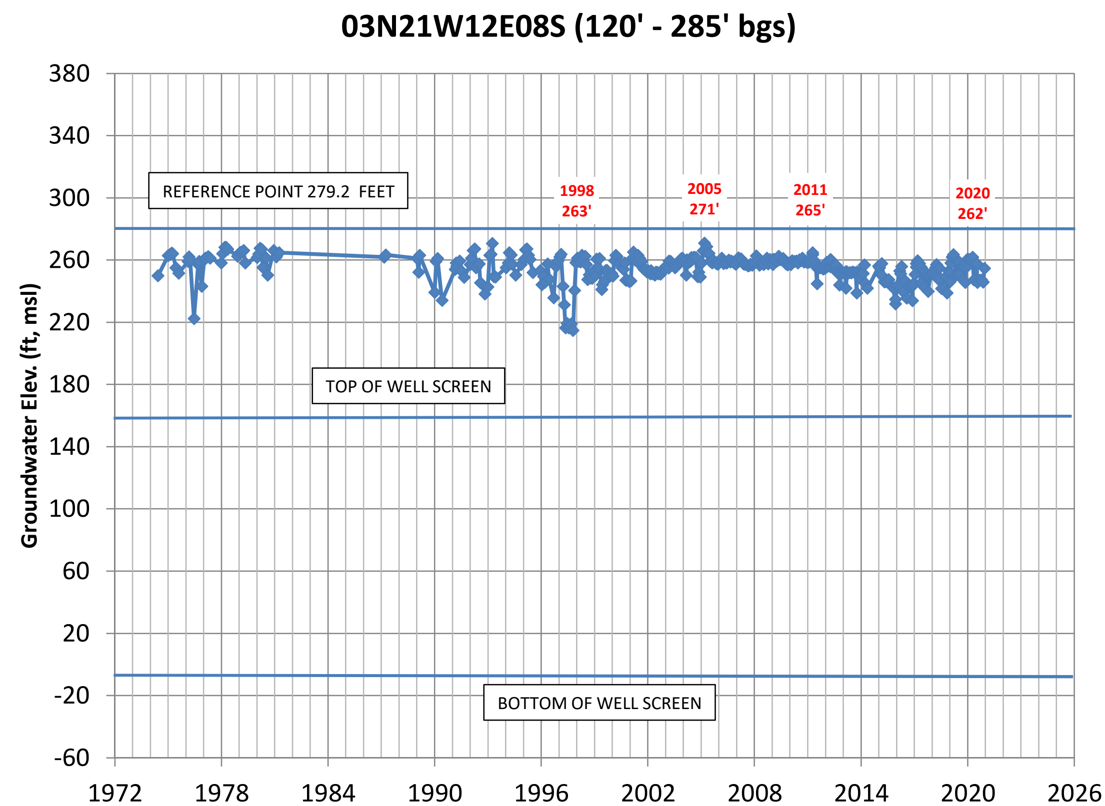


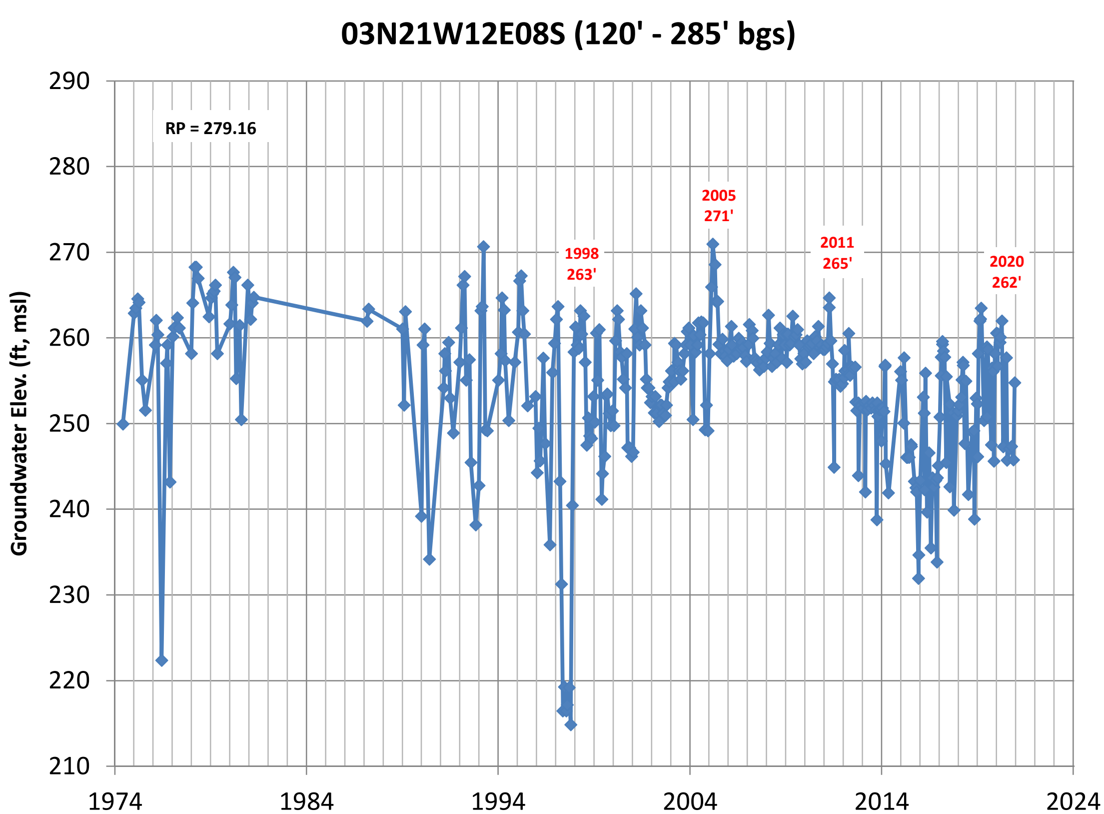
03N21W11J02S (260' - 700' bgs)

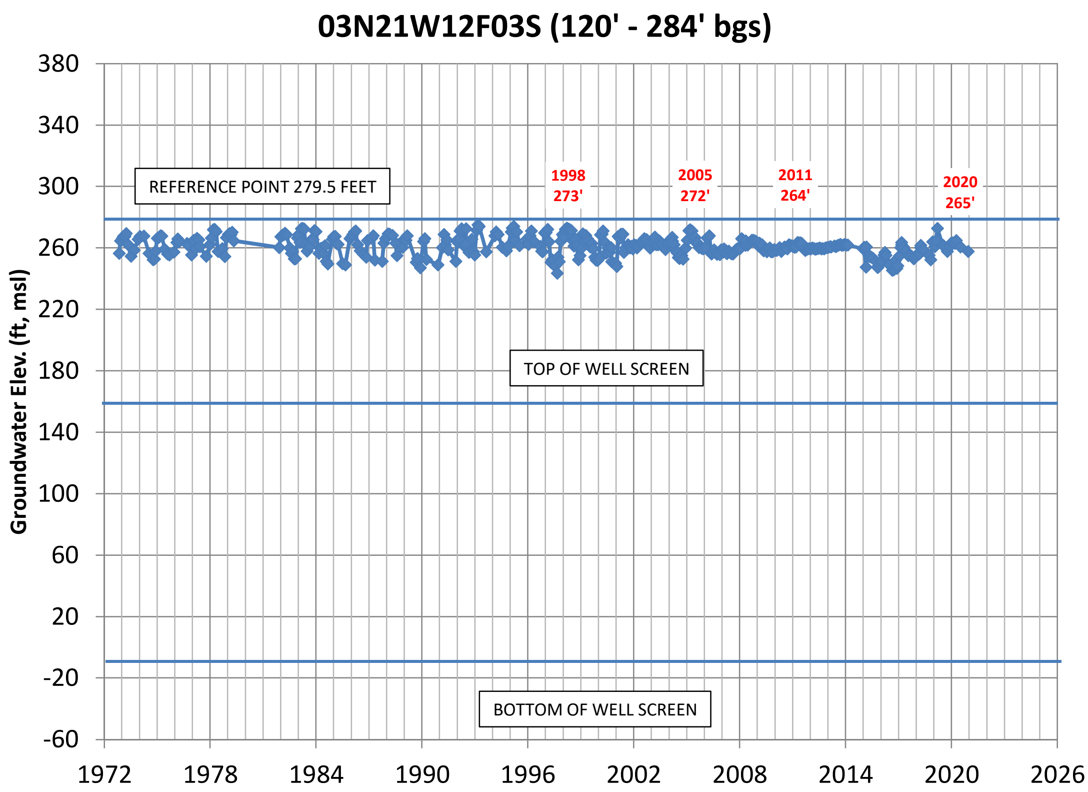


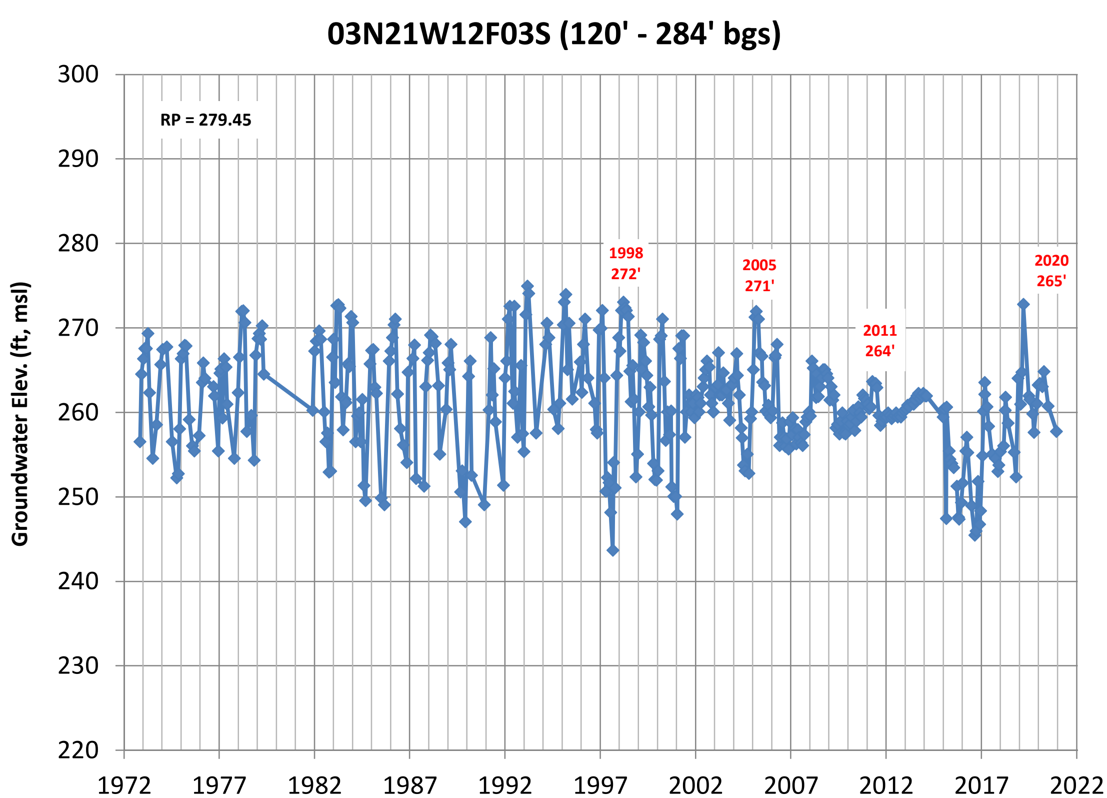

03N21W12E04S (120' - 284' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 278.7 FEET
1998
271'
2005
269'
2011
264'
2020
263'
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

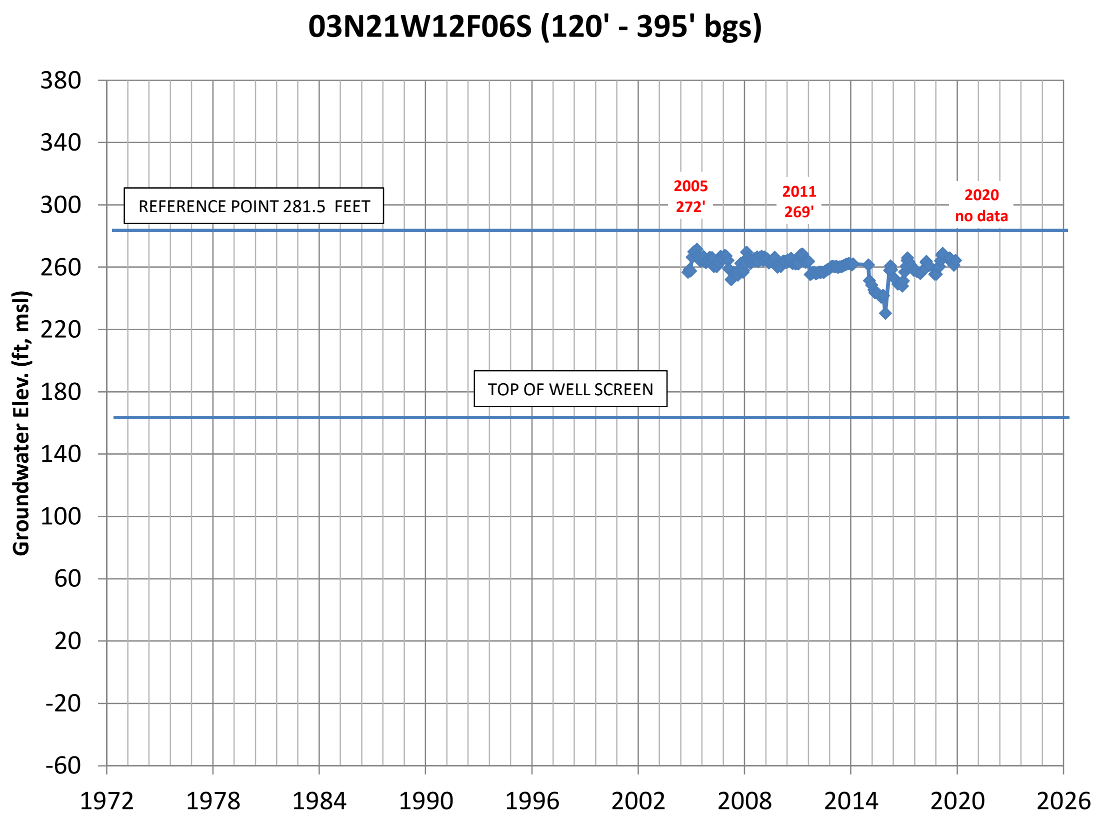

03N21W12E04S (120' - 284' bgs)
Groundwater Elev. (ft, msl)
RP = 278.74
1998
271'
2005
269'
2011
264'
2020
263'
290
280
270
260
250
240
230
220
210
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022

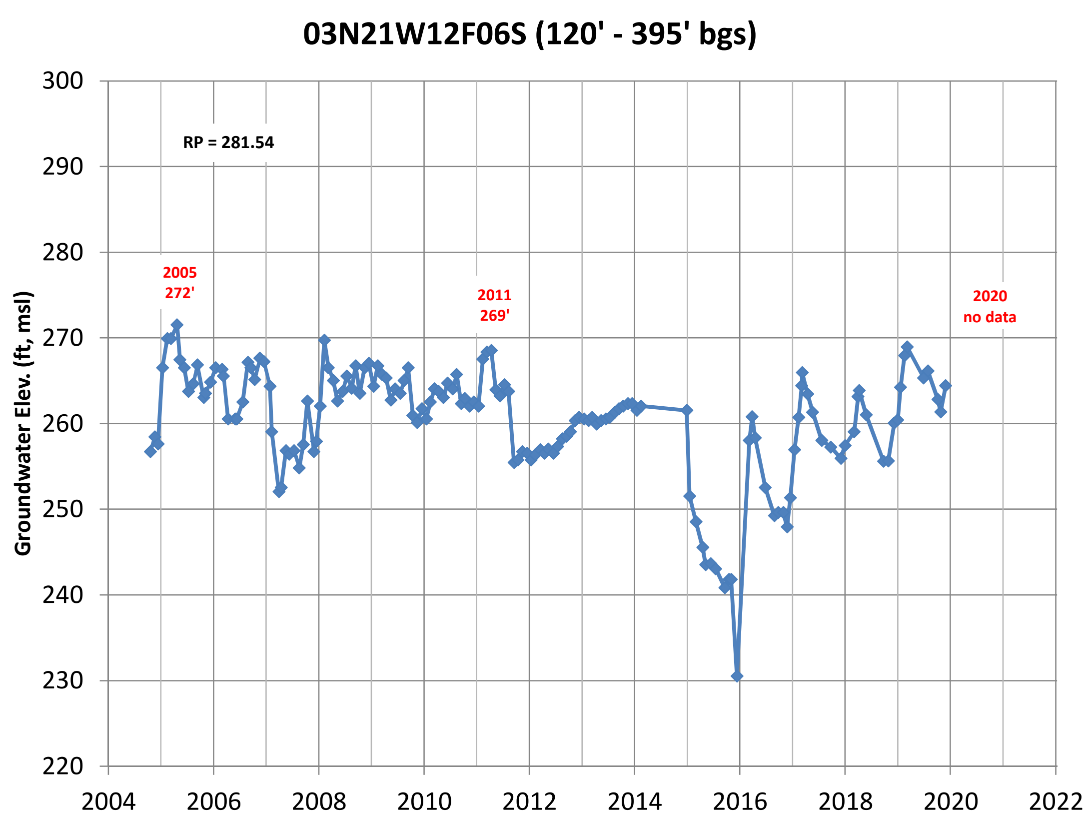

03N21W12E08S (120' - 285' bgs)
REFERENCE POINT 279.2 FEET
1998
263'
2005
271'
2011
265'
2020
262'
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

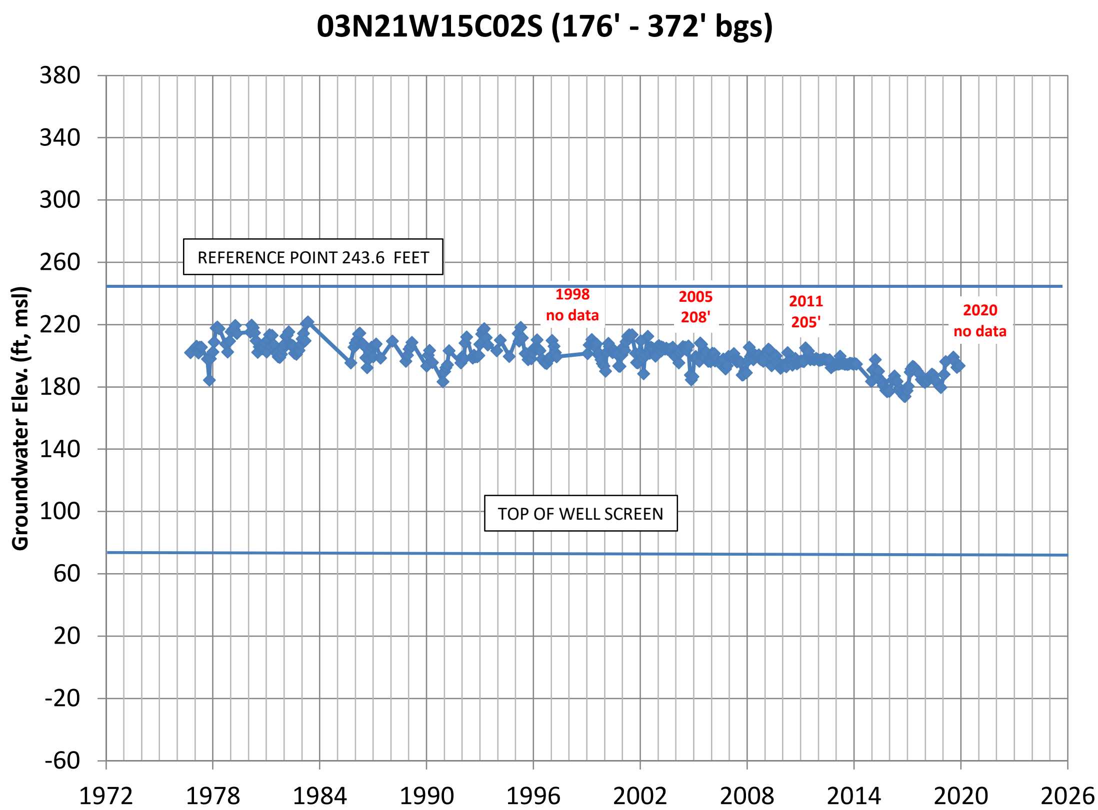

03N21W12E08S (120' - 285' bgs)
RP = 279.16
2005
271'
1998
263'
2011
265'
2020
262'
Groundwater Elev. (ft, msl)
290
280
270
260
250
240
230
220
210
1974
1984
1994
2004
2014
2024

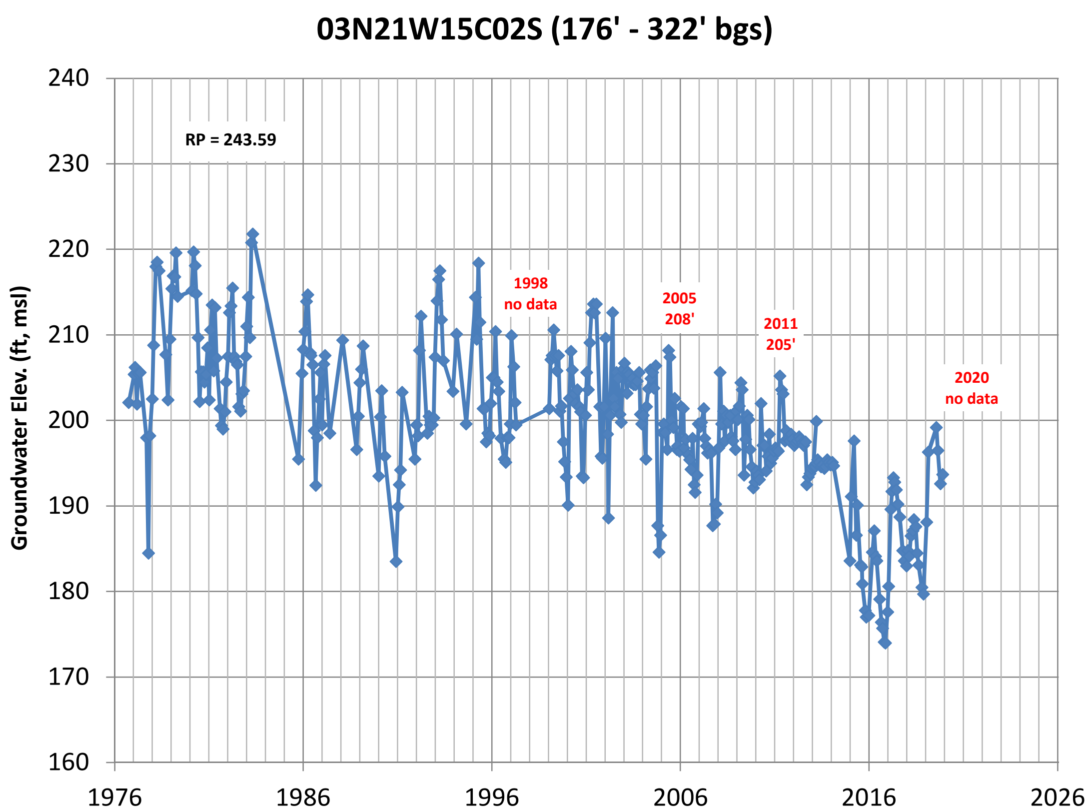

03N21W12F03S (120' - 284' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 279.5 FEET
1998
273'
2005
272'
2011
264'
2020
265'
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W12F03S (120' - 284' bgs)
Groundwater Elev. (ft, msl)
RP = 279.45
1998
272'
2005
271'
2011
264'
2020
265'
300
290
280
270
260
250
240
230
220
1972
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022

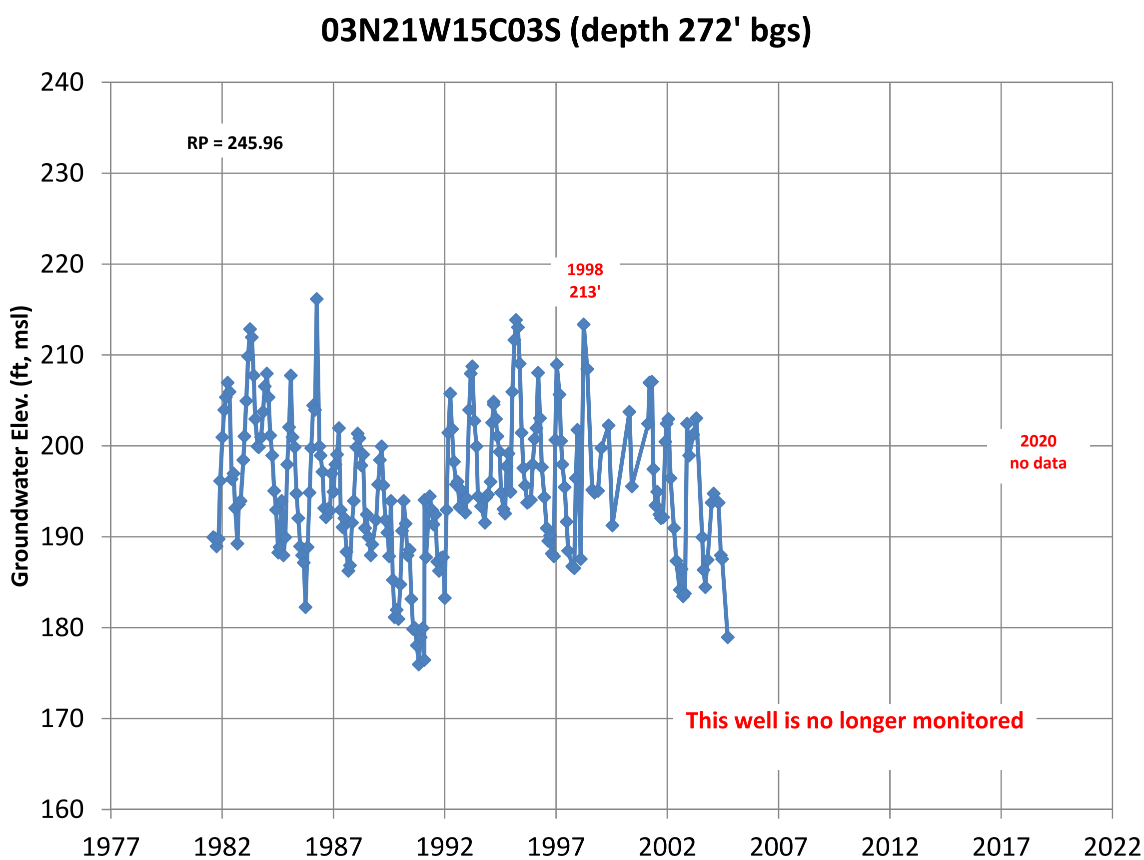

03N21W12F06S (120' - 395' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 281.5 FEET
TOP OF WELL SCREEN
2005
272'
2011
269'
2020
no data

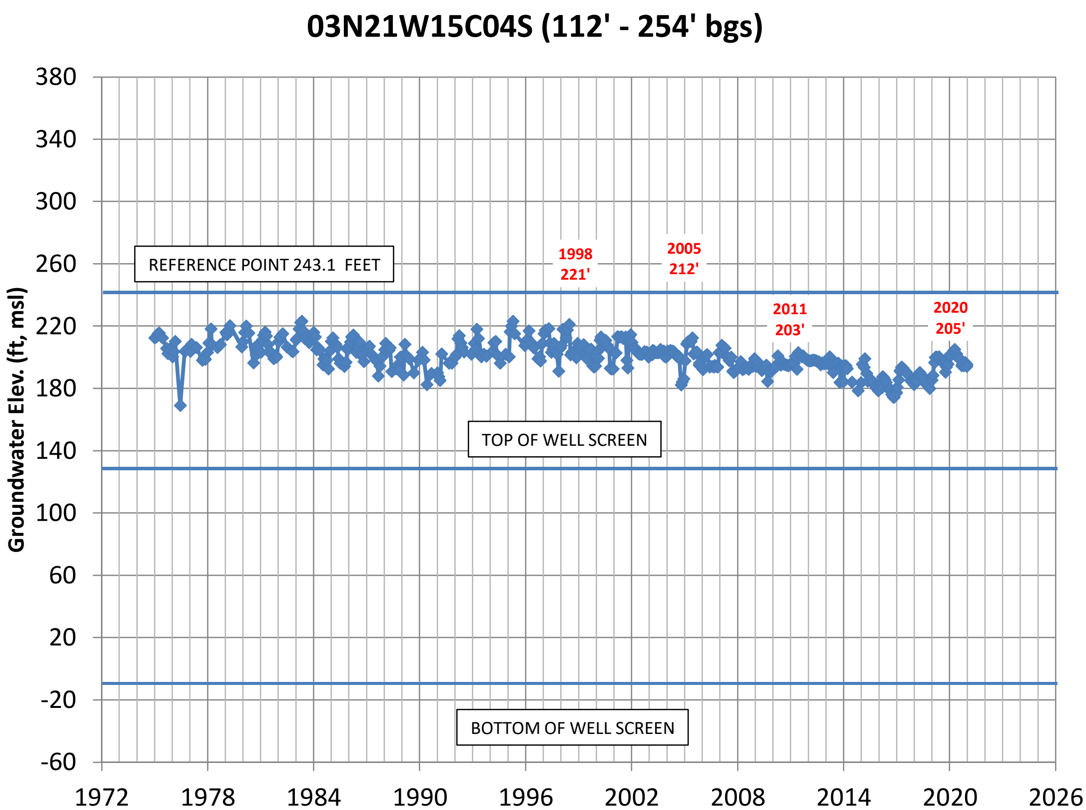

03N21W12F06S (120' - 395' bgs)
Groundwater Elev. (ft, msl)
RP = 281.54
2005
272'
2011
269'
2020
no data

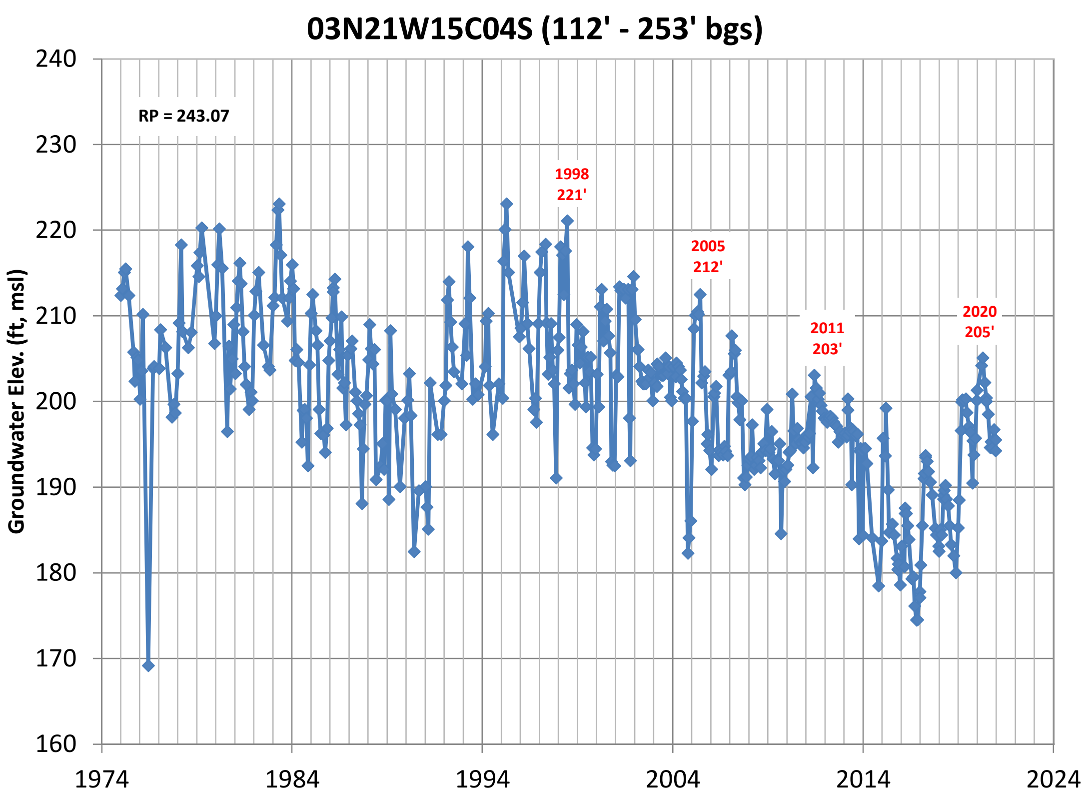

03N21W15C02S (176' - 372' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 243.6 FEET
TOP OF WELL SCREEN
1998
no data
2005
208'
2011
205'
2020
no data
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

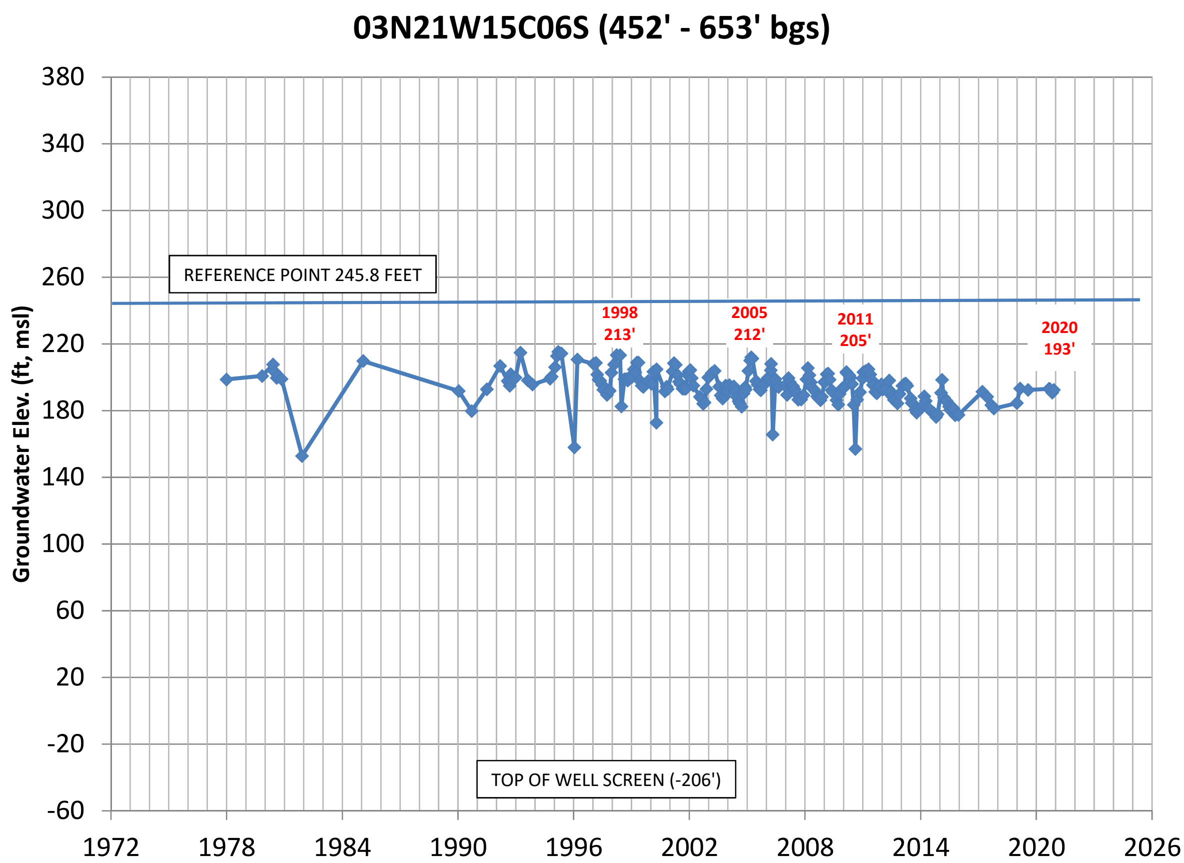

03N21W15C02S (176' - 322' bgs)
Groundwater Elev. (ft, msl)
RP = 243.59
1998
no data
2005
208'
2011
205'
2020
no data
240
230
220
210
200
190
180
170
160
1976
1986
1996
2006
2016
2026

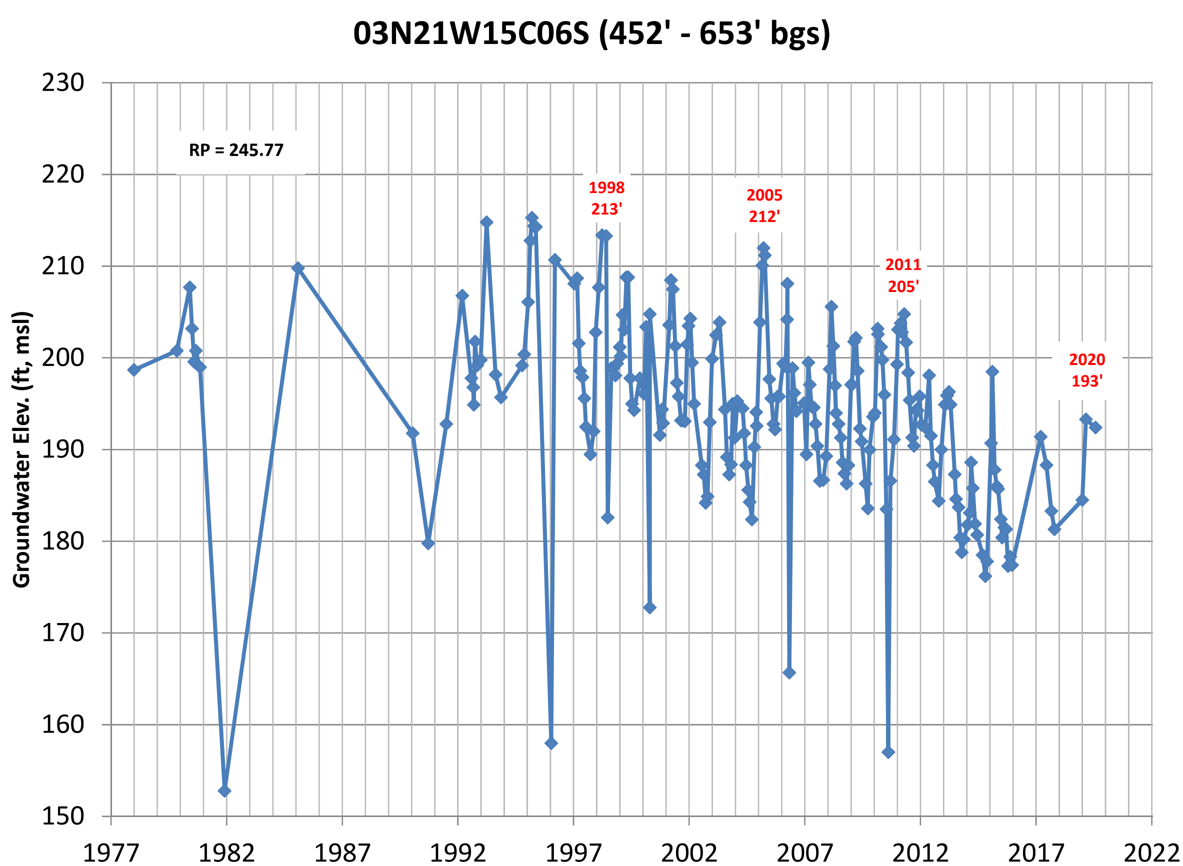
Intentionally Left Blank

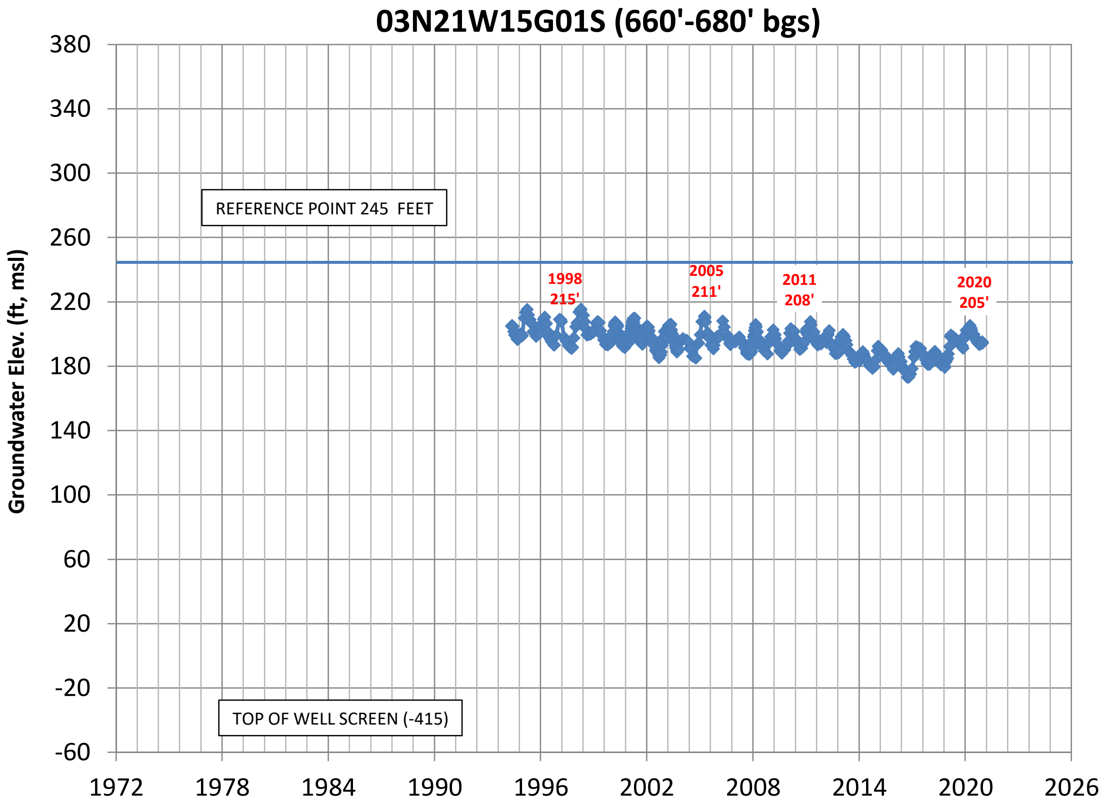



03N21W15C04S (112' - 254' bgs)
REFERENCE POINT 243.1 FEET
1998
221'
2005
212'
2011
203'
2020
205'
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

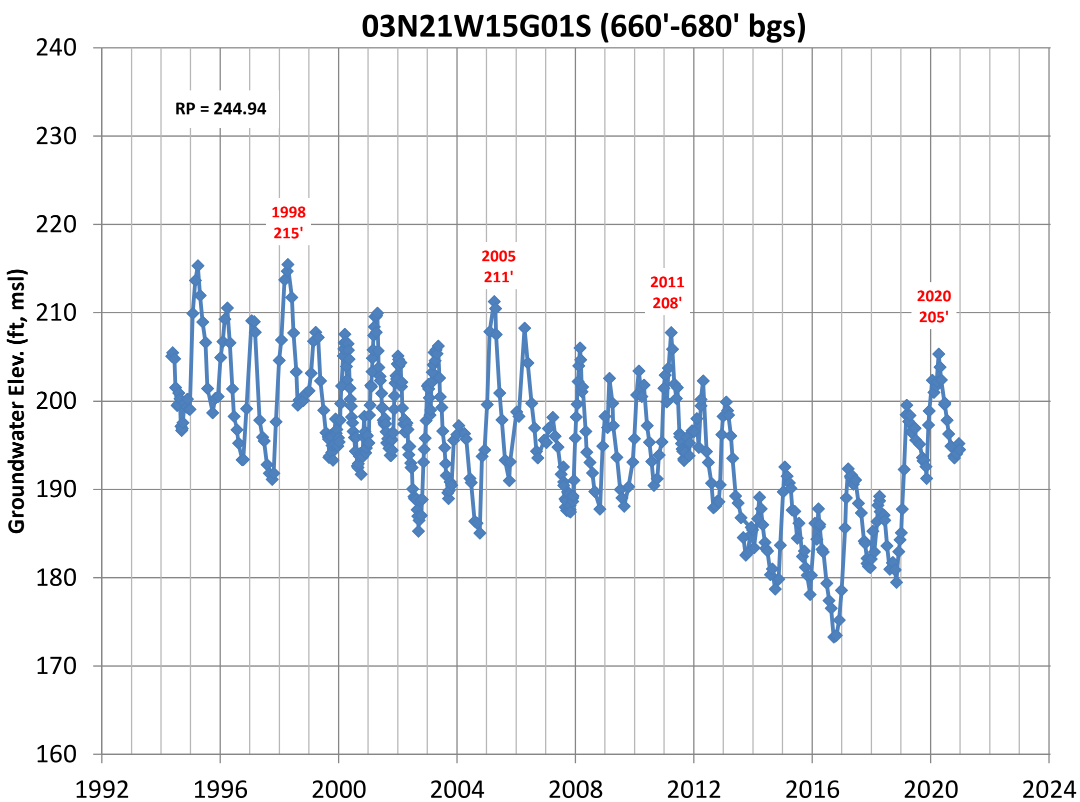

03N21W15C04S (112' - 253' bgs)
RP = 243.07
1998
221'
2005
212'
2011
203'
2020
205'
Groundwater Elev. (ft, msl)
240
230
220
210
200
190
180
170
160
1974
1984
1994
2004
2014
2024


03N21W15C06S (452' - 653' bgs)
REFERENCE POINT 245.8 FEET
1998
213'
2005
212'
2011
205'
2020
193'
TOP OF WELL SCREEN (-206')
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

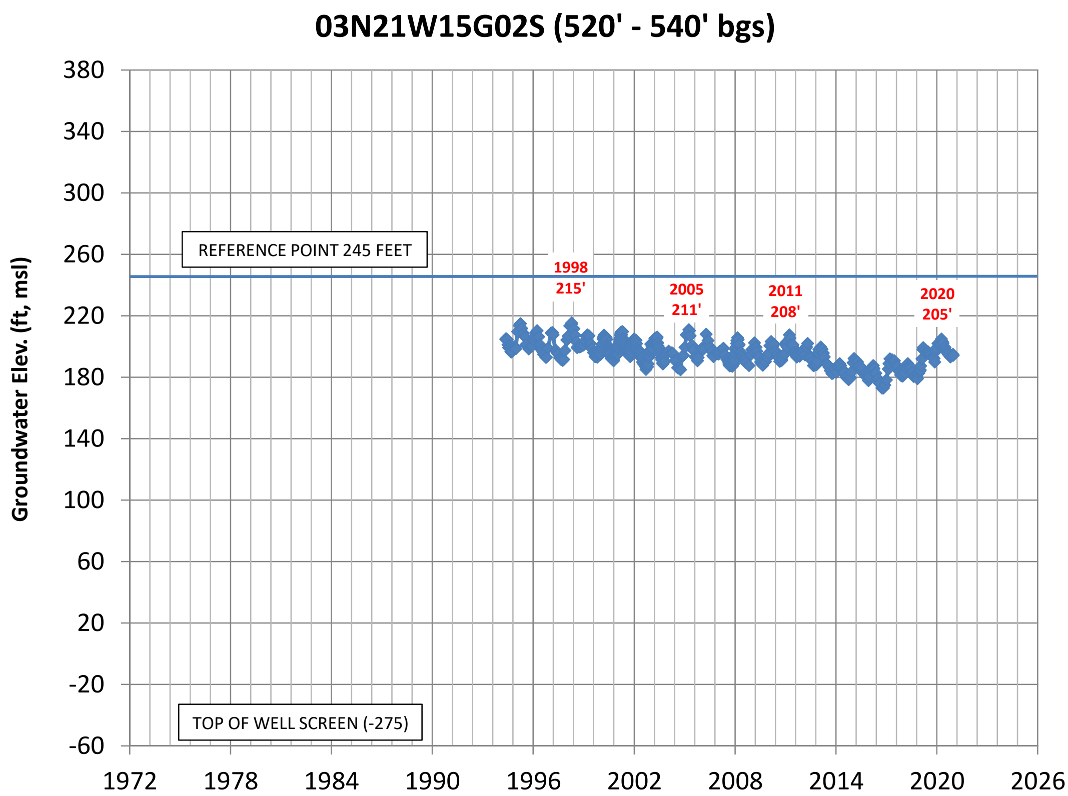

03N21W15C06S (452' - 653' bgs)
RP = 245.77
1998
213'
2005
212'
2011
205'
2020
193'
Groundwater Elev. (ft, msl)
230
220
210
200
190
180
170
160
150
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022



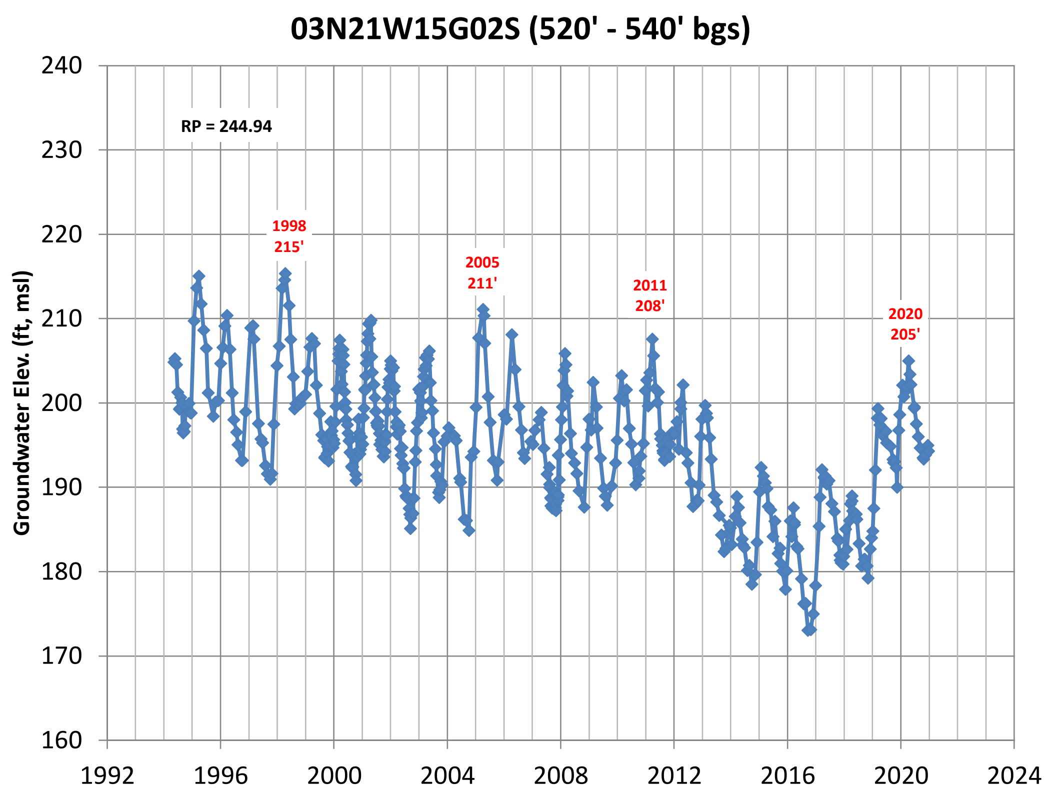
03N21W15G01S (660'-680' bgs)
REFERENCE POINT 245 FEET
TOP OF WELL SCREEN (-415)
Groundwater Elev. (ft, msl)
1998
215'
2005
211'
2011
208'
2020
205'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026



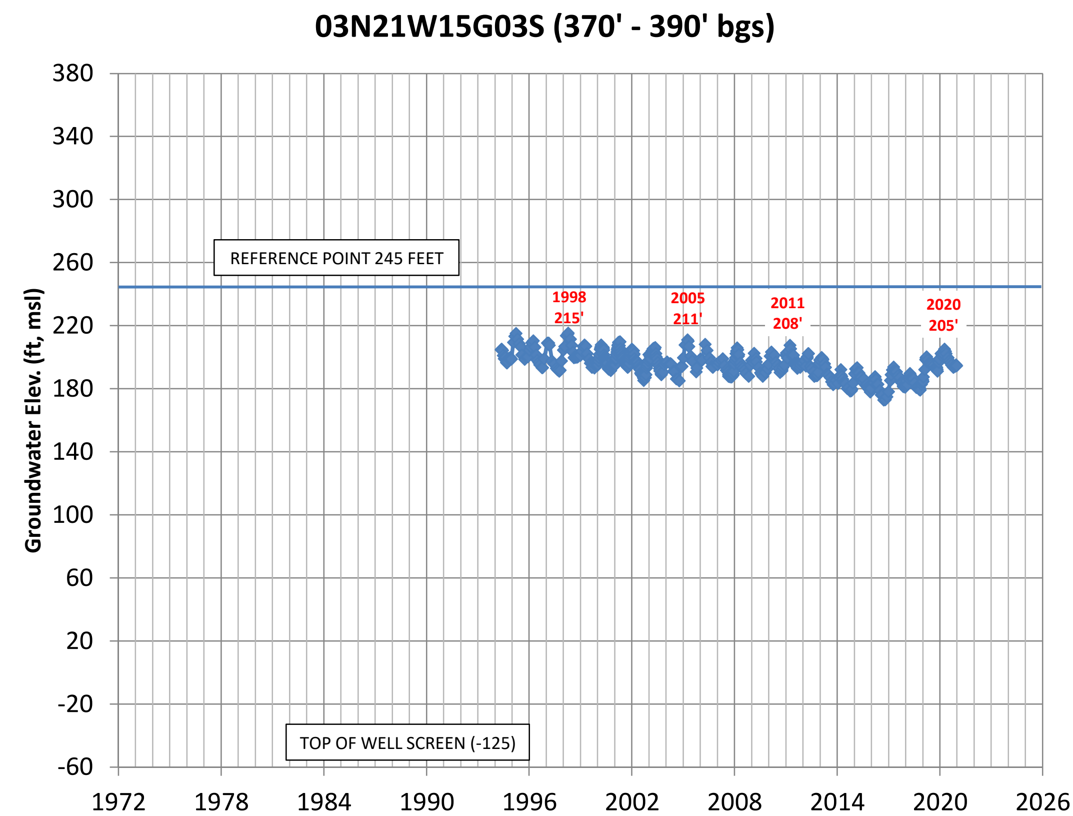
03N21W15G01S (660'-680' bgs)
RP = 244.94
Groundwater Elev. (ft, msl)
1998
215'
2005
211'
2011
208'
2020
205'
240
230
220
210
200
190
180
170
160
1992
1996
2000
2004
2008
2012
2016
2020
2024

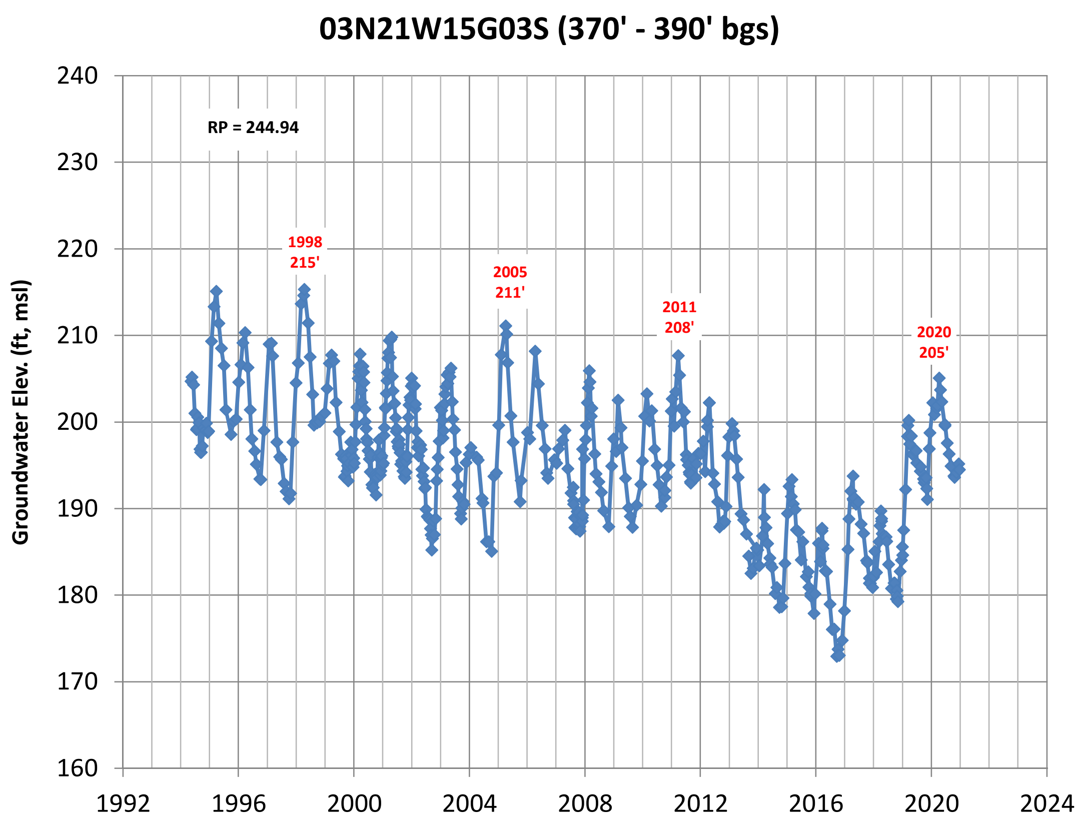


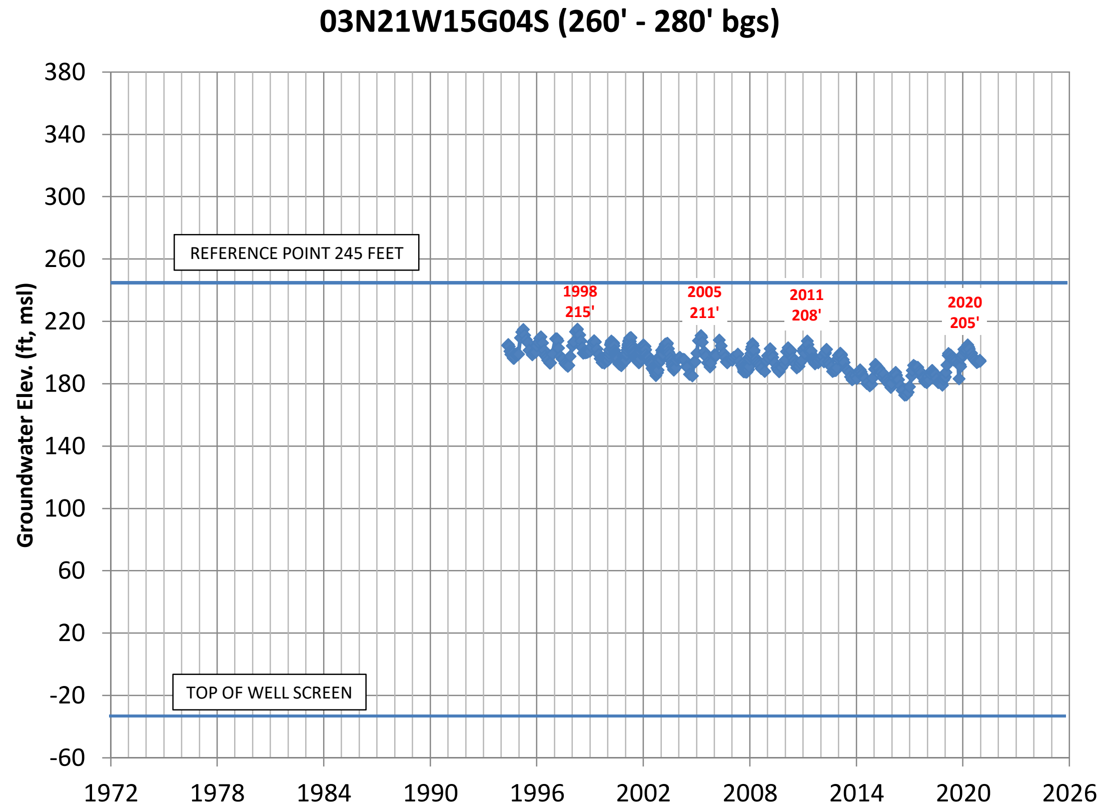
03N21W15G02S (520' - 540' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 245 FEET
TOP OF WELL SCREEN (-275)
1998
215'
2005
211'
2011
208'
2020
205'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026



