TRANQUILLITY IRRIGATION DISTRICT

WATER MANAGEMENT PLAN

2005-2009

prepared for:

United States Bureau of Reclamation
Mid-Pacific Region

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District Name: **Tranquillity Irrigation District**

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A. History

Tranquillity Irrigation District (TID or District) was formed January 22, 1918, as a public agency designed to serve the local community with water. It is the second oldest such agency in Fresno County. A Board of Directors elected from the community at-large governs the District. TID encompasses approximately 10,750 acres in the west central portion of Fresno County in California's Central San Joaquin Valley. District farmland has historically produced a variety of commodities including cotton (pima and acala), canning tomatoes, alfalfa (seed and hay), sugar beets, small grains, and almonds. The principal community is the unincorporated town of Tranquillity, which is within the District boundary. See **Attachments A1 & A2** for TID vicinity and location maps.

The District is geographically adjacent to the Fresno Slough, an historic northern flood outlet of the Kings River. Fresno Slough was also a flooded backwater (swamp) of the San Joaquin River. As a result, the District has historic riparian water right claims to water from both the Kings and San Joaquin Rivers. However, almost from the very beginning, those claims were constantly disputed by other water users. Finally, in the 1950's the United States Bureau of Reclamation (USBR) constructed the Central Valley Project (CVP), which includes the Delta-Mendota Canal (DMC) that terminates at the Mendota Pool. The Mendota Pool provided a storage reservoir at the confluence of the Fresno Slough and San Joaquin River, which allowed the United States to settle the water rights related disputes of various diverters around the Mendota Pool. Ultimately, TID signed a contract with the United States in 1963 that memorialized the solution. TID received a quantity of "water rights settlement" water and the opportunity to purchase supplemental or "contract" water in order to meet the total needs of the District's agricultural water users. The District then settled with some Kings River water users by establishing an agreement allowing the District's Kings River water rights to be used for the most efficient operation of that river. In exchange, the Kings River water users assist the District with the cost of its "contract" water from the United States.

Today, the DMC discharges water into the Mendota Pool, and some of this supply flows south into the Fresno Slough. The District then lifts its allocation of CVP water from the Fresno Slough into its own distribution system. The TID distribution system includes approximately 42 miles of unlined canals, 5 miles of pipeline, two major lift-pump stations, and a series of secondary lifts and automation structures. The entire system is metered, which includes water diverted by the District and deliveries to farm turnouts. The system also is automated, which facilitates efficient operation. In addition to surface water, the District owns nine agricultural groundwater wells, which are operated to provide for peaking during periods of high demand, and water supply reliability to supplement decreased CVP surface water allocations, which have been frequent since 1992. In 1992, the CVP was required to provide water for new demands, such as environmental requirements from endangered fish species in the Sacramento-San Joaquin River Delta. Providing CVP water for these new demands has reduced water allocation for south of Delta CVP water users and has placed pressure on other water sources.

A portion of the land in TID, in the southwest of the District, has been designated by the USBR as a drainage problem area. The shallow groundwater table is generally 15 feet or deeper beneath District land and subsurface drainage systems have not been constructed. Crops are grown without impact from shallow groundwater. The District has installed monitoring wells to track the elevation of this shallow groundwater table and to determine if lateral subsurface drainage flows from upland areas are impacting District land. To date shallow groundwater has not affected irrigation practices or crop production in the District.

The District also owns and maintains the domestic/drinking water system for the local community and throughout the rural areas of the District, as well as the community park. The demand for these urban water uses is provided by groundwater pumping. Due to the small number of drinking water connections (about 350 +/-), the District is not deemed an urban water supplier. The District's surface water sources are used solely for agricultural irrigation.

1. Date district formed: Jan 22, 1918 *Date of first Reclamation contract*: 1963
Original size (acres): 10,750 *Current year (last complete calendar year)*: 2009

2. Current size, population, and irrigated acres

	(2009)
Size (acres)	10,750
Population served	N/A*
Irrigated acres	8,596

* The District does not serve an urban population with their USBR contract water, nor are they considered an "Urban Water Supplier"

3. Water supplies received in current year (2009)

Water Source	*AF*
Federal urban water (Tbl 1)	0
Federal agricultural water (Tbl 1)	744
State water (Tbl 1)	0
Other Wholesaler (define) (Tbl 1)	0
Local surface water (Tbl 1)	16,911
Upslope drain water (Tbl 1)	0
District ground water (Tbl 2)	13,021
Banked water (Tbl 1)	0
Transferred water (Tbl 6)	-4,131
Recycled water (Tbl 3)	0
Other (James ID unintentional spills) (Tbl 1)	590
Total	27,135

4. Annual entitlement under each right and/or contract

	AF	Source	Contract #	Availability period(s)
USBR Urban AF/Y	N/A	-	-	-
USBR Agriculture AF/Y	13,800	USBR	14-06-200-701-A-LTR1	CVPIA reductions, long-term average 60% deliveries
Other AF/Y	20,200	San Joaquin River Riparian	14-06-200-701-A	February to September, amount & schedule based on hydrology

5. Anticipated land-use changes

New industry and housing in the area tends to be limited in Tranquillity due to the existing sewer plant capacity and Fresno County zoning requirement limitations. TID has also seen a slow gradual shift towards higher value permanent crops. The shift toward permanent crops is expected to continue over the next five years.

6. Cropping patterns (Agricultural only)

List of current crops (crops with 5% or less of total acreage) can be combined in the 'Other' category.

TID lands are predominately used for the production of irrigated field, row and forage crops. The crops grown during 2009 included Alfalfa (140 acres), Cereals (714 acres), Cotton (2,980 acres), Nuts (506 acres), Onions (748 acres), Pomegranates (79 acres), Seed Crops (1,637 acres, primarily alfalfa), and Tomatoes (1,793 acres). During the last 5 years, production has shifted away from cotton to other crops. Double cropping typically does not occur in TID. Nuts include both pistachios and almonds.

Original Plan (2003)		Current Plan (2009)	
Crop Name	Acres	Crop Name	Acres
		Alfalfa Seed	140
		Cereals	714
Cotton	7,416	Cotton	2,979.5
		Almonds	351
		Pistachios	155
		Onions	748
		Pomegranates	79
		Misc Seed Crops	1,636.5
Sugar Beets	800	Sugar Beets	0
Tomatoes	650	Tomatoes	1,793
Other (<5%)	723	Other (<5%)	0
Total	9,589	Total	8,596

(See Planner, Chapter 2, Appendix A for list of crop names)

7. Major irrigation methods (by acreage) (Agricultural only)

Original Plan (2003)		Current Plan (2009)	
Irrigation Method	Acres	Irrigation Method	Acres
Level basin, 1/8 mile	7,640	Level basin, 1/8 mile	5,950
Graded surface, 1/8 mile	1,907	Graded surface, 1/8 mile	0
Trickle, surface	42	Trickle, surface	2,646
Other	0	Other	0
Total	9,589	Total	8,596

(See Planner, Chapter 2, Appendix A for list of irrigation system types)

Most of TID is irrigated using dead level basins with short length of water run, usually 1/8 mile long. It is estimated that about 70 percent of the District is irrigated using this approach. Surface trickle irrigation (i.e. drip irrigation) is typically used for the almond plantings. Sprinklers and gated pipe may be used during pre-irrigation. TID turnouts provide large flows, generally in the 7 to 14 cfs range, which allows for rapid flooding of small fields. Irrigation method acreages are estimated as the District does not typically gather information on irrigation methods.

B. Location and Facilities

See **Attachment A3** for a map of the District's major agricultural facilities, including points of delivery, outflow points, conveyance system (canals and pipelines), lifts, automated structures, measurement locations, and well locations.

1. Incoming flow locations and measurement methods

Location Name	Physical Location	Type of Measurement Device	Accuracy
TID Lift #1	Fresno Slough at James Road	Hour meter calibrated to SLDMWA pump test flow measurement	+/- 6%
TID Lift #2	Fresno Slough at Colorado Avenue	Hour meter calibrated to SLDMWA pump test flow measurement	+/- 6%
Groundwater Wells	Various locations throughout the District	Propeller meter	+/- 6%
James ID "E Stub" Inter-connection	End of James ID Lateral E near intersection of Manning and Solano Avenues	James ID Propeller meter	+/- 6%
Lincoln Interconnection	Boundary of Fresno Slough WD and TID at Lincoln Avenue	Canal gate/orifice	+/- 10%
Fresno Slough Re-circulation Lift Pump	Fresno Slough south of Colorado Avenue and TID Lift#1	None	N/A

2. Current year Agricultural Conveyance System

Miles Unlined - Canal	Miles Lined - Canal	Miles Piped	Miles - Other
36.8	0	2.3	0

3 Current year Urban Distribution System

Miles AC Pipe	Miles Steel Pipe	Miles Cast Iron Pipe	Miles - Other
N/A	N/A	N/A	N/A

4. Storage facilities (tanks, reservoirs, regulating reservoirs)

Name	Type	Capacity (AF)	Distribution or Spill
None			

5. Outflow locations and measurement methods (Agricultural only)
Provide this information in Section 2 F.

6. Description of the agricultural spill recovery system

The TID conveyance/distribution system is managed as automated level pools to avoid operational spills. Irrigation tail water is confined to the irrigated land and most water users typically irrigate using dead level fields or graded fields with blocked ends. On occasion, some water users will recycle tail water using temporary portable pumps. These pumps collect tail water from a temporary sump and pump the water back to the head of the irrigation run for reuse. Tranquillity ID can deliver groundwater for storage, sale, or exchange at either of two pump in locations to the Mendota Pool, Tranquillity ID Lift #1, or the downstream end of the Fresno Slough Water District canal system.

7. Agricultural delivery system operation (check all that apply)

On-demand	Scheduled	Rotation	Other (describe)
	100%		

8. Restrictions on water source(s)

Source	Restriction	Cause of Restriction	Effect on Operations
Schedule 2 CVP water	Schedule	Contractual	Dictates delivery amounts each month which doesn't restrict operations due to other supplies available

9. Proposed changes or additions to facilities and operations for the next 5 years

Proposed changes and additions to the District's facilities in the next 5 years (2010-2014) are listed below. Implementation of the improvements will depend on available funding.

Facility	Description	Schedule
Railroad Reservoir	Investigation and construction of 300 AF+/- regulation/storage reservoir	2011
Fresno Slough Water District Inter-connections	Pipeline or canal interconnections for delivery of water between Districts	When funding permits
Recovery wells	Construct new agricultural wells	Replace aging wells as needed
Recovery wells	Two USBR drought relief ARRA funded wells	2010-2011
Fresno Slough Re-Lift Pump	Increase size of Lift pump on Fresno Slough for re-circulation of James ID spills to Fresno Slough	When maintenance dictates pump replacement
Grower turnout modifications	Modify to pressurized system to allow drip irrigation	As requested by growers

In December 2008 the District completed a 2006 USBR Water Conservation Field Service Program funded study for the inter-connection of seven (7) possible locations between TID and neighboring Districts, four with Fresno Slough Water District (FSWD) and three with James Irrigation District (James ID).

One connection from FSWD to TID along the Lincoln Avenue alignment was completed during the study. Three additional inter-connections were studied and may be completed in the future if funding permits. These inter-connections allow Tranquillity ID to wheel surface water supply into their District through shorter conveyance systems, and to bring TID groundwater into the District from their wells which are located on TID property within FSWD.

Two inter-connections from James ID to the Tranquillity ID were existing and studied, one which goes from James ID to the Fresno Slough and then the District's Fresno Slough Re-Lift Pump, and another from the James ID E-stub to the TID Slough Canal Lateral 3. These inter-connections allow James ID to send water from within their canal system to TID when beneficial to the Districts.

C. Topography and Soils

1. Topography of the district and its impact on water operations and management

After many years, the USDA Natural Resources Conservation Service published the soil survey of Western Fresno County in February 2006. The soil survey indicates that soil slope ranges from 0 to 1 percent for the majority of the soils in the District. Based on US Geological Survey topographic mapping, the direction of fall or slope is predominately from south to north at about 1 ¾ foot per mile, up to about 3 ½ foot per mile. The total fall from south to north is about 14 feet from the northern to southern TID boundaries. From east to west the District is relatively flat with little slope. The topography results in the need for a series of lift pumps in the TID conveyance/distribution system to provide water service to higher elevation lands.

2. District soil associations (Agric only)

Soil Association (Detailed Mapping Units)	Estimated Acres	Effect on Water Operations and Management
Tachi-Armon-Wekoda Soil Association (General Soil Map Unit)		
Tachi clay, 0-1% slope (ca282)	*3,525*	The Tachi series consists of very deep, very poorly drained soils on flood plains on basin floors. Some areas may have high water table, saline-sodic conditions, restricted permeability, and shrink-swell potential.
Altaslough clay loam, 0-1% slope (ca120)	*2,961*	The Altaslough series consists of very deep, somewhat poorly drained soils on flood plains and basin floors. Some areas may have high water table, saline-sodic conditions, restricted permeability, and shrink-swell potential.
Gepford clay, 0-1% slope (ca130)	*2,421*	The Gepford series consists of very deep, poorly drained soils on flood plains and basin floors. Some areas may have high water table, saline-sodic conditions, restricted permeability, and shrink-swell potential.
Lillis clay, 0-1% slope (ca2840	*1,163*	The Lillis series consists of very deep, poorly drained soils on fan skirts. Some areas may have high water table, saline-sodic conditions, restricted permeability, and shrink-swell potential.
Tranquillity-Ciervo, saline-sodic-Calflax (General Soil Map Unit)		
Tranquillity-Tranquillity, wet, complex, saline-sodic, 0-1% slope (ca285)	*614*	Tranquillity series consists of very deep, somewhat poorly drained soils on fan skirts. Some areas may have high water table, saline-sodic conditions, restricted permeability, and shrink-swell potential.
Calflax clay loam, saline-sodic, wet, 0-1% slope (ca482)	*3*	The Calflax series consists of very deep, moderately well drained soils on fan skirts. Some areas may have high water table, saline-sodic conditions, restricted permeability, and shrink-swell potential.
Total	*10,687*	

Note: It may be observed that there is slight difference (1 percent) in acreages between the GIS District boundary (10,687 acres) used in the NRCS soils areas and the known District area (10,750 acres). This difference is typical of GIS calculations due to use of different source data.

The two soil associations which occur in TID, were mapped by the USDA NRCS and have potential limitations such as restricted permeability and native salinity and sodicity. These issues have been addressed by soil reclamation, ongoing soil and irrigation management approaches, and selection of suitable crops. The TID irrigation conveyance/distribution system was designed with consideration for these potential limitations and they do not have an effect on TID water system operation and management. The soils map showing soil mapping units, and the descriptions of the NRCS detailed soil mapping units occurring in TID are included in **Attachment B**, District Soils Map.

3. Agricultural limitations resulting from soil problems (Agricultural only)

Soil Problem	Estimated Acres	Effect on Water Operations and Management
N/A		

D. Climate

1. General climate of the district service area

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Avg Precip. (inches)	1.72	1.50	1.47	0.60	0.30	0.05	0.03	0.05	0.22	0.66	0.65	1.08	8.33
Avg Temp. (°F)	46	51	56	61	69	75	79	77	73	64	53	46	63
Max. Temp. (°F)	57	63	69	75	84	90	95	94	89	80	67	57	77
Min. Temp (°F)	38	40	43	46	52	57	62	61	57	47	41	36	49
ETo (inches)	1.34	2.10	4.13	6.14	8.23	8.68	8.92	8.20	6.36	4.48	2.34	1.33	62.25

Weather station ID Five Points *Data period: Year* 1982 *to Year* 2010

Average wind velocity 5.7 mph *Average annual frost-free days:* 250

Source: California Irrigation Management Information System (CIMIS), Station #2 (www.cimis.water.ca.gov)

The TID area is characterized by a warm desert climate. Temperatures during summer often exceed 100°F with winter temperature usually 32°F or higher. The growing season is long with most precipitation occurring during winter. The highest precipitation occurs during January with about 90 percent of the total precipitation occurring between November and April. Precipitation is rare during the summer and usually associated

with infrequent tropical storms. Prevailing winds are from the northwest and usually less than 10 miles per hour.

2. Impact of microclimates on water management within the service area
No known microclimates exist within TID.

E. Natural and Cultural Resources

1. Natural resource areas within the service area

Name	Estimated Acres	Description
NONE	NONE	NONE

2. Description of district management of these resources in the past or present
N/A

3. Recreational and/or cultural resources areas within the service area

Name	Estimated Acres	Description
Tranquillity Community Park	1.6	Park, playground, and picnic area
Tranquillity High School	21 +\-	Basketball & tennis courts, baseball field, football field, track, swimming pool, gym, open space, etc.

F. Operating Rules and Regulations

1. Operating rules and regulations
See **Attachment C**, Rules and Regulations of Tranquillity Irrigation District (agricultural water related rules).

2. Water allocation policy (Agricultural only)
The District allocates water based on the total water supply divided by the total acreage requesting water for the upcoming irrigation season. Each irrigated acre receives an equal water share. In the event that during any irrigation season there is an anticipated shortage of water, or an actual shortage of water occurs, the District will pro-rate the available supply among all consumers. The basis for water allocation is described in Rules 8 and 13 of the Rules and Regulations of Tranquillity Irrigation District (see **Attachment C**).

3. Official and actual lead times necessary for water orders and shut-off (Agricultural only)

District rules and regulations require a minimum of 48 hours advance notice for water orders, but the actual District operations in practice require 24 hours advance notice. A request for delivery of water during shortages should be made at least five days prior to the date water is wanted. Actual times may vary depending on canal conditions, and/or field emergencies that require alternative schedules. The procedures for delivery water are described in Rule 12 of the Rules and Regulations of Tranquillity Irrigation District. The District attempts to accommodate water user needs in an effort to maximize the flexibility of the water ordering and delivery process in order to efficiently operate District conveyance/distribution facilities and maximize on-farm irrigation efficiency. See **Attachment C**, Rules 12 and 13.

4. Policies regarding return flows (surface and subsurface drainage from farms) and outflow (Agricultural only)

Water users are required to construct and maintain adequate surface drainage facilities to control tail water and prevent surface drainage from entering adjacent parcels. Water users are not allowed to receive deliveries in amounts that exceed their ability for economic and beneficial use without waste. The operation and maintenance requirements for private ditches and laterals are described in Rule 4 of the Rules and Regulations of Tranquillity Irrigation District. The production of agricultural crops on within the District is not affected by shallow groundwater and therefore subsurface drainage systems have not been constructed. See **Attachment C**, Rule 4.

5. Policies on water transfers by the district and its customers

Transfers of allocated water within the District are permitted during times of water shortage with advance notice provided by August 15. The District may refuse these transfers should the transfer result in potential re-scheduling or re-allocation impacts, or conflict with contractual commitments. Incoming water transfers are permitted with written application to the District and compliance with USBR guidelines. Outgoing water transfers are not permitted until all internal water demands are met and the water is declared surplus to those demands. Outgoing transfers must comply with all District rules and regulations, and state and federal law. The transfer of water is described in Rules 14 and 17 of the Rules and Regulations of Tranquillity Irrigation District. See **Attachment C**, Rules 14 & 17.

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers

a. Number of farms 37

b. Number of delivery points (turnouts and connections) 213

c. Number of delivery points serving more than one farm 25

d. Number of measured delivery points (meters and measurement devices) 213

e. Percentage of delivered water that was measured at a delivery point
100%

f. Delivery point measurement device table (Agricultural only)

Measurement Type	Number	Accuracy (+/- %)	Reading Frequency (Days)	Calibration Frequency (Months)	Maintenance Frequency (Months)
Orifices					
Propeller meter	213	+/-6%	Daily	60 +/-	Annual
Weirs					
Flumes					
Venturi					
Metered gates					
Acoustic doppler					
Other (define)					
Total	213				

Note: Meter calibration and/or repair is performed as needed, when meters malfunction or ditch tenders observe erroneous readings or foggy site glasses, or about every 5 years. All meters are factory calibrated and sealed.

2. Urban Customers

Although Tranquillity ID provides municipal/industrial/drinking water to their customers, they are not by definition an urban water supplier. Furthermore, all municipal/industrial/drinking water is obtained from local groundwater sources.

a. *Total number of connections* N/A

b. Total number of metered connections N/A

c. Total number of connections not billed by quantity N/A

d. Percentage of water that was measured at delivery point N/A

e. Percentage of delivered water that was billed by quantity N/A

f. Measurement device table N/A

Meter Size and Type	Number	Accuracy (+/-percentage)	Reading Frequency (Days)	Calibration Frequency (Months)	Maintenance Frequency (Months)
5/8-3/4”					
1"					
1 ½"					
2”					
3"					
4"					
6”					
8”					
10”					
Compound					
Turbo					
Other (define)					
Total					

3. Agriculture and Urban Customers

a. Current year agriculture and /or urban water charges - including rate structures and billing frequency

The District charges for water by quantity (acre-foot), at a uniform rate. Lands within the District are subject to Reclamation Law. The District charged $65/acre-foot in 2009 for regular/standard lands, and $85/acre-foot for excess lands.

b. Annual charges collected from customers (current year data)

Fixed Charges			
Charges ($ unit)	Charge units ($/acre), ($/customer) etc.	Units billed during year (acres, customer) etc.	$ collected ($ times units)
$7.50	$/acre	9,038	$67,784

Fixed charges are a special assessment which applies to all open ground/land within the District (excluding acreage for roads, farmsteads, etc.), even if no irrigation or farming occurs. The charge also applies to landowners within the Community of Tranquillity.

Volumetric charges			
Charges ($ unit)	Charge units ($/AF), ($/HCF), etc.	Units billed during year (AF, HCF) etc.	$ collected * ($ times units)
$65	$/AF	22,222.26 AF	$1,444,446.50
$85 (excess lands rate)	$/AF	1,383.21 AF	$117,572.50

* Numbers have been rounded

The 2009 water rate was $65.00 per acre-foot for regular acreage, and $85.00 per acre-foot for excess ground lands. Excess lands are irrigated solely from groundwater. Water users are billed each month based on metered water use. TID charges for water, materials and services are described in Rule 10 of the District rules and regulations.

c. Water-use data accounting procedures

Ditch tenders generally visit each meter daily to clock meters and collect meter reading data. Meter data is collected using data loggers and downloaded into an electronic data-base used to track and summarize water use data for each turnout for water billing purposes. TID uses a custom water data management (WDM) software system developed specifically for the District. Water use data are compiled on a monthly basis and monthly summaries are prepared for each board report. See **Attachment D** for a sample monthly "Irrigation Water Statement" (water bill) that is sent to growers. The bill clearly shows how much water was used and that it is billed on a volumetric basis. The District typically keeps copies of past statements for seven (7) years, which are available if requested by the grower.

H. Water Shortage Allocation Policies

1. Current year water shortage policies or shortage response plan - specifying how reduced water supplies are allocated

In the event of anticipated or actual water shortages, the District prorates the available water supply among the water users with each acre receiving an equal share. The District may reduce the length of run time, the amount of water delivered during each run and the amount of water delivered during the shortage period. District water shortage policies are described in Rule 13 of the attached District Rules and Regulations.

The District's water waste policy is documented in the Rules and Regulations of Tranquillity Irrigation District (see **Attachment C**, Rules 4, 12 and 13).

TID policies provide that in the event that water is ordered in excess of the capacity of a privately owned ditch, only amounts up to the capacity of the ditch as determined by the

District will be delivered. If the ditch is in such unclean or otherwise unsuitable condition that a usable amount of water cannot be delivered safely, or waste of water would result, delivery will be refused until such conditions are remedied. Additionally, in order to provide timely service and to minimize waste of water, the Watermaster or Operations staff must be given an approximate shut-off date and time. A 10% surcharge on the water used during a delivery will be charged if the user fails to specify a shut-off date and time.

In the event of overuse of allocated water during shortages, a penalty of three times the amount of water used in excess of the user's allocation will be deducted from the user's allocation for the next succeeding year. Alternate arrangements can be made to replace the water, however all such written transactions must be completed by August 15 of the instant irrigation season. In addition users who consume water in excess of their allocation shall have a surcharge of 10% applied to the charges for amounts of water delivered which exceed the user's allocation, unless the District has received the advance notice of a transfer of water for an amount of water equal to or greater than the excess delivery.

No irrigator shall be delivered a greater amount of water than he can economically and beneficially use without waste and with due regard to the needs of other irrigators.

Section 2: Inventory of Water Resources

Section 2: Inventory of Water Resources

A. Surface Water Supply

1. *Acre-foot amounts of surface water delivered to the water purveyor by each of the purveyor's sources*

See **Section 5, Water Inventory Tables, Table 1**. In 2009 the following surface water was used: 744 acre-feet of CVP contract water, 16,911 acre-feet of Schedule 2 water and 590 acre-feet" Upslope Drain Water."

Normal surface water supplies of the District include Schedule 2 CVP Water and South of Delta Central Valley Project Water.

Schedule 2 CVP Water (Riparian Water or Rights Water) is delivered without charge as a settlement of the District's water rights claims in Fresno Slough; the settlement amount is 20,200 acre-feet of water. The contract (Contract 14-06-200-701-A) requires that the District take delivery of this water according to the schedule shown in the following table. In practice, the USBR has allowed some flexibility on when this water is taken.

USBR Scheduled Water Deliveries to TID (AF)

Hydrologic Year Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Normal	0	400	1,300	2,900	4,700	6,900	3,400	400	200	0	0	0
Dry	0	400	1,300	2,100	3,800	5,200	2,500	300	100	0	0	0

In addition, the Tranquillity Irrigation District is a South of Delta CVP Water (SOD Water) contractor (Contract 14-06-200-701-A-LTR1) and is under contract with the USBR for CVP water up to 13,800 acre-feet of water each year. The water is generally delivered in the spring and summer months and varies each year based on demand, availability and schedules set by the USBR.

2. *Amount of water delivered to the district by each of the district sources for the last 10 years*

See **Section 5, Water Inventory Tables, Table 8**.

These water deliveries averaged 26,867 acre-feet between 2000 and 2009, with federal agricultural water averaging 2,994 acre-feet, or approximately 22% of the contracted supply.

B. Ground Water Supply

1. *Acre-foot amounts of ground water pumped and delivered by the district*

See **Section 5, Water Inventory Tables, Table 2**.

2. Ground water basin(s) that underlies the service area

Name	Size (Square Miles)	Usable Capacity (AF)	Safe Yield (AF/Y)
5-22.07, Delta Mendota sub-basin (part of San Joaquin Basin)	1,170	26,600,000*	Unknown

*This value represents usable groundwater in 1995 to a depth of 300 feet for the entire sub-basin.

According to the California Department of Water Resources, Bulletin 118 (01/20/2006 update) "*estimations of the total storage capacity of the sub-basin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 11.8 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this sub-basin is estimated to be 30,400,000 AF to a depth of 300 feet and 81,800,000 AF to the base of fresh groundwater. These same calculations give an estimate of 26,600,000 AF of groundwater to a depth of 300 feet stored in this sub-basin as of 1995. According to published literature, the amount of stored groundwater in this sub-basin as of 1961 is 51,000,000 AF to a depth of less than 1,000 feet*."

The District's August 2009 Groundwater Management Plan (see **Attachment G, page 15**) estimates the safe yield for the Tranquillity Irrigation District/Fresno Slough Water District service area at 2,000 to 2,500 acre-feet per year.

The District owns nine (9) agricultural production wells, with four located within the District (wells 16, 19, 20 & 21) and five located on property owned by TID in the Fresno Slough Water District (wells 22, 23, 24, 25 & 26). The wells are operated typically only in the summer to help meet peak demands, and augment surface water supplies when there are shortages. For the agricultural wells located with the District, they are typically drilled above the Corcoran Clay (also known as the "E clay"), where the drinking water system wells are typically drilled below the Corcoran Clay. The Tranquillity ID wells located on land in Fresno Slough WD have typically been drilled below the Corcoran Clay. The agricultural wells in TID are typically drilled to about 550 feet in depth, where the agricultural wells located in Fresno Slough WD have been drilled to about 760-780 feet in depth. The yields of individual TID's wells are between 3.6 – 5.5 cfs.

The well locations are shown on **Attachment F, District Map of Groundwater Facilities**. The estimated capacity of all the District agricultural wells is about 42 cfs, with individual well capacities shown in the table below.

Well #	Capacity (cfs)	Location
16	3.6	TID
19	5.1	TID
20	4.0	TID
21	4.8	TID
22	5.5	FSWD
23	5.5	FSWD
24	4.6	FSWD
25	4.0	FSWD
26	4.8	FSWD

3. Map of district-operated wells and managed ground water recharge areas
See **Attachment F**, District Groundwater Facilities.

4. Description of conjunctive use of surface and ground water
Conjunctive use of groundwater and surface water has long been, and will continue to be an integral part of the District's practices. Much effort goes into planning the use of TID's surface water and groundwater supplies to maximize the benefit of both. The District will generally use any and all surface water that is available and within the District's capacity to receive first, then pump whatever groundwater is needed to make up any shortfall. The District will also pump groundwater into Mendota Pool for temporary storage, to be used at a later date. In wet hydrologic years, when there are high flows on the Kings River, the District will use these high flows before the use of any other water supply.

5. Ground Water Management Plan
The District's Groundwater Management Plan (GMP), originally approved in August 2009, was prepared jointly with neighboring Fresno Slough Water District. **Attachment G** is a copy of the Groundwater Management Plan.

6. Ground Water Banking Plan
The District does not have a ground water banking plan, except the use of the temporary surface storage of groundwater supplies in Mendota Pool. The TID is in discussions with other districts about the possibility of partnering on groundwater banking projects.

C. Other Water Supplies

1. "Other" water used as part of the water supply
See the **Water Inventory Tables, Table 1 in Section 5.**

Other water used by the District includes high flows from the Kings River, and unintentional spills from James Irrigation District for the last 10 years. These are highlighted in **Section 5, Table 8**.

Source	2009 Amount (AFY)	Length of contract	Use
James ID spills	590	None	Agriculture
Kings River high flows	0	None	Agriculture
TOTAL	590		

TID receives limited unintentional operational spills from James Irrigation District at two different locations. There are measurement devices installed at both locations.,
The District also diverts Kings River high flows from the Fresno Slough when it is available, typically during wet hydrologic years. This last occurred in 2005 and 2006. The District only receives Kings River water from high flows in about 45 percent of the years, or every 2 to 3 years on average. Kings River water that is diverted is usually received in high quantity, short duration flows.

In the past, during wet years, the USBR has made surplus water available to TID, which is above its normal contract deliveries. The source of this water may be either imports from the Delta via the Delta Mendota Canal, or San Joaquin River flood releases (called Section 215 water by the USBR).

D. Source Water Quality Monitoring Practices

1. Potable Water Quality (Urban only)
TID is not an urban water supplier (i.e. they are under the threshold of number of customers or connections to be defined as an urban water supplier), and therefore does not provide an urban water supply. The District does however provide drinking water to customers throughout the District, and complies with state and federal requirements for water quality testing and reporting.

2. Agricultural water quality concerns: *Yes* _____ *No* X
(If yes, describe)

3. Description of the agricultural water quality testing program and the role of each participant, including the district, in the program

The District has been monitoring water quality at various locations in the canal system throughout the irrigation season. During the irrigation season, up to 15 locations are monitored on a weekly basis for pH and TDS. Otherwise, the District relies on data

developed by monitoring programs of other agencies like the USBR, San Luis Delta Mendota Water Authority, and Kings River Conservation District. Since TID does not have any drainage water, it does not participate in a drainage water-quality monitoring-program.

4. *Current water quality monitoring programs for surface water by source (Agricultural only)*

Analyses Performed	Frequency	Concentration Range	Average
pH	Weekly	6.6 – 9.5	8.3
Total Dissolved Solids (TDS)	Weekly	510 – 1,110 ppm	780 ppm

Note: Values are the range and average within the District's distribution system

Current water quality monitoring programs for groundwater by source (Agricultural only)

Analyses Performed	Frequency	Concentration Range (2005-2009)	Average (2005-2009)
Irrigation Analysis	For new wells	N/A	N/A
Total Dissolved Solids (TDS)	continuous	750 – 1,100 ppm	850 ppm

The District typically has an "irrigation water quality analysis" conducted on each well shortly after new construction. Also, the District has installed a telemetry system that includes monitoring of the discharges from eight irrigation wells (16, 19, 20, 21, 22, 23, 24 & 25) in the District. Testing is continuous when the wells are operating, and the electrical conductivity is reported in Total Dissolved Solids (TDS) units. Other wells that show high EC readings are sometimes sampled for general mineral laboratory analysis as well.

E. Water Uses within the District

1. Agricultural

See ***Section 5, Water Inventory Tables, Table 5 - Crop Water Needs***

2. Types of irrigation systems used for each crop in current year

Crop name	Total Acres	Level Basin - acres	Furrow - acres	Sprinkler - acres	Low Volume - acres	Multiple methods - acres
Alfalfa Seed	140					140
Cereals	714		714			
Cotton	2979		2979			
Almonds	351				351	
Pistachios	155				155	
Onions	748			748		
Pomegranates	79				79	
Misc Seed Crops	1636		1636			
Tomatoes	1793					1793

Most of TID is irrigated using dead level basins with short length of water run, usually 1/8 mile long. It is estimated that about 70 percent of the District is irrigated using this approach. Surface trickle irrigation (i.e. drip irrigation) is typically used for the almond plantings. Irrigation method acreages are estimated as the District does not typically gather information on irrigation methods.

3. Urban use by customer type in current year - none

4. Urban Wastewater Collection/Treatment Systems serving the service area – current year

Treatment Plant	Treatment Level (1, 2, 3)	AF	Disposal to / uses
Tranquillity PUD	1 - Disinfected	200 est.	Evaporation Ponds – Land Disposal per RWQCB permit
NONE	Total	200	
Total discharged to ocean and/or saline sink		0	

Tranquillity Public Utility District (TPUD), a special district separate from Tranquillity ID, provides wastewater collection and treatment, and storm drainage collection, for customers within the Community of Tranquillity.

5. Ground water recharge/management in current year (Table 6)

Recharge Area	Method of Recharge	AF	Method of Retrieval
None			
	Total	0	

The soils (primarily clays or clay loams as shown on **Attachment B**) in Tranquillity ID are not conducive to groundwater recharge. Therefore, no sites have been developed for recharge purposes. The District considers joint opportunities for recharge of water within nearby Districts as they arise.

6. Transfers and exchanges into or out of the service area in current year (Table 6)

From Whom	To Whom	AF	Use
Tranquillity ID	San Luis Water District	4,131	agricultural supply

7. Trades, wheeling, wet/dry year exchanges, banking or other transactions in current year (Table 6)

From Whom	To Whom	AF	Use
None			

8. Other uses of water in current year

Other Uses	AF
NONE	

F. Outflow from the District (Agricultural only)

Districts included in the drainage problem area, as identified in "A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley (September 1990)," should also complete Water Inventory Table 7 and Appendix B (include in plan as Attachment L)

See Facilities Map, **Attachment A3**, for the location of surface outflow points, outflow measurement points, and outflow water-quality testing locations. See **Attachment L** for information addressing the USBR designation of the a portion of the District being in a "drainage problem area."

1. Surface and subsurface drain/outflow in current year

Outflow point	Location description	AF	Type of measurement	Accuracy (%)	% of total outflow	Acres drained
None						

2. Description of the Outflow (surface and subsurface) water quality testing program

and the role of each participant in the program

Between 2007 and 2009, the District installed various components for a telemetry system at some of the facilities throughout the District. The initial funding was provided by a 2007 USBR Field Services Program grant of $50,000. The District now has the ability to remotely monitor if facilities are turned on or off, the surface water elevation, hours a facility is run, and Total Dissolved Solids (TDS). The discharges from wells 16, 19, 20, 21, 22, 23, 24, & 25, in addition to the FSWD and TID Lift #1 pump in points to Mendota Pool/Fresno Slough are monitored for TDS.

3. Outflow (surface drainage & spill) Quality Testing Program

Analyses Performed	Frequency	Concentration Range	Average	Reuse limitation?
None				

4. Provide a brief discussion of the District's involvement in Central Valley Regional *Water Quality Control Board programs or requirements for remediating or monitoring any contaminants that would significantly degrade water quality in the receiving surface waters.*

The District is not responsible for groundwater remediation or contaminant plume management, and therefore they are not involved directly in any Central Valley Regional Water Quality Control Board programs. Those responsibilities are assigned to other agencies such as cities, counties, the USEPA or California Department of Toxic Substances Control. TID tries to stay informed of contaminant plumes and their management and remediation within District boundaries. TID also monitors groundwater quality and takes practical measures to prevent groundwater quality degradation.

G. Water Accounting (Inventory)

The tables listed below can be found in **Section 5 – District Water Inventory Tables.**

1. Water Supplies Quantified

a. Surface water supplies, imported and originating within the service area, by month (Table 1)
b. Ground water extracted by the district, by month (Table 2)
c. Effective precipitation by crop (Table 5)
d. Estimated annual ground water extracted by non-district parties (Table 2)
e. Recycled urban wastewater, by month (Table 3)
f. Other supplies, by month (Table 1)

2. Water Used Quantified

a. Agricultural conveyance losses, including seepage, evaporation, and operational spills in canal systems (Table 4) or
Urban leaks, breaks and flushing/fire uses in piped systems (Table 4)
b. Consumptive use by riparian vegetation or environmental use (Table 6)
c. Applied irrigation water - crop ET, water used for leaching/cultural practices (e.g., frost protection, soil reclamation, etc.) (Table 5)
d. Urban water use (Table 6)
e. Ground water recharge (Table 6)
f. Water exchanges and transfers and out-of-district banking (Table 6)
g. Estimated deep percolation within the service area (Table 6)
h. Flows to perched water table or saline sink (Table 7)
i. Outflow water leaving the district (Table 6)
j. Other (Table8 and 8a)

3. Overall Water Inventory
a. Table 6

H. Assess Quantifiable Objectives:

Identify the Quantifiable Objectives that apply to the District (Planner, chapter 10) and provide a short narrative describing past, present and future plans that address the CALFED Water Use Efficiency Program goals identified for the District.

No ”Quantifiable Objectives” are listed in Chapter 10 of the USBR document “Water Management Planner – Developed to meet the 2005 Standard Criteria for Evaluation Water Management Plans” for Tranquillity Irrigation District.

Section 3: Best Management Practices (BMPs) for Agricultural Contractors

Section 3: Best Management Practices (BMPs) for Agricultural Contractors

A. Critical Agricultural BMPs

1. Water Measurement

Measure the volume of water delivered by the district to each turnout with devices that are operated and maintained to a reasonable degree of accuracy, under most conditions, to +/- 6% (done)

Number of turnouts that are unmeasured or do not meet the standards listed above: 0

Number of measurement devices installed last year (2008): 0

Number of measurement devices installed this year (2009): 0

Number of measurement devices to be installed next year (2010): 0

Types of Measurement Devices Being Installed	Accuracy	Total Installed During Current Year
Open Flow Propeller Meters	+/- 6%	0

All of the District's turnouts are metered. The District typically repairs 10 open channel flow meters per year, and replaces meters as needed.

2. Water Conservation Coordinator

Designate a water conservation coordinator to develop and implement the Plan and develop progress reports

Name: Danny M. Wade *Title:* General Manager

Address: PO Box 487, Tranquillity, CA 93668

Telephone: (559) 698-7225 *E-mail:* danny@trqid.com

Danny M. Wade, the General Manager, is the designated Conservation Coordinator. He coordinated all District activities and goals discussed in the Water Management Plan and communicated with the USBR. Specifically, the Conservation Coordinator assisted with planning of new facilities, attended regular Board meetings, and directed District water conservation activities. All these tasks further the goals and objectives in the

USBR Best Management Practices Guidelines. Danny Wade is currently designated to continue his role as the Conservation Coordinator.

3. Water Management Services

Provide or support the availability of water management services to water users (done)

a. On-Farm Evaluations

1) On farm irrigation and drainage system evaluations using a mobile lab type assessment

	Total in district	# surveyed last year	# surveyed in current year	# projected for next year	# projected 2nd yr in future
Irrigated acres	8,596	n/a	n/a	n/a	n/a
Number of farms	37	n/a	n/a	n/a	n/a

The District does not perform on-farm irrigation system evaluations since many farmers proactively use independent irrigation consultants for the evaluations. The District has encouraged farmers to hire crop irrigation specialists who perform irrigation evaluations. The District, upon receiving a request, assists water users in selecting a consultant who provides such services. TID estimates that about 10 percent of the acreage in the District have evaluations performed annually. The District continues to notify water users of the availability of mobile lab services in the area.

TID cooperates with Kings River Conservation District (KRCD), which aims to assist valley farmers with finding the most efficient and cost-effective use of water. Growers can schedule an appointment for a member of the KRCD staff to visit the location to review current irrigation practices.

2) Timely field and crop-specific water delivery information to the water user

Total irrigation event volumes also are recorded by the ditch tenders and then submitted to the District office for billing purposes. These irrigation application totals are available to each water user upon request. Monthly water bills list the volume of water used by work order date, by turnout and field. A sample water bill is included as **Attachment D**. In addition, year-end summary reports may be created to show total water usage per user account by field or crop.

b. Real-time and normal irrigation scheduling and crop ET information

Numerous sources of real-time ET information are available to the growers. Most growers use information gathered from websites or hire private consultants or both.. Furthermore, CIMIS Station #2 (www.cimis.ca.gov) at Five Points is near the District. This on-line information can be assessed daily by water users. Information is generally used by water users who have outside consultants making recommendations on water irrigation events and soil moisture levels. TID supports this activity and assists water users with obtaining the information from CIMIS. Local newspapers also report daily ET information for area agriculture.

The District also encourages growers to use the Kings River Conservation District provided "AgLine Information System" (http://www.krcd.org/water/water_management/agline/) for crop water use information for the Kings River service area. Information provided for each crop includes:

- Crop water use for the past 7 days
- Predicted water use for the next 7 days
- Total crop water use season to date

These numbers, updated every Friday, can be used to assist growers in irrigation management decisions. AgLine includes crop water use data for 31 cropping cases. To find information on a specific crop, locate the crop on the table below and click on one of the two general categories at the top of the table.

c. Surface, ground, and drainage water quantity and quality data provided to water users

The District's water-quality monitoring-program includes the following:

1. Agricultural irrigation water quality analysis on new wells when they are initially constructed.
2. Continuous TDS testing of eight Irrigation Wells (16, 19, 20, 21, 22, 23, 24 & 25) when they are operating (i.e. thru the District's telemetry system).
3. Testing of the District's two drinking water wells (City Wells 4 & 5) according to California Department of Public Health and US EPA schedule and requirements.
4. Periodic (as often as weekly) testing of surface water TDS or PH at various locations throughout the District distribution system.
5. During the irrigation season, continuous TDS testing of the water in the canals above the FSWD and TID Lift #1 pump in points (using the District's telemetry system).
6. Water quality testing at the Mendota Pool including continuous electrical conductivity and monthly grab samples.

Since the Tranquillity Irrigation District does not have any drainage water, it does not participate in a drainage water-quality monitoring program.

The water quality data is available to the growers and their irrigation consultants upon request, for determining suitable crop types. The data is also used by the District to characterize trends and identify changes in water quality.

d. Agricultural water management educational programs and materials for farmers, staff, and the public

Program	Co-Funders (If Any)	Yearly Targets
Growers meeting	None	Annually
District Newsletter	None	N/A
Newsletter – The Westside Resource	Westside RCD	Annually to Semi-Annually
Newsletter – KRCD News	Kings River Conservation District	Quarterly
Pesticide Training	Target	Yearly
Pump /Irrigation Training	Cal Poly ITRC	For new staff

The District does not have a newsletter. However, the District is part of the Kings River Conservation District and the Westside Resource Conservation District and can communicate thru their newsletters if needed. The District has an annual growers meeting every Fall and can communicate with farmers at that meeting. On occasion the District will include notices to farmers in with their monthly water bills.

e. other

None

4. Pricing Structure

Pricing structure - based at least in part on quantity delivered

Describe the quantity-based water pricing structure, the cost per acre-foot, and when it became effective.

Volumetric pricing involves a water pricing structure for District water users based at least in part on quantity delivered. Water is billed using a flat rate per acre-foot price based on the actual quantity delivered as metered at each turnout, therefore growers have incentive to conserve.

5. Policy Changes

Evaluate and describe the need for changes in policies of the institutions to which the district is subject

No major policy changes were evaluated or implemented during 2005-2009. No major policy changes are expected in the forthcoming five years.

6. Pump Efficiency

Evaluate and improve efficiencies of district pumps

Describe the program to evaluate and improve the efficiencies of the contractor's pumps.

Tranquillity ID contracts with a local pump company to provide annual pump and motor maintenance, and repair services. The local company also provides emergency services as required. The District also participates in the pump efficiency program sponsored by the Center for Irrigation Technology (CIT) when it is available, and has historically tested booster pumps on a 5-year basis.

The San Luis & Delta-Mendota Water Authority periodically performs flow tests on the booster pumps which lift water from Fresno Slough. Major changes in measurements between tests could indicate pumping plant inefficiencies and would prompt the District to investigate further.

B. Exemptible BMPs for Agricultural Contractors

(See Planner, Chapter 2, Appendix C for examples of exemptible conditions)

1. Facilitate Alternative Land Use

Drainage Characteristic	Acreage	Potential Alternate Uses
High water table (<5 feet)	NA	Currently being investigated (see below)
Poor drainage	NA	Currently being investigated (see below)
Ground water Selenium concentration > 50 ppb	0	
Poor productivity	0	

A portion of the Tranquillity Irrigation District has been identified as a drainage problem area in "A Management Plan for Agricultural Subsurface Drainage and Related

Problems on the Westside San Joaquin Valley" (September 1990), commonly known as the "Rainbow Report." However, observations have suggested that lands within the District do not have the shallow water table and water quality problems that occur in other districts in the described area, so drainage improvements have not been implemented. The District has implemented source control measures by requiring the retention of all surface drainage water on land that generates that water. Subsurface drainage systems have not been constructed within the District. Land retirement has not been an option in the District, and drainage water treatment and reuse is not occurring. Shallow groundwater pumping is not practiced and the District does not operate or contain evaporation ponds.

The District's neighbor, James Irrigation District, received a grant from the California Department of Water Resources Local Groundwater Assistance Act (Assembly Bill 303) to further evaluate drainage problems in James ID. Tranquillity ID is cooperating with the James ID investigation by allowing James ID to install a monitor well within Tranquillity ID near Contra Costa Avenue and the San Luis Drain. This work is ongoing and will be completed by James ID in November 2010.

2. Recycled Water

Facilitate use of available recycled urban wastewater that otherwise would not be used beneficially, meets all health and safety criteria, and does not cause harm to crops or soils

Sources of Recycled Urban Waste Water	AF/Y Available	AF/Y Currently Used in District
Tranquillity PUD, Wastewater Treatment Plant	NONE	NONE

The District does not presently use any recycled water from treatment plants for irrigation. The Tranquillity PUD's treatment plant is the only nearby waste water source, but the plant is located outside of the District. They treat their wastewater, but the water does not receive tertiary level treatment and therefore cannot be used on edible crops. Presently, the wastewater (estimated at 200 acre-feet/year) is delivered to evaporation ponds. Some of the water may infiltrate and provide beneficial groundwater recharge in the area. If the water could be treated to a higher standard and discharged to Fresno Slough, the District could pick up and use the water at Tranquillity ID's Lift #2.

3. Finance Capital Improvements

Facilitate the financing of capital improvements for on-farm irrigation systems

Funding source Programs	How provide assistance
None	None

The District remains cognizant of future loan and grant programs for conversion to more efficient irrigation systems, and will educate growers on these programs and assist with applications. The USDA Natural Resources Conservation Service in cooperation with Kings River Conservation District has funding for the Agricultural Water Enhancement Program (AWEP). AWEP provides financial and technical assistance to farmers and ranchers in agricultural water enhancement activities for the purposes of conserving surface and groundwater and improving water quality. The program provides payments up to 75 percent of the incurred costs of certain water conservation practices and activities.

In the absence of District financing, farmers have still been proactive in financing their own on-farm capital improvements and have independently converted some irrigation systems to drip irrigation systems.

4. Incentive Pricing

Structure of incentive pricing	Related goal
Volumetric pricing	Incentive to conserve water
Rates adjusted for Percent Water Year	Encourage use of floodwater and conservation in dry years

The current pricing structure promotes in-District transfers and exchanges, which allow for the most efficient use of District water at the farm level. TID supports keeping water within the area for the conjunctive use needs of the District, at reasonable rates. This incentive also keeps prices stable, affords price control, and improves management of the resource. District rates encourage users to determine and apply only the water a crop needs, thus reducing over-irrigation and creating drainage problems. Crop water demand is met with the current surface water supply supplemented by groundwater during high demand periods. Additional incentive pricing to restrict current total water applications could be implemented should water supplies become inadequate and/or it is determined that water users are irrigating inefficiently. TID has determined that the appropriate use of available water supplies has and is being practiced by all District water users.

The Tranquillity Irrigation District currently uses volumetric water pricing and incentive pricing policies as follows:

1) Volumetric Pricing. Volumetric pricing involves a water pricing structure for district water users based at least in part on quantity delivered. The District charges a

uniform rate per acre-foot of water delivered. This billing method provides growers a monetary incentive to conserve water. Water bills sent to the growers include the volume of water used each billing period.

2) Rates Adjusted for Percent Water Year. The District provides incentive pricing by adjusting water rates based on annual hydrological conditions. For example, in wet years when floodwaters are available at low costs, average water costs to growers are lower than in dry years when floodwaters are not available. Therefore, in dry years farmers have incentives to conserve water due to the higher average water costs.

5. Canal and Reservoir Lining

a) Line or pipe ditches and canals

Canal/Lateral (Reach)	Type of Improvement	Number of Miles in Reach	Estimated Seepage (AF/Y)	Accomplished / Planned Date
None				

The District piped 2.3 miles of canals in 1994. Since that time, only minor periodic projects needed to improve the efficiency of selected District facilities have been constructed. The District has considered other canal lining and piping projects, but the cost of lining/piping and unavailability of financing has prevented implementation of this option. Further, these potential projects were determined to be uneconomic, in part due to the heavy clay soils located throughout much of the District. TID will continue to pursue funding for canal lining or piping projects for District unlined canals.

b) Construct regulatory reservoirs

Reservoir Name	Annual Spill in Section (AF/Y)	Estimated Spill Recovery (AF/Y)	Accomplished/ Planned Date
Railroad Reservoir	~900	None	2011

The District investigated the possibility of constructing an off peak regulation reservoir in 2001, which was not completed due to various factors. In 2010, the District is planning to investigate the feasibility of a reservoir (the “Railroad Reservoir”) on TID owned property in Fresno Slough WD for the purpose of regulation, storage of high flows off of the Kings River, and temporary storage of groundwater for flow peaking needs. Surplus high flows and off-peak flows can be stored in the reservoirs for future use. The reservoir would also reduce energy costs since stored groundwater would be pumped during off-peak periods (nights and weekends). It is estimated that the proposed reservoir will be about 300 acre-feet in size and could be filled and emptied 3 times per year for a total 900 acre-feet of storage in a year.

6. Water Ordering

Increase flexibility in water ordering by, and delivery to, water users (done)

The District officially requires 48 hours advance notice for water orders (see Rule 12, Delivery of Water in **Attachment C**). In practice, however, District staff attempt to provide as much flexibility to their growers as possible, if the requests are reasonable and they do not disrupt other water deliveries. This is possible due to the TID distribution system being fully automated, the conversion to a portion of the District to permanent crops and the increase in drip irrigation methods. Additional detail is provided below:

Conversion to permanent crops
The District has seen a trend involving the conversion of annual crops to permanent crops. The permanent crops have lower peak demands (take less flow over a longer time period) and thus allow greater flexibility in operating the system.

Installation of More Efficient Sprinkler Systems
There has also been a trend in the installation of more efficient sprinkler systems in the District, such as drip and micro-sprinkler systems. These sprinkler systems reduce peak demands and can reduce overall water usage through better water management, and, as a result provide greater flexibility in ordering and delivering water. It is expected that the trend of conversion to permanent crops and easier managed irrigation systems will continue in the future.

Regulation Reservoirs
TID will be investigating the possible construction of the District's first irrigation regulation/storage reservoir. If constructed, a reservoir will help the District to better satisfy peak demands, growers could experience less lead time when ordering water and have greater flexibility in when they can turn off water.

District deliveries are all scheduled. On-demand deliveries are not practiced.

A copy of a sample water bill is included as **Attachment D**. The District does not use or have a water order form.

7. Spill and Tailwater Recovery

Construct and operate district spill and tailwater recovery systems - none

8. Outflow Measurement

Plan to measure outflow

Total # of outflow (surface) locations/points 0

Total # of outflow (subsurface) locations/points 0

Total # of measured outflow points 0

Percentage of total outflow (volume) measured during report year 100%

Identify locations, prioritize, determine best measurement method/cost, submit funding proposal

Location & Priority	Estimated cost (in $1,000s)				
	2009	2010	2011	2012	2013
TID Lift #1	-	0.5	-	0.5	-
Fresno Slough WD canal end	-	0.5	-	0.5	-

Estimated expenses shown in the table above are for minor repairs and maintenance to the existing flow measurement devices, if needed. The District does not plan to install any new outflow measurement facilities or make major modifications to existing facilities in the next five years.

9. Conjunctive Use

Optimize conjunctive use of surface and ground water

The District uses available surface water first and when available from the four available sources – CVP contracted supply, CVP rights water, Kings River high flows, and spills from James Irrigation District. A series of District wells are in use for peaking and temporary storage. The District will be investigating and likely constructing a regulation/storage reservoir to better optimize the available water supplies, as well as work with neighboring Districts to optimize supplies.

10. Automate Canal Structures

The District's distribution system is fully automated. The system operates by downstream control methods, as a series of level pools, with booster pumps (Lift #1 and Lift #2) at the head of the portion of two areas. The booster pumps are on level controls ("Warrick switches"), which turn the pumps on when downstream levels drop, and shut off when a set water surface elevation is reached. Between the individual pools, water flows thru an "Automatic Gate" structure, when downstream water levels drop. The District's Automatics are based on the "Danaidean Gate" system as show in the picture and similar to the schematic below. Some side laterals are pressurized pipeline systems.

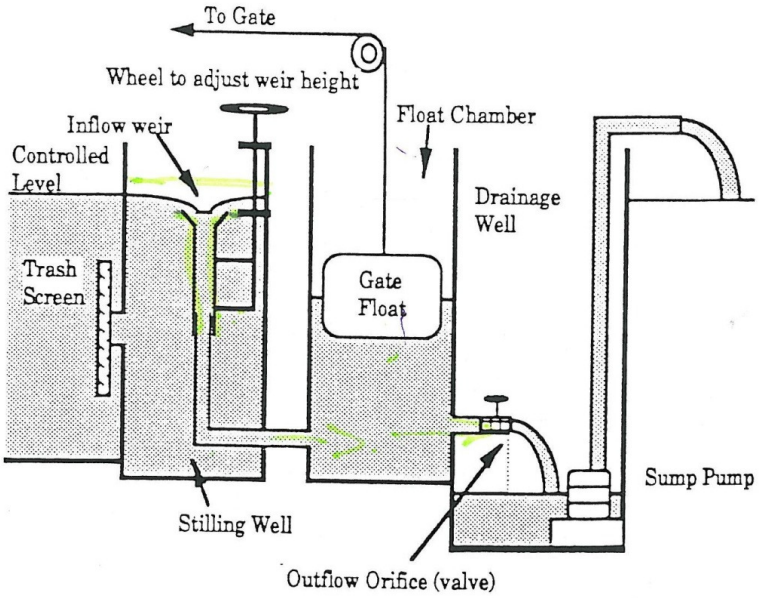
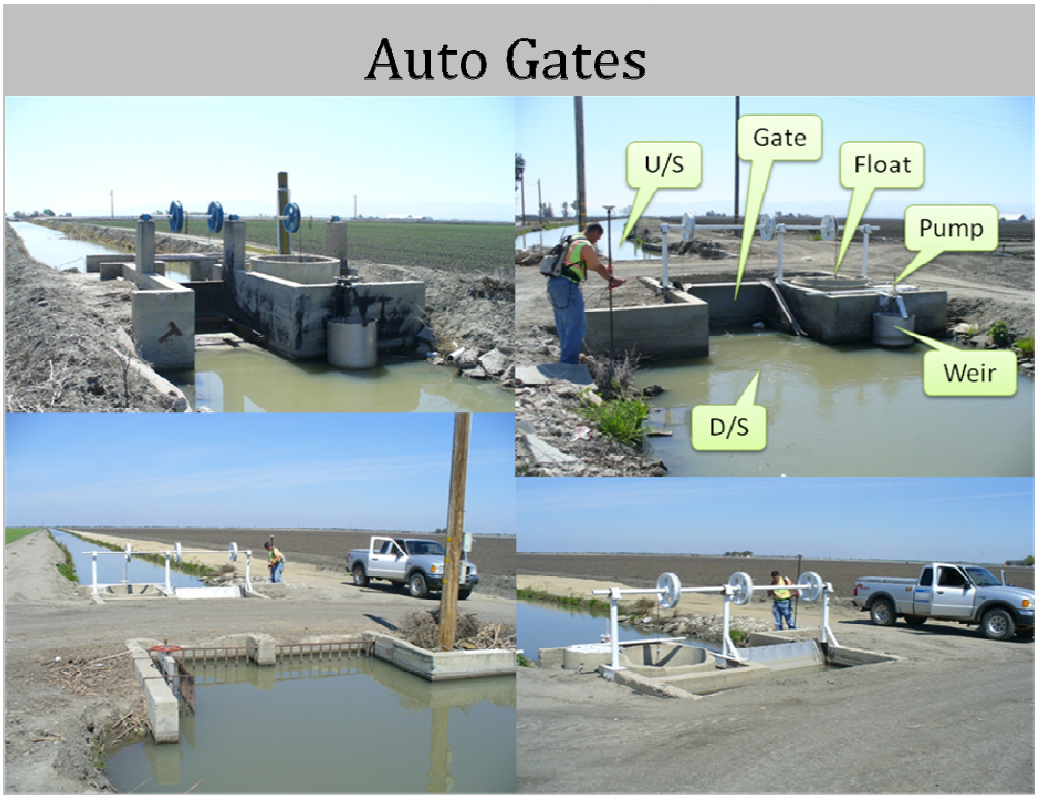


Fig. 11.10. Schematic of Danaidean Controlled-Leak System for Controlling Upstream Water Levels.



11. Pump Testing

Facilitate or promote water customer pump testing and evaluation

There are effectively no private agricultural wells in the District. The District informs private landowners of opportunities for pump testing of booster pumps. Local pump companies also make frequent calls on water users and provide educational materials promoting the value of timely pump testing, maintenance and repair.

12. Mapping

The District has GIS maps of their distribution system, groundwater facilities, and soils (The District has no natural or cultural resources). The District does not have a drainage system. The District uses NRCS data for soils maps and updates will not be needed. **Attachments A3 (Distribution System), B (District Soils Map), and F (District Groundwater Facilities)** include printed copies of these maps from GIS system. Future work will be limited to updating maps with new information.

GIS maps	Estimated cost (in $1,000s)				
	2009	2010	2011	2012	2013
Layer 1 – Distribution system	-	0.3	0.3	0.3	0.3
Layer 2 – Drainage system	-	-	-	-	-
Suggested layers:	-	-	-	-	-
Layer 3 – Ground water information	0.5	0.2	0.2	0.2	0.2
Layer 4 – Soils map	-	-	-	-	-
Layer 5 – Natural & cultural resources	-	-	-	-	-
Layer 6 – Problem areas	-	-	-	-	-

C. Provide a 3-Year Budget for Implementing BMPs

1. Amount actually spent during current year (2009).

BMP #		BMP Name	Actual Expenditure (not including staff time)	Staff Hours
A	1	Measurement	0	20
	2	Conservation staff	$5,000	100
	3	On-farm evaluation /water delivery info	$0	10
		Irrigation Scheduling	$0	10
		Water quality	$215,000	200
		Agricultural Education Program	$0	20
	4	Quantity pricing	$0	0
	5	Policy changes	$0	0
	6	Contractor's pumps	$350,000	20
B	1	Alternative land use	$0	0
	2	Urban recycled water use	$0	0
	3	Financing of on-farm improvements	$0	0
	4	Incentive pricing	$0	0
	5	Line or pipe canals/install reservoirs	$0	0
	6	Increase delivery flexibility	$80,000	100
	7	District spill/tailwater recovery systems	$0	0
	8	Measure outflow	$0	10
	9	Optimize conjunctive use	$1,000	10
	10	Automate canal structures	$5,000	20
	11	Customer pump testing	$0	0
	12	Mapping	$500	4
		Total	**$656,500**	**524**

2. Projected budget summary for the next year (2010)

BMP #		BMP Name	*Budgeted Expenditure* Actual Expenditure (not including staff time)	Staff Hours
A	1	Measurement	$0	20
	2	Conservation staff	$5,000	100
	3	On-farm evaluation /water delivery info	$0	10
		Irrigation Scheduling	$0	10
		Water quality	$0	160
		Agricultural Education Program	$0	20
	4	Quantity pricing	$0	0
	5	Policy changes	$0	0
	6	Contractor's pumps	$50,000	20
B	1	Alternative land use	$0	0
	2	Urban recycled water use	$0	0
	3	Financing of on-farm improvements	$0	0
	4	Incentive pricing	$0	0
	5	Line or pipe canals/install reservoirs	$1,000,000	640
	6	Increase delivery flexibility	$10,000	40
	7	District spill/tailwater recovery systems	$0	0
	8	Measure outflow	$1,000	10
	9	Optimize conjunctive use	$300,000	20
	10	Automate canal structures	$5,000	20
	11	Customer pump testing	$0	0
	12	Mapping	$700	4
		Total	**$1,371,700**	**1,070**

3. Projected budget summary for 3rd year (2011)

BMP #		BMP Name	Actual Expenditure (not including staff time)	Staff Hours
A	1	Measurement	$0	20
	2	Conservation staff	$5,000	100
	3	On-farm evaluation /water delivery info	$0	10
		Irrigation Scheduling	$0	10
		Water quality	$0	160
		Agricultural Education Program	$0	20
	4	Quantity pricing	$0	0
	5	Policy changes	$0	0
	6	Contractor's pumps	$50,000	20
B	1	Alternative land use	$0	0
	2	Urban recycled water use	$0	0
	3	Financing of on-farm improvements	$0	0
	4	Incentive pricing	$0	0
	5	Line or pipe canals/install reservoirs	$550,000	40
	6	Increase delivery flexibility	$10,000	40
	7	District spill/tailwater recovery systems	$0	0
	8	Measure outflow	$0	10
	9	Optimize conjunctive use	$5,000	20
	10	Automate canal structures	$5,000	20
	11	Customer pump testing	$0	0
	12	Mapping	$500	4
		Total	**$625,500**	**474**

Section 4: Best Management Practices for Urban Contractors

Section 4: Best Management Practices for Urban Contractors

Tranquillity Irrigation District provides drinking water from groundwater sources to customers within the District, but they are not an urban water supplier and therefore do not provide an urban water supply.

Section 5: District Water Inventory Tables

Year of Data	2009	**Enter data year here**

Table 1

Surface Water Supply

2009 Month	**Federal Ag Water** (acre-feet)	**Federal non-Ag Water.** (acre-feet)	**Kings River High Flows** (acre-feet)	**San Joaquin River** (acre-feet)	**Other Water** (acre-feet)	**Upslope Drain Water** (acre-feet) /1	**Total** (acre-feet)
Method	M2			M2	O1		M2/O1
January	0			0			0
February	744			250			994
March	0			225			225
April	0			1,882			1,882
May	0			4,616			4,616
June	0			5,938			5,938
July	0			3,400		39	3,439
August	0			400		33	433
September	0			200		17	217
October	0			0		89	89
November	0			0		412	412
December	0			0			0
TOTAL	744	0	0	16,911		590	18,245

Notes: /1 "Upslope Drain Water" total includes James ID spills

Table 2

Ground Water Supply

2009 Month	District Groundwater (acre-feet)	Private Groundwater *(acre-feet)
Method	M2	
January	861	0
February	1,092	0
March	0	0
April	0	0
May	2,483	0
June	2,067	0
July	1,952	0
August	431	0
September	1,149	0
October	1,618	0
November	1,368	0
December	0	0
TOTAL	13,021	0

*normally estimated

Table 3

Total Water Supply

2009 Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Recycled M&I Wastewater (acre-feet)	Total District Water Supply (acre-feet)
Method	M2/O1	M2		M2/O1
January	0	861		861
February	994	1,092		2,086
March	225	0		225
April	1,882	0		1,882
May	4,616	2,483		7,099
June	5,938	2,067		8,005
July	3,439	1,952		5,391
August	433	431		864
September	217	1,149		1,366
October	89	1,618		1,707
November	412	1,368		1,780
December	0	0		0
TOTAL	18,245	13,021	0	31,266

*Recycled M&I Wastewater is treated urban wastewater that is used for agriculture.

Table 4

Distribution System

2009 Canal, Pipeline, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitation (acre-feet)	Evaporation (acre-feet)	Spillage (acre-feet)	Seepage (acre-feet)	Total (acre-feet)
Lift 1 main canal	22,704	20	454,080	10	57	0	261	(307)
Lift 2 main canal	52,272	20	1,045,440	24	131	0	192	(299)
Lateral 1	10,560	10	105,600	2	13	0	0	(11)
Lateral 2	6,864	10	68,640	2	9	0	0	(7)
Lateral 3	25,344	10	253,440	6	32	0	0	(26)
Lateral 5	6,336	10	63,360	1	8	0	0	(6)
Lateral 6	4,752	10	47,520	1	6	0	0	(5)
Lateral 7	2,640	10	26,400	1	3	0	0	(3)
Pipelines	12,144	1.5	18,216	0	2	0	0	(2)
16 stub canals	46,464	10	464,640	11	58	0	0	(48)
	0	0	0	0	0	0	0	0
TOTAL			2,547,336	59	320	0	453	192

Note: Typical or average size of facilities used due to lack of available of data
Canal seepage estimated for 10 months/year at 1-inch/day
Pipeline seepage estimated at 100 gallons per diameter inch per mile per day

Table 5

Crop Water Needs

2009 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Leaching Requirement (AF/Ac)	Cultural Practices (AF/Ac)	Effective Precipitation (AF/Ac)	Appl. Crop Water Use (acre-feet)
Alfalfa Seed	140.0	4.10	0.00	0.00	0.00	574
Cereals	714.0	1.70	0.00	0.00	0.00	1,214
Cotton	2,979.5	2.82	0.00	0.00	0.00	8,402
Almonds	351.0	3.22	0.00	0.00	0.00	1,130
Onions	748.0	1.71	0.00	0.00	0.00	1,279
Pomegranates	79.0	3.38	0.00	0.00	0.00	267
Misc Seed Crops	1,636.5	4.10	0.00	0.00	0.00	6,710
Tomatoes	1,793.0	2.15	0.00	0.00	0.00	3,855
Pistachios	155	3.22	0.00	0.00	0.00	499
	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
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	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
	0	0.00	0.00	0.00	0.00	0
Crop Acres	8,596					23,930

Total Irrig. Acres 8,596 (If this number is larger than your known total, it may be due to double cropping)
Double cropping does not occur in the District
Seed crops are primarily alfalfa, with a small amount of corn and vegetables

Table 6

2009 District Water Inventory

Water Supply	Table 3		31,266	
Riparian ET	(Distribution and Drain)	minus	0	
Groundwater recharge	(intentional - ponds, injection)	minus	0	
Seepage	Table 4	minus	453	
Evaporation - Precipitation	Table 4	minus	261	
Spillage	Table 4	minus	0	
Transfers/exchanges/trades/wheeling	(into or out of the district)	plus/minus	0	
Non-Agri deliveries	(delivered to non-ag customers)	minus	0	
Water Available for sale to agricultural customers			30,553	
Compare the above line with the next line to help find data gaps				
2009 Actual Agricultural Water Sales	From District Sales Records		23,605	98% of water available
Private Groundwater	Table 2	plus	0	
Crop Water Needs	Table 5	minus	23,930	82% of water sales
Drainwater outflow	(tail and tile not recycled)	minus	0	
Percolation from Agricultural Land	(calculated)		(325)	

Table 7

Influence on Groundwater and Saline Sink

2009

Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence on	(12,568)
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	8,596
Irrigated acres over a perched water table	0
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agri seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	0
Portion of Dist. Sys. seep/leaks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	0

Table 8

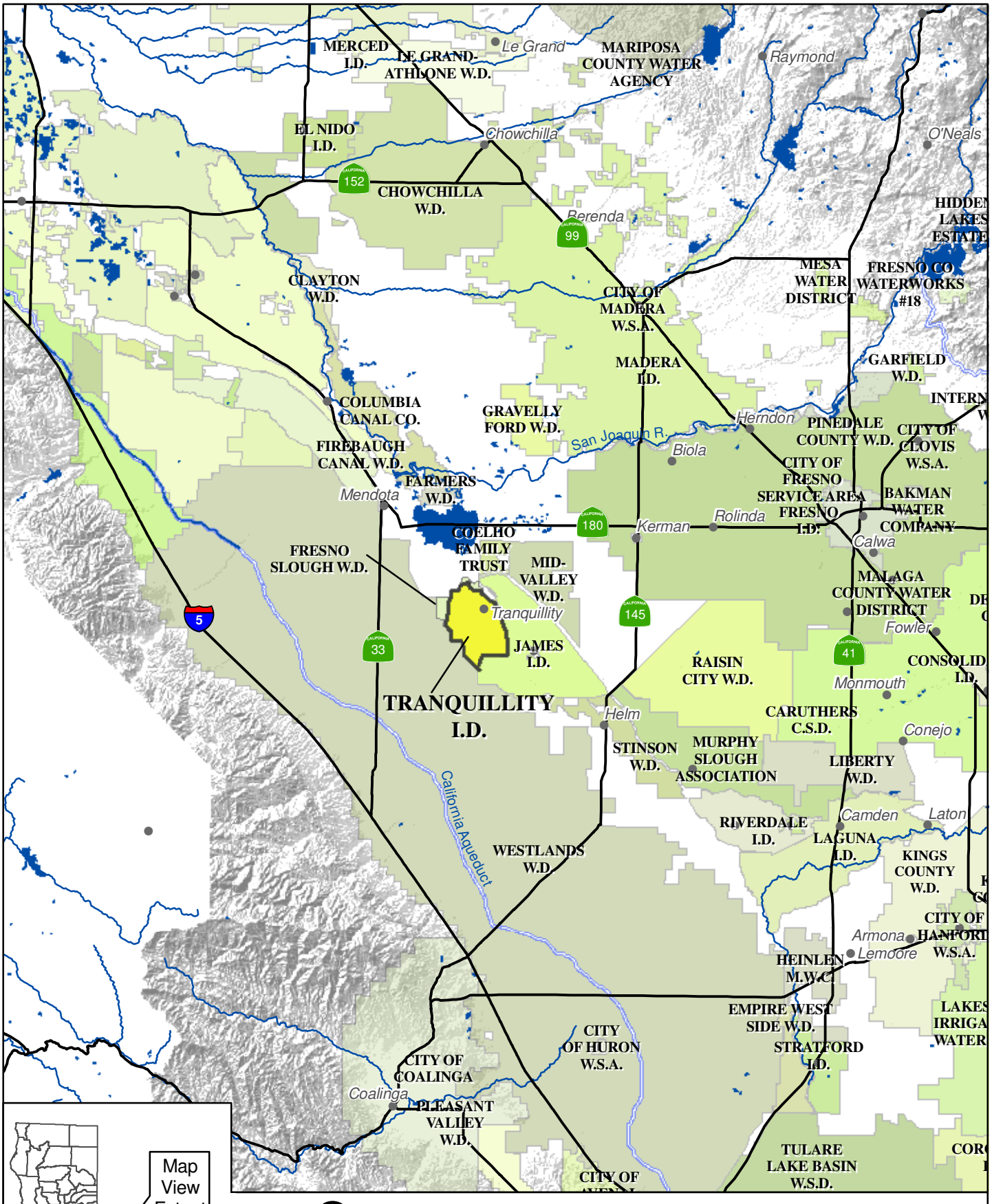
Annual Water Quantities Delivered Under Each Right or Contract

Year	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	Kings River High Flows (acre-feet)	San Joaquin River (acre-feet)	Other Water (acre-feet) /1	Upslope Drain Water (acre-feet) /2	Total (acre-feet)
2000	408	0	0	19,995	5,717	0	26,120
2001	5,417	0	0	20,201	3,111	0	28,729
2002	6,500	0	0	20,200	0	0	26,700
2003	5,634	0	0	20,200	0	60	25,894
2004	5,169	0	0	20,200	0	70	25,439
2005	4,746	0	1,952	16,655	0	140	23,493
2006	954	0	6,038	17,114	0	210	24,316
2007	88	0	0	20,200	0	160	20,448
2008	276	0	0	20,200	0	220	20,696
2009	744	0	0	16,911	0	590	18,245
Total	29,936	0	7,990	191,876	8,828	1,450	240,080
Average	2,994	0	799	19,188	883	145	24,008

Notes: /1 "Other Water" total includes Transfers In

/2 "Upslope Drain Water" total includes James ID spills

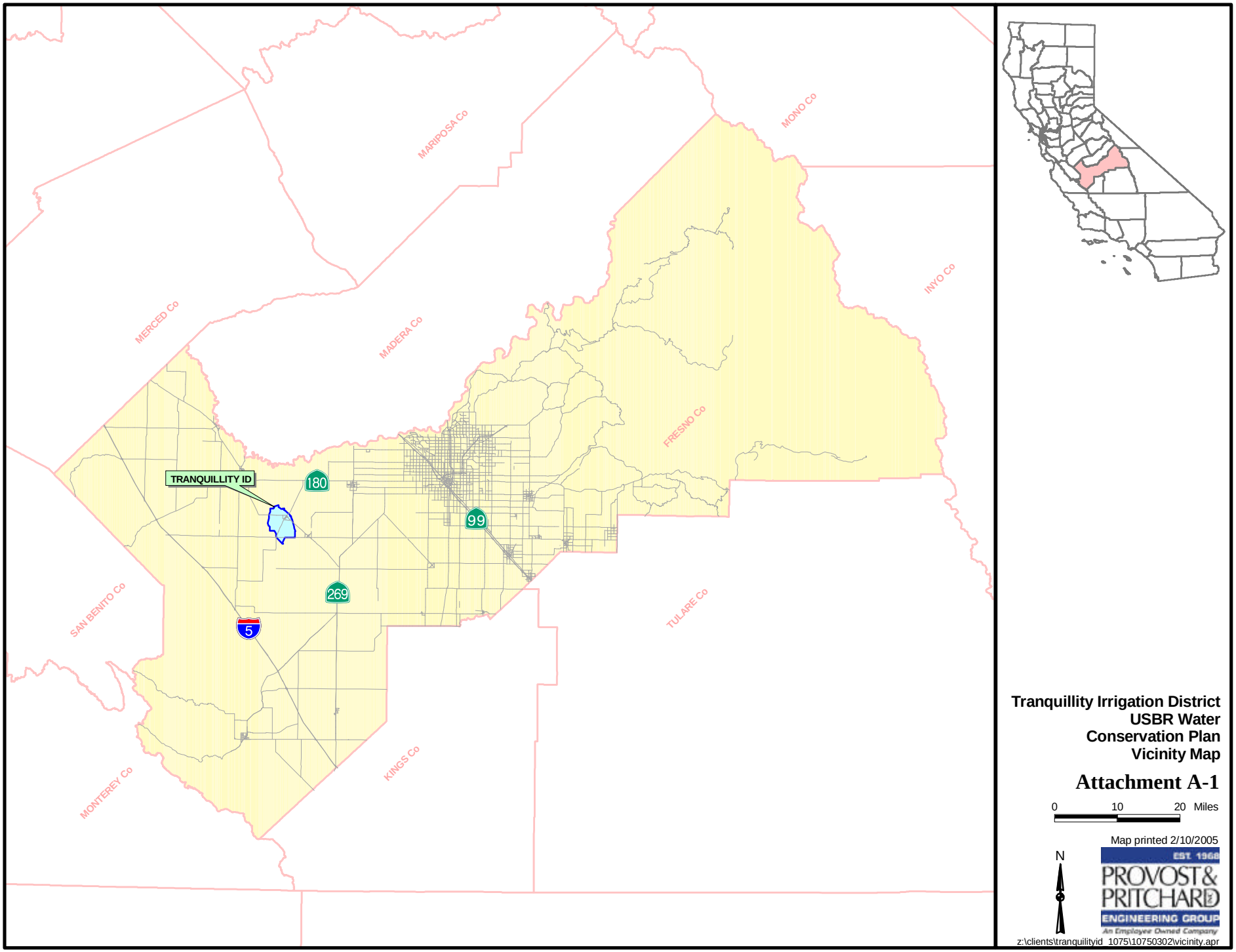
ATTACHMENTS



Tranquillity Irrigation District
Vicinity Map

Attachment A-1

5/14/2010 \\Evolution\clv_clients\Clients\TranquillityID-1075\Ongoing-1075\300-Surface Water Supply\320.3 - Water Conservation Plan 2010\GIS\Map\Vicinity_Map.mxd



Tranquillity Irrigation District
USBR Water
Conservation Plan
Vicinity Map

Attachment A-1

0 10 20 Miles

Map printed 2/10/2005

N

PROVOST & PRITCHARD ENGINEERING GROUP
EST. 1968
An Employee Owned Company

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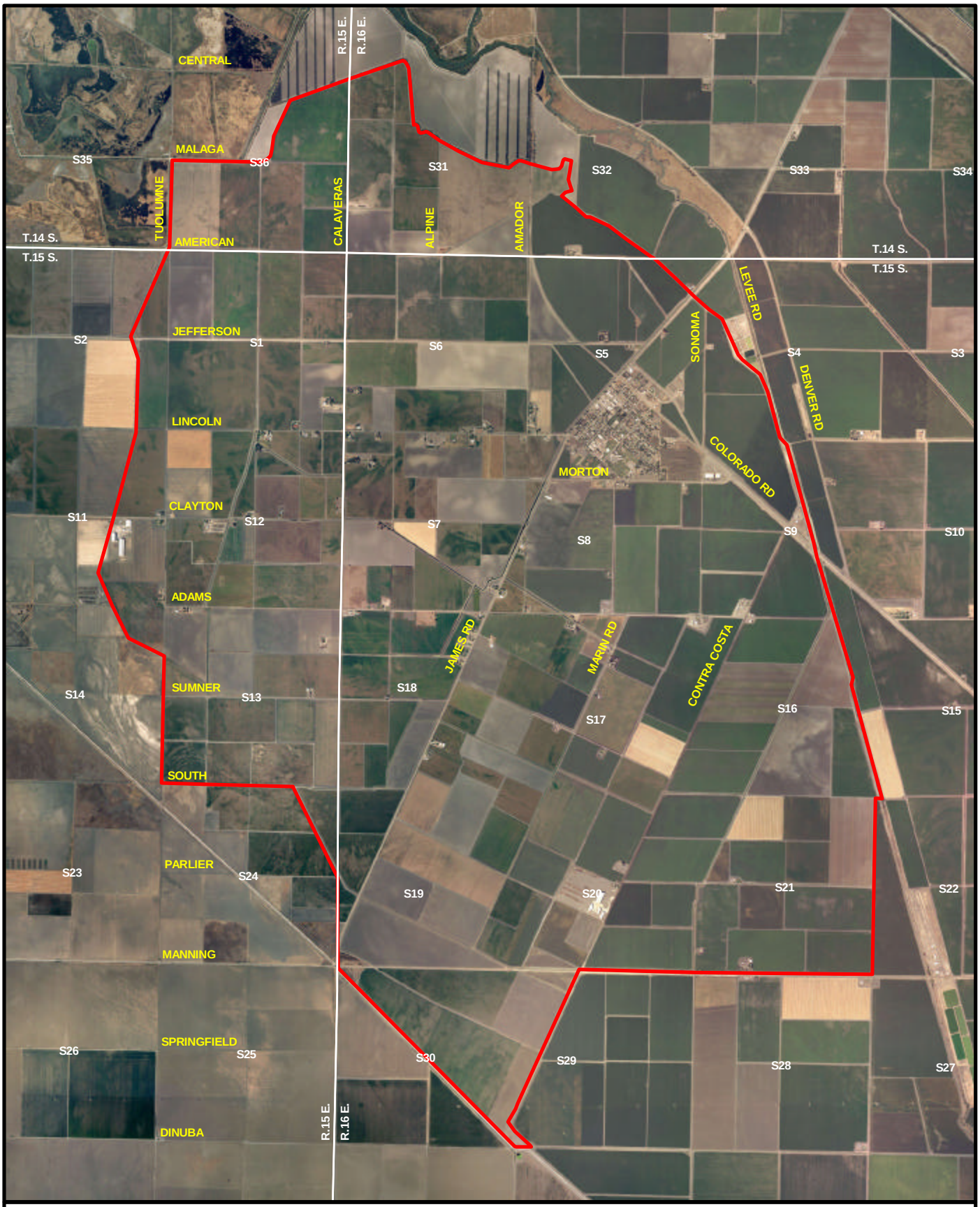

0 2000 4000 Feet

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Tranquillity Irrigation District Boundary

PROVOST & PRITCHARD ENGINEERING GROUP

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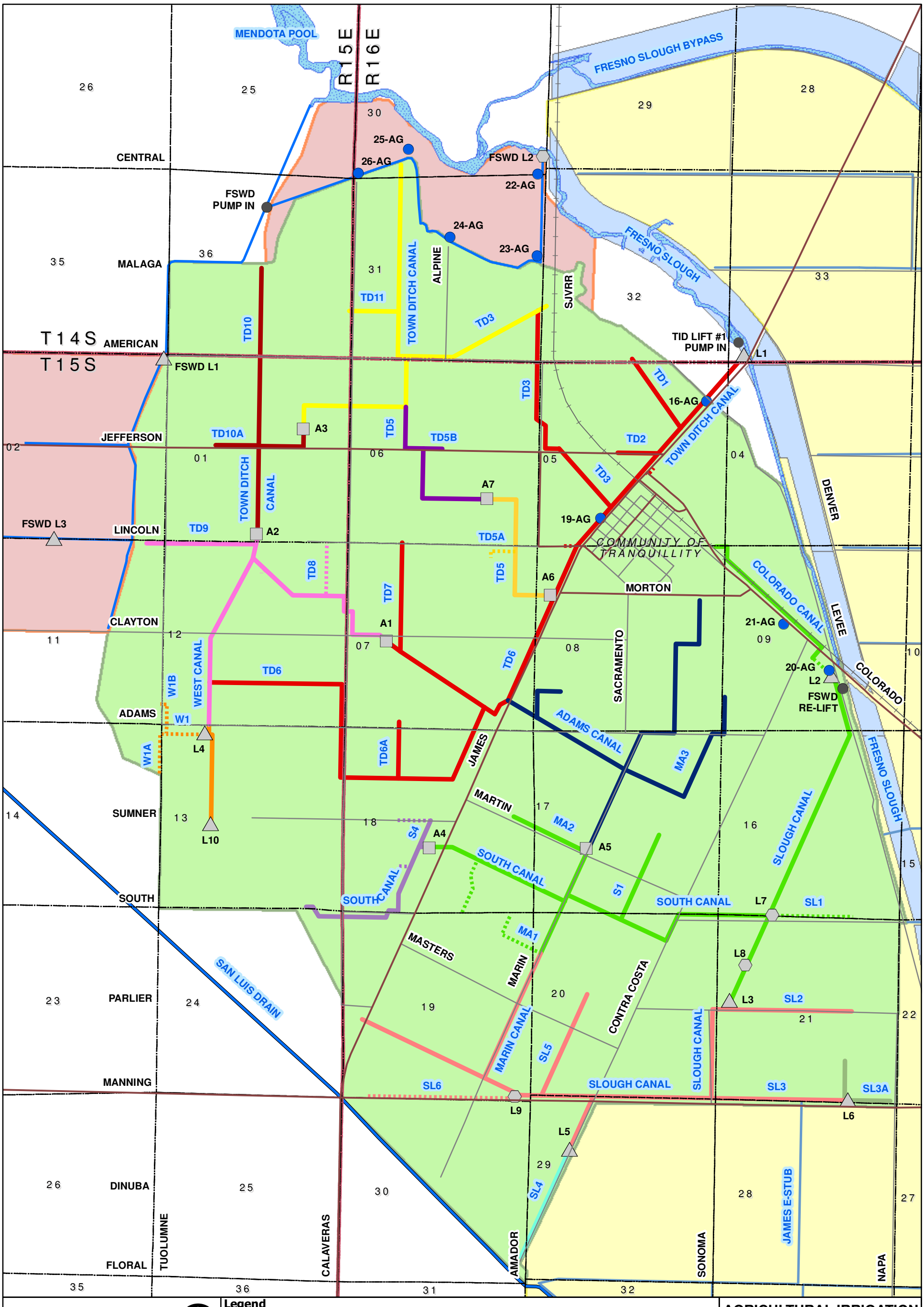
Tranquillity Irrigation District

USBR Water Conservation Plan
Aerial Location Map
Attachment A-2

Photography by AirPhoto USA, 2002



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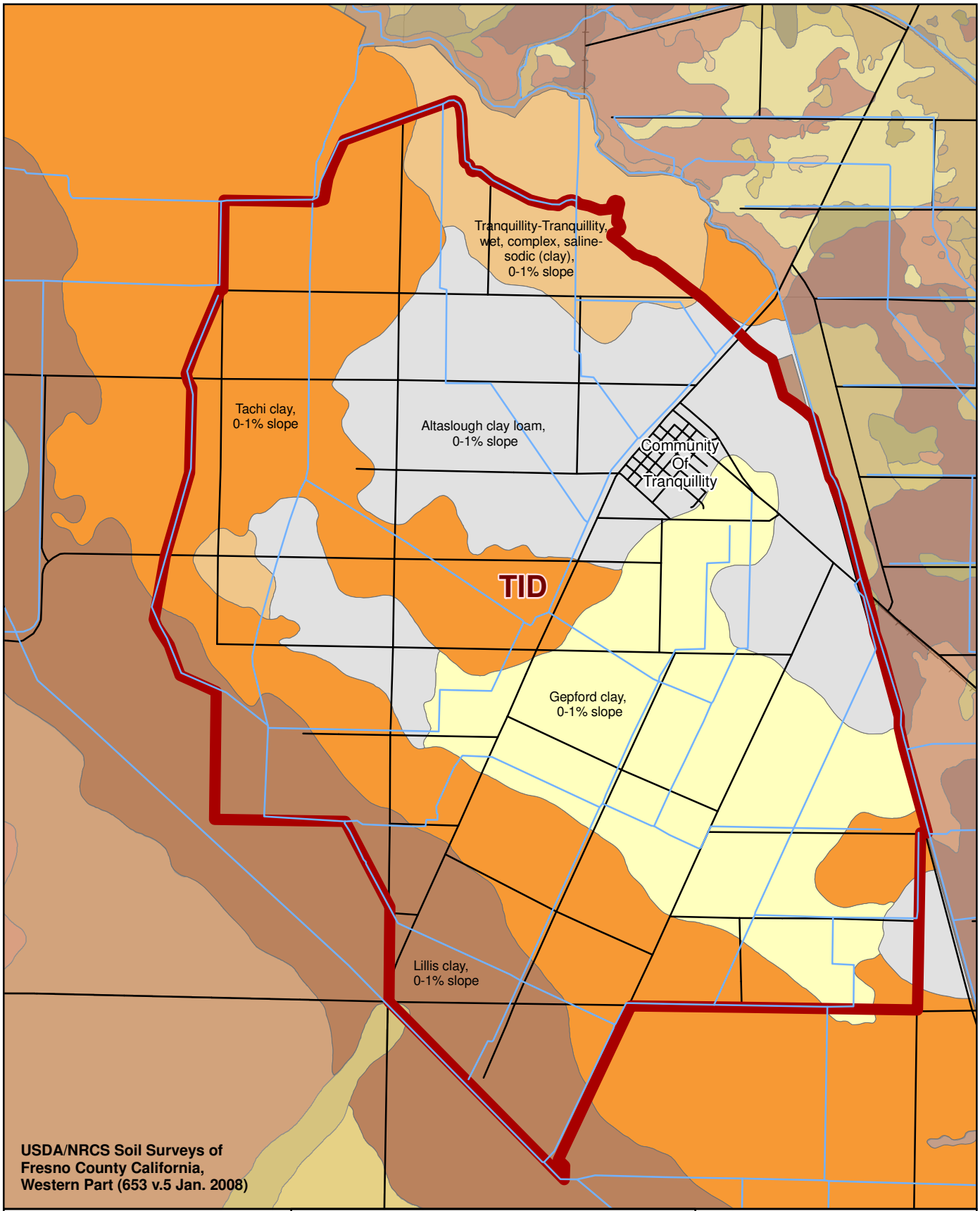
Fresno, CA 93711-6162
(559) 449-2700



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Miles

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Fresno, CA 93711-6162
(559) 449-2700

Soils

- Altaslough clay loam, 0-1% slope
- Gepford clay, 0-1% slope
- Lillis clay, 0-1% slope
- Tachi clay, 0-1% slope
- Tranquillity-Tranquillity, wet, complex, saline-sodic (clay), 0-1% slope
- Water Conveyance Facility
- Fresno County Road

Tranquillity ID

District Soils Map

Attachment B

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Rules and Regulations of Tranquillity Irrigation District

Attachment C

TRANQUILLITY IRRIGATION DISTRICT

Celebrating Our 75th Year
1918-1993

WM. PUCHEU
J.D. FAIRLESS
J.F. SALVADOR
Directors

SARGEANT GREEN
Manager

JEANNIE FAIRLESS
Secretary-Treasurer

NICK FLOCCHINI
Watermaster

Burn down your cities and they will spring up again as if by magic; but destroy our farms and the grass will grow in the streets of every city in the country.

RULES AND REGULATIONS

of

TRANQUILLITY IRRIGATION DISTRICT

Governing the Distribution and Use of Irrigation Water

Introduction

Tranquillity Irrigation District, hereafter called District, is a State agency governed by a Board of Directors elected by the people. It operates under the Water Code of the State of California. The District is a "General Act District", that is, it operates under the Water Code sections that apply to Irrigation Districts and has no special powers granted to it under any special act of the State Legislature. The Water Code Sections that empower the District are contained in Division 11, Sections 20500 to 29999.

The District irrigation water supplies come from various sources but principally include; exchange and contract surface water supplied through the Mendota Pool by the United States Bureau of Reclamation, Kings River flood water when it is available and ground water underlying the District extracted by wells.

The District makes no profit and is operated for the sole benefit of the lands and people within its boundaries. The benefits the people can derive from the District will be measured by the extent to which they cooperate to make it a success. The following rules encompass many of the circumstances and conditions that can assist the District and its customers in finding common ground for continued cooperation and success.

RULE 1

Management

The operations and maintenance of the irrigation system of the District shall be under the exclusive control of the Manager, acting under policies set by the Board of Directors.

The manager shall employ such personnel as may be required and authorized by the Board of Directors for the operation, maintenance and improvement of the system.

RULE 2

Control of Work

All diversion works, canals, ditches, headgates, and other structures belonging to the District will be operated and maintained by the District and their control and operations will be under the exclusive control of the authorized agents of the District. Upon application, the District shall construct, or cause to be constructed, water service outlets for the purpose of delivering water from a District conduit. The service outlet (customarily a "headgate" or "gate") shall be constructed in such a manner as to conform to standards established by the District, and once constructed, shall become the sole property of the District. All costs for materials and/or labor, including that of an adequate measuring device, shall be paid for by the District and reflected in the costs of water to all users, therefore, frequent alterations shall be discouraged and subject to the approval of the Board of Directors. Maintenance of such works shall be at the expense of the District. In such cases when the user or landowner is responsible for extraordinary needed maintenance and/or replacement (such as when a landowner requests a replacement when the existing facility is adequate or accidental damage or abuse by field operators is determined by the District to be beyond the boundary of normal wear and tear), the costs shall be born by the user or landowner. Such extraordinary work will require a written application by the operator or landowner and construction will be integrated into the maintenance program schedule at the discretion of the Manager. The location and number of "gates" for the distribution of water from the District's canals and the manner of delivery from such facilities, so as to secure safe and efficient operation, shall be ultimately determined by the Manager, subject to the approval of the Board of Directors.

RULE 3

Tampering and Damage to District Facilities

Manipulation of District weirs, headgates and other structures is forbidden, unless permission is given by the Watermaster or other authorized employee of the District. Cutting canal or ditch banks and/or placing dams or other obstructions in District-owned canals or ditches is prohibited.

Removal of dirt from, or other use, of the District-owned property such as, but not limited to, the utilization of the canal bank on which to turn farm equipment, the placing of toe ditches, drainage ditches, fences, trees or other crops, pumping plants, structures or other obstructions upon the District's rights-of-way are also prohibited, unless done with specific written permission and in accord with any conditions imposed by the District.

Water users or others, shall not permit their livestock to feed or trespass upon the rights-of-way of District-owned canals, drains or ditches except with specific permission of the District. In cases where it is necessary to cross the right-or-way, or to move livestock from one point to another along District rights-or-way, permission to use the rights-of-way for that purpose must be obtained from the Manager in advance. Any damage done to canal or ditch banks in using them for a roadway , whether moving livestock, farm equipment, or other vehicles, shall be the responsibility of those making use of the property. If it is found necessary for the District to repair such damage, those responsible shall pay all cost of such repairs.

RULE 4

Operation and Maintenance of Private Ditches or Laterals

The term "ditch" as used in this Rule, includes all gates, structures or other diversion works within a private ditch or lateral.

The operation and maintenance of privately owned ditches or laterals shall be the sole responsibility of the individuals who use the private ditch or lateral. "Use" of such ditch or lateral means irrigating from it, draining into it, or allowing the grazing or watering of stock therein, or taking or permitting any action of any nature which affects the condition of the ditch or causes any impairment of flow of water therein.

Privately owned ditches or laterals must be kept in reasonable repair and reasonably free from weeds and other obstructions, and be of sufficient capacity at all times to carry an adequate amount of water to irrigate the lands under them.

In the event that water is ordered in excess of the capacity of a privately owned ditch, only amounts up to the capacity of the ditch as determined by the District will be delivered. If the ditch is in such unclean or otherwise unsuitable condition that a usable amount of water cannot be delivered safely, or waste of water would result, delivery will be refused until such conditions are remedied.

Landowners shall construct and maintain adequate drainage facilities so that adjacent or lower lying lands will not be damaged, and no irrigator shall be delivered a greater amount of water than he can economically and beneficially use without waste, and with due regard to the needs of other irrigators.

The District will not be responsible for any loss or damage resulting from open ditch or drainage cuts, or improperly closed ditch or drainage cuts made by the user in any privately owned ditch or lateral, or for the improper functioning of any gate, structure or other diversion works therein.

Agreements may be entered into by the District, leasees and the landowners owning a particular ditch or section thereof, for the construction, reconstruction, and/or maintenance thereof under appropriate sections of the Water Code.

The legal provisions of the Water Code governing maintenance of privately owned ditches, and the District's power with respect thereto, are set forth in Appendix A of these Rules and Regulations.

RULE 5

Liability for Damage

The District will not be liable for any damage caused by the negligence or carelessness of any user in the use of water or for failure on his part to maintain any ditch or structure therein for which he is responsible - either wholly or in part. A waiver of such liability will be incorporated in an annual application for water (Rule 8). Each operator or owner will sign such a waiver or be subject to forfeiture of any rights or priveleges the District is legally entitled to grant.

RULE 6

Access to District Property and Rights-of-Way

Use of District property and right-of-way is by permission only. The use of canal banks or other real properties is limited to activities related to agricultural operations and other uses deemed appropriate by the Manager under Board direction. Any user or any other individual entering upon District property does so at his own risk.

RULE 7

Irrigation of Excessively High Ground

The District will not raise water to an excessive height in canals or ditches in order to give service to lands or ditches of unreasonable elevation, as determined by the District.

RULE 8

Application for Water

At the beginning of each irrigation season, each user shall submit to the Manager a properly completed written application for irrigation water in the specified year. The aplication form will be furnished by the District and will require the following: the number of acres to be irrigated and if deemed necessary by the District, proof of the rights to irrigate said land (deed, lease or other appropriate instrument), the kind of crops and the number of acres to be devoted to each crop, as nearly as can be determined, and such other information as the Manager may require to enable him to plan properly for distribution of water. If the applicant is part of a partnership or corporation, the other responsible officers must co-sign the application thereby signifying an understanding of their responsibilities and the requirements and rules of the District. The landowner, if different from the water user, shall receive a copy of the water application, informing him of his responsibility for payment of any unpaid charges incurred on his property.

RULE 9

Irrigation Season

The District's annual irrigation season shall commence with the filling of the canal system starting on or about February 1st of each year, and terminate on November 15th of each year. However, the District reserves the right at its sole discretion to deviate from these dates, both as to the canal system as a whole, or any portion thereof, based upon irrigation water requirements, climatic conditions, construction and maintenance requirements, or for any other reason.

During the period November 16th to January 31st of the following year, or such other non-irrigation period as may be determined by the District, irrigation service may be given, at the sole discretion of the District, by the use of available gravity entitlement surface water supply, or by the use of District wells, where physically and economically feasible, and where such service does not in any manner interfere with the District's contractual obligations, or with maintenance, construction or other activities of the District necessary to properly operate district canals and facilities.

RULE 10

Charges for Water, Materials and Services

Charges for water, materials and services including the transportation of foreign (non-District) water, will be fixed and the date or dates of payment of the same shall be determined by the Board of Directors. Such charges are in addition to any assessments that may be levied by the Board of Directors under the provisions of the Water Code.

The charges to the water user or users of water service (usually well water) during the non-irrigation season shall include all appropriate costs of the use of physical facilities required (such as power at lift pumps), and a flat charge per acre foot for all well water costs as may be determined and established by the Board of Directors.

The charges for all waters, regardless of source, will reflect a pro-rata share of system conveyance losses which will be reviewed periodically in an independent evaluation by an engineer or equivalent professional.

RULE 11

Unpaid Charges and Refusal of Service

All invoices for water, work orders, materials, and permanent maintenance agreements are due and payable by the 25th day of the month after receipt of the service. All past due bills shall be subject to a penalty of one and one half percent (1 1/2 %) per month, compounded monthly with a fifty cent ($ 0.50) handling charge.

Any charges that are not paid in full prior to February 1 of the following year will be declared delinquent, and the person who is responsible for those charges may be required to pay all water, delinquent or other charges for the succeeding year in advance of service, or face termination of service. Any users who are consistently delinquent for water charges (for more than two consecutive years), at the sole discretion of the Board of Directors, will be charged in advance of services. The water charges will be paid on or about February 1 (before water service can begin) for subsequent irrigations and on June 1 for the balance of the anticipated irrigation amounts or allocation, whichever is appropriate. If for any reason an allocation is adjusted upward, users under the advance payment schedule shall make the necessary payments to cover the adjustment within ten days of the District announcement or forfeit the entitlement.

Because landowners are ultimately responsible to the District for all unpaid bills incurred by themselves or tenants, the Manager shall notify all landowners of all outstanding bills against their particular property as soon as practical after December 31st of each year. However, failure to so notify the landowner will not eliminate the ultimate legal responsibility of the landowner for such payment.

The District reserves the right to refuse or discontinue service to any user who is in default in the payment of any District assessment or charge of any nature, and also to any land on which any such payment is delinquent, in accordance with Sections 22256 and 22282.1 of the Water Code of the State of California. In addition, the amount of any delinquent charges may be recorded as a lien against the user's or land owner's property, in accordance with Section 25806 of the Water Code.

All claims for overcharges or errors must be made in person or in writing and filed with the District within thirty days from the date the bill is received.

RULE 12

Delivery of Water

During the irrigation season, the hours of 7:00 a.m. to 9:00 p.m. shall be considered normal business hours for the Watermaster/Operations staff. Telephone calls during that time may be answered by a telephone recording device. Routine calls will be promptly acknowledged, and emergencies will be responded to as quickly as possible. All water orders will be recorded on a form provided by the District. These service orders must be signed by the water user, his representative or a District representative in the case of a phone order. All such signed service orders obligate the user to pay any charges associated with the order.

Water should be ordered at least 48 hours in advance, and the District will attempt to deliver water to the District's headgate as timely as possible. In order to provide timely service and to minimize waste of water, the Watermaster or Operations staff must be given an approximate shut-off date and time. A 10% surcharge on the water used during a delivery will be charged if the user fails to specify a shut-off date and time.

Water will be delivered as ordered within lateral areas as equitably as possible. Any consumer not able to use water at the time requested may receive water upon the completion of the deliveries in his lateral area, provided no undue loss of water is involved and there is no interference with deliveries to other irrigators. Heads or flow rates applied for may be altered by the District when necessary. Users should apply the water continuously day and night until irrigation is completed and without waste at any time.

Foreign water brought into the District by a user will be distributed by the District the same as District water. However, foreign water will be assessed its approximate share of losses as determined in an engineering report (Rule 10) and lift costs attributed to the District system as determined by the Manager and approved by the Board of Directors. Foreign water that is unused after completion of an irrigation season shall be lost unless the user makes arrangements for storage with agents acceptable to the District.

RULE 13

Basis of Allocation, Shortage of Water and Overuse

Each consumer shall be entitled to his proportionate share of the quantity of water available in accordance with the provisions of the Water Code of the State of California. Requests for delivery of water during shortages should be made at least five days prior to the date water is wanted. However, water will be delivered on requests made less than five days before the date water is wanted provided water is available and deliveries can be made without interference with other users and without undue waste of water or undue manipulations of weirs and gates. In the event that during any irrigation season there is an anticipated shortage of water, or an actual shortage of water occurs, the District will pro-rate the available supply among all consumers. In pro-rating the water the District may reduce the length of time of each run of water, and/or the amount of water delivered during each run of water, or the amount of water delivered during the period of shortage. The District will attempt to provide notice of any anticipated shortage, but assumes no responsibility for any inconvenience, damage, loss or injury arising from a failure to provide such advance notice.

In the event of overuse of allocated water during shortages, a penalty of three times the amount of water used in excess of the user's allocation will be deducted from the user's allocation for the next succeeding year. Alternate arrangements can be made to replace the water, however all such written transactions must be completed by August 15 of the instant irrigation season. In addition, users who consume water in excess of their allocation shall have a surcharge of 10% applied to the charges for amounts of water delivered which exceed the user's allocation, unless the District has received the advance notice of a transfer of water for an amount of water equal to or greater than the excess delivery.

Carryover of District water from one year to the next is prohibited.

The District reserves the right to suspend service during any period of time when it is necessary to take water out of the canals for public safety, emergencies, cleaning or other maintenance, repair or reconstruction work.

RULE 14

Transfers of Water

Transfers of allocated water within the District during times of shortage will be permitted. However, advance notice of such transfers shall be given to the District in written form not later than August 15 of any irrigation season so as to allow the District to make proper arrangements for delivery and determine availability and impacts of such transfers. The District reserves the right to refuse such transfers if the re-scheduling and re-allocation adversely impacts the ability of the District to serve other users or comply with other contractual commitments or requirements.

Transfers of District water outside of the District as authorized or controlled by Federal or State law or on the District's own volition, will be permitted when all the requirements of the laws or subsequent regulations have been met or all needs internal to the District and its users have been satisfied and the water declared by the Board of Directors surplus to those needs. The Board of Directors has found and declares that the priority for utilizing transferrable water should first be District operators and landowners, then others. The cost of the water will be determined by the Board of Director's but in all cases will as a minimum recover all reasonble District costs. The Board reserves the right to review the appropriateness of any transfer request and may require certain information necessary to determine the appropriateness and to the degree possible, prevent transfers which will result in any undue consideration or benefits to the receiving party or third parties. Delinquent users and their principals are not eligible to exercise any outside transfers.

All transfer related charges and fees must be paid in full before the execution of any outside transfer.

RULE 15

Point of Delivery

All measurements and deliveries of water shall be made at the point where the consumer's lateral or ditch connects with the canal or ditch owned by the District, at which point the District shall install and operate a controlled outlet box or headgate as provided for in Rule 2. The time of delivery will start when the headgates to such laterals or ditches are opened and expire when said headgates are closed. Exceptions to this rule may be made by the District to fit operating conditions.

RULE 16

Unauthorized Taking of Water

Persons interfering with the regulation of water in the canals or ditches of the District are subject to criminal prosecution. If any person takes water without permission of the Watermaster, he shall not only be subject to criminal prosecution, but may also forfeit his right to water, in addition to any other penalties or liabilities which may accrue as a consequence of such conduct.

District penalties will include as a minimum all charges and remedies described for overuse (Rule 13).

RULE 17

Transportation of Well and/or Government Water

The Board of Directors reserves the right to adopt such policies and/or rules and regulations on the transportation of well and/or Government owned waters through District owned canals and ditches as may be to the best interest of the District and its users.

RULE 18

Ownership of Water

All water in District owned canals, drains or ditches, regardless of source, except water being transported therein by written permission of the District, is District water and is subject to diversion and use by the District.

RULE 19

Limitation on Drainage

No drainage waters shall be introduced into District-owned canals, drains or ditches, either directly or indirectly, without the specific written permission of the District.

RULE 20

Access to Land

The authorized agents or employees of the District shall have reasonable access at all times to all lands irrigated from the

District system for the purpose of examining any ditches, laterals or drains serving such lands and/or the flow of water therein, for the purpose of ascertaining the acreage of crops on lands irrigated or to be irrigated, or for any other District purpose.

RULE 21

Nuisances

No material or substance of any nature, and particularly those that are or may become offensive to the senses or injurious to health or which do or may injuriously affect the quality of water, obstruct the flow of water, or result in the scattering of seeds or noxious weeds, plants or grasses, shall be placed or dumped in any ditch or on any right-of-way of the District, or be placed or left so as to roll, slide, flow, or be washed or blown into any ditch or onto any right-of-way. Any violation of this rule will subject the offender to criminal prosecution and/or civil liability. All employees of the District shall promptly report any violation of this rule, and the users of the District are especially urged to cooperate in its enforcement.

RULE 22

Complaints of District Customers

Complaints of any kind against the District or any of its personnel should be made in writing to the manager promptly after acts complained of have occurred. Customers shall have the right to refer any complaints in writing or in person to the Board of Directors of the District, which meets at 8:30 a.m., on the second, and when necessary to complete the Board's business, fourth Tuesdays of each month, at the office of the District, 25390 W. Silveira Street, Tranquillity, California. Nothing in this rule abrogates any provision contained in California Government Code Section 810, et. seq., pertaining to claims and complaints against the District.

RULE 23

Stock Water

The District shall not be required to furnish water for the exclusive purpose of watering stock.

RULE 24

Pumping and Pipelines

All water users who elect to pump water from the canals or conveying water by means of pipelines or closed conduits using their own equipment and facilities, shall nonetheless be governed in all respects by the rules and regulations applicable to consumers under gravity ditch service. Pumping by users of District transported or Government water is done at the user's risk, and the District, its officers and employees, assume no liability for damages to pumping equipment or to pipelines, or other damages as a result of turbid water, chemical quality, shortage or excess of water, or other causes.

RULE 25

Penalty for Non-Compliance

Refusal to comply with the requirements herein, or transgression of any of the foregoing rules and regulations, or any interference with the discharge of the duties of any employee of the District, shall be sufficient cause for shutting off the water, and water will not again be furnished until full compliance has been made with all requirements hereof. Nothing contained in these rules shall be construed as a limitation of the rights of the District. Any remedies and rights stated herein are in addition to any rights or remedies otherwise available to the District.

RULE 26

Changes in Rules and Regulations

The Board of Directors reserves the right to change these Rules and Regulations by majority action of the Board at any regular or special meeting, by adopting an appropriate resolution and publishing such resolution in the minutes of the District, a public record. Publications and disseminations of such changes by the printing of revised Rules and Regulations will be limited to economically feasible intervals as determined by the Board.

There shall be maintained at the office of the District, however, a master copy of these Rules and Regulations, including all changes made by the Board of Directors, which copy will be open to inspection at any time during normal office hours of the District.

APPENDIX A -- SELECTED CