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TECHNICAL MEMORANDUM

2025 Groundwater Quality Trend Monitoring Program Results

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Background and Purpose

The Butte County Department of Water and Resource Conservation (WRC) continued its groundwater quality trend monitoring within the County in August of 2025to provide information on groundwater quality conditions for salinity, measured as specific conductivity (SC). Conductivity is a basic groundwater quality characteristic to evaluate a subbasin for evidence of saline intrusion: as conductivity increases, salinity increases. Conductivity measures the ability of water to pass an electrical current, such as those from dissolved ions i.e. salts and other inorganic chemicals. Overtime with regular measurements, comparisons to baseline conditions can show trends in changing conditions.

Originally required by Chapter 33A, the Basin Management Objective Program, ran by the County has been monitoring wells for evidence of saline intrusion since 2001. In 2014, SGMA required Groundwater Sustainability Agencies (GSAs) to develop and submit Groundwater Sustainability Plans (GSPs) to the California Department of Water Resources (DWR) by 2022. The Butte, Vina and Wyandotte Creek Subbasin GSPs include a conductivity monitoring plan to avoid groundwater quality degradation (Davids, 2021; Geosyntec Consultants, Inc., 2021a; Geosyntec Consultants, Inc., 2021b). With the onset of SGMA, Chapter 33A was sunset in 2019, however the Department continues to conduct the Groundwater Quality Trend Monitoring Program to support the GSAs with their monitoring needs and to fulfill the program's original objectives of:

- Establishing a baseline of information to reveal trends over time of Butte County groundwater quality. Measurements taken serve as initial indicators of changes in water quality that may warrant further investigation or testing.

- Ensuring that groundwater resources are well managed by documenting the quality of local groundwater. Availability and distribution of this information will be a useful educational tool.

The purpose of this memo is to summarize the groundwater quality conditions for salinity, measured as specific conductance in the Butte, Vina and Wyandotte Creek Subbasins during the fourth year (2025) of groundwater quality monitoring related to their respective Groundwater Sustainability Plans (GSPs) per the Sustainable Groundwater Management Act (SGMA) of 2014.

The network of wells changed significantly in 2022 as a result of the GSPs. The redefined network targeted inclusion of deep wells (where available) within each subbasin to track the migration of connate water upwelling from deep portions of the aquifer.

Conductivity is affected by temperature and increases as water temperatures increase. The terms "specific" and "electrical" conductivity are often used interchangeably in the literature to report the same measurement, however; specific conductivity refers to conductivity measured with a temperature compensation factor and standardized to 25°C. Electrical conductivity (EC) however, generally refers to measurements that are not standardized to a specific temperature, unless specified. The equipment that has been used to measure groundwater conductivity measurements by the WRC since 2022 reports values as SC.

Salinity is the only water quality constituent for which sustainable management criteria (SMC) goals were set in all three subbasins and is measured in the field as SC. Each subbasin specifically defines how conductivity measurements are reported as related to the SMC in each respective GSP. In the Vina, and Wyandotte Creek Subbasins, specific conductivity is identified for the SMC, while in the Butte Subbasin GSP electrical conductivity is identified for the SMC. For the Butte Subbasin, these measurements can therefore be reported as EC @ 25°C for comparison to their SMC.

Methodology

Conductivity measurements are taken at each monitoring well once per year. The wells are typically measured within the month of August during the peak of the irrigation season.

In 2021, the Department purchased a Solinst 107 temperature, level and conductivity (TLC) meter which includes a probe that measures SC in microsiemens (µs) / centimeter (cm), as well as temperature and water level (similar to an electric sounder) on a 1,000-foot-long laser-marked flat tape with markings every 1/100th ft. This meter has been used since 2022 to conduct conductivity monitoring at various depths within the monitoring wells. The Solinst SC meter is only lowered in wells without pumping equipment i.e. observation wells, in order to avoid potential damage to the equipment through entanglement in the wiring or pumps.

At the beginning of each monitoring day the meter was calibrated with known standard solutions according to the manufacturer's specifications. At each site, the probe is lowered to the water surface and a depth to water measurement is recorded. It is then lowered to the midpoint of each screened interval(s) within the well to record the conductivity of the water entering the well from that portion of the aquifer. In prior reports (2022 and 2023), conductivity measurements from each screened interval were depicted in the graphs. Since 2024, the average of the conductivity measurements collected at the midpoint of every screened interval within each well is displayed in the graphs, unless there are variances in where measurements were recorded. For example, if one of the measurements was not taken within a screened interval due to limits of the equipment (i.e the length of the tape the SC probe is attached to was too short to reach a screened interval) the data taken outside of the screened interval was not included in reported average and is noted as such in the graphs. If not all measurements were able to be taken within the screened intervals for other reasons such as obstructions within the well preventing the equipment from reaching the screened depths, the measurements were deemed as questionable measurements and depicted as such in the graphs.

For most of the remaining wells in the monitoring network with pumps, the Solinst probe was used in the field to measure a water sample collected from a spigot or sprinkler after the well was purged of standing water by pumping it for at least 20 minutes. One exception, well 19N01W28A001M located in the Glenn County portion of the Butte Subbasin was measured with a Hach Sension 156 meter by Glenn County staff after being purged; however it was only pumped for 10 minutes before the sample was collected to measure.

Some water quality monitoring sites do have intermittent conductivity data collected by other entities, however most sites do not. Data in the graphs referred to as "Other Data" or "Historic SC" reflects any other SC data located for the well and is sourced from a variety of entities including DWR's 2020 Northern Sacramento Valley Groundwater Quality Assessment (DWR, 2020), data retrieved from DWR's Water Data Library (WDL) website (DWR, 2025) and data provided by DWR's Northern Region Office Water Quality Section where available. Methodologies of how these measurements were collected vary; however in cases where data included both field and lab conductance values on the same date, the average of the two is reported; most variance of the two values is minimal (under 50 µs/cm) with only one well reporting a variance of about 225 µs/cm.

Monitoring Network

The GSPs define the groundwater quality monitoring Representative Monitoring Site (RMS) well networks to include wells distributed spatially throughout the Subbasins, focusing on the inclusion of wells screened deep enough to capture changes in conductivity in the deeper portions of the aquifer, where any changes in conductivity would be expected to be detected first. There are however a few shallower wells within the network, due to a lack of deeper wells available. Modifications to the networks have been made including the removal and addition of wells for various reasons as described in more detail below and in **Table 1.**

In 2025, the overall revised monitoring network in the Vina Subbasin included seven RMS wells as identified in the GSP. One RMS well, 28J005 was removed from the network in 2024 due to an obstruction preventing

the equipment from reaching the mid-point of the screening interval to measure conductivity. Based on field observations, and a video logging survey conducted by DWR in 2025, well 28J005, drilled in 1955, has filled in with sediment approximately 600 feet above the first screened interval.

In 2025, the overall revised monitoring network in the Butte Subbasin included seven RMS wells as identified in the GSP and one additional new well added to the network in 2024. One deep multicompletion well, 20N01E18L001M, an extensometer site used to monitor potential inelastic subsidence was removed from the network in 2024 due to obstructions from the extensometer elements preventing the equipment from reaching the mid-point of the deepest screening interval to measure conductivity. This obstruction was confirmed from a video logging survey conducted by DWR in 2023. Another multi-completion well at the same location, 20N01E18L002M measuring the intermediate zones of the aquifer, was added to the network in 2024 and measured without issue; however in 2025, this well had sediment preventing the equipment from reaching the deepest screened interval in the well. The sediment obstruction was confirmed from a video logging survey conducted by DWR in 2025.

In 2025, the overall revised monitoring network in Wyandotte Creek Subbasin included two RMS wells as identified in the GSP; 18N04E08M001M and 18N04E19D001-3M. As depicted in **Table 1.** four RMS wells identified in the GSP were removed from the monitoring network for the following reasons:

- Two RMS wells were removed from the network per the request of the landowners, 28L001M in 2022 and 16Q001M in 2023.
- RMS well 13B002M was removed from the monitoring network in 2022 due to an inoperable pump.
- Well CWS-02 was removed from the monitoring network in 2023 due to water quality issues at the well which have persisted.

Well 06E002M was added to the network in 2022. This well was historically measured for groundwater quality as part of the Butte County Basin Management Objective (BMO) program. One more additional well, 09N002M was added into the monitoring network in 2023.

A map of each subbasin and the revised network of 2025 groundwater quality sites is shown in **Figure 1.** As part of their GSP Periodic Evaluations (due in January 2027), the GSAs will continue to consider modifications to the groundwater quality RMS network.

The monitoring network details including well type, monitoring equipment, total well depth, depth of the screened zones(s) in each well and notes are provided in **Table 1.** The portion of the state well number in bold indicates the RMS well identification numbers for each well, where applicable.

Most wells in the network are located with Butte County with the exception of two wells; 17N01W10A001M located in Colusa County and 19N01W28A001M located in Glenn County. The RMS wells within the Butte Subbasin are predominantly multi-completion wells (multiple wells at a single location screened at different depths below the ground surface) with the exception of 18N01E35L001M, a single observation well and 19N01W28A001M, a shallow irrigation well. One RMS well in the Butte Subbasin 19N01E35B002M is also an extensometer site which continuously monitors for potential inelastic land subsidence. The RMS wells within the Vina Subbasin are all multi-completion wells sampling from the deepest completion at each location. In the Wyandotte Creek subbasin, there are a variety of well use types in the monitoring network including irrigation, municipal and observation wells.

Sustainable Management Criteria

In these three subbasins, the groundwater quality SMC are established to address degraded groundwater quality caused by groundwater pumping where the potential exists for movement of underlying brackish water from greater depths, upward into the freshwater aquifer where groundwater pumping for beneficial uses occurs. One objective of the groundwater quality monitoring program is to measure conductivity levels in the RMS wells and compare those to the Measurable Objectives (MO) and Minimum Thresholds (MT) set for each RMS well as identified in the GSPs, as a way to gauge whether undesirable results are occurring in the subbasin. In each subbasin's GSP, MTs were established to be protective of water uses and users. When considering MTs, it is important to note that in the case of groundwater levels, exceedance of a MT is caused by groundwater levels dropping below the threshold. However, for groundwater quality, exceedance of a MT is counterintuitively caused by measuring levels higher than the threshold. The MT for groundwater quality is a highest allowable value, rather than lowest.

As shown in **Table 2**., in the Bute Subbasin the MO for each RMS well for salinity is set at 700 µs/cm for agricultural use, consistent with the historic Butte County BMO program. The MTs at the RMS wells are set as either the higher of 900 µs/cm or the measured historical high, whichever was greater in the Butte Subbasin. This MT was set based on best available data, the 19-year dataset of the Butte County BMO program, and maximum contamination levels established by the State. The occurrence of an Undesirable Result occurs in the Butte Subbasin if 25% of RMS wells exceed their MTs for 24 consecutive months.

As shown in **Table 2**., in the Vina and Wyandotte Creek Subbasins, the MOs for salinity are set at 900 µs/cm and the MTs are 1,600 µs/cm, which is the upper limit of the Secondary Maximum Contaminant Level (SMCL) based on State Secondary Drinking Water Standards. Secondary Drinking Water Standards are set on the basis of aesthetic concerns, values exceeding this number are typically unacceptable for drinking water. The occurrence of an Undesirable Result occurs in the Vina and Wyandotte Creek Subbasins when two RMS wells within each Subbasin exceeds their MTs for two consecutive non-dry years.

Table 1. 2025 Groundwater Quality Trend Monitoring Network Information

Subbasin	State Well Number	RMS well?	Well Type	Monitoring Equipment	Total Well Depth (feet)	Depth of Screened Zone(s) (feet)	Notes
Butte	**17N01E24A003M**	Yes	Observation	Solinst 107	833	770 - 790	
	17N01W10A001M	Yes	Observation	Solinst 107	820	770 – 780, 790-800	
	18N01E35L001M*	Yes	Observation	Solinst 107	899	816 – 836	
	19N01E35B002M*	Yes	Observation	Solinst 107	980	930 – 950	
	19N01W28A001M	Yes	Irrigation	Hach Sension156	140	120 – 140	
	19N02E13Q003M	Yes	Observation	Solinst 107	690	670 – 680	
	20N01E18L001M	Yes	Observation	Solinst 107	1,000	767 – 810, 873–894	Removed from the network due to obstruction.
	20N01E18L002M	No	Observation	Solinst 107	581	510 – 530, 550-560	Added in 2024 to supplement network
	21N01W13J001M	Yes	Observation	Solinst 107	830	780 – 820	
Vina	20N02E**24C003M**	Yes	Observation	Solinst 107	520	484 – 505	
	21N01E**13L002M**	Yes	Observation	Solinst 107	771	735 - 760	
	21N02E**18C001M**	Yes	Observation	Solinst 107	914	770 – 780, 830–840,	
	21N02E**26E003M**	Yes	Observation	Solinst 107	660	610 – 620	
	22N01E**28J005M**	Yes	Observation	Solinst 107	948	740 - 800	Removed from the network due to obstruction.
	23N01W**03H002M**	Yes	Observation	Solinst 107	553	510 – 540	
	23N01W**28M002M**	Yes	Observation	Solinst 107	1,031	791–801, 881–891, 951–961, 1011–1021	
	23N01W**31M001M**	Yes	Observation	Solinst 107	1,055	969–979, 1,020-1,030	
Wyandotte Creek	17N03E**13B002M**	Yes	Irrigation	Solinst 107	320	120 – 320	Removed from the network due to inoperable pump.
	17N04E**09N002M**	No	Irrigation	Solinst 107	325	100 – 112	Added in 2023 to supplement network
	18N04E**08M001M**	Yes	Irrigation	Solinst 107	~350	168–204, 208 - 244	
	18N04E**19D001M**	Yes	Observation	Solinst 107	744	700 – 720	
	18N04E**19D002M**				594	430–450, 550–570	
	18N04E**19D003M**				220	120 – 130,	
	18N04E**28L001M**	Yes	Irrigation	Solinst 107	190	n/a	Removed from the network due to landowner request.
	19N03E**16Q001M**	Yes	Residential	Solinst 107	120	100 – 120	Removed from the network due to landowner request.
	19N04**E06E002M**	No	Municipal	Solinst 107	196	110–130, 164–174	Added in 2022 to supplement network
	CWS-02	Yes	Municipal	Solinst 107	340	60 – 190, 300-322	Removed from the network due to water quality issues.

** Extensometer sites that measure inelastic land subsidence.*

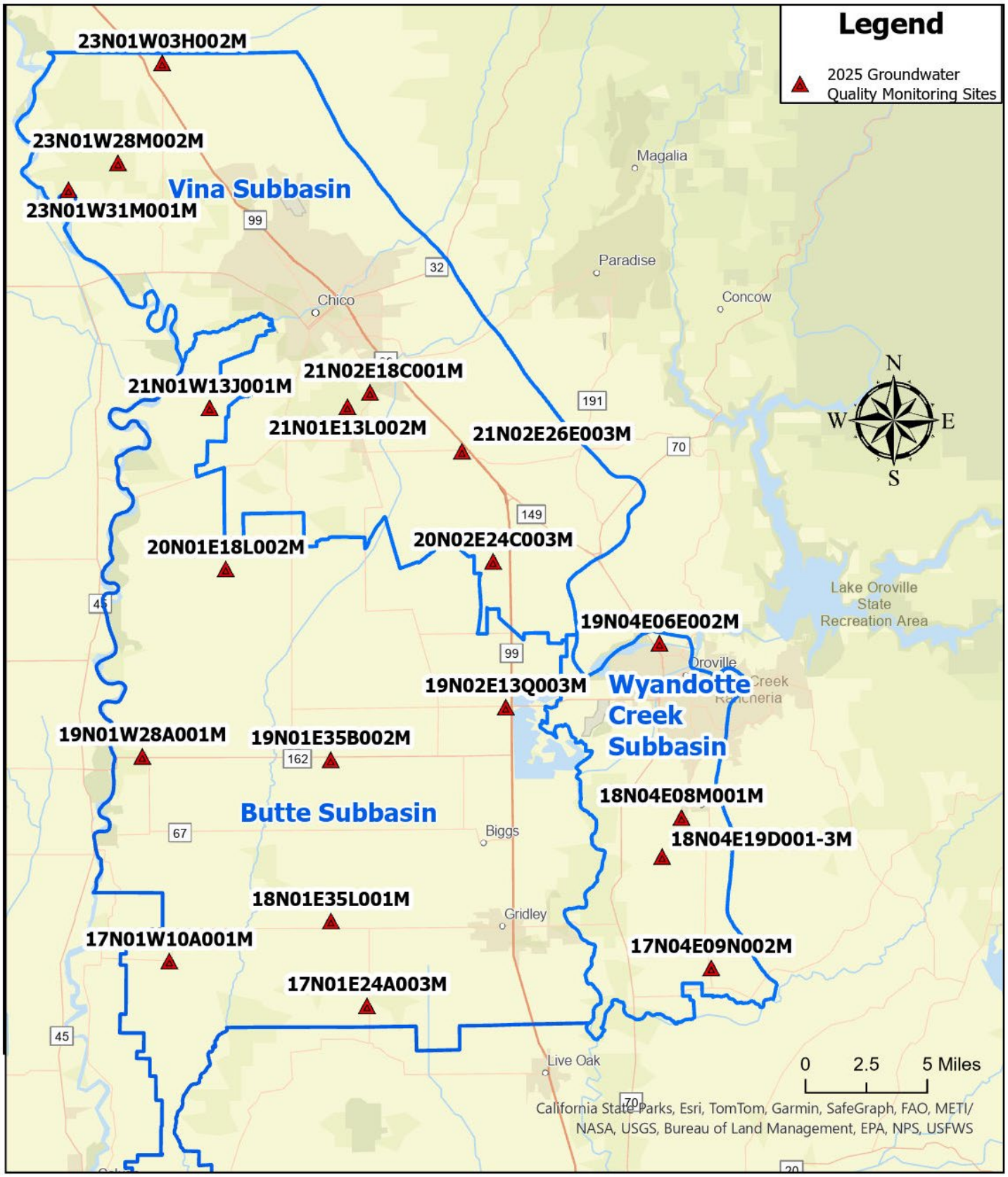

Legend
2025 Groundwater Quality Monitoring Sites
23N01W03H002M
23N01W28M002M
23N01W31M001M
Vina Subbasin
21N01W13J001M
21N02E18C001M
21N01E13L002M
21N02E26E003M
20N01E18L002M
20N02E24C003M
19N04E06E002M
19N02E13Q003M
Wyandotte Creek Subbasin
19N01W28A001M
19N01E35B002M
Butte Subbasin
18N04E08M001M
18N04E19D001-3M
18N01E35L001M
17N01W10A001M
17N04E09N002M
17N01E24A003M
Magalia
Paradise
Concow
Chico
Oroville
Lake Oroville State Recreation Area
Biggs
Gridley
Live Oak
N
S
E
W
0 2.5 5 Miles
California State Parks, Esri, TomTom, Garmin, SafeGraph, FAO, METI/ NASA, USGS, Bureau of Land Management, EPA, NPS, USFWS

Figure 1. Groundwater Quality Trend Monitoring well locations in the Vina, Butte and Wyandotte Creek Subbasins in 2025

Table 2. 2022 GSP Measurable Objectives, Minimum Thresholds for Conductivity [microsiemens (µs) / centimeter (cm)] and definition of Undesirable Results in each Subbasin

Subbasin	Measurable Objective	Minimum Thresholds	Undesirable Result
Butte	700 µS/cm	The greater of 900 µS/cm or the measured historical high	25% of RMS wells exceed MTs for 24 consecutive months
Vina	900 µS/cm	1,600 µS/cm	2 RMS wells exceed their MT for two consecutive non-dry years
Wyandotte Creek	900 µS/cm	1,600 µS/cm	2 RMS wells exceed their MT for two consecutive non-dry years

Results

In 2025, the third non-dry water year type in a row, the majority of all wells monitored within each subbasin had groundwater quality conditions, measured as SC, that fell within the acceptable range of groundwater quality values set forth by the GSPs as summarized in Table 2. No major shifts occurred in the conductivity measurements in the sampled wells. Details of the monitoring results for each Subbasin are described below.

Butte Subbasin

In the Butte Subbasin the majority of RMS wells measured in 2025 had conductivity values that were lower than the MO of 700 µS/cm and therefore lower than each well's MT. The MTs vary per well since they are based on historic data, if available. **Figure 2.** displays the overall results for the 2025 water quality wells within the Butte Subbasin. Graphs of historic data for individual wells for previous years can be found in **Appendix A.** Results from one RMS well, 17N01W10A001M, a deep multi-completion well located in Colusa County, has had conductivity measurements slightly higher than the MT in 2023, 2024 and again in 2025. Historic (DWR, 2020, DWR 2023a) and recent data for this well are shown in **Figure 3.** This well is near the Sutter Buttes mountain range in an area known for high concentrations of conductivity (Davids, 2021). Future plans of the GSAs may include the formation of the Sutter Buttes Water Quality Interbasin Working Group as described in more detail in section 6.1.2.2 of the Butte Subbasin GSP (Davids, 2021) to focus on collaborative discussions, consensus building and planning to address groundwater quality matters associated with the unique geology of the Sutter Buttes area.

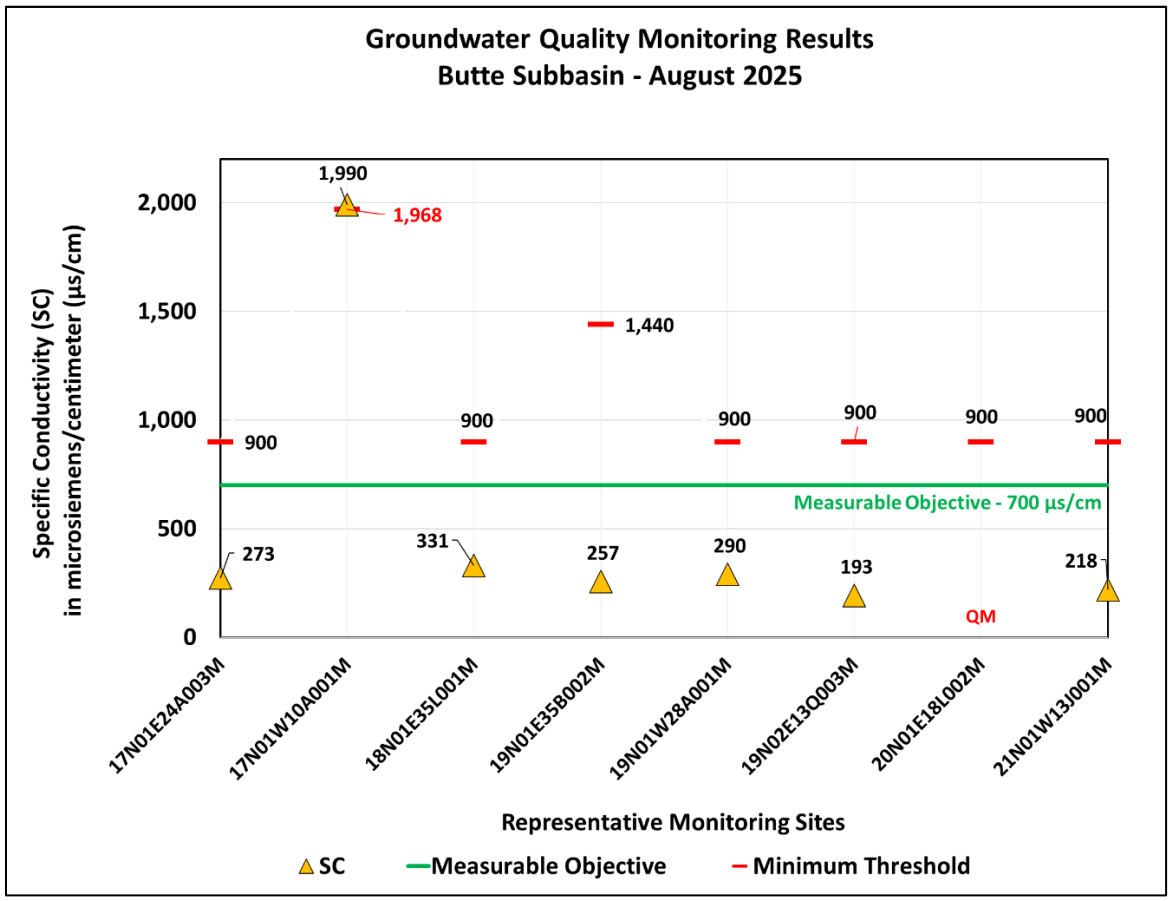


Figure 2. Groundwater quality monitoring results in the Butte Subbasin for the 2025 water year

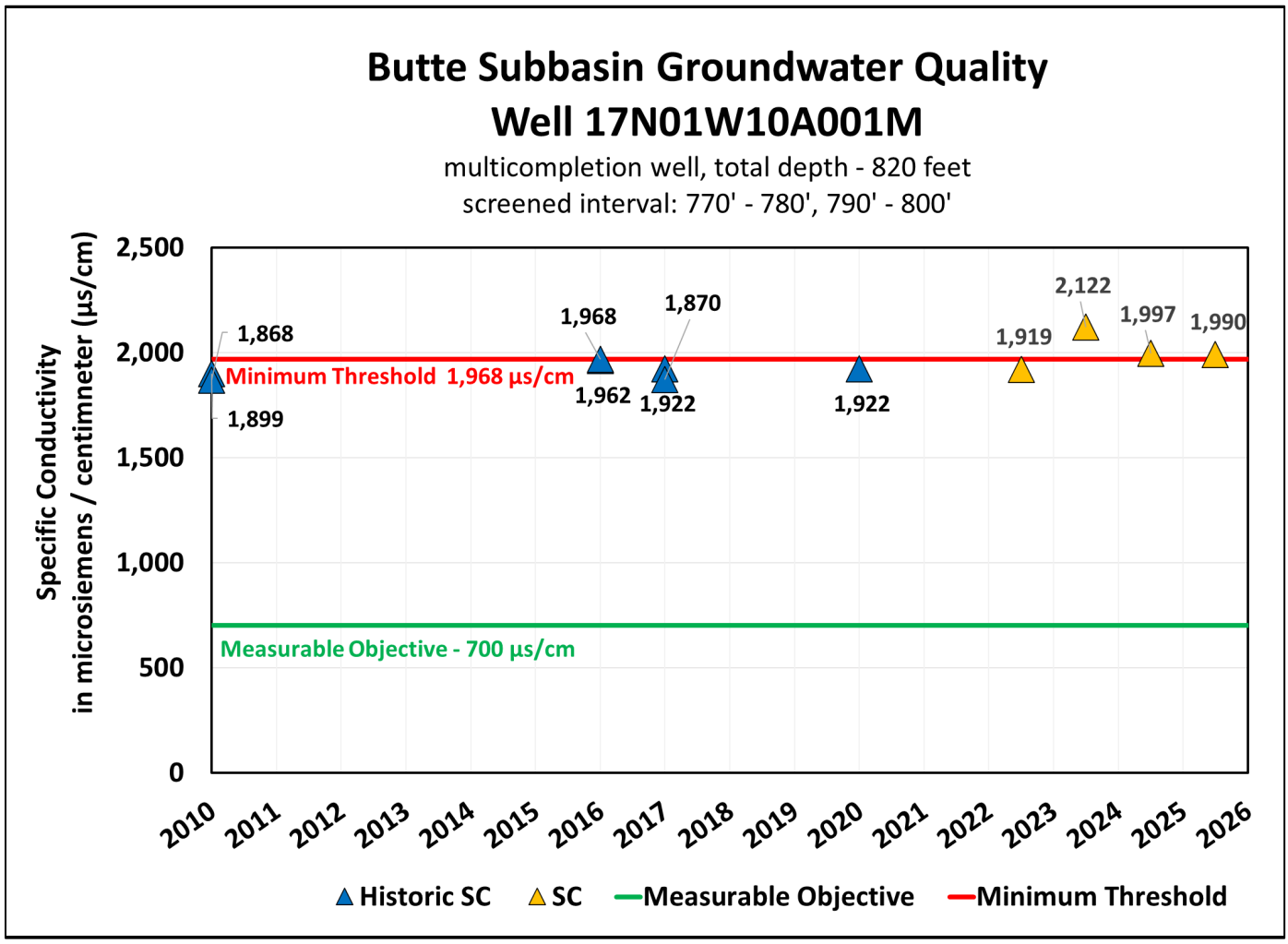


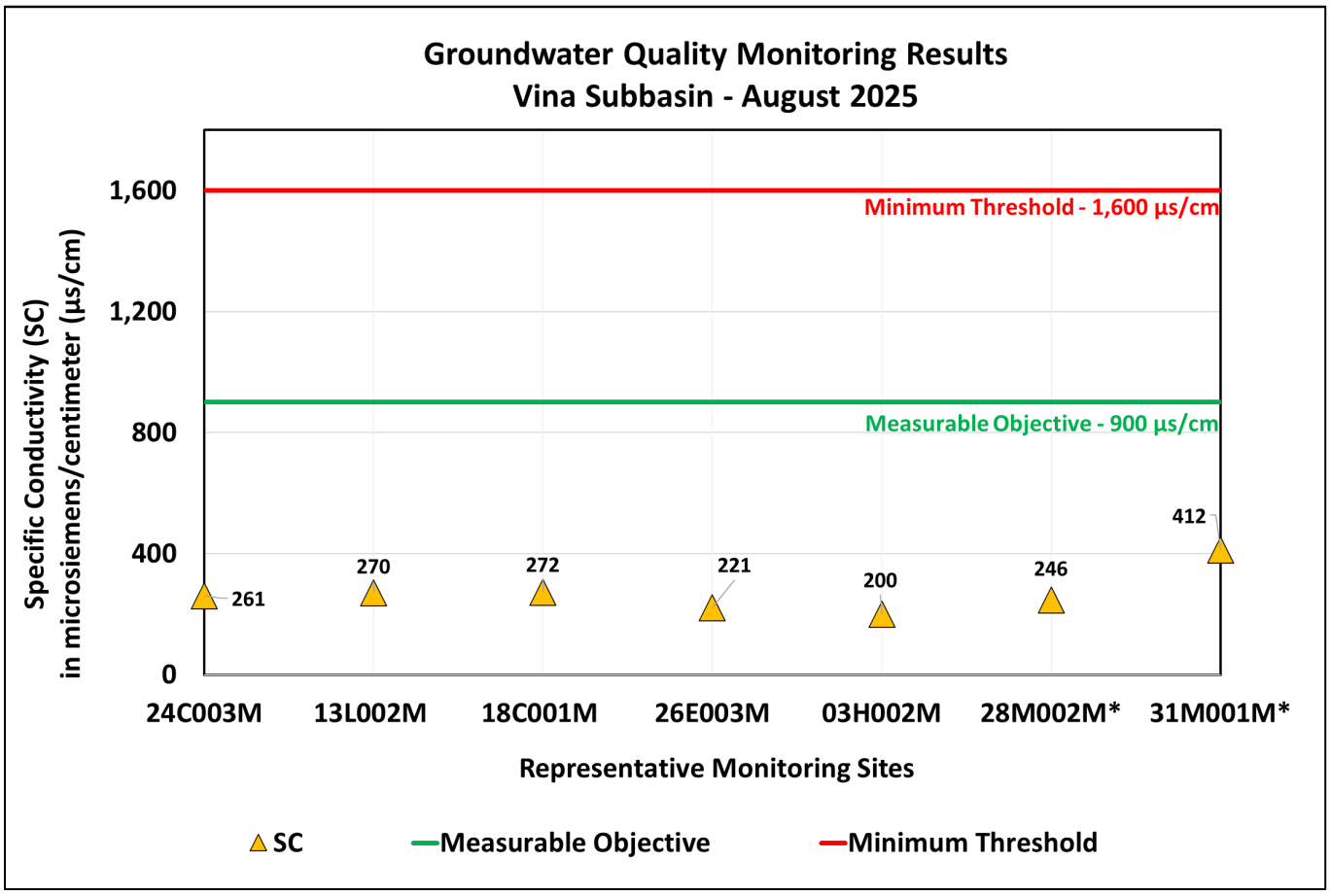
Figure 3. Current and historic groundwater quality data for well 17N01W10A001M in the Butte Subbasin.

Vina Subbasin

In the Vina Subbasin all RMS wells measured in 2025 had conductivity values that were lower than the MO of 900 µS/cm and therefore lower than the MT of 1,600 µS/cm as shown in **Figure 4.** Two wells, 28M002M, and 31M001M the length of the tape the SC probe is attached to was too short to reach the last screened intervals of the wells. The graphs reflect an average of the SC measurements recorded at the other screened intervals.

Wyandotte Creek Subbasin

In the Wyandotte Creek Subbasin the majority of RMS wells measured in 2025 had conductivity values that were lower than the MO of 900 µS/cm and therefore lower than the MT of 1,600 µS/cm as shown in **Figures 5. and 6.**



* *Indicates a measurement was not taken within a screened interval due to limits of the equipment. Data taken outside of the screened interval is not included in the average.*

Figure 4. Groundwater quality monitoring results in the Vina Subbasin for the 2025 water year

In the multi-completion well drilled in 2021 by DWR through the Technical Support Services program to measure three distinct zones of the aquifer in one location, there were two zones, intermediate (19D002M) and deep (19D001M), which exhibited high conductivity levels in 2025, exceeding the MT depicted in **Figure 6**. This multicompletion well was constructed after the GSA set the sustainable management criteria for water quality. Both zones of this well had high levels of conductivity, greater than the MT when initially developed, prior to the adoption of the GSP and again when the wells were re-tested months after their initial development. ss shown in **Figure 6**. as 'Other Data'. Anecdotally, this general area of the subbasin is known to have geologic formations bearing groundwater with high concentrations of salinity and natural gas. Better characterization of naturally occurring salinity is needed to help improve appropriate monitoring and management of groundwater with respect to water quality in this Subbasin. The Butte County Technical Advisory Committee may consider making recommendations to the GSA regarding changes to the monitoring network of wells and collection of additional long-term data in the future. DWR has recently collected groundwater quality measurements at 19D002M (intermediate zone of the multicompletion well in the Wyandotte Creek Subbasin) as depicted in **Figure 6.** DWR has also indicated that there are plans to deploy continuous data loggers to record hourly conductivity data in the wells in the future which will highlight any changes during the peak irrigation season as compared to baseline conditions throughout the water year.

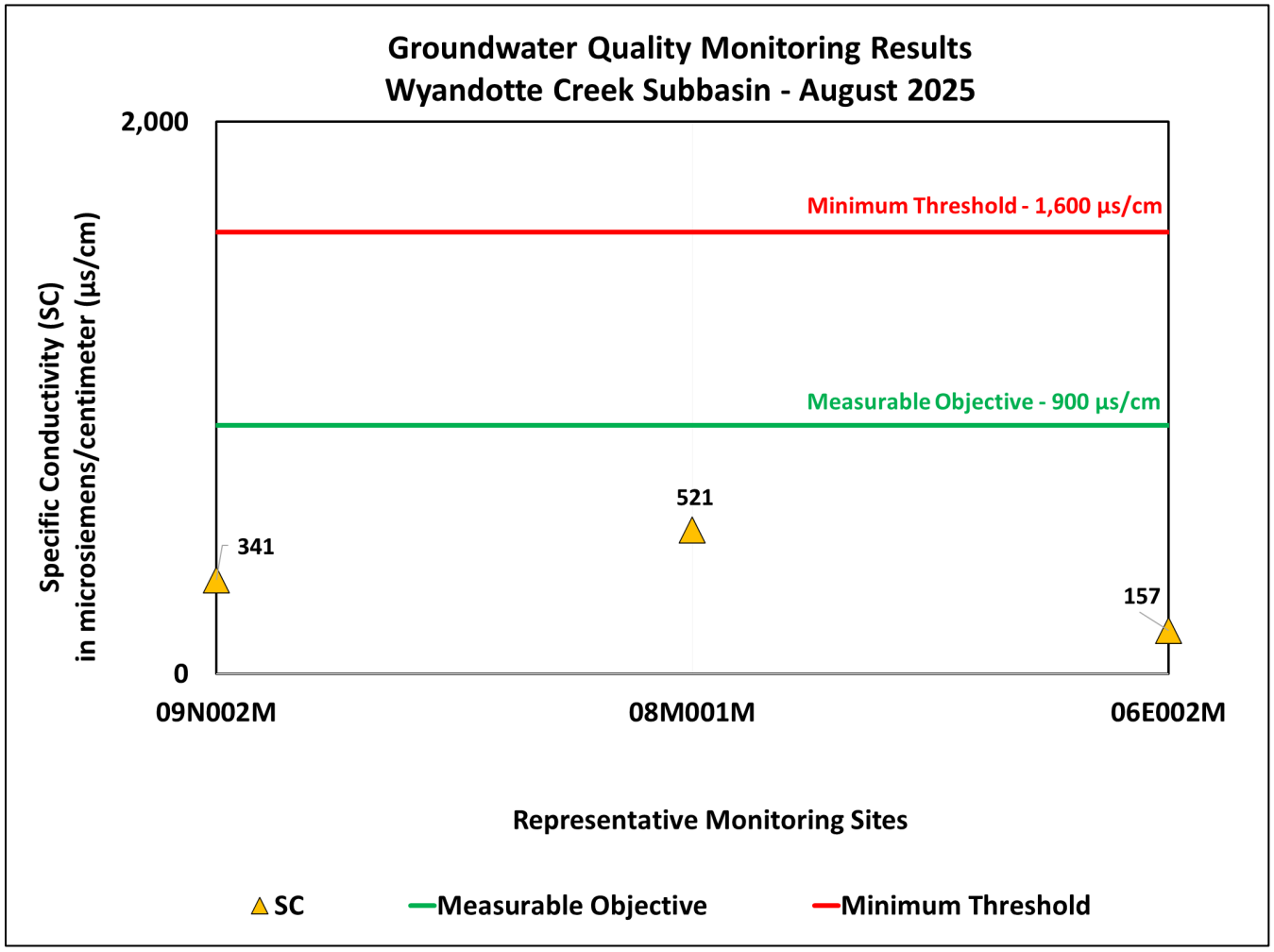


Figure 5. Groundwater quality monitoring results in the Wyandotte Creek Subbasin excluding 19D001-3M for the 2025 water year

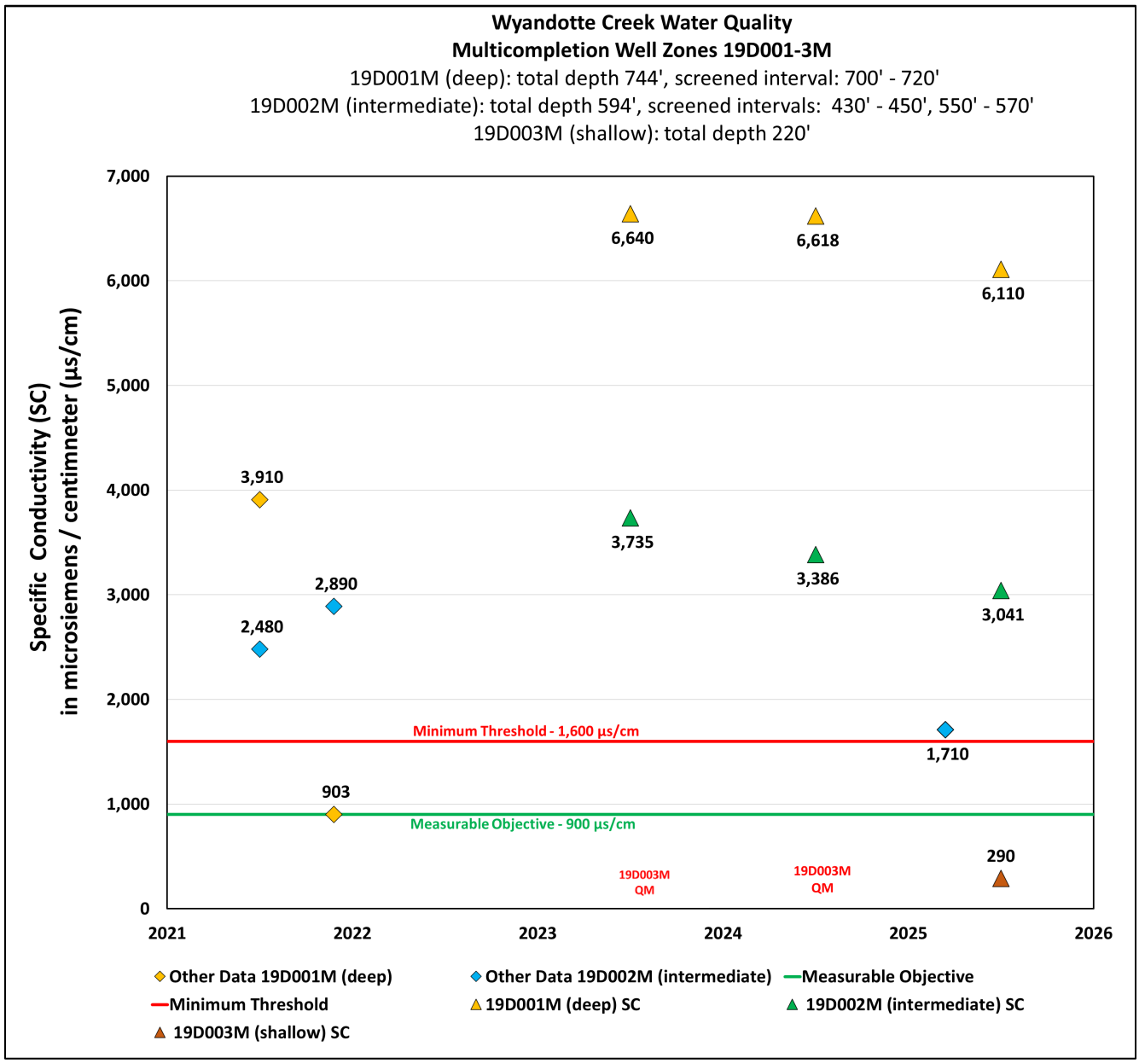


Figure 6. Current and historic groundwater quality data for zones in RMS well 19D001-3M in the Wyandotte Creek Subbasin.

Discussion

Groundwater quality monitoring serves to establish baseline levels for salinity (via conductivity) throughout the Subbasins so that any future changes may be identified and further investigation and or additional monitoring can subsequently be developed. **Table 3.** below summarizes the status of monitoring results in relation to exceedances of MTs and whether or not Undesirable Results occurred based on the SMC established for each subbasin. While there was one RMS well in exceedance of a MT for conductivity within the Butte Subbasin over the past 24 months, this does not indicate the presence of Undesirable Results in the Subbasin for degraded water quality, as only one well exceeded the MT over 24 months, not two, as described in the GSP. Importantly, the observed conductivity in the well is in the range of previously observed historical levels and does not indicate a changed condition or upward trend. The WRC may consider adding another

Table 3. Conductivity monitoring results and the presence of Undesirable Results since 2022 in relation to each well's Minimum Thresholds in the Butte, Vina and Wyandotte Creek Subbasins.							
Subbasin	**State Well Number**	**2022 Dry Year**	**2023 Non-Dry Year**	**2024 Non-Dry Year**	**2025 Non-Dry Year**	**Undesirable Result Identification**	**Indication of Undesirable Results?**
		Was measurement above the Minimum Threshold?					
Butte	**17N01E24A003M**	No	No	No	No	When 25% of RMS wells (2 of 8) exceed their MT for 24 consecutive months	No
	17N01W10A001M	No	**Yes**	**Yes**	**Yes**		
	18N01E35L001M	No	No	QM	No		
	19N01E35B002M	No	No	No	No		
	19N01W28A001M	n/a	No	No	No		
	19N02E13Q003M	No	No	No	No		
	20N01E18L001M	Removed from the network in 2022					
	21N01W13J001M	n/a	No	No	No		
Vina	20N02E**24C003M**	No	No	QM	No	When 2 RMS wells exceed their MT for two consecutive non-dry years.	No
	21N01E**13L002M**	No	No	No	No		
	21N02E**18C001M**	No	No	No	No		
	21N02E**26E003M**	No	No	No	No		
	22N01E**28J005M**	Removed from the network in 2022					
	23N01W**03H002M**	No	No	No	No		
	23N01W**28M002M**	No	No	No	No		
	23N01W**31M001M**	No	No	No	No		
Wyandotte Creek	**CWS-02**	No	Removed from the network in 2022				
	17N03E**13B002M**	Removed from the network in 2022					
	18N04E**08M001M**	QM	QM	No	No	When 2 RMS wells exceed their MT for two consecutive non-dry years.	No
	18N04E**19D001-3M**	QM	QM	QM	**Yes**		
	18N04E**28L001M**	Removed from the network in 2022					
	19N03E**16Q001M**	No	Removed from the network in 2023				
Note: The portion of the State Well number in bold is the RMS well identification number. QM indicates a questionable measurement and n/a indicates the well was not measured. Multicompletion well 18N04E19D001-3M is reported as an average of all three zones							

well to the monitoring network given the obstructions observed in 20N01E18L001-2M over the past few years.

DWR has indicated there are plans to install continuous data loggers in all four multicompletion wells at the 17N01W10A001-4M well and to conduct monthly water quality monitoring at the shallow-intermediate

zoned portion of multicompletion well 17N01E24A004M. WRC may include any data available from this effort in future reports.

There were no RMS wells in exceedance of any MTs in the Vina Subbasin in 2025 and therefore no indication of Undesirable Results as defined in the GSP. The WRC may consider adding another well to the monitoring network given the obstructions observed in 28J005M over the past few years. DWR has indicated there are plans to conduct monthly water quality monitoring at the shallow-intermediate zoned portion of multicompletion well 28M004M. WRC will include any data available from this effort in future reports.

There were two zones within the multicompletion well 18N04E19D001-3M in the Wyandotte Creek Subbasin in exceedance of the MTs in 2025; however, this does not indicate the presence of Undesirable Results in the subbasin for degraded water quality, as only one well exceeded the Minimum Threshold for one year, not two, as described in the SMC. These completions monitor the deep and intermediate zones in this multi-completion well drilled in 2021 by DWR through their Technical Support Services program. When the well was first developed, the baseline conductivity was 3,910 µs/cm and 2,480 µs/cm respectively, roughly 1.5 and 2.5 times higher than the MT for these wells as shown in **Figure 6**. Approximately four months after initial development, DWR conducted additional water quality sampling after the well had time to settle. Results indicated a drop in conductivity to 903 µs/cm for 19D001M (deep zone) but an increase in 19D002M (intermediate zone) to 2,890 µs/cm. Baseline conditions at these wells are not well understood, but clearly exhibit naturally occurring high levels of conductivity. Revisiting the sustainable management criteria of this well seems appropriate. Additional characterization through additional data collection of naturally occurring salinity is needed to help improve appropriate monitoring and management of groundwater with respect to groundwater quality in this Subbasin. The WRC may consider adding other wells to the monitoring network given the low number of wells currently in the monitoring network. DWR has indicated there are plans to install continuous data loggers in all three multicompletion wells at the 19D001-3M well. WRC may include any data available from this effort in future reports.

Additional monitoring will continue to be conducted by DWR and other agencies to track constituents not managed under the current GSPs, or WRC's Groundwater Quality Trend Monitoring Program, including a variety of minerals, metals, pesticides and herbicides. Data from ongoing monitoring by various state and federal agencies will be available to the GSAs to augment local datasets and their understanding of groundwater quality and can be found on the State Board's Groundwater Ambient Monitoring and Assessment (GAMA) program at https://www.waterboards.ca.gov/gama.

The County will continue to work with the GSAs within the Butte, Vina and Wyandotte Creek Subbasins as available, to recommend modifications to the monitoring networks, to conduct monitoring to support data collection that compliments the GSAs SGMA requirements, and to ensure that conductivity data is shared with the GSAs.

References

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California Department of Water Resources (DWR). 2025. Available at: https://wdl.water.ca.gov/waterdatalibrary/Map.aspx

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Geosyntec Consultants, Inc. 2021a. Vina Groundwater Sustainability Plan. Available at: https://sgma.water.ca.gov/portal/gsp/preview/86.

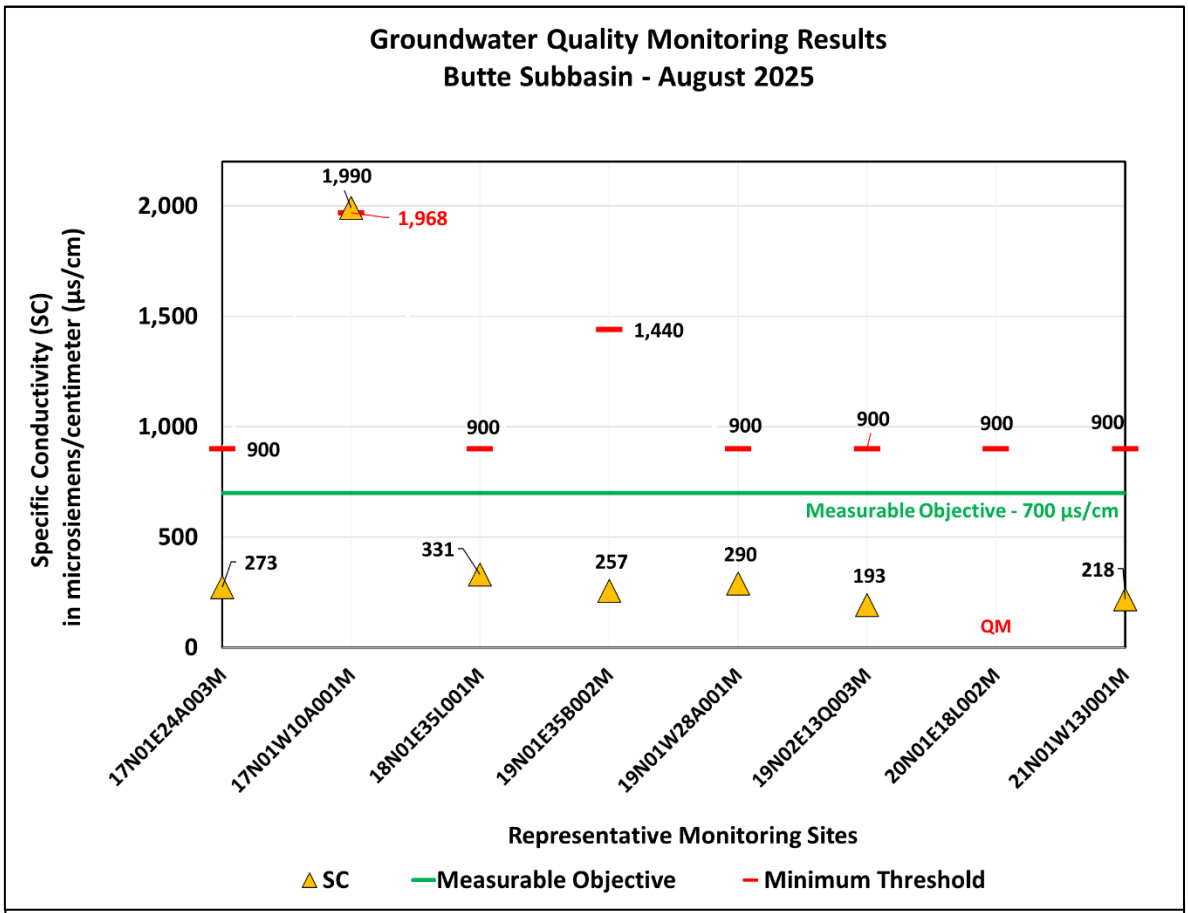
Geosyntec Consultants, Inc. 2021b. Wyandotte Creek Groundwater Sustainability Plan. Available at: https://sgma.water.ca.gov/portal/gsp/preview/99.

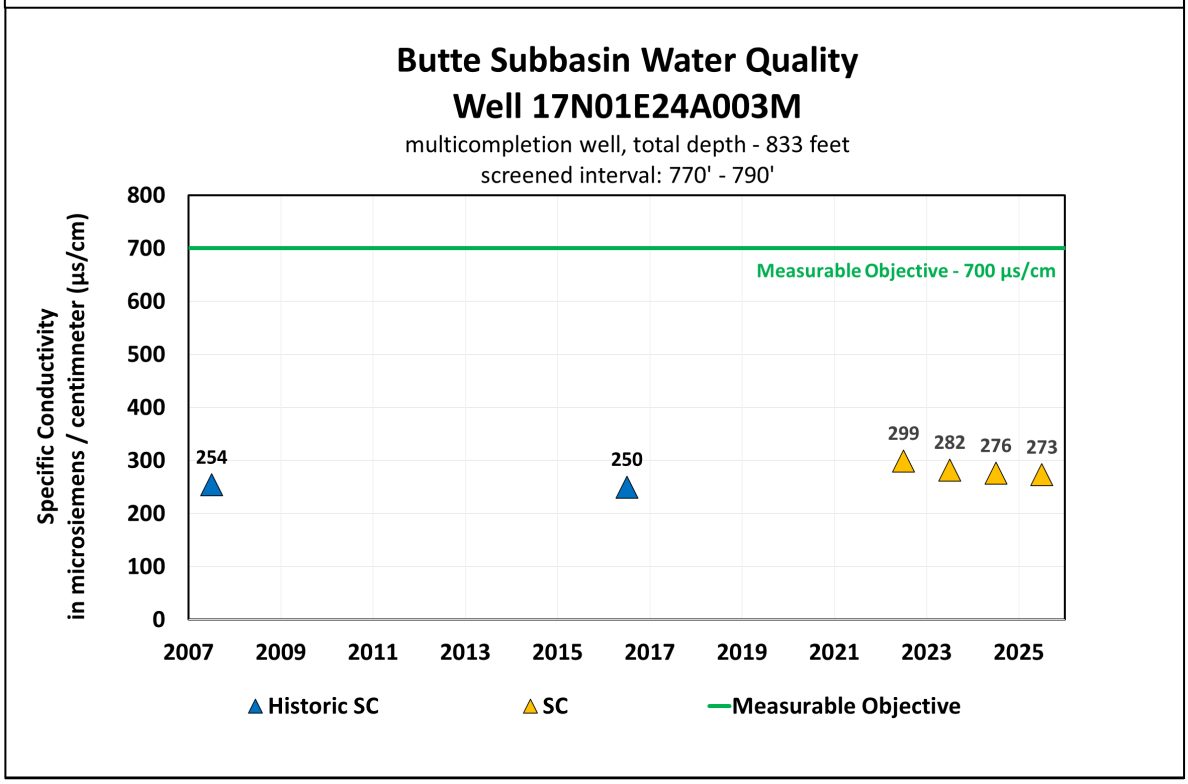
Appendix A

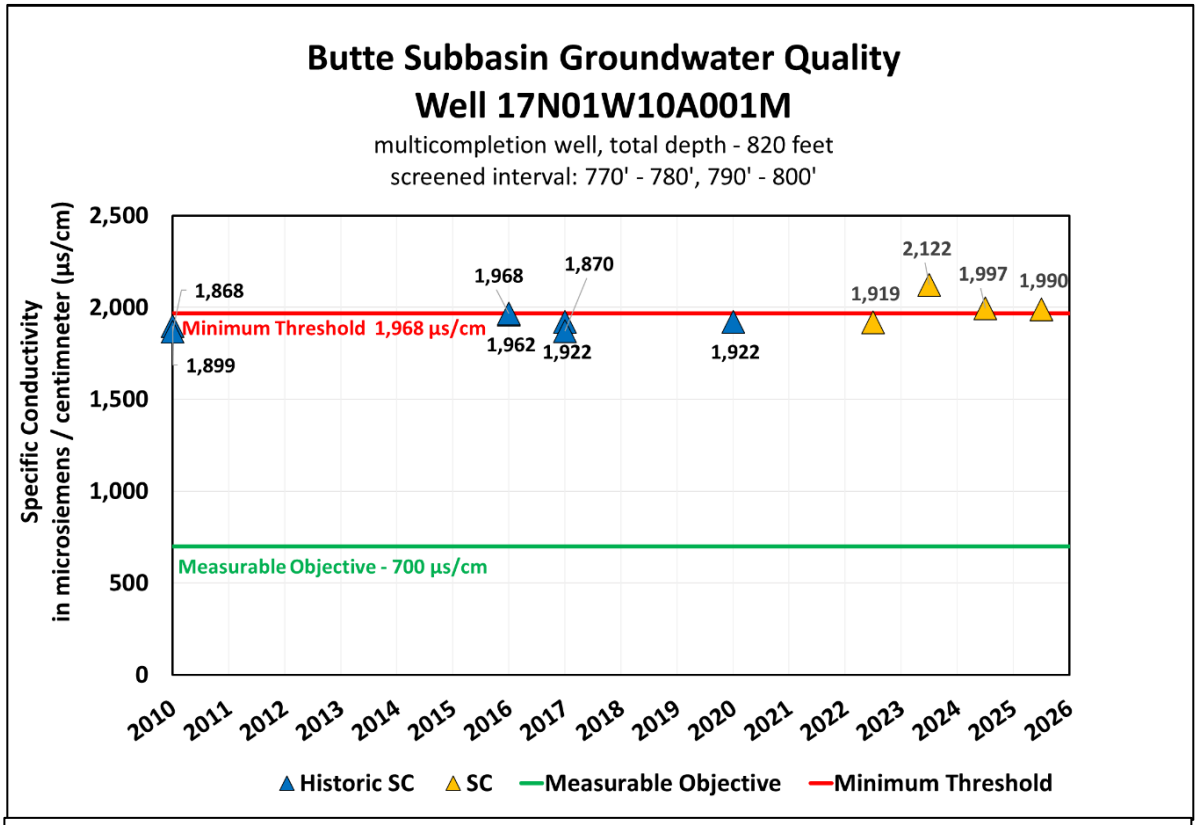
2025 Butte, Vina and Wyandotte Creek Subbasin Groundwater Quality Monitoring Results

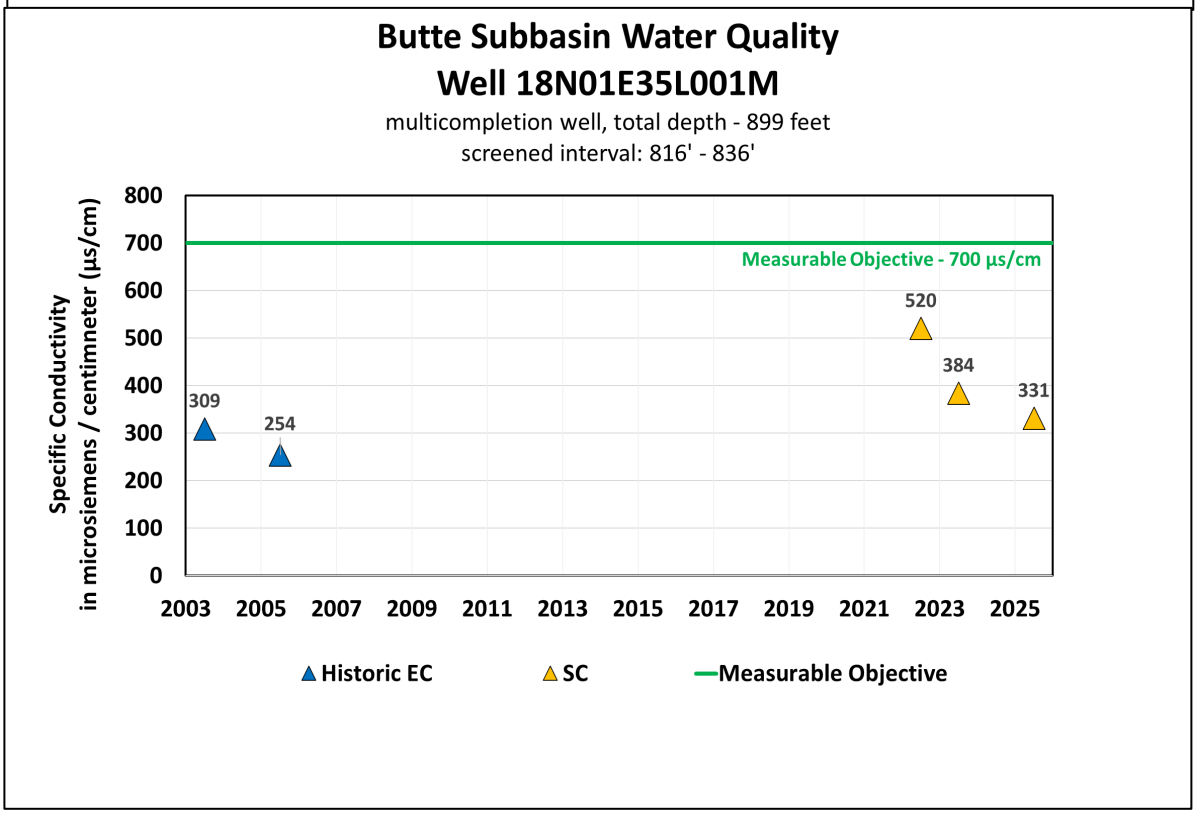
Appendix A. Historical and current conductivity data for individual wells in the Butte, Vina and Wyandotte Creek Subbasin's 2025 water quality monitoring network.

Butte Subbasin



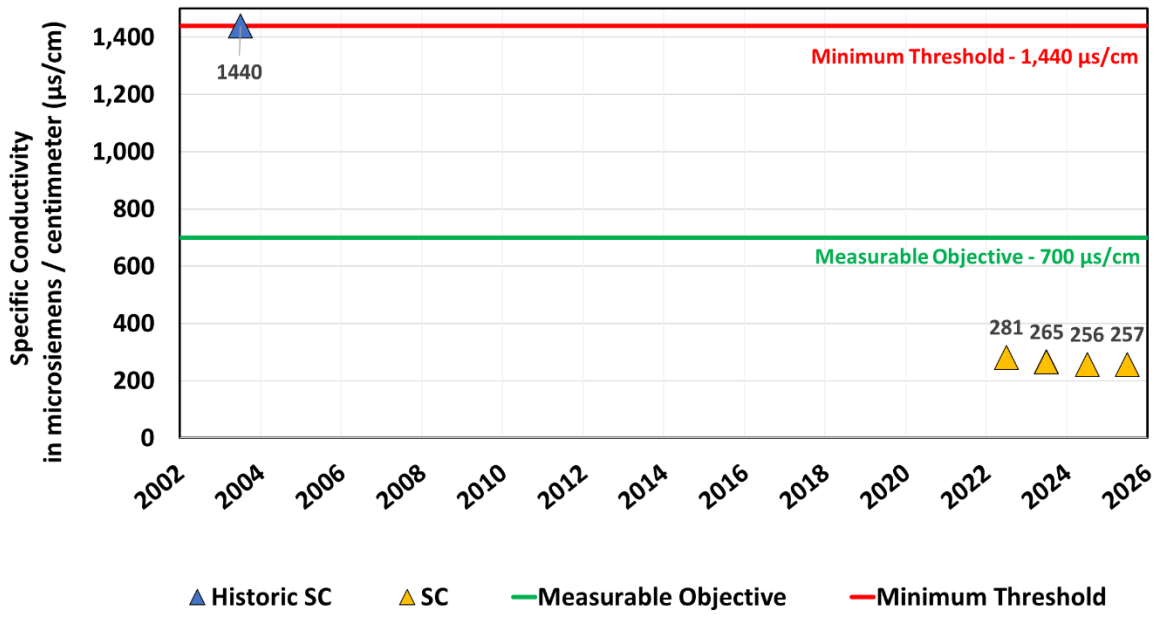



Butte Subbasin Groundwater Quality
Well 17N01W10A001M
multicompletion well, total depth - 820 feet
screened interval: 770' - 780', 790' - 800'
Specific Conductivity
in microsiemens / centimeter (µs/cm)
2,500
2,000
1,500
1,000
500
0
1,868
1,899
1,968
1,962
1,870
1,922
1,922
1,919
2,122
1,997
1,990
Minimum Threshold 1,968 µs/cm
Measurable Objective - 700 µs/cm
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Historic SC
SC
Measurable Objective
Minimum Threshold


Butte Subbasin Water Quality
Well 18N01E35L001M
multicompletion well, total depth - 899 feet
screened interval: 816' - 836'
Specific Conductivity
in microsiemens / centimeter (µs/cm)
800
700
600
500
400
300
200
100
0
Measurable Objective - 700 µs/cm
309
254
520
384
331
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Historic EC
SC
Measurable Objective

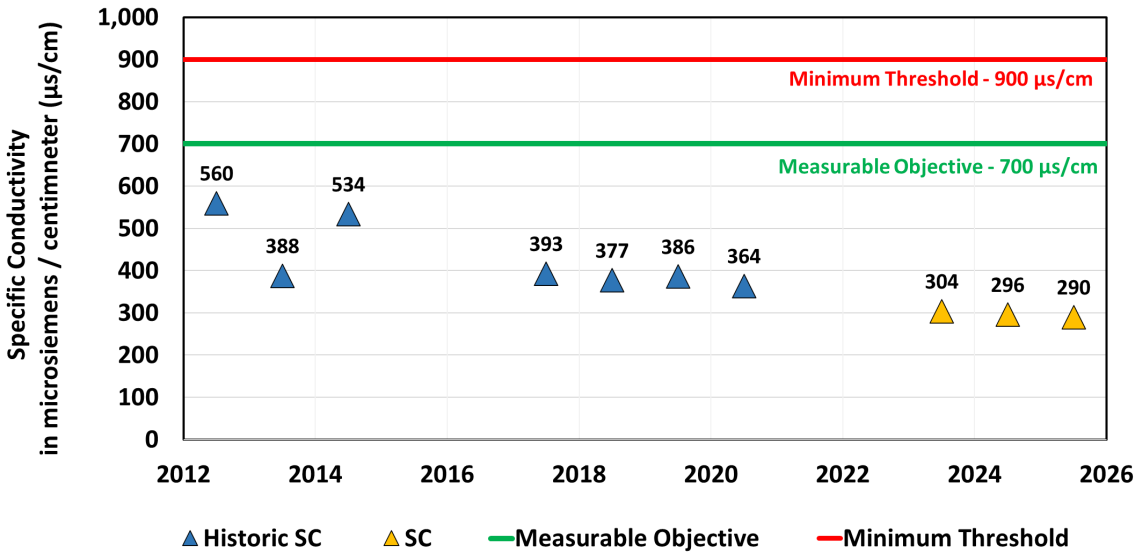
Butte Subbasin Groundwater Quality
Well 19N01E35B002M

multicompletion well, total depth - 980 feet
screened interval: 930' - 950'



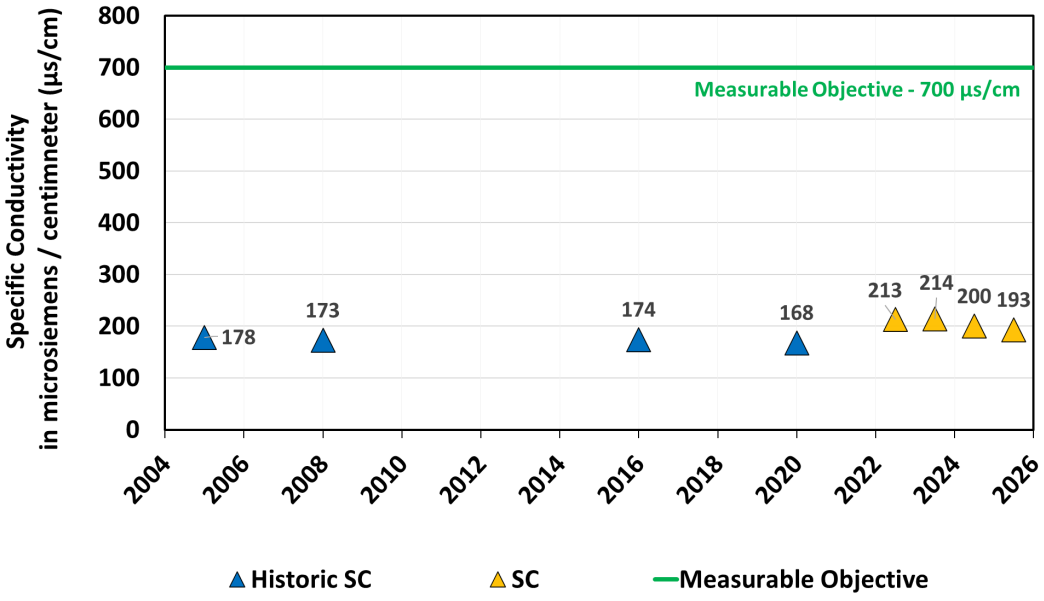
Butte Subbasin Groundwater Quality
Well 19N01W28A001M

irrigation well, total depth - 140 feet
screened interval: 120' - 140'



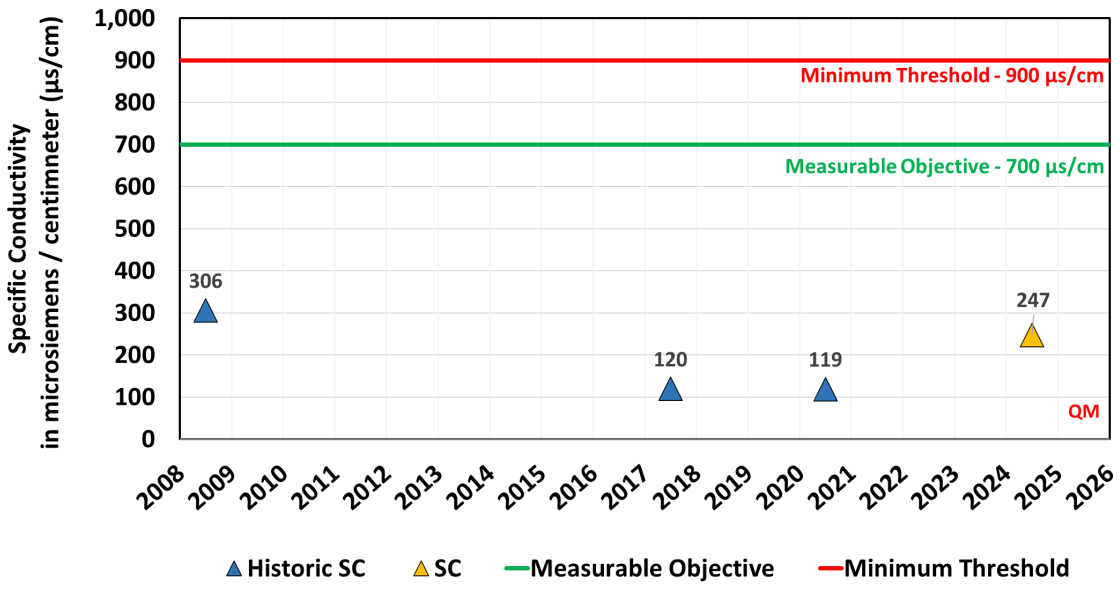
Butte Subbasin Water Quality
Well 19N02E13Q003M

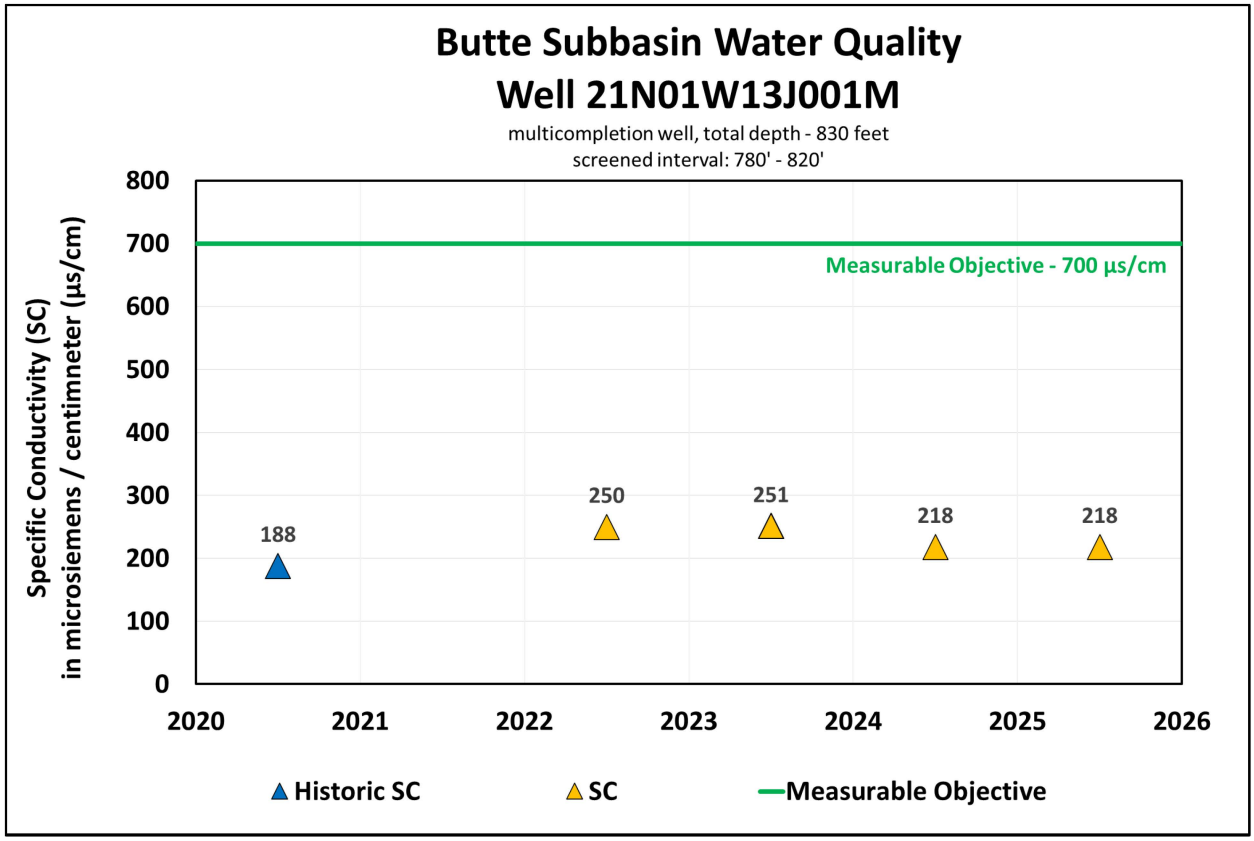
multicompletion well, total depth - 690 feet
screened interval: 670' - 680'



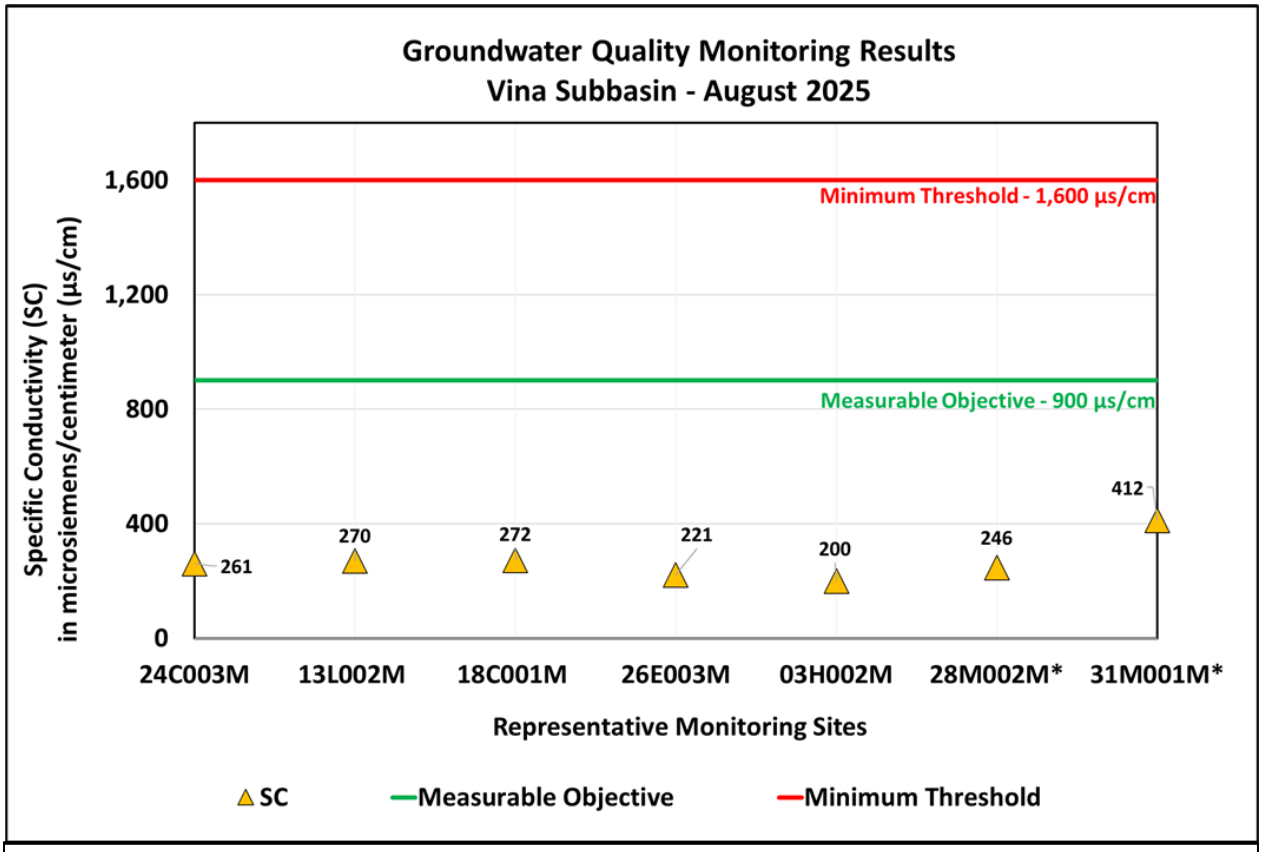
Butte Subbasin Groundwater Quality
Well 20N01E18L002M

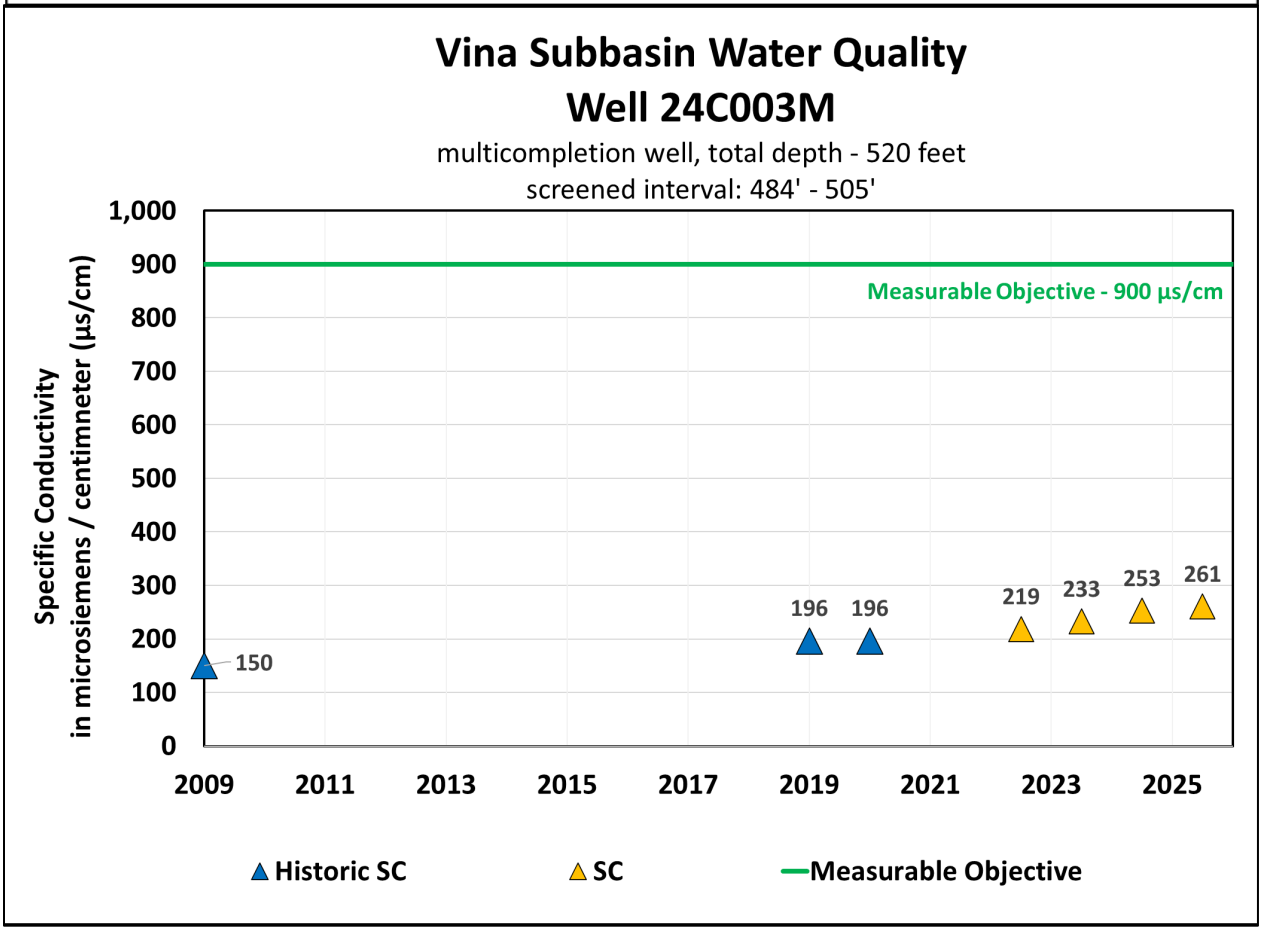
multicompletion well, total depth - 581 feet
screened interval: 510' - 530', 550' - 560'

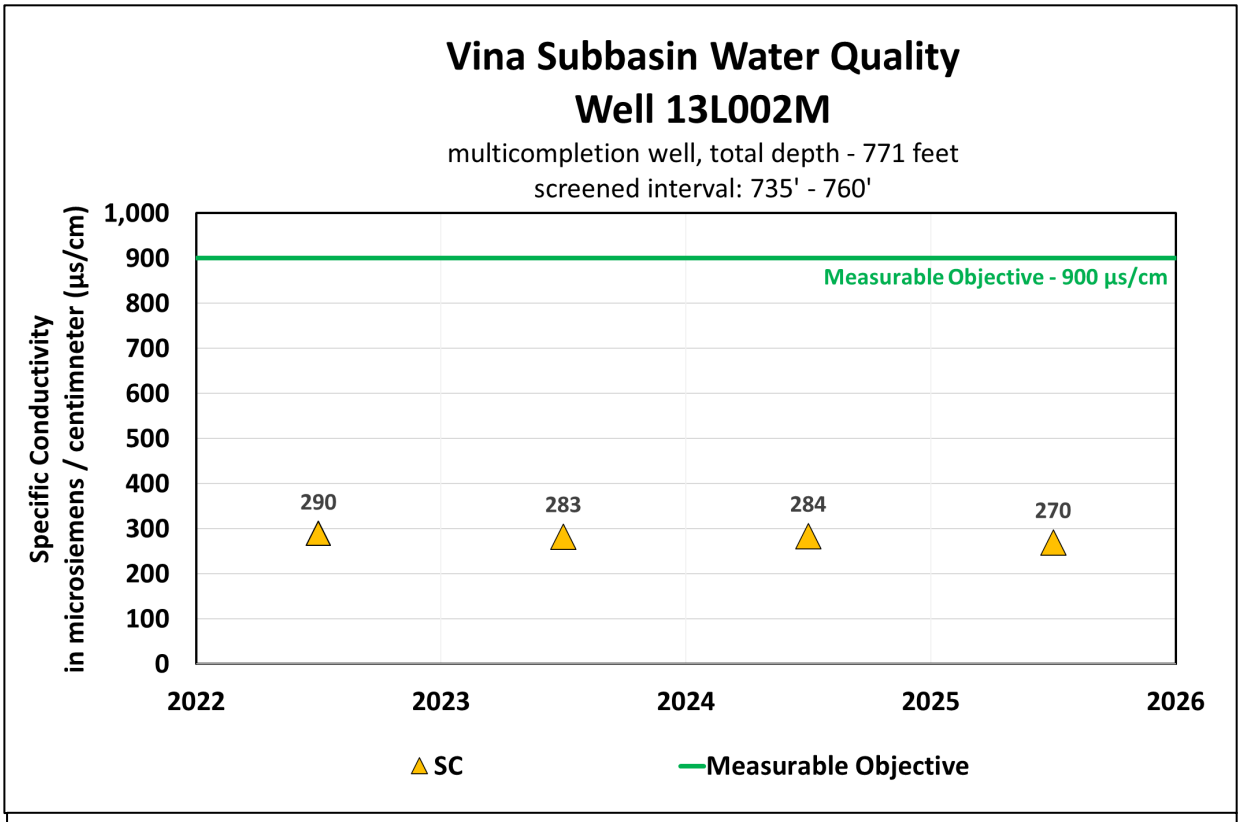


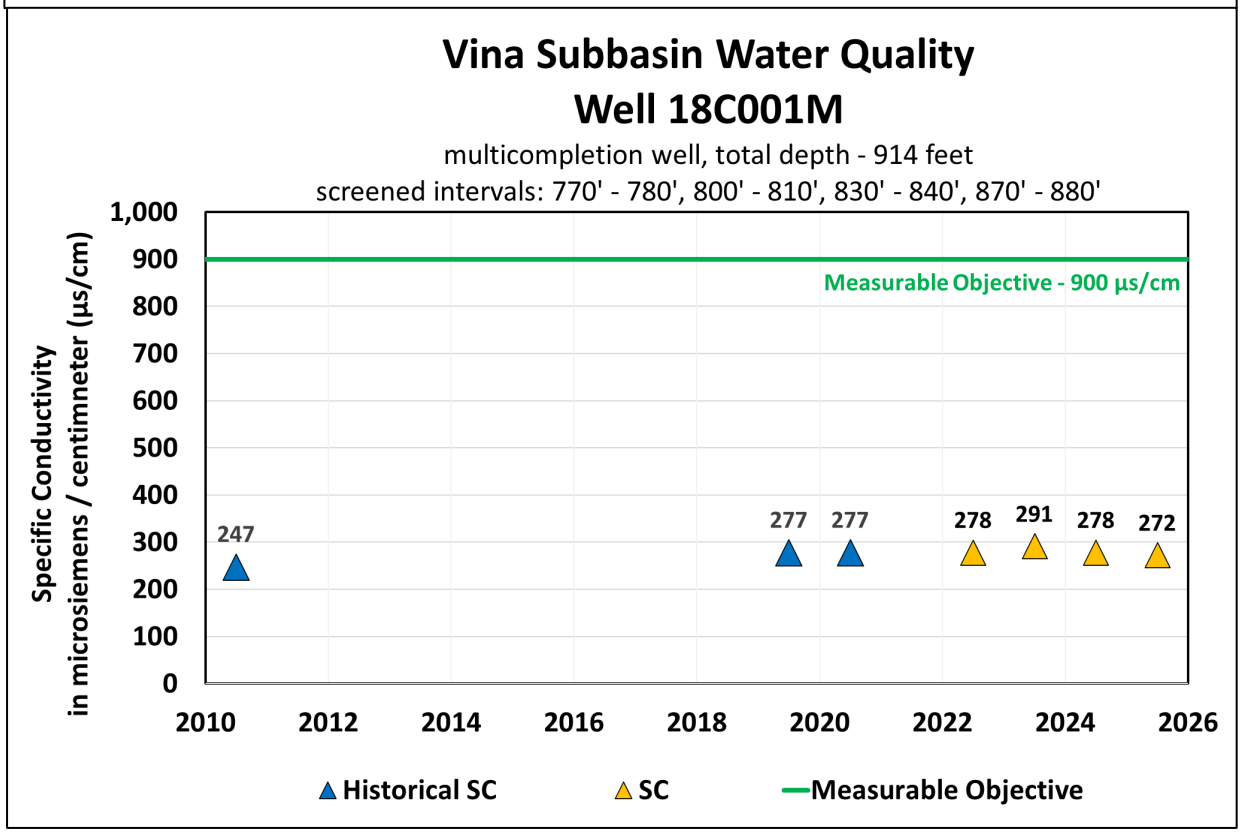

Butte Subbasin Water Quality
Well 21N01W13J001M
multicompletion well, total depth - 830 feet
screened interval: 780' - 820'
Specific Conductivity (SC)
in microsiemens / centimneter (µs/cm)
800
700
600
500
400
300
200
100
0
Measurable Objective - 700 µs/cm
188
250
251
218
218
2020
2021
2022
2023
2024
2025
2026
Historic SC
SC
Measurable Objective

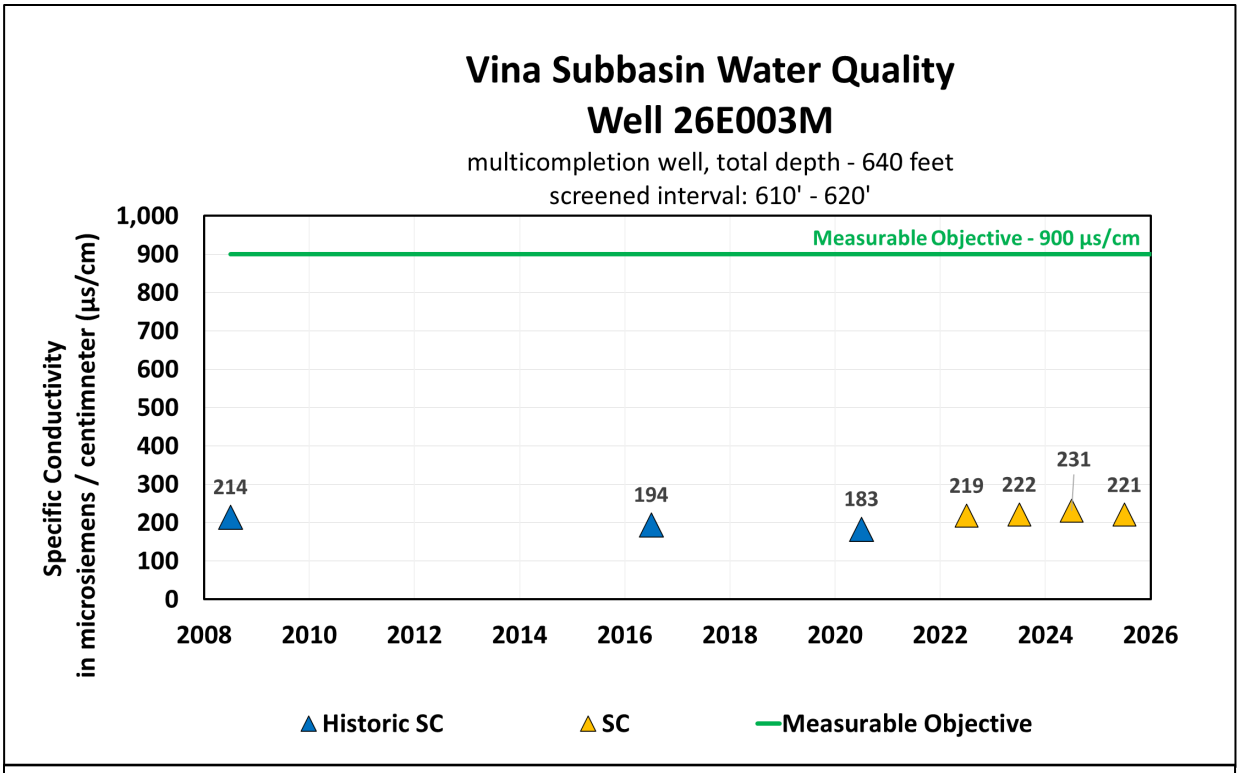
Vina Subbasin

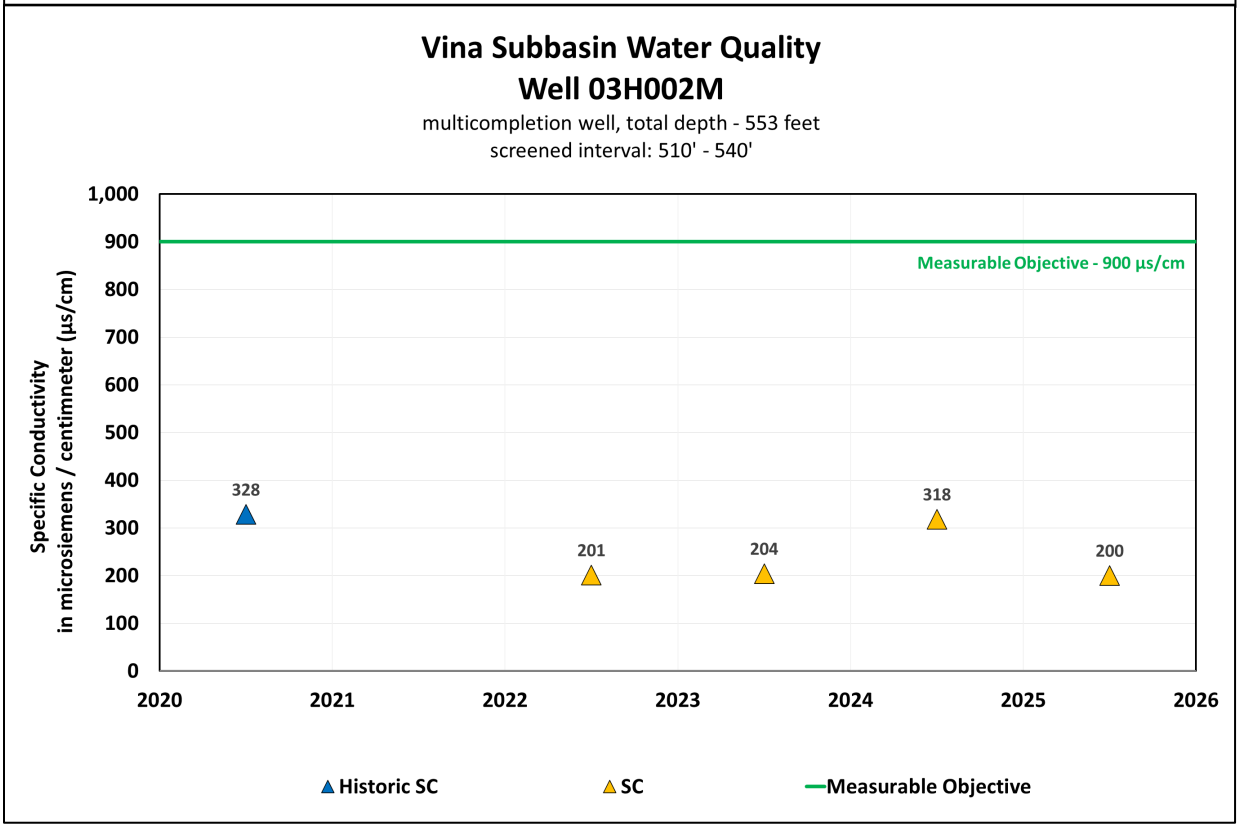





Vina Subbasin Water Quality
Well 13L002M
multicompletion well, total depth - 771 feet
screened interval: 735' - 760'
Specific Conductivity
in microsiemens / centimeter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
290
283
284
270
2022
2023
2024
2025
2026
SC
Measurable Objective

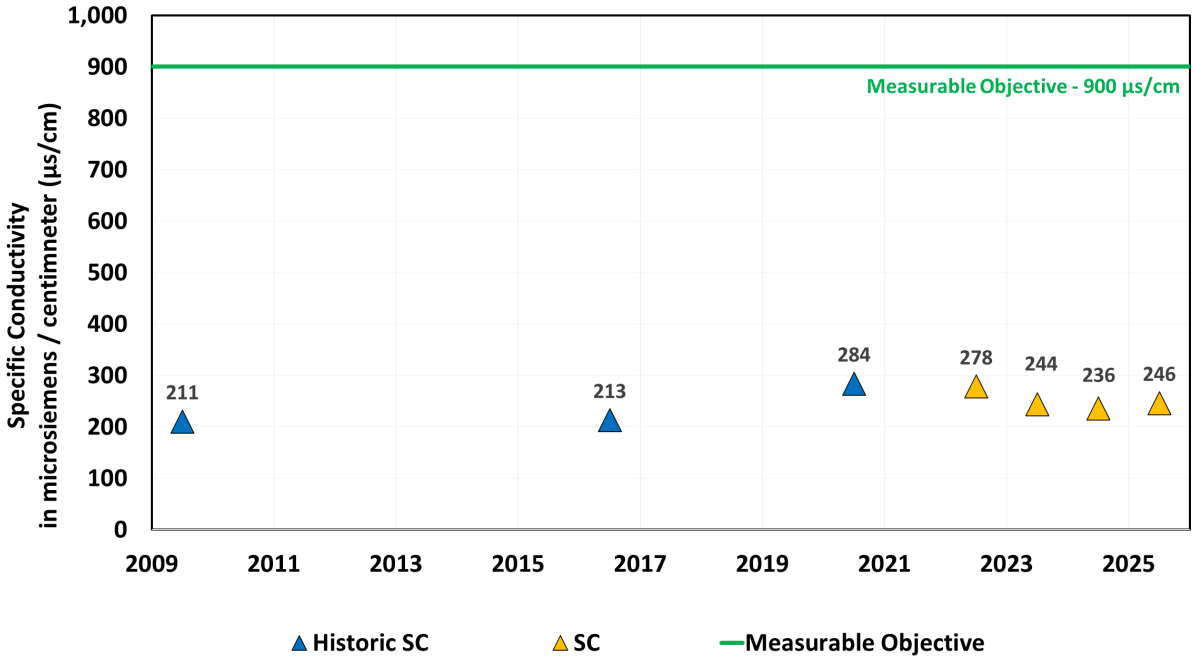

Vina Subbasin Water Quality
Well 18C001M
multicompletion well, total depth - 914 feet
screened intervals: 770' - 780', 800' - 810', 830' - 840', 870' - 880'
Specific Conductivity
in microsiemens / centimeter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
247
277
277
278
291
278
272
2010
2012
2014
2016
2018
2020
2022
2024
2026
Historical SC
SC
Measurable Objective


Vina Subbasin Water Quality
Well 26E003M
multicompletion well, total depth - 640 feet
screened interval: 610' - 620'
Specific Conductivity
in microsiemens / centimeter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
214
194
183
219
222
231
221
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Historic SC
SC
Measurable Objective


Vina Subbasin Water Quality
Well 03H002M
multicompletion well, total depth - 553 feet
screened interval: 510' - 540'
Specific Conductivity
in microsiemens / centimeter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
328
201
204
318
200
2020
2021
2022
2023
2024
2025
2026
Historic SC
SC
Measurable Objective

Vina Subbasin Water Quality
Well 28M002M

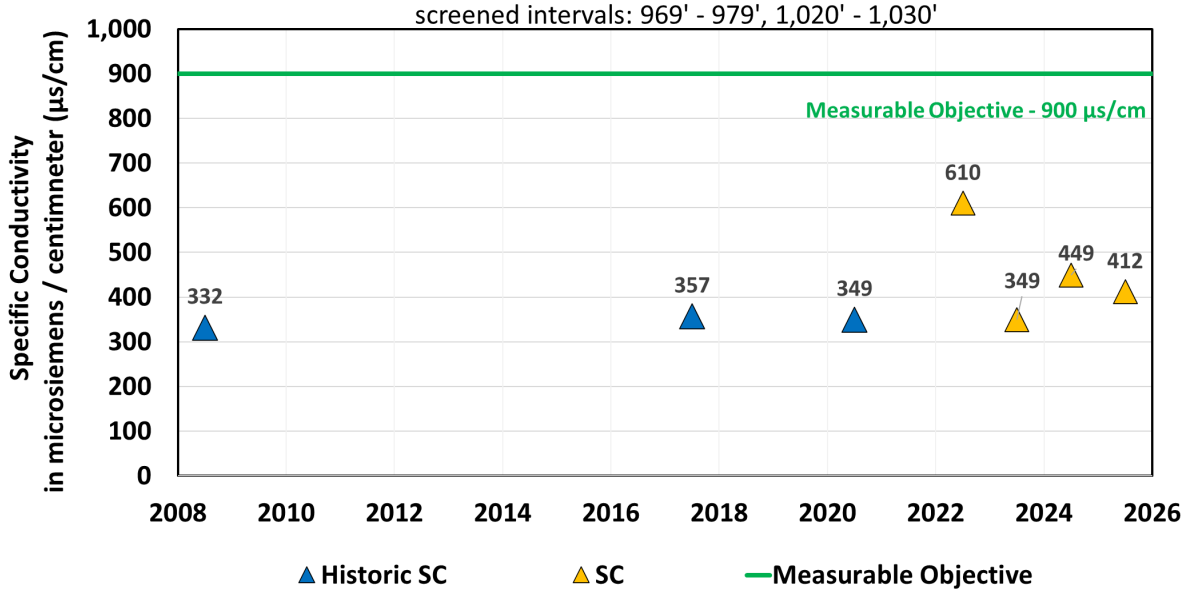
multicompletion well, total depth - 1,031 feet
screened intervals: 791' - 801', 881' - 891', 951' - 961', 1,011' - 1,021'



Note: SC values are average of measurements from only the first 3 screened intervals due to limitations of equipment (1,000 feet long).

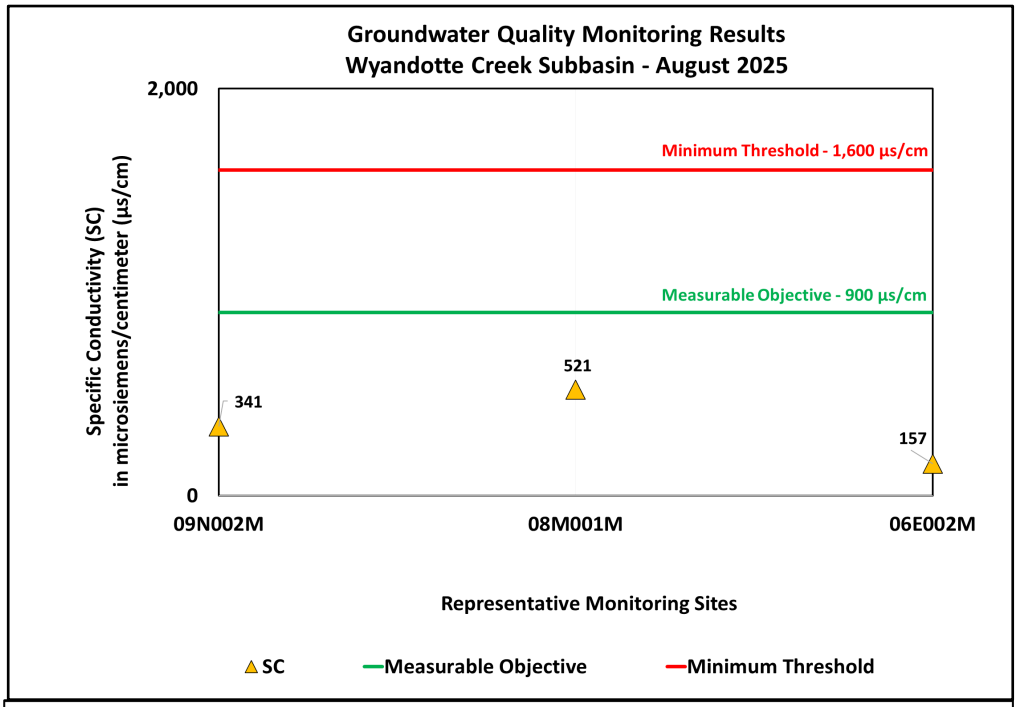
Vina Subbasin Water Quality
Well 31M001M

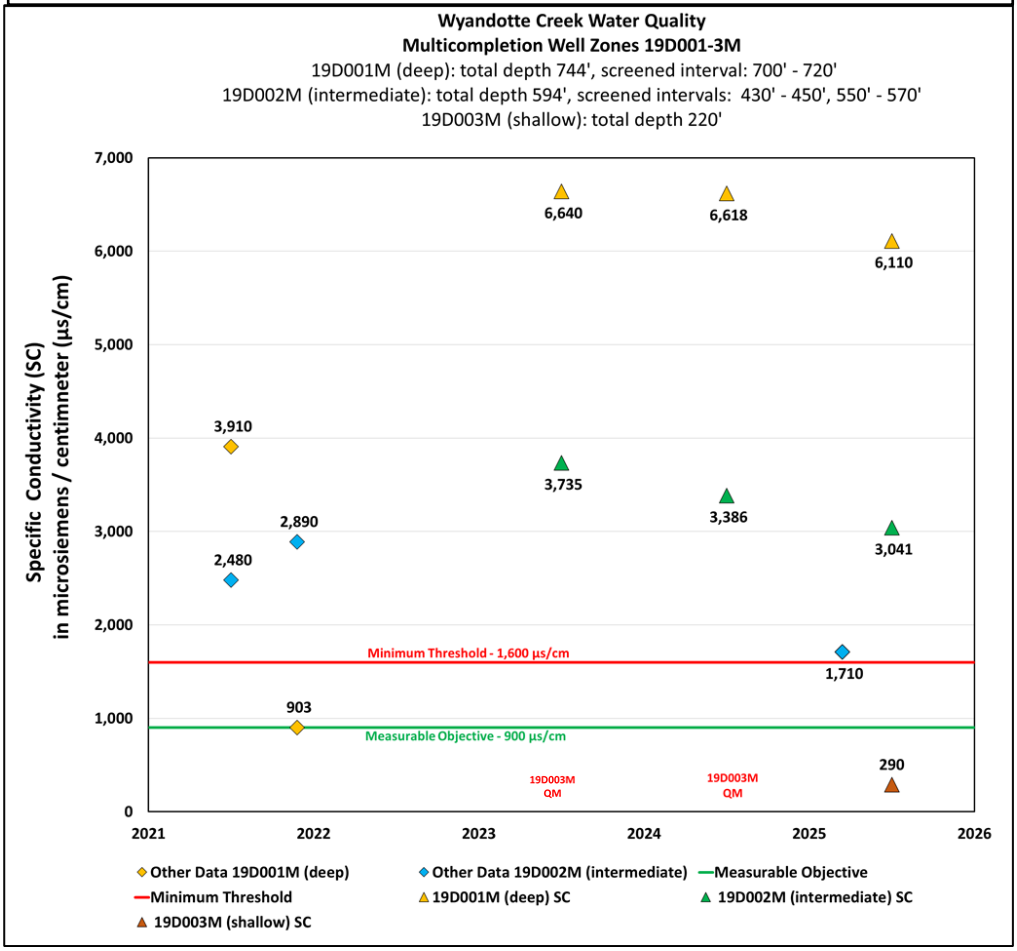
multicompletion well, total depth - 1,055 feet
screened intervals: 969' - 979', 1,020' - 1,030'

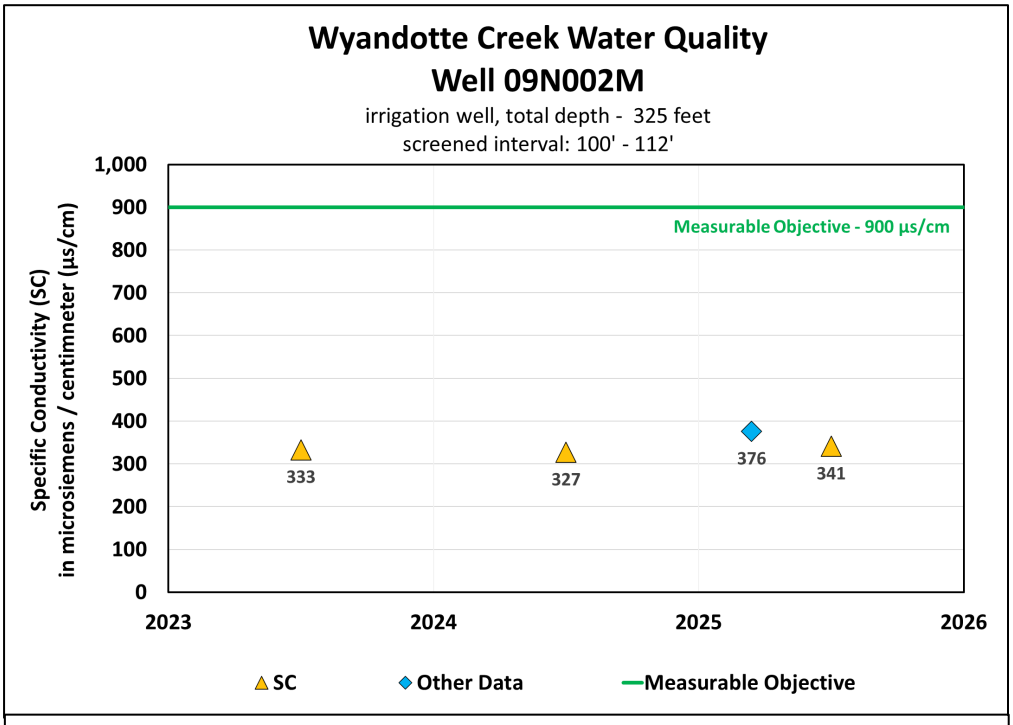


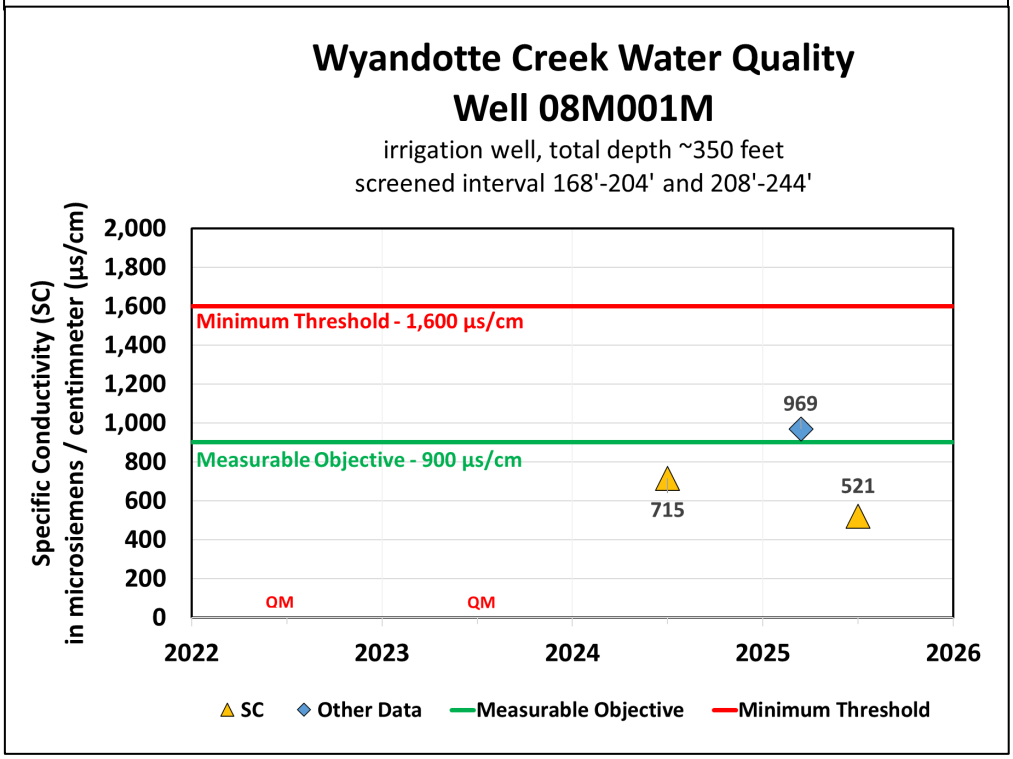
Note: SC values are average of measurements from only the first 3 screened intervals due to limitations of equipment (1,000 feet long).

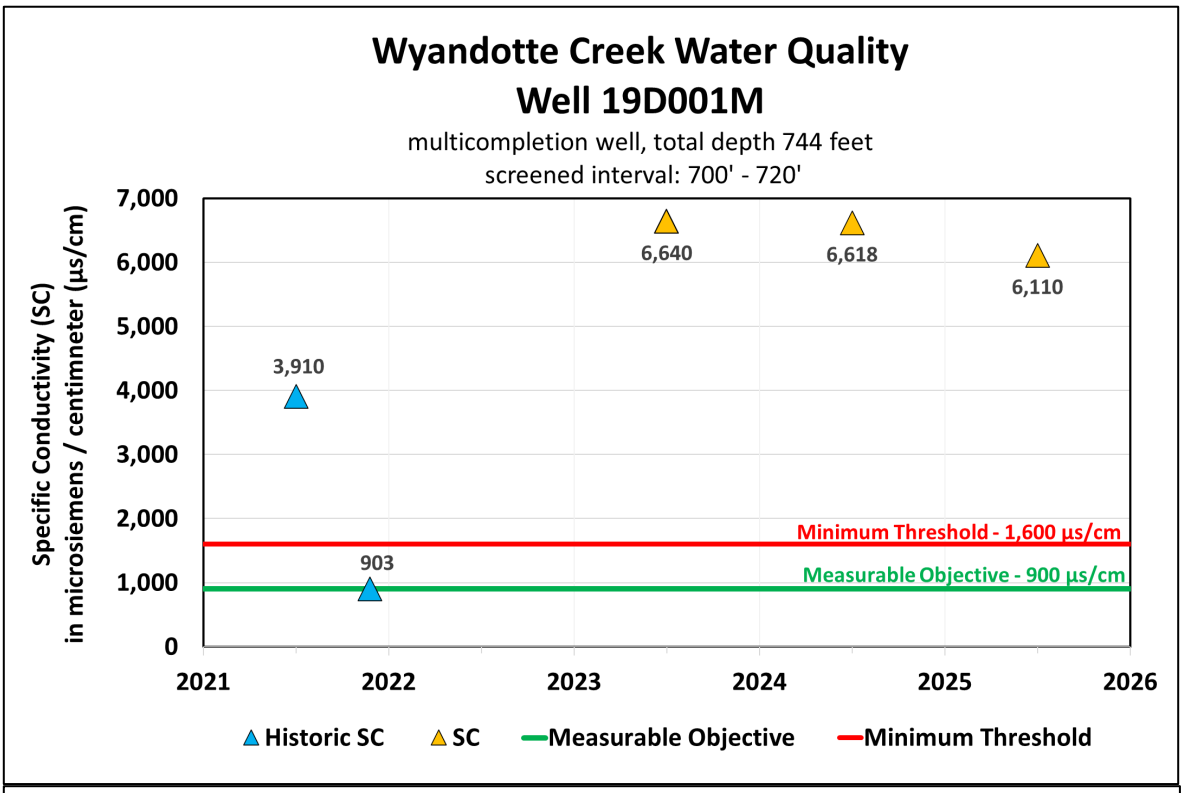
Wyandotte Creek Subbasin

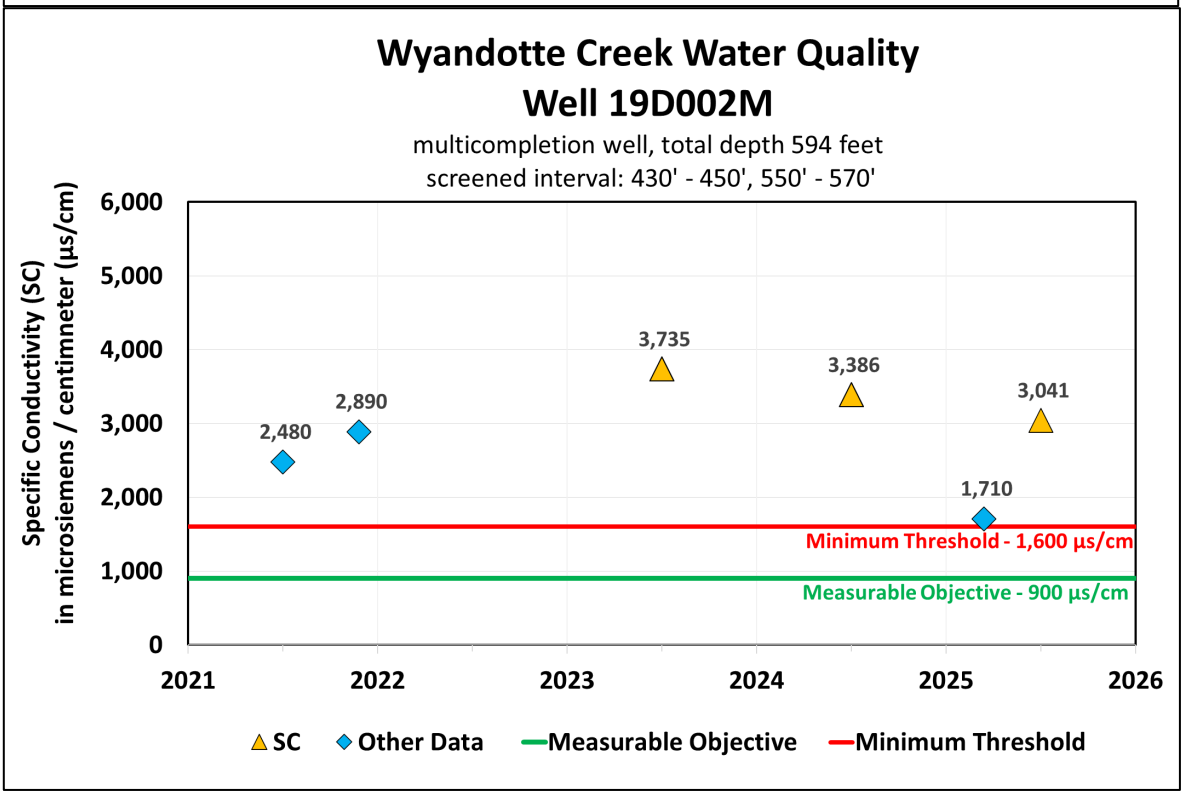


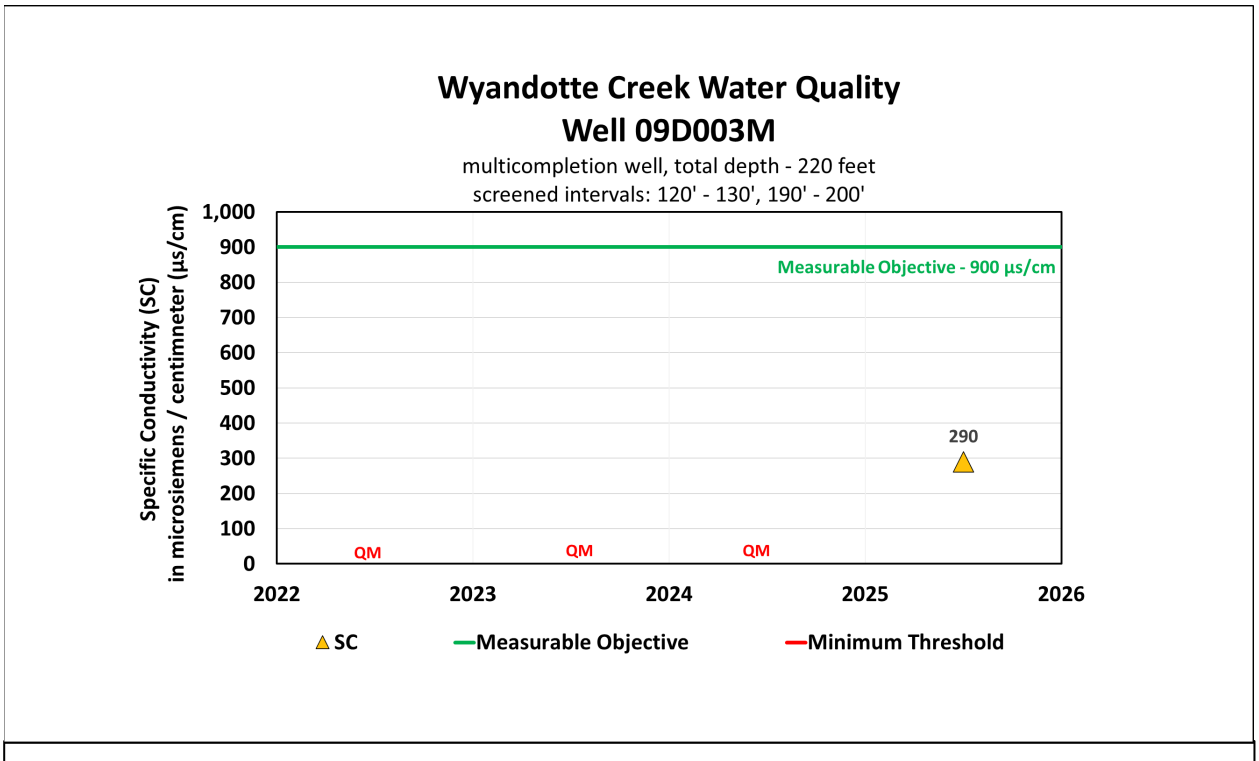


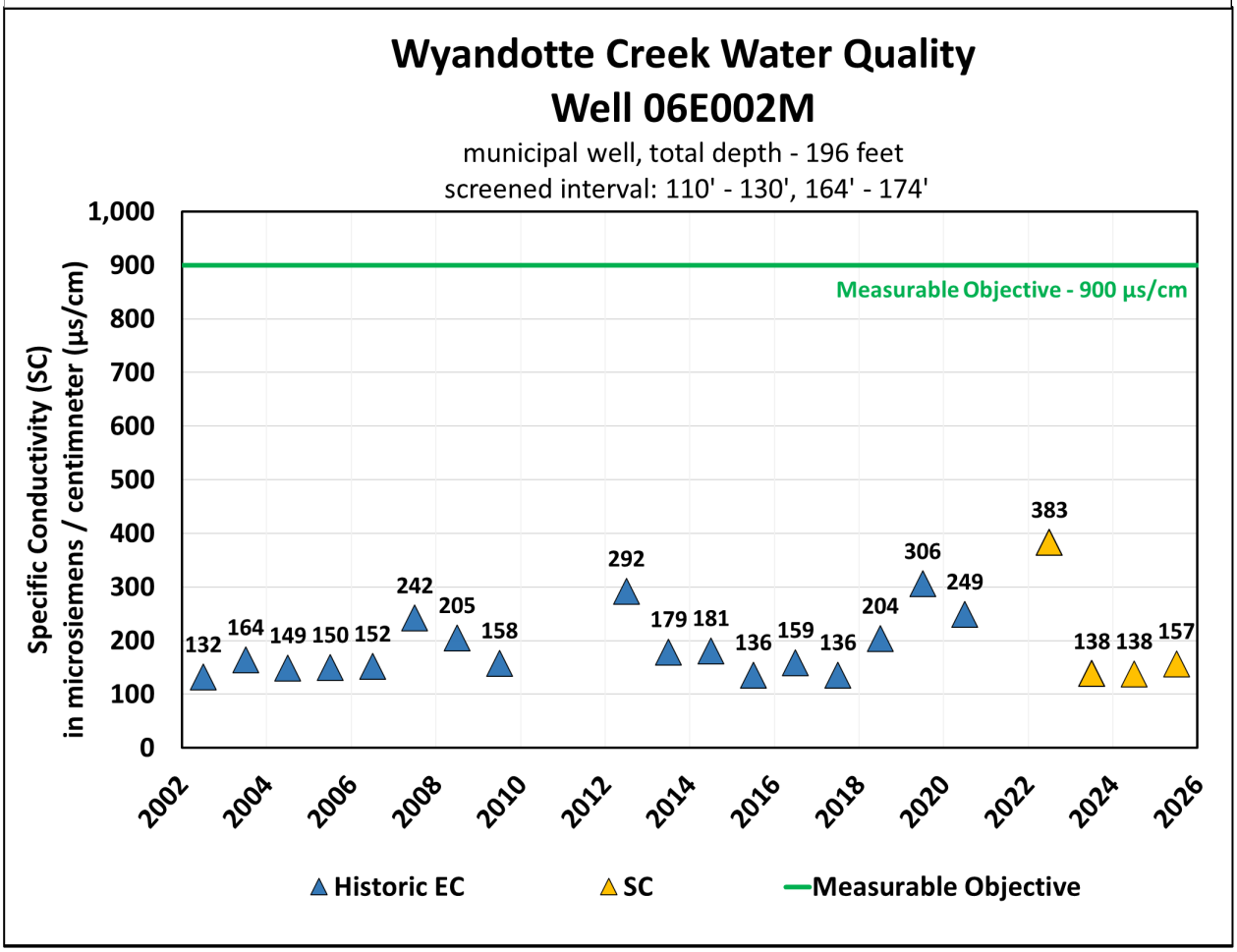

Wyandotte Creek Water Quality
Well 09N002M
irrigation well, total depth - 325 feet
screened interval: 100' - 112'
Specific Conductivity (SC)
in microsiemens / centimeter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
333
327
376
341
2023
2024
2025
2026
SC
Other Data
Measurable Objective


Wyandotte Creek Water Quality
Well 08M001M
irrigation well, total depth ~350 feet
screened interval 168'-204' and 208'-244'
Specific Conductivity (SC)
in microsiemens / centimeter (µs/cm)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Minimum Threshold - 1,600 µs/cm
Measurable Objective - 900 µs/cm
969
715
521
QM
QM
2022
2023
2024
2025
2026
SC
Other Data
Measurable Objective
Minimum Threshold


Wyandotte Creek Water Quality
Well 19D001M
multicompletion well, total depth 744 feet
screened interval: 700' - 720'
Specific Conductivity (SC)
in microsiemens / centimeter (µs/cm)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
3,910
6,640
6,618
6,110
903
Minimum Threshold - 1,600 µs/cm
Measurable Objective - 900 µs/cm
2021
2022
2023
2024
2025
2026
Historic SC
SC
Measurable Objective
Minimum Threshold


Wyandotte Creek Water Quality
Well 19D002M
multicompletion well, total depth 594 feet
screened interval: 430' - 450', 550' - 570'
Specific Conductivity (SC)
in microsiemens / centimeter (µs/cm)
6,000
5,000
4,000
3,000
2,000
1,000
0
2,480
2,890
3,735
3,386
3,041
1,710
Minimum Threshold - 1,600 µs/cm
Measurable Objective - 900 µs/cm
2021
2022
2023
2024
2025
2026
SC
Other Data
Measurable Objective
Minimum Threshold


Wyandotte Creek Water Quality
Well 09D003M
multicompletion well, total depth - 220 feet
screened intervals: 120' - 130', 190' - 200'
Specific Conductivity (SC)
in microsiemens / centimmeter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
290
QM
QM
QM
2022
2023
2024
2025
2026
SC
Measurable Objective
Minimum Threshold


Wyandotte Creek Water Quality
Well 06E002M
municipal well, total depth - 196 feet
screened interval: 110' - 130', 164' - 174'
Specific Conductivity (SC)
in microsiemens / centimmeter (µs/cm)
1,000
900
800
700
600
500
400
300
200
100
0
Measurable Objective - 900 µs/cm
132
164
149
150
152
242
205
158
292
179
181
136
159
136
204
306
249
383
138
138
157
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
Historic EC
SC
Measurable Objective