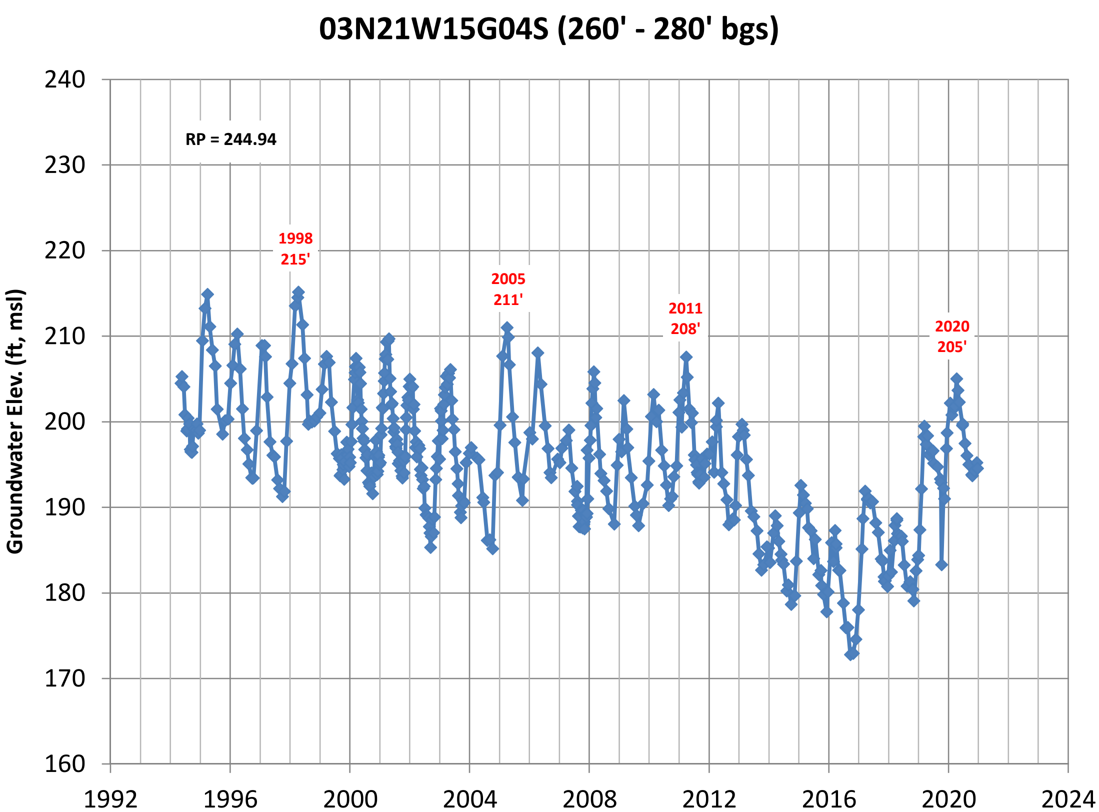
03N21W15G02S (520' - 540' bgs)
Groundwater Elev. (ft, msl)
RP = 244.94
1998
215'
2005
211'
2011
208'
2020
205'
240
230
220
210
200
190
180
170
160
1992
1996
2000
2004
2008
2012
2016
2020
2024


03N21W15G03S (370' - 390' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 245 FEET
TOP OF WELL SCREEN (-125)
1998
215'
2005
211'
2011
208'
2020
205'

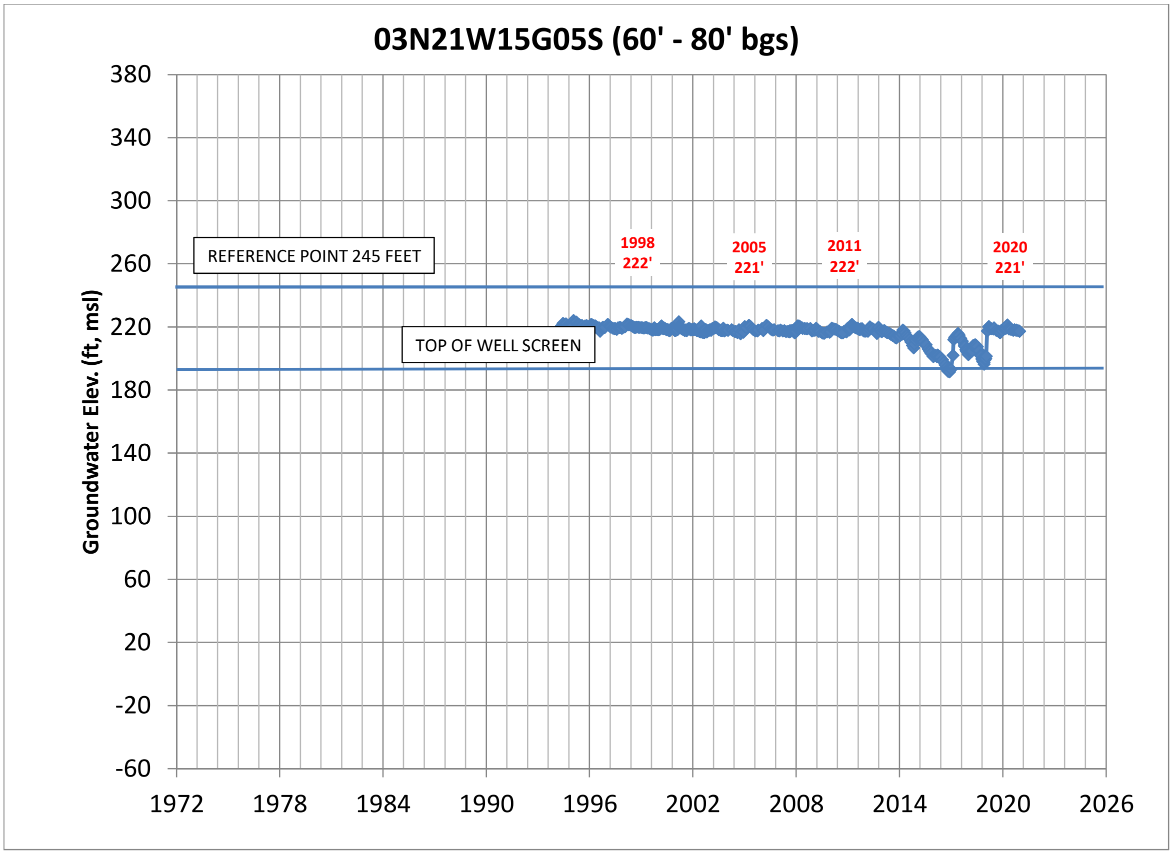

03N21W15G03S (370' - 390' bgs)
Groundwater Elev. (ft, msl)
RP = 244.94
1998
215'
2005
211'
2011
208'
2020
205'

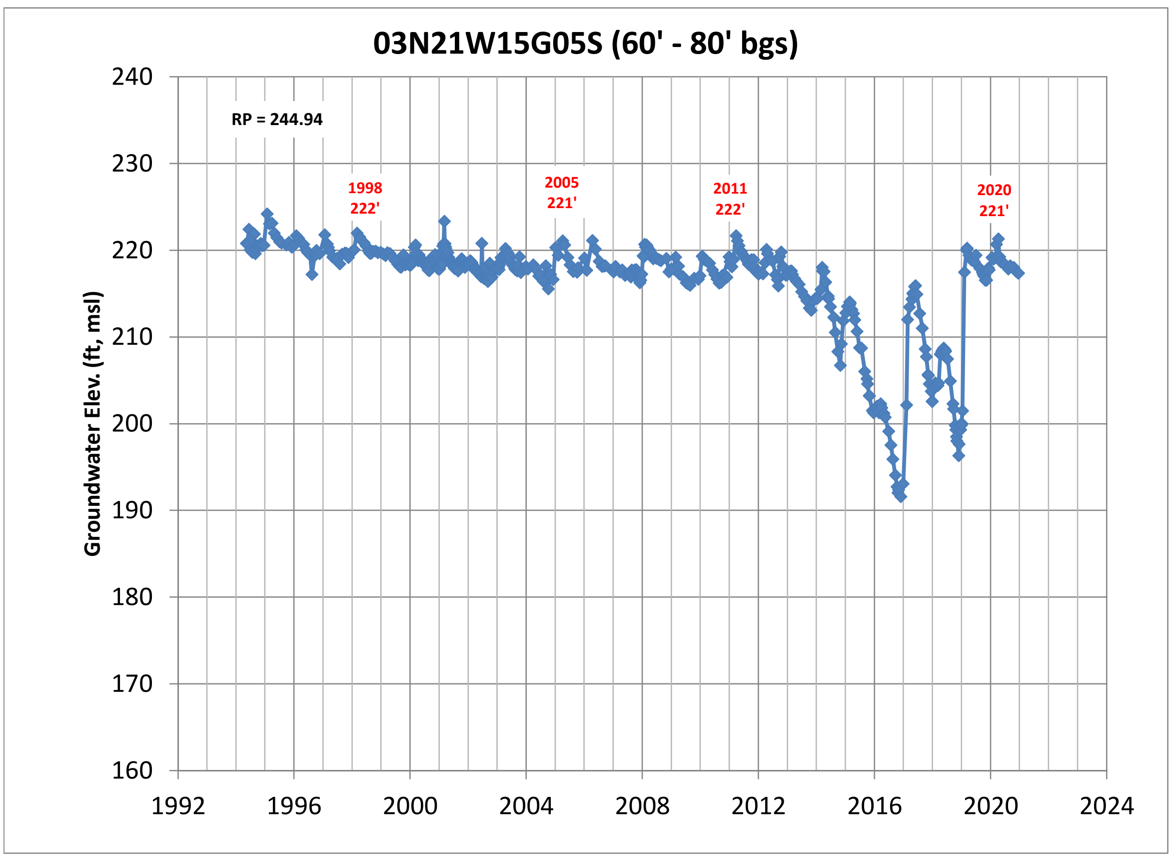


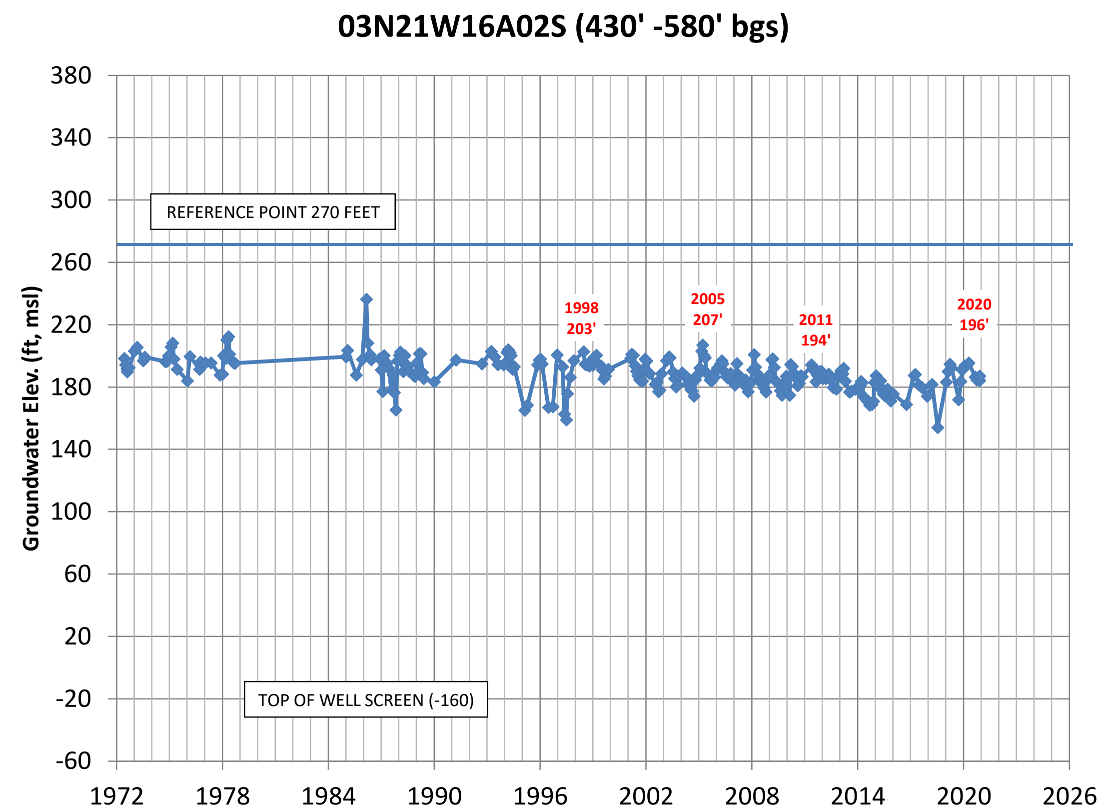
03N21W15G04S (260' - 280' bgs)
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026
REFERENCE POINT 245 FEET
TOP OF WELL SCREEN
1998
215'
2005
211'
2011
208'
2020
205'

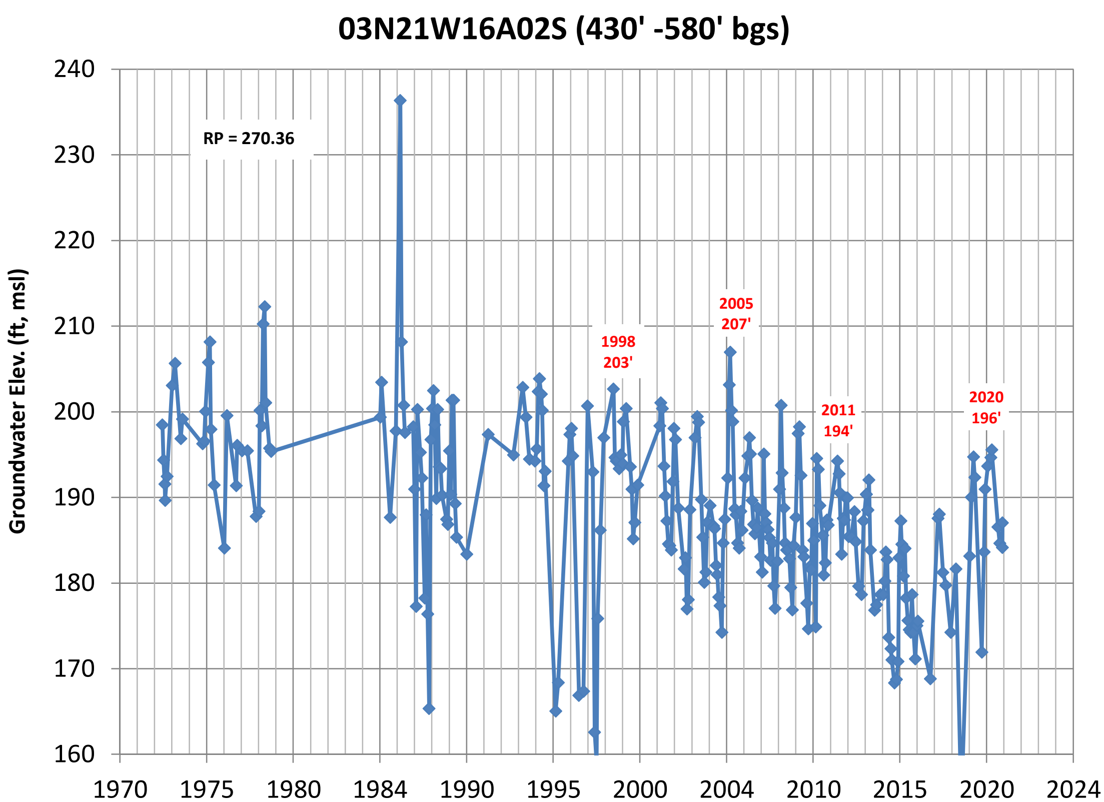


03N21W15G04S (260' - 280' bgs)
Groundwater Elev. (ft, msl)
240
230
220
210
200
190
180
170
160
1992
1996
2000
2004
2008
2012
2016
2020
2024
RP = 244.94
1998
215'
2005
211'
2011
208'
2020
205'

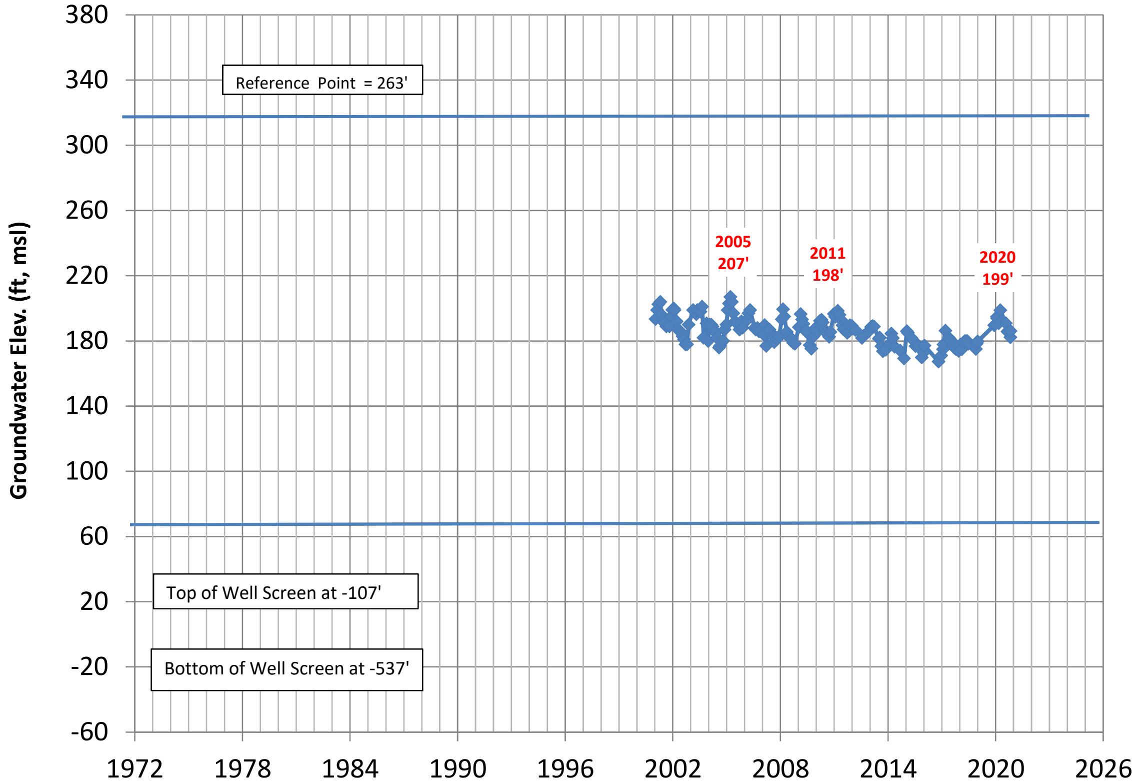

03N21W15G05S (60' - 80' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 245 FEET
TOP OF WELL SCREEN
1998
222'
2005
221'
2011
222'
2020
221'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W15G05S (60' - 80' bgs)
Groundwater Elev. (ft, msl)
RP = 244.94
1998
222'
2005
221'
2011
222'
2020
221'
240
230
220
210
200
190
180
170
160
1992
1996
2000
2004
2008
2012
2016
2020
2024

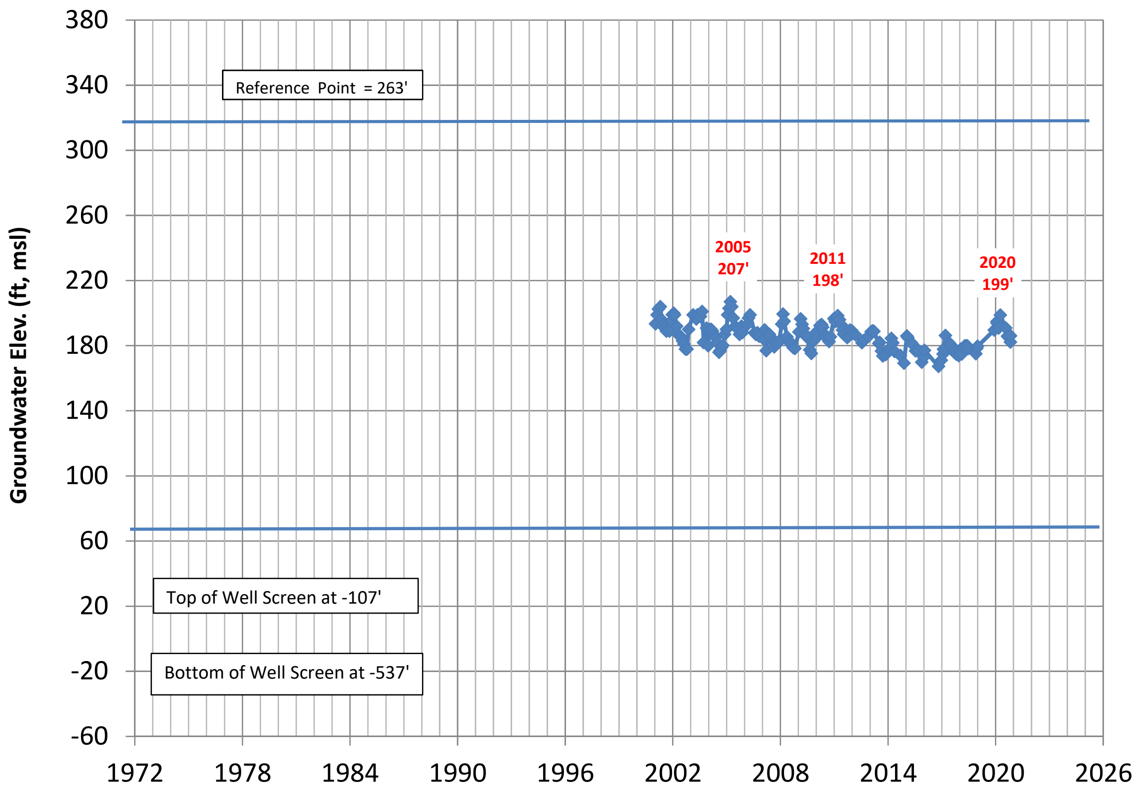

03N21W16A02S (430' -580' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 270 FEET
TOP OF WELL SCREEN (-160)
1998
203'
2005
207'
2011
194'
2020
196'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W16A02S (430' -580' bgs)
Groundwater Elev. (ft, msl)
RP = 270.36
1998
203'
2005
207'
2011
194'
2020
196'
240
230
220
210
200
190
180
170
160
1970
1975
1980
1984
1990
1995
2000
2004
2010
2015
2020
2024

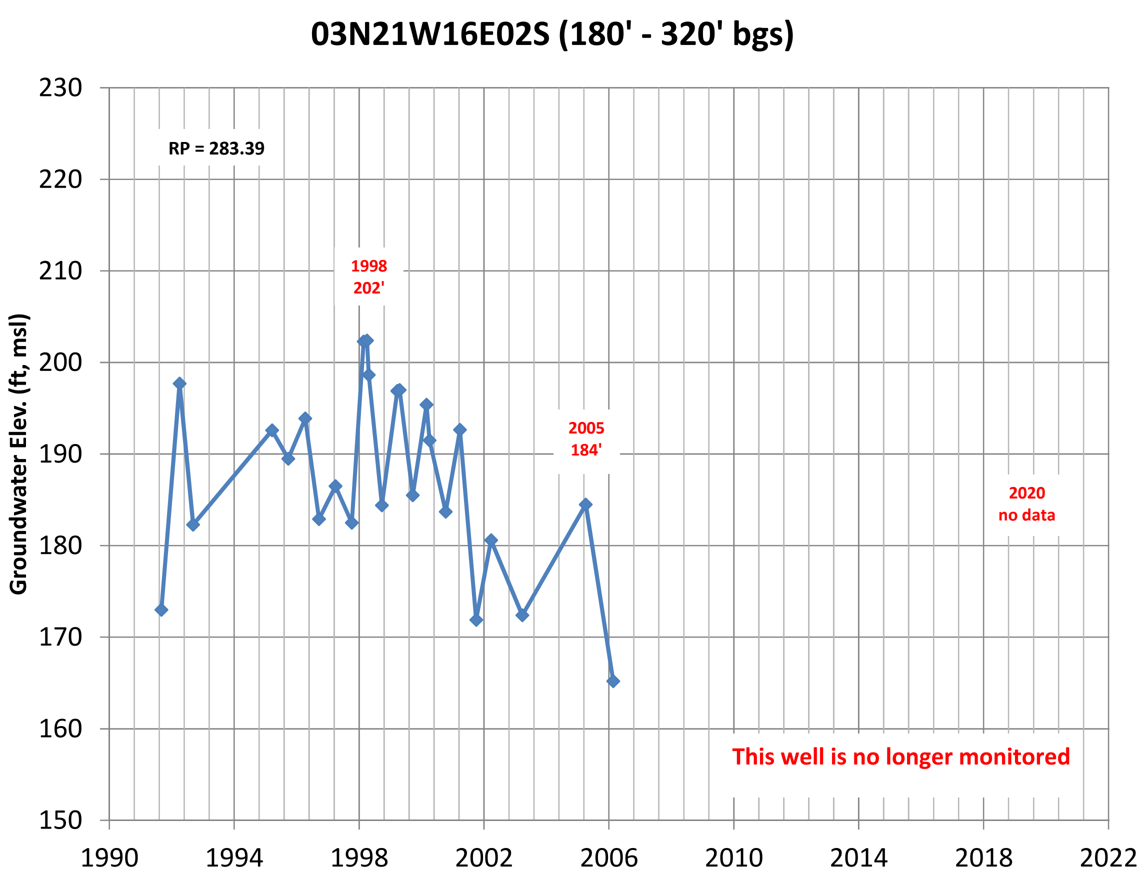
03N21W16A03S (370' - 800' bgs)



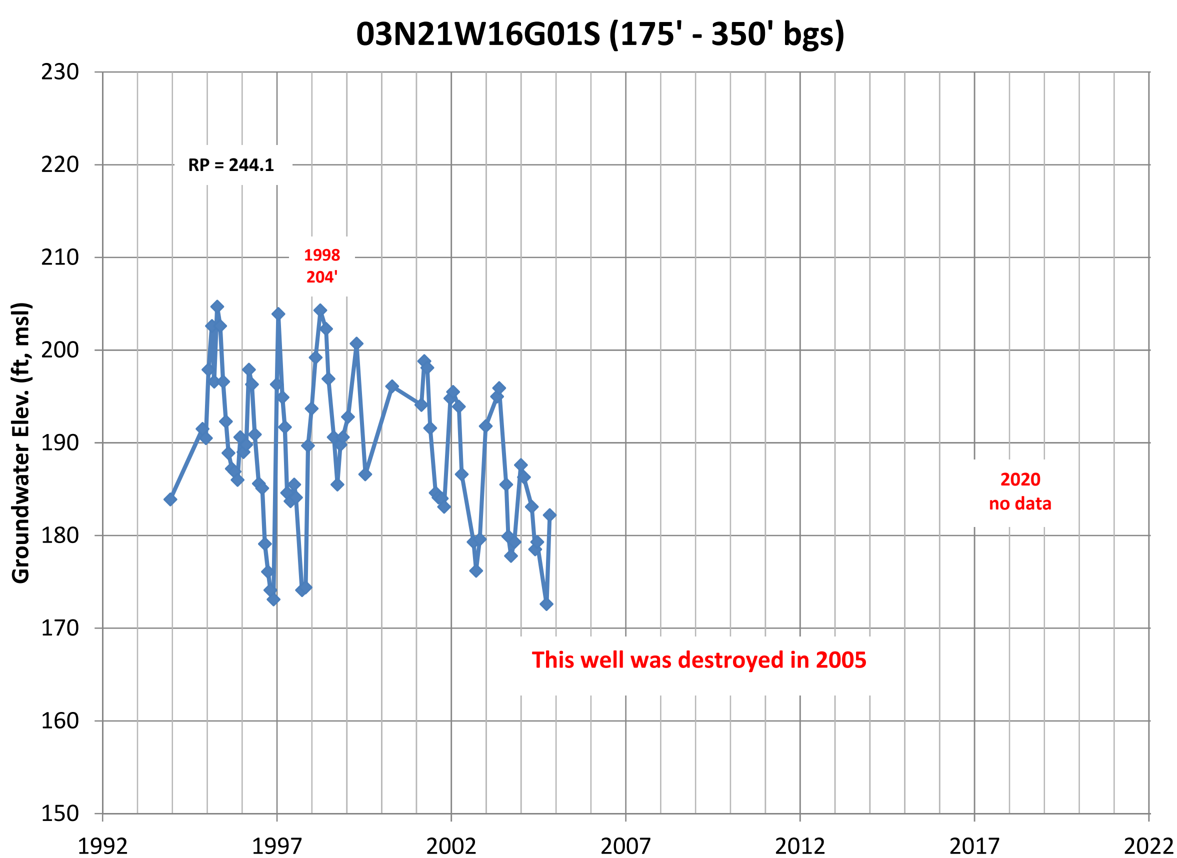
03N21W16A03S (370' - 800' bgs)

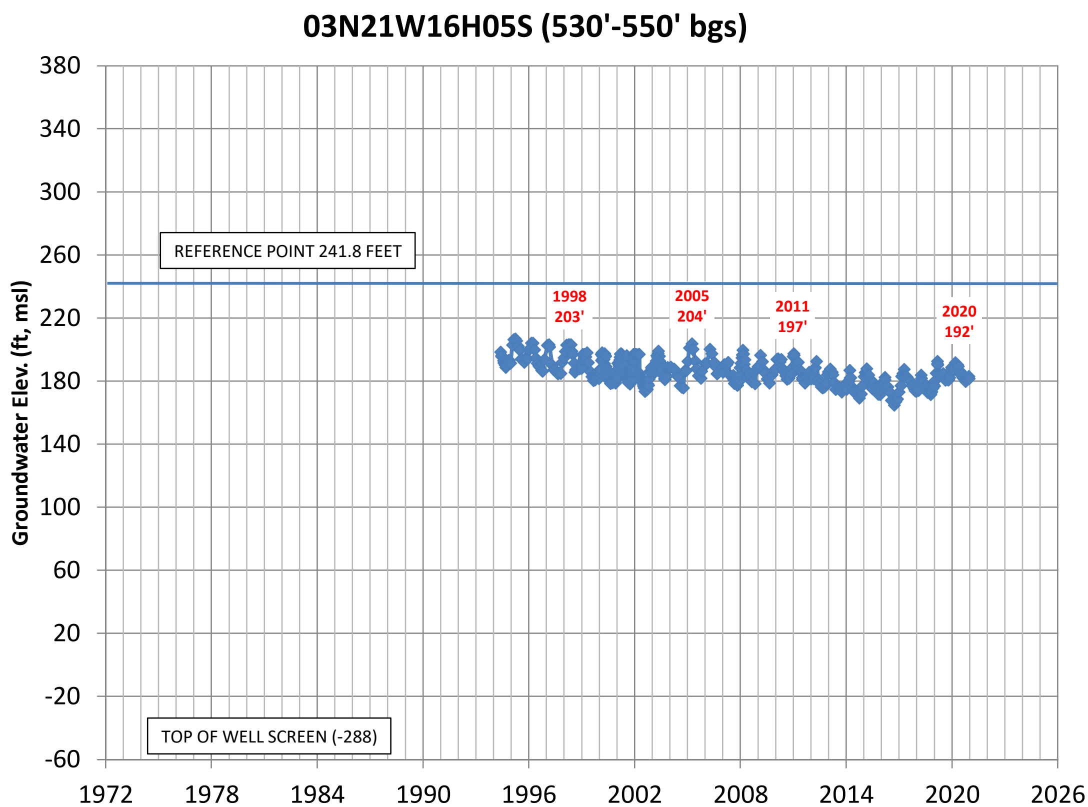


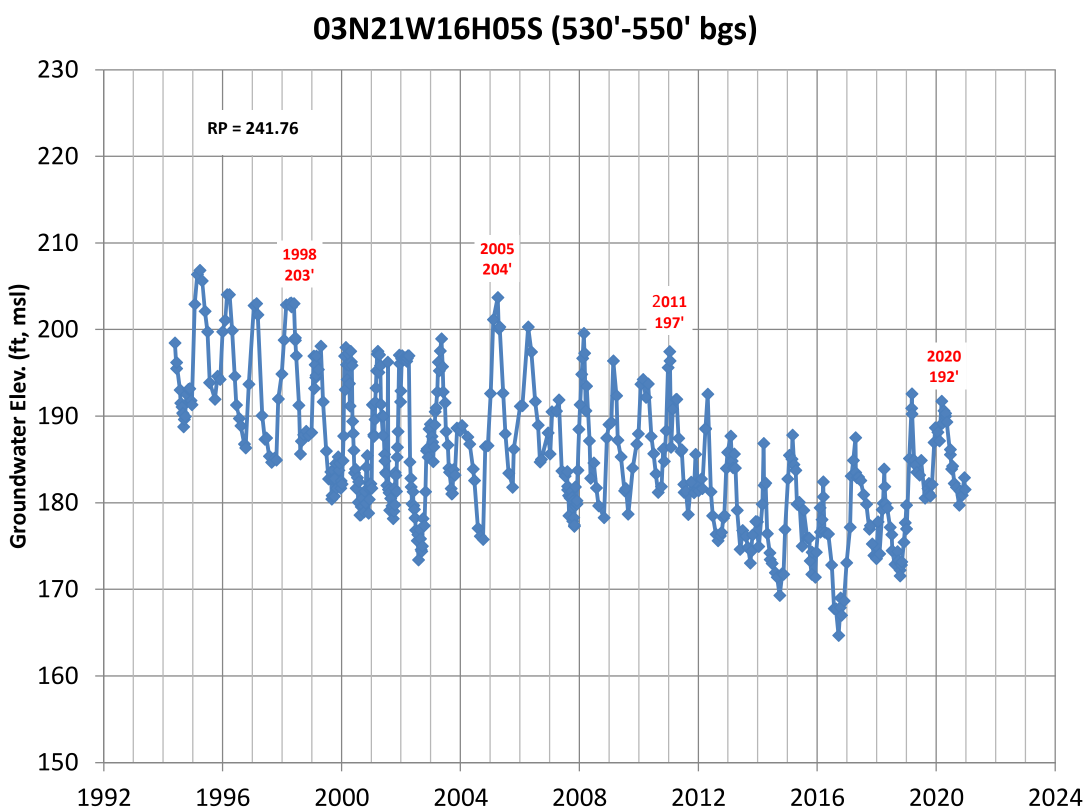
Intentionally Left Blank

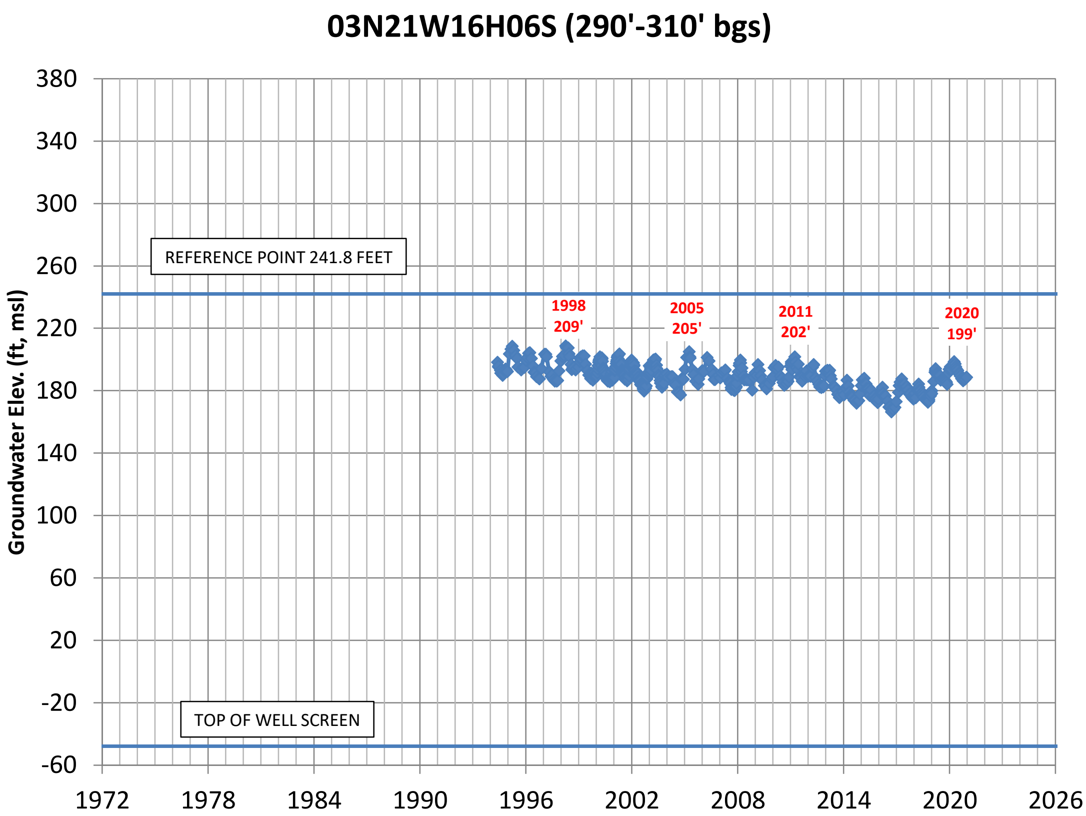


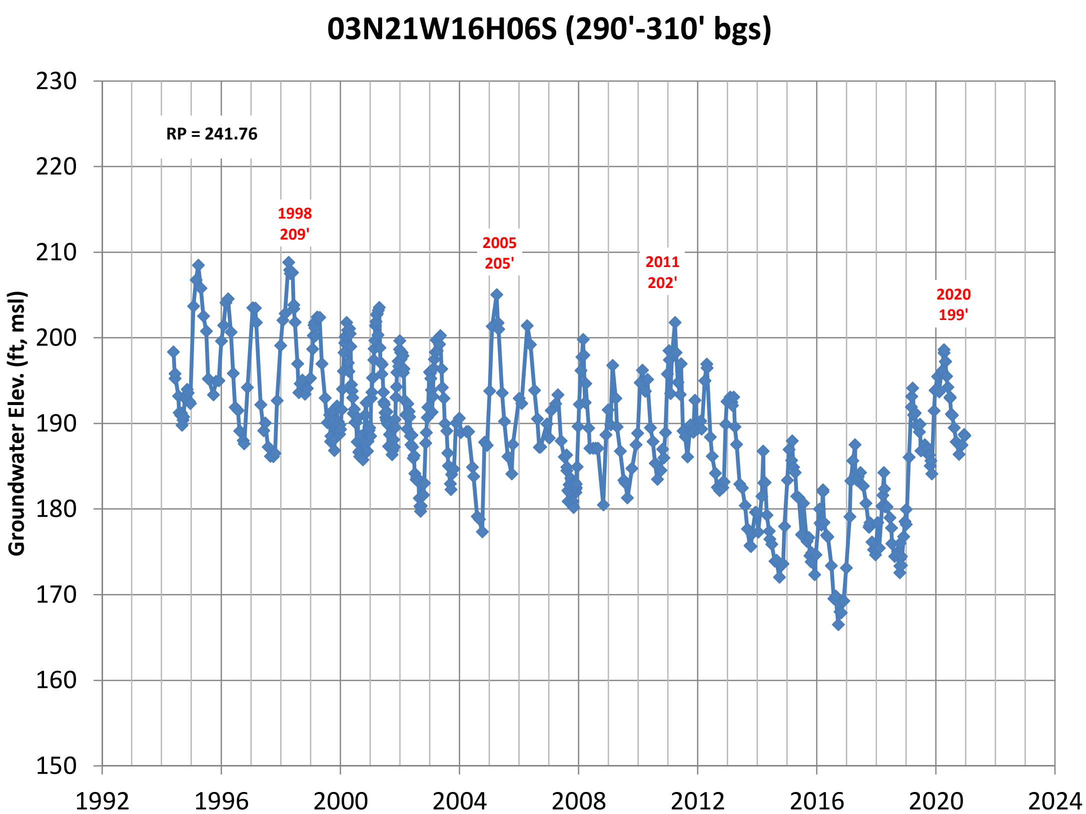
Intentionally Left Blank



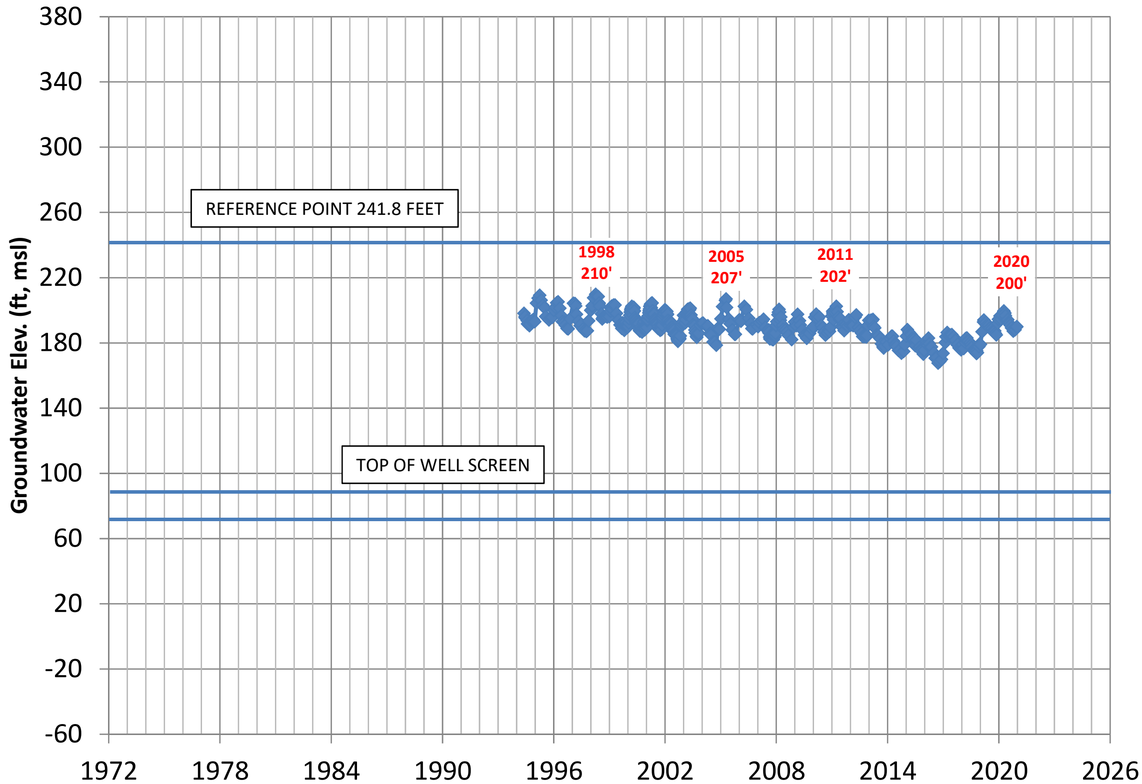

03N21W16H05S (530'-550' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 241.8 FEET
TOP OF WELL SCREEN (-288)
1998
203'
2005
204'
2011
197'
2020
192'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W16H05S (530'-550' bgs)
Groundwater Elev. (ft, msl)
RP = 241.76
1998
203'
2005
204'
2011
197'
2020
192'
230
220
210
200
190
180
170
160
150
1992
1996
2000
2004
2008
2012
2016
2020
2024

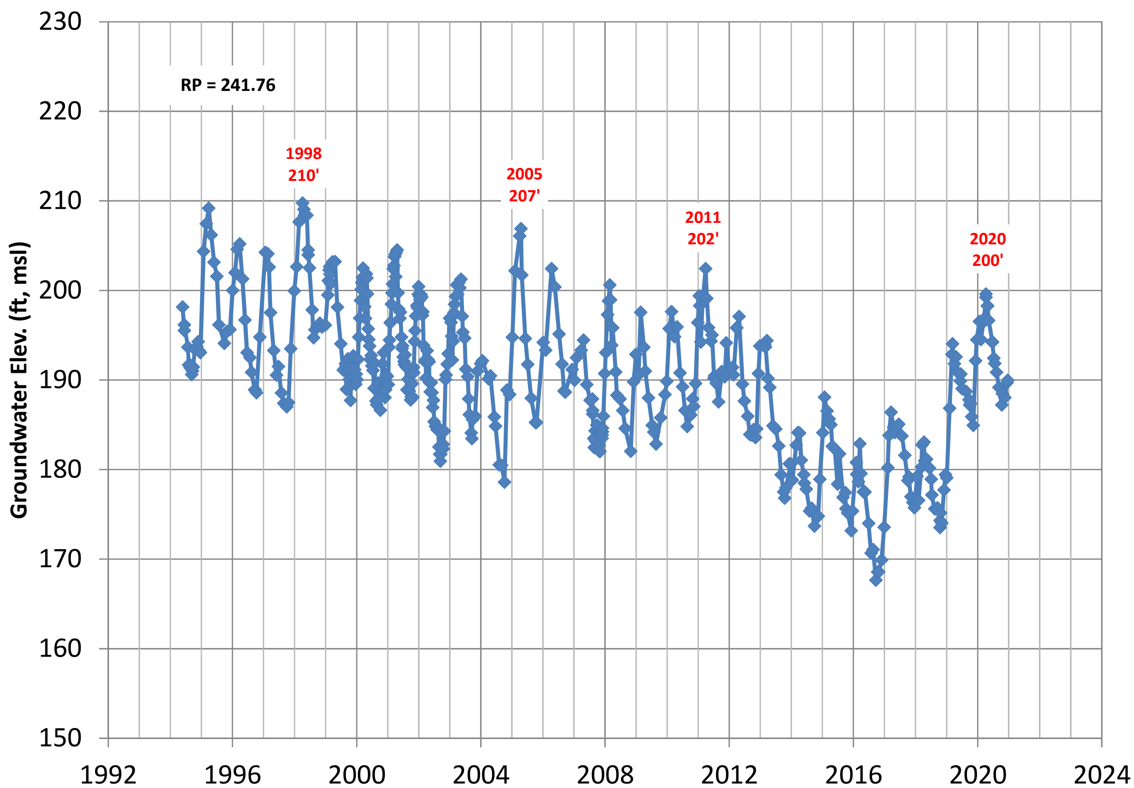

03N21W16H06S (290'-310' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 241.8 FEET
TOP OF WELL SCREEN
1998
209'
2005
205'
2011
202'
2020
199'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

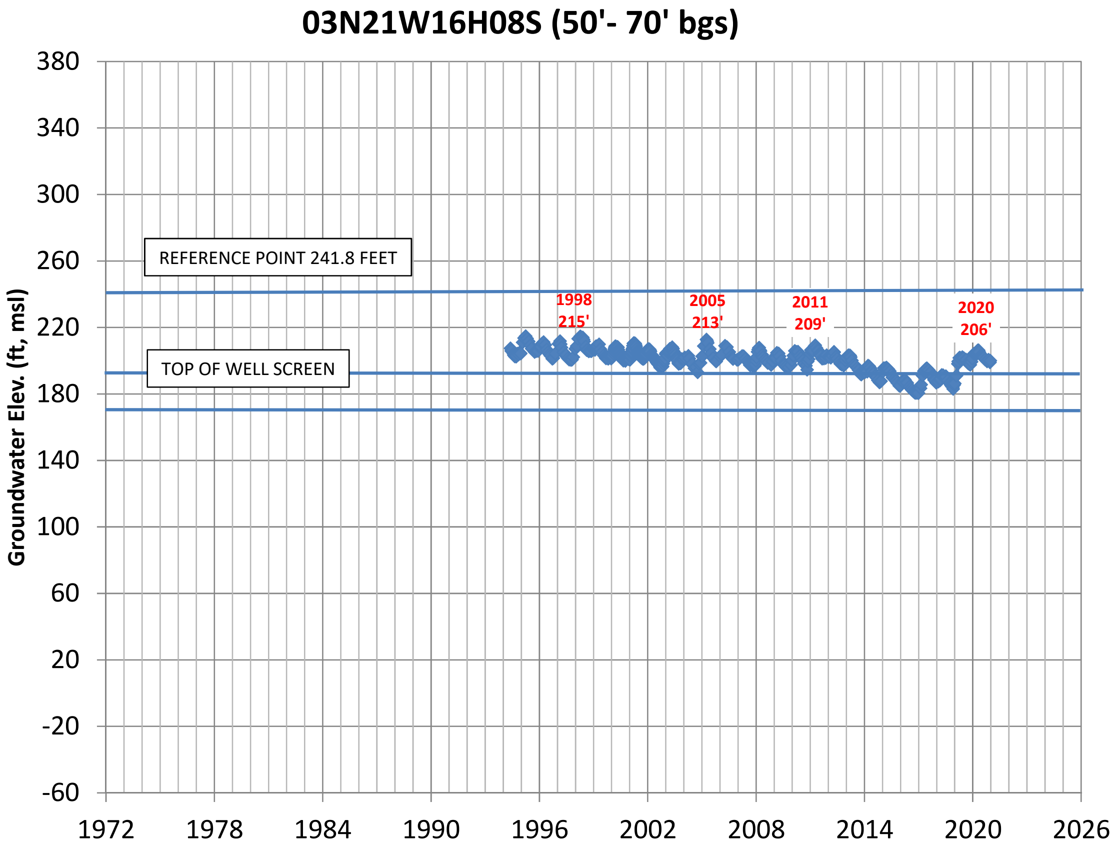

03N21W16H06S (290'-310' bgs)
Groundwater Elev. (ft, msl)
RP = 241.76
1998
209'
2005
205'
2011
202'
2020
199'
230
220
210
200
190
180
170
160
150
1992
1996
2000
2004
2008
2012
2016
2020
2024

03N21W16H07S (150' - 170' bgs)

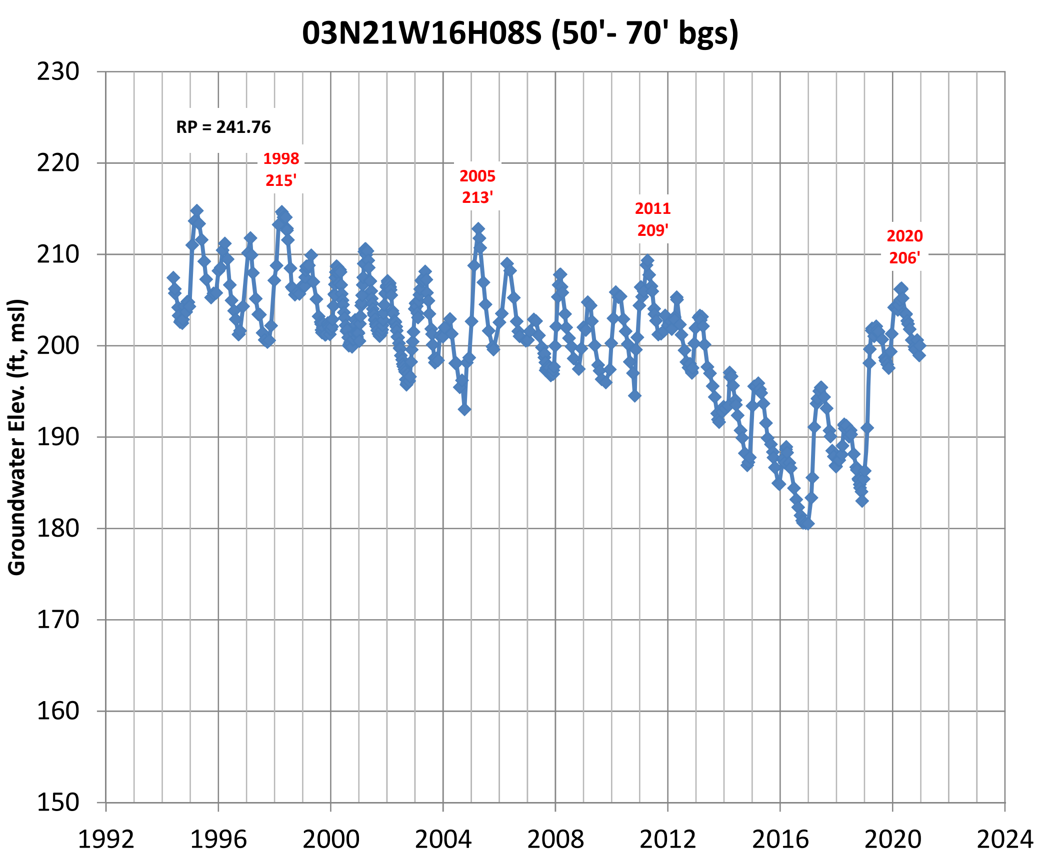


03N21W16H07S (150' - 170' bgs)

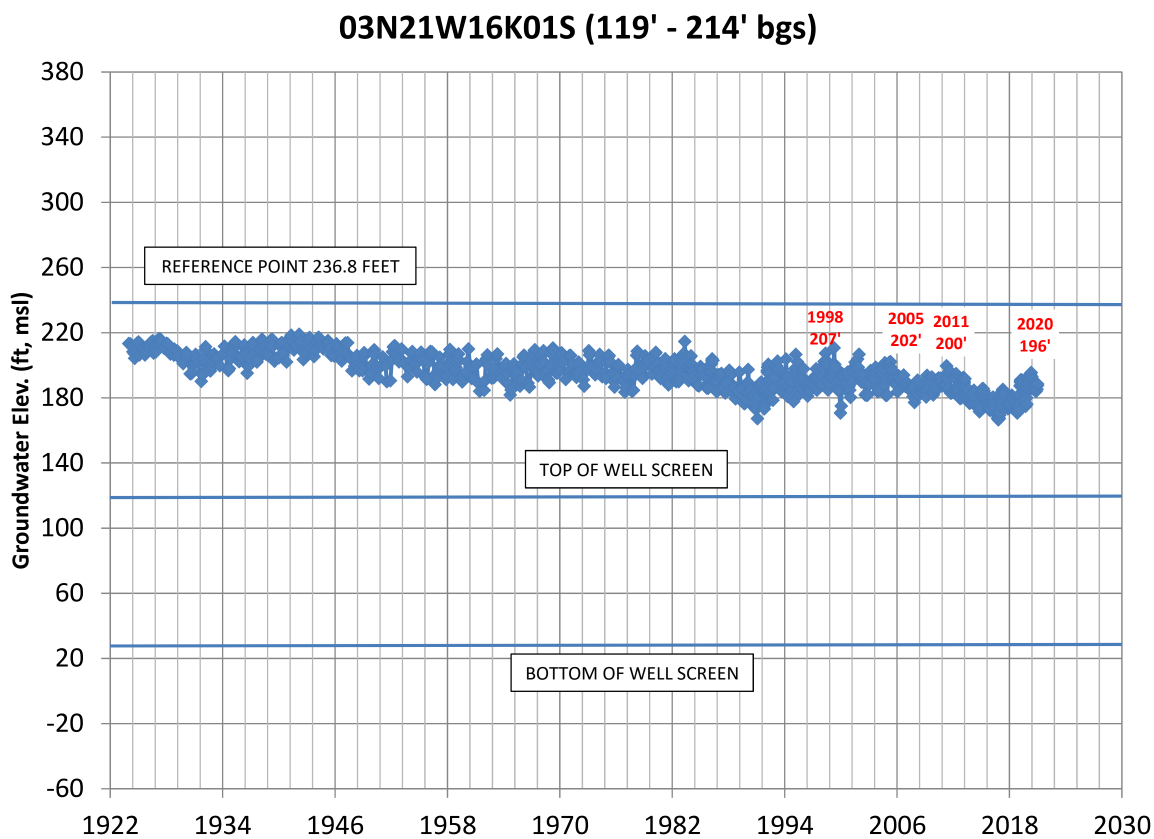


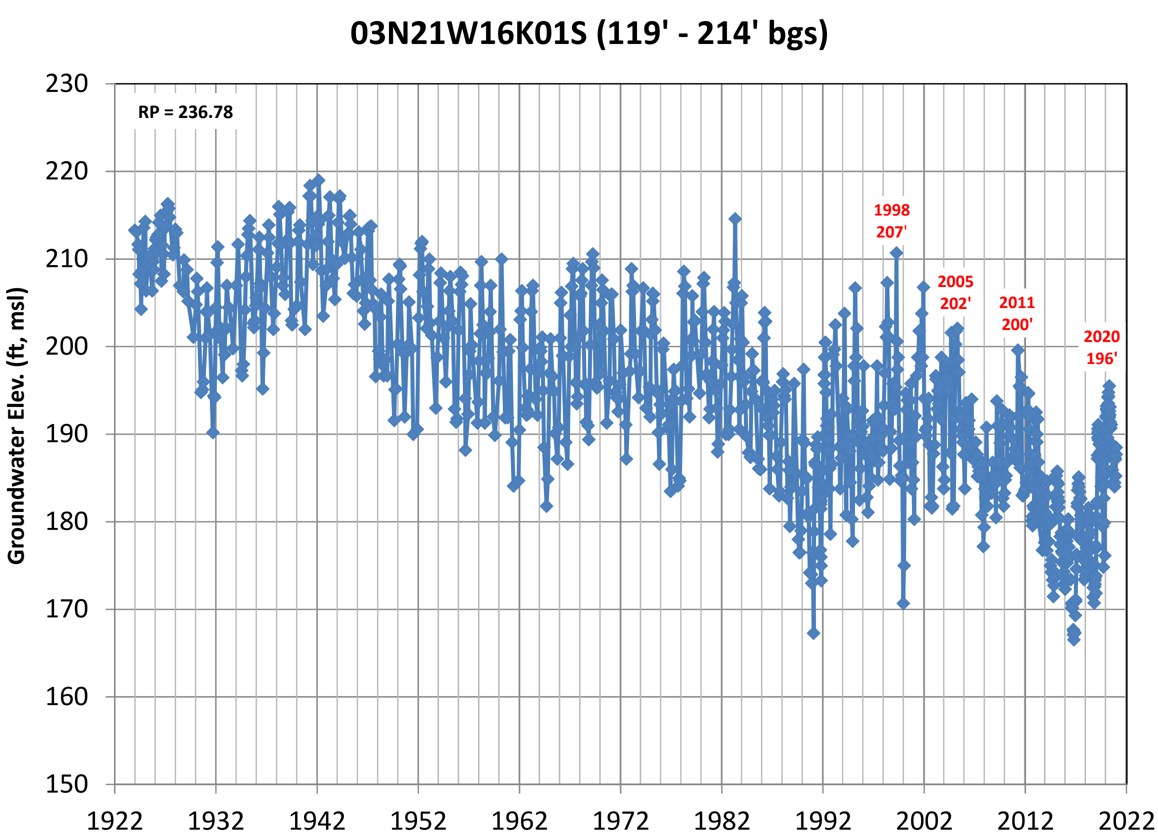


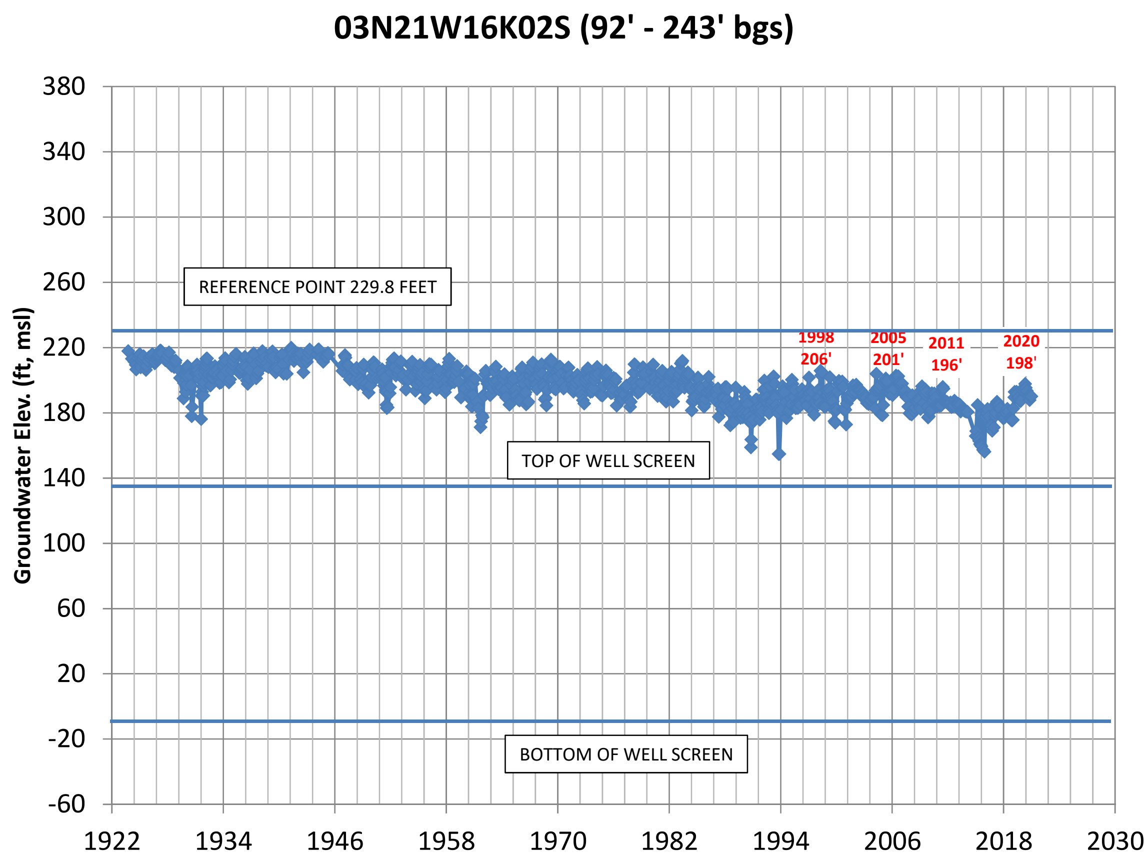
03N21W16H08S (50'- 70' bgs)
REFERENCE POINT 241.8 FEET
TOP OF WELL SCREEN
1998
215'
2005
213'
2011
209'
2020
206'
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

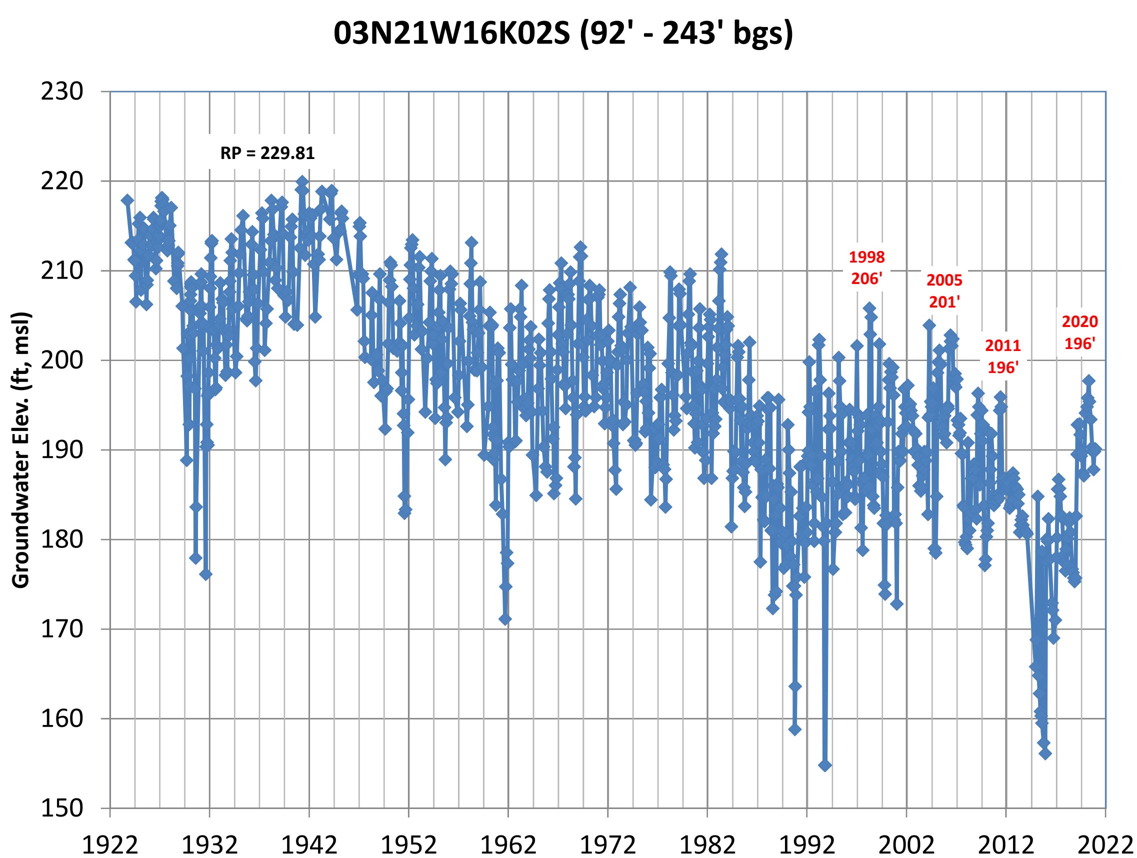


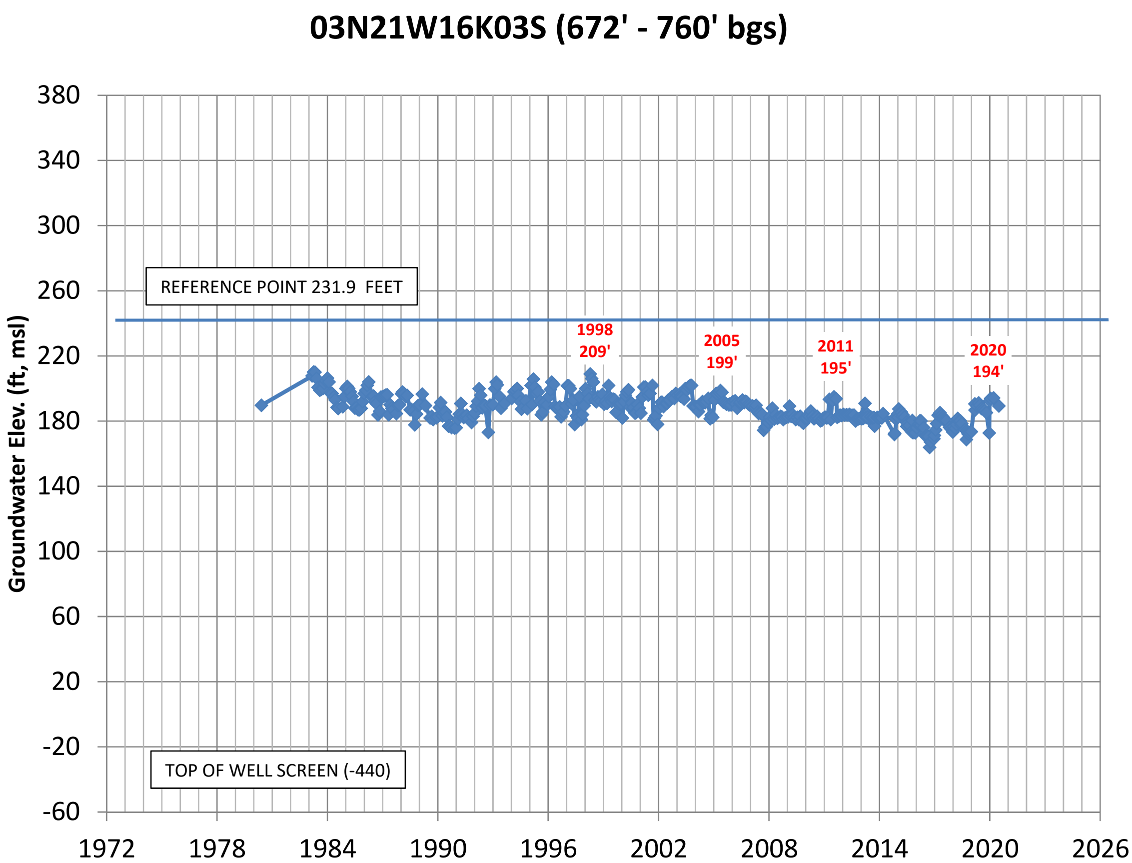
03N21W16H08S (50'- 70' bgs)
RP = 241.76
1998
215'
2005
213'
2011
209'
2020
206'
Groundwater Elev. (ft, msl)
230
220
210
200
190
180
170
160
150
1992
1996
2000
2004
2008
2012
2016
2020
2024

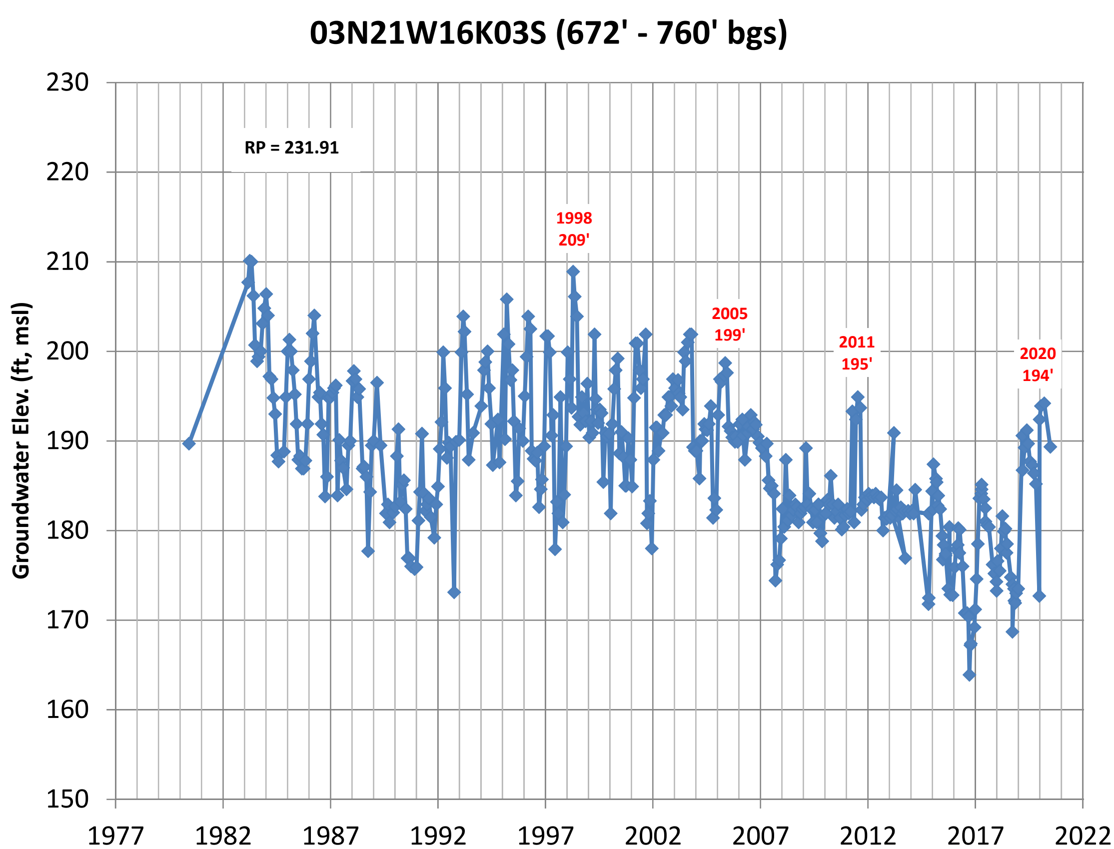

03N21W16K01S (119' - 214' bgs)
REFERENCE POINT 236.8 FEET
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
1998
207'
2005
202'
2011
200'
2020
196'
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1922
1934
1946
1958
1970
1982
1994
2006
2018
2030


03N21W16K01S (119' - 214' bgs)
RP = 236.78
1998
207'
2005
202'
2011
200'
2020
196'
Groundwater Elev. (ft, msl)
230
220
210
200
190
180
170
160
150
1922
1932
1942
1952
1962
1972
1982
1992
2002
2012
2022

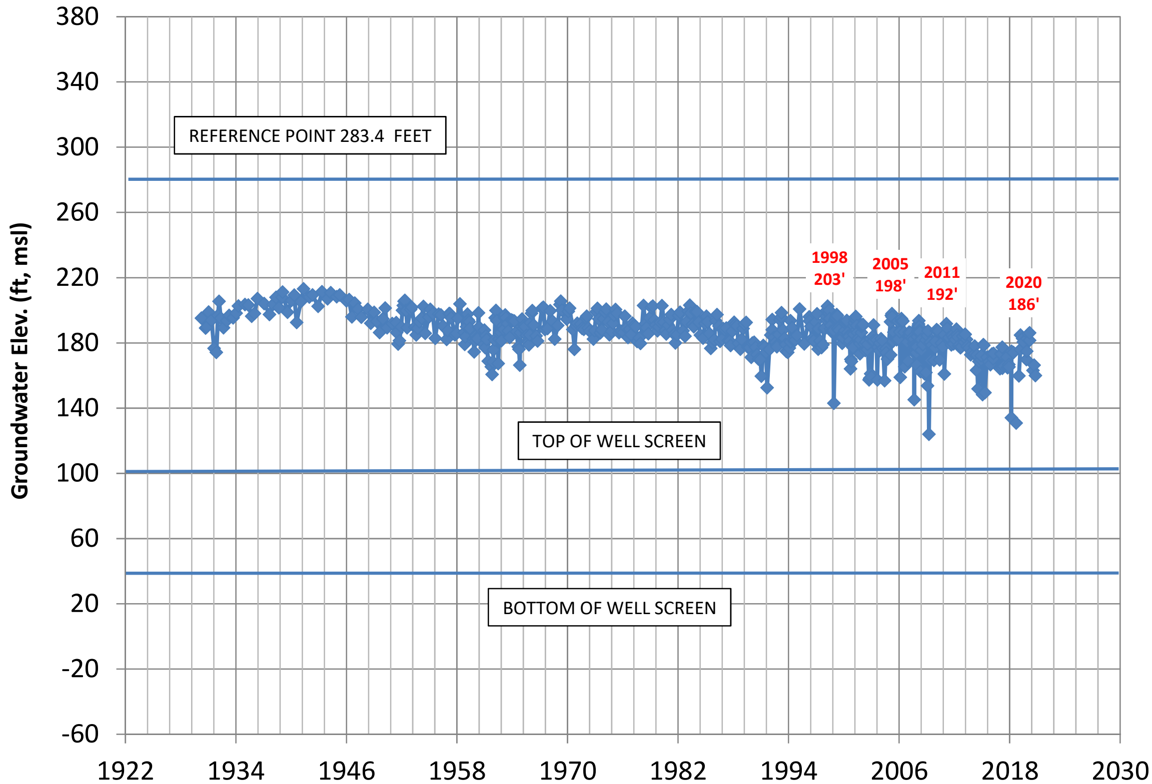

03N21W16K02S (92' - 243' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 229.8 FEET
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
1998
206'
2005
201'
2011
196'
2020
198'
380
340
300
260
220
180
140
100
60
20
-20
-60
1922
1934
1946
1958
1970
1982
1994
2006
2018
2030


03N21W16K02S (92' - 243' bgs)
Groundwater Elev. (ft, msl)
RP = 229.81
1998
206'
2005
201'
2011
196'
2020
196'
230
220
210
200
190
180
170
160
150
1922
1932
1942
1952
1962
1972
1982
1992
2002
2012
2022

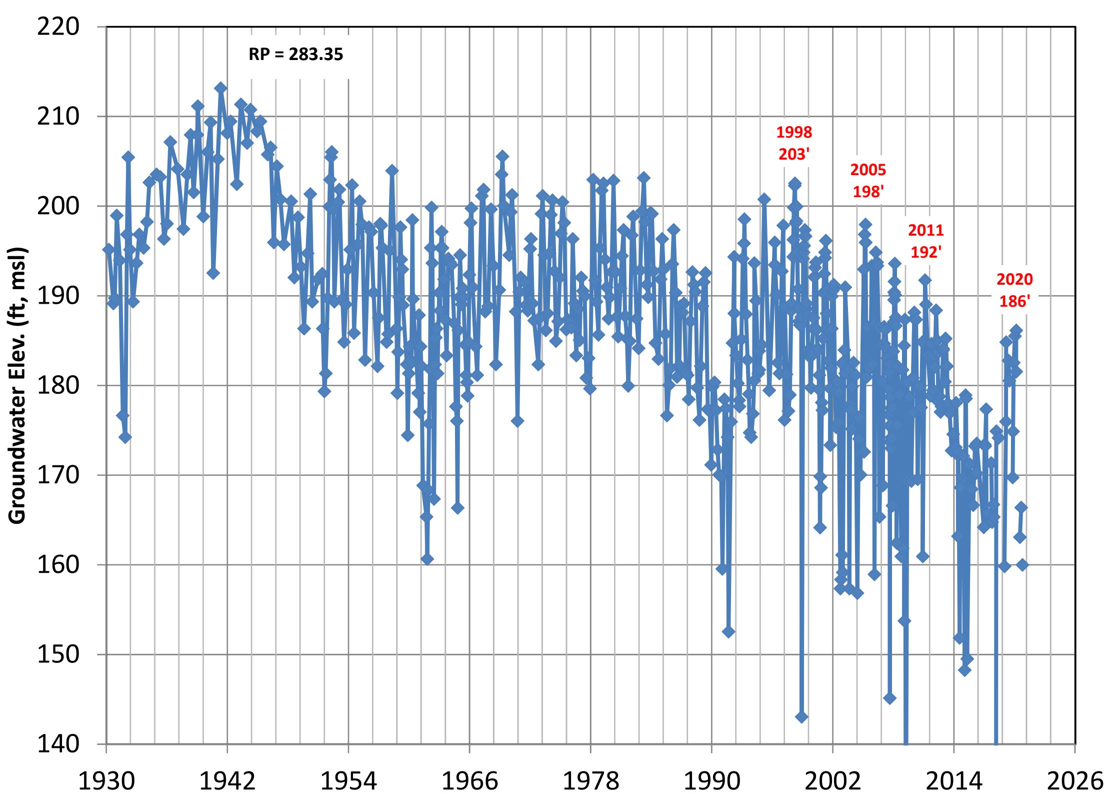

03N21W16K03S (672' - 760' bgs)
REFERENCE POINT 231.9 FEET
TOP OF WELL SCREEN (-440)
Groundwater Elev. (ft, msl)
1998
209'
2005
199'
2011
195'
2020
194'


03N21W16K03S (672' - 760' bgs)
RP = 231.91
Groundwater Elev. (ft, msl)
1998
209'
2005
199'
2011
195'
2020
194'

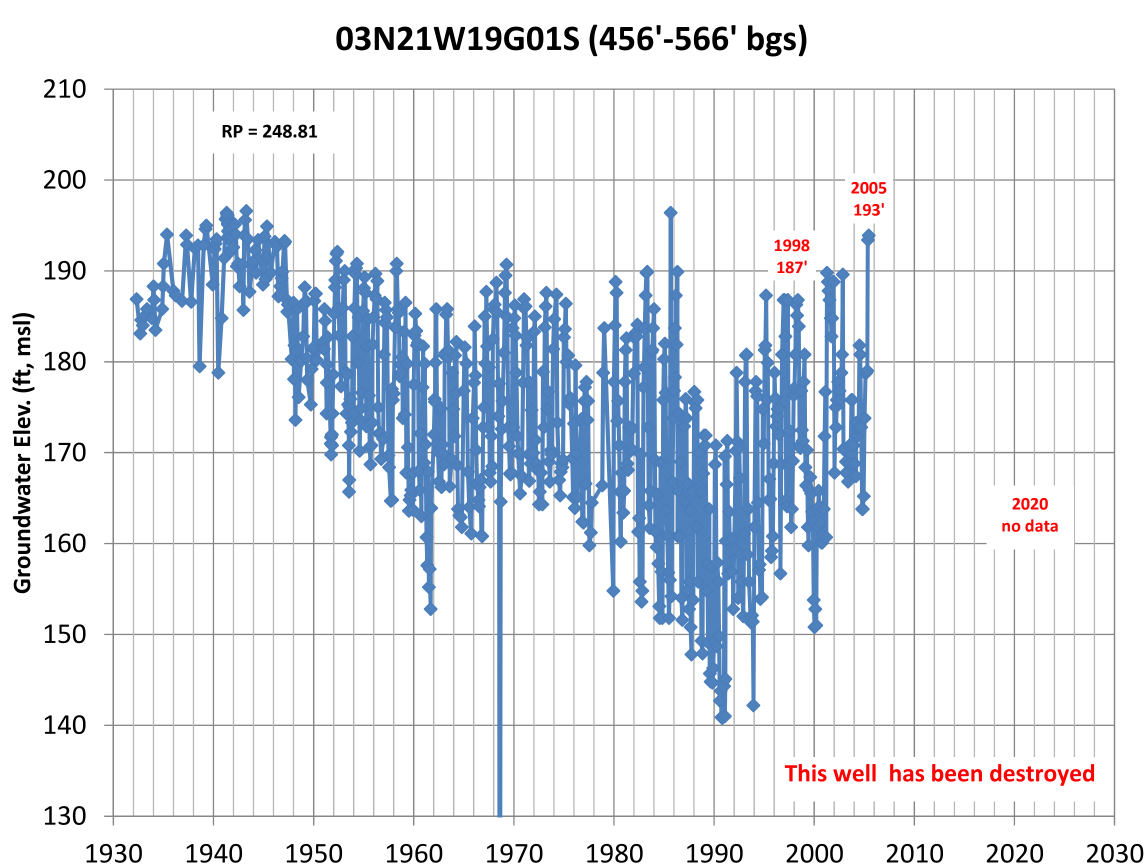
03N21W17Q01S (183' - 243' bgs)



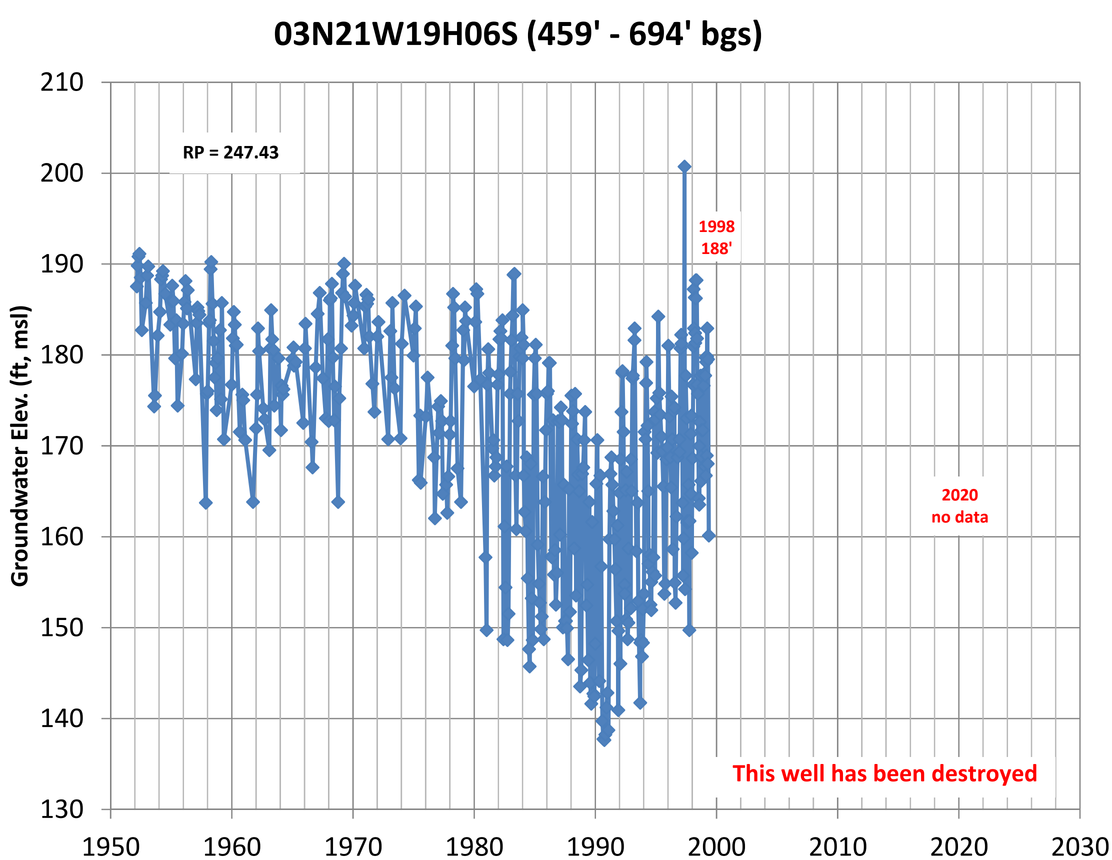
03N21W17Q01S (183' - 243' bgs)

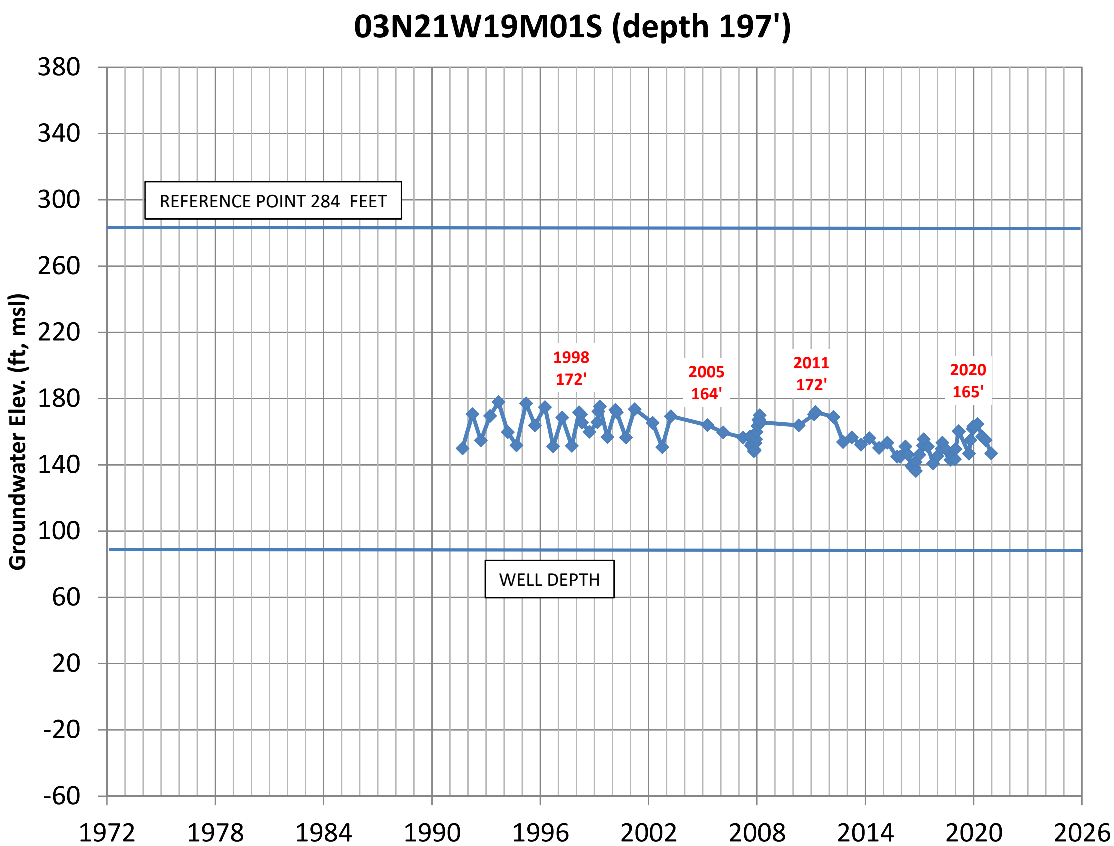


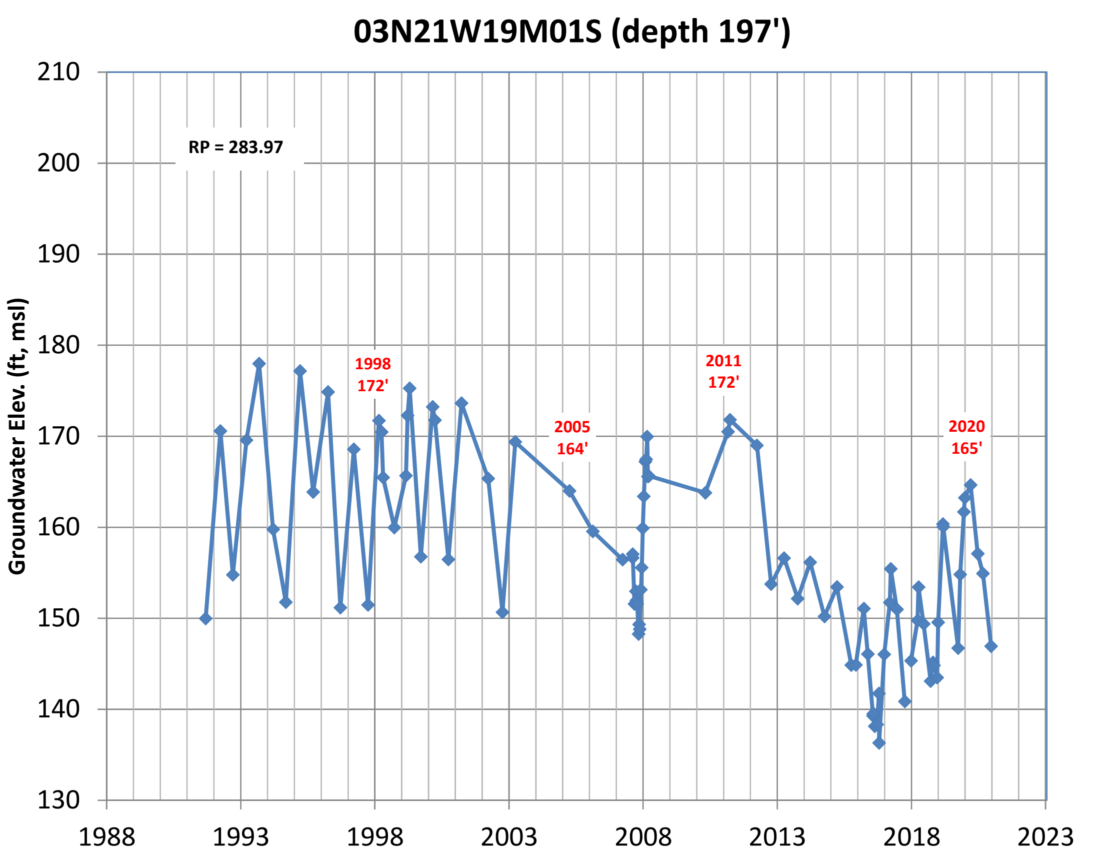
Intentionally Left Blank

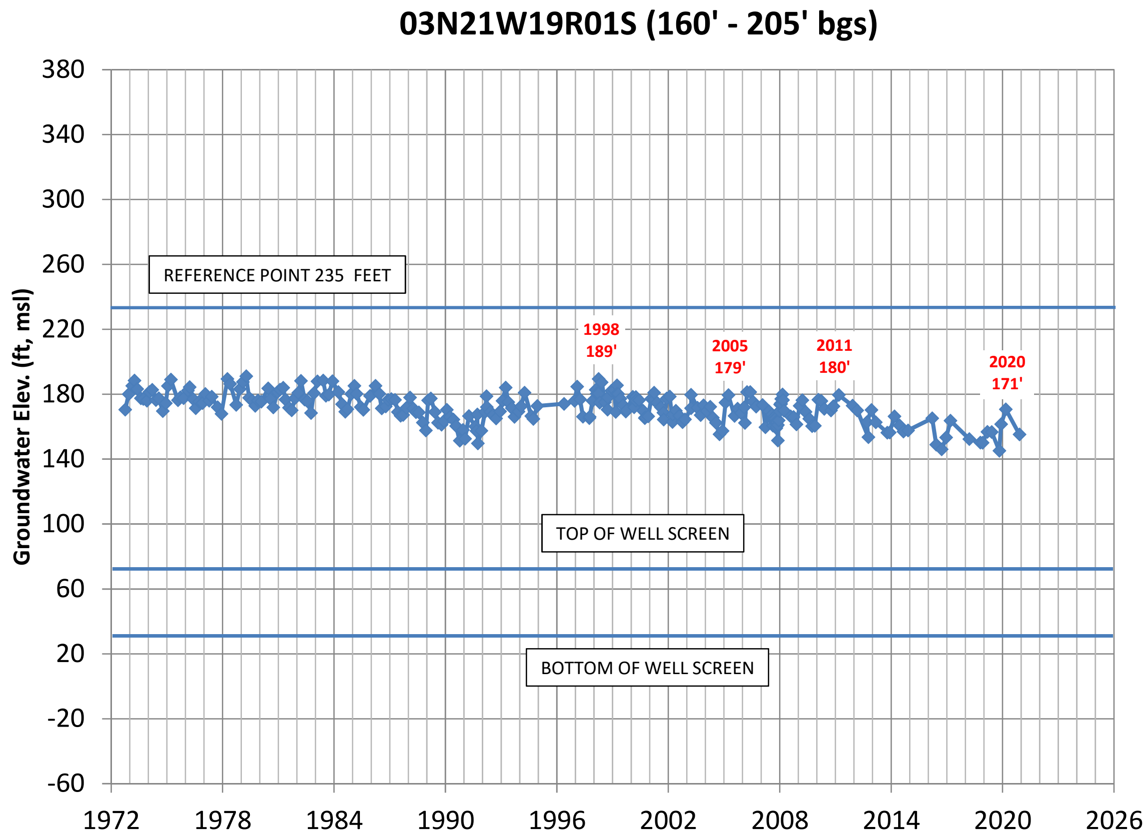


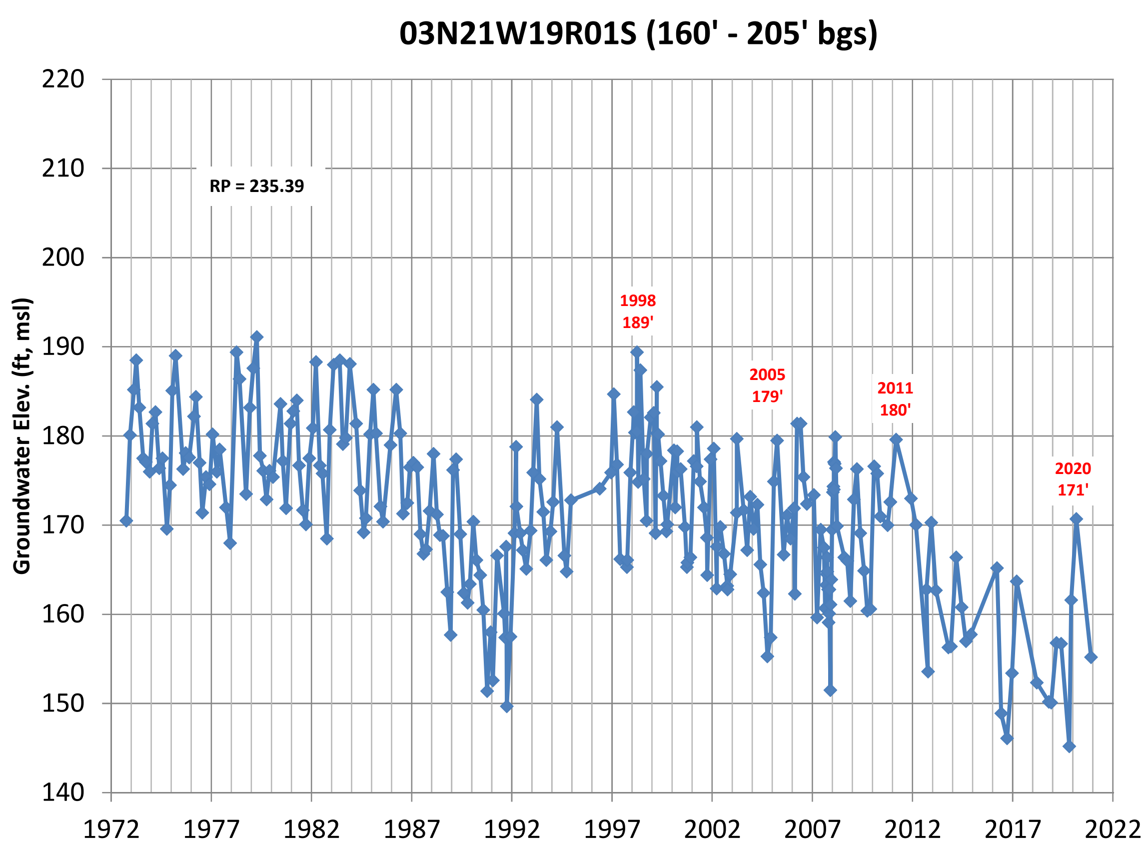
Intentionally Left Blank

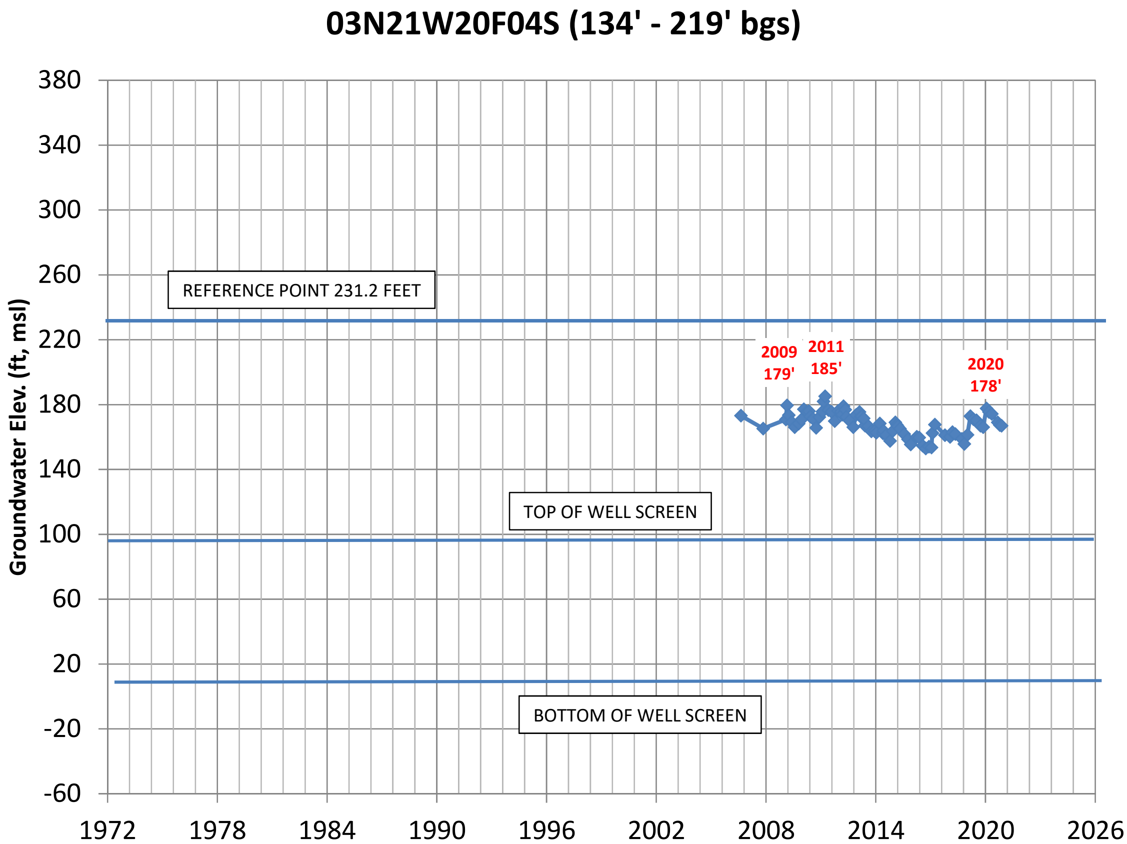


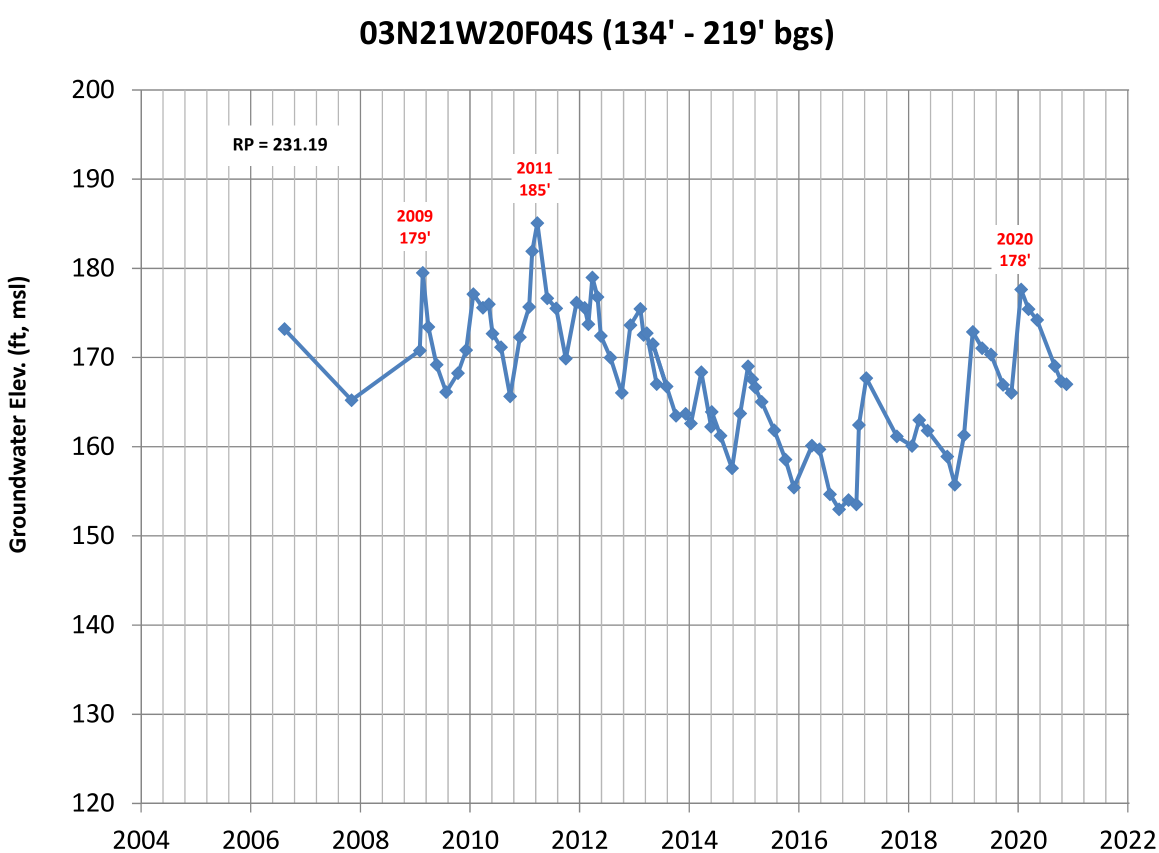

03N21W19M01S (depth 197')
REFERENCE POINT 284 FEET
WELL DEPTH
1998
172'
2005
164'
2011
172'
2020
165'
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

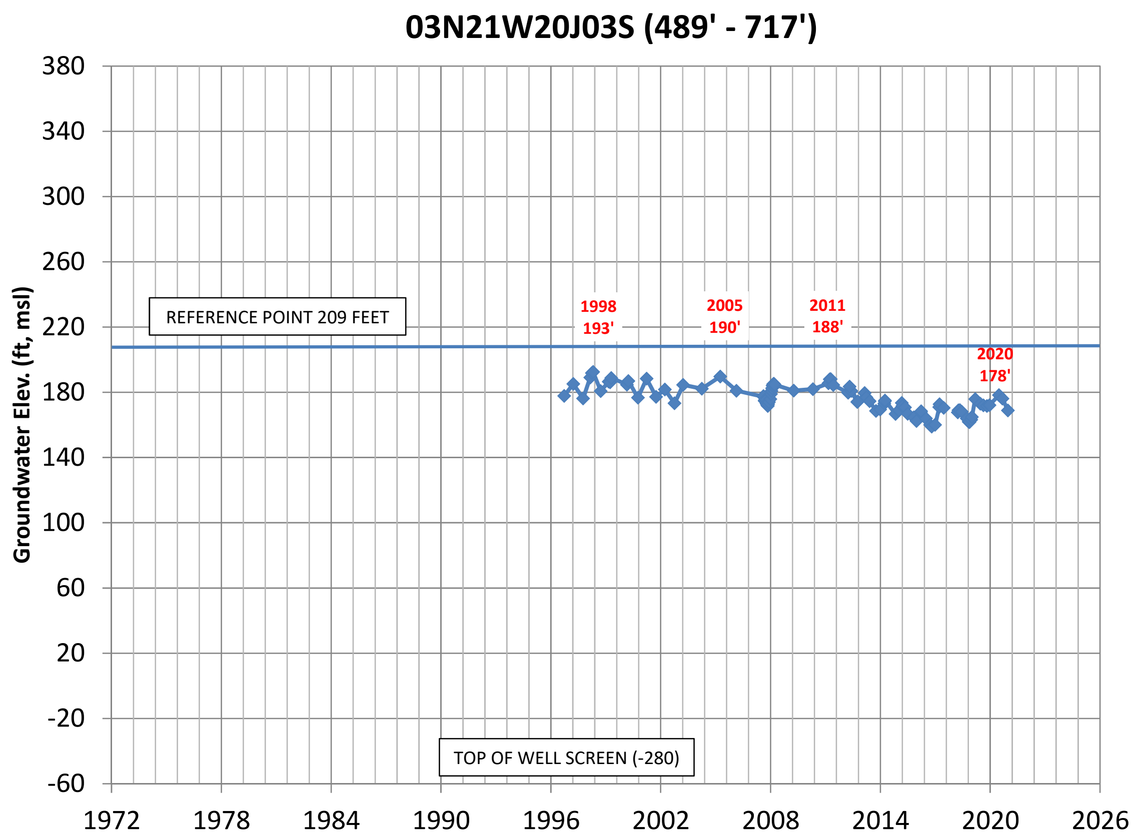

03N21W19M01S (depth 197')
RP = 283.97
1998
172'
2005
164'
2011
172'
2020
165'
Groundwater Elev. (ft, msl)
210
200
190
180
170
160
150
140
130
1988
1993
1998
2003
2008
2013
2018
2023

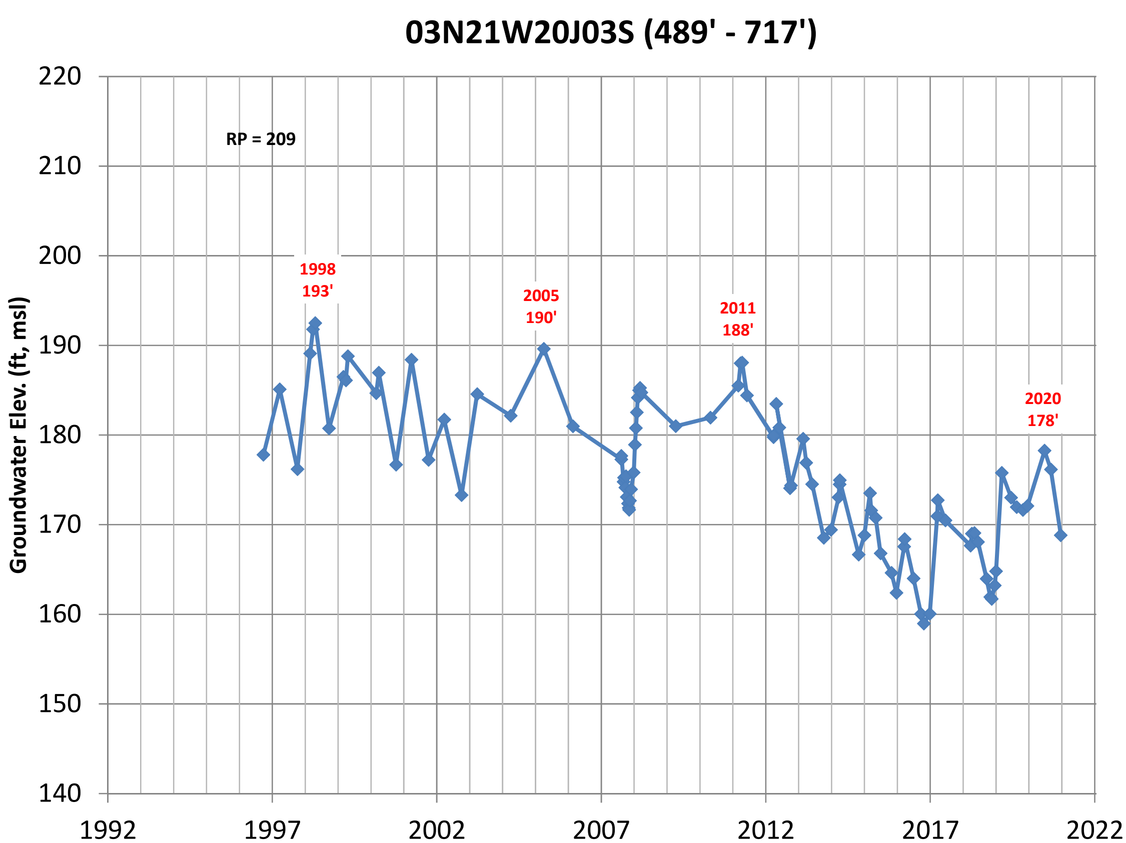

03N21W19R01S (160' - 205' bgs)
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026
REFERENCE POINT 235 FEET
1998
189'
2005
179'
2011
180'
2020
171'
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN


03N21W19R01S (160' - 205' bgs)
Groundwater Elev. (ft, msl)
220
210
200
190
180
170
160
150
140
1972
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
RP = 235.39
1998
189'
2005
179'
2011
180'
2020
171'

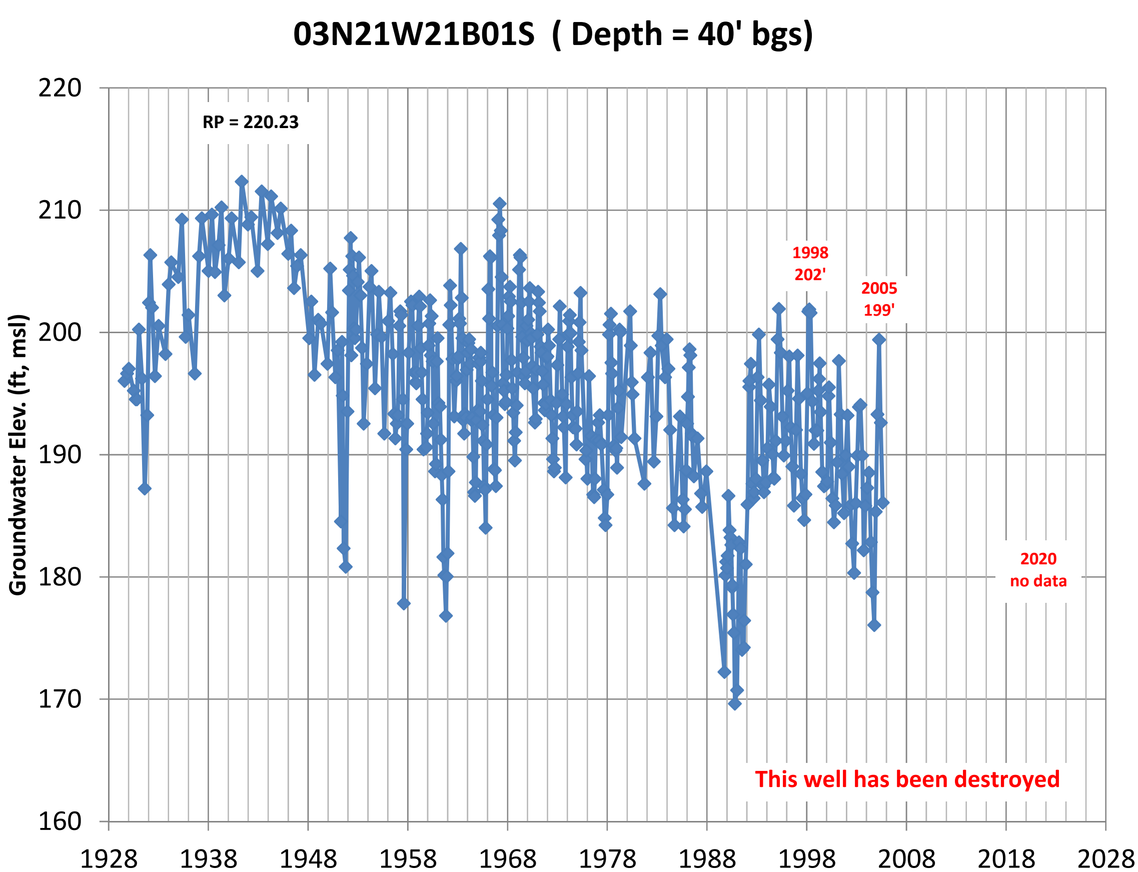

03N21W20F04S (134' - 219' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 231.2 FEET
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
2009
179'
2011
185'
2020
178'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W20F04S (134' - 219' bgs)
Groundwater Elev. (ft, msl)
RP = 231.19
2009
179'
2011
185'
2020
178'
200
190
180
170
160
150
140
130
120
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022

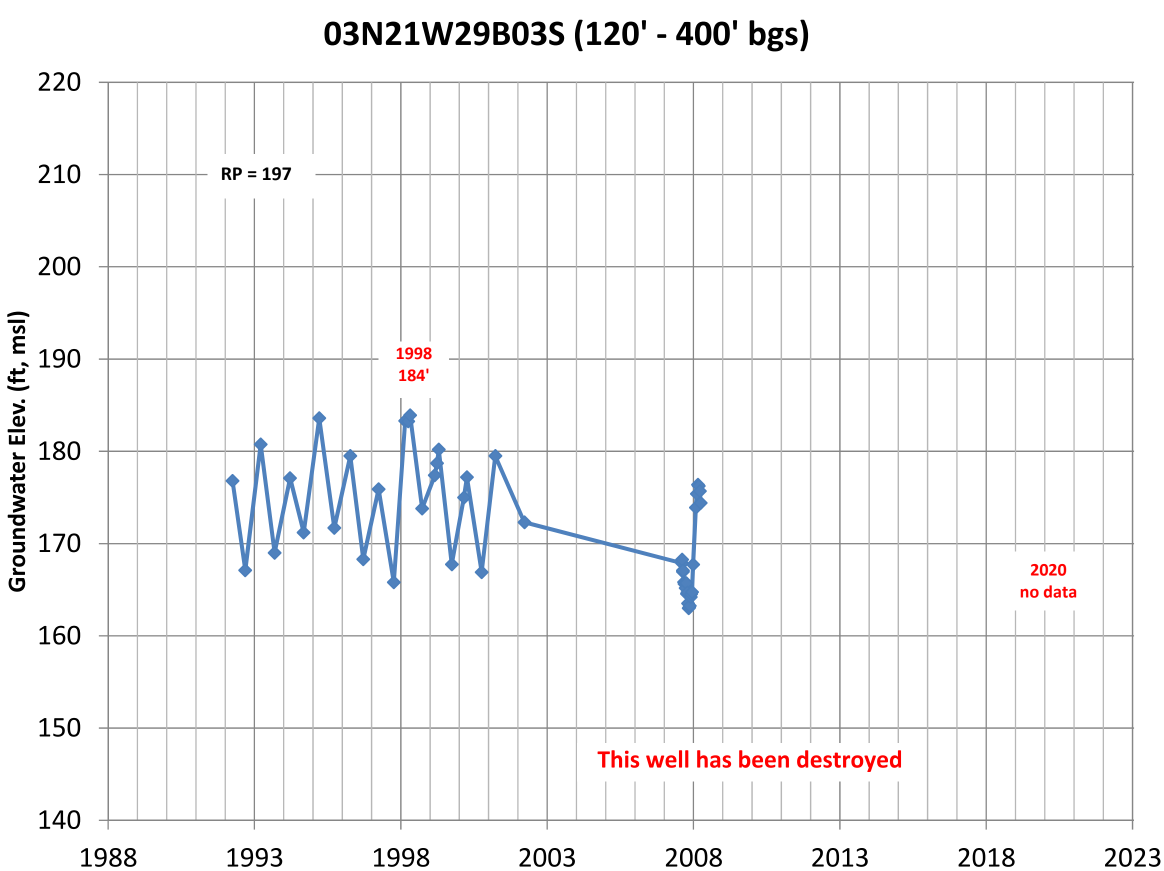

03N21W20J03S (489' - 717')
Groundwater Elev. (ft, msl)
REFERENCE POINT 209 FEET
1998
193'
2005
190'
2011
188'
2020
178'
TOP OF WELL SCREEN (-280)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

