

Atascadero Basin Groundwater Sustainability Plan

Draft Chapter for Public Comment

Section 7

Monitoring Networks

Released for Comment June 1, 2020

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Thank you for your interest in sustainable groundwater management.





Draft Atascadero Groundwater Sustainability Plan

Atascadero Groundwater Subbasin Section 7

DRAFT

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Prepared for: Atascadero Subbasin Groundwater Sustainability Agency

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Abbreviations and Acronyms

Act (or SGMA)	Sustainable Groundwater Management Act
AMWC	Atascadero Mutual Water Company
Basin	Salinas Valley Basin
BMP	Best Management Practice
CASGEM	California Statewide Groundwater Elevation Monitoring
County	San Luis Obispo County
DMS	data management system
DWR	Department of Water Resources
GIS	Geographic Information System
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
ILRP	Irrigated Lands Regulatory Program
MWC	Mutual Water Company
NED 10	10-meter USGS National Elevation Dataset
NWIS	National Water Information System
OSWCR	DWR's Online System for Well Completion Reports
Qa	Alluvial Aquifer
QTp	Paso Robles Formation Aquifer
RMS	Representative Monitoring Sites
RPE	reference point elevation
SGMA	Sustainable Groundwater Management Act
SLOFCWCD	San Luis Obispo County Flood Control and Water Conservation District
SWRCB	State Water Resources Control Board
TCSD	Templeton Community Services District
USGS	United States Geologic Survey
WCR	well completion report

7. Monitoring Networks

This section describes the monitoring networks that exist and improvements to the monitoring networks that will be developed for the basin identified by the Department of Water Resources (DWR) in its Bulletin 118 as Basin No. 3-004.11, Atascadero Area Groundwater Sub-basin of the Salinas Valley Basin (Basin) as part of Groundwater Sustainability Plan (GSP) implementation. This section is prepared in accordance with the Sustainable Groundwater Management Act (SGMA) regulations §354.32 and §354.34 and includes monitoring objectives, monitoring protocols, and data reporting requirements.

The monitoring networks presented in this section are based on existing monitoring sites. It will be necessary to expand the existing monitoring networks and identify or install more monitoring sites to fully demonstrate sustainability and improve the GSP model. Monitoring networks are described for each of the five applicable sustainability indicators, and data gaps are identified for every monitoring network. These data gaps will be addressed during GSP implementation. Addressing these data gaps and developing more extensive and complete monitoring networks will improve the Atascadero Basin Groundwater Sustainability Agency's (GSA) ability to track progress and demonstrate sustainability.

7.1 Monitoring Objectives

The SGMA regulations require monitoring networks be developed to promote the collection of data of sufficient quality, frequency, and spatial distribution to characterize groundwater and related surface water conditions in the Basin and to evaluate changing conditions that occur through implementation of the GSP. The monitoring network should accomplish the following:

- Demonstrate progress toward achieving measurable objectives described in the GSP
- Monitor impacts to the beneficial uses and users of groundwater
- Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds
- Quantify annual changes in water budget components

The minimum thresholds and measurable objectives monitored by the networks are described in Section 8 - Sustainable Management Criteria.

7.1.1 Monitoring Networks

Monitoring networks are developed for each of the five sustainability indicators that are relevant to the Basin:

- Chronic lowering of groundwater levels

- Reduction in groundwater storage
- Degraded water quality
- Land subsidence
- Depletion of interconnected surface water

The Basin is isolated from the Pacific Ocean and is not threatened by seawater intrusion; therefore, this GSP does not provide monitoring for the seawater intrusion sustainability indicator.

The SGMA regulations allow the GSP to use existing monitoring sites for the monitoring network. Wells used for monitoring, however, are limited by restrictions in §352.4(c) of the SGMA regulations which requires the GSAs to provide various data for any wells used as monitoring wells, including but not limited to: California Statewide Groundwater Elevation Monitoring (CASGEM) well identification number, well location, ground surface elevation, well depth, and perforated intervals. Wells for which these data were not available, were not publicly accessible because of confidentiality agreements, or could not be easily inferred, could not be used in the current groundwater monitoring network.

The approach for establishing the monitoring network for the Basin is to leverage existing monitoring programs and incorporate additional monitoring locations that have been made available by cooperating entities. The monitoring networks are limited to locations with data that are publicly available and not collected under confidentiality agreements. This section identifies data gaps in each monitoring network and proposes locations for filling those data gaps.

7.1.2 Management Areas

The SGMA regulations require that if management areas are established, the quantity and density of monitoring sites in those areas shall be sufficient to evaluate conditions of the Basin setting and sustainable management criteria specific to that area. At this time, management areas have not been defined for the Basin. If management areas are developed in the future, the monitoring networks will be reevaluated to ensure that there is sufficient monitoring to evaluate conditions in each management area.

7.2 Groundwater Level Monitoring Network

The minimum thresholds and measurable objectives for the chronic lowering of groundwater levels sustainability indicator are evaluated by monitoring groundwater levels. The SGMA regulations require a network of monitoring wells sufficient to demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features.

Existing well records and existing groundwater monitoring programs in the Basin are described in Sections 3 and 5, respectively. Groundwater well construction data and water level data were obtained from the following public sources:

- San Luis Obispo County Flood Control and Water Conservation District (SLOFCWCD)
- United States Geological Survey (USGS) National Water Information System (NWIS)
- DWR Online System for Well Completion Reports (OSWCR)
- DWR SGMA Data Viewer
- DWR CASGEM
- City of Paso Robles, Atascadero Mutual Water Company (AMWC) and Templeton Community Services District (TCSD) for public drinking water supply wells and associated monitoring wells
- Environmental consulting reports for the Santa Margarita to Tassajara Creek Pipeline cleanup (Geotracker site ID: SL0607989492)

These data sources resulted in a dataset of nearly 200 wells, each analyzed using the following steps to assess whether they would be included in the GSP groundwater level monitoring network:

1. Include Only Currently Measured Wells: To reduce the possibility of selecting a well that has not been monitored in many years or that may no longer be accessible, wells were excluded that did not have at least one groundwater level measurement from 2017 or later. All the groundwater level monitoring data available for the Basin that met this criterion were provided by SLOFCWCD (a subset of which is included in CASGEM) or the environmental consulting reports for the Santa Margarita to Tassajara Creek Pipeline cleanup, for a total of 114 wells.
2. Prioritize Wells with Known Well Completion Information: Wells without enough information to determine principal aquifer of completion were removed. This excluded nine wells.
3. Remove Confidential Wells: Many of the wells in the SLOFCWCD groundwater level monitoring network are subject to confidentiality agreements. An effort has been made to reach out to confidential well owners and offer them the opportunity to opt in to the GSP groundwater level monitoring network. Several wells have been added to the GSP monitoring network as a result of this effort. Because monitoring data collected as part of this GSP will be publicly available, data from the wells subject to confidentiality agreements cannot be published and therefore these wells are currently excluded from the GSP monitoring network. The groundwater level data that met this criterion resulted in a total of 85 wells.
4. Additional Wells: Include Additional Wells and/or Water Level Data Provided by AMWC and TCSD. This resulted in the addition of the TCSD Selby monitoring well, for a total of 86 wells.

5. Remaining Wells: The remaining 86 wells were scored in terms of their total number of historical water elevation records, data quality¹, and in terms of their spatial distribution within the Basin and their spatial distribution relative to other candidate wells completed in the same principal aquifer. Wells with a greater number of high-quality historical water elevation records were prioritized over those with fewer records or wells with lower quality data. In cases where multiple high-scoring wells completed in the same principal aquifer are located in close proximity, only the highest-scoring well, based on number of high-quality water elevation records, was retained. In addition to these considerations, wells that are included in the CASGEM network were prioritized over other wells and three sets of paired vertical-gradient monitoring wells were included, despite a couple of them being in close proximity to other high-scoring wells. This selection process resulted in a GSP groundwater level monitoring network consisting of 26 wells (12 completed in the Alluvial Aquifer [Qa]; 14 completed in the Paso Robles Formation Aquifer [QTp]).

The wells in the GSP groundwater level monitoring network are listed in Table 7-1 and shown on Figure 7-1.

A subset of wells from the GSP groundwater level monitoring network has been selected as Representative Monitoring Sites (RMS). RMS are defined in the SGMA regulations as a subset of monitoring sites that are representative of conditions in the Basin. These RMS wells are evaluated in terms of sustainable management criteria in Section 8. The groundwater level RMS network is indicated in Table 7-1 and shown on Figure 7-2.

All but two wells in the GSP groundwater level monitoring network are part of the SLOFCWCD monitoring network. None of these wells are subject to confidentiality agreements and therefore the data are publicly available. The monitoring frequency indicates that water levels are presumably measured twice a year, in accordance with the SLOFCWCD protocol of measuring depths to water in April and October of each year. The most recent available measurement was 2017, 2018, or 2019 in all wells.

¹ Historical water elevation data were inspected for obvious pumping effects or otherwise suspect data. These suspect data were flagged for removal.

Table 7-1. Groundwater Level Monitoring Network

Well ID	Well Depth (feet)	Screen Interval(s) (feet bgs)	Reference Point Elevation (feet AMSL)	First Date Measured	Last Date Measured	Years Measured (years)	Number of Measurements	Aquifer	RMS Well (y/n)	Int. SW Well (y/n)
27S/12E-09N02*	85	44-85	721	4/16/1996	4/5/2019	23	32	Qa	Y	Y
27S/12E-21XX6	61	31-51	754.2	4/30/2017	4/5/2019	2	5	Qa		Y
27S/12E-29H03	65	35-55	753.0	4/16/1996	4/5/2019	23	33	Qa	Y	Y
28S/12E-04J02	86	21-86	795.8	3/29/1965	4/10/2019	54	96	Qa	Y	Y
28S/12E-04J04	70	30-70	802.4	4/1/1996	4/8/2019	23	37	Qa		
28S/12E-05AX2	60	25-55	796.2	10/24/2016	4/1/2019	3	6	Qa	Y	Y
28S/12E-10R04	75	46-75	820	4/27/1984	4/11/2019	35	56	Qa	Y	Y
28S/12E-14K04	105	50-100	835	4/21/1989	4/18/2019	30	41	Qa	Y	Y
28S/12E-25B03	120	100-120	867.8	5/25/1971	10/19/2018	47	95	Qa	Y	Y
29S/13E-19H04*	57	29-49	1005	4/6/1998	3/29/2019	21	43	Qa	Y	
E11W-26B	35	10-35	1,003.0	6/30/1999	11/29/2017	18	18	Qa	Y	
TCSD Selby Well	50	25-50	764.5	2/21/1997	4/6/2020	23	2	Qa	Y	Y
27S/12E-17B02	400	200-360, 380-400	828.3	9/29/1989	4/5/2019	30	46	QTp	Y	
27S/12E-17E01*	310	190-300	842.4	10/4/1988	4/5/2019	31	60	QTp	Y	
27S/12E-20A02	205	105-195	776	10/4/1988	4/5/2019	31	51	QTp	Y	
27S/12E-20R01*	230	110-230	771	4/6/1998	4/5/2019	21	36	QTp	Y	
27S/12E-21XX5	360	110-140, 180-250, 300-360	752.5	4/30/2017	4/5/2019	2	5	QTp		Y
27S/12E-22M01	550	pump @ 300 ¹	850.5	3/30/1965	3/29/2019	54	99	QTp	Y	
27S/12E-33F01	340	140-340	880	6/15/1969	3/29/2019	50	99	QTp		
27S/12E-33G01	460	200-460	892	11/14/1973	3/29/2019	46	79	QTp	Y	
27S/12E-XXXX1	650	260-420, 440-640	723.2	4/30/2017	4/5/2019	2	4	QTp		Y
28S/12E-04J05	360	145-190, 210-360	803.1	4/3/1995	4/1/2019	24	41	QTp		Y
28S/12E-04J06*	153	93-153	800.5	4/1/1996	4/1/2019	23	37	QTp	Y	
28S/12E-10A03	500	157-500	808.3	6/30/1972	4/8/2019	47	75	QTp	Y	Y
28S/12E-11K02*	603	300-600	882	4/5/1993	4/9/2019	26	46	QTp	Y	
28S/13E-31F02	310	55-300	884.3	11/26/1974	10/8/2018	44	67	QTp	Y	Y

Figure 7-1. Groundwater Level Monitoring Network

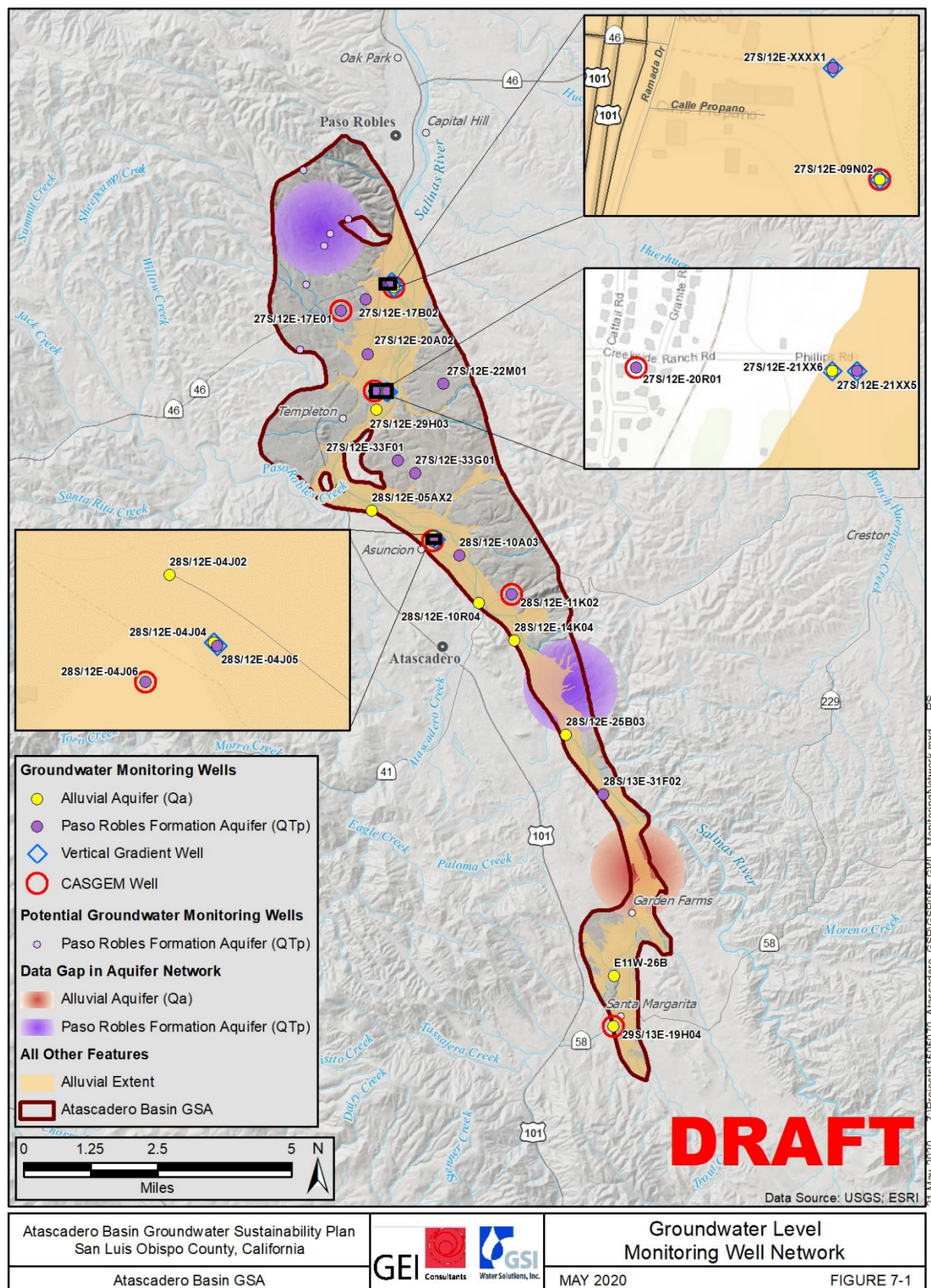
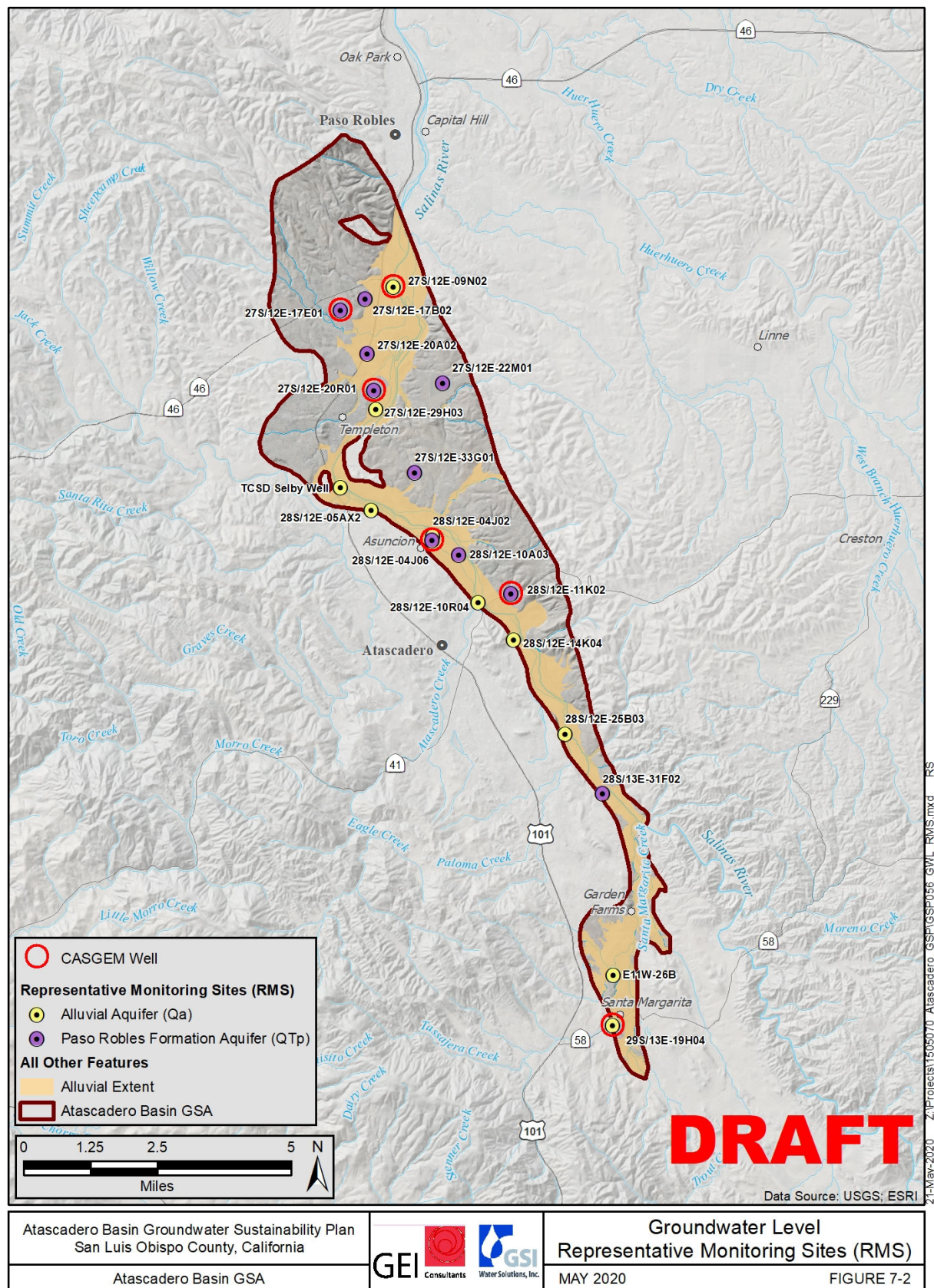


Figure 7-2. Groundwater Level Representative Monitoring Sites



7.2.1 Groundwater Level Monitoring Network Data Gaps

The GSA identified data gaps using guidelines in the SGMA regulations and Best Management Practices (BMPs) published by DWR on monitoring networks (DWR, 2016). Table 7-2 summarizes the suggested attributes of a groundwater level monitoring network from the BMPs in comparison to the current network and identifies data gaps.

The SGMA regulations require a sufficient density of monitoring wells to characterize the groundwater table or potentiometric surface for each principal aquifer. Professional judgement is also used to determine an adequate level of monitoring density.

While there is no definitive rule on well density, the BMP cites a range of 0.2 to 10 wells per 100 square miles, with a median of 5 wells per 100 square miles from various cited studies. The Basin is 31 square miles, which equates to 1.6 wells at a median density of 5 wells per 100 square miles. The monitoring network of 11 wells in the Alluvial Aquifer and 14 wells in the Paso Robles Formation Aquifer is many times greater than the recommended range cited in the BMP (0.1 to 3.1 wells).

Although the existing GSP groundwater level monitoring network satisfies the requirements cited in the BMP, there are two data gap areas identified, based on professional judgement, in the Paso Robles Formation Aquifer and one data gap area identified in the Alluvial Aquifer, as shown on Figure 7-1. The Paso Robles Formation Aquifer data gap in the northwest area of the Basin occurs in an area with many existing private agricultural supply and domestic supply wells. Several of these wells are currently enrolled in the Irrigated Lands Regulatory Program (ILRP, *see* Section 7.4) and may be good candidates to bring into the GSP groundwater level monitoring program through an outreach program that will be initiated during GSP implementation. The five most recently sampled ILRP wells (all sampled since 2018) and one USGS well are shown as potential Paso Robles Formation Aquifer monitoring wells on Figure 7-1.

The other Paso Robles Formation Aquifer data gap area located to the south and the single Alluvial Aquifer data gap area located near Garden Farms both occur in areas where existing confidential SLOFCWCD monitoring network wells are located. These confidential wells cannot be shown on the map. However, the GSA will reach out to these confidential well owners and offer them the opportunity to opt in to the GSP groundwater level monitoring network during GSP implementation.

A program to increase monitoring frequency may be considered during GSP implementation to better determine seasonal high and low groundwater elevations and monitor groundwater response to recharge and other activities². One method to increase monitoring frequency is to install continuous dataloggers in existing and new monitoring wells.

The reference point elevations (RPE's) for each GSP groundwater level monitoring well listed in Table 7-1 were taken from the SLOFCWCD monitoring program database, where available, or were estimated using the 10-meter USGS National Elevation Dataset (NED 10) in a Geographic Information

² AMWC and TCSD both measure groundwater levels in their wells on a weekly basis, but only the April and October data are reported to the SLOFCWCD groundwater monitoring program.

System (GIS). The accuracies of these RPE's are unknown. The elevations of these RPE's should be determined to within 0.1-foot NAVD88³ accuracy by a professional land surveyor during GSP implementation.

Although well completion reports are available online via DWR's Online System for Well Completion Reports (OSWCR), the well completion report (WCR) identification numbers are unknown for many of the wells in the GSP groundwater level monitoring network and therefore it is not possible to always identify the associated WCRs. The known WCRs, with redacted ownership information, are provided in Appendix 7A.

Groundwater level data must be sufficient to identify changes in groundwater flow directions and gradients. Groundwater contour maps are presented in Section 5 for both the Alluvial Aquifer and the Paso Robles Formation Aquifer. These maps were prepared using available monitoring data, including data collected from wells subject to confidentiality agreements. To comply with the confidentiality agreements, the data and well locations are not included on the maps. Continued use of confidential wells/groundwater level data is expected to be sufficient for preparation of future groundwater contour maps.

³ NAVD88 – North American Vertical Datum of 1988.

Table 7-2. Summary of Best Management Practices, Groundwater Level Monitoring Well Network, and Data Gaps

Best Management Practice (DWR, 2016a)	Current Monitoring Network	Data Gap
Groundwater level data will be collected from each principal aquifer in the basin.	14 wells in the Paso Robles Formation Aquifer; and 12 wells in the Alluvial Aquifer.	Minor data gaps: two data gap areas identified based on professional judgement in the Paso Robles Formation Aquifer and one data gap area identified in the Alluvial Aquifer
Groundwater level data must be sufficient to produce seasonal maps of groundwater elevations throughout the basin that clearly identify changes in groundwater flow direction and gradient (Spatial Density).	Current GSP network of 26 wells plus additional wells in the SLOFCWCD monitoring network is sufficient for mapping all of these areas.	Some data used to prepare groundwater elevation maps in the GSP are confidential. Continued use of confidential wells/groundwater level data is expected to be sufficient for preparation of future groundwater contour maps.
Groundwater levels will be collected during the middle of October and March for comparative reporting purposes, although more frequent monitoring may be required (Frequency).	All 26 wells in the existing monitoring network have been monitored twice a year, in spring (April ⁴) and fall (October).	Seasonal monitoring is the protocol for SLOFCWCD (Appendix 7B); more frequent monitoring may be needed to identify actual seasonal high and low groundwater elevations and further characterize groundwater level fluctuations; instrumentation like transducers or other technology may be used in future to monitor groundwater elevations.
Data must be sufficient for mapping groundwater depressions, recharge areas, and along margins of basins where groundwater flow is known to enter or leave a basin.	Current GSP network of 26 wells plus additional wells in the SLOFCWCD monitoring network is sufficient for mapping all of these areas.	Some data used to prepare groundwater elevation maps in the GSP are confidential. Continued use of confidential wells/groundwater level data is expected to be sufficient for preparation of future groundwater contour maps.
Well density must be adequate to determine changes in storage.	Current GSP network of 26 wells plus additional wells in the SLOFCWCD monitoring network is sufficient for mapping all of these areas.	None.
Data must be able to demonstrate the interconnectivity between shallow groundwater and surface water bodies, where appropriate.	Current Interconnected Surface Water network of 14 wells plus 3 confidential wells in the SLOFCWCD monitoring network is sufficient for mapping these areas.	There are no surface water gaging stations in the Basin. The potential need for installation of surface water gaging station(s) along the Salinas River within the Basin to aid in determining gaining/losing reaches may be evaluated during GSP implementation.
Data must be able to map the effects of management actions, i.e., managed aquifer recharge.	Current GSP network of 26 wells plus additional wells in the SLOFCWCD monitoring network is sufficient for mapping all of these areas.	Additional monitoring wells may be required to map the effectiveness of management actions. This monitoring will be addressed as projects are implemented.
Data must be able to demonstrate conditions near basin boundaries; agencies may consider coordinating monitoring efforts with adjacent basins to provide consistent data across basin boundaries. Agencies may consider characterization and continued impacts of internal hydraulic boundary conditions, such as faults, disconformities, or other internal boundary types.	Current GSP network of 26 wells plus additional wells in the SLOFCWCD monitoring network is sufficient for mapping all of these areas.	Additional wells may be necessary to map the structure and effect of internal faults.
Data must be able to characterize conditions and monitor adverse impacts to beneficial uses and users identified within the basin.	Current GSP network of 26 wells plus additional wells in the SLOFCWCD monitoring network is sufficient for mapping all of these areas.	Network may be expanded in accordance with the data gaps identified above.

⁴ Although the Monitoring Networks and Identification of Data Gaps BMP calls for collection of groundwater levels in the middle of March, the only available spring data for many of the GSP groundwater level monitoring wells were from the month of April (as available from the SLOFCWCD monitoring program database). The April data is considered representative of spring conditions in the Basin.

7.2.2 Groundwater Level Monitoring Protocols

The groundwater level monitoring protocols established by SLOFCWCD are adopted by this GSP for manual groundwater level monitoring. The monitoring protocols are included in Appendix 7B.

AMWC and TCSD measure groundwater levels in their wells on a weekly basis. It is likely that these more frequently measured data will be incorporated during GSP implementation. The GSA may consider use of automated groundwater level data loggers in the GSP groundwater level monitoring network wells. These data may be used to supplement the current water level monitoring network in the future. As automated groundwater level monitoring systems are added to the monitoring network, appropriate protocols for each automated system will be incorporated into this GSP.

Automated groundwater level monitoring systems have the advantage of supplying more frequent groundwater levels. The groundwater level monitoring BMP recommends more frequent monitoring in certain areas, including shallow, unconfined aquifers, in areas of rapid recharge, and in areas of greater withdrawal rates. More frequent monitoring may also be required in specific places where sustainability indicators are a concern or to track impacts of specific management actions and projects. The need for more frequent monitoring will be evaluated, and a program to increase monitoring frequency may be developed during the GSP implementation phase.

7.3 Groundwater Storage Monitoring Network

This GSP adopts groundwater levels as a proxy for assessing change in groundwater storage, as described in Section 8, Sustainable Management Criteria. The GSP groundwater level monitoring network identified in Section 7.2 is central to the monitoring network used to create historical groundwater elevation contour maps and change in groundwater elevation maps for each principal aquifer (*see* Section 5). However, there are several additional wells used for these analyses that are subject to confidentiality agreements or otherwise do not meet the criteria for inclusion in the GSP groundwater level monitoring network as specified in Section 7.2. As described in Section 5, a total of approximately 128 wells (depending on year) were used for these groundwater elevation analyses. Of these wells, 95 are not subject to confidentiality agreements. The locations of these non-confidential wells are shown on Figure 5-1 (*see* Section 5) and are listed in Appendix 7C.

7.3.1 Groundwater Storage Monitoring Data Gaps

Data gaps in the groundwater storage monitoring network are the same as the data gaps identified for the groundwater level monitoring network discussed in Section 7.2.1.

7.3.2 Groundwater Storage Monitoring Protocols

The groundwater storage monitoring network is identical to the groundwater level monitoring network. Therefore, the protocols used for gathering water level data to assess changes in groundwater storage are identical to the protocols used for the chronic lowering of groundwater levels sustainability indicator. Protocols for the manual collection of groundwater levels are included in Appendix 7B. As automated groundwater level collection devices are added to the monitoring network, protocols will be developed for each of these automated systems and incorporated into the GSP.

7.4 Water Quality Monitoring Network

The sustainability indicator for degraded water quality is evaluated by monitoring groundwater quality at a network of existing supply wells. The SGMA regulations require sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators to address known water quality issues.

As described in Section 5, there are no known contaminant plumes in the Basin, therefore the monitoring network is monitoring only non-point source constituents of concern and naturally occurring water quality impacts.

Existing groundwater quality monitoring programs in the Basin are described in Section 3 and groundwater quality distribution and trends are described in Section 5. Constituents of concern were identified in Section 5 based on comparison to drinking water standards and levels that could impact crop production. As described in Section 8, separate minimum thresholds are set for agricultural constituents of concern and drinking water constituents of concern. Therefore, different wells in the network will be assessed for different constituents. Constituents of concern for drinking water will be assessed at public water supply wells, domestic wells associated with the Irrigated Lands Regulatory Program (ILRP), and monitoring wells associated with open/active State Water Resources Control Board (SWRCB) Geotracker contamination sites (*see* Section 5). Constituents of concern for crop health will be assessed at agricultural supply wells.

The GSP groundwater quality monitoring network includes 54 public water supply wells that were identified by reviewing data from the SWRCB Division of Drinking Water. Wells were selected that were sampled for at least one of the constituents of concern during 2015 or more recently. These 54 wells are listed in Table 7-3 and shown on Figure 7-3. There are 28 public water supply wells that are completed in the Paso Robles Formation Aquifer and 26 public water supply wells completed in the Alluvial Aquifer⁵.

The agricultural supply wells and associated domestic supply wells included in the GSP groundwater monitoring network were identified by reviewing data from the ILRP that are stored in the SWRCB's Geotracker/GAMA database. Wells were selected that were sampled in 2012 or more recently. There are 54 ILRP properties in the groundwater quality monitoring network with a total of 73 wells. Of these 73 wells, 24 are assumed to be domestic supply wells based on their Geotracker/GAMA ID and the other 49 are assumed to be agricultural supply wells. Although well completion information is unknown for the ILRP wells, 68 are assumed to be completed in the Paso Robles Formation Aquifer, based on the surficial geology at the well locations. The remaining five wells are assumed to be completed in the Alluvial Aquifer based on their proximity to the Salinas River. These well completions will be confirmed during GSP implementation. The agricultural supply wells and associated domestic supply wells are listed in Table 7-3 and shown on Figure 7-3.

The GSP groundwater quality monitoring network also includes 55 monitoring wells associated with open/active SWRCB Geotracker contamination sites. All of these wells are completed in the Alluvial

⁵ Three of these 26 public water supply wells do not have available well completion information but based on location are assumed to be completed in the Alluvial Aquifer. These well completions will be confirmed during GSP implementation.

Aquifer. These wells are sampled for various water quality constituents as determined by each site's monitoring plan including constituents of concern for drinking water. These monitoring wells will be included in the GSP groundwater quality monitoring network at least until the parent SWRCB Geotracker contamination site(s) are closed⁶. The SWRCB Geotracker monitoring wells are listed in Table 7-3 and shown on Figure 7-3.

⁶ In the event of SWRCB Geotracker site closure(s) the GSA may endeavor to retain certain monitoring wells in the GSP groundwater quality monitoring network if agreement(s) with the well owner(s) can be coordinated.

Table 7-3. Groundwater Quality Monitoring Network

Well ID	Type of Well	Well Depth (feet)	Screen Interval(s)	First Sampling Event Date	Last Sampling Event Date	Number of Sampling Events	Assumed Aquifer
AMWC-1B	PWS	65	50-65	5/22/2007	5/14/2019	83	Qa
AMWC-2A	PWS	105	50-100	1/31/2000	7/19/2018	77	Qa
AMWC-3A	PWS	75	46-75	2/7/1984	5/5/2014	44	Qa
AMWC-4	PWS	86	21-85	5/10/1984	5/9/2019	109	Qa
AMWC-5	PWS	90	20-90	3/12/1985	4/11/2019	125	Qa
AMWC-5A	PWS	100	50-100	2/3/1994	5/14/2019	149	Qa
AMWC-13A	PWS	330	210-310	9/12/2000	6/7/2018	28	Qa
AMWC-16	PWS	72	37-72	3/9/1995	11/27/2018	90	Qa
AMWC-19	PWS	115	35-105	3/7/1995	11/27/2018	86	Qa
Atascadero State Hosp - WELL 01 (1953)	PWS	--	--	10/31/1988	6/6/2019	717	Qa
Atascadero State Hosp - WELL 02 (1968) - STANDBY	PWS	120	40-120	7/12/1989	6/6/2019	810	Qa
Atascadero State Hosp - WELL 03 (1969)	PWS	--	20-77	7/12/1989	3/14/2019	867	Qa
Atascadero State Hosp - WELL 04	PWS	--	--	4/15/2003	3/14/2019	609	Qa
CSA23 Well-3	PWS	49.5	30-49.5	1/24/1992	6/17/2019	734	Qa
CSA23 Well-4	PWS	57	29-49	7/29/1997	6/17/2019	136	Qa
Garden Farms 1	PWS	80	40-80	4/9/1987	2/25/2019	28	Qa
Garden Farms 2	PWS	127	--	1/15/2002	2/28/2018	26	Qa
Garden Farms 3	PWS	80	55-80	8/19/2002	2/25/2019	12	Qa
Paso Robles-Thunderbird 10	PWS	210	60-210	10/8/1984	11/1/2018	114	Qa
Paso Robles-Thunderbird 13	PWS	130	70-130	9/11/1985	11/1/2018	101	Qa
Paso Robles-Thunderbird 17	PWS	130	70-130	6/22/1993	2/12/2019	65	Qa
Paso Robles-Thunderbird 23	PWS	140	90-140	10/7/1998	11/1/2018	53	Qa
SANTA LUCIA SCHOOL - WELL 01	PWS	--	--	9/18/2002	11/7/2019	136	Qa
TCSD-Creekside River Well	PWS	61	31-51	6/10/2008	5/14/2019	335	Qa
TCSD-Platz Well 02	PWS	85	44-85	4/17/1985	10/29/2018	69	Qa
TCSD-Smith River Well	PWS	65	35-55	1/12/1994	10/29/2018	95	Qa
ALMIRA WATER ASSOCIATION - WELL 02	PWS	--	--	12/10/1987	12/23/2019	397	QTp
AMWC-6A	PWS	480	240-470	4/2/2002	11/19/2018	31	QTp
AMWC-7	PWS	500	157-500	4/24/1989	11/6/2018	85	QTp
AMWC-8A	PWS	425	140-415	9/14/2004	2/14/2019	39	QTp
AMWC-9A	PWS	400	155-420	6/4/2001	11/6/2018	48	QTp
AMWC-10	PWS	550	192-550	4/18/1989	11/27/2018	77	QTp

Well ID	Type of Well	Well Depth (feet)	Screen Interval(s)	First Sampling Event Date	Last Sampling Event Date	Number of Sampling Events	Assumed Aquifer
AMWC-12	PWS	603	300-600	7/6/1988	4/16/2019	101	QTp
AMWC-25	PWS	400	155-355	4/5/2011	5/9/2019	26	QTp
AMWC-26	PWS	500	160-490	4/5/2011	2/26/2019	28	QTp
LOS ROBLES MOBILE HOME ESTATES - WELL 01	PWS	--	102-184	1/2/2002	7/1/2019	407	QTp
LOS ROBLES MOBILE HOME ESTATES - WELL 02	PWS	--	125-240	1/2/2002	7/1/2019	447	QTp
LOS ROBLES MOBILE HOME ESTATES - WELL 03	PWS	--	115-185	1/2/2002	7/1/2019	397	QTp
PASO ROBLES CHEVROLET CADILLAC - WELL 01	PWS	--	--	10/27/2003	8/13/2019	131	QTp
SANTA YSABEL RANCH MWC - WELL 01, RESERVIOR WELL	PWS	--	145-315	6/30/2004	7/3/2019	402	QTp
SANTA YSABEL RANCH MWC - WELL 02, RANCH HOUSE WELL	PWS	--	140-410	6/30/2004	7/3/2019	433	QTp
TCSD-Bonita Well 01	PWS	245	140-240	4/11/1989	7/11/2017	56	QTp
TCSD-Claussen Well 01	PWS	310	190-300	10/13/1987	10/29/2018	61	QTp
TCSD-Cow Meadows	PWS	290	120-290	6/16/1998	10/29/2018	229	QTp
TCSD-Creekside Deep Well	PWS	360	110-360	5/20/2008	5/14/2019	311	QTp
TCSD-Davis Well	PWS	230	110-230	3/9/1990	5/7/2019	57	QTp
TCSD-Fortini Well	PWS	400	200-400	2/27/1989	10/29/2018	66	QTp
TCSD-Platz Well 04	PWS	650	260-640	5/19/2009	10/29/2018	35	QTp
TCSD-Saunders Well	PWS	280	160-280	3/11/2003	10/29/2018	28	QTp
TCSD-Silva Well 01	PWS	205	105-195	3/14/2003	10/29/2018	128	QTp
WALNUT HILLS MUTUAL WATER CO - WELL 01	PWS	--	120-240	10/27/2003	8/13/2019	131	QTp
WALNUT HILLS MUTUAL WATER CO - WELL 04	PWS	--	--	6/4/2009	4/16/2019	232	QTp
WALNUT HILLS MUTUAL WATER CO - WELL 05	PWS	--	--	5/19/2010	5/19/2010	1	QTp
WALNUT HILLS MUTUAL WATER CO - WELL 07	PWS	--	--	7/31/2018	12/12/2019	267	QTp
SL0607989492-B10-2	MW	--	--	9/30/2005	10/4/2011	25	Qa
SL0607989492-B10-3	MW	--	--	9/30/2005	10/4/2011	25	Qa
SL0607989492-B1-1A	MW	--	--	12/14/2006	10/24/2012	24	Qa
SL0607989492-B1-2	MW	--	--	12/15/2006	10/11/2011	12	Qa
SL0607989492-B1-3	MW	--	--	12/14/2006	10/24/2012	24	Qa
SL0607989492-B5-2	MW	--	--	10/5/2005	10/24/2012	30	Qa
SL0607989492-E10W-40A	MW	--	--	9/30/2005	10/25/2012	31	Qa
SL0607989492-E10W-41A	MW	--	--	9/30/2005	10/25/2012	31	Qa
SL0607989492-E11W-26B	MW	--	--	10/4/2005	12/4/2015	35	Qa
SL0607989492-E1W-1	MW	--	--	12/14/2006	10/24/2012	24	Qa
SL0607989492-E1W-2	MW	--	--	12/14/2006	10/24/2012	24	Qa

Well ID	Type of Well	Well Depth (feet)	Screen Interval(s)	First Sampling Event Date	Last Sampling Event Date	Number of Sampling Events	Assumed Aquifer
SL0607989492-E1W-4A	MW	--	--	12/14/2006	10/24/2012	24	Qa
SL0607989492-E3W-22	MW	--	--	10/5/2005	12/4/2015	29	Qa
SL0607989492-E3W-24	MW	--	--	10/5/2005	10/24/2012	30	Qa
SL0607989492-E5W-8	MW	--	--	10/5/2005	10/24/2012	24	Qa
SL0607989492-E5W-9	MW	--	--	10/5/2005	10/24/2012	30	Qa
SL0607989492-E9W-33C	MW	--	--	10/3/2005	10/25/2012	30	Qa
SL0607989492-P-1A	MW	--	--	10/21/2009	10/31/2011	57	Qa
SL0607989492-P-1B	MW	--	--	10/21/2009	10/31/2011	57	Qa
SL0607989492-P-2A	MW	--	--	10/21/2009	10/31/2011	57	Qa
SL0607989492-P-2B	MW	--	--	10/21/2009	10/31/2011	55	Qa
SL0607989492-S11-B12	MW	--	--	10/4/2005	10/24/2012	30	Qa
SL0607989492-S11-B13	MW	--	--	10/4/2005	10/24/2012	30	Qa
SL0607989492-S11-B14	MW	--	--	12/13/2006	12/13/2006	6	Qa
SL0607989492-S11-B17	MW	--	--	10/4/2005	10/25/2012	30	Qa
SL0607989492-S11-B18	MW	--	--	10/5/2005	12/4/2015	35	Qa
SL0607989492-S11-B20	MW	--	--	10/4/2005	10/25/2012	24	Qa
SL0607989492-S11-B6	MW	--	--	10/3/2005	10/25/2012	36	Qa
SL0607989492-S11-B9	MW	--	--	10/4/2005	12/4/2015	35	Qa
SL0607989492-S1-B3	MW	--	--	12/14/2006	10/24/2012	24	Qa
SL0607989492-S1-B4	MW	--	--	12/14/2006	10/24/2012	24	Qa
SL0607989492-S3-B1	MW	--	--	10/4/2005	10/24/2012	24	Qa
SL0607989492-S3-B2	MW	--	--	10/5/2005	10/24/2012	24	Qa
SL0607989492-S9-B1	MW	--	--	10/3/2005	10/25/2012	30	Qa
SL0607989492-S9-B2	MW	--	--	10/3/2005	10/25/2012	30	Qa
SL0607989492-S9-B3	MW	--	--	10/3/2005	10/25/2012	30	Qa
T0607900001-MW-10	MW	--	27-47	11/28/2001	4/20/2018	313	Qa
T0607900001-MW-11	MW	--	25-45	11/28/2001	1/13/2011	48	Qa
T0607900001-MW-12	MW	--	20-40	11/28/2001	2/13/2017	192	Qa
T0607900001-MW-13	MW	--	25-45	11/28/2001	1/12/2011	48	Qa
T0607900001-MW-14	MW	--	19-35	9/20/2002	2/13/2017	194	Qa
T0607900001-MW-15	MW	--	19-35	9/20/2002	12/15/2009	137	Qa
T0607900001-MW-16	MW	--	20-35	5/16/2003	1/12/2011	98	Qa
T0607900001-MW-17	MW	--	19-26	5/16/2003	1/12/2011	136	Qa

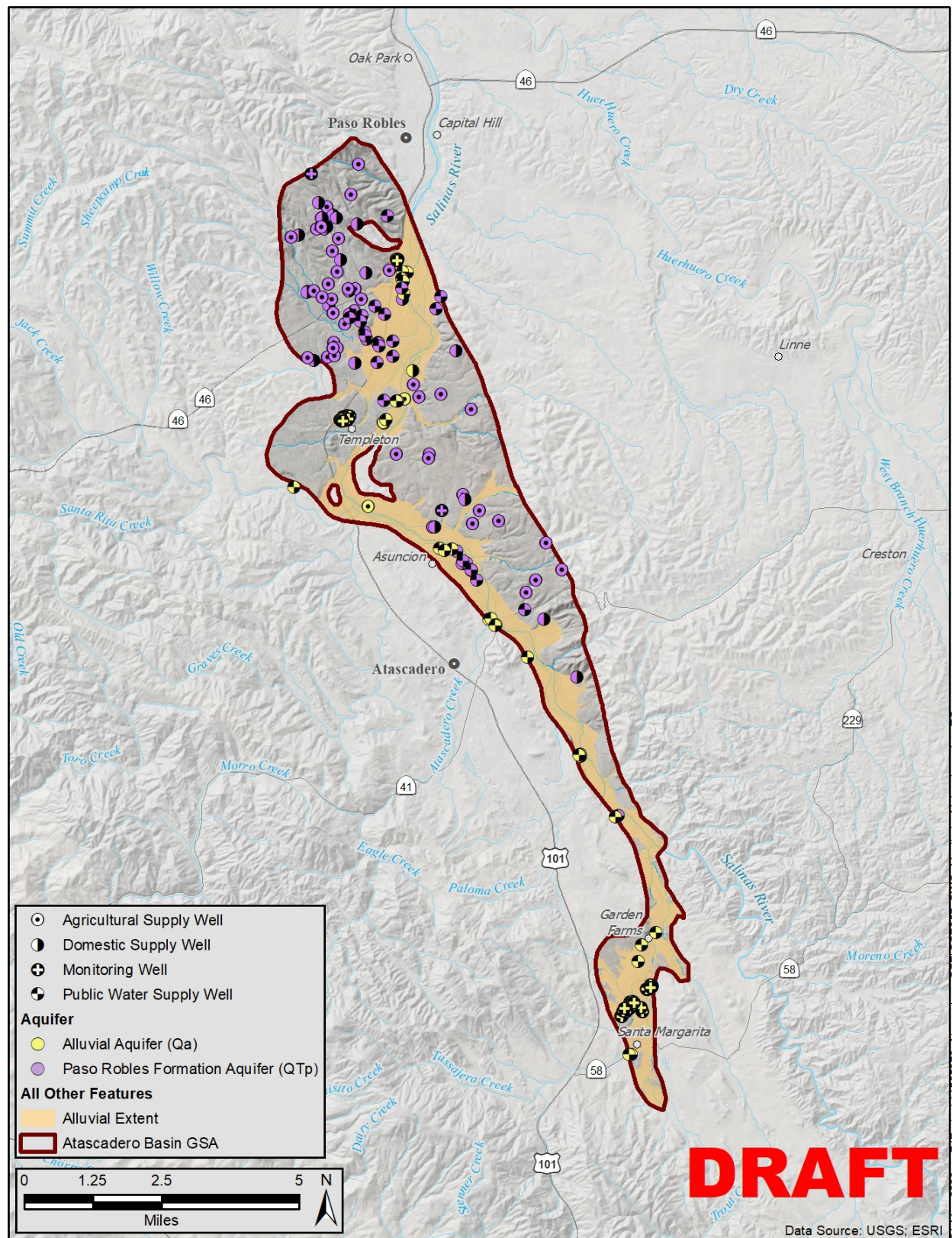
Well ID	Type of Well	Well Depth (feet)	Screen Interval(s)	First Sampling Event Date	Last Sampling Event Date	Number of Sampling Events	Assumed Aquifer
T0607900001-MW-18	MW	--	20-35	5/16/2003	1/12/2011	145	Qa
T0607900001-MW-2	MW	--	25-40	11/28/2001	2/13/2017	250	Qa
T0607900001-MW-3	MW	--	16.5-46.5	11/28/2001	1/13/2011	39	Qa
T0607900001-MW-4	MW	--	30-40	11/28/2001	1/13/2011	39	Qa
T0607900001-MW-5	MW	--	27-47	11/28/2001	2/13/2017	229	Qa
T0607900001-MW-6	MW	--	29-39	11/28/2001	1/13/2011	211	Qa
T0607900001-MW-7	MW	--	25-45	8/30/2002	1/13/2011	59	Qa
T0607900001-MW-8	MW	--	29-44	11/28/2001	1/12/2011	38	Qa
T10000009038-MW1	MW	--	45-60	4/7/2016	12/7/2018	146	Qa
T10000009038-MW2	MW	--	45-60	4/7/2016	7/26/2016	98	Qa
T10000009038-MW3	MW	--	45-60	4/7/2016	7/26/2016	98	Qa
MSPR-01	MW	--	--	7/19/2005	8/11/2014	2	QTp
S-MS-H04	MW	235	--	11/27/2012	11/27/2012	1	QTp
S-MS-SV01	MW	--	--	11/8/2012	11/8/2012	1	QTp
AGL020000598-FLETCHER DOM	Dom	--	--	3/26/2013	6/14/2013	2	Qa
AGL020027483-VAQUERO DW	Dom	--	--	12/27/2012	12/12/2017	4	Qa
AGL020000508-DW	Dom	--	--	10/16/2012	6/14/2017	3	QTp
AGL020000648-MAIN_D/I	Dom	--	--	1/7/2014	6/2/2014	2	QTp
AGL020001003-HOME DOMESTIC	Dom	--	--	12/12/2012	10/26/2017	4	QTp
AGL020001035-DW	Dom	--	--	12/11/2012	6/24/2013	2	QTp
AGL020001087-PRIMARY AW DW	Dom	--	--	12/12/2012	10/26/2017	4	QTp
AGL020001433-COBBLE C HOME #	Dom	--	--	12/17/2012	12/17/2012	1	QTp
AGL020002826-DOM/AG WELL	Dom	--	--	12/10/2012	6/4/2013	2	QTp
AGL020003068-DW	Dom	--	--	1/22/2013	6/4/2013	2	QTp
AGL020003461-WINERY DOM	Dom	--	--	7/28/2014	7/28/2014	1	QTp
AGL020005112-DW	Dom	--	--	10/16/2012	4/6/2016	2	QTp
AGL020005225-DW AW	Dom	--	--	9/24/2013	12/7/2017	5	QTp
AGL020007294-DW	Dom	--	--	12/4/2012	12/12/2017	4	QTp
AGL020012109-HOME WELL #1	Dom	--	--	12/11/2012	5/27/2013	2	QTp
AGL020015262-AVR DW	Dom	--	--	9/25/2012	11/27/2017	3	QTp
AGL020019682-DW AW	Dom	--	--	10/15/2013	6/17/2014	2	QTp
AGL020027467-BLACKSETH DW	Dom	--	--	12/27/2012	11/29/2017	4	QTp
AGL020027660-DOM WELL	Dom	--	--	12/16/2016	9/24/2017	4	QTp

Well ID	Type of Well	Well Depth (feet)	Screen Interval(s)	First Sampling Event Date	Last Sampling Event Date	Number of Sampling Events	Assumed Aquifer
AGL020028468-AOK DOM	Dom	--	--	6/21/2017	10/30/2017	3	QTp
AGL020028474-KCV DOM 1	Dom	--	--	6/21/2017	10/30/2017	2	QTp
AGL020028474-KCV DOM 2	Dom	--	--	6/21/2017	10/30/2017	2	QTp
AGL020028474-KCV DOM 3	Dom	--	--	6/21/2017	10/30/2017	2	QTp
AGL020035786-MAINCOPIA_DOM	Dom	--	--	1/11/2019	1/11/2019	1	QTp
AGL020000598-FLETCHER IRR	Ag	--	--	3/26/2013	6/14/2013	2	Qa
AGL020003146-RIVER	Ag	--	--	6/8/2015	12/12/2017	3	Qa
AGL020027481-RIVER WELL	Ag	--	--	4/18/2016	9/21/2017	4	Qa
AGL020000484-ROOS-HOMESTEAD	Ag	--	--	11/27/2012	12/12/2017	4	QTp
AGL020000508-AW	Ag	--	--	10/16/2012	6/14/2017	3	QTp
AGL020001000-LAGO FOSSIL	Ag	--	--	12/12/2012	10/26/2017	4	QTp
AGL020001035-AW	Ag	--	--	12/11/2012	6/24/2013	2	QTp
AGL020001138-PRIMARY AW	Ag	--	--	5/14/2013	12/19/2017	4	QTp
AGL020001433-JACK CREEK WELL	Ag	--	--	12/17/2012	12/17/2012	1	QTp
AGL020001433-WHALE ROCK #1	Ag	--	--	12/17/2012	1/17/2018	4	QTp
AGL020001744-BARN WELL	Ag	--	--	10/31/2013	12/8/2017	3	QTp
AGL020001744-POND WELL	Ag	--	--	10/31/2013	12/8/2017	3	QTp
AGL020002320-PRIMARY WELL	Ag	--	--	11/12/2012	6/17/2013	3	QTp
AGL020002364-AG WELL	Ag	--	--	11/28/2012	9/25/2017	4	QTp
AGL020002753-OLEA WELL	Ag	--	--	1/31/2013	12/28/2017	3	QTp
AGL020002801-PROPERTY WELL	Ag	--	--	1/15/2013	9/29/2017	4	QTp
AGL020002926-AW DW	Ag	--	--	2/26/2013	12/12/2017	4	QTp
AGL020003068-AW	Ag	--	--	1/15/2013	11/28/2017	5	QTp
AGL020003146-BARN	Ag	--	--	6/8/2015	12/12/2017	3	QTp
AGL020003461-AG WELL	Ag	--	--	12/11/2012	12/19/2017	3	QTp
AGL020004031-POMAR RIDGE	Ag	--	--	12/3/2012	5/24/2017	3	QTp
AGL020004709-IRR1	Ag	--	--	6/8/2015	12/5/2017	4	QTp
AGL020004789-IRRIGATION	Ag	--	--	3/8/2018	6/8/2018	2	QTp
AGL020005112-AW 1	Ag	--	--	10/16/2012	10/16/2012	1	QTp
AGL020007196-DWS NEW	Ag	--	--	11/16/2012	4/20/2018	3	QTp
AGL020007294-AW	Ag	--	--	12/4/2012	12/12/2017	4	QTp
AGL020007507-ONLY WELL	Ag	--	--	12/17/2013	9/29/2017	3	QTp
AGL020007659-YRLY WTR SAMPLE	Ag	--	--	9/24/2012	4/26/2017	3	QTp

Well ID	Type of Well	Well Depth (feet)	Screen Interval(s)	First Sampling Event Date	Last Sampling Event Date	Number of Sampling Events	Assumed Aquifer
AGL020007709-AG WELL	Ag	--	--	12/5/2012	12/12/2017	4	QTp
AGL020012109-WELL #1	Ag	--	--	12/11/2012	6/21/2017	3	QTp
AGL020012322-WELL 1	Ag	--	--	11/13/2012	10/16/2017	4	QTp
AGL020012322-WELL 2	Ag	--	--	11/13/2012	10/16/2017	4	QTp
AGL020012842-AG WELL	Ag	--	--	11/28/2012	9/25/2017	4	QTp
AGL020013302-WELL 1	Ag	--	--	12/5/2012	10/3/2017	3	QTp
AGL020015262-AVR IRR	Ag	--	--	9/25/2012	11/27/2017	3	QTp
AGL020017182-AG WELL	Ag	--	--	2/28/2013	9/25/2017	4	QTp
AGL020017862-ANDERSON	Ag	--	--	1/3/2013	12/8/2017	3	QTp
AGL020018782-BELLETO	Ag	--	--	5/28/2015	10/11/2017	3	QTp
AGL020022602-WELL	Ag	--	--	4/28/2014	9/25/2017	3	QTp
AGL020023442-WELL	Ag	--	--	4/28/2014	10/13/2014	2	QTp
AGL020025242-PRIMARY AG	Ag	--	--	12/16/2014	8/25/2015	2	QTp
AGL020027472-JAVADI - CAT 1	Ag	--	--	6/20/2016	11/29/2017	4	QTp
AGL020027483-VAQUERO IW	Ag	--	--	12/27/2012	12/12/2017	4	QTp
AGL020027660-AG WELL	Ag	--	--	12/16/2016	9/24/2017	4	QTp
AGL020027743-PRIMARY AG	Ag	--	--	8/25/2015	10/30/2017	4	QTp
AGL020027968-J DUSI WELL 1	Ag	--	--	4/14/2016	4/14/2016	1	QTp
AGL020028424-WELL	Ag	--	--	9/25/2017	9/25/2017	1	QTp
AGL020028474-KCV PRIMARY AG	Ag	--	--	6/21/2017	10/31/2017	2	QTp
AGL020035655-ARBORMAIN_IRR	Ag	--	--	11/16/2018	11/16/2018	1	QTp

Notes: PWS – public water supply well, MW – monitoring well, Dom – domestic well, Ag – agricultural supply well, Qa – Alluvial Aquifer, QTp – Paso Robles Formation Aquifer

Figure 7-3. Groundwater Quality Monitoring Well Network



Atascadero Basin Groundwater Sustainability Plan San Luis Obispo County, California	 	Groundwater Quality Monitoring Well Network	
Atascadero Basin GSA		MAY 2020	FIGURE 7-3

7.4.1 Groundwater Quality Monitoring Data Gaps

Because the GSP groundwater quality monitoring network is based on existing supply wells, there are no spatial data gaps in the network. Table 7-4 summarizes the recommendations for groundwater quality monitoring from the BMPs, the current network, and data gaps. There is adequate spatial coverage in the network to assess impacts to beneficial uses and users. The primary data gap is that well construction info for many wells in the monitoring network is unknown. This is a data gap that will be addressed during GSP implementation.

Table 7-4. Summary of Groundwater Quality Monitoring, Best Management Practices, and Data Gaps

Best Management Practices (DWR, 2016a)	Current Network	Data Gap
<p>Monitor groundwater quality data from each principal aquifer in the basin that is currently, or may be in the future, impacted by degraded water quality.</p> <p>The spatial distribution must be adequate to map or supplement mapping of known contaminants.</p> <p>Monitoring should occur based upon professional opinion, but generally correlate to the seasonal high and low groundwater level, or more frequent as appropriate.</p>	<p>There are 54 municipal wells, 73 IRLP wells, and 55 monitoring wells associated with open/active SWRCB Geotracker contamination sites within the plan area that have been regularly sampled since at least 2015 for groundwater quality.</p>	<p>None; the current monitoring network contains adequate spatial distribution to map water quality in the basin.</p>
<p>Collect groundwater quality data from each principal aquifer in the basin that is currently, or may be in the future, impacted by degraded water quality.</p> <p>Agencies should use existing water quality monitoring data to the greatest degree possible. For example, these could include ILRP, GAMA, existing RWQCB monitoring and remediation programs, and drinking water source assessment programs.</p>	<p>Public databases provide adequate water quality information for degraded water quality.</p>	<p>Well depth and construction info for some wells in the monitoring network is unknown; however, there is adequate coverage in both principal aquifers.</p>
<p>Define the three-dimensional extent of any existing degraded water quality impact.</p>	<p>There are a large number of wells that are actively sampled.</p>	<p>Depth or construction information will need to be obtained for some wells to determine the vertical extent of contaminants.</p>
<p>Data should be sufficient for mapping movement of degraded water quality.</p>	<p>There are a large number of wells that are actively sampled.</p>	<p>None.</p>
<p>Data should be sufficient to assess groundwater quality impacts to beneficial uses and users.</p>	<p>Water quality monitoring program assesses impacts to agricultural, domestic, and municipal users.</p>	<p>None.</p>
<p>Data should be adequate to evaluate whether management activities are contributing to water quality degradation.</p>	<p>There are a large number of wells that are actively sampled.</p>	<p>Projects and actions may be developed. Water quality network will be evaluated and augmented if necessary.</p>

7.4.2 Groundwater Quality Monitoring Protocols

Water quality samples are currently being collected according to SWRCB and ILRP requirements and according to the monitoring plans associated with open/active SWRCB Geotracker contamination sites. ILRP data are currently collected under Central Coast RWQCB Ag Order 3.0. ILRP samples are collected under the Tier 1, Tier 2, or Tier 3 monitoring and reporting programs. Copies of these monitoring and reporting programs are included in Appendix 7B and incorporated herein as monitoring protocols. These protocols will continue to be followed during GSP implementation for the groundwater quality monitoring.

7.5 Land Subsidence Monitoring Network

The sustainability indicator for land subsidence is evaluated by monitoring land subsidence using interferometric synthetic-aperture radar (InSAR) data. As described in Section 5, land subsidence is monitored in the Basin by measuring ground elevation using microwave satellite imagery. This data is currently provided by DWR, covers the most recent three years of subsidence data (2015-2018), and is adequate to identify areas of recent subsidence. The GSA will continue to annually assess subsidence using the DWR provided InSAR data.

7.5.1 Land Subsidence Monitoring Data Gaps

Available data indicate that there is currently no long-term subsidence occurring in the Basin that affects infrastructure. There are no data gaps identified with the subsidence network at this time.

7.5.2 Land Subsidence Monitoring Protocols

The BMP notes that no standard procedures exist for collecting subsidence data. The GSA will continue to monitor data annually as part of GSP implementation. If additional relevant datasets become available, they will be evaluated and incorporated into the monitoring program. If monitoring indicates subsidence is occurring at a rate greater than the minimum thresholds, then additional investigation and monitoring may be warranted. In this case, the GSA would implement a study to assess if the observed subsidence can be correlated to groundwater elevations, and whether a reasonable causality can be established. The GSA will also consider subsidence surveys published by the USGS in assessing land subsidence across the Basin if they become available.

7.6 Interconnected Surface Water Monitoring Network

As discussed in Section 5, the spatial extent of interconnected surface water in the Basin was evaluated using water level data from confidential and non-confidential Alluvial Aquifer and Paso Robles Formation Aquifer wells adjacent to the Salinas River. The GSP groundwater level monitoring network (*see* Table 7-1 and Figure 7-2) contains all of the non-confidential wells used to evaluate interconnected surface water. As discussed in Section 7.2, an effort has been made to reach out to confidential well owners and offer them the opportunity to opt in to the GSP

groundwater level monitoring network. Several wells have been added to the GSP monitoring network as a result of this effort and the GSA will continue to make this effort during implementation. Regardless, as was done for the analysis in Section 5, water level data from the confidential wells will continue to be utilized for evaluations of interconnected surface water in the Basin. In accordance with the assessment of wells discussed in Section 7.2, nine Alluvial Aquifer wells and five Paso Robles Aquifer wells were identified that meet the criteria for inclusion in the GSP groundwater level monitoring network for monitoring shallow groundwater levels adjacent to the Salinas River. These monitoring wells are indicated in Table 7-1 and shown on Figure 7-4.

7.6.1 *Interconnected Surface Water Monitoring Data Gaps*

The existing GSP groundwater level monitoring network provides good coverage to evaluate interconnected surface water in both principal aquifers within the Basin. The network is of sufficient density and spatial distribution especially when coupled with three additional existing confidential wells in the SLOFCWCD groundwater level monitoring network. The potential need for an increased frequency of water level measurements, especially in spring months, to capture annual maximum groundwater levels will be evaluated during GSP implementation.

Although the county of San Luis Obispo(County) records releases from the Salinas Reservoir (upstream of the Basin) and completes “Live Stream” surveys (as described in Section 5) and there is an active USGS stream gaging station in the City of Paso Robles (USGS Station 11147500), there are no surface water gaging stations in the Basin. The potential need for installation of surface water gaging station(s) along the Salinas River within the Basin to aid in determining gaining/losing reaches will be evaluated during GSP implementation.

7.6.2 *Interconnected Surface Water Monitoring Protocols*

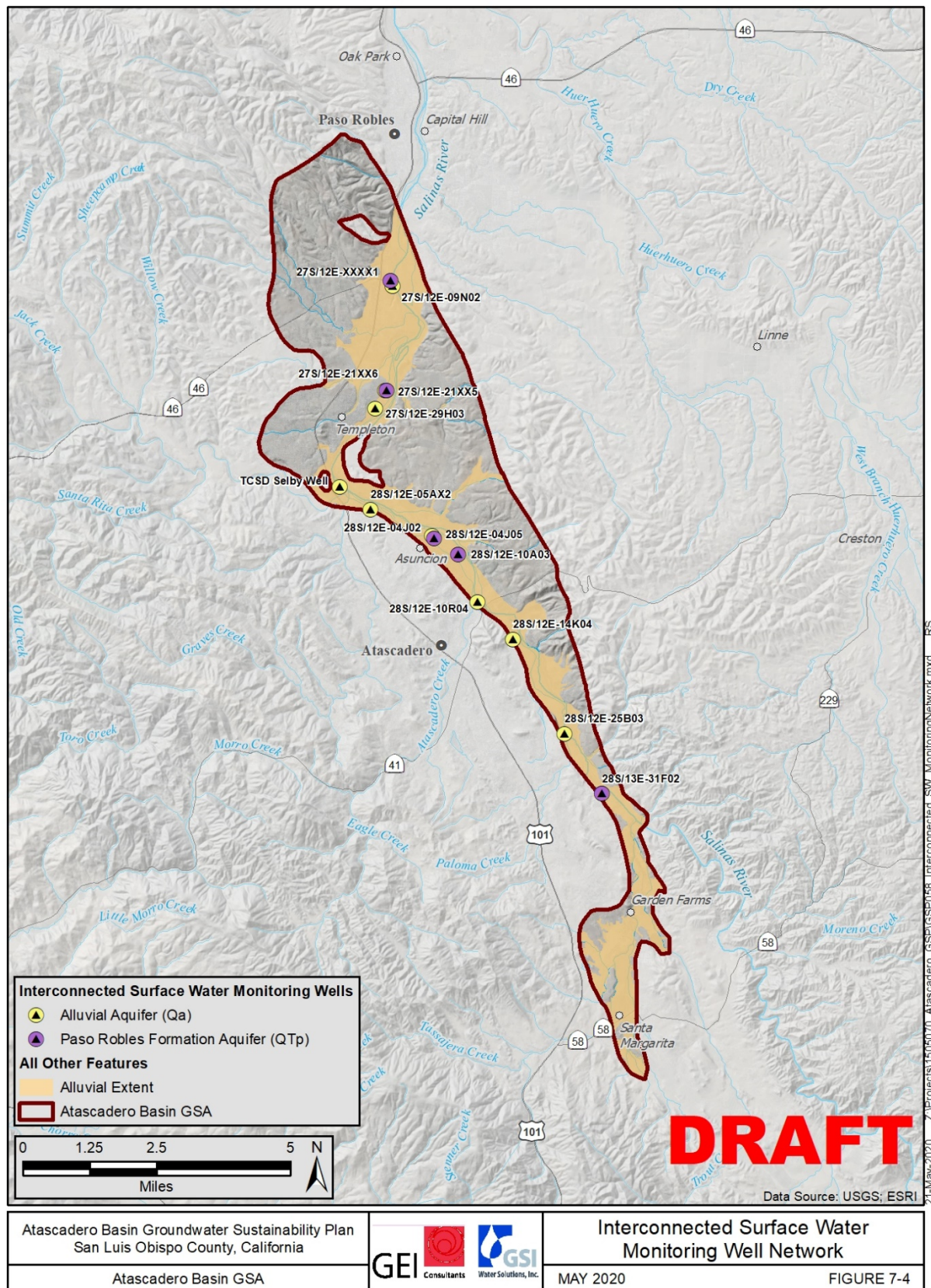
Water level monitoring will be conducted in accordance the protocols described in the water level monitoring network section of this section.

7.7 Data Management System and Data Reporting

The SGMA regulations provide broad requirements on data management, stating that a GSP must adhere to the following guidelines for a data management system (DMS):

- Article 3, Section 352.6: Each Agency shall develop and maintain a data management system that is capable of storing and reporting information relevant to the development or implementation of the GSP and monitoring of the Basin.
- Article 5, Section 354.40: Monitoring data shall be stored in the DMS developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.

Figure 7-4. Interconnected Surface Water Monitoring Well Network



SGMA-related data for the Atascadero Basin will be incorporated into the county-wide Data Management System currently under development for the County as part of another project. The Atascadero Basin GSA and entities that collect and report data within the Basin will have access and authorization to enter their data into the County DMS.

The data and information stored in the DMS will be presented on a web-based map viewer that displays data relevant to SGMA implementation, GSP development, and annual reporting to the DWR. The map viewer accommodates data within and outside of GSA monitoring networks. The types of data visualized on the map and available via the map's navigation menu are listed in Table 7-5.

Table 7-5. Map Viewer Navigation

Menu Navigation	Description
Groundwater Levels	Water level data and associated wells with well completion reports.
Groundwater Storage	GSA groundwater storage monitoring network sites.
Water Quality	Water quality well and station data for greater than 100 constituents (e.g., Magnesium).
Land Subsidence	Subsidence data from extensometers and other stations plus InSAR data.
Interconnected Surface Water	Data related to the interconnected surface water sustainability indicator such as proximity wells, river and stream gages, precipitation stations, and more.
Seawater Intrusion	Sites (primarily wells) tracking the SGMA seawater intrusion sustainability indicator. This data set is not applicable to the Atascadero Basin, but will be present in the San Luis Obispo County DMS.
Hydrogeologic Conceptual Model (HCM)	Data useful for development of a hydrogeologic conceptual model of the basin including suitability of soil for recharge, geologic maps, and fault maps.
Boundaries	GSA and other relevant boundaries.

Data sources used to populate the DMS are listed on Table 7-6. Categories marked with an X indicate datasets that are publicly accessible. Data are compiled and reviewed to comply with data quality objectives. The review included the following checks:

- Identifying outliers that may have been introduced during the original data entry process by others.
- Removing or flagging questionable data being uploaded in the DMS. This applies to historic water level data, water quality data, and water level over time.

The data will be loaded into the database and checked for errors and missing data. Error tables will be developed to identify water level and/or well construction data that were missing. For water level data, another data quality check was completed by plotting well hydrographs to identify and remove anomalous data points.

In the future, well log information will be entered for selected wells and other information will be added as needed to satisfy the requirements of the SGMA regulations.

Table 7-6. Data Sources Used to Populate DMS

Data Sets	Data Category						
	Well and site info	Well construction	Aquifer properties and lithology (data to be added)	Water level	Pumping (data to be added)	Recharge (data to be added)	Water quality
DWR (CASGEM)	X	X		X			
San Luis Obispo County	X	X		X			
SRWCB Geotracker	X	X		X			
Geotracker GAMA	X						X

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Reference

California Department of Water Resources (DWR). 2016. California's Groundwater: Bulletin 118 Interim Update.