SAN JOAQUIN VALLEY DRAINAGE AUTHORITY

WESTSIDE SAN JOAQUIN RIVER WATERSHED COALITION

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May 16, 2018

Ms. Pamela Creedon, P.E.
Executive Officer
Central Valley Regional Water Quality Control Board
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Rancho Cordova, CA 95670-6114

SUBJECT: WESTERN SAN JOAQUIN RIVER WATERSHED GROUNDWATER QUALITY TREND MONITORING WORKPLAN PHASE 2 WDR GENERAL ORDER R5-2014-0002

Dear Pamela:

The Central Valley Regional Water Quality Control Board's (CVRWQCB) *Order No. R5-2014-0002 Waste Discharge Requirements General Order for Growers within the Western San Joaquin River Watershed that are Members of the Third-Party Group* (WSJRWC WDRs) requires the Westside San Joaquin River Watershed Coalition (Coalition) to develop a Groundwater Quality Trend Monitoring (GQTM) Program. Key to the GQTM Program is the design of a network of wells that will generate the data necessary to meet the program's objectives, as specified in the WSJRWC WDRs.

The document, the *Western San Joaquin River Watershed Groundwater Quality Trend Monitoring Workplan, Phase 2 – Determination of Network Wells*, addresses the requirements for the GQTM Program as outlined in the WSJRWC WDRs Attachment B, Sections IV.C and IV.E. Specifically, this Workplan:

1. Discusses the approach and rationale for the design of the monitoring program, as they relate to the WSJRWC WDRs,
2. Describes the methodology and presents the results for the delineation of areas where trend monitoring is to occur,
3. Identifies a pool of candidate wells,
4. Outlines the process and criteria used to select a network of GQTM wells for fulfilling the monitoring requirements,
5. Presents the proposed GQTM well network,
6. Proposes a schedule for well sampling and GQTM reporting,

7. Develops a sampling and analysis plan,
8. Describes anticipated approaches to long-term data evaluation,
9. Discusses considerations for the ongoing evaluation and refinement of the GQTM Program, and
10. Highlights linkages and coordination of the GQTM with the Central Valley Groundwater Monitoring Collaborative.

The outcome of this Workplan is the initial proposed GQTM well network, which is considered the beginning of an evolving network, not a static end result. The initial GQTM well network will consist of principal wells and complementary wells. Principal wells are those that meet the requirements of the WSJRWC WDRs and the Coalition can successfully gain access to. However, it is anticipated that the vetting process will identify wells that would add substantial value to the GQTM effort although they may not satisfy these two criteria. These wells will be included in the GQTM well network as complementary wells.

The GQTM design approach recognizes the importance for the monitoring program to be allowed to evolve over time based on consideration of data derived through implementation of the program itself. This favors a relatively simple initial well network design but also necessitates continuous evaluation. Therefore, the spatial representation and sufficiency of the GQTM well network will be evaluated on an annual basis with respect to the objectives of the program.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel or represented members properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment for violations.

We would be pleased to discuss any questions or comments you may have regarding the enclosed Workplan.

Sincerely,

Joseph C. McGahan
Watershed Coordinator
Westside San Joaquin River Watershed Coalition

enclosure

Western San Joaquin River Watershed
Groundwater Quality Trend Monitoring Workplan
Phase 2 - Determination of Network Wells



May 2018

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

Western San Joaquin River Watershed

Groundwater Quality Trend Monitoring Workplan

Phase 2 – Determination of Network Wells

May 2018

Prepared For

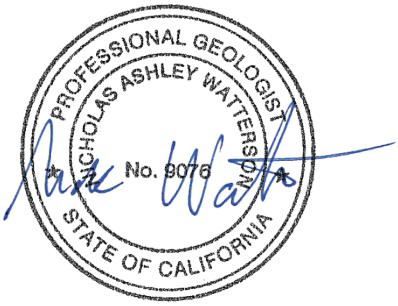
SAN JOAQUIN VALLEY
DRAINAGE AUTHORITY

On Behalf Of

Westside San Joaquin River Watershed Coalition

Prepared By

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS



May 16, 2018

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Acronyms

CDP	Census Designated Places
Coalition	Westside San Joaquin River Watershed Coalition
coalitions	any of the water quality coalitions formed in response to the ILRP
COC	Constituents of Concern
CVRWQCB	Central Valley Regional Water Quality Control Board
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
DAC	Disadvantaged Community
DDW	SWRCB's Division of Drinking Water
DPR	California Department of Pesticide Regulation
DUC	Disadvantaged Unincorporated Community
DWR	California Department of Water Resources
GAR	Groundwater Assessment Report
GIS	Geographic Information Systems
GQMP	Groundwater Quality Management Plan
GQTM	Groundwater Quality Trend Monitoring
HVA	High Vulnerability Groundwater Areas
ILRP	Long-Term Irrigated Lands Regulatory Program
LVA	Low Vulnerability Groundwater Areas
MCL	Maximum Contaminant Level (for regulated drinking water contaminants)
MPEP	Management Practice Evaluation Program
NOA	Notice of Applicability
NOI	Notice of Intent
PLSS	Public Land Survey System
PWS	Public water system
QAPP	Groundwater Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
SAMP	CV-SALTS' Surveillance and Monitoring Plan
SNMP	CV-SALTS' Salt and Nitrate Management Plan
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WCR	Well Completion Report
WDRs	Waste Discharge Requirements
WSJRWC	Westside San Joaquin River Watershed Coalition

Executive Summary

The Central Valley Regional Water Quality Control Board's (CVRWQCB) *Order No. R5-2014-0002 Waste Discharge Requirements General Order for Growers within the Western San Joaquin River Watershed that are Members of the Third-Party Group* (WSJRWC WDRs) requires the Westside San Joaquin River Watershed Coalition (Coalition) to develop a Groundwater Quality Trend Monitoring (GQTM) Program. Key to the GQTM Program is the design of a network of wells that will generate the data necessary to meet the program's objectives, as specified in the WSJRWC WDRs.

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The GQTM design approach recognizes the importance for the monitoring program to be allowed to evolve over time based on consideration of data derived through implementation of the program itself. This favors a relatively simple initial well network design but also necessitates continuous evaluation. Therefore, the spatial representation and sufficiency of the GQTM well network will be evaluated on an annual basis with respect to the objectives of the program.

1 Introduction

The Central Valley Regional Water Quality Control Board's *Order No. R5-2014-0002 Waste Discharge Requirements General Order for Growers within the Western San Joaquin River Watershed that are Members of the Third-Party Group*, hereafter referred to as the WSJRWC WDRs (CVRWQCB, 2014), requires the Westside San Joaquin River Watershed Coalition (Coalition) to develop a Groundwater Quality Trend Monitoring (GQTM) Program for the Western San Joaquin River Watershed area. The Coalition region encompasses more than 1.27 million acres, including about 400,000 acres of irrigated agricultural land, primarily within the San Joaquin Valley Groundwater Basin and the Central Valley Floor area (**Figure 1-1**). The Coalition represents growers in the San Joaquin River Watershed area, including through member Districts shown on **Figure 1-1**. Key to the GQTM Program is the design of a network of wells that will generate the data necessary to meet the objectives of the GQTM Program.

This document, the *Western San Joaquin River Watershed Groundwater Quality Trend Monitoring Workplan, Phase 2 – Determination of Network Wells*, addresses the requirements for the GQTM Program as outlined in the WSJRWC WDRs Attachment B, Sections IV.C and IV.E. Specifically, this Workplan:

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The GQTM design approach recognizes the importance for the monitoring program to be allowed to evolve over time based on consideration of data derived through implementation of the program itself. This favors a relatively simple initial well network design but also necessitates continuous evaluation.

Therefore, the spatial representation and sufficiency of the GQTM well network will be evaluated on an annual basis with respect to the objectives of the program.

The Workplan presents the proposed network of wells to be used in the GQTM with results from initial vetting of candidate wells. Not all wells included in the proposed GQTM well network have been completely vetted relating to the details of well construction and well site conditions and well owner agreements have not been confirmed, where needed. Additional vetting of the proposed GQTM network wells is planned prior to the initial sampling to confirm or further evaluate the suitability of wells for the GQTM network. Details on any network modifications, including any additional wells added to the network, will be presented in the GQTM Annual Report. The required elements of the GQTM Workplan, and where the required elements will be addressed are shown in **Table 1-1**.

The Coalition is a participant in the Central Valley Monitoring Collaborative (CVGMC), which is intended to facilitate coordinated groundwater quality monitoring and reporting efforts between numerous agricultural Coalitions and other dischargers and monitoring entities within the Central Valley as part of fulfilling regulatory requirements associated with the ILRP, the Central Valley Salt and Nitrate Management Plan (SNMP), and other waste dischargers. The Coalition GQTM Workplan describes the approach used in designing the GQTM well network specific to the Coalition region. The approach to the GQTM data analysis and reporting will be consistent and coordinated with the approach described in the CVGMC Phase 1 ILRP Technical Workplan (CVGMC Technical Workplan) (LSCE et al., 2018), which is also due on May 16, 2018 and is being submitted by the CVGMC concurrent with this GQTM Workplan.

Table 1-1: Groundwater Quality Trend Monitoring Workplan Items Identified in the WDRs

GQTM Workplan Items Identified in Monitoring and Reporting Program (Appendix B) of the WDR General Order	Where Addressed		How Addressed
	Workplan (Phases 1&2)	*Annual Report*	
1. Workplan Approach			
Discussion of the rationale for the number of proposed wells to be monitored and their locations	X		Workplan: Rationale monitoring approach, target well depth, and proposed monitoring emphasis and approach based on numerous prioritization factors; initial proposed GQTM well network Annual Report: Finalized GQTM well network after complete well vetting
A. *Consideration of variety of agricultural commodities produced within the third-party's boundaries*	X		
B. *Consideration of conditions discussed/identified in the GAR related to the vulnerability prioritization*	X		
C. *Consideration of areas identified in GAR as contributing significant recharge to urban and rural communities where groundwater serves as a significant source of supply*	X		
2. Well Details			
Details for well proposed for trend monitoring	X	X	Workplan: Information on proposed GQTM network wells Annual Report: Confirmed well details after final vetting
A. GPS coordinates	X	X	
B. Physical address of the property on which the well is situated (if available)	X	X	
C. California State well number (if known)	X	X	
D. Well depth	X	X	
E. Top and bottom perforation depths	X	X	
F. Copy of DWR Well Completion Report (water well drillers log), if available	X	X	
G. Depth of standing water (static water level), if available (may be obtained after implementing program)		X	
H. Well seal information (type of material, length of seal)	X	X	

Table 1-1 (continued): Groundwater Quality Trend Monitoring Workplan Items Identified in the WDRs

GQTM Workplan Items Identified in Monitoring and Reporting Program (Appendix B) of the WDR General Order	Where Addressed		How Addressed
	Workplan (Phases 1&2)	*Annual Report*	
3. Proposed Sampling Schedule			
Trend monitoring wells to be sampled, at a minimum, annually at the same time of year for indicator parameters (parameters identified in Table 3 of WDRs, Attachment B).	X	X	Workplan: Proposed sampling schedule will be in accordance with CVGMC Technical Workplan (LSCE et al., 2018) with initial sampling anticipated in Fall 2018; proposed sampling schedule is included pending coordination with ongoing monitoring by others. Annual Report: Specific timing of sampling to depend on vetting of wells and determined in conjunction with existing monitoring by others.
4. Workplan Implementation and Analysis			
Proposed methods to be used to evaluate trends in the groundwater monitoring data over time.	X		Workplan: Methods and schedule proposed to present results and evaluate temporal trends and spatial patterns in trends will be in accordance with analysis and reporting discussed in CVGMC Technical Workplan; summary of the proposed methods and reporting schedule is included.

1.1 Background

The CVRWQCB initiated the Irrigated Lands Program in 2003 with the adoption of a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands. The Irrigated Lands Program, later the Long-Term Irrigated Lands Regulatory Program (ILRP), was developed to regulate discharges from irrigated agriculture to surface waters. The WSJRWC WDRs, along with other orders to be adopted for the irrigated lands in the Central Valley, constitute the ILRP, an expansion of the initial program.

The adoption of the WSJRWC WDRs by the CVRWQCB on January 9, 2014 starts the timeline for several ILRP requirements associated with the CVRWQCB's strategy for evaluating groundwater quality and protection. This strategy consists of four related efforts, the Groundwater Quality Assessment Report (GAR), the Management Practices Evaluation Program (MPEP), the GQTM Program, and the Groundwater Quality Management Plan (GQMP). Per the WSJRWC WDRs, the GAR is to provide the foundational information necessary for the design of the MPEP and the GQTM Program.

The GAR was submitted on March 16, 2015 (LSCE et al., 2015) and was approved by the Executive Officer on September 16, 2015 (CVRWQCB, 2016). The CVWQCB's approval established the required the GQTM Workplan submittal date of September 16, 2016, one year after GAR approval. The Coalition submitted a *GQTM Workplan - Phase 1 Monitoring Design Approach* on September 16, 2016, which presented the conceptual approach for the network design for discussion with the CVRWQCB prior to designing the GQTM network. The *GQTM Workplan Phase 1* also outlined a conceptual approach for developing a groundwater quality monitoring program with the goal of coordinating groundwater quality monitoring across the Central Valley was presented. This proposed regional monitoring program was eventually approved by the CVRWQCB as the Central Valley Groundwater Monitoring Collaborative (CVGMC) with a submittal date for a CVGMC Technical Workplan on May 16, 2018. As a condition of the Coalition's participation in the CVGMC, the CVRWQB revised the due date for submittal of the Coalition's GQTM Workplan to May 16, 2018. The WSJRWC WDRs also require that a Groundwater Quality Assurance Project Plan (QAPP) be submitted at the same time as the GQTM Workplan. The QAPP requirement for the GQTM is being satisfied through coordination with the programmatic QAPP or Quality Assurance Program Plan (QAPrP) for the CVGMC, which is also being submitted on May 16, 2018 (MLJ et al., 2018) along with the CVGMC Technical Workplan (LSCE et al., 2018). The relevance of the GAR, the MPEP, and the GQMP to the GQTM are briefly described below.

Groundwater Assessment Report: The GAR is a key element of the ILRP, with a focus on the assessment of groundwater conditions and long-term protection of regional groundwater quality. For this purpose, the GAR reviewed previous studies related to groundwater quality and hydrogeology, and analyzed large data sets pertaining to hydrogeology, soil characteristics, land use, and groundwater quality with an emphasis on the constituents of concern (COCs) generally associated with irrigated agriculture (i.e., nitrate, salinity, and pesticides). The GAR documents current groundwater quality in the Coalition region and evaluates the influence of irrigated agriculture on groundwater quality. The primary GAR outcome which is of importance to this GQTM Workplan is the areal delineation of groundwater vulnerability, specifically the location of high and low vulnerability groundwater areas (HVAs and LVAs), where irrigated agriculture operations have impacted or are more/less likely to impact groundwater quality. The HVAs were directly incorporated into this report's methodology for the delineation of areas for trend monitoring (*Section 3.2*). The GAR established that groundwater in the Coalition region has naturally high salinity with some areas of concern related to nitrate. Pesticides do not appear to present a significant issue in the region based on the relatively few pesticide detections found in groundwater. Nitrate, however, was detected in areas within the Central Valley floor, and is considered the primary COC (LSCE et al., 2015).

Management Practice Evaluation Program: The WSJRWC WDRs require the retrieval of groundwater samples for chemical analyses as part of the MPEP and the GQTM Program. However, the objectives of the two programs are very different and, as a result, the scope of the well network designs and data collection efforts will also be very different between these programs. Fundamentally, the MPEP seeks to identify cause-and-effect relationships between specified (i.e., quantified, semi-quantified, categorized, and/or otherwise described) agricultural practices and chemical concentrations in first encountered groundwater. This is a site-specific (potentially commodity-specific) effort that seeks to isolate specific agricultural practices for purposes of evaluating their effect on groundwater chemical concentrations. Consistent with this purpose, the WSJRWC WDRs explicitly require for the MPEP Workplan (Attachment

B, Section IV.D.1., p. 25), "*Any groundwater quality monitoring that is part of the workplan must be of first encountered groundwater*."

Groundwater Quality Management Plan: The intent of the GQMP is to reduce and/or eliminate impairments of beneficial uses of groundwater and involves implementing three activities (WDRs, Attachment B, Appendix MRP-1):

1. A broad-spectrum method of evaluation of whether constituents of concern in groundwater are related to agricultural practices and identification of potential agricultural sources,
2. Outreach to all members whose parcels lay above groundwater identified as exceeding water quality parameters, providing recommendations of management practices with the potential to be effective in managing discharges,
3. Monitoring to evaluate the efficacy of those implemented management practices.

In essence, the GQMP ties together findings from the GAR (including its five-year updates), the MPEP, and the GQTM Program and makes sure that these findings result in actionable items for Coalition members.

1.2 Collaboration Across Water Quality Coalition Boundaries

On May 5, 2017, the CVRWQCB's Executive Officer authorized coalitions to participate in the CVGMC and comply with the GQTM requirements through participation in the CVGMC. Key objectives of the CVGMC include developing a consistent approach to groundwater quality monitoring intended to:

- Maximize the efficiency and efficacy of Central Valley wide monitoring activities,
- Reduce redundancy with other required monitoring programs,
- Streamline the trend monitoring effort, and
- Provide efficiencies for addressing required trend monitoring and analysis aspects of the required five-year GAR updates.

It is anticipated that a collaborative approach can be devised to take advantage of the similarities between coalitions' conditions and circumstances, while also recognizing the differences. Therefore, potential benefits of this type of collaboration not only apply to the technical approach used for the initial design of the trend monitoring well network, but also to comprehensive data analysis and reporting in the future. Most importantly, the broader approach may allow coalitions to provide a less costly alternative to the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) Surveillance and Monitoring Program (SAMP) (CV-SALTS, 2017).

A Conceptual Workplan for the CVGMC was submitted on October 31, 2017 outlining a multi-phased approach to achieving the CVGMC objectives. The first phase in the approach includes a Technical Workplan that will present the approach for monitoring and reporting that participating Coalitions will follow as part of individual Coalition compliance with their respective GQTM requirement. In accordance with the letter of Conditional Approval (CVRWQB, 2017) of the CVGMC Conceptual Workplan, the CVGMC provided a schedule for completion of the CVGMC Technical Workplan including submittal of the Workplan by May 16, 2018.

2 Foundational Coalition Region Information

The GAR for the Coalition region contains detailed information on land use, hydrogeology, historical groundwater quality, and analyses leading to the identification of high vulnerability areas (LSCE et al., 2015). This section summarizes foundational data pertinent to the GQTM program; some of the information presented below has been updated since the GAR.

2.1 Basins and Subbasins

The California Department of Water Resources (DWR) mapped alluvial groundwater basins and subbasins in the Central Valley (DWR, 2016) (**Figure 2-1**). The Coalition region overlies portions of several subbasins within the San Joaquin Valley Groundwater Basin including and most of the Delta-Mendota Subbasin and parts of several subbasins on the east side of the San Joaquin. The Coalition region also encompass the Los Banos Creek Valley Groundwater Basin, located peripheral to the Central Valley Floor. The majority of the groundwater in the Western San Joaquin River Watershed is stored in alluvial aquifers (DWR, 2015), which occur primarily within the Central Valley Floor in the Coalition region.

2.2 Groundwater Use and Well Construction

Because of the naturally high salinity in much of the groundwater within the Coalition region, the number of wells in the area and the beneficial use of groundwater in the area are somewhat limited. Well Completion Reports (WCRs) submitted to DWR were used to evaluate the distribution and the uses of groundwater wells in the region (DWR, 2017a). DWR does not have WCRs for all of the wells completed in the region. For some wells, information regarding their location, construction, well use, or other attributes is inaccurate, incomplete, ambiguous, or missing (DWR, 2015). Limited review of the available WCR data for the Coalition region was conducted to evaluate the degree to which these data accurately reflect current groundwater uses in the area.

Characteristics related to the construction of wells are a highly important consideration in identification of wells suitable for use as part of the GQTM network. This includes information about well depth, perforated interval (i.e., depth to the top and bottom of perforations or screens), and seal depth and material. Some of these well details are available in public well databases; however, well details should be confirmed through association of DWR WCRs with GQTM network wells, whenever possible, or through other reliable means, as appropriate.

Based on data in the DWR WCR database (DWR, 2017a), the average depths of domestic, agricultural and public water supply (PWS) wells by Public Land Survey System (PLSS) section are shown on **Figures 2-2** to **2-4**. The relationship between the depths of these well types and their depth of completion within the underlying groundwater system is discussed in *Section 2.3*. The distribution and density of wells by different well type are presented in **Appendix A**. Although **Figures 2-2** to **2-4** and **Appendix A** present a summary of the WCR data as reported in the DWR database for the area, it is notable that review of the WCRs conducted during the development of the GQTM network confirmed that the WCR database maintained by DWR contains many mislocated, abandoned, or misattributed wells in the Coalition region.

2.3 Target Monitoring Depth: Upper Zone of Groundwater System

Nomenclature regarding the groundwater system was developed for the CV-SALTS initiative as part of technical work for the Central Valley SNMP (CV-SALTS, 2016). Specifically, the depth zones used by CV-SALTS (LSCE and LWA, 2016) are defined as follows (schematics are shown in **Figures 2-5A** and **2-5B**)[1]:

Upper Zone (Central Valley)

- Includes the depth from the bottom of the vadose zone to the top of the Lower Zone.
- The depth of the Upper Zone is based on well construction information, as possible, and other comparable information that provides the best available indication of well depth; the analysis gives the highest weight to domestic well depths.

Lower Zone (Central Valley)

- Includes the depth from the bottom of the Upper Zone to the depth of the bottom of the Lower Zone. The depth of the Lower Zone is based on well construction information, as possible, and other comparable information that provides the best available indication of well depth; the analysis gives the highest weight to municipal well depths.

The Upper Zone (**Figure 2-5A**) was defined at a Central Valley-wide scale to represent the depth zone in which relatively shallow groundwater production occurs. The Upper Zone, or upper part of the aquifer system, is based on weighting of well construction information from the USGS Central Valley Hydrologic Model (Faunt et al., 2009) and typical well construction from WCRs, with consideration of other hydrogeologic information, including the depth of the top of the Corcoran Clay (LSCE and LWA, 2016). Specifically, the Upper Zone delineation incorporated calculations based on the following weighting scheme for available well construction information (LSCE and LWA, 2016):

- Domestic wells bottom perforations (from the Central Valley Hydrologic Model [CVHM]) – 40 percent;
- Farm wells top perforations (from CVHM) – 10 percent;
- Urban PWS wells top perforations (from CVHM) – 20 percent;
- Rural PWS wells top perforations (from CVHM) – 20 percent;
- SWRCB Division of Drinking Water (DDW) system database wells top perforations – 10 percent.

Where the Corcoran Clay is present, the Upper Zone does not extend below the Corcoran Clay (LSCE and LWA, 2016).

The Upper Zone varies in depth within the Coalition region from less than 100 feet below ground surface (BGS) to over 400 feet BGS (**Figure 2-6**) with the shallower areas generally occurring in the northern part of the Coalition region where the Corcoran Clay is also shallow. The depth to the bottom of the Upper Zone within the HVA is consistent with the Coalition-wide Upper Zone depth range**.** Although, the Upper Zone is the target zone for the GQTM and for evaluating groundwater quality trends relating to agricultural practices, the population of wells to select from for this purpose is limited in some areas,

[1] Additional information is contained in LSCE and LWA (2016) for areas where the Corcoran Clay member is present.

particularly where the Upper Zone is shallow. As illustrated in **Figures 2-2** to **2-4**, many wells are constructed to depths below the Upper Zone.

Very shallow groundwater underlies much of the Coalition region and commonly occurs within 25 feet of the ground surface and can be high in salinity. In the GAR the zone of very shallow groundwater was considered to be the zone up to 50 feet deep. This zone likely represents "first-encountered groundwater", and as suggested on **Figures 2-2** to **2-4**, is not believed to provide a major supply of water for agricultural or drinking water supplies in the Coalition region. Therefore, the zone of very shallow groundwater (<50 feet) is not a target for the GQTM Program.

2.4 Groundwater Quality: Current Conditions

Cooperative opportunities with ongoing monitoring already being conducted by others is another important consideration for the development of the GQTM Program. Existing monitoring activities by other entities provide an opportunity to incorporate monitoring locations with potentially extensive historical water quality records that can help improve and accelerate the identification of long-term groundwater quality trends. Utilizing monitoring by others also minimizes unnecessary redundancy of groundwater monitoring activities, resulting in reduced overall cost of the GQTM Program. This may allow the Coalition to direct additional resources towards addressing and implementing improvements across other elements of the ILRP or other groundwater management programs.

Recent and/or ongoing monitoring of wells is a helpful indicator of wells that are potentially available and accessible for monitoring as part of the GQTM Program. A variety of wells throughout the Coalition region have historically been monitored for groundwater quality by various entities, including water and irrigation districts, municipalities and public water systems, and governmental entities such as the USGS, DWR, California Department of Pesticide Regulation (DPR), and counties (**Figure 2-7**). Monitoring entities that have conducted recent groundwater quality monitoring are summarized in the GAR. The suitability of wells being monitored by others for inclusion in the GQTM network, through evaluation of the nature of ongoing monitoring efforts and potential for a cooperative arrangement with the Coalition as part of the GQTM, is an important consideration in the design of the GQTM well network.

2.4.1 Groundwater Quality: Nitrate

Characterization of the current groundwater quality conditions relevant to irrigated agriculture was previously accomplished as part of the GAR through the assembly and evaluation of extensive current and historical groundwater quality information for the Coalition region (LSCE et al., 2015). Detailed documentation and summarization of the groundwater quality characterization for the Coalition region are contained within the GAR.

The existence and duration of historical water quality data are important factors in considering candidate trend monitoring wells because such data provide a foundation with which to evaluate long-term trends in concentrations especially as they relate to legacy conditions and changing trends and concentrations resulting from agricultural practices. Primary considerations relating to the historical water quality record for a well consist of the time period (range of dates) and the total number of available water quality results. For the purpose of identifying potential candidate monitoring wells, the

availability of historical nitrate concentration data was considered because this parameter is a useful indicator of influences from irrigated agriculture and because nitrate as nitrogen data are more widely available than many other water quality parameters. Nitrate is a major COC in the Coalition region and **Figures 2-8** and **2-9** show the average and maximum nitrate as nitrogen concentrations for wells monitored historically in the Coalition region (data set range varies by well, total range 1944-2018).

2.5 Land Use: Irrigated Agriculture

For the GQTM, monitoring is to be focused on groundwater quality trends in relation to irrigated agriculture. Thus, the extent and density of irrigated agriculture are key factors for monitoring prioritization and areas with intensive irrigated agriculture are given a priority for monitoring.

The GAR (LSCE et al., 2015) includes land use information from 2013. This Workplan uses 2016 land use information available from the U.S. Department of Agriculture (USDA) Cropscape dataset (USDA, 2016). Land use within the Coalition is a mix of agricultural and non-agricultural. In some cases, areas indicated by the 2016 USDA data as agricultural land use are not actually irrigated lands; this can occur on lands that are dry-farmed. Major land use types are mapped in **Figure 2-10** and summarized in **Table 2-1**. The following categories of land uses are considered to be irrigated agriculture:

- Citrus & Subtropical Crops
- Field Crops
- Fruit Tree Crops
- Grain & Hay Crops
- Nut Tree Crops
- Rice
- Seed & Bean Crops
- Vegetable Crops
- Vineyard Crops

The dominant categories of irrigated agriculture are grain and hay crops and nut trees within the entire Coalition region, and within a one-mile radius of identified communities.

Wetland areas, including managed wetlands, total about 80,000 acres within the Coalition region and are not considered irrigated agriculture for the purpose of the GQTM.

Table 2-1: Summary of 2016 Land Use

Land Use Type	Western San Joaquin River Watershed		Within One Mile of Communities	
	Acreage	Percent of Area	Acreage	Percent of Area
Citrus & Subtropical[1]	671	0.1%	142	0.1%
Field Crops[1]	70,433	5.5%	18,334	12.3%
Fruit Trees[1]	1,548	0.1%	282	0.2%
Grain & Hay[1]	120,687	9.5%	27,206	18.2%
Nut Trees[1]	117,897	9.3%	23,841	15.9%
Rice[1]	710	0.1%	181	0.1%
Seeds & Beans[1]	5,523	0.4%	2,148	1.4%
Vegetables[1]	49,129	3.9%	10,924	7.3%
Vineyards[1]	12,719	1.0%	1,887	1.3%
Idle	49,029	3.9%	7,578	5.1%
Pasture	401,494	31.6%	19,389	13.0%
Native	379,601	29.9%	17,292	11.6%
Urban	61,137	4.8%	20,386	13.6%
TOTAL	**1,270,577**	**100%**	**149,588**	**100%**

[1] Considered irrigated agriculture for analyses in the GQTM Workplan

2.6 High Vulnerability Areas

HVAs are characterized by intrinsic physical properties that cause groundwater in an area to be particularly vulnerable to potential impacts from overlying land uses. The WSJRWC WDRs require the delineation of HVAs (and by default, LVAs, which are comprised of the areas not delineated as HVAs) in the GAR. The HVAs are shown in **Figure 2-11**.

3 Trend Monitoring Well Network Design

This Workplan uses a multi-step approach to the design of the trend monitoring network. The first step prioritizes areas for focusing of trend monitoring (*Section 3.2*). The second step identifies a pool of candidate wells for consideration in the GQTM network and from this pool of candidate wells an initial proposed GQTM network of wells is selected (*Section 3.3*). *Section 3.1* discusses pertinent regulatory requirements and how they affect work performed herein.

3.1 Regulatory Requirements and Implications for GQTM Approach

The basis for the development of the GQTM Program are the WSJRWC WDRs. Sections of the WSJRWC WDRs that are pertinent to the substance of the GQTM Program are included in this section. WSJRWC WDRs Attachment B, Section IV.C. (p. 1-2) states:

> "This section provides the objectives and minimum sampling and reporting requirements for Groundwater Quality Trend Monitoring. As specified in section IV.E of this MRP, the third-party is required to develop a workplan that will describe the methods that will be utilized to meet the trend monitoring requirements. This MRP allows developing and implementing a regional Groundwater Quality Trend Monitoring workplan that involves participants in other areas or third-party groups, provided the regional workplan meets the objectives and sampling and reporting requirements described herein. The third-party must submit a copy of the agreement between the parties included in the regional Groundwater Quality Trend Monitoring Group (Trend Monitoring Group). Under this option, the regional workplan may propose a phased approach to develop and implement the workplan elements specified in section IV.E of this MRP.
>
> *1. Objectives.* The objectives of Groundwater Quality Trend Monitoring are (1) to determine current water quality conditions of groundwater relevant to irrigated agriculture, and (2) to develop long-term groundwater quality information that can be used to evaluate the regional effects (i.e., not site-specific effects) of irrigated agriculture and its practices.
>
> *2. Implementation.* To reach the stated objectives for the Groundwater Quality Trend Monitoring program, the third-party shall develop a groundwater quality monitoring network that will (1) be implemented over both high and low vulnerability areas in the third-party area; and will (2) employ shallow wells, but not necessarily wells completed in the uppermost zone of first encountered groundwater. The use of existing wells is less costly than installing wells specifically designed for groundwater quality monitoring, while still yielding data which can be compared with historical and future data to evaluate long-term groundwater quality trends. The third party may also consider using existing monitoring networks such as those used by AB 3030 and SB 1938 plans.
>
> The third-party, either solely or in conjunction with a regional Groundwater Quality Trend Monitoring Group, shall submit a proposed Groundwater Quality Trend Monitoring Workplan described in section IV.E below to the Central Valley Water Board. The proposed network shall consist of a sufficient number of wells to provide coverage in the third-party geographic area so that current water quality conditions of groundwater and composite regional effects of irrigated agriculture can be assessed according to the trend monitoring objectives. The rationale for the distribution of trend monitoring wells shall be included in the workplan submitted by the third-party. If the third-party participates in a Trend Monitoring Group, the proposed well network and rationale for distribution of trend monitoring wells is not required in the initial workplan. However, the initial workplan must include a schedule for developing and submitting a proposed well network and rationale for distribution of trend monitoring wells.
>
> *3. Reporting.* The results of trend monitoring are to be included in the third-party's Monitoring Report and shall include a map of the sampled wells, tabulation of the analytical data, and time concentration charts. Groundwater quality monitoring data are to be submitted electronically to the State Water Board's GeoTracker Database and to the Central Valley Water Board.
>
> Following collection of sufficient data (sufficiency to be determined by the method of analysis proposed by the third-party or Trend Monitoring Group) from each well, the third-party is to evaluate the data for trends.

The methods to be used to evaluate trends shall be proposed by the third-party or Trend Monitoring Group in the Groundwater Quality Trend Monitoring Workplan described in section IV.E below."

These requirements have several direct implications for the GQTM Program development, as discussed below:

- Per the WSJRWC WDRs, the GQTM Program deals exclusively with the evaluation of groundwater quality relevant to irrigated agriculture. Therefore, areas that are both devoid of irrigated agricultural activities *and* where underlying groundwater cannot be affected by neighboring agricultural activities (because there are none) are not subject to the GQTM Program.
- This Workplan proposes monitoring activities to be carried out without a preconceived notion of an end of these activities. This ensures the "development of long-term groundwater quality information" while the first monitoring campaign will serve to "determine current water quality conditions".
- Per the WSJRWC WDRs, the GQTM Program deals exclusively with the collection and evaluation of groundwater quality information relevant to "regional effects (i.e., not site-specific effects)" (see above item *1. Objectives*) or "composite regional effects" (see above item *2. Implementation*) of irrigated agriculture. Consequently, the GQTM Program does not focus on collecting data from wells extracting groundwater near the water table (i.e., uppermost zone of first encountered groundwater) because such groundwater quality data would be reflective of more site-specific conditions, which may not be consistent with regional conditions. Likewise, the GQTM Program does not collect data from wells extracting groundwater from very deep or highly confined aquifers because such data would not be reflective of a great number of existing domestic and municipal drinking water supply wells. Furthermore, subsurface travel times from source to receptor well would be too long to facilitate timely evaluation. Therefore, consistent with the trend monitoring's objectives, this Workplan focuses on the Upper Zone (see *Section 2.3* for nomenclature). Wells completed in the Upper Zone, but not necessarily in first-encountered groundwater, are best suited to yield groundwater quality data reflecting regional groundwater conditions that support the evaluation of influences from land use practices occurring on the surface on an aggregated scale over the long term.
- Per the WSJRWC WDRs, the GQTM Program deals exclusively with the collection and evaluation of groundwater quality information relevant to "regional effects (i.e., not site-specific effects)" (see above item *1. Objectives*) or "composite regional effects" (see above item *2. Implementation*) of irrigated agriculture. Consequently, the GQTM Program focuses on public water supply and agricultural water supply wells completed in the Upper Zone for the selection of the initial set of proposed GQTM network wells, whenever possible. Water quality from such wells is more likely to represent composite regional effects than water quality from domestic wells or other wells producing smaller volumes of water because wells with larger rates of extraction (such as irrigation or public water supply wells) induce larger capture zones. However, this Workplan does not exclude domestic wells or other small-capacity wells from the GQTM network.
- Per the WSJRWC WDRs, the GQTM Program makes use of existing wells.
- Per the WSJRWC WDRs, the GQTM Program consists of a network of wells that is distributed over both HVAs and LVAs; the extent of these areas was designated in the Western San Joaquin River Watershed GAR (LSCE et al., 2015).

WSJRWC WDRs Attachment B, Section IV.E. (p. 2-3) states:

> "The third-party, either solely or in conjunction with a regional Groundwater Quality Trend Monitoring Group, shall develop a workplan for conducting trend monitoring within its boundaries that meets the objectives and minimum requirements described in section IV.C of this MRP. The workplan shall be submitted to the Executive Officer for review and approval. If the regional Groundwater Quality Trend Monitoring Group option is selected, the workplan must be submitted to the Executive Officer by 31 October 2017. The regional Groundwater Quality Trend Monitoring Workplan may propose a schedule for a phased approach to develop and implement items 1 through 4 below. In addition, the proposed schedule shall include submittal of a QAPP for the regional Trend Monitoring Workplan. A single third-party Trend Monitoring Workplan shall provide full information/details for items 1 through 4 below upon submittal of the workplan, due one (1) year following approval of the GAR.
>
> *1. Workplan approach.* A discussion of the rationale for the number of proposed wells to be monitored and their locations. The rationale needs to consider: 1) the variety of agricultural commodities produced within the third-party's boundaries (particularly those commodities comprising the most irrigated agricultural acreage), 2) the conditions discussed/identified in the GAR related to the vulnerability prioritization within the third-party area, and 3) the areas identified in the GAR as contributing significant recharge to urban and rural communities where groundwater serves as a significant source of supply.
>
> *2. Well details.* The Workplan will provide details for wells proposed for trend monitoring, including:
> i. GPS coordinates;
> ii. Physical address of the property on which the well is situated (if available);
> iii. California State well number (if known);
> iv. Well depth;
> v. Top and bottom perforation depths;
> vi. A copy of the water well drillers log, if available;
> vii. Depth of standing water (static water level), if available (this may be obtained after implementing the program); and
> viii. Well seal information (type of material, length of seal).
>
> *3. Proposed sampling schedule*. Trend monitoring wells will be sampled, at a minimum, annually at the same time of the year for the indicator parameters identified in Table 3 below.
>
> *4. Workplan implementation and analysis.* The Workplan will describe proposed method(s) to be used to evaluate trends in the groundwater quality monitoring data over time."

Table 3 Required monitored parameters at groundwater Trend Monitoring wells ‡
Annual Monitoring Conductivity (at 25 ºC)* (µmhos/cm) pH* in pH units Dissolved oxygen (DO)* (mg/L) Temperature* (ºC) Nitrate as nitrogen (mg/L) * field parameters
Trend monitoring wells are also to be sampled initially and once every five years thereafter for the following COCs: Total dissolved solids (TDS) (mg/L) General minerals (mg/L): Anions (carbonate, bicarbonate, chloride, and sulfate) Cations (boron, calcium, sodium, magnesium, and potassium)

‡ WSJRWC WDRs Attachment B, Section IV.E. (p. 20)

This Workplan addresses the requirements listed under above item *1. Workplan approach* as follows:

Agricultural commodities: This Workplan uses the USDA 2016 land use coverage in its analysis (*Section 2.5*). Coverage for irrigated agriculture was extracted from this data set for further analysis and is considered in the GQTM design as discussed below.

GAR-identified conditions regarding vulnerability: The GAR's vulnerability analysis considered a variety of factors, including soil characteristics, hydrogeology, and observed groundwater quality. The HVAs delineated in the GAR and the individual factors considered in determining the HVA represent important considerations in the design of the GQTM well network.

Recharge to Communities: The GAR presented potential recharge areas within the Coalition region. Together with ratings for other variables used in delineating HVAs (e.g., soil hydraulic conductivity, soil drainage class), recharge areas in proximity to communities was a variable that was used in the prioritization of HVAs conducted in the GAR for the purpose of groundwater management. As described below, recharge areas relative to communities are also explicitly considered in the prioritization of areas for monitoring as part of the GQTM Program.

Other notable implications of the WSJRWC WDRs Attachment B, Section IV.E. for the GQTM Program development are as follows:

- In response to item 2, available well details for the proposed GQTM network wells are provided; additional well details will be provided in the annual reporting as additional network well data are acquired or as network modifications occur.
- In response to item 3, principal trend monitoring wells will be sampled, at a minimum, annually at the same time of the year for the indicator parameters identified in WSJRWC WDRs Attachment B, Section IV.E., Table 3. Further details regarding well sampling are provided in *Section 4*.
- In response to item 4, groundwater monitoring data will be reported on an annual basis, with more in depth analysis occurring every five years. Further details regarding trend analysis are discussed in *Section 5*.

3.2 Delineation of Areas for Trend Monitoring

The WSJRWC WDRs require designating HVAs and LVAs, but recognize that monitoring activities cannot and should not occur with the same intensity across the entire Coalition region. The WSJRWC WDRs also recognize that further differentiation beyond HVAs and LVAs is needed to effectively focus trend monitoring efforts.

The areas considered to represent a higher trend monitoring priority were identified by spatial analysis on the PLSS section level (i.e., 1- by 1-mile grid) over the entirety of the Coalition region using a ranking scheme involving the following six factors:

Factor 1. HVA/LVA
Factor 2. Percent coverage by cultivated lands
Factor 3. Increasing nitrate trend
Factor 4. Nitrate maximum contaminant level (MCL) exceedances
Factor 5. Community type
Factor 6. Communities downgradient of significant nitrate measurements

Each factor was assigned a weight (ranging from 1 to 5, low to high) to reflect its overall significance for trend monitoring (**Table 3-1**). Each factor was subdivided into three to five groups and each group was assigned a rank (ranging from 1 to 5, low to high) to differentiate its relative significance for trend monitoring. The factor weights were multiplied by their respective factor ranks and the results were summed to yield a prioritization score:

$$Prioritization\ Score = \sum_{i=1}^{n} FactorWeight_i FactorRank_i$$

Each of the factors is described below.

Factor 1: HVA/LVA

HVAs are characterized by intrinsic physical properties that cause groundwater in an area to be particularly vulnerable to potential impacts from overlying land uses. The WSJRWC WDRs require the delineation of HVAs (and by default, LVAs, which are comprised of the areas not delineated as HVAs) in the GAR. HVAs were further evaluated to prioritize areas within the HVAs for planning of future monitoring and management efforts. Various factors identified in the WSJRWC WDRs were considered, and this resulted in priority areas ranging from priority 1 (high priority) to priority 4 (low priority). This factor was weighted heavily due to its importance in the protection of groundwater resources. Rankings were assigned according to the priority of the HVAs, from 1 (LVAs) to 5 (priority 1) (**Figure 3-1**).

Factor 2: Percent Coverage by Irrigated Agriculture

The percent of irrigated area was determined by evaluating the land use within each PLSS section, based on the 2016 USDA land use coverage (see **Figure 2-11**). The GAR established that the following land use categories are to be considered irrigated agriculture:

- Citrus & Subtropical Crops
- Field Crops
- Fruit Tree Crops
- Grain & Hay Crops
- Nut Tree Crops
- Rice
- Seed & Bean Crops
- Vegetable Crops
- Vineyard Crops

The area occupied by these land use categories was summed to compute the total area of irrigated agriculture in each PLSS section. This factor received the highest weight because the primary objective of the GQTM Program is to monitor groundwater in relation to irrigated agricultural practices. The percentage of irrigated agricultural area was subdivided in five equal groups with ranks ranging from 1 (low percentage) to 5 (high percentage), and is mapped in **Figure 3-2**.

Factor 3: Increasing Nitrate Trend

Groundwater nitrate time series data compiled for the GAR were used to identify PLSS sections where increasing nitrate trends have been observed. This factor was assigned a relatively small weight because it is one of two factors evaluating nitrate conditions and the sum of these factors' weights equals 5.

As part of the GAR, trend analysis was performed on wells with more than three samples for nitrate. Because of the minimum data requirement for the statistical temporal trend analysis, there are relatively few wells for which statistically significant temporal trends in nitrate concentrations are indicated. Analysis was performed using linear regression analysis. For the linear regression trend analyses, the correlation coefficients (using date and concentration pairs) were calculated for each well and then evaluated for significance. The significance of a calculated correlation coefficient is dependent on the size of the sample and the magnitude of the correlation coefficient. A t-value was determined from the calculated correlation coefficient and also the number of degrees of freedom (n-2; n representing the number of samples for a well). The t-value was then compared to the t-distribution to determine a corresponding probability (p-value), which will determine if the trend is significant. A p-value of 0.05 was used as a threshold for defining significance. Following the determination of significance for a well's correlation coefficient for concentration and time, the linear regression slope was calculated for each well using ordinary least squares regression. Significant nitrate concentration trends greater than 0.1 mg/L per year (mg/L/yr) and less than 1 mg/L/yr were indicated as mildly increasing, while trends in nitrate concentrations greater than 1 mg/L/yr were considered increasing.

Increasing trends indicate the most acute risk to the beneficial use of groundwater and this is reflected in the ranks, although this analysis does not establish a causal relationship to agricultural activities. Results are shown in **Figure 3-3**.

Factor 4: Nitrate MCL Exceedances

Groundwater nitrate data from the GAR were used to identify PLSS sections where nitrate MCL exceedances have occurred. The year of the most recent MCL exceedance was used to assign ranks. The more recently an exceedance occurred, the higher the rank to reflect a more acute condition that could affect the beneficial use of groundwater. This factor was assigned a relatively small weight because, as mentioned above, it is one of two factors evaluating nitrate conditions and the sum of these factors' weights equals 5. Results are shown in **Figure 3-4**.

Factor 5: Community Type

The potential need to beneficially use groundwater for drinking water supply is heightened in and near communities. Communities were identified using Census Designated Places (U.S. Census Bureau, 2017), DWR's Disadvantaged Communities Mapping Tool (DWR, 2017b), and other identified unincorporated and disadvantaged communities (PolicyLink, 2013). This factor was assigned the highest weight because the protection of beneficial uses, especially where those uses already exist or may be needed, is critical. The ranking scheme emphasized disadvantaged and severely disadvantaged communities. As defined by DWR (DWR, 2017b), disadvantaged communities are communities with less than 80 percent of the State's median household income, while severely disadvantaged

communities are communities with less than 60 percent of the State's median household income. Rankings were assigned to PLSS sections intersecting communities (**Figure 3-5**).

Factor 6: Communities Downgradient of Significant Nitrate Measurements

Determination of whether a community was downgradient of a significant nitrate measurement included the evaluation of groundwater flow direction and location of communities in relation to observed increasing trends and historical MCL exceedances. Groundwater flow directions were determined using Spring 2016 and Fall 2016 groundwater level contours. The directions of flow were then compared to the location of communities with relative to significant nitrate measurements (either observed increasing trends or historical MCL exceedances). This factor received a weight of 4 to reflect the risk-heightening effect it has on the potential contamination of drinking water sources actively being used by communities.

Communities located where local hydraulic gradients suggest that groundwater has the potential to flow from locations of significant nitrate measurements toward the community, with the significant nitrate measurement occurring near the community, were designated as downgradient. Communities where local groundwater flow directions suggest potential for flow from a significant nitrate measurement toward the community, but when the significant measurements occurred at a distance, were designated as likely downgradient. Communities located in a position where local groundwater flow directions could potentially bring nitrate to the community from locations where a significant measurement had occurred were designated as possibly downgradient. Rankings assigned to this factor are mapped in **Figure 3-6**.

Table 3-1: Weights and Rankings of Factors Used in the Prioritization of Areas for Monitoring

Factor	Ranking			Weight
	Ranking Metric	Range		
High Vulnerability Areas	Areas where physical conditions make groundwater more vulnerable to impacts from land use activities on the surface	LVAs	1	4
		Priority 4	2	
		Priority 3	3	
		Priority 2	4	
		Priority 1	5	
Irrigated Area	Percent of irrigated area	0-20%	1	5
		20-40%	2	
		40-60%	3	
		60-80%	4	
		80-100%	5	
Trends and Exceedances	Historical nitrate MCL exceedances	None	1	3
		≤ 1970s	2	
		1980s	3	
		1990s	4	
		≥ 2000s	5	
	Increasing nitrate trends	No	1	2
		Probable	4	
		Yes	5	
Communities	Non-disadvantaged communities, disadvantaged communities, and severely disadvantaged communities	None	1	5
		Community	3	
		DAC/DUC	4	
		SDAC/SDUC	5	
Gradient	Location of communities downgradient of significant nitrate measurement	Not downgradient	1	4
		Possibly downgradient	2	
		Likely downgradient	3	
		Either increasing trends and MCL exceedances	4	
		Both increasing trends and MCL exceedances	5	

The prioritization scores that were computed for each PLSS section across the Coalition region were categorized into five monitoring priority classes based on the Natural Breaks classification using ArcGIS software (ESRI ArcGIS Version 10.6). This function identifies clusters in the data to maximize differences between clusters and to best group similar values within the data set. Prioritization scores were grouped into five monitoring priority classes: *Very Low*, *Low*, *Medium*, *High*, and *Very High* (**Table 3-2**). The monitoring priority classes exhibit a dissected and complex mosaic throughout the Coalition (**Figure 3-7**). *Very High* monitoring priority areas typically occur in association with *High* monitoring priority areas, and the combination of these two groups form many distinct clusters. However, these clusters are also frequently dissected by areas of *Medium* or even *Low* monitoring priority rank.

Table 3-2: Monitoring Priority Ranking Results

Monitoring Priority	Ranking	Range
Very Low	28-36	8
Low	37-51	14
Medium	52-64	12
High	65-80	15
Very High	81-113	32

White areas indicate were trend monitoring is not needed. As described in *Section 3.1*, the GQTM Program deals exclusively with the evaluation of groundwater quality relevant to irrigated agriculture. Therefore, these non-irrigated areas are not subject to the GQTM Program; the great majority of white areas are located in the Coast Ranges in the western part of the Coalition region.

It is challenging to separate monitoring activities by monitoring priority class due to the complex and dissected nature of the highest priority classes. To address this challenge, Monitoring Areas were delineated (**Figure 3-8**). These Monitoring Areas encompass all *Very High* and *High* monitoring priority areas, but they also include some associated *Medium* monitoring priority areas. This approach to highlighting areas for prioritized monitoring recognizes that groundwater in these *Medium* priority areas located amongst higher priority areas may also be affected by agricultural activity in the adjacent areas of *Very High* and *High* monitoring priority.

4 Selection of Wells for Trend Monitoring Network

The selection of individual wells for the trend monitoring network consists of a preliminary selection of candidate wells (*Section 4.1*) followed by a vetting process (*Section 4.2*).

4.1 Identification of Candidate GQTM Network Wells

The GQTM network design includes the evaluation of candidate wells for monitoring (*Section 4.1.1*) and the selection of candidate wells to be vetted and considered for the proposed GQTM network (*Section 4.1.2*). The proposed GQTM network consists of principal and complementary wells.

The principal wells are those that meet the requirements of the WDRs and the Coalition can successfully access for annual sampling. Principal wells in the GQTM network will be sampled annually by the Coalition. Data collected from these wells will be used to characterize groundwater quality trends.

Complementary wells include those wells currently or historically monitored by other entities that satisfy the target monitoring criteria for the GQTM Program, but which may not be accessible to the Coalition. In most cases these are wells serving communities (PWS or community water system wells). Most PWS or community water system wells have historical groundwater quality data in publicly available water quality databases, and therefore inclusion of these wells in the GQTM program contributes considerable value because of the pre-existing data that useful for analysis of groundwater quality trends. Complementary wells with a long period of record can play a prominent role in the monitoring and understanding of regional groundwater quality trends.

4.1.1 Evaluation of Candidate Wells

To determine their potential suitability as wells for monitoring as part of the GQTM, all known locations for wells monitored for groundwater quality (candidate monitoring wells) that are in designated Monitoring Areas, or other relatively higher monitoring priority areas, were evaluated with respect to their individual characteristics as they relate to the objectives of the GQTM Program. Although all well types were considered, the initial evaluation of candidate GQTM network wells focused on district-owned or operated wells screened in the Upper Zone, since these wells are generally higher-capacity wells and thus, more likely to represent regional groundwater quality conditions. The greater regional representation of higher-capacity wells is highlighted in the conceptual diagram of potential capture zones for hypothetical wells with different extraction rates (e.g., irrigation, community supply, domestic) presented in **Figure 4-1**. The preliminary assessment of candidate wells included the evaluation of well characteristics and availability of groundwater quality data. A point system was used to calculate a score for each well to evaluate its effectiveness as a trend monitoring well (**Table 4-1**).

Figure 4-2 shows the initial set of wells considered for the selection of candidate wells. This figure shows the availability of construction details for each well. Wells were considered to be in the Upper Zone if sufficient construction details were available to determine that the well is completed above the base of the Upper Zone (see **Figure 2-6**). Wells with no construction were not given a depth classification and were retained as candidates for consideration pending additional well vetting.

Table 4-1: Scoring System for the Identification of Candidate Wells

Well Score					
Criteria	**Score System**			**Total Available Score**	
	Metric	**Range/Points**			
Construction Detail	Sufficient construction details available to identify the well as being completed in the Upper Zone	Upper Zone	1	1	
Location	Is the well located in a Monitoring Area?	Yes	1	2	
	Is the well located in an irrigated area?	Yes	1		
Well Type	Is the well an irrigation well?	Yes	1	2	
	Is the well a member district well?	Yes	1		
			Total Possible Points		5
Groundwater Quality Score					
Criteria	**Score System**			**Total Available Score**	
	Metric	**Range/Points**			
Nitrate Measurement Count	Number of nitrate measurements available	≥ 15	1	2	
		≥ 25	1		
Most Recent Nitrate Measurement	Year of most recent nitrate measurement	≥ 2010	1	2	
		≥ 2015	1		
Period of Record for Nitrate Measurements	Historical period of record for nitrate measurements	≥ 5 years	1	2	
		≥ 10 years	1		
			Total Possible Points		6
Total Score = Well Score + Groundwater Quality Score					**11**

Wells were given a point if they were determined to be in the Upper Zone (i.e., identified as "Upper" on **Figure 4-2**). By assigning a point to only those wells with definitive construction data locating the well in the Upper Zone, priority was given to these wells as potential candidates for monitoring. However, shallow wells with a total depth of less than 50 feet and wells without definitive construction details, classified as "Shallow (< 50')" and "Unknown," respectively, on **Figure 4-2**, were also included for further consideration. The purpose of this was to maintain these wells for further consideration in the event that wells with definitive construction details do not provide sufficient monitoring coverage.

Figure 4-3 presents the locations of candidate wells relative to irrigated agriculture. Because the purpose of the GQTM program is to monitor groundwater quality as it relates to irrigated agricultural practices, wells located in irrigated areas are assigned a point and prioritized as potential candidates for

monitoring. **Figure 4-4** shows wells by well use or well type. Wells were assigned a point for being classified as an irrigation well. As noted above, irrigation wells have larger extraction rates and groundwater sampled from irrigation wells is reflective of a more regional capture zone. Wells were assigned a point for being Coalition member District wells or for wells historically monitored by Coalition member Districts. **Figure 4-5** shows the source of well data, which also represents the monitoring entity.

Figure 4-6 shows the nitrate concentration measurement count by well. Wells were assigned a point for having a count greater than or equal to 15 measurements. Wells were assigned an additional point for having a count greater than or equal to 25 measurements. **Figure 4-7** shows the date of the most recent nitrate concentration measurement by well. Wells were assigned a point for having a most recent measurement in 2010 or later. Wells were assigned an additional point for having the most recent measurement in 2015 or later. **Figure 4-8** shows the period of record for nitrate concentration measurements by well. Wells were assigned a point for having a period of record greater than or equal to five years. Wells were assigned an additional point for having a period of record greater than or equal to 10 years.

Well characteristic scores ranged from 0 to 5, and groundwater quality scores ranged from 0 to 6. These two scores were summed to calculate a total well score, which ranged from 0 to 11. High scoring wells were preferentially selected as preliminary candidates for monitoring, with lower scoring wells being considered in areas where fewer candidate wells exist.

4.1.2 Selection of Candidate Wells for Vetting

The selection of candidate wells for the proposed GQTM network focused on member district irrigation wells as principal candidate wells, and PWS wells or community water system wells as complementary candidate wells. Upper Zone wells with definitive construction details were prioritized over shallow wells and wells with unknown construction details.

The selection of specific wells within Monitoring Areas was based on consideration of similar criteria as was used in the delineation of the Monitoring Areas and the preliminary identification of candidate wells. This includes criteria such as the monitoring priority, proximity to DACs, land use, and predominant groundwater flow directions. Unlike a random design approach, this ensures that the focus of monitoring efforts is in areas where impacts from agricultural activities are more likely to manifest in the groundwater and where there is a heightened interest in monitoring because of the greater reliance on groundwater for beneficial uses.

In addition to site-selection considerations, wells included in the GQTM network should also provide a representative indication of groundwater conditions within the Monitoring Areas. As noted above and illustrated in **Figure 4-1**, larger-capacity wells have larger contributing areas and are more likely to represent regional groundwater conditions and trends that are the focus of the GQTM.

PWS or community water system wells and irrigation wells which tend to pump higher volumes of water are the preferred well type for the GQTM network because they are more likely to indicate regional conditions and trends in groundwater quality. Such wells completed in the Upper Zone are likely to provide more regional representation of groundwater quality within a time frame that enables the

evaluation of trends in groundwater quality resulting from changes in past and current land use practices. Although larger-capacity wells are preferred for the GQTM network, other well types such as domestic wells and observation wells also can be used to monitor more localized groundwater quality conditions, which can also provide informative data on the effects of agricultural practices. To ensure that wells selected for the initial GQTM network provide reasonable indications of regional trends, the degree to which the land use composition within the vicinity of wells represents regional land uses and the land use composition in the vicinity of communities is also a consideration.

With this pool of candidate wells as a starting point, the initial proposed GQTM well network was selected based on well vetting conducted to date. This analysis does not presume to have identified all suitable wells as candidate wells and it is recognized that additional wells may exist that are not identifiable via readily available data sources. Future identification of additional wells may be of importance in Monitoring Areas where the coverage of candidate wells identified herein is sparse (see discussion in *Section 2.3*).

4.2 Selection of Proposed GQTM Network Wells

A process of vetting of candidate wells was undertaken to identify proposed wells for the GQTM network. Although, some of the steps in the well vetting process have already occurred to date for the purpose of identifying the proposed GQTM well network, many of the proposed GQTM network wells have not been completely vetted in accordance with the well vetting process described below. The complete well vetting process includes:

1. Confirming individual well existence and location (including site visits),
2. Evaluating well construction information through review of a DWR Well Completion Reports or other comparable documentation of the well construction,
3. Determining well accessibility and means of collecting groundwater quality samples and water level measurements,
4. Ensuring that any anthropogenic water quality characteristics are from agriculture and not from other land uses or activities (e.g., municipal waste water treatment),
5. Detailed review of the historical water quality record in conjunction with changing land use patterns, and
6. Acquiring permission, as necessary, for inclusion of the well in the GQTM network.

This includes the exploration of coordination opportunities with agencies currently monitoring groundwater quality in the Coalition region. Information obtained through evaluation of coordinating opportunities will ensure that the well location and construction and monitoring activities (timing, frequency, measurements) are sufficient to satisfy the objectives and design of the GQTM Program. Well vetting constitutes a significant Coalition effort necessitating outreach to well owners and agencies, and includes the development and execution of well access agreements and other contractual arrangements or memoranda of understanding. It is anticipated that ongoing vetting of proposed network wells will be conducted as part of the implementation of this GQTM Workplan and initial GQTM sampling, as discussed in *Section 4.2.3*.

4.2.1 Initial Vetting of Candidate Wells

Initial and preliminary vetting of candidate wells primarily focused on confirming individual well existence and acquiring/confirming well construction details. To the extent possible, preliminary well vetting was conducted by Coalition representatives and member Districts and included efforts at determining whether wells were still in existence, acquiring well construction details, and evaluating suitability of well sites for monitoring based on available site location information (e.g., land use data, aerial photography).

During the preliminary vetting process, some candidate wells were removed from consideration based on well construction information, including wells determined to be too deep or too shallow to accomplish the monitoring objectives of the GQTM. Because of challenges associated with finding information on available, qualified candidate wells, the criteria for candidate monitoring wells was adjusted to include some wells previously not considered. Other well types, particularly PWS wells, were considered as principal candidate wells for inclusion.

4.2.2 Selection of Individual Wells for Proposed GQTM Network

The proposed GQTM well network consists of 19 principal wells and 52 complementary wells. Required well details for reporting are presented in **Table 4-2**.

4.2.2.1 Proposed Principal GQTM Network Wells

The 19 principal wells proposed for the GQTM network are spatially distributed throughout the Coalition region (**Figure 4-9**). The wells are a mix of irrigation and public water supply wells, with some wells of currently unknown type. Of the proposed principal GQTM wells, most are confirmed to be screened entirely within the Upper Zone, although a few wells with screens extending below the Upper Zone are included. Four of the proposed GQTM network wells are still pending construction details, although they are proposed as GQTM network wells based on their location and pending more information about their construction. Available well details for the initial proposed principal network wells are presented in **Table 4-3.** Additional currently available information about proposed principal network wells is presented in the well information sheets in **Appendix B**; currently available WCRs for the proposed principal network wells are also included in **Appendix B**.

All wells are located on rural or semi-rural properties. **Figure 4-10** shows the distribution of irrigated agriculture within one mile of principal network wells. Major land uses within one mile of principal wells include grain and hay crops, followed by nut trees, field crops, and vegetables.

The selection of proposed GQTM network wells also considered the locations of GQTM network wells being proposed by adjacent coalitions. The GQTM well networks being proposed for adjacent areas include some wells located near the Coalition boundary, which also serve the objectives of the GQTM Program in tracking of regional groundwater quality trends related agricultural practices. Collectively, the GQTM efforts being conducted by the Westside Coalition, along with those of adjacent coalitions, many of which are participating in the CVGMC, will help inform regional groundwater quality trends in the area as they relate to agricultural practices.

4.2.2.2 Proposed Complementary GQTM Network Wells

An additional 52 PWS wells, which are monitored for regulatory compliance and that may be suitable for use in the GQTM Program, were selected to provide data to complement the annual groundwater quality data collected for GQTM principal wells. These wells are incorporated as complementary wells for the GQTM Program. Historical sampling intervals for the complementary wells vary, but the sampling that is conducted conforms to accepted standards as required by DDW.

Figure 4-11 shows the locations of the 52 proposed complementary network wells. Well depth information is available for eight complementary wells, while the remaining wells are pending construction details (see **Table 4-4** for full complementary well details). Additional currently available information about proposed complementary network wells is presented in the well information sheets in **Appendix B.** The wells without depth information have been retained as complementary GQTM wells because they have a historical water quality record and may provide helpful information on groundwater quality trends, even if their screens are not in the Upper Zone. As the GQTM effort continues, the Coalition will work to obtain screened interval and other construction information for these wells to improve their usefulness for the GQTM.

Figure 4-12 shows the complete proposed GQTM network, including principal and complementary wells. Wells were targeted in the highest vulnerability areas, as shown on **Figure 4-12**. Additionally, wells were selected to monitor changes in groundwater quality associated with a variety of irrigated land uses occurring near communities, as shown in **Figure 4-13**. **Figure 4-14** illustrates the depth of the proposed network wells in relation to depths of domestic and public supply wells in the Coalition region, based on WCR data from DWR (2017). The Upper Zone being targeted for the GQTM was defined by CV-SALTS (LSCE and LWA, 2016) based on the depth of typical domestic and public supply wells. As highlighted in **Figure 4-14**, the depths of the proposed GQTM network wells are similar to those of typical domestic and public supply wells in the region. The proposed GQTM well network is subject to ongoing vetting of wells, as discussed in *Section 4.2.3,* and also the results from efforts to identify additional network wells (see *Section 4.3*).

4.2.3 Ongoing Vetting of Proposed GQTM Network Wells

As discussed in *Section 4.2.1*, some preliminary vetting has occurred for the proposed GQTM network wells, though the entire vetting process has not been completed. **Figure 4-15** shows the preliminary vetting status of proposed network wells. As mentioned above, preliminary vetting of network wells included efforts at determining whether wells are still in existence, acquiring available well construction information, and evaluating suitability of well sites for monitoring based on a preliminary evaluation using well site location information (e.g., land use data, aerial photography). It is anticipated that ongoing vetting efforts will continue up to, and potentially during, the first sampling event. The ongoing vetting process will focus on linking wells with their well completion reports, detailed well site evaluation, and securing well owner agreements for use of their wells in the GQTM program. As a result of the ongoing vetting process, the proposed GQTM network outlined here is subject to change, as wells may be added and removed from the network as additional information becomes available. Any additional available well details or necessary modifications to the proposed network resulting from the well vetting will be presented and discussed in the first annual GQTM report.

4.3 GQTM Network Refinement

The initial GQTM well network is expected to be dynamic. The GQTM network design represents the beginning of an ongoing process of network development and refinement. The spatial representation and statistical validity of the GQTM well network will be evaluated on an annual basis with respect to the objectives of the program. Specific attention will focus on the adequacy of monitoring in areas where the direction and magnitude of temporal trends in groundwater quality suggest a consistent pattern that is likely to be attributable to influences from irrigated agriculture. Recommendations will be made regarding potential addition, elimination, or substitution of wells.

During GQTM implementation, efforts will be made to verify well construction information for complementary wells. As more information is obtained about the construction of the complementary wells, some of these wells may be determined to be inappropriate for the network, due to their well construction as it relates to the targeted depth zones for the GQTM program or other factors. A determination would be made at that time regarding the role individual wells may play in the network and whether to include different wells in the network. Over time, some network wells may fall into disrepair, or be abandoned or destroyed; such occurrences will also be evaluated individually to determine the appropriate actions for network modifications.

Although the GQTM network wells presented in this workplan represent the wells intended for initial monitoring as part of the GQTM program, additional evaluation of candidate wells in several network well search areas is occurring. Based on the evaluation conducted to derive the set of GQTM network wells presented in this workplan, there appear to be some areas within the Coalition region where few or no wells have been identified in the Upper Zone. This lack of Upper Zone representation is largely a result of the shallow depth of the Upper Zone in many areas of the Coalition region, which results in a more limited population of wells with known information to consider for the GQTM Program. Although wells producing water from greater depths, including from below the Upper Zone and below the Corcoran Clay, are less likely to exhibit influences from agricultural practices occurring on the overlying lands, wells screened in the Upper Zone and extending to greater depth (composite wells) will reflect influences from agricultural practices (especially trends in concentrations) and would be beneficial for the GQTM network. Efforts to find wells in the Upper Zone for use in the GQTM will continue in these areas, although composite wells may eventually be used for the GQTM in some areas even if their construction is not ideal for monitoring groundwater quality exclusively in the Upper Zone. For some of the composite wells, the available historical water quality record associated with the well makes them particularly useful wells for the GQTM network.

Figure 4-16 highlights key areas where additional network wells are currently being investigated for potential future inclusion in the GQTM network or where complementary wells may be considered for use as principal wells. Some of the candidate wells to be considered in these GQTM network well search areas (based on available well information) are shown on **Figure 4-16**. Candidate wells are shown on **Figure 4-16** in relation to the well search areas. Many of the candidate wells in **Figure 4-16** currently don't have available well construction information. The target depths for network wells in these areas will be based on consideration of the Upper Zone depth in combination with the depth to groundwater and depth from which beneficial users extract groundwater. Focused outreach efforts and evaluation of available well information in these areas are occurring to identify suitable wells for the GQTM network.

As additional candidate wells are evaluated in these areas and selected for the GQTM well network, they will be included in the GQTM sampling and reporting, as appropriate.

Table 4-2: Well Detail Reporting Information

Category of Well Information	Description of Well Detail	Required[1] or Optional	Comment
Unique Well Identification	State well number	Required	If known
	GQTM well ID	Optional	
	Monitoring entity	Optional	
Well Location	GPS coordinates	Required	Latitude and longitude in decimal degrees (datum NAD83, minimum of five decimal places
	Physical address	Required	As applicable or available
	PLSS coordinates (T/R/S)	Optional	
Well Construction	Total well depth	Required	
	Depth to top of perforations	Required	
	Depth to bottom of perforations	Required	
	Well seal depth/length	Required	
	Well seal material	Required	
	DWR Well Completion Report (water well drillers log)	Required	Provide copy, if available
	Well construction date	Optional	
Well Characteristics	Depth to standing water (static water level)	Required	Collected annually at time of well sampling, if available/ accessible
	Estimated ground surface elevation	Optional	Feet above mean sea level from digital elevation model
	Water level measurement reference point	Optional	Feet above ground surface
	Well pumping rate	Optional	
	Well operation	Optional	Typical pumping cycles; annual pumping duration
Historical Well Testing	Period of available historical water quality record	Optional	Range of years (first/last year)
	Number of historical water quality tests	Optional	
Characteristics of Well Vicinity	Land use composition in vicinity of well	Optional	Percent agriculture by commodity

[1] Required well construction details will be included for wells selected for trend monitoring conducted by the Coalition. Some cases may exist where well construction information is not available for a well determined to represent a particularly informative monitoring site for various other reasons (e.g., historical period of record). Detailed well construction information will be provided for all GQTM network wells after completion of well vetting. Some complementary wells may have more limited available well construction information, although efforts will also be made to acquire well details for complementary wells.

Table 4-3: Proposed Principal Well Details

GQTM Well ID	State Well Number	DWR Well Completion Report	Well Use	Previous Water Quality Samples	Well Information from Well Completion Report						Latitude (NAD83)	Longitude (NAD83)
					Seal Depth	Seal Material	Total Well Depth (feet)	Depth to Top of Screen (feet)	Depth to Bottom of Screen (feet)	Year Drilled		
P01	-	E0310529	Irrigation	No	22	Cement	360	140	340	2016	37.58324	-121.20204
P02	-	-	Public Supply	Yes	-	-	-	146	168	-	37.56233	-121.17674
P03	-	427229	Irrigation	No	30	Cement	255	130	250	1991	37.49401	-121.08620
P04	-	483378	Public Supply	Unknown	50	Cement	76	none	none	1991	37.45705	-121.13094
P05	06S/08E-04P01	247065	Unknown	No	20	Bentonite	108	88	108	1983	37.43714	-121.09579
P06	-	-	Public Supply	Yes	-	-	-	-	-	-	37.39417	-121.07590
P07	07S/08E-13N01	-	Unknown	No	-	-	-	-	-	-	37.32046	-121.04680
P08	08S/08E-01H01	-	Unknown	No	-	-	-	-	-	-	37.26942	-121.03345
P09	09S/09E-05R01	-	Irrigation	Yes	-	-	120	52	112	-	37.17350	-120.99540
P10	-	739637	Public Supply	Yes	90	Cement	285	135	275	2002	37.07056	-120.87644
P11	-	374510	Public Supply	Yes	-	-	218	125	208	-	37.05328	-120.82598
P12	10S/10E-35K01	54231	Domestic	No	20	-	180	80	180	2008	37.01850	-120.84160
P13	-	-	Unknown	No	-	-	180	80	180	-	37.16000	-120.75800
P14	-	508390	Irrigation	No	50	Cement	180	60	180	1997	37.08600	-120.65600
P15	-	E0074839	Irrigation	No	50	Cement	180	60	180	2008	37.04400	-120.65200
P16	11S/12E-16Q01	-	Irrigation	Yes	-	-	-	-	-	-	36.96921	-120.66050
P17	11S/13E-17E01	E0067194	Irrigation	Yes	30	Cement	175	60	170	2008	36.97770	-120.57990
P18	13S/14E-02M02	207508	Irrigation	No	20	Cement	180	90	180	-	36.82630	-120.42040
P19	-	81073	Irrigation	No	80	Cement	280	100	275	1973	36.79940	-120.36881

Blanks ("-") indicate items pending additional vetting.

Table 4-4: Proposed Complementary Well Details

GQTM Well ID	Well Owner	Well Details			Primary Station Code	Historical Water Quality Data					
		Total Well Depth (feet)	Depth to Top of Screens (feet)	Depth to Bottom of Screens (feet)		First Year of Nitrate Data	Last Year of Nitrate Data	First Year of TDS Data	Last Year of TDS Data	Number of Nitrate Tests	Number of TDS Tests
C01	Oakwood Lake Water District-Subdivision	-	-	-	3910023-004	2009	2017	12	2011	2017	3
C02	City of Patterson	-	-	-	5010017-004	1989	2015	90	1989	2007	13
C03	City of Patterson	-	-	-	5010017-002	1989	2017	45	1989	2016	15
C04	Patterson Vegetable Company	-	-	-	5000193-004	2002	2012	18	2003	2012	4
C05	Patterson Vegetable Company	-	-	-	5000193-003	2002	2009	7	2003	2009	4
C06	Villa Las Flores	-	50	60	5000301-001	2004	2011	5	2004	2004	1
C07	City of Patterson	-	-	-	5010017-012	1999	2018	26	1999	2018	18
C08	City of Patterson	-	-	-	5010017-014	2002	2017	20	2002	2017	10
C09	Patterson Vegetable Company	-	-	-	5000193-007	-	-	-	-	-	-
C10	Sha Walnut Acres Closed Down	-	-	-	5010012-001	1985	1988	5	-	-	-
C11	Sha Walnut Acres Closed Down	-	-	-	5010012-002	1985	1989	7	-	-	-
C12	Sha Walnut Acres Closed Down	-	-	-	5010012-003	1985	1990	6	1990	1990	1
C13	City of Patterson	-	-	-	5010017-018	2010	2017	8	2010	2017	4
C14	Excell Center	-	-	-	5000473-001	2002	2017	20	2004	2013	4
C15	Soria Labor Camp	-	65	85	5000381-001	2002	2005	2	-	-	-
C16	Las Palmas Fishing Access -Stanislaus	-	50	60	5000365-001	1999	1999	1	-	-	-
C17	Crows Landing Comm SVC District	-	-	-	5000005-004	2003	2017	22	2006	2015	4
C18	Crows Landing Comm SVC District	-	-	-	5000005-003	2003	2004	15	-	-	-
C19	Martin S Mobile Home Court	-	-	-	5000061-001	2002	2017	24	2004	2016	19
C20	City of Newman-Water Department	-	-	-	5010013-010	2004	2018	24	2004	2017	23
C21	City of Newman-Water Department	-	-	-	5010013-004	1985	2018	69	1989	2013	14
C22	City of Newman-Water Department	-	-	-	5010013-005	1991	2017	51	1991	2016	23
C23	City of Newman-Water Department	-	-	-	5010013-006	1995	2018	46	1995	2016	20
C24	Marty S Inn Water System	147	127	147	5000386-001	2009	2011	4	-	-	-
C25	Saputo Dairy Foods Usa, LLC	-	-	-	2400055-003	2017	2017	1	2017	2017	1
C26	Saputo Dairy Foods Usa, LLC	-	-	-	2400055-012	2006	2017	31	2006	2007	2

Table 4-4 (continued): Proposed Complementary Well Details

GQTM Well ID	Well Owner	Well Details			Primary Station Code	Historical Water Quality Data					
		Total Well Depth (feet)	Depth to Top of Screens (feet)	Depth to Bottom of Screens (feet)		First Year of Nitrate Data	Last Year of Nitrate Data	First Year of TDS Data	Last Year of TDS Data	Number of Nitrate Tests	Number of TDS Tests
C27	Saputo Dairy Foods Usa, LLC	-	-	-	2400055-011	2004	2004	2	-	-	-
C28	City of Gustine	-	-	-	2410003-006	1999	2017	25	1999	2017	6
C29	Hillview Packing	-	-	-	2400229-001	2014	2017	10	2014	2014	1
C30	USFWS San Luis NWR Complex	-	-	-	2410021-001	2011	2017	10	2011	2011	1
C31	City of Los Banos	-	-	-	2410005-008	1988	2001	13	1988	1999	6
C32	City of Los Banos	-	-	-	2410005-009	1994	2018	29	1994	2017	10
C33	City of Los Banos	-	-	-	2410005-005	1984	2018	87	1984	2017	15
C34	City of Los Banos	-	-	-	2410005-013	2000	2018	70	2001	2017	8
C35	City of Los Banos	-	-	-	2410005-007	1986	2018	83	1986	2017	15
C36	CA Dairies, Inc. D.B.A. Los Banos Foods	-	-	-	2400107-001	2002	2007	53	2003	2005	2
C37	City of Los Banos	-	-	-	2410005-001	1986	2018	85	1986	2017	15
C38	City of Los Banos	-	-	-	2410005-002	1986	2018	76	1986	2017	16
C39	City of Los Banos	-	-	-	2410005-003	1986	2018	83	1986	2017	16
C40	City of Los Banos	-	-	-	2410005-016	2002	2002	1	-	-	-
C41	City of Los Banos	-	-	-	2410005-017	2002	2002	1	-	-	-
C42	City of Los Banos	-	-	-	2410005-012	1998	2018	52	1998	2017	8
C43	City of Firebaugh	-	-	-	1010005-017	2005	2018	16	2005	2017	16
C44	City of Firebaugh	-	-	-	1010005-018	2005	2018	16	2005	2017	16
C45	Firebaugh City	-	-	-	1010005-011	2000	2015	9	2000	2016	10
C46	City of Firebaugh	180	155	180	1010005-014	1996	2018	24	1996	2017	21
C47	City of Firebaugh	200	165	190	1010005-010	1993	2018	25	1993	2017	20
C48	City of Firebaugh	215	140	210	1010005-019	2015	2018	4	2015	2017	5
C49	Firebaugh City	-	-	-	1010005-012	2000	2015	9	2000	2016	10
C50	East Acres Mutual Water Company	-	-	-	2000512-003	2006	2017	12	2008	2017	3
C51	Firebaugh City	-	-	-	1010005-005	1985	1998	5	1985	1985	1
C52	City of Mendota	200	140	200	1010021-007	1993	2013	13	1993	2002	2

Blanks ("-") indicate items pending additional vetting.

5 Sampling and Analysis Plan

5.1 Field and Laboratory Methods

Wells selected for inclusion in the initial GQTM network will be sampled on an annual interval for select water quality parameters and will also be sampled every five years for a more extensive set of parameters. **Table 5-1** summarizes the testing and analyses to be conducted and the frequency of testing for each water quality parameter, in accordance with the requirements of the WDRs. The Coalition intends to utilize the CVGMC QAPrP and will be submitting content to the CVGMC with locally relevant details in accordance with the approach and schedule outlined in the CVGMC Technical Workplan (LSCE et al., 2018) and QAPrP (MLJ et al., 2018). Field and laboratory methods will be described in the CVGMC QAPrP.

5.1.1 Groundwater Quality Analyses

5.1.1.1 Annual Sampling

Annual monitoring of GQTM network wells will include sampling and laboratory analysis of nitrate concentrations in groundwater. Nitrate concentrations will be reported in units of milligrams per liter (mg/L) as nitrogen. Additional measurement of select water quality parameters will take place in the field at the time of sampling. Field parameters that should be measured at an annual frequency include electrical conductivity at 25 °C (EC) in µS/cm, pH, temperature (in °C), and dissolved oxygen (DO) in mg/L. The annual testing of wells for these water quality parameters is consistent with sampling requirements specified in the WDRs, as summarized in **Table 5-1**. Additional field testing for oxidation-reduction potential (ORP or redox potential) may provide information relating to the groundwater quality that is helpful in understanding existing influences on groundwater quality from agricultural operations and potential for future impacts that may impact beneficial uses. Field turbidity in sampled water may indicate issues associated with the sample collection (suspended solids) or other characteristics of the water being tested that may affect the results of laboratory analyses. Although not required by the WDRs, field testing of samples for ORP and turbidity, when possible through coordination with monitoring entities or through sampling by the Coalition, will be included in the annual testing procedures. Although any annual sampling of the GQTM network wells conducted by the Coalition will include collection of the field parameters identified above, monitoring of these wells by other monitoring entities through coordination with other ongoing monitoring programs (such as Division of Drinking Water compliance sampling and reporting) may not include testing of all of the identified field parameters. The Coalition will coordinate with other monitoring entities in an attempt to ensure that the water quality parameters indicated in the WDRs are collected for any network wells being monitoring by other entities.

5.1.1.2 Every Five Years

Every five years GQTM network wells will be tested for a more extensive set of groundwater quality constituents in addition to the laboratory and field water quality parameters included as part of the annual testing. The constituents to be tested for and analyzed in a laboratory every five years include total dissolved solids (TDS) and major cations such as boron, calcium, sodium, magnesium, and potassium and anions including carbonate, bicarbonate, chloride, and sulfate (**Table 5-1**). Results from

analyses of cations and anions will be reported in mg/L. Groundwater quality testing in additional wells monitored by others may not align exactly with the frequency of testing for all water quality parameters specified in the WDRs, although coordination efforts with cooperating monitoring entities will focus on establishing a testing program that is consistent and compatible with the monitoring objectives for the GQTM.

5.1.2 Network Well Sampling Protocols and Procedures

Sampling of wells as part of the trend monitoring network should follow established protocols and procedures relating to sample timing, well purging, sample collection and handling, and field observations and measurements, to the extent possible, as outlined in the standard operating procedures (SOP).

5.1.2.1 Timing

Consistent timing of sampling of GQTM network wells (to the extent possible) will be coordinated taking into consideration the timing of existing ongoing monitoring by others, timing of historical monitoring of network wells and other wells in the Coalition region, and the seasonality of hydrologic conditions and influences from irrigated agriculture. Consistent with the annual timing of sampling proposed in the CVGMC Technical Workplan (LSCE et al., 2018), annual sampling for the GQTM is proposed for the fall, which is defined as the months of September through November. Some exceptions to the fall sampling period may occur as a result of limitations on well access and availability; however, in such circumstances an effort will be made to maintain consistent year-to-year timing in sample collection. The proposed timing will also be considered in any coordination of sampling that occurs with other monitoring entities as part of the GQTM or as supplemental monitoring to the GQTM. The initial GQTM well sampling event will occur in the fall upon approval of the GQTM Workplan and the CVGMC Technical Workplan, and is anticipated to occur in Fall 2018.

5.1.2.2 Sample Collection

Wells will be sampled in accordance with the CVGMC QAPrP. Wells will be appropriately purged in accordance with their type and operational history to ensure that a representative groundwater sample is collected from the well. Wells will be purged for a sufficient time to evacuate water held in casing storage before collecting the water sample. This is important to ensure that water collected from a well is representative of groundwater in the aquifer formation outside the well bore. If possible, three casing volumes will be purged from the well prior to sample collection. Larger-capacity wells may not need purging (or may need more pumping) depending on their operational history. For smaller-capacity wells, such as domestic wells, achieving a three-casing volume purge may not be practical because of operational constraints relating to the well and water distribution system. In cases where a three-casing volume purge is not achievable, field parameters (EC, pH, temperature, etc.) of the water will be monitored during pumping/purging and a sample will not be collected until the field parameters have sufficiently stabilized in accordance with the sampling SOP. As identified in the CVGMC QAPrP, in wells lacking pumping equipment and with casing volumes that make well purging difficult or impractical, a no-purge sampling device such as a HydraSleeve may be utilized to collect the sample. No-purge

sampling methods should be conducted in accordance with recommended guidelines for the sample collection indicated in the SOP specific to the sampling device.

Groundwater samples will be collected from a point in the distribution system as near to the wellhead as possible and prior to any filtration or pressure tank, if possible. Water samples collected for laboratory analytical testing will be collected in appropriate laboratory-provided sample containers and stored on ice or in accordance with recommended sample handling procedures indicated by the laboratory and established in the CVGMC QAPrP. The sample identification, time, date, and any other informational fields indicated on the sample container label will be clearly provided. The associated laboratory Chain of Custody for samples will be completed and signed and provided with the samples at the time of delivery of samples to the laboratory for analysis.

5.1.3 Field Observations and Measurements

Prior to sampling of a well, the depth to the water in the well will be measured, if possible, and recorded. It may not be possible to measure the water level due to wellhead accessibility or because the well is actively pumping. The well operational status prior to and at the time of sampling will be noted and any other observations at a well site that may potentially relate to the well or groundwater sampling will be described. Field water quality parameters, including EC, pH, temperature, and DO, and possibly ORP and turbidity, will be tested during sampling; when a well is purged as part of the sampling procedure, field parameters should be stable prior to collecting a sample. Field parameters will be monitored and recorded at least three times during well pumping/purging. When using a no-purge sampling method, a sufficient water sample should be collected for measuring field parameters and filling all necessary laboratory sample bottles. Observed characteristics of the water during sampling such as color, smell, or other visual observations will be documented, if possible. All instruments used to measure field conditions during sampling will be calibrated on a regular basis in accordance with manufacturer guidelines and recommendations or otherwise established in the CVGMC QAPrP.

5.1.4 Quality Assurance/Quality Control Protocols and Procedures

To ensure the quality and consistency of data collected as part of the GQTM, specific protocols and procedures relating to well sampling and analytical testing will be adhered to in accordance with the CVGMC QAPrP. Data assembled by the Coalition as part of the GQTM will be evaluated through a quality assurance/quality control (QA/QC) procedure involving review of results and data formatting to verify reasonableness and accuracy. Analytical and field data collected by the Coalition through sampling of wells will be evaluated with respect to laboratory and analytical QA/QC metrics. Data collected by others and incorporated as part of the GQTM will undergo a more general QA/QC review to identify potentially erroneous data. More details regarding the QA/QC of GQTM data are included in the CVGMC QAPrP. Adherence to procedures that are aligned with the established protocols and procedures in the SOP and QAPrP will be emphasized as part of coordination with cooperating monitoring entities collecting additional groundwater quality data within the Coalition region. The Coalition will utilize the CVGMC QAPrP along with Coalition-specific content providing locally relevant details, to be submitted in accordance with the approach and schedule outlined in the CVGMC Technical Workplan (LSCE et al., 2018) and QAPrP (MLJ et al., 2018).

5.1.5 Data Management

Data generated or acquired as part of the GQTM will be assembled within a data management system to facilitate organization, analysis, and display of the data and to assist the Coalition with meeting objectives of the GQMP. All wells in the data system will be attributed with a unique well identification (ID) and information associated with wells, such as well characteristics and historical hydrologic observations, will be compiled and maintained within the data management system. The structure of the data management system will be compatible with GIS and other data formats and will also facilitate submittal of the GQTM data to the CVRWQCB via uploading of data to Geotracker or otherwise providing the data in accordance with the WDRs. Data management efforts will also utilize or coordinate with the data management system to be implemented by the CVGMC as described in the CVGMC Technical Workplan (LSCE et al., 2018).

Table 5-1: Water Quality Testing Requirements

Water Quality Constituent	Reporting Units	Testing Frequency	Required or Optional[1]	Field or Laboratory Analysis	Comment
Nitrate (as N)	mg/L (as N)	Annual	Required	Laboratory	Should be part of trend monitoring for all network wells
Electrical conductivity (EC)	µS/cm	Annual	Required	Field	at 25 °C
pH	pH units	Annual	Required	Field	
Dissolved oxygen (DO)	mg/L	Annual	Required	Field	
Temperature	°C	Annual	Required	Field	
Oxidation-reduction potential (ORP)	mV	Annual	Optional	Field	
Turbidity	NTU	Annual	Optional	Field	
Total dissolved solids (TDS)	mg/L	Five years	Required	Laboratory	Should be part of trend monitoring for all network wells
Carbonate	mg/L	Five years	Required	Laboratory	
Bicarbonate	mg/L	Five years	Required	Laboratory	
Chloride	mg/L	Five years	Required	Laboratory	
Sulfate	mg/L	Five years	Required	Laboratory	
Boron	mg/L	Five years	Required	Laboratory	
Calcium	mg/L	Five years	Required	Laboratory	
Sodium	mg/L	Five years	Required	Laboratory	
Magnesium	mg/L	Five years	Required	Laboratory	
Potassium	mg/L	Five years	Required	Laboratory	

[1] Required water quality constituents will be included in all trend monitoring conducted by the Coalition. Not all required constituents will necessarily be included in trend monitoring conducted through coordination with other monitoring entities.

6 GQTM Reporting

Annual GQTM reporting will be done consistent with the pertinent requirements in the WDRs (i.e., Attachment B, Section IV.C.3, p.24):

> *3. Reporting.* The results of trend monitoring are to be included in the third-party's Monitoring Report and shall include a map of the sampled wells, tabulation of the analytical data, and time concentration charts. Groundwater monitoring data are to be submitted electronically to the State Water Board's GeoTracker Database and to the Central Valley Water Board in a format specified by the Executive Officer.
>
> Following collection of sufficient data (sufficiency to be determined by the method of analysis proposed by the third-party) from each well, the third-party is to evaluate the data for trends. The methods to be used to evaluate trends shall be proposed by the third-party in the Trend Groundwater Monitoring Workplan described in section IV.E below."

The annual GQTM reporting will be consistent and coordinated with the CVGMC reporting approach, material, and content indicated in the CVGMC Technical Workplan (LSCE et al., 2018). Annual reports will be cumulative, i.e., the data record will be continuously expanded and new data will be presented and discussed in the context of historical data, including data that predate the GQTM effort, as applicable. Annual reporting will emphasize presentation of data using tabular and visual means such as graphs and maps. Formal trend analyses are only useful after enough data are available to evaluate trends and formal trend analysis are also not believed to be helpful at a frequency of less than five years since trends in groundwater quality are not likely to change rapidly. Therefore, as proposed in the CVGMC Technical Workplan, it is envisioned that expanded, comprehensive, in-depth evaluation of GQTM data will be conducted as part of the Five-Year GQTM reporting in coordination with the CVGMC, and these efforts will be linked with activities required for the Five-Year GAR Updates. The more comprehensive GQTM analyses and reporting to be conducted every five years in coordination with the CVGMC will include statistical analyses on data collected from GQTM network wells and also incorporation of other available groundwater quality data collected by other monitoring entities in the region as part of sampling of wells that are not included in the GQTM well network. The more comprehensive Five-Year GQTM reporting, conducted in conjunction with analyses for the Five-Year GAR Updates, provides a broad analysis of groundwater quality trends by including evaluation of data from GQTM network wells and also a much larger groundwater quality data set (albeit with less data quality control). This comparison and incorporation of additional data provides an opportunity to greatly enhance the ability to interpret the GQTM information and assess any apparent trends in groundwater quality that may relate to agricultural practices. The content and schedule of proposed GQTM reporting are summarized in **Table 6-1**.

Groundwater quality analysis will be performed within the context of groundwater flow information. For example, groundwater level contours and other representations of groundwater levels within select areas of the Coalition region, as applicable and appropriate relative to the regional monitoring network design, will be included (based on recent groundwater elevation contours by DWR) as part of the annual report. The observed groundwater levels in GQTM network wells will be presented together with DWR groundwater level contour data as depth to water and groundwater elevation to inform hydrogeologic understanding and support groundwater quality analysis.

It is expected that methods of trend analysis included in the Five-Year GQTM reporting by the CVGMC will include:

- Exploratory and summary statistics
- Time series plotting of groundwater quality constituents and qualitative visual inspection
- Linear regression, potentially including residual analysis and detrending
- LOWESS (locally weighted scatterplot smoothing) and/or related nonlinear trend analyses
- Correlation matrices (e.g., statistical associations between land use and management practice implementation)
- Maps of constituent concentrations (e.g., contours, color gradients).

The methods of trend analysis will be consistent and coordinated across the CVGMC area as described in the CVGMC Technical Workplan (LSCE et al., 2018).

6.1 GQTM Well Network Refinement

As stated in *Section 3.3.2*, and consistent with Alley (1993), the initial proposed GQTM well network presented in this Workplan is not considered a static end result, but rather a beginning of a dynamic process. This favors a relatively simple initial well network design but also necessitates continuous evaluation. Therefore, the spatial representation and sufficiency of the GQTM well network will be evaluated on an annual basis with respect to the objectives of the program. Specific attention will focus on the adequacy of monitoring in areas where the direction and magnitude of temporal trends in groundwater quality suggest a consistent pattern that is likely to be attributable to influences from irrigated agriculture. Recommendations will be made regarding potential addition, elimination, or substitution of wells.

Table 6-1: Reporting Elements

Reporting Element	Description of Reporting Method	Reporting Frequency
GQTM data submittal	Upload data to Geotracker database or in accordance and coordination with CVGMC approach (see *Section 1.2*)	Annual
Report Content		
Design of trend monitoring program	Map(s) of monitoring subareas	Annual/Five-Year CVGMC Report*
	Map(s) of sampled wells	Annual/Five-Year CVGMC Report*
Tabulation of results	Summary statistics	Annual/Five-Year CVGMC Report*
	Complete analytical results	Annual/Five-Year CVGMC Report*
	Analytical reports	Annual/Five-Year CVGMC Report*
Visual presentation and interpretation of results	Map(s) of patterns within aquifer system (e.g., color gradient symbols)	Annual/Five-Year CVGMC Report*
Graphic presentation of time series data	Graphs of time series data illustrating temporal changes	Annual/Five-Year CVGMC Report*
Groundwater levels	Map(s) of groundwater elevations (e.g., contours) within select areas as applicable to regional monitoring network	Annual/Five-Year CVGMC Report*
Update regional groundwater quality characterization (using all readily available groundwater quality data)	Map(s) and tabulation of groundwater quality data relevant to irrigated agriculture	Five-Year CVGMC Report*
	Map(s) and tabulation of DPR groundwater pesticide monitoring data	Five-Year CVGMC Report*
Comparison of regional groundwater quality trends (using all readily available water quality data)		
Temporal trend analyses	Non-parametric statistical analyses of trends (e.g., Mann-Kendall test)	Five-Year CVGMC Report*
	Parametric statistical analysis of trends (e.g., linear regression)	Five-Year CVGMC Report*
Presentation of spatial patterns in trends (i.e., maps showing trends)	Statistical summary of conditions and trends relative to monitoring subareas	Five-Year CVGMC Report*
	Analyses of groundwater quality trends by depth zone	Five-Year CVGMC Report*
	Analyses of groundwater quality trends by location and locational characteristics (e.g., land use composition)	Five-Year CVGMC Report*

Table 6-1 (continued): Reporting Elements

Reporting Element	Description of Reporting Method	Reporting Frequency
Report Discussion		
Rationale for trend monitoring program design	Discussion of basis for trend monitoring well selection	Annual/Five-Year CVGMC Report*
Synthesis of findings	Discussion of findings relating to groundwater quality trends and patterns	Five-Year CVGMC Report*
	Evaluation of relationships between groundwater quality trends and land use	Five-Year CVGMC Report*
Evaluation of uncertainty and data gaps	Evaluation of representation of GQTM well network in relation to trends and patterns observed across Coalition region	Annual/Five-Year CVGMC Report*
Assess need to future GQTMP refinements	Provide recommendations regarding monitoring network	Annual/Five-Year CVGMC Report*
Coordination with education and outreach efforts	Evaluation of GQTM design in relation to Coalition education and outreach efforts	Annual/Five-Year CVGMC Report*

* Will be done in accordance and coordination with annual and five-year reporting as described in CVGMC Technical Workplan (LSCE et al., 2018).

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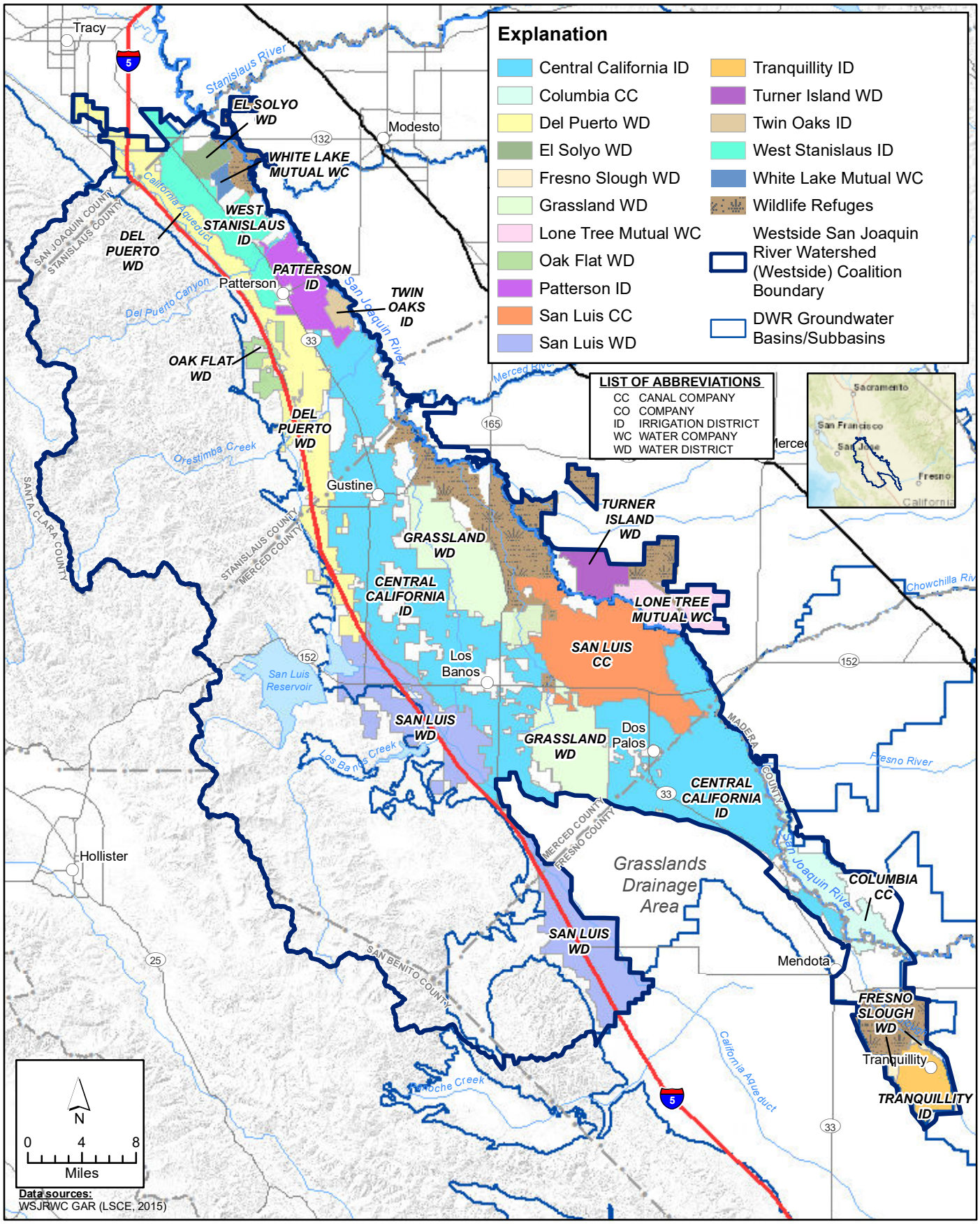
Figures



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 1-1 Westside SJRWC Location Map.mxd

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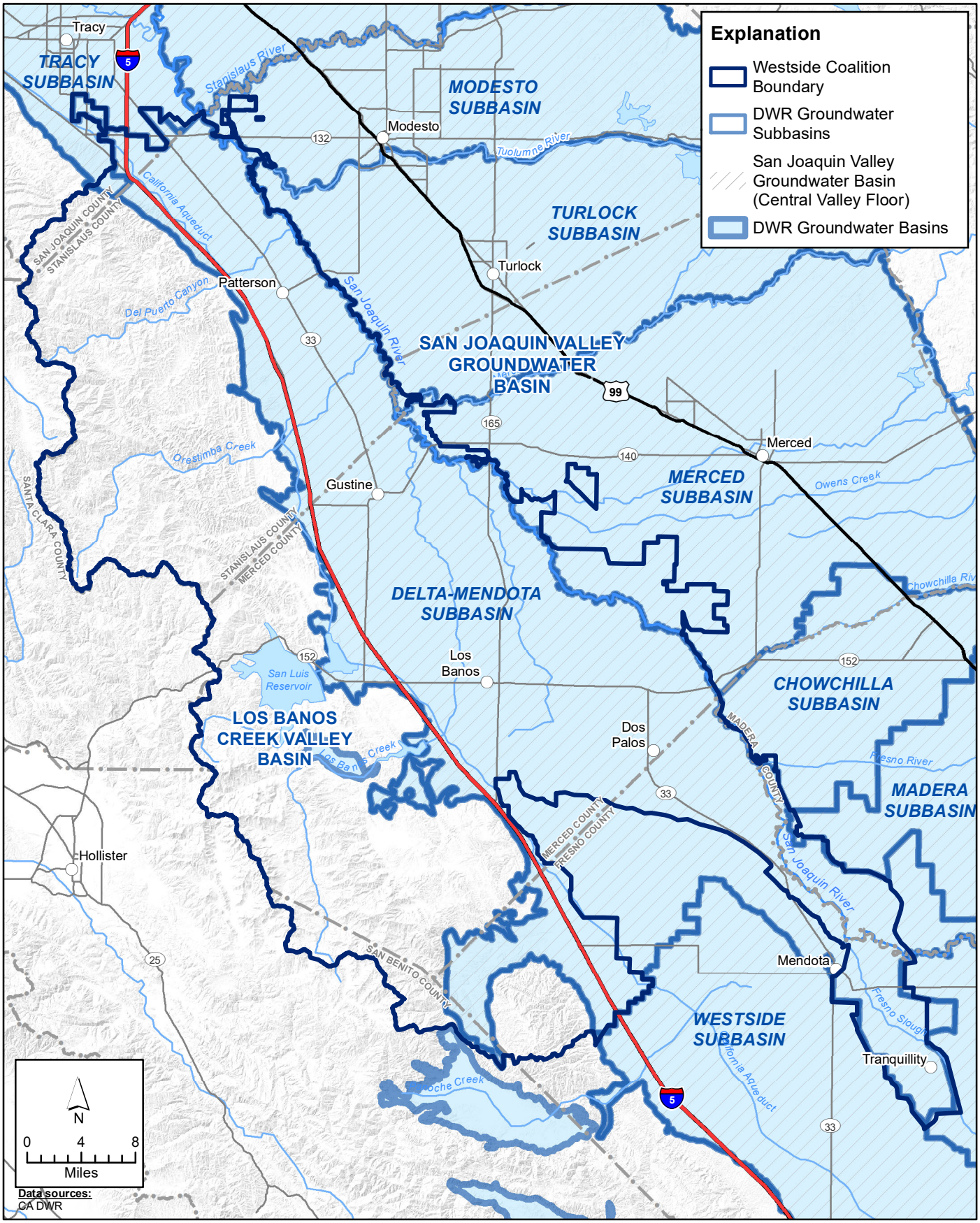
FIGURE 1-1
Westside San Joaquin River Watershed Coalition & Coalition Member Entities

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-1 Groundwater Basins and Subbasins.mxd

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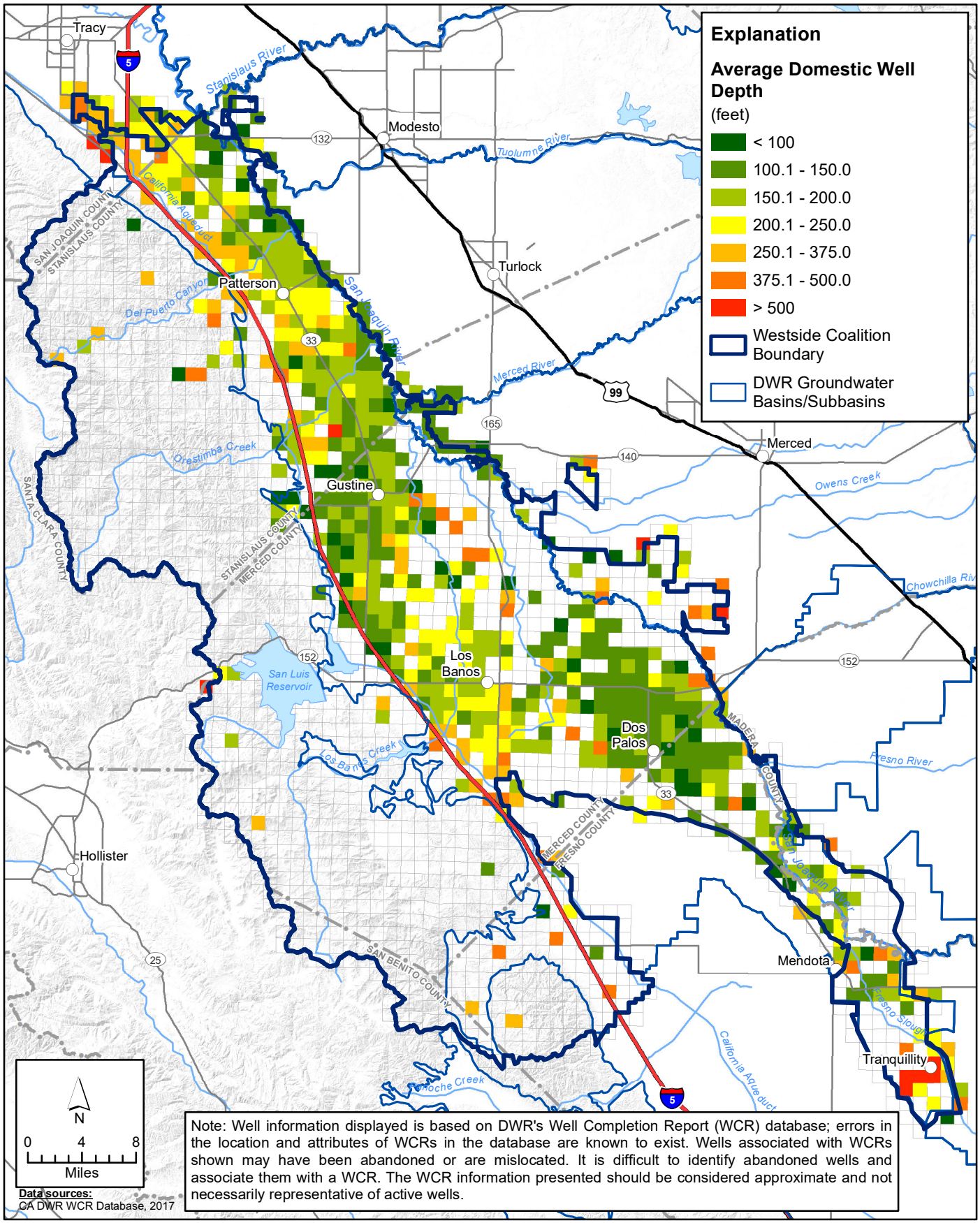
FIGURE 2-1

Groundwater Basins and Subbasins

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-2 Average Depth of Domestic Wells by Section.mxd

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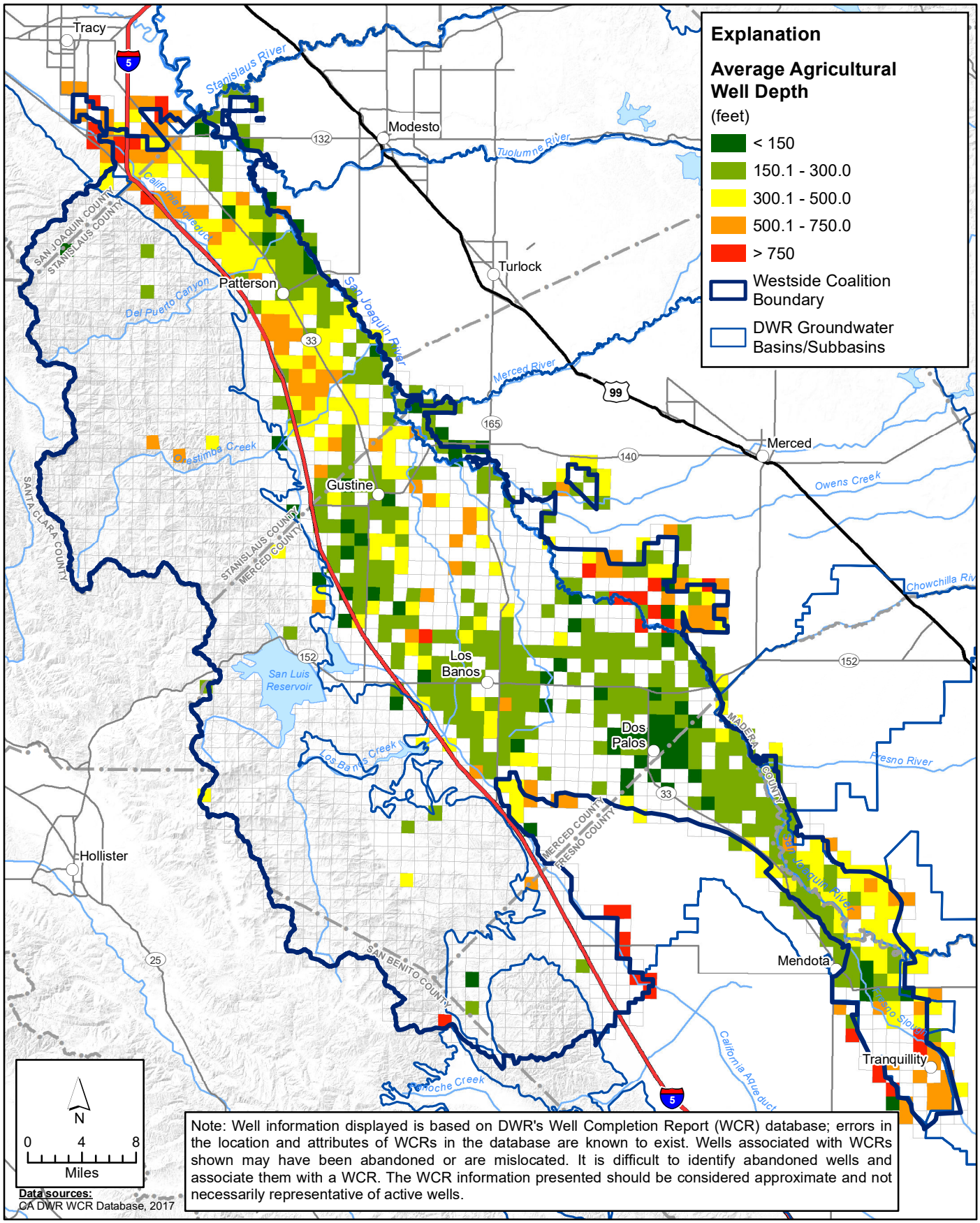
FIGURE 2-2
Average Depth of Domestic Wells by Section (from WCR data)

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-3 Average Depth of Agricultural Wells by Section.mxd

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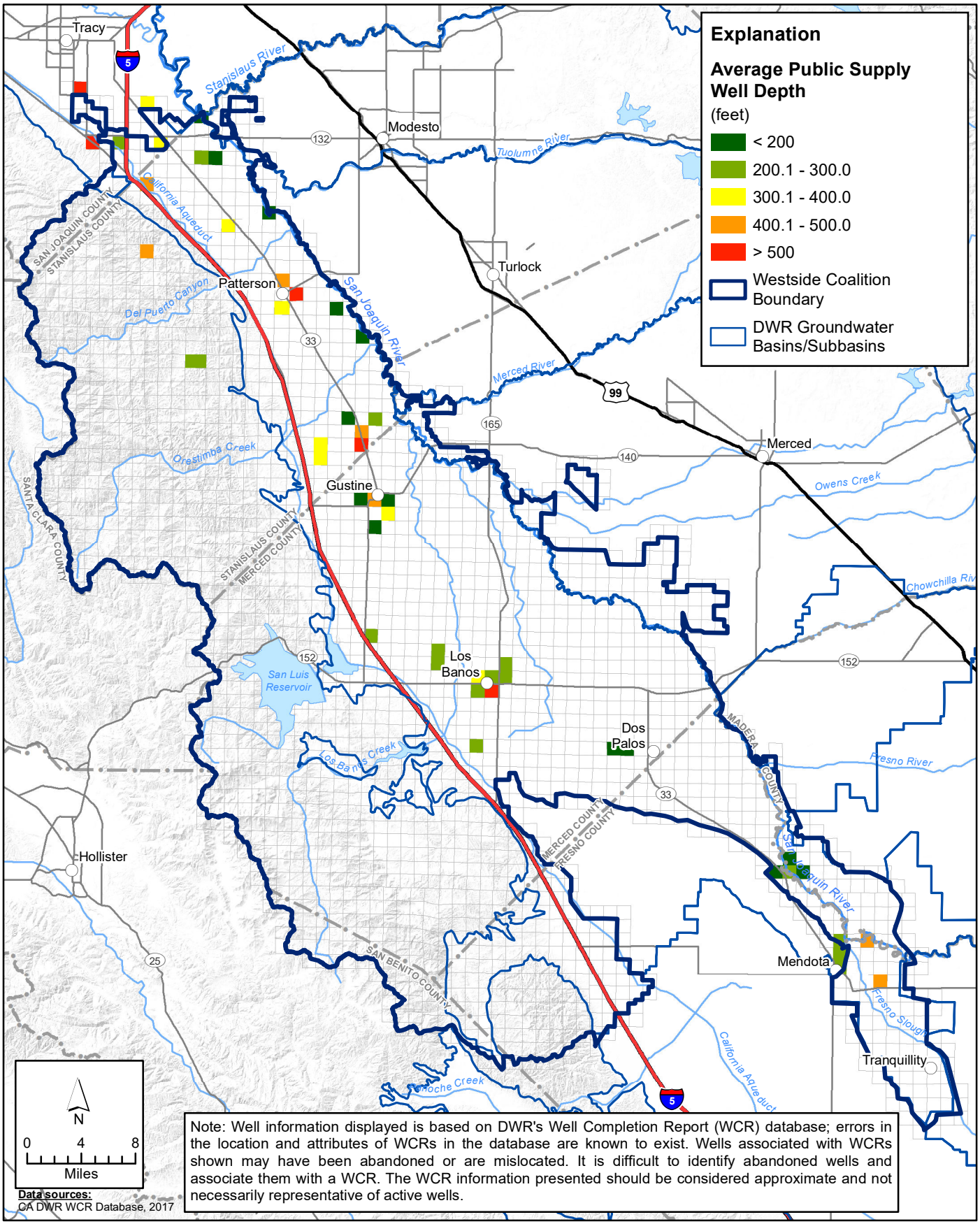
FIGURE 2-3
Average Depth of Agricultural Wells by Section (from WCR data)

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-4 Average Depth of Public Supply Wells by Section.mxd

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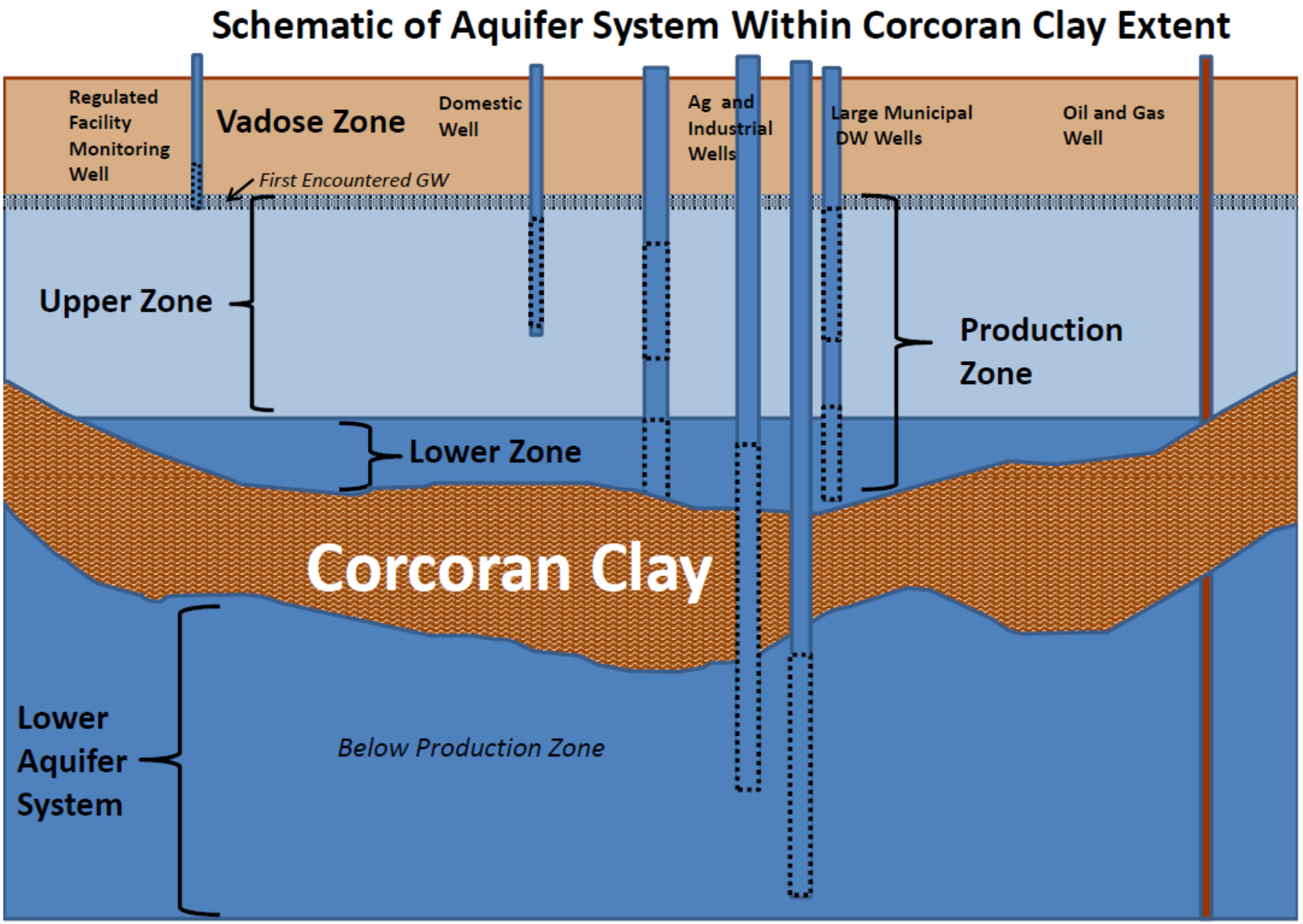
FIGURE 2-4
Average Depth of Public Supply Wells by Section (from WCR data)

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-5a Schematic of Zone Nomenclature for CVSALTS.mxd

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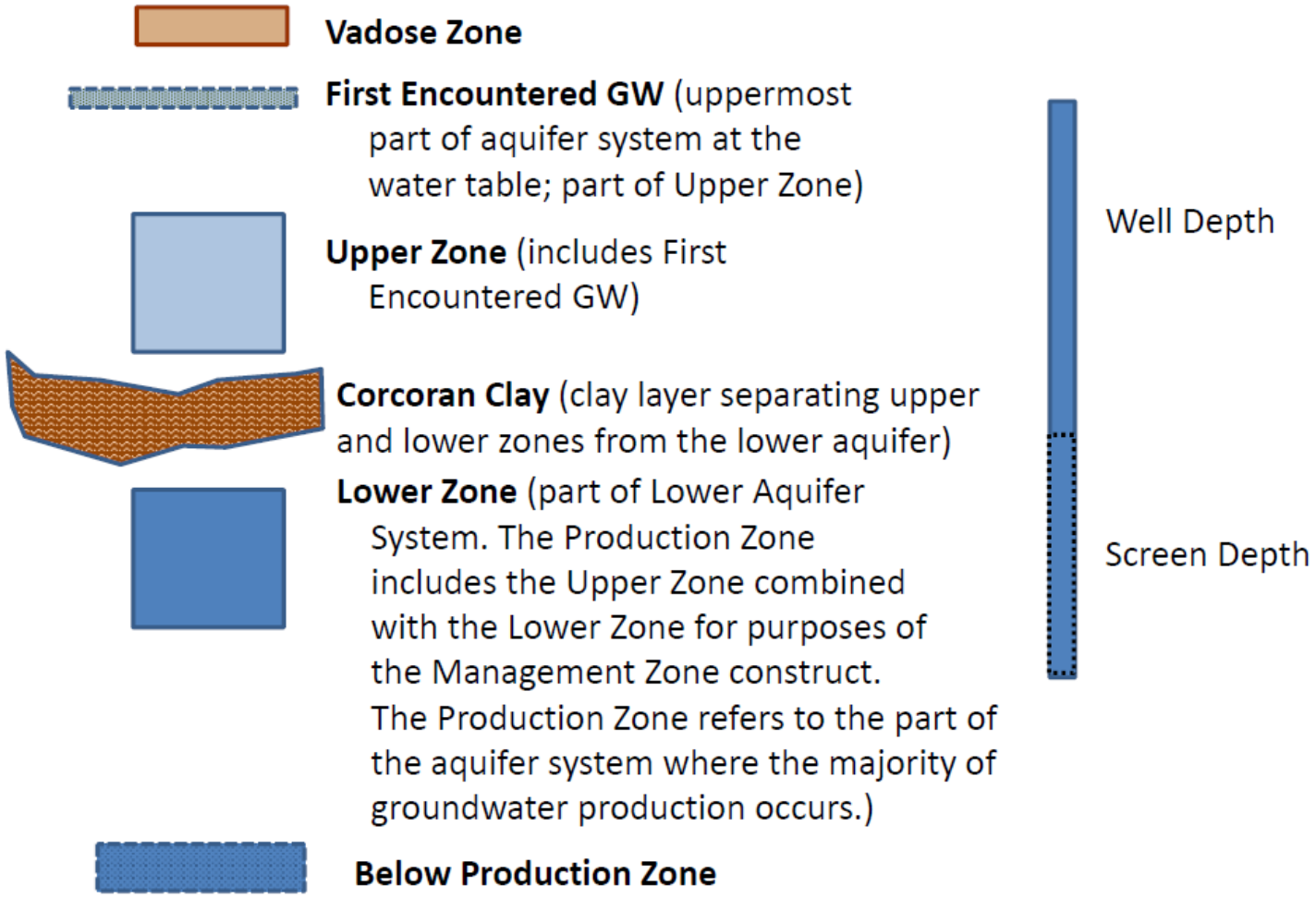
FIGURE 2-5A

Schematic of Zone Nomenclature for CV-SALTS

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition

Explanation of Terms



If well depth is unknown, well types are categorized by:
Upper Zone – Regulated Facility Monitoring Wells; Domestic Wells
Lower Zone – Ag Wells, Industrial Wells, Public Supply Wells

X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-5b Explanation - Schematic of Zone Nomenclature for CVSALTS.mxd

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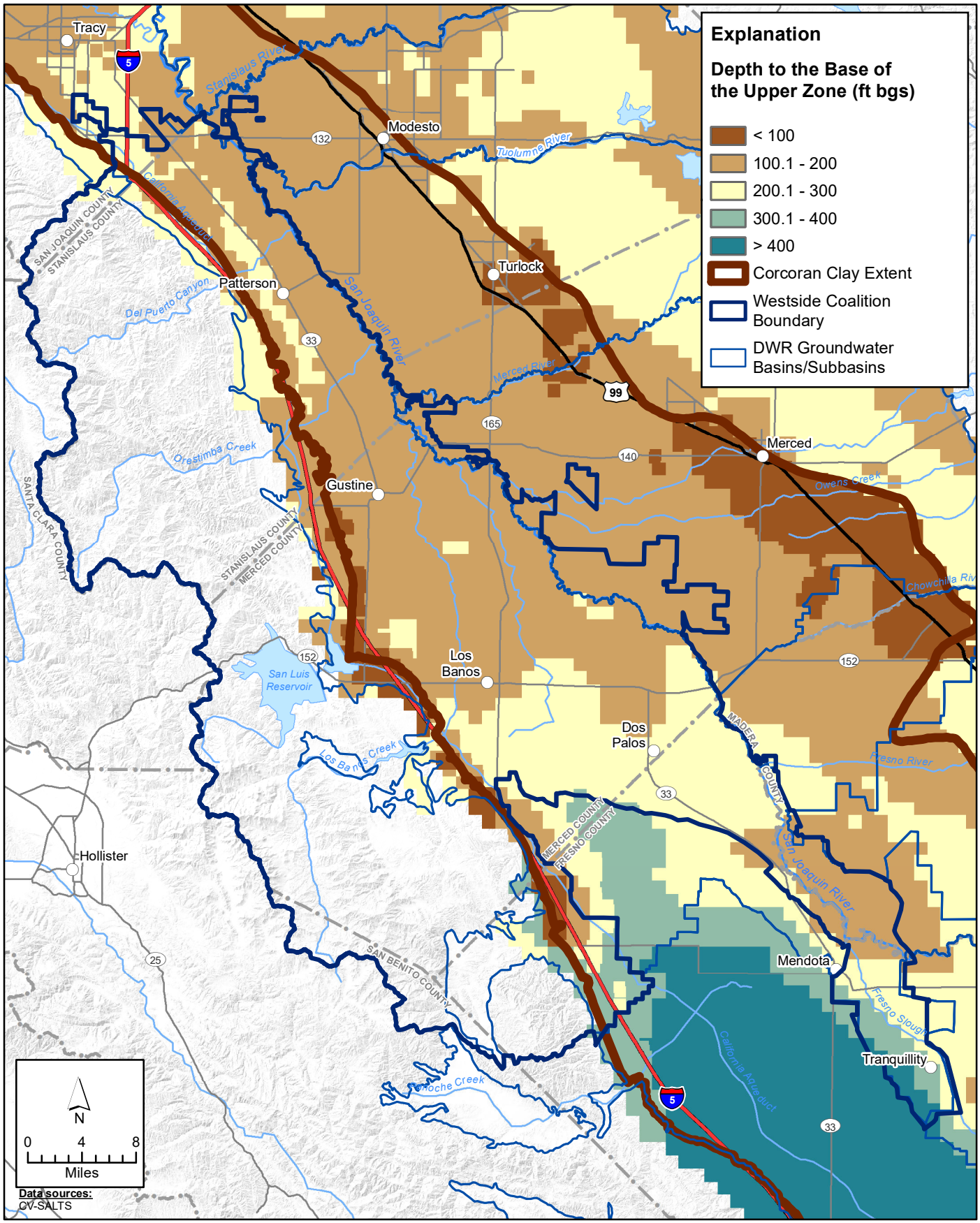
FIGURE 2-5B

Explanation - Schematic of Zone Nomenclature for CV-SALTS

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-6 Depth to the Bottom of the Upper Zone (CVSALTS).mxd

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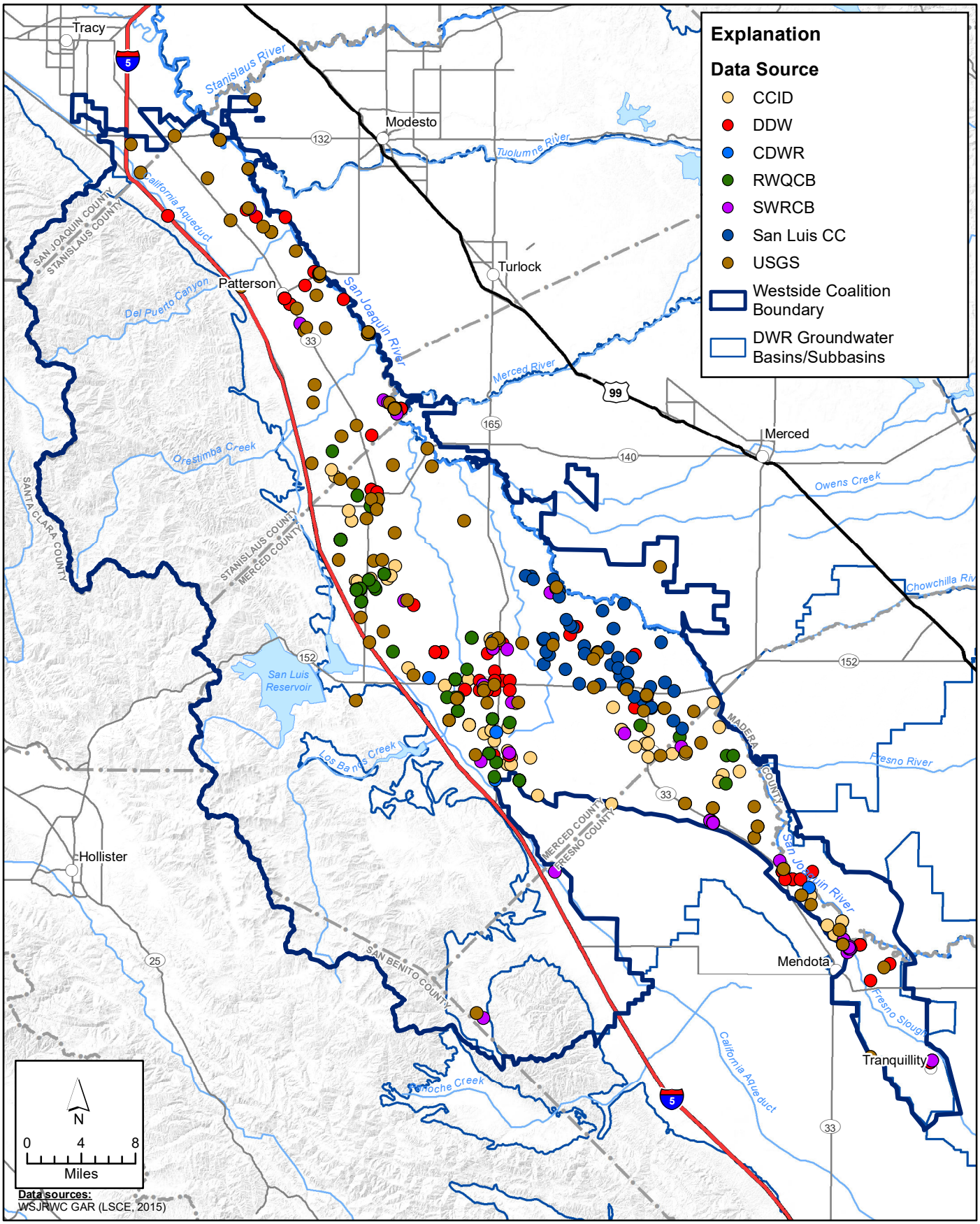
FIGURE 2-6
Depth to the Base of the Upper Zone (from CV-SALTS)

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-7 Nitrate Data by Source.mxd

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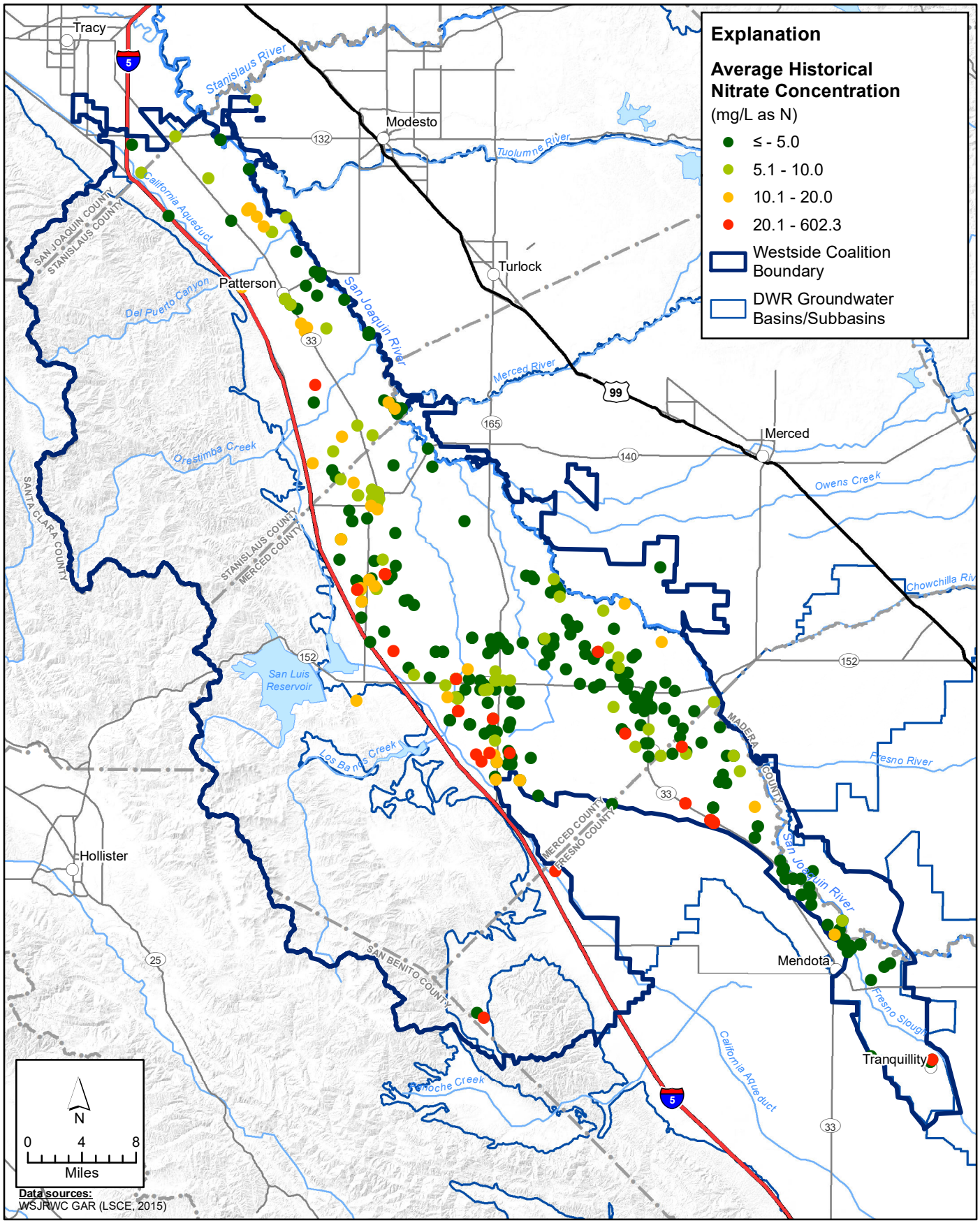
FIGURE 2-7

Historical Nitrate Data by Source

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-8 Average Nitrate Concentrations.mxd

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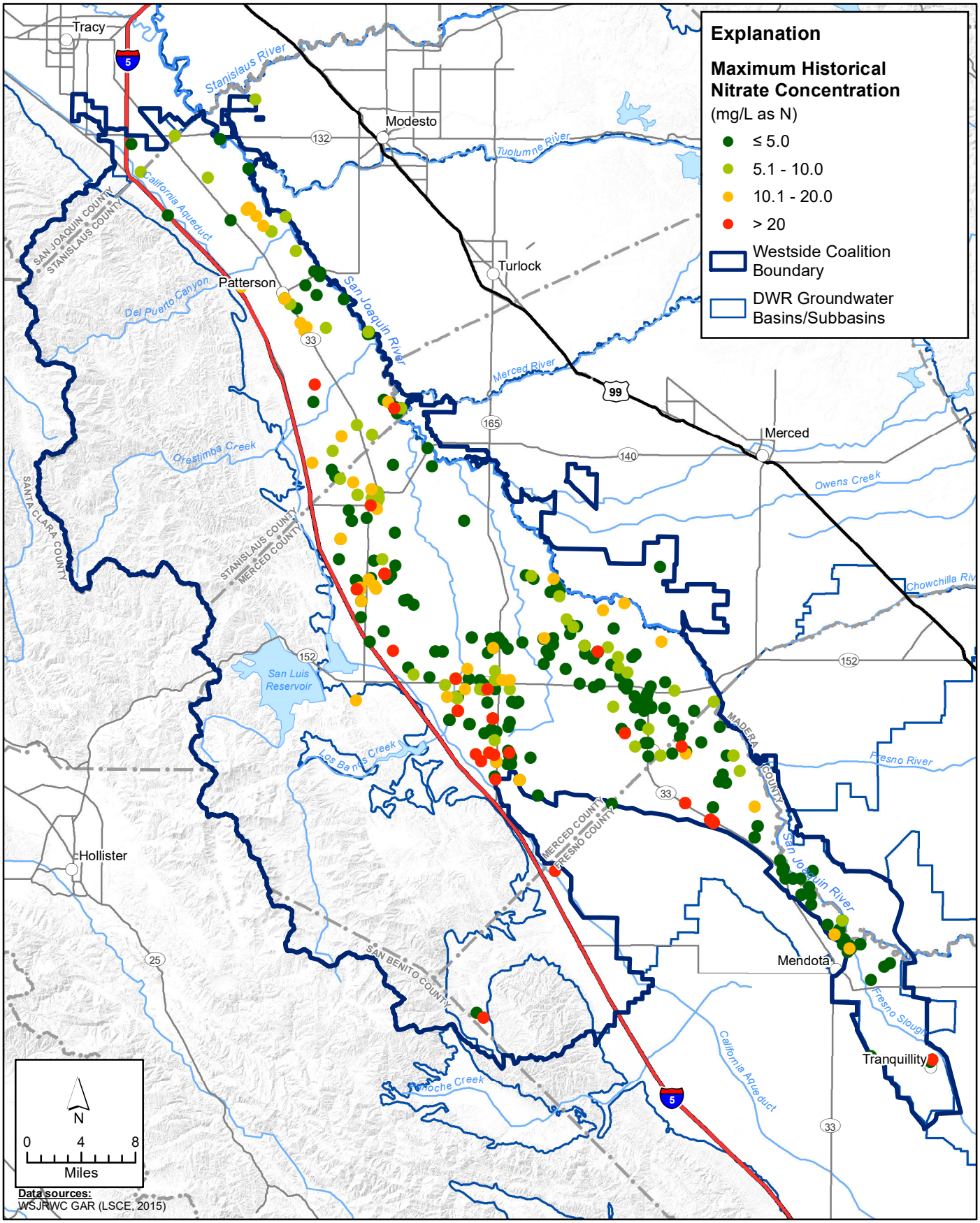
FIGURE 2-8

Average Historical Nitrate Concentrations

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-9 Maximum Nitrate Concentrations.mxd

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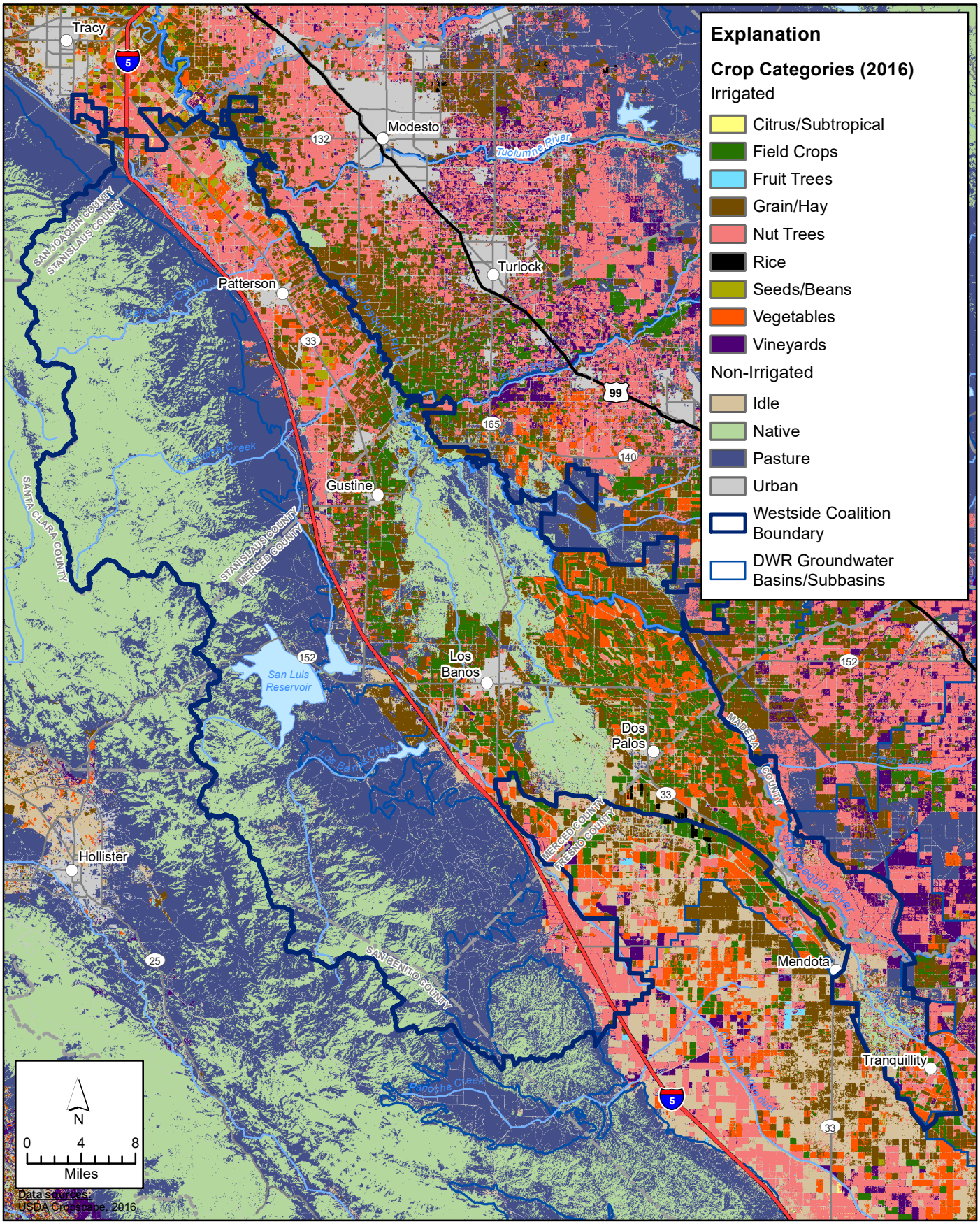
FIGURE 2-9

Maximum Historical Nitrate Concentrations

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-10 Map of Major Land Use Types.mxd

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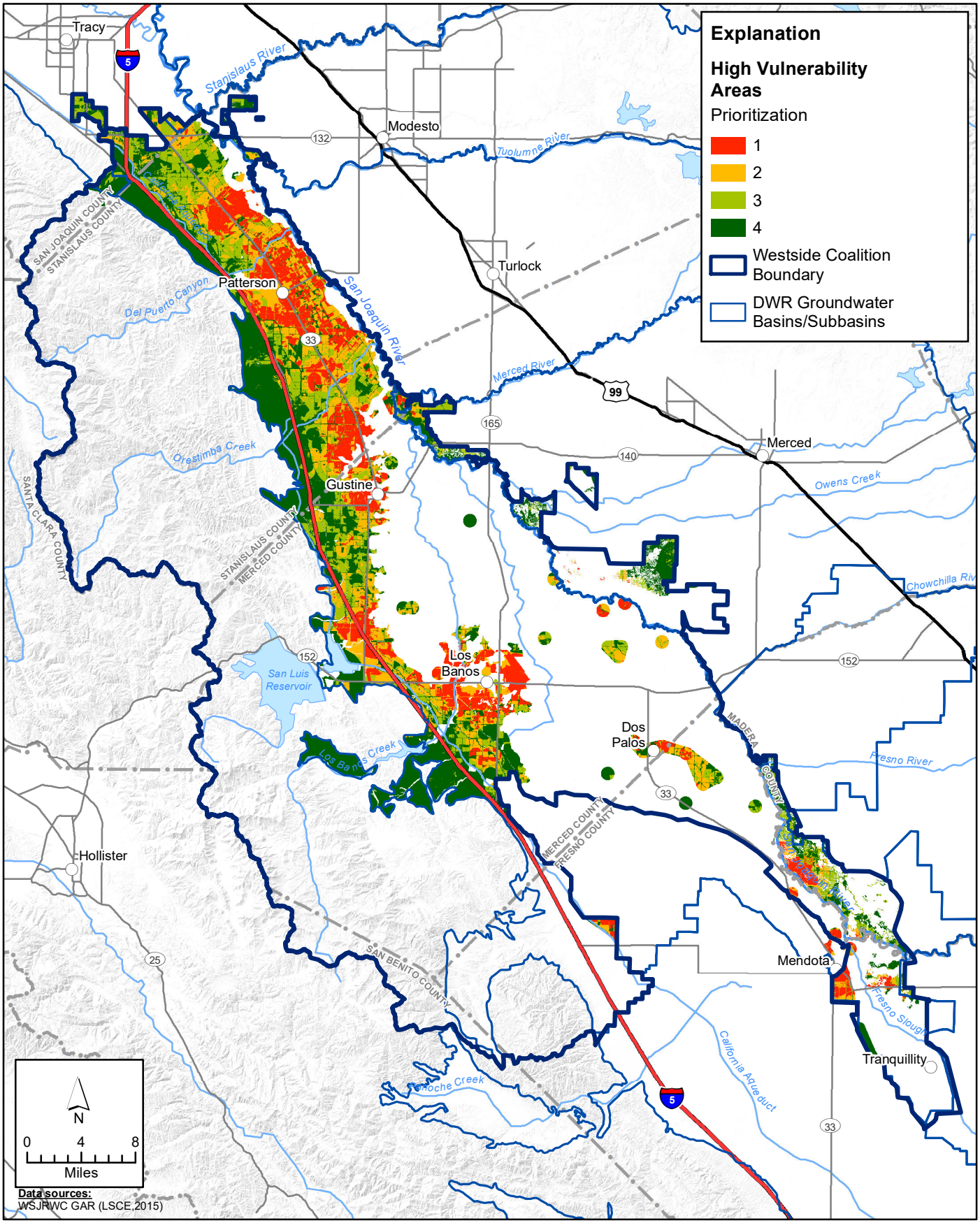
FIGURE 2-10
Map of Major Land Use Types (2016 USDA)

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 2-11 Prioritization of HVAs (from GAR).mxd

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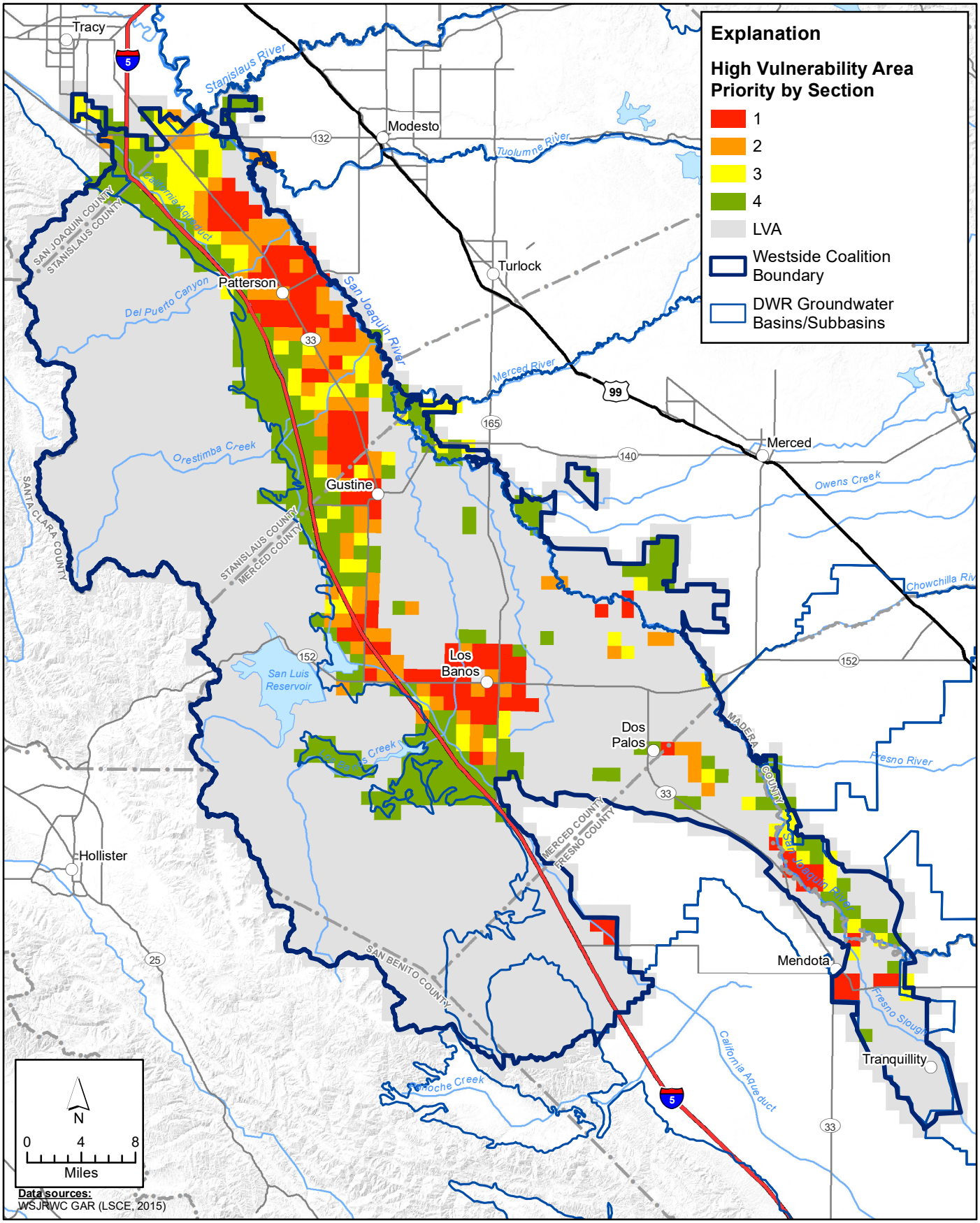
FIGURE 2-11

Map of High Vulnerability Area Prioritization

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 3-1 Map of High Vulnerability Areas by Section.mxd

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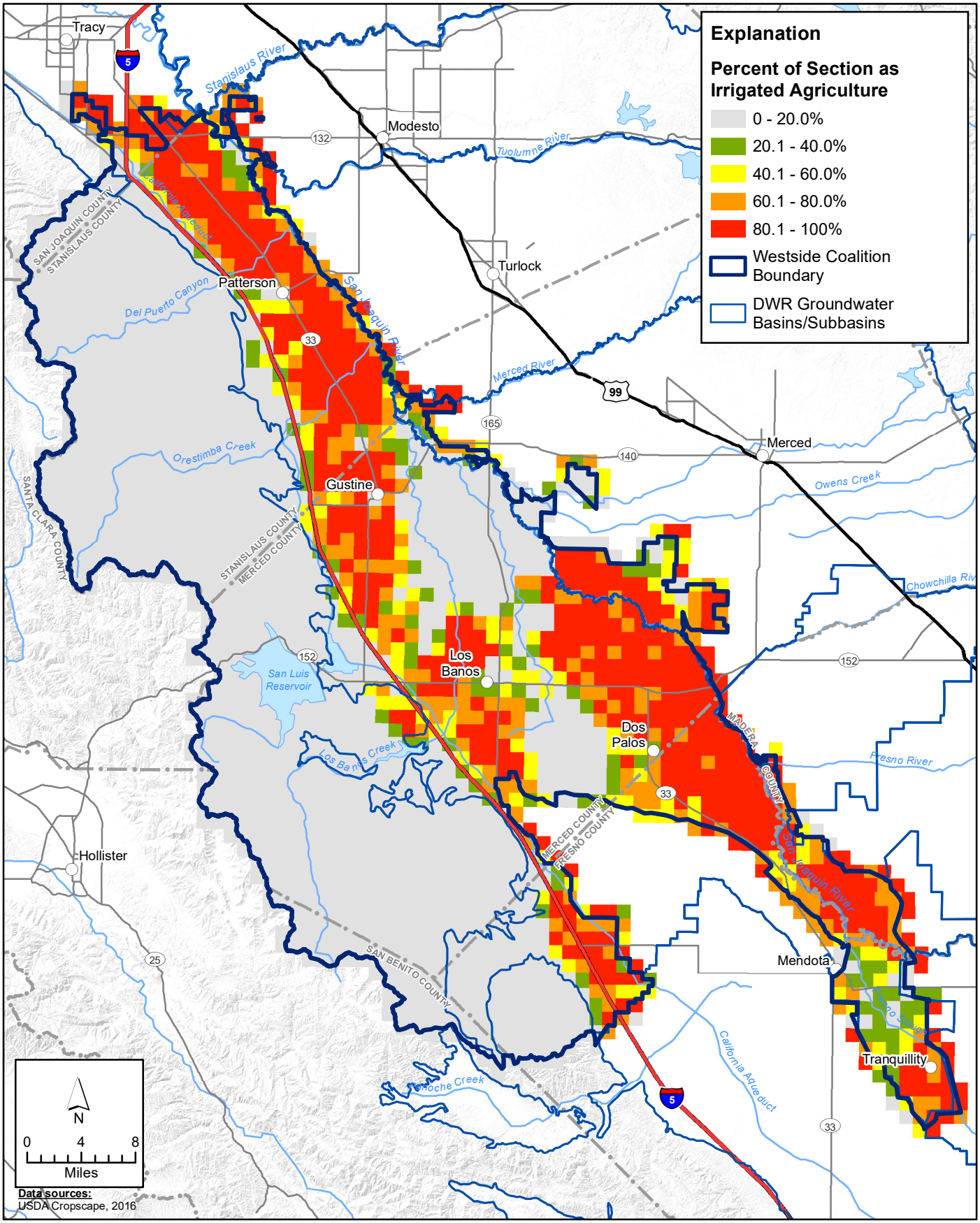
FIGURE 3-1

Map of High Vulnerability Areas by Section

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 3-2 Map of Irrigated Agriculture by Section.mxd

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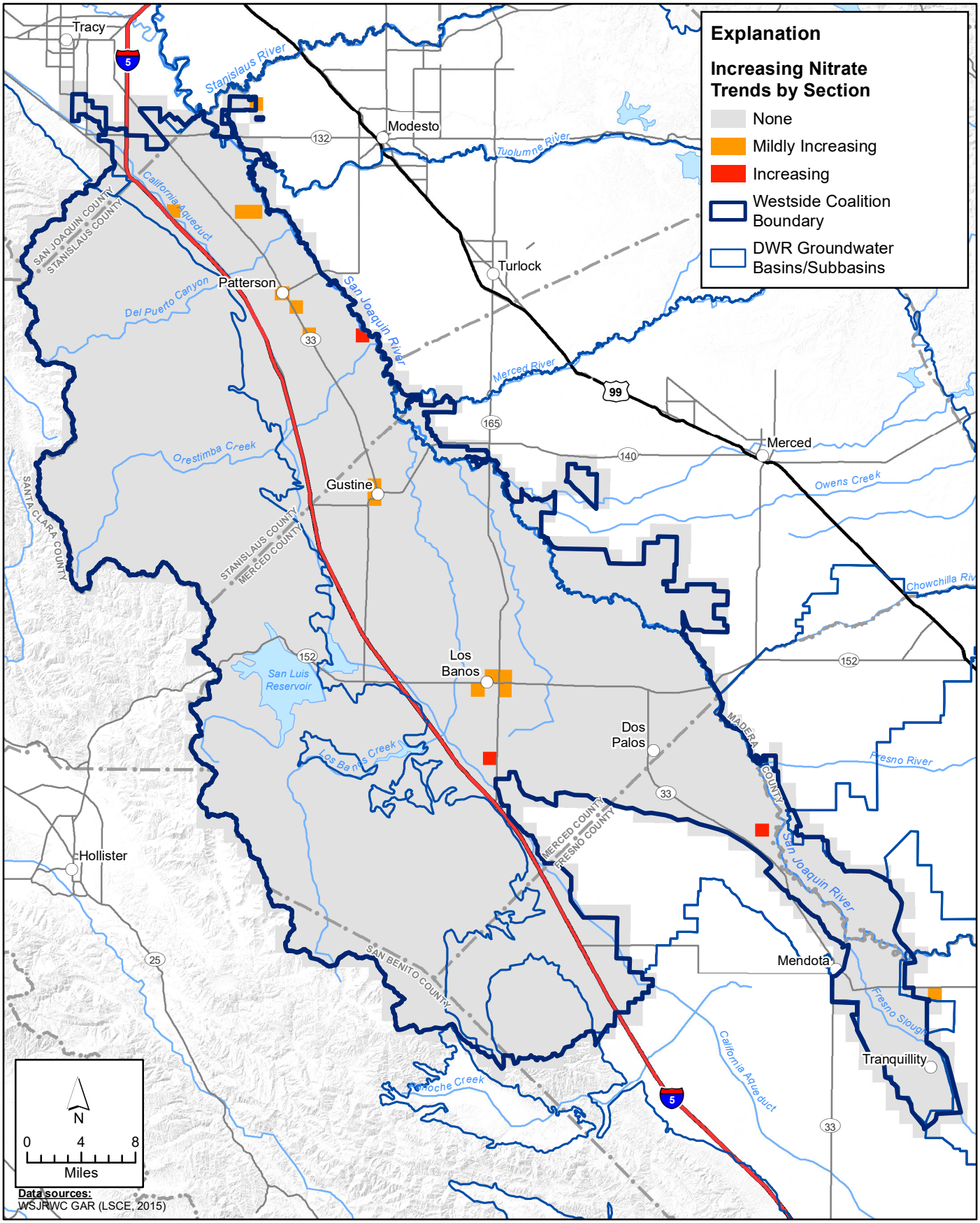
FIGURE 3-2

Map of Irrigated Agriculture by Section

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 3-3 Map of Increasing Nitrate Trends by Section.mxd

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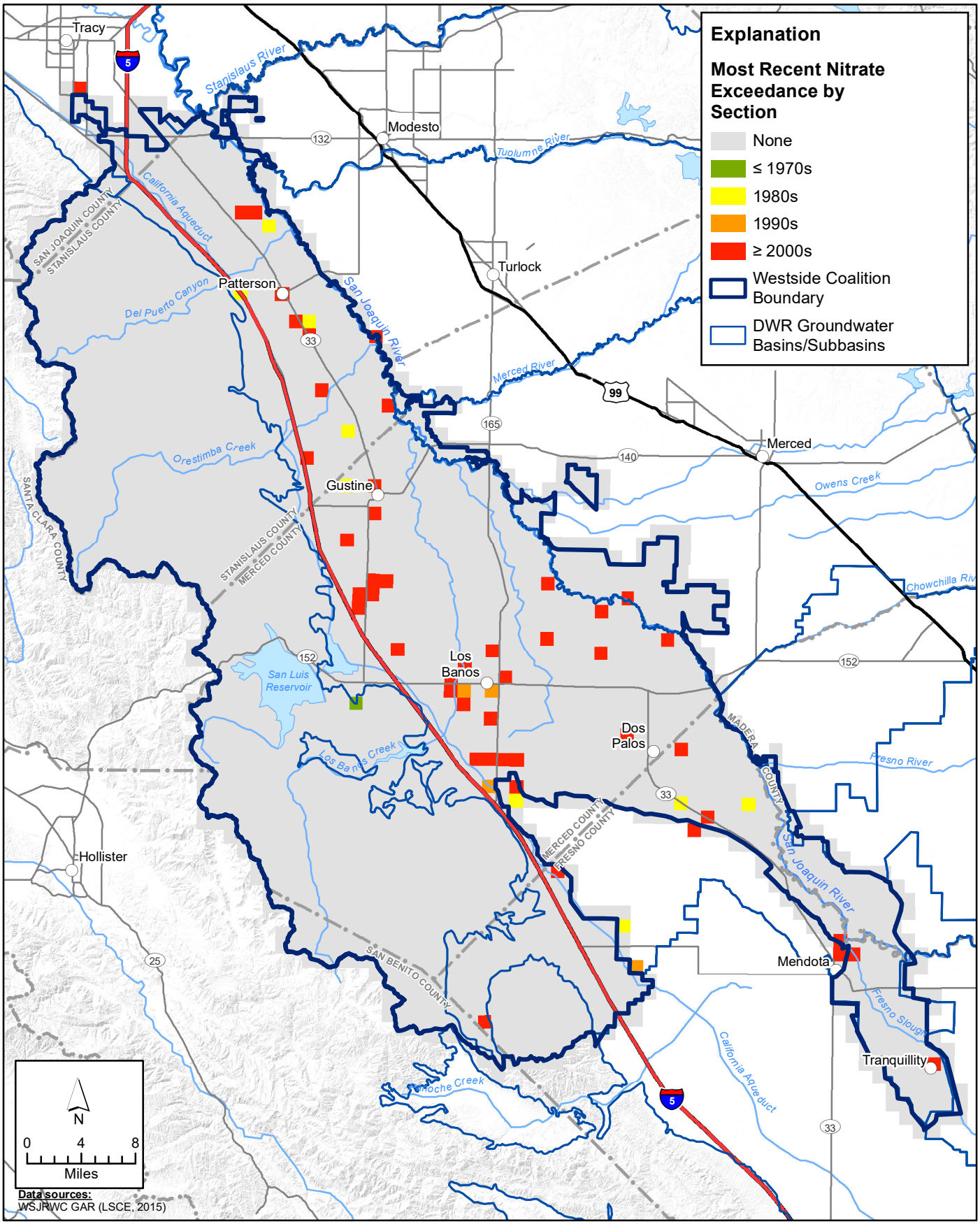
FIGURE 3-3

Map of Increasing Nitrate Trends by Section

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 3-4 Map of MR Nitrate MCL Exceedance by Section.mxd

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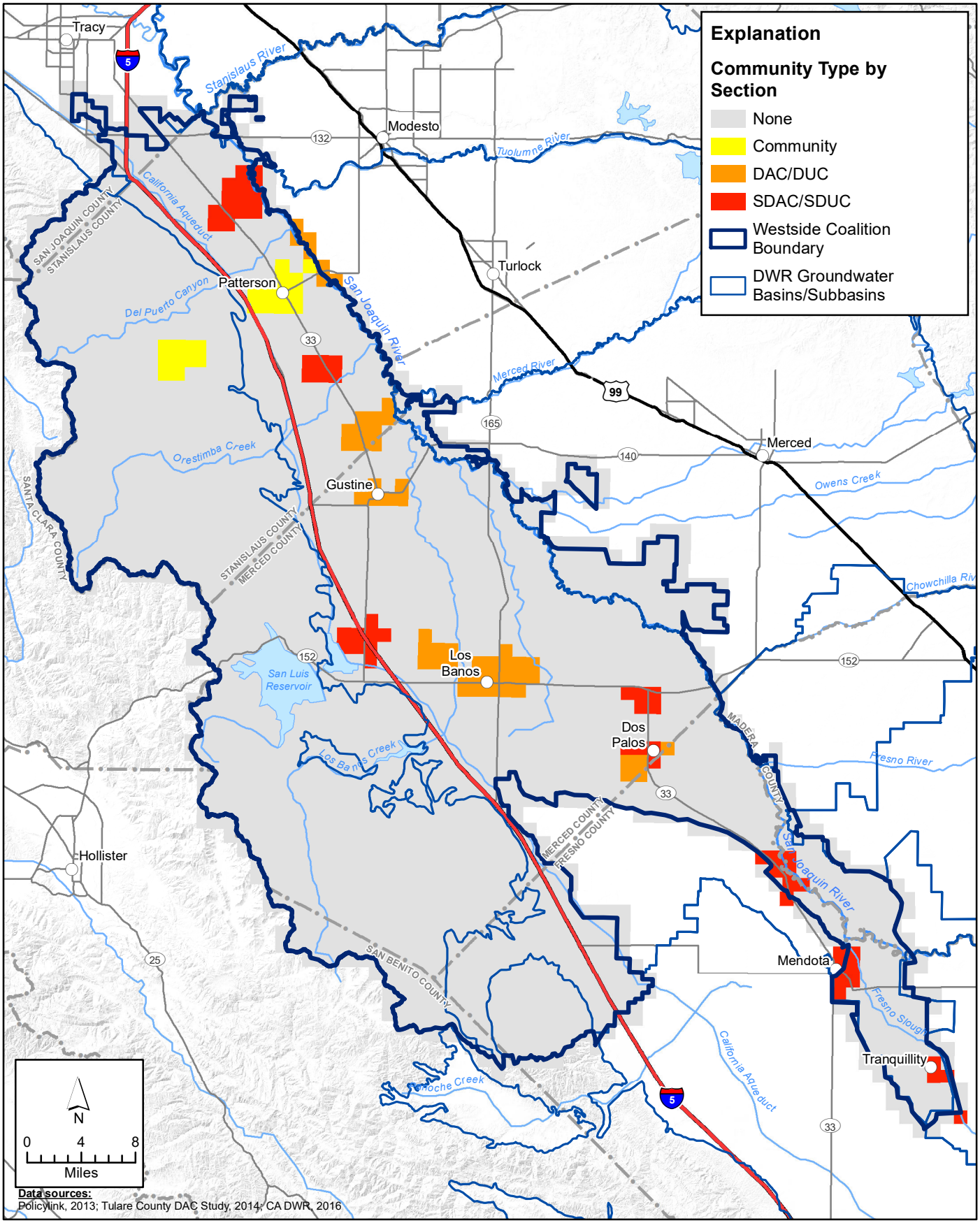
FIGURE 3-4

Map of Most Recent Nitrate MCL Exceedance by Section

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 3-5 Map of Community Type by Section.mxd

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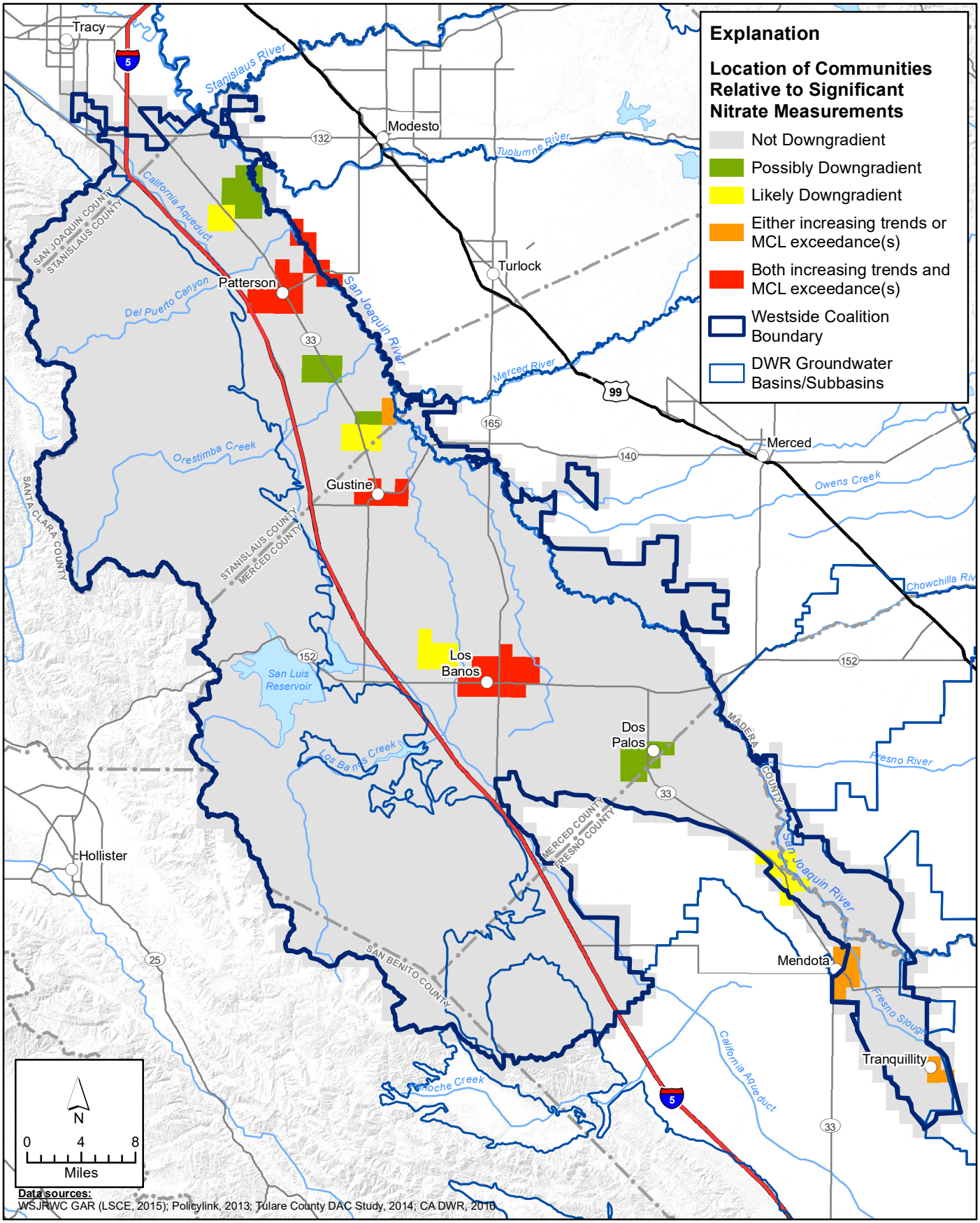
FIGURE 3-5

Map of Community Type by Section

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 3-6 Map of Communities Downgradient of Significant Nitrate Measurements by Section.mxd

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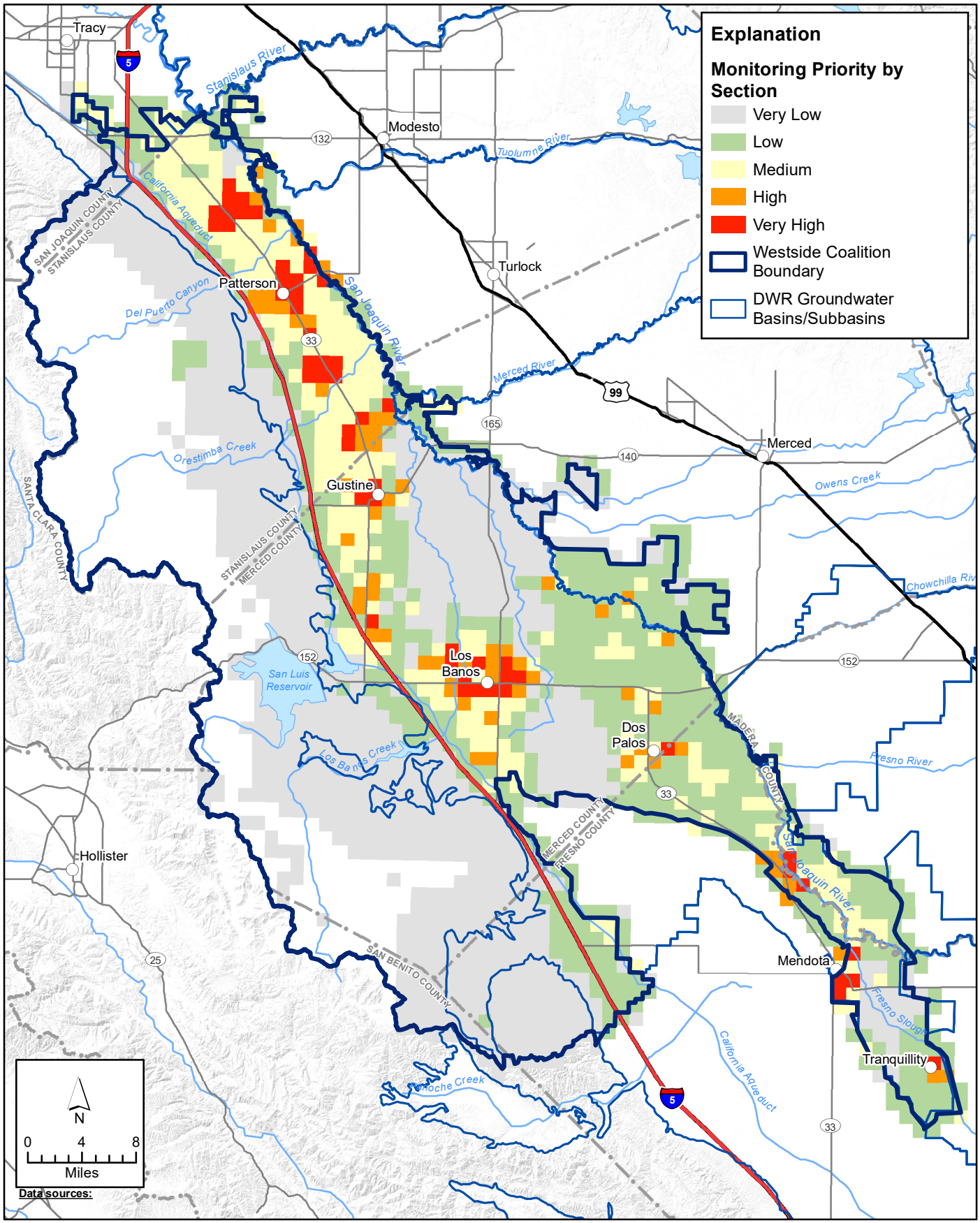
FIGURE 3-6
Map of Communities Downgradient of Significant Nitrate Measurements by Section

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 3-7 Map of Monitoring Priority by Section.mxd

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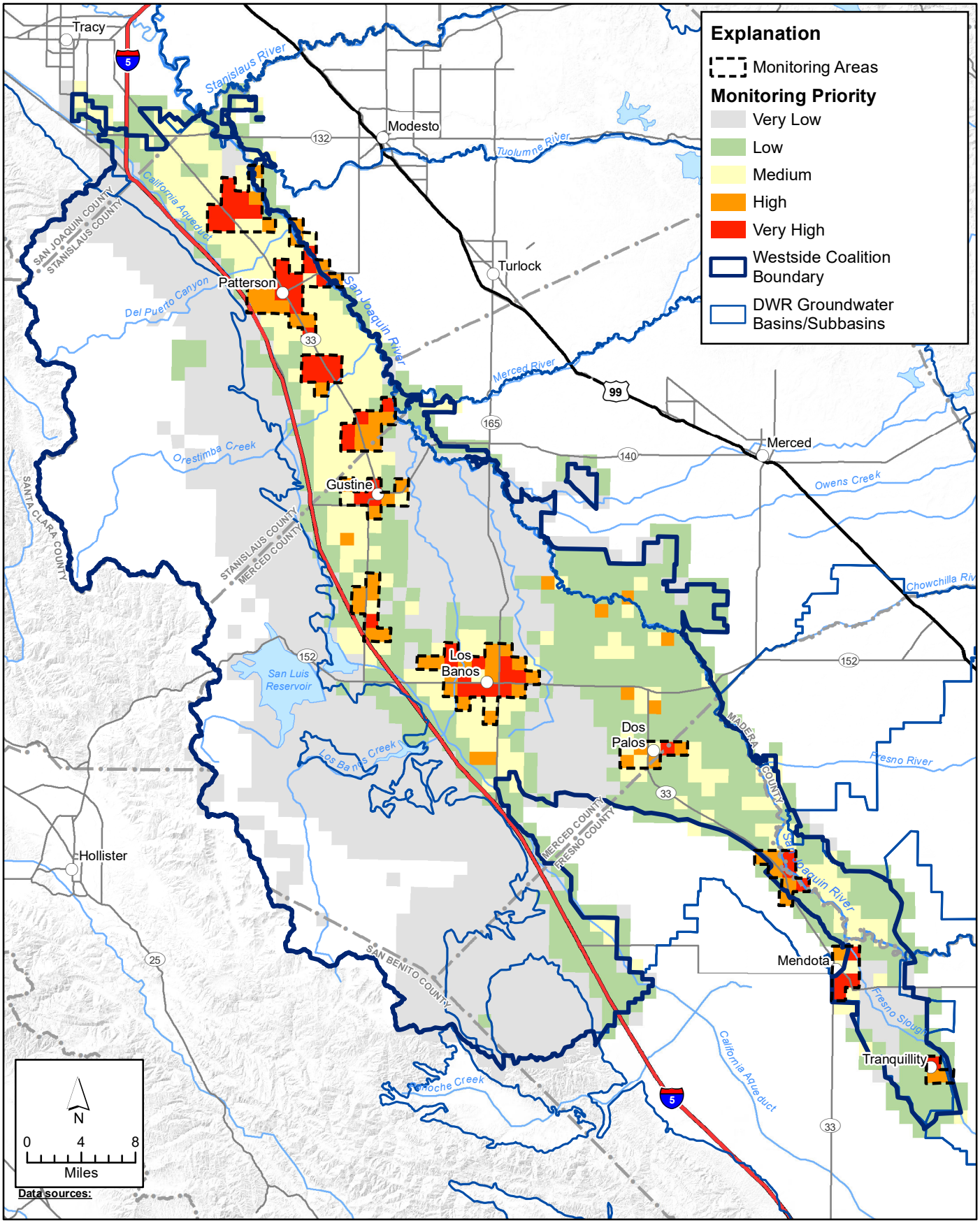
FIGURE 3-7

Map of Monitoring Priority by Section

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 3-8 Monitoring Areas.mxd

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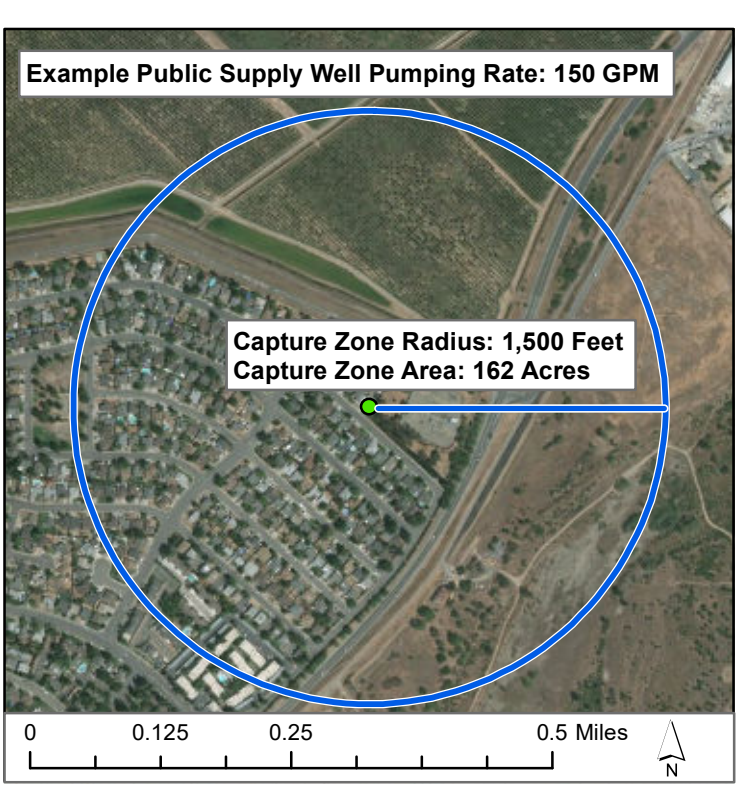
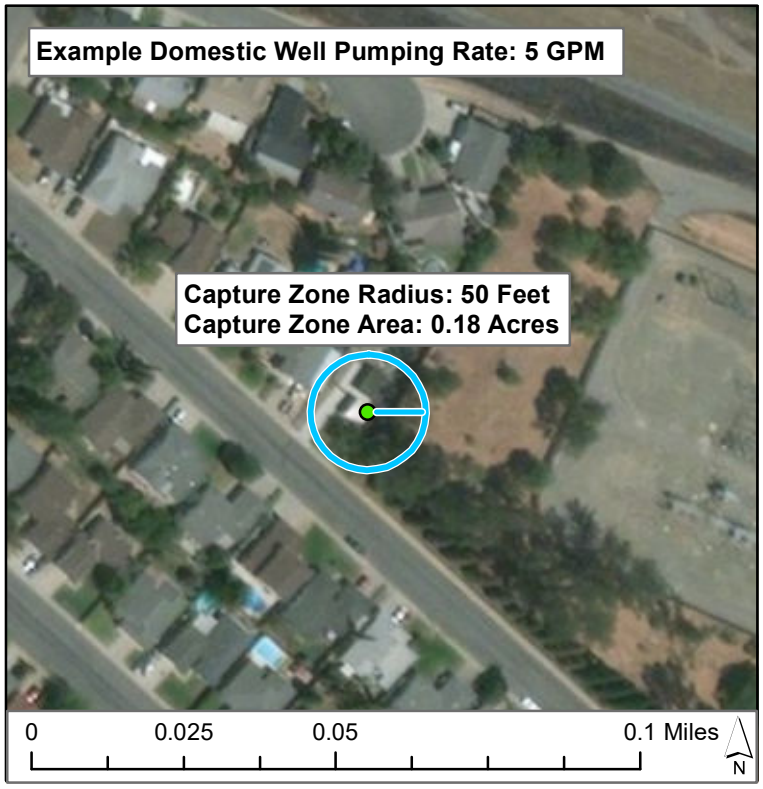
FIGURE 3-8

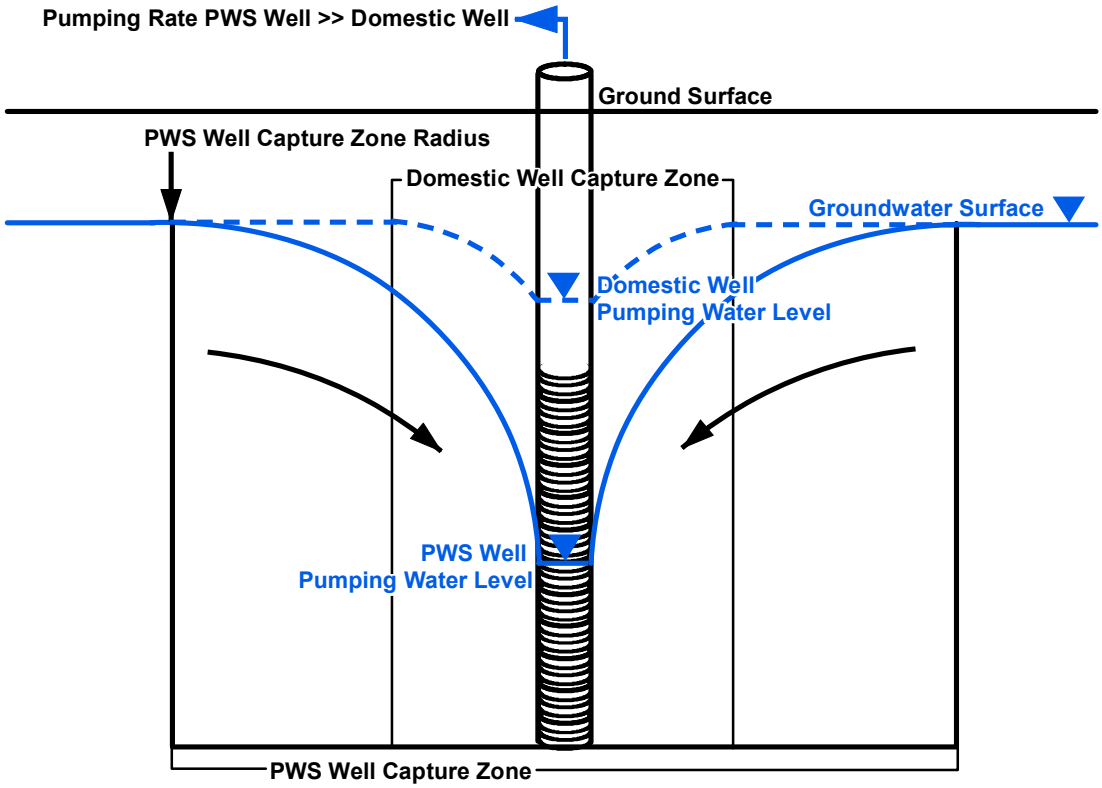
Monitoring Areas

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition





Note: Well capture zone scenario results are for illustrative purposes based on distance to stagnation point calculated using Darcy transmissivity method assuming the following properties: aquifer hydraulic conductivity=2 feet/day; saturated thickness=150 feet; hydraulic gradient=0.01.



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-1 Conceptual Schematic of Well Capture Zones.mxd

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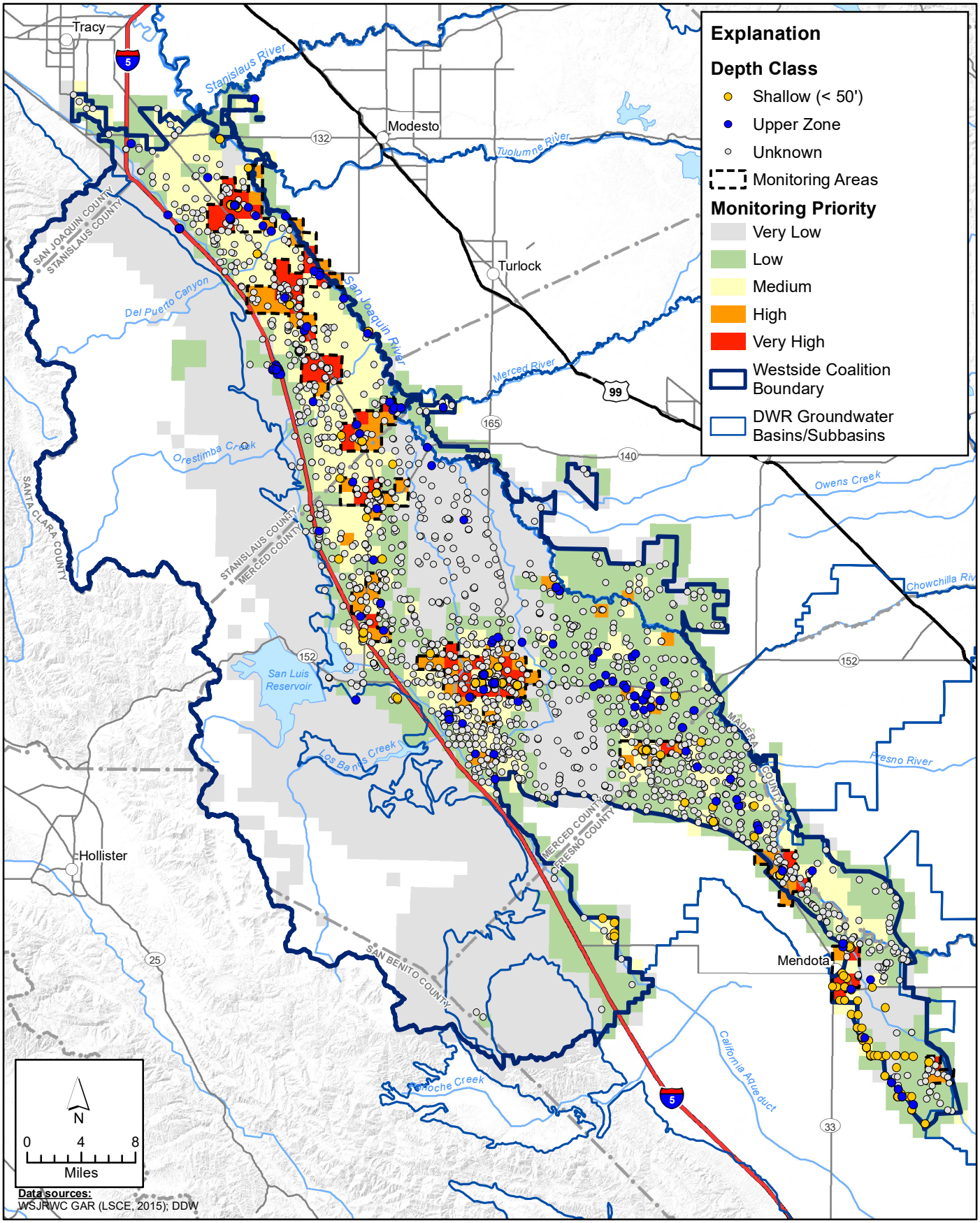
FIGURE 4-1

Conceptual Schematic of Well Capture Zones in Hypothetical Unconfined Aquifer

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-2 Candidate Wells by Depth Class.mxd

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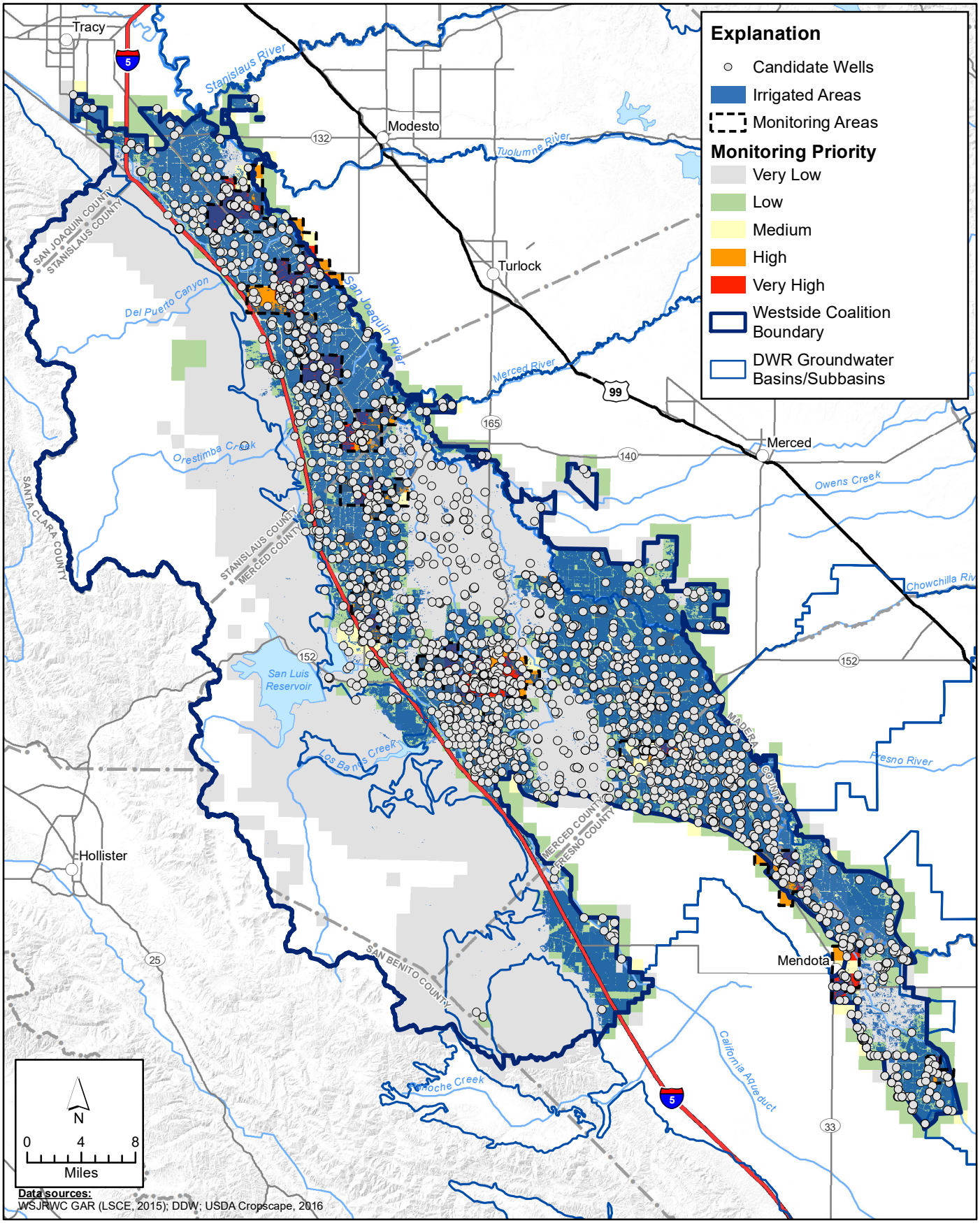
FIGURE 4-2

Candidate Wells by Depth Class

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-3 Candidate Wells and Irrigated Areas.mxd

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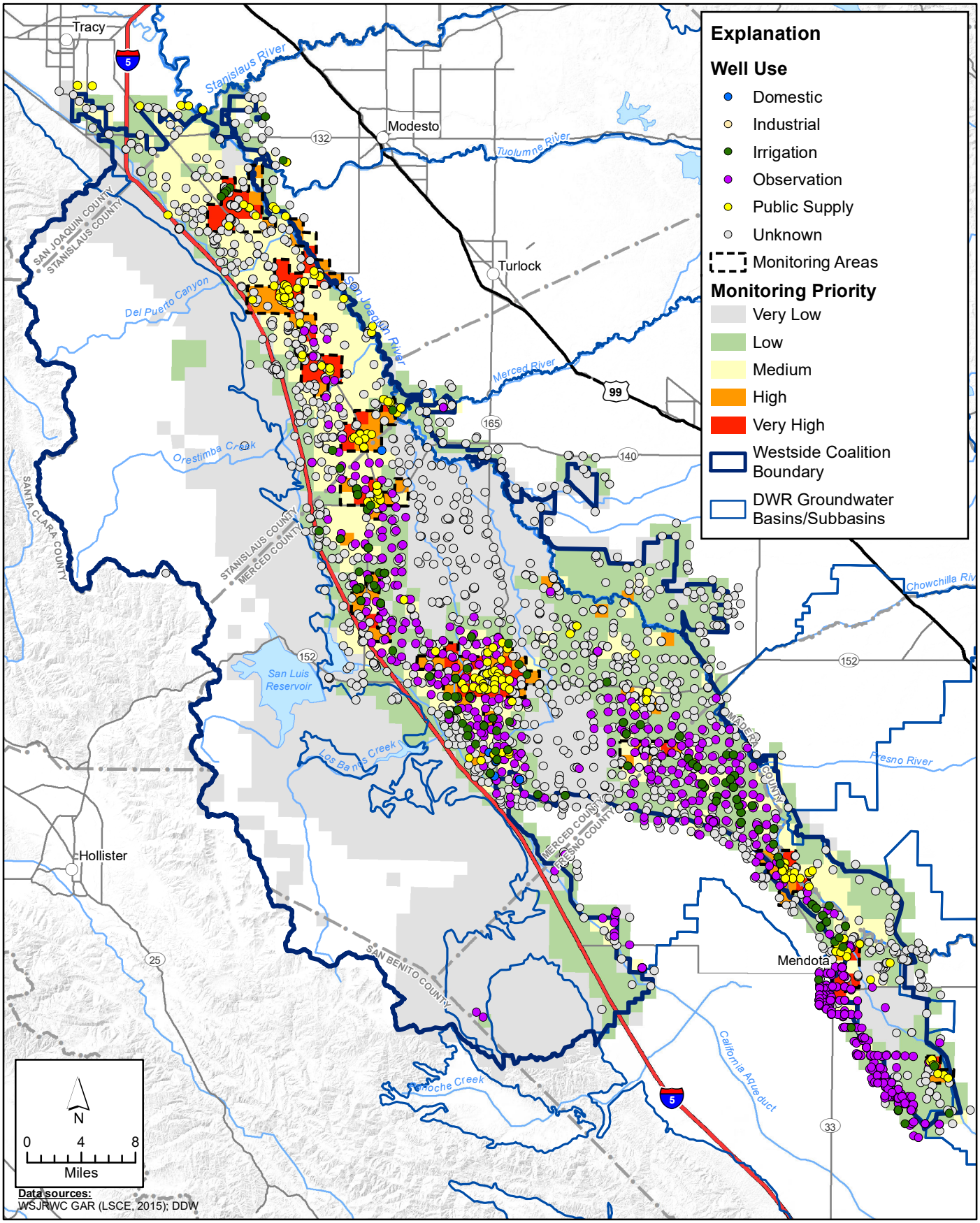
FIGURE 4-3

Candidate Wells and Irrigated Areas

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-4 Candidate Wells by Well Use.mxd

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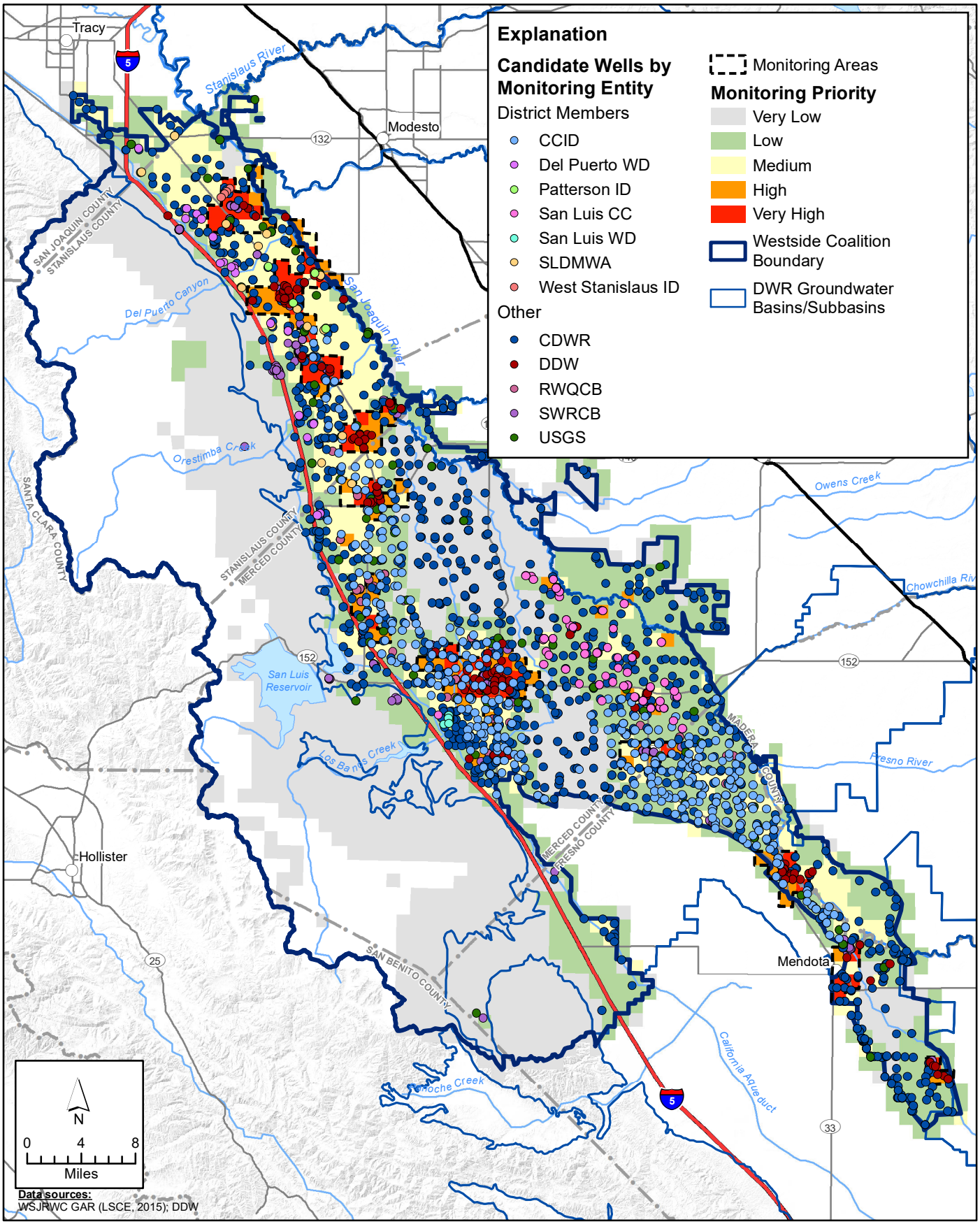
FIGURE 4-4

Candidate Wells by Well Use

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-5 Candidate Wells by Monitoring Entity.mxd

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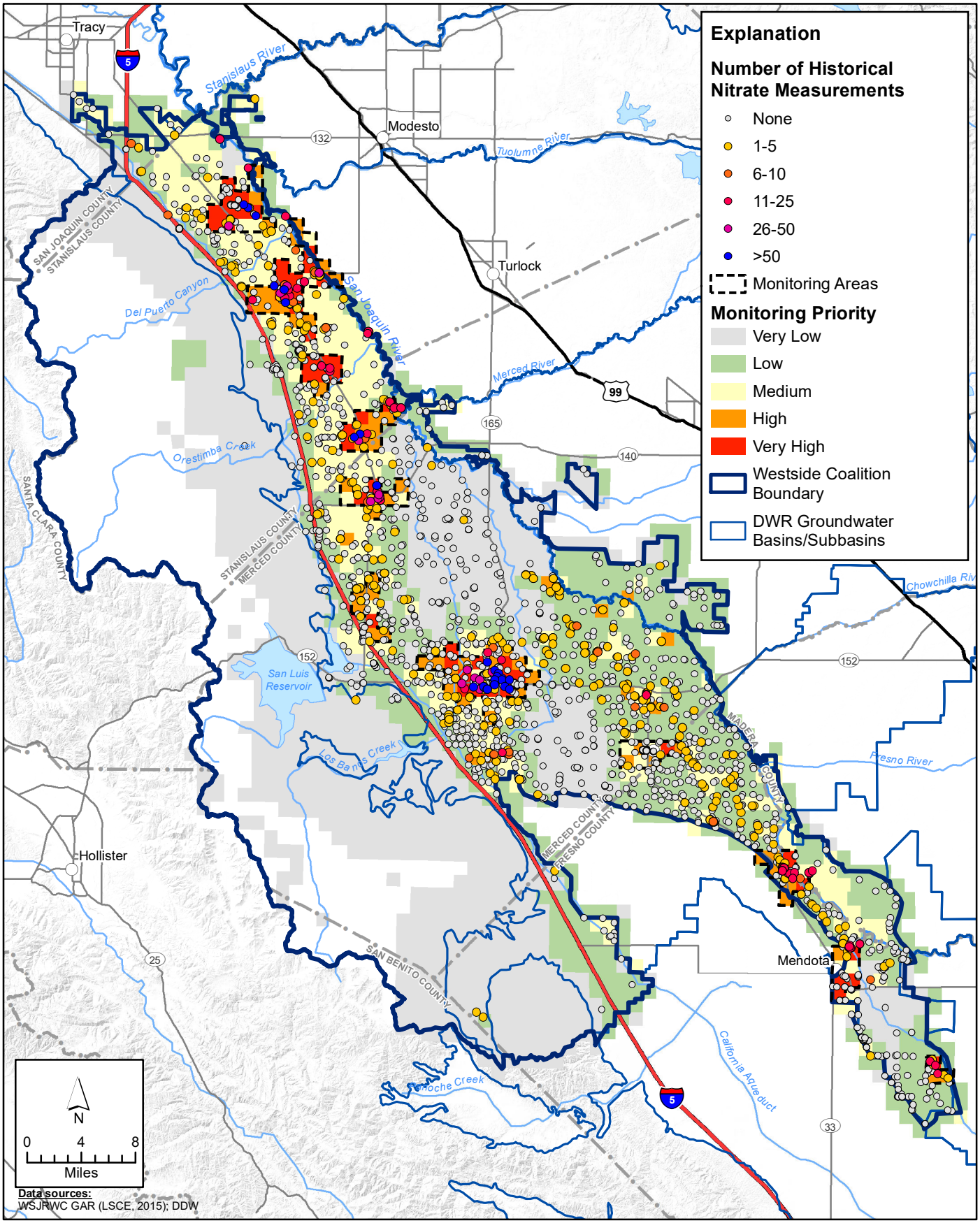
FIGURE 4-5

Candidate Wells by Monitoring Entity

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-6 Candidate Wells by Nitrate Measurement Count.mxd

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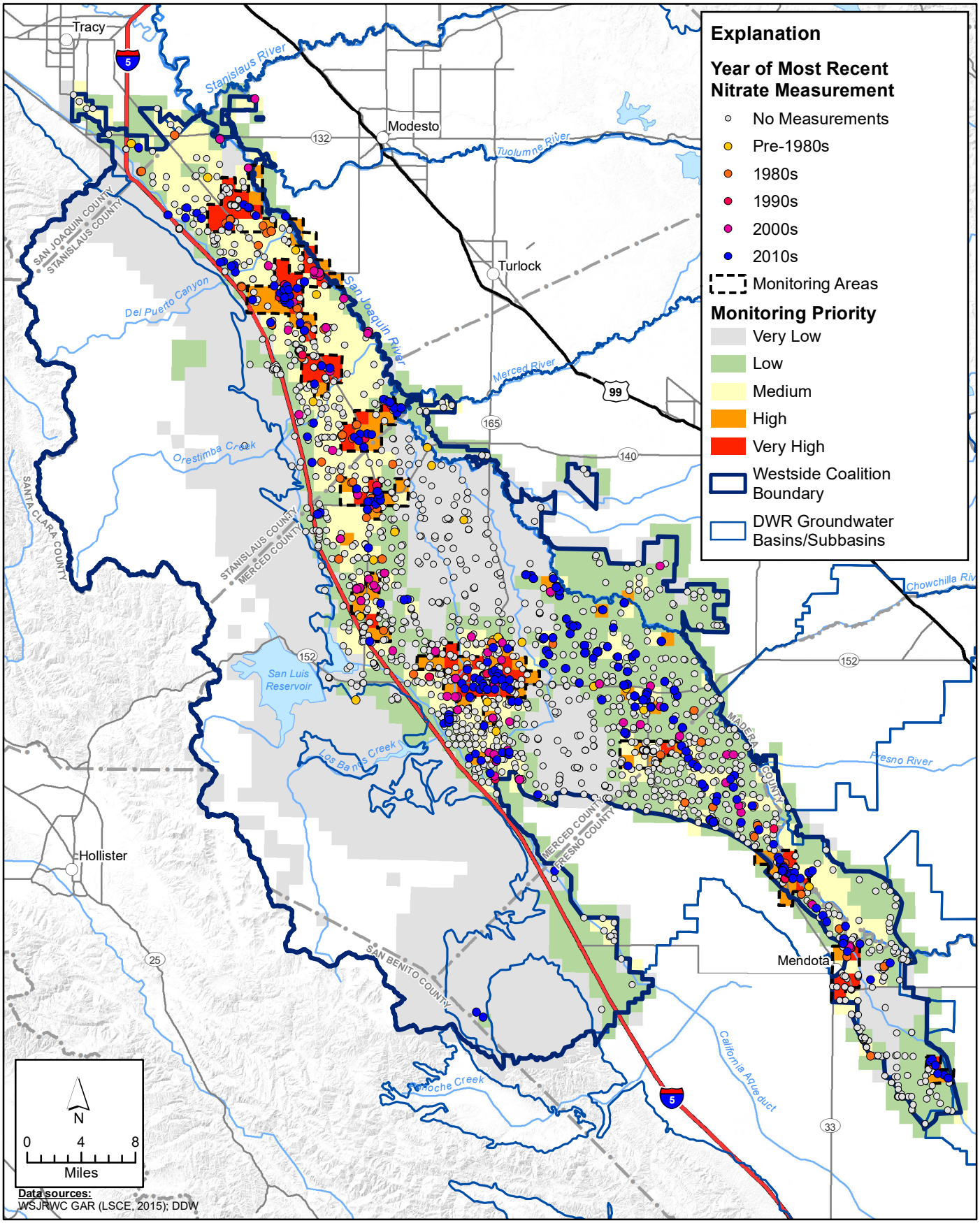
FIGURE 4-6

Candidate Wells by Nitrate Measurement Count

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-7 Candidate Wells by Most Recent Nitrate Measurement.mxd

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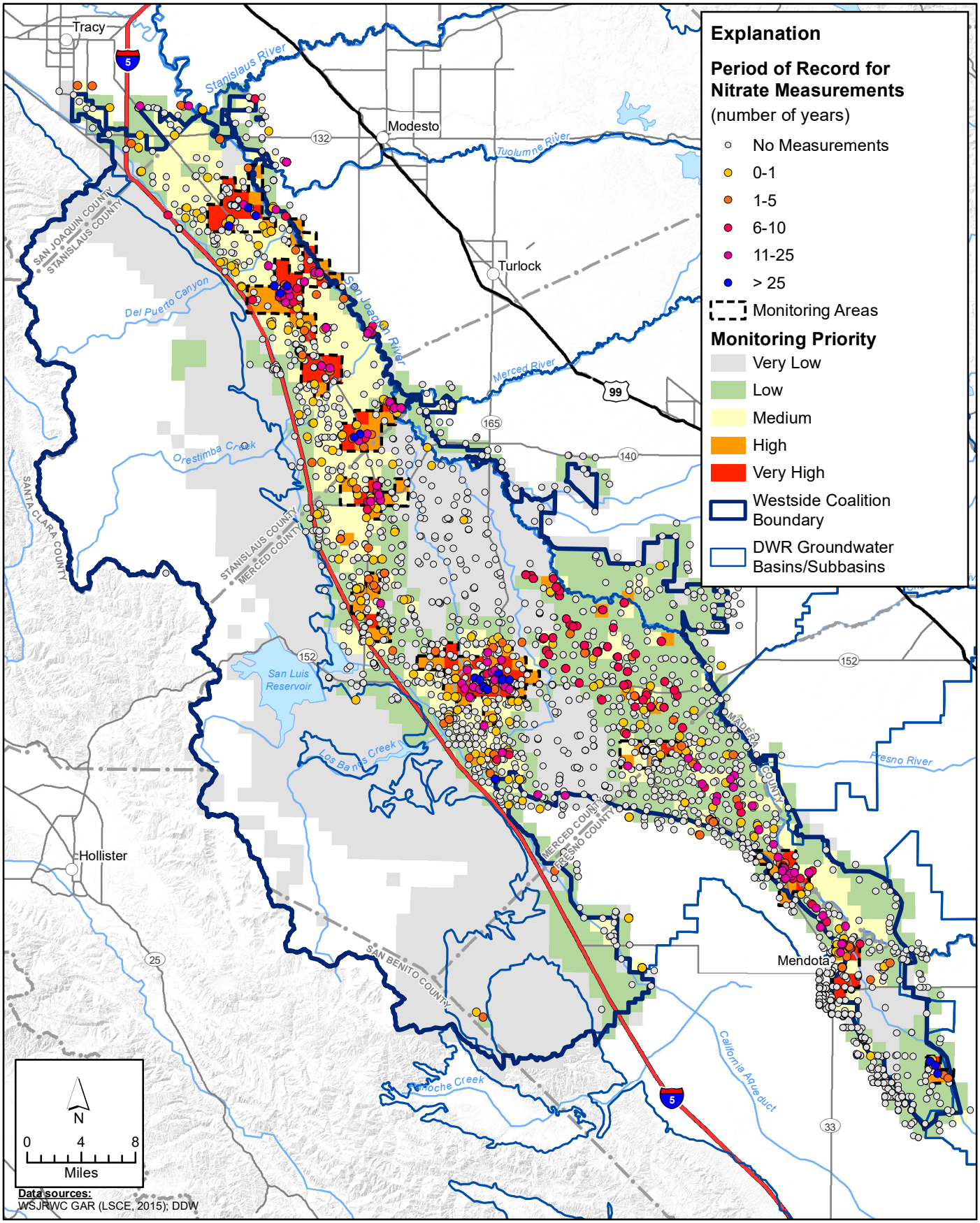
FIGURE 4-7
Candidate Wells by Most Recent Nitrate Measurement Date

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-8 Candidate Wells by Period of Record for Nitrate Measurements.mxd

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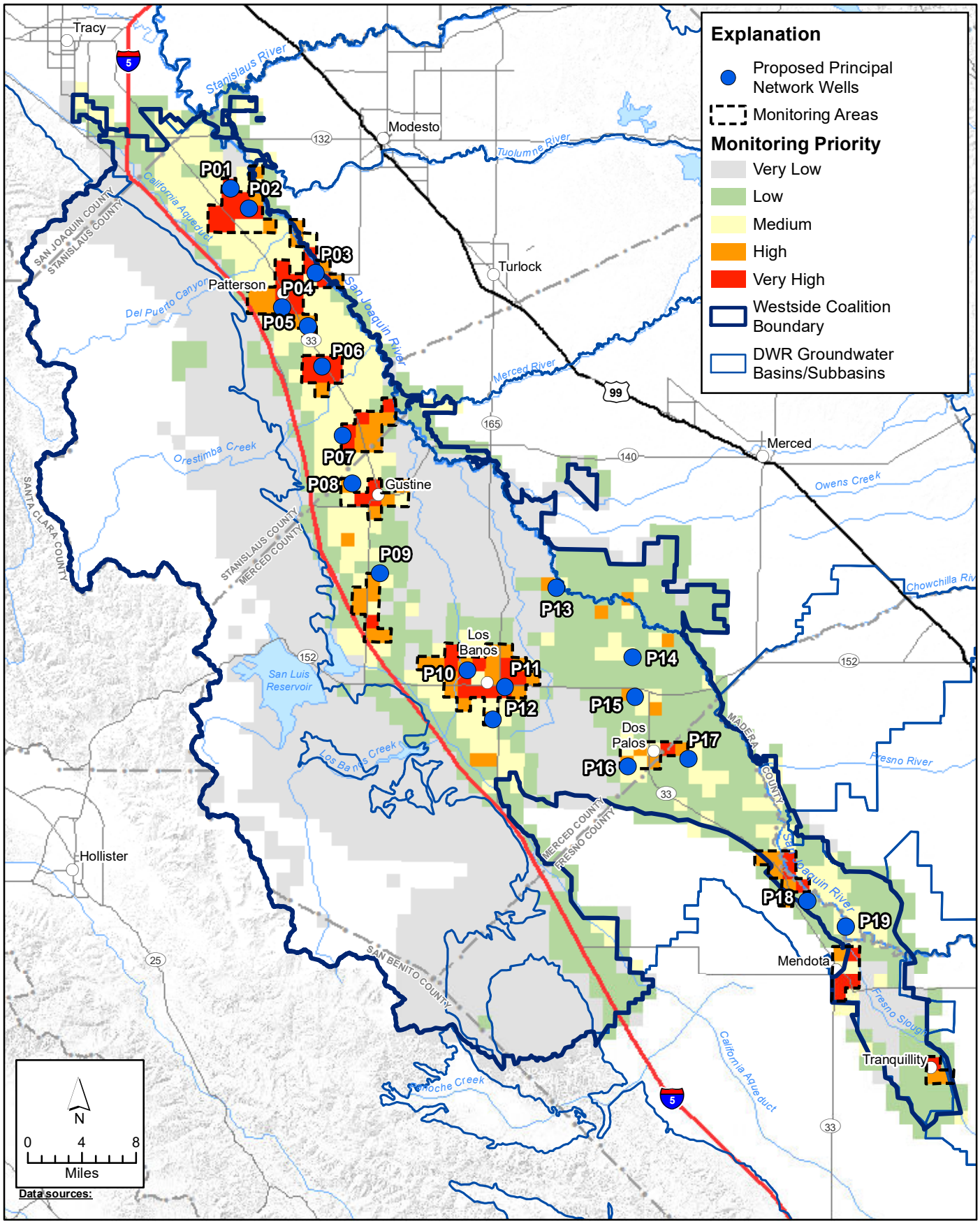
FIGURE 4-8
Candidate Wells by Period of Record for Nitrate Measurements

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-9 Proposed Principal Network Wells.mxd

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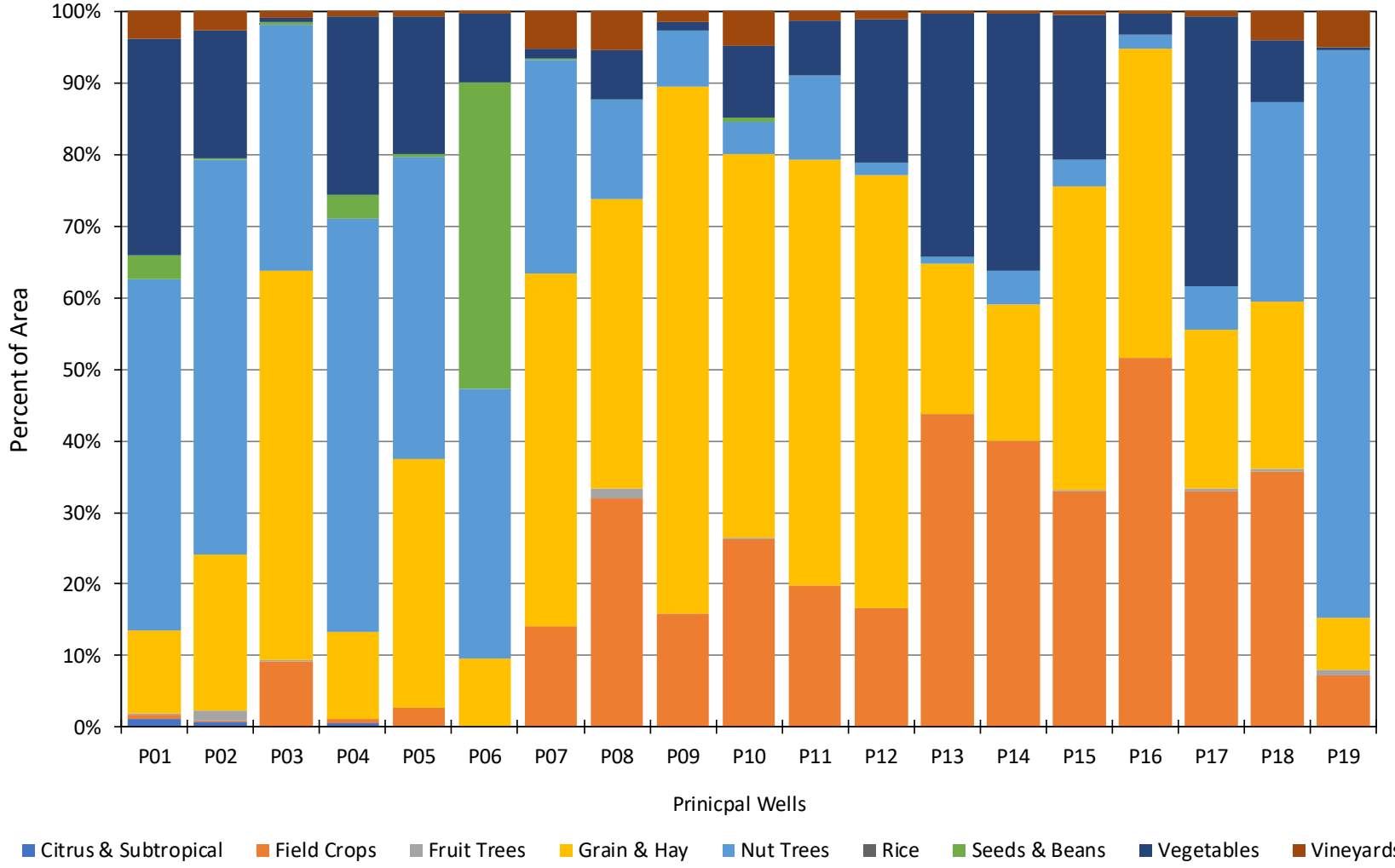
FIGURE 4-9

Proposed Principal Network Wells

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-10 Distribution of Irrigated Agriculture within 1-mile of Principal Network Wells.mxd

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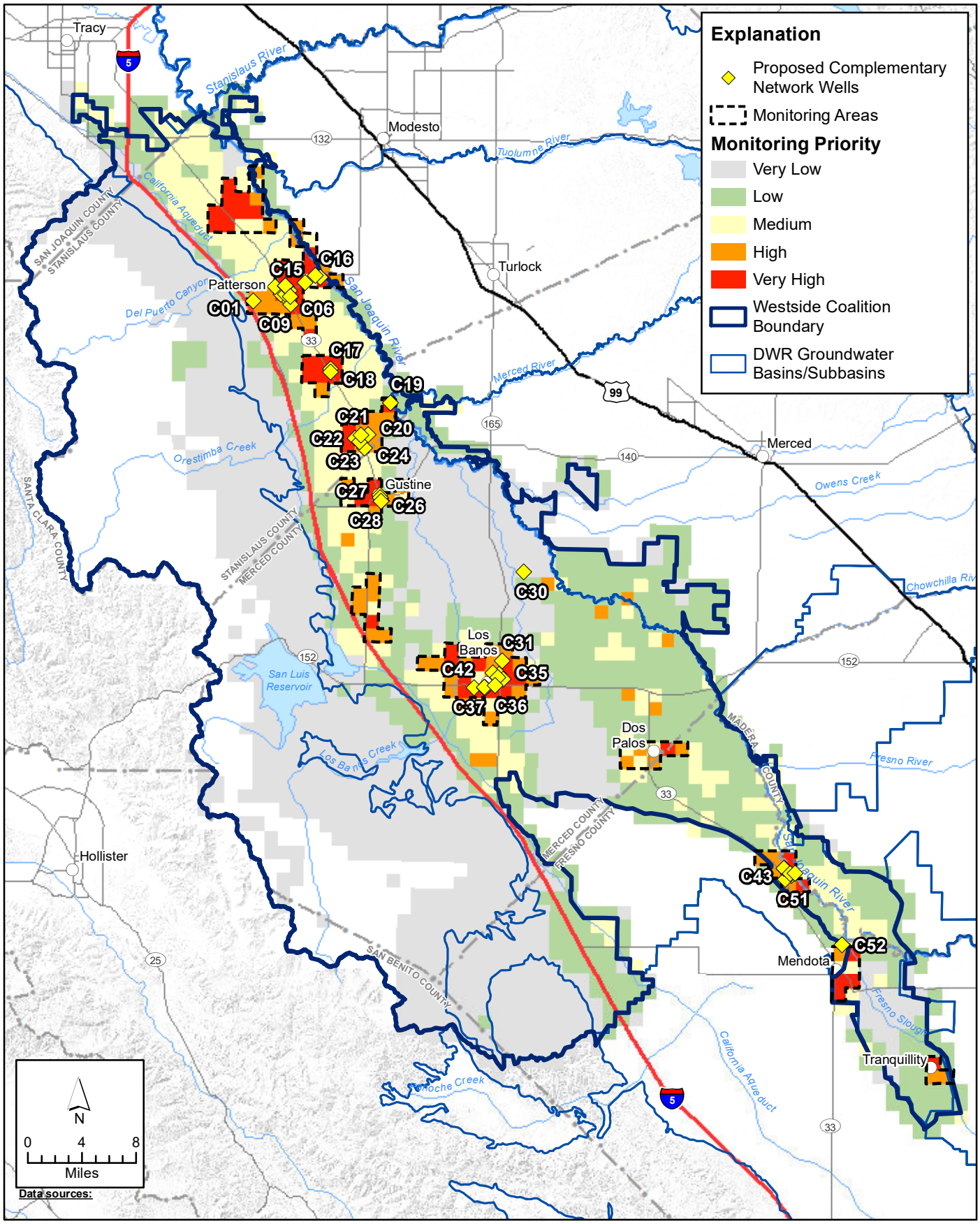
FIGURE 4-10

Distribution of Irrigated Agriculture within One Mile of Principal Network Wells

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-11 Proposed Complementary Network Wells.mxd

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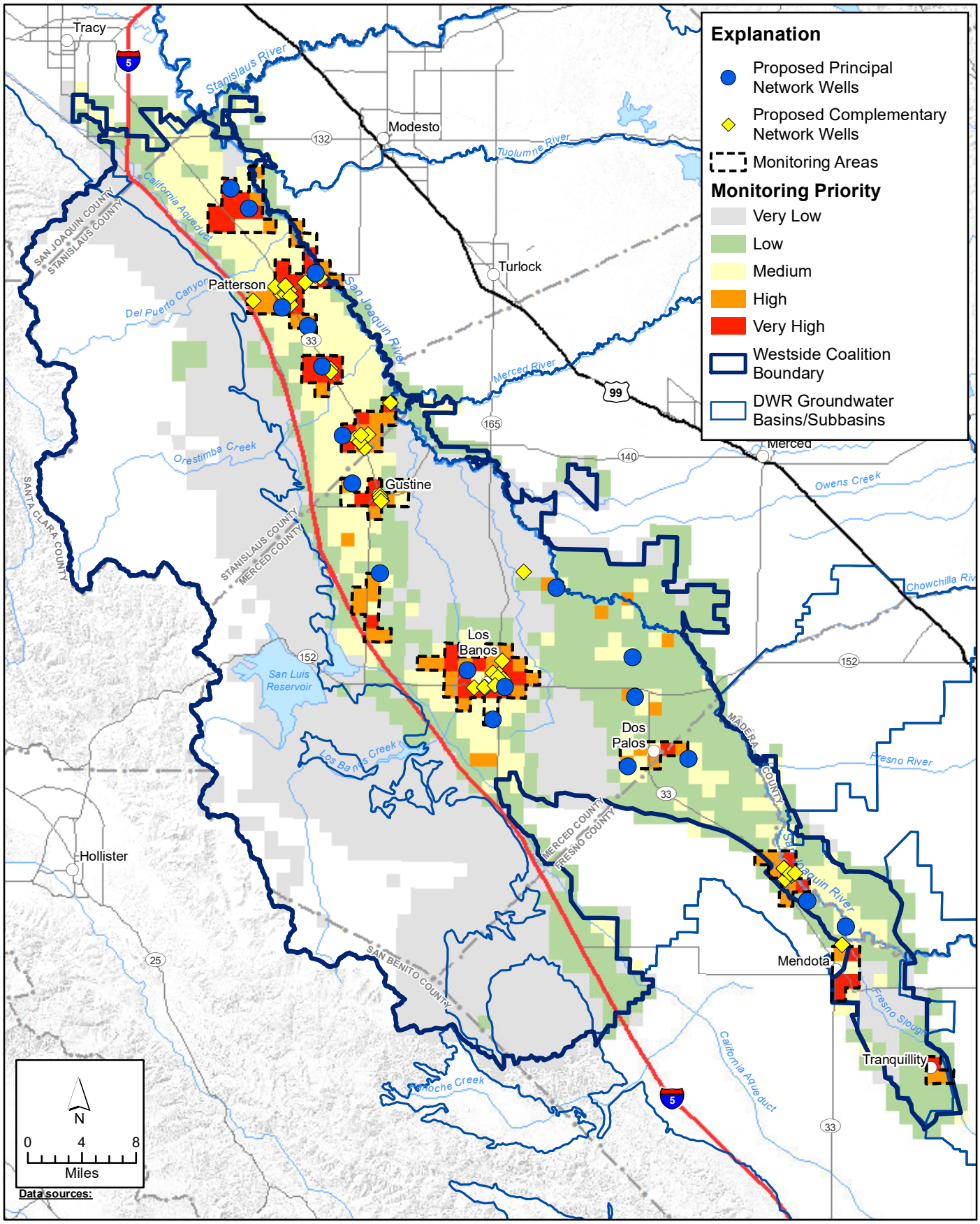
FIGURE 4-11

Proposed Complementary Network Wells

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-12 Proposed GQTM Network.mxd

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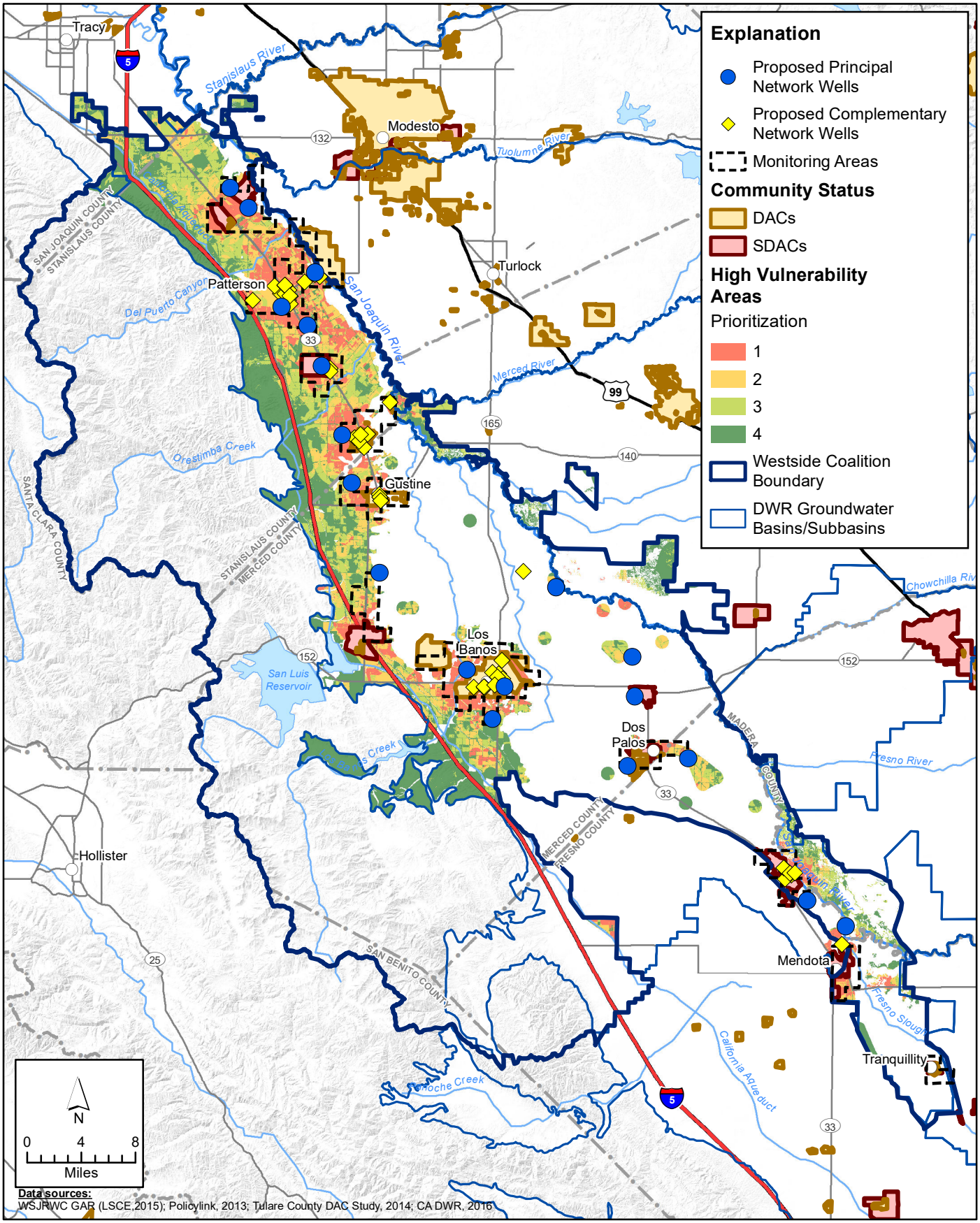
FIGURE 4-12

Proposed GQTM Network

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-13 Proposed GQTM Network and HVAs.mxd

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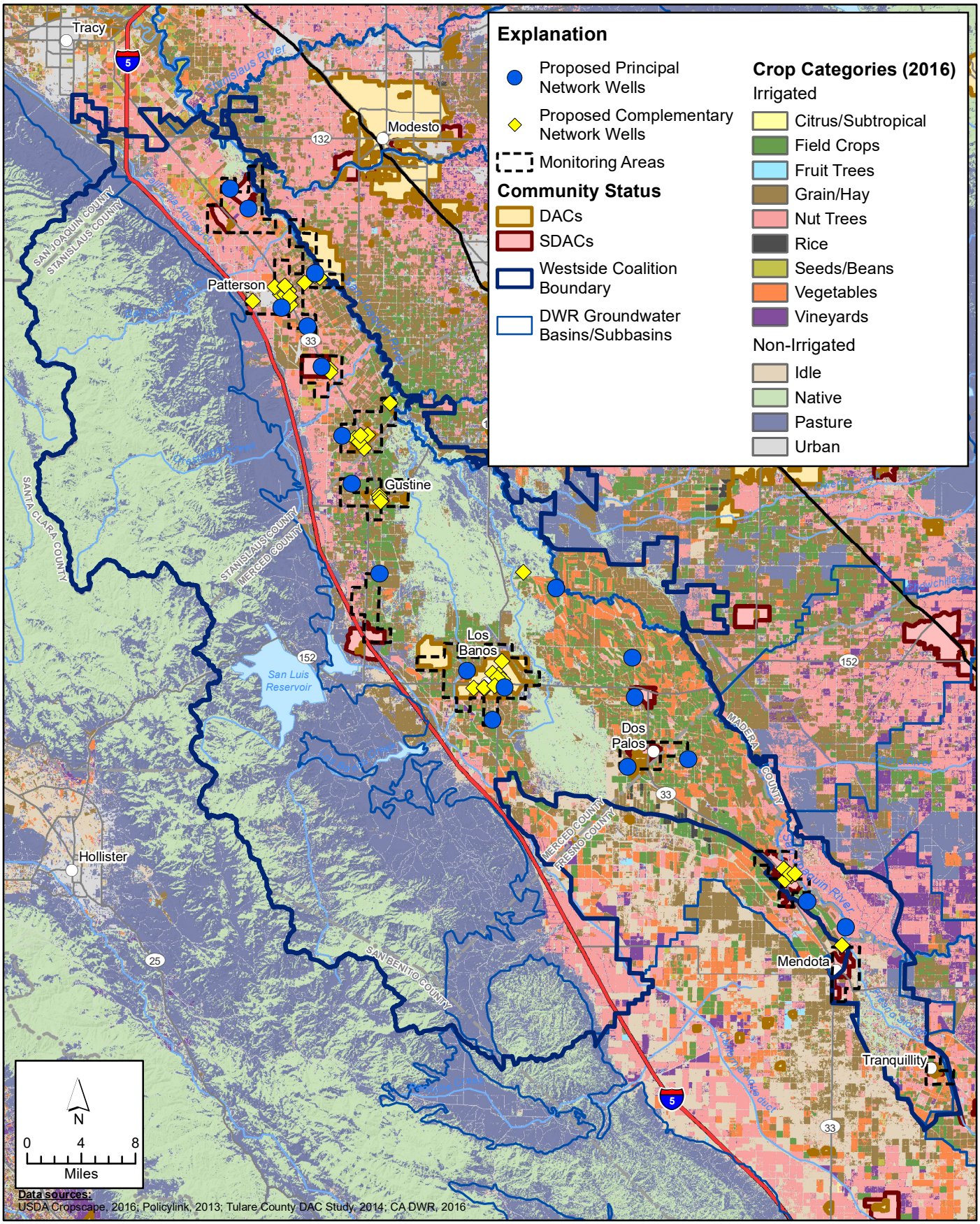
FIGURE 4-13

Proposed GQTM Network and High Vulnerability Areas

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-14 Proposed GQTM Network and Major Land Use Types.mxd

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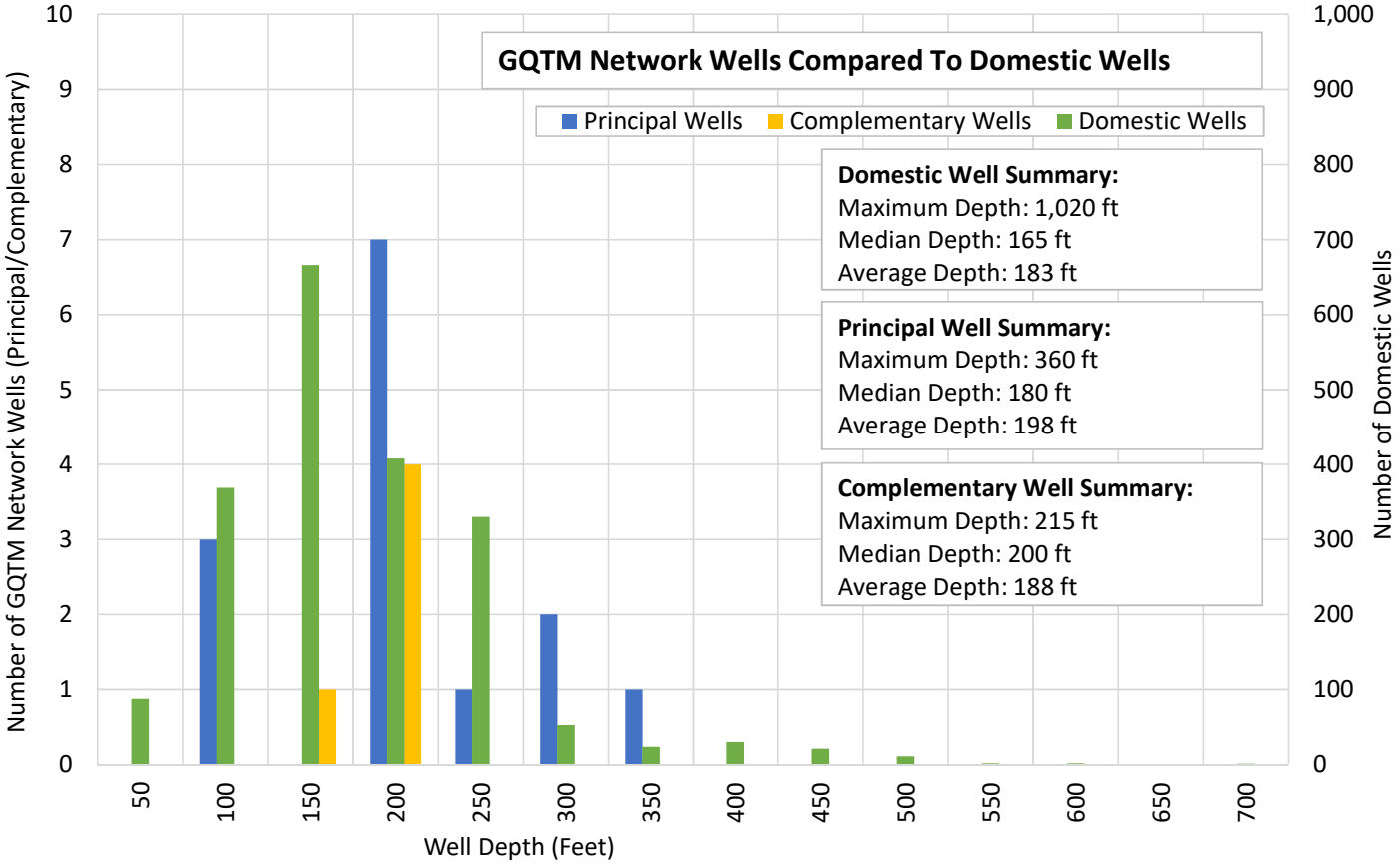
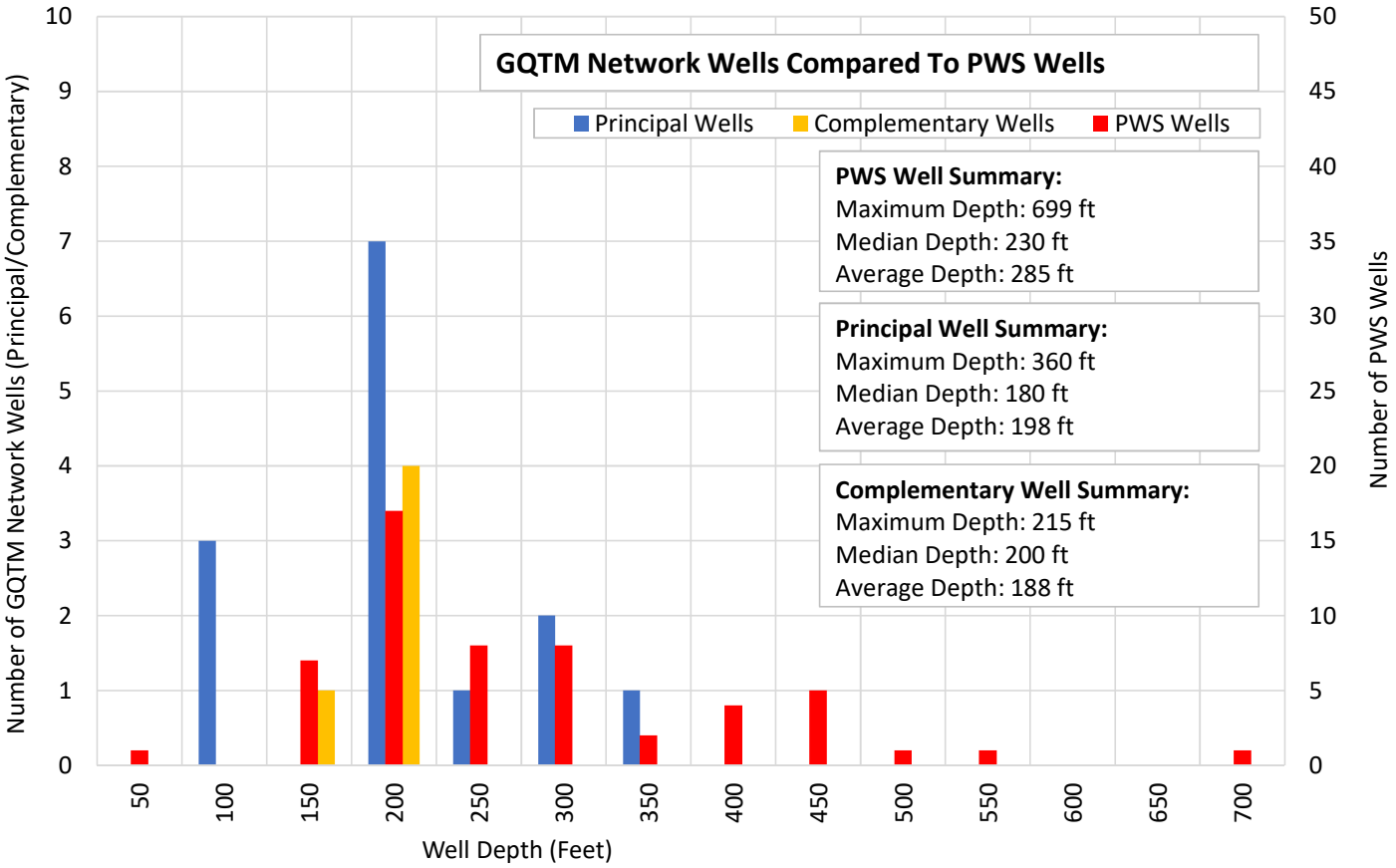
FIGURE 4-14

Proposed GQTM Network and Major Land Use Types

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition





Note: GQTM well counts are only for GQTM wells with known construction information.
Domestic/PWS well counts are based on the DWR WCR database for wells located within DWR-designated groundwater basins.

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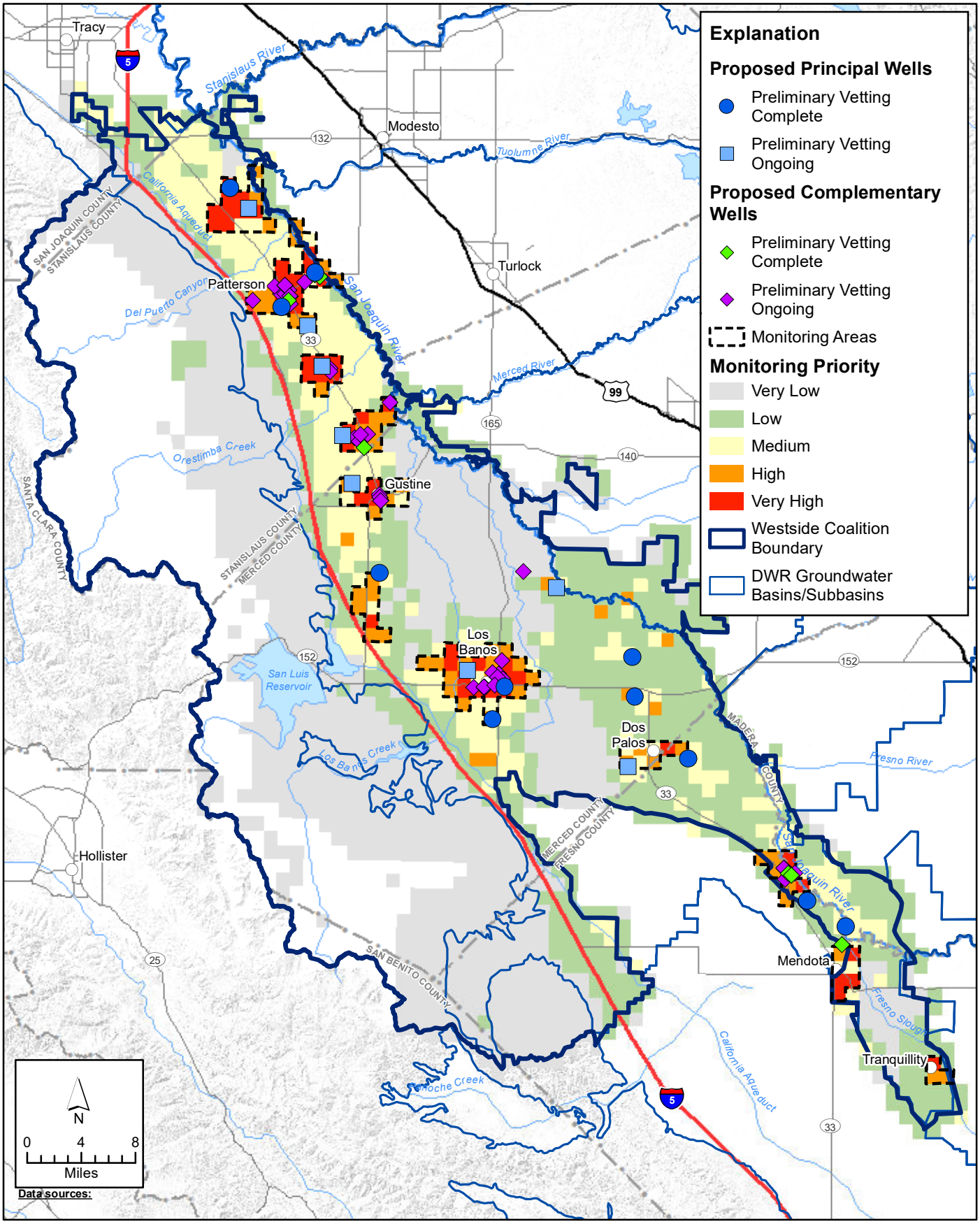
FIGURE 4-15
Depths of GQTM Network Wells Compared to Domestic and Public Supply Wells

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-16 Proposed GQTM Network Status.mxd

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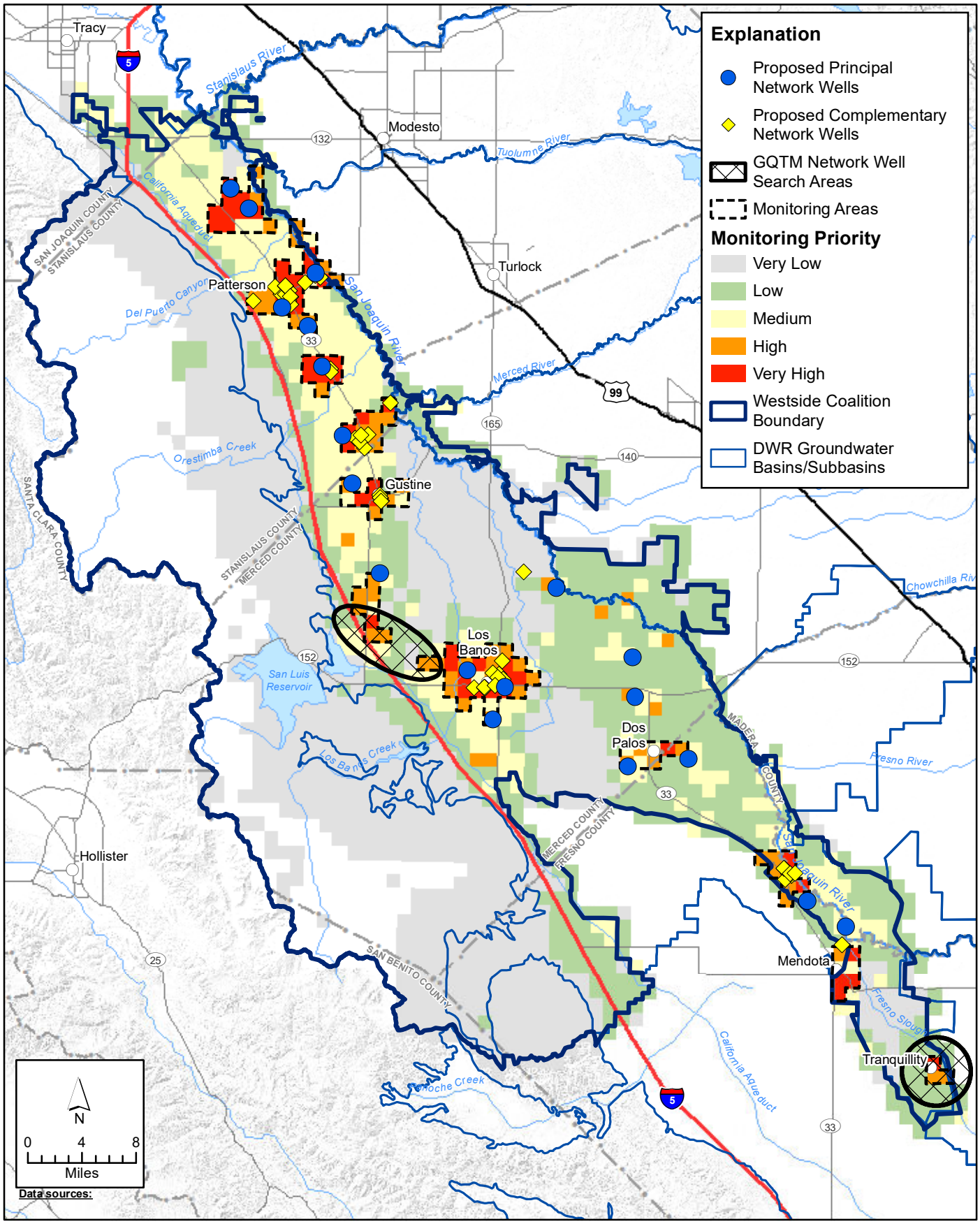
FIGURE 4-16
Vetting Status of Proposed GQTM Network Wells

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure 4-17 GQTM Network Well Search Areas.mxd

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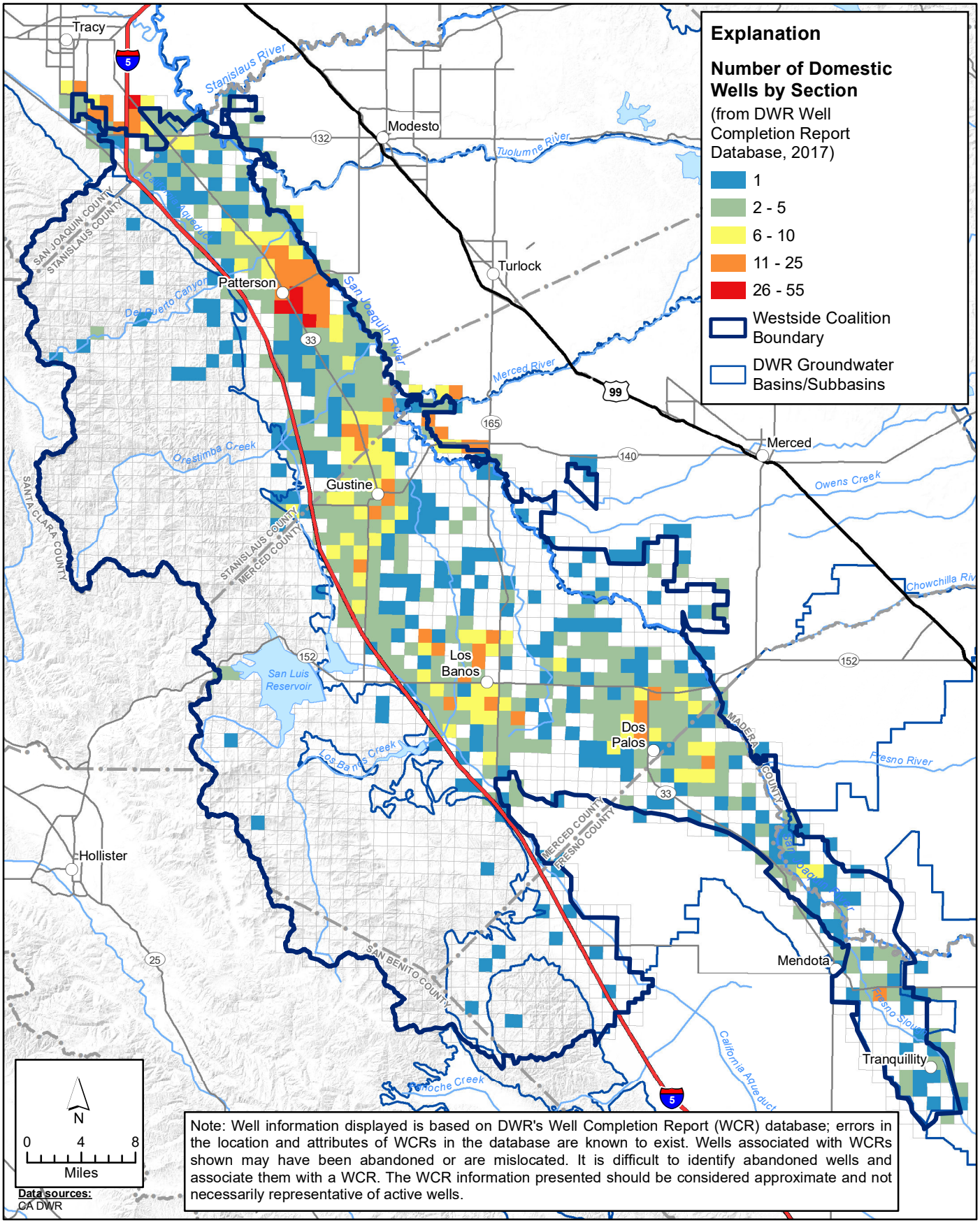
FIGURE 4-17

GQTM Network Well Seach Areas

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition

Appendix A



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure A-1 Number of Domestic Wells by Section.mxd

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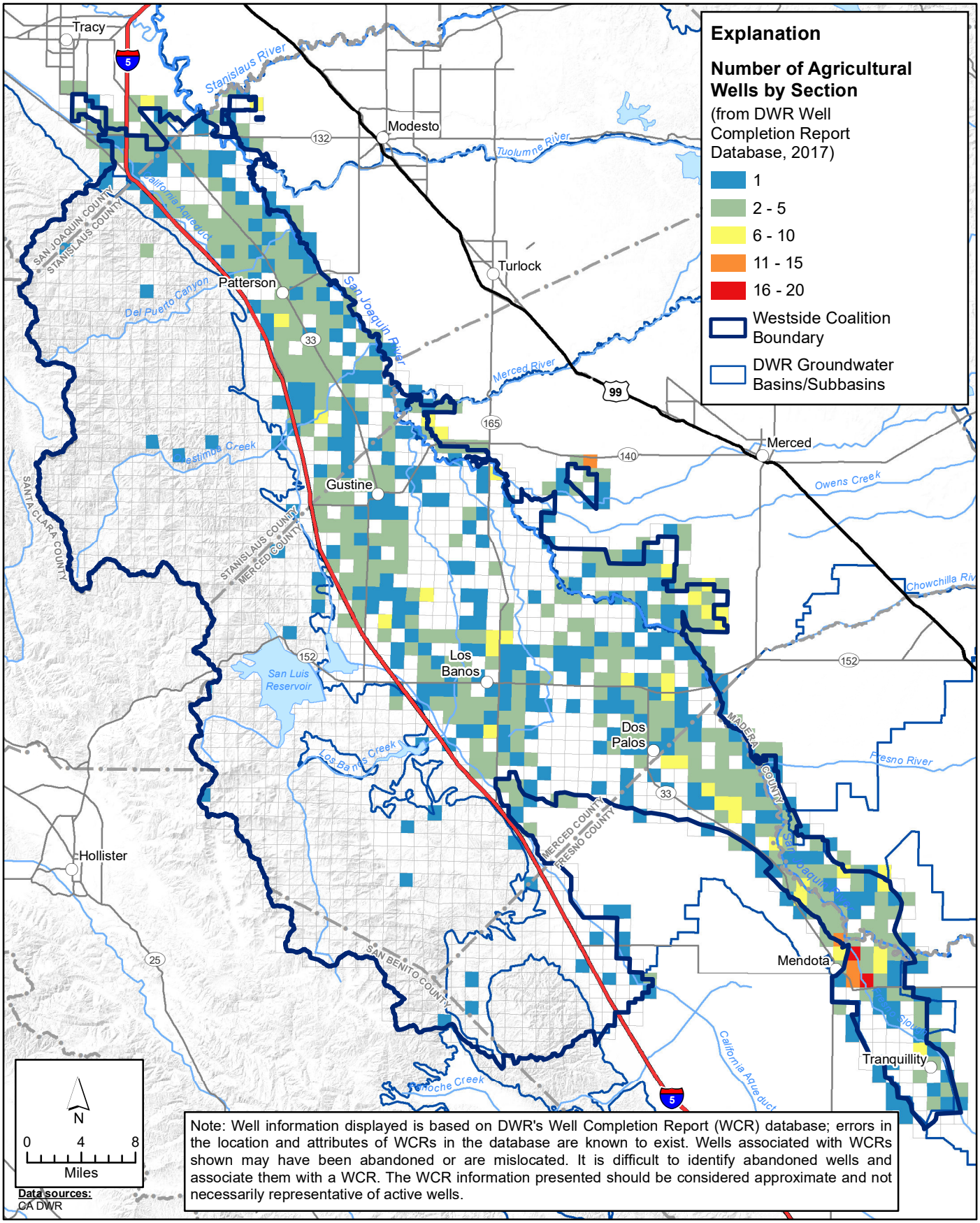
FIGURE A-1
Number of Domestic Wells by Section (from WCR data)

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure A-2 Number of Agricultural Wells by Section.mxd

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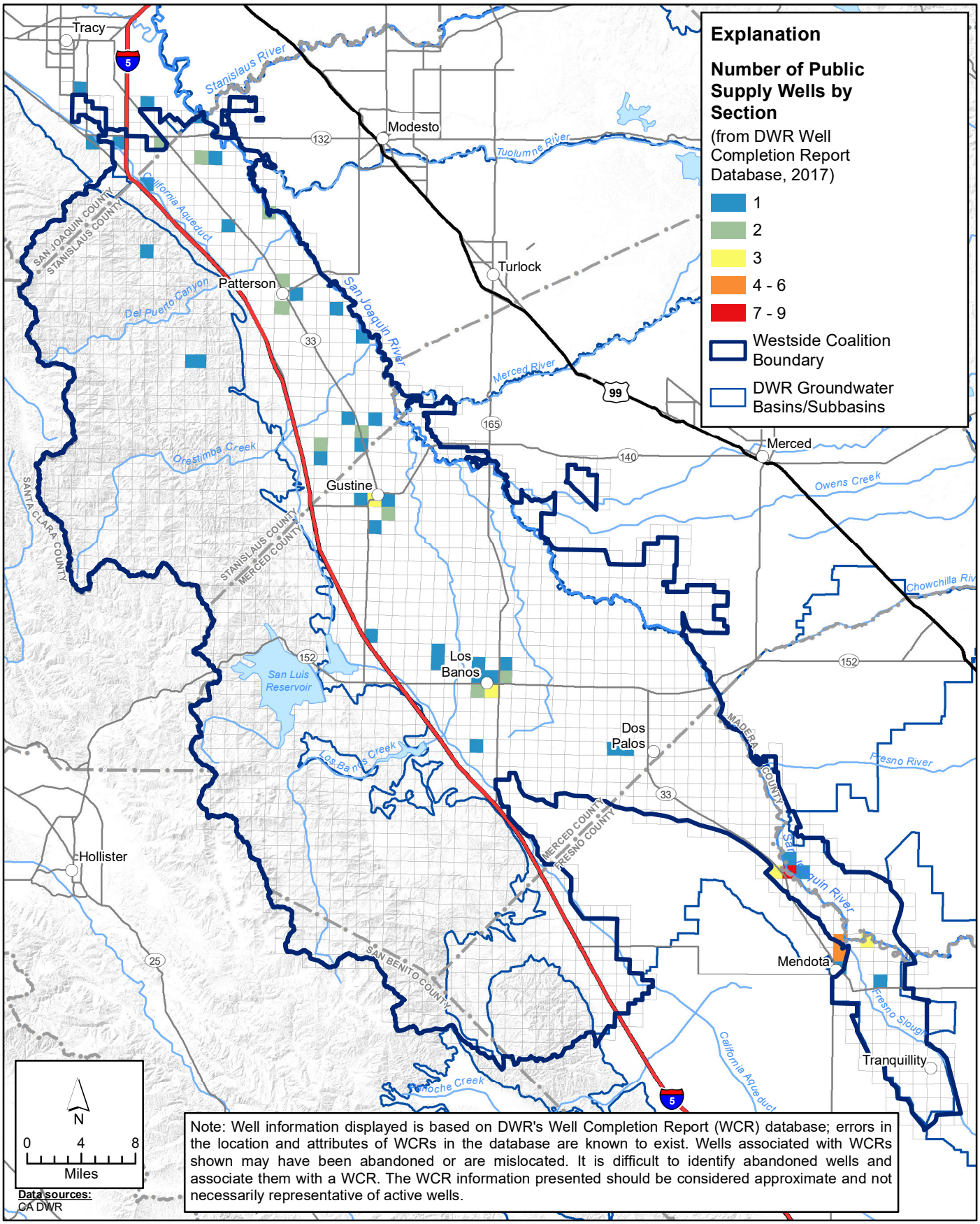
FIGURE A-2
Number of Agricultural Wells by Section (from WCR data)

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition



X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Figure A-3 Number of Public Supply Wells by Section.mxd

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FIGURE A-3
Number of Public Supply Wells by Section (from WCR data)

Groundwater Quality Trend Monitoring Workplan Phase II
Westside San Joaquin River Watershed Coalition

Appendix B

This appendix presents detailed information about the proposed GQTM principal and complementary wells, including available Well Completion Reports for the principal wells. Customized Well Information Sheets assembled for the proposed GQTM principal and complementary wells present currently available information to date on each of the wells. The Well Information Sheets are intended to be utilized throughout the GQTM implementation. Data presented in the Well Information Sheets are based on available data from existing well datasets and Well Completion Reports used to identify proposed GQTM network wells. As additional well and water quality information are developed or available through the GQTM program, this information will be included as appropriate. Well information fields for which no data are currently available are represented by blanks (in the case of text fields) or -*999* (in the case of value fields).

Well Information Sheets for Principal Network Wells

Proposed GQTM Network Well P01

GQTM Well Identification
GQTM Well ID: P01
State Well Number:
GQTM Monitoring Area: 1

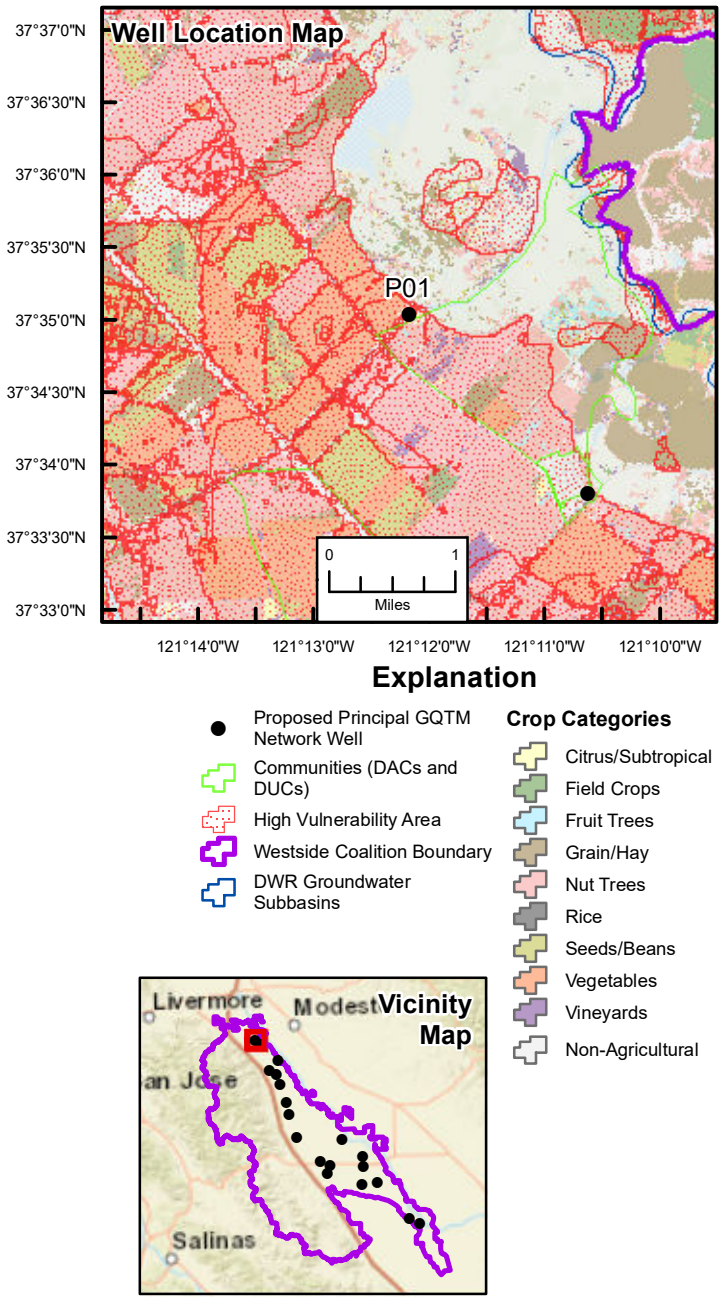
Well Location
Longitude: -121.202044
Latitude: 37.583239
Well Street Address:
Township/Range/Section: M04.0S07.0E16
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 69
Current Percent Agriculture: 38
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Irrigation
Well Depth (ft bgs): 360
Top of Perforated Interval (ft bgs): 140
Bottom of Perforated Interval (ft bgs): 340
Well Seal Depth (ft bgs): 22
Well Seal Material: Cement
Well Completion Report Number: E0310529

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 24
Date of Most Recent Depth to Water: 4/10/2014
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Principal Network Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well P02

GQTM Well Identification
GQTM Well ID: P02
State Well Number:
GQTM Monitoring Area: 1

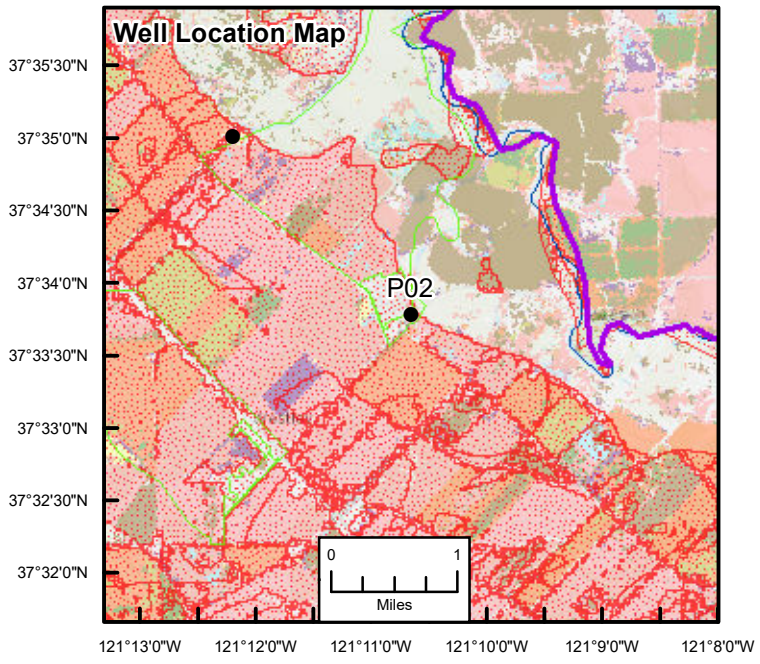
Well Location
Longitude: -121.17674
Latitude: 37.56233
Well Street Address:
Township/Range/Section: M04.0S07.0E26
County: Stanislaus

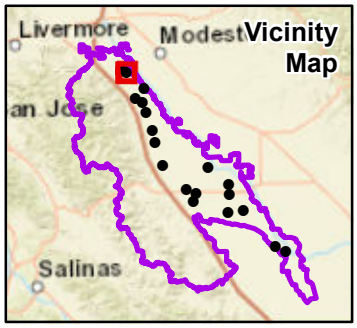
Locational Proximity Description (within 1 mile of well)
Percent HVA: 65
Current Percent Agriculture: 36
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs): 146
Bottom of Perforated Interval (ft bgs): 168
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

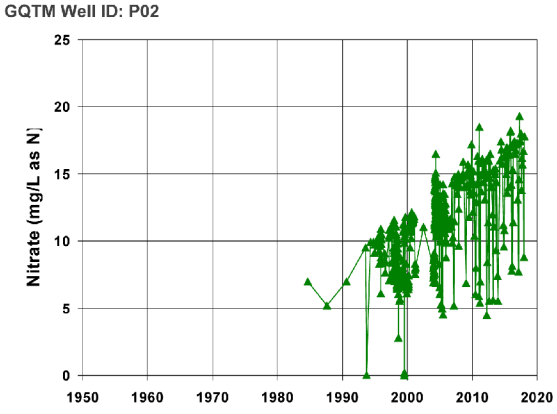
Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 19.3
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L): 19.3
Date of Most Recent TDS Concentration: 1/3/2018

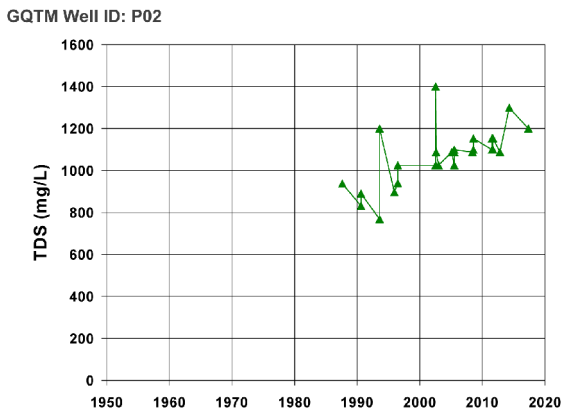




Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well P03

GQTM Well Identification
GQTM Well ID: P03
State Well Number:
GQTM Monitoring Area: 2

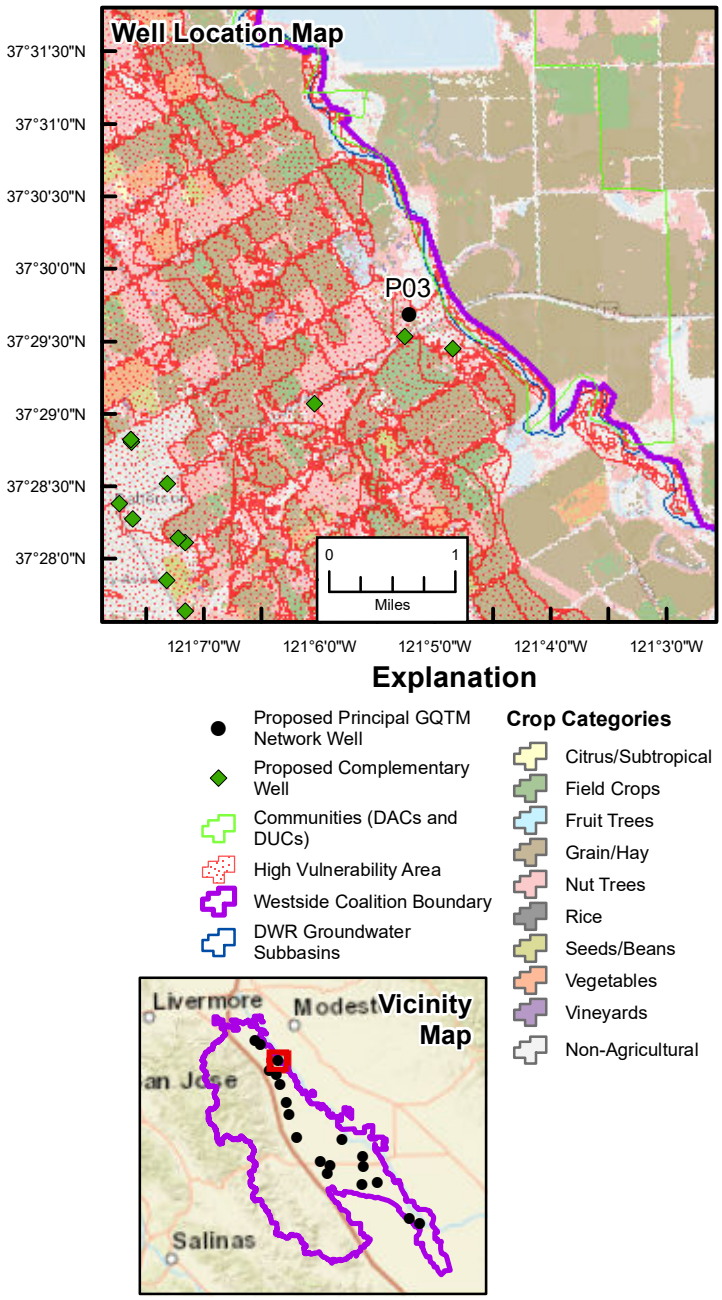
Well Location
Longitude: -121.0862
Latitude: 37.494011
Well Street Address:
Township/Range/Section: M05.0S08.0E16
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 60
Current Percent Agriculture: 52
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Irrigation
Well Depth (ft bgs): 255
Top of Perforated Interval (ft bgs): 130
Bottom of Perforated Interval (ft bgs): 250
Well Seal Depth (ft bgs): 30
Well Seal Material: Cement
Well Completion Report Number: 427229

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 39.169998
Date of Most Recent Depth to Water: 10/20/2014
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Principal Network Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well P04

GQTM Well Identification
GQTM Well ID: P04
State Well Number:
GQTM Monitoring Area: 2

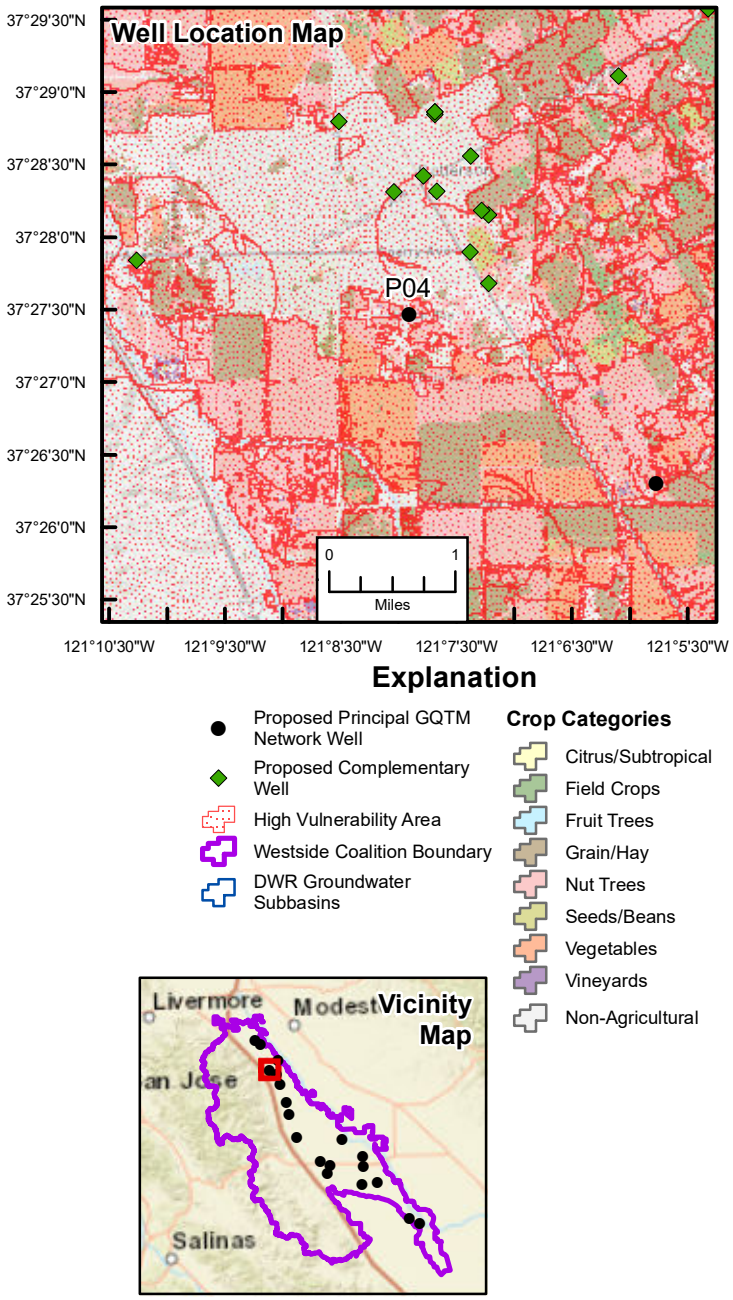
Well Location
Longitude: -121.13094
Latitude: 37.45705
Well Street Address:
Township/Range/Section: M05.0S08.0E31
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 21
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs): 76
Top of Perforated Interval (ft bgs): none
Bottom of Perforated Interval (ft bgs): none
Well Seal Depth (ft bgs): 50
Well Seal Material: Cement
Well Completion Report Number: 483378

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Principal Network Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well P05

GQTM Well Identification
GQTM Well ID: P05
State Well Number: 06S/08E-04P01
GQTM Monitoring Area: 2

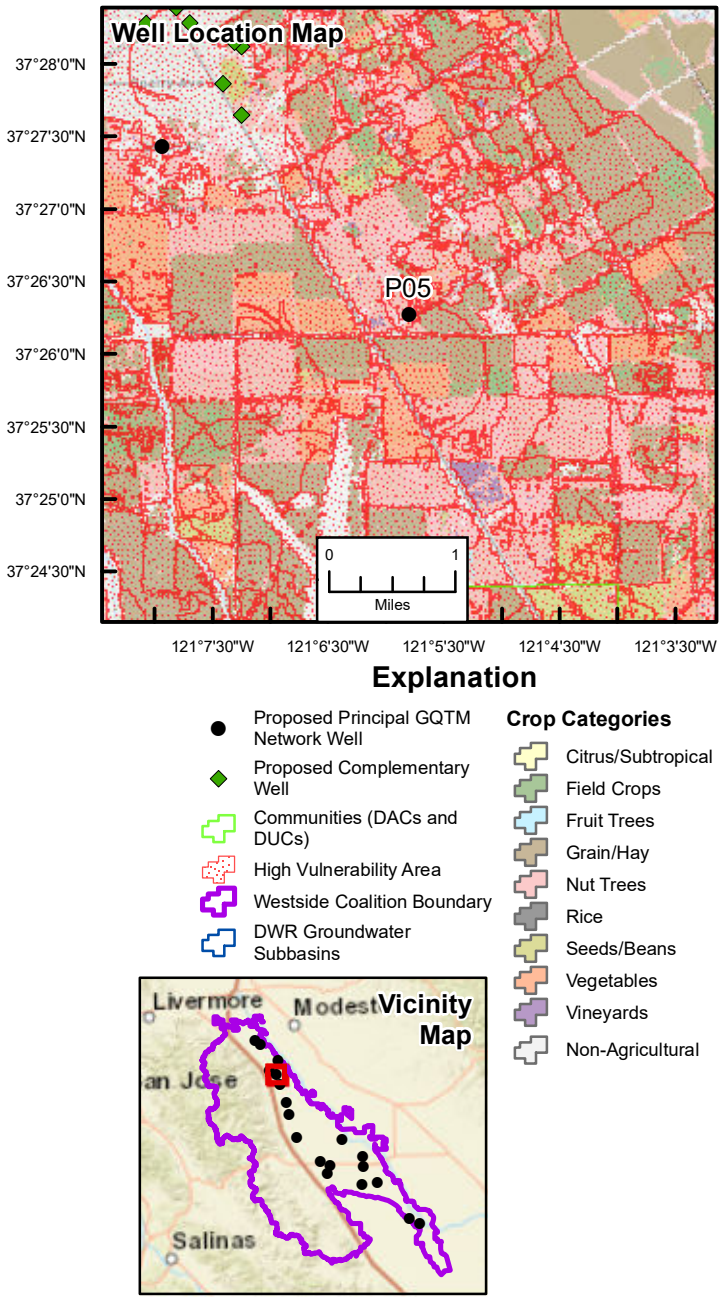
Well Location
Longitude: -121.095794
Latitude: 37.437138
Well Street Address:
Township/Range/Section: M06.0S08.0E04
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 64
Current Percent Agriculture: 51
Current Primary Irrigated Land Use Type: Field Crops

Well Construction Information
Well Type: Unknown
Well Depth (ft bgs): 108
Top of Perforated Interval (ft bgs): 88
Bottom of Perforated Interval (ft bgs): 108
Well Seal Depth (ft bgs): 20
Well Seal Material: Bentonite
Well Completion Report Number: 247065

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 20.2
Date of Most Recent Depth to Water: 3/9/1966
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Proposed GQTM Network Well P06

GQTM Well Identification
GQTM Well ID: P06
State Well Number:
GQTM Monitoring Area: 3

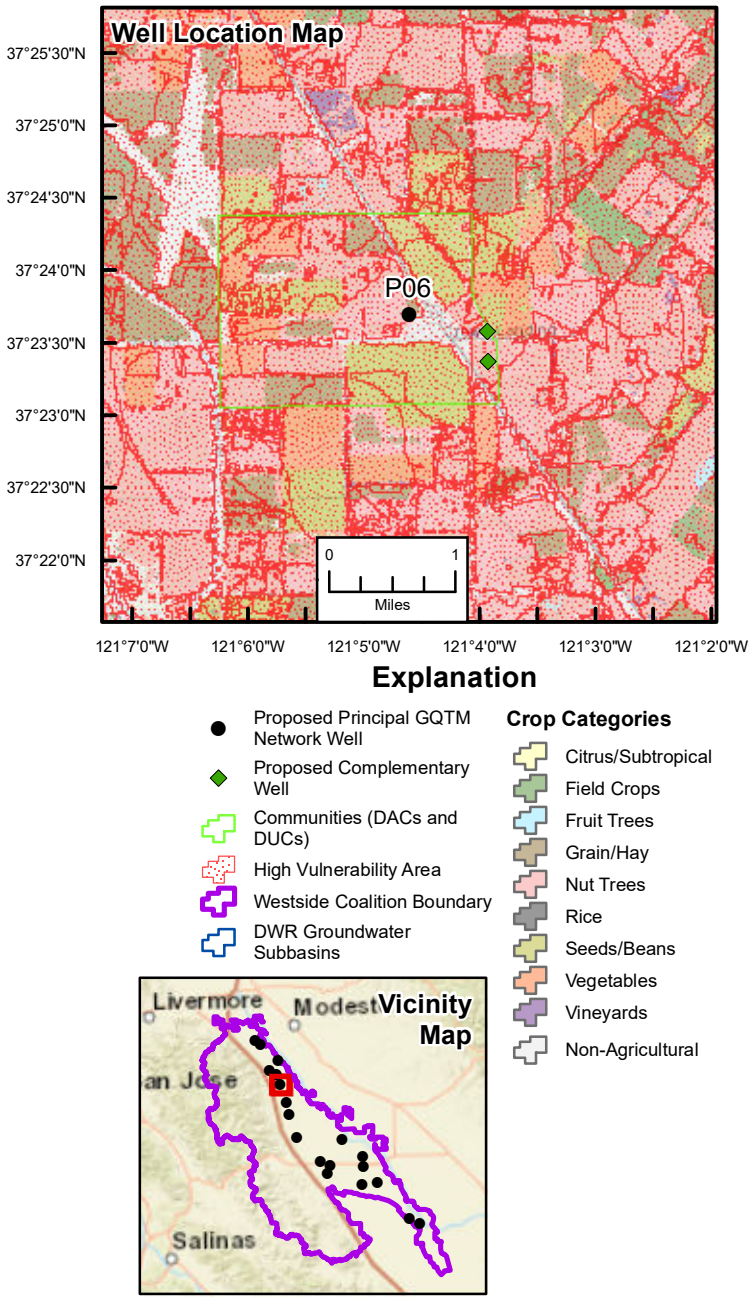
Well Location
Longitude: -121.0759
Latitude: 37.394174
Well Street Address:
Township/Range/Section: M06.0S08.0E22
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 55
Current Primary Irrigated Land Use Type: Field Crops

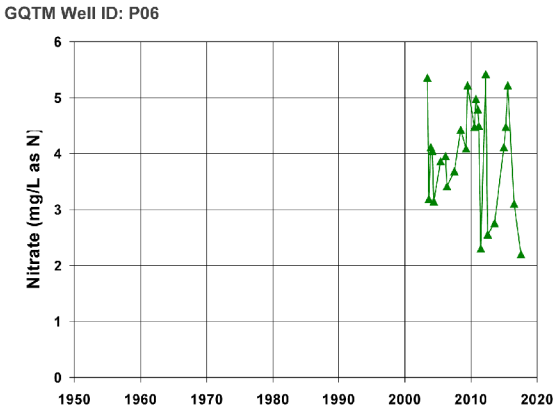
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

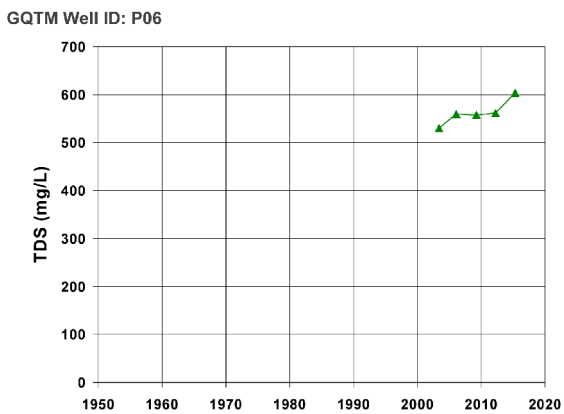
Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 5.4216
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L): 5.4216
Date of Most Recent TDS Concentration: 7/21/2017



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well P07

GQTM Well Identification
GQTM Well ID: P07
State Well Number: 07S/08E-13N01
GQTM Monitoring Area: 4

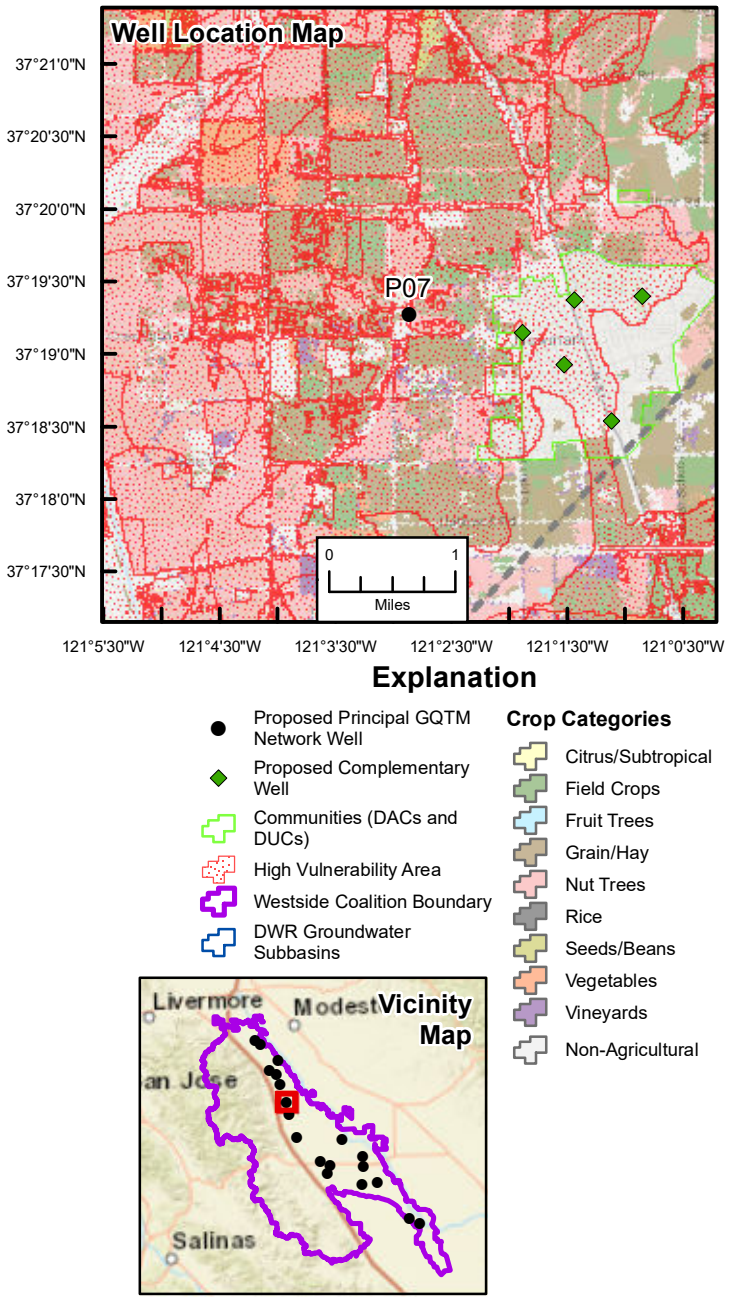
Well Location
Longitude: -121.046804
Latitude: 37.320456
Well Street Address:
Township/Range/Section: M07.0S08.0E13
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 58
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Unknown
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 55.4
Date of Most Recent Depth to Water: 3/20/1969
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Principal Network Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well P08

GQTM Well Identification
GQTM Well ID: P08
State Well Number: 08S/08E-01H01
GQTM Monitoring Area: 5

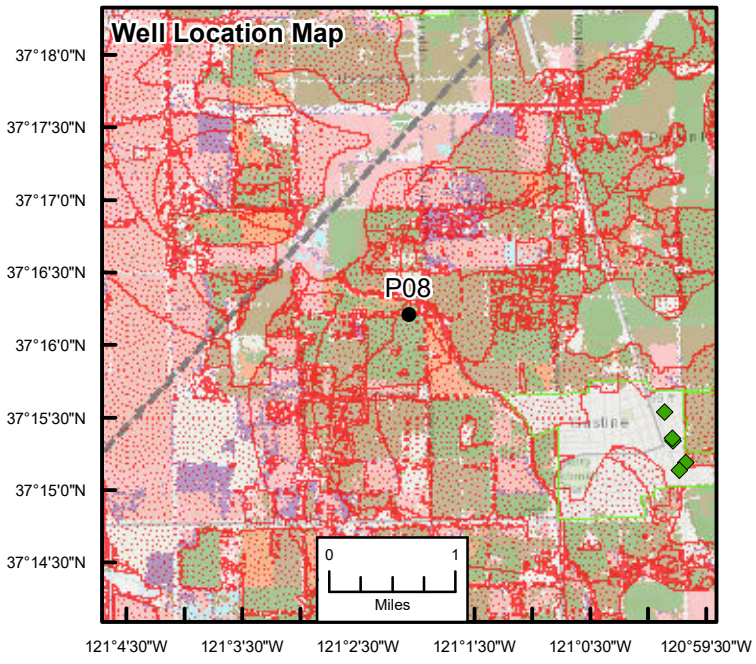
Well Location
Longitude: -121.03345
Latitude: 37.26942
Well Street Address:
Township/Range/Section: M08.0S08.0E01
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 92
Current Percent Agriculture: 81
Current Primary Irrigated Land Use Type: Field Crops

Well Construction Information
Well Type: Unknown
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:

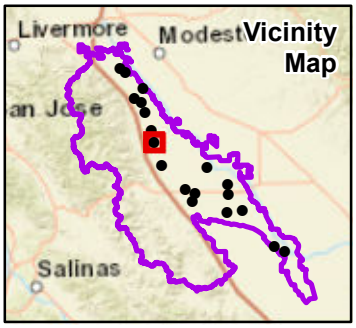


Explanation

- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Proposed GQTM Network Well P09

GQTM Well Identification
GQTM Well ID: P09
State Well Number: 09S/09E-05R01
GQTM Monitoring Area: 6

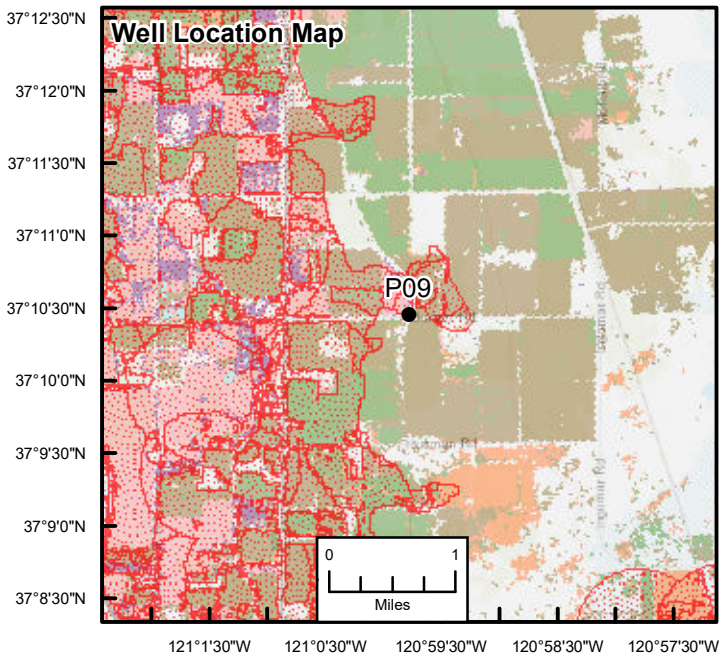
Well Location
Longitude: -120.9954
Latitude: 37.1735
Well Street Address:
Township/Range/Section: M09.0S09.0E05
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 34
Current Percent Agriculture: 78
Current Primary Irrigated Land Use Type: Vegetables

Well Construction Information
Well Type: Irrigation
Well Depth (ft bgs): 120
Top of Perforated Interval (ft bgs): 52
Bottom of Perforated Interval (ft bgs): 112
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 33.84
Date of Most Recent Depth to Water: 4/1/2017
Most Recent Nitrate Concentration (mg/L as N): 0.225
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L): 0.225
Date of Most Recent TDS Concentration: 8/19/2014

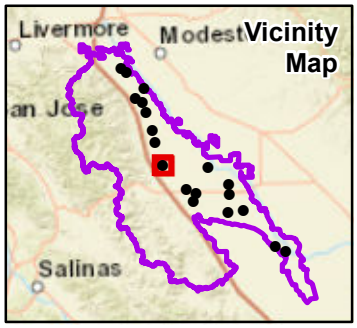


Explanation

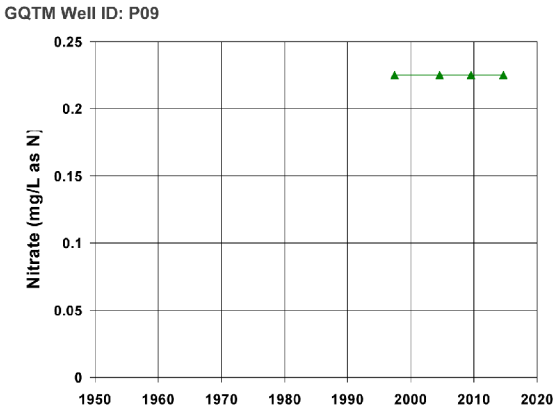
- Proposed Principal GQTM Network Well
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

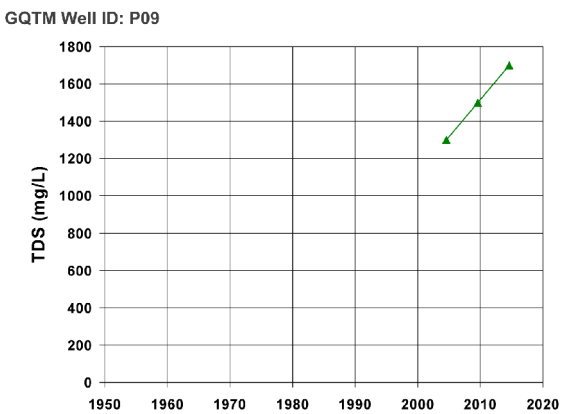
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well P10

GQTM Well Identification
GQTM Well ID: P10
State Well Number:
GQTM Monitoring Area: 7

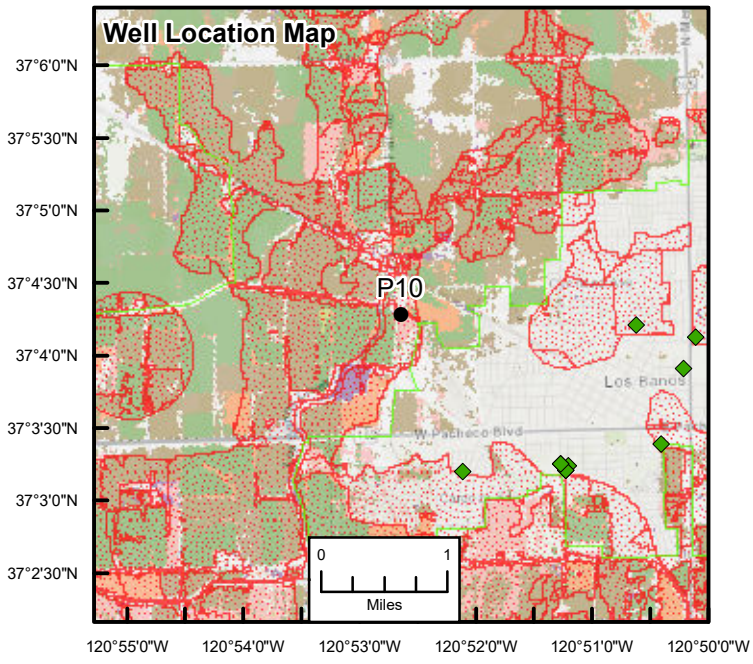
Well Location
Longitude: -120.876438
Latitude: 37.070559
Well Street Address:
Township/Range/Section: M10.0S10.0E16
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 53
Current Percent Agriculture: 73
Current Primary Irrigated Land Use Type: Field Crops

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs): 285
Top of Perforated Interval (ft bgs): 135
Bottom of Perforated Interval (ft bgs): 275
Well Seal Depth (ft bgs): 90
Well Seal Material: Cement
Well Completion Report Number: 739637

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8.5842
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L): 8.5842
Date of Most Recent TDS Concentration: 1/3/2018

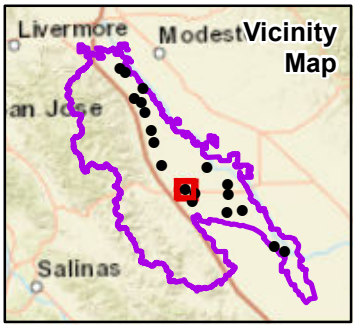


Explanation

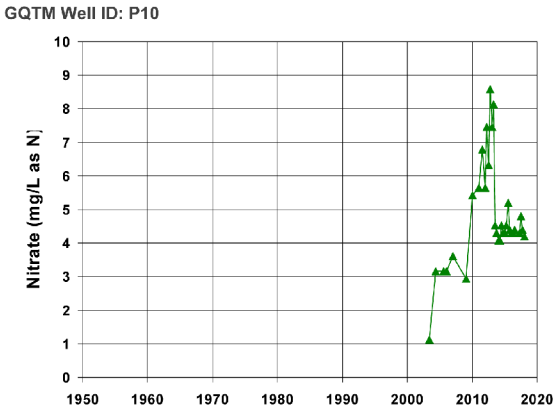
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

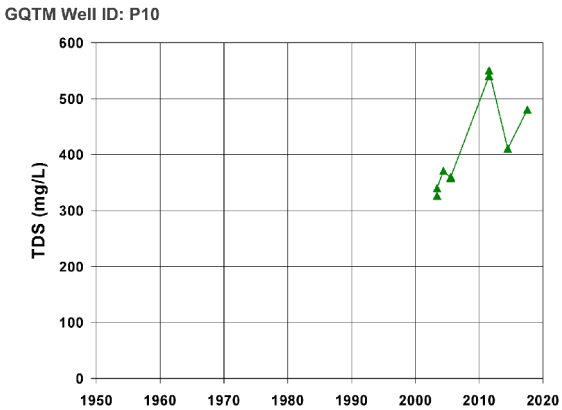
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well P11

GQTM Well Identification
GQTM Well ID: P11
State Well Number:
GQTM Monitoring Area: 7

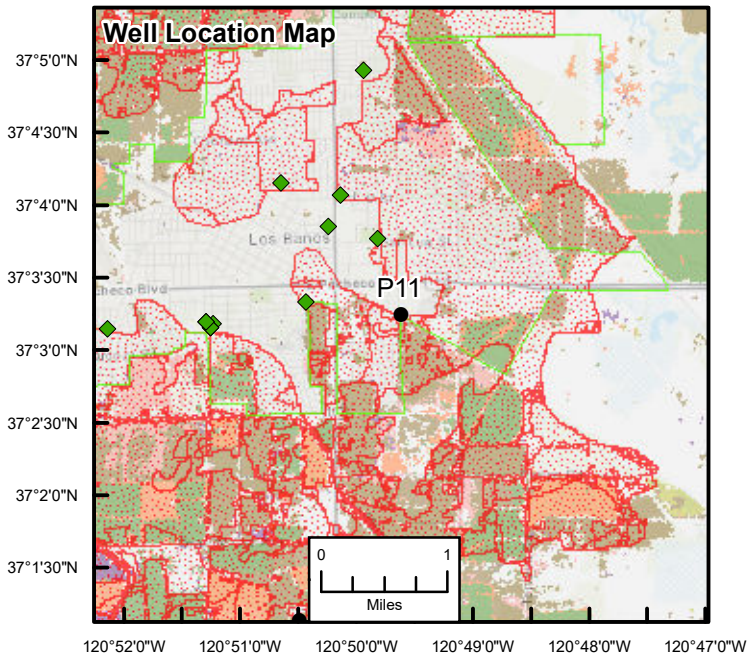
Well Location
Longitude: -120.82598
Latitude: 37.053276
Well Street Address:
Township/Range/Section: M10.0S10.0E24
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 66
Current Percent Agriculture: 30
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs): 218
Top of Perforated Interval (ft bgs): 125
Bottom of Perforated Interval (ft bgs): 208
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number: 374510

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8.1
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L): 8.1
Date of Most Recent TDS Concentration: 1/3/2018

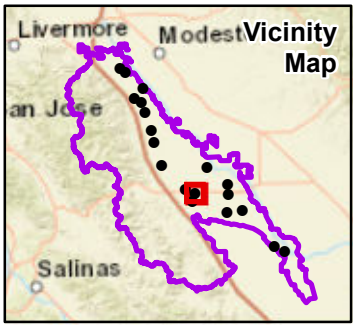


Explanation

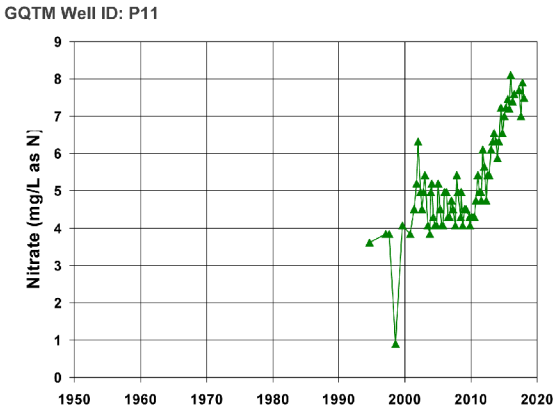
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

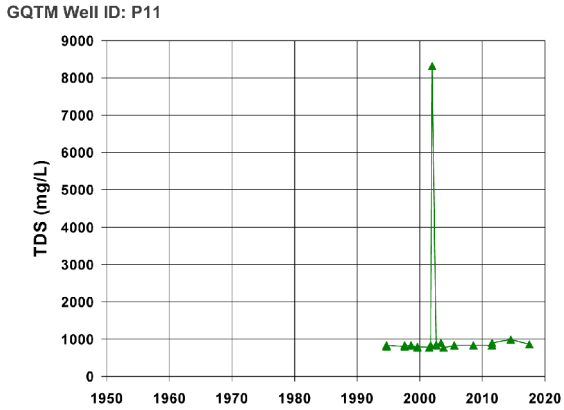
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well P12

GQTM Well Identification
GQTM Well ID: P12
State Well Number: 10S/10E-35K01
GQTM Monitoring Area: 7

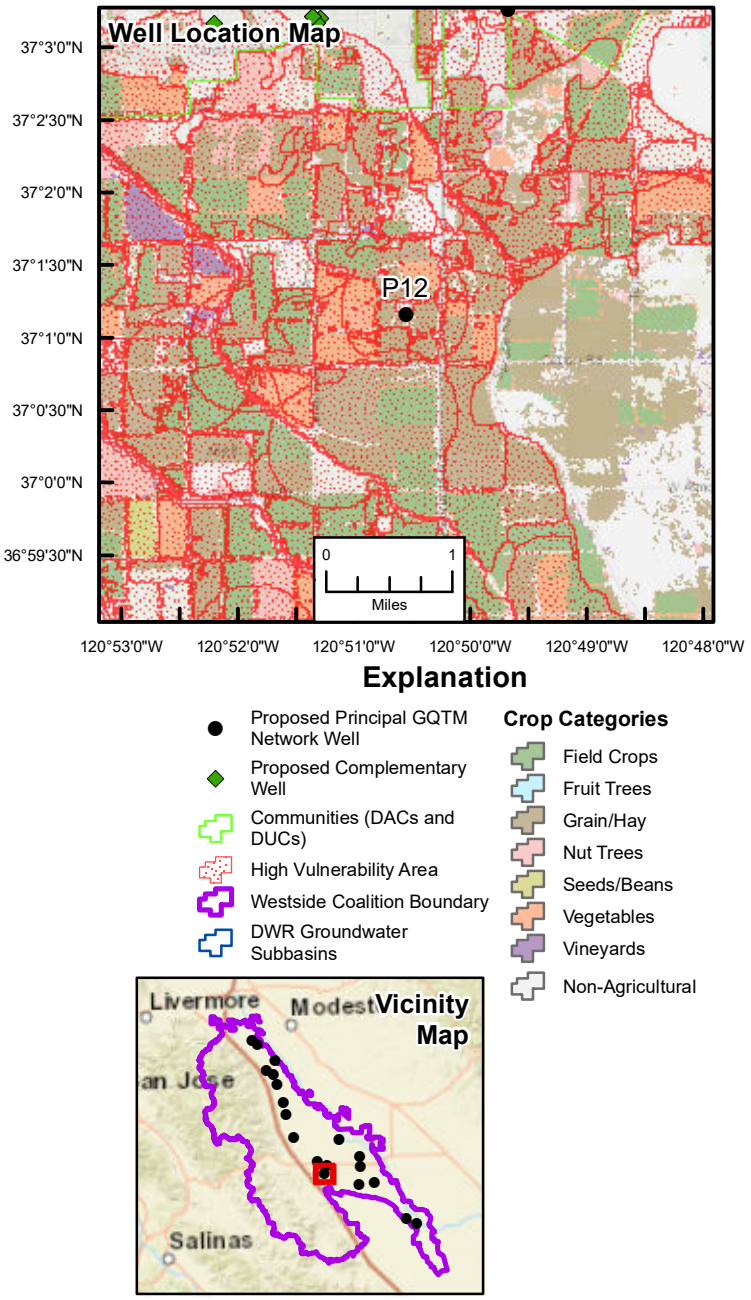
Well Location
Longitude: -120.8416
Latitude: 37.0185
Well Street Address:
Township/Range/Section: M10.0S10.0E35
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 89
Current Percent Agriculture: 87
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Domestic
Well Depth (ft bgs): 180
Top of Perforated Interval (ft bgs): 80
Bottom of Perforated Interval (ft bgs): 180
Well Seal Depth (ft bgs): 20
Well Seal Material:
Well Completion Report Number: 54231

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 30.8
Date of Most Recent Depth to Water: 4/5/2017 12:00:00 PM
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Proposed GQTM Network Well P13

GQTM Well Identification
GQTM Well ID: P13
State Well Number:
GQTM Monitoring Area:

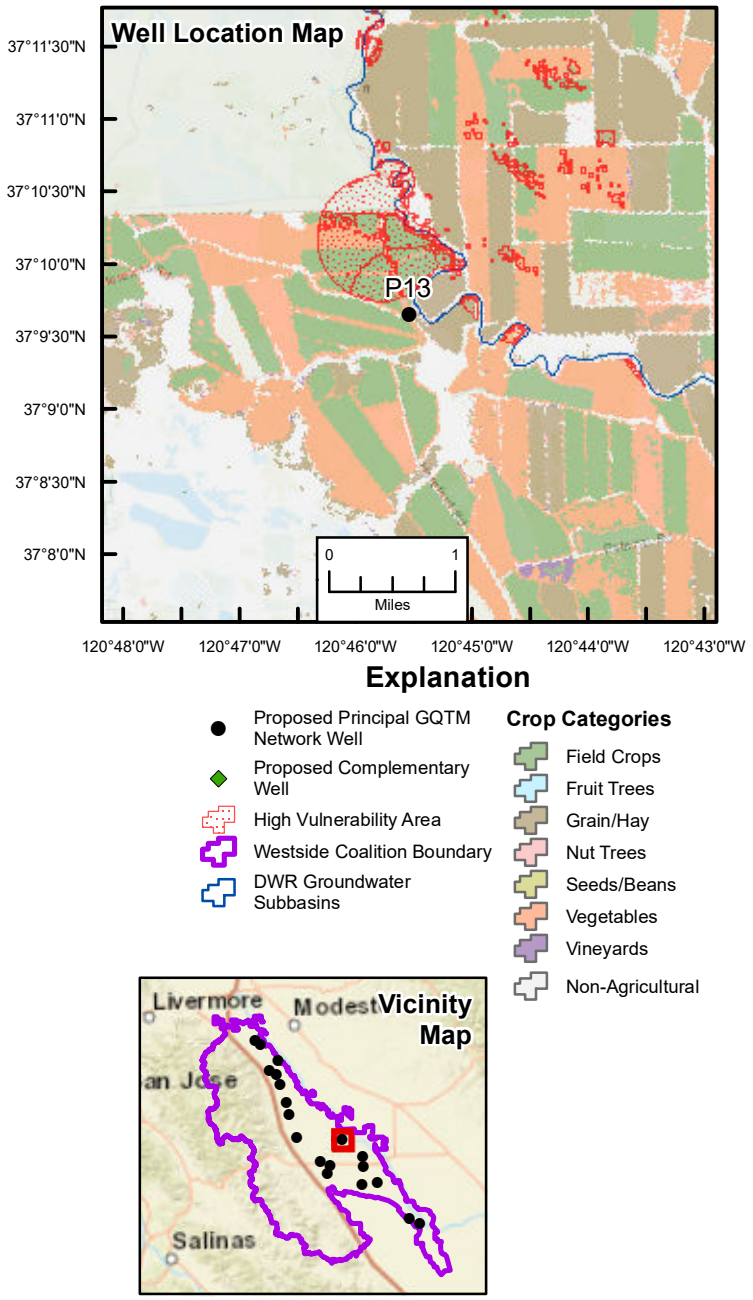
Well Location
Longitude: -120.758
Latitude: 37.16
Well Street Address:
Township/Range/Section: M09.0S11.0E10
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 22
Current Percent Agriculture: 84
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Unknown
Well Depth (ft bgs): 180
Top of Perforated Interval (ft bgs): 80
Bottom of Perforated Interval (ft bgs): 180
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 38
Date of Most Recent Depth to Water: 6/1/2014
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Principal Network Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well P14

GQTM Well Identification
GQTM Well ID: P14
State Well Number:
GQTM Monitoring Area:

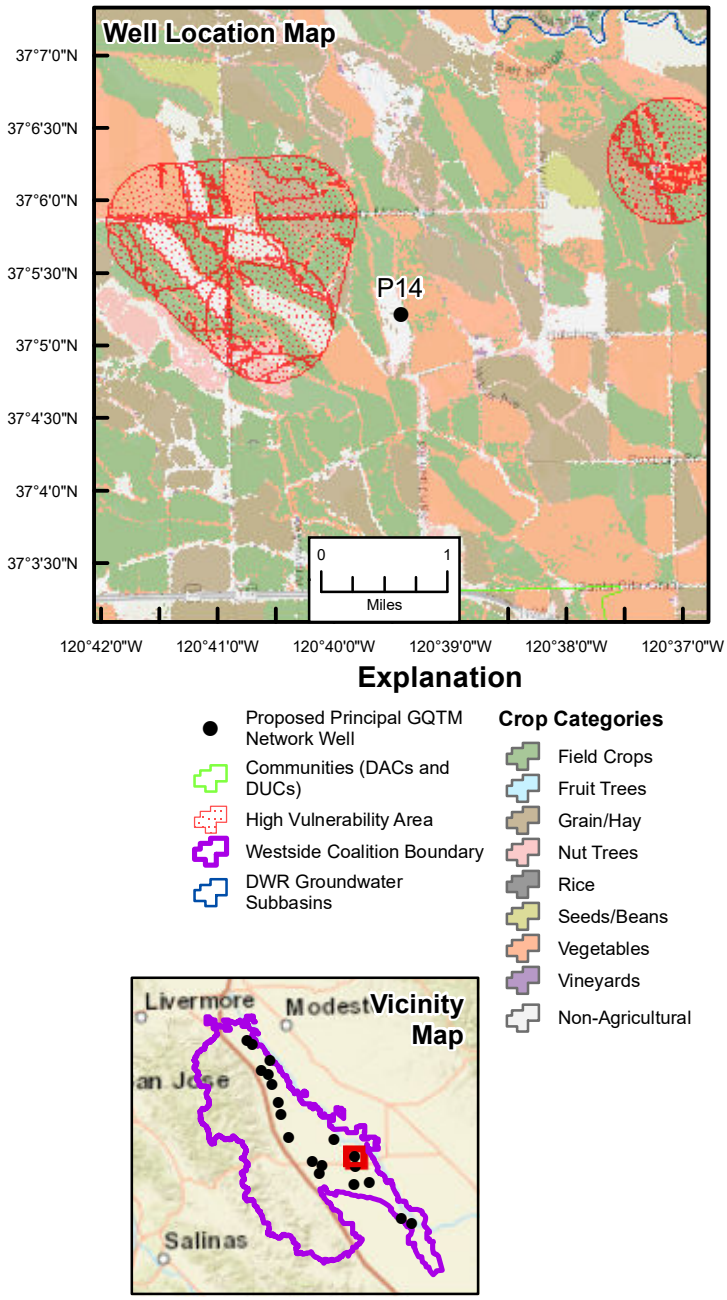
Well Location
Longitude: -120.656
Latitude: 37.086
Well Street Address:
Township/Range/Section: M10.0S12.0E04
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 17
Current Percent Agriculture: 92
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Irrigation
Well Depth (ft bgs): 180
Top of Perforated Interval (ft bgs): 60
Bottom of Perforated Interval (ft bgs): 180
Well Seal Depth (ft bgs): 50
Well Seal Material: Cement
Well Completion Report Number: 508390

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 55
Date of Most Recent Depth to Water: 6/1/2014
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Principal Network Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well P15

GQTM Well Identification
GQTM Well ID: P15
State Well Number:
GQTM Monitoring Area:

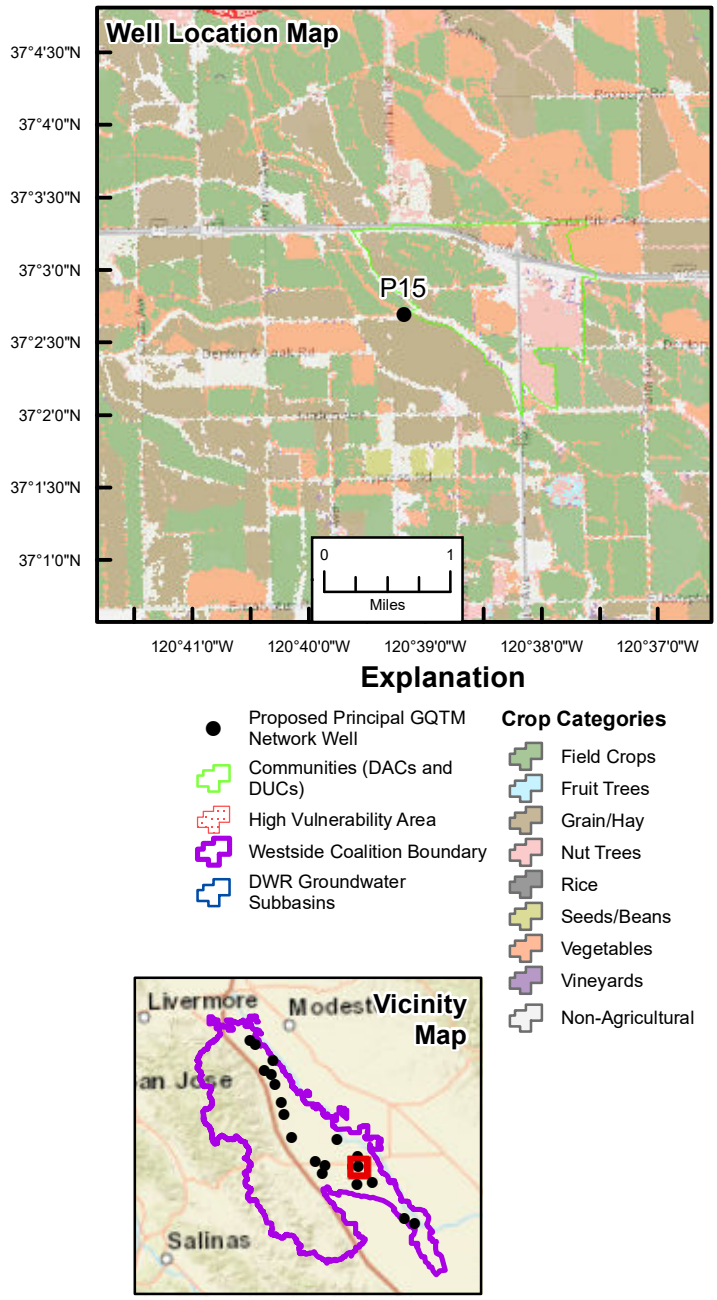
Well Location
Longitude: -120.652
Latitude: 37.044
Well Street Address:
Township/Range/Section: M10.0S12.0E22
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 0
Current Percent Agriculture: 83
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Irrigation
Well Depth (ft bgs): 180
Top of Perforated Interval (ft bgs): 60
Bottom of Perforated Interval (ft bgs): 180
Well Seal Depth (ft bgs): 50
Well Seal Material: Cement
Well Completion Report Number: E0074839

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 33
Date of Most Recent Depth to Water: 6/1/2014
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Principal Network Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well P16

GQTM Well Identification
GQTM Well ID: P16
State Well Number: 11S/12E-16Q01
GQTM Monitoring Area: 8

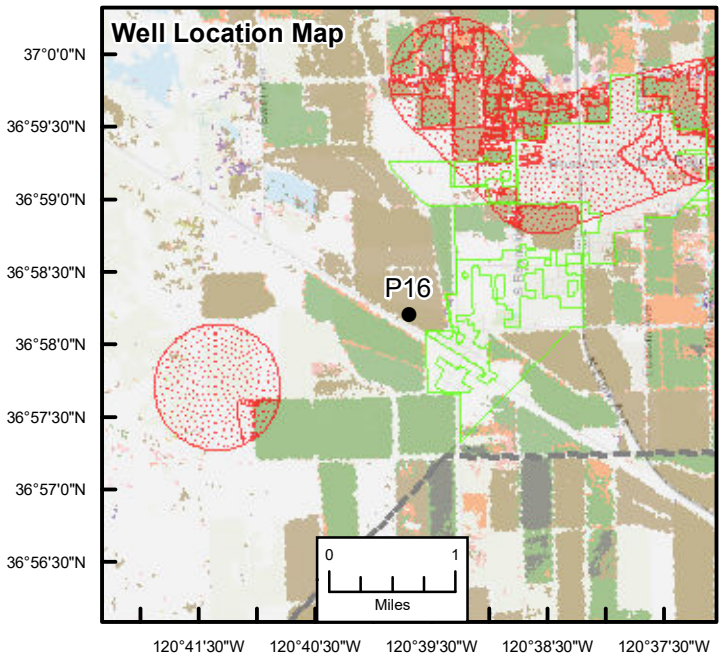
Well Location
Longitude: -120.660496
Latitude: 36.969208
Well Street Address:
Township/Range/Section: M11.0S12.0E16
County: Merced

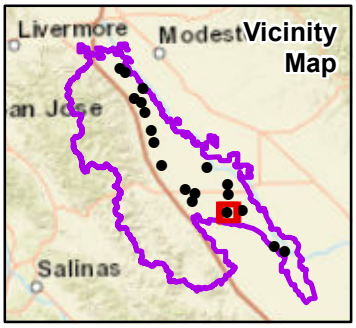
Locational Proximity Description (within 1 mile of well)
Percent HVA: 0
Current Percent Agriculture: 70
Current Primary Irrigated Land Use Type: Seeds and Beans

Well Construction Information
Well Type: Irrigation
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

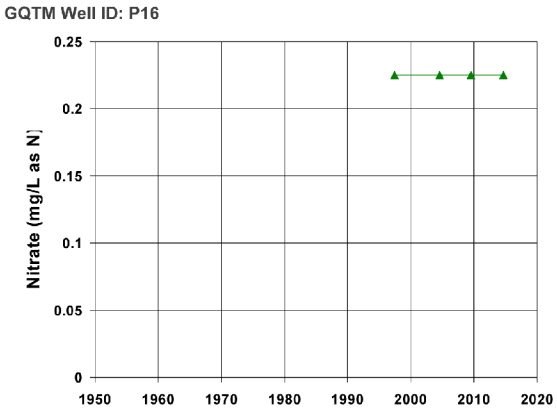
Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 109.839996
Date of Most Recent Depth to Water: 10/1/2014
Most Recent Nitrate Concentration (mg/L as N): 0.225
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L): 0.225
Date of Most Recent TDS Concentration: 8/19/2014

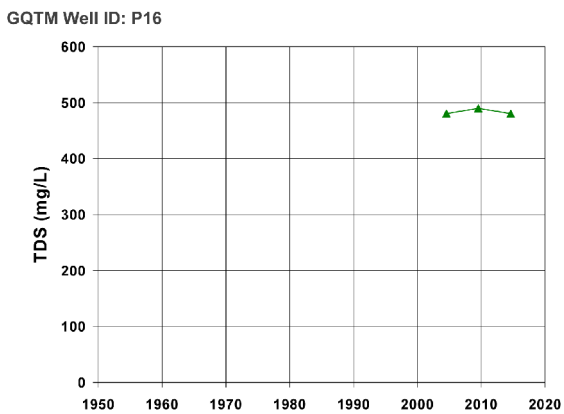




Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well P17

GQTM Well Identification
GQTM Well ID: P17
State Well Number: 11S/13E-17E01
GQTM Monitoring Area:

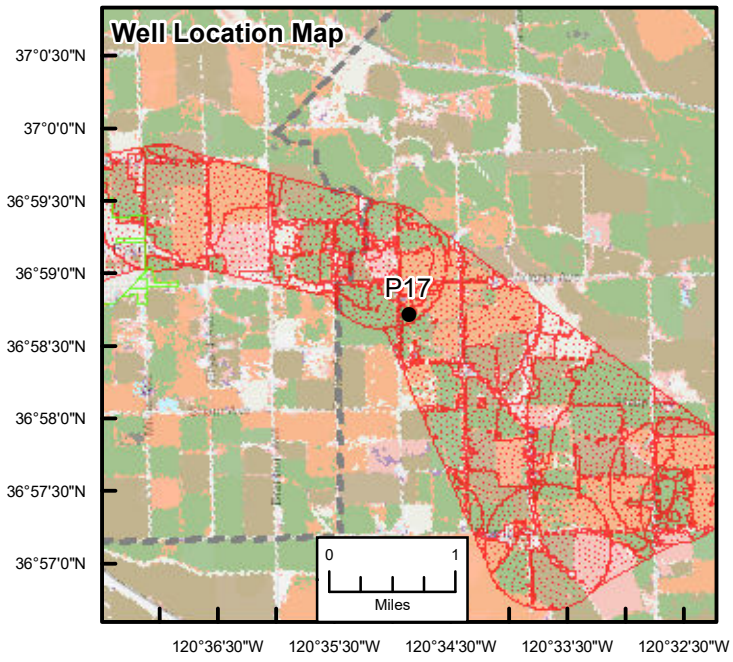
Well Location
Longitude: -120.5799
Latitude: 36.9777
Well Street Address:
Township/Range/Section: M11.0S13.0E17
County: Fresno

Locational Proximity Description (within 1 mile of well)
Percent HVA: 64
Current Percent Agriculture: 89
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Irrigation
Well Depth (ft bgs): 175
Top of Perforated Interval (ft bgs): 60
Bottom of Perforated Interval (ft bgs): 170
Well Seal Depth (ft bgs): 30
Well Seal Material: Cement
Well Completion Report Number: E0067194

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 27.58
Date of Most Recent Depth to Water: 4/1/2017
Most Recent Nitrate Concentration (mg/L as N): 0.225
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L): 0.225
Date of Most Recent TDS Concentration: 8/19/2014

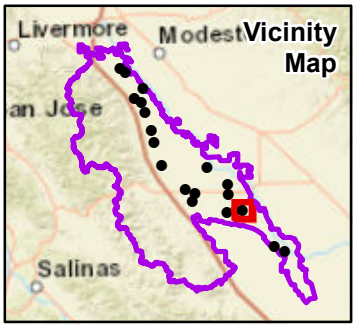


Explanation

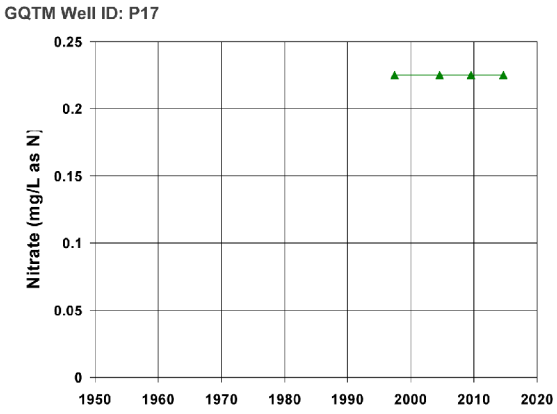
- Proposed Principal GQTM Network Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

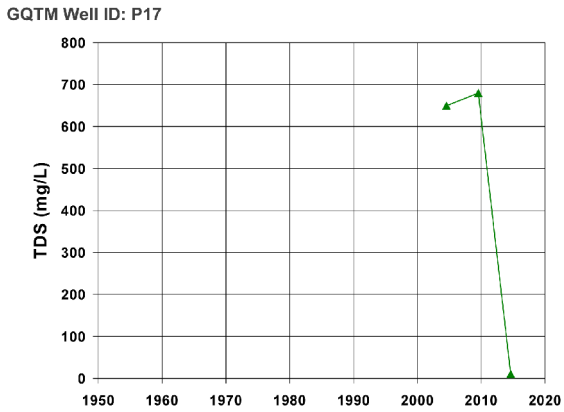
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well P18

GQTM Well Identification
GQTM Well ID: P18
State Well Number: 13S/14E-02M02
GQTM Monitoring Area:

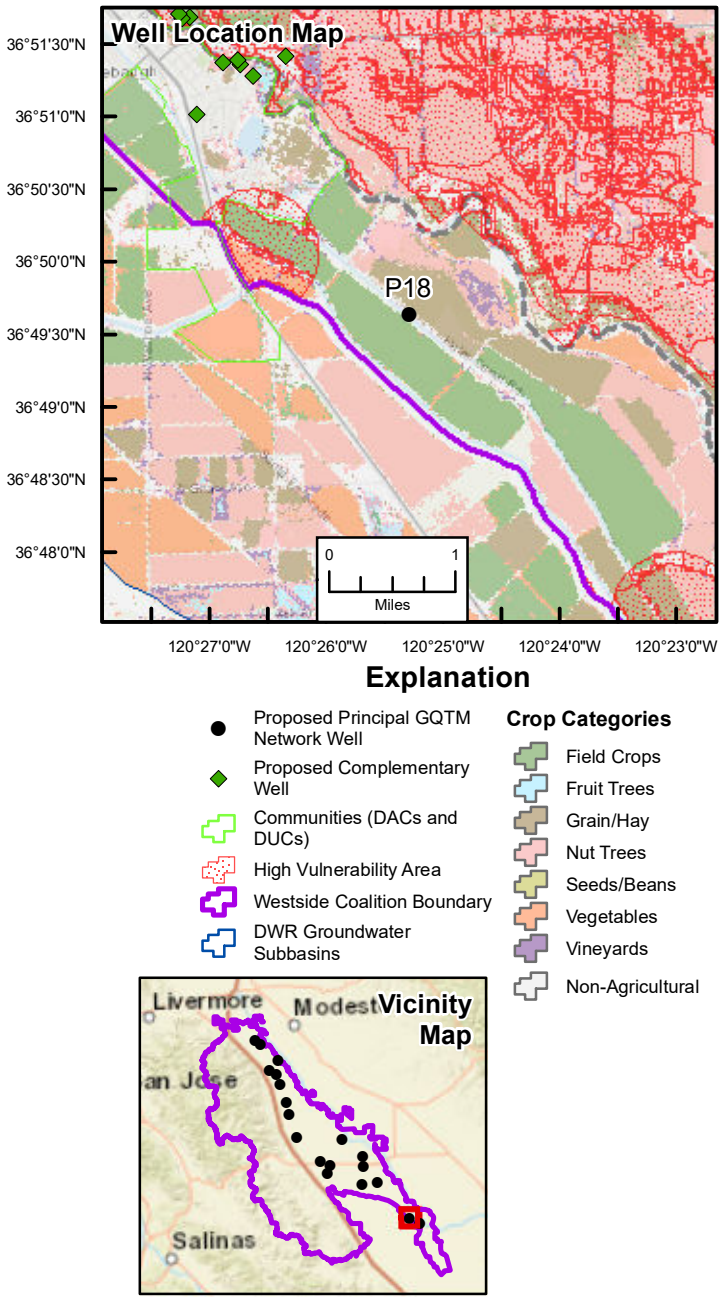
Well Location
Longitude: -120.4204
Latitude: 36.8263
Well Street Address:
Township/Range/Section: M13.0S14.0E02
County: Fresno

Locational Proximity Description (within 1 mile of well)
Percent HVA: 6
Current Percent Agriculture: 56
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Irrigation
Well Depth (ft bgs): 180
Top of Perforated Interval (ft bgs): 90
Bottom of Perforated Interval (ft bgs): 180
Well Seal Depth (ft bgs): 20
Well Seal Material: Cement
Well Completion Report Number: 207508

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs): 25.24
Date of Most Recent Depth to Water: 4/1/2017
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Principal Network Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well P19

GQTM Well Identification
GQTM Well ID: P19
State Well Number:
GQTM Monitoring Area:

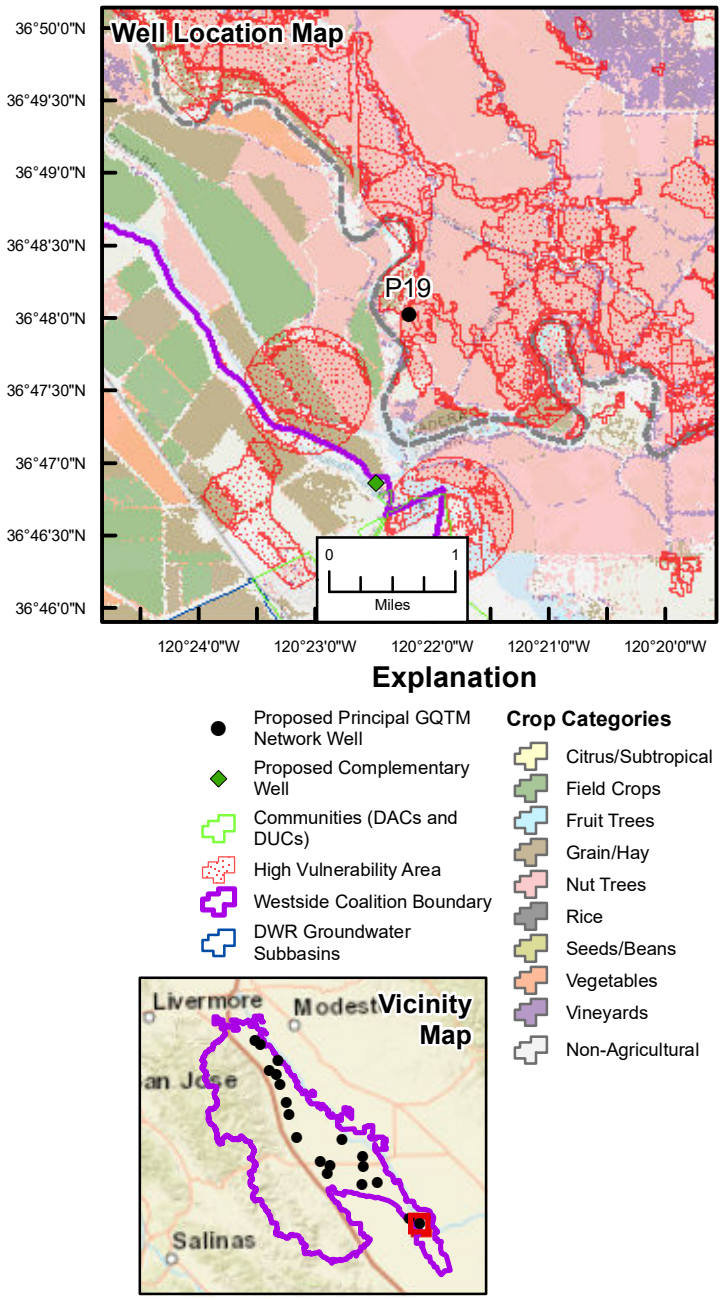
Well Location
Longitude: -120.36881
Latitude: 36.799403
Well Street Address:
Township/Range/Section: M13.0S15.0E18
County: Madera

Locational Proximity Description (within 1 mile of well)
Percent HVA: 35
Current Percent Agriculture: 18
Current Primary Irrigated Land Use Type: Grain and Hay

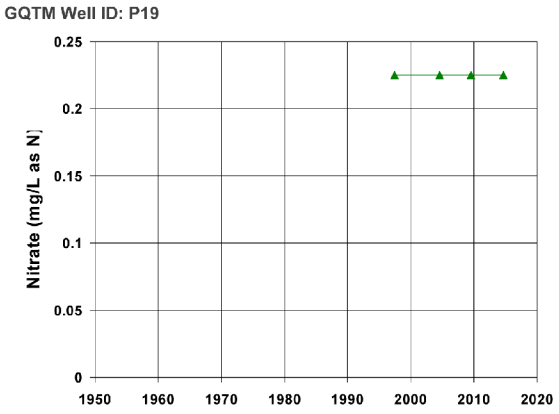
Well Construction Information
Well Type: Irrigation
Well Depth (ft bgs): 280
Top of Perforated Interval (ft bgs): 100
Bottom of Perforated Interval (ft bgs): 275
Well Seal Depth (ft bgs): 80
Well Seal Material: Cement
Well Completion Report Number: 81073

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

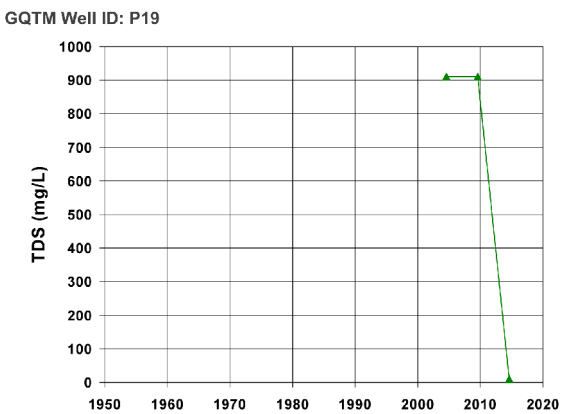
Groundwater Observations
Most Recent Depth to Water (ft, bgs): 25.4
Date of Most Recent Depth to Water: 10/1/2013
Most Recent Nitrate Concentration (mg/L as N): 0.225
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L): 0.225
Date of Most Recent TDS Concentration: 8/19/2014



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Well Information Sheets for Complementary Network Wells

Proposed GQTM Network Well C01

GQTM Well Identification
GQTM Well ID: C01
Primary Station Code: 3910023-004
GQTM Monitoring Area: 2

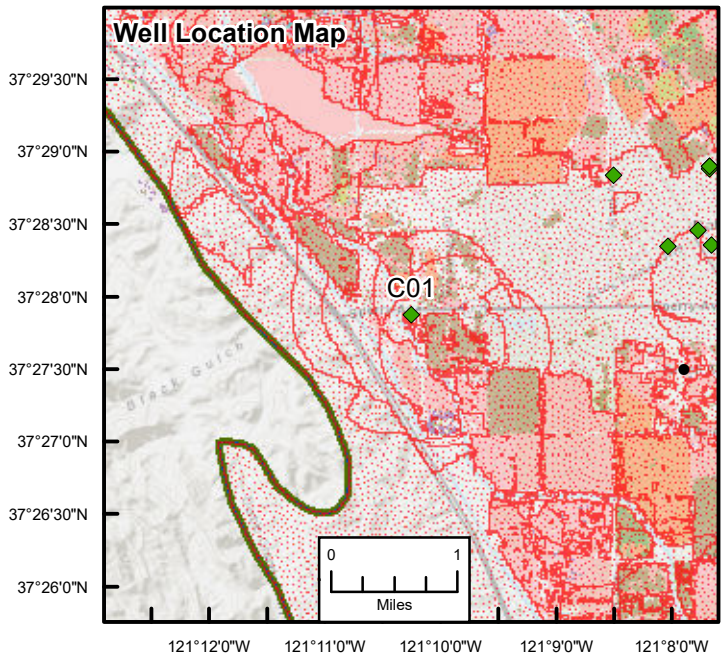
Well Location
Longitude: -121.170064
Latitude: 37.463896
Well Street Address:
Township/Range/Section: M05.0S07.0E35
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 99
Current Percent Agriculture: 32
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 0.4
Date of Most Recent Nitrate Concentration: 11/15/2017
Most Recent TDS Concentration (mg/L): 0.4
Date of Most Recent TDS Concentration: 11/15/2017

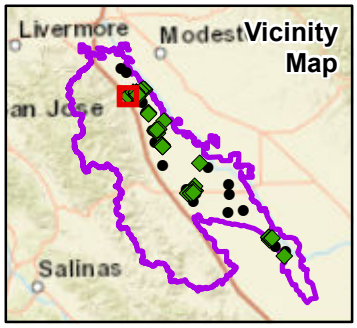


Explanation

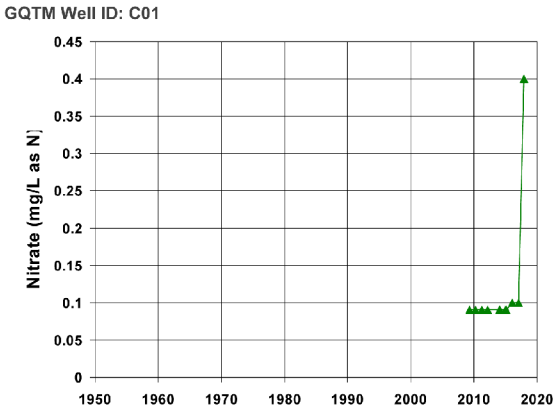
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

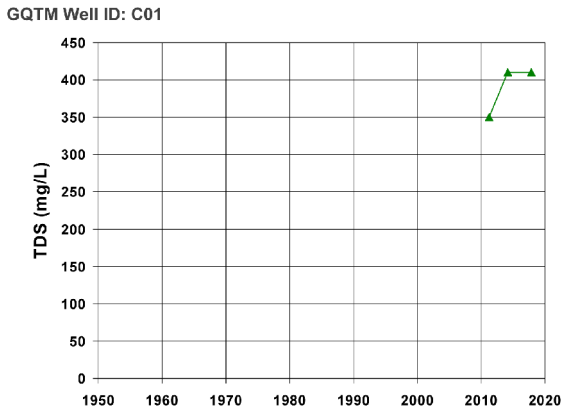
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C02

GQTM Well Identification
GQTM Well ID: C02
Primary Station Code: 5010017-004
GQTM Monitoring Area: 2

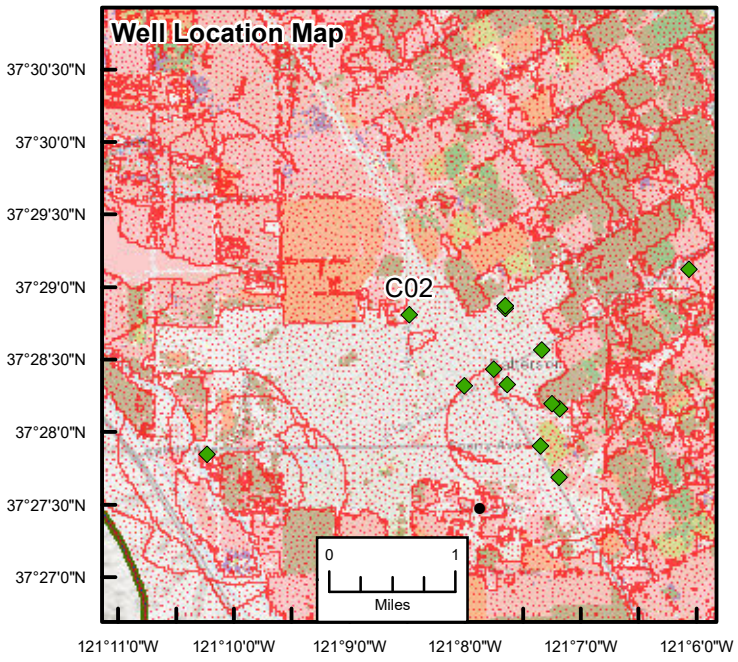
Well Location
Longitude: -121.140552
Latitude: 37.479451
Well Street Address:
Township/Range/Section: M05.0S08.0E19
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 41
Current Primary Irrigated Land Use Type: Vegetables

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 16.4907
Date of Most Recent Nitrate Concentration: 6/30/2015
Most Recent TDS Concentration (mg/L): 16.4907
Date of Most Recent TDS Concentration: 6/30/2015

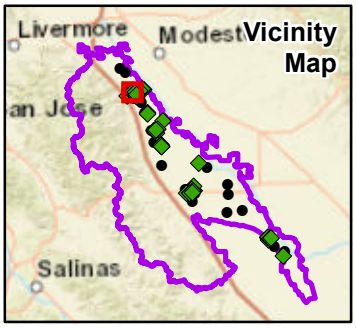


Explanation

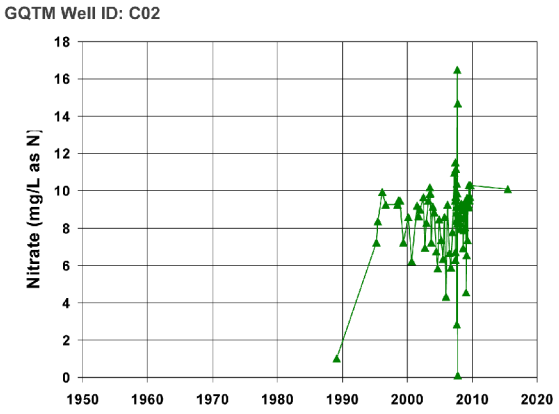
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

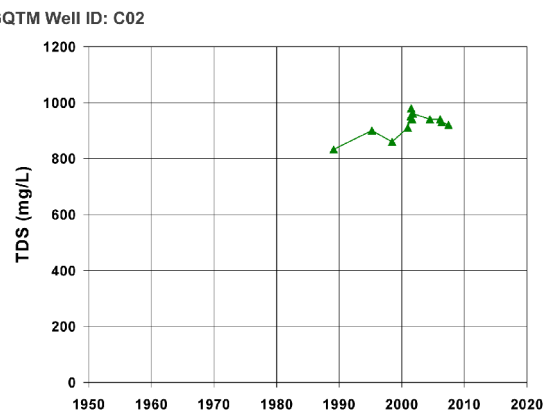
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C03

GQTM Well Identification
GQTM Well ID: C03
Primary Station Code: 5010017-002
GQTM Monitoring Area: 2

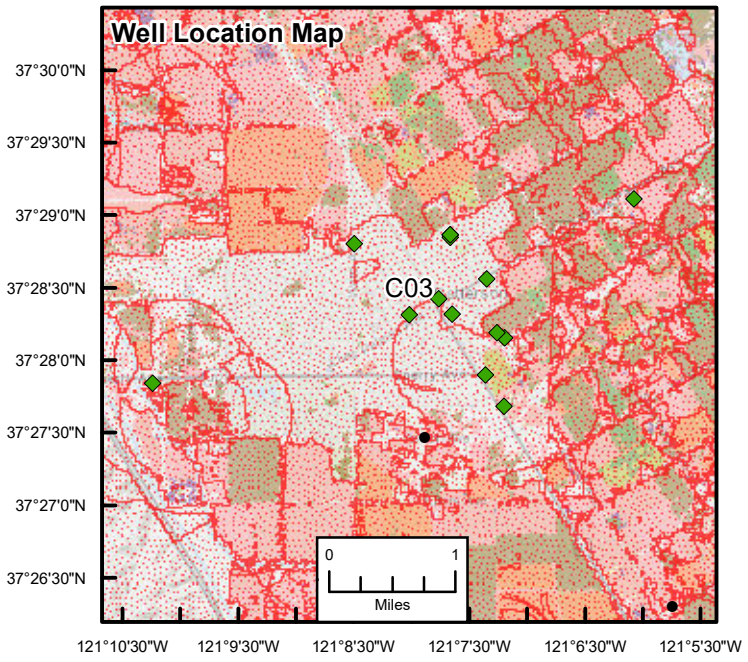
Well Location
Longitude: -121.132831
Latitude: 37.471196
Well Street Address:
Township/Range/Section: M05.0S08.0E30
County: Stanislaus

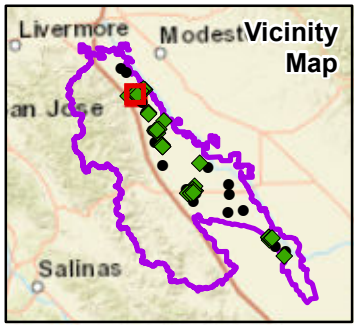
Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 21
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

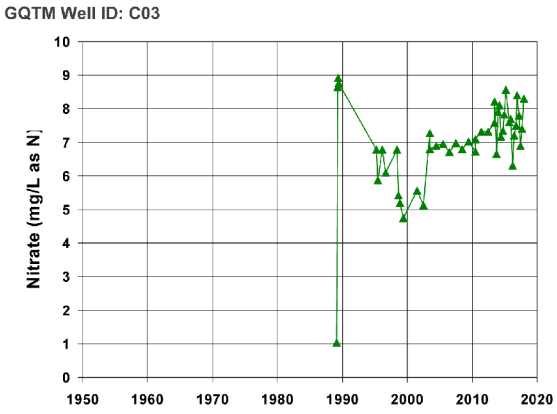
Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8.92305
Date of Most Recent Nitrate Concentration: 12/12/2017
Most Recent TDS Concentration (mg/L): 8.92305
Date of Most Recent TDS Concentration: 12/12/2017

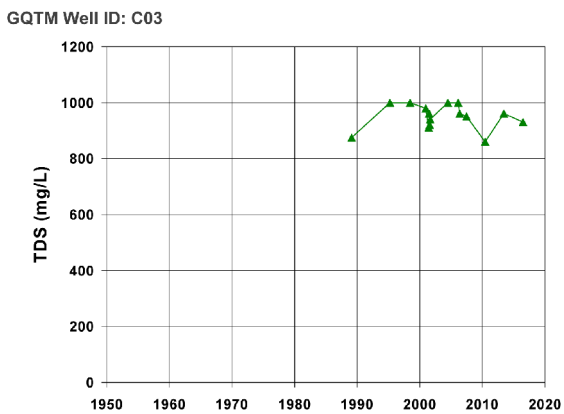




Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C04

GQTM Well Identification
GQTM Well ID: C04
Primary Station Code: 5000193-004
GQTM Monitoring Area: 2

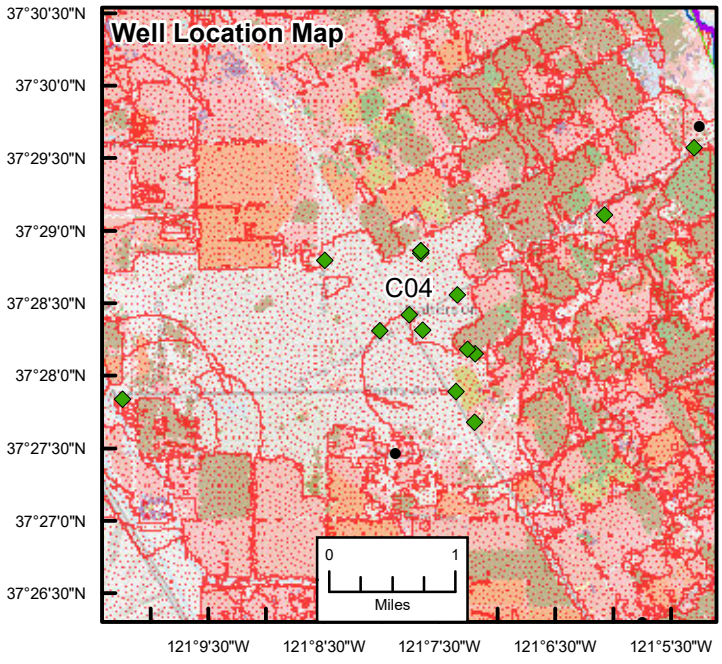
Well Location
Longitude: -121.128532
Latitude: 37.472982
Well Street Address:
Township/Range/Section: M05.0S08.0E30
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 31
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 7.2288
Date of Most Recent Nitrate Concentration: 10/17/2012
Most Recent TDS Concentration (mg/L): 7.2288
Date of Most Recent TDS Concentration: 10/17/2012

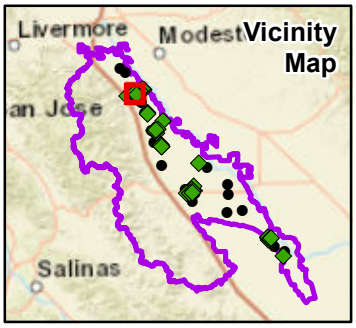


Explanation

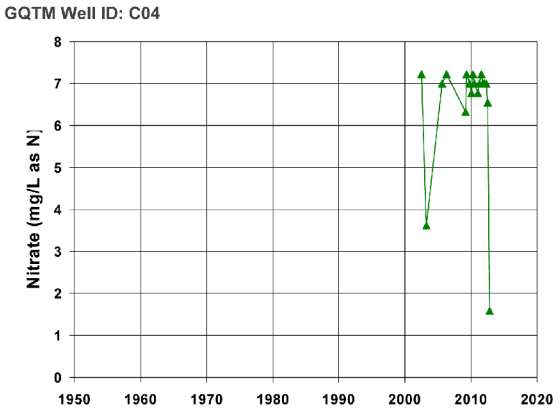
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

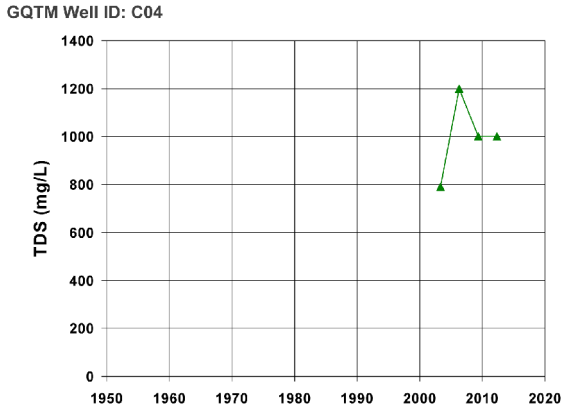
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C05

GQTM Well Identification
GQTM Well ID: C05
Primary Station Code: 5000193-003
GQTM Monitoring Area: 2

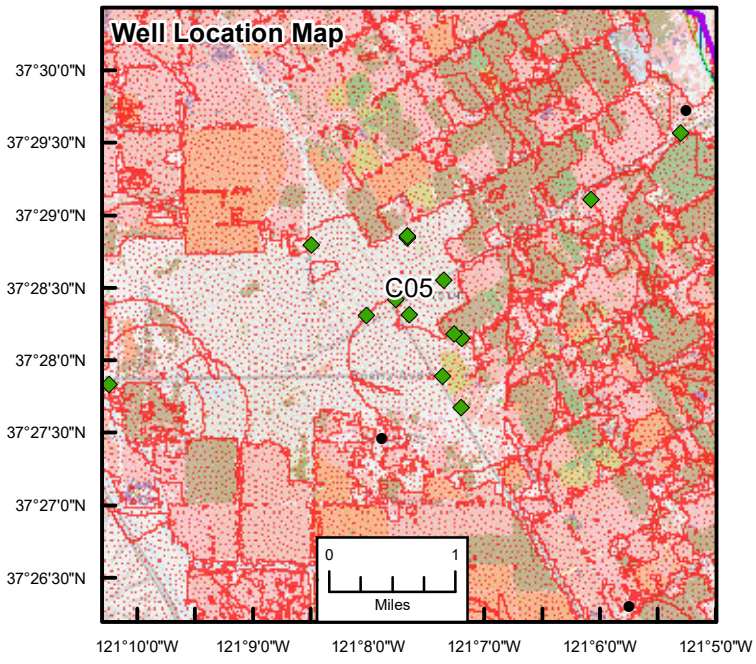
Well Location
Longitude: -121.12663
Latitude: 37.471207
Well Street Address:
Township/Range/Section: M05.0S08.0E30
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 32
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 7.2288
Date of Most Recent Nitrate Concentration: 4/21/2009
Most Recent TDS Concentration (mg/L): 7.2288
Date of Most Recent TDS Concentration: 4/21/2009

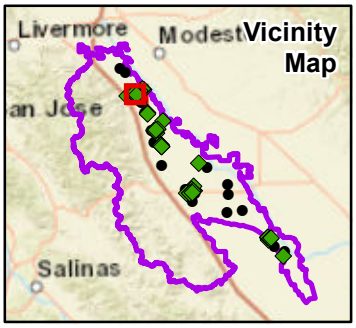


Explanation

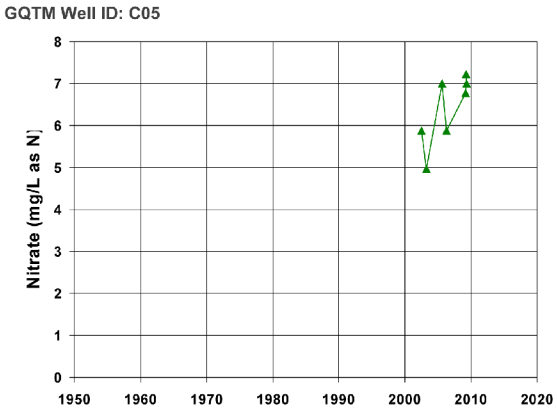
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

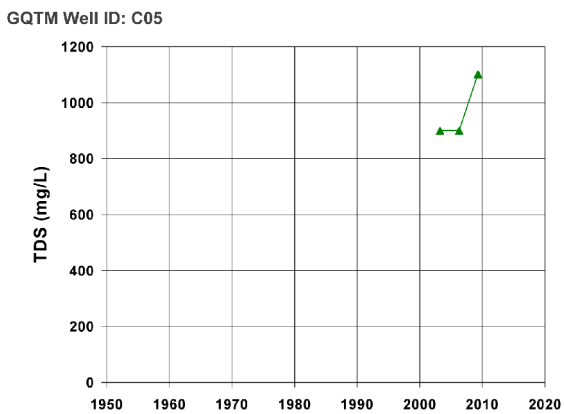
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C06

GQTM Well Identification
GQTM Well ID: C06
Primary Station Code: 5000301-001
GQTM Monitoring Area: 2

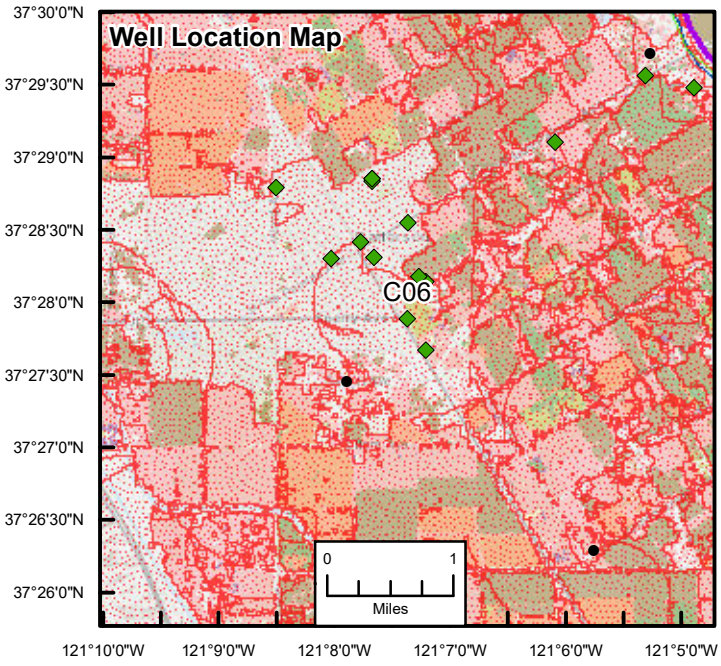
Well Location
Longitude: -121.121981
Latitude: 37.464082
Well Street Address:
Township/Range/Section: M05.0S08.0E31
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 45
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs): 50
Bottom of Perforated Interval (ft bgs): 60
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 7.65801
Date of Most Recent Nitrate Concentration: 6/3/2011
Most Recent TDS Concentration (mg/L): 7.65801
Date of Most Recent TDS Concentration: 6/3/2011

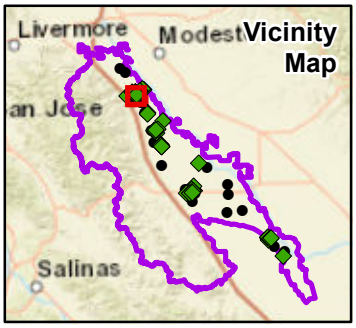


Explanation

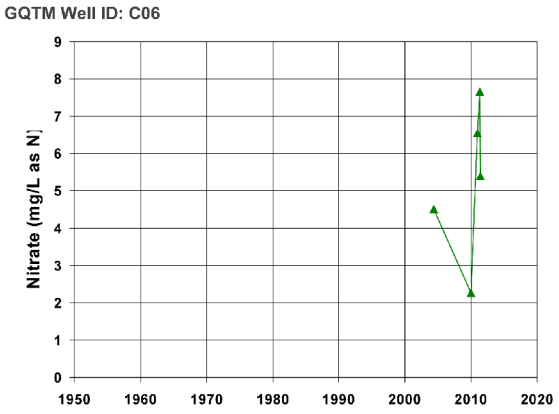
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

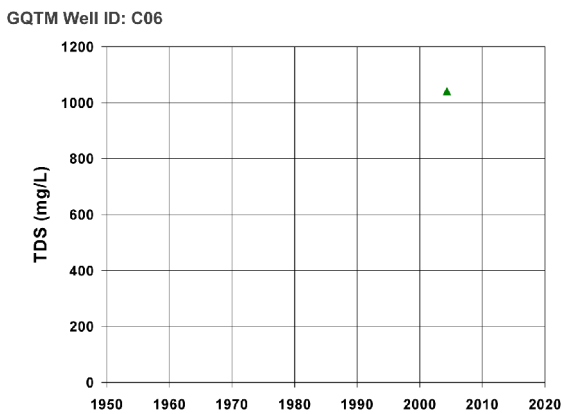
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C07

GQTM Well Identification
GQTM Well ID: C07
Primary Station Code: 5010017-012
GQTM Monitoring Area: 2

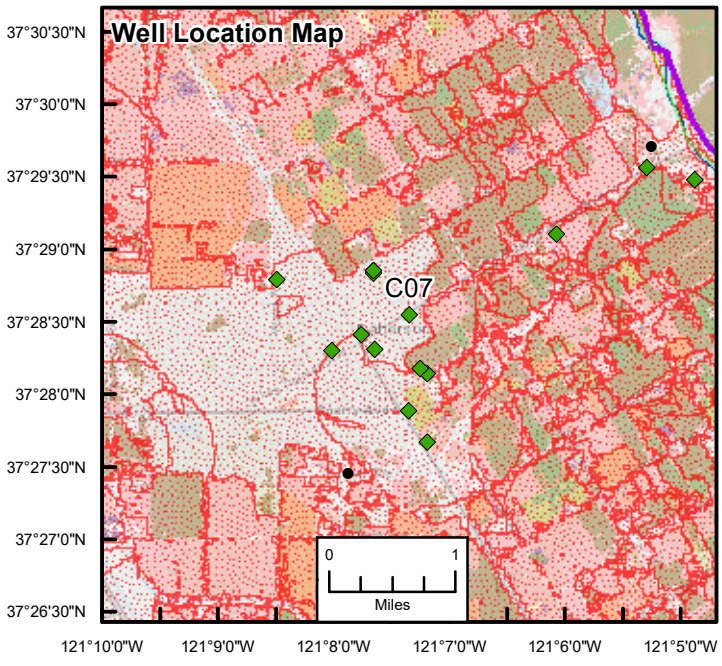
Well Location
Longitude: -121.121593
Latitude: 37.475121
Well Street Address:
Township/Range/Section: M05.0S08.0E30
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 50
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 7.8
Date of Most Recent Nitrate Concentration: 1/9/2018
Most Recent TDS Concentration (mg/L): 7.8
Date of Most Recent TDS Concentration: 1/9/2018

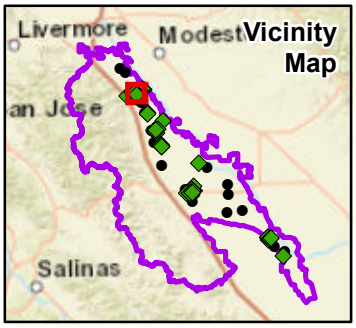


Explanation

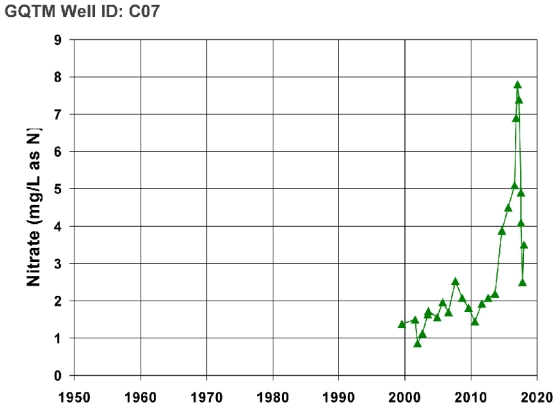
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

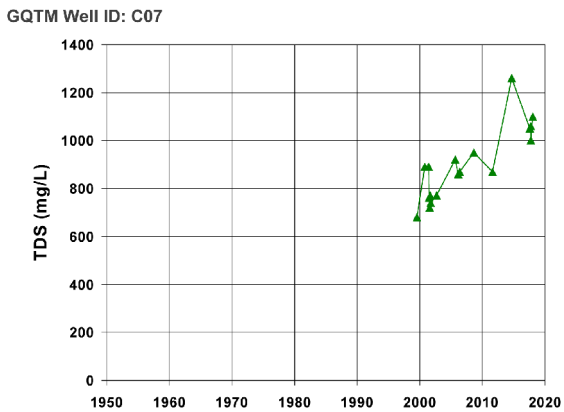
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C08

GQTM Well Identification
GQTM Well ID: C08
Primary Station Code: 5010017-014
GQTM Monitoring Area: 2

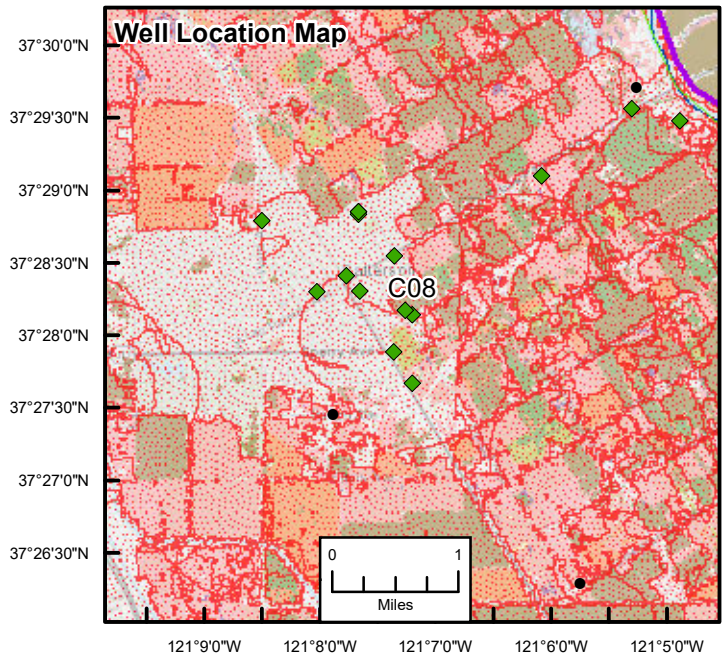
Well Location
Longitude: -121.119167
Latitude: 37.468333
Well Street Address:
Township/Range/Section: M05.0S08.0E29
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 47
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 3.59181
Date of Most Recent Nitrate Concentration: 5/9/2017
Most Recent TDS Concentration (mg/L): 3.59181
Date of Most Recent TDS Concentration: 5/9/2017

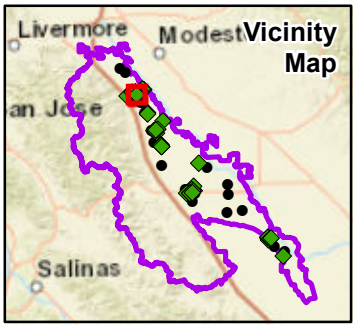


Explanation

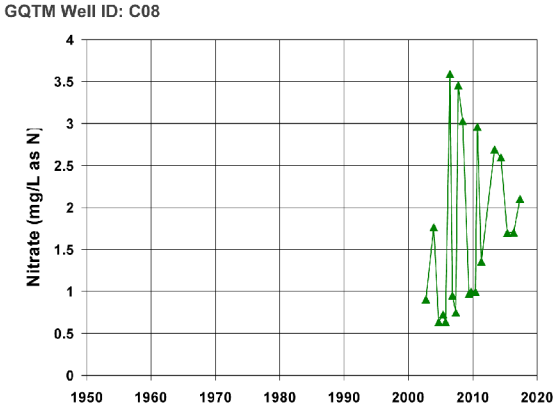
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

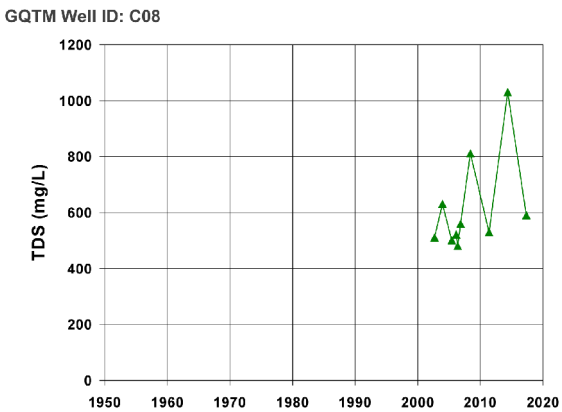
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C09

GQTM Well Identification
GQTM Well ID: C09
Primary Station Code: 5000193-007
GQTM Monitoring Area: 2

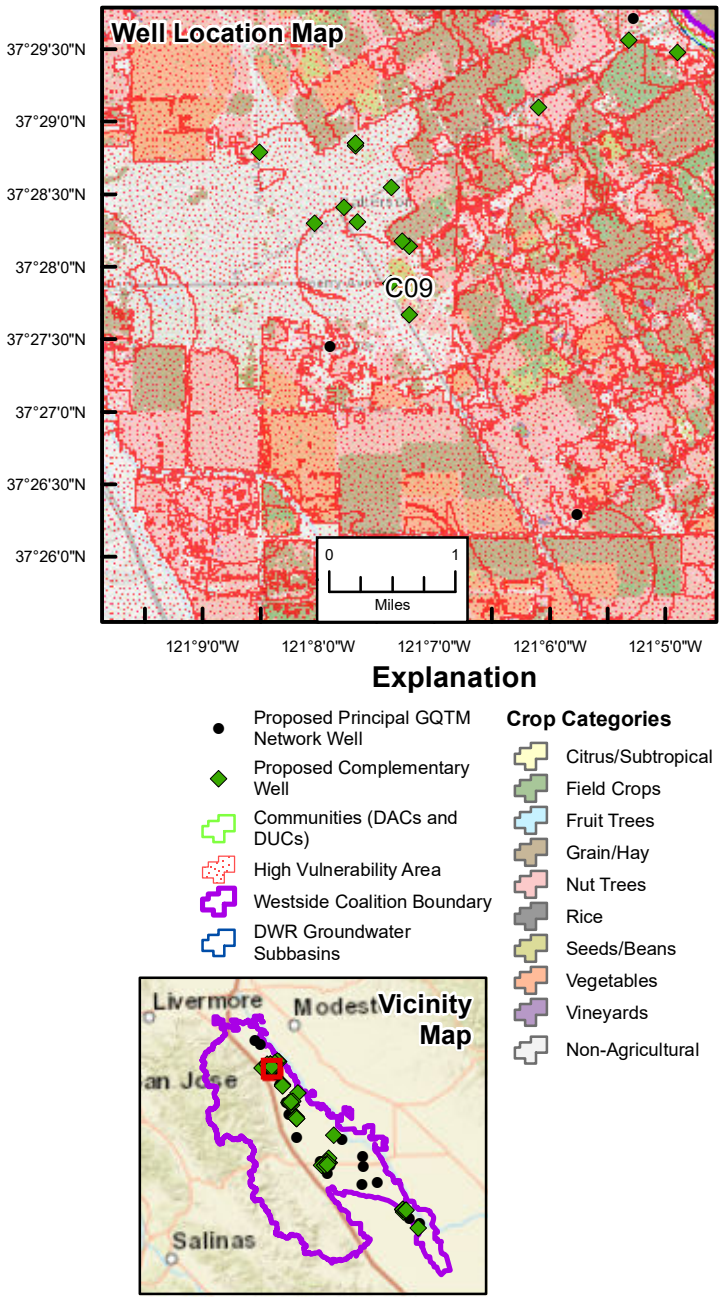
Well Location
Longitude: -121.1194
Latitude: 37.46046
Well Street Address:
Township/Range/Section: M05.0S08.0E32
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 56
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N):
Date of Most Recent Nitrate Concentration:
Most Recent TDS Concentration (mg/L):
Date of Most Recent TDS Concentration:



Graph of Historical Nitrate Concentrations

No Historical Nitrate Data Available

Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C10

GQTM Well Identification
GQTM Well ID: C10
Primary Station Code: 5010012-001
GQTM Monitoring Area: 2

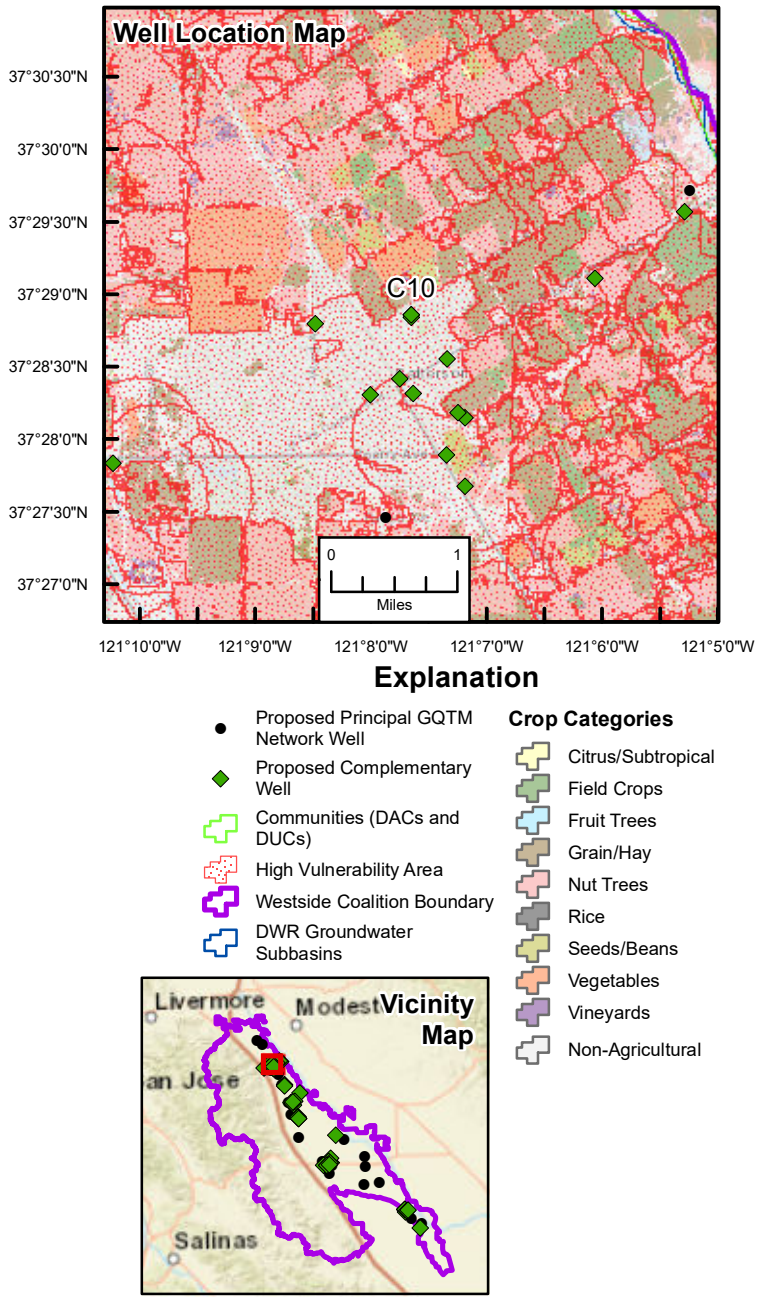
Well Location
Longitude: -121.126667
Latitude: 37.480278
Well Street Address:
Township/Range/Section: M05.0S08.0E19
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 52
Current Primary Irrigated Land Use Type: Grain and Hay

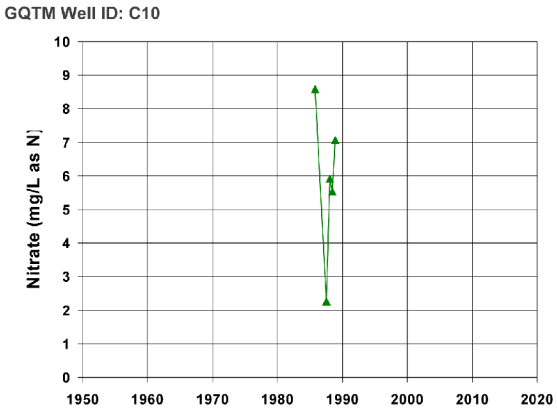
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8.5842
Date of Most Recent Nitrate Concentration: 11/18/1988
Most Recent TDS Concentration (mg/L): 8.5842
Date of Most Recent TDS Concentration: 11/18/1988



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C11

GQTM Well Identification
GQTM Well ID: C11
Primary Station Code: 5010012-002
GQTM Monitoring Area: 2

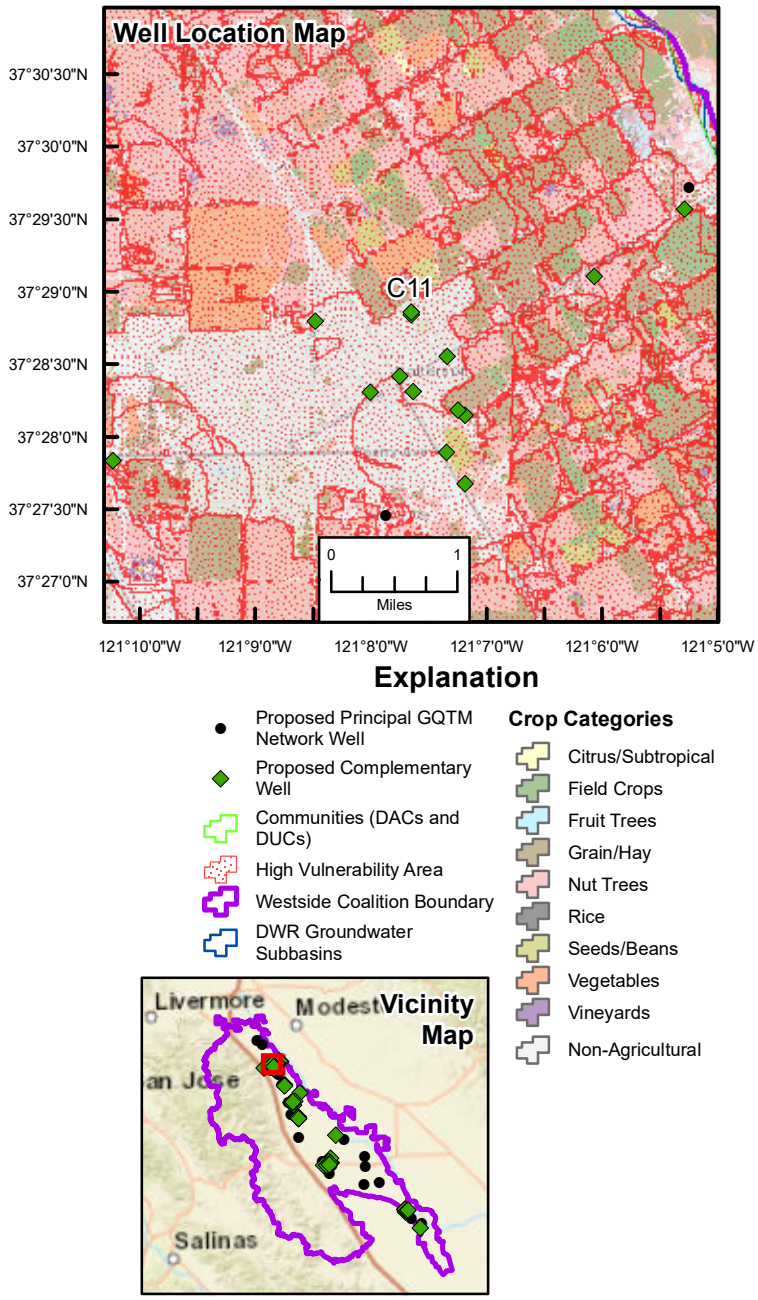
Well Location
Longitude: -121.126667
Latitude: 37.48
Well Street Address:
Township/Range/Section: M05.0S08.0E19
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 51
Current Primary Irrigated Land Use Type: Grain and Hay

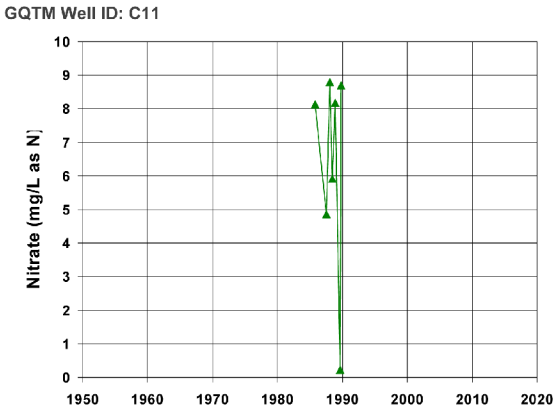
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8.78751
Date of Most Recent Nitrate Concentration: 10/20/1989
Most Recent TDS Concentration (mg/L): 8.78751
Date of Most Recent TDS Concentration: 10/20/1989



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations

No Historical TDS Data Available

Proposed GQTM Network Well C12

GQTM Well Identification
GQTM Well ID: C12
Primary Station Code: 5010012-003
GQTM Monitoring Area: 2

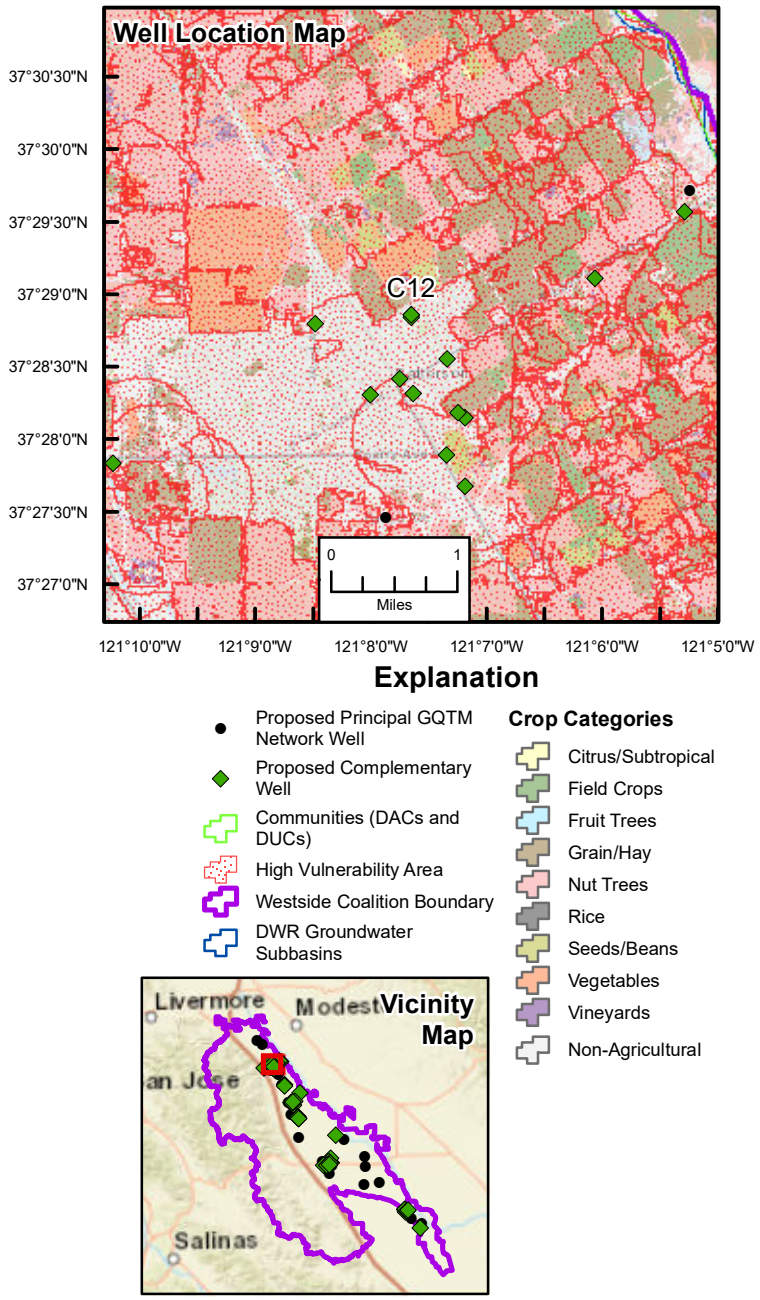
Well Location
Longitude: -121.126667
Latitude: 37.480278
Well Street Address:
Township/Range/Section: M05.0S08.0E19
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 52
Current Primary Irrigated Land Use Type: Grain and Hay

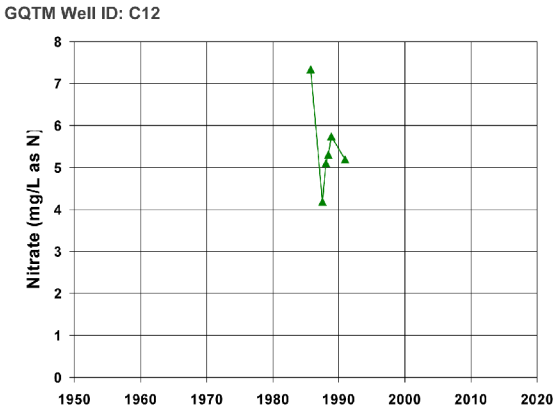
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

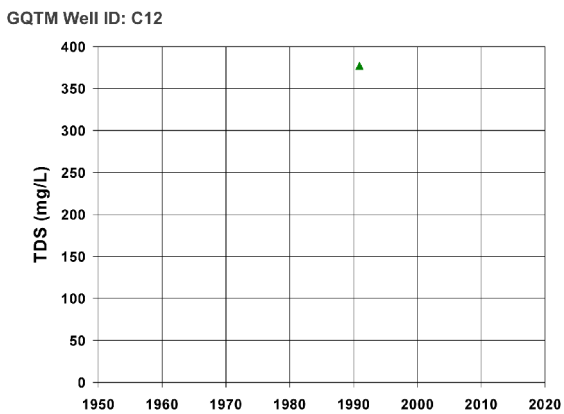
Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 7.34175
Date of Most Recent Nitrate Concentration: 12/7/1990
Most Recent TDS Concentration (mg/L): 7.34175
Date of Most Recent TDS Concentration: 12/7/1990



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C13

GQTM Well Identification
GQTM Well ID: C13
Primary Station Code: 5010017-018
GQTM Monitoring Area: 2

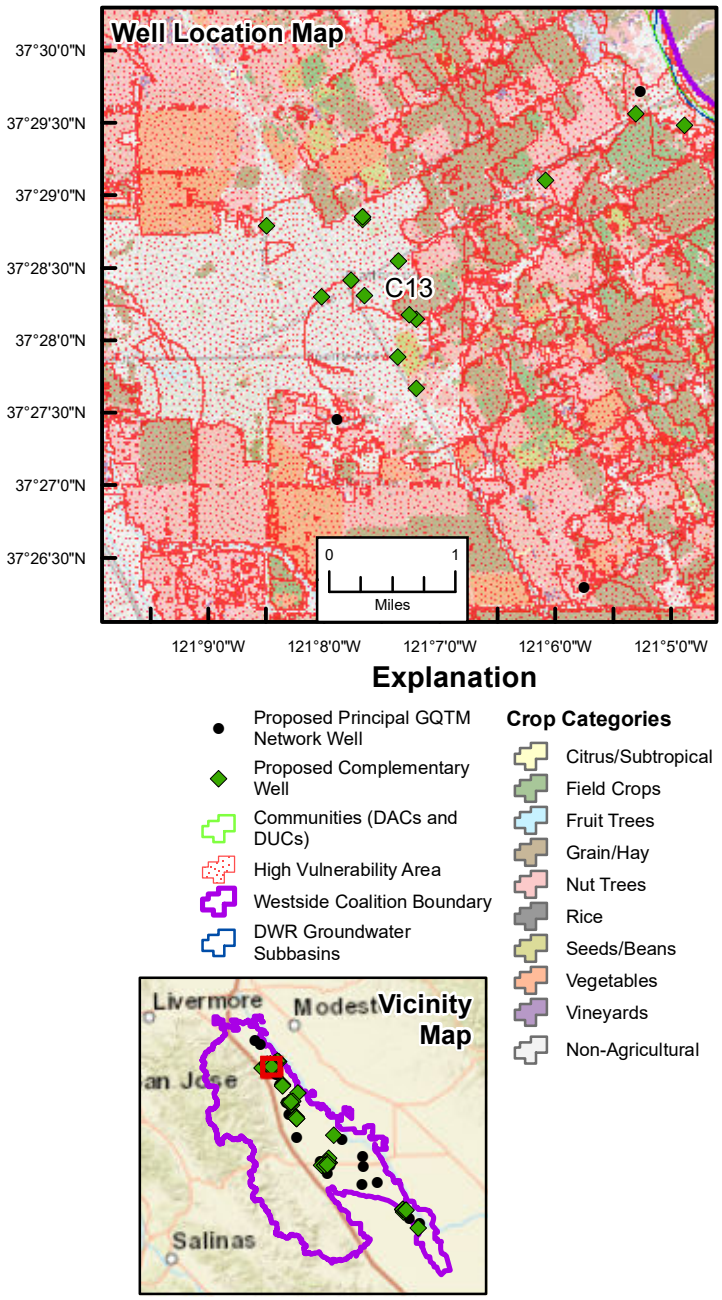
Well Location
Longitude: -121.1202
Latitude: 37.4689
Well Street Address:
Township/Range/Section: M05.0S08.0E29
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 44
Current Primary Irrigated Land Use Type: Nut Trees

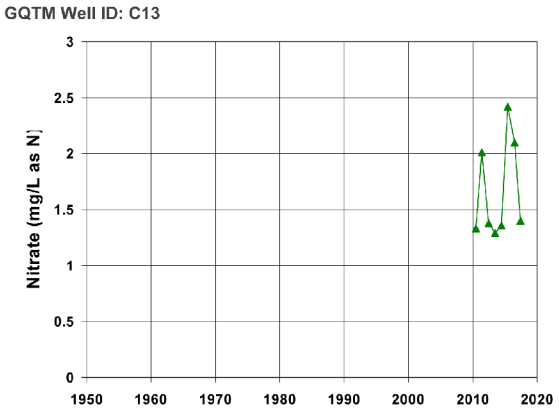
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

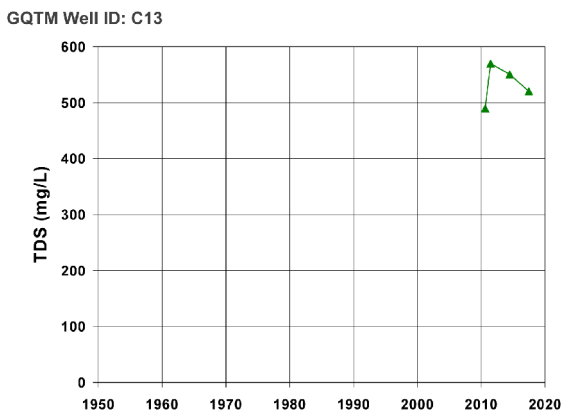
Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 2.41713
Date of Most Recent Nitrate Concentration: 6/6/2017
Most Recent TDS Concentration (mg/L): 2.41713
Date of Most Recent TDS Concentration: 6/6/2017



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C14

GQTM Well Identification
GQTM Well ID: C14
Primary Station Code: 5000473-001
GQTM Monitoring Area: 2

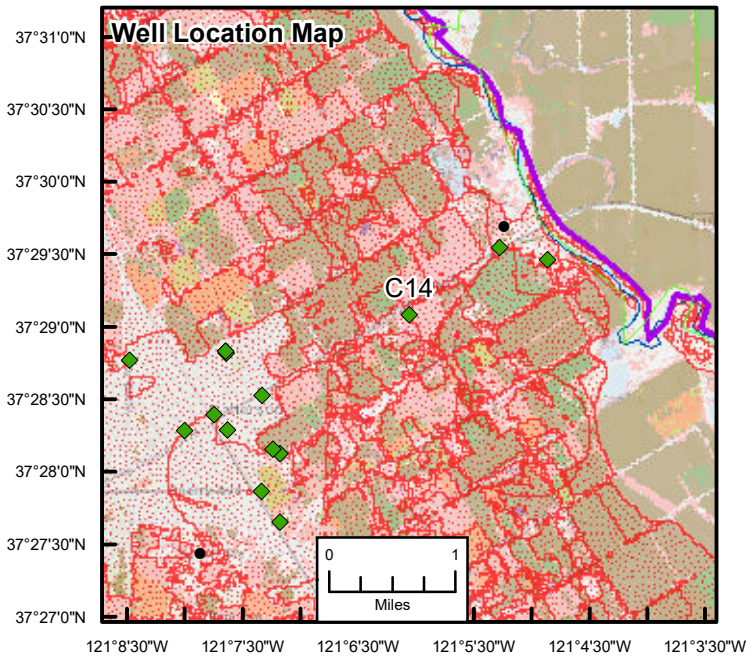
Well Location
Longitude: -121.100119
Latitude: 37.484012
Well Street Address:
Township/Range/Section: M05.0S08.0E21
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 88
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 6.03153
Date of Most Recent Nitrate Concentration: 3/6/2017
Most Recent TDS Concentration (mg/L): 6.03153
Date of Most Recent TDS Concentration: 3/6/2017

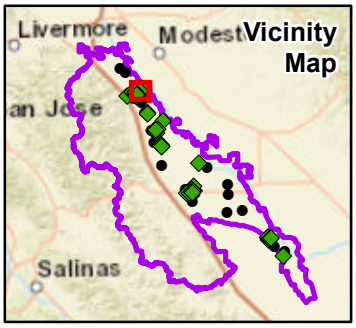


Explanation

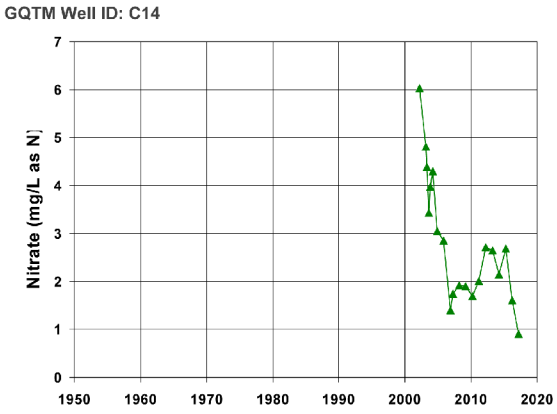
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

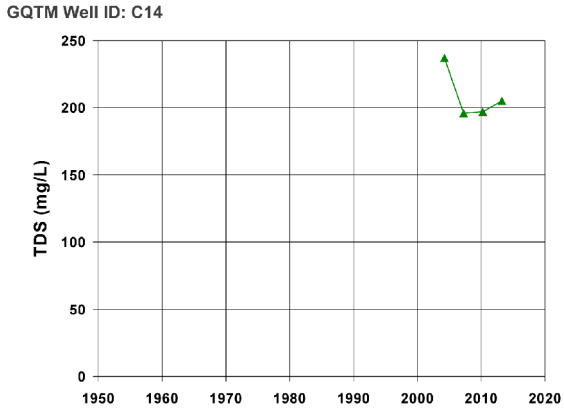
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C15

GQTM Well Identification
GQTM Well ID: C15
Primary Station Code: 5000381-001
GQTM Monitoring Area: 2

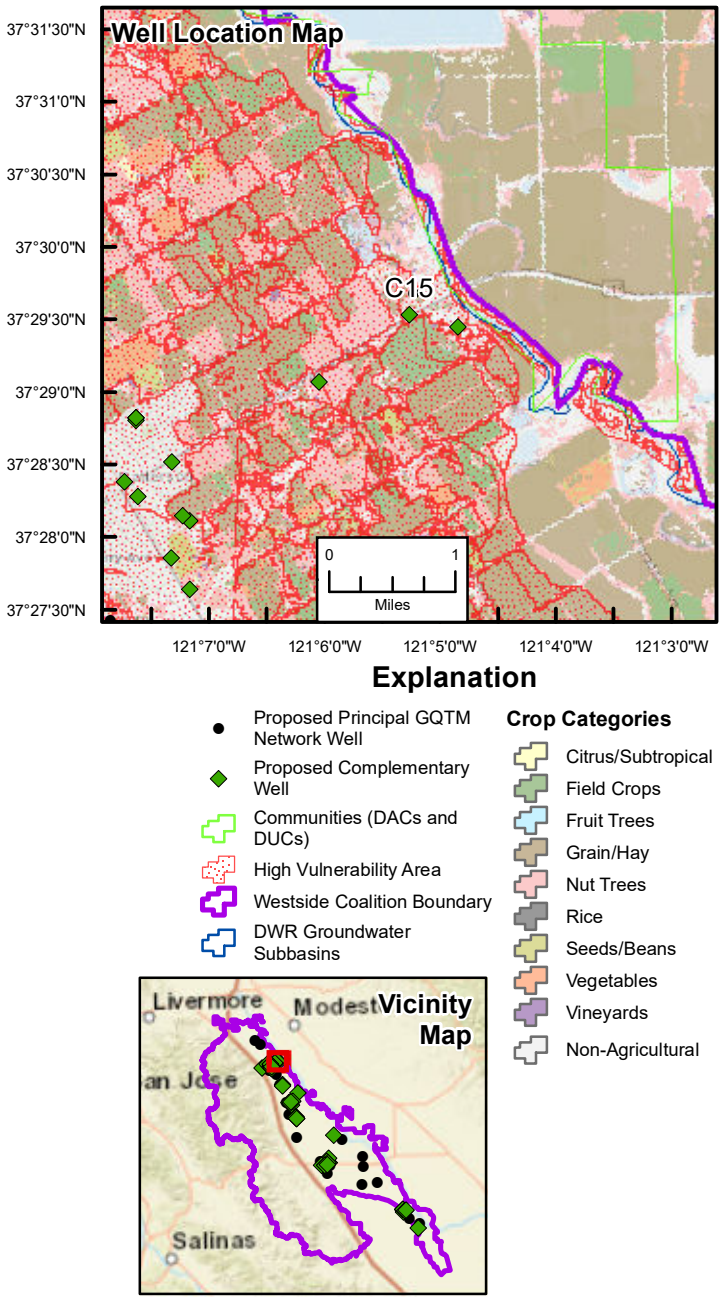
Well Location
Longitude: -121.086944
Latitude: 37.4915
Well Street Address:
Township/Range/Section: M05.0S08.0E21
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 69
Current Percent Agriculture: 80
Current Primary Irrigated Land Use Type: Grain and Hay

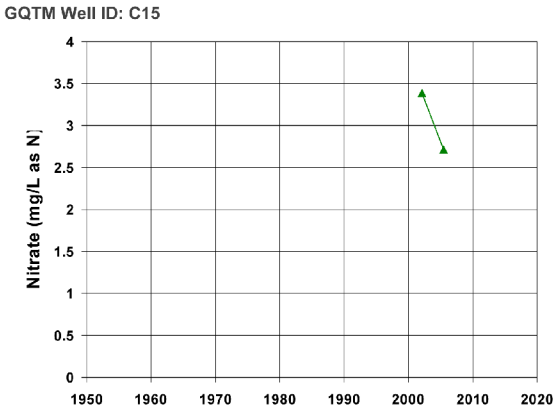
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs): 65
Bottom of Perforated Interval (ft bgs): 85
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 3.3885
Date of Most Recent Nitrate Concentration: 6/9/2005
Most Recent TDS Concentration (mg/L): 3.3885
Date of Most Recent TDS Concentration: 6/9/2005



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C16

GQTM Well Identification
GQTM Well ID: C16
Primary Station Code: 5000365-001
GQTM Monitoring Area: 2

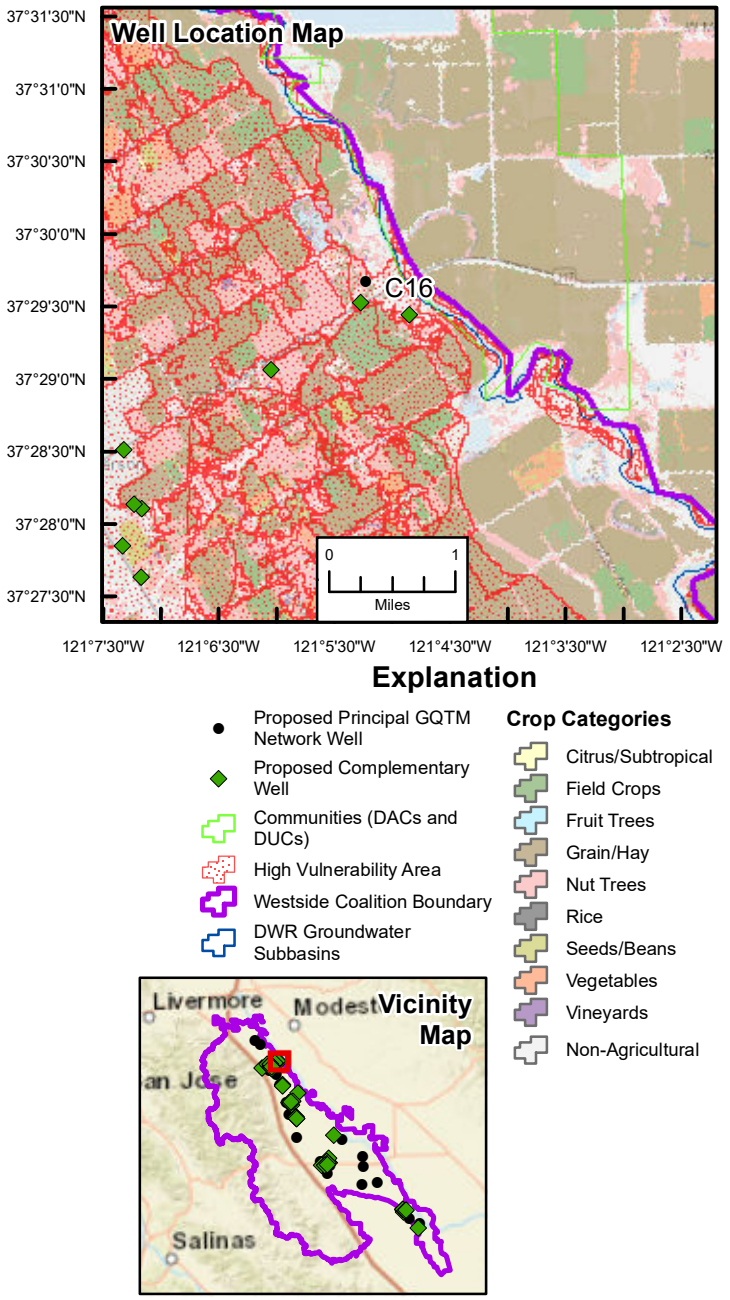
Well Location
Longitude: -121.08
Latitude: 37.49
Well Street Address:
Township/Range/Section: M05.0S08.0E22
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 54
Current Percent Agriculture: 77
Current Primary Irrigated Land Use Type: Grain and Hay

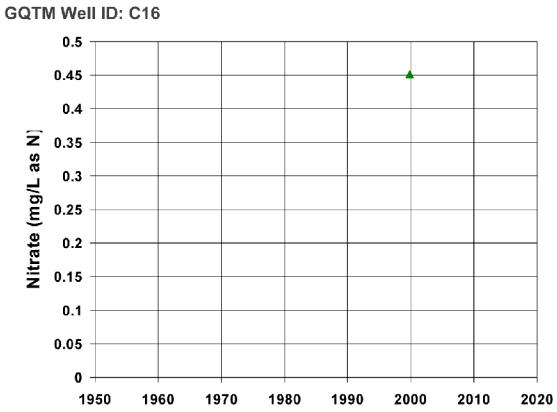
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs): 50
Bottom of Perforated Interval (ft bgs): 60
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 0.4518
Date of Most Recent Nitrate Concentration: 10/28/1999
Most Recent TDS Concentration (mg/L): 0.4518
Date of Most Recent TDS Concentration: 10/28/1999



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C17

GQTM Well Identification
GQTM Well ID: C17
Primary Station Code: 5000005-004
GQTM Monitoring Area: 3

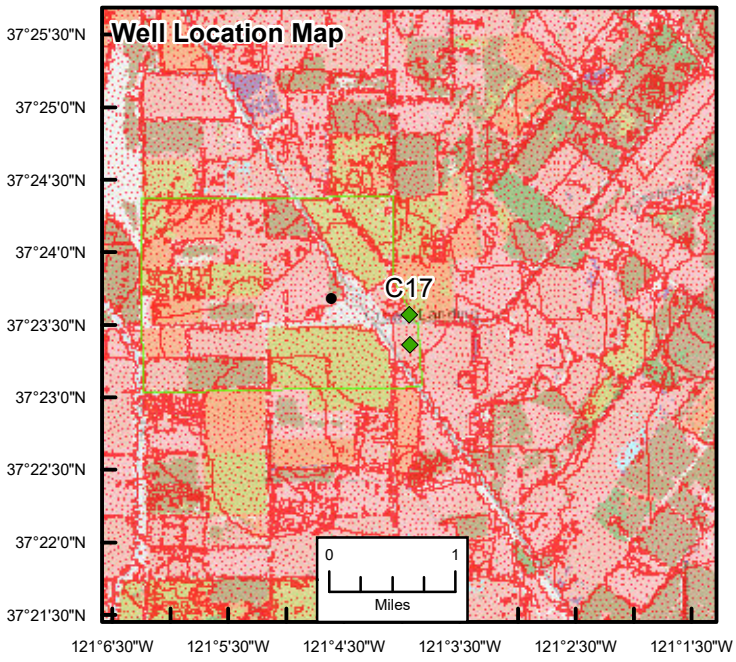
Well Location
Longitude: -121.064739
Latitude: 37.392104
Well Street Address:
Township/Range/Section: M06.0S08.0E23
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 88
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 5.03757
Date of Most Recent Nitrate Concentration: 6/9/2017
Most Recent TDS Concentration (mg/L): 5.03757
Date of Most Recent TDS Concentration: 6/9/2017

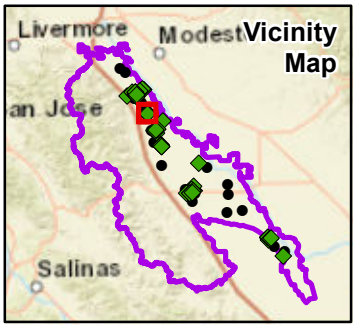


Explanation

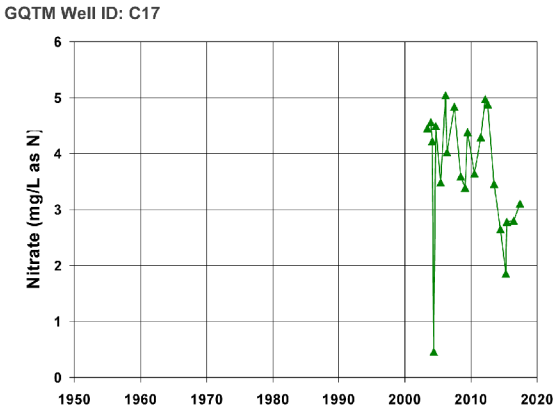
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

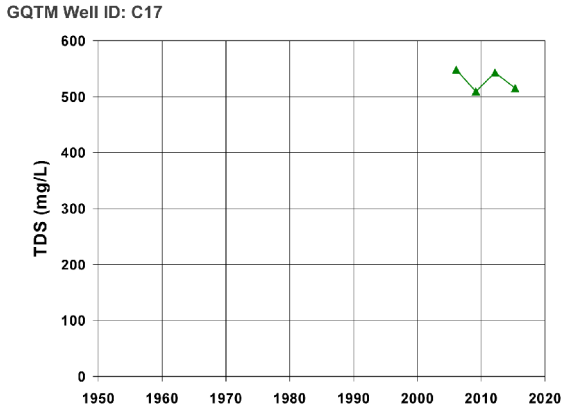
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C18

GQTM Well Identification
GQTM Well ID: C18
Primary Station Code: 5000005-003
GQTM Monitoring Area: 3

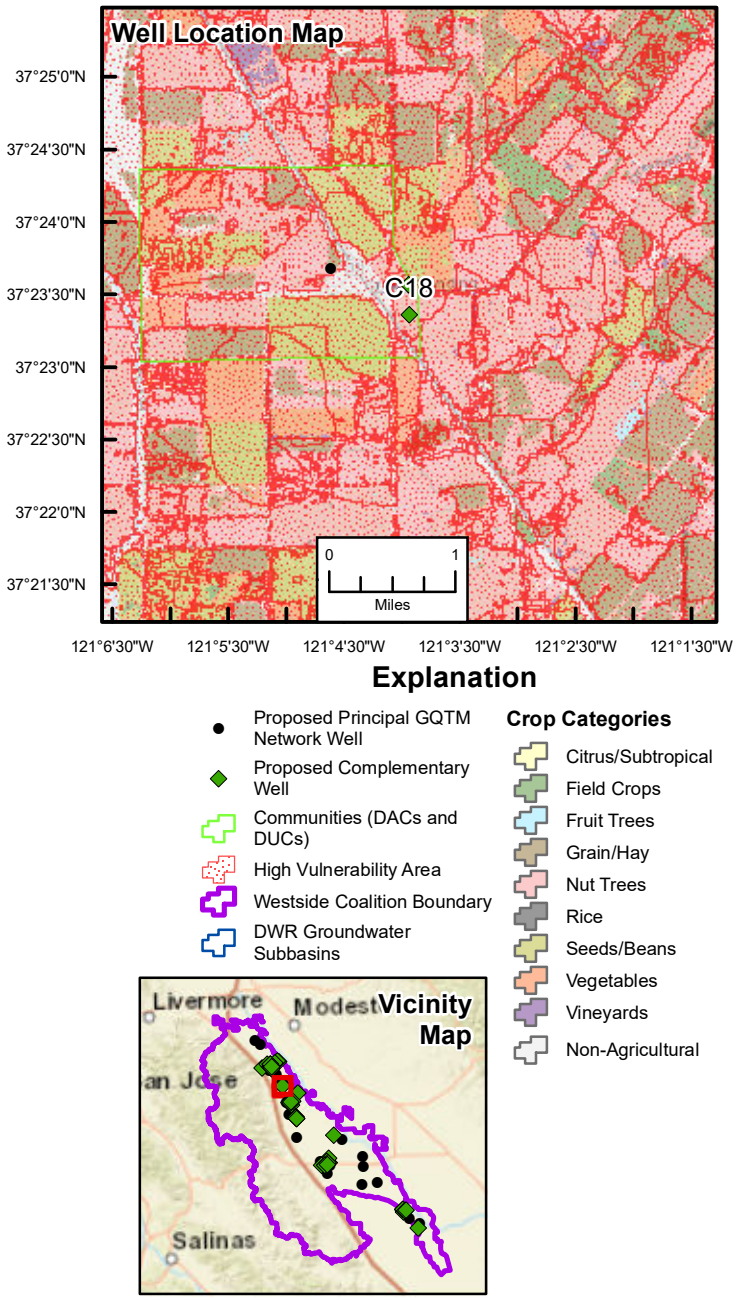
Well Location
Longitude: -121.064722
Latitude: 37.388611
Well Street Address:
Township/Range/Section: M06.0S08.0E26
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 100
Current Percent Agriculture: 87
Current Primary Irrigated Land Use Type: Nut Trees

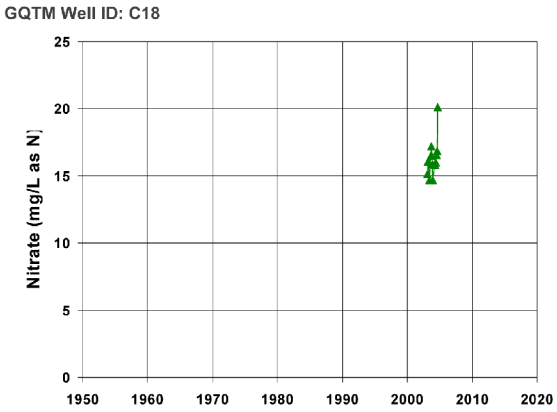
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 20.1051
Date of Most Recent Nitrate Concentration: 9/14/2004
Most Recent TDS Concentration (mg/L): 20.1051
Date of Most Recent TDS Concentration: 9/14/2004



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C19

GQTM Well Identification
GQTM Well ID: C19
Primary Station Code: 5000061-001
GQTM Monitoring Area: 4

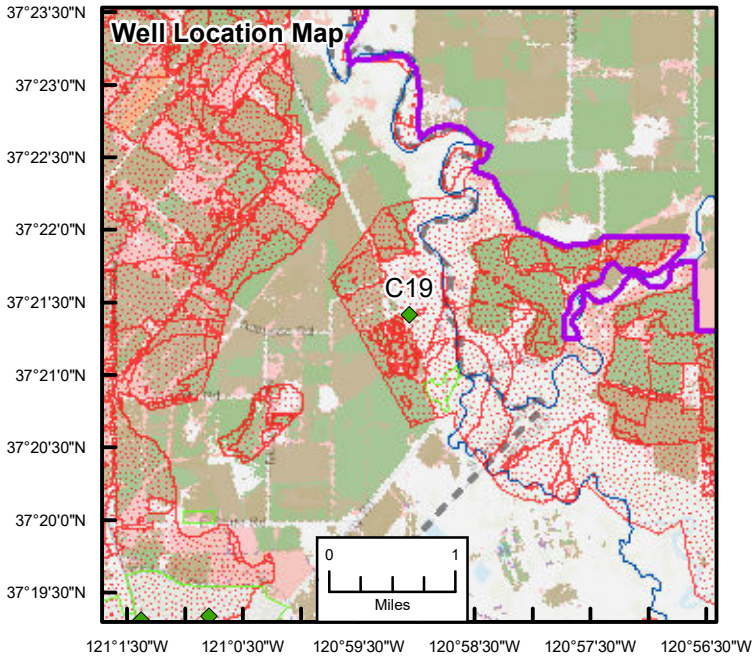
Well Location
Longitude: -120.983472
Latitude: 37.356166
Well Street Address:
Township/Range/Section: M07.0S09.0E04
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 67
Current Percent Agriculture: 60
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 9.8
Date of Most Recent Nitrate Concentration: 12/8/2017
Most Recent TDS Concentration (mg/L): 9.8
Date of Most Recent TDS Concentration: 12/8/2017

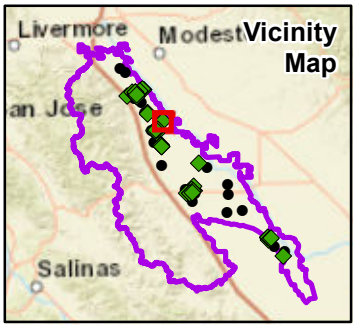


Explanation

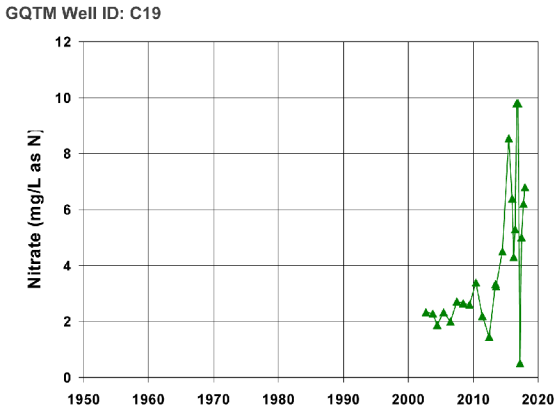
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

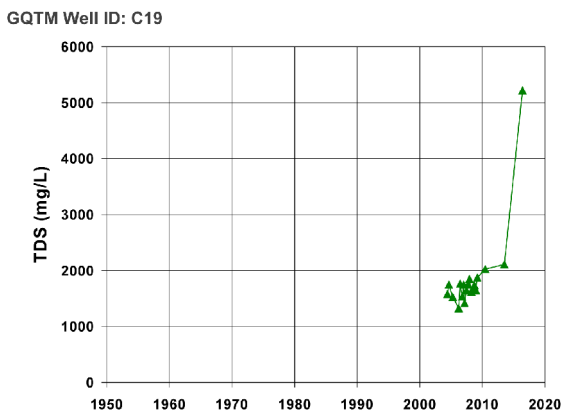
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C20

GQTM Well Identification
GQTM Well ID: C20
Primary Station Code: 5010013-010
GQTM Monitoring Area: 4

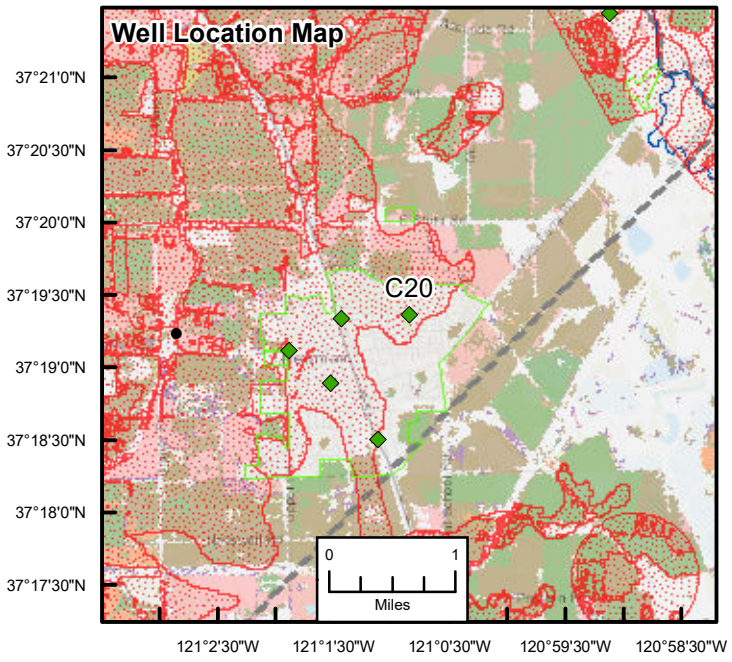
Well Location
Longitude: -121.0132
Latitude: 37.322
Well Street Address:
Township/Range/Section: M07.0S09.0E18
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 47
Current Percent Agriculture: 46
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 6.18966
Date of Most Recent Nitrate Concentration: 1/11/2018
Most Recent TDS Concentration (mg/L): 6.18966
Date of Most Recent TDS Concentration: 1/11/2018

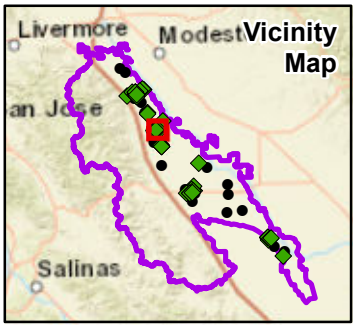


Explanation

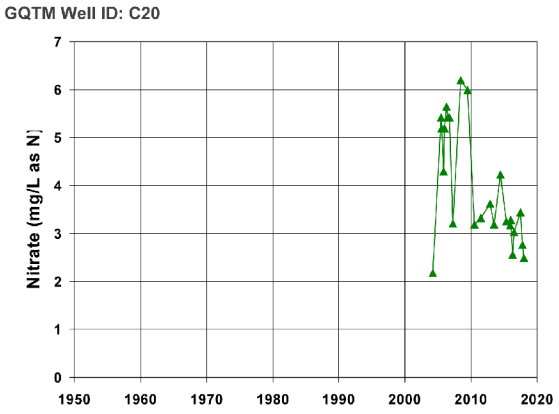
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

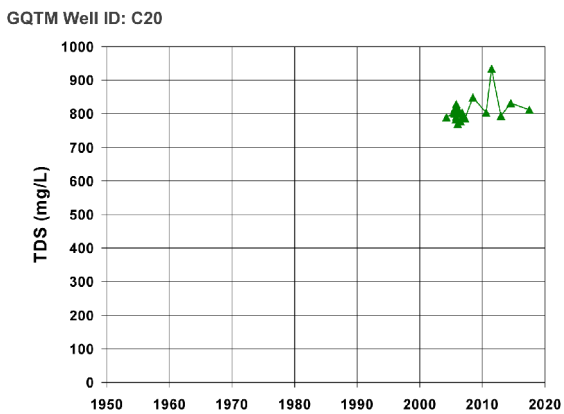
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C21

GQTM Well Identification
GQTM Well ID: C21
Primary Station Code: 5010013-004
GQTM Monitoring Area: 4

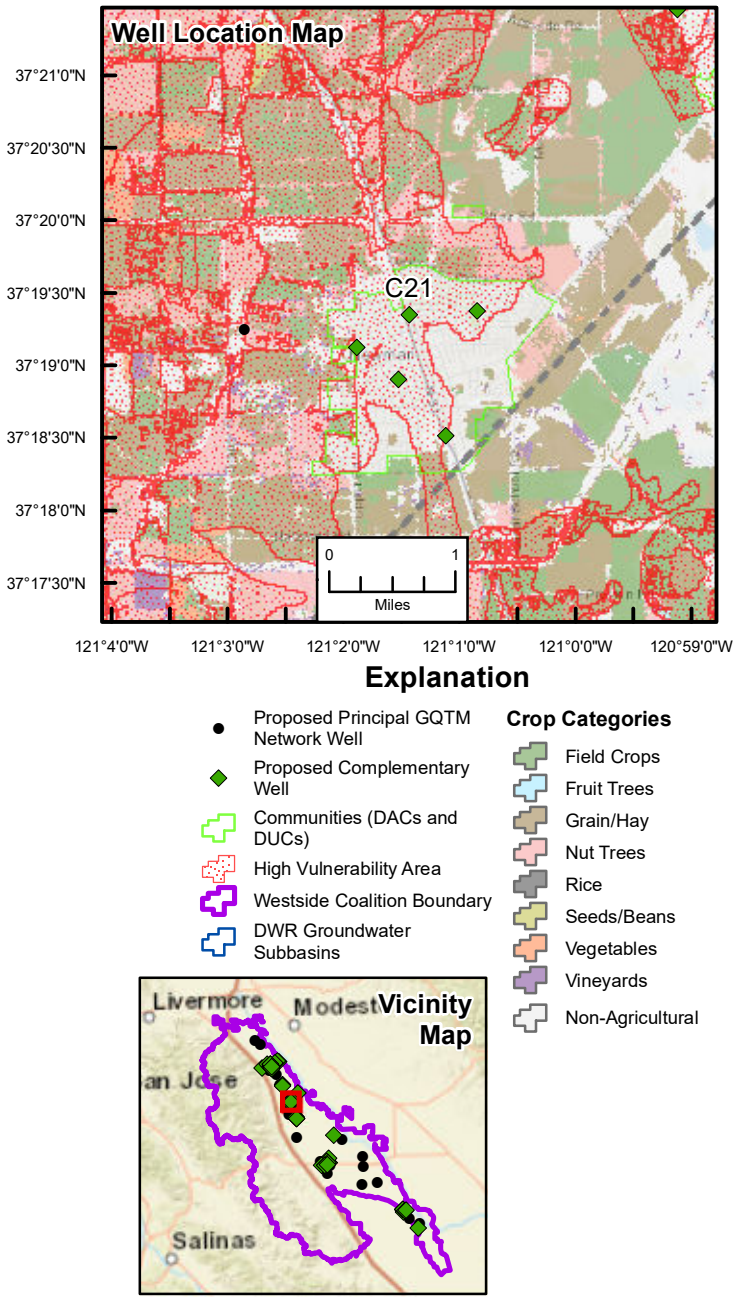
Well Location
Longitude: -121.022966
Latitude: 37.321745
Well Street Address:
Township/Range/Section: M07.0S09.0E18
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 78
Current Percent Agriculture: 37
Current Primary Irrigated Land Use Type: Grain and Hay

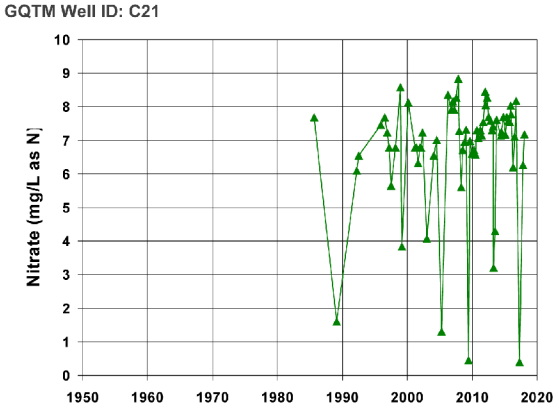
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

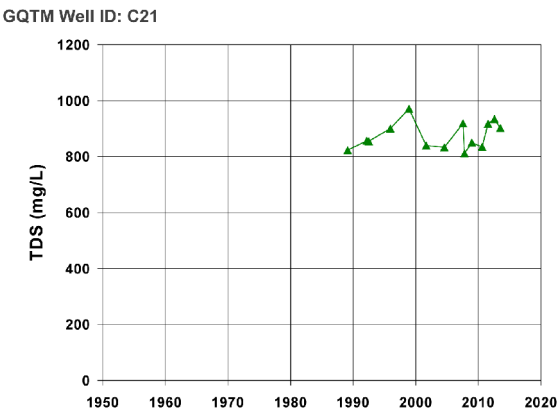
Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8.83269
Date of Most Recent Nitrate Concentration: 1/11/2018
Most Recent TDS Concentration (mg/L): 8.83269
Date of Most Recent TDS Concentration: 1/11/2018



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C22

GQTM Well Identification
GQTM Well ID: C22
Primary Station Code: 5010013-005
GQTM Monitoring Area: 4

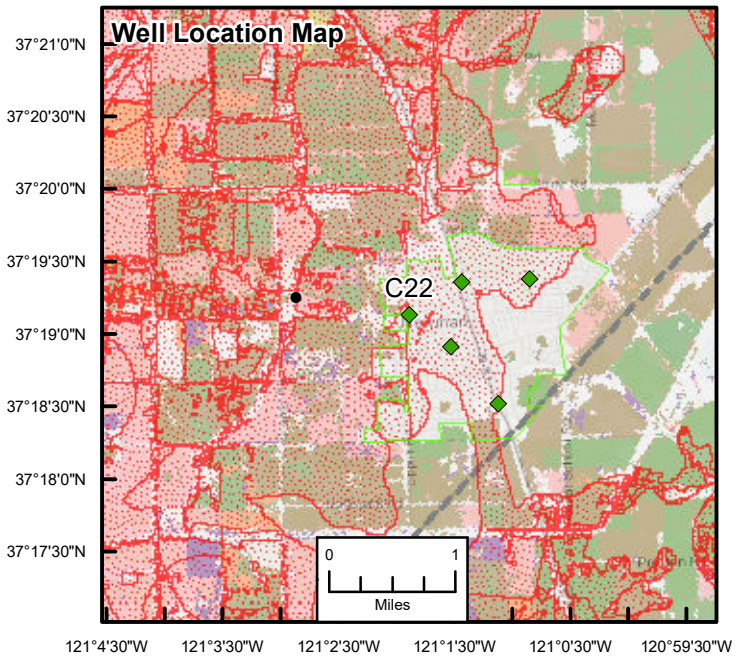
Well Location
Longitude: -121.030581
Latitude: 37.318148
Well Street Address:
Township/Range/Section: M07.0S09.0E19
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 88
Current Percent Agriculture: 41
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 7.4547
Date of Most Recent Nitrate Concentration: 10/11/2017
Most Recent TDS Concentration (mg/L): 7.4547
Date of Most Recent TDS Concentration: 10/11/2017

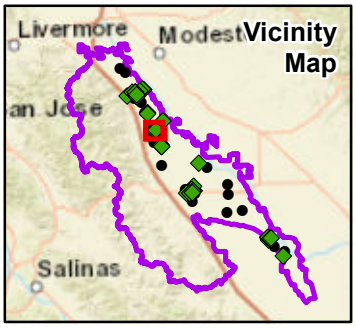


Explanation

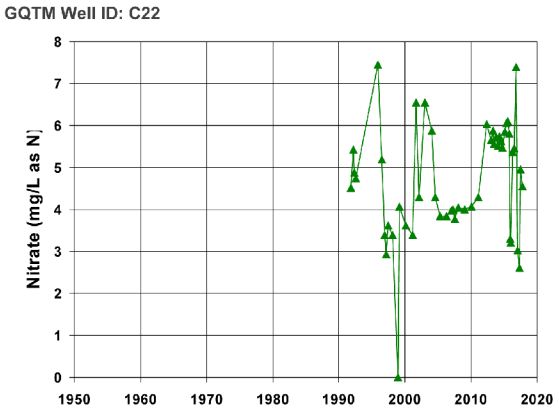
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

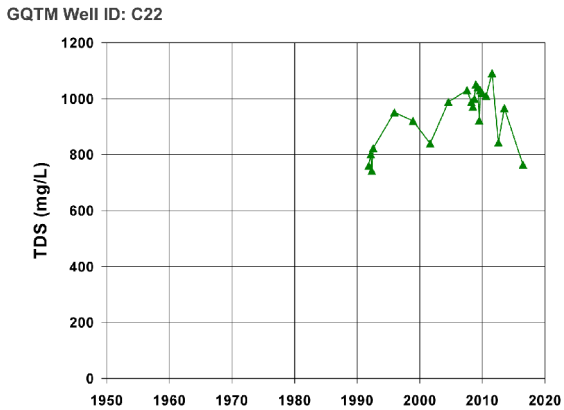
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C23

GQTM Well Identification
GQTM Well ID: C23
Primary Station Code: 5010013-006
GQTM Monitoring Area: 4

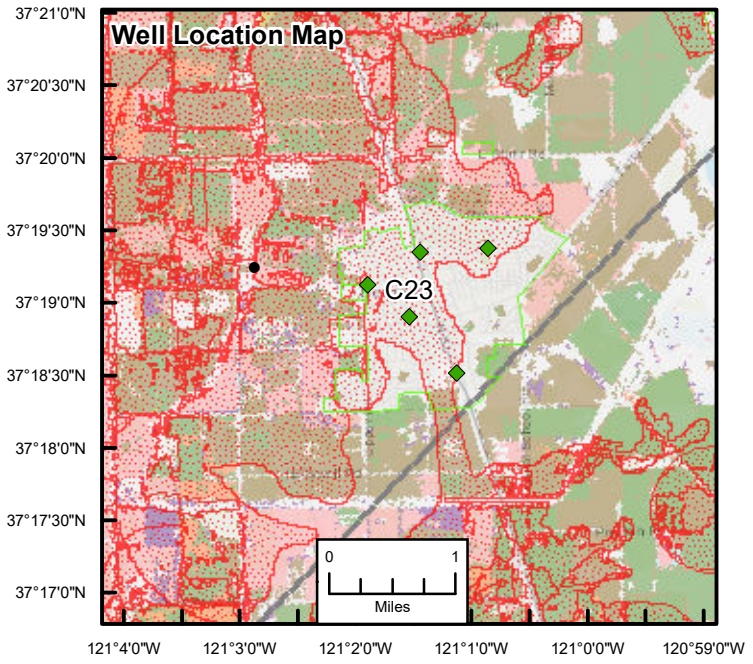
Well Location
Longitude: -121.024713
Latitude: 37.314338
Well Street Address:
Township/Range/Section: M07.0S09.0E19
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 66
Current Percent Agriculture: 33
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8
Date of Most Recent Nitrate Concentration: 1/11/2018
Most Recent TDS Concentration (mg/L): 8
Date of Most Recent TDS Concentration: 1/11/2018

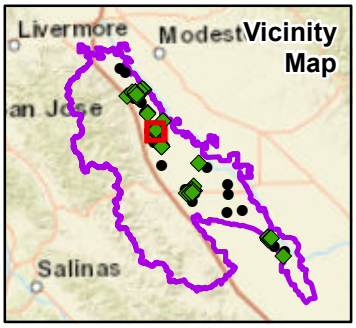


Explanation

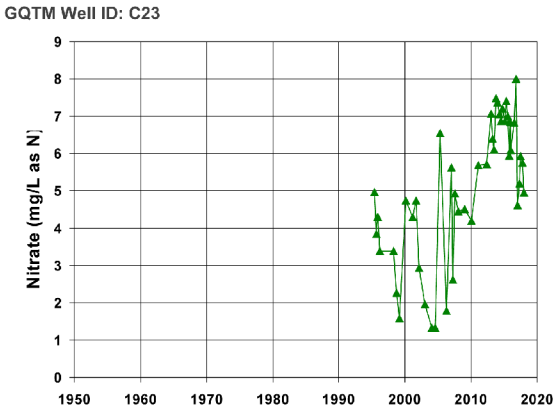
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

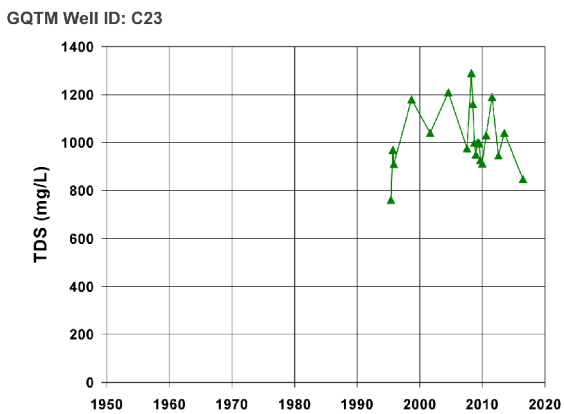
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C24

GQTM Well Identification
GQTM Well ID: C24
Primary Station Code: 5000386-001
GQTM Monitoring Area: 4

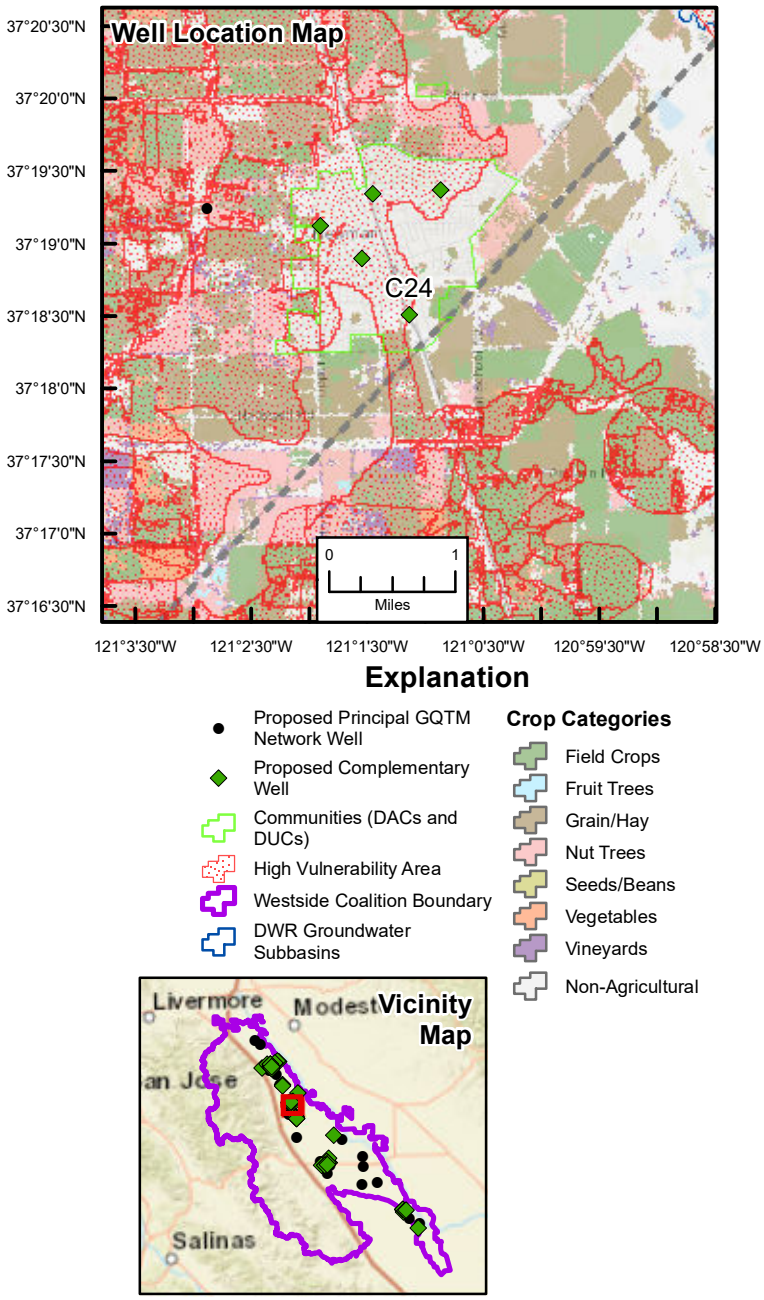
Well Location
Longitude: -121.018045
Latitude: 37.307747
Well Street Address:
Township/Range/Section: M07.0S09.0E19
County: Stanislaus

Locational Proximity Description (within 1 mile of well)
Percent HVA: 37
Current Percent Agriculture: 46
Current Primary Irrigated Land Use Type: Grain and Hay

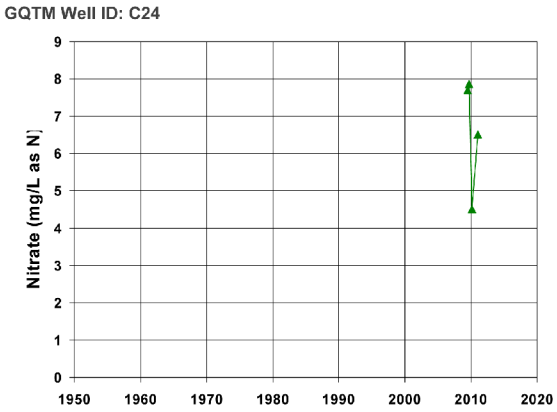
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs): 147
Top of Perforated Interval (ft bgs): 127
Bottom of Perforated Interval (ft bgs): 147
Well Seal Depth (ft bgs): 60
Well Seal Material: Bentonite
Well Completion Report Number: 426363

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 7.86132
Date of Most Recent Nitrate Concentration: 1/24/2011
Most Recent TDS Concentration (mg/L): 7.86132
Date of Most Recent TDS Concentration: 1/24/2011



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C25

GQTM Well Identification
GQTM Well ID: C25
Primary Station Code: 2400055-003
GQTM Monitoring Area: 5

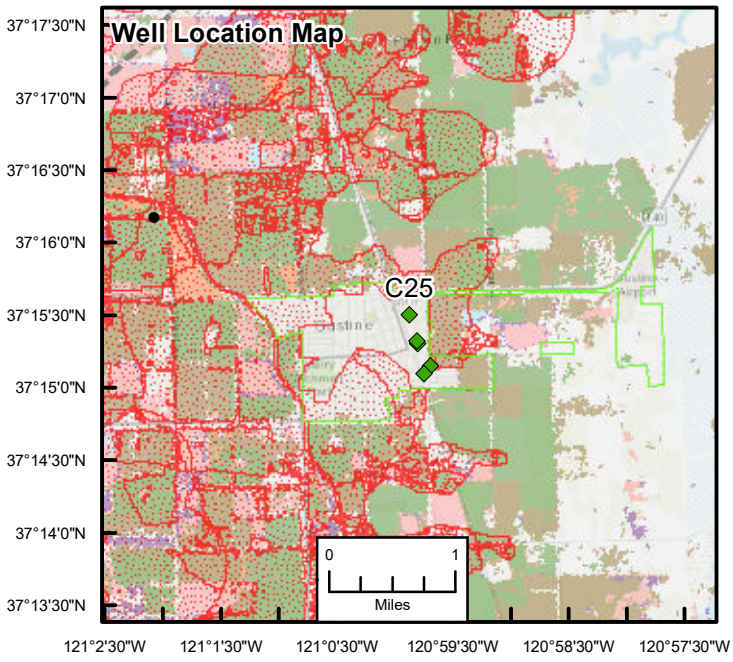
Well Location
Longitude: -120.997007
Latitude: 37.257638
Well Street Address:
Township/Range/Section: M08.0S09.0E08
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 41
Current Percent Agriculture: 55
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 1.8
Date of Most Recent Nitrate Concentration: 7/10/2017
Most Recent TDS Concentration (mg/L): 1.8
Date of Most Recent TDS Concentration: 7/10/2017

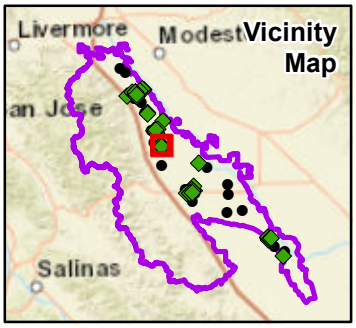


Explanation

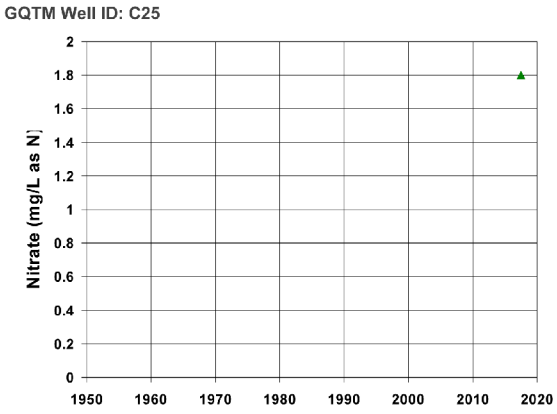
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

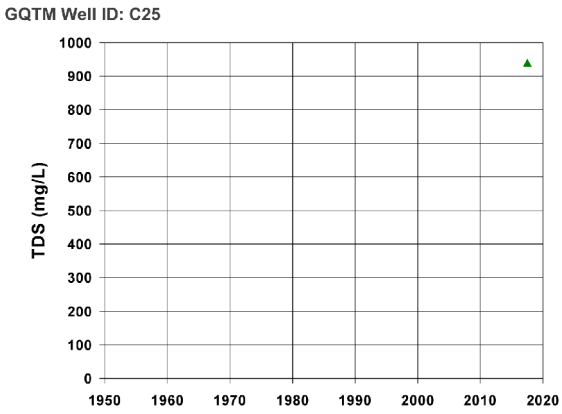
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C26

GQTM Well Identification
GQTM Well ID: C26
Primary Station Code: 2400055-012
GQTM Monitoring Area: 5

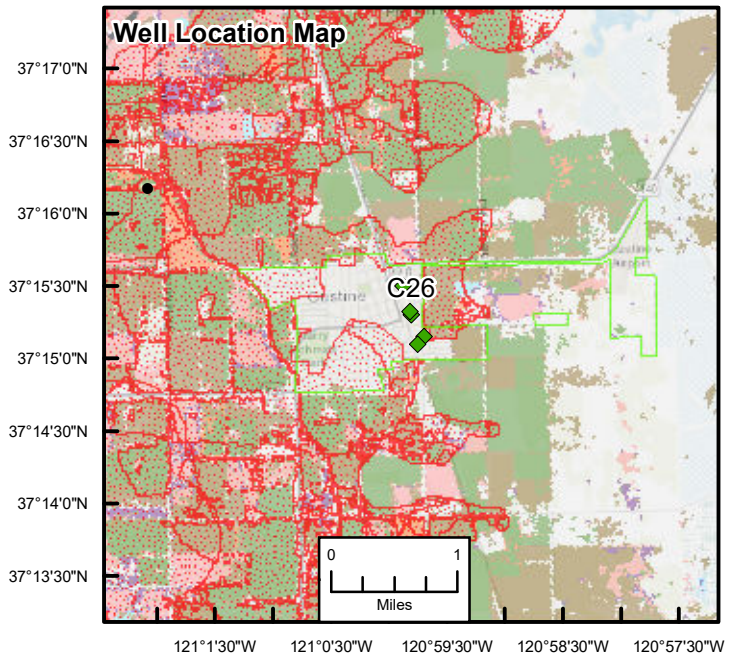
Well Location
Longitude: -120.995887
Latitude: 37.254293
Well Street Address:
Township/Range/Section: M08.0S09.0E08
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 43
Current Percent Agriculture: 55
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 9.21672
Date of Most Recent Nitrate Concentration: 11/21/2017
Most Recent TDS Concentration (mg/L): 9.21672
Date of Most Recent TDS Concentration: 11/21/2017

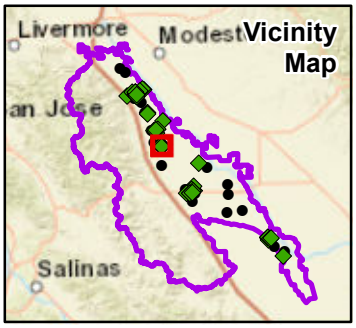


Explanation

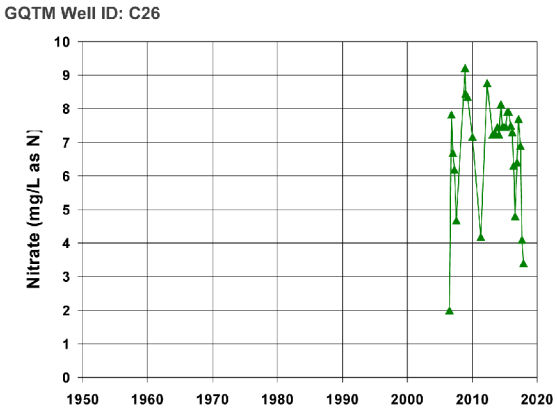
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

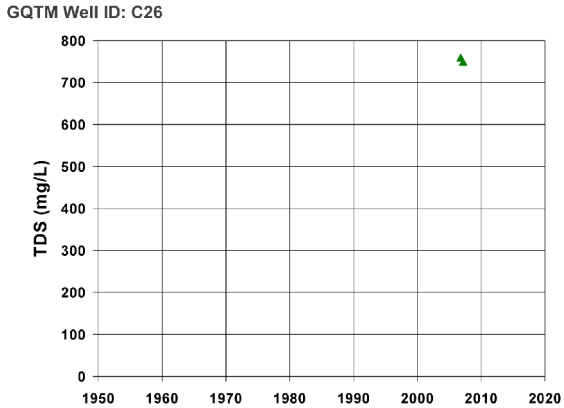
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C27

GQTM Well Identification
GQTM Well ID: C27
Primary Station Code: 2400055-011
GQTM Monitoring Area: 5

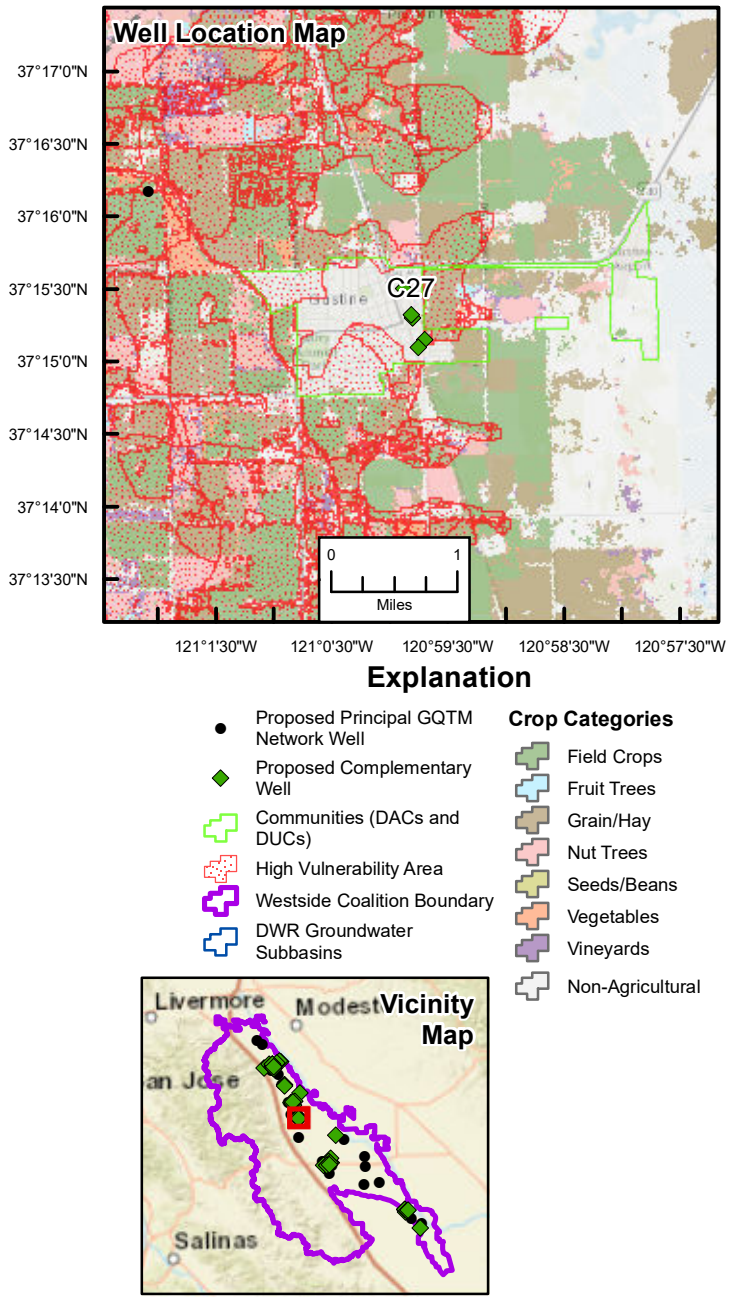
Well Location
Longitude: -120.996021
Latitude: 37.254629
Well Street Address:
Township/Range/Section: M08.0S09.0E08
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 42
Current Percent Agriculture: 55
Current Primary Irrigated Land Use Type: Grain and Hay

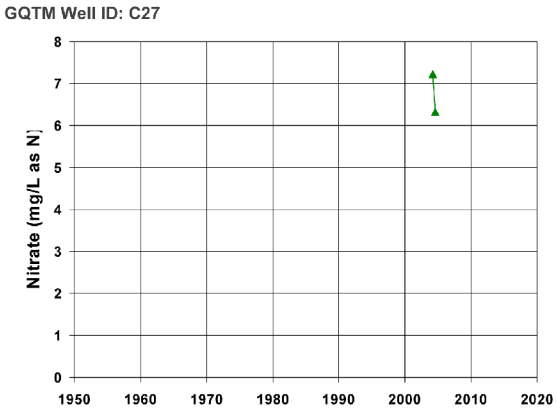
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 7.2288
Date of Most Recent Nitrate Concentration: 8/11/2004
Most Recent TDS Concentration (mg/L): 7.2288
Date of Most Recent TDS Concentration: 8/11/2004



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations

No Historical TDS Data Available

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Proposed GQTM Network Well C28

GQTM Well Identification
GQTM Well ID: C28
Primary Station Code: 2410003-006
GQTM Monitoring Area: 5

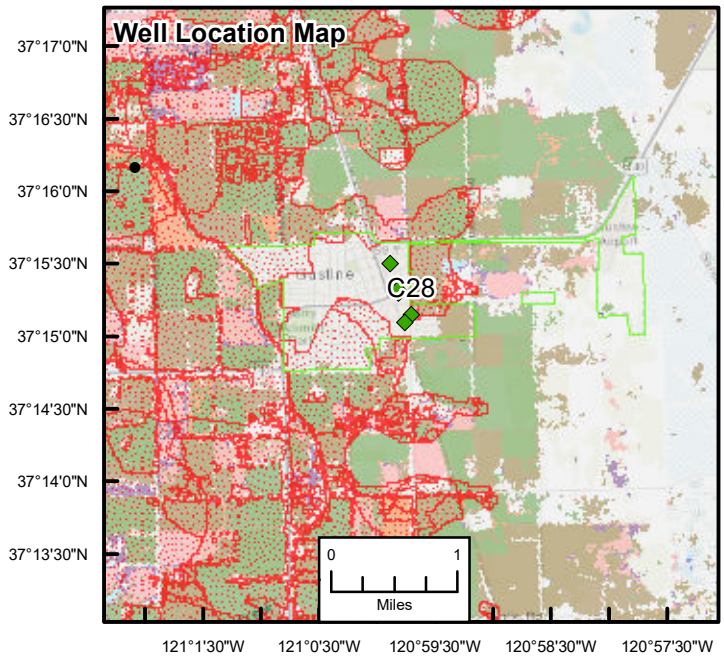
Well Location
Longitude: -120.994158
Latitude: 37.251739
Well Street Address:
Township/Range/Section: M08.0S09.0E09
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 43
Current Percent Agriculture: 57
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 6.1
Date of Most Recent Nitrate Concentration: 10/11/2017
Most Recent TDS Concentration (mg/L): 6.1
Date of Most Recent TDS Concentration: 10/11/2017

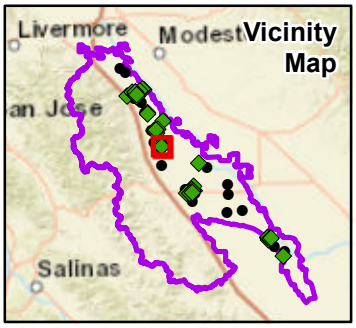


Explanation

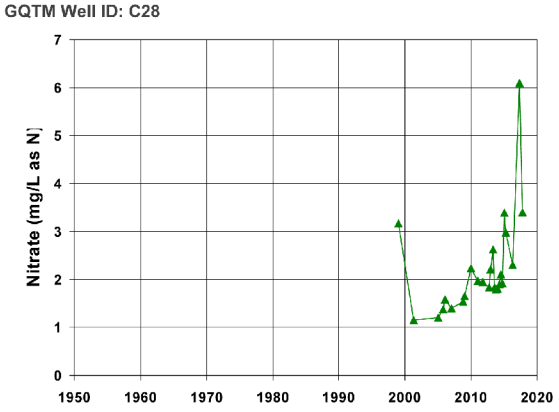
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

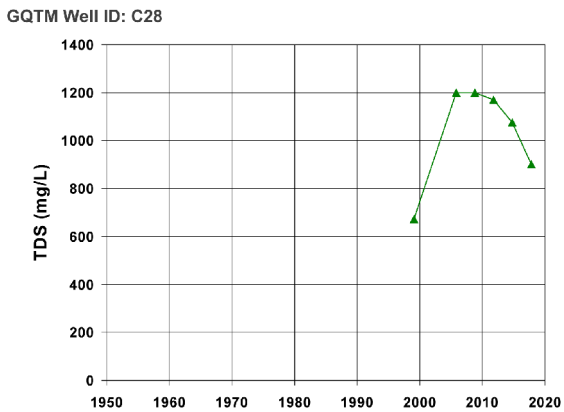
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C29

GQTM Well Identification
GQTM Well ID: C29
Primary Station Code: 2400229-001
GQTM Monitoring Area: 5

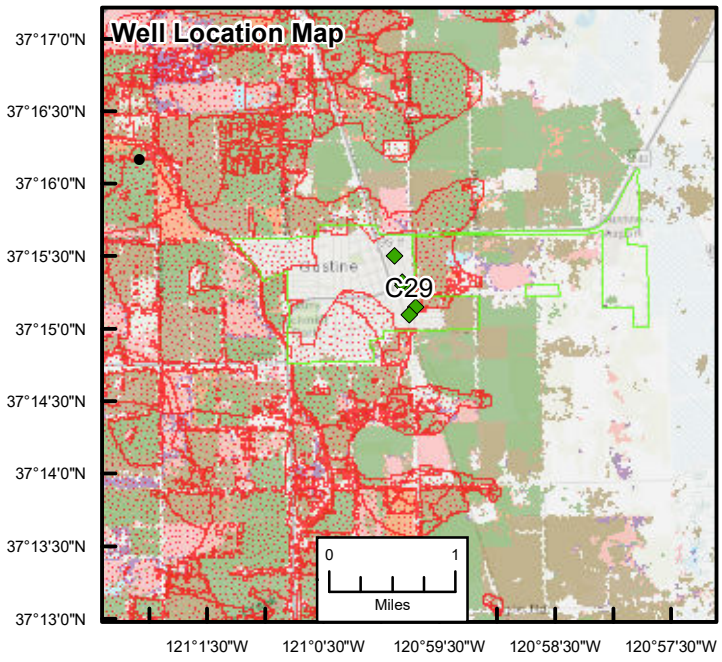
Well Location
Longitude: -120.995063
Latitude: 37.250863
Well Street Address:
Township/Range/Section: M08.0S09.0E08
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 44
Current Percent Agriculture: 56
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8.4
Date of Most Recent Nitrate Concentration: 11/21/2017
Most Recent TDS Concentration (mg/L): 8.4
Date of Most Recent TDS Concentration: 11/21/2017

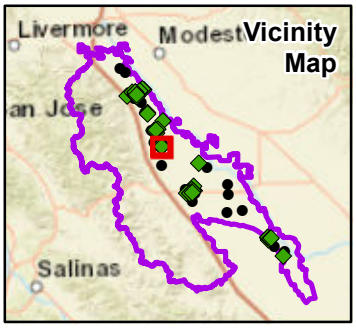


Explanation

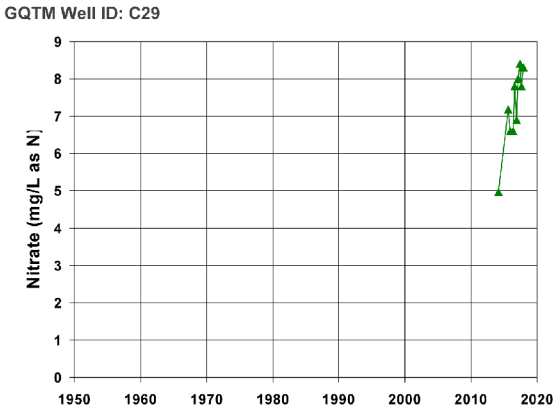
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

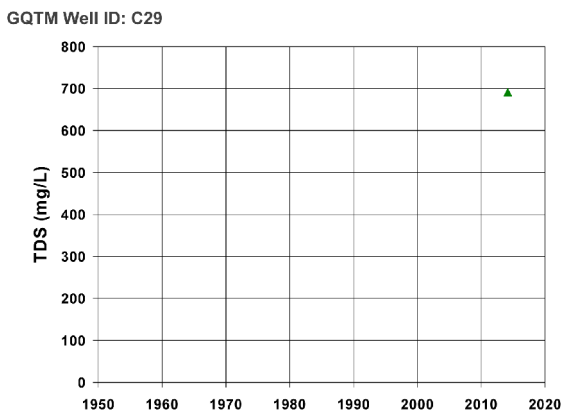
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C30

GQTM Well Identification
GQTM Well ID: C30
Primary Station Code: 2410021-001
GQTM Monitoring Area:

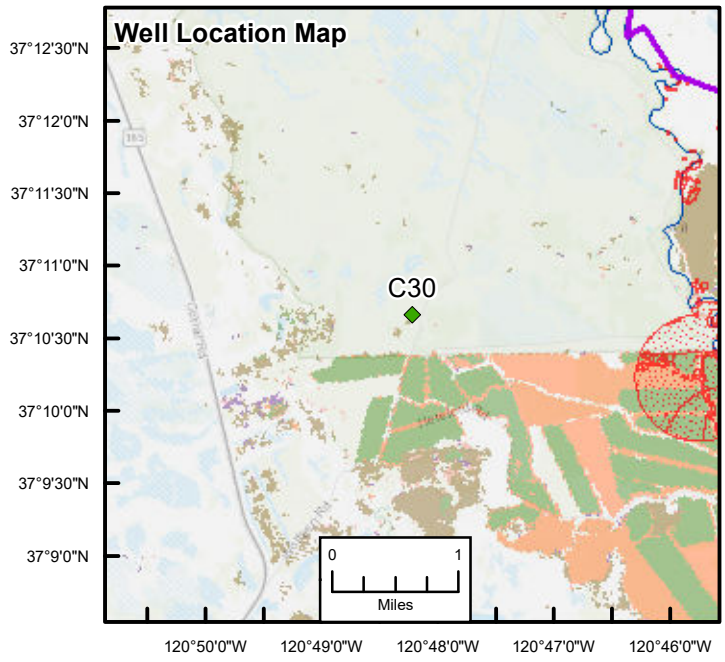
Well Location
Longitude: -120.802687
Latitude: 37.176895
Well Street Address:
Township/Range/Section: M09.0S11.0E06
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 0
Current Percent Agriculture: 23
Current Primary Irrigated Land Use Type: Field Crops

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 3.5
Date of Most Recent Nitrate Concentration: 10/20/2017
Most Recent TDS Concentration (mg/L): 3.5
Date of Most Recent TDS Concentration: 10/20/2017

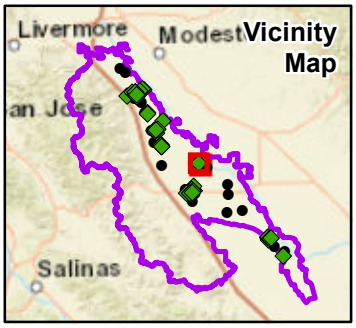


Explanation

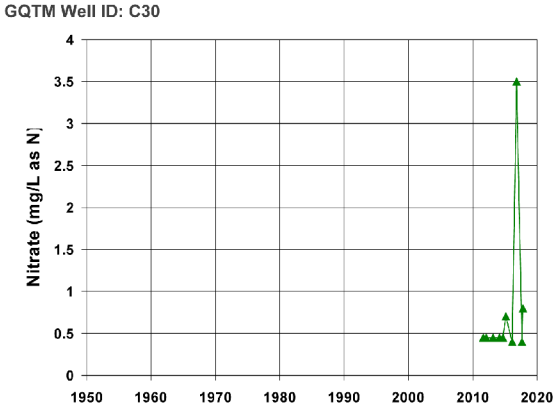
- Proposed Complementary Well
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

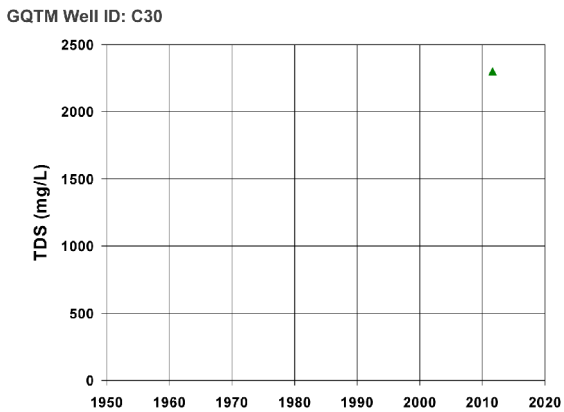
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C31

GQTM Well Identification
GQTM Well ID: C31
Primary Station Code: 2410005-008
GQTM Monitoring Area: 7

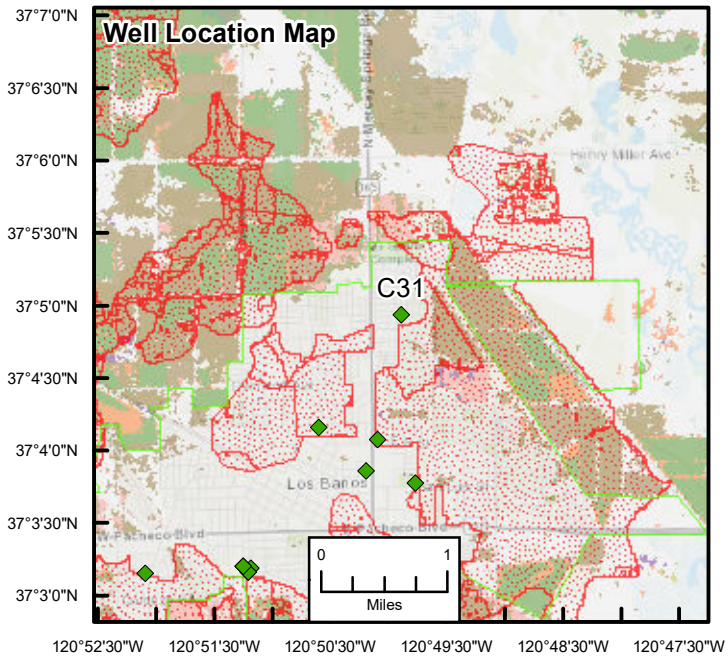
Well Location
Longitude: -120.830578
Latitude: 37.081471
Well Street Address:
Township/Range/Section: M10.0S10.0E12
County: Merced

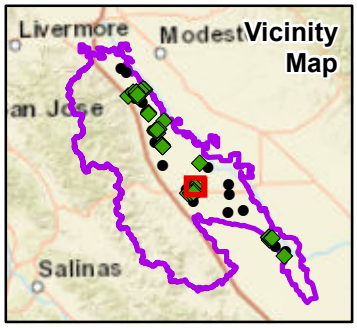
Locational Proximity Description (within 1 mile of well)
Percent HVA: 62
Current Percent Agriculture: 34
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

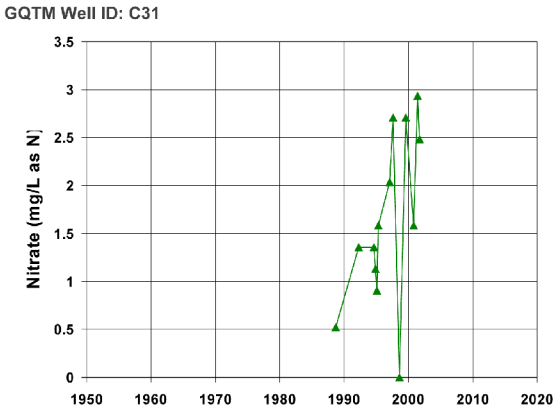
Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 2.9367
Date of Most Recent Nitrate Concentration: 10/3/2001
Most Recent TDS Concentration (mg/L): 2.9367
Date of Most Recent TDS Concentration: 10/3/2001

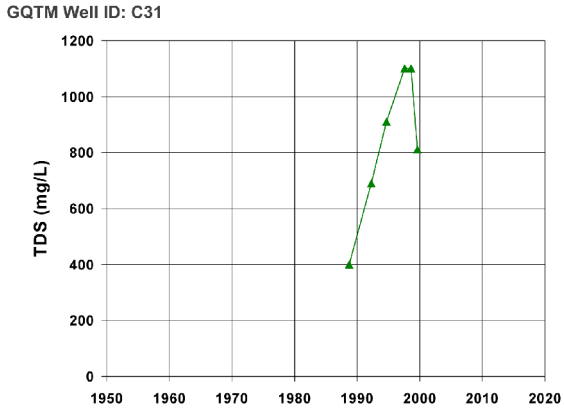




Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C32

GQTM Well Identification
GQTM Well ID: C32
Primary Station Code: 2410005-009
GQTM Monitoring Area: 7

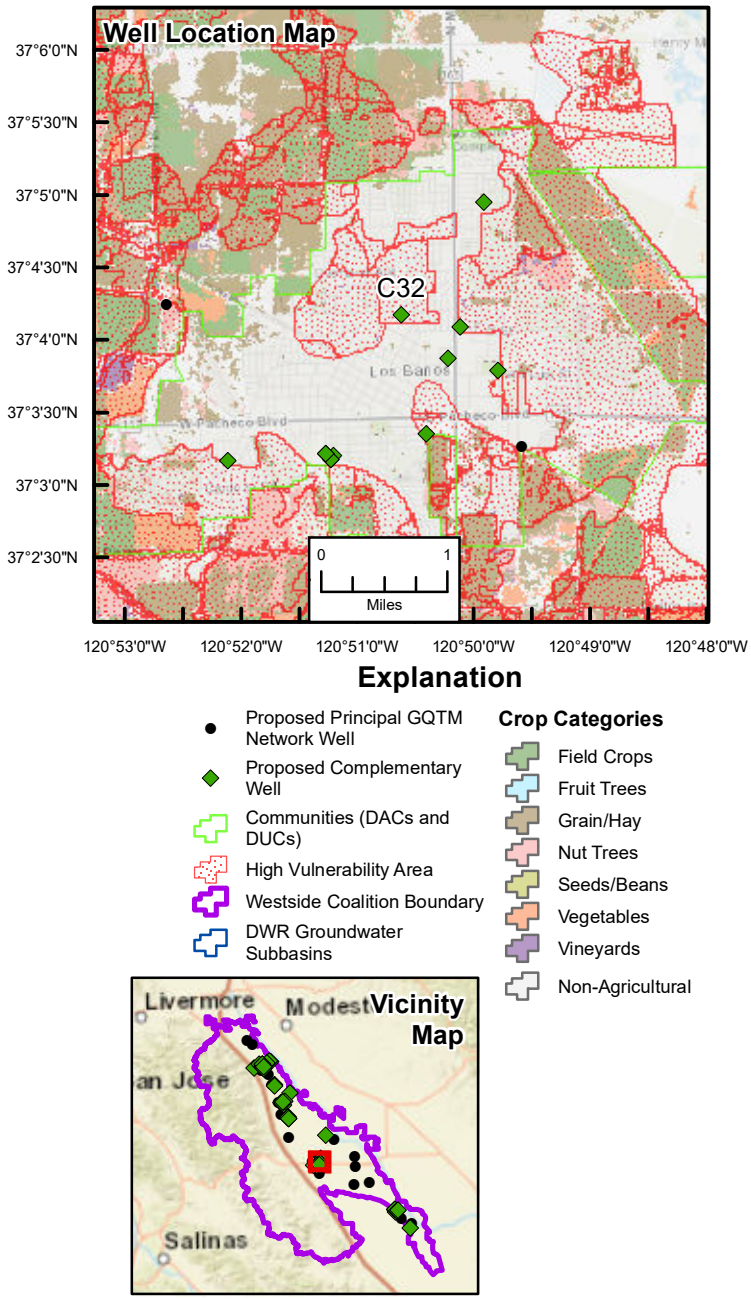
Well Location
Longitude: -120.84278
Latitude: 37.068759
Well Street Address:
Township/Range/Section: M10.0S10.0E14
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 45
Current Percent Agriculture: 5
Current Primary Irrigated Land Use Type: Grain and Hay

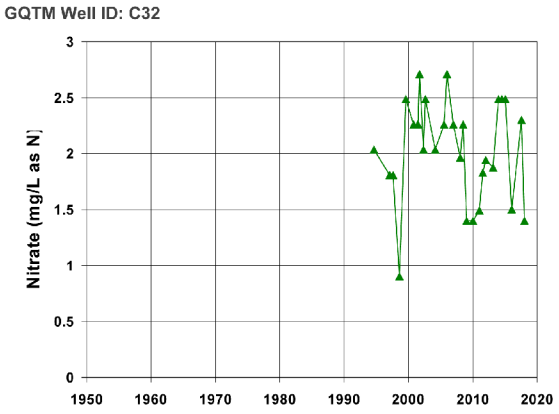
Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

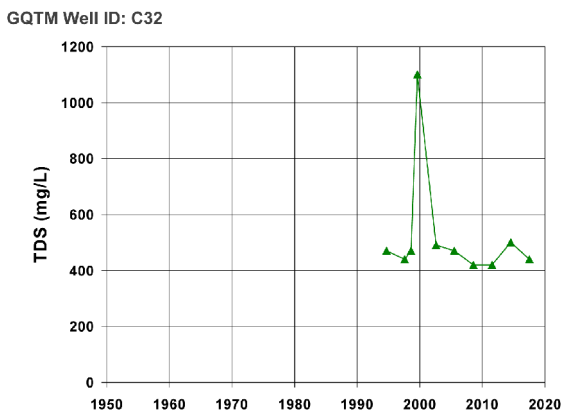
Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 2.7108
Date of Most Recent Nitrate Concentration: 1/3/2018
Most Recent TDS Concentration (mg/L): 2.7108
Date of Most Recent TDS Concentration: 1/3/2018



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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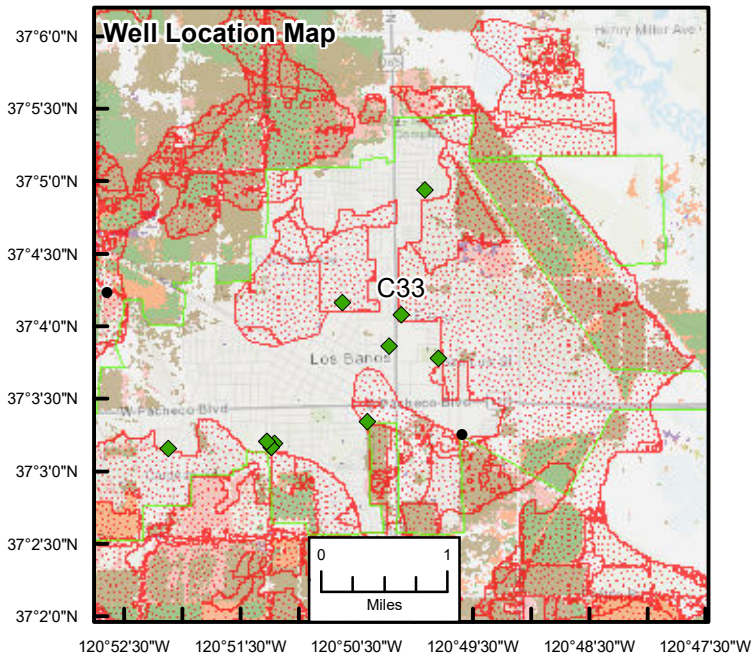
Proposed GQTM Network Well C33

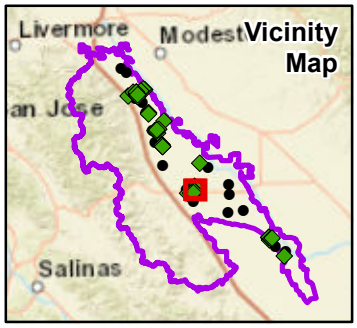


Explanation

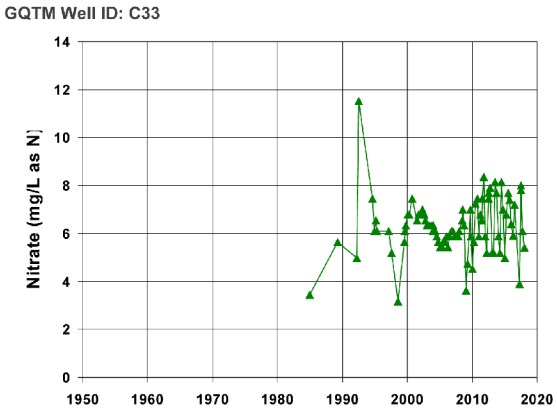
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

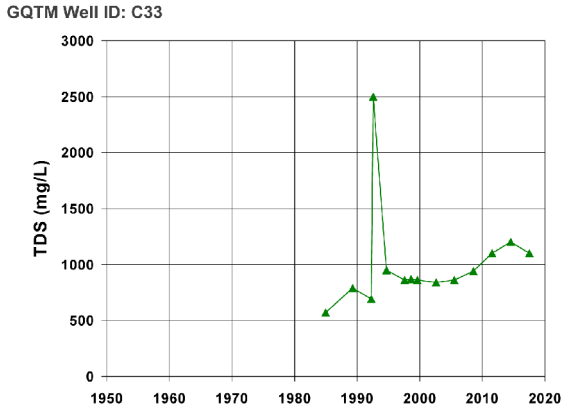
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



GQTM Well Identification
GQTM Well ID: C33
Primary Station Code: 2410005-005
GQTM Monitoring Area: 7

Well Location
Longitude: -120.834337
Latitude: 37.067191
Well Street Address:
Township/Range/Section: M10.0S10.0E13
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 62
Current Percent Agriculture: 8
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 11.5209
Date of Most Recent Nitrate Concentration: 1/3/2018
Most Recent TDS Concentration (mg/L): 11.5209
Date of Most Recent TDS Concentration: 1/3/2018

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Proposed GQTM Network Well C34

GQTM Well Identification
GQTM Well ID: C34
Primary Station Code: 2410005-013
GQTM Monitoring Area: 7

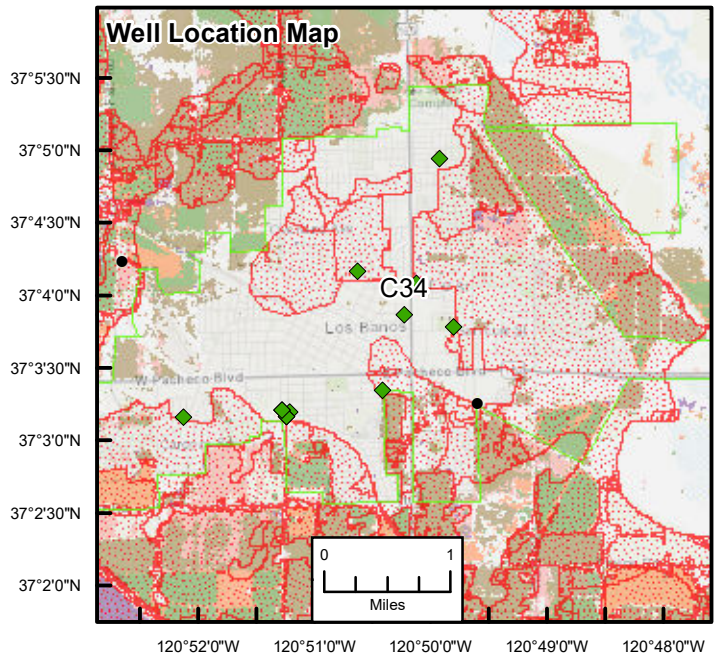
Well Location
Longitude: -120.83618
Latitude: 37.063642
Well Street Address:
Township/Range/Section: M10.0S10.0E14
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 55
Current Percent Agriculture: 6
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8.3583
Date of Most Recent Nitrate Concentration: 1/3/2018
Most Recent TDS Concentration (mg/L): 8.3583
Date of Most Recent TDS Concentration: 1/3/2018

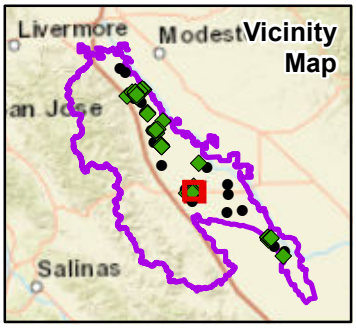


Explanation

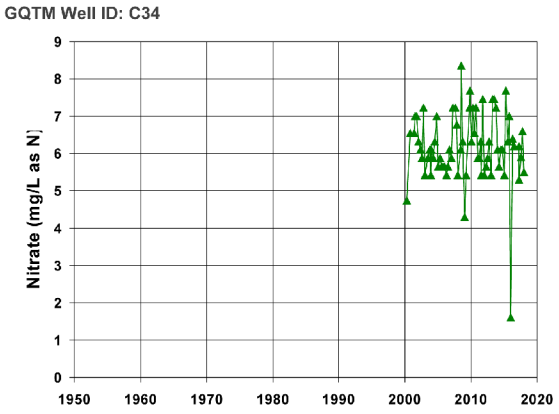
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

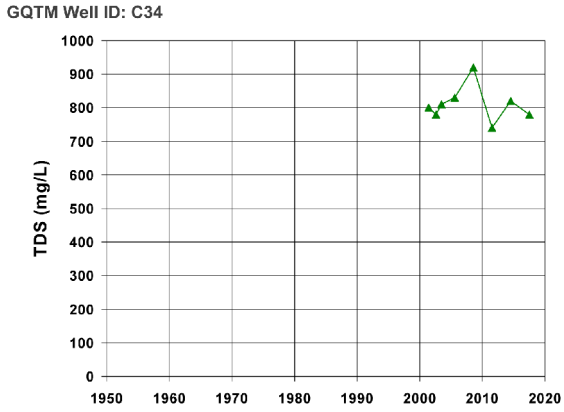
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C35

GQTM Well Identification
GQTM Well ID: C35
Primary Station Code: 2410005-007
GQTM Monitoring Area: 7

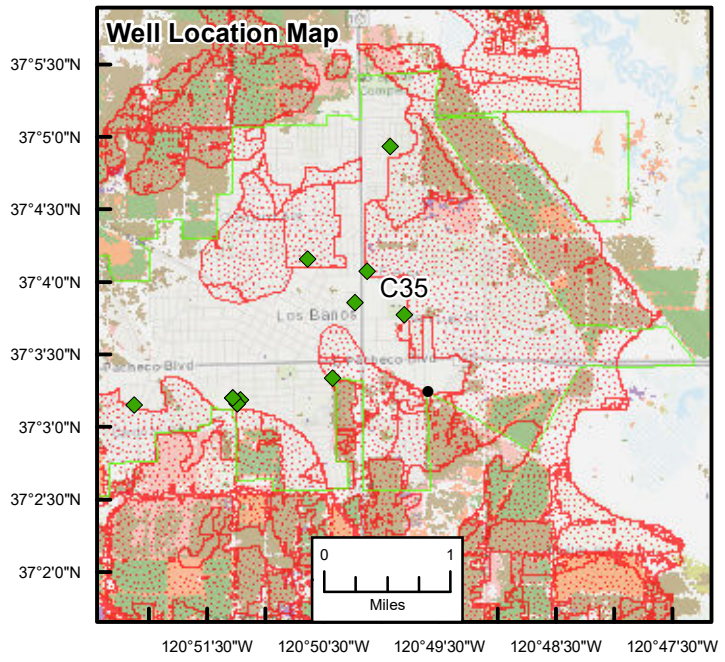
Well Location
Longitude: -120.829149
Latitude: 37.062103
Well Street Address:
Township/Range/Section: M10.0S10.0E13
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 67
Current Percent Agriculture: 12
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 10.1655
Date of Most Recent Nitrate Concentration: 1/3/2018
Most Recent TDS Concentration (mg/L): 10.1655
Date of Most Recent TDS Concentration: 1/3/2018

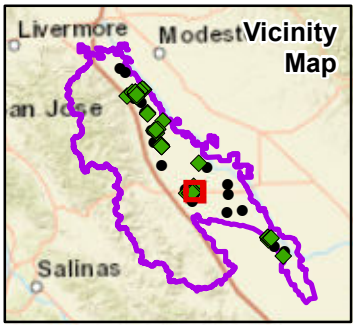


Explanation

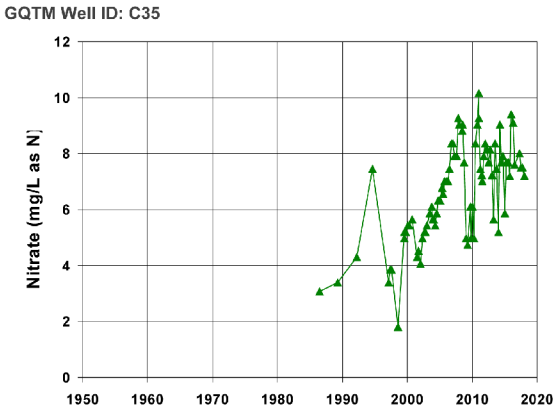
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

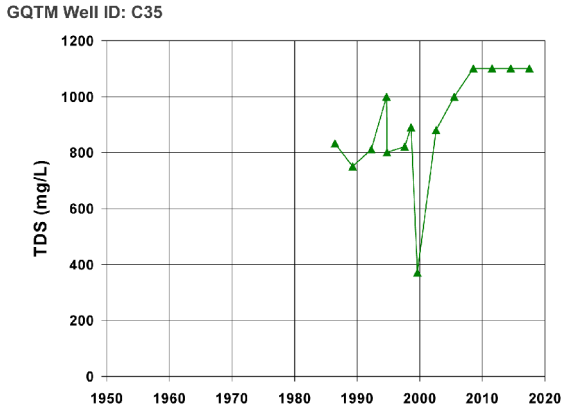
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C36

GQTM Well Identification
GQTM Well ID: C36
Primary Station Code: 2400107-001
GQTM Monitoring Area: 7

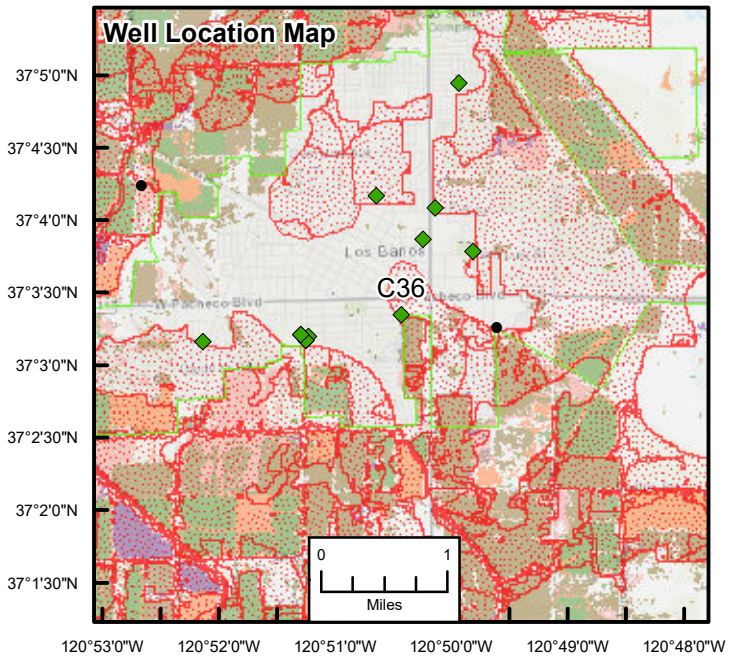
Well Location
Longitude: -120.839587
Latitude: 37.054999
Well Street Address:
Township/Range/Section: M10.0S10.0E23
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 48
Current Percent Agriculture: 16
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 4.99239
Date of Most Recent Nitrate Concentration: 9/24/2007
Most Recent TDS Concentration (mg/L): 4.99239
Date of Most Recent TDS Concentration: 9/24/2007

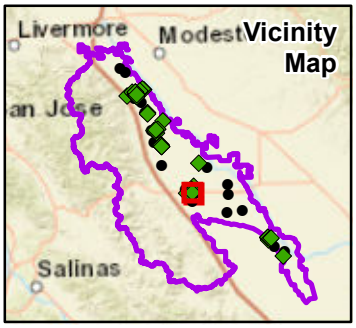


Explanation

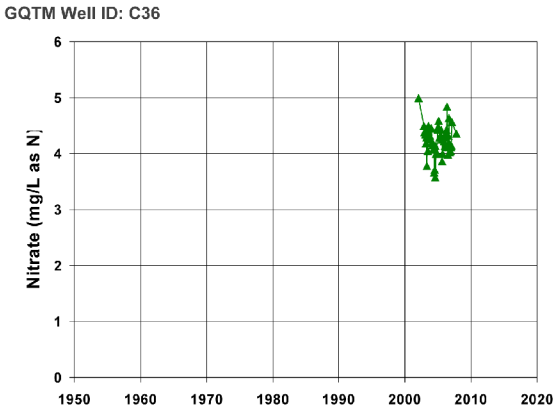
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

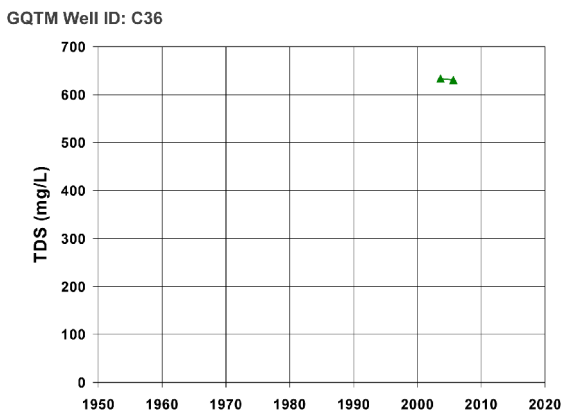
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C37

GQTM Well Identification
GQTM Well ID: C37
Primary Station Code: 2410005-001
GQTM Monitoring Area: 7

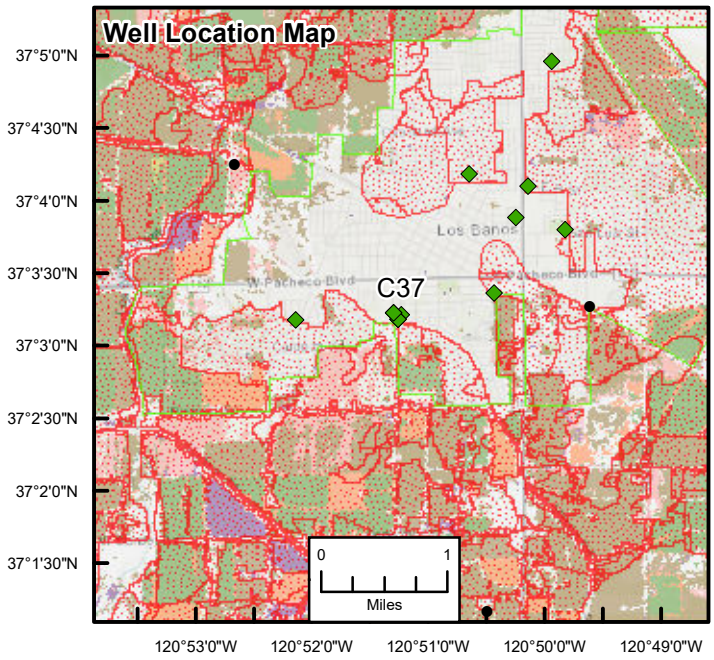
Well Location
Longitude: -120.852942
Latitude: 37.052768
Well Street Address:
Township/Range/Section: M10.0S10.0E23
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 50
Current Percent Agriculture: 23
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 9.7137
Date of Most Recent Nitrate Concentration: 1/3/2018
Most Recent TDS Concentration (mg/L): 9.7137
Date of Most Recent TDS Concentration: 1/3/2018

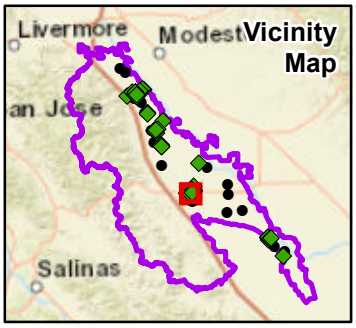


Explanation

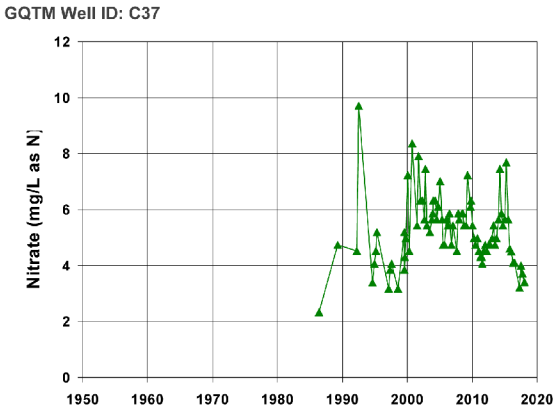
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

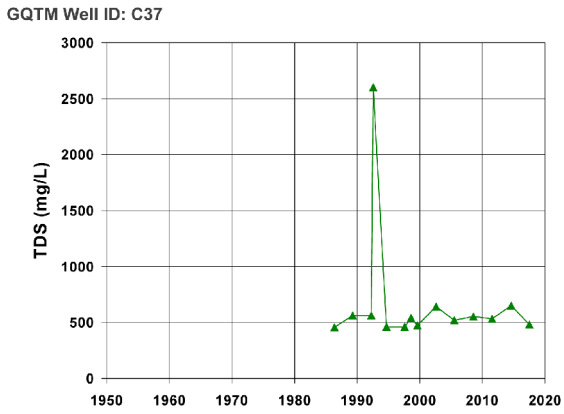
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C38

GQTM Well Identification
GQTM Well ID: C38
Primary Station Code: 2410005-002
GQTM Monitoring Area: 7

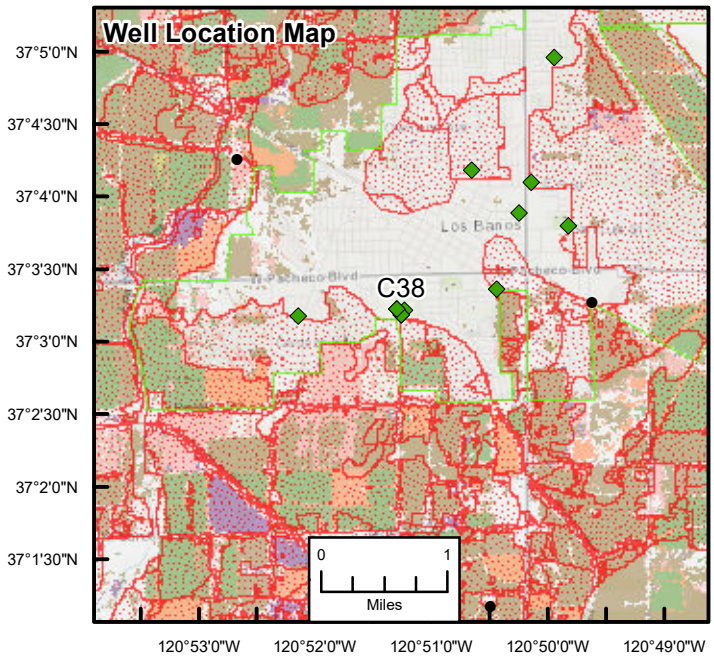
Well Location
Longitude: -120.853387
Latitude: 37.052291
Well Street Address:
Township/Range/Section: M10.0S10.0E23
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 51
Current Percent Agriculture: 24
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 10.1655
Date of Most Recent Nitrate Concentration: 1/3/2018
Most Recent TDS Concentration (mg/L): 10.1655
Date of Most Recent TDS Concentration: 1/3/2018

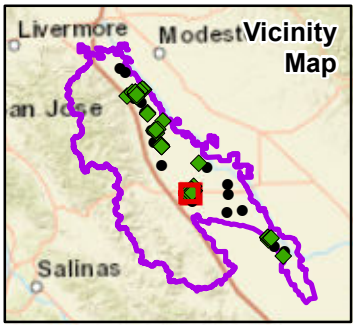


Explanation

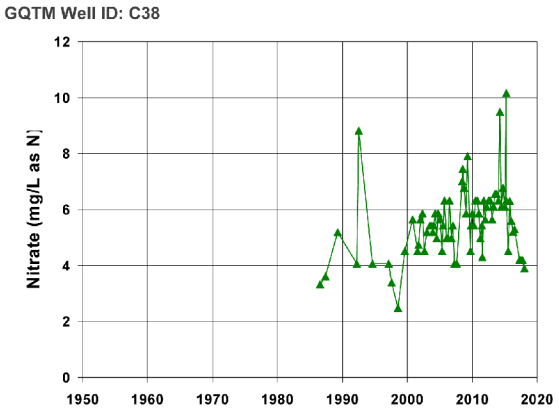
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

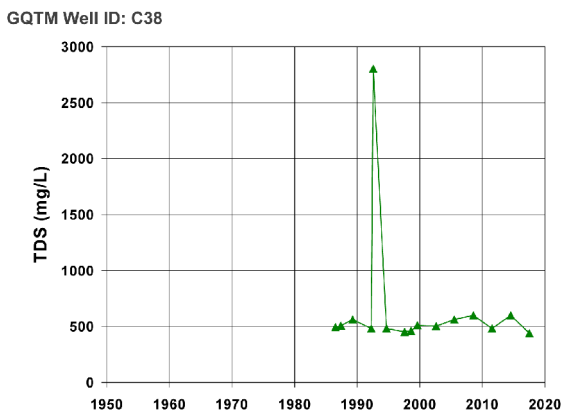
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C39

GQTM Well Identification
GQTM Well ID: C39
Primary Station Code: 2410005-003
GQTM Monitoring Area: 7

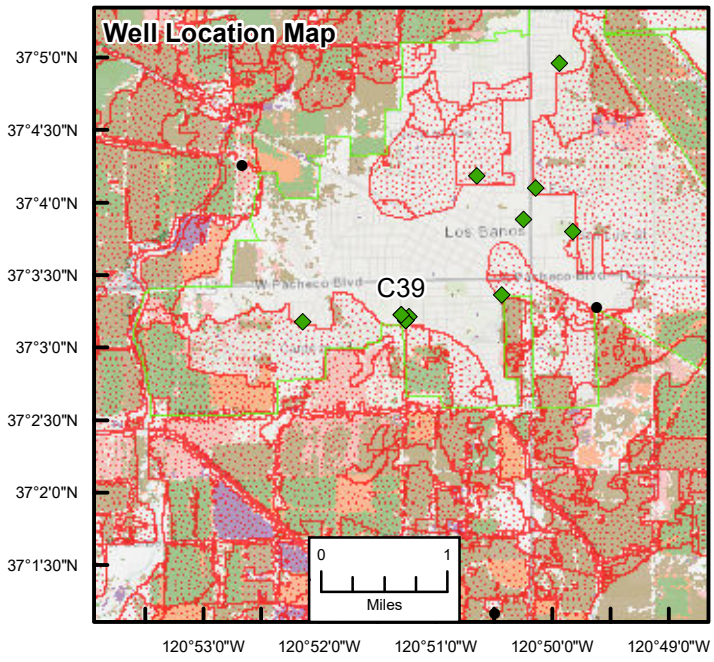
Well Location
Longitude: -120.85403
Latitude: 37.052994
Well Street Address:
Township/Range/Section: M10.0S10.0E22
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 49
Current Percent Agriculture: 22
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 22.59
Date of Most Recent Nitrate Concentration: 1/3/2018
Most Recent TDS Concentration (mg/L): 22.59
Date of Most Recent TDS Concentration: 1/3/2018

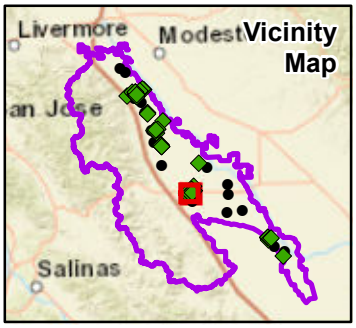


Explanation

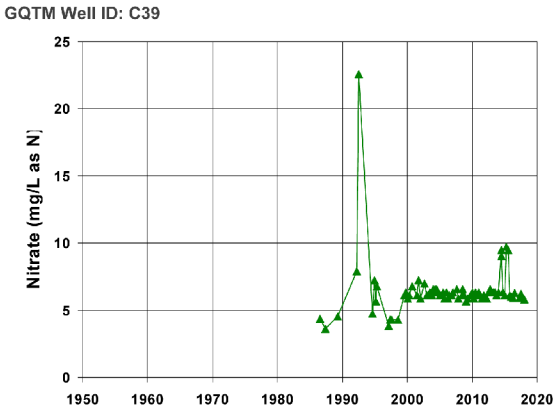
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

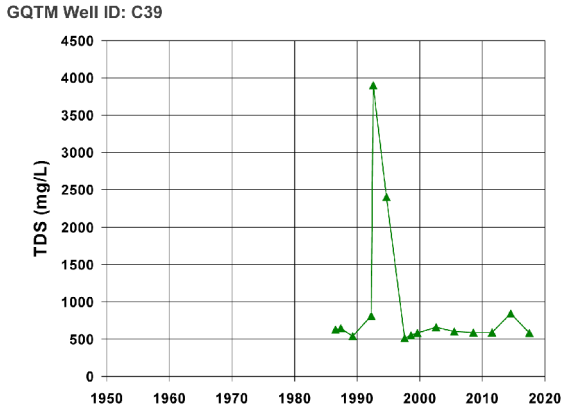
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C40

GQTM Well Identification
GQTM Well ID: C40
Primary Station Code: 2410005-016
GQTM Monitoring Area: 7

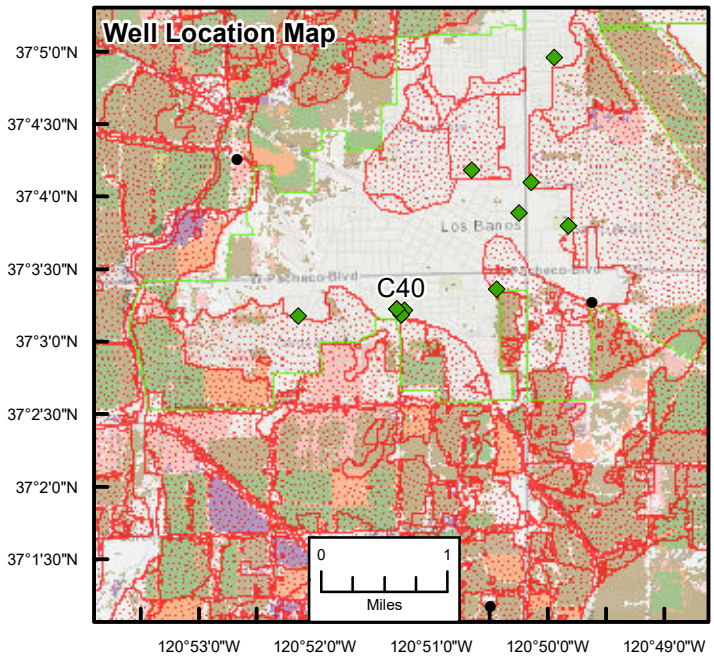
Well Location
Longitude: -120.853387
Latitude: 37.052291
Well Street Address:
Township/Range/Section: M10.0S10.0E23
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 51
Current Percent Agriculture: 24
Current Primary Irrigated Land Use Type: Grain and Hay

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 6.777
Date of Most Recent Nitrate Concentration: 10/23/2002
Most Recent TDS Concentration (mg/L): 6.777
Date of Most Recent TDS Concentration: 10/23/2002

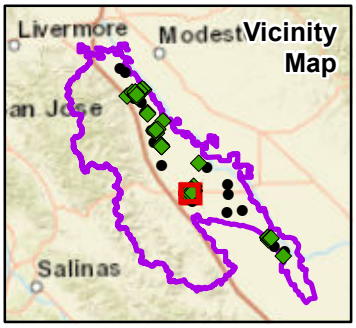


Explanation

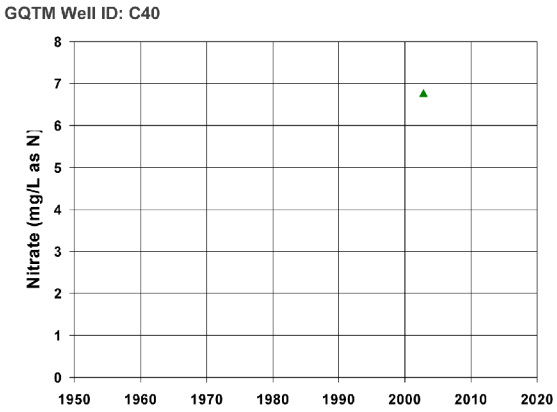
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C41

GQTM Well Identification
GQTM Well ID: C41
Primary Station Code: 2410005-017
GQTM Monitoring Area: 7

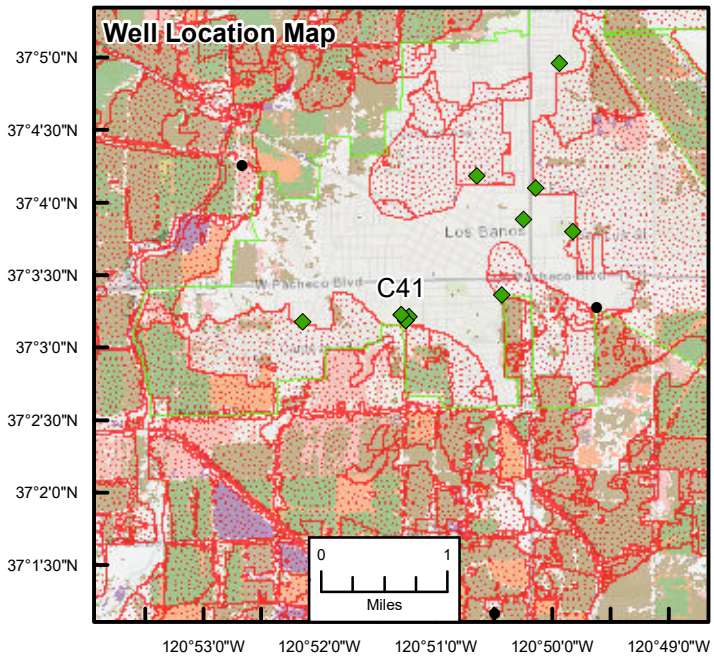
Well Location
Longitude: -120.85403
Latitude: 37.052994
Well Street Address:
Township/Range/Section: M10.0S10.0E22
County: Merced

Locational Proximity Description (within 1 mile of well)
Percent HVA: 49
Current Percent Agriculture: 22
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 6.3252
Date of Most Recent Nitrate Concentration: 10/23/2002
Most Recent TDS Concentration (mg/L): 6.3252
Date of Most Recent TDS Concentration: 10/23/2002

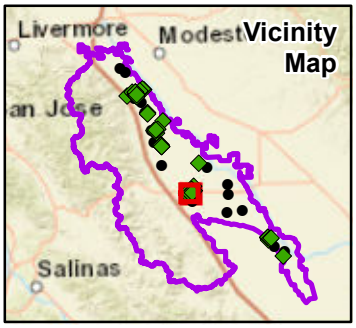


Explanation

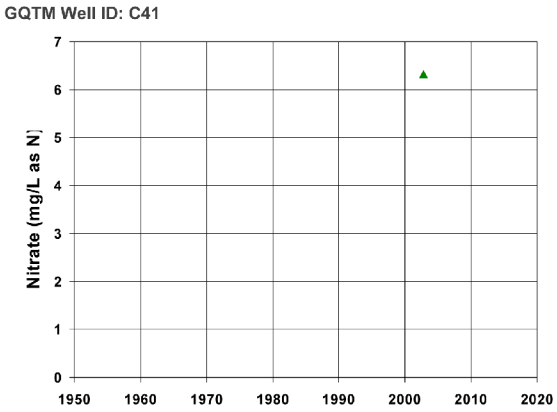
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations

No Historical TDS Data Available

Path: X:\2017\17-132 San Joaquin Valley Drainage Authority - Westside Coalition Phase 2 GQTM\GIS\Map Files\Appendix B Westside GQTM Proposed Complementary Well Info Sheet_DDP_20180510.mxd

Proposed GQTM Network Well C42

GQTM Well Identification
GQTM Well ID: C42
Primary Station Code: 2410005-012
GQTM Monitoring Area: 7

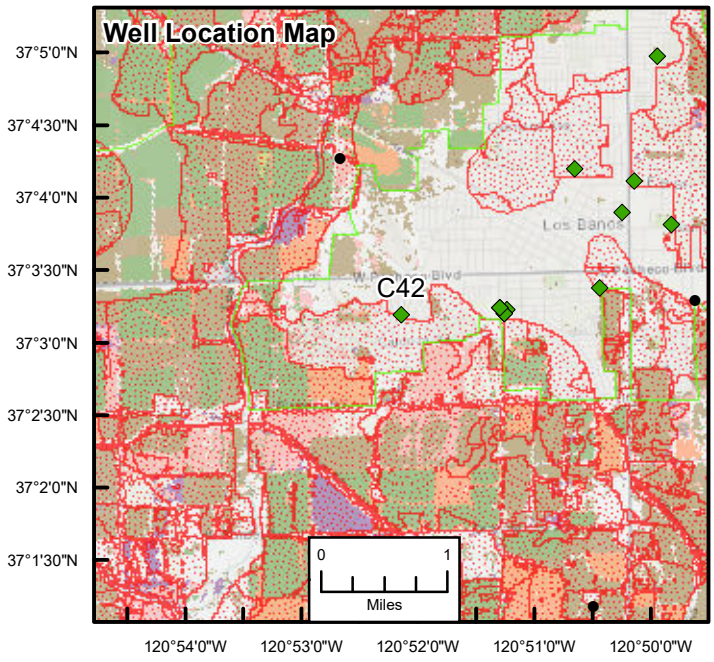
Well Location
Longitude: -120.868137
Latitude: 37.05242
Well Street Address:
Township/Range/Section: M10.0S10.0E22
County: Merced

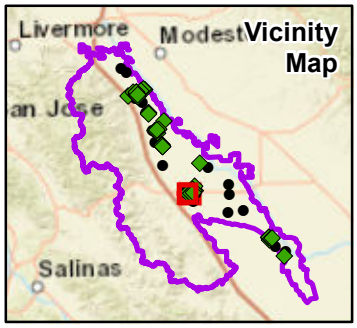
Locational Proximity Description (within 1 mile of well)
Percent HVA: 53
Current Percent Agriculture: 35
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

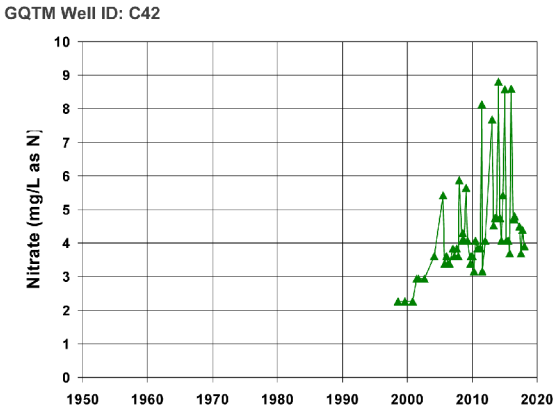
Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 8.8101
Date of Most Recent Nitrate Concentration: 1/3/2018
Most Recent TDS Concentration (mg/L): 8.8101
Date of Most Recent TDS Concentration: 1/3/2018

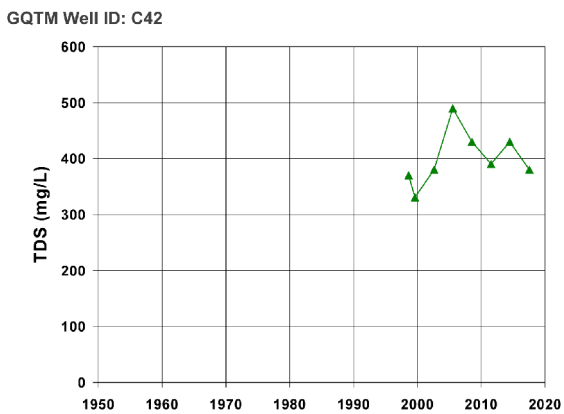




Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C43

GQTM Well Identification
GQTM Well ID: C43
Primary Station Code: 1010005-017
GQTM Monitoring Area: 9

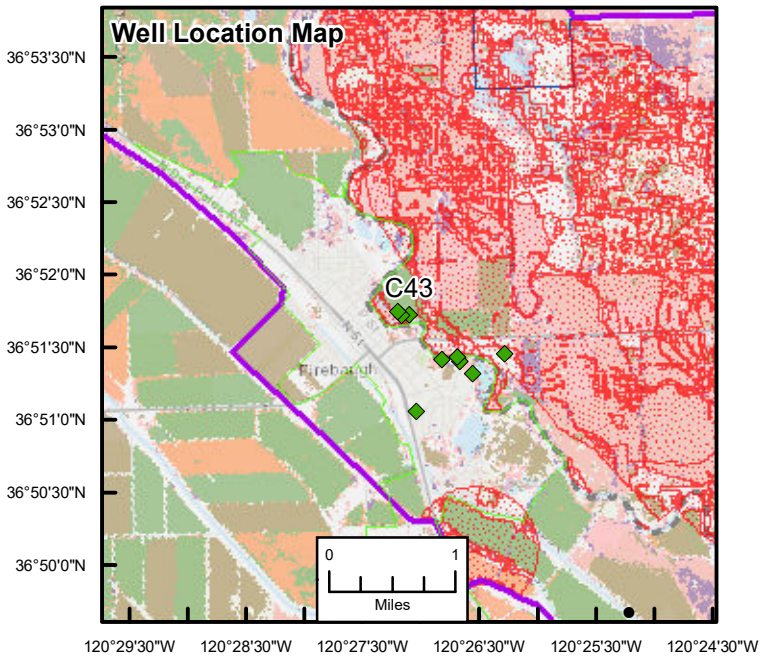
Well Location
Longitude: -120.450599
Latitude: 36.861136
Well Street Address:
Township/Range/Section: M12.0S14.0E28
County: Madera

Locational Proximity Description (within 1 mile of well)
Percent HVA: 33
Current Percent Agriculture: 50
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 0
Date of Most Recent Nitrate Concentration: 1/16/2018
Most Recent TDS Concentration (mg/L): 0
Date of Most Recent TDS Concentration: 1/16/2018

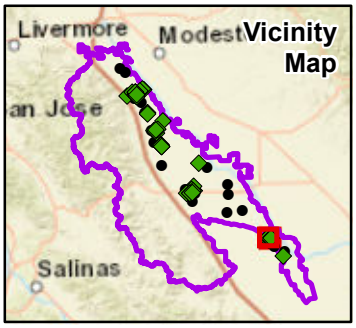


Explanation

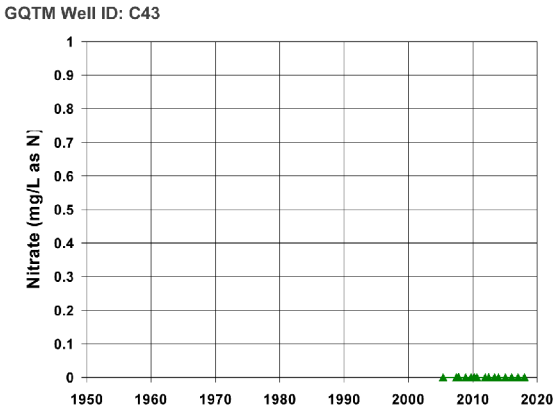
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

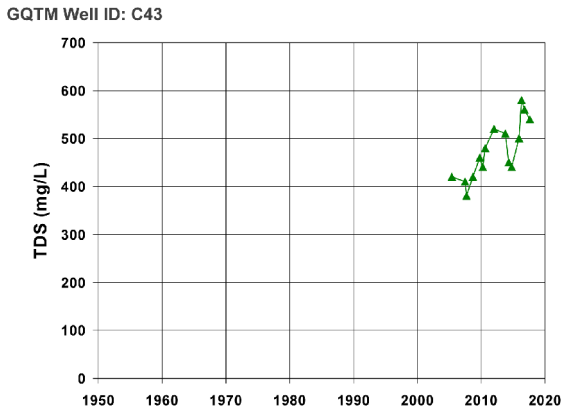
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C44

GQTM Well Identification
GQTM Well ID: C44
Primary Station Code: 1010005-018
GQTM Monitoring Area: 9

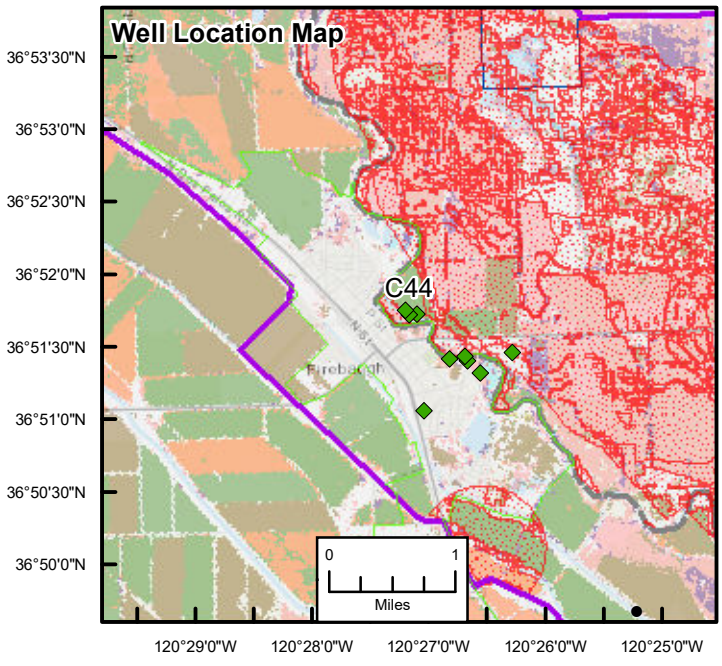
Well Location
Longitude: -120.451697
Latitude: 36.861072
Well Street Address:
Township/Range/Section: M12.0S14.0E28
County: Madera

Locational Proximity Description (within 1 mile of well)
Percent HVA: 31
Current Percent Agriculture: 49
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 0
Date of Most Recent Nitrate Concentration: 1/16/2018
Most Recent TDS Concentration (mg/L): 0
Date of Most Recent TDS Concentration: 1/16/2018

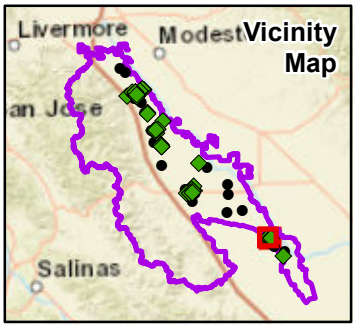


Explanation

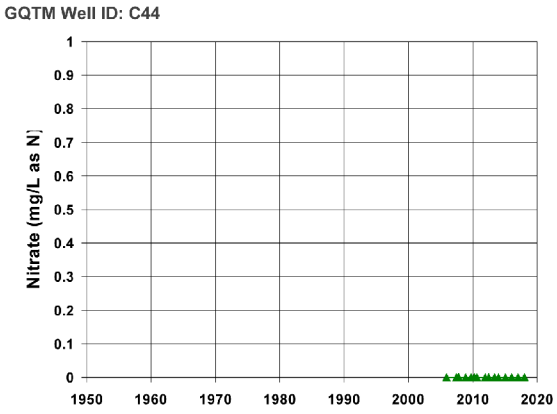
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

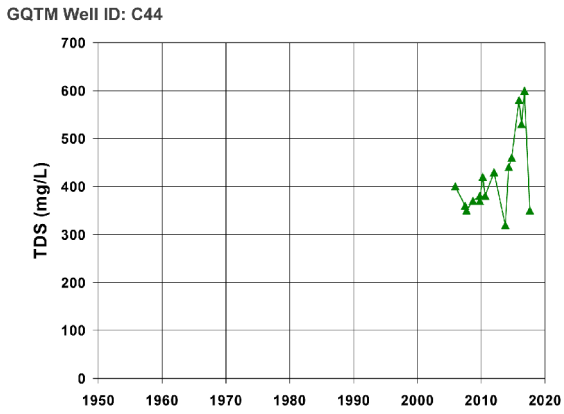
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C45

GQTM Well Identification
GQTM Well ID: C45
Primary Station Code: 1010005-011
GQTM Monitoring Area: 9

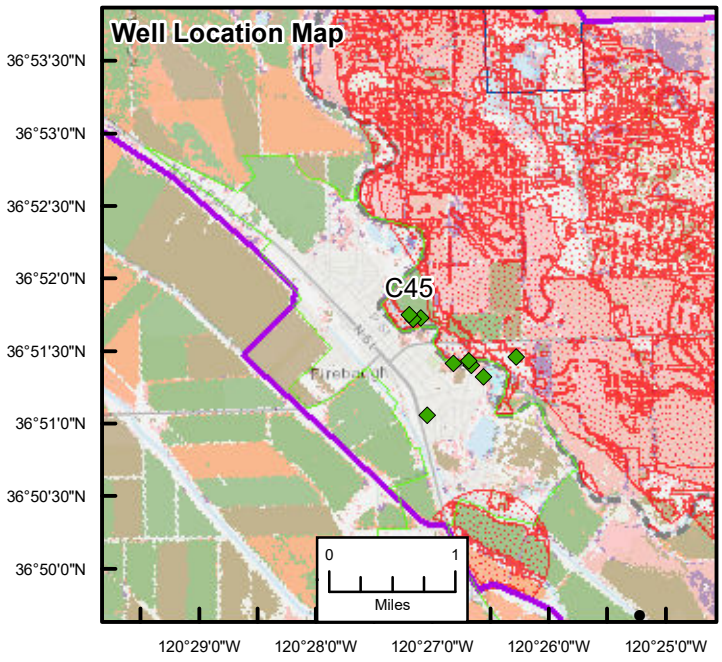
Well Location
Longitude: -120.452219
Latitude: 36.861569
Well Street Address:
Township/Range/Section: M12.0S14.0E28
County: Madera

Locational Proximity Description (within 1 mile of well)
Percent HVA: 30
Current Percent Agriculture: 49
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 2.259
Date of Most Recent Nitrate Concentration: 12/29/2015
Most Recent TDS Concentration (mg/L): 2.259
Date of Most Recent TDS Concentration: 12/29/2015

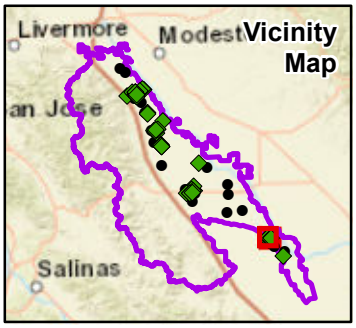


Explanation

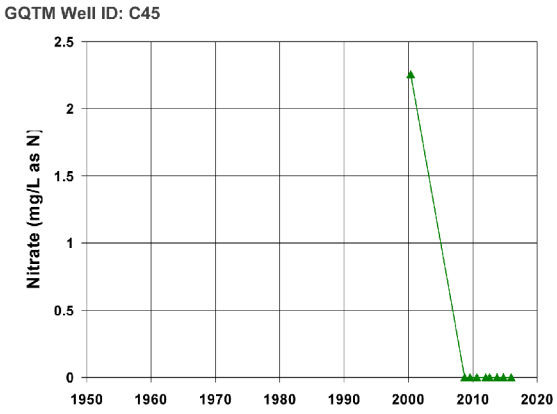
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

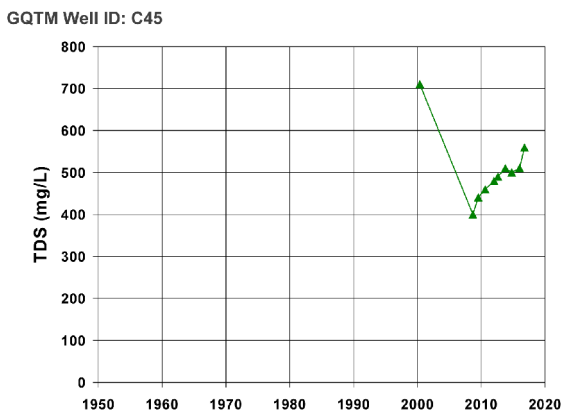
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C46

GQTM Well Identification
GQTM Well ID: C46
Primary Station Code: 1010005-014
GQTM Monitoring Area: 9

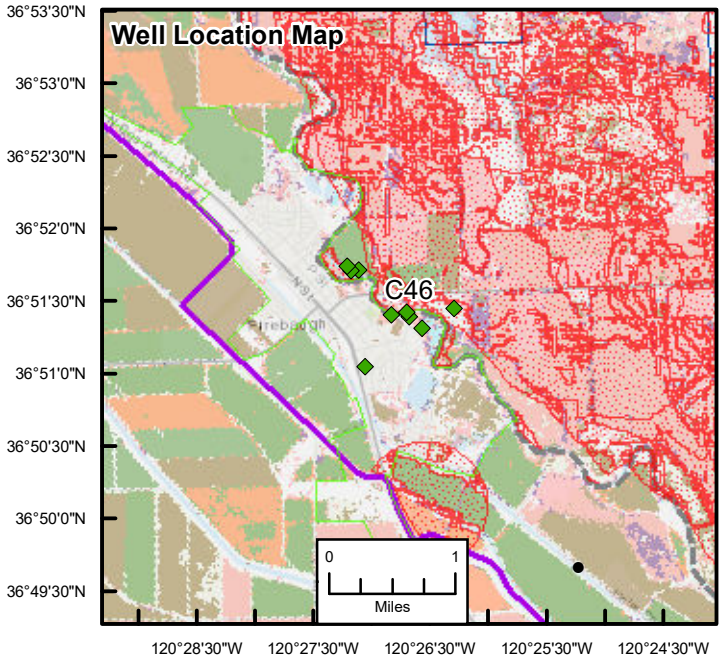
Well Location
Longitude: -120.443542
Latitude: 36.855591
Well Street Address:
Township/Range/Section: M12.0S14.0E29
County: Fresno

Locational Proximity Description (within 1 mile of well)
Percent HVA: 41
Current Percent Agriculture: 59
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs): 180
Top of Perforated Interval (ft bgs): 155
Bottom of Perforated Interval (ft bgs): 180
Well Seal Depth (ft bgs): 80
Well Seal Material: Cement
Well Completion Report Number: 567005

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 1.5813
Date of Most Recent Nitrate Concentration: 1/16/2018
Most Recent TDS Concentration (mg/L): 1.5813
Date of Most Recent TDS Concentration: 1/16/2018

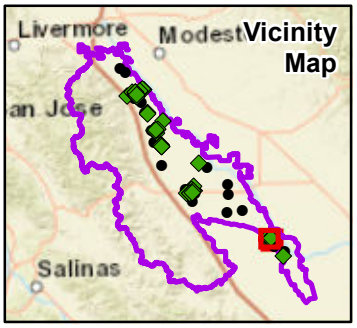


Explanation

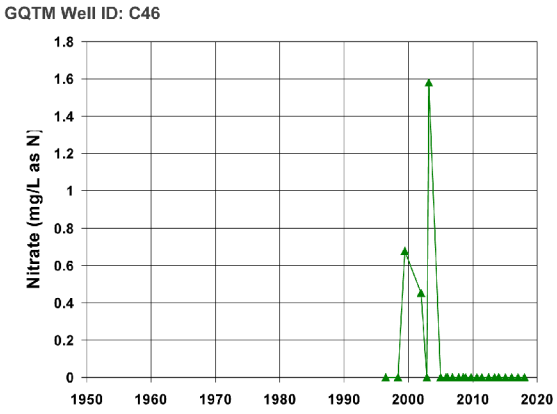
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

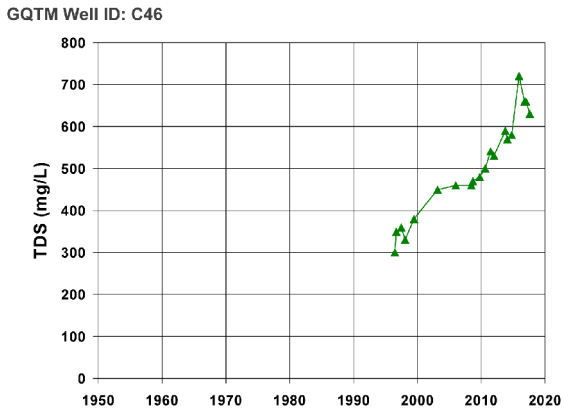
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C47

GQTM Well Identification
GQTM Well ID: C47
Primary Station Code: 1010005-010
GQTM Monitoring Area: 9

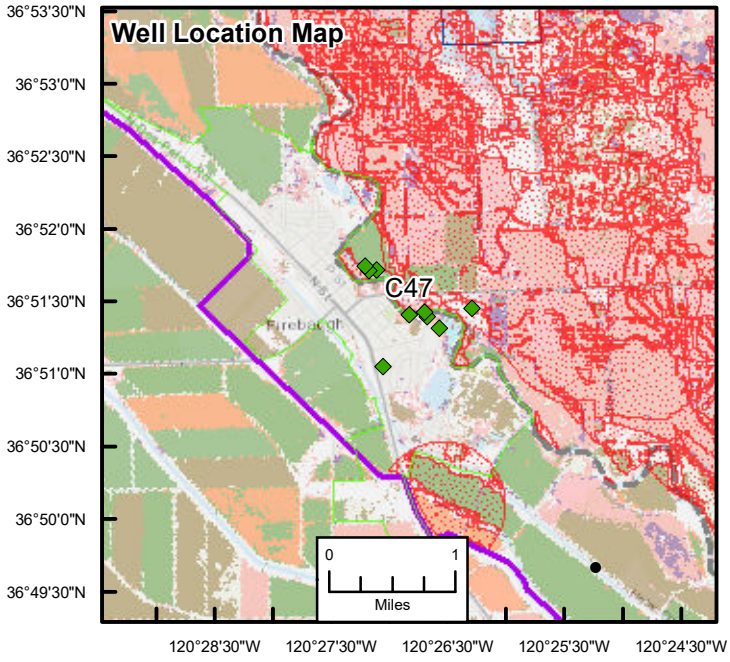
Well Location
Longitude: -120.446087
Latitude: 36.855865
Well Street Address:
Township/Range/Section: M12.0S14.0E28
County: Fresno

Locational Proximity Description (within 1 mile of well)
Percent HVA: 35
Current Percent Agriculture: 55
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs): 200
Top of Perforated Interval (ft bgs): 165
Bottom of Perforated Interval (ft bgs): 190
Well Seal Depth (ft bgs): 150
Well Seal Material: Cement
Well Completion Report Number: 479985

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 1.8072
Date of Most Recent Nitrate Concentration: 1/16/2018
Most Recent TDS Concentration (mg/L): 1.8072
Date of Most Recent TDS Concentration: 1/16/2018

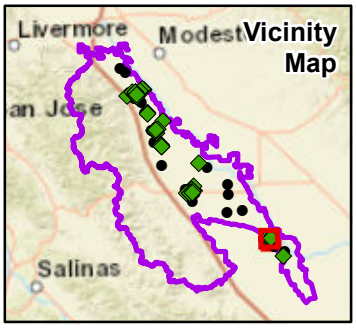


Explanation

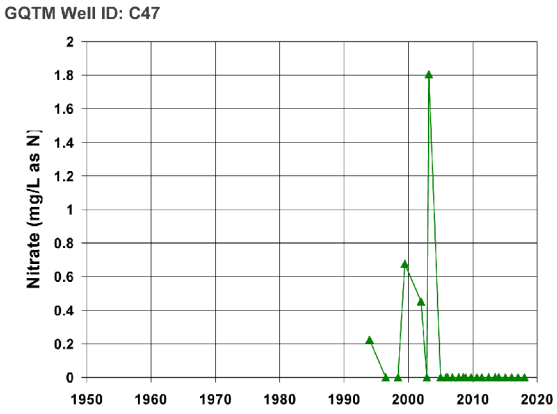
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

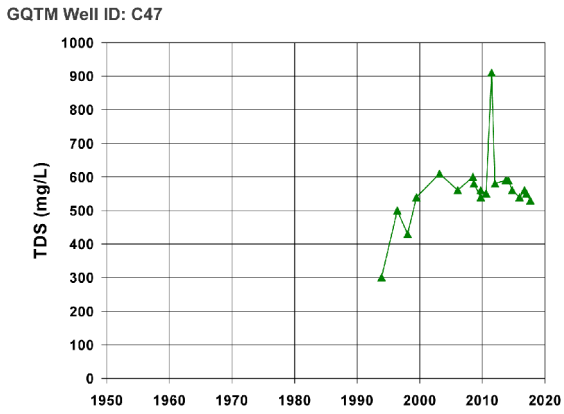
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C48

GQTM Well Identification
GQTM Well ID: C48
Primary Station Code: 1010005-019
GQTM Monitoring Area: 9

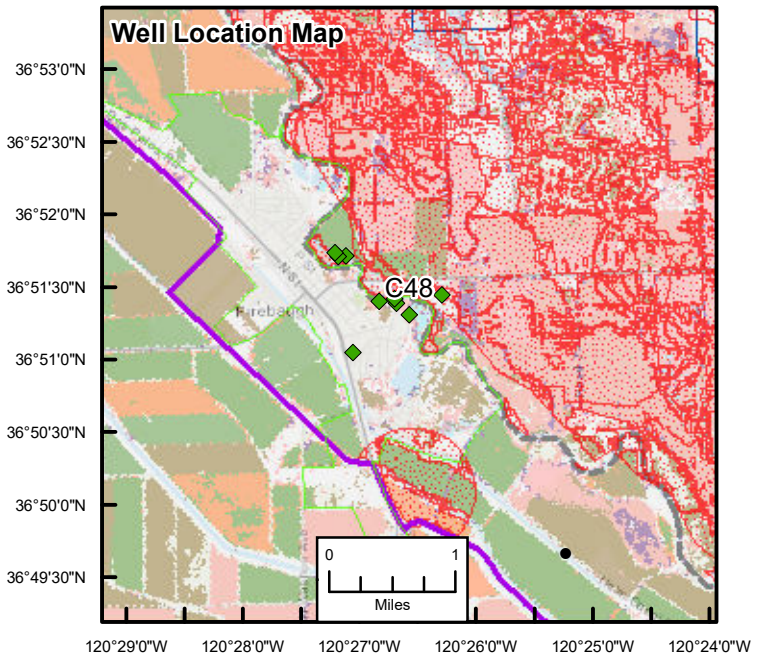
Well Location
Longitude: -120.441803
Latitude: 36.8542
Well Street Address:
Township/Range/Section: M12.0S14.0E28
County: Fresno

Locational Proximity Description (within 1 mile of well)
Percent HVA: 42
Current Percent Agriculture: 61
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs): 215
Top of Perforated Interval (ft bgs): 140
Bottom of Perforated Interval (ft bgs): 210
Well Seal Depth (ft bgs): 120
Well Seal Material: Cement
Well Completion Report Number: E0223496

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 0
Date of Most Recent Nitrate Concentration: 1/16/2018
Most Recent TDS Concentration (mg/L): 0
Date of Most Recent TDS Concentration: 1/16/2018

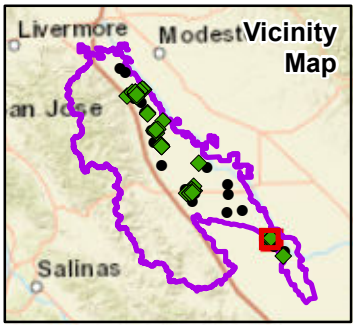


Explanation

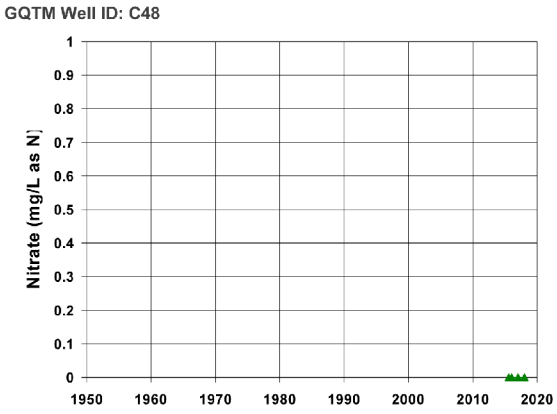
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

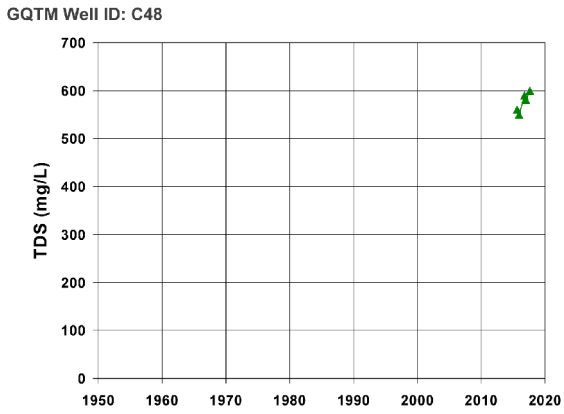
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C49

GQTM Well Identification
GQTM Well ID: C49
Primary Station Code: 1010005-012
GQTM Monitoring Area: 9

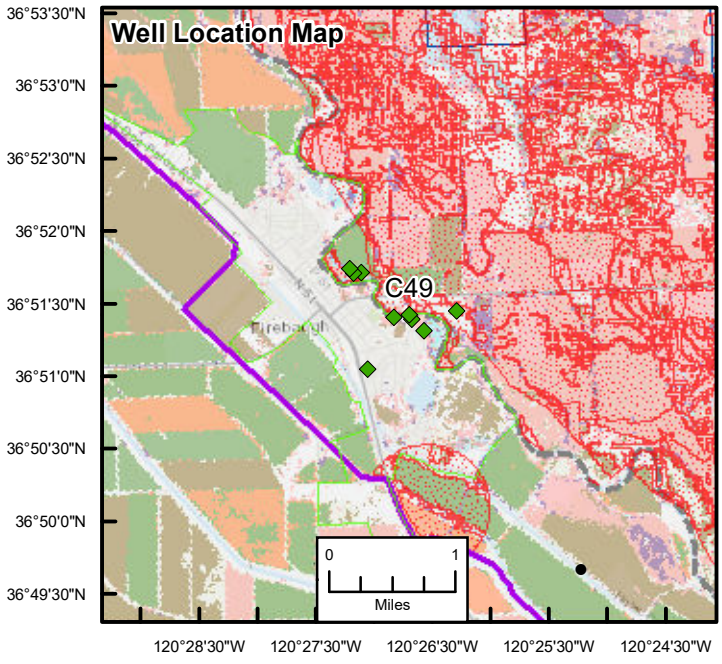
Well Location
Longitude: -120.443889
Latitude: 36.856111
Well Street Address:
Township/Range/Section: M12.0S14.0E28
County: Fresno

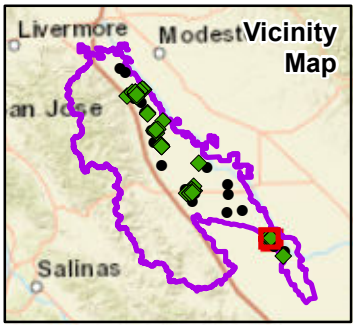
Locational Proximity Description (within 1 mile of well)
Percent HVA: 41
Current Percent Agriculture: 58
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

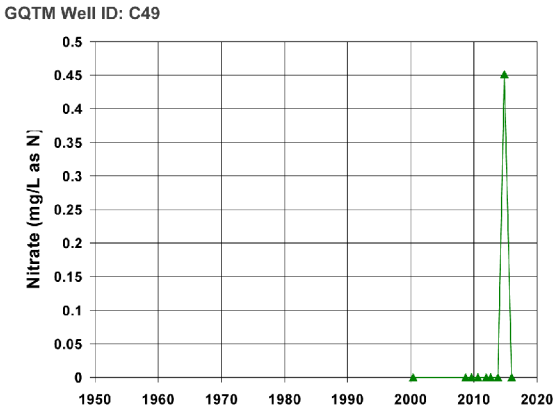
Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 0.4518
Date of Most Recent Nitrate Concentration: 12/29/2015
Most Recent TDS Concentration (mg/L): 0.4518
Date of Most Recent TDS Concentration: 12/29/2015

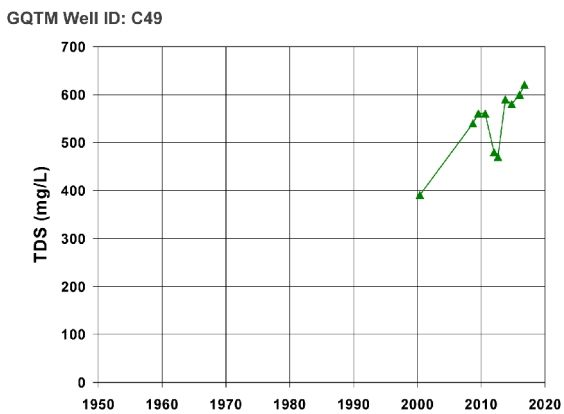




Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C50

GQTM Well Identification
GQTM Well ID: C50
Primary Station Code: 2000512-003
GQTM Monitoring Area: 9

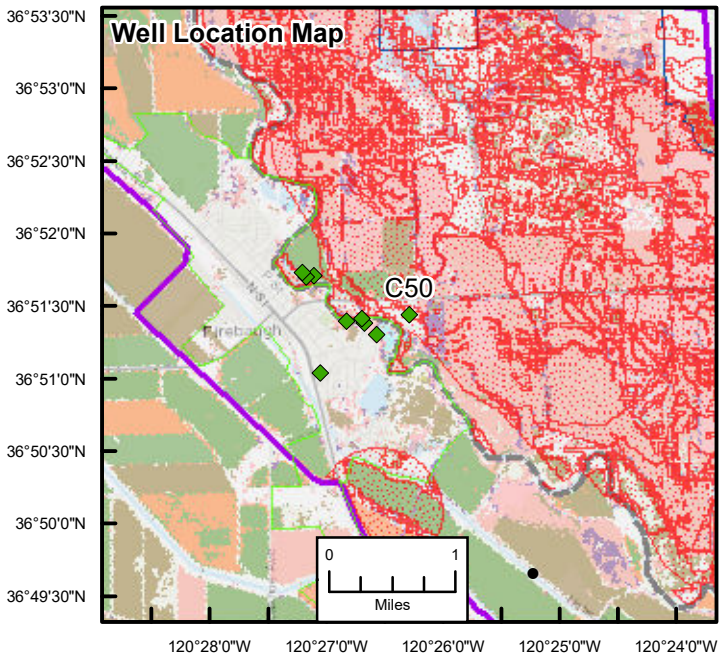
Well Location
Longitude: -120.437091
Latitude: 36.85639
Well Street Address:
Township/Range/Section: M12.0S14.0E28
County: Madera

Locational Proximity Description (within 1 mile of well)
Percent HVA: 57
Current Percent Agriculture: 68
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 0.4518
Date of Most Recent Nitrate Concentration: 6/20/2017
Most Recent TDS Concentration (mg/L): 0.4518
Date of Most Recent TDS Concentration: 6/20/2017

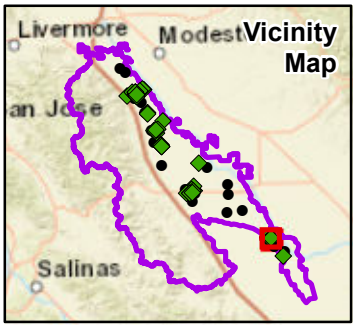


Explanation

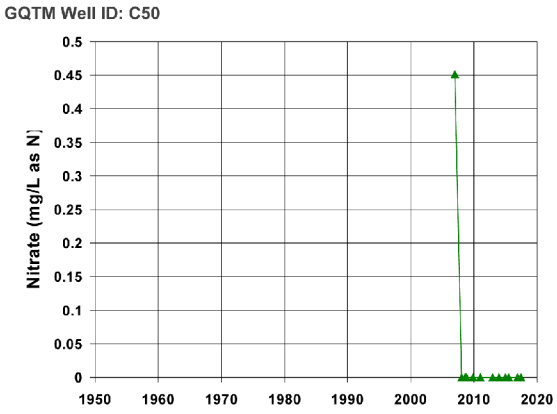
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

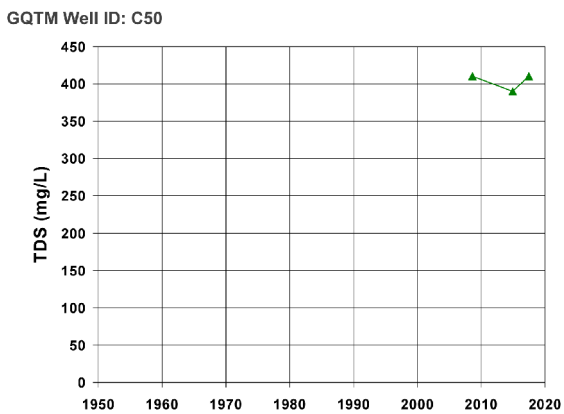
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C51

GQTM Well Identification
GQTM Well ID: C51
Primary Station Code: 1010005-005
GQTM Monitoring Area: 9

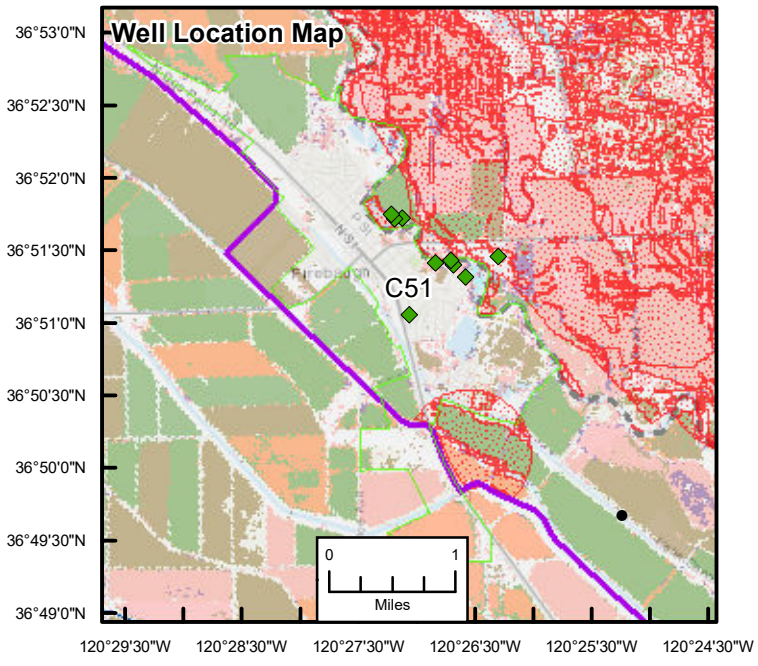
Well Location
Longitude: -120.45
Latitude: 36.85
Well Street Address:
Township/Range/Section: M12.0S14.0E33
County: Fresno

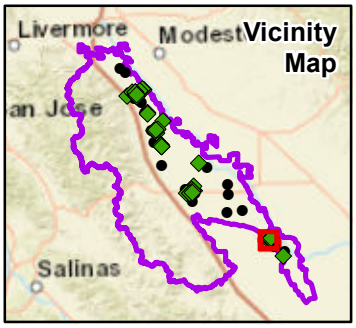
Locational Proximity Description (within 1 mile of well)
Percent HVA: 18
Current Percent Agriculture: 49
Current Primary Irrigated Land Use Type: Field Crops

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs):
Top of Perforated Interval (ft bgs):
Bottom of Perforated Interval (ft bgs):
Well Seal Depth (ft bgs):
Well Seal Material:
Well Completion Report Number:

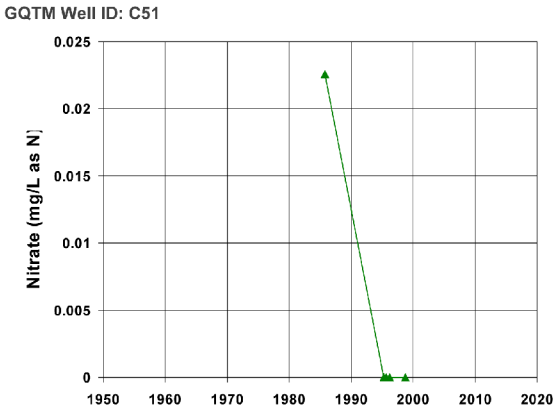
Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 0.02259
Date of Most Recent Nitrate Concentration: 9/8/1998
Most Recent TDS Concentration (mg/L): 0.02259
Date of Most Recent TDS Concentration: 9/8/1998

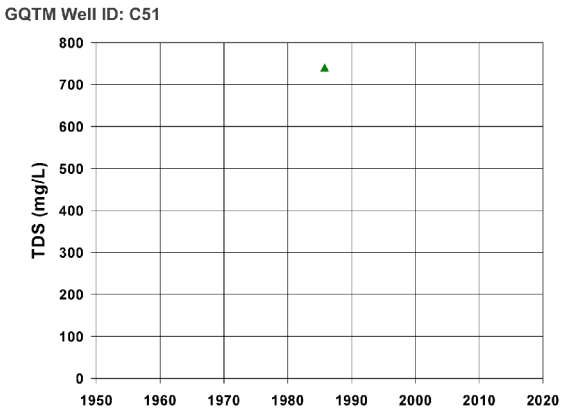




Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Proposed GQTM Network Well C52

GQTM Well Identification
GQTM Well ID: C52
Primary Station Code: 1010021-007
GQTM Monitoring Area: 10

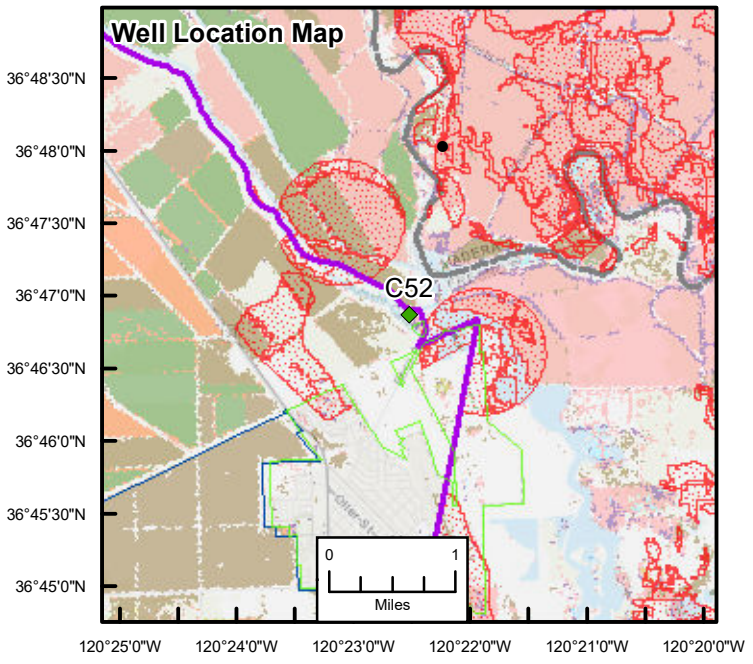
Well Location
Longitude: -120.374254
Latitude: 36.780203
Well Street Address:
Township/Range/Section: M13.0S15.0E19
County: Fresno

Locational Proximity Description (within 1 mile of well)
Percent HVA: 40
Current Percent Agriculture: 41
Current Primary Irrigated Land Use Type: Nut Trees

Well Construction Information
Well Type: Public Supply
Well Depth (ft bgs): 200
Top of Perforated Interval (ft bgs): 140
Bottom of Perforated Interval (ft bgs): 200
Well Seal Depth (ft bgs): 50
Well Seal Material: Cement
Well Completion Report Number: 143530

Well Monitoring Information
Reference Point:
Reference Point Datum (ft, NAVD88):

Groundwater Observations
Most Recent Depth to Water (ft, bgs):
Date of Most Recent Depth to Water:
Most Recent Nitrate Concentration (mg/L as N): 3.3885
Date of Most Recent Nitrate Concentration: 2/12/2013
Most Recent TDS Concentration (mg/L): 3.3885
Date of Most Recent TDS Concentration: 2/12/2013

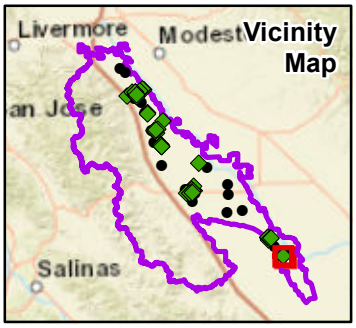


Explanation

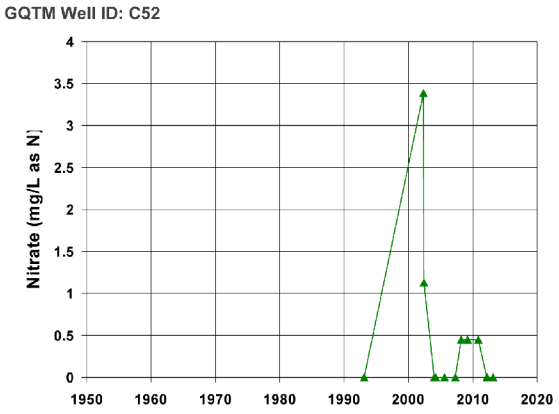
- Proposed Principal GQTM Network Well
- Proposed Complementary Well
- Communities (DACs and DUCs)
- High Vulnerability Area
- Westside Coalition Boundary
- DWR Groundwater Subbasins

Crop Categories

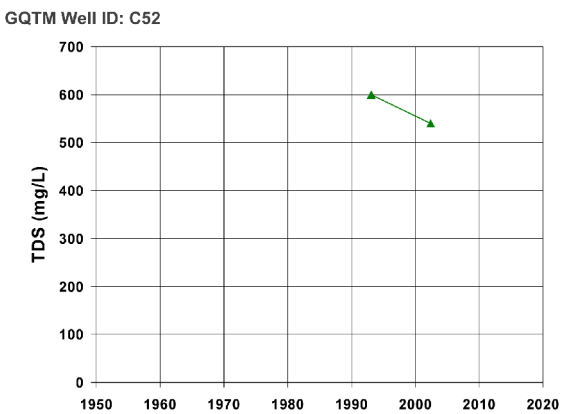
- Citrus/Subtropical
- Field Crops
- Fruit Trees
- Grain/Hay
- Nut Trees
- Rice
- Seeds/Beans
- Vegetables
- Vineyards
- Non-Agricultural



Graph of Historical Nitrate Concentrations



Graph of Historical TDS Concentrations



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Well Completion Reports for GQTM Principal Network Wells

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0310529

Page 1 of 2

Owner's Well Number Well #1

Date Work Began 05/09/2016 Date Work Ended 5/13/2016

Local Permit Agency Stanislaus County Department of Environmental Resources

Permit Number 16-110 Permit Date 4/14/16

DWR Use Only -- Do Not Fill In

State Well Number/Site Number

N Latitude W Longitude

APN/TRS/Other

Geologic Log

Orientation ◉ Vertical ○ Horizontal ○ Angle Specify

Drilling Method REVERSE ROTARY Drilling Fluid BENTONITE

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc.)
0	131	CLAY
131	156	1" GRAVEL/SMALL COBBLES
156	196	CLAY
196	232	COBBLES/1" GRAVEL
232	303	CLAY
303	331	SMALL COBBLES/SMALL GRAVEL
331	360	CLAY

Total Depth of Boring 360 Feet

Total Depth of Completed Well 360 Feet

Well Owner

Name West Stanislaus Irrigation District

Mailing Address PO Box 37

City Westley State CA Zip 95387

Well Location

Address East of River Road

City Westley County Stanislaus

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

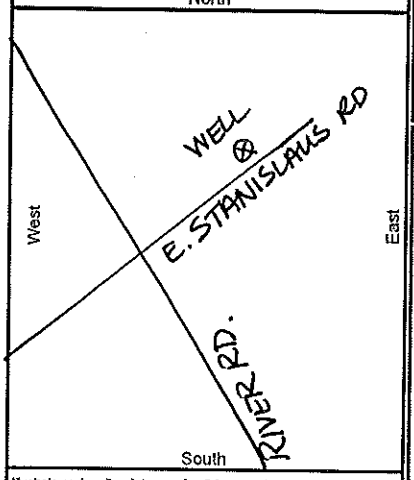
Datum ___ Dec. Lat. ___ Dec. Long. ___

APN Book NONE Page ASSIGNED Parcel ___

Township ___ Range ___ Section ___

Location Sketch

(Sketch must be drawn by hand after form is printed.)



Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

◉ New Well
○ Modification/Repair
○ Deepen
○ Other ___
○ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

◉ Water Supply
☐ Domestic ☐ Public
☑ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ___

Water Level and Yield of Completed Well

Depth to first water ___ (Feet below surface)

Depth to Static Water Level 25 (Feet) Date Measured 05/12/2016

Estimated Yield * 1,000 (GPM) Test Type Air Lift

Test Length 6.0 (Hours) Total Drawdown 0 (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)
0	22	42	CONDUCTO	STEEL	.375	32	NONE	
0	140	30	BLANK	STEEL	.375	20	NONE	
140	160	30	SCREEN	STEEL	.375	20	SLOT	0.080
160	200	30	BLANK	STEEL	.375	20	NONE	
200	240	30	SCREEN	STEEL	.375	20	SLOT	0.080
240	300	30	BLANK	STEEL	.375	20	NONE	

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	22	CEMENT	POURED
0	360	FILL	PEA GRAVEL

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other ___

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Canepa and Sons, Inc.
Person, Firm or Corporation

14384 Cuesta Court Sonora CA 95370
Address City State Zip

Signed Ricky Canepa 5/16/2016 425749
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0310529

Page 2 of 2

Owner's Well Number Well #1

Date Work Began 05/09/2016 Date Work Ended 5/13/2016

Local Permit Agency Stanislaus County Department of Environmental Resources

Permit Number 16-110 Permit Date 4/14/16

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ◉ Vertical ○ Horizontal ○ Angle Specify

Drilling Method REVERSE ROTARY Drilling Fluid BENTONITE

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	131	CLAY
131	156	1" GRAVEL/SMALL COBBLES
156	196	CLAY
196	232	COBBLES/1" GRAVEL
232	303	CLAY
303	331	SMALL COBBLES/SMALL GRAVEL
331	360	CLAY

Total Depth of Boring 360 Feet

Total Depth of Completed Well 360 Feet

Well Owner

Name West Stanislaus Irrigation District

Mailing Address PO Box 37

City Westley State CA Zip 95387

Well Location

Address East of River Road

City Westley County Stanislaus

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ___ Dec. Lat. ___ Dec. Long. ___

APN Book NONE Page ASSIGNED Parcel ___

Township ___ Range ___ Section ___

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West

East

South

see page 1

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. **Please be accurate and complete.**

Activity

◉ New Well

○ Modification/Repair

○ Deepen

○ Other ___

○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

◉ Water Supply

☐ Domestic ☐ Public

☑ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

○ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other ___

Water Level and Yield of Completed Well

Depth to first water ___ (Feet below surface)

Depth to Static Water Level 25 (Feet) Date Measured 05/12/2016

Estimated Yield * 1,000 (GPM) Test Type Air Lift

Test Length 6.0 (Hours) Total Drawdown 0 (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)
300	340	30	SCREEN	STEEL	.375	20	SLOT	0.080
340	360	30	BLANK	STEEL	.375	20	NONE	

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	22	CEMENT	POURED
0	360	FILL	PEA GRAVEL

Attachments

☐ Geologic Log

☐ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☐ Other ___

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Canepa and Sons, Inc. (Person, Firm or Corporation)

14384 Cuesta Court (Address) Sonora (City) CA (State) 95370 (Zip)

Signed Ricky Canepa (C-57 Licensed Water Well Contractor) 5/16/2016 (Date Signed) 425749 (C-57 License Number)

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

DUPLICATE
Driller's Copy

Page ___ of ___
Owner's Well No. ___
Date Work Began 5-21-91, Ended 6-15-91
Local Permit Agency ___
Permit No. 91-278 Permit Date ___

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 427229

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ___ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 21 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	6	Clay
6	25	Sand & clay
25	27	Sand
27	30	Clay
30	100	Sand
100	135	Sand/blue clay streaks
135	145	Sand & gravel/blue clay streaks
145	150	Clay
150	160	Fine sand
160	198	Sand & gravel-small
198	205	Clay & shale
205	225	Clay
225	245	Sand & gravel-small
245	258	Blue clay
258	268	Blue sand-fine
268	299	Blue clay
299	303	Blue sand
303	335	Blue clay
335	355	Blue sand
355	362	Blue clay
362	365	Blue sand-fine
365	390	Blue clay
390	392	Blue sand
392	400	Blue clay

TOTAL DEPTH OF BORING 400 (Feet)
TOTAL DEPTH OF COMPLETED WELL 255 (Feet)

WELL OWNER

Name Patterson Water District
Mailing Address P.O. Box 685
CITY Patterson STATE Ca ZIP 95363

WELL LOCATION

Address Las Palmas Ave.-.3mi. east of Poplar,
City south side Patterson
County Stanislaus
APN Book ___ Page ___ Parcel ___
or Township ___ Range ___ Section ___
or Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WEST

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

___ MONITORING
WATER SUPPLY
___ Domestic
___ Public
X Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Reverse Rotary FLUID water

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 27 (Ft.) & DATE MEASURED ___
ESTIMATED YIELD* 5988 (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN 93 (Ft.)
* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL/ GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	130	26"	X				Steel	16"	1/4	
130	190	"		X			"	"	"	ful-flo
190	220	"		X			"	"	"	reg.perf.
220	250	"		X			"	"	"	ful-flo
250	255	"	X				"	"	"	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	255				gravel
0	20	30" conductor- cemented in			

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
✓ Other Electric log

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Hennings Bros. Drilling Co., Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 3525 Pelandale Ave. CITY Modesto STATE CA ZIP 95356

Signed Magdeline Eddy
WELL DRILLER/AUTHORIZED REPRESENTATIVE

DATE SIGNED 8-8-91

C-57 LICENSE NUMBER 290813

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

5

FOR DEPT USE	
Date	Wup

P.D. 7-25-91 MM

Permit No. 91-278
Date Issued 7-25-91

STANISLAUS COUNTY
DEPARTMENT OF ENVIRONMENTAL RESOURCES
1716 Morgan Road, Modesto, CA 95351
525-4154

APPLICATION FOR WELL CONSTRUCTION OR PUMP PERMIT

THIS PERMIT EXPIRES 1 YEAR FROM DATE ISSUED
(Complete in Triplicate)

Application is hereby made to the Stanislaus County Department of Environmental Resources for a permit to construct and/or install the work herein described. PLEASE NOTIFY THIS DEPARTMENT (USING PERMIT #) WHEN WELL AND/OR PUMP WORK IS COMPLETED.

JOB ADDRESS/LOCATION OLD LOS PALMAS RD/.3 MI. E OF POPLAR City PATTERSON

Owner's Name PATTERSON IRRIGATION DISTRICT Phone 892-6233

Address P.O. BOX 685 City/State PATTERSON, CA 95363

Contractor's Name HENNINGS BROS. DRILLING CO. License # 290813 Phone 545-1185

TYPE OF WORK (CHECK): NEW WELL [X] DEEPEN [ ] RECONDITION [ ] DESTRUCTION [ ]
PUMP INSTALLATION (NEW WELL) [ ] PUMP REPAIR [ ] PUMP REPLACEMENT [ ]
OTHER _____

DISTANCE TO NEAREST: SEPTIC TANK NONE SEWER LINES NONE PIT PRIVY _____
OTHER WELL _____ SEWAGE DISPOSAL FIELD _____ CESSPOOL/SEEPAGE PIT _____
OTHER _____

INTENDED USE
- [ ] Industrial
- [ ] Domestic/private
- [ ] Domestic/public
- [X] Irrigation
- [ ] Other

TYPE OF WELL
- [ ] Cable Tool
- [ ] Drilled
- [ ] Driven
- [ ] Gravel Pack
- [ ] Rotary
- [X] Other REVERSE

CONSTRUCTION SPECIFICATIONS
Dia. of Well Excavation 26"
Dia. of Well Casing 16"
Gauge of Casing ¼"ga
Depth of Grout Seal 30"x20' CAN-CEMENTED IN " " "
Type of Grout _____
Other Information Slab by owner

PUMP INSTALLATION: Contractor _____
Type of Pump _____ H.P. _____

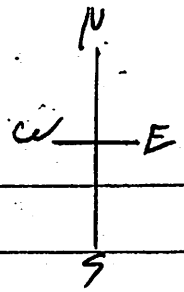
PUMP REPLACEMENT: [ ] State Work to be Done _____

PUMP REPAIR: [ ] State Work to be Done _____

DESTRUCTION OF WELL: Well Diameter _____ Approx. Depth _____
Describe Material and Procedure _____

PLOT PLAN: Show on reverse side.

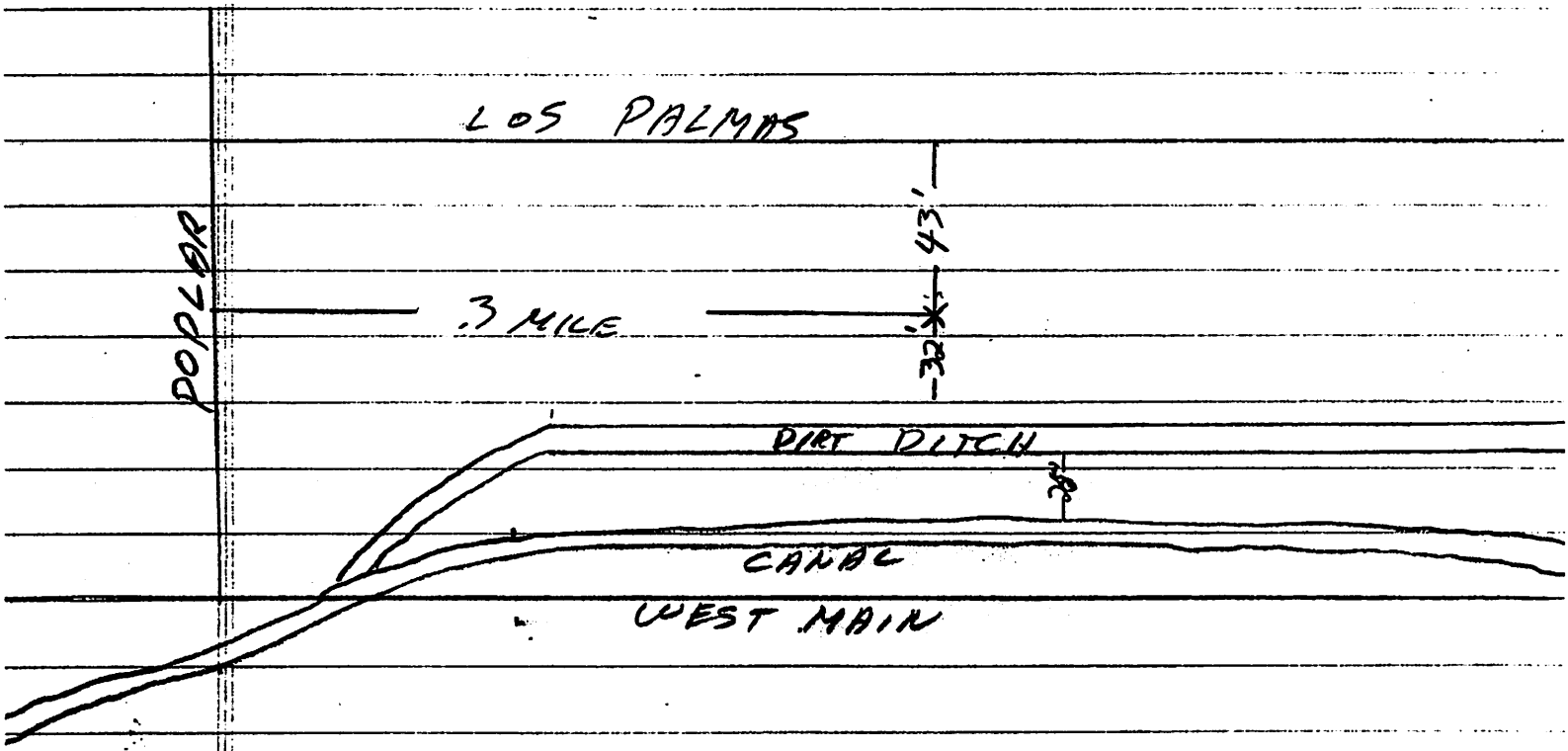
FOR DEPARTMENT USE ONLY:
Permit Issued by Rodney Estrada Date 7/25/91
Permit Denied by _____ (See separate report)
Inspected by _____ Date _____



PATTERSON IRRIGATION DISTRICT 16" X 4"

22 N. DEL PUERTO AVE 892-6233

PATTERSON, CA. 95363



LOC.

OLD LOS PALMAS RD. .3 MILE EAST OF POPLAR RD. ON SOUTH SIDE

WELL TEST 6-11-91

RPM	GPM	PUMPING LEVEL
1600	5988	93'
1400	4602	79'
1200	3711	69'

Standing water table- 21'

Static water level- 27'

ORIGINAL
File with DWR

5/8-31

Page ___ of ___

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. ___ No. 483378
Date Work Began 6-18-91, Ended 6-26-91
Local Permit Agency Stanislaus Co. DER
Permit No. 91-213 Permit Date 6-19-91

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 6 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	6'	Sand
6'	19'	broken & weathered Shale
19'	40'	Fractured shale - black
40'	310'	Soft shale - black
310	400'	Soft Shale - dark gray
		No Fractures beyond 35'-40' of any significance
		Pinac 6-4 Dia. 8.125"

TOTAL DEPTH OF BORING 400' (Feet)
TOTAL DEPTH OF COMPLETED WELL ___ (Feet)

WELL LOCATION

Address Del Puerto Canyon
City Patterson CA. 95363
County Stanislaus
APN Book ___ Page ___ Parcel ___
or Township ___ Range ___ Section ___
or Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WEST

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S) (✓)

___ MONITORING
WATER SUPPLY
___ Domestic
✓ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Air FLUID ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD* 2 (GPM) & TEST TYPE Air
TEST LENGTH 1 (Hrs.) TOTAL DRAWDOWN 400 (Ft.)
* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	76	12½	✓				Steel Gauge A-53	8½	.154	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	50	✓			
50	55		✓		
55	76			✓	¼" pea gravel

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Duran Sanko's Sanko Bros Inc
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 21047 Shaws Flat Rd CITY Sonora STATE CA ZIP 95370
Signed Duran Sanko WELL DRILLER/AUTHORIZED REPRESENTATIVE
DATE SIGNED 7-3-91
C-57 LICENSE NUMBER 325623

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill in

No. 247065

State Well No. 6/8-4

Other Well No.

Notice of Intent No.

Local Permit No. or Date 5244

(2) LOCATION OF WELL (See instructions):

County Stanislaus Owner's Well Number

Well address if different from above

Township Range Section

Distance from cities, roads, railroads, fences, etc. 266 Pomegranate Rd.- 1 mile east of Hwy 33

WELL LOCATION SKETCH

(3) TYPE OF WORK:

New Well [X] Deepening [ ]
Reconstruction [ ]
Reconditioning [ ]
Horizontal Well [ ]
Destruction [ ] (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic [X]
Irrigation [ ]
Industrial [ ]
Test Well [ ]
Stock [ ]
Municipal [ ]
Other [ ]

(5) EQUIPMENT:

Rotary [X] Reverse [ ]
Cable [ ] Air [ ]
Other [ ] Bucket [ ]

(6) GRAVEL PACK: Sand & gravel

Yes [X] No [ ] Size

Diameter of bore 11"

Packed from 20 to 108 ft.

(7) CASING INSTALLED:

Steel [ ] Plastic [X] Concrete [ ]

From ft.	To ft.	Dia. in.	Gage or Wall
0	108	6	160

(8) PERFORATIONS:

Type of perforation or size of screen

From ft.	To ft.	Slot size
88	108	screen

(9) WELL SEAL:

Was surface sanitary seal provided? Yes [X] No [ ] If yes, to depth 20 ft.

Were strata sealed against pollution? Yes [ ] No [ ] Interval ft.

Method of sealing Bentonite

(10) WATER LEVELS:

Depth of first water, if known ft.

Standing level after well completion 24 ft.

(11) WELL TESTS:

Was well test made? Yes [ ] No [X] If yes, by whom?

Type of test Pump [ ] Bailer [ ] Air lift [ ]

Depth to water at start of test ft. At end of test ft.

Discharge gal/min after hours Water temperature

Chemical analysis made? Yes [ ] No [X] If yes, by whom?

Was electric log made? Yes [ ] No [X] If yes, attach copy to this report

(12) WELL LOG: Total depth 115 ft. Depth of completed well 108 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	-95	Clay & sand streaks
95	-104	Gravel
104	-115	Clay

Work started 1-11 19 83 Completed 19

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED Madeline Roddy (Well Driller)

NAME Hennings Bros. Drilling Co., Inc. (Person, firm, or corporation) (Typed or printed)

Address 3525 Pelandale Ave.

City Modesto, Ca. Zip 95356

License No. 290813 Date of this report 1-26-83

ORIGINAL
NOT FOR PUBLIC USE
WATER CODE SEC. 13752
UNCONFINED

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

TRIPLICATE
Owner's Copy

Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 739637

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. 15
Date Work Began 03/26/01, Ended 02/08/02
Local Permit Agency Merced Co EHD
Permit No. 01-094-DO Permit Date 01/22/01

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD REVERSE FLUID MUD

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	12	sandy clay
12	15	sand
15	22	clay
22	42	fine sand/clay streaks/small gravel
42	80	clay streaks/sand
80	135	clay
135	140	small gravel
140	154	clay
154	158	small gravel/very fine sand
158	168	clay/shale
168	172	very fine sand/small gravel
172	183	clay/shale
183	184	very fine sand
184	217	clay
217	220	very fine sand/small gravel
220	234	clay
234	237	very fine sand/small gravel/clay streaks
237	244	clay
244	255	sand/gravel
255	256	clay
256	260	gravel
260	290	clay
290	415	blue clay
415	420	shale
420	430	clay
430	440	very fine black sand
440	460	very fine black sand/small gravel/clay streaks
460	475	clay/shale
475	500	very fine-coarse sand
500	540	clay/sand streaks

TOTAL DEPTH OF BORING 540 (Feet)
TOTAL DEPTH OF COMPLETED WELL 285 (Feet)

WELL OWNER

Name CITY OF LOS BANOS
Mailing Address 411 MADISON AVENUE
LOS BANOS CA 93635
CITY STATE ZIP

WELL LOCATION

Address Badger Flat Rd.
City Los Banos CA 93635
County Merced
APN Book 81 Page 030 Parcel 04
Township ___ Range ___ Section ___
Latitude ___ DEG. MIN. SEC. ___ DEG. MIN. SEC.

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ✓ Public
___ Irrigation ___ Industrial
MONITORING ___
TEST WELL ✓
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 53 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 53 (Ft.) & DATE MEASURED 02/08/02
ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	135	26	✓				STEEL	16	.25	
135	160	26		✓			STEEL	16	.25	.090
160	175	26	✓				STEEL	16	.25	
175	185	26		✓			STEEL	16	.25	.090
185	240	26	✓				STEEL	16	.25	
240	275	26		✓			STEEL	16	.25	.090

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	90	✓			
90	285				4x16

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME CALWATER DRILLING CO., INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
300 S. Kilroy Rd. Turlock CA 95380
ADDRESS CITY STATE ZIP
Signed Miranda 03/19/02 434218
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

RECEIVED MAR 2 2 2002

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill in

No. 374510

Notice of Intent No. ______
Local Permit No. or Date ______

State Well No. ______
Other Well No. ______

(1) OWNER: Name City of Los Banos
Address ______
City ______ ZIP ______

(2) LOCATION OF WELL (See instructions):
County Merced Owner's Well Number 10
Well address if different from above ______
Township Los Banos Range ______ Section ______
Distance from cities, roads, railroads, fences, etc. ______

WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☐
Irrigation ☐
Industrial ☐
Test Well ☐
Municipal ☒
Other ☐
(Describe)

(5) EQUIPMENT:
Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:
Yes ☒ No ☐ Size 4-12 sand
Diameter of bore 26"
Packed from 50 to 168 ft.

(7) CASING INSTALLED:
Steel ☒ Plastic ☐ Concrete ☐

From ft.	To ft.	Dia. in.	Gage or Wall
0	168	16"	1/4"

(8) PERFORATIONS:
Type of perforation or size of screen

From ft.	To ft.	Slot size
See addendum		.090

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 50 ft.
Were strata sealed against pollution? Yes ☐ No ☐ Interval ______ ft.
Method of sealing Cement

(10) WATER LEVELS:
Depth of first water, if known ______ ft.
Standing level after well completion ______ ft.

(11) WELL TESTS:
Was well test made? Yes ☐ No ☐ If yes, by whom? ______
Type of test Pump ☐ Bailer ☐ Air lift ☐
Depth to water at start of test ______ ft. At end of test ______ ft.
Discharge ______ gal/min after ______ hours Water temperature ______
Chemical analysis made? Yes ☐ No ☐ If yes, by whom? ______
Was electric log made Yes ☐ No ☐ If yes, attach copy to this report

(12) WELL LOG: Total depth 242 ft. Completed depth 218 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	29	Clay
29	36	Sand
36	107	Clay
107	165	Sand
165	174	Clay
174	177	Sand
177	199	Clay
199	206	Sand
206	242	Clay/shale and sand streaks

Addendum: Perforations
0 - 125 Blank
125 - 165 Stainless steel screen
165 - 198 Blank
198 - 208 Stainless steel screen
208 - 218 Blank

CONFIDENTIAL
NOT FOR PUBLIC RELEASE
(WATER CODE SEC. 13752)

Work started ______ 19__ Completed March 19 91

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Signed ______ , Bkkpr.
(Well Driller)
NAME Calwater Drilling Co., Inc.
(Person, firm, or corporation) (Typed or printed)
Address 300 S. Kilroy
City Turlock, Ca. ZIP 95380
License No. 321252 Date of this report 4-25-91

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill in

No. 054231

State Well No. 10/10-35

Other Well No.

Notice of Intent No.

Local Permit No. or Date

(2) LOCATION OF WELL (See instructions):

County Merced Owner's Well Number

Well address if different from above

Township Range Section

Distance from cities, roads, railroads, fences, etc.

Same as Address

WELL LOCATION SKETCH

(3) TYPE OF WORK:

New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☒
Irrigation ☐
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

(5) EQUIPMENT:

Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:

Yes ☐ X No ☐ Size birdseye
Diameter of bore 14"
Packed from 0 to 160 ft.

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ X Concrete ☐

From ft.	To ft.	Dia. in.	Gage or Wall
0	160	8"	160

(8) PERFORATIONS:

Type of perforation or size of screen

From ft.	To ft.	Slot size
80	180	1/8x3"

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 20 ft.
Were strata sealed against pollution? Yes ☒ No ☐ Interval 20 ft.
Method of sealing

(10) WATER LEVELS:

Depth of first water, if known ft.
Standing level after well completion ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? driller
Type of test Pump ☐ Bailer ☐ Air lift ☒
Depth to water at start of test ft. At end of test ft.
Discharge 200+ gal/min after hours Water temperature
Chemical analysis made? Yes ☐ No ☐ If yes, by whom?
Was electric log made? Yes ☐ No ☐ If yes, attach copy to this report

(12) WELL LOG:

Total depth 180 ft. Depth of completed well 160 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	5	top soil
5	26	clay
26	82	sand
82	114	clay
114	180	sand

Work started 4-20-80 19 Completed 4-22-80 19

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

SIGNED K. V. Herman kp (Well Driller)

NAME B & W Drilling (Person, firm or corporation) (Typed or printed)

Address 215 N. Marks, Ave.

City Fresno, Ca. Zip 93706

License No. 339912 Date of this report 4-29-80

ORIGINAL
NOT FOR PUBLIC USE
DO NOT DESTROY
WATER CODE SEC. 13752
UNCONFINED

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

Page ___ of ___
Owner's Well No. ___

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 508390

Date Work Began 2-19-97 , Ended 2-19-97
Local Permit Agency MERCED
Permit No. 96-222-R Permit Date 1-2-97

DWR USE ONLY — DO NOT FILL IN
10S/12E/4
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 40 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	5	top soil
5	8	clay
8	19	sand
19	65	clay
65	76	sand
76	110	clay
110	138	sand
138	141	clay
141	152	sand
152	159	clay
159	176	sand
176	185	clay

TOTAL DEPTH OF BORING 185 (Feet)
TOTAL DEPTH OF COMPLETED WELL 180 (Feet)

WELL OWNER

N ___
M ___
C ___ IP ___

WELL LOCATION

Address ¼ mi. so. of Henery Miller Rd SAN JUAN
City DOS PALOS
County MERCED
APN Book 85 Page 280 Parcel 004
or
Township 10s Range 12e Section 4
or
Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

___ MONITORING
WATER SUPPLY
___ Domestic
___ Public
X Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD rotaty FLUID natural

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL/ GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	60	28	x				PVC	16	SCH40	
60	180	28		x			PVC	16	sch40	.090

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	50	x			
50	185			x	5/16#2

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME ARTHUR & ORUM WELL DRILLING INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 3262 E. CONEJO AVE. CITY FRESNO, STATE CA. ZIP 93725

Signed ___ DATE SIGNED 2-20-97 C-57 LICENSE NUMBER 361319
WELL DRILLER/AUTHORIZED REPRESENTATIVE

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. E074839

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./ STATION NO. 10S/12E-22 1/2

LATITUDE LONGITUDE

APN/TRS/OTHER

Owner's Well No. HENRYMILLER8

Date Work Began 8/14/2008, Ended 9/6/2008

Local Permit Agency MERCED COUNTY

Permit No. 08-289-IR Permit Date 6/23/2008

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD REVERSE FLUID

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	5	SAND CLAY
5	20	SAND
20	32	RED WOOD & SAND
32	43	SAND
43	50	COARSE SAND & CLAY
50	58	MEDIUM COARSE SAND
58	68	SAND & CLAY
68	79	SAND MEDIUM COARSE
79	94	SANDY CLAY BROWN
94	99	MEDIUM SAND
99	106	BLUE SANDY CLAY
106	141	BROWN SANDY CLAY
141	147	BLUE SANDY CLAY
147	170	MEDIUM SAND
170	184	GRAY SANDY CLAY

TOTAL DEPTH OF BORING 184 (Feet)

TOTAL DEPTH OF COMPLETED WELL 180 (Feet)

WELL OWNER

WELL LOCATION

Address DAIRY LN & HWY 33

City MERCED CA

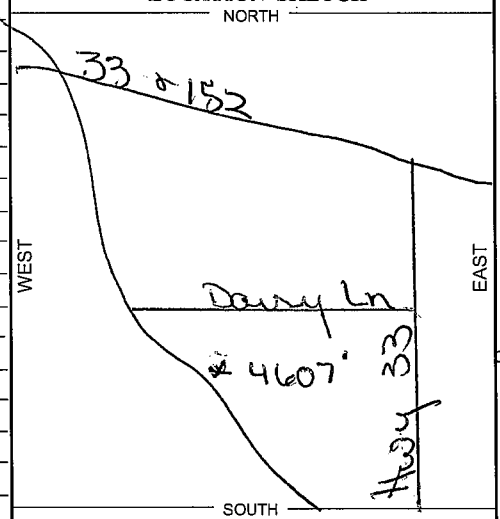
County MERCED

APN Book 085 Page 400 Parcel 031

Township 10 S Range 12 E Section 22

Latitude DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH



Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG"

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
✓ Irrigation — Industrial

— MONITORING
— TEST WELL
— CATHODIC PROTECTION
— HEAT EXCHANGE
— DIRECT PUSH
— INJECTION
— VAPOR EXTRACTION
— SPARGING
— REMEDIATION
— OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER — (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL — (Ft.) & DATE MEASURED

ESTIMATED YIELD * — (GPM) & TEST TYPE

TEST LENGTH — (Hrs.) TOTAL DRAWDOWN — (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	50	44"			✓		STEEL	34"	5/16"	
0	60	30"	✓				CERTA LOC	17.4"	1"	
60	180	30"		✓			CERTA LOC	17.4"	1"	.050

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	50	✓			SIX SACK
0	30			✓	1/4 X #10
30	40		✓		
40	184			✓	1/4 X #10

ATTACHMENTS (✓)

— Geologic Log
✓ Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME MYERS BROS. WELL DRILLING, INC. (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

8650 E. LACEY BLVD. ADDRESS HANFORD CITY CA STATE 93230-4844 ZIP

Signed [signature] WELL DRILLER/AUTHORIZED REPRESENTATIVE 09/11/08 DATE SIGNED 548214 C-57 LICENSE NUMBER

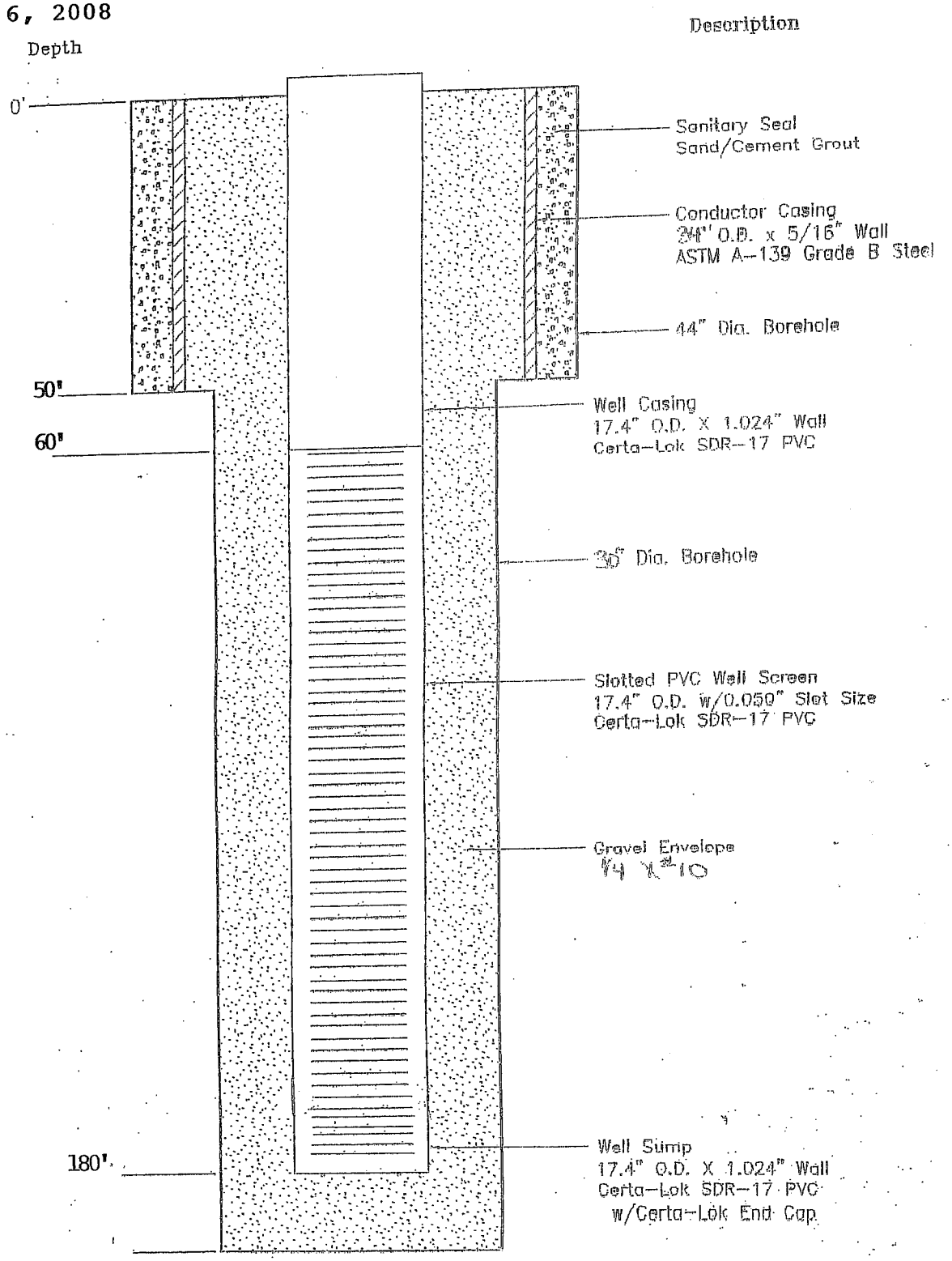
DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

105/12E-22 2/2

MYERS BROS. WELL DRILLING, INC.
8650 E. LACEY BLVD.
HANFORD, CA 93230-4844
phone (559) 582-9031 fax (559) 582-5744
License # 548214 Class C 57

HENRY MILLER REC. # 8
SEPT. 6, 2008



ORIGINAL
File with DWR

age 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. **E067194**

DWR USE ONLY — DO NOT FILL IN

11S/13E-17 — STATE WELL NO./ STATION NO.

LATITUDE — LONGITUDE

APN/TRS/OTHER

Owner's Well No. #11

Date Work Began 6/6/2008, Ended 6/12/2008

Local Permit Agency FRESNO COUNTY

Permit No. WP0028134 Permit Date 1/23/2008

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD REVERSE FLUID

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	12	BROWN CLAY
12	23	SAND
23	25	BROWN CLAY
25	38	BROWN SANDY CLAY
38	90	GRAY MEDIUM SAND
90	101	FINE SAND
101	110	MEDIUM SAND
110	114	RIVER ROCK 1 INCH
114	178	MEDIUM SAND

TOTAL DEPTH OF BORING 178 (Feet)

TOTAL DEPTH OF COMPLETED WELL 170 (Feet)

WELL OWNER

WELL LOCATION

Address VALERIA & DAVIDSON

City DOS PALOS CA

County FRESNO

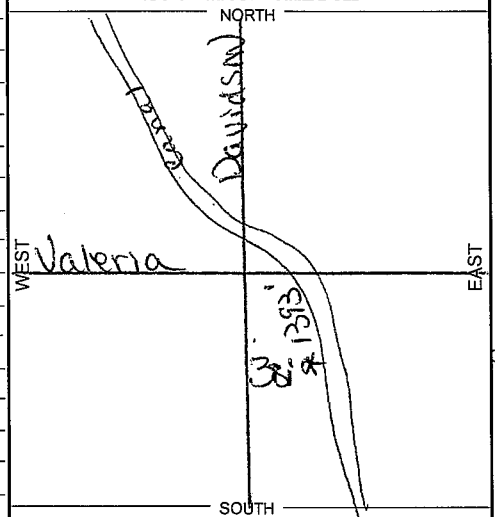
APN Book 001 Page 270 Parcel 16

Township 11 S Range 13 E Section 17

Latitude 36 DEG. 58 MIN. 669 N SEC.

120 DEG. 34 MIN. 798 W SEC.

LOCATION SKETCH



Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic — Public
✓ Irrigation — Industrial

MONITORING —
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER — (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL — (Ft.) & DATE MEASURED

ESTIMATED YIELD * — (GPM) & TEST TYPE

TEST LENGTH — (Hrs.) TOTAL DRAWDOWN — (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	30	44"			✓		STEEL	34"	5/16"	
0	60	28"	✓				CORTEN S	16"	1/4"	
60	160	28"		✓			CORTEN S	16"	1/4"	.050 FUL
160	170	28"	✓				CORTEN S	16"	1/4"	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	30	✓			SIX SACK
0	178			✓	1/4 X 8

ATTACHMENTS (✓)

— Geologic Log
✓ Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME MYERS BROS. WELL DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

8650 E. LACEY BLVD. ADDRESS — HANFORD CITY — CA STATE — 93230-4844 ZIP

Signed [signature] WELL DRILLER/AUTHORIZED REPRESENTATIVE — 06/24/08 DATE SIGNED — 548214 C-57 LICENSE NUMBER

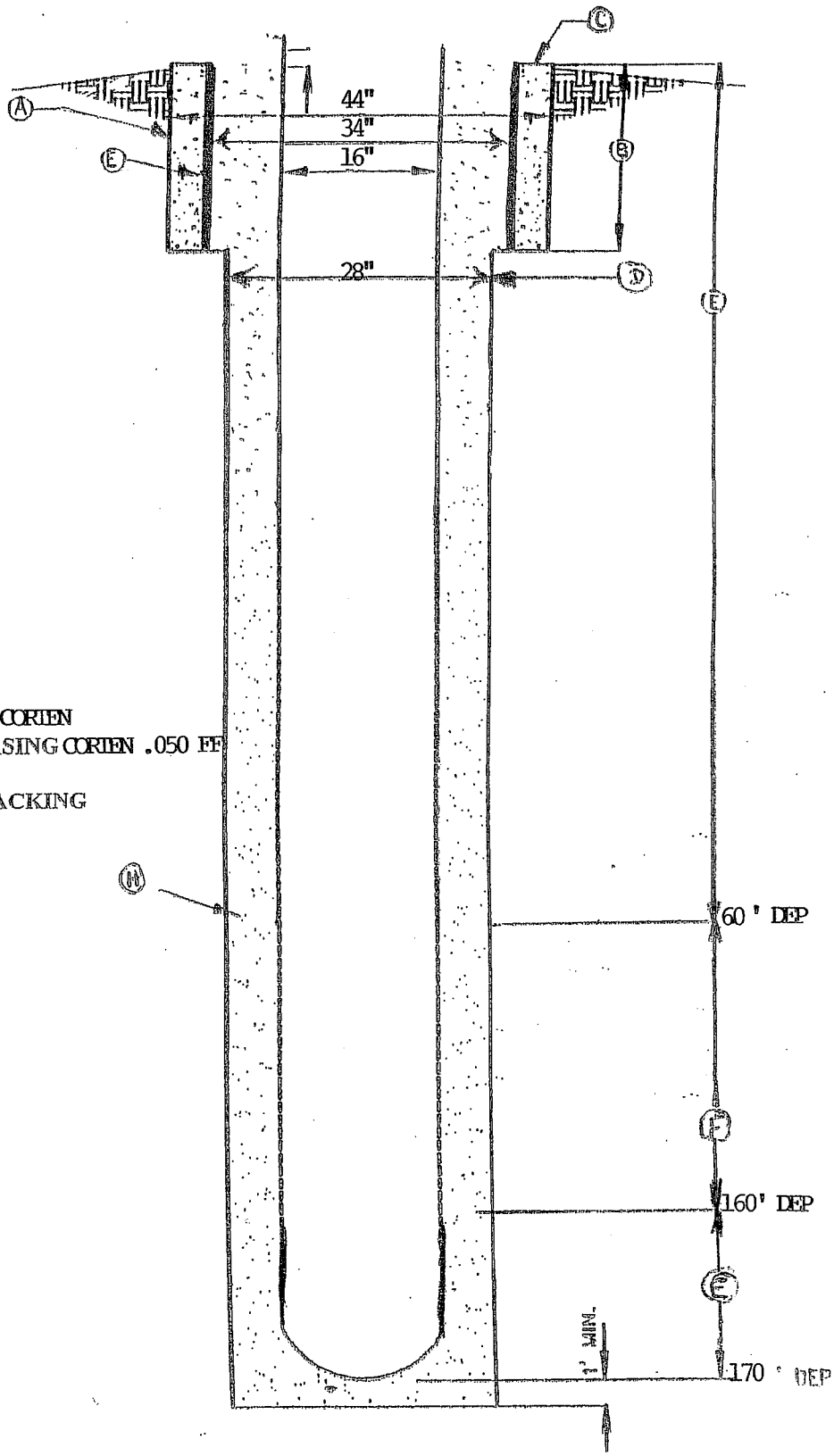
DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

0

11S/13E-17 2/2

MYERS BROS. WELL DRILLING, INC.
8650 E. LACEY BLVD.
HANFORD, CA 93230-4844
phone (559) 582-9031 fax (559) 582-5744
License # 548214



NOTES:

A. 30 L.F. 44" BORE HOLE
B. 30 L.F. 34" CONDUCTOR
C. 30 L.F. SIX SACK MIX SEAL
D. 148 L.F. 28" BORE HOLE
E. 70 L.F. 16 X ¼" BLANK CASING CORIEN
F. 100 L.F. 16 X ¼" PERFORATED CASING CORIEN .050 FF
G. L.F.
H. 178 L.F. ¼ X 8 GRAVEL FILTER PACKING

ORIGINAL
File with DWR

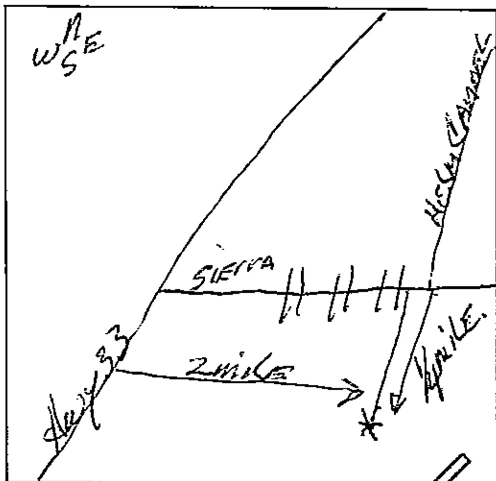
Notice of Intent No. ____________
Local Permit No. or Date ____________

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do not fill in
No. 207508
State Well No. 13/14-3
Other Well No. ____________

(1) ____________
Addr ____________
City ____________ Zip ____________

(2) **LOCATION OF WELL** (See instructions):
County Fresno Owner's Well Number 23B
Well address if different from above Main canal Firebaugh
Township ______ Range ______ Section ______
Distance from cities, roads, railroads, fences, etc. ____________



WELL LOCATION SKETCH

(3) **TYPE OF WORK:**
New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) **PROPOSED USE:**
Domestic ☐
Irrigation ☒
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

(5) **EQUIPMENT:**
Rotary ☐ Reverse ☒
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) **GRAVEL PACK:**
Yes ☒ No ☐ Size 5/16x2
Diameter of bore 34"
Packed from 0 to 205 ft.

(7) **CASING INSTALLED:**
Steel ☐ Plastic ☒ Concrete ☐

(8) **PERFORATIONS:**
Type of perforation or size of screen ____________

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	180	16"	10 Fiberglass	90'	180'	.60

(9) **WELL SEAL:**
Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 20 ft.
Were strata sealed against pollution? Yes ☐ No ☐ Interval ______ ft.
Method of sealing Cement

(10) **WATER LEVELS:**
Depth of first water, if known ______ ft.
Standing level after well completion ______ ft.

(11) **WELL TESTS:**
Was well test made? Yes ☐ No ☐ If yes, by whom? ______
Type of test Pump ☐ Bailer ☐ Air lift ☐
Depth to water at start of test ______ ft. At end of test ______ ft
Discharge ______ gal/min after ______ hours Water temperature ______
Chemical analysis made? Yes ☐ No ☐ If yes, by whom? ______
Was electric log made? Yes ☐ No ☐ If yes, attach copy to this report

(12) W...

from ft.		to ft.	
0			
3	-	17	Brown clay
17	-	23	Med coarse sand
23	-	29	Brown clay
29	-	38	Med to coarse sand
38	-	45	Coarse sand & gravel
45	-	51	Blue clay
51	-	60	Med sand
60	-	69	Coarse sand & wood
69	-	75	Blue Clay
75	-	95	Coarse sand
95	-	122	Med sand
122	-	125	Gray clay
125	-	137	Med to coarse sand
137	-	153	Blue Clay
153	-	170	Coarse sand
170	-	177	Clay & sand
177	-	182	Med SAnd
182	-	205	Blue Clay

30' gravel chute with 4" PVC

CONFIDENTIAL NOT FOR PUBLIC RELEASE WATER CODE SEC. 13752

UNCONFINED

Work started 5-21 19 87 Completed 5-22-87 19

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED ____________ (Well Driller)
NAME Myers Bros. Inc.
(Person, firm, or corporation) (Typed or printed)
Address 8650 E Lacey Blvd.
City HAnford Calif Zip 93230
License No. 280310 Date of this report 5-27-87

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

13/15-1.8

Do Not Fill In

№ 81073

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

State Well No. _____

Other Well No. 28 A

(1) _____

Nam

Addr

(2) LOCATION OF WELL:

County ~~Merced~~ FRESNO Owner's number, if any

Township, Range, and Section

Distance from cities, roads, railroads, etc. 1/2 mile South of Sierra Ave. 1/2 mile North of Bass Ave.

(3) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Destroying ☐

If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) EQUIPMENT:

Rotary ☒
Cable ☐
Other ☐

(6) CASING INSTALLED:

STEEL: OTHER:
SINGLE ☐ DOUBLE ☐

Roscoe Moss Casing

If gravel packed

From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.
0	280	16"OD	1/4	29"	80	293

Size of shoe or well ring: Bull Nose

Size of gravel: 5/16 x 4

Describe joint 10, 20, 30, joints with collars

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen Louver

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
100	275			
	100' of	4"	3/16	gravel chute

CONFIDENTIAL
Water Code Sec. 13752

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes ☒ No ☐ To what depth 80 ft.

Were any strata sealed against pollution? Yes ☒ No ☐ If yes, note depth of strata

From 0 ft. to 80 ft.

From ft. to ft.

Method of sealing 12 yards of cement

(9) WATER LEVELS:

Depth at which water was first found, if known ft.

Standing level before perforating, if known ft.

Standing level after perforating and developing ft.

(10) WELL TESTS:

Was pump test made? Yes ☐ No ☐ If yes, by whom?

Yield: gal./min. with ft. drawdown after hrs.

Temperature of water Was a chemical analysis made? Yes ☐ No ☐

Was electric log made of well? Yes ☐ No ☒ If yes, attach copy

(11) WELL LOG:

Total depth 293 ft. Depth of completed well 280 ft.

Formation: Describe by color, character, size of material, and structure

Formation	ft. to	ft.
Top Soil	0 ft to	7 ft
Clay	7 ft to	13 ft
Sand & Rock	13 ft to	20 ft
Blue Clay	20 ft to	31 ft
Coarse Sand	31 ft to	52 ft
Blue Clay	52 ft to	56 ft
Coarse Sand	56 ft to	77 ft
Blue Clay	77 ft to	91 ft
Fine Sand	91 ft to	95 ft
Blue Clay	95 ft to	97 ft
Coarse Sand	97 ft to	138 ft
Blue Clay	138 ft to	145 ft
Gravel & Coarse Sand	145 ft to	153 ft
Blue Clay	153 ft to	161 ft
Coarse Sand	161 ft to	169 ft
Blue Clay	169 ft to	171 ft
Coarse Sand	171 ft to	176 ft
Blue Clay	176 ft to	180 ft
Coarse Sand	180 ft to	189 ft
Blue Clay	189 ft to	200 ft
Coarse Sand	200 ft to	213 ft
Brn Clay	213 ft to	217 ft
Med + Sand	217 ft to	232 ft
Sandy Blue Clay	232 ft to	236 ft
Med + Sand	236 ft to	242 ft
Brn Clay	242 ft to	249 ft
Coarse Sand	249 ft to	257 ft
½ Sand & ½ Clay	257 ft to	260 ft
Coarse Sand	260 ft to	269 ft
Brn Clay	269 ft to	293 ft

0 ft to	100 ft	Blank
100 ft to	110 ft	Std. Perf
110 ft to	240 ft	Full Flow
240 ft to	250 ft	Std. Perf
250 ft to	275 ft	Full Flow
275 ft to	280 ft	Blank

Work started 6-11 19 73 Completed 6-12 19 73

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME MYERS BROTHERS, INC.
(Person, firm, or corporation) (Typed or printed)

Address 8650 E. LACEY BLVD.
HANFORD, CALIF. 93230

[SIGNED] _____
(Well Driller)

License No. 280310 Dated June 13, 1973

SKETCH LOCATION OF WELL ON REVERSE SIDE

25179-950 9-68 50M TRIP △D OSP

Well Completion Reports for GQTM Complementary Network Wells

ORIGINAL
File with DWR

7/8-12

Page ___ of ___

Owner's Well No. ___

Date Work Began June 1, 1993 Ended ___

Local Permit Agency Stanislaus Co.

Permit No. P-93-109 Permit Date ___

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 426363

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ___ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	12	Clay
12	18	gravel
18	41	Clay
41	54	Sand & gravel
54	108	Clay & shale
108	115	Gravel
115	133	Clay & shale
133	144	Sand & gravel
144	148	Clay
148	161	Gravel -tight
161	188	Clay & shale

UNCOATED

TOTAL DEPTH OF BORING 188 (Feet)

TOTAL DEPTH OF COMPLETED WELL 147 (Feet)

WELL OWNER

Name

Mailing

CITY

WELL LOCATION

Address 29030 Hwy 33

City Newman

County Stanislaus

APN Book ___ Page ___ Parcel ___

or Township ___ Range ___ Section ___

or Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WEST

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY

___ Domestic

X Public

___ Irrigation

___ Industrial

___ "TEST WELL"

___ CATHODIC PROTECTION

___ OTHER (Specify)

DRILLING METHOD Rotary FLUID water

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___

ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___

TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/ GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	127	12"	X				PVC	6"	160	
127	147	12"		X			PVC	6"	160	45/1000

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	60		X		
60	147				Sand/gravel

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Hennings Bros. Drilling Co.,Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 3525 Pelandale AVe. CITY Modesto STATE CA ZIP 95356

Signed Madeline Grady
WELL DRILLER/AUTHORIZED REPRESENTATIVE

DATE SIGNED 7-19-93

C-57 LICENSE NUMBER 290813

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR 12/14-28

Page ___ of ___

Owner's Well No. # 11

Date Work Began 6-12-91 . Ended 6-18-91

Local Permit Agency ___

Permit No. ___ Permit Date ___

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 479985

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0 2	Sandy Top Soil
2 108	Sand
108 121	Clay
121 154	Sand
154 156	Clay
156 185	Sand
185 190	Clay
190 205	Sand

TOTAL DEPTH OF BORING 205 (Feet)

TOTAL DEPTH OF COMPLETED WELL 200 (Feet)

WELL OWNER

WELL LOCATION

Address ½ Mile South of 15th St., 100' East of S St.

City Firebaugh

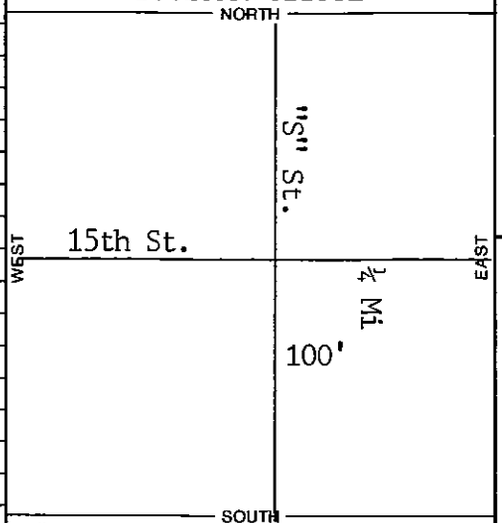
County Fresno

APN Book ___ Page ___ Parcel ___

or Township ___ Range ___ Section ___

or Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY
___ Domestic
X Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Reverse FLUID ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___

ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___

TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 165	30	X				Steel	16	5/16	
165 190	30		X			Steel	16	5/16	FulFlo .050
190 200	30	X				Steel	16	5/16	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 55	X			& Conductor
0 150	X			
150 155		X		

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Myers Bros. Well Drilling, Inc. RV 4
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

8650 E. Lacey Blvd. Hanford, CA 93230
ADDRESS CITY STATE ZIP

Signed ___ 6-20-91 548214
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

14066 Firebaugh 1/2

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0223496

Page 1 of 2

Owner's Well Number 17

Date Work Began 04/28/2014 Date Work Ended 6/20/2014

Local Permit Agency N/A

Permit Number N/A Permit Date

DWR Use Only – Do Not Fill In

12S/14E+28

State Well Number/Site Number

N Latitude W Longitude

APN/TRS/Other

Geologic Log

Orientation ⦿ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Reverse Circulation Rotary Drilling Fluid Bentonite mud

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0	40	Clay, Sand
40	50	Sand, Gravel, Cobbles
50	60	Sand, Cobbles
60	70	Sand, Gravel, Cobbles
70	110	Caly, Sand, Gravel
110	120	Sand, Cobbles
120	130	Sand, Gravel, Cobbles
130	170	Sand, Gravel
170	200	Clay, Sand
200	210	Sand
210	220	Clay, Sand
220	230	Clay

Total Depth of Boring 220 Feet

Total Depth of Completed Well 215 Feet

Well Location

Address East of Vasquez Dr. / North of Riverlane

City Firebaugh County Fresno

Latitude 36 Deg. 51 Min. 15 Sec. N Longitude 120 Deg. 26 Min. 30 Sec. W

Datum Dec. Lat. Dec. Long.

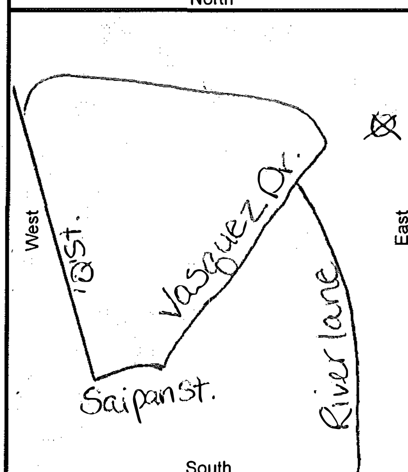
APN Book Page Parcel

Township 12S Range 14E Section 28

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North



South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

⦿ New Well
○ Modification/Repair
○ Deepen
○ Other
○ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

⦿ Water Supply
☐ Domestic ☑ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level 31 (Feet) Date Measured 07/15/2014

Estimated Yield * 1,500 (GPM) Test Type Constant Rate

Test Length 24.0 (Hours) Total Drawdown 66 (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	40	40	Conductor	Low Carbon Steel	.375	30		
0	130	28	GravelTube	Sch. 40 Steel		3		
0	138	28	SoundTube	Sch. 40 Steel		2		
0	140	28	Blank	Carbon Steel	.375	16		
140	185	28	Screen	304 S.S. FulFlo	.312	16	Louver	0.045
185	200	28	Blank	Carbon Steel	.375	16		

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	40	Cement	11 Sack
0	120	Cement	11 Sack
120	125	Fill	Fine Sand
125	220	Filter Pack	8x20 Premier

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Zim Industries, Inc.
Person, Firm or Corporation

4545 E. Lincoln Ave Fresno CA 93725
Address City State Zip

Signed [signature] 7/25/14 440537
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR 12/18-29

Page ___ of ___

Owner's Well No. ___

Date Work Began 1/3/94 . Ended 1/6/94

Local Permit Agency ___

Permit No. ___ Permit Date ___

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 567005

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ___ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	8	Sandy loam soil
8	71	Coarse Gray Sand
71	88	soft blue clay
88	161	coarse gray sand
161	166	sand and clay
166	177	coarse gray sand
177	183	sand and clay
183	190	soft blue clay
190		stopped drilling

UNCONFIRMED

TOTAL DEPTH OF BORING 190 (Feet)

TOTAL DEPTH OF COMPLETED WELL 180 (Feet)

WELL OWNER

WELL LOCATION

Address "S" Street & 15th Street

City Firebaugh

County Fresno

APN Book ___ Page ___ Parcel ___

or Township ___ Range ___ Section ___

or Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH

75' East of "S" Street

1/8 mile South of 15th Street

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY

___ Domestic

XX Public

___ Irrigation

___ Industrial

___ "TEST WELL"

___ CATHODIC PROTECTION

___ OTHER (Specify)

DRILLING METHOD Reverse Circulation FLUID Water

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 27' (Ft.) & DATE MEASURED 2/2/94

ESTIMATED YIELD* 2500 (GPM) & TEST TYPE Gear Head

TEST LENGTH 16 (Hrs.) TOTAL DRAWDOWN 75 (Ft.)

* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	60	42"			X		steel	36"	5/16	none
0	155	32"	X				steel	16"	5/16	none
155	180	32"		X			steel	16"	5/16	.60

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	80	X			
80	180			X	4/16 gravel

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME SETH ABAJIAN WELL DRILLING
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 891 SO GOLDEN STATE BLVD CITY SELMA STATE CA ZIP 93662

Signed Anthony D Knecht
(WELL DRILLER/AUTHORIZED REPRESENTATIVE)

DATE SIGNED 2-11-94

C-57 LICENSE NUMBER 425883

DWR 188 REV 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL

File with DWR

Notice of Intent No.

Local Permit No. or Date

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill in

No. 143530

State Well No. 13/15-19 92

Other Well No. #2

(2) LOCATION OF WELL (See instructions):

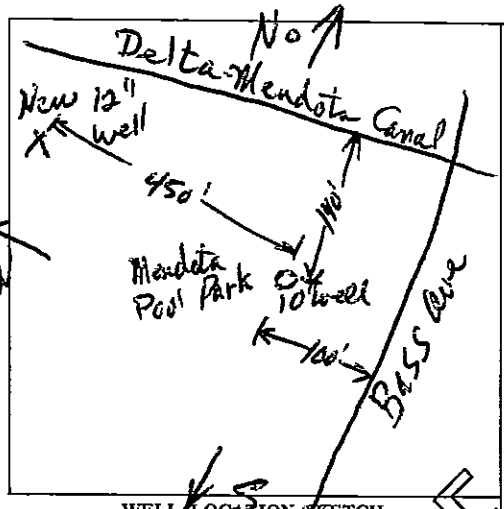
County Fresno Owner's Well Number

Well address if different from above Mendota Pool Park

Township 13S Range 15E Section 19

Distance from cities, roads, railroads, fences, etc.

450' west of 10" well



(3) TYPE OF WORK:

New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☐
Irrigation ☐
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☒
Other ☐

(5) EQUIPMENT:

Rotary ☒ Reverse ☒
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:

Yes ☒ No ☐ Size 1/8"-3/16" (Birdseye)
Diameter of bore 24"
Packed from 0 to 200 ft.

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ Concrete ☐

From ft.	To ft.	Dia. in.	Gage or Wall
0	200	12	Sch. 160

(8) PERFORATIONS:

Type of perforation or size of screen: Sawed slots

From ft.	To ft.	Slot size
140	200	1/8"x6"

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 50 ft.
Were strata sealed against pollution? Yes ☐ No ☐ Interval ft.
Method of sealing Neat cement

(10) WATER LEVELS:

Depth of first water, if known 20 ft.
Standing level after well completion 20 ft.

(11) WELL TESTS:

Was well test made? Yes ☐ No ☐ If yes, by whom? Airlifted approx. 300 gpm w/26' of drawdown
Type of test Pump ☐ Bailer ☐ Air lift ☐
Depth to water at start of test ft. At end of test ft.
Discharge gal/min after hours Water temperature
Chemical analysis made? Yes ☐ No ☒ If yes, by whom?
Was electric log made? Yes ☐ No ☒ If yes, attach copy to this report

(12) WELL LOG:

Total depth 210 ft. Depth of completed well 200 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	6	Top soil
6	11	Sand
11	32	Clay
32	36	Sand
36	47	Clay
47	73	Sand
73	95	Clay
95	109	Sand
109	128	Clay
128	135	Sand
135	149	Clay
149	161	Sand
161	168	Clay
168	183	Sand
183	188	Clay
188	204	Sand
204	210	Clay

Work started 7/20/79 19 Completed 7/20/79 19

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED Bill Belknap vh (Well Driller)

NAME Bill Belknap FA- (Person, firm, or corporation) (Typed or printed)

Address P. O. Box 846

City Reedley, California Zip 93654

License No. 106833 Date of this report 7/31/79

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

NOT FINAL
NOT FOR PUBLIC USE
WATER CODE SEC. 13752
UNCONFINED