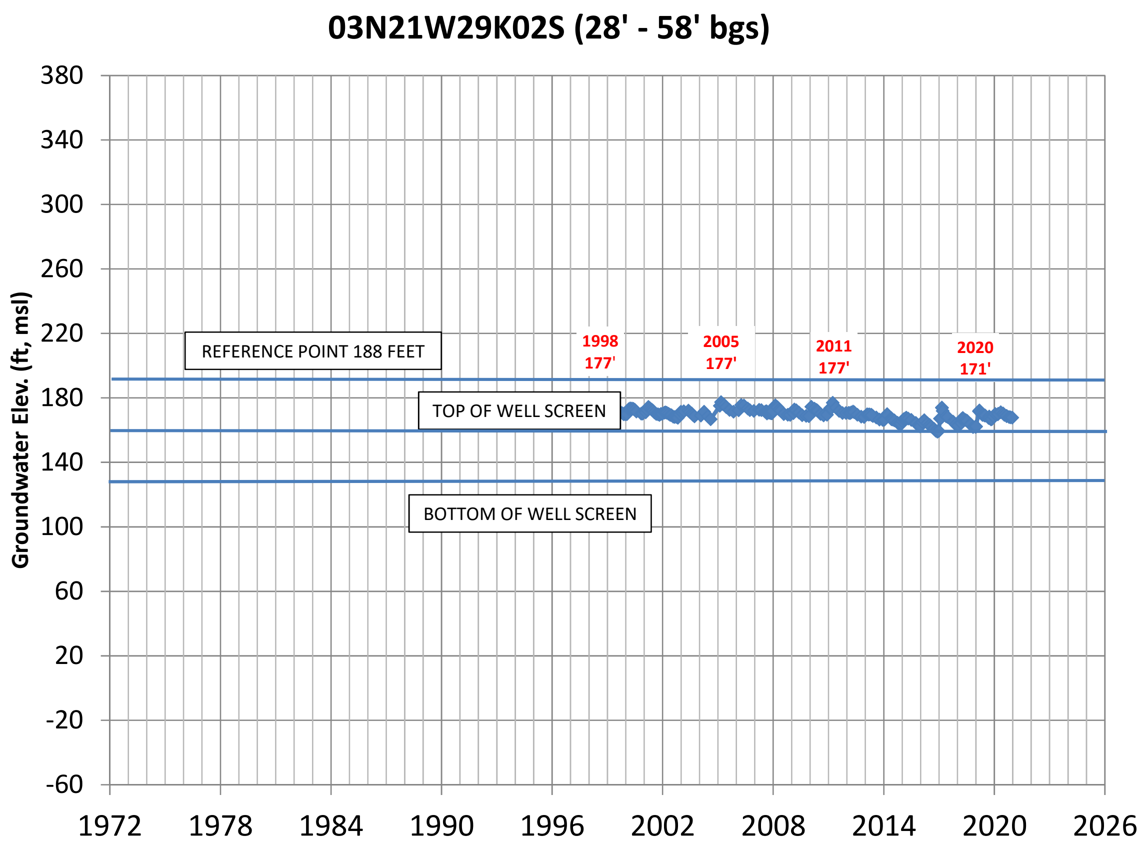

03N21W20J03S (489' - 717')
Groundwater Elev. (ft, msl)
RP = 209
1998
193'
2005
190'
2011
188'
2020
178'
220
210
200
190
180
170
160
150
140
1992
1997
2002
2007
2012
2017
2022

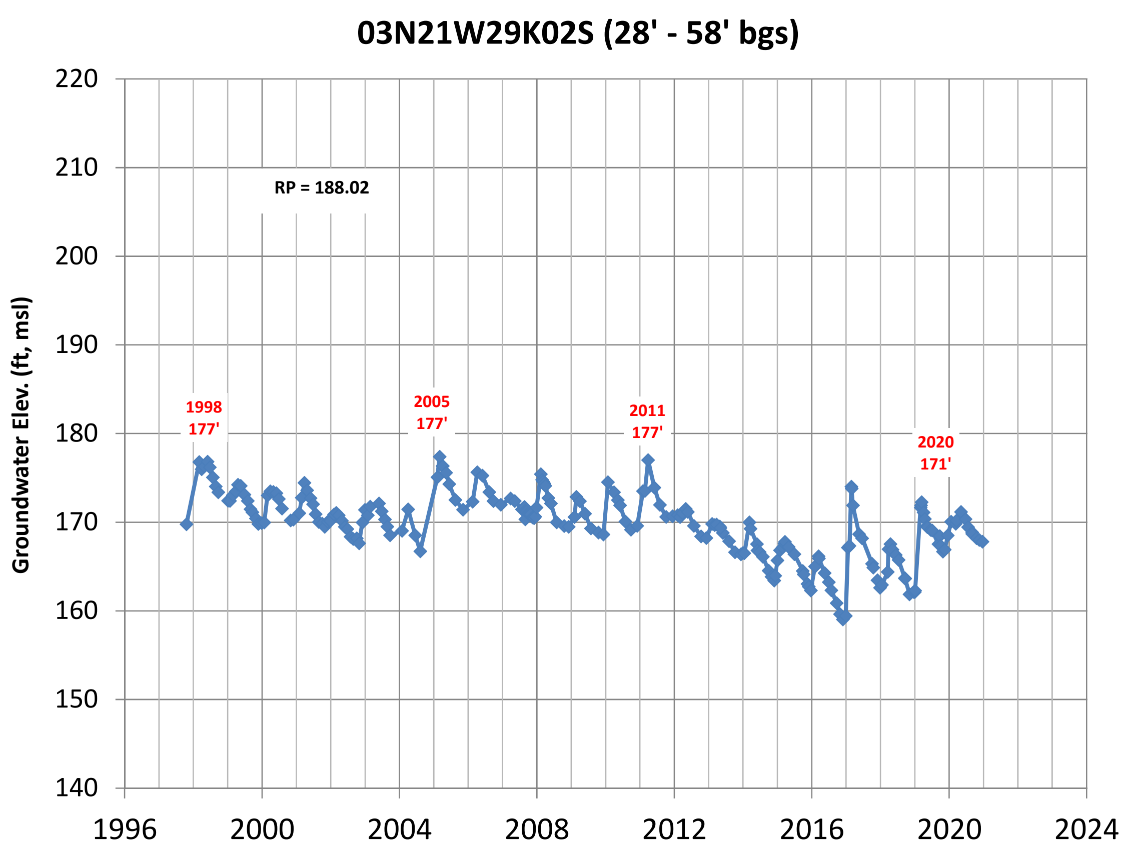
Intentionally Left Blank



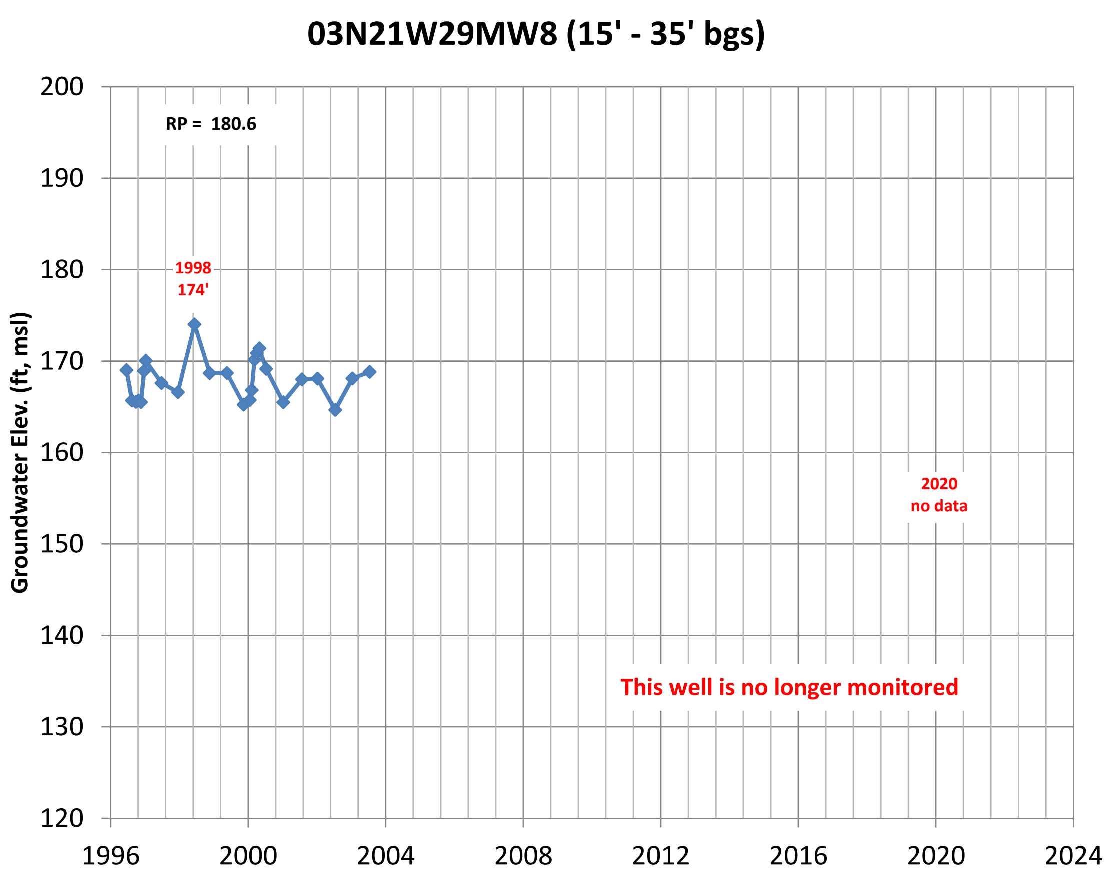
Intentionally Left Blank



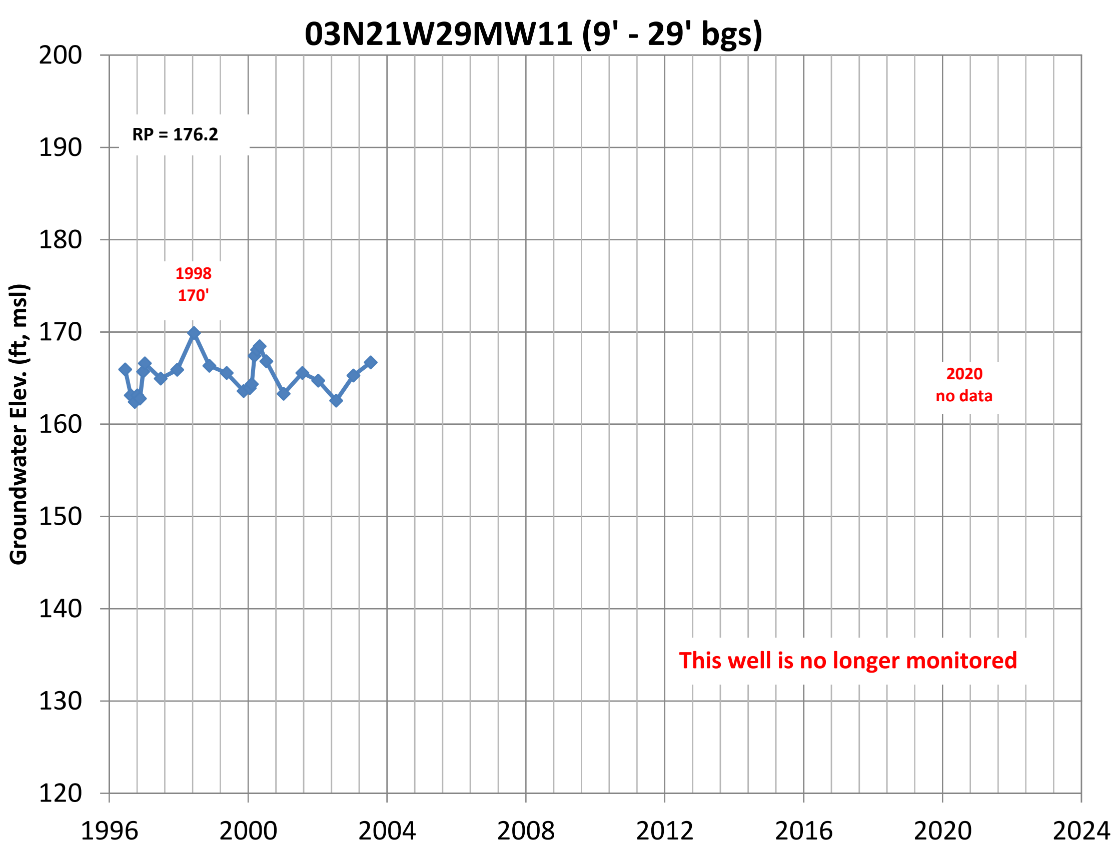

03N21W29K02S (28' - 58' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 188 FEET
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
1998
177'
2005
177'
2011
177'
2020
171'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W29K02S (28' - 58' bgs)
Groundwater Elev. (ft, msl)
RP = 188.02
1998
177'
2005
177'
2011
177'
2020
171'
220
210
200
190
180
170
160
150
140
1996
2000
2004
2008
2012
2016
2020
2024

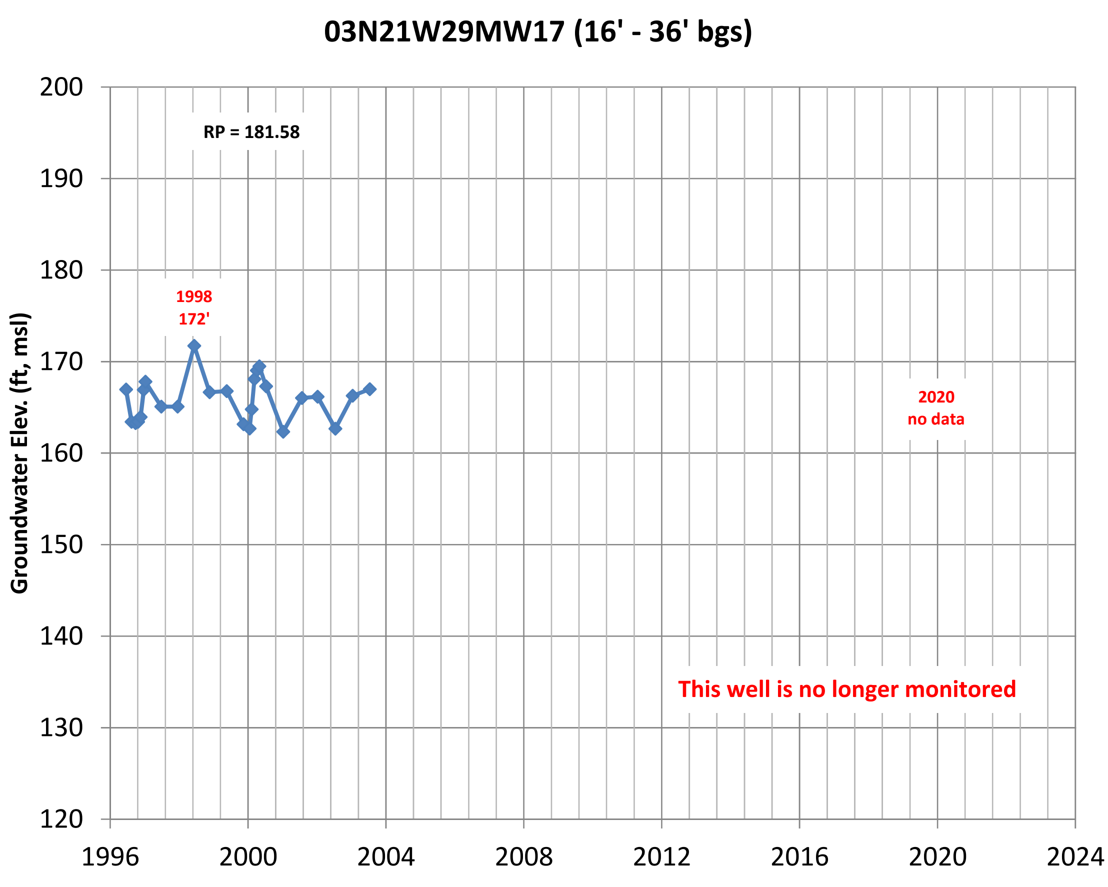
Intentionally Left Blank

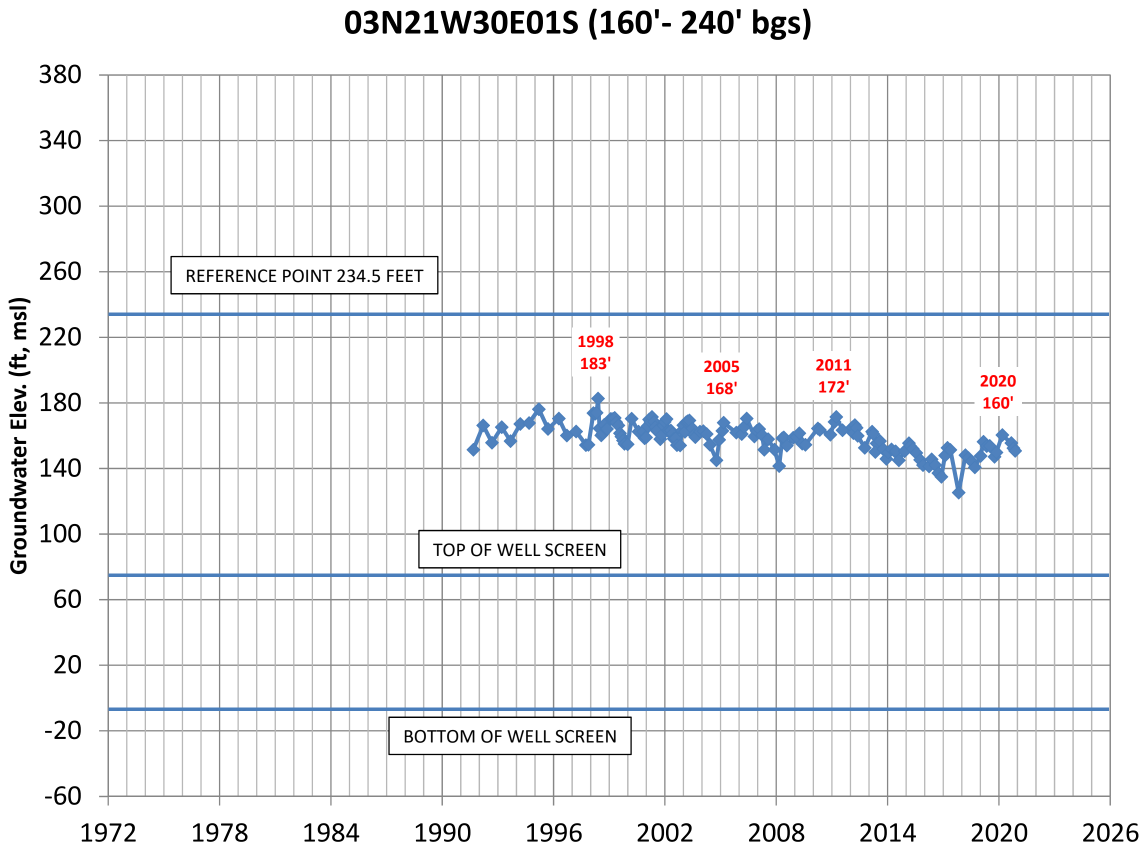


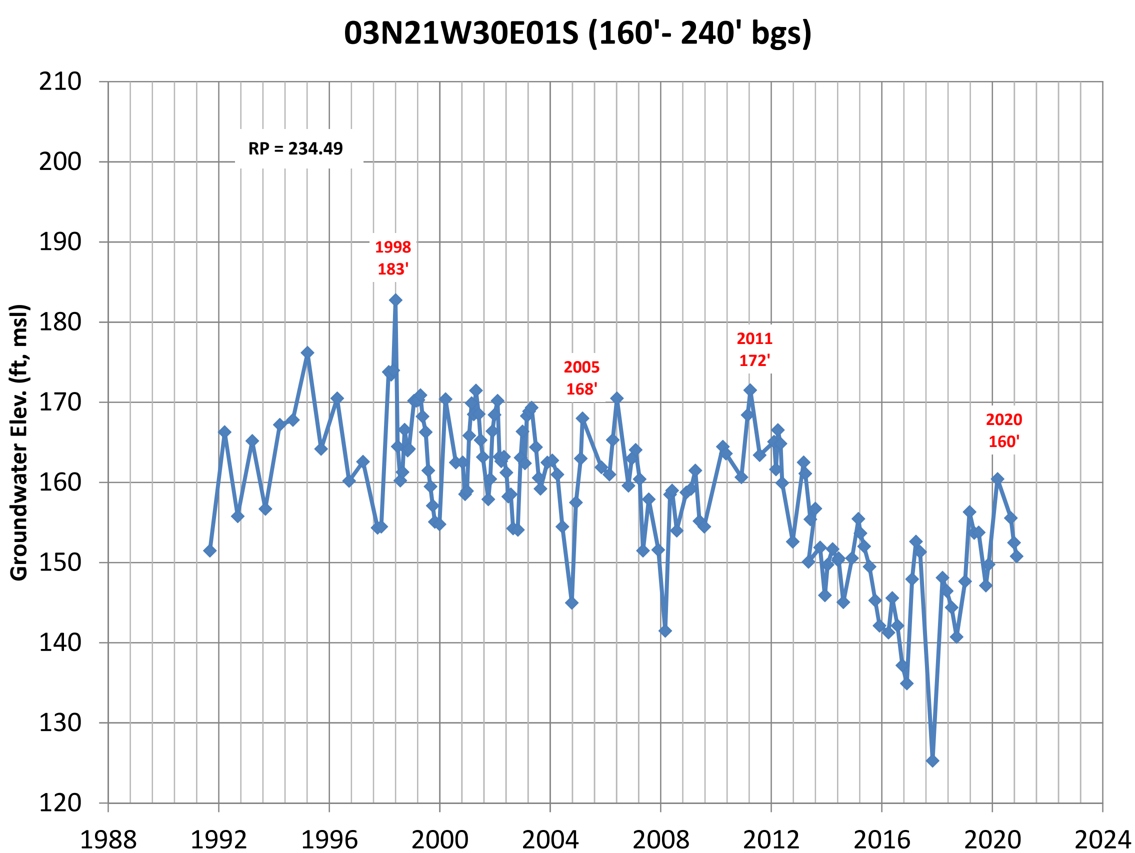
Intentionally Left Blank

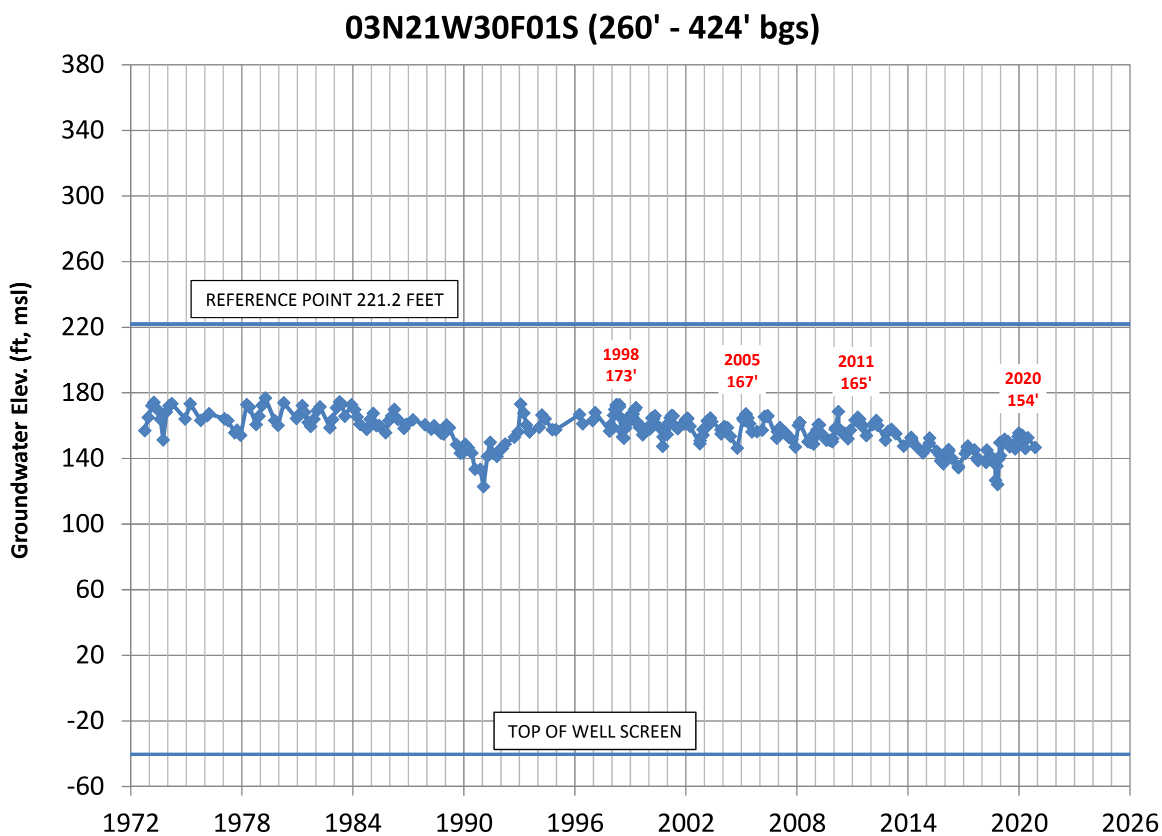


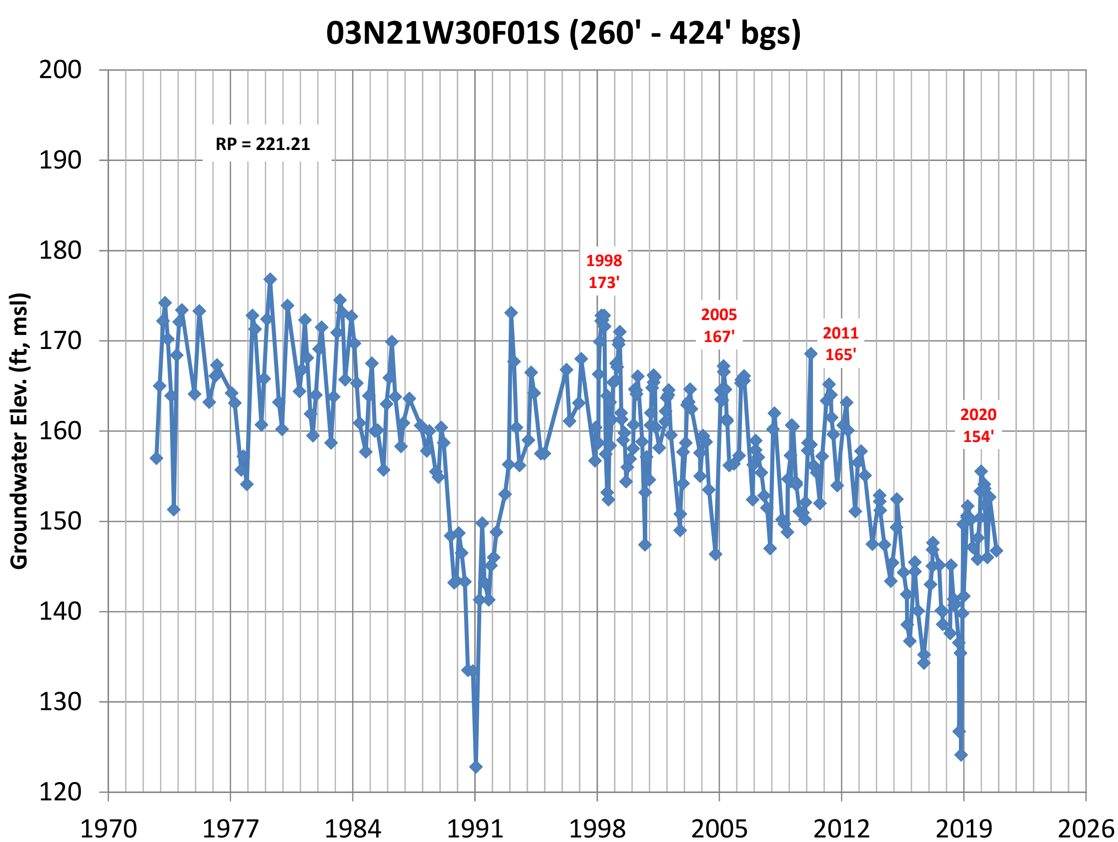
Intentionally Left Blank



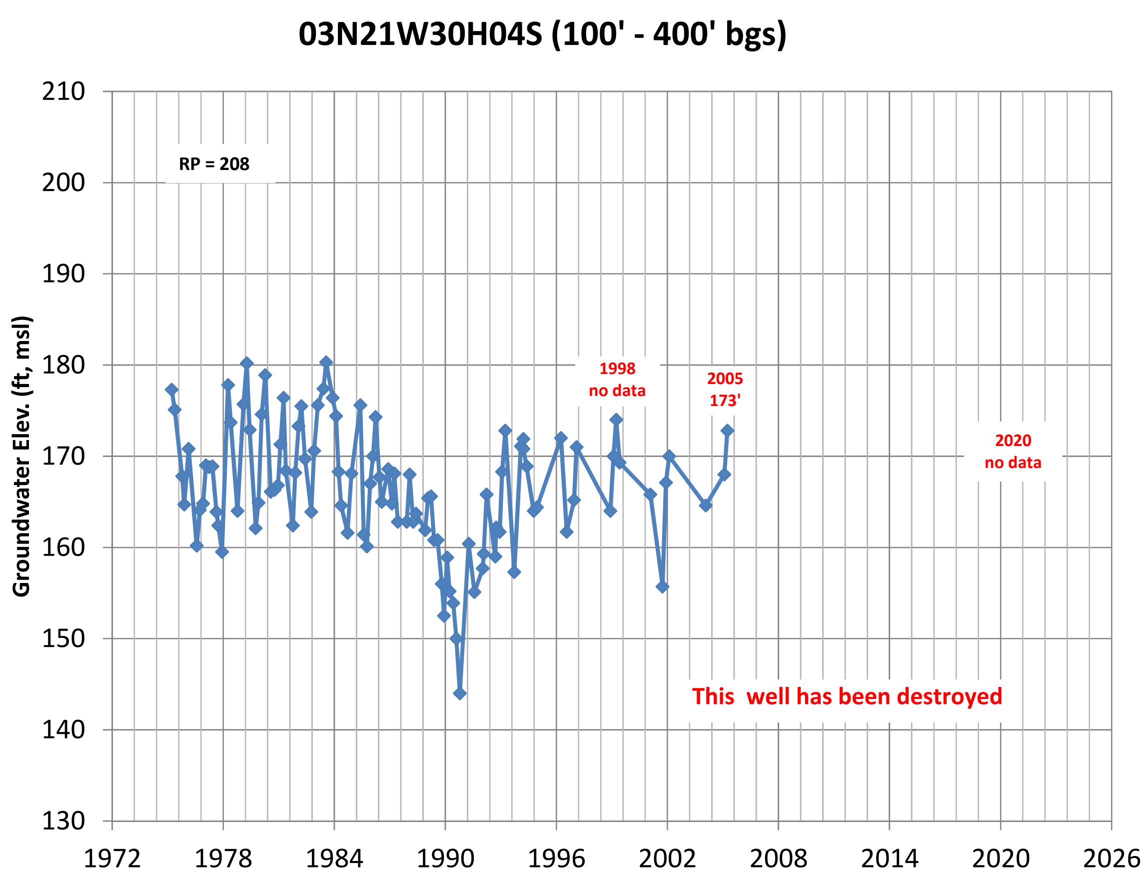

03N21W30E01S (160'- 240' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 234.5 FEET
TOP OF WELL SCREEN
BOTTOM OF WELL SCREEN
1998
183'
2005
168'
2011
172'
2020
160'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W30E01S (160'- 240' bgs)
Groundwater Elev. (ft, msl)
RP = 234.49
1998
183'
2005
168'
2011
172'
2020
160'
210
200
190
180
170
160
150
140
130
120
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024

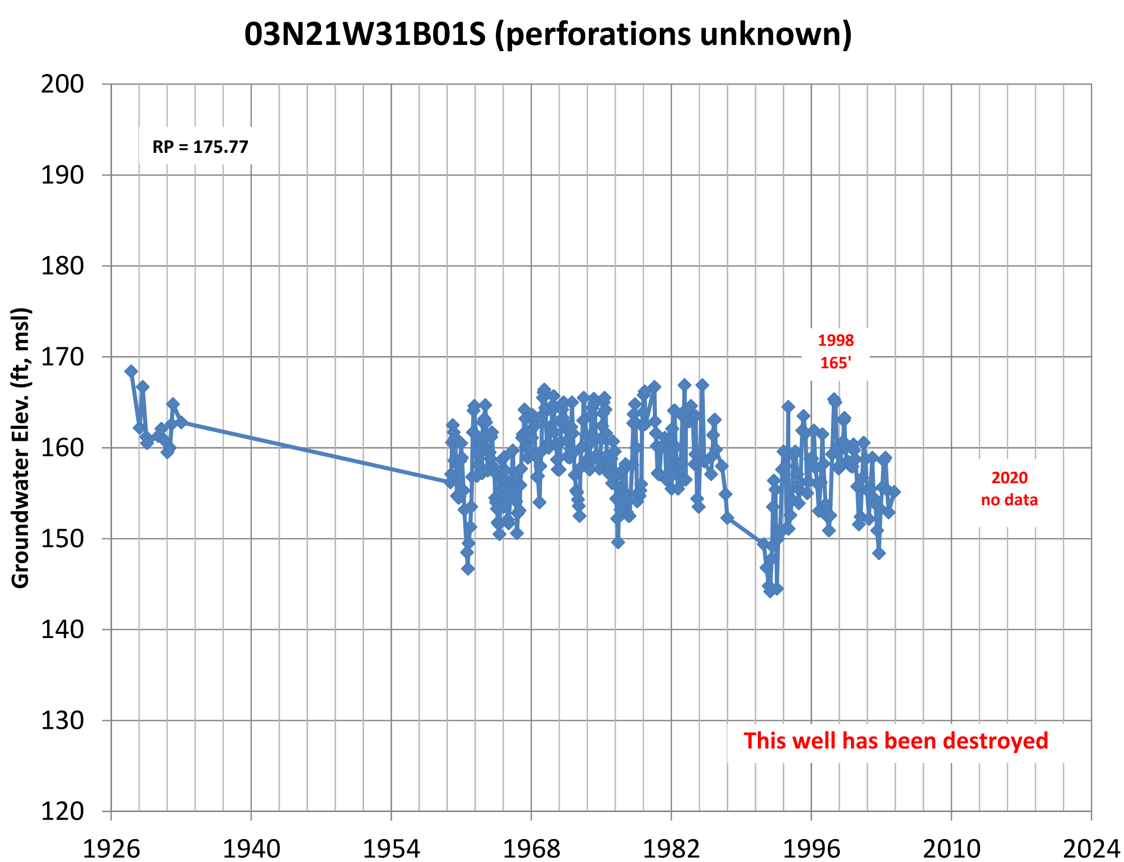

03N21W30F01S (260' - 424' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 221.2 FEET
TOP OF WELL SCREEN
1998
173'
2005
167'
2011
165'
2020
154'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

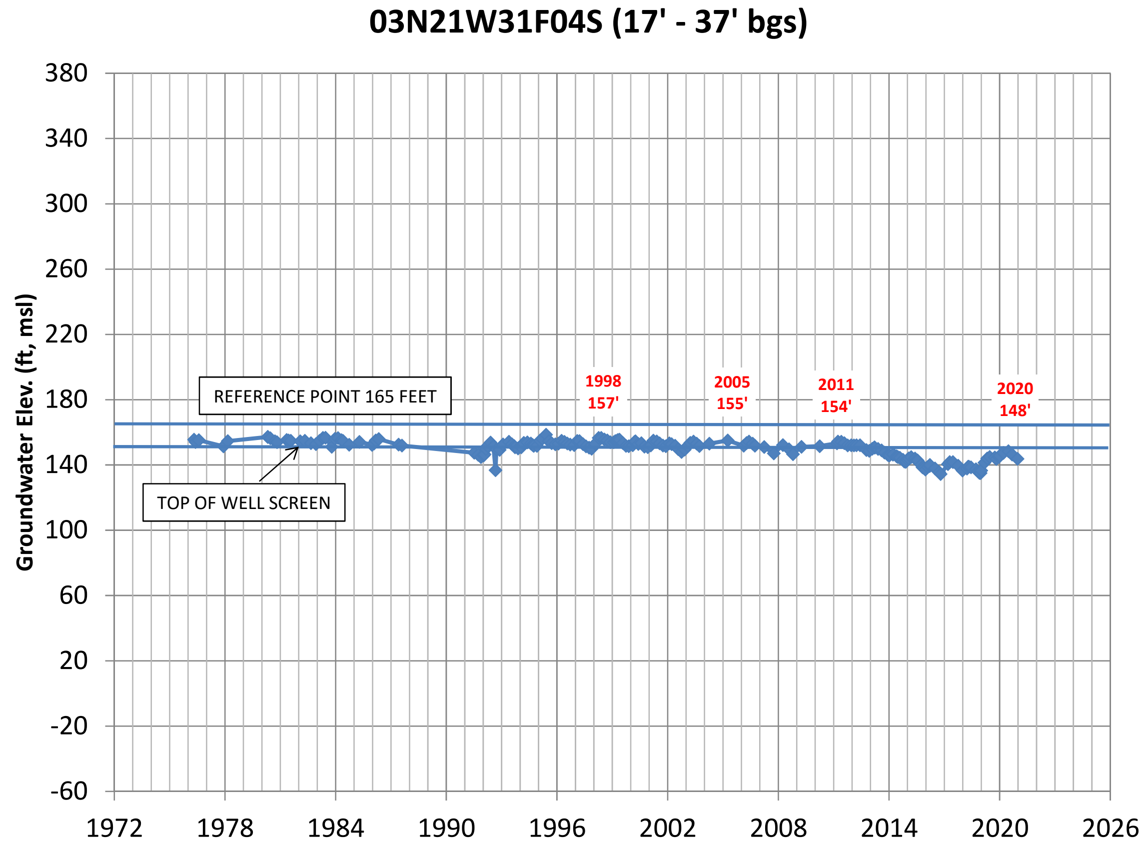

03N21W30F01S (260' - 424' bgs)
Groundwater Elev. (ft, msl)
RP = 221.21
1998
173'
2005
167'
2011
165'
2020
154'
200
190
180
170
160
150
140
130
120
1970
1977
1984
1991
1998
2005
2012
2019
2026

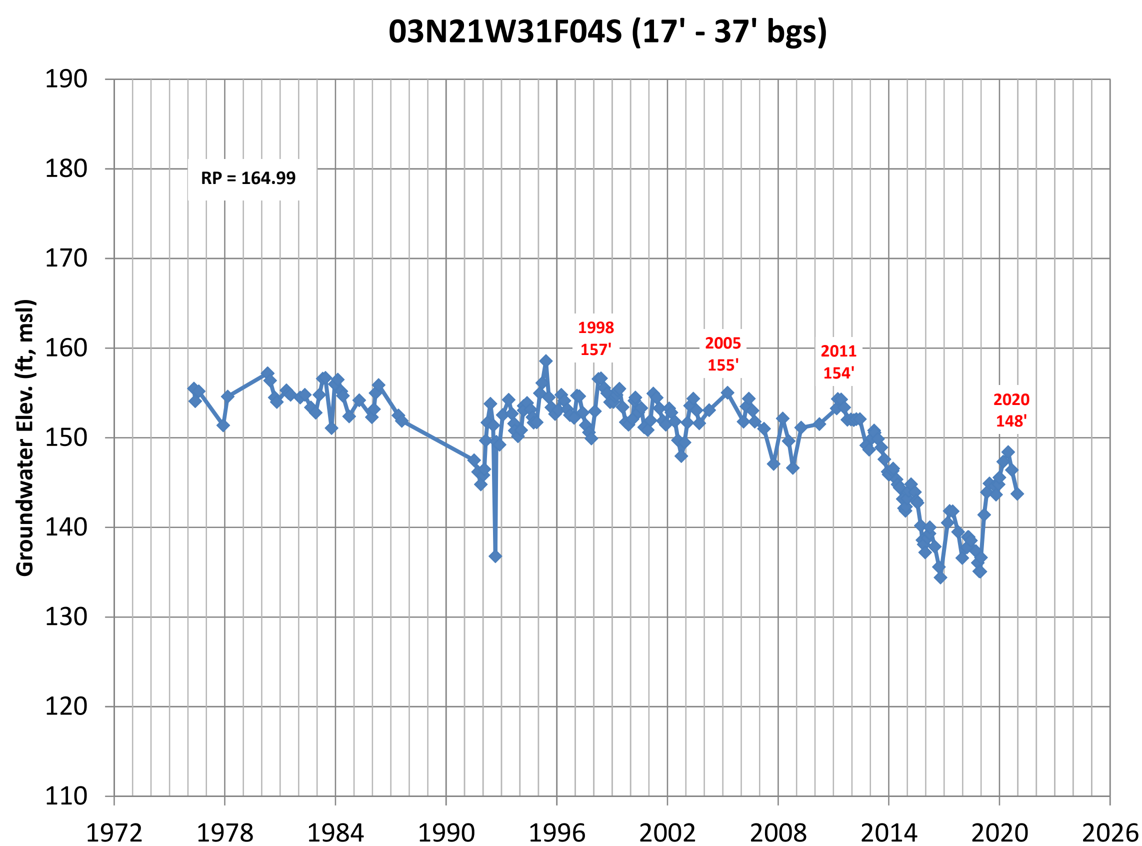
Intentionally Left Blank

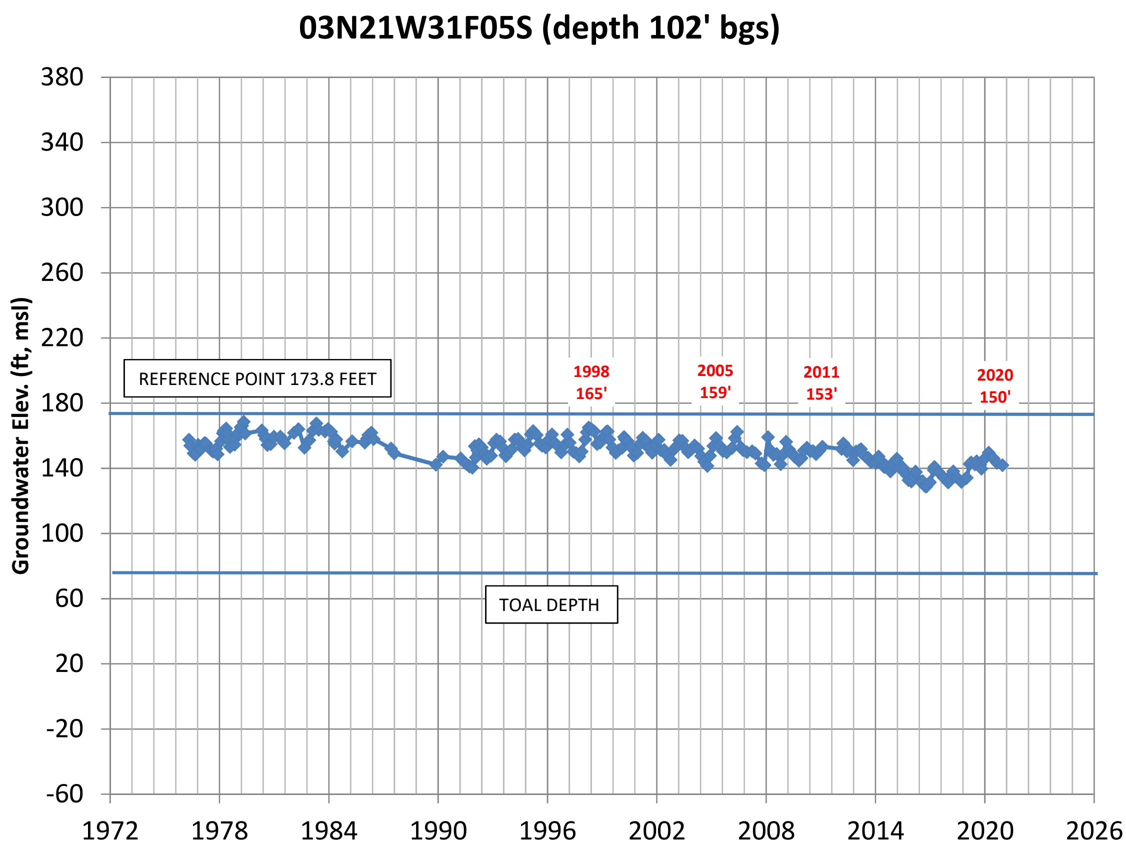


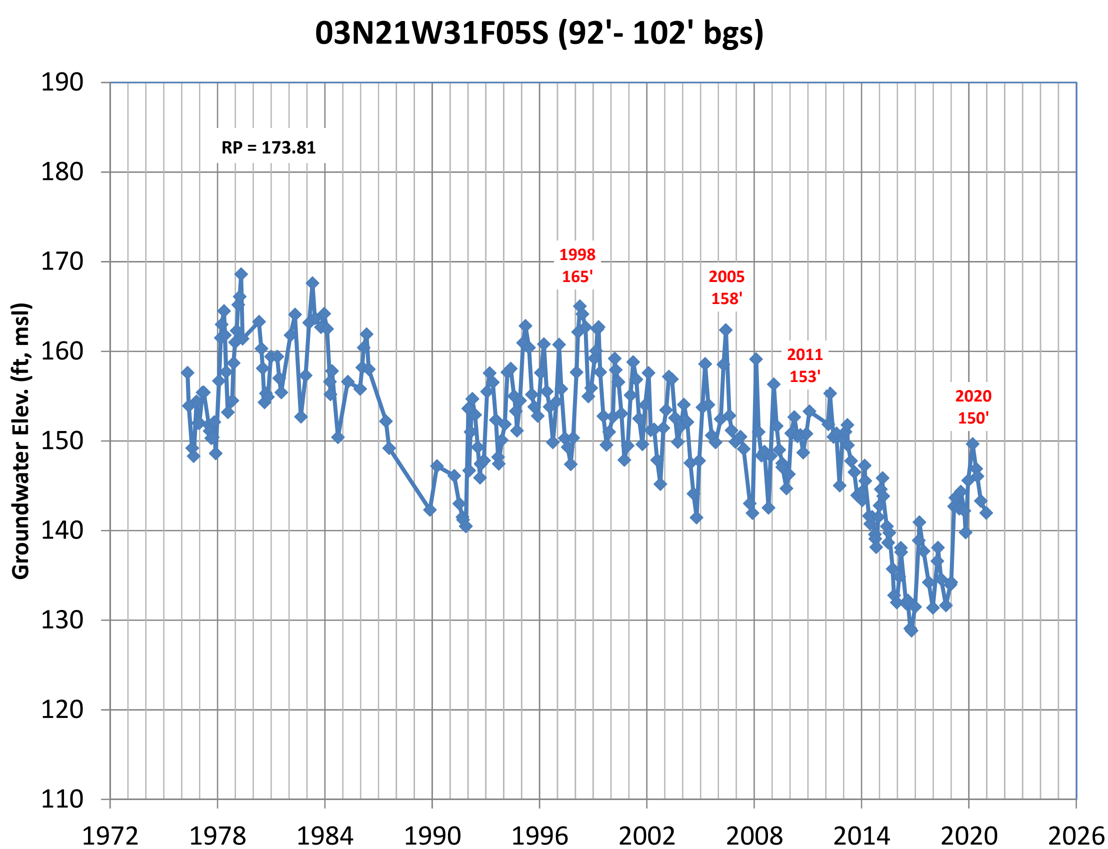
Intentionally Left Blank

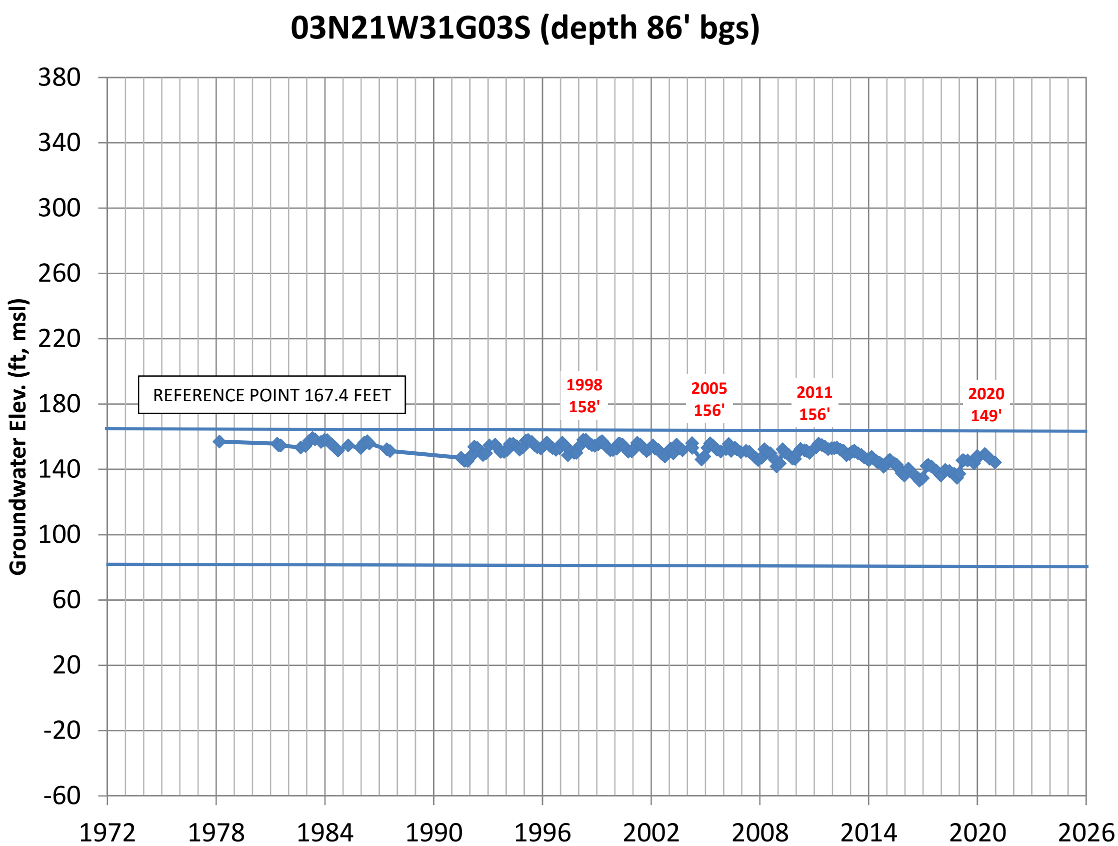


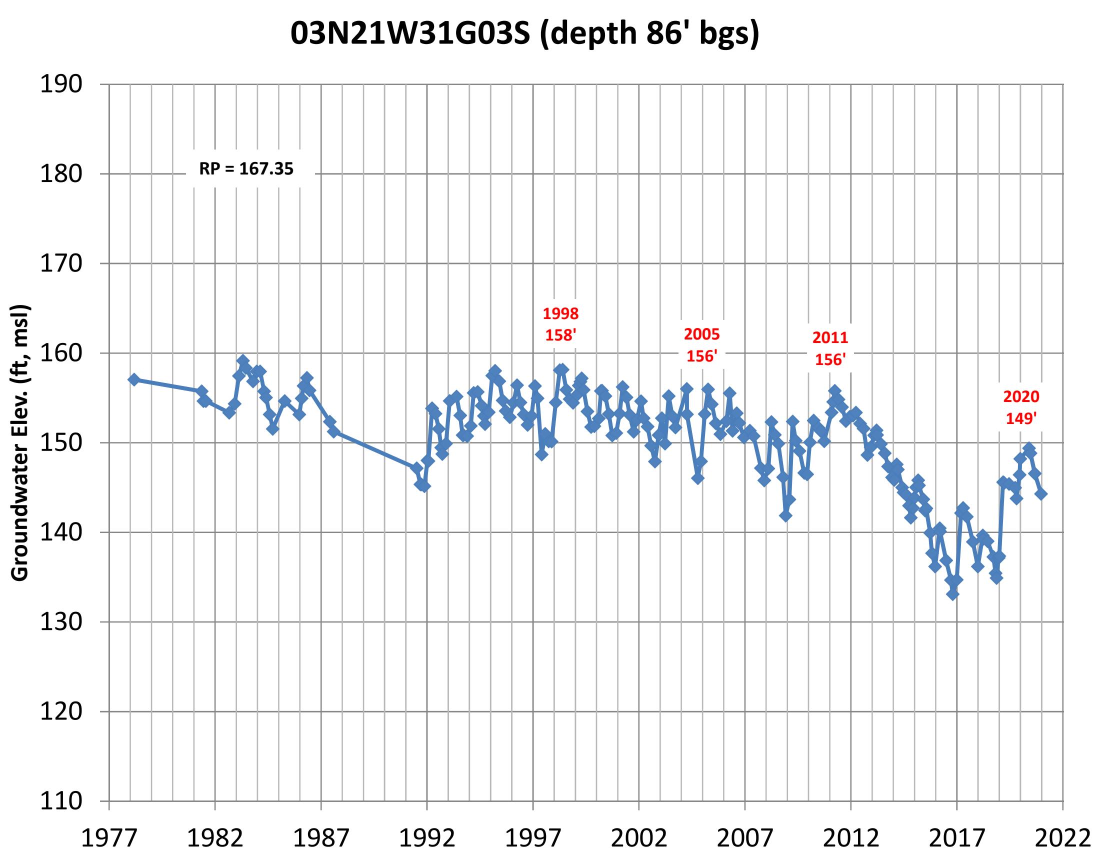

03N21W31F04S (17' - 37' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 165 FEET
TOP OF WELL SCREEN
1998
157'
2005
155'
2011
154'
2020
148'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

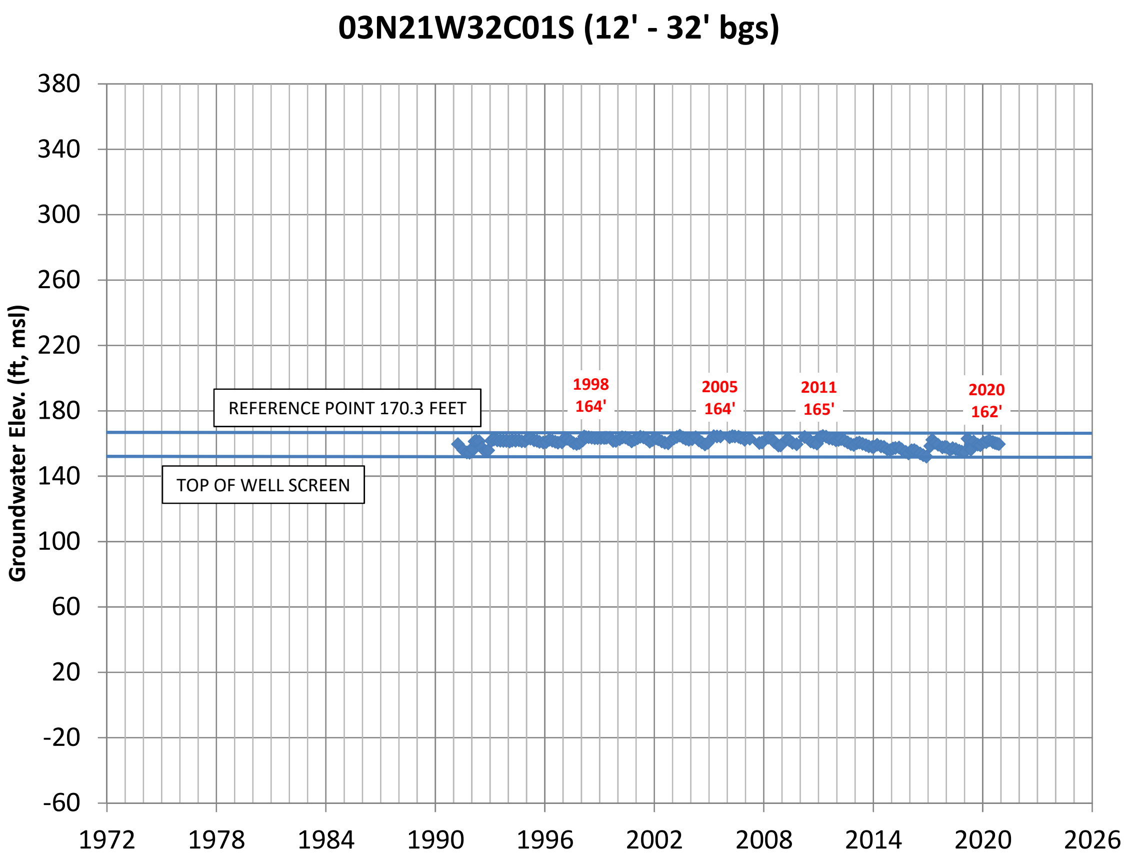

03N21W31F04S (17' - 37' bgs)
Groundwater Elev. (ft, msl)
RP = 164.99
1998
157'
2005
155'
2011
154'
2020
148'
190
180
170
160
150
140
130
120
110
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

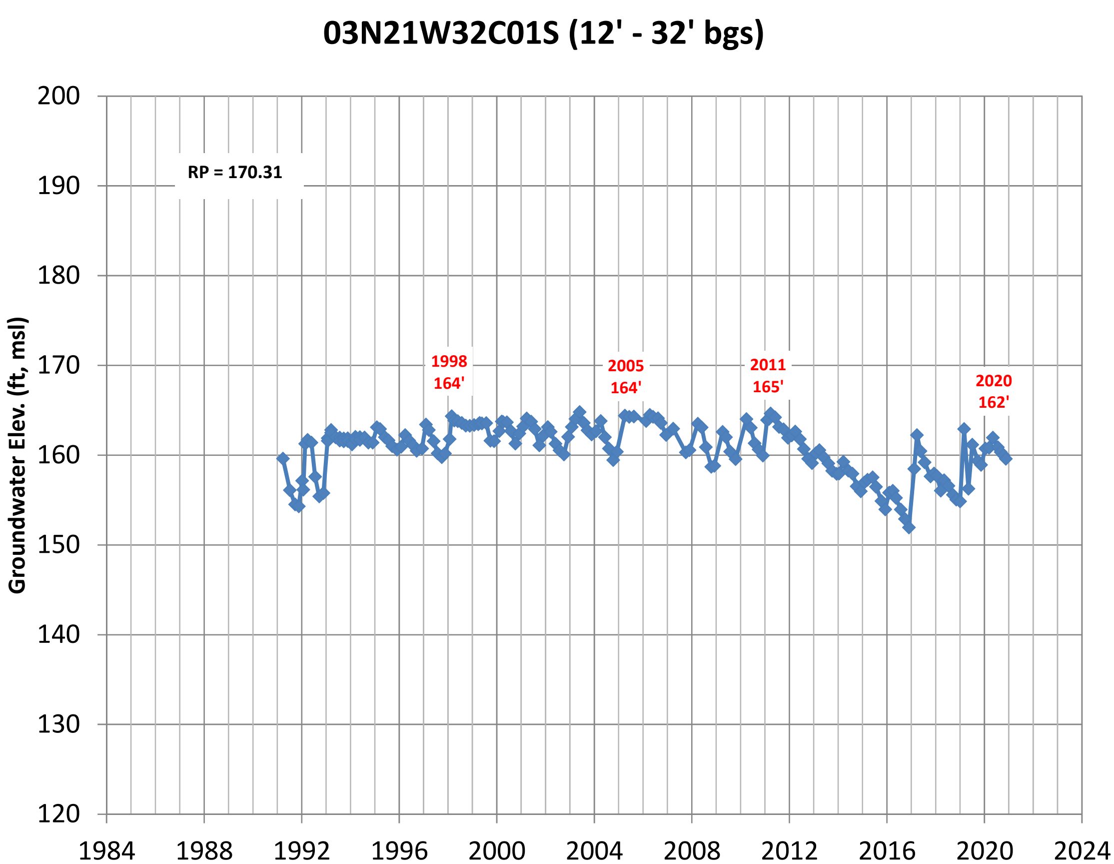

03N21W31F05S (depth 102' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 173.8 FEET
1998
165'
2005
159'
2011
153'
2020
150'
TOAL DEPTH
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W31F05S (92'- 102' bgs)
Groundwater Elev. (ft, msl)
RP = 173.81
1998
165'
2005
158'
2011
153'
2020
150'
190
180
170
160
150
140
130
120
110
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

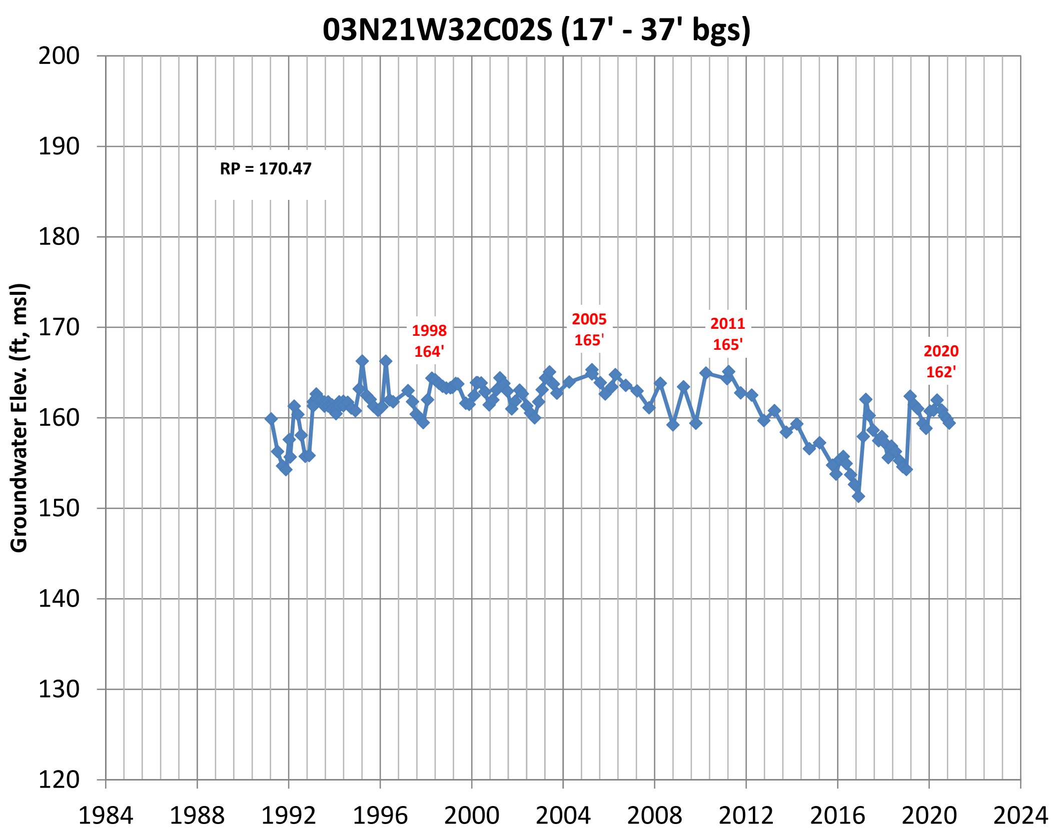

03N21W31G03S (depth 86' bgs)
REFERENCE POINT 167.4 FEET
1998
158'
2005
156'
2011
156'
2020
149'
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026


03N21W31G03S (depth 86' bgs)
RP = 167.35
1998
158'
2005
156'
2011
156'
2020
149'
Groundwater Elev. (ft, msl)
190
180
170
160
150
140
130
120
110
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022

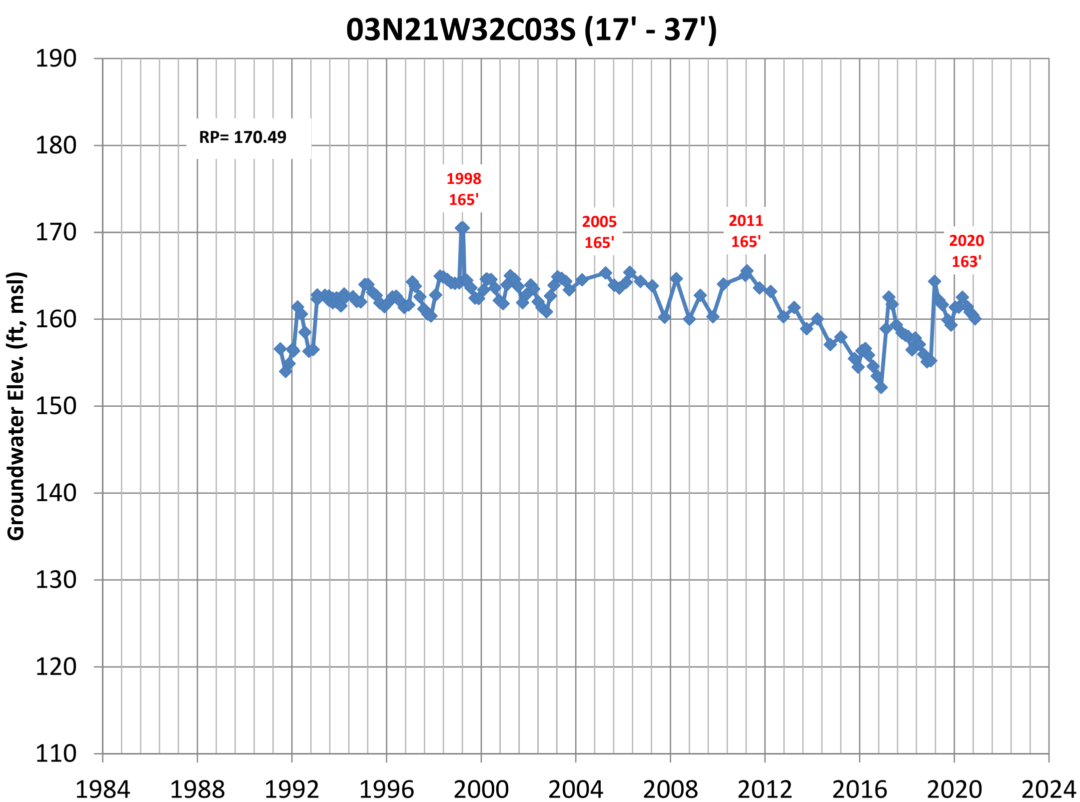

03N21W32C01S (12' - 32' bgs)
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026
REFERENCE POINT 170.3 FEET
TOP OF WELL SCREEN
1998
164'
2005
164'
2011
165'
2020
162'

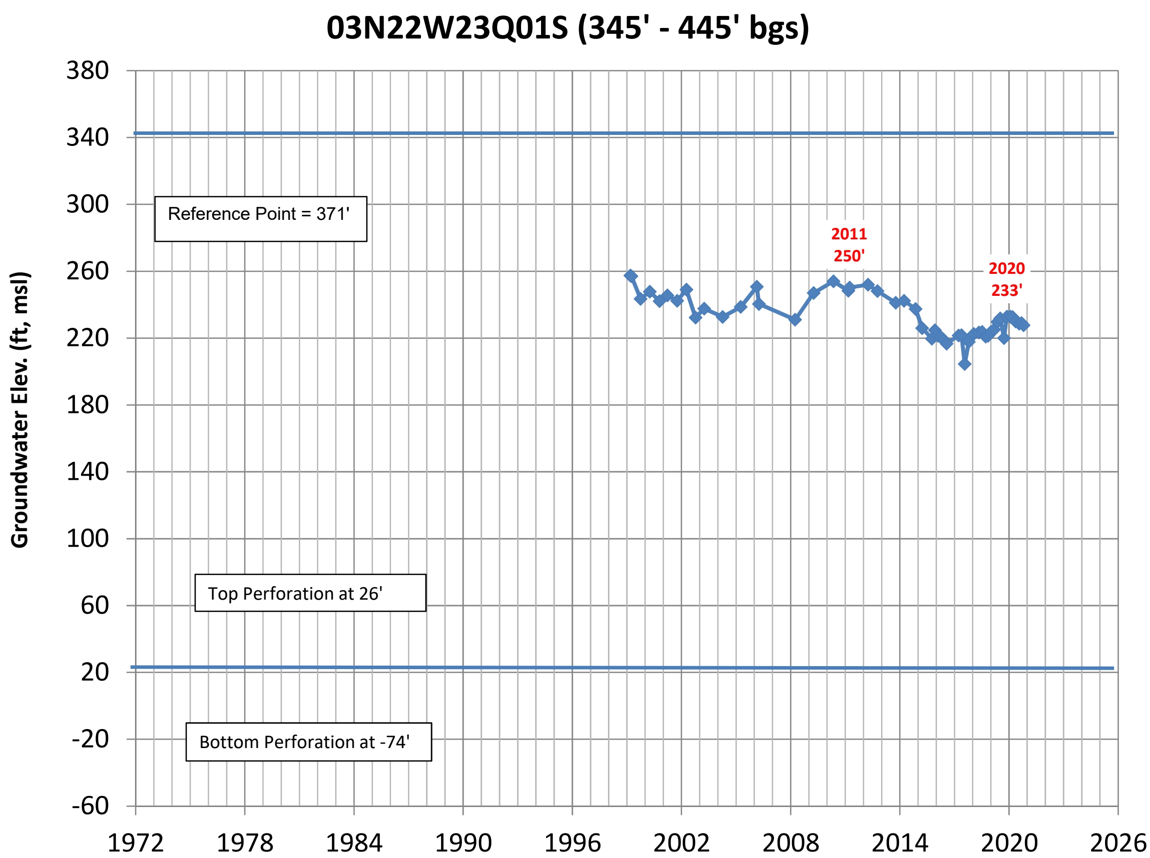

03N21W32C01S (12' - 32' bgs)
Groundwater Elev. (ft, msl)
200
190
180
170
160
150
140
130
120
1984
1988
1992
1996
2000
2004
2008
2012
2016
2020
2024
RP = 170.31
1998
164'
2005
164'
2011
165'
2020
162'

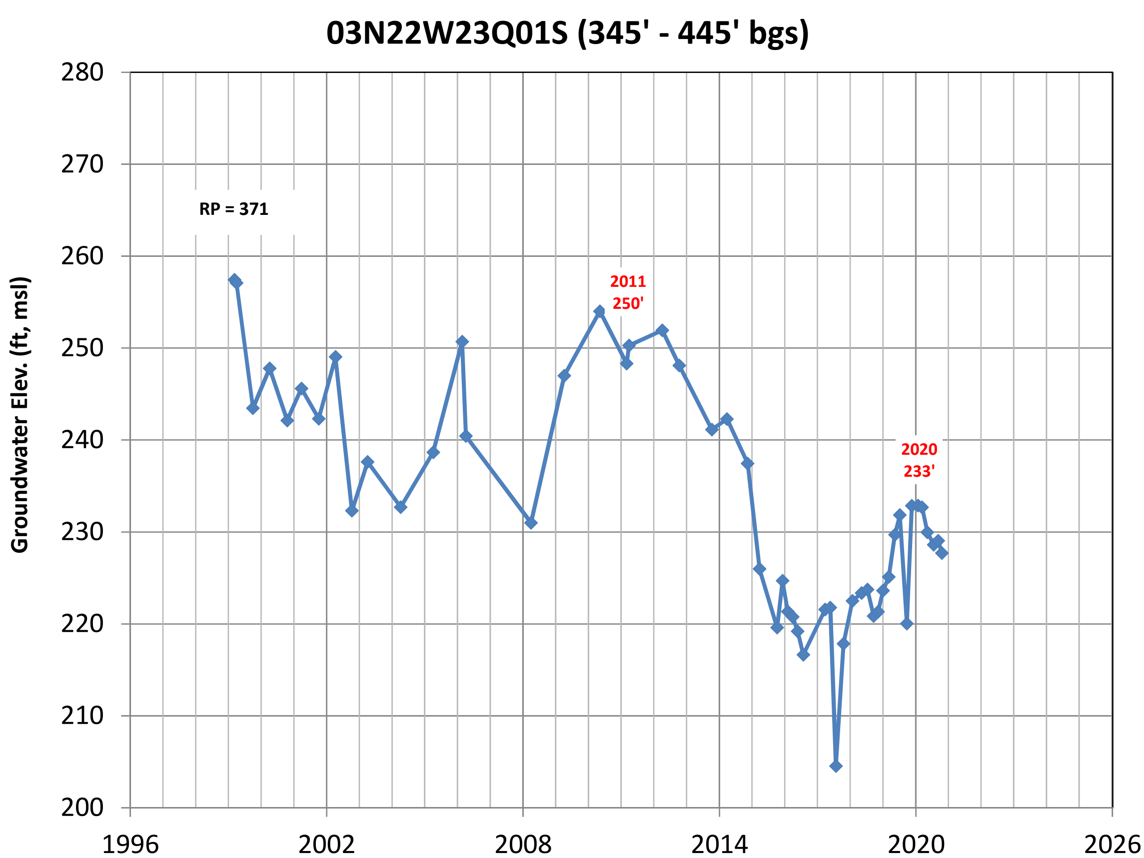
Intentionally Left Blank



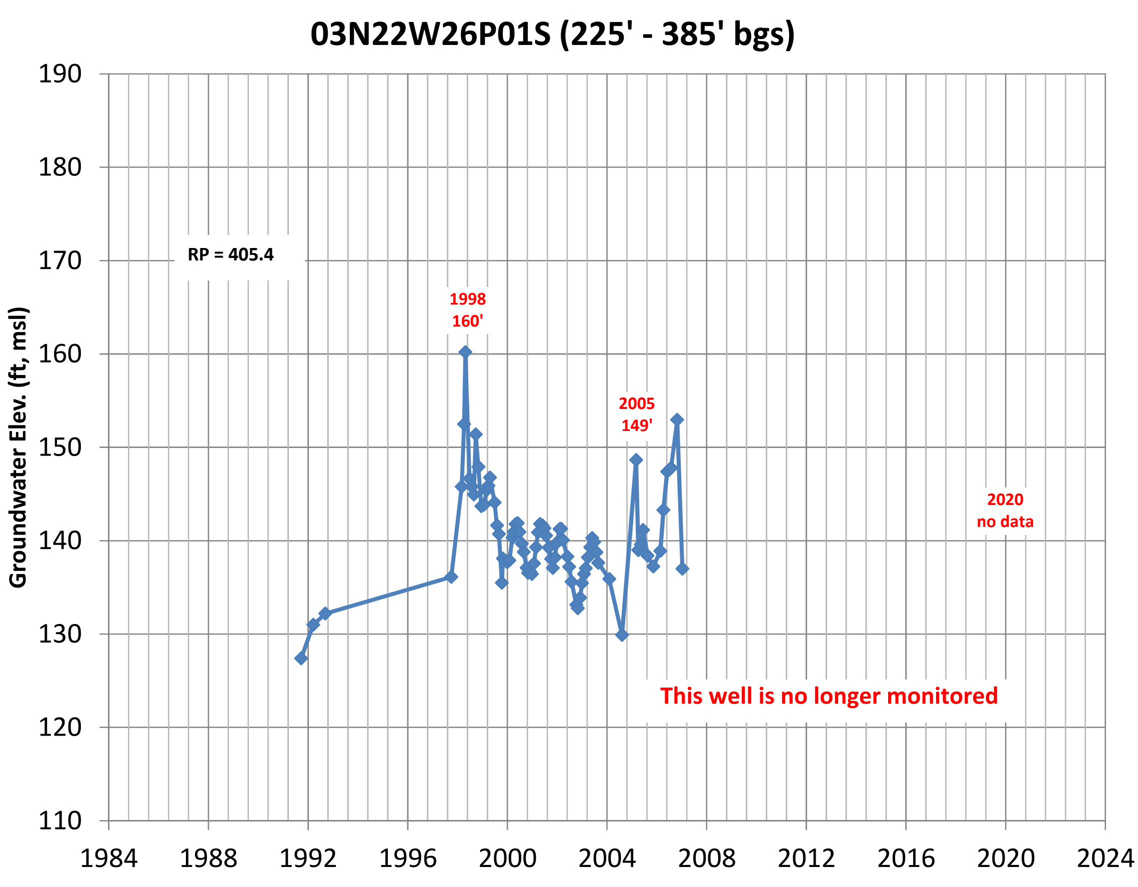
Intentionally Left Blank



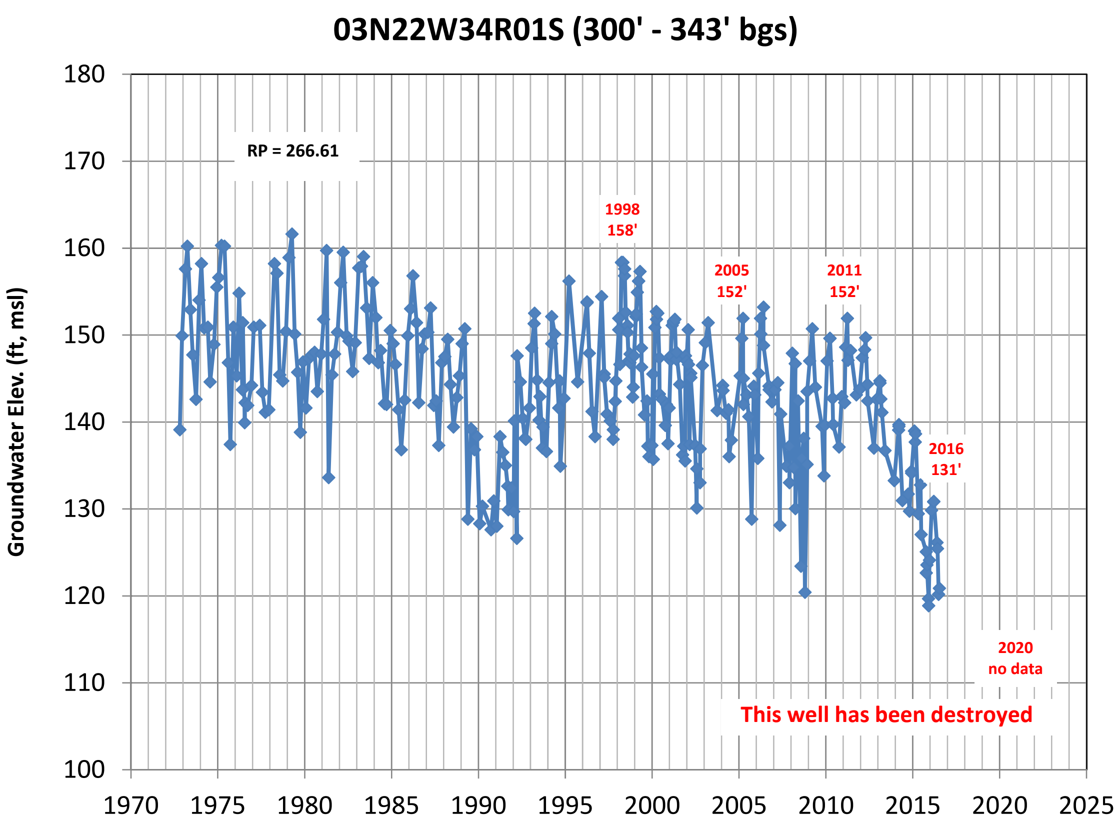

03N22W23Q01S (345' - 445' bgs)
Groundwater Elev. (ft, msl)
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026
Reference Point = 371'
Top Perforation at 26'
Bottom Perforation at -74'
2011
250'
2020
233'

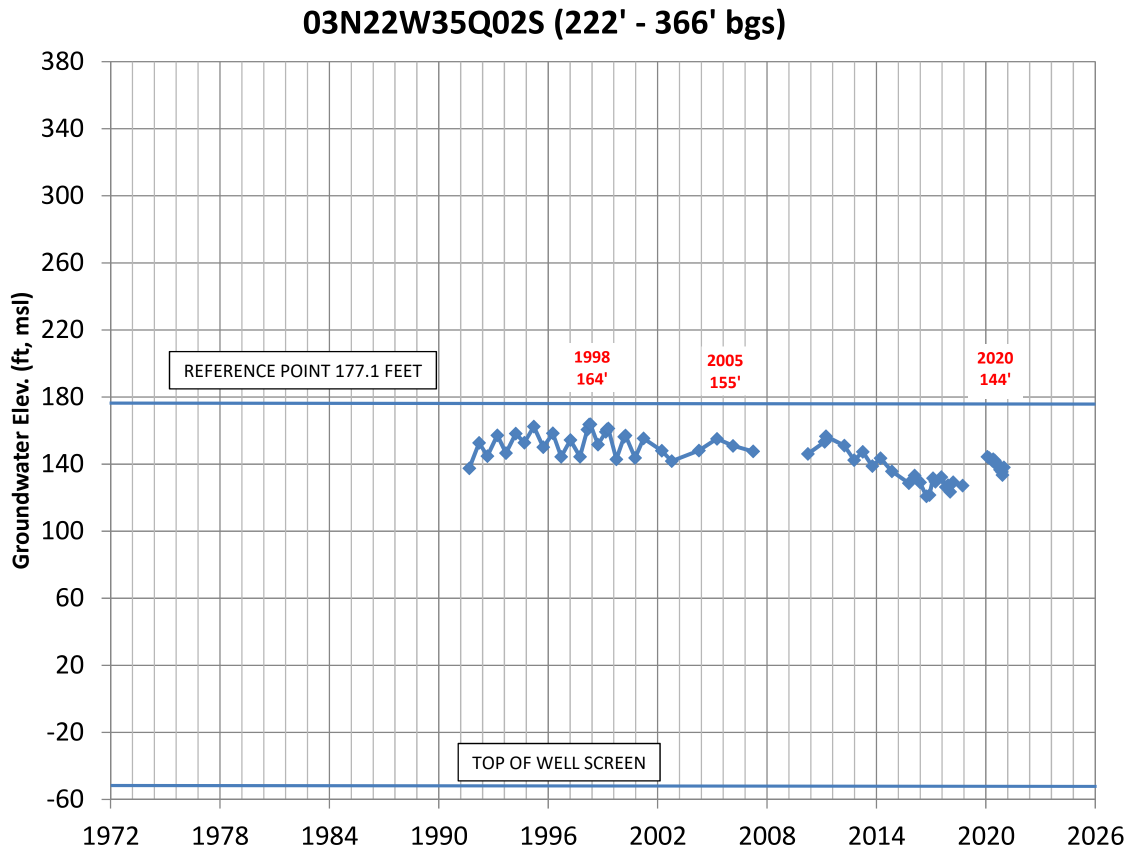

03N22W23Q01S (345' - 445' bgs)
Groundwater Elev. (ft, msl)
280
270
260
250
240
230
220
210
200
1996
2002
2008
2014
2020
2026
RP = 371
2011
250'
2020
233'

Intentionally Left Blank

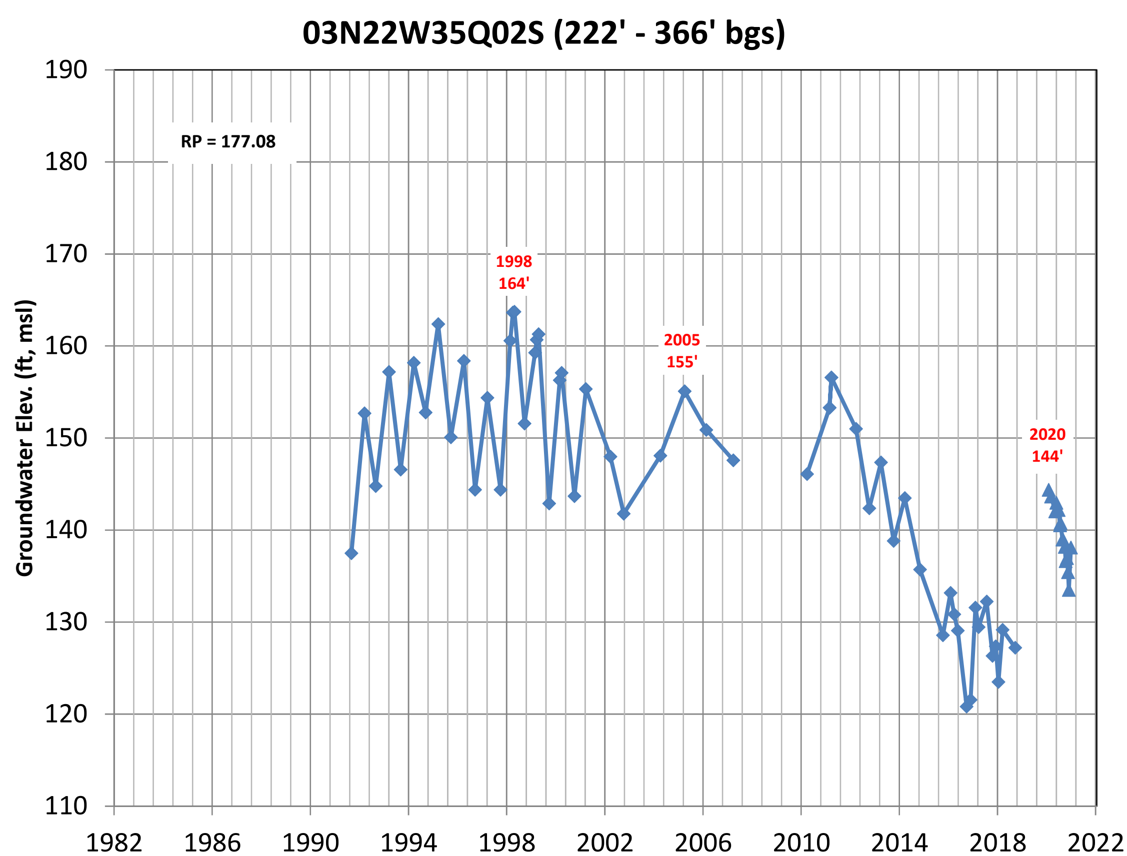


Intentionally Left Blank

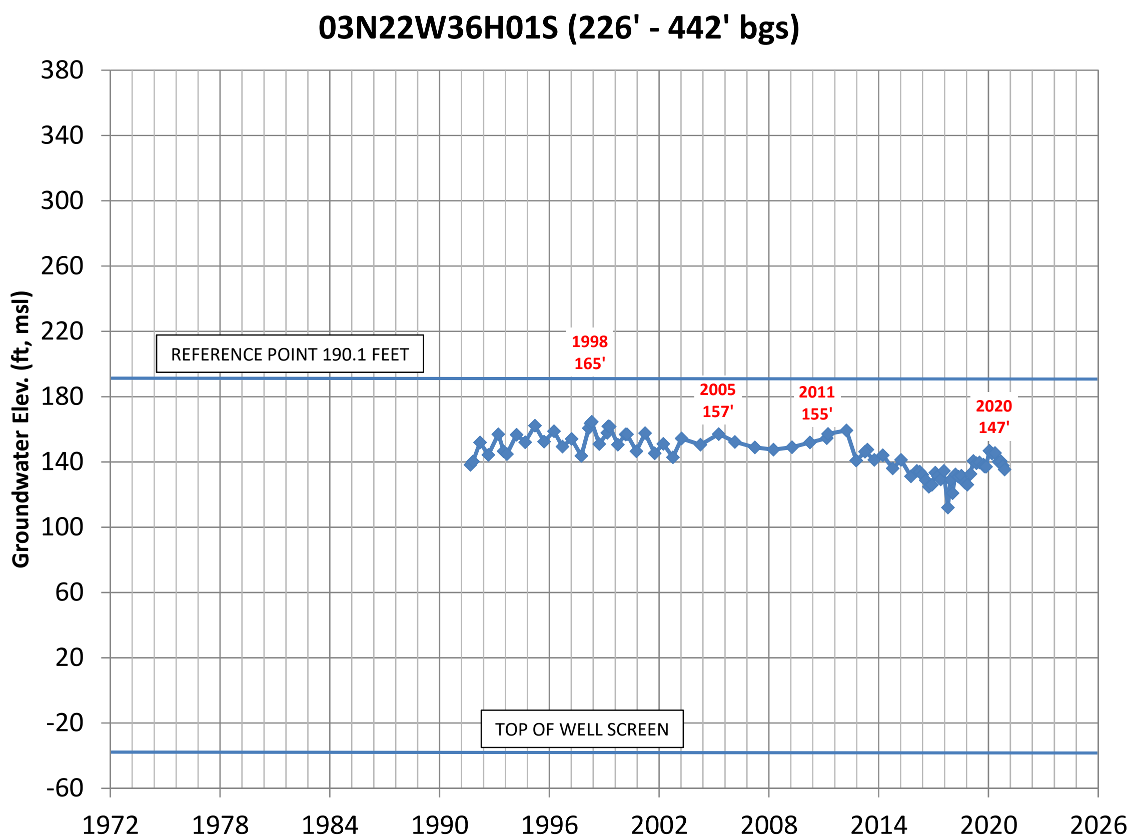


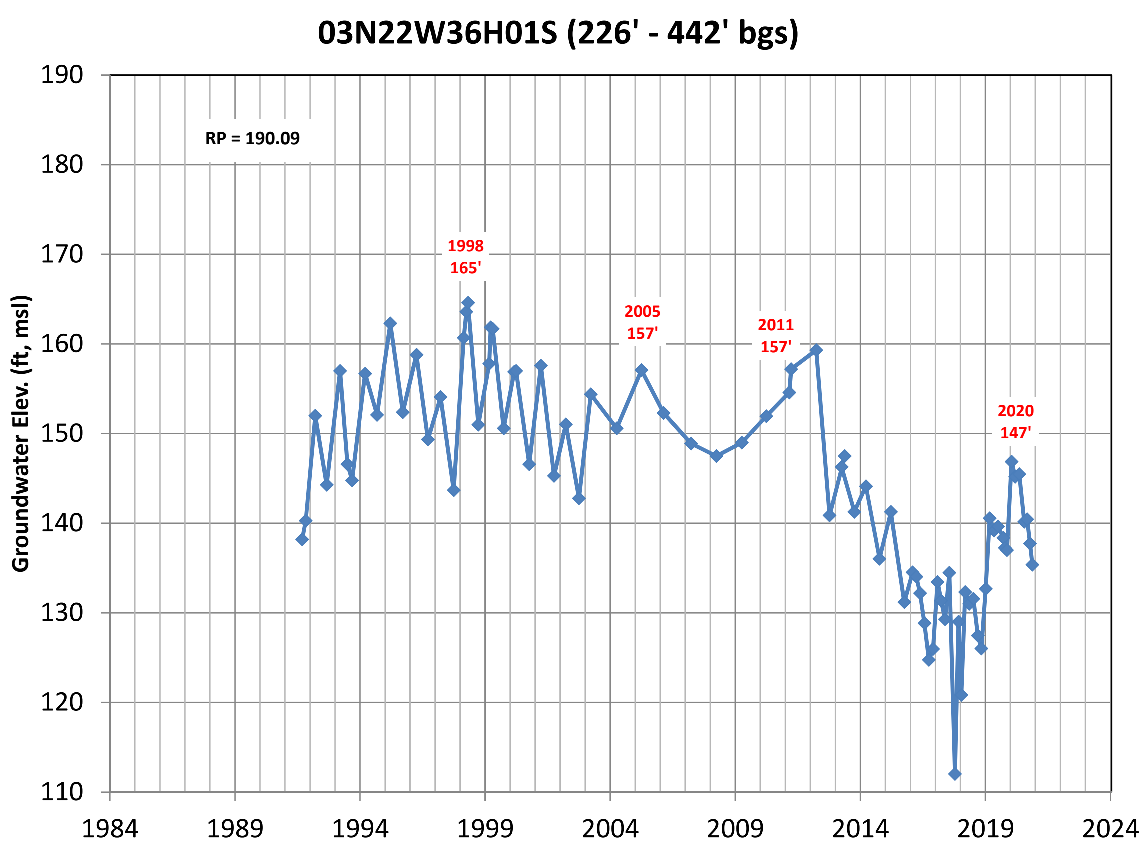


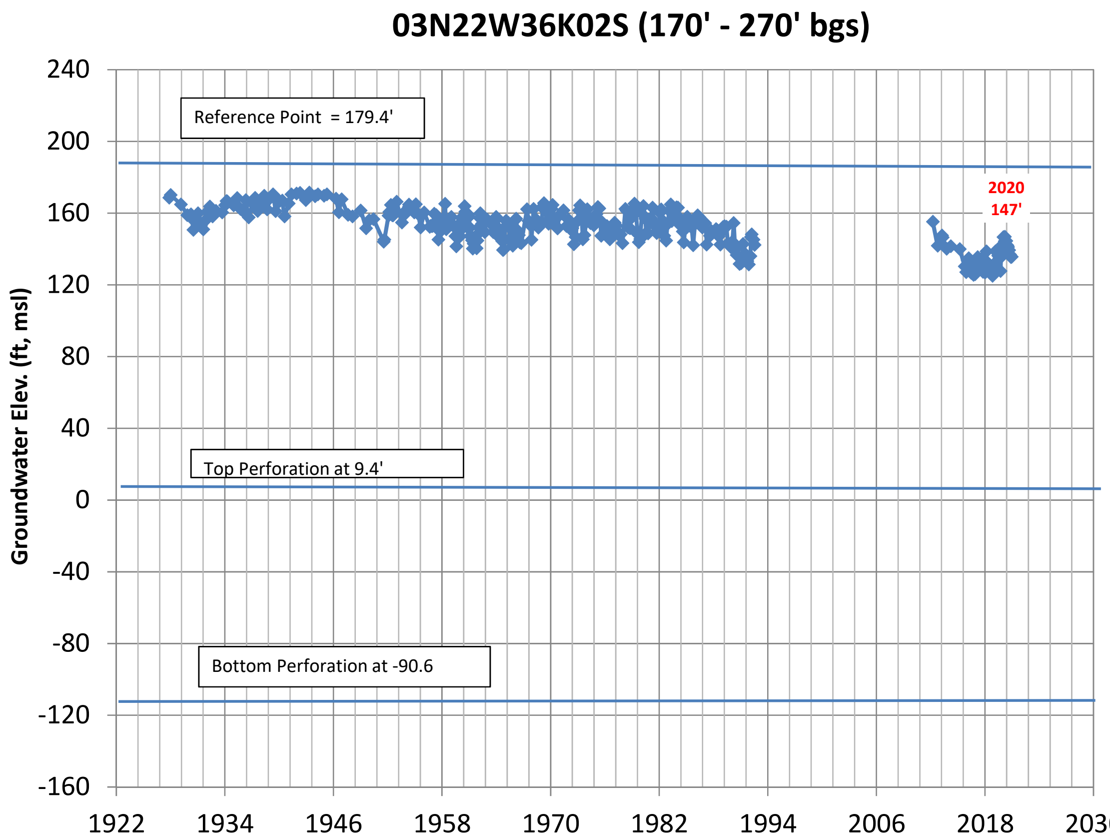
03N22W35Q02S (222' - 366' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 177.1 FEET
TOP OF WELL SCREEN
1998
164'
2005
155'
2020
144'



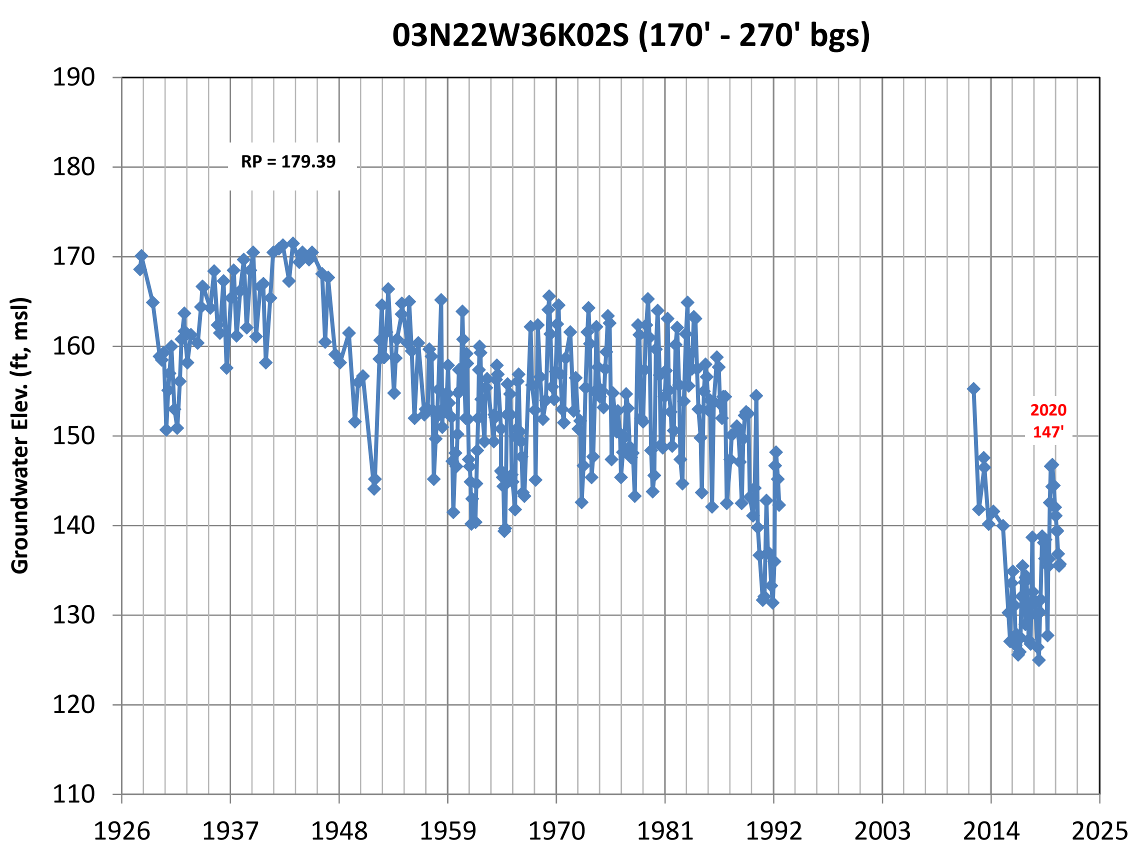
03N22W35Q02S (222' - 366' bgs)
Groundwater Elev. (ft, msl)
RP = 177.08
1998
164'
2005
155'
2020
144'


03N22W36H01S (226' - 442' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 190.1 FEET
TOP OF WELL SCREEN
1998
165'
2005
157'
2011
155'
2020
147'
380
340
300
260
220
180
140
100
60
20
-20
-60
1972
1978
1984
1990
1996
2002
2008
2014
2020
2026

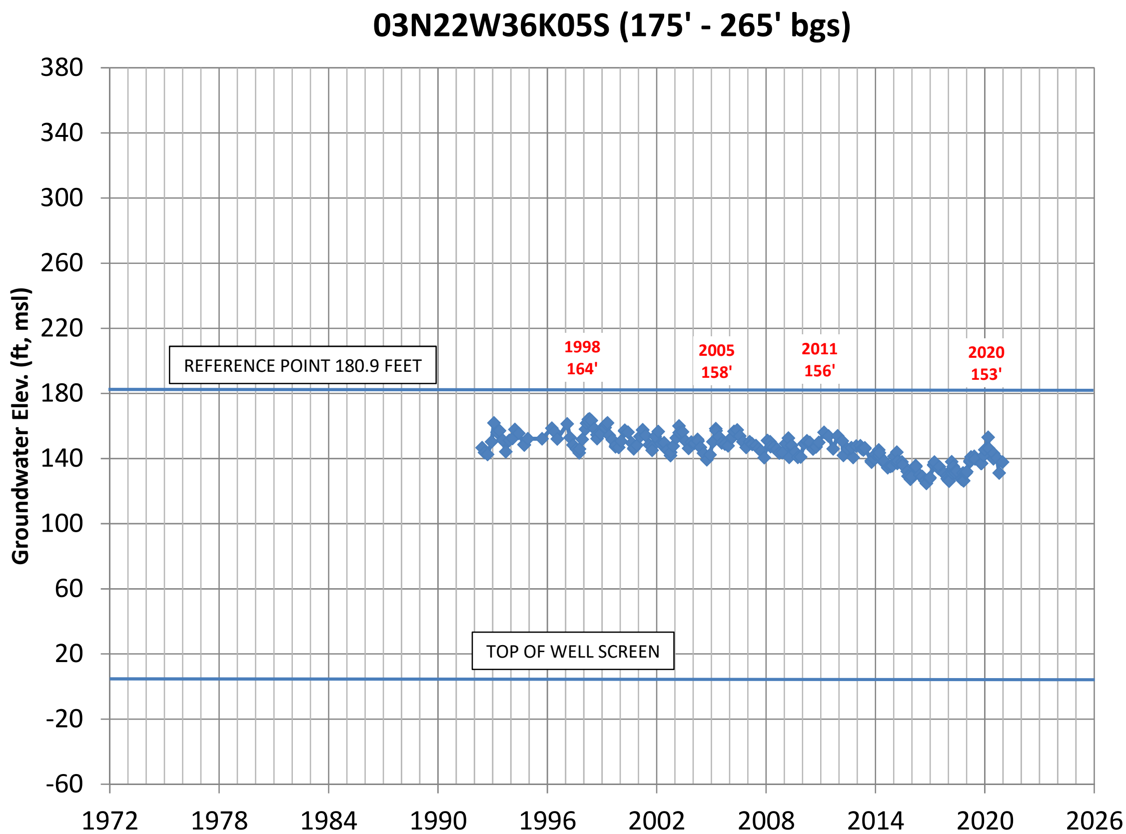

03N22W36H01S (226' - 442' bgs)
Groundwater Elev. (ft, msl)
RP = 190.09
1998
165'
2005
157'
2011
157'
2020
147'
190
180
170
160
150
140
130
120
110
1984
1989
1994
1999
2004
2009
2014
2019
2024

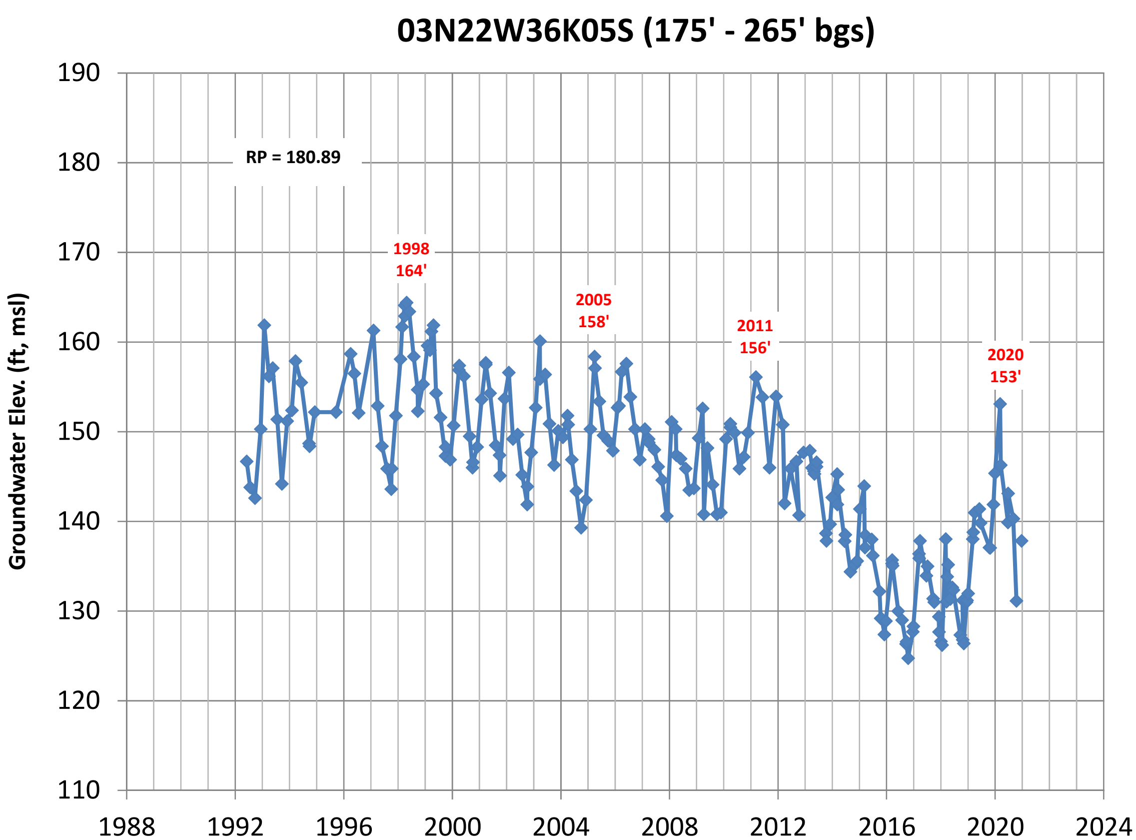


03N22W36K02S (170' - 270' bgs)
Reference Point = 179.4'
Top Perforation at 9.4'
Bottom Perforation at -90.6
2020
147'
Groundwater Elev. (ft, msl)
240
200
160
120
80
40
0
-40
-80
-120
-160
1922
1934
1946
1958
1970
1982
1994
2006
2018
2030



03N22W36K02S (170' - 270' bgs)
RP = 179.39
2020
147'
Groundwater Elev. (ft, msl)
190
180
170
160
150
140
130
120
110
1926
1937
1948
1959
1970
1981
1992
2003
2014
2025

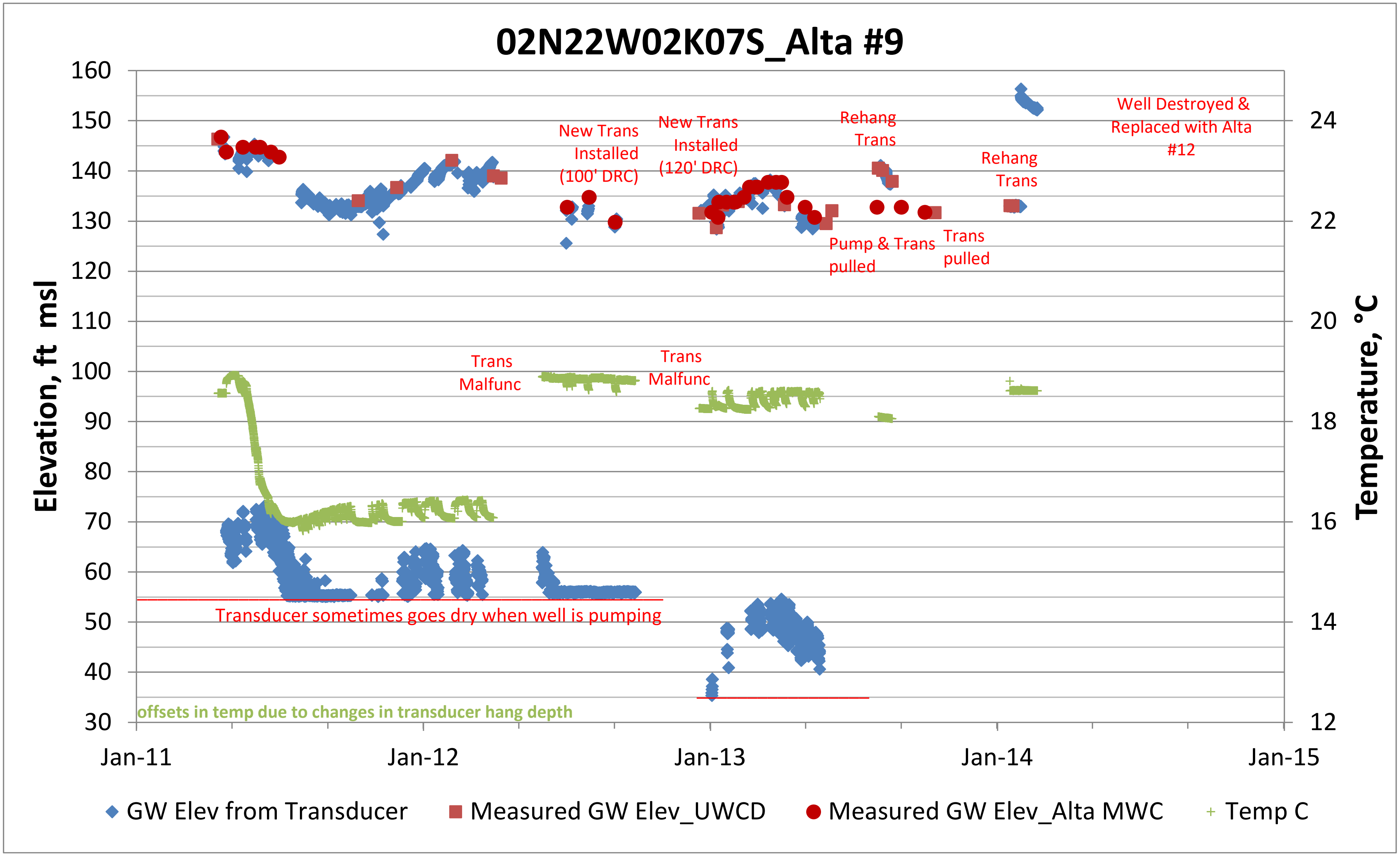

03N22W36K05S (175' - 265' bgs)
Groundwater Elev. (ft, msl)
REFERENCE POINT 180.9 FEET
TOP OF WELL SCREEN
1998
164'
2005
158'
2011
156'
2020
153'

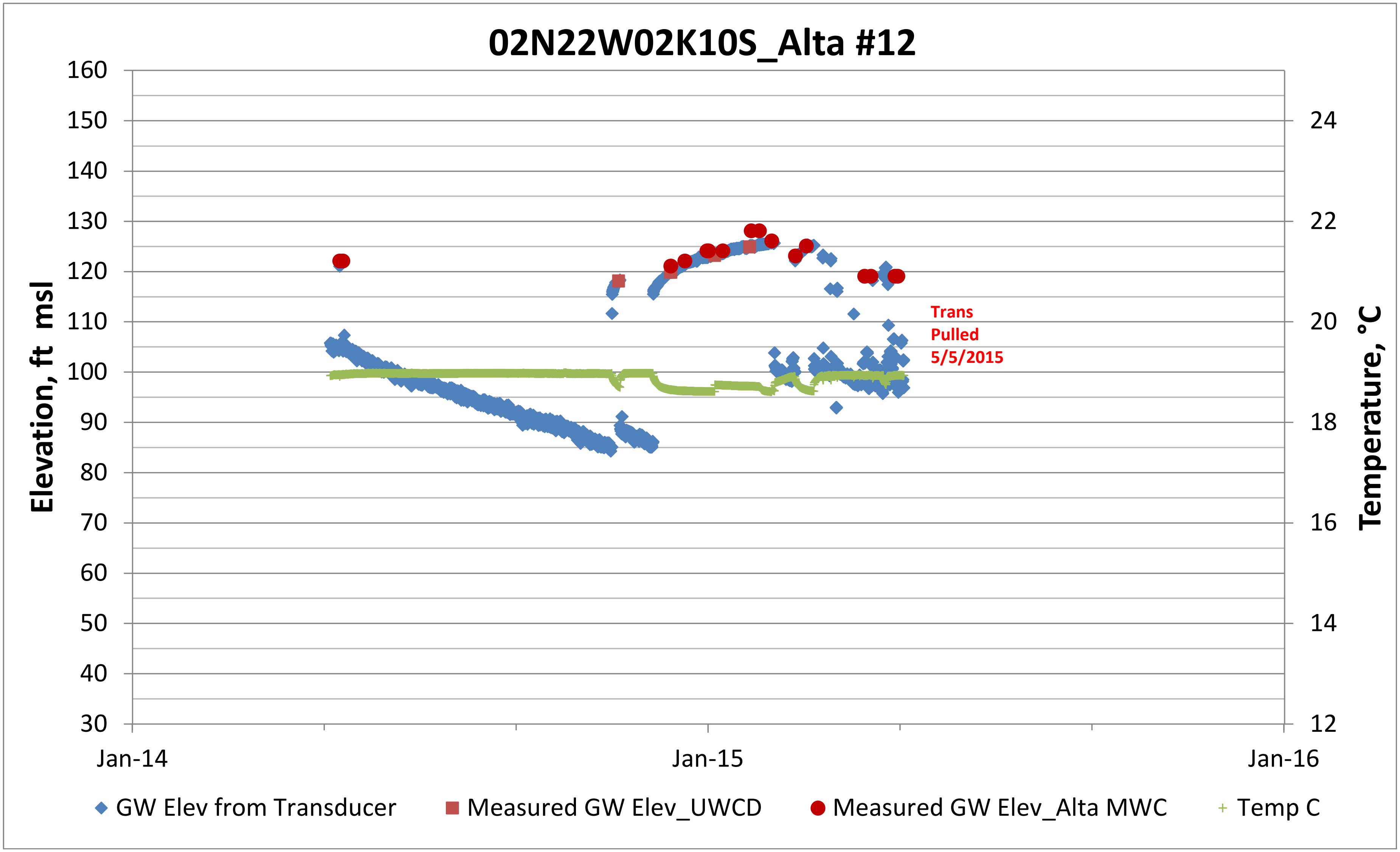

03N22W36K05S (175' - 265' bgs)
Groundwater Elev. (ft, msl)
RP = 180.89
1998
164'
2005
158'
2011
156'
2020
153'

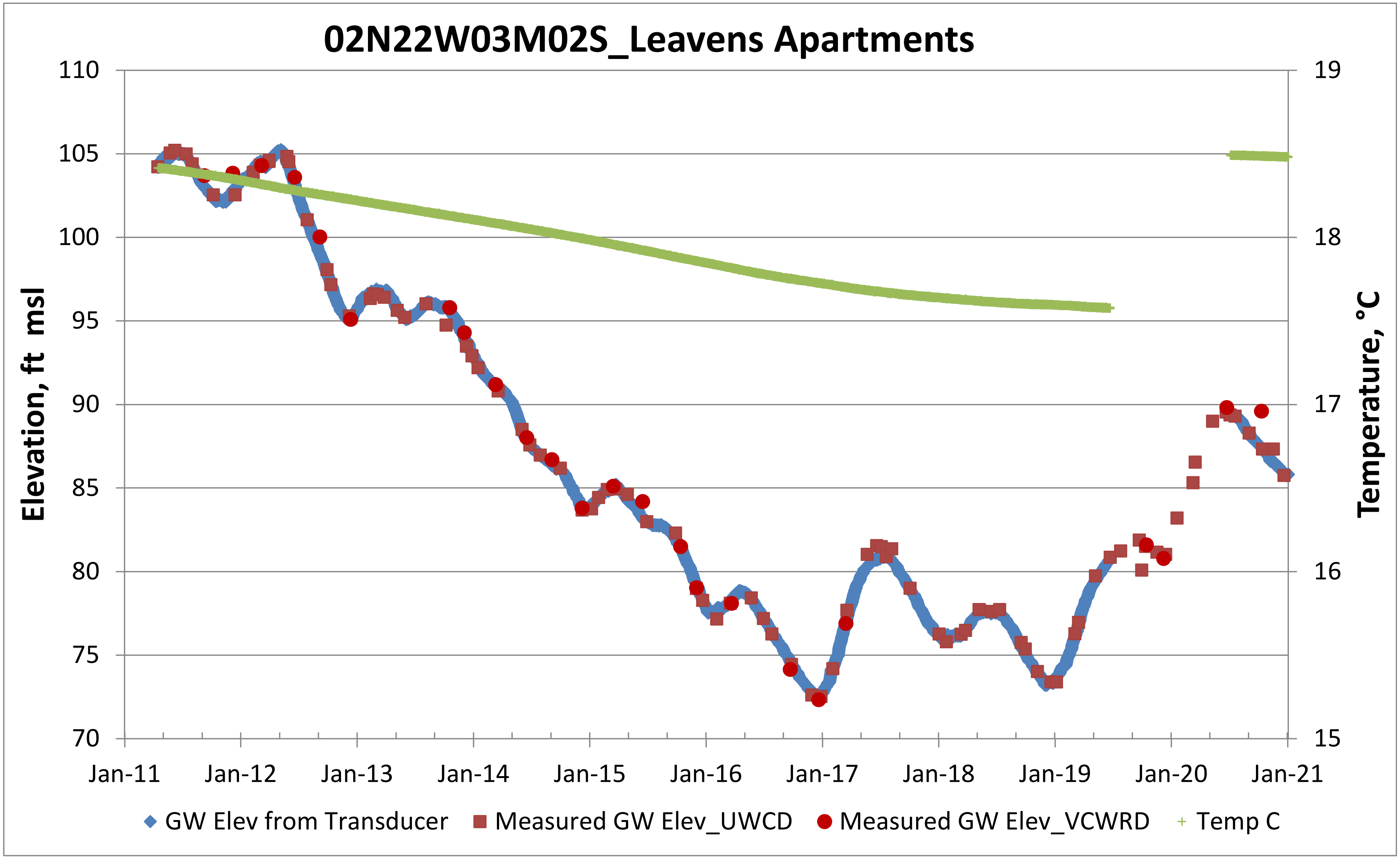
This page intentionally blank.

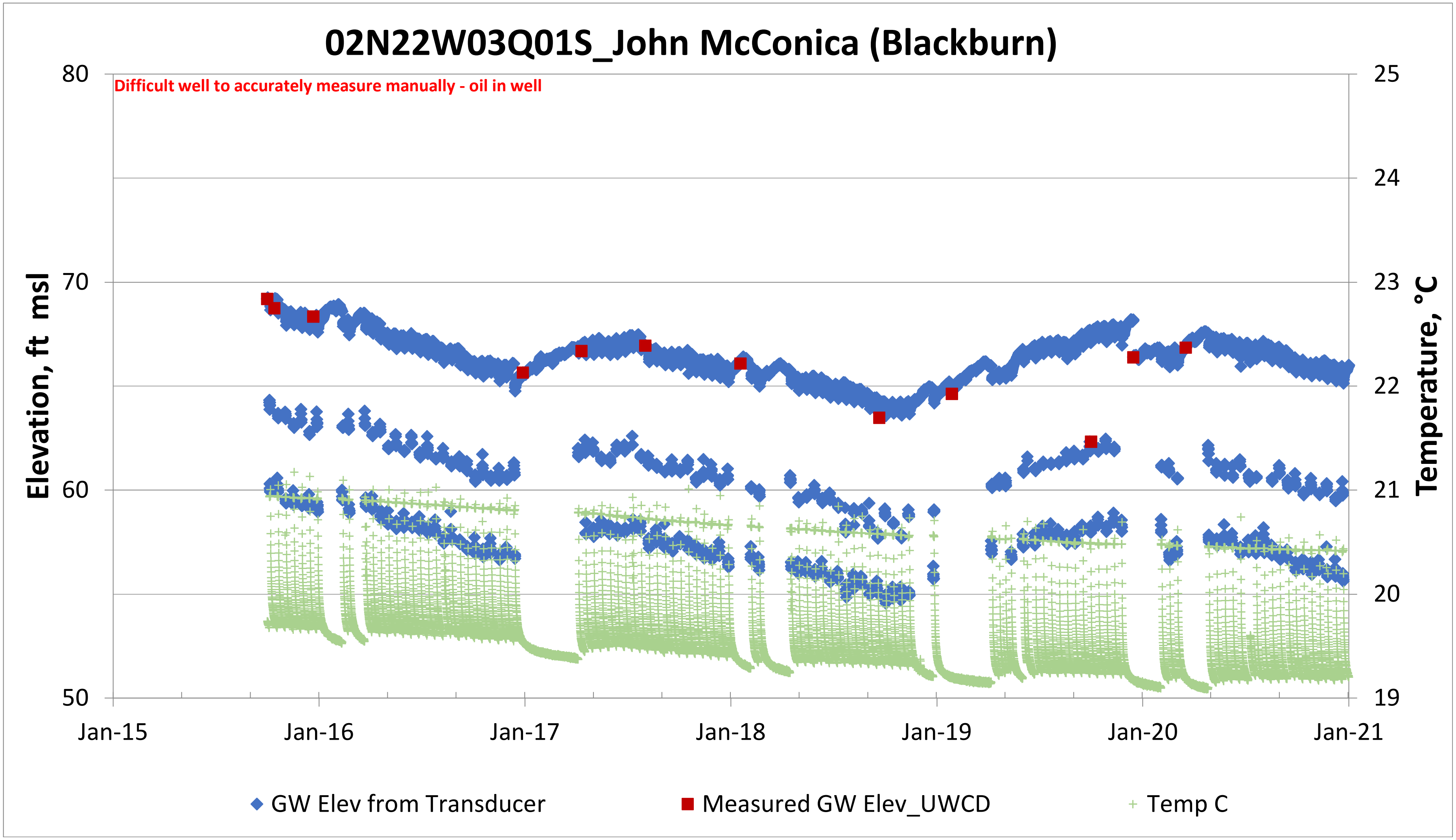
Transducer Records

This page intentionally blank.

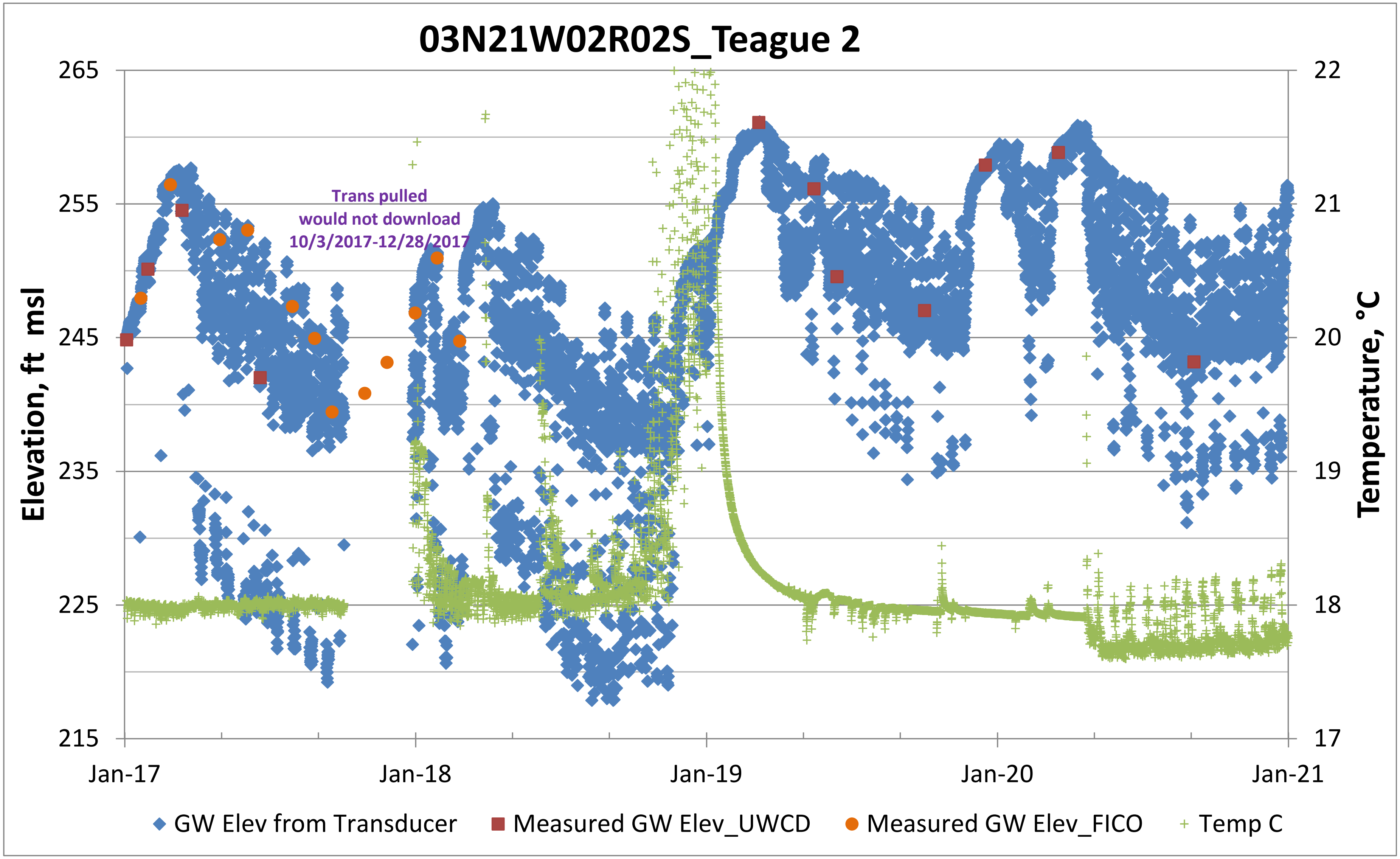

02N22W02K07S_Alta #9
Elevation, ft msl
Temperature, °C
160
150
140
130
120
110
100
90
80
70
60
50
40
30
24
22
20
18
16
14
12
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
New Trans Installed (100' DRC)
New Trans Installed (120' DRC)
Rehang Trans
Rehang Trans
Well Destroyed & Replaced with Alta #12
Pump & Trans pulled
Trans pulled
Trans Malfunc
Trans Malfunc
Transducer sometimes goes dry when well is pumping
offsets in temp due to changes in transducer hang depth
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_Alta MWC
Temp C

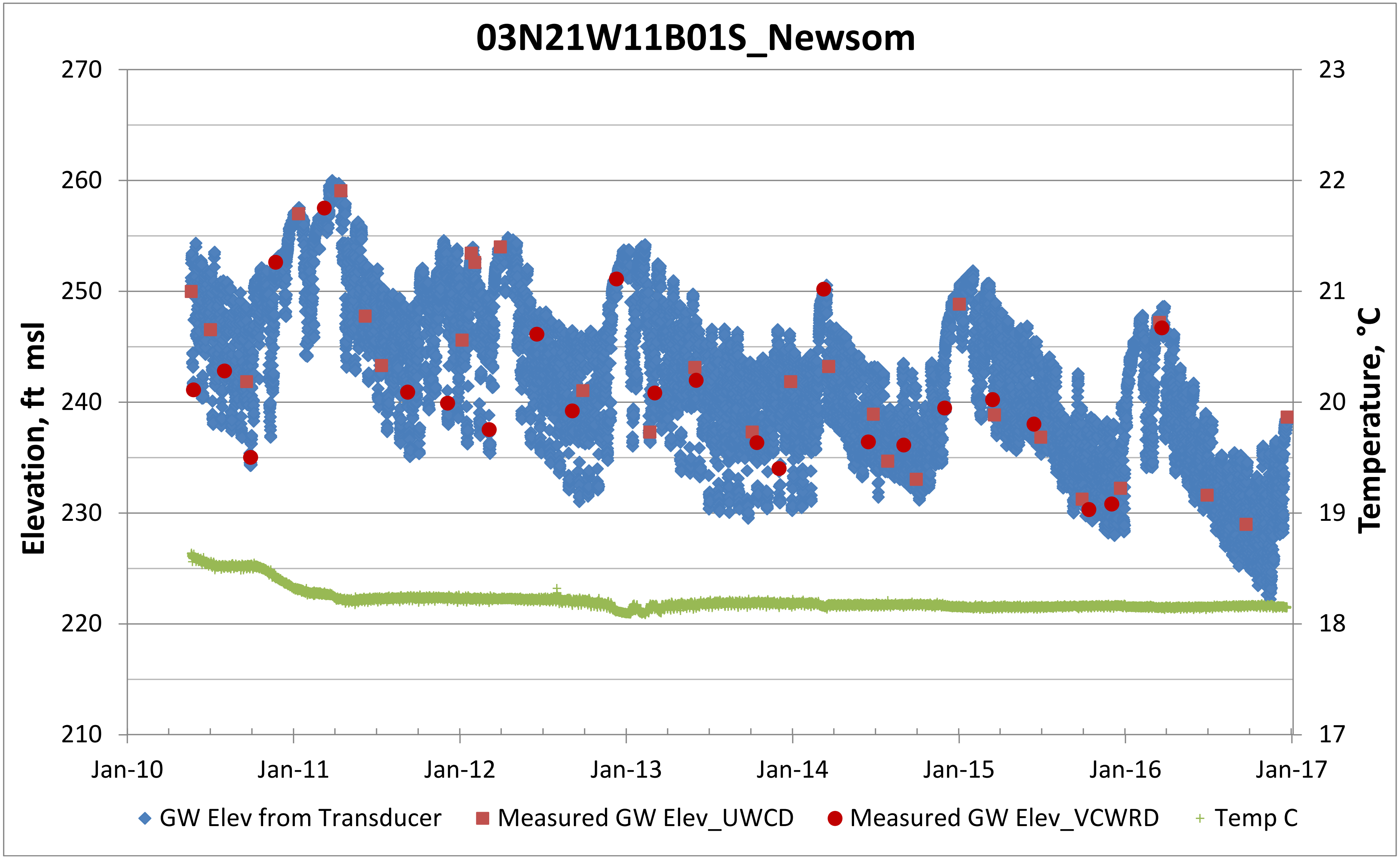

02N22W02K10S_Alta #12
Elevation, ft msl
Temperature, °C
160
150
140
130
120
110
100
90
80
70
60
50
40
30
24
22
20
18
16
14
12
Jan-14
Jan-15
Jan-16
Trans
Pulled
5/5/2015
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_Alta MWC
Temp C


02N22W03M02S_Leavens Apartments
Elevation, ft msl
Temperature, °C
110
105
100
95
90
85
80
75
70
19
18
17
16
15
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_VCWRD
Temp C

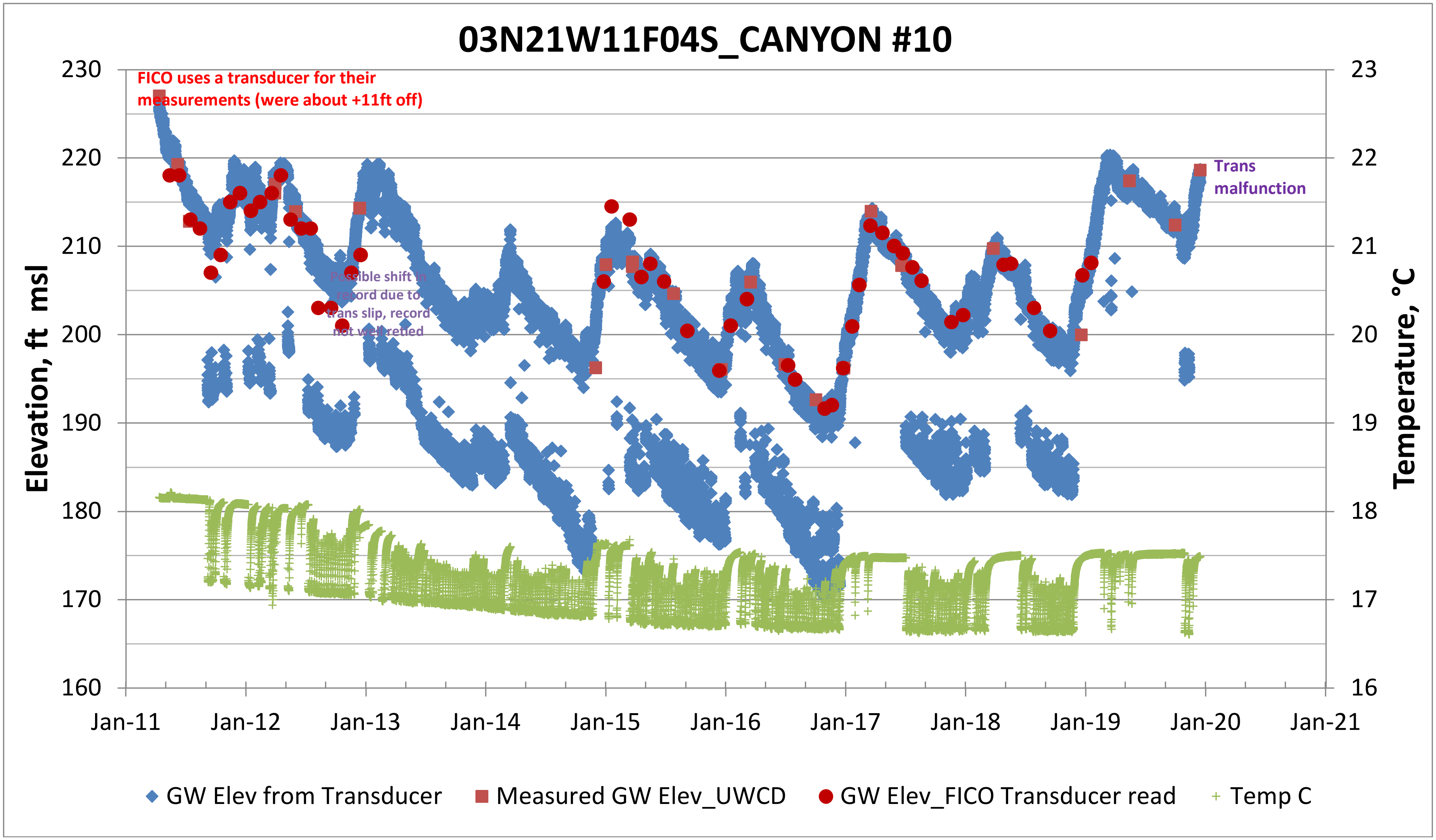


02N22W03Q01S_John McConica (Blackburn)
Difficult well to accurately measure manually - oil in well
Elevation, ft msl
Temperature, °C
80
70
60
50
25
24
23
22
21
20
19
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev_UWCD
Temp C

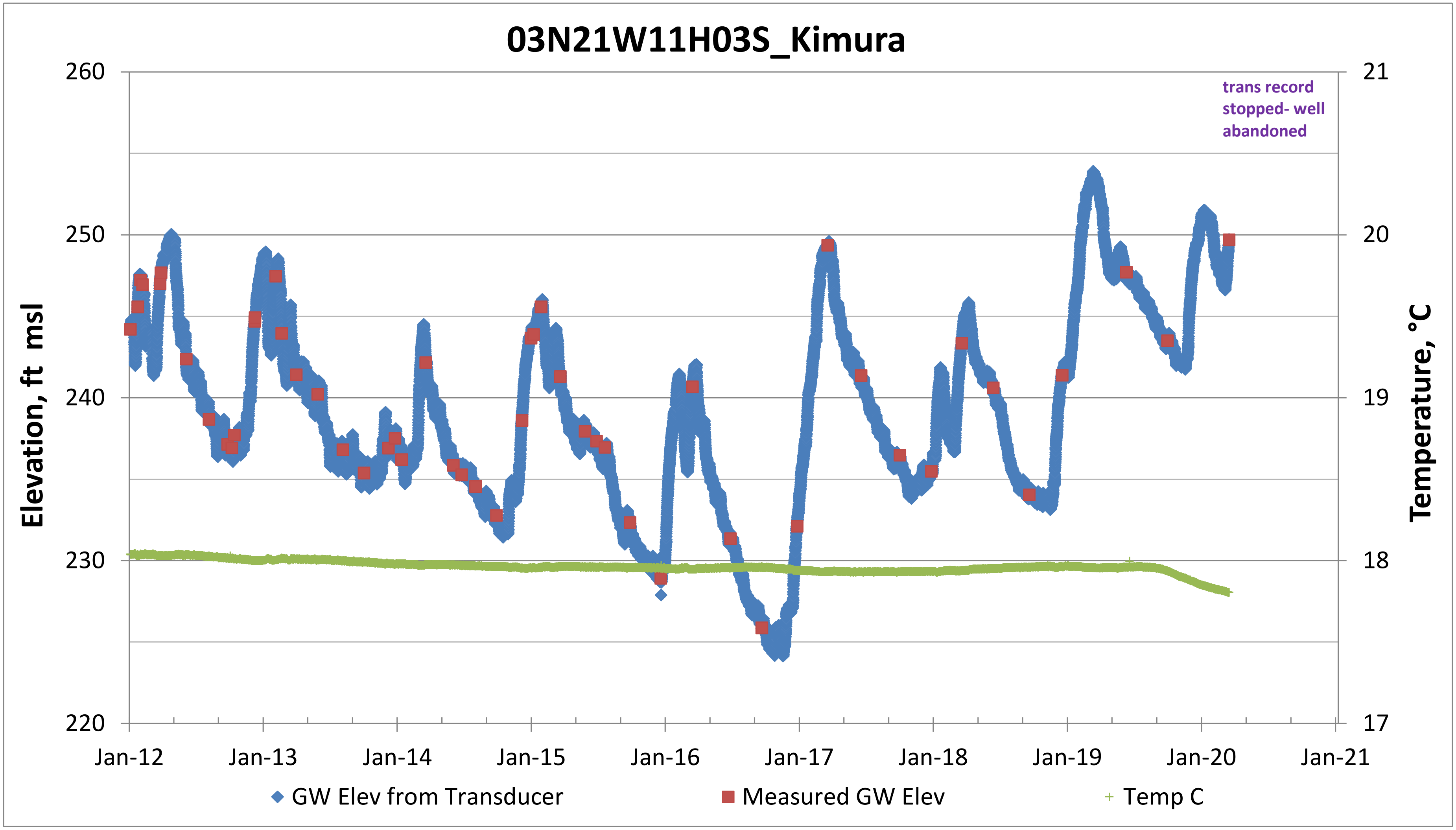

03N21W02R02S_Teague 2
Elevation, ft msl
Temperature, °C
265
255
245
235
225
215
22
21
20
19
18
17
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Trans pulled
would not download
10/3/2017-12/28/2017
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_FICO
Temp C



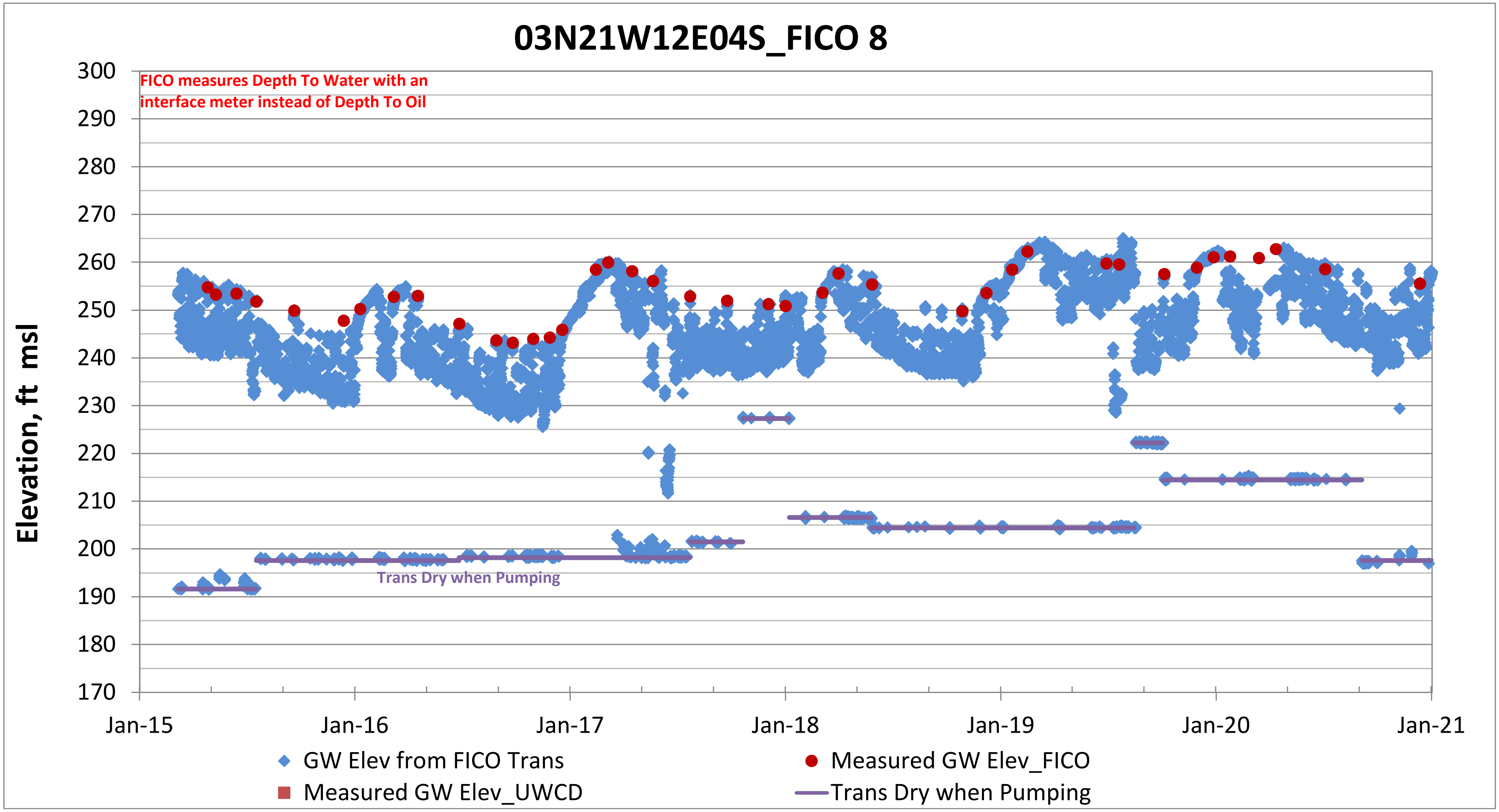
03N21W11B01S_Newsom
Elevation, ft msl
Temperature, °C
270
260
250
240
230
220
210
23
22
21
20
19
18
17
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_VCWRD
Temp C

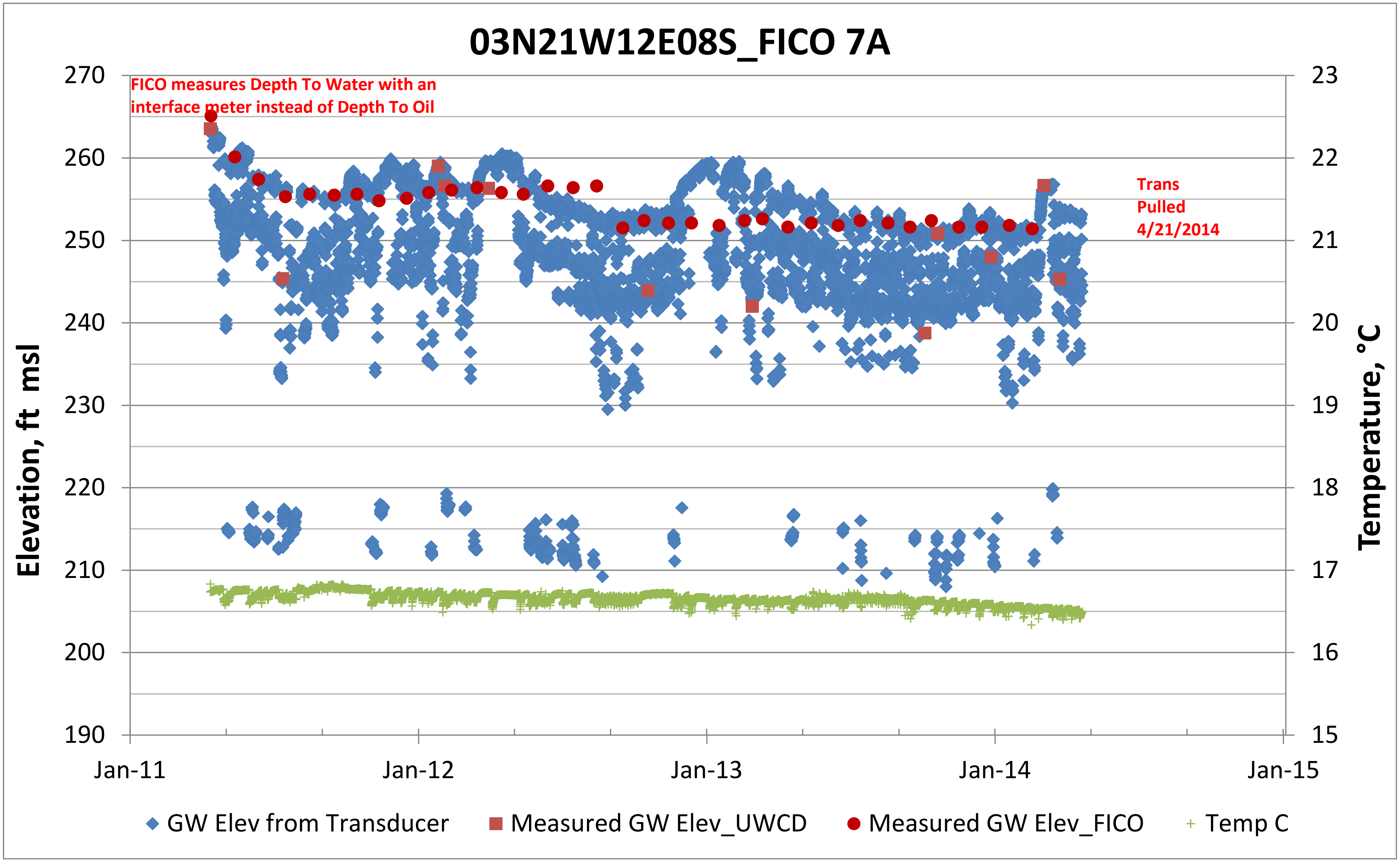


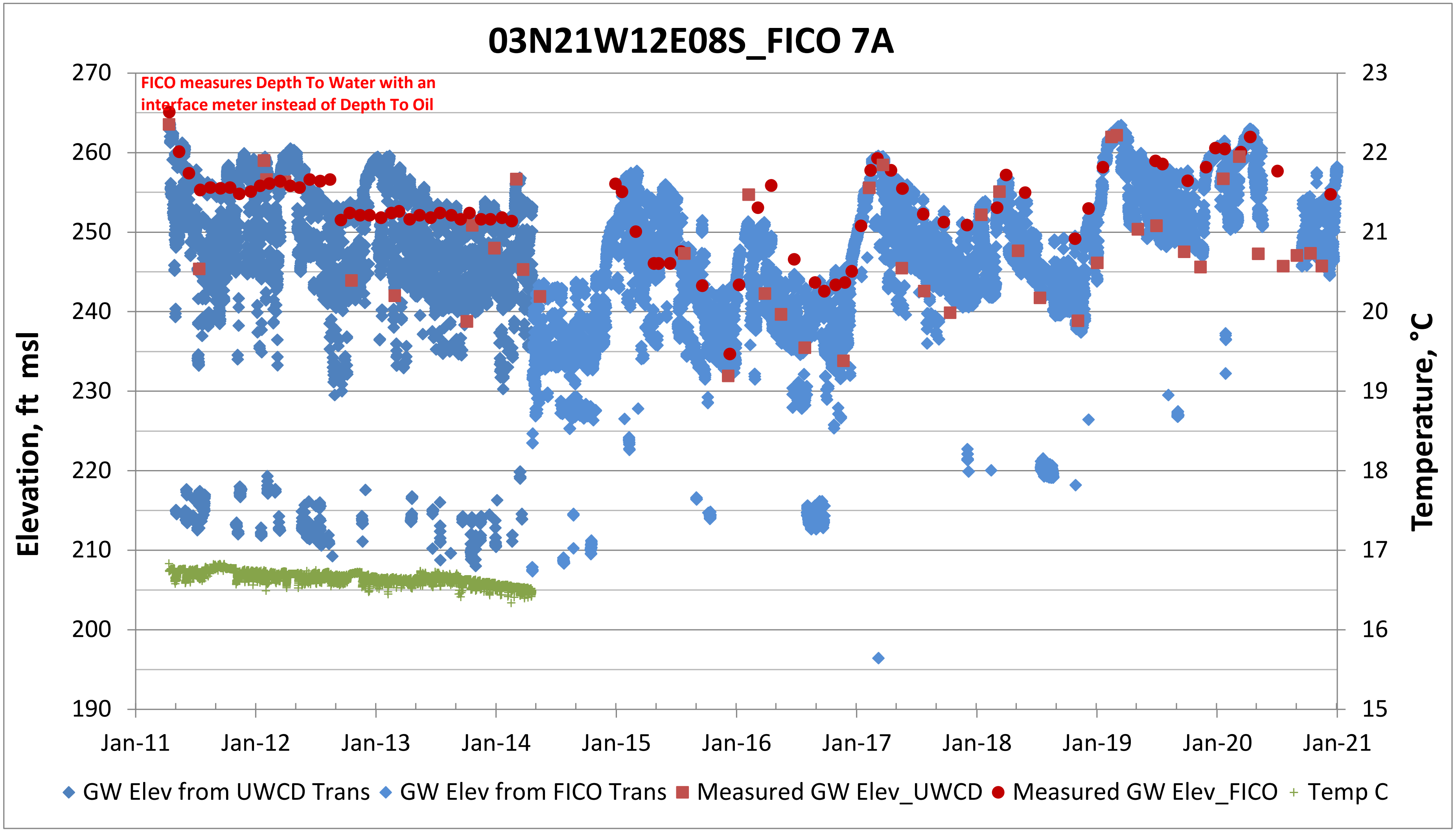
03N21W11F04S_CANYON #10
FICO uses a transducer for their measurements (were about +11ft off)
Possible shift in record due to trans slip, record not well retied
Trans malfunction
Elevation, ft msl
Temperature, °C
230
220
210
200
190
180
170
160
23
22
21
20
19
18
17
16
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev_UWCD
GW Elev_FICO Transducer read
Temp C



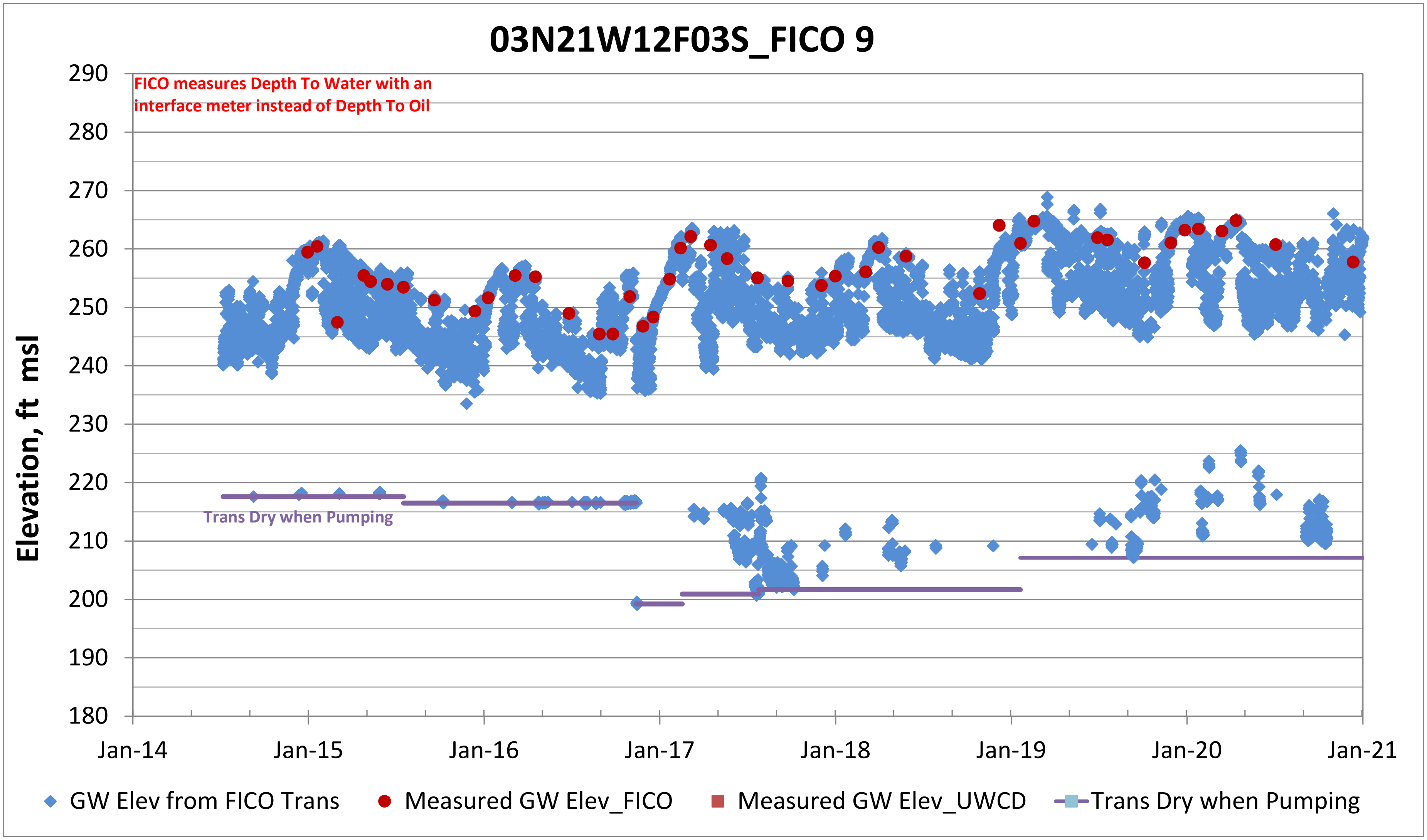
03N21W11H03S_Kimura
260
250
240
230
220
21
20
19
18
17
Elevation, ft msl
Temperature, °C
trans record stopped- well abandoned
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev
Temp C

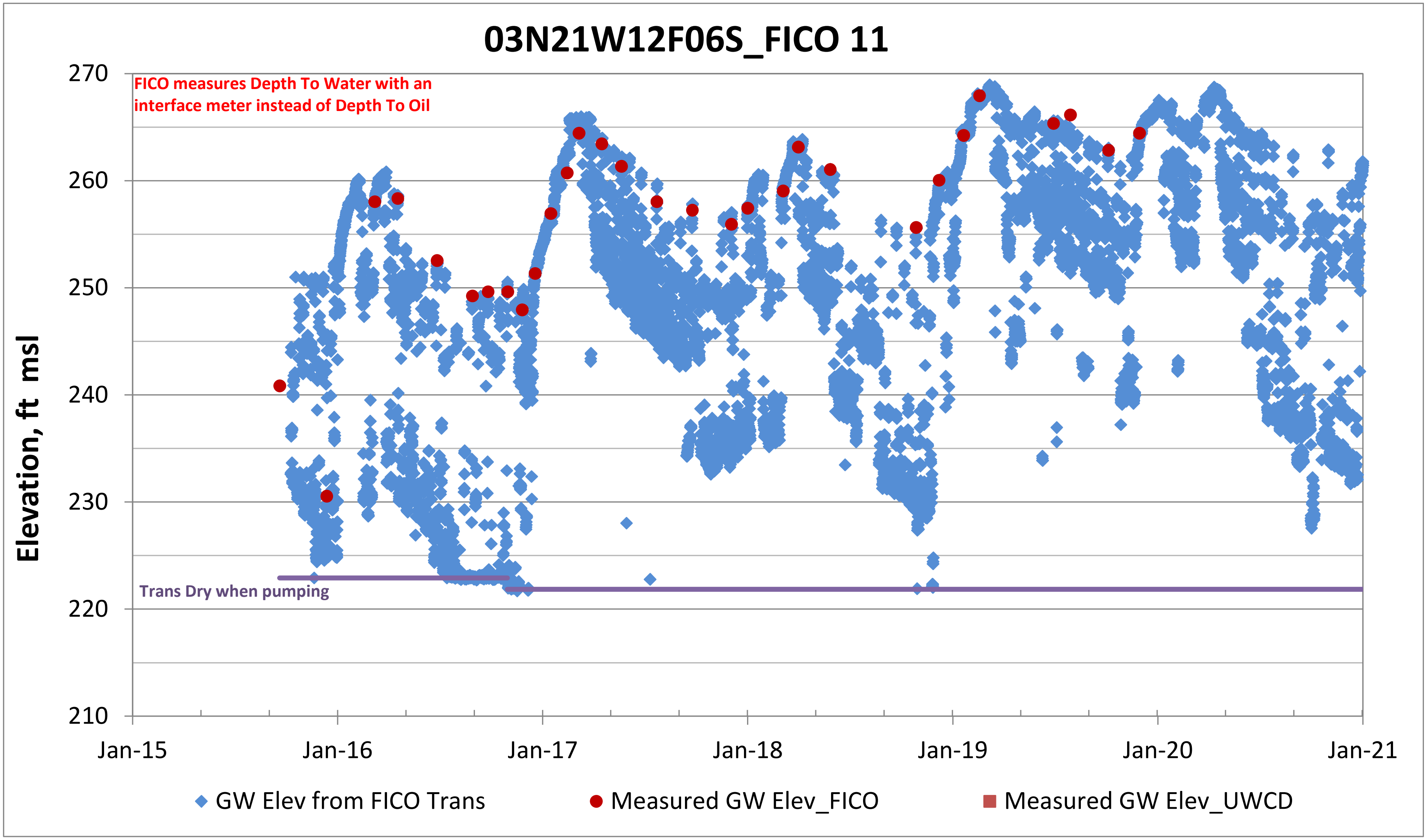

03N21W12E04S_FICO 8
FICO measures Depth To Water with an
interface meter instead of Depth To Oil
Trans Dry when Pumping
Elevation, ft msl
300
290
280
270
260
250
240
230
220
210
200
190
180
170
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from FICO Trans
Measured GW Elev_FICO
Measured GW Elev_UWCD
Trans Dry when Pumping

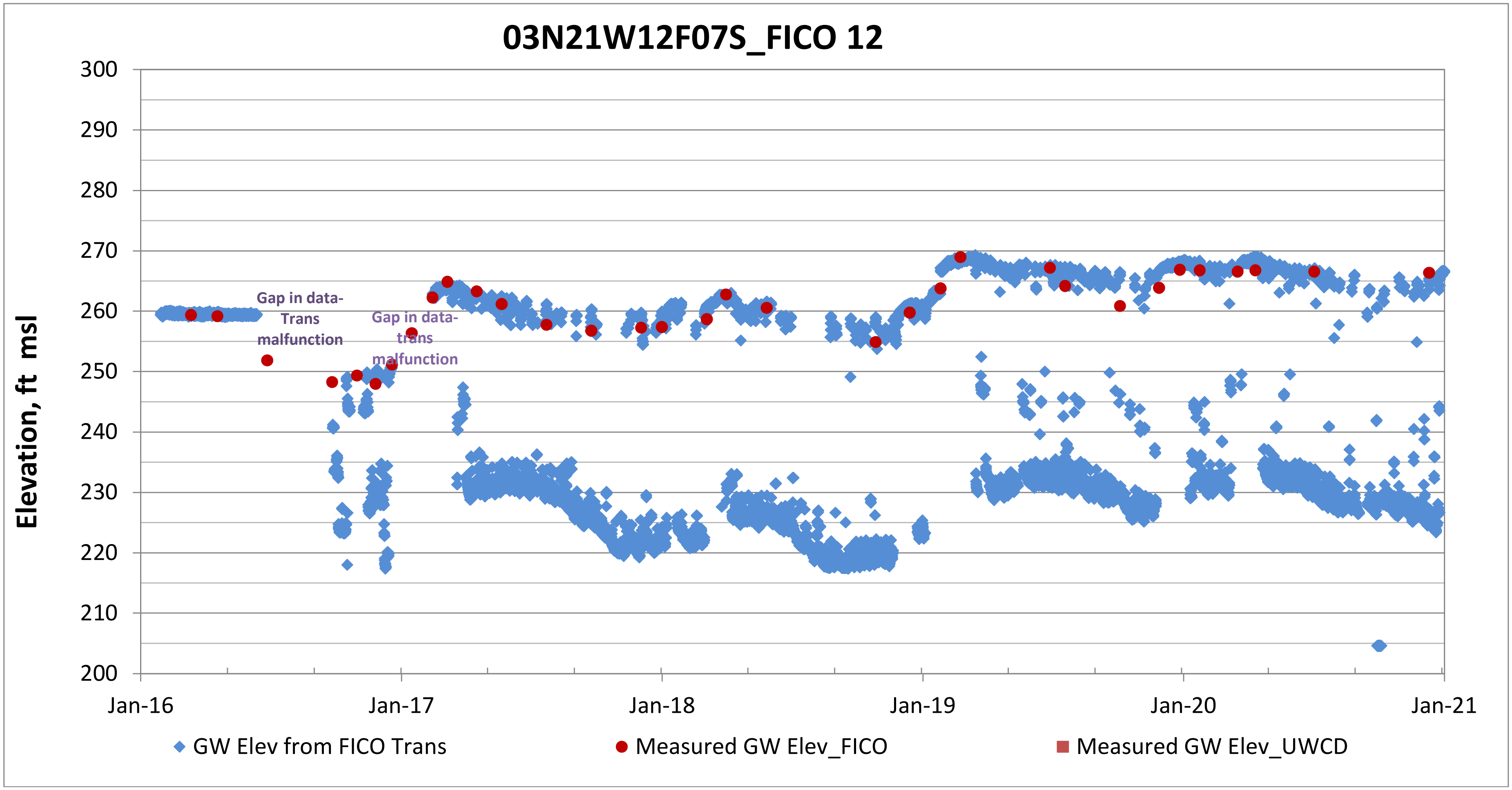

03N21W12E08S_FICO 7A
FICO measures Depth To Water with an interface meter instead of Depth To Oil
Trans Pulled 4/21/2014
Elevation, ft msl
Temperature, °C
270
260
250
240
230
220
210
200
190
23
22
21
20
19
18
17
16
15
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_FICO
Temp C

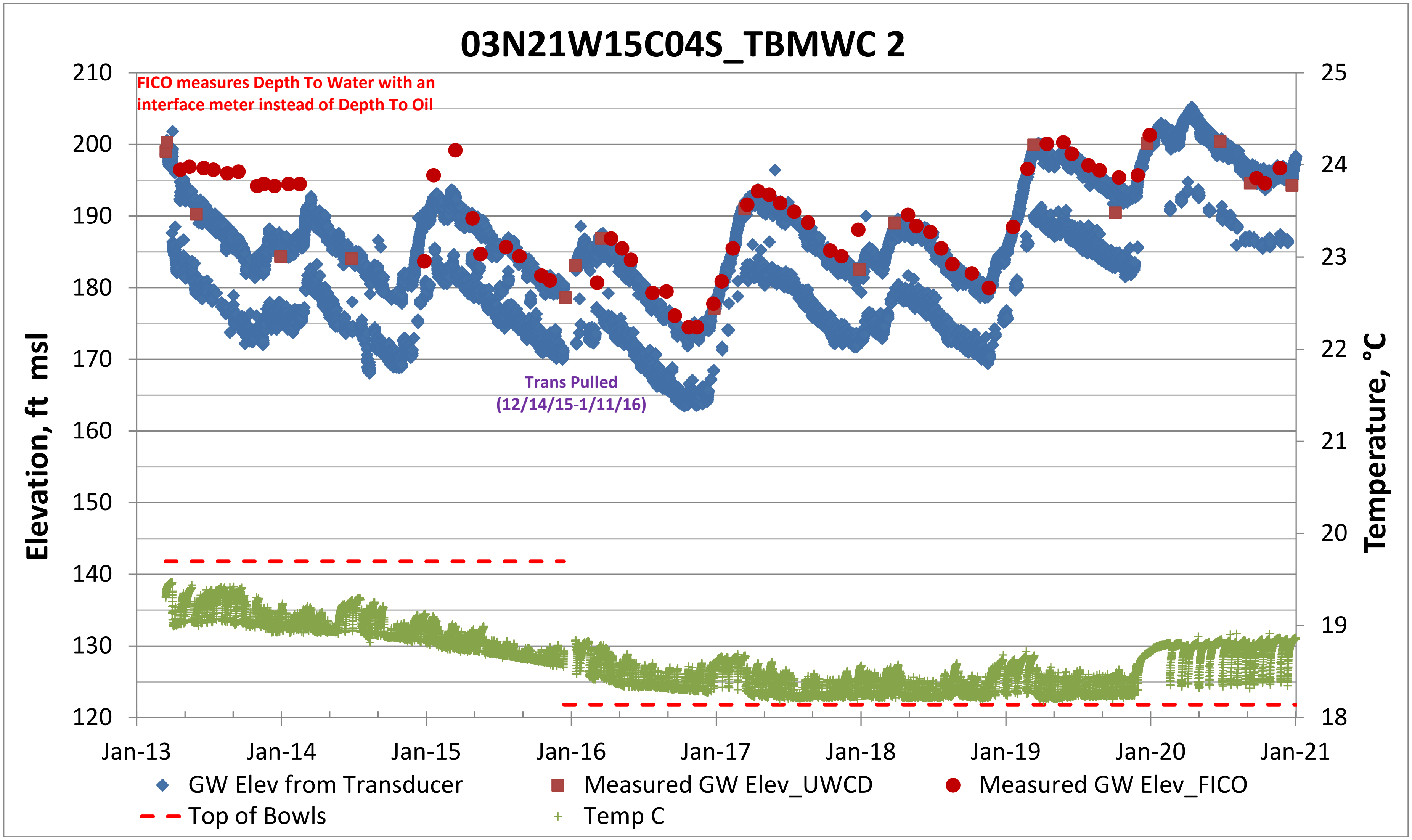


03N21W12E08S_FICO 7A
FICO measures Depth To Water with an interface meter instead of Depth To Oil
Elevation, ft msl
Temperature, °C
270
260
250
240
230
220
210
200
190
23
22
21
20
19
18
17
16
15
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from UWCD Trans
GW Elev from FICO Trans
Measured GW Elev_UWCD
Measured GW Elev_FICO
Temp C

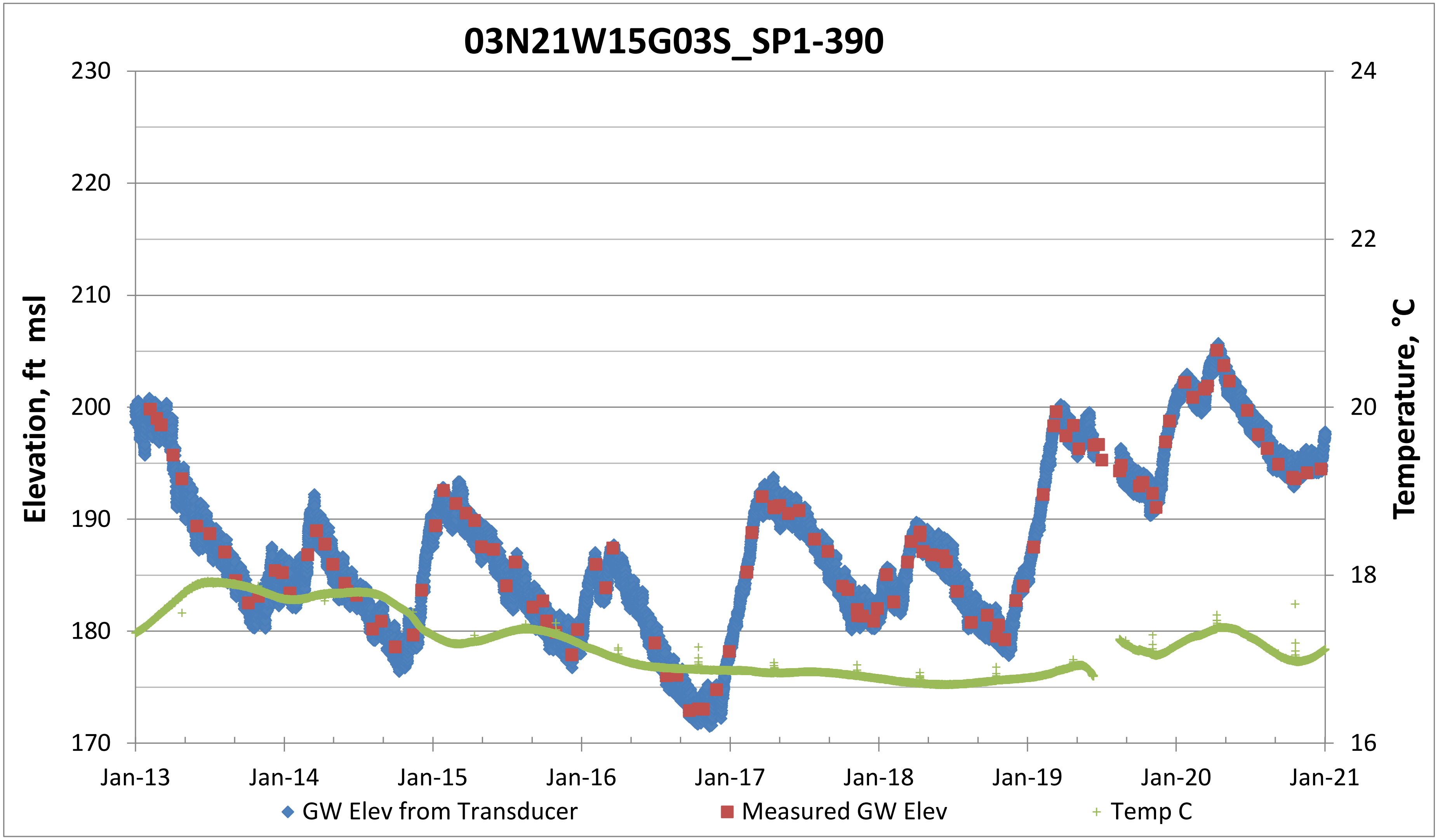

03N21W12F03S_FICO 9
FICO measures Depth To Water with an interface meter instead of Depth To Oil
Trans Dry when Pumping
Elevation, ft msl
290
280
270
260
250
240
230
220
210
200
190
180
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from FICO Trans
Measured GW Elev_FICO
Measured GW Elev_UWCD
Trans Dry when Pumping

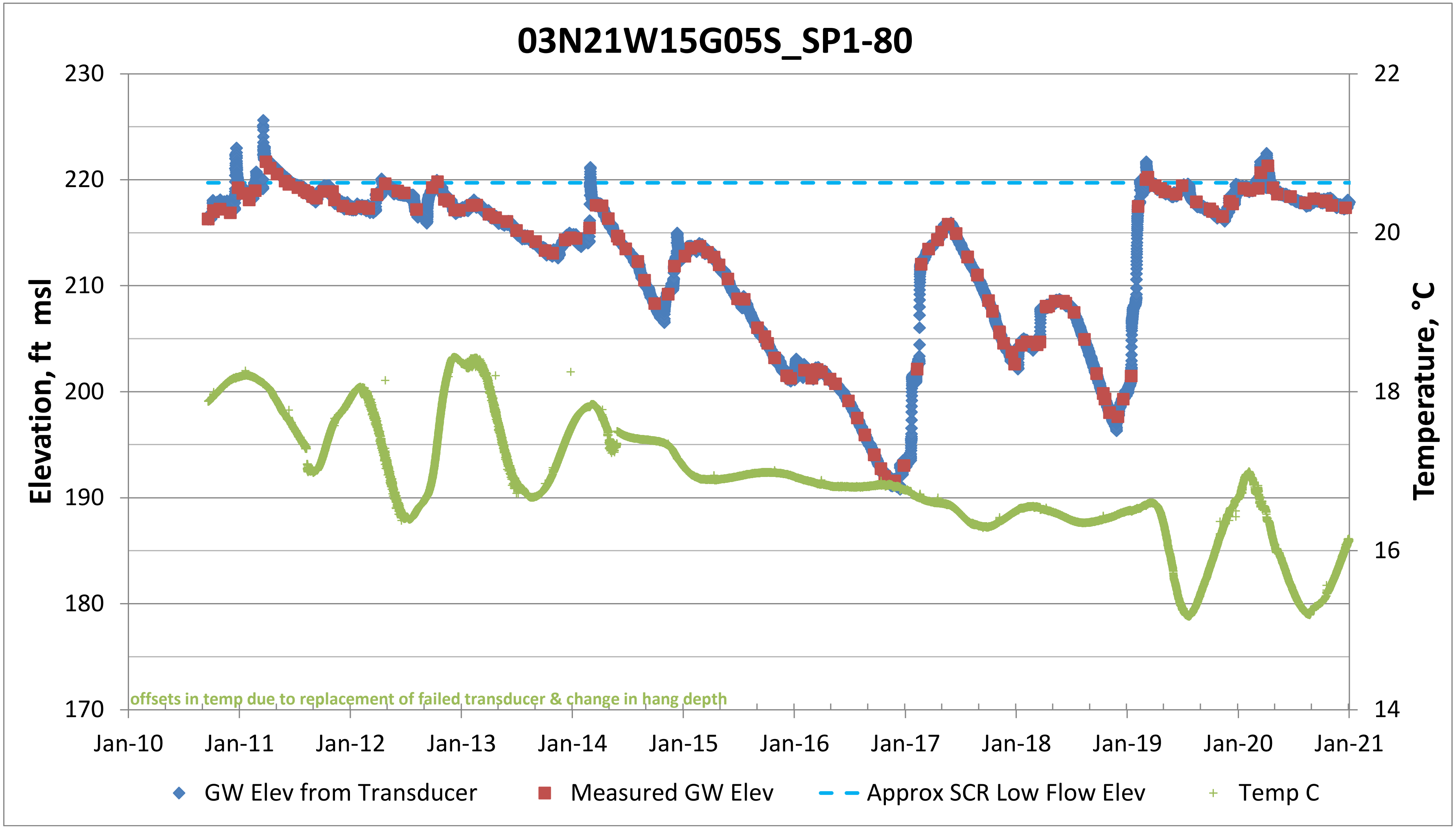

03N21W12F06S_FICO 11
FICO measures Depth To Water with an interface meter instead of Depth To Oil
Trans Dry when pumping
Elevation, ft msl
270
260
250
240
230
220
210
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from FICO Trans
Measured GW Elev_FICO
Measured GW Elev_UWCD

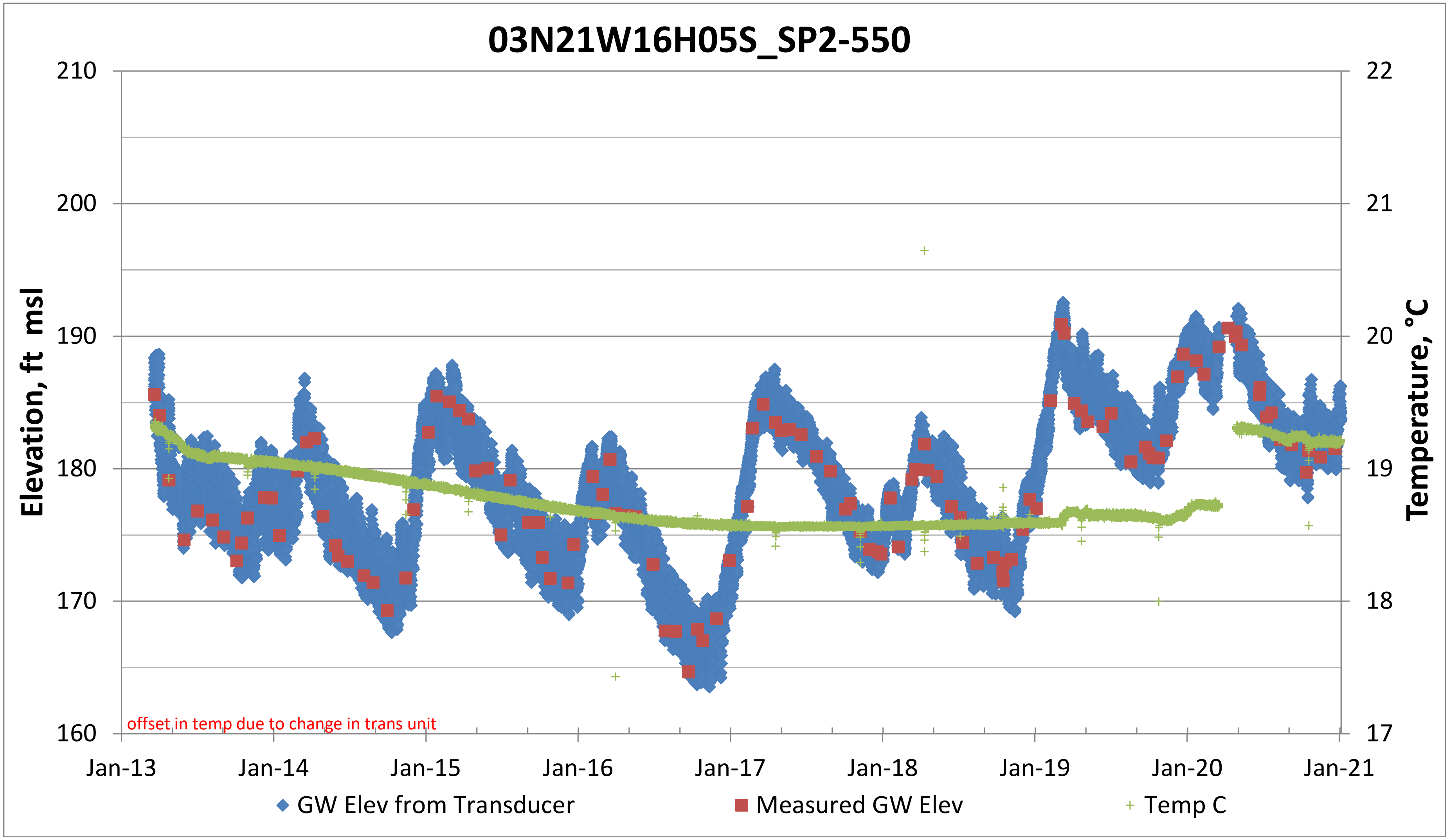

03N21W12F07S_FICO 12
Elevation, ft msl
300
290
280
270
260
250
240
230
220
210
200
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Gap in data-
Trans
malfunction
Gap in data-
trans
malfunction
GW Elev from FICO Trans
Measured GW Elev_FICO
Measured GW Elev_UWCD



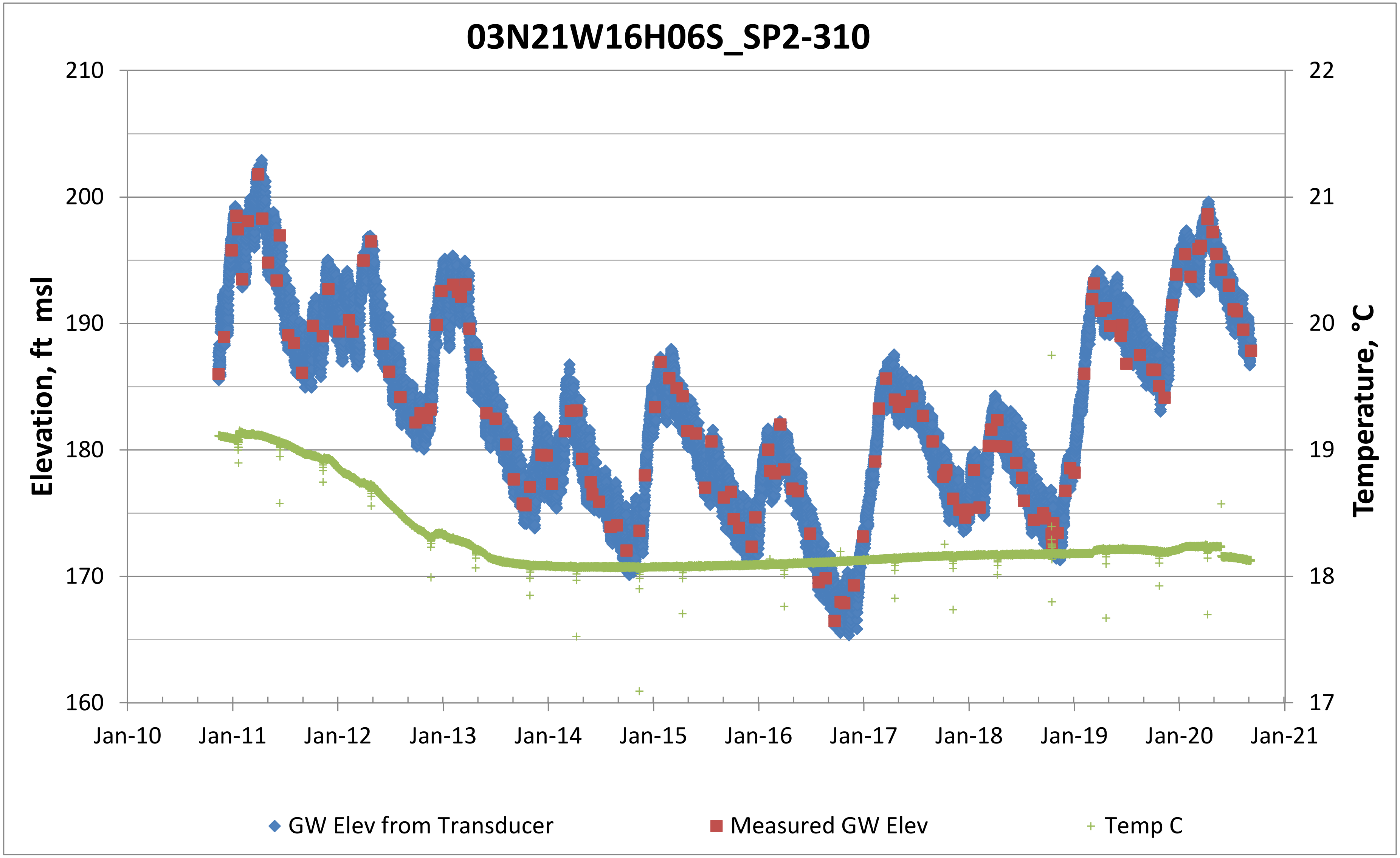
03N21W15C04S_TBMWC 2
FICO measures Depth To Water with an interface meter instead of Depth To Oil
Trans Pulled (12/14/15-1/11/16)
Elevation, ft msl
Temperature, °C
210
200
190
180
170
160
150
140
130
120
25
24
23
22
21
20
19
18
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_FICO
Top of Bowls
Temp C

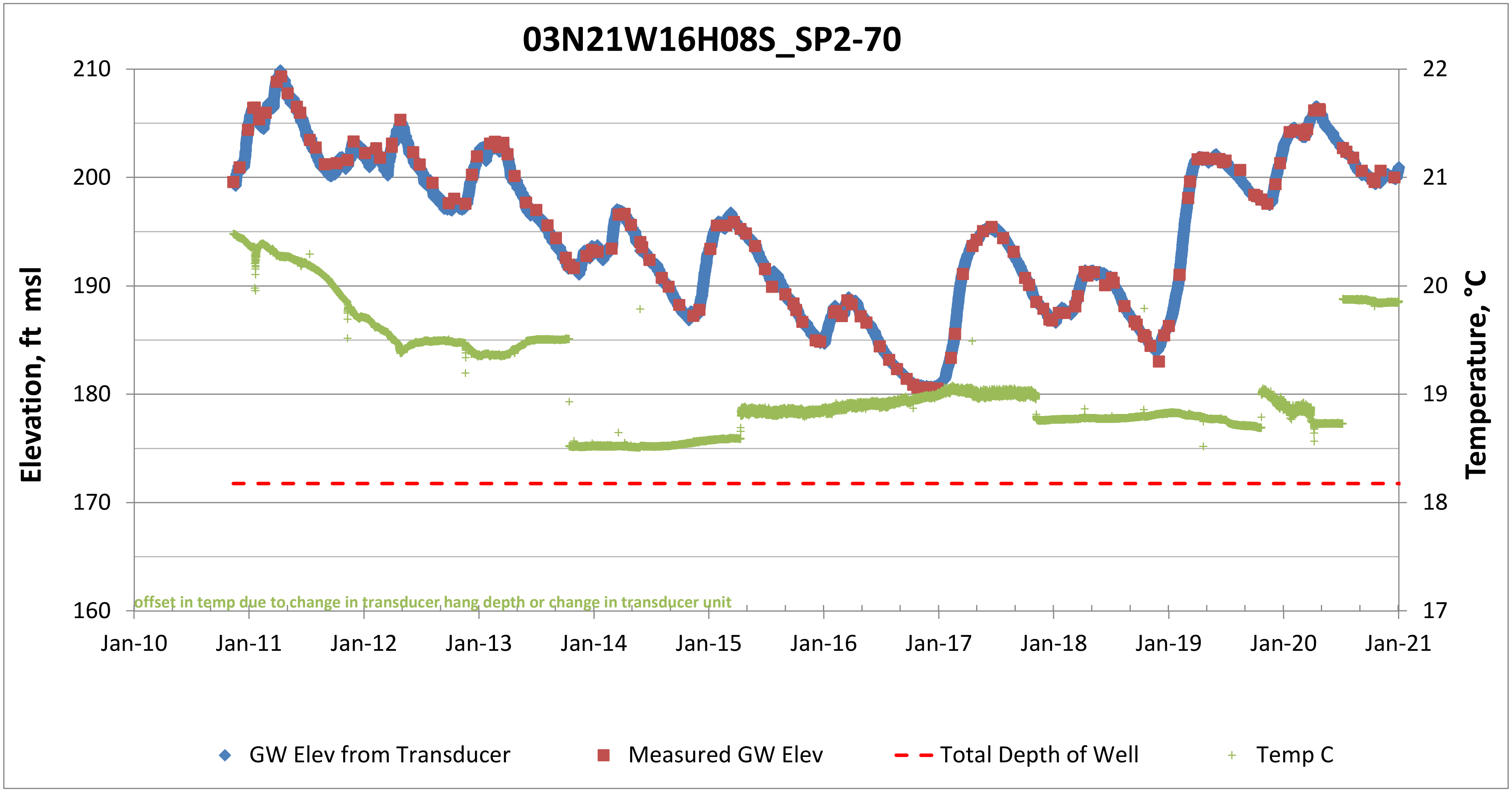

03N21W15G03S_SP1-390
Elevation, ft msl
Temperature, °C
230
220
210
200
190
180
170
24
22
20
18
16
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev
Temp C


03N21W15G05S_SP1-80
Elevation, ft msl
Temperature, °C
230
220
210
200
190
180
170
22
20
18
16
14
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
offsets in temp due to replacement of failed transducer & change in hang depth
GW Elev from Transducer
Measured GW Elev
Approx SCR Low Flow Elev
Temp C

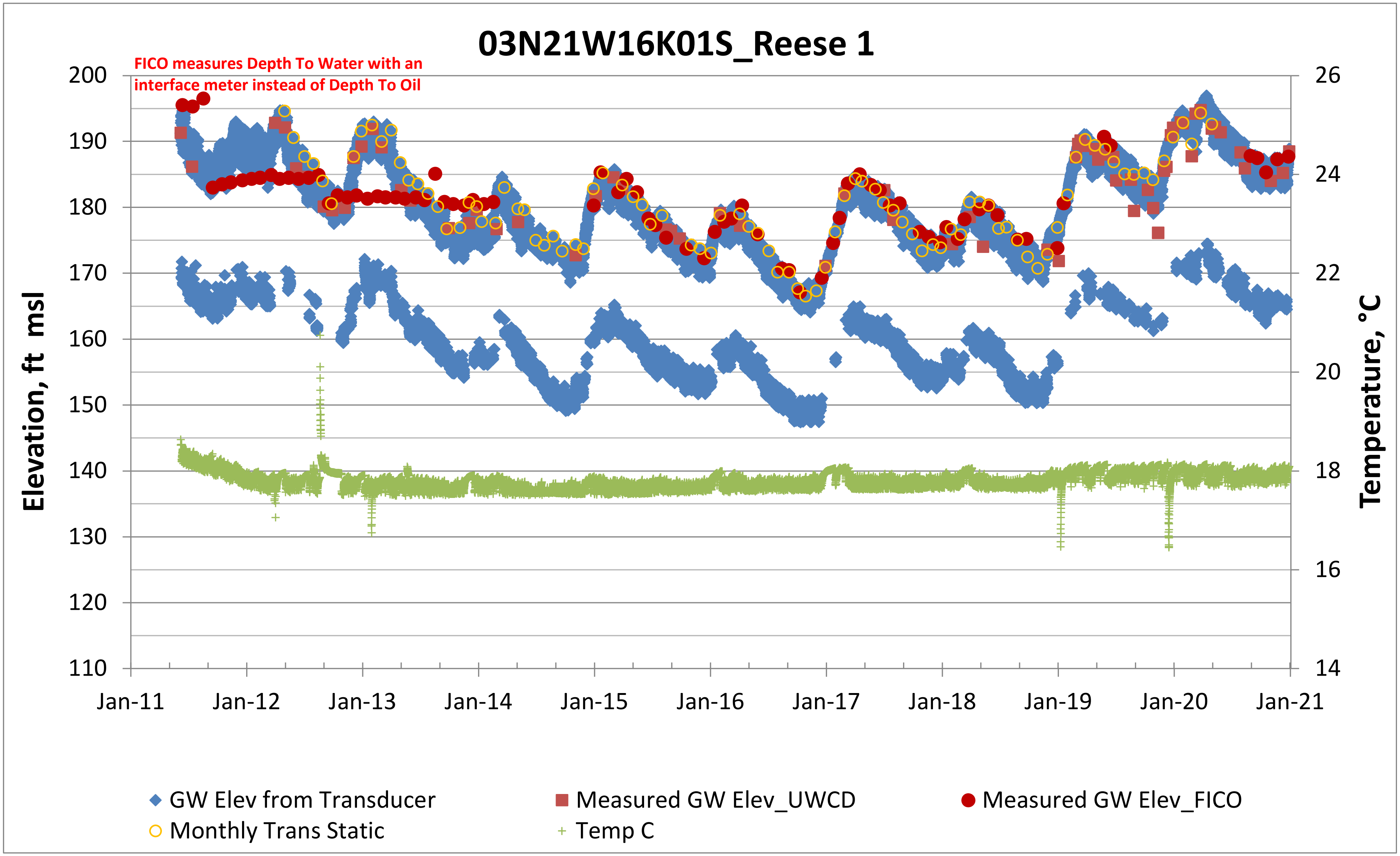


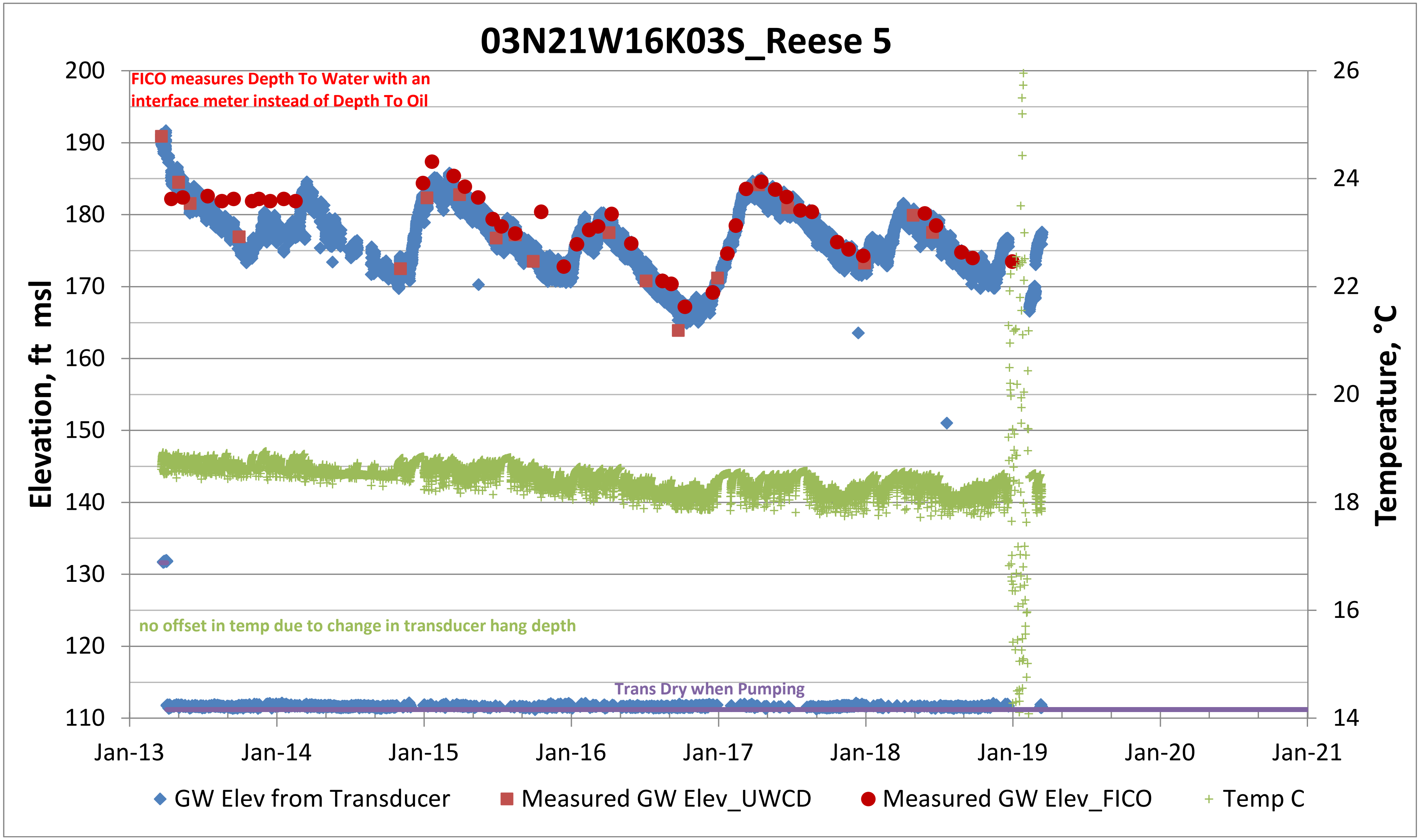
03N21W16H05S_SP2-550
Elevation, ft msl
Temperature, °C
210
200
190
180
170
160
22
21
20
19
18
17
offset in temp due to change in trans unit
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev
Temp C


03N21W16H06S_SP2-310
Elevation, ft msl
Temperature, °C
210
200
190
180
170
160
22
21
20
19
18
17
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev
Temp C

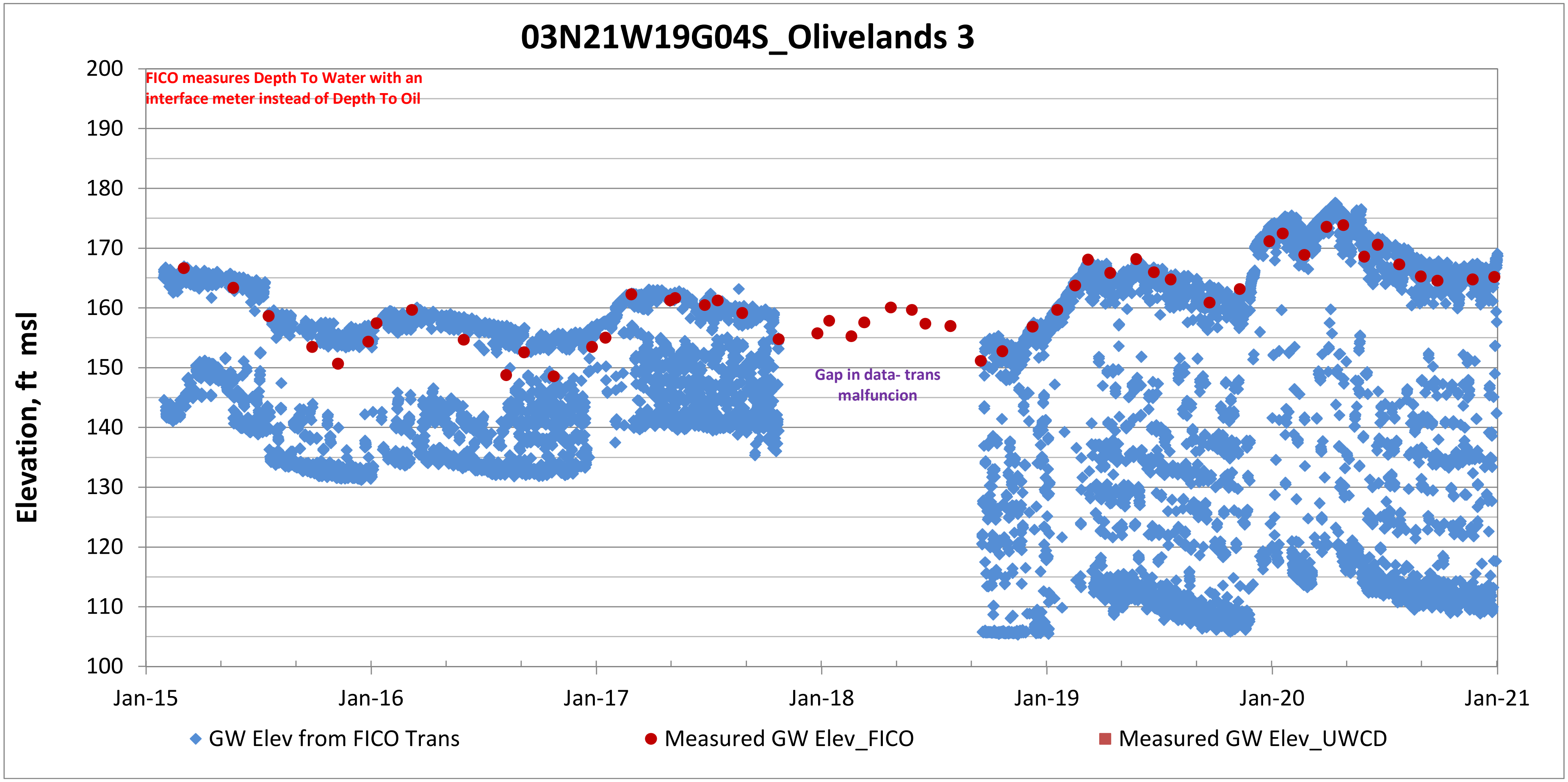


03N21W16H08S_SP2-70
210
200
190
180
170
160
22
21
20
19
18
17
Elevation, ft msl
Temperature, °C
offset in temp due to change in transducer hang depth or change in transducer unit
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev
Total Depth of Well
Temp C

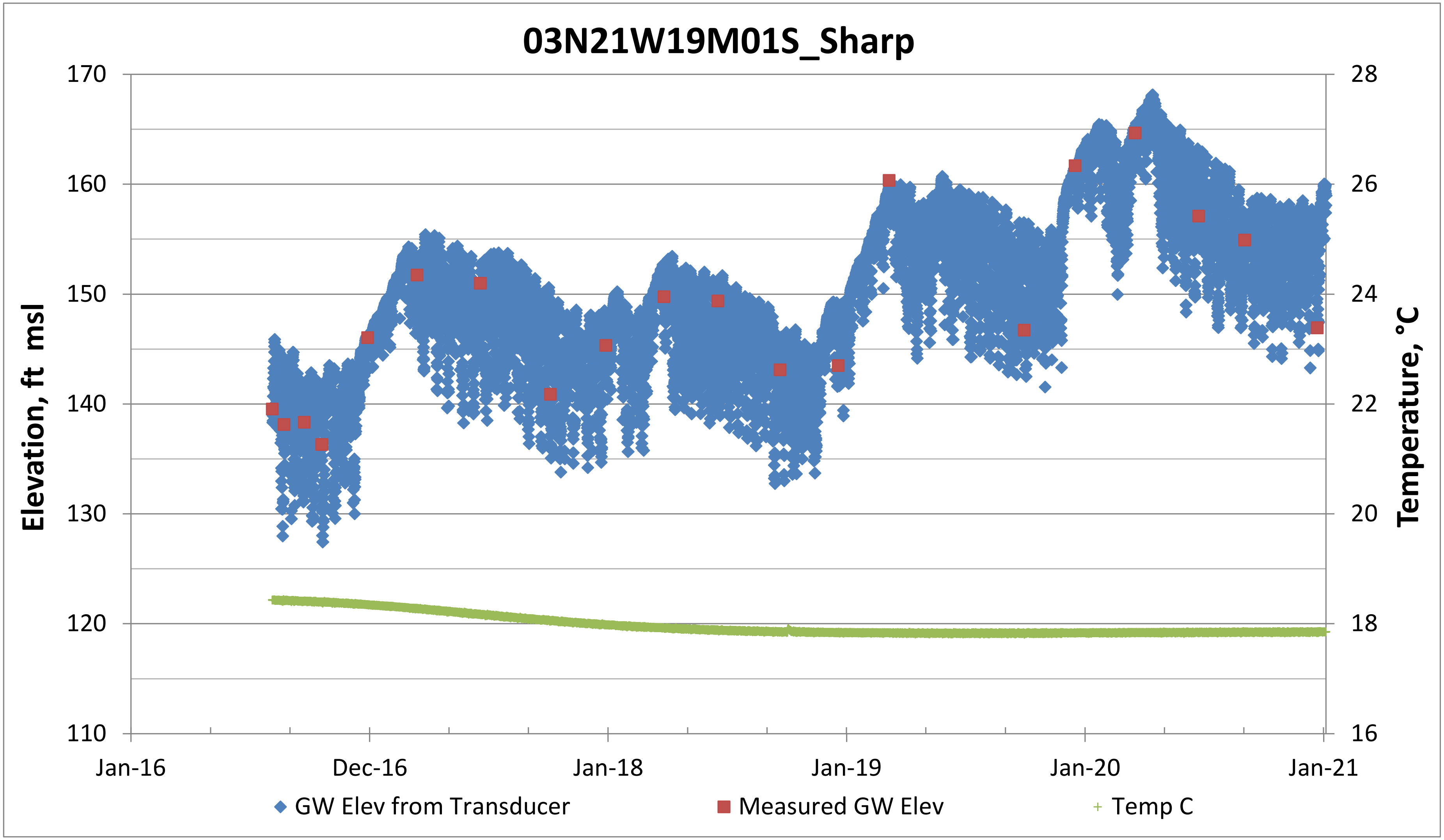

03N21W16K01S_Reese 1
FICO measures Depth To Water with an interface meter instead of Depth To Oil
Elevation, ft msl
Temperature, °C
200
190
180
170
160
150
140
130
120
110
26
24
22
20
18
16
14
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_FICO
Monthly Trans Static
Temp C



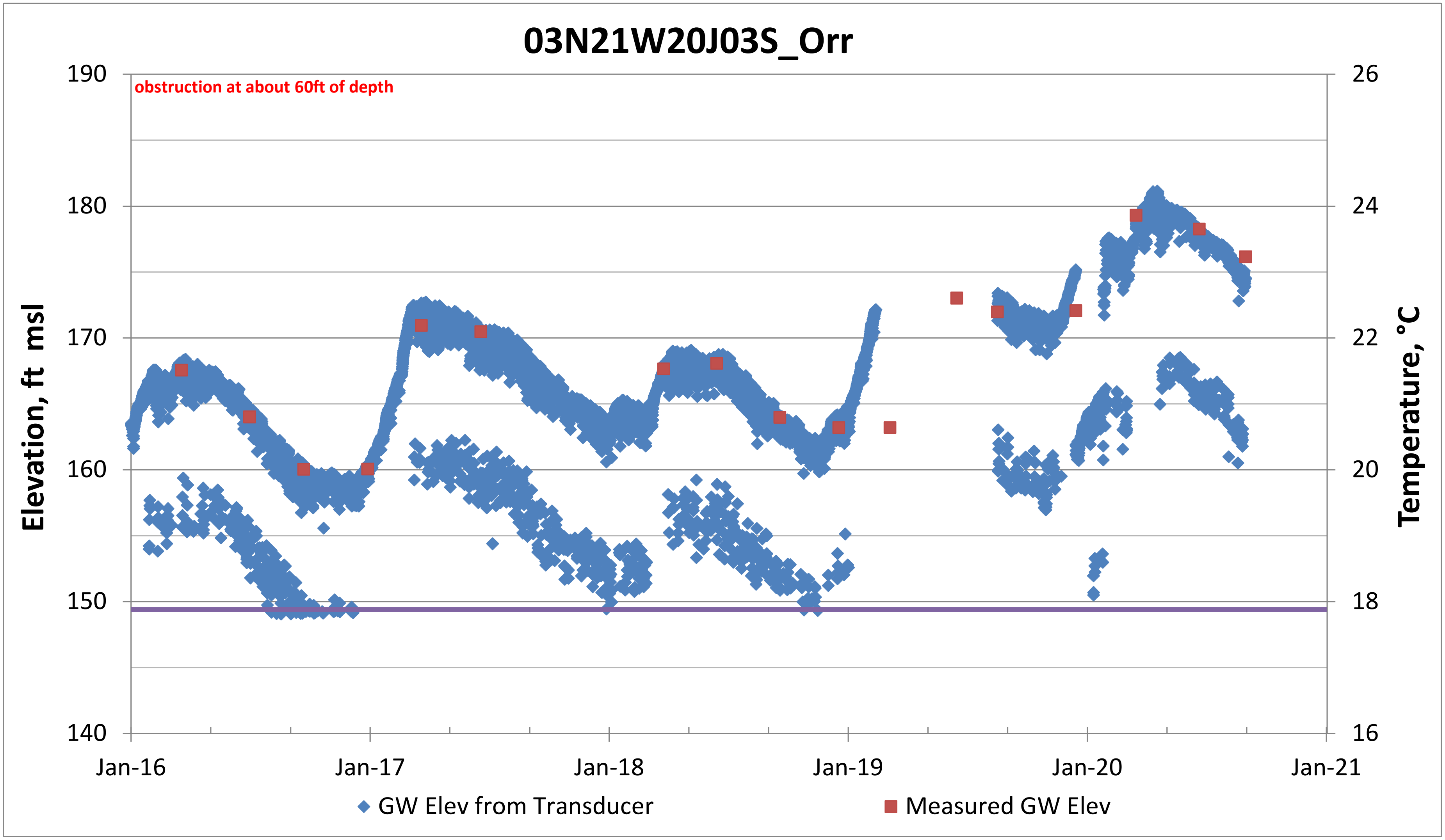
03N21W16K03S_Reese 5
FICO measures Depth To Water with an
interface meter instead of Depth To Oil
no offset in temp due to change in transducer hang depth
Trans Dry when Pumping
Elevation, ft msl
Temperature, °C
200
190
180
170
160
150
140
130
120
110
26
24
22
20
18
16
14
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_FICO
Temp C



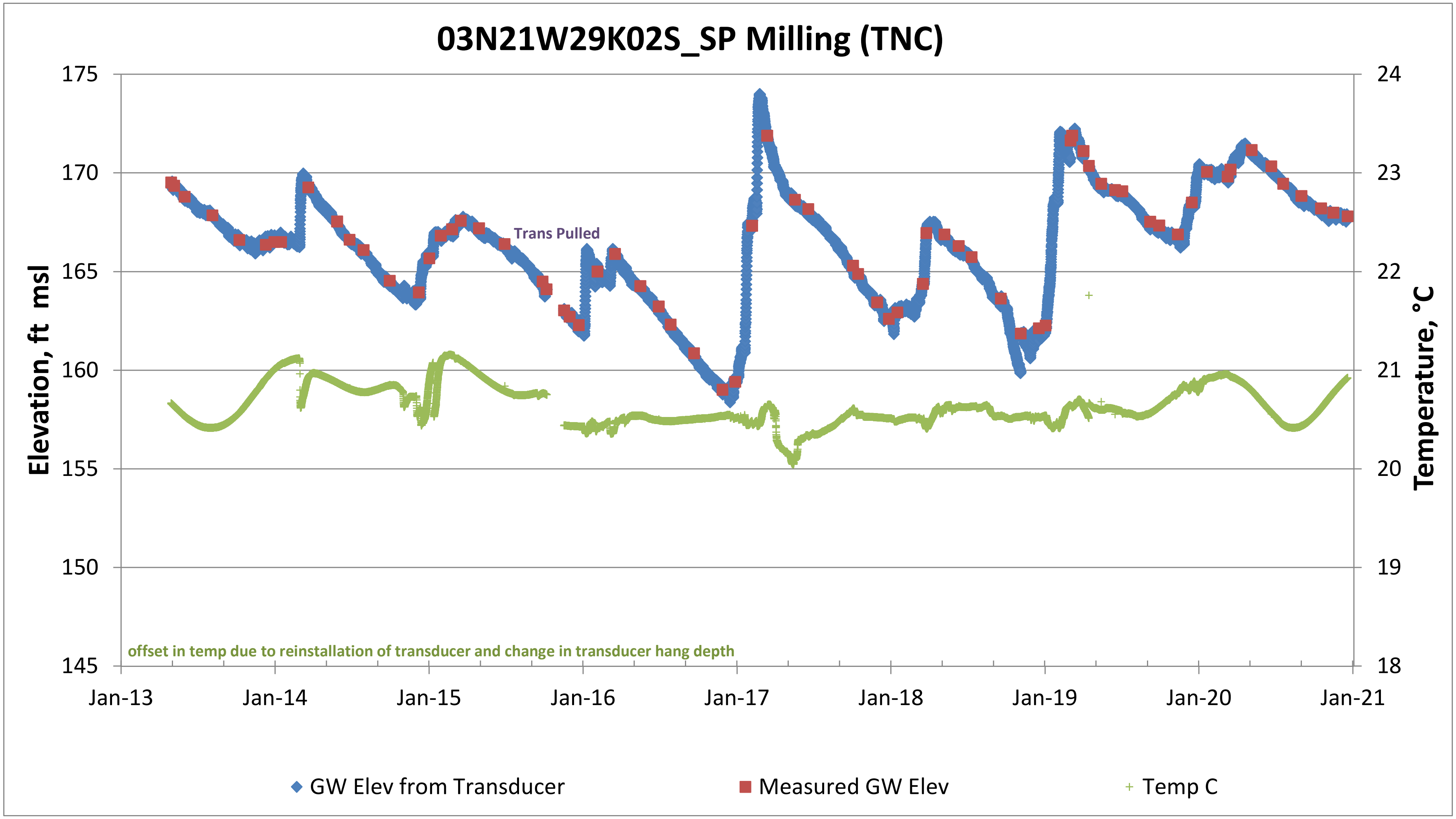
03N21W19G04S_Olivelands 3
FICO measures Depth To Water with an interface meter instead of Depth To Oil
Gap in data- trans malfuncion
Elevation, ft msl
200
190
180
170
160
150
140
130
120
110
100
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from FICO Trans
Measured GW Elev_FICO
Measured GW Elev_UWCD

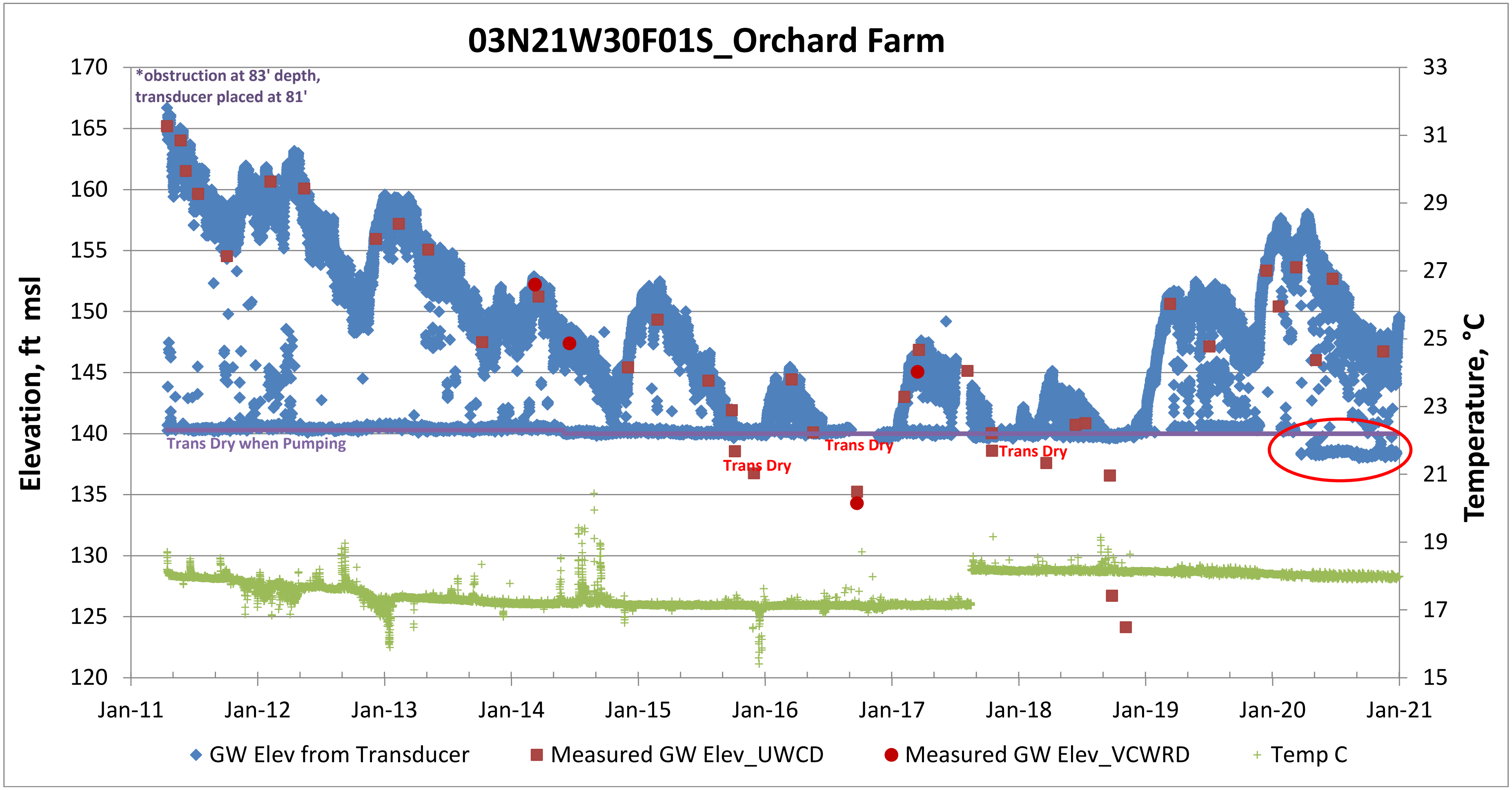


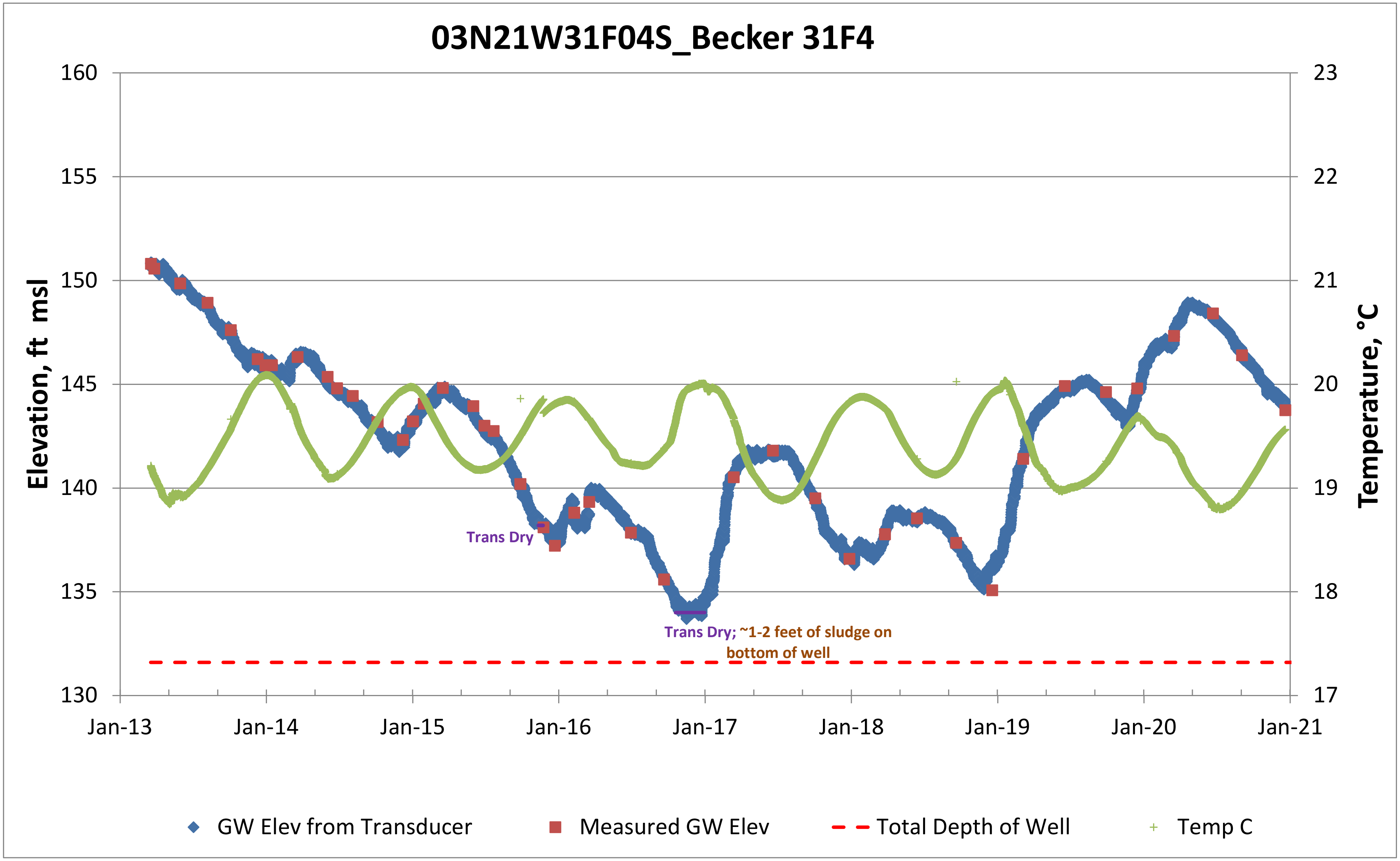
03N21W19M01S_Sharp
170
160
150
140
130
120
110
28
26
24
22
20
18
16
Elevation, ft msl
Temperature, °C
Jan-16
Dec-16
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev
Temp C



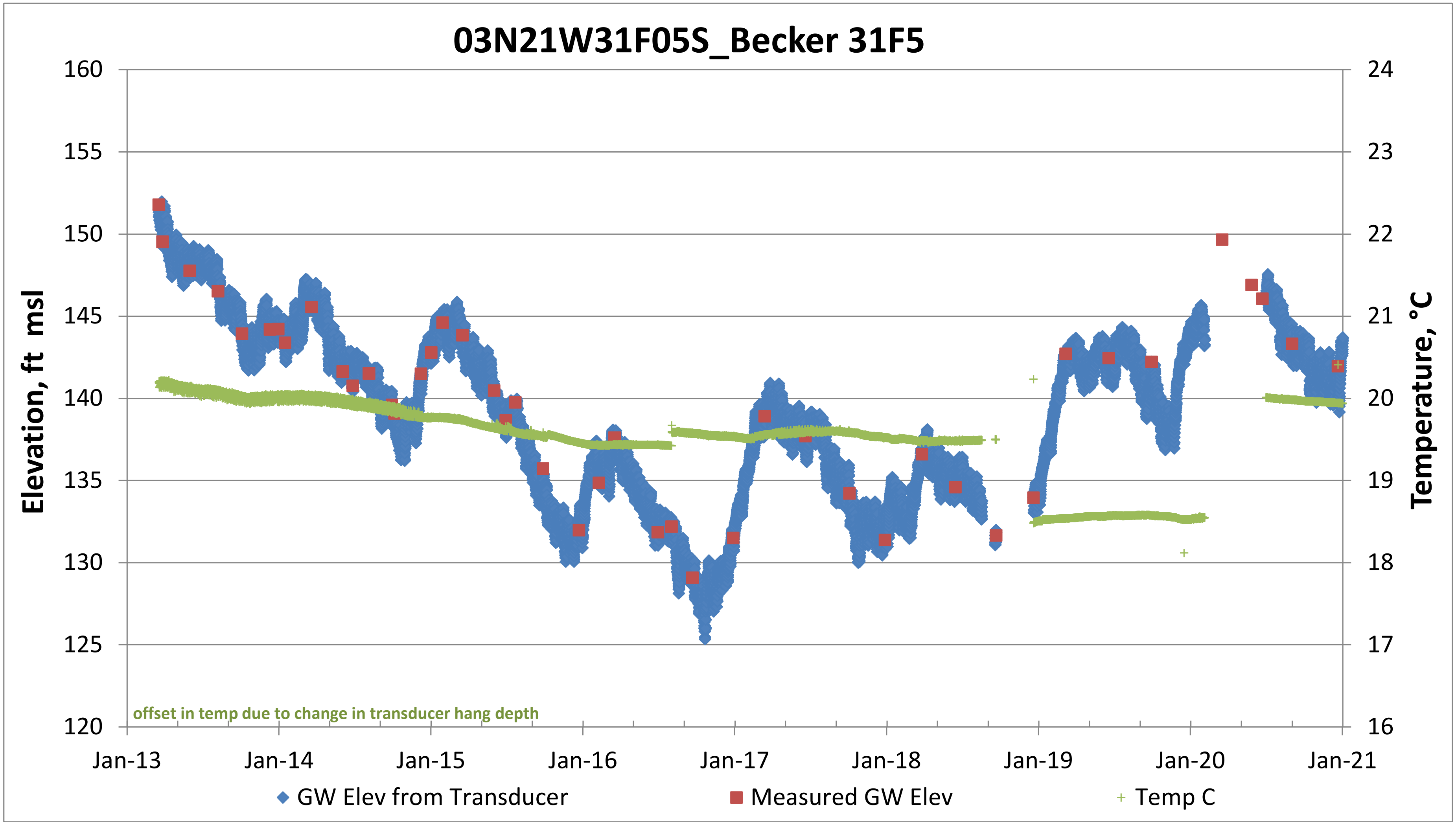
03N21W20J03S_Orr
obstruction at about 60ft of depth
Elevation, ft msl
Temperature, °C
190
180
170
160
150
140
26
24
22
20
18
16
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev


03N21W29K02S_SP Milling (TNC)
175
170
165
160
155
150
145
Elevation, ft msl
24
23
22
21
20
19
18
Temperature, °C
Trans Pulled
offset in temp due to reinstallation of transducer and change in transducer hang depth
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev
Temp C

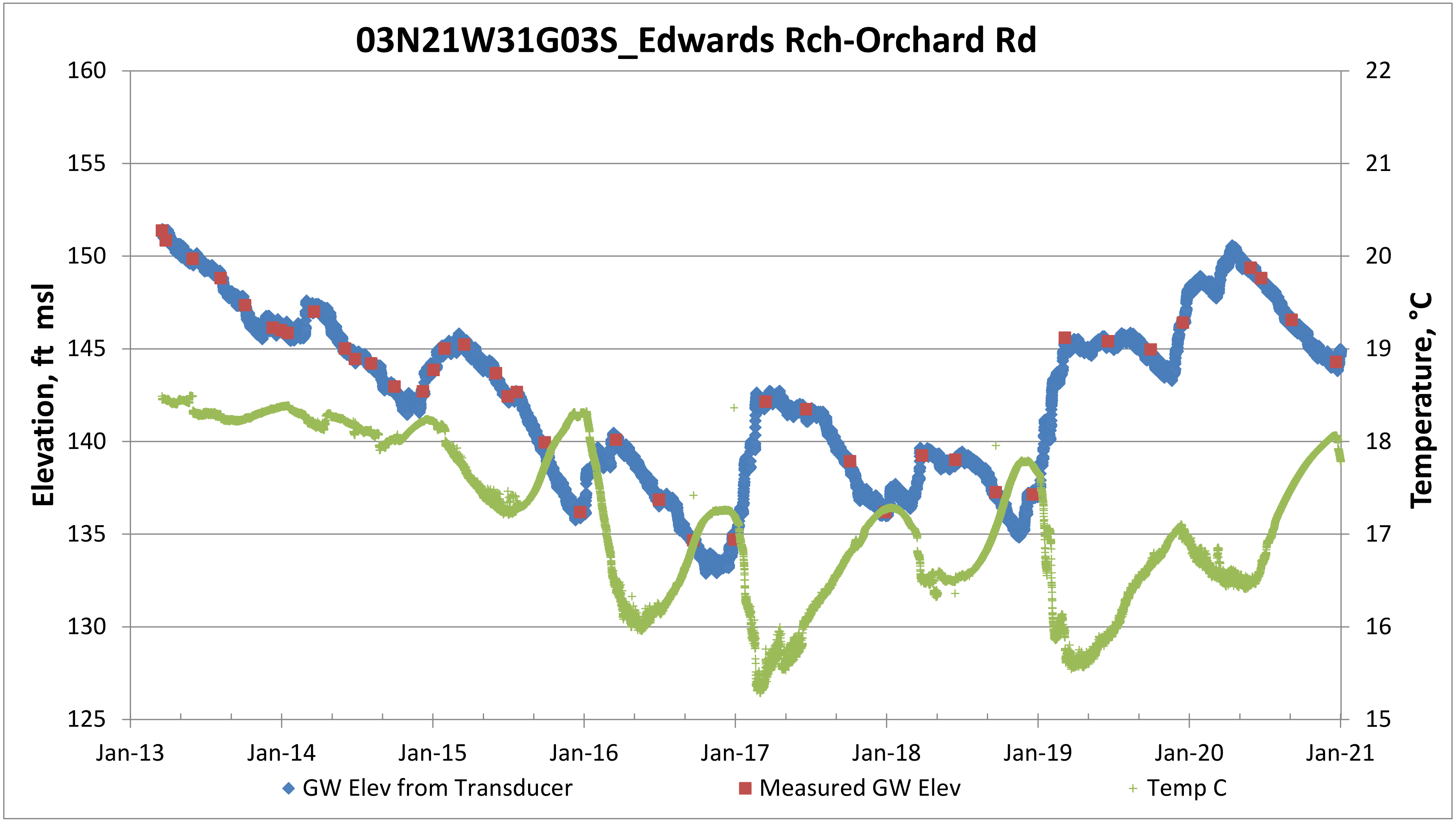

03N21W30F01S_Orchard Farm
*obstruction at 83' depth,
transducer placed at 81'
Trans Dry when Pumping
Trans Dry
Trans Dry
Trans Dry
Elevation, ft msl
Temperature, °C
170
165
160
155
150
145
140
135
130
125
120
33
31
29
27
25
23
21
19
17
15
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_VCWRD
Temp C



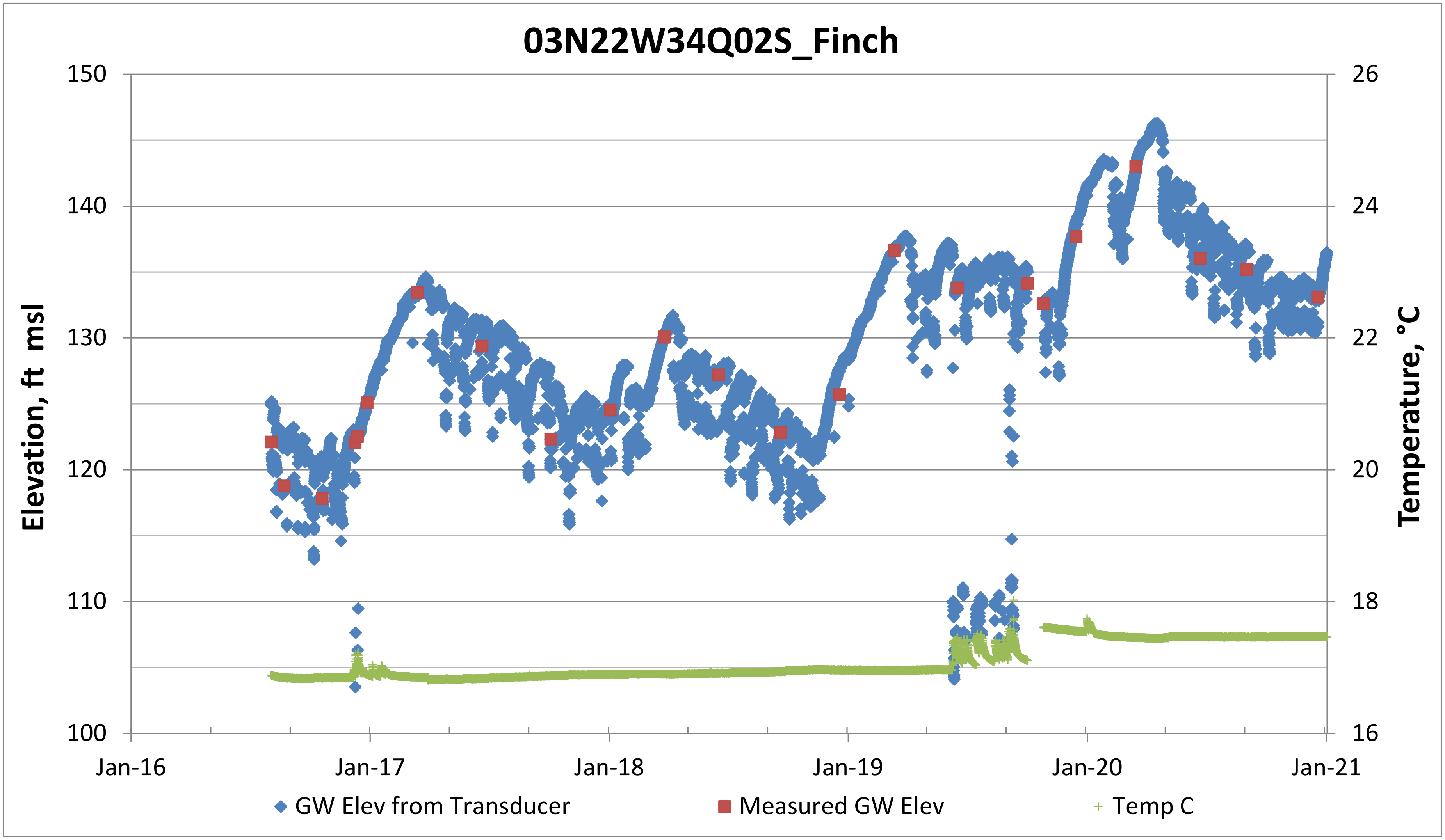
03N21W31F04S_Becker 31F4
Elevation, ft msl
Temperature, °C
160
155
150
145
140
135
130
23
22
21
20
19
18
17
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Trans Dry
Trans Dry; ~1-2 feet of sludge on bottom of well
GW Elev from Transducer
Measured GW Elev
Total Depth of Well
Temp C

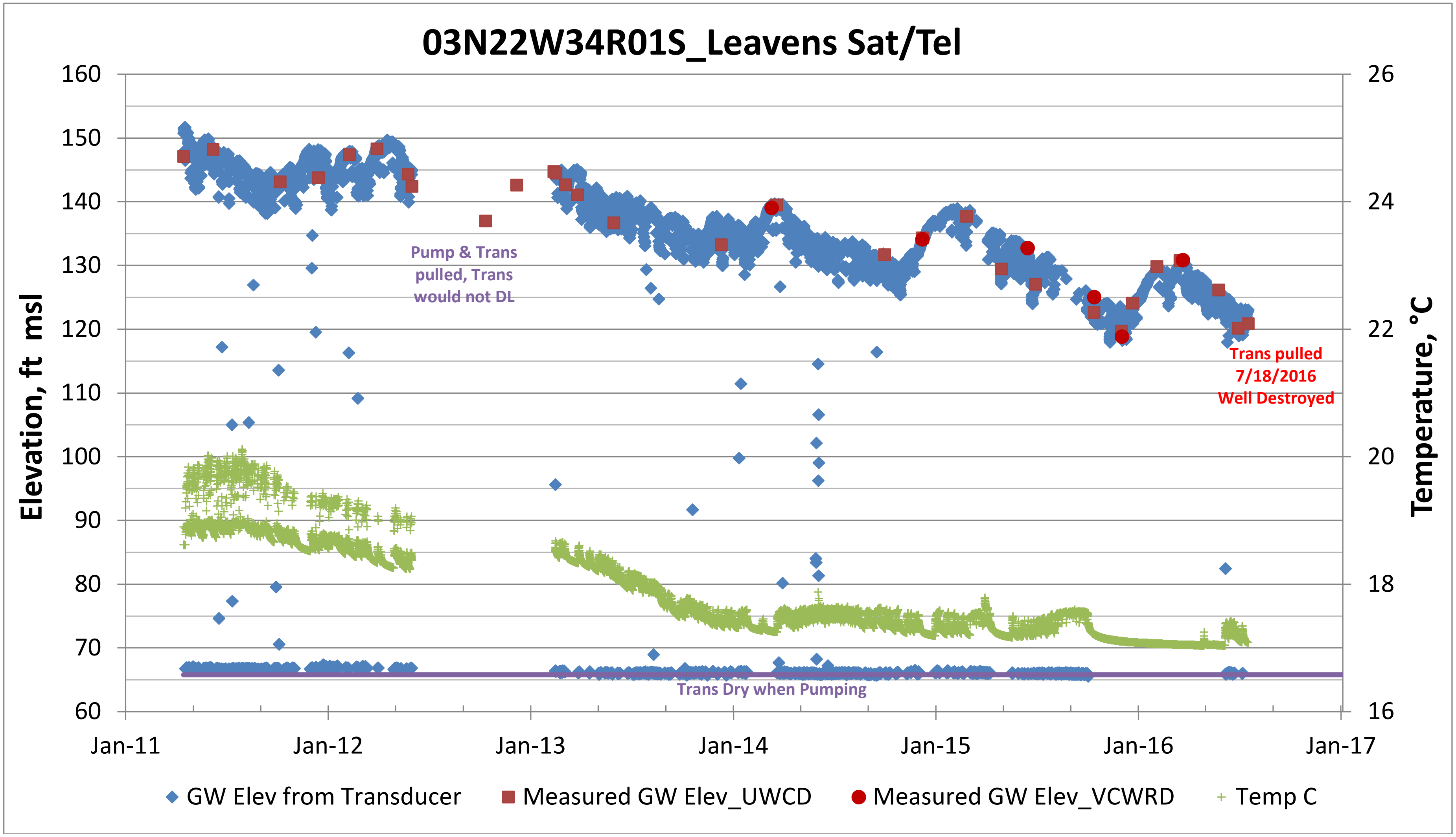


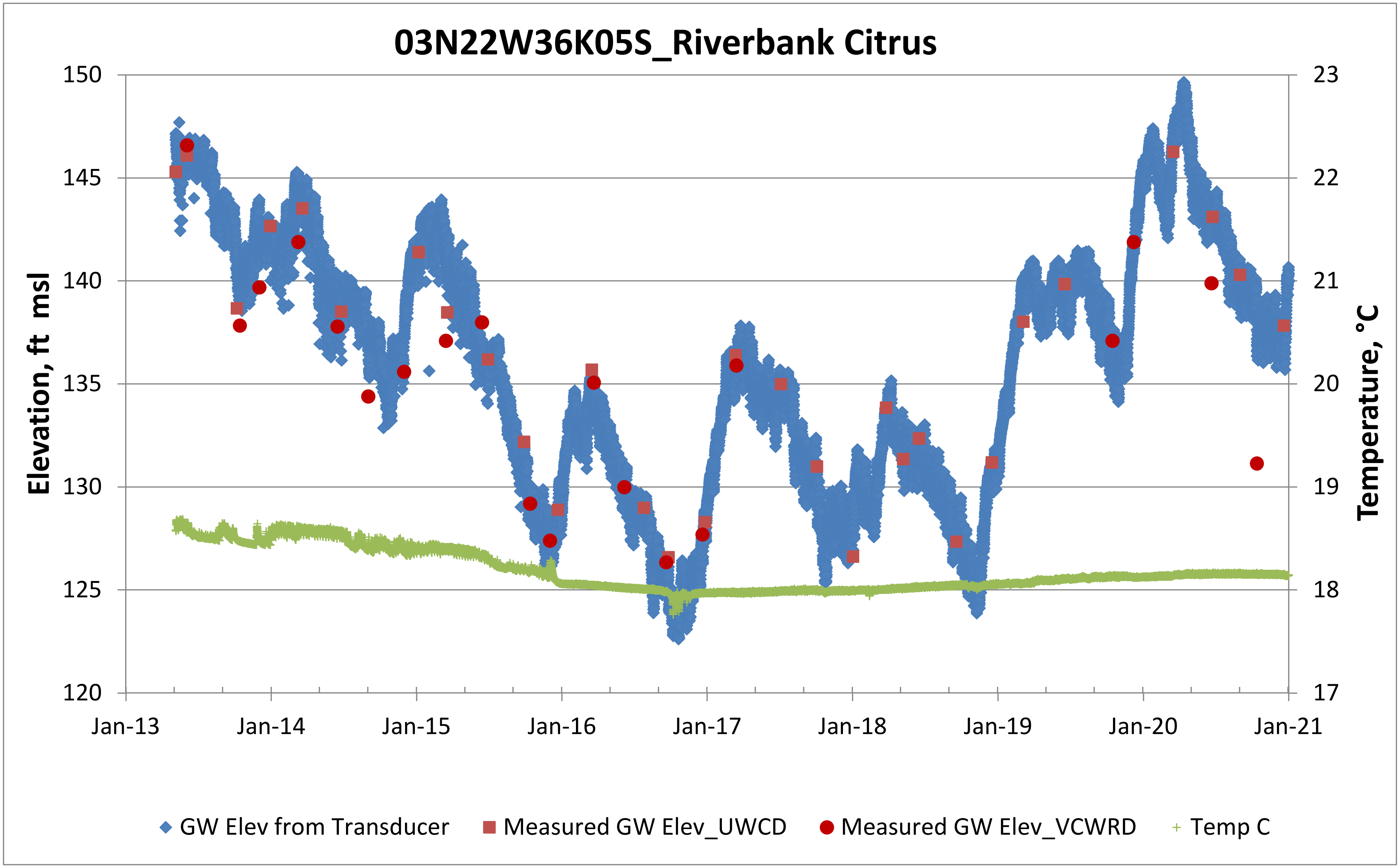
03N21W31F05S_Becker 31F5
Elevation, ft msl
Temperature, °C
160
155
150
145
140
135
130
125
120
24
23
22
21
20
19
18
17
16
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
offset in temp due to change in transducer hang depth
GW Elev from Transducer
Measured GW Elev
Temp C



03N21W31G03S_Edwards Rch-Orchard Rd
Elevation, ft msl
Temperature, °C
160
155
150
145
140
135
130
125
22
21
20
19
18
17
16
15
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev
Temp C


03N22W34Q02S_Finch
Elevation, ft msl
Temperature, °C
150
140
130
120
110
100
26
24
22
20
18
16
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev
Temp C


03N22W34R01S_Leavens Sat/Tel
Elevation, ft msl
Temperature, °C
160
150
140
130
120
110
100
90
80
70
60
26
24
22
20
18
16
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Pump & Trans pulled, Trans would not DL
Trans pulled 7/18/2016 Well Destroyed
Trans Dry when Pumping
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_VCWRD
Temp C



03N22W36K05S_Riverbank Citrus
Elevation, ft msl
Temperature, °C
150
145
140
135
130
125
120
23
22
21
20
19
18
17
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
GW Elev from Transducer
Measured GW Elev_UWCD
Measured GW Elev_VCWRD
Temp C

This page intentionally blank.

APPENDIX C - Spring 2019 to Spring 2020 Groundwater Elevation Change Measured in Wells

This page intentionally blank.

Well ID	Well No.	Spring 2020 Groundwater Elevation (ft, msl)	Spring 2019 Groundwater Elevation (ft, msl)	Difference
02N22W01P01S		46.25	78.85	-32.60
02N22W01P02S	NB1	59.98	80.81	-20.83
02N22W01R02S	HR1	87.95	88.09	-0.14
02N22W02C01S	Greg Well	146.82	139.86	6.96
02N22W02H02S	Vta Saticoy #3	142.00	131.00	11.00
02N22W02K09S	Vta Saticoy #2	147.35	126.85	20.50
02N22W02K10S	Alta #12	130.13	126.13	4.00
02N22W02R05S	Alta #11	48.52	74.67	-26.15
02N22W02R06S	Alta #13	57.08	79.08	-22.00
02N22W03K02S		121.75	112.05	9.70
02N22W03M02S	by apts sub pump	86.55	79.18	7.37
02N22W03Q01S		67.63	66.18	1.45
02N22W09K04S		14.10	4.41	9.69
02N22W09L03S	CWP-950	53.95	51.68	2.27
02N22W09L04S	CWP-510	88.47	71.60	16.87
02N22W10N03S	Well 2	-25.21	-28.57	3.36
02N22W11G01S	NB2	64.43	75.03	-10.60
02N22W11J01S	FERRO A	42.87	50.98	-8.11
02N22W11J02S	HR3	51.18	72.41	-21.23
02N22W11MW1	Saticoy #1	34.26	69.70	-35.44
02N22W11MW2	Saticoy #2	36.20	69.66	-33.46
02N22W11MW3	Saticoy #3	33.16	75.86	-42.70
02N22W11Q01S	FERRO D	57.76	61.99	-4.23
02N22W12A01S	Saticoy Test#4	99.55	85.50	14.05
02N22W12A02S		56.44	85.53	-29.09
02N22W12B08S	Dos Diegos- Shop	46.69	81.09	-34.40
02N22W12E04S	Vulcan 12E4	52.09	65.50	-13.41
02N22W12F03S	HR2	54.20	71.43	-17.23
02N22W12F04S	NOBLE 1	34.38	61.05	-26.67
02N22W12G03S		41.28	69.41	-28.13
02N22W14D01S	HR4	10.64	-1.49	12.13
03N21W01P02S		256.95	267.95	-11.00
03N21W02R02S		260.87	261.15	-0.28
03N21W09K02S		195.19	194.01	1.18
03N21W09R04S		196.70	192.40	4.30
03N21W11E03S	Santa Paula #8	233.89	233.19	0.70
03N21W11F03S	Santa Paula #9	236.62	235.82	0.80
03N21W11F04S	CIC #10	220.94	220.35	0.59
03N21W11H03S		249.69	253.89	-4.20
03N21W11J02S	Santa Paula #12	237.37	233.37	4.00
03N21W12B02S	McCauly	267.99	267.57	0.42
03N21W12B04S	Van Wingerden	276.15	276.07	0.08
03N21W12E04S	FICO #8	263.09	266.21	-3.12
03N21W12E08S	FICO 7A	262.95	262.19	0.76
03N21W12F03S	FICO #9	265.09	272.79	-7.70
03N21W12F06S	FICO #11	268.75	268.96	-0.21
03N21W12F07S	FICO 12	269.07	269.32	-0.25
03N21W12H01S		10,276.83	10,276.83	0.00
03N21W15C04S		205.21	200.10	5.11

Well ID	Well No.	Spring 2020 Groundwater Elevation (ft, msl)	Spring 2019 Groundwater Elevation (ft, msl)	Difference
03N21W15G01S	SP1-680	205.32	199.52	5.80
03N21W15G02S	SP1-540	204.97	199.32	5.65
03N21W15G03S	SP1-390	205.70	199.59	6.11
03N21W15G04S	SP1-280	205.01	199.49	5.52
03N21W15G05S	SP1-80	221.31	221.70	-0.39
03N21W16A02S	Santa Paula #11	195.54	194.74	0.80
03N21W16H05S	SP2-550	191.72	192.56	-0.84
03N21W16H06S	SP2-310	199.64	194.15	5.49
03N21W16H07S	SP2-170	199.60	194.04	5.56
03N21W16H08S	SP2-70	206.54	201.91	4.63
03N21W16K01S	Reese 1	196.92	191.09	5.83
03N21W16K02S	Reese 2	197.71	192.81	4.90
03N21W16K03S	Reese 5	194.20	190.60	3.60
03N21W17Q01S		186.14	184.84	1.30
03N21W19G04S		177.62	168.06	9.56
03N21W19M01S		168.13	160.35	7.78
03N21W19M02S		164.51	160.75	3.76
03N21W19R01S		170.69	156.79	13.90
03N21W20F04S	Hansen Ag Ctr	175.42	172.87	2.55
03N21W20J03S		181.14	175.79	5.35
03N21W29K02S		171.50	172.26	-0.76
03N21W30E01S		160.44	156.32	4.12
03N21W30F01S	Orchard Rd	158.00	151.70	6.30
03N21W31F04S	Becker 31F4	148.96	143.93	5.03
03N21W31F05S	Becker 31F5	149.66	143.67	5.99
03N21W31G03S	EdwardRch-Orchrd	150.57	145.60	4.97
03N21W31L01S	Becker 31L1	145.42	140.11	5.31
03N21W32C01S	Freeman Becker A	160.83	162.91	-2.08
03N21W32C02S	Freeman Becker B	160.82	162.38	-1.56
03N21W32C03S	Freeman Becker C	161.39	164.35	-2.96
03N22W23Q01S		232.68	225.11	7.57
03N22W26B03S		144.31	127.39	16.92
03N22W34Q02S		146.29	136.63	9.66
03N22W34Q03S		140.03	136.75	3.28
03N22W35N01S		151.32	144.03	7.29
03N22W36H01S		145.17	140.56	4.61
03N22W36K02S		146.79	138.82	7.97
03N22W36K05S		153.09	140.98	12.11

APPENDIX D - Individual Party Allocations and Groundwater Extractions (from Frank B & Associates)

Table "D-1" DRAFT

IPA's 2014 - 2020 Production & Averages

6/28/2021

2014 (2)	2015 (2)	2016 (2)	2017 (2)	2018 (2)	2019 (2)	2020 (2)	7 Year Average	Avg Over + Under (-)	Acre Feet	Party Name	Well Number
										18004 Telegraph Road Properties LLC (33)	03N/21W-11H03
									0.0	ABC Rubarb Farms	03N/21W-16P01
0.8	0.6	1.0	0.7	0.5	0.4	1.20	0.8	(1.0)	1.8	Aliso Vista Ranch	03N/22W-23Q01
									0.0	Alsono, Andrew	03N/21W-21M01
1,018.4	1,175.1	1,386.5	709.1	745.7	292.0	536.74	837.7	74.56	763.1	Alta Mutual Water Company, Inc.	02N/22W-02K07, 02N/22W-02K10
6.2	4.4	2.9	5.1	1.3	1.4	1.97	3.3	0.4	2.9	Arambula, Pedro	03N/21W-21E02
									0.0	Associated Concrete Products, Inc.	3N/21W-29K03 D
									0.0	Axell, Randall as Trustee of the Dorthey E. Axell Trust	3N/21W16P02, 3N/21W16P03
							0.0	0.0	0	Basso Properties	03N/21W-09J01
								0.0	0	Bender Farms (23) (29)	03N/21W-16P01
273.7	247.8	188.2	221.9	246.8	76.4	278.49	219.1	(73.5)	292.56	Bender Realty LTD (29)	3N/21W16P02, 3N/21W16P03, 3N21W17R01 (4) 03N/21W-17R01
62.1	46.5	52.4	71.3	71.7	26.2	80.09	58.6	(42.2)	100.8	Billiwhack Ranch LLC	03N/22W-23F02
									0.0	Birky, Angie E. Trustee	3N/21W-10E01
									0.0	Brucker, Frank R. as Trustee of the Frank R. Brucker Trust	03N/21W-29E1, 3N/21W-29C3
2.5	2.5	2.2	2.5	1.1	2.1	1.75	2.1	(3.9)	6.0	Bratcher Family Revocable Tr 1-24-02 & Cutright Revocable Tr 8-18-03 (22)	03N/21W-16P01
561.9	237.0	266.7	242.8	383.5	400.8	439.19	361.7	85.2	276.5	Brucker Family Trust (29)	3N/21W-19Q1, 3N/21W-29E1, 3N/21W-29C3 03N/21W-29E1, 3N/21W-29C3
137.0	165.6	91.4	174.8	140.0	54.2	150.80	130.6	(151.7)	282.3	Campbell, Dan	03N/21W-19R01
0.6	0.4	0.4	0.3	3.5	0.1	0.29	0.8	(0.3)	1.1	Canine Adoption and Rescue League	03N/21W-29B02
2,013.9	1,526.5	1,342.9	772.5	819.5	53.5	227.68	965.2	292.2	673.0	Canyon Irrigation Company	03N/21W-11F03, 3N/21W-11E3, 3N/21W-11F4
46.5	42.3	37.0	43.2	42.3	28.2	45.82	40.7	(58.6)	99.3	Casa De Oro Ranch	03N/21W-20F01
88.0	140.0	65.6	71.1	60.4	59.9	87.34	81.8	(19.6)	101.4	Castaneda, Albert and Mary	03N/21W-19L01 (1), 3N21W19K01 03N/21W-19L01

Table "D-1" DRAFT

IPA's 2014 - 2020 Production & Averages

6/28/2021

2014 (2)	2015 (2)	2016 (2)	2017 (2)	2018 (2)	2019 (2)	2020 (2)	7 Year Average	Avg Over + Under (-)	Acre Feet	Party Name	Well Number
										Coffman, Laura K. McAvoy,	03N/22W-35N01
4,846.8	4,168.0	4,087.2	4,260.1	4,232.5	4,082.8	4,444.93	4,303.2	(1,412.1)	5,715.3	City of Santa Paula (37) (38)	03N/21W-21B03 3N21W2R2 3N/21W9R5, 03N/21W11J02, 03N/21W15C06, 03N/21W16A02, 3N/21W16A3
39.0	50.8	33.3	40.6	33.5	36.2	41.36	39.3	(54.3)	93.6	Clow, The Roger D. Clow Trust, Dated September 15, 1994	3N/21W20J04 (17) 03N/21W-20A02, 03N21WL02S
127.2	74.2	96.0	82.0	150.3	262.2	204.38	142.3	(16.4)	158.7	Cole, Lecil E. Trustee of the Lecil E. and May Jeanette Cole Revocable Trust	3N/21W-16E02
									0.0	Conklin, Patricia	03N/21W-21D02
8.85	11.76	13.2	10.4	7.3	14.8	7.87	10.6	1.0	9.6	The Judson T. Cook & Suzette H. Cook Revocable Trust dated December 5, 2007 (28)	3N/22W-26B1
168.2	142.3	121.3	238.6	204.3	194.3	163.15	176.0	3.8	172.2	County of Ventura, General Services Agency (26)	03N/21W-30H08, 3N/21W-30H02
134.6	115.7	110.8	81.0	95.3	77.9	73.95	98.5	(79.8)	178.3	County of Ventura, General Services Agency	02N/22W-02G01
							0.0	0.0	0.0	Cummings, Paul R. and Irene & Sons	03N/21W-19L01
							0.0	0.0		Dabney, George & Rebecca Trust Inter Vivos	3N/22W-26B1
							0.0	0.0		Dickenson, D&P Dickenson Family Revocable Trust, Louise Dickenson, Bruce E. Dickenson, Virginia Dickenson, Reed and Diana G. Dickenson as undivided co-owners	03N/21W-10M01
							0.0	0.0		Dominguez, G. (6)	03N/21W-12E07
							0.0	0.0	0.0	Evergreen Ranch AKA San Miguel Products	03N/21W-19R01
124.5	115.6	51.0	75.0	97.5	59.8	281.68	115.0	(25.2)	140.2	Dickenson, Bruce E and Janice J Trustees of the B&J Dickenson Revocable Trust August 26, 2015	03N21W-10M01

Table "D-1" DRAFT

IPA's 2014 - 2020 Production & Averages

6/28/2021

2014 (2)	2015 (2)	2016 (2)	2017 (2)	2018 (2)	2019 (2)	2020 (2)	7 Year Average	Avg Over + Under (-)	Acre Feet	Party Name	Well Number
						0.00	0.0	0.0		Fam, J. LLC	03N/22W-35N01
9,543.8	7,431.2	7,730.0	5,459.6	6,002.2	4,242.9	5,494.90	6,557.8	(3,355.4)	9,913.2	Farmers Irrigation Company, Inc.	03N/21W09R04, 03N/21W12E04, 03N/21W12E08, 03N/21W12F03, 03N/21W16K01, 03N/21W16K02, 03N/21W16K03, 03N/21W19H07, 3N/21W19G4, 3N/21W12F6, 03N21W15C04, 3N21W15C02
33.8	43.3	30.1	14.7	11.4	10.7	12.69	22.4	22.4	0.0	Fiano, Michael (21)	3N/22W26B02 & 3
											03N/21W-15C02, 03N/21W-15C04
211.3	193.1	171.2	167.9	184.9	113.9	155.30	171.1	(42.3)	213.4	Finch, J.J. & H.H.	3N/22W-34Q02, 3N22W34Q03
0.00	0.00	0.00	0.0	0.0	0.0		0.0	0.0	0	Flying D Ranch LLC	03N/21W-10M01
							0.0		0.0	Galbreaith Brothers, Inc.	03N/21W-17Q01
13.89	6.75	6.51	20.70	19.12	4.39	16.11	12.5	2.90	9.6	Garcia, Elias & Guadalupe (15)	3N/22W-26B1
18.4	18.8	16.7	11.2	18.0	12.2	11.09	15.2	(27.6)	42.8	Gilbert, Patricia L., Trustee of the Gilbert Family Survivor's Trust	03N/21W-16E01
136.3	125.1	34.3	136.6	112.4	101.3	123.67	109.9	8.1	101.8	Gooding Ranch (John F. Gooding)	03N/21W-09K02, 03N/21W-09K05
41.5	31.4	31.6	44.2	33.2	27.0	33.90	34.7	(18.2)	52.9	Grant Family Ranches, LLC (20) (30)	3N22W3E01, 3N21W20E01
							0.0		0.0	Gregory, Eva as Trustee of the Gregory Family Trust	
62.2	83.2	47.6	72.7	56.0	44.5	119.42	69.4	(28.2)	97.6	Grether, Elizabeth Broome, Ann B. Priske, John S. Broome Jr. as Trustee of the John S. Broome Jr. Trust	03N/22W-35Q02
11.1	8.2	10.7	10.0	9.7	10.4	10.27	10.1	(2.9)	13.0	Guzman, Yeisi Brayen, Trustee of the Brayen And Mesa Guzman Revocable Family Trust, dated July 24, 2015	03N/21W-19G03
91.4	128.9	136.9	119.7	102.3	46.7	87.06	101.9	(27.3)	129.2	Hadley-Williams Partnership	02N/22W-03E01 (9)
							0.0			Hampton Canyon Ranch (Leslie) (32)	03N/21W-19A02
0.5	0.5	2.4	2.4	1.6	3.6	0.11	1.6	1.5	0.1	Herbert Family Trust (formerly Ray, Richard T. and Ruth L.)	03N/22W026P01
0.0	0.0						0.0	(7.9)	7.9	Held, Family Trust dtd 1-16-03	03N/22W-23F02
											03N/22W-23F02

Table "D-1" DRAFT

IPA's 2014 - 2020 Production & Averages

6/28/2021

2014 (2)	2015 (2)	2016 (2)	2017 (2)	2018 (2)	2019 (2)	2020 (2)	7 Year Average	Avg Over + Under (-)	Acre Feet	Party Name	Well Number
0.0	0.0						0.0	(33.8)	33.8	Held, Joann	
							0.0	(45.1)	45.1	JAKRAN VI LLC	02N/22W-01M03, 02N/22W-01M04
125.0	34.0	77.14	83.80	62.93	78.56	89.06	78.6	(46.4)	125.0	JKJ Farms, LLC (29)	3N/21W-16P01 3N/21W-16P02&3
									0.0	Juanamaria Land Company	02N/22W-03E01
									2.0	JVP Citrus, Inc.	
										Kimura, Albert	03N/21W-11H03
									0.0	Kimura, Tama	03N/21W-11H01
									0.0	La Mesa Partnership #1	3N/21W-17R01
									0.0	Lassich, Madeline	03N/21W-29B02
235.5	195.0	159.1	171.3	120.0	178.1	138.53	171.1	(24.2)	195.3	Leavens Ranches	03N/22W-24R01 (13), 2N22W03F02
2,234.2	2,537.8	2,063.0	1,611.6	1,517.1	982.2	1,372.17	1,759.7	(1,604.1)	3,363.8	Limoneira Company (36, 37)	03N/21W-01N02, 03N/21W-02Q01, 03N/21W-19G02, 03N/21W-30F01, 03N/21W-30H04, 03N/21W-31E03, 3N/21W-31L2 03N/21W-11A01 See Limoneira
30.0	30.0	30.0	30.0	30.0	30.0	63.03	34.7	4.7	30.0	Limoneira Lewis Community Builders	3N/21W2R2
1.1	0.5	1.0	1.6	1.6	1.8	2.10	1.4	(8.6)	10.0	Little Clara Ranch LLC (30)	3N22W34E01
							0.0	0.0			3N22W34E01
305.4	319.1	245.4	242.8	362.2	254.8	358.73	298.3	43.1	255.2	Loza Investments LLC	03N/21W-10M01, 02N/22W-03K02, 2N/22W-3K3
										Malzacher, Fred H. & Elaine C., Trustees	

Table "D-1" DRAFT

IPA's 2014 - 2020 Production & Averages

6/28/2021

2014 (2)	2015 (2)	2016 (2)	2017 (2)	2018 (2)	2019 (2)	2020 (2)	7 Year Average	Avg Over + Under (-)	Acre Feet	Party Name	Well Number
7.2	8.9	18.7	20.6	23.1	18.8	20.44	16.8	(19.5)	36.3	of the Fred H. Malzacher and Elaine C. Malzacher Revocable Trust dated January 16, 1992 U/D/T dated November 25, 2009, as amended	03N/21W-21G03
31.5	31.5	47.3	32.7	41.8	19.5	45.04	35.6	1.3	34.3	Martinez, Esther	3N21W-29G02
23.8	17.3	25.2	22.8	22.6	23.5	22.99	22.6	(2.1)	24.7	McConica, John II	2N/22W-3Q1
							0.0			McConica, John R. et al.	3N/21W21B3
							0.0			McConica, John R. II et al.	03N/21W-21B03
124.8	162.9	123.74	85.80	66.55	162.47	154.28	125.8	(55.8)	181.6	McGaelic Group	03N/21W17R01 (4), 3N/21W11H01
392.0	479.9	296.6	447.3	430.8	319.9	287.99	379.2	95.6	283.6	McGrath, John & Sons (18)	03N/21W21E05, 3N/21W21E11, 3N/21W-20J04 (17),3N/21W-20R3
							0.0			Mondol, J.K.	03N/21W-10E01, 3N/21W-10E2
							0.0		0.0	Newsom, Alice C. as Trustee of the Newsom Family Trust	03N/21W-11A01
27.4	35.8	18.5	27.3	38.1	14.1	18.02	25.6	(21.1)	46.7	Nichols Associates	03N/22W36H01, 03N/22W36H02
28.1	25.5	23.4	19.3	15.6	23.5	24.14	22.8	(103.6)	126.4	Nutwood Farms	03N/22W-36J01, 36J02 & 36J03
0.1	0.1	0.0	0.1	0.04	0.02	0.03	0.0	(7.9)	7.9	Oba Family Trust dtd 12-22-92	3N/21W17D03(10)
6.3	12.3	10.3	11.8	11.1	11.0	13.21	10.8	(4.3)	15.1	Ohst, Gary	03N/21W-10E01, 3N/21W-10E2
261.3	108.5	159.0	126.2	111.7	75.8	104.13	135.2	(58.7)	193.9	Orr Ranch Co. (25)	03N/21W-20J03, 3N/21W-20J2
89.82	101.97	115.8	91.0	108.8	86.9	104.86	99.9	61.3	38.6	Ortiz Trust - Joseph & Sons	03N/21W-30E01 3N/21W-30E2, 3N/21W-20H1
445.8	392.7	299.3	343.8	343.9	121.2	314.87	323.1	(87.2)	410.3	Panamerican Seed, aka Ball Horticultural	3N/21W20K01, 3N/21W20M01 03N/21W20P01 & 3N/21W20F4
										Parklands Ventura LLC	3N22W35N01
										Pear Blossom Town & Country Marke	03N/21W-10E01, 3N/21W-10E2
86.8	63.6	42.1	62.6	57.4	76.1	74.46	66.2	(49.8)	116.0	Petty Ranch LP	03N/22W-36K04, 3N/22W-36K6

Table "D-1" DRAFT

IPA's 2014 - 2020 Production & Averages

6/28/2021

2014 (2)	2015 (2)	2016 (2)	2017 (2)	2018 (2)	2019 (2)	2020 (2)	7 Year Average	Avg Over + Under (-)	Acre Feet	Party Name	Well Number
							0.0			Pinkerton, Dan C. and Susan V. Pinkerton, Co-Trustees of the Pinkerton Family Living Trust dated March 19, 1990	03N/21W-17P02
							0.0	(39.1)	39.1	Pinkerton, Arlene	3N21W17Q01 (5)
									2	Pinkerton, Jennifer Paulene	
59.2	41.5	1.6	33.8	93.2	57.2	105.92	56.1	(5.8)	61.9	Pinkerton, Murray	03N/21W-21E01
									2	Pinkerton Ranch Trust	
									0.0	Pinkerton, W. B. Limited Partnership	3N21W17Q01
										Pinkerton, W. J. Estate Ranch 1 & 2	03N/21W-16E02, 3N/21W-29B4
							0.0	0.0	0	Pinkerton, W. J. Estate Ranch	3N/21W-16E02
									0.0	Pinkerton, Wesley Estate	03N/21W-21E01
									0.0	Rancho Attilio	2N/22W-2Q01
160.6	172.6	143.7	159.0	125.7	72.2	87.84	131.7	12.1	119.6	Rancho Filoso, LLC	03N/21W-09K03, 3N/21W-9K4
							0.0	(10.0)	10.0	Rancho Santa Paula, LLC	
0.0							0.0	0.0	0	Regents of the University of California (31)	3N/22W-34R1
1,092.2	1,114.4	1,268.1	1,343.5	1,094.6	966.5	1,144.92	1,146.3	382.8	763.5	Riverbank Citrus, LLC	3N/22W36K7 & 3N/22W36Q1, 3N22W36K05, 03N22W36L01S, 03N22W36K02S
							0.0	0.0		Riverpark A LLC	02N/22W-01M03, 02N/22W-01M04
									0.0	R.F. Robertson as Trustee of the Robertson Family Trust	03N/21W-17Q01
245.4	325.7	268.4	198.3	265.7	123.7	214.89	234.6	(129.2)	363.8	Santana, Jamie, L. Trustee of the Survivor's Trust Under the Jamime L. Santana Family Trust dated May 30, 1984 as amended	3N/22W-24R01 (13) usage recorded under Leavens ranches 03N/21W-17Q01 (5) 03N/21W-17Q01 (5) 3N21W17R01 (4) listed under McGaelic 3N21W9J01 (24) 2N22W03E01 listed under City Ventura Juanamaria
8.3	5.0	10.4	7.9	7.7	3.4	8.02	7.3	(14.6)	21.9	Santa Paula Hay & Grain and Ranches	03N/21W-19A02
75.9	63.5	64.1	63.1	73.8	98.4	71.26	72.9	(61.1)	134.0	Saticoy Foods Corp.	03N/21W-30H05 (7), 3N/21W-30H6, 3N/21W-30H9
114.4	95.5	0.0	167.5	206.0	118.9	158.78	123.0	(44.3)	167.3	Sharp, J. M. Company	03N/21W-19M01, 19M02

Table "D-1" DRAFT

IPA's 2014 - 2020 Production & Averages

6/28/2021

2014 (2)	2015 (2)	2016 (2)	2017 (2)	2018 (2)	2019 (2)	2020 (2)	7 Year Average	Avg Over + Under (-)	Acre Feet	Party Name	Well Number
										Shores, John Family Partnership	03N/21W-20J04 (17), 3N/21W-20R2
87.6	80.4	81.4	69.6	98.8	88.1	93.91	85.7	13.5	72.2	Shozi Ventura, LLC	02N/22W-03B01, 02N/22W-03B02
								0.0	0	Silva, Frank	02N/22W-01M03, 02N/22W-01M04
									0.0	Southern California Edison Co.	3N/22W-27M02 D
103.6	72.9	73.3	78.2	71.2	44.9	24.16	66.9	4.8	62.1	Strata Holdings LP	03N/21W-17P02
			44.9	52.3	34.2	2.99	19.2	(88.3)	107.5	The Nature Conservency	3N/21W29K1, 29K02 & 29K4
									0.0	Thermal Belt Mutual Water Co. Inc.	03N/21W-15C02, 03N/21W-15C04
										Torres, George 2013 Trust (32)	03N/21W-19A02
										Trademark Concrete Systems, Inc.	03N/21W-11H03
									0.0	Tri-Leaf Nursery (Bruce Arikawa)	3N/21W-30E01
										Tucker Ranch	02N/22W-03K02, 2N/22W-3K3
206.0	247.6	187.2	206.5	165.7	141.6	184.44	191.3	58.8	132.5	TVC Pinkerton Ranch LLC (27)	3N21W-29B4
										Twyford Plant Laboratories, Inc Fedes	03N/21W-17R01
							0.0	(5.8)	5.8	Utility Vault (Newbasis is Parent Co)	3N/21W-29K03 D (8)
1.2	1.2	1.0	1.0	1.0	1.0	1.00	1.1	(6.9)	8.0	Vanoni, David or Mary - Mary Vanoni	02N/22W-02Q01
0.0	0.0						0.0	0.0	0.0	Walking Beam Ranches	03N/21W-19G03
									0.0	Wallace, William	3N/21W-21E01
23.87	28.22	44.3	8.1	2.0	0.0	0.00	15.2	5.4	9.8	We 5 Properties (35)	02N/22W-02J03
										WH Ventura 165 LLC (31)	3N/22W-34R1, 3N21W20F04
2.2	1.5	1.0	1.0	1.0	1.0	1.10	1.3	(26.3)	27.6	Williams, James W. III	03N/22W-23G01
										Wittenberg-Livingston Inc. (30)	02N/22W-02Q01
16.5	4.6	0.5					3.1	(34.4)	37.5	Wright, Scott	03N/21W-11H03
										Von Chmielewski, Wolfgang (15)	03N/21W-10E01, 3N/21W-10E2

Table "D-1" DRAFT

IPA's 2014 - 2020 Production & Averages

6/28/2021

2014 (2)	2015 (2)	2016 (2)	2017 (2)	2018 (2)	2019 (2)	2020 (2)	7 Year Average	Avg Over + Under (-)	Acre Feet	Party Name	Well Number
2.4	16.7	79.1	40.4	32.4	27.2	30.16	32.6	1.6	31.0	Yoon Family Trust, (Soo Han Yoon)	2N/22W-3L01, 02N22W03K04S
15.0	15.7	14.9	23.7	13.8	16.3	8.54	15.4	(5.4)	20.8	Zimmerman, Wade N. III and Patricia B. Zimmerman Trust	3N/21W-21E08 03N/21W-21D02
26,495.0	**23,181.8**	**22,162.8**	**19,041.5**	**19,558.0**	**14,613.4**	**18,479.22**	20,504.5	(6,915.2)	**27,425.7**	**Total Basin IPA Stipulated Parties**	
27,466.4	**27,466.4**	**27,466.4**	**27,466.4**	**27,466.4**	**27,466.4**	**27,466.40**	27,466.4		**27,466.4**	**Historical Association IPA With Non-Parties (40.7 AF)**	
27,426	**25,856**	**25,363**	**21,889**	**22,881**	**17,242**	**21,212.55**	**23,874**			**Total IPA, Ventura, Non-Parties and De Minimus**	
27,445	**25,856**	**25,363**	**21,889**	**22,881**	**17,242**	**21,212.55**				**United Water Conservation District Totals**	
(19.09)	(0.01)	(0.01)	0.00	0.00	(0.00)	0.00				**Over/Under Amounts (1) (3) (19)**	

Footnotes:

Archived notes: 1, 3, 6, 11, 12, 14, 16, 18, 19, 20, 31, 32, 33

(2) Source of production data for 2012, 2013, 2014, 2015, 2016, 2017, 2018 and 2019 was the United Water Conservation District, reviewed by the Association.

(4) Shared well amoung Bender Realty LTD, Santana, Jamie L. and McGaelic Group. Production is split in accorance with each parties metered use.

(5) Shared well need to determine how to allocate production between Santana and Pinkerton, Arlene.

(7) Saticoy Foods Well number 3N/21W-30H3 should be changed to 3N/21W-30H5.

(8) Newbasis is the reporting party, Utility Vault is parent.

(9) Shared well allocated 356.0 AF/Year of production for 2007 - 2013 between City of San Buenaventura & Hadley Williams Partnership: 64/36% of allocation, production meter to be installed to allocate produced water.

(10) Well number was added Oba.

(13) Shared well (3N/22W-24R01) between Leavens Ranches and Jamie Santana Family Trust. Production is reported separately.

(15) Garcia - Spelling correction

(17) Roger Clow is a 1/3 owner of the Shores well; however, Clow used 100% of the water for 2007 and 2008. Clow's usage totals 30.5 AF for 2007 and 61 AF for 2008 were reallocated from Shores.

(21) Michael Fiano stipulated in 2012, will be leasing all water pumped annually going forward, transfers to date were estimated, any remaining balances will be made current with 2014 recorded production.

(22) Bratcher Cutright IPA From Bender Farms, 6 acre-feet

(23) Bender Reality and Bender Farms are owned by the same person, Bender Farms transferred 4.6 AF to the City of Santa Paula in 2012 and 6.0 AF to Bratcher in 2014, minus numbers reflect remaining allocation for prior years, plus Bratcher reported production for the years reported to United Water Conservation District.

(24) Basso Properties Sold to Jaime Santana Trust 43.4 acre-feet with property

(25) Roger Orr as Trustee of the Orr Family Trust so the Orr Ranch Co. to Bryce R. and Elaine V. Bannatyne Co Trustees of the Bannatyne Trust

(26) County of Ventura over reported 158.62 acre-feet in 2013, (331.2+2.67-158.62=175.2) United Water Conservation Distrcit did not recognize that production correction in their records.

(27) Pinkerton, W. J. Estate Ranch 1 & 2, Sold to Pinkerton W. J. Estate Ranch 158.7 AF of IPA and 132.5 AF of IPA to TVC Pinkerton Ranch LLC in 2014, combined production is reflected on TVC Pinkerton

(28) The Judson T. Cook & Suzette H. Cook Revocable Trust dated December 5, 2007 Purchased the Dabney, George and Rebecca Trust Inter Vivos in January 2018

(29) Bender Reality and Bender Farms sold property to JKJ Farms LLC with 225 acre-feet of allocation and JKJ later transferred 100 acre-feet to Brucker Family Trust

(30) Wittenberg-Livingston, Inc. sold 4 acre-feet to Little Clara Ranch and 20.8 acre-feet to Grant Family Ranches

(34) Silva allocation of 108 Acre-Feet was distributed to County of Ventura 47.5, Jakraan 45.1 and Riverpark A LLC 16.2

(35) 2014 Production was reduced to 5.9 AF from 15.01 using SCE Pump Test well was pumping air do to disrepair over recording, also 2015 was reduced to 21.61 from 40.28

(36) 30 AF Transferred from Limoneira to Limoneria Lewis Community Builders LLC, effective February 2020

(37) 94.45 AF Transferred from Limoneira to City of Santa Paula September 2020

(38) 60.71 AF Transferred From Limoneira to City of Santa Paula February 2021

Table "D-2"

De Minimus 2014-2020 Production & Averages DRAFT
(Production Not to Exceed 5 AFY)

2014	2015	2016	2017	2018	2019	2020	7 Year Average	Party Name	Well Number
1.0	1.0	1.0	1.0	1.0	0.6	1.00	0.9	Chapman, Kenneth	3N/21W21F1
3.4	2.2	2.2	2.6	2.4	2.4	2.40	2.5	Chavez, Joel and Carmen	3N/21W21E07
0.0	0.0	1.0	2.6	3.6	3.7	4.29	2.2	Loza, Jesus and Veronica	3N/22W26L01S
4.3	3.3	3.9	8.1	10.0	7.3	4.39	5.9	Rogers, Charles W., Jason C. Rogers, and Aaron W. Rogers	2N/22W-1M2
4.1	4.2	4.2	4.7	5.0	4.4	5.10	4.5	Santa Paula Airport Association	3N21W14D01
3.5	3.5	3.5	3.5	3.5	3.5	3.50	3.5	Sullivan, Russell J.	3N21W21L1
16.3	**14.2**	**15.8**	**22.5**	**25.5**	**21.9**	**20.68**	**19.5**	**Total De Minimus Producers**	

This page intentionally blank.

Table "D-3" DRAFT

Non-Party 2014 - 2020 Production & Averages

2014 (7)	2015 (7)	2016 (7)	2017 (7)	2018 (7)	2019 (7)	2020 (7)	2014-20 Average AFY Production	Name	Well Number
3.2	3.2	3.0	2.4	3.0	2.3	2.40	2.8	Davis, Linda Trust	3N21W21E04, 3N/21W-21E10 (2)
							0.0	Dominguez, G.(5) (0.9 AF)	03N/21W-12E07
							0.0	Fiano, Michael	3N/22W26B02 & 3
	0.0	0.0				0.00	0.0	Garman, William (5) (2.0 AF)	02N/22W-02N04
							0.0	Grant Family Ranches, LLC	3N22W3E01 (1), 3N21W20E01 (2)
2.0	1.6	2.0	1.6	1.6	1.6	1.40	1.7	Minero, Gilbert (5) (1.1 AF)	03N/21W-21M01
4.4	6.3	10.6	11.0	10.7	7.5	7.49	8.3	Sanchez, Martin	3N/21W-21E6
		3.5					0.5	Sullivan, Russell J.	3N21W21L1
							0.0	Ventura Unified School District (5) (30.8 AF)	02N/22W-03P01
2.0	1.8	2.0	1.9	1.6	1.3	1.50	1.7	Vint, Thomas H. (5) (4.9 AF)	03N/21W-21E03
5.0	1.6	1.1	2.2	2.2	1.9	1.58	2.2	Westerdale Trust (5) 1.0 AF)	03N/21W-21G01
16.6	**14.5**	**22.2**	**19.1**	**19.2**	**14.6**	**14.37**	**16.7**	**Total Average AFY Production (Average 2014-2020)**	

Footnotes to Non-Stipulating Pumpers

Achived footnotes: 3, 4, 6

40.7 Acre-Feet for Non Parties from original Judgment

(1) Incorrect well number.
(2) Added well number.
(5) Non-party individuals named in the Original Judgment, 40.7 Acre-Feet 7/28/2011
(7) Source of production data for 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 and 2019 was the United Water Conservation District, reviewed by the Association.

This page intentionally blank.

Table "D-4" DRAFT
Temporary Water Transfers

6/28/2021

2014	2015	2016	2017	2018	2019	2020	7 Year Average	Avg Over + Under (-)	AF Annual Allocation	Transfering Parties
2,234	2,538	2,063	1,612	1,517	982	1,372.17	1,759.7	(1,604)	3,364	**Limoneira Company**
674.0	756.2	441.0	364.9	660.0						**To:** Canyon Irrigation Company
136.1	79.8			39.4						**To:** Canyon Irrigation Company for Rancho La Cuesta
231.0	250.0	526.4				579.60				**To:** Riverbank Citrus LLC
49.0										**To:** Fiano, Michael J. Trust
135.1										**To:** Leavens Ranches
74.5										**To:** Regents of the University of Califorrnia
(62.2)	(62.2)	(62.2)								**To:** City of Santa Paula (2016 Permanent Transfer)
										To: Dabney/Cook
90.0	132.0	43.0								**To:** Tucker Ranch
35.0	24.0		17.0							**To:** Gooding Ranch
3,596.7	3,717.7	3,011.2	1,993.5	2,216.4	982.2	1,951.77	2,495.6	(868)	3,364	**Limoneira Company Balance**
33.8	43.3	30.1	14.7	11.4	10.7	12.69	22.4	22	-	**Fiano, Michael J. Trust**
-49.0										**From:** Limoneira Company
				-30.00						**From**: Dan Campbell
	-43.3	-30.09								**From:** Malzacher, Fred H & Elaine Trust
-15.2	0.0	0.0	14.7	-18.6	10.7	12.69	0.6	0.62	-	**Fiano, Michael J. Trust Balance**
137.0	165.6	91.4	174.8	140.0	54.2	150.80	130.6	(152)	282.3	**Campbell, Dan**
				30.0						**To:**Michael J Trust
				90.0						**To:** Alta Mutual Water Company, Inc**.**
137.0	165.6	91.4	174.8	260.0	54.2	150.80	147.7	(134.61)	282.3	**Campbell, Dan Balance**
7.2	8.9	18.7	20.6	23.1	18.8	20.44	16.8	(19)	36	**Malzacher, Fred H. & Elaine C., Trustees of the Fred H**
	43.3	30.1	0.0	0.0						**To: Fiano, Michael j. Trust**
7.2	52.2	48.8	20.6	23.1	18.8	20.44	27.3	(8.99)	36	**Malzacher, Fred H. & Elaine C. Balance**
9,543.8	7,431.2	7,730.0	5,459.6	6,002.2	4,242.9	5,494.9	6,557.8	(3,355)	9,913	**Farmers Irrigation Company**
	33.0		123.4	128.0	588.2	499.7				**To:** Canyon Irrigation Company
185.4	5.6									**To:** Brucker Family Trust
51.2	63.4	77.2	52.4	70.2	48.3	66.3				**To:** Ortiz Trust - Joseph & Sons
										To: Bender Reality LTD
						76.5				**To:** Loza Investments, LLC
										To: Rancho Filoso, LLC
			28.3	39.1	18.2					**To:** Schozi Ventura
150.0	170.0	85.0	85.0	132.0	93.0	57.0				**To:** McGrath, John & Sons
		426.3	145.8							**To:** Alta Mutual Water Company
3.3			3.7							**To:** Aramblua, Pedro
			295.6	220.4	149.1	279.3				**To:** Riverbank Citrus
100.0	100.0									**To:** Strata Holdings LP
9.4										**To:** Grant Family Ranches
		116.1			79.4					**To:** TVC Pinkerton Ranch LLC
10,043.1	7,803.1	8,434.6	6,193.9	6,591.9	5,219.1	6,473.6	7,251.3	(2,661.9)	9,913	**Farmers Irrigation Company Balance**
2013.9	1,526.5	1,342.9	772.5	819.5	53.5	227.7	965.2	292	673	**Canyon Irrigtion Company**
0.0	-33.0	0.0	-123.4	-128.0	-588.2	-499.7				**To:** City of Santa Paula
0.0	33.0	0.0	123.4	128.0	588.2	499.7				**From:** Farmers Irrigation Company
-136.1	-79.8									**From:** Limoneira Company for La Cuesta over use
-674.0	-756.2	-441.0	-364.9	-699.3						**From:** Limoneira Company
1203.8	690.5	901.9	407.6	120.2	53.5	227.7	515.0	(157.98)	673	**Canyon Irrigation Company Balance**
4,846.8	4,168.0	4,087.2	4,260.1	4,232.5	4,082.8	4,444.9	4,303.2	(1,412)	5,715	**City of Santa Paula**
0.0	-33.0	0.0	-123.4	-128.0	-588.2	-499.7				**From:** Canyon Irrigation Company
62.2	62.2	62.2								**From:** Limoneira Company (62.2 Permenant Transfer '16)
4,909.0	4,197.2	4,149.4	4,136.7	4,104.5	3,494.6	3,945.3	4,133.8	(1,581)	5,715	**City of Santa Paula Balance**
0	0	0	0	0	0		-	-	0.0	**Dickenson, D&P Dickenson Family Revocable Tr.**
										To: Gooding Ranch (John F. Gooding)

Table "D-4" DRAFT
Temporary Water Transfers

6/28/2021

2014	2015	2016	2017	2018	2019	2020	7 Year Average	Avg Over + Under (-)	AF Annual Allocation	Transfering Parties
136.29	125.06	34.3	136.57	112.38	101.31	123.67	109.9	8	101.8	**Gooding Ranch (John F. Gooding)**
										From: Dickeson, D&P Dickenson Family Rev. Tr.
-35.0	-24.0		-17.0							**From:** Limoneira Company
101.29	101.06	34.3	119.57	112.38	101.31	123.67	99.1	(2.7)	101.8	**Gooding Ranch (John F. Gooding) Balance**
124.8	162.9	123.7	85.8	66.6	162.5	154.3	125.8	(56)	181.6	**McGaelic Group**
48.8			75.0	51.0						**To:** McGrath, John & Sons (Permanent Transfer of 55.9)
173.6	162.9	123.7	160.8	117.6	162.5	154.3	150.8	(31)	181.6	**McGaelic Group Balance**
87.6	80.4	81.4	69.6	98.8	88.1	93.9	85.7	13	72.2	**Shozi Ventura, LLC**
			-28.3	-39.1	-18.2					**From: Farmers Irrigaton Company**
87.6	80.4	81.4	41.3	59.8	69.9	93.9	73.5	1.3	72.2	**Shozi Ventura, LLC Balance**
0							-	-	0.0	**From: Shores, John Family Partnership**
										To: McGrath, John & Sons (Permanent Transfer of 126.7)
0.0							(0.0)	(0)	0.0	**Shores, John Family Partnership Balance**
392.0	479.9	296.6	447.3	430.8	319.9	288.0	379.2	96	283.6	**McGrath, John & Sons**
-48.8			-75	-51						**From:** McGaelic Group
										From: The Nature Conservency
										From: Shores, John Family Partnership
-150.0	-170.0	-85.0	-85.0	-132.0	-93.0	-57.0	(110.3)			**From:** Farmers Irrigation Company
193.2	309.9	211.6	287.3	247.8	226.9	231.0	244.0	(39.6)	283.6	**McGrath, John & Sons Balance**
0.0							-	-	0.0	**Regents of the University of California**
0.0							-			**From:** Leavens Ranches
0.0							-	-	0.0	**Regents of the University of California Balance**
0.0	0.0						-	-	0.0	**WH Ventura 165 LLC (Regents)**
172.0							8.6			**From: Leavens Ranches**
-74.5	0.0						(10.6)			**From: Limoneira Company**
97.5	0.0							-	0.0	**WH Ventura 165 LLC**
235.5	195.0	159.1	171.3	120.0	178.1	138.5	171.1	(24)	195.3	**From: Leavens Ranches**
										To: Regents of the University of California
-135.1										**From:** Limoneira Company
100.4	195.0	159.1	171.3	120.0	178.1	138.5	151.8	(43.5)	195.3	**Leavens Ranches Balance**
1092.2	1114.4	1268.1	1343.5	1094.6	966.5	1144.9	1,146.3	383	763.5	**Riverbank Citrus LLC**
-231.0	-250.0	-526.4								**From:** Limoneira Company
			-295.6	-220.4	-149.1	-279.3				**From:** Farmers Irrigation Company
-98.3	-100.9	-105.6	-107.1	-110.9	-53.8	-151.2				**From:** Nutwood Farms
762.9	763.5	636.1	940.8	763.3	763.5	714.4	763.5	(0.0)	763.5	**Riverbank Citrus LLC Balance**
28.1	25.5	23.4	19.3	15.6	23.5	24.1	22.8	(104)	126.4	**Nutwood Farms**
98.3	100.9	103.0	107.1	110.8	53.8	151.2				**To:** Riverbank Citrus LLC
126.4	126.4	126.4	126.4	126.4	77.4	175.3	126.4	(0.0)	126.4	**Nutwood Farms Balance**
1.1	0.5	1.0	1.6	1.6	1.8	2.1	1.4	(9)	10.0	**Little Clara Ranch LLC**
										To: We 5 Properties
1.1	0.5	1.0	1.6	1.6	1.8	2.1	1.4	(9)	10.0	**Little Clara Ranch Balance**
23.9	28.2	44.3	8.1	2.0	0.0	0.0	15.2	5	9.8	**We 5 Properties**
										From: Little Clara Ranch LLC
0.0	-42.98	-28.77								**From:** Alta Mutual Water Company
23.9	-14.8	15.5	8.1	2.0	0.0	0.0	5.0	(4.84)	9.8	**We 5 Properties Balance**

Table "D-4" DRAFT
Temporary Water Transfers

6/28/2021

2014	2015	2016	2017	2018	2019	2020	7 Year Average	Avg Over + Under (-)	AF Annual Allocation	Transfering Parties
	70.0									**To: County of Ventura Gen Services Agency Jail**
		100.0								**To: Alta Mutual Water Company**
100.0										**To:** Brucker Family Trust
100.0	70.0	100.0	44.9	52.3	34.2	3.0	57.8	(49.7)	107.5	**The Nature Conservancy Balance**
561.9	237.0	266.7	242.8	383.5	400.8	439.2	361.7	85	276.5	**Brucker Family Trust**
-100										**From:** The Nature Conservency
						-253.81				**From:** JKJ Farms, LLC
-185.4	-5.6	-51.7								**From:** Farmers Irrigation Company
276.5	231.5	215.1	242.8	383.5	400.8	185.4	276.5	-	276.5	**Brucker Family Trust Balance**
125.0	34.0	77.1	83.8	62.9	78.6	89.1	78.6	(46)	125.0	**JKJ Farms, LLC**
						253.8				**To: Brucker Family Trust**
125.0	34.0	77.1	83.8	62.9	78.6	342.9	114.9	(10.10)	125.0	**JKJ Farms, LLC**
89.8	102.0	115.8	91.0	108.8	86.9	104.9	99.9	61	38.6	**Ortiz Trust - Joseph & Sons**
-51.2	-63.4	-77.2	-52.4	-70.2	-48.3	-66.3				**From:** Farmers Irrigation Company
38.6	38.6	38.6	38.6	38.5	38.6	38.6	38.6	-	38.6	**Ortiz Trust - Joseph & Sons Balance**
8.9	11.8	13.2	10.4	7.3	14.8	7.9	10.6	1	9.6	**The Judson T. Cook & Suzette H. Cook Revocable Tru**
		-11.6								From: Limoneira Company
8.9	11.8	1.6	10.4	7.3	14.8	7.9	8.9	(0.65)	9.6	**The Judson T. Cook & Suzette H. Cook Revocable Trust da**
1,018.4	1,175.1	1,386.5	709.1	745.7	292.0	536.7	837.7	75	763.1	**Alta Mutual Water Company**
				(90.0)						**From:** Dan Campbell
		(100.0)								**From:** The Nature Conservency
		(26.6)	(23.2)							**From:** Wallace, James III
										To: We 5 Properties
		-426.3	-145.8							**From: Farmers Irrigation Company**
1018.4	1175.1	833.6	540.1	655.7	292.0	536.7	721.7	(41.4)	763.1	**Alta Mutual Water Company Balance**
305.4	319.1	245.38	242.76	362.19	254.76	358.73	298.3	43	255.2	**Loza Investments LLC - Tucker Ranch**
-90.0	-132.0	-43.0								From: Limoneira Company
						-76.51				From: Farmers Irrigation Company
		37.5	2.1							To: Yoon Family Trust
215.4	187.1	239.9	244.8	362.2	254.8	282.2	255.2	0.00	255.2	**Loza Investments LLC - Tucker Ranch Balance**
6.21	4.43	2.91	5.08	1.33	1.38	1.97	3.3	0	2.9	**Arambula, Pedro**
-3.3			-3.7							From: Farmers Irrigation Company
										From: Correction of Reporting to United (3)
2.9	4.4	2.9	1.4	1.3	1.4	2.0	2.3	(0.57)	2.9	**Arambula, Pedro Balance**
2.2	1.5	1	1	1	1	1.1	1.3	(26)	27.6	**Williams, James W. III**
		26.6	23.2							**To:** Alta Mutual Water Company
2.2	1.5	27.6	24.2	1	1	1.1	8.4	(19)	27.6	**Williams, James W. III**
273.7	247.8	188.2	221.9	246.8	76.4	278.5	219.1	(74)	292.6	**Bender Reality, LTD & Bender Farms**
										From: Farmers Irrigation Company
273.7	247.8	188.2	221.9	246.8	76.4	278.5	219.1	(74)	292.6	**Bender Reality, LTD & Bender Farms**
13.9	6.8	6.5	20.7	19.1	4.4	16.1	12.5	3	9.6	**Garcia, Elias & Guadalupe**
-4.3			-2.4							From: Castaneda, Albert & Mary
9.6	6.8	6.5	18.3	19.1	4.4	16.1	11.5	1.94	9.6	**Garcia, Elias Balance**
88.0	140.0	65.6	71.1	60.4	59.9	87.3	81.8	(20)	101.4	**Castaneda, Albert & Mary**
4.3			2.4							To: Garcia, Elias & Guadalupe
92.3	140.0	65.6	73.5	60.4	59.9	87.3	82.7	(19)	101.4	**Castaneda, Albert & Mary**
41.5	31.4	31.6	44.2	33.2	27.0	33.9	34.7	(18)	52.9	**Grant Family Ranches**
-9.4										From:Farmers Irrigation Company
32.1	31.4	31.6	44.2	33.2	27.0	33.9	33.3	(20)	52.9	**Grant Family Ranches Balance**

Table "D-4" DRAFT

Temporary Water Transfers

6/28/2021

2014	2015	2016	2017	2018	2019	2020	7 Year Average	Avg Over + Under (-)	AF Annual Allocation	Transfering Parties
-11.2	-65.0	-28.7	-65.5							From: JM Sharp Company
										From:Farmers Irrigation Company
149.4	107.6	115.0	93.5	125.7	72.2	87.8	107.3	(12.3)	119.6	**Rancho Filoso, LLC Balance**
114.37	95.47	0	167.48	206.02	118.9	158.78	123.0	(44.3)	167.3	**Sharp, JM Compnay**
11.2	65.0	28.7	65.5							To: Rancho Filloso
		15.0								Cook, The Judson T. Cook & Suzette H. Cook Revocable Trust dated December 5, 2007 (28)
125.57	160.47	43.7	233.01	206.02	118.9	158.78	149.5	(17.8)	167.3	**Sharp, JM Company Balance**
8.9	11.8	13.2	10.4	7.3	14.8	7.9	10.6	1.0	9.6	**Cook, The Judson T. Cook & Suzette H. Cook**
		-15.0								From: Sharp, JM Company
8.9	11.8	(1.8)	10.4	7.3	14.8	7.9	8.5	(1.1)	9.6	**Cook, The Judson T. Balance**
206.04	247.64	187.17	206.53	165.65	141.57	184.44	191.3	58.8	132.5	**TVC Pinkerton Ranch LLC (27)**
-31.47										From: Pinkerton, W. J. Estate Ranch
-69.8	-116.1	-116.1			-79.4					From: Farmers Irrigation Company
104.77	131.50	71.12	206.53	165.65	62.14	184.44	132.3	(0.2)	132.5	**TVC Pinkerton Ranch LLC Balance**
127.23	0	0	0				18.2	140.5	158.7	**From: Pinkerton W. J. Estate Ranch**
31.47							289.3			**To: TVC Pinkerton Ranch LLC**
158.7	0.0	0.0	0.0				22.7	(136.0)	158.7	**TVC Pinkerton Ranch LLC Balance**
103.6	72.93	73.31	78.24	71.22	44.93	24.16	66.9	0.0	62.1	**Strata Holdings LP**
-100.0	-100.0									From: Farmers Irrigation Company
3.6	-27.07	73.31	78.24	71.22	44.93	24.16	38.3	(23.8)	62.1	**Strata Holding LP Balance**
168.18	142.3	121.33	238.58	204.3	194.33	163.15	176.0	3.8	172.2	**County of Ventura, General Services Agency**
	-70									**From:** The Nature Conservancy
168.18	72.3	121.33	238.58	204.3	194.33	163.15	166.0	(6.2)	172.2	**County of Ventura, General Services Agency Jail Bal**
2.4	16.66	79.09	40.41	32.43	27.18	30.16	32.6	1.6	31.0	**Yoon Family Trust**
		-37.54	-2.05				(5.4)			**From: Tucker Ranch**
2.4	16.66	41.55	38.36	32.43	27.18	30.16	27.0	(4.0)	31.0	**Yoon Family Trust Balance**

Table "D-5" DRAFT

Original and Acquired Allocation of the City of San Buenaventura

6/28/2021

2014 (7)	2015 (7)	2016 (7)	2017 (7)	2018 (7)	2019 (7)	2020 (7)	7 Year Average	Over (+) Under (-)	Acre Feet	Party Name	Well Number
162.4	229.1	243.4	212.8	182.2	83.1	154.78	181.11	(38.9)	220.0	City of San Buenaventura	02N/22W-03E01 (1)
									5.8	City of San Buenaventura (3)	3N/21W-21B3
97.6	97.8	15.4					30.11	7.0	23.1	City of San Buenaventura (10)	3N/22W-34R1
9.3		5.9					2.17	(94.8)	97.0	City of San Buenaventura (9)	03N/22W-35N01
269.3	326.9	264.7	212.8	182.2	83.1	154.78	213.39	(132.5)	**345.9**	**Total Aquired by City of San Buenaventura**	

629.0	2,318.3	2,897.6	2,593.3	3,095.9	2,509.2	2,543.51	2,369.54	(630.5)	3,000.0	City of San Buenaventura	02N/22W-02K09 (2) 2N/22W-02H02 (8)
898.3	2,645.2	3,162.2	2,806.1	3,278.0	2,592.2	2,698.29	2,582.93	(763.0)	**3,345.9**	**Total City of San Buenaventura**	

FOOTNOTES:
Archived footnotes: 4, 5, 6
(1) Shared well allocated 356.0 AF/Year of production for 2007 to 2013 between City of San Buenaventura and Hadley Williams Partnership by 64/36% of allocation a production meter should be used.
(2) Well number was added.
(3) McConica allocation transfer.
(7) Source of production data for 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020was the United Water Conservation District, reviewed by the Association.
(8) New well put online in 2015.
(9) Permanent water transfer from J Fam, LLC to City of Ventura in 2015 (12.0 AF) from Parklands Ventura LLC 2021 (85)
(10) Permanent water transfer from WH Ventura 165 LLC to City of Ventura, 2016 (23.1 AF)