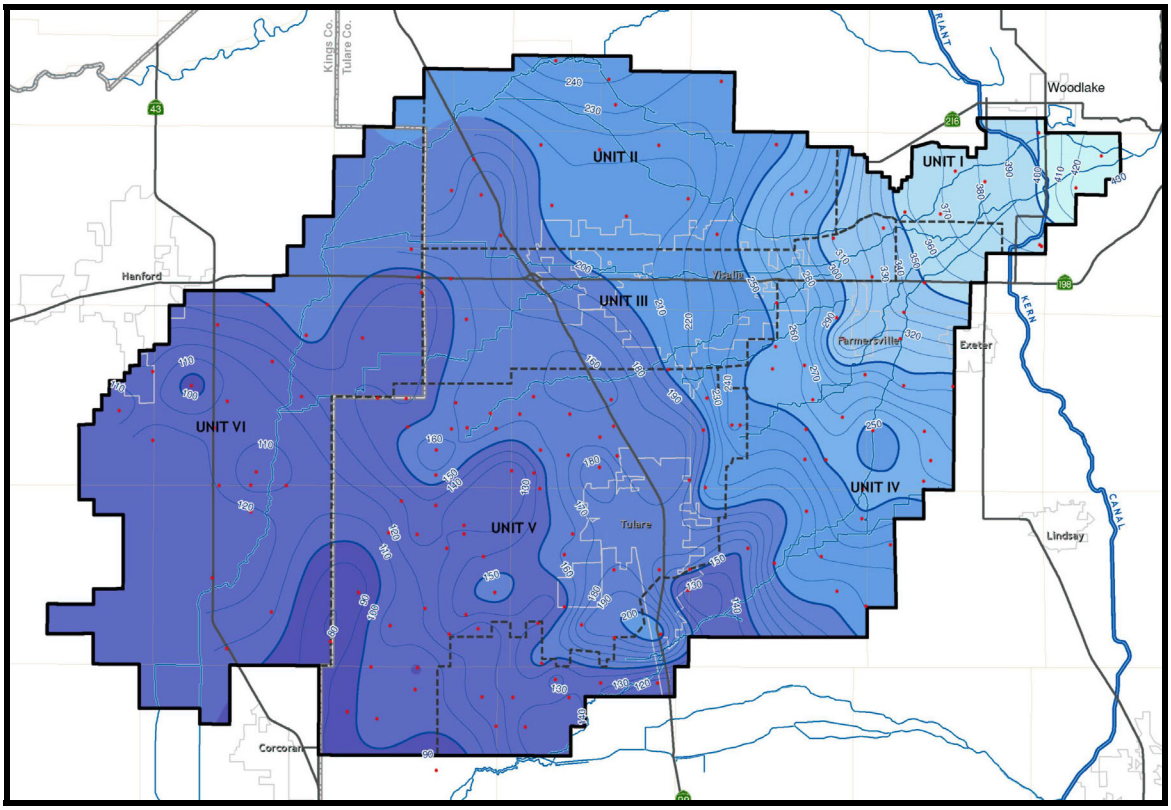
EXHIBIT 3.3

KAWEAH DELTA
Water Conservation
DISTRICT



GROUNDWATER MANAGEMENT PLAN

(Updated: November 7, 2006)

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SECTION 1: INTRODUCTION

1.1 Overview

On July 5, 1995, the Kaweah Delta Water Conservation District (District) formally adopted the District's Groundwater Management Plan (Plan). The Plan allows the District to manage groundwater on a local basis in lieu of a mandated plan administered by the State of California Department of Water Resources. The District has long recognized groundwater as an important resource to the area and the Plan gives the District the authority to engage in specific activities, which are beneficial to the groundwater basin within the Plan area.

The Plan was originally prepared and implemented by the District in response to 1992 state legislation AB 3030. Since the establishment of the District's Plan, more recent state legislation SB 1938, current California Water Code interpretation and discussions within the Department of Water Resource's Bulletin 118 led the District to reevaluate the Plan and its components. This document, therefore, is an update of the Kaweah Delta Water Conservation District's 1995 Groundwater Management Plan.

1.2 Plan Authority

The District is an authorized groundwater management agency within the meaning of California Water Code (CWC) § 10753[1](b) and by the establishment of the Plan. The Plan does not conflict with existing groundwater ordinances and groundwater management plans and the District continues to endeavor to coordinate Plan elements with other local agencies that have adopted rules and regulations to implement and enforce their own AB255, or AB 3030 plans as required by CWC § 10753.9(a).

1.3 Background

AB 3030 provided an opportunity for the District to prepare and implement a Groundwater Management Plan. While the legislation allows for separate plans to be developed by each public agency with jurisdiction over water, a well-conceived Plan covering the entire District offers improved management and benefit capabilities for all agencies within the plan area.

The availability of groundwater to serve community and agricultural needs can be impacted by activities that take place a considerable distance beyond local boundaries. There is considerable common use of the

[1] CWC § 10753(b). Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area.

groundwater resource and this coordinated Plan has been and will continue being a benefit to competing interests using the groundwater resource. This coordination is accomplished through the development of a Memorandum of Understanding (MOU) between the District and other local agencies within the plan area along with a periodic meeting of the MOU participants.

The Plan covers all of the land within the boundary of the District. Any local agency, as that term is defined by Government Code section 10752(g), can exclude the land within its boundary from being covered by the Plan by choosing not to be included in the Plan. Accordingly, the Plan covers all land within the boundary of the District, less that land within the boundaries of local agencies which elect not to participate in the Plan or which may opt out of the Plan (hereinafter the "Plan Area").

1.4 Purpose and Goals

The Plan recognizes that the conjunctive management of water supplies within the Plan Area must be continued. Achieving hydrologic equilibrium requires the management of both surface and groundwater supplies. Maintaining this balance will be the principal benefit to be derived from the Plan. Retaining all existing surface and groundwater supplies within the Plan Area is critical to maintaining this delicate balance.

The Groundwater Management Plan is also a vital element within the District's Integrated Regional Water Management Plan (IRWMP). The Plan provides the organizational foundation for the operation of the IRWMP. Many of the Plan's primary elements are used in carrying out the purpose of the IRWMP. Shared elements between the Plan and IRWMP include;

- ✓ Participation
- ✓ Regional Coverage
- ✓ Regional Objectives
- ✓ Water Management Strategies
- ✓ Integration
- ✓ Project Prioritization

The principal actions called for by the Plan will be gathering and evaluating data concerning the quantity of groundwater. Actions have been and will continue to be developed to enhance the valuable groundwater resource by promoting those measures necessary to reduce the long-term groundwater level decline in the Plan Area. Many of the actions identified are currently being conducted. Other actions will require further study prior to implementation.

Adherence to Plan objectives and procedures will avoid and reduce duplication of activities by local jurisdictions. Additionally, plan elements can be utilized by all the agencies within the Plan Area in long-term planning activities. The Plan is designed to be flexible, allowing updates to be made as needed, based principally on the additional information that is gathered through the monitoring programs.

1.5 Plan Area

The District is located on the alluvial fan of the Kaweah River. This alluvial fan extends approximately 40 miles in a southwesterly direction, commencing in the foothills of the Sierra Nevada range on the east and continuing to near the central axis of the San Joaquin Valley in the vicinity of the east bed edge of Tulare Lake. The north and the northwest boundaries of the District generally abut the service area of the Kings River. The south boundary of the District generally abuts the service area of the Tule River.

The District's Plan includes those areas overlying the groundwater basin or associated groundwater sub-basins within the District. Those areas of the San Joaquin Valley Groundwater Basin resources located within the District include portions of the Kaweah, Kings, Tule and Tulare Lake groundwater sub-basins. These sub-basins are shown on Plate 1.

The District's Plan Area is presented on Plate 2. Areas managed under existing Groundwater Management Plans by local agencies that are excluded by agreement from this Plan include areas within the borders of the Corcoran Irrigation District and specific lands managed under the Tulare Lake Bed Coordinated Groundwater Management Plan (TLBCGMP).

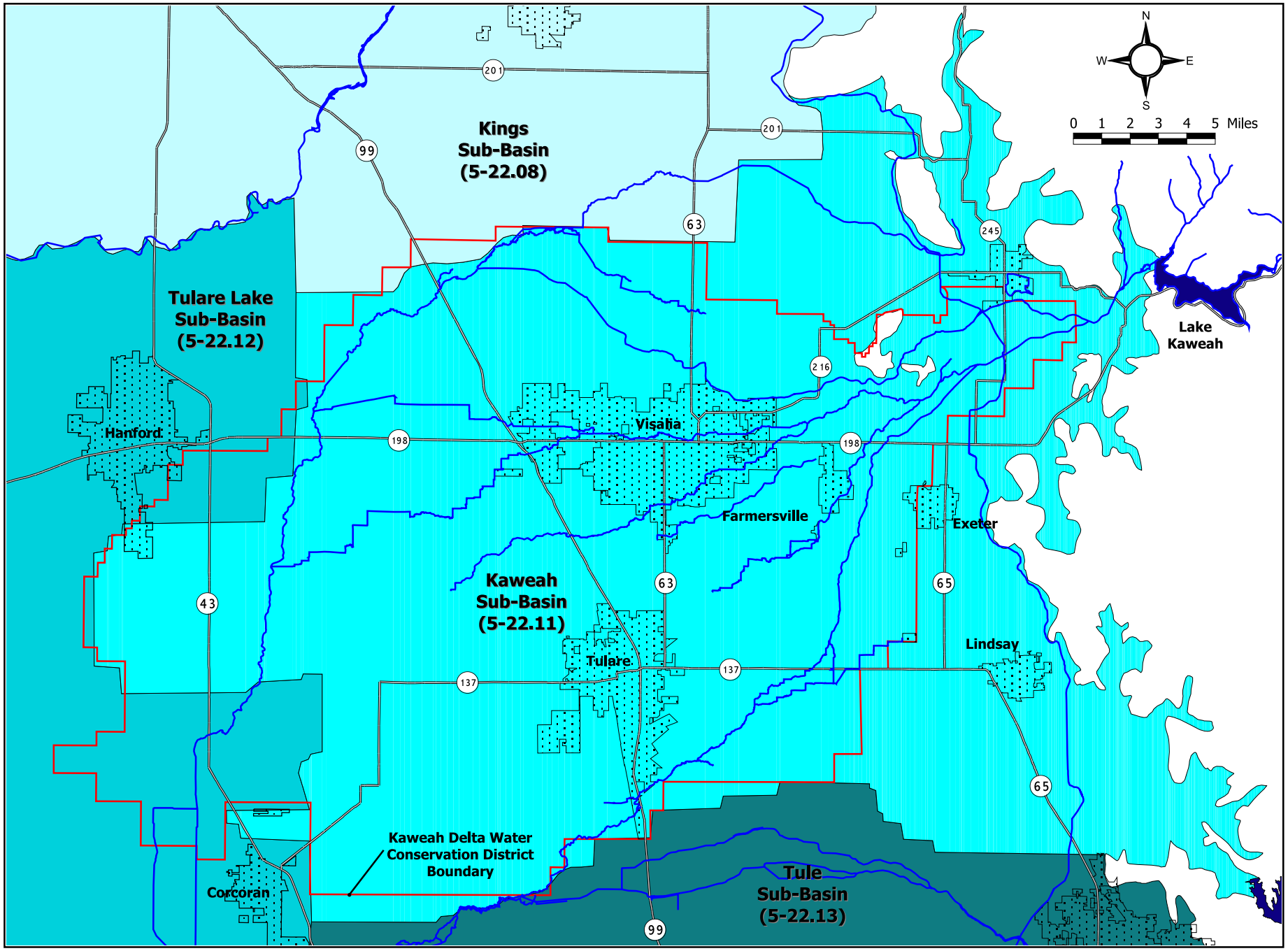


Plate No. 1 : Groundwater Sub-Basins

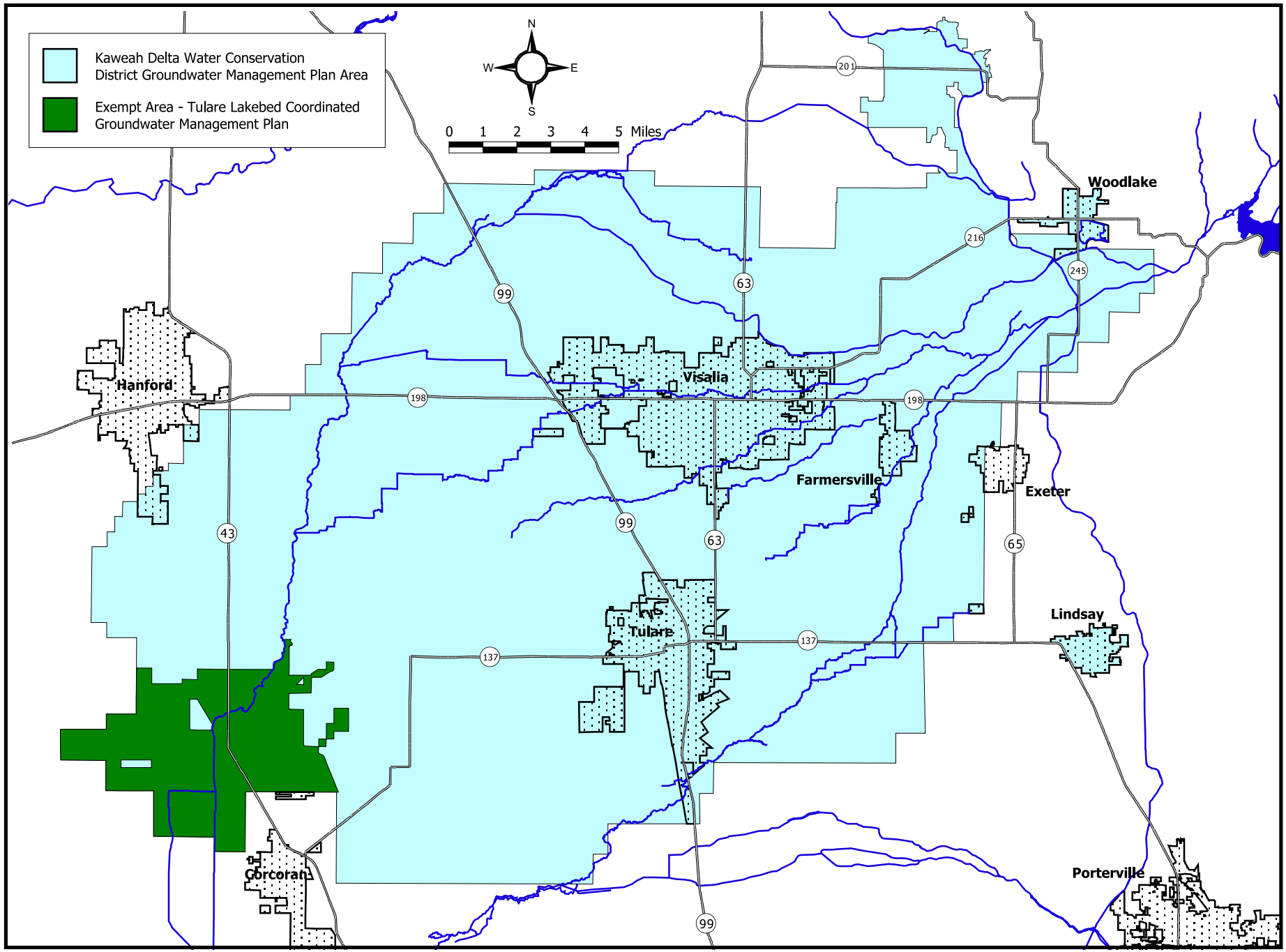


Plate No. 2 : Groundwater Management Plan Area

The District's Plan Area contains multiple local agencies that provide various types of water services. Those local agencies that have been included as stakeholders through the execution of a *Memorandum of Understanding (MOU)* are shown on Plate 3. The list of current stakeholders covered under a MOU is provided below in Table 1.

TABLE 1
PLAN STAKEHOLDERS

California Water Service Company	Kings County Water District (*AB 3030 Plan*)
City of Farmersville	Lakeside Ditch Company
City of Lindsay	Lakeside Irrigation Water District
City of Tulare	St. Johns Water District
City of Visalia	Stone Corral Irrigation District
City of Woodlake	Tulare Irrigation District (*AB 255 Plan*)
Consolidated Peoples Ditch Company	Ivanhoe Irrigation District

1.6 Management Plan Components

The District's Plan includes the following required and recommended components:

- ✓ CWC § 10753.7 (four mandatory components). Recent amendments to the CWC at § 10750 et seq. require a Groundwater Management Plans (GMP) to include several components to be eligible for award of funding administered by the Department of Water Resources (DWR) for the implementation of groundwater related studies, construction of groundwater projects and groundwater quality projects. These amendments to the CWC were included in Senate Bill 1938, effective January 1, 2003.
- ✓ CWC § 10753.8 (12 optional components). CWC § 10753.8 includes 12 specific technical issues that could be addressed in GMPs to manage the basin optimally and protect against adverse conditions.
- ✓ DWR Bulletin 118-2003, Appendix C (six recommended components). The recent 2003 update to the Department of Water Resource's Bulletin 118, *California's Groundwater*, includes discussion of required and recommended components of Local Groundwater Management Plans. Review of the material results in identifying components that are not included in CWC § 10750 et seq.

Table 2 summarizes the required and recommended components of an AB 3030 plan developed pursuant to current State guidance and the appropriate section of the District's Plan where each component is addressed.

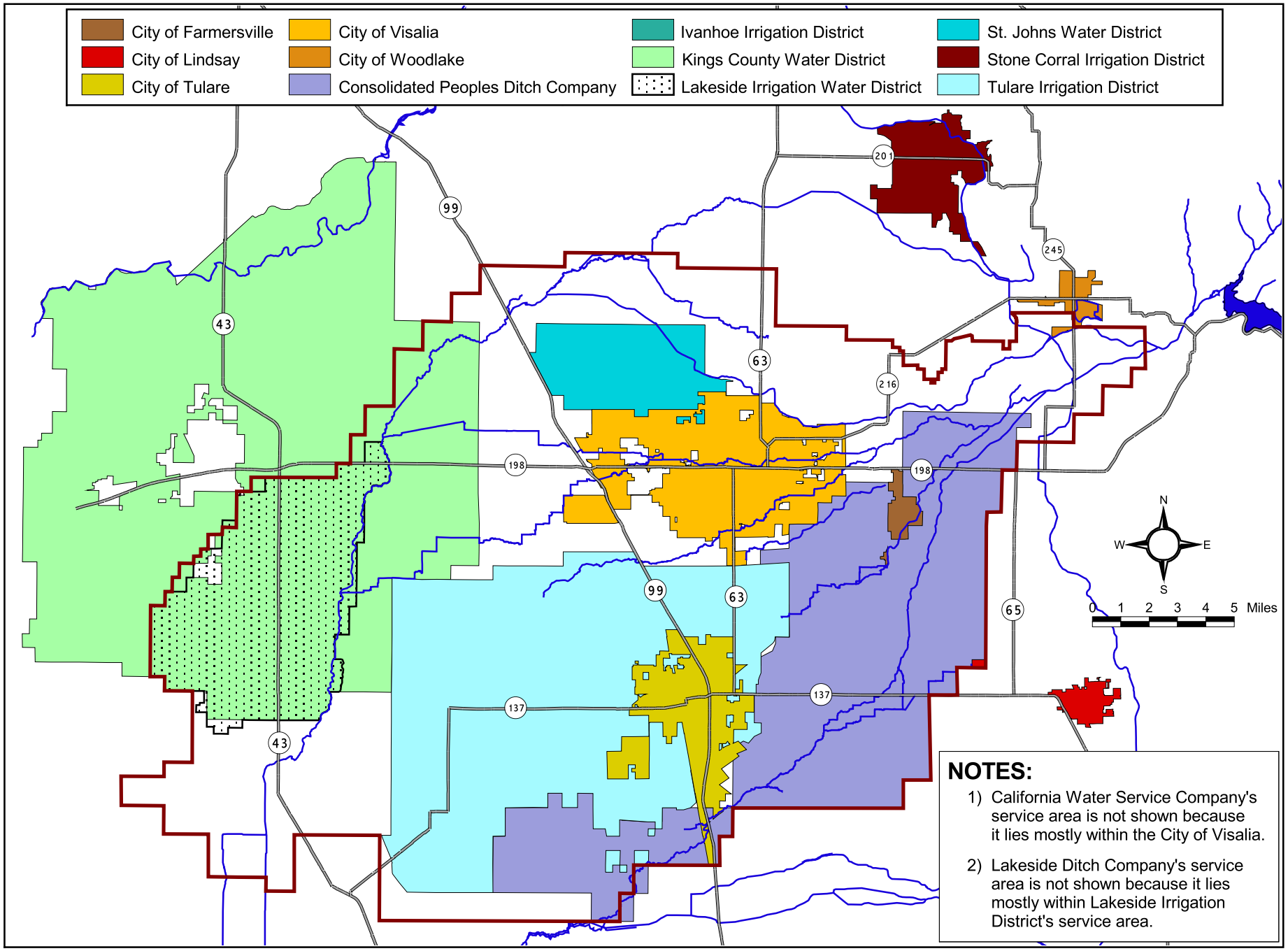


Plate No. 3 : Plan Participants

TABLE 2
GROUNDWATER MANAGEMENT PLAN COMPONENTS

Plan Component Description	District Plan Section
Mandatory Plan Components (CWC § 10753.7(a))	
(1) Basin Management Objectives	3.2
(2) Other Agency Involvement	3.6
(3) Plan Map	1.4
(4) Monitoring Protocols	3.3.5
Optional Plan Components (CWC § 10753.8)	
(a) Saline Water Intrusion	3.4.3
(b) Wellhead Protection	3.4.2
(c) Migration of Contaminated Water	3.4.4
(d) Well Abandonment	3.4.1
(e) Overdraft Mitigation	3.5.2
(f) Groundwater Replenishment	3.5.1
(g) Groundwater Monitoring	3.3.1
(h) Conjunctive Use	3.5.3
(i) Well Construction Policies	3.4.5
(j) Operation of Facilities	3.5.1.4
(k) Relationships with other agencies	3.6.3
(l) Land Use Planning	3.7.1
Recommended Plan Components (BU 118-2003, Appendix C)	
✓ Stakeholder Advisory Committee	3.6.2
✓ Plan Area Description	2.1 – 2.7
✓ Management Objectives Contributions	3.2
✓ Monitoring Program Description	3.3
✓ Periodic Groundwater Reports	3.7.3
✓ Periodic Plan Re-evaluation	3.7.4

SECTION 2: BASIN CONDITIONS

2.1 The District

The District was formed under the provisions of the Water Conservation District Act of 1927 for the purpose of doing those things authorized by the Act. The District, includes lands in both Tulare County and Kings County. The boundary is shown on Plate 4, which also shows hydrologic units established in the District. The total area of the District is about 340,000 acres, with approximately 257,000 acres located in the westerly portion of Tulare County and the balance, or about 83,000 acres, in the northeasterly corner of Kings County.

The lands within the District are used for agricultural purposes, although the cities of Visalia and Tulare constitute significant areas of urbanization. Other communities include Farmersville, Exeter, Goshen, Ivanhoe, Waukena and Guernsey.

2.2 Climate

The area is semi-arid with mild winters and hot, dry summers. The average rainfall, based on District records, is approximately 11 inches per year. Distribution of such rainfall varies from 13 inches on the eastern portions of the District to 7 inches on the western portions. The majority of this rainfall occurs from November through April. With the long, hot summers that normally occur in the valley, there is a potential for about five feet of water that evaporates per year, with the majority of that evaporation occurring during the period from April through October.

Rainfall in the District occurs primarily in the winter months, with virtually no rainfall in the summer months. Annual crop use per acre averages several times the amount of average precipitation. As a result, agricultural crops grown within the District are heavily dependent upon irrigation from surface water deliveries and groundwater pumping, with water needs only partially satisfied by rainfall.

2.3 Land Use

The cropping patterns within the District vary with changes in agricultural economics. In 1981, approximately 77% of the irrigated land was planted in row crops, 20% in permanent plantings and 3% in pasture. In 1999, approximately 71% of the irrigated land was in row crops, 28 % in permanent plantings and 1% in pasture. A tabulation of the land utilization for 1981 and 1999 as compiled in the Final Report (2003) of Water Resources Investigation of the Kaweah Delta Water Conservation District is presented in Table 3.

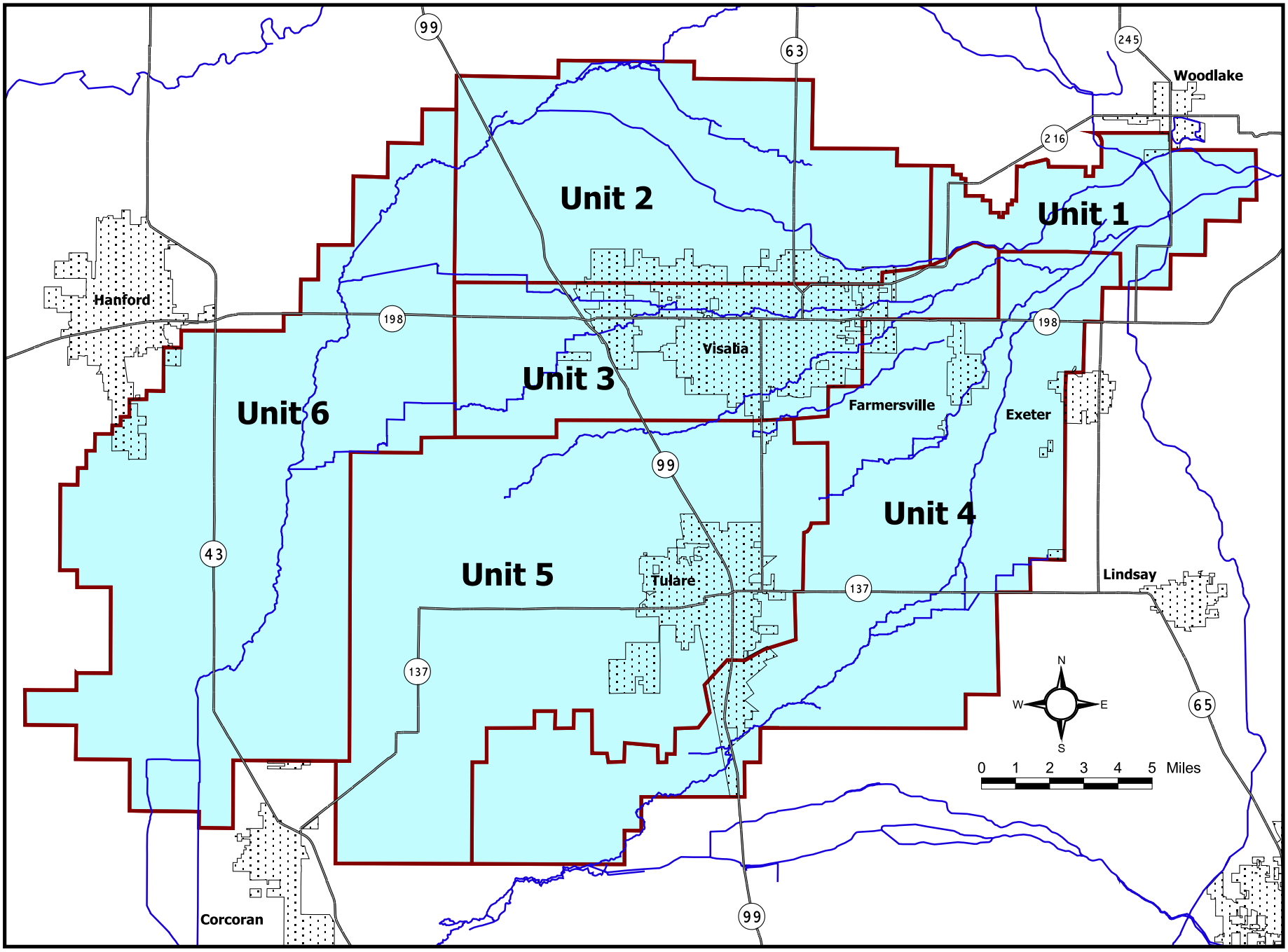


Plate No. 4 : Hydrologic Units

TABLE 3
DISTRICT SUMMARY OF LAND UTILIZATION

(Values in Acres)

Category of Land Use	1981	1990	1999
Irrigated			
Cotton	94,229	93,765	62,295
Alfalfa	33,977	41,257	38,923
Grain	65,062	65,960	87,927
Deciduous and Nuts	36,502	39,262	44,540
Pasture	8,873	4,005	2,954
Miscellaneous Field	2,911	1,053	510
Sugar Beets	1,869	1,100	900
Grapes	9,187	7,492	29,796
Citrus	6,337	6,587	7,184
Rice	313	31	0
Truck	3,995	5,494	10,872
Subtotal, Irrigated	**263,255**	**266,006**	**285,901**
Nonirrigated			
Farmsteads, Dairies, Feed Lots	21,352	29,797	29,508
Urban, Commercial and Industrial	10,397	10,156	13,136
Idle (Fallow)	13,923	7,634	6,958
Roads, Channel and Canals	2,045	3,386	2,433
Undeveloped	28,833	23,047	2,115
Unknown	246	25	0
Sub-total, Nonirrigated	**76,796**	**74,045**	**54,150**
TOTAL	**340,051**	**340,051**	**340,051**

Reference: Water Resources Investigation of the Kaweah Delta Water Conservation District (Final Report 2003)

2.4 Surface Water Hydrology

The majority of the watershed area for the Kaweah River is in the high Sierra Nevada Mountains, which experiences heavy snowfall during most winter months. During the spring and summer months, the snow melts to form tributaries of the Kaweah River. In normal years, the Kaweah River does not reach its highest stage until the middle of May or early June. For the last fifty years, the average annual runoff for the Kaweah River has been 454,295 acre-feet. Average runoff is not the runoff experienced every year. There are great variations in the flows of the Kaweah River, not only from year to year, but also from month to month. Historically, there have been alternating periods of flood and drought in the discharge

area of the Kaweah River, which have been greatly curtailed since 1961 with the completion and operation of Terminus Dam.

In addition to the Kaweah River runoff and rainfall, water enters the District by of way canals from the Kings River and smaller tributary streams such as Dry Creek and Yokohl Creek. Water is also often imported into the District from the Central Valley Project.

At McKay Point, a significant geographical feature immediately to the east of the eastern District boundary and about 1 ½ miles west of the community of Lemon Cove, the Kaweah River divides into the St. Johns River and Lower Kaweah River. Water then enters the District in these two channels. Within the District, these branches continue to divide into both natural and manmade distributaries forming the Kaweah Delta. Included in Section 3.3 of this Plan is Plate No. 16 “Kaweah Watercourses” that displays the extent of the surface water conveyance systems throughout the District.

Numerous public and private entities within the District divert surface water from the Kaweah River and its distributaries. About 250,000 acres within the District have access to surface water supplies from the rivers system. Because of the erratic nature of flows in the Kaweah River, which vary substantially in magnitude from month to month and year to year, nearly all these lands must satisfy supplemental water needs from groundwater. Note that all municipal and industrial uses within the District are supplied exclusively from groundwater.

Terminus Dam and Reservoir, located on the Kaweah River about 3 ½ miles to the east of the District, was completed in 1962 by the U.S. Army Corps of Engineers. This project was constructed mainly for flood control purposes and to provide storage for irrigation waters. The dam is an earth fill structure with a controlled outlet capacity of up to 8,900 cfs. The reservoir space available for conservation and irrigation re-regulation is about 183,000 acre-feet. The District presently has contracts with the United States for the repayment of operation and maintenance costs allocated to flood control and irrigation re-regulation space purposes. The District is the sole entity that holds the contracts for all the conservation and irrigation storage space in the reservoir.

The Friant-Kern Canal, a feature of the Federal Central Valley Project (hereinafter "CVP"), traverses the easterly portion of the District. San Joaquin River water is delivered to certain lands within the Plan Area via this facility. Both the Tulare Irrigation District and Ivanhoe Irrigation District which lie entirely within the Plan Area, obtain water from the Friant-Kern Canal as they have a long-term contract with the Bureau of Reclamation for CVP water. Although the Tulare Irrigation District and Ivanhoe Irrigation District are

the only entities fully within the Plan Area with such a Friant Division contract, the District itself, as well as other entities therein, has historically received substantial quantities of CVP water from time to time through temporary and surplus water service contracts. This water was either percolated or used to offset groundwater extraction. Other special districts located partially within or adjacent to the Plan Area, such as Exeter Irrigation District and Lindmore Irrigation District, also have long-term Friant Division contracts for CVP water.

In common with other areas along the east side of the San Joaquin Valley, the District historically has experienced the anomaly of flood control problems coupled with water deficiency. From time to time, flows in the Kaweah River have reached damaging levels, with substantial volumes of water escaping their channel banks to flood valuable agricultural lands within the District. Even with capture of some of the water associated with these high flood flow events, water supplies are insufficient to meet demands. This is demonstrated in groundwater level declines in all but the eastern portions of the District.

2.5 Hydrogeology

Most of the lands in the District are contained within the Kaweah subbasin of the San Joaquin Valley Groundwater Basin. The San Joaquin Valley Groundwater Basin is surrounded on the west by the Coast Range, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta utilizing the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne and Stanislaus Rivers. The Kings, Kaweah, Tule and Kern Rivers that flow toward the trough of the Tulare drainage basin, which includes the beds of the former Tulare, Buena Vista and Kern Lakes, internally drain the southern portion of the valley.

The Kaweah subbasin lies between the Kings Groundwater Subbasin on the north, the Tule Groundwater Subbasin on the south, crystalline bedrock of the Sierra Nevada foothills on the east and the Tulare Lake subbasin on the west. The subbasin is generally comprised of lands in the Kaweah Delta Water Conservation District. Major rivers and streams in the subbasin include the Lower Kaweah and St. Johns Rivers. The Kaweah River is considered a primary surface water source for groundwater recharge to the area.

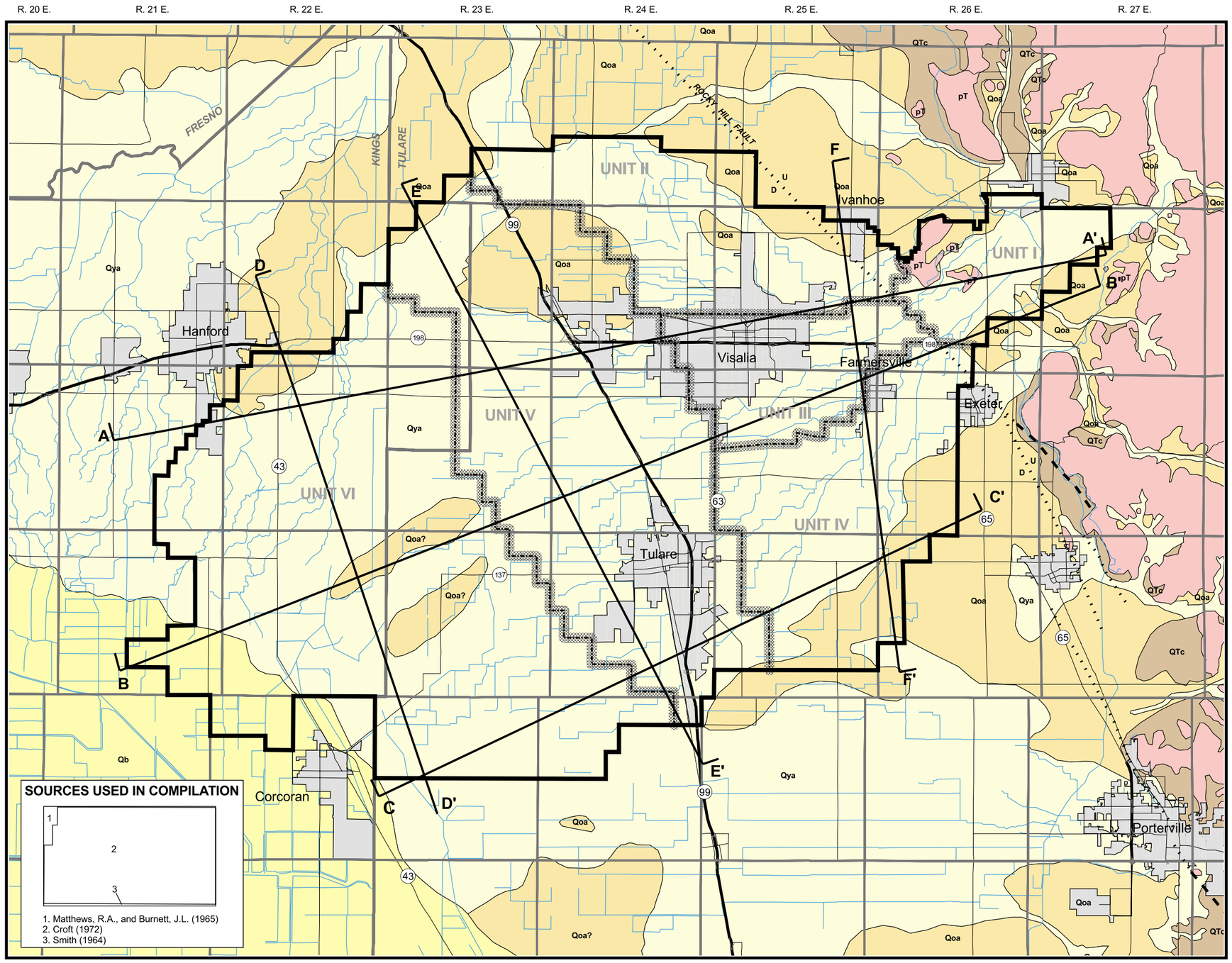
The sediments that comprise the Kaweah Subbasin aquifers are unconsolidated deposits of Pliocene, Pleistocene and Holocene age. On the east side of the subbasin, these deposits consist of arkosic material derived from the Sierra Nevada and are divided into three stratigraphic units: continental deposits, older alluvium and younger alluvium. In the western portion of the subbasin, near Tulare Lake bed,

unconsolidated deposits consisting of flood-subbasin and lacustrine and marsh deposits interfinger with east-side deposits.

The continental deposits of Pliocene and Pleistocene age are divided into oxidized and reduced deposits based on depositional environment. The oxidized deposits, which crop out along the eastern margin of the valley, consist of deeply weathered, poorly permeable, reddish-brown sandy silt and clay with well-developed soil profiles. The reduced deposits are moderately permeable and consist of micaceous sand, silt and clay that extend across the trough in the subsurface to the west side of the valley.

Older alluvium, which overlies the continental deposits, is moderately to highly permeable and is the major aquifer in the subbasin. Younger alluvium consists of arkosic beds, moderately to highly permeable consisting of sand and silty sand. Flood-basin deposits consist of poorly permeable silt, clay and fine sand. Groundwater in the flood-basin deposits is often of poor quality. Lacustrine and marsh deposits consist of blue, green, or gray silty clay and fine sand and underlie the flood-subbasin deposits. Clay beds of the lacustrine and marsh deposits form aquitards that control the vertical and lateral movement of groundwater. The most prominent clay bed is the Corcoran Clay, which underlies the western half of the Kaweah Subbasin at depths ranging from about 200 to 500 feet (DWR 1981). In the eastern portion of the subbasin, groundwater occurs under unconfined and semi-confined conditions. In the western half of the subbasin, where the Corcoran Clay is present, groundwater is primarily confined below the Corcoran Clay.

