

KAWEAH BASIN WATER QUALITY ASSOCIATION

Groundwater Trend Monitoring Workplan – Phase II Addendum

Tulare County, California
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P.O. Box 2840, Visalia, CA 93279

Prepared by:



Certifications

This Groundwater Trend Monitoring Workplan Phase II – Addendum is signed by the following certified professionals:

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Project Team

This Groundwater Trend Monitoring Workplan Phase II – Addendum was prepared by the following project team members:

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The Kaweah Basin Water Quality Association (**KBWQA**) is submitting a “Groundwater Trend Monitoring Work Plan - Phase II Addendum” (**Addendum**) in response to the monitoring requirements described in the Monitoring and Reporting Program Section IV.E required by Waste Discharge Requirements, General Order for Growers in the Tulare Lake Basin that are Members of a Third-Party Group, Order No. R5-2013-0120 (**General Order**). This Addendum is prepared in response to a comment letter dated June 29, 2018, from the Central Valley Regional Water Quality Control Board’s (**Regional Board**) review of the KBWQA Groundwater Trend Monitoring Work Plan – Phase II (**GTMW-II**), submitted on May 16, 2018.

This Addendum fulfills the requirements of Attachment B MRP Section IV.E of the General Order and addresses staff’s comments by providing:

- List of wells that the KBWQA has permission to sample and that compose the groundwater trend monitoring network (**GTM**).
- A map showing the locations of the trend monitoring wells.
- All information required by the General Order No. R5-2013-0120 for trend monitoring wells.

This Addendum clarifies the KBWQA’s GTMW-II well selection approach and provides relevant well details for all wells the KBWQA has received permission to sample. The groundwater trend monitoring process is a dynamic and adaptive process, and as such, the GTM may need to adapt over time to meet the requirements of the General Order. The information presented in this Addendum provides information on the KBWQA’s GTM for Fall 2018.

Attachment B, Section IV.E.2 of the General Order requires details for wells proposed for trend monitoring, including:

- Global Positioning System (GPS) coordinates.
- California State Well Number (if known).
- DWR Well Completion Report/Driller’s Log Number.
- Well depth.
- Top and bottom perforation depths.
- A copy of the well driller’s log (if available).
- Depth of standing water (static water level), if available.
- Well seal information (type of material and length of seal).

The dataset of well details, including construction and location information, is provided in **Table 1**. A map showing the location of the KBWQA’s monitoring wells is provided in **Figure 1**. Section 5 of the KBWQA’s GTM-II describes the methodology used for selecting wells that meet the requirements of Attachment B, MRP Section IV.C.2, including the rationale for the spatial distribution of selected wells.

Design of the GTM considered:

- The types of agricultural crops grown within the KBWQA area, particularly those with the most irrigated agricultural acreage.
- Hydrogeologic conditions, such as relative groundwater depths, groundwater flow direction in relation to DACs, dairy land, and significant recharge areas as determined in the GAR.

The spatial distribution of monitoring areas was not defined by specific acreage or location (grid), but rather by specific criteria. Potential general monitoring areas were initially selected by reviewing crop maps for the largest crop types (by acreage) and selecting areas near each of the crop types that were:

- Located above relatively shallow groundwater.
- Generally, upgradient of a disadvantaged community (**DAC**) or within relatively close proximity of a DAC.
- Located in both low vulnerability areas (**LVA**s) and high vulnerability areas (**HVA**s).
- In areas with greater potential recharge as documented in the GAR.
- Generally representative of NRCS soil textural classes present in the KBWQA area.
- Not downgradient from an area where other land application practices would potentially lead to water quality issues that could not be differentiated from those resulting from farming practices.

Due to the long-term monitoring requirement, it is anticipated that the well network will need to be modified over time. Necessary changes will be made to maintain a regional representation of groundwater quality. The KBWQA will maintain information for backup wells to ensure the continuity of the trend monitoring program. In addition, the KBWQA supports the concept presented in Section 3.6, “Dynamic Network: Adaptive Design and Refinement”, of the Central Valley Groundwater Monitoring Collaborative (**CVGMC**) Technical Workplan. The initial well network design will require ongoing evaluation of the spatial representation and sufficiency to fulfill the requirements of the General Order.

The KBWQA will evaluate the adequacy of the monitoring network over time with respect to changes in the distribution of irrigated agriculture. Spatial coverage of the monitoring well network will be adaptive and necessary changes will be made to maintain a regional representation of groundwater quality. Changes to the trend monitoring network will be discussed with Regional Board staff at least 60 days before trend monitoring begins for the next water year (October 1 - September 30).

As a member of the CVGMC, the KBWQA plans to begin sampling of the GTM by Fall of 2018, upon Executive Officer approval. The KBWQA will coordinate with other CVGMC members to schedule annual sampling. As stated in Section 6 of the KBWQA’s GTM-II, annual sampling will occur at the same time of the year and Table 6-1 demonstrates that annual sampling will include all the constituents required by Table 3 of Attachment B, MRP Section IV.E.

As required by Attachment B, MRP Section IV.E.3 and MRP Section V.B, the KBWQA will submit required groundwater monitoring results as an Excel workbook containing an export of all data records uploaded to the State Water Resources Control Board’s GeoTracker database. After data records are uploaded in the GeoTracker database, the KBWQA will also submit required Electronic Deliverable Format (**EDFs**) directly to the CVGMC. Shapefiles for needed key figures and maps will be submitted in a readable format and media type with the report submittals. In the case that any data are missing from the report, a submittal will be included with a description of what data are missing and when they will be submitted to the Regional Board. Samples collected during the early part of the 2018-2019 water year (after October 1, 2018) will be reported and evaluated in coordination with the CVGMC specified timelines.

As the GTM evolves, evaluation methods to address the changing needs of the groundwater quality trend monitoring program will be reviewed annually and described in the annual monitoring report (**AMR**). Once each annual data set is tabulated, it will be assessed for data sufficiency. Some trend analysis methods require an accumulation of data over time, and others require minimum analytical suites. Specifically, groundwater elevation graphs (hydrographs) will be prepared from the initial

monitoring event and updated annually. To be meaningful, these graphs rely on the change in elevation over time. It is anticipated that a minimum of five to ten years of data will be needed to begin to provide a representation of the changes in groundwater levels. Time-series concentration graphs will be prepared from the initial sampling results and updated annually. As with the hydrographs, these graphs rely on the change in constituent concentrations over time. A minimum of five to ten years of data will be needed to begin assessing the concentration changes.

Table 1. KBWQA Well Locations and Construction Details

APN	Area	TRS	Latitude	Longitude	Physical Address	Well Depth (feet)	Open Bottom Well?	Top Perforation Depth (feet)	Bottom Perforation Depth (feet)	Well Driller's Log Number	Depth of Standing Water (feet)	Well Seal Depth (feet)	Well Seal Material
057-060-045	1	T17SR26E24	36.429063	-119.109	20800 Ave. 352, Woodlake	116	No	56	116	498571	47.12	50	Cement
079-050-065	16	T18SR25E16	36.368128	-119.277	31812 Rd. 132, Visalia	180	No	140	180	718552	103.95	23	Cement
079-130-050	17	T18SR25E08	36.381252	-119.285	32595 Rd. 132, Visalia	168	Yes	N/A	N/A	773617	116.61	20	Cement
085-570-007	23	T18SR24E27	36.337056	-119.361	6306 W. Hurley, Visalia	209	No	189	209	E0005874	148.46	20	Cement
108-100-037	15	T18SR25E13	36.358628	-119.220	15600 Mills Dr., Visalia	150	Yes	N/A	N/A	461065	70.34	20	Cement
110-050-004	5	T18SR2E03	36.395523	-119.144		176	No	96	166	468659	65.80	20	Cement
111-060-036	10	T18SR26E21	36.355412	-119.165		159	No	70	140	E0181205	24.50	20	Bentonite
112-050-034	4	T18SR26E12	36.384126	-119.111	20695 Ave. 328, Woodlake	140	No	20	120	517596	22.36	20	Bentonite
112-230-006	7	T18SR26E26	36.344112	-119.117		192	No	92	192	415022	64.63	20	Cement
133-020-075	20	T19SR26E05	36.295544	-119.174	27854 Morgans Dr., Exeter	130	No	80	130	489256	102.21	55	Cement
141-060-029	21	T19SR26E24	36.267647	-119.107		225	Yes	N/A	N/A	582463	140.23	20	Bentonite
153-150-008	3	T20SR23E21	36.265167	-119.173		270	No	220	260	399453	80.32	20	Cement
174-100-001	9	T20SR24E26	36.163903	-119.345		141	Yes	N/A	N/A	517141	-	20	Cement
111-160-016	18	T18SR26E30	36.334368	-119.185		150	No	88	120	381640	42.00	20	Grout

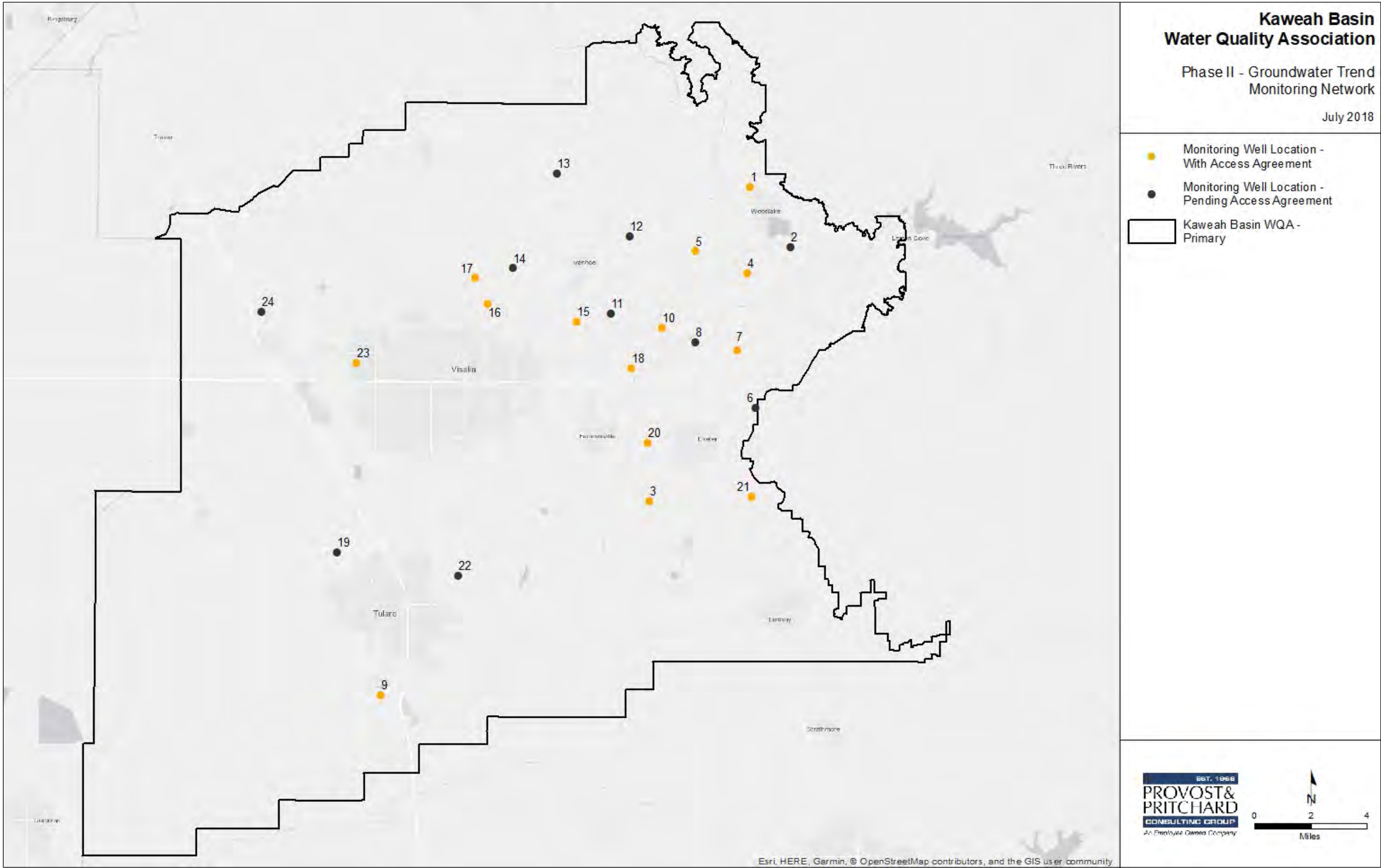


Figure 1. KWBCA's Well Monitoring Network Map