The geology of the District and surrounding areas is depicted on Plate 5. The associated geologic legend is depicted in Plate 12. Plates 6 through 11 illustrate this geology in cross section.



Legend

- District Boundary
- Hydrologic Unit Boundary
- Cross Section Location
- County Line
- Township and Range Lines
- Streams
- Urban Areas
- Fault--dashed where inferred, dotted where concealed; U, upthrown side; D, downthrown side

Projection: California State Plane, Zone 4. NAD83, Feet

UNCONSOLIDATED DEPOSITS

WEST SIDE (Coast Ranges Provenance)

- QTa Alluvium, undifferentiated (Pliocene to Holocene)

EAST SIDE (Sierra Nevada Provenance)

- Qb Flood basin deposits (Holocene)
- Qya Younger alluvium (Holocene)
- Qoa Older alluvium (Pleistocene and Holocene (?))
- QTl Lacustrine and marsh deposits (Pliocene and Pleistocene)
- QTc Continental deposits (Pliocene and Pleistocene(?))

CONSOLIDATED ROCKS

- pT Basement complex (gabbro, diorite, granodiorite, and metamorphic rocks) (pre-Tertiary)

N

SCALE = 1:250,000

4 0 4 Miles

Plate No. 5
Regional Geologic Map

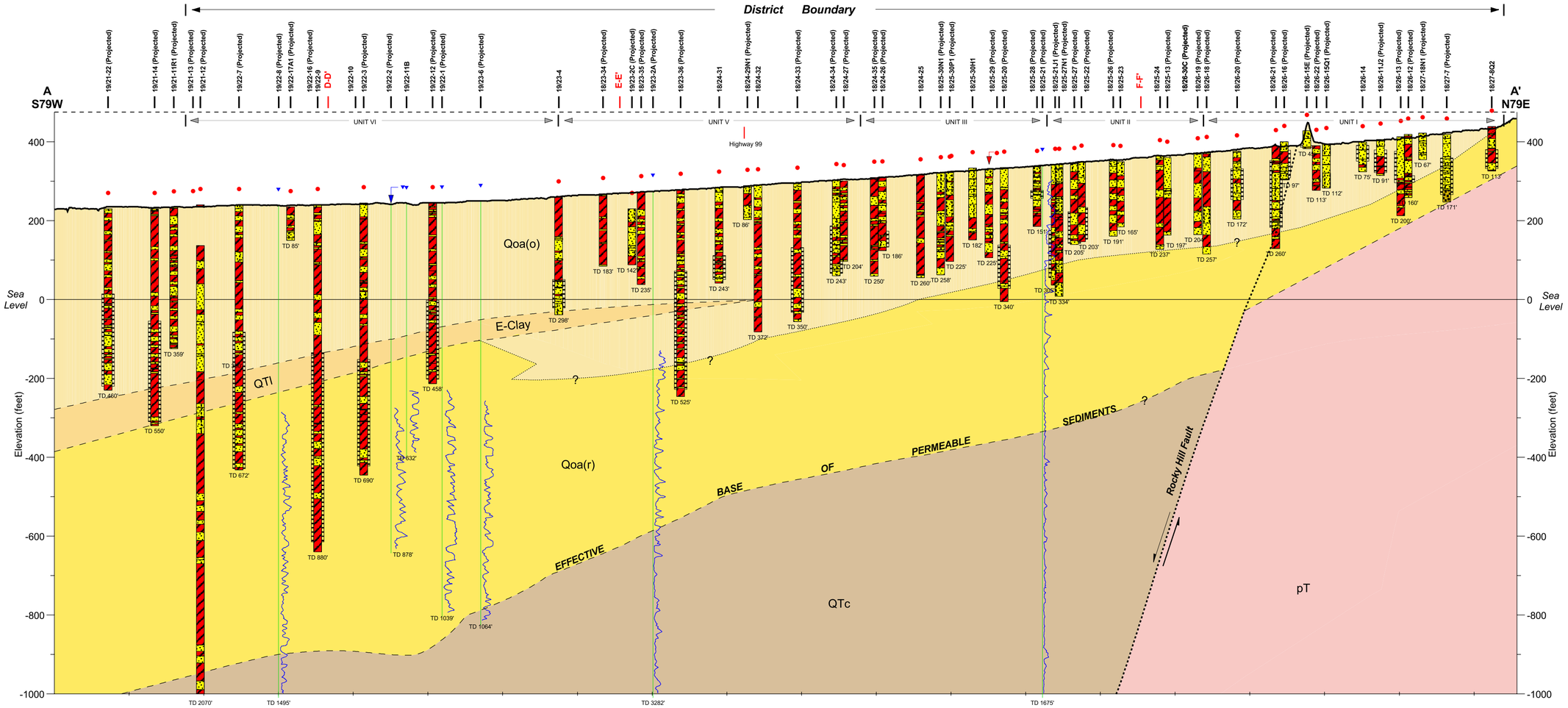


Plate No. 6:
Hydrogeologic Section A-A'
Kaweah Delta Water Conservation District
Kings and Tulare Counties

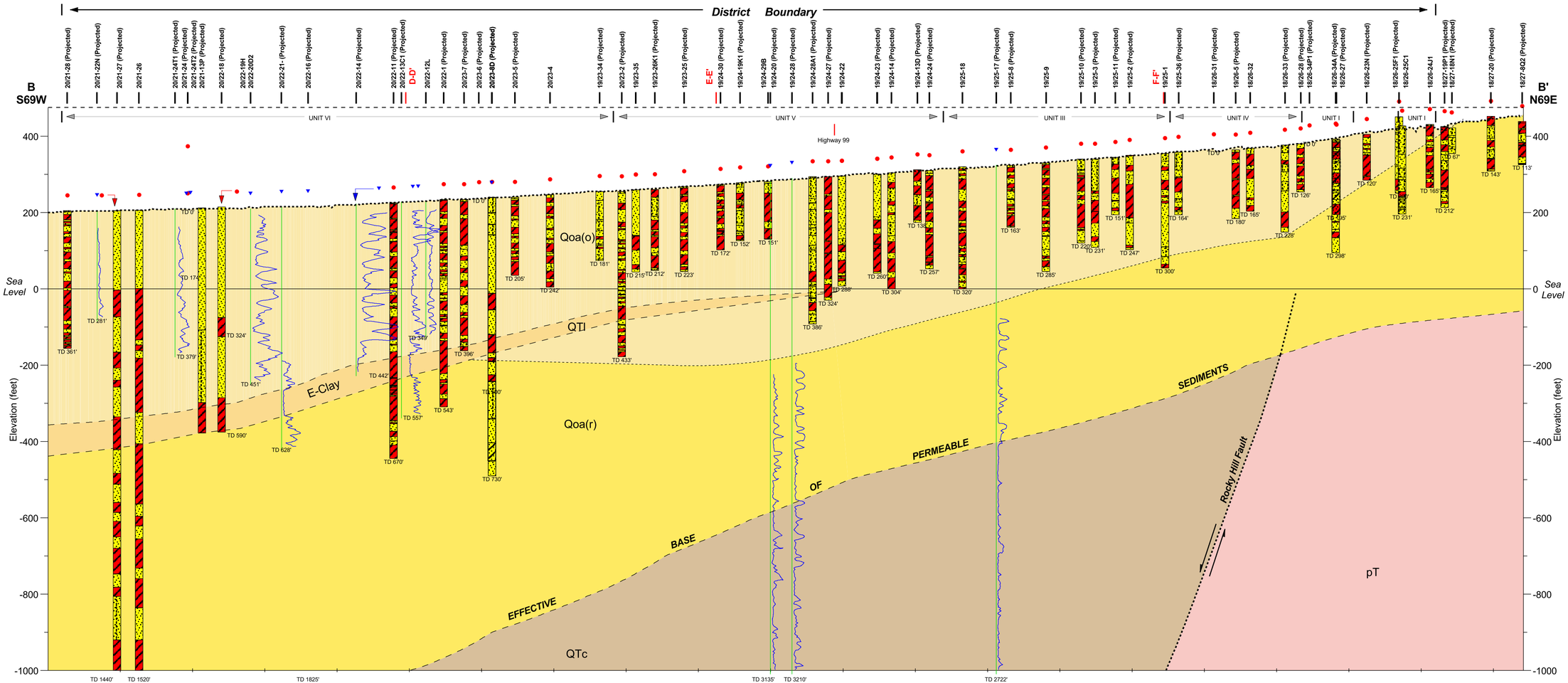


Plate No. 7:
Hydrogeologic Section B-B'
Kaweah Delta Water Conservation District
Kings and Tulare Counties

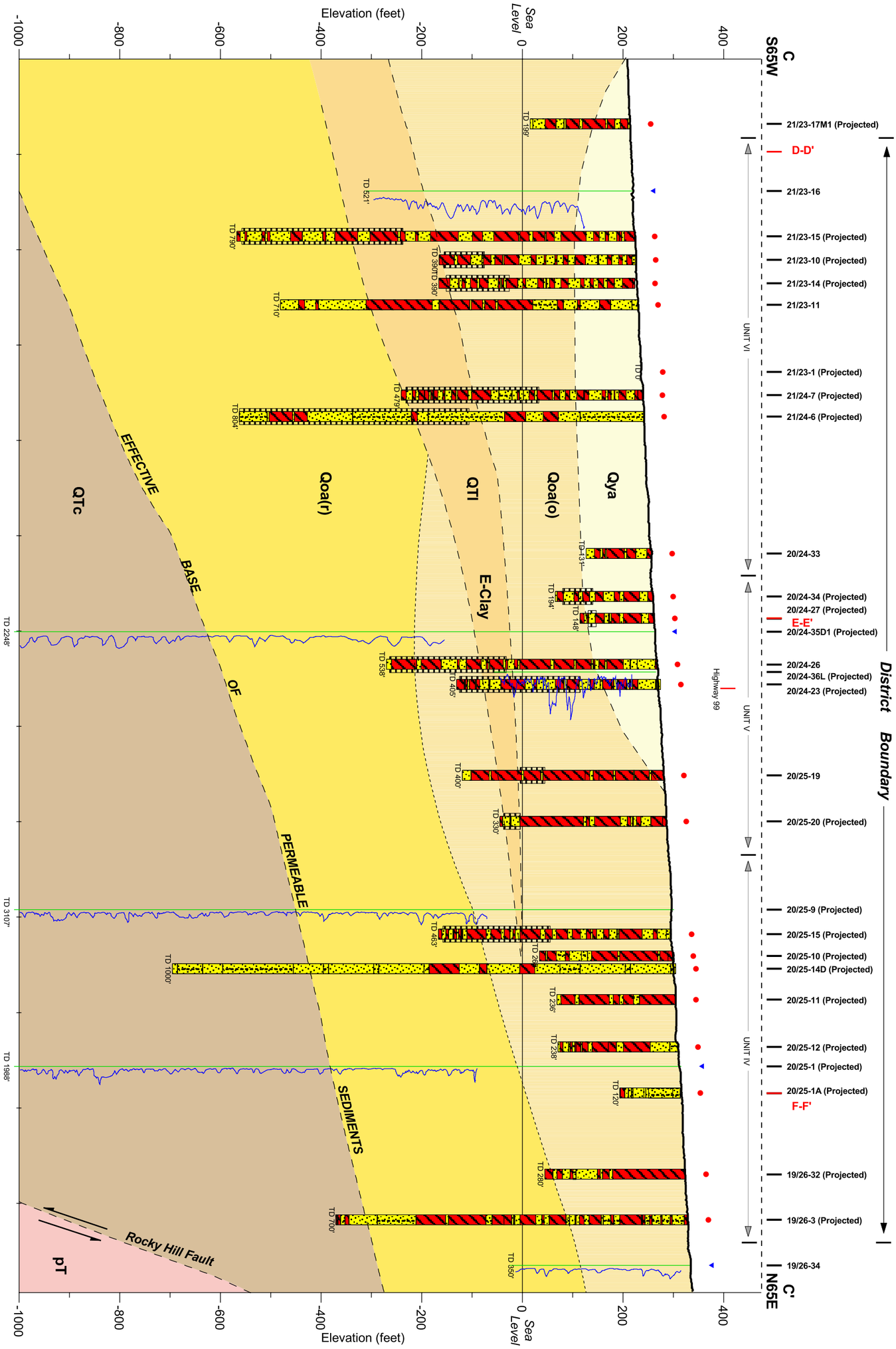


Plate No. 8:
Hydrogeologic Section C-C'

Kaweah Delta Water Conservation District
Kings and Tulare Counties

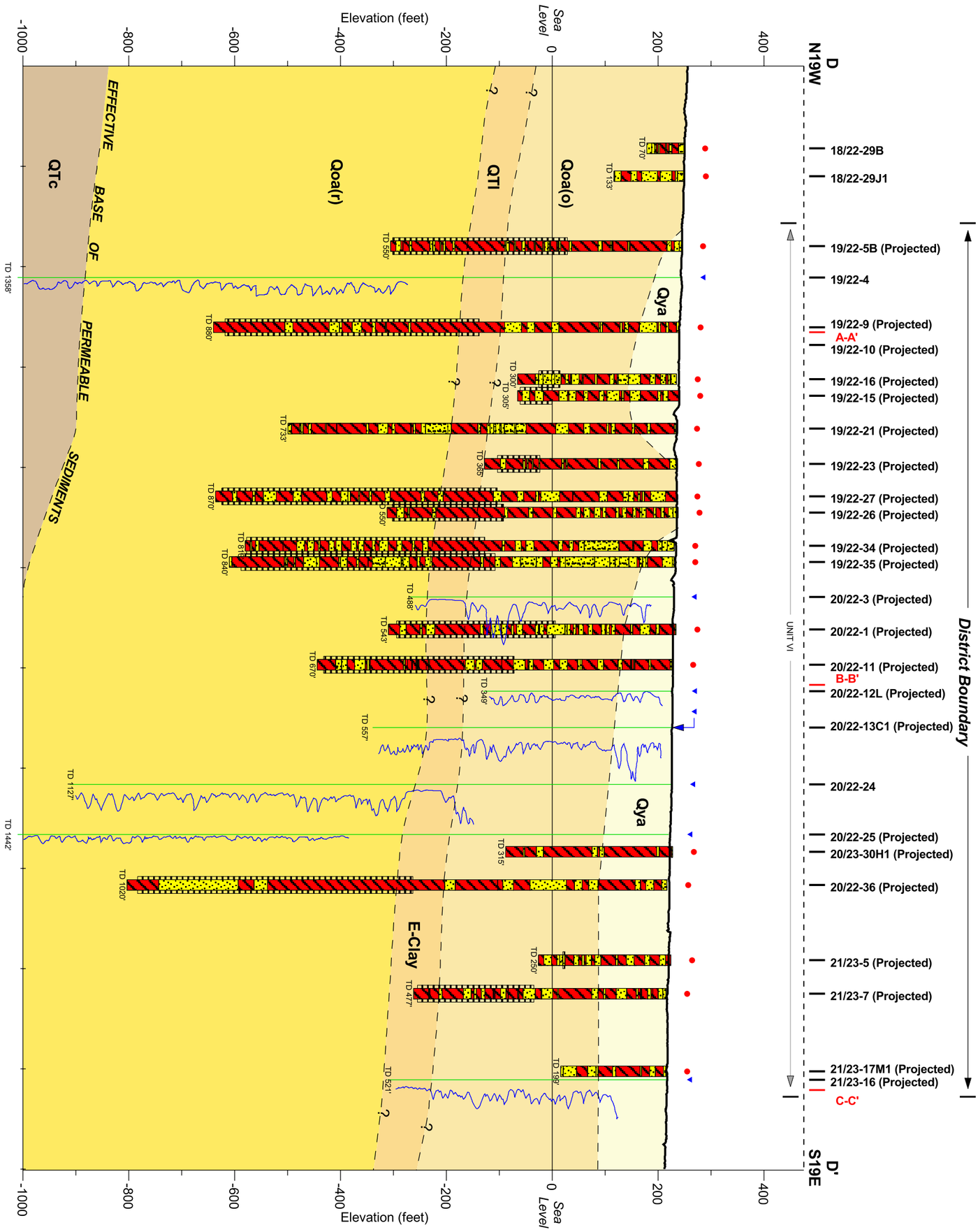


Plate No. 9:
Hydrogeologic Section D-D'
Kaweah Delta Water Conservation District
Kings and Tulare Counties

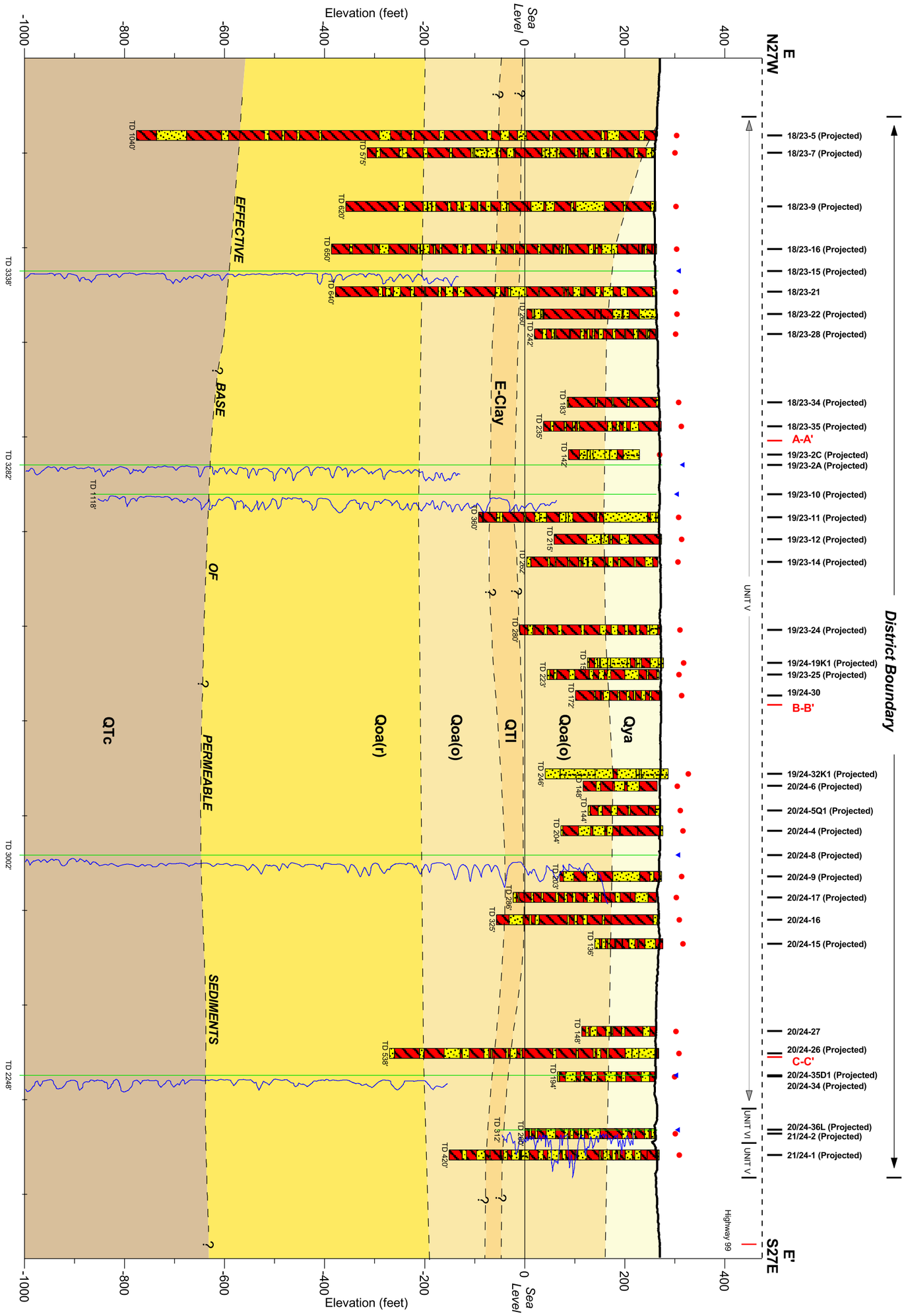


Plate No. 10:
Hydrogeologic Section E-E'
Kaweah Delta Water Conservation District
Kings and Tulare Counties

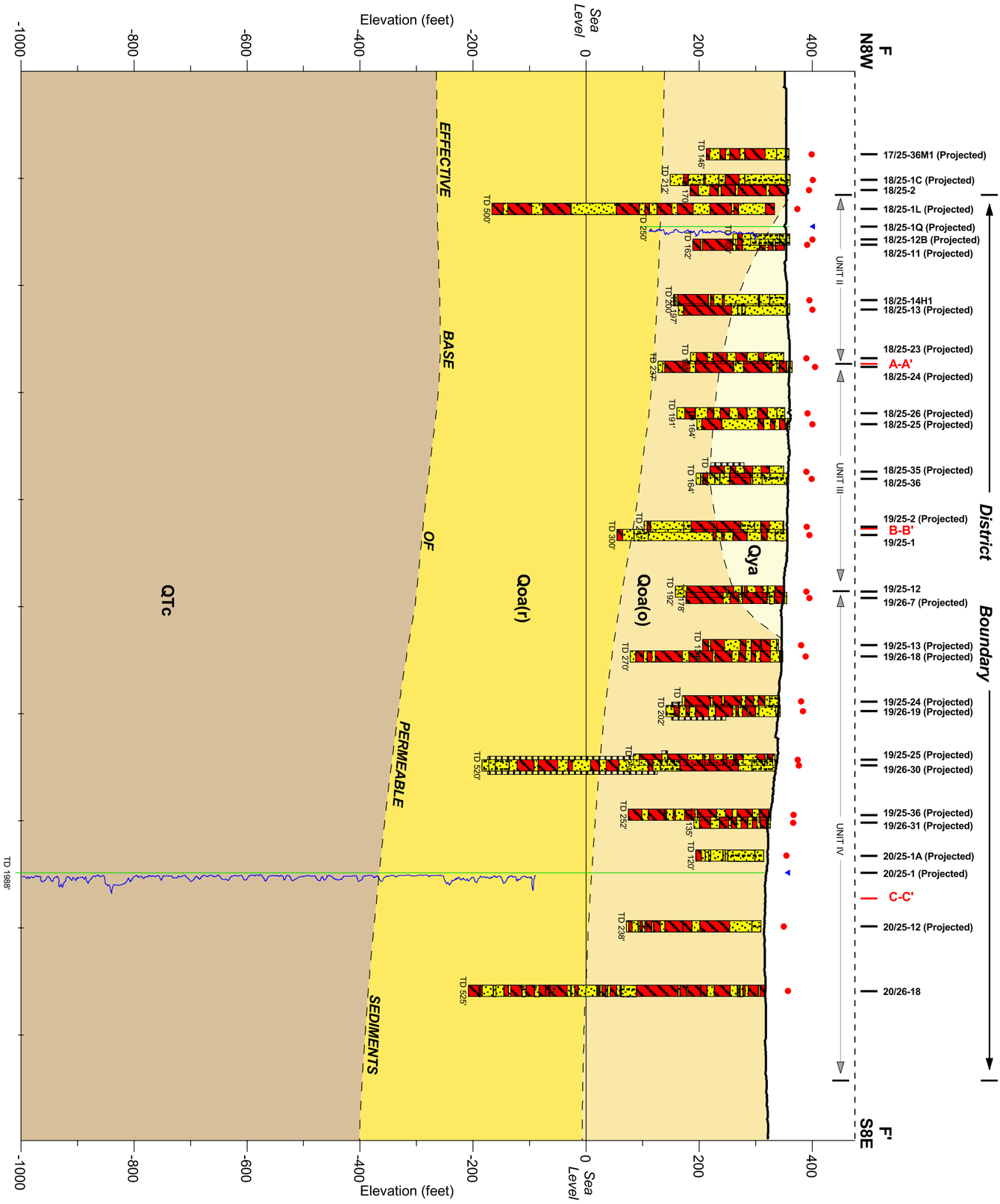


Plate No. 11:
Hydrogeologic Section F-F'
Kaweah Delta Water Conservation District
Kings and Tulare Counties

SOIL TYPES

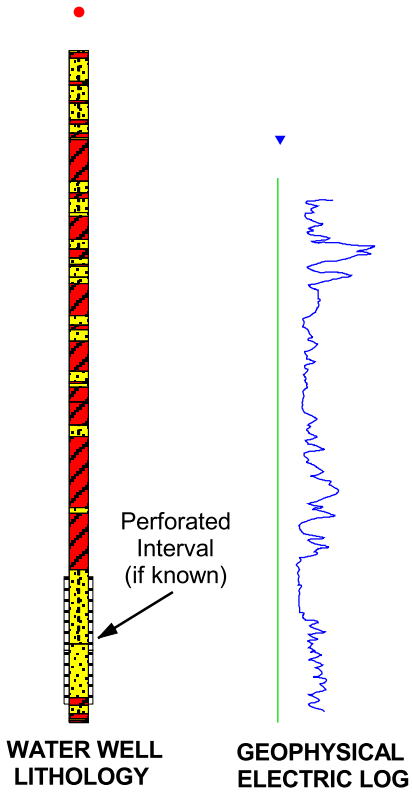
- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- GRAVEL with sand (GP or GW)
- GRAVEL with clay (GP or GW)
- Clayey GRAVEL (GC)
- GRAVEL with silt (GP or GW)
- Silty GRAVEL (GM)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- SAND with gravel (SP or SW)
- SAND with clay (SP-SC)
- Clayey SAND (SC)
- Silty SAND (SM)
- SAND with silt (SP-SM)
- Fat CLAY (CH)
- Sandy Fat CLAY (CH)
- Lean CLAY (CL)
- Sandy Lean CLAY (CL)
- Silty CLAY (CL-ML)
- Elastic SILT (MH)

UNCONSOLIDATED DEPOSITS

WEST SIDE			EAST SIDE	
Coast Range Provenance			Sierra Nevada Provenance	
Pliocene to Recent	Recent	Qb Flood basin deposits	Qya Younger alluvium	QUATERNARY
	Pliocene and Holocene (?)		Qoao	
			Qoar Older alluvium	
QTa Alluvium, undifferentiated	Pliocene and Pleistocene	QTl Lacustrine and marsh deposits	Pliocene and Pleistocene (?) QTc Continental deposits	TERTIARY and QUATERNARY

CONSOLIDATED ROCKS

pT
Basement complex



- Ground Elevation
- Lithologic Contact (queried where evidence is not conclusive)
- Inferred Fault (arrows indicate direction of movement)
- Contact between oxidized (O) and reduced (R) deposits

Plate No. 12 : Geologic Legend

2.6 Groundwater

Historically, much of the land within the District had a groundwater table close to the land surface. In the early part of the 20th century, the distance from the ground surface to the groundwater table may have averaged less than fifty feet. Over the last fifty years, each successive drought period has resulted in an increase in groundwater pumping that has caused the water table to drop significantly. It is anticipated that as agricultural land is converted to urban uses and industry grows, the competition for water resources among agricultural, urban, industrial and environmental interests will continue to increase.

Groundwater is the most dependable water supply for the Basin's agricultural, industrial and domestic water users who regularly draw upon this valuable resource from individually owned wells. The continued pumping of groundwater has resulted in an overdraft of the groundwater basin, that is, more water has been pumped from the basin than has been recharged into the basin on a long-term basis. Even though over 3 million acre-feet of surface water has been imported into the District over the past 30 years in an effort to supplement local surface water supply and reduce dependence on groundwater, the average depth to groundwater within the Plan Area has continued to drop.

The District has been monitoring groundwater levels since the 1950's. This is accomplished through groundwater level measurements taken in the late fall and early spring. Based on the water level readings, there is an overall trend of declining groundwater levels within the Basin. A graphical analysis of historical groundwater levels reveals the areal extent of overdraft throughout the District and is presented on Plate No. 13, "Contours of Equal Difference in Water Levels, 1952 to 1999". It is important to note that the Basin does have the ability to respond to positive conditions and this is demonstrated during years of above-average precipitation when the decline has been periodically interrupted by short-term groundwater recovery.

The condition of overdraft results in additional pumping costs to accommodate increased lift. As the water table continues to drop, pumping must occur from deeper levels of the aquifer which often have lower porosity and specific yield characteristics than those found in the upper levels of the unconfined aquifer. The long-term impact is a further reduction in the available groundwater supply in storage. Using the collected historical data and the transmissivity factors of the aquifers, a determination can be made of the estimated quantity of inflow and/or outflow of groundwater within the Plan Area. This data allows the District to identify and evaluate areas that could be more severely impacted during periods of sustained drought due to low yield of wells and the limited depths of the aquifers. This important water management tool is useful to the District in developing long-term planning decisions.

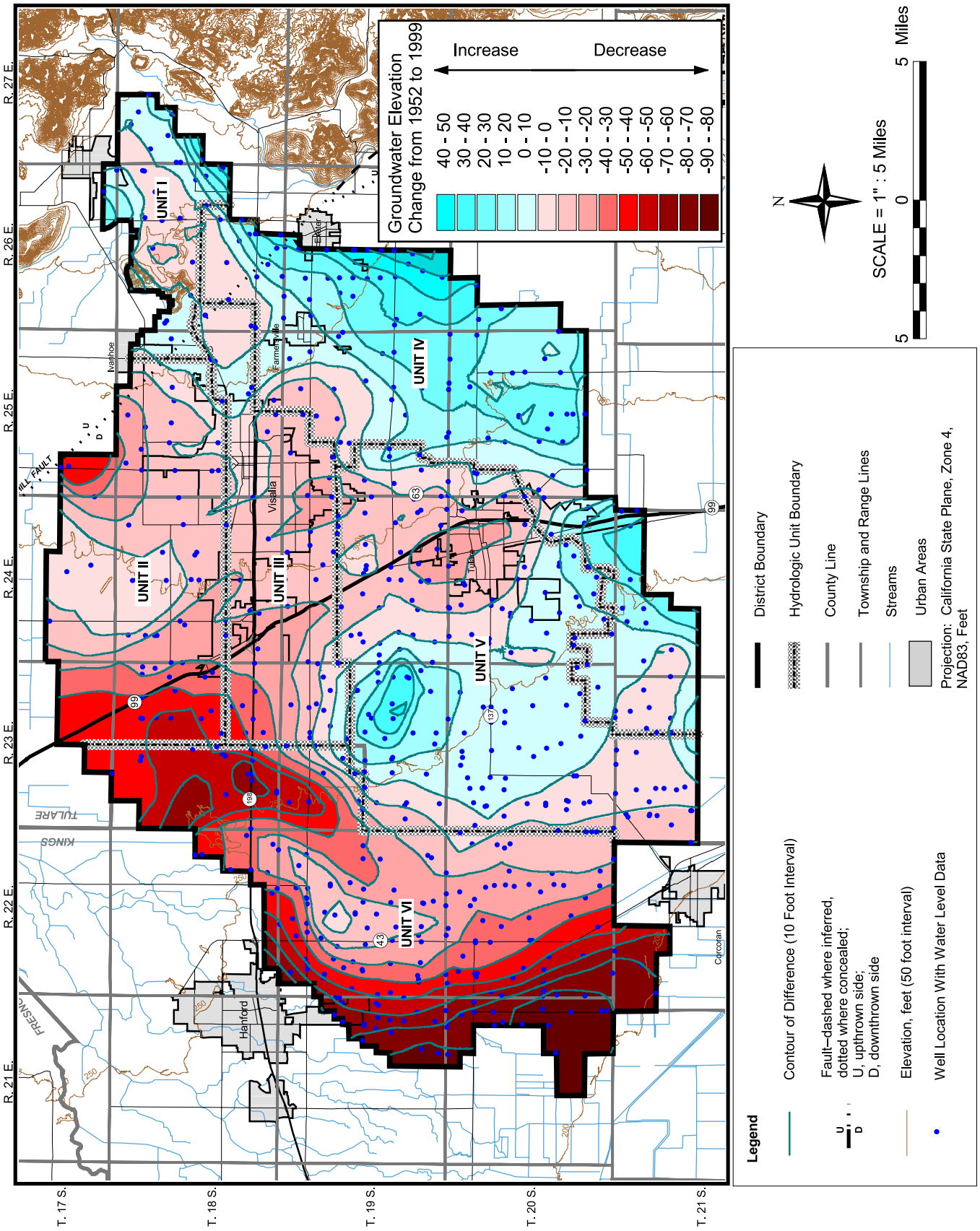


Plate No. 13

Contours of Equal Difference in Water Levels, 1952 to 1999

Kaweah Delta Water Conservation District

2.7 Water Demand and Supply

The dominant use of water within the District occurs from irrigated agricultural. Average annual applied water demand for crops grown in the District is approximately 3.7 acre-feet per acre. The applied water demand ranges from 1.9 acre-feet per acre for truck crops to 6.5 acre-feet per acre for pasture. A summary tabulation of estimated annual water demands for crops grown in the District for the years 1981, 1990 and 1999 is set forth in Table 5 on the following page. Uses outside of irrigated agriculture commonly include municipal, industrial and domestic applications. Table 4 presents a summary of water demands within the District that are not classified as irrigated agricultural.

TABLE 4
ESTIMATED M&I WATER DEMAND IN THE DISTRICT

(Values in Acre-Feet)

Use Classification	**1981**	**1990**	**1999**
Urban Water Demand	24,167	32,947	42,457
Public Water System Demand	5,739	7,222	8,242
Rural Domestic Water Demand	1,876	1,876	1,876
Dairy and Related Water Demand	4,169	10,846	16,255
TOTAL	**35,951**	**52,891**	**68,830**

Reference: Water Resources Investigation of the Kaweah Delta Water Conservation District (Final Report 2003)

The District receives approximately 80% of its average annual surface water supply from the Kaweah River System and approximately 20% of its average surface water supply through imported water. Water demands that are not met from the supply of surface water are pumped from the groundwater basin. Since 1962, records show that over 5 million acre-feet of water has been imported into the District. The annual imported supply is variable and is dependent on available CVP supply. Kings River water is also diverted into the District. The annual imported surface water supply and deliveries (1963 through 2005) are presented in Table 6, Kaweah Delta Water Supply Inventory.

Notable changes that have affected water supplies to the District include the following:

- ✓ Central Valley Project (1950's)
- ✓ Terminus Project (Lake Kaweah: 1962)
- ✓ State Water Project (Tulare Lake Basin Water Storage District: 1968)
- ✓ Terminus Project (Lake Kaweah Enlargement: 2004)

TABLE 5
ESTIMATED APPLICATION OF IRRIGATED WATER TO CROPS IN THE DISTRICT

Category of Land Use	Average Water Demand (Feet)	1981		1990		1999	
		Net Irrigated Area (Acres)	Total Application (Acre-Feet)	Net Irrigated Area (Acres)	Total Application (Acre-Feet)	Net Irrigated Area (Acres)	Total Application (Acre-Feet)
Cotton	3.9	94,229	367,493	93,765	365,684	62,295	242,951
Alfalfa	5.0	33,977	169,885	41,257	206,285	38,923	194,615
Grain	2.8	65,062	182,174	65,960	184,688	87,927	246,196
Deciduous and Nuts	4.0	36,502	146,008	39,262	157,048	44,540	178,160
Pasture	6.5	8,873	57,675	4,005	26,033	2,954	19,201
Miscellaneous Field	3.0	2,911	8,733	1,053	3,159	510	1,530
Sugar Beets	4.0	1,869	7,476	1,100	4,400	900	3,600
Grapes	3.8	9,187	34,911	7,492	28,470	29,796	113,225
Citrus	2.9	6,337	18,377	6,587	19,102	7,184	20,834
Rice	6.0	313	1,878	31	186	0	0
Truck	1.9	3,995	7,591	5,494	10,439	10,872	20,657
	TOTAL	**263,255**	**1,002,200**	**266,006**	**1,005,493**	**285,901**	**1,040,967**

Note: Total annual crop demand obtained from DWR Bulletin 113 or information from California Department of Water Resources for DAU242

TABLE 6
KAWEAH DELTA WATER SUPPLY INVENTORY

(Values in Acre-Feet)

Water Year	SURFACE WATER INFLOW					SURFACE WATER OUTFLOW		
	Terminus Flows	Creek Flows	CVP Imports	Kings River	TOTAL	Spills	Friant-Kern Pumping	TOTAL
1962-63	474,120	10,604	285,741	0	**770,465**	14,027	0	**14,027**
1963-64	228,099	3,703	105,736	0	**337,538**	1,190	0	**1,190**
1964-65	481,989	19,044	276,516	0	**777,548**	5,399	0	**5,399**
1965-66	246,551	1,648	117,175	0	**365,375**	2,900	0	**2,900**
1966-67	1,000,713	79,997	282,316	8,481	**1,371,506**	104,794	0	**104,794**
1967-68	231,545	2,168	134,922	0	**368,635**	3,775	0	**3,775**
1968-69	1,185,412	141,336	186,749	0	**1,513,497**	418,092	0	**418,092**
1969-70	429,185	13,329	113,373	26,468	**582,355**	17,586	0	**17,586**
1970-71	287,302	5,353	113,044	17,294	**422,993**	0	0	**0**
1971-72	163,243	1,835	42,014	0	**207,092**	0	0	**0**
1972-73	609,878	40,565	172,628	28,961	**852,032**	34,229	0	**34,229**
1973-74	485,551	27,093	260,418	19,785	**792,847**	29,566	0	**29,566**
1974-75	376,310	13,916	162,649	20,168	**573,043**	7,589	0	**7,589**
1975-76	135,927	1,505	36,782	1,753	**175,968**	202	0	**202**
1976-77	96,161	196	109	0	**96,467**	0	0	**0**
1977-78	814,317	99,802	122,348	9,037	**1,045,504**	44,863	9,112	**53,975**
1978-79	420,353	19,246	287,179	7,716	**734,494**	13,885	0	**13,885**
1979-80	874,598	62,371	209,303	1,087	**1,147,359**	97,785	5,096	**102,880**
1980-81	246,907	5,697	66,293	11,118	**330,014**	1,956	0	**1,956**
1981-82	742,680	41,983	241,594	3,217	**1,029,474**	58,035	29,532	**87,568**
1982-83	1,398,397	171,130	62,601	0	**1,632,129**	459,619	148,197	**607,816**
1983-84	528,171	37,214	121,468	42,685	**729,538**	79,973	0	**79,973**
1984-85	328,718	6,553	92,348	3,207	**430,827**	367	0	**367**
1985-86	808,032	51,337	163,909	18,068	**1,041,345**	63,660	92,739	**156,399**
1986-87	180,551	3,160	30,671	2,430	**216,812**	0	0	**0**
1987-88	182,282	2,747	99,058	1,995	**286,082**	0	0	**0**
1988-89	207,723	2,269	39,612	1,000	**250,604**	0	0	**0**
1989-90	134,201	859	0	0	**135,060**	0	0	**0**
1990-91	246,485	4,741	7,716	0	**258,942**	0	0	**0**
1991-92	146,744	1,787	17,639	1,226	**167,397**	0	0	**0**
1992-93	545,966	26,420	145,690	7,093	**725,169**	0	0	**0**
1993-94	188,055	2,535	27,777	1,392	**219,760**	0	0	**0**
1994-95	854,667	58,872	125,682	13,383	**1,052,604**	114,966	0	**114,966**
1995-96	518,993	21,753	128,521	33,796	**703,063**	236	0	**236**
1996-97	760,268	68,708	82,930	20,734	**932,641**	170,109	54,780	**224,889**
1997-98	906,426	127,460	79,058	13,918	**1,126,862**	94,306	137,018	**231,324**
1998-99	283,025	25,311	124,909	20,107	**453,352**	7,734	0	**7,734**
1999-00	361,012	35,084	114,236	2,575	**512,907**	21,479	0	**21,479**
2000-01	259,317	5,645	23,296	6,944	**295,203**	8	0	**8**
2001-02	297,368	5,427	41,654	2,095	**346,543**	81	0	**81**
2002-03	426,046	8,704	122,039	11,732	**568,521**	530	0	**2,156**
2003-04	229,667	2,410	34,374	73,973	**340,424**	391	0	**805**
2004-05	614,095	18,274	240,023	80,064	**952,456**	2,372	0	**2,372**
TOTAL	**19,937,050**	**1,279,791**	**5,142,100**	**513,502**	**26,872,447**	**1,871,704**	**476,474**	**2,350,218**
AVERAGE	**463,652**	**29,763**	**119,584**	**11,942**	**624,941**	**43,528**	**11,081**	**54,656**

SECTION 3: MANAGEMENT PROGRAM

3.1 Statutory Authority

The District hereby includes in its groundwater management program the right to engage in all of those activities provided by statutes, which authorize or are related to Plan developments.

California Water Code § 10753.7(a) states that, for the District to have a qualifying plan eligible to receive state funds administered by the Department of Water Resources, that such plan shall include as components all of the following:

(1) Prepare and implement basin management objectives;
(2) Involve other agencies to work cooperatively;
(3) Prepare a Plan Area map detailing the groundwater basin; and
(4) Adopt monitoring protocols designed to detect changes in groundwater conditions.

California Water Code § 10753.8 authorizes the District to include as components in its groundwater management plan the following:

(a) The control of saline water intrusion;
(b) Identification and management of wellhead protection areas and recharge areas;
(c) Regulation of the migration of contaminated groundwater;
(d) The administration of a well abandonment and well destruction program;
(e) Mitigation of conditions of overdraft;
(f) Replenishment of groundwater extracted by water producers;
(g) Monitoring of groundwater levels and storage;
(h) Facilitating conjunctive use operations;
(i) Identification of well construction policies;
(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling and extraction projects;
(k) The development of relationships with state and federal regulatory agencies; and
(l) The review of land use plans and coordination with land use planning agencies to assess activities, which create a reasonable risk of groundwater contamination.

Additionally, the District intends to exercise all of the authority given to a water replenishment district in California Water Code § 60220 through § 60232, together with the authority of a water replenishment district to fix and collect fees and assessments within the Plan Area for groundwater management in accordance with California Water Code § 60300 through § 60352, as may be necessary for the District to accomplish the purposes and goals of the Plan.

Notwithstanding the foregoing, the District reserves the right to decide whether or not it will be involved and to the extent to which it will be involved in each of the activities authorized by the aforementioned

statutes. The District assumes no responsibility or liability for any authorized activity in which it is not actually involved. Further, upon thirty (30) days written notice to all other local agencies located within the Plan Area, the District may terminate the Plan, together with any and all activities, which may be a part of its groundwater management program at the time of such termination. The District shall not be required to notify other local agencies, or anyone else, if it merely terminates its involvement in an activity authorized by the aforementioned statutes, without terminating the Plan itself.

3.2 Basin Management Objectives

The goal of the Plan is to offer efficient and effective groundwater management in an effort to provide a sustainable, high quality supply of groundwater for agricultural, environmental and urban use for the future. The groundwater of San Joaquin Valley Groundwater Basin aquifer underlying the Kaweah Delta Water Conservation District is a significant water resource that must be reasonably used and conserved for the benefit of the overlying lands. This can be accomplished by avoiding extractions that exceed safe yield or produce a condition of overdraft within the Plan Area.

To accomplish the Plan's goal, the following management objectives are adopted under the Plan:

- ✓ Stabilize and potentially reverse the long-term decline of groundwater levels
- ✓ Monitor groundwater quality
- ✓ Monitor inelastic land surface subsidence resulting from groundwater pumping
- ✓ Maintain and augment surface water supplies that directly affect groundwater levels
- ✓ Monitor changes to surface water quality that directly affect groundwater quality
- ✓ Evaluate groundwater replenishment projects
- ✓ Evaluate cooperative management projects
- ✓ Provide effective and efficient management of groundwater recharge projects, facilities and programs
- ✓ Coordinate groundwater basin management with local agencies with groundwater authority within the Plan Area

Each of the adopted management objectives is designed toward attaining the Plan's goal. The way in which each objective contributes toward a more reliable supply of groundwater for long-term benefical use is described as follows:

- ✓ Stabilizing or reversing long-term decline of groundwater levels provides a balancing between groundwater demand and supply, ensuring a resource that will be available into the future
- ✓ Monitoring groundwater quality will enable the Plan to assess possible impacts that might diminish the usability of the resource

- ✓ Monitoring inelastic land surface subsidence is valuable in determining available groundwater storage and evaluating groundwater supplies
- ✓ Maintenance and augmentation of surface water supplies will reduce expected impacts of increased demands on groundwater supplies, which is critical in maintaining the ability to stabilize long-term draw down
- ✓ Monitoring surface water quality changes will enable the Plan to assess possible impacts that might diminish the usability of the resource
- ✓ Evaluation of replenishment projects will focus on providing greater recharge productivity, which will make the most efficient and effective use of facilities and resources.
- ✓ Evaluation of cooperative management projects is an effort to provide for greater recharge opportunities, which is important in attaining the stabilization of groundwater levels
- ✓ Providing effective and efficient management of groundwater recharge projects, facilities and programs works toward increasing recharge in the efforts to stabilize groundwater levels
- ✓ Coordinating groundwater basin management will promote a consistency in objectives between local agencies, providing a unified approach to meeting goals.

The interaction between basin management objectives, Plan elements and corresponding activities is fundamental to Plan effectiveness. The Plan will be carried out based upon the specific correlations developed between objectives and activities. The relationships for implementation of the Plan are diagramed in Plate No. 14.

3.3 Monitoring Program

Attaining the Plan's goal requires obtaining a comprehensive understanding of the interactive components that comprise and define the aquifer system. A vital Plan function is the collection of information concerning and related to groundwater conditions. Management objectives have been founded upon the knowledge of past and current conditions ascertained through the District's monitoring efforts. The Plan will continue to progress toward its goal through ongoing monitoring of the following components:

- ✓ Groundwater Supply and Quality
- ✓ Surface Water Supply and Quality
- ✓ Surface Water Management
- ✓ Inelastic Land Surface Subsidence

Consistent and reliable information is critical for any monitoring program. The Plan will be able to achieve this requirement through the implementation of monitoring protocols. Protocols have been and will continue to be developed to track changes in conditions.

Plate No. 14

Groundwater Management Plan Implementation Diagram

Kaweah Delta Water Conservation District

3.3.1 Groundwater

The District has an extensive monitoring network that was initially established in the 1950's. This network has been maintained and improved in a continuing effort to provide reliable information for annual and long-term assessment of groundwater conditions. Plate 15 identifies the location of monitoring sites where groundwater level measurements are currently collected. Ongoing groundwater monitoring will provide information needed to document current conditions, assess long-term trends and to support development and implementation of objectives associated with:

- ✓ Groundwater levels
- ✓ Groundwater quality
- ✓ Inelastic land surface subsidence

3.3.1.1 Groundwater Levels

Since the establishment of the groundwater monitoring network, the District has performed static groundwater level measurements in the spring and fall periods. Such measuring operations have been performed in coordination with DWR's semiannual requests for groundwater levels. The information is utilized by DWR in mapping groundwater levels for the San Joaquin Valley Groundwater Basin and by the District in annual reporting of groundwater conditions.

The District shall continue to monitor groundwater levels semi-annually. Further, the District will prepare charts depicting the information gathered through the monitoring phase, as well as reports quantifying the water demands, surface water and groundwater supplies. These summaries will assist the District in evaluating the effectiveness of the various elements of its program. The collection of this data will be continued with the conduct of the Plan. The information that has been prepared from this data in the past includes the following:

- ✓ Charts of spring and fall water elevations
- ✓ Charts of spring and fall depths to groundwater
- ✓ Charts showing the changes in groundwater levels

In addition, groundwater reports could include estimates of changes in groundwater storage, water delivered, water use and overdraft. Existing information coupled with possible new data would benefit the evaluation of the effectiveness of management activities.

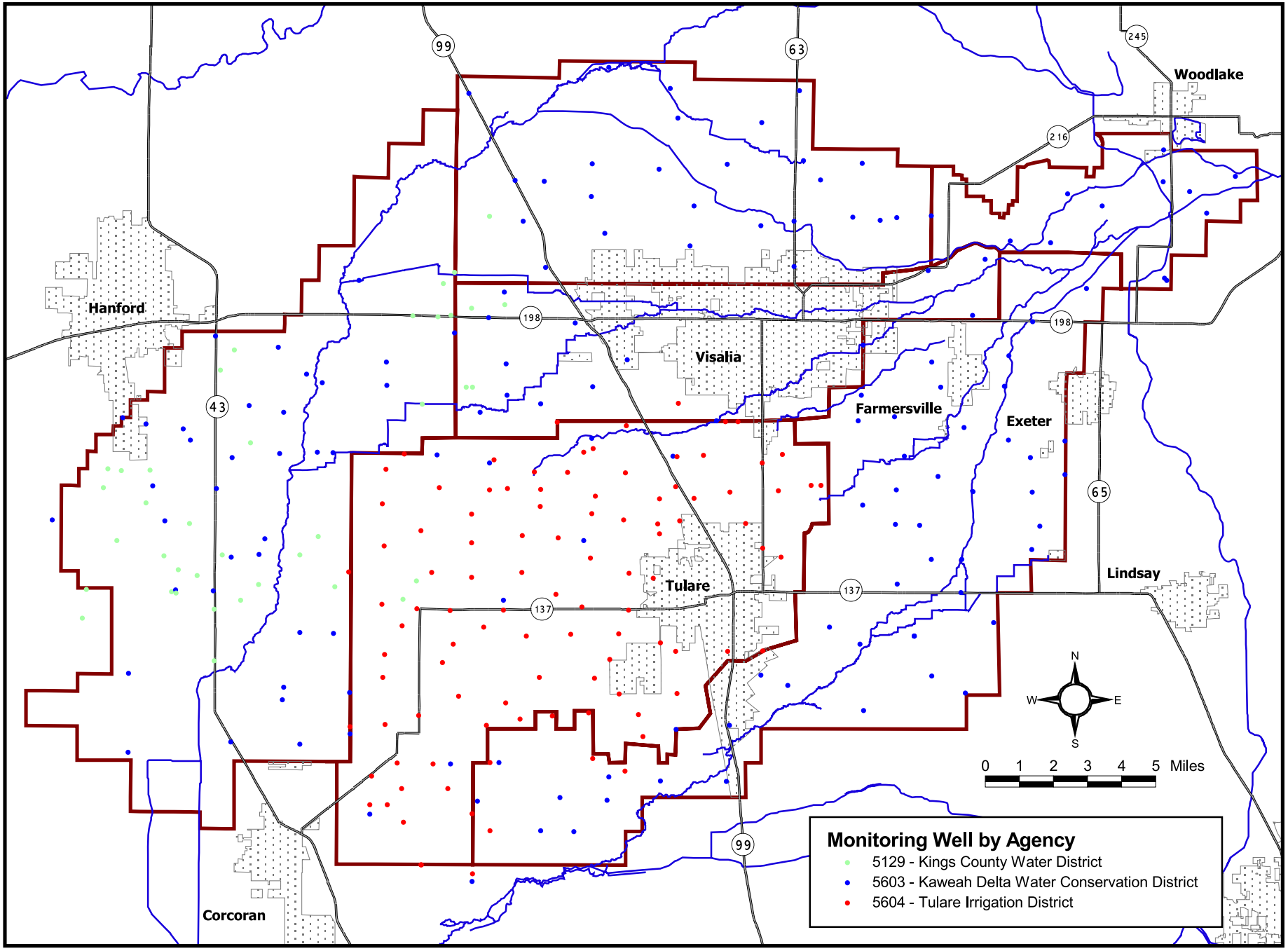


Plate No. 15 : Monitoring Wells (Water Levels)

3.3.1.2 Groundwater Quality

The District will pursue the collection of groundwater quality data from those agencies that have existing programs that record and report on relevant conditions. The effort will be focused toward monitoring key indicators of groundwater quality for the aquifers lying within the District. The indicators that the Plan will concentrate on will consist of the following:

- ✓ Temperature
- ✓ Total Dissolved Solids (TDS)
- ✓ Electrical Conductivity (EC)
- ✓ Acidity (pH)
- ✓ Chloride
- ✓ Sodium
- ✓ Nitrates

The initial effort will be the collection and review of water quality data for adequacy. The Environmental Health Departments of Kings and Tulare Counties will be used as a primary source for acquiring relevant data. Additionally, the Regional Water Quality Control Board can provide information gathered through their regulatory efforts. The District also intends to incorporate findings from the "Ground-Water Ambient Monitoring and Assessment Program" (GAMA) that is currently being performed by the United States Geological Survey and the State Water Resources Control Board. Compiling diverse sources of available information for tracking, trending and reporting within a specified area will be a useful way for the Plan to monitor groundwater quality conditions.

3.3.2 Surface Water

The delivery of surface water throughout the District is known to have a major influence on groundwater conditions. Percolation of surface water delivered through natural and man-made conveyance facilities is a primary source of inflow to the aquifers. Approximately 95 percent of all water usage within the District is for agricultural purposes. The supply for such demands is met with a combination of surface and groundwater. Therefore, the annual quantity and distribution of surface water has a direct correlation to the quantity of groundwater withdrawn from the aquifer. The quality of groundwater can also be affected through its supply source, as well as by changes in aquifer flow conditions that occur from groundwater elevation differences that result from the aquifer's response to water demands.

3.3.2.1 Surface Water Flows

There are two (2) primary surface water supply sources to lands lying within the Plan. The first source is water originating from the Kaweah River Watershed and the second from outside water sources such as the Friant-Kern Canal or Kings River. These available waters are obtained by or entitled to various irrigation companies and districts for delivery for beneficial purposes to lands within their respective

service areas. Continual measurement of all such surface flows are made and recorded by these entities for operational and legal purposes. Presently all those entities that have entitlement to Kaweah River water are bound together by the "Kaweah & St. Johns Rivers Association" (Association). The Association functions as Watermaster for delivery of waters to its members by means of the natural watercourses that run throughout the District. In the performance of such duties all surface water deliveries, both Kaweah River and imported sources, are regularly recorded and reported. Plate 16 identifies the watercourses and recording station locations operated or reported by the Association.

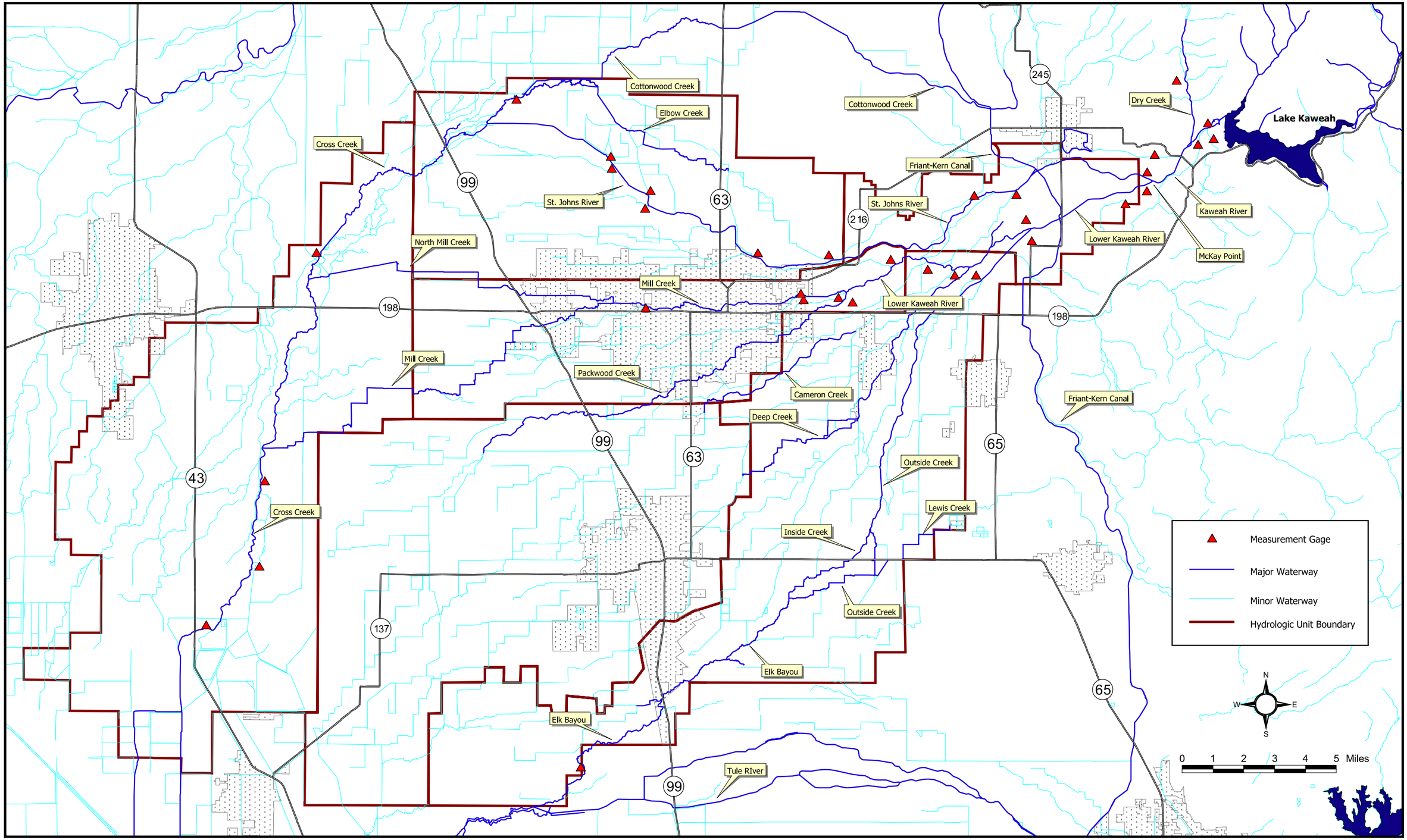
The District is a Kaweah River entitlement holder and member of the Association and as such has access to surface water flow information that will be utilized in exercising the Plan. More importantly, the District is under contract with the Association for performing all management and operational responsibilities. Thereby, the District directly oversees all aspects of measuring and recording surface water flows.

3.3.2.2 Surface Water Quality

The District will pursue the collection of surface water quality data from those agencies or organizations that have existing programs that record and report on relevant conditions. The District may use the surface water quality data it collects to monitor potential contamination of groundwater within the Plan Area. The effort will be focused toward monitoring key indicators of water that is conveyed in the natural systems within the District. Those indicators that the Plan will concentrate will consist of the following:

- ✓ Temperature
- ✓ Total Dissolved Solids (TDS)
- ✓ Electrical Conductivity (EC)
- ✓ Acidity (pH)
- ✓ Chloride
- ✓ Sodium
- ✓ Nitrates

As with groundwater quality monitoring, the Plan's initial effort will be the collection and review for adequacy of surface water quality data. Currently, the Association is engaged in a water quality program in response to the California Regional Water Quality Control Board's "Agricultural Conditional Discharge Waiver." The program involves performing surface water sampling at established locations on a defined cycle. Additionally, the Board also has permits in place for the monitoring and regulation of point source discharges, such as the City of Visalia's treated effluent discharges into Mill Creek. Plate 17 identifies known locations where surface water is sampled and monitored. The Plan will monitor surface water quality based upon available data in an effort to provide a consistent representation of key indicators on an annual and long-term basis.



Kaweah Watercourses

Plate No. 16

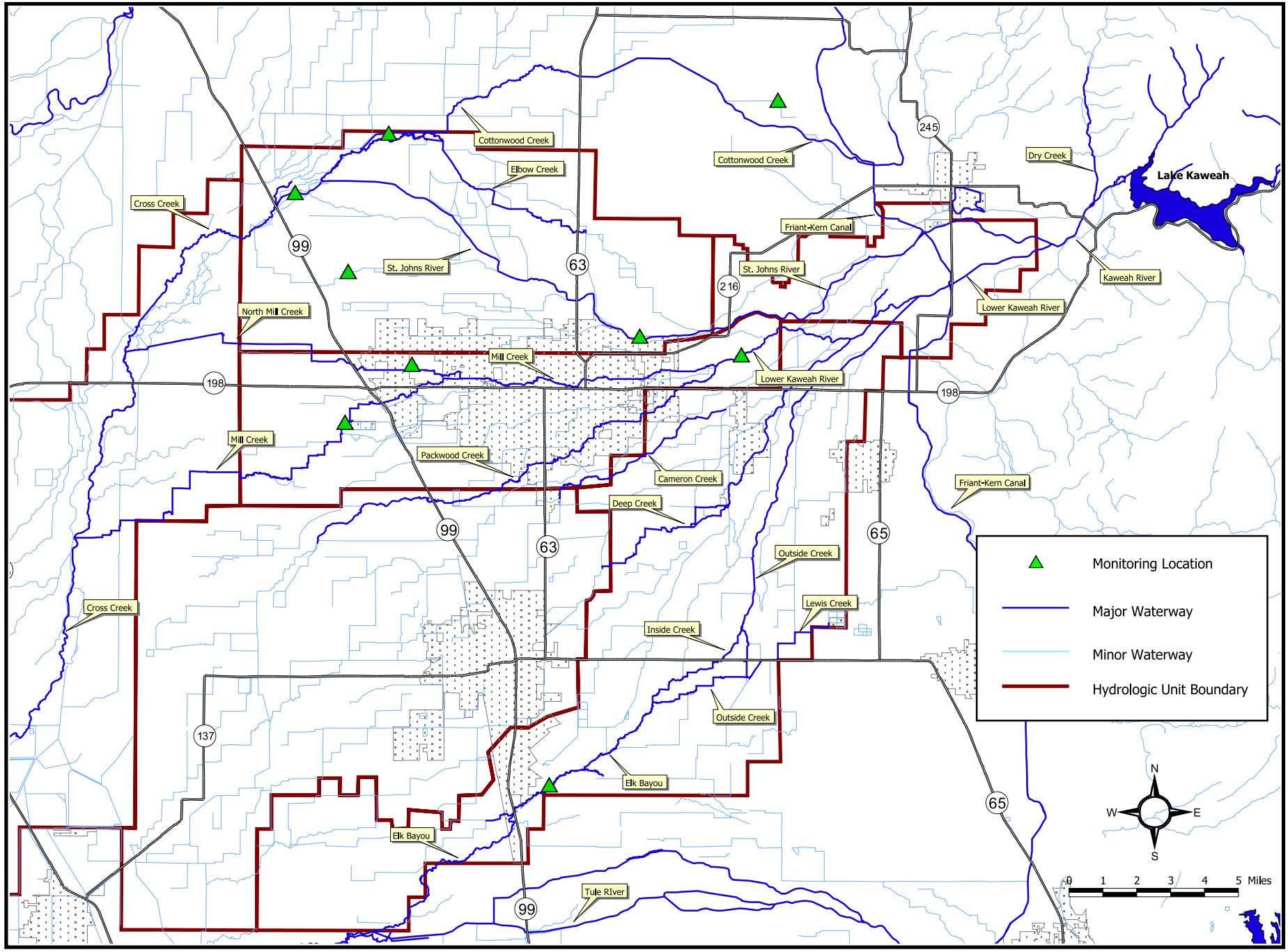


Plate No. 17 : Surface Water Monitoring

3.3.3 Water Transfers

Since the development of water storage facilities, like Lake Kaweah, water users have been able to manage surface water supplies for increased benefit. The ability to store water provides opportunities to acquire additional or release excess supplies through the water transfer process. Water transfers are means for the redistribution of surface waters to meet water demands. Groundwater is influenced by water transfers in such a way that those areas that are able to acquire additional surface supplies will proportionally reduce aquifer withdrawals. The two (2) types of transfers that the Plan is designed to monitor are Intra-District and Inter-District Transfers.

3.3.3.1 Intra-District Transfers

Intra-District surface water transfers are those that occur for the Plan's native water source, the Kaweah River, within the Kaweah River Basin as designated by the Association's "Transfer Policy". A copy of the "Transfer Policy" is included in Appendix "A." Kaweah River entitlement holders that store water within Lake Kaweah have the ability to transfer quantities of water in storage, under defined conditions, between like parties. An entitlement holder's water supply is based upon such factors as mean daily inflows to the lake and an allocation schedule. The most commonly occurring transfer is between users that have supplies in excess of their immediate demand to those users that have insufficient supplies. Frequency and magnitude of transfers are normally a function of the influence of seasonal climatic conditions on run-off from the watershed. Kaweah River water transfers within the Plan Area take place on a routine basis. The Plan has and will continue to monitor these transfers and their influence on groundwater conditions. Water transfers within the Plan Area are permissible and subject to the administration of the Kaweah River Watermaster under the direction of the Association's Board of Directors.

3.3.3.2 Inter-District Transfers

Inter-District surface water transfers are those that transfer Kaweah Water outside the District in exchange for a transfer back into the District from an external water source. The circumstances for these transfers are similar in nature to Intra-District Transfers. Supply and demand is the driving force behind such transactions. The main differences consist of utilizing multi-regional conveyance facilities and prolonged scheduling of deliveries.

Kaweah River water transfers between different water entities have been previously performed and will continue in the future. In the past, the District and Plan participants have completed such transfers on a limited basis. Intra-District transfers are seen as a mechanism that could be used to increase the total water supply within the Plan Area or to augment the water supply in specific areas of the basin during

critically dry years. In all cases, transfers shall be such that there is no net loss of water supply to lands within the District. The District shall endeavor to promote advantageous water transfers that increase the water supply available within the Plan Area. The Board of Directors of the District ("District Board of Directors") has the authority to initiate such transfers.

3.3.4 Inelastic Land Surface Subsidence

The San Joaquin Valley has been characterized as the largest human alteration of the earth's surface. The reason behind this statement comes from inelastic land surface subsidence that has occurred principally from aquifer-system compaction. The lowering of groundwater levels through sustained groundwater overdraft causes this type of subsidence. The impact to groundwater from such subsidence is the reduction in available aquifer storage capacity caused by the compaction of soil void space that retains groundwater. Studies performed by the Department of Water Resources and the United States Geological Survey have identified an area of subsidence in the western portion of the District that correlates with a confining geologic layer known as the Corcoran Clay. The magnitude of subsidence within this portion of the District was in the order of four feet for a study period extending from 1926 to 1970. Plate 18 is a representation of this subsidence in the San Joaquin Valley for this study period as reported in Geological Survey Professional Paper 437-H[2]. Studies performed since these findings have revealed a dramatic decrease in the rate of subsidence. This could be a result of the provision of State Project water to lands that pumped high amounts of groundwater that were in a condition of sustained groundwater overdraft.

The Plan will continue to monitor inelastic land surface subsidence through the use of research and reporting accomplished by agencies or organizations with a developed program. Monitoring efforts relating to subsidence will also consist of annual and long-term evaluations of sustained overdraft. Based on such indicators versus available data, the Plan will continue to assess the need for a more proactive approach through implementing subsidence surveying or installing and operating compaction recorders (extensometers).

3.3.5 Monitoring Protocols

Adequate assessment of groundwater conditions requires information that is both consistent and reliable. This is necessary in order to properly track and evaluate annual and long-term changes in those conditions that are monitored. The Plan's monitoring program has developed and employs measures to provide dependable and comparable data. The monitoring protocols applied by the Plan are outlined as follows:

[2] Figure 5, Page H11 of "Land Subsidence in the San Joaquin Valley, California, As of 1972", Studies of Land Subsidence, U.S. Geological Survey Professional Paper 437-H, by J.F. Poland, B.E. Lofgren, R.L. Ireland, and R.G. Pugh. Prepared in cooperation with the California Department of Water Resources. (1975)

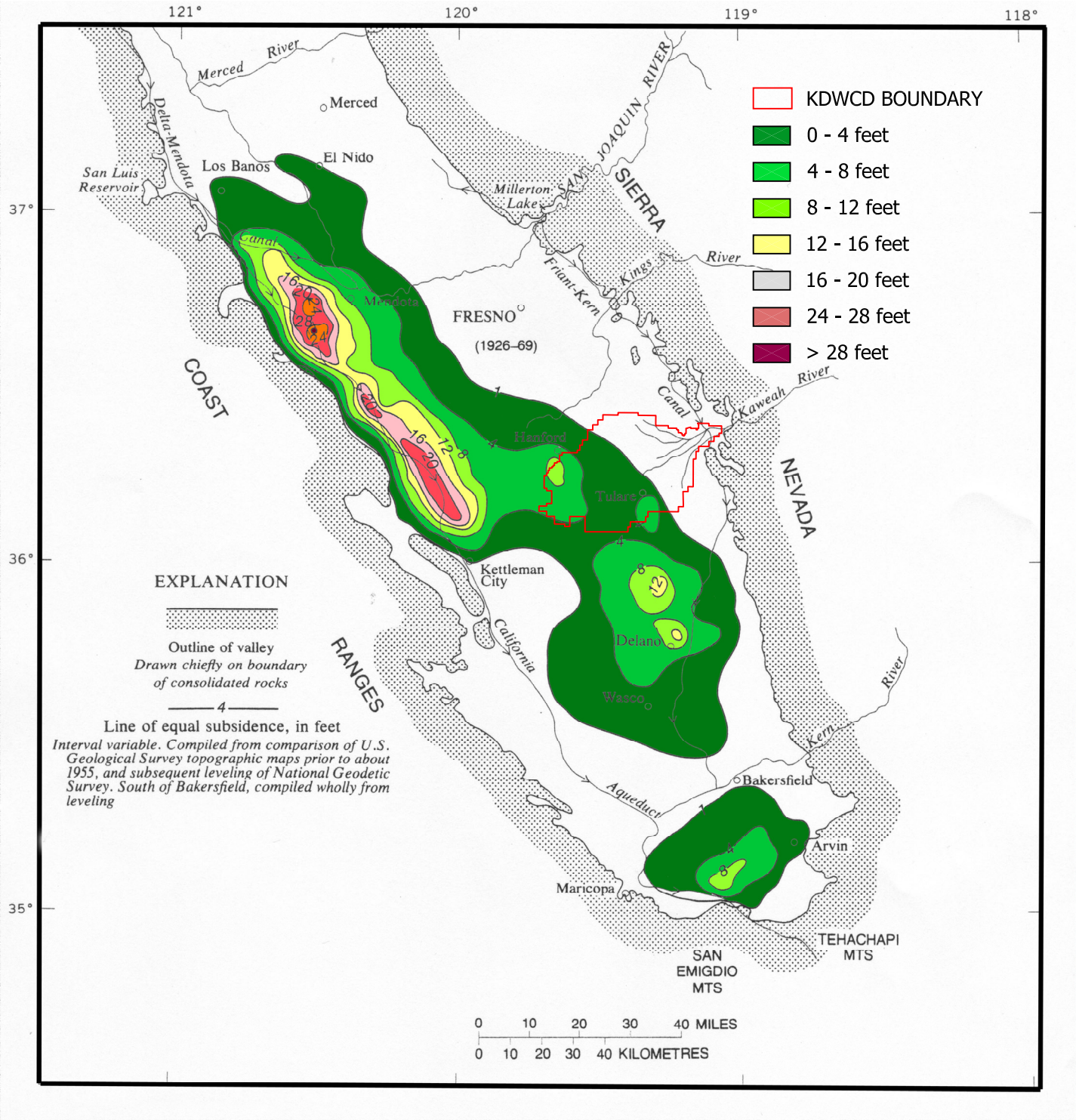


Plate No. 18
Inelastic Land Surface Subsidence
1926 thru 1970

Groundwater Levels: Measurements are taken semi-annually by the District and Plan participants in coordination with DWR's Spring and Fall measurement program. All identification, measuring and recording of data is performed in accordance with DWR's standards and procedures. The recorded data is compiled for presentation in the District's annual groundwater report.

Groundwater Quality: The Plan has established seven (7) different groundwater quality indicators that will be monitored. The District will annually compile data for the Plan from agencies that regularly collect groundwater quality data. The information will be organized in a manner for annual presentation and evaluation of the indicators. The effort will be focused on accumulating analogous data for tracking changes or trends in groundwater quality conditions.

Surface Water Flows: The District, in accordance with contracted responsibilities to the Association, regularly acquires surface flow measurements. Most all of the flows are measured on a continuous basis and in accordance with standard accepted practices. All flow information is compiled into annual water year reports. The Plan will draw all necessary surface flow information from this source.

Surface Water Quality: The Plan has established seven (7) different surface water quality indicators that will be monitored. The District will annually compile data for the Plan from agencies that regularly collect surface water quality data. The information will be organized in a manner for annual presentation and evaluation of the indicators. The effort will be focused on accumulating analogous data for tracking changes in surface quality conditions as it relates to groundwater management.

Water Transfers: The District, in accordance with contracted responsibilities to the Association, obtains all water transfer data on an occurrence basis. The collected information is recorded for reporting in the Association's annual water year reports. The Plan will draw all necessary water transfer information from this source. The data will be assembled in such a manner as to report the redistribution of surface water throughout the District and evaluate its influence on groundwater conditions.

Inelastic Land Surface Subsidence: The District will annually research known sources, like the United States Geological Survey or the State Department of Water Resources, for recent documentation and data from applicable programs focused primarily on the San Joaquin Valley. Pertinent information will be extracted for assessing conditions for inelastic land surface subsidence within the Plan Area.

3.4 Resource Protection

The Plan recognizes the importance of protecting the groundwater aquifer system. This resource is considered a vital component for both the region's economy and public health. California Water Code § 10753.8 authorizes the District to include components in its Plan for the provision of resource protection measures. Notwithstanding the foregoing, the District reserves the right to decide whether or not it will be involved in each of the activities authorized by the aforementioned statute. The Plan provides for resource protection through federal, state and local agency measures currently in place. The Plan will continue to coordinate with agencies that have protection measures in the form of ordinances and programs relevant to the protection of groundwater resources within the Plan Area. The following discussions will focus on those Plan components that address specific resource protection measures.

3.4.1 Well Abandonment

The County of Tulare, Kings County and City of Visalia have adopted Well Ordinances that address well destruction and establish requirements for destroying or abandoning wells within each agencies jurisdiction. All of these ordinances have provisions that stipulate impairment of the quality of water within the well or groundwater encountered by the well is not allowed. Those wells that are identified as defective require correction of the defective conditions or destruction of the well. Both county agencies have promoted programs for the destruction of abandoned wells in an effort to reduce potential sources that could have a negative impact to groundwater. In all cases, the primary responsibility for remedying defective or abandoned wells falls on the landowner and in those cases of non-compliance, the agencies have the authority to take necessary action to abate unsatisfactory conditions.

3.4.2 Wellhead Protection

The federal Wellhead Protection Program was established by Section 1428 of the Safe Drinking Water Act Amendments of 1986. The purpose of the program is to protect groundwater sources of public drinking water supplies from contamination, thereby eliminating the need for costly treatment to meet drinking water standards. A Wellhead Protection Area (WHPA), as defined by the 1986 Amendments, is "the surface and subsurface area surrounding a water well or wellfield supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield." The WHPA may also be the recharge area that provides the water to a well or wellfield. Unlike surface watersheds that can be easily determined from topography, WHPAs can vary in size and shape depending on geology, pumping rates, and well construction.

Wellhead Protection Programs are not regulatory by nature, nor do they address specific sources. They are designed to focus on the management of the resource, rather than control a limited set of activities or

contamination sources. Efforts to supply wellhead protection include Kings County's ordinance section for "Special Protection Areas." The ordinance provides for the prevention of mixing water between aquifers where groundwater quality problems are known to exist. Other protection areas within the Plan involve municipal/industrial water systems and small rural domestic water systems that rely on groundwater as a supply source.

3.4.3 Saline Water Intrusion

Saline water can slowly degrade a groundwater basin and ultimately render all or part of a basin unusable. The concentration of minerals in water is also referred to as total dissolved solids (TDS). The dissolved minerals are classified as inorganic salts, thus the term "salinity" is another way to describe mineral concentration. Several sources can contribute to increased salinity in groundwater. In addition to sea water intrusion, saline degradation of groundwater can be caused by use and re-use of the water supply; lateral or upward migration of saline water; downward seepage of sewage and industrial wastes; downward seepage of mineralized surface water from streams, lakes and lagoons; and interzonal or interaquifer migration of saline water.

Salt accumulation in surface water and groundwater in the Central Valley is a natural process inherent to lands with semi-arid to arid climates, enclosed basins, or reduced or impeded drainage. Salt accumulation in surface water and groundwater can impact and eventually eliminate most beneficial uses. Salt accumulation can be exacerbated by a wide variety of human activities including irrigation; importation of surface water; application of fertilizer (including manure and biosolids) and pesticides; land disposal of wastes including those from food processing facilities, wineries and municipal wastewater treatment plants; discharge of urban storm water runoff; and use of recycled wastewater.

Control of saline water intrusion occurs primarily at the state level through the State Water Resources Control Board and the Central Valley Regional Water Quality Control Board.

3.4.4 Migration of Contaminated Groundwater

Groundwater contamination originates from a number of sources or activities such as leaking tanks discharging petroleum products or solvents, or the application of pesticides and fertilizers. Effective control and clean-up of contaminated groundwater requires a coordinated effort between all regulatory agencies involved, source control, understanding of the hydrogeology and delineation of the contamination.

Agencies with a role to play in mitigating groundwater contamination include the Kings and Tulare County Environmental Health Departments, California Regional Water Quality Control Board, California Environmental Protection Agency and the U.S. Environmental Protection Agency. The degree to which each agency participates depends on the nature and magnitude of the problem.

3.4.5 Well Construction Policies

The County of Tulare, Kings County and City of Visalia have adopted Well Ordinances that specify water well construction, deepening and reconstruction standards within each agencies' respective jurisdiction. In all the ordinances, reference is made to State of California, Department of Water Resources Bulletin's 74-81 and 74-90 as that agency's adopted water well standard or supplementary to their established standard. The ordinances have provisions that require permits for well construction, deepening and reconstruction, with oversight provided by the agencies' health or building departments.

3.5 Sustainability

Maintaining the ability to use the underlying aquifer without incurring depletion or permanent damage is one of the Plan's main objectives. The sustainability of the groundwater supply for all beneficial uses is of critical importance to the region's economic, social and environmental well-being. California Water Code § 10753.8 authorizes the District to include components in its Plan to implement measures that progress toward attaining a sustainable groundwater resource. Notwithstanding the foregoing, the District reserves the right to decide whether or not it will be involved in each of the activities authorized by the aforementioned statute. Groundwater replenishment, overdraft mitigation and conjunctive use have been identified by the Plan as fundamental elements in attaining groundwater sustainability.

3.5.1 Groundwater Replenishment

In any conjunctive use area, groundwater recharge is a critical part of the overall Plan. For many years, the District has operated and maintained recharge basins throughout the District. They are generally located in areas of highly permeable soils. One of the District's ongoing objectives is the location and acquisition of additional recharge sites. In addition, effective recharge is also obtained through the natural channels, canals and ditches located within the Plan Area. The reason being that most of the channels are located within soil zones with high permeability. The District has established and will continue to develop programs that promote surface water use that result in additional groundwater recharge and reduction in groundwater pumping.

3.5.1.1 Distribution of District Owned Water

There is a tremendous difference in the aquifer characteristics within the Plan Area. This is evident in both storage capability and yield. The impact of cyclical droughts is revealed by a greater drop in groundwater levels for those areas with limited aquifer thickness in comparison to portions of the Plan Area that are located over a thicker and higher yielding aquifer. The District has surface water sources derived from appropriated Kaweah River entitlement and temporary Central Valley Project Water supply contracts (CVP Section 215 Water). When such waters are utilized, they are distributed in a fashion to maximize the benefits of the resource and effectively recharge groundwater. During critically dry years, District owned surface water, if available, may need to be directed to the most severely impacted areas. The distribution of District owned water is at the discretion of and according to the direction given by the District Board of Directors.

3.5.1.2 Channel Recharge

There are over 200 miles of natural channels and many times that amount of manmade channels located within the Plan Area. One of the primary means of recharging groundwater is accomplished through the seepage that occurs in these channels during the conveyance of water. The transport of surface water throughout the Plan Area generally requires that water be diverted from natural channels into ditch systems. Natural channels are typically located in permeable soils. The effective amounts of channel recharge vary from year to year and are dependent upon water supplies, which are contingent upon annual climatic conditions. Channel recharge can also occur through programs, promulgated by the Plan, that use various sources of surface water to supply either conveyance losses for supplement of irrigation deliveries or that are delivered and retained in the channels solely for recharge.

The Plan participants will continue to use available surface waters to meet demands, which in turn replenish the aquifers by sinking those waters through distribution system seepage. The District will actively seek the cooperation of other government and water entities in the development of programs that promote channel recharge through water conveyance. When feasible, the District will consider delivery of water for channel recharge within the Plan Area. All such deliveries of recharge water shall be at the discretion of the District Board of Directors. The District will endeavor to evaluate and utilize recharge from natural channels, when appropriate. Natural channels with good recharge capabilities will be used as groundwater recharge facilities to receive recharge water.

3.5.1.3 Basin Recharge

Surface water that is conveyed into recharge facilities for the purpose of having such water infiltrate into the aquifer is classified as basin recharge. This type of recharge can be accomplished in a variety of

different ways. Basin recharge most commonly occurs during non-irrigation periods when water is released from Terminus Reservoir for flood control purposes. These flows are conveyed throughout the District, distributed in conveyance systems and delivered to recharge basins. The primary purpose of this activity is flood control with a simultaneous benefit of groundwater recharge. Other occurrences of basin recharge consist of programs, promulgated by the Plan, that use various sources of surface water delivered to recharge facilities.

Plan participants will continue to use available surface waters to replenish the aquifers by sinking those waters through recharge basins. The District will actively seek the cooperation of other government and water entities in the development of programs that promote basin recharge through utilization of existing facilities and the creation of new facilities. When feasible, the District will consider delivery of water for basin recharge within the Plan Area. All such deliveries of recharge water shall be at the discretion of the District Board of Directors.

3.5.1.4 In-Lieu Recharge

Another method of recharge occurs when additional surface water supplies are acquired and used to satisfy irrigation demands. These additional supplies proportionately reduce the amount of irrigation demand on groundwater. Thereby, surface water is used in-lieu of groundwater, allowing aquifers the ability to recover through a reduction in demand during irrigation cycles. This type of recharge is considered highly effective because groundwater demand is reduced while at the same time additional recharge is taking place from the delivery channels.

The Plan will continue to promote the acquisition of additional water supplies in order to maximize the amount of surface water available in the promulgation of in-lieu recharge. The District will actively seek the cooperation of other government and water entities in the development of programs that promote in-lieu recharge through the provision of additional water supplies. When feasible, the District will consider delivery of water for in-lieu recharge within the Plan Area. All such deliveries of recharge water shall be at the discretion of the District Board of Directors. The District will endeavor to evaluate and utilize in-lieu recharge, when appropriate.

3.5.1.5 Construction and Operation of Facilities

Presently there are more than forty (40) groundwater recharge basins located within the Plan Area. Most of these basins were constructed and are operated by the District. Additionally, there are Facilities Use Agreements in place between the District and most of the irrigation water entities within the Plan. These agreements grant the District the right to use and operate those companies' facilities for multiple

purposes, including the sinking (recharge) of water. The combination of recharge basins and access to conveyance facilities enables the District to capture available water for replenishment to the aquifer throughout the District. The District, in its sole discretion, shall determine which sinking basin(s), natural channel(s), canal(s) or ditch(es) shall be used to sink any water which the District has available for such purpose.

One of the District's objectives, which is integral to the Plan, is the expansion and improvement to the system of facilities that are used in the recharge of groundwater. New developments include cooperative programs that are progressing toward the construction of multi-functional facilities. These programs are expected to result in facilities that will provide composite solutions to such issues as urban storm water runoff, environmental enhancement and groundwater replenishment. The District will actively seek cooperation with other government and water entities in the acquisition and construction of facilities for groundwater replenishment.

3.5.2 Overdraft Mitigation

Since the early 1950's, the District has observed declining groundwater levels and the Kaweah Basin has been identified by the California Department of Water Resources as a basin subject to critical conditions of overdraft.[3] Critical conditions of overdraft are defined as a groundwater basin in which continuation of present practices would probably result in significant adverse overdraft-related environmental, social or economic impacts. Throughout the years the District has accomplished various studies that examined groundwater supplies. The most recent study was completed at the end of 2003. The "*Water Resources Investigation of the Kaweah Delta Water Conservation District*" once again confirmed the Basin was in a state of overdraft. The study was a comprehensive review of all the elements required to determine safe yield for the aquifers within the District. The final conclusion was that annual groundwater supplies were insufficient for water demands not met by surface water in the range of 20,000 to 36,000 acre-feet annually. The Plan will consider certain actions that will help alleviate the ongoing strain on the Basin aquifers. These actions are considered to be of great value in mitigating the existing overdraft of groundwater.

3.5.2.1 Water Conservation

Groundwater overdraft exists mainly because water demands exceed supply, with the difference taken from groundwater. Reducing demands through the most efficient usage of water is considered a viable approach to assist in mitigating overdraft. Water conservation efforts will be encouraged throughout the

[3] California Department of Water Resources, Bulletin 118-80: *Ground Water Basins in California*, A Report to the Legislature in Response to Water Code Section 12924 (January 1980)

Plan Area for agricultural, industrial and residential users. Existing and new irrigation methods, reuse of industrial water and domestic water saving devices are and will be encouraged.

District's policies and procedures promote the beneficial use of water. The District will continue to promote policies that enhance water conservation policies. The District Board of Directors has the authority to adopt water conservation and water regulation policies for the District and, pursuant to its Groundwater Management Plan, the Plan Area. If a local public agency adopts and enforces a water conservation plan within its boundaries, such a plan is encouraged to the extent it is not inconsistent with the District's Plan.

3.5.2.2 No Exportation of Groundwater

The Plan recognizes the importance of applying groundwater to lands within the Plan Area. Hydrogeologic conditions are such that equilibrium cannot be achieved or maintained if groundwater supplies are withdrawn and exported from the area. Since the District is located within an overdrafted basin, it is prudent to utilize all groundwater resources within the Plan Area. The District will take all appropriate action to prevent the exportation of water from the Plan Area.

A position has been adopted in the Plan that there shall be no exportation of groundwater that results in any additional net loss to the Plan Area's total available water supplies. The District Board of Directors has the authority to institute any measures proposed to prevent such loss.

3.5.2.3 Reduction in Groundwater Outflow

Groundwater within the Basin is not static, but travels vertically and horizontally due to a range of hydrogeological factors. The direction and quantity of groundwater flow is susceptible to changes that occur to the hydraulic gradient. Groundwater level measurements taken twice a year within the District will be used to identify the direction and quantity of groundwater flow. Typically, this outflow has been to the west and southwest. Groundwater outflow has historically been a naturally occurring condition within the Plan Area. The District will continue its efforts to monitor the amounts of such groundwater outflow annually. Monitoring will be used to assess changes to groundwater outflow resulting from influences outside the Plan Area.

3.5.2.4 Additional Water Supply and Storage

As previously noted, groundwater overdraft is the result of inadequate water supplies. One of the most effective means to overcome this shortfall is acquiring additional supplies of water. These supplies can be obtained from external water sources or be produced as a result of additional storage. Development of

additional water supply and storage is a crucial element in the Plan's efforts to mitigate groundwater overdraft.

A supplemental source of surface water necessary to conduct extensive programs is normally available in wet years when floodwaters are available on the Kaweah River or additional water supplies are available from other sources. The District has historically made beneficial use of floodwaters and excess waters for recharging groundwater supplies and will continue to do so in the future. Further, the District will continue to seek opportunities to purchase and import water into the District for groundwater recharge purposes.

Additional water supplies would enhance the local groundwater. Present political and environmental realities discourage developing additional water supplies by building dams and large water storage projects. Yet through the cooperative efforts of Plan participants, the District was able to promote an enlargement project for Lake Kaweah that provides over 42,000 acre-feet of additional storage in Terminus Reservoir. The enlargement project took the United States Army Corps of Engineers over 20 years from the initial study until completion. Water was first stored to the new gross pool elevation in 2005. The District will continue to pursue feasible efforts to secure additional water supply and storage that will be beneficial to the Plan Area.

3.5.2.5 Pumping Restrictions

The progress of those measures taken in mitigating groundwater overdraft will require ongoing evaluation as to their effectiveness. Upon a determination that the measures are not accomplishing desired results, restriction of groundwater pumping could be considered. Pumping restrictions could reduce the amount of groundwater use. Restricting groundwater pumping is highly controversial and would currently be considered as the last alternative to be implemented in mitigating groundwater overdraft.

Implementation of this step could have severe implications to a local economy that relies on unrestricted access to groundwater. Initially, any program requiring pumping restrictions would be voluntary rather than mandatory. From a practical standpoint, when restrictions on urban groundwater water supplies are implemented, mandatory agricultural pumping restrictions would be considered.

Only under special circumstances would pumping restrictions be imposed. The District Board of Directors will not impose such restrictions until consulting with local agencies and holding a mandatory public hearing at least sixty (60) days prior to the effective date of such restrictions. The District Board of Directors could impose such action only by resolution.

3.5.3 Conjunctive Use

Conjunctive use is defined as the coordinated and planned management of both surface and groundwater resources in order to maximize the efficient use of the resource. The District began conjunctive use activities in the 1930's, starting with the construction of groundwater recharge basins for the capture of available Kaweah River water. Facilities Use Agreements accompanied basin development enabling the District to convey and sink water throughout the delta of the Kaweah River. After the completion of Terminus Dam in 1962, conjunctive use was increased as a result of the ability to annually store and regulate river flows.

Conjunctive use within the Plan Area takes place through the distribution of surface water for irrigation and groundwater recharge, with groundwater being used when and where surface waters are unable to fully meet demands, either in time or area. Since the early 1970's, water entities have worked together through a formal association to use available water to its greatest benefit. The Plan will continue to foster and facilitate conjunctive use with an objective toward mitigating groundwater overdraft conditions.

3.6 Stakeholder Involvement

The management of groundwater resources is based upon serving the public interest in a responsible manner. The Plan fulfills this purpose through the involvement of entities with a permanent stake in the availability of the groundwater source. These stakeholder groups consist of various water entities like ditch companies, irrigation districts, water districts and urban water service purveyors. Local government agencies are also included as Plan stakeholders. Interactive participation by stakeholders in the review and planning process is a fundamental element in carrying out the Plan's purpose. The Plan offers a forum for stakeholders through the following elements.

3.6.1 Memorandum of Understanding

The Plan officially recognizes stakeholders through the execution of a Memorandum of Understanding (MOU) between the District and the interested entity. The purpose of the MOU is to document the interests and responsibilities of participants in the adoption and implementation of the Plan. The MOU also promotes the sharing of information, the development of a course of action and the resolving of differences that may arise regarding the Plan. Since the Plan's inception in 1995, the number of stakeholders has regularly grown to the present number of thirteen (13). It is foreseen that stakeholder involvement will increase with time. The District will continue to pursue new stakeholder involvement and shall endeavor to enter into an agreement with other local agencies in the form of a Memorandum of Understanding in compliance with California Water Code § 10750.8. A sample of one form of Memorandum of Understanding is included in Appendix "B".

One of the initial Plan participants was Tulare Irrigation District (TID), who adopted a groundwater management program in accordance with AB 255 in 1992, the first agency in the state to adopt such a program and plan. In 1996, the District and TID executed a MOU obligating both districts to coordinate their respective plan efforts and groundwater management activities within areas of overlap. It is the District's understanding that TID intends to update and amend its plan in accordance with AB 3030 provisions and as may be modified by other state legislation.

3.6.2 Advisory Committee

The Advisory Committee offers one of the primary means that stakeholders are given to participate in the Plan. This committee is open to stakeholders that have been recognized as a Plan participant through a MOU. The Advisory Committee helps guide the development and implementation of the Plan and provides a forum for resolution of controversial issues. Meetings are held annually, at a minimum, for the purpose of review and discussion of past, present and future Plan activities.

3.6.3 Relationships with Other Agencies

The Plan acknowledges that there are interests in the groundwater resource that reach beyond the area covered by the Plan. State and Federal agencies' participation in managing groundwater is an important element to the Plan. The development and enhancement of relationships with other agencies benefits the Plan through the exchange of information and resources that progress toward a better understanding and management of groundwater.

Such agencies not only have regulations that influence the Plan, but extend opportunities by sharing information, providing relevant programs and allocating funds that can be used for programs and projects within the Plan. The Plan has historically tapped into these valuable sources and it is expected to continue to do so in the future. California Water Code § 10753.8 authorizes the District to include components in its groundwater management plan for the development of relationships with state and federal agencies. Notwithstanding the foregoing, the District reserves the right to decide whether or not it will be involved in each of the activities authorized by the aforementioned statute.

3.7 Planning and Management

The establishment of an organized structure is necessary in order for the Plan to fulfill its intended purpose. The Plan is structured to function in such a way that numerous elements relating to or influencing groundwater conditions are brought together and managed for meeting Plan objectives. The planning process also plays an important role in developing such objectives and providing direction in

accomplishing goals. Both the process of planning and management combined afford the opportunity to produce the most beneficial use of the groundwater resource.

3.7.1 Land Use Planning

The District has long-standing relationships with both city and county agencies within the Plan Area that oversee land use and zoning activities. The connection between land use and the groundwater resource is reflected in the differing water demands related to land classifications and the need to supply those demands from groundwater. Land use planning coordination enables the Plan to participate in decisions that will affect future groundwater conditions. Coordination also supplies the Plan participants with information pertinent to forming programs that could address forecasted changes to groundwater. Involvement with land use planning essentially affords the Plan the opportunity to be proactive instead of reactive.

California Water Code § 10753.8 authorizes the District to include components in its groundwater management plan for the review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk for groundwater contamination. Notwithstanding the foregoing, the District reserves the right to decide whether or not it will be involved in each of the activities authorized by the aforementioned statue.

3.7.2 Groundwater Model

An important planning and management tool that was recently implemented is the District's numerical groundwater flow model. In 2005, utilizing a cooperative grant from the State Department of Water Resources, the District developed a groundwater model to calculate future changes in groundwater conditions that could occur based upon major influences such as changes in population growth, water supply and distribution. The model is able to calculate quantifiable changes to groundwater levels and flow conditions. This analytical tool can be applied to assess how existing and proposed groundwater management actions, changes in cultural practices or changes in hydrologic conditions may influence groundwater sustainability. The knowledge gained from the model will be applied in the development and evaluation of new and existing programs. The expected result will be the progression of programs and policies that will efficiently use available resources to affect the most beneficial influence to groundwater supplies.

3.7.3 Groundwater Reports

Adequate information is a vital element of planning and management of the groundwater resource. The Plan will produce, at a minimum, annual reports summarizing groundwater basin conditions and

management activities. These annual reports will include the following presentations as they pertain to the Plan.

- ✓ Summary of monitoring results, including a discussion of historical trends
- ✓ Summary of management actions during the period covered by the report
- ✓ A discussion, supported by monitoring results, of whether management actions are achieving progress in meeting management objectives
- ✓ Summary of proposed management actions for the future
- ✓ Summary of any plan component changes, including addition or modification of management objectives, during the period covered by the report
- ✓ Summary of actions taken to coordinate with other water management and land use agencies, and other government agencies

3.7.4 Plan Re-evaluation

An essential task in determining the value of management activities and goals is a periodic re-evaluation of the entire Plan. The effectiveness of the Plan is a reflection of the success and failure of measures taken in attempts to change or maintain groundwater conditions. Reviews will be focused on identifying potential changes to the Plan that could be beneficial to the groundwater resource. Additionally, assessing changing conditions in the Basin could warrant modifications of management objectives. Periodic Plan re-evaluation will occur at an interval of not more than five years apart. Separate from entire re-evaluations will be adjustments to Plan components on an ongoing basis, if necessary. The re-evaluations will focus on determining if actions under the Plan are meeting management objectives and if the management objectives are achieving the goal of sustaining the resource.

3.7.5 Dispute Resolution

The Plan acknowledges that controversial issues could arise concerning the groundwater resource. Stakeholders are encouraged to work through the Plan in addressing and resolving differences. When this process proves insufficient, the District has an applicable policy in place for dispute resolution. The Plan hereby adopts the District's "Alternative Dispute Resolution Policy", as included in Appendix "C" or the most current version of the policy.

3.7.6 Program Funding and Fees

Plan activities are funded through various sources relevant to the specific program. The District alone regularly performs recharge programs with capital budgeted for that purpose. The District also funds multiple other groundwater programs, such as facility development, operation and maintenance. Respectively, plan participants support their own individual programs from revenue derived from that

agency's budget. The Plan additionally fosters and supports multi-agency programs, where participants cooperatively combine funds and resources toward common objectives in a regional approach.

Future activities required to fully implement the Plan may require additional funding sources. Implementing legislation related to AB 3030 allows for the levying of groundwater assessments or fees under certain circumstances and according to specific procedures. Prior to instituting a groundwater assessment or fee structure, the District must hold an election on whether or not to proceed with the enactment of the assessments. A majority of the votes cast at the election is required to implement an additional funding assessment.

The District intends to exercise all of the authority given to a water replenishment district in California Water Code § 60220 through 60232 as may be necessary for the District to accomplish its purposes and goals for the Plan. A water replenishment district has the authority to fix and collect fees and assessments within the Plan Area for groundwater management in accordance with California Water Code § 60300 through 60352. The District reserves the right to decide whether or not it will be involved in this activity authorized by the aforementioned statutes.

SECTION 4: RULES AND REGULATIONS

The below presented items in this section are the Groundwater Management Plan rules and regulations to implement the Groundwater Management Plan of Kaweah Delta Water Conservation District adopted August 1, 1995 and updated on November 7, 2006.

1. Water Monitoring: At least twice per year, the Kaweah Delta Water Conservation District (hereinafter the "District") shall provide staff at its expense to monitor and measure the depth to standing groundwater at well sites within the Plan Area. In its sole discretion, District shall select the number and location of well sites. District shall prepare charts as required by the Plan.

2. Channel Recharge: District shall endeavor to evaluate and utilize recharge from natural channels when appropriate, as determined by District. Natural channels with good recharge capabilities will be evaluated for potential use as groundwater recharge facilities to receive recharge water.

3. Basin Recharge: When feasible, District will consider delivery of water to recharge basins within the Plan Area. All such deliveries of recharge water shall be at the discretion of District Board of Directors ("District Board of Directors").

4. Water Conservation: District's policies and procedures promote the beneficial use of water. The District shall continue to promote policies that enhance water conservation policies. The District Board of Directors has the authority to adopt water conservation and water regulation policies for the District and, pursuant to its groundwater management plan, the Plan Area. If a local public agency adopts and enforces a water conservation plan within its boundaries, such Plan shall be effective to the extent it is not inconsistent with the District's Plan.

5. No Exportation of Groundwater: After the adoption hereof, there shall be no exportation of groundwater that results in any additional net loss to the Plan Area's total available water supplies. The District Board of Directors has the authority to institute any measures proposed to prevent such net loss.

6. Intra-district Water Transfers: Water transfers within the Plan Area are permissible and subject to the administration of the Kaweah River Watermaster under the direction of the Kaweah & St. Johns Rivers Association Board of Directors.

7. Inter-district Water Transfers: District shall endeavor to promote advantageous water transfers (water transfers that increase the water supply available within the Plan Area). The District Board of Directors has the authority to initiate such transfers.

8. Reduction in Groundwater Outflow: The District may monitor the outflow of groundwater from the Plan Area. Before the District takes any steps to prevent such outflow, such steps shall be approved by the District Board of Directors.

9. Pumping Restrictions: Only under special circumstances would pumping restrictions be imposed. The District Board of Directors shall not impose such restrictions until after consulting with local agencies and holding a mandatory public hearing at least sixty (60) days prior to the effective date of such restrictions. The District Board of Directors could impose such action only by resolution.

10. Additional Water Supply and Storage: The District will continue to actively review and evaluate potential new supplies of water and new storage facilities for water which may benefit the Plan Area. To the extent the District Board of Directors determines that it has the capability to do so, the District will fund projects which increase the water supply and water storage which benefit the Plan Area. The District's involvement in any project to increase water supply or water storage shall be approved by the Board of the Directors of the District.

11. <u>Redistribution of Surface Water:</u> The District, in its sole discretion, shall determine which sinking basin(s), natural channel(s), canal(s) or ditch(es) shall be used to sink any water which the District has available for such purpose.

GLOSSARY

A

acre-foot (af) The volume of water necessary to cover one acre to a depth of one foot; equal to 43,560 cubic feet or 325,851 gallons.

alluvial Of or pertaining to or composed of alluvium.

alluvium A general term for clay, silt, sand, gravel, or similar unconsolidated detrital material, deposited during comparatively recent geologic time by a stream or other body of running water, as a sorted or semi sorted sediment in the bed of the stream or on it's floodplain or delta, as a cone or fan at the base of a mountain slope**.**

aquitard A confining bed and/or formation composed of rock or sediment that retards but does not prevent the flow of water to or from an adjacent aquifer. It does not readily yield water to wells or springs, but stores ground water.

aquifer A body of rock or sediment that is sufficiently porous and permeable to store, transmit, and yield significant or economic quantities of groundwater to wells and springs.

artificial recharge The addition of water to a groundwater reservoir by human activity, such as putting surface water into dug or constructed spreading basins or injecting water through wells.

average annual runoff The average value of total annual runoff volume calculated for a selected period of record, at a specified location, such as a dam or stream gage.

average year water demand Demand for water under average hydrologic conditions for a defined level of development.

B

basin management objectives (BMOs) See management objectives

beneficial use One of many ways that water can be used either directly by people or for their overall benefit. The State Water Resources Control Board recognizes 23 types of beneficial use with water quality criteria for those uses established by the Regional Water Quality Control Boards.

C

confined aquifer An aquifer that is bounded above and below by formations of distinctly lower permeability than that of the aquifer itself. An aquifer containing confined ground water. See artesian aquifer.

conjunctive use The coordinated and planned management of both surface and groundwater resources in order to maximize the efficient use of the resource; that is, the planned and managed operation of a groundwater basin and a surface water storage system combined through a coordinated conveyance infrastructure. Water is stored in the groundwater basin for later and planned use by intentionally recharging the basin during years of above-average surface water supply.

contaminant Any substance or property preventing the use or reducing the usability of the water for ordinary purposes such as drinking, preparing food, bathing washing, recreation, and cooling. Any solute or cause of change in physical properties that renders water unfit for a given use. (Generally considered synonymous with pollutant).

critical conditions of overdraft A groundwater basin in which continuation of present practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts. The definition was created after an extensive public input process during the development of the Bulletin 118-80 report.

D

dairy and related water demand The use of water from those facilities where herds of cows are managed for the production of milk.

deep percolation Percolation of water through the ground and beyond the lower limit of the root zone of plants into groundwater.

drought condition Hydrologic conditions during a defined period when rainfall and runoff are much less than average.

E

electrical conductivity (EC) The measure of the ability of water to conduct an electrical current, the magnitude of which depends on the dissolved mineral content of the water.

environmental water Water serving environmental purposes, including instream fishery flow needs, wild and scenic river flows, water needs of fresh-water wetlands, and Bay-Delta requirements.

evapotranspiration (ET) The quantity of water transpired (given off), retained in plant tissues, and evaporated from plant tissues and surrounding soil surfaces.

G

groundwater basin An alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and having a definable bottom.

groundwater budget A numerical accounting, the *groundwater equation*, of the recharge, discharge and changes in storage of an aquifer, part of an aquifer, or a system of aquifers.

groundwater in storage The quantity of water in the zone of saturation.

groundwater management The planned and coordinated management of a groundwater basin or portion of a groundwater basin with a goal of long-term sustainability of the resource.

groundwater management plan A comprehensive written document developed for the purpose of groundwater management and adopted by an agency having appropriate legal or statutory authority.

groundwater monitoring network A series of monitoring wells at appropriate locations and depths to effectively cover the area of interest. Scale and density of monitoring wells is dependent on the size and complexity of the area of interest, and the objective of monitoring.

groundwater overdraft The condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years during which water supply conditions approximate average conditions.

groundwater recharge facility A structure that serves to conduct surface water into the ground for the purpose of replenishing groundwater. The facility may consist of dug or constructed spreading basins, pits, ditches, furrows, streambed modifications, or injection wells.

groundwater recharge The natural or intentional infiltration of surface water into the zone of saturation.

groundwater storage capacity volume of void space that can be occupied by water in a given volume of a formation, aquifer, or groundwater basin.

groundwater subbasin A subdivision of a groundwater basin created by dividing the basin using geologic and hydrologic conditions or institutional boundaries.

groundwater table The upper surface of the zone of saturation in an unconfined aquifer.

groundwater Water that occurs beneath the land surface and fills the pore spaces of the alluvium, soil, or rock formation in which it is situated. It excludes soil moisture, which refers to water held by capillary action in the upper unsaturated zones of soil or rock.

H

hydraulic conductivity A measure of the capacity for a rock or soil to transmit water; generally has the units of feet/day or cm/sec.

hydrograph A graph that shows some property of groundwater or surface water as a function of time.

hydrologic region A study area consisting of multiple planning subareas. California is divided into 10 hydrologic regions.

I

infiltration The flow of water downward from the land surface into and through the upper soil layers.

in-lieu recharge The practice of providing surplus surface water to historic groundwater users, thereby leaving groundwater in storage for later use.

L

land subsidence The lowering of the natural land surface due to groundwater (or oil and gas) extraction.

lithologic log A record of the lithology of the soils, sediments and/or rock encountered in a borehole from the surface to the bottom.

lithology The description of rocks, especially in hand specimen and in outcrop, on the basis of such characteristics as color, mineralogic composition, and grain size.

losing stream A stream or reach of a stream that is losing water by seepage into the ground.

M

management objectives Objectives that set forth the priorities and measurable criteria of local groundwater basin management.

N

natural recharge Natural replenishment of an aquifer generally from snowmelt and runoff; through seepage from the surface.

O

operational yield An optimal amount of groundwater that should be withdrawn from an aquifer system or a groundwater basin each year. It is a dynamic quantity that must be determined from a set of alternative groundwater management decisions subject to goals, objectives, and constraints of the management plan.

ordinance A law set forth by a governmental authority.

P

perched groundwater Groundwater supported by a zone of material of low permeability located above an underlying main body of groundwater.

perennial yield The maximum quantity of water that can be annually withdrawn from a groundwater basin over a long period of time (during which water supply conditions approximate average conditions) without developing an overdraft condition.

perforated interval The depth interval where slotted casing or screen is placed in a well to allow entry of water from the aquifer formation.

permeability The capability of soil or other geologic formations to transmit water. See hydraulic conductivity.

point source A specific site from which wastewater or polluted water is discharged into a water body.

public water system demand The use of water from small, regulated public water systems. Typical facility types included mutual water companies, schools, mobile home parks, golf courses, county facilities, motels, livestock sales yards, and miscellaneous industries such as nurseries, food processing facilities, packing houses, etc.

R

recharge Water added to an aquifer or the process of adding water to an aquifer. Ground water recharge occurs either naturally as the net gain from precipitation, or artificially as the result of human influence. See artificial recharge.

recharge basin A surface facility constructed to infiltrate surface water into a groundwater basin.

runoff The volume of surface flow from an area.

rural domestic water demand The use of water from residences not served by a municipal connection, mutual water company, or other small public water system.

S

safe yield The maximum quantity of water that can be continuously withdrawn from a groundwater basin without adverse effect.

salinity Generally, the concentration of mineral salts dissolved in water. Salinity may be expressed in terms of a concentration or as electrical conductivity. When describing salinity influenced by seawater, salinity often refers to the concentration of chlorides in the water. See also total dissolved solids.

saline intrusion The movement of salt water into a body of fresh water. It can occur in either surface water or groundwater bodies.

seepage The gradual movement of water into, through or from a porous medium. Also the loss of water by infiltration into the soil from a canal, ditches, laterals, watercourse, reservoir, storage facilities, or other body of water, or from a field.

semi-confined aquifer A semi-confined aquifer or leaky confined aquifer is an aquifer that has aquitards either above or below that allow water to leak into or out of the aquifer depending on the direction of the hydraulic gradient.

specific yield the ratio of the volume of water a rock or soil will yield by gravity drainage to the total volume of the rock or soil**.**

stakeholders Any individual or organization that has an interest in water management activities. In the broadest sense, everyone is a stakeholder, because water sustains life. Water resources stakeholders are typically those involved in protecting, supplying, or using water for any purpose, including environmental uses, who have a vested interest in a water-related decision.

surface supply Water supply obtained from streams, lakes, and reservoirs.

sustainability Of, relating to, or being a method of using a resource so that the resource is not depleted or permanently damaged.

T

total dissolved solids (TDS) a quantitative measure of the residual minerals dissolved in water that remain after evaporation of a solution. Usually expressed in milligrams per liter. See also salinity

transmissivity The product of hydraulic conductivity and aquifer thickness; a measure of a volume of water to move through an aquifer. Transmissivity generally has the units of ft^2/day or gallons per day/foot. Transmissivity is a measure of the subsurface's ability to transmit groundwater horizontally through its entire saturated thickness and affects the potential yield of wells.

U

unconfined aquifer An aquifer which is not bounded on top by an aquitard. The upper surface of an unconfined aquifer is the water table.

unsaturated zone The zone below the land surface in which pore space contains both water and air.

urban water demand The use of water from incorporated cities (Visalia, Tulare, Farmersville, Exeter, Ivanhoe) and in the unincorporated areas served by a municipal water purveyor.

urban water management plan (UWMP) An UWMP is required for all urban water suppliers having more than 3,000 connections or supplying more than 3,000 acre-feet of water. The plans include discussions on water supply, supply reliability, water use, water conservation, and water shortage contingency and serve to assist urban water suppliers with their long-term water resources planning to ensure adequate water supplies for existing and future demands.

usable storage capacity The quantity of groundwater of acceptable quality that can be economically withdrawn from storage.

W

water quality Description of the chemical, physical, and biological characteristics of water, usually in regard to its suitability for a particular purpose or use.

water year A continuous 12-month period for which hydrologic records are compiled and summarized. Different agencies may use different calendar periods for their water years.

watershed The land area from which water drains into a stream, river, or reservoir.

well completion report A required, confidential report detailing the construction, alteration, abandonment, or destruction of any water well, cathodic protection well, groundwater monitoring well, or geothermal heat exchange well. The reports were called *Water Well Drillers' Report* prior to 1991 and are often referred to as "driller's logs." The report requirements are described in the California Water Code commencing with Section 13750.

APPENDIX A

KAWEAH & ST. JOHNS RIVERS ASSOCIATION
TRANSFER POLICY

KAWEAH & ST. JOHNS RIVERS ASSOCIATION
STATEMENT OF POLICY RE WATER TRANSFERS AND EXCHANGES
(Adopted September 8, 1994)

The purpose of this policy statement is to confirm the intent of the Association to retain waters of the Kaweah River and its tributaries in the Kaweah River hydrologic surface basin ("Basin") for beneficial use therein. The boundaries of the Basin are set forth on Exhibit A, appended hereto and made a part of this statement.

Each of the Member Units shall retain the right and privilege alter, amend, change or modify their respective service areas, without notice to or consent of the Association, provided that the expanded service area of the Member Unit does not extend beyond the boundary of the historical Basin. Should a Member Unit make such an adjustment to its service area, it shall so notify the Watermaster. Documentation shall be provided by the Member Unit, to the Watermaster, adequate to demonstrate that the expanded service area is within the Basin.

Water to which Member Units are entitled shall be utilized only within said Basin boundary except as provided hereinafter for periods of flood release. Transfer(s) of entitlement waters shall be allowed within the Basin upon proper notification to the Watermaster of such impending transfer(s). The Watermaster shall provide notification to the Board of Directors of any such transfer(s). Approval of the Board of Directors shall not be required for any transfer within the Basin. It is acknowledged that under certain flood release conditions, after irrigation and spreading demands have been fully satisfied and the capability of the Basin to retain flood release water has been fulfilled, flood water flows naturally to the historic Tulare Bed which lies within the Basin.

Member Units may enter into water exchange agreements which call for no net loss to the Basin of to any in-Basin water rights holder, subject to administrative rules and regulations adopted by the Board of Directors.

Transfer(s) of riparian waters or waters resulting from settlement of riparian entitlement negotiations shall not be allowed. Transfers of water received under contracts for water made available through the State Water Project, the Federal Central Valley Project or the Cross Valley Canal Exchange Program shall not be subject to these provisions.

This policy shall be implemented by the following additions to the rules and regulations effective upon adoption of the policy by the Board of Directors:

Transfers of water shall be allowed between entities for use within the Basin. Notice of an impending transfer shall be provided to the Watermaster in writing.

Exchanges of water out of the Basin shall be subject to approval of the Board of Directors. Such exchanges shall only be considered when the recipient of the water can demonstrate, to the satisfaction of the Board of Directors, that a hardship situation exists. The required information associated with the documentation of the hardship situation shall be established by the Board of Directors on a case by case basis.

An out-of-Basin water exchange agreement may be entered into by a member unit subject to approval of the Association Board of Directors. Any exchange approved by the Board of Directors shall be conditioned on the full execution of an exchange/return agreement submitted with the petition for approval. Such agreement(s) shall call for no net loss to the Basin or to any in-Basin water rights holder.

To this end, exchanges shall call for channel loss water to be withheld from the total quantity of water available for exchange in the year of the exchange.

The total quantity of water exchanged shall be returned to the Basin for further diversion to a headgate designated by the exchanger subject to coordination with the Watermaster.

To compliment the Terminus and in-Basin storage capabilities available to members of the Association, temporary out-of-Basin storage historically has been permitted on a case-by-case basis and may be permitted in the future. Authority to grant permission to store out-of-Basin shall reside with the Watermaster, subject to appeal to the Board of Directors. Permission shall be predicated on the ability of the requesting entity to demonstrate the eventual delivery within the Basin of waters temporarily stored out-of-Basin. Following removal from storage, documentation shall be provided that the water, less the normal losses, was delivered within the Basin.

APPROVED BY
THE KAWEAH AND ST. JOHNS RIVERS ASSOCIATION BOARD OF DIRECTORS
ON SEPTEMBER 8, 1994.

APPENDIX B

MEMORANDUM OF UNDERSTANDING (SAMPLE)

MEMORANDUM OF UNDERSTANDING BETWEEN KAWEAH DELTA WATER CONSERVATION DISTRICT AND CITY OF TULARE

ARTICLE I - AGREEMENT

The articles and provisions contained herein constitute a bilateral and binding agreement by and between KAWEAH DELTA WATER CONSERVATION DISTRICT (hereinafter the "District") and CITY OF TULARE (hereinafter "Agency").

ARTICLE II - RECOGNITION

The District has developed a Groundwater Management Plan (hereinafter the "Plan") with input from several local agencies located within the District. It is the intent of District to allow and encourage such agencies to coordinate efforts and be a part of the District's Plan by means of a separate Memorandum of Understanding (hereinafter the "MOU") between each agency and District.

ARTICLE III - PURPOSE

It is the purpose of the MOU, entered into willingly, between District and Agency, to document the interests and responsibilities of both parties in the adoption and implementation of the Plan. It is also hoped that such MOU will promote and provide a means to establish an orderly process to share information, develop a course of action and resolve any misunderstandings or differences that may arise regarding the Plan.

ARTICLE IV - COORDINATE

There shall be an annual coordinating meeting (hereinafter the "Meeting") between the District and the Agency. District shall give notice to the Agency thirty (30) days prior to date of the Meeting to discuss the manner in which the Plan is being implemented and other items related to the Plan. If there are concerns or questions regarding the Plan, Agency shall transmit its concerns in writing to District seven (7) days prior to the Meeting.

SAMPLE

ARTICLE V - OBLIGATIONS

The Plan shall be binding on the parties hereto unless superseded by the MOU or amendment thereto.

ARTICLE VI - AREA OF PLAN.

The Plan shall be effective in all areas within the Agency boundaries. The Plan shall also be effective in any area annexed to the Agency subsequent to the adoption of the Plan.

ARTICLE VII - TERM

The initial term of the MOU shall commence on the date hereof and continue for five (5) years, and shall continue year to year thereafter, unless terminated by written notice given at least one (1) year prior to such termination.

This Memorandum of Understanding is made and entered into this _____ day of _____, 2004.

KAWEAH DELTA WATER CONSERVATION DISTRICT	**CITY OF TULARE**
By:_____	By:_____
Title:_____	Title:_____
By:_____	By:_____
Title:_____	Title:_____

SAMPLE

APPENDIX C

KAWEAH DELTA WATER CONSERVATION DISTRICT
ALTERNATIVE DISPUTE RESOLUTION POLICY

KAWEAH DELTA WATER CONSERVATION DISTRICT
ALTERNATIVE DISPUTE RESOLUTION POLICY
(Adopted February 3, 2004)

Purpose. The District recognizes that defending or prosecuting lawsuits can be expensive and time-consuming, resulting in a drain on District resources that should be avoided, if reasonably possible. To that end, the District hereby implements this policy to encourage the resolution of disputes, claims and lawsuits through alternative dispute resolution procedures.

Procedures. Whenever the District is named in a lawsuit or receives a written claim or a serious threat of imminent litigation, the District staff shall immediately consult with the District General Counsel regarding the same. Together, the District staff and the District General Counsel shall formulate a recommended response to be considered by the Board of Directors at its next meeting.

Whenever the District becomes aware of any unasserted potential lawsuit, claim or dispute, with a reasonable likelihood of being asserted, against the District, the District staff shall consult with the District's counsel regarding the best method for responding to the same. Possible responses include, but are not limited to, the following:

1. Do nothing.
2. A verbal communication from the District or its general counsel.
3. A written communication from the District or its general counsel.
4. An offer to meet and discuss the matter with District personnel.
5. An offer to mediate the matter before a neutral third-party mediator.
6. An offer to arbitrate the matter before the American Arbitration Association.
7. An offer to arbitrate the matter using the rules of Judicial Arbitration found in California statutes.

District staff shall advise the Board of Directors of any unasserted lawsuit, claim or dispute, with a reasonable likelihood of being asserted, including the District's response to the same. The Board of Directors shall be advised whether or not the matter is resolved. If the potential lawsuit, claim or dispute becomes an actual lawsuit, claim or dispute, the response of the District shall be handled as set forth above in the previous paragraphs.

It shall be the practice of the District to encourage mediation of lawsuits, claims or disputes, whenever reasonably practical, in order to resolve such matters. Mediation shall be by a neutral third-party qualified to mediate such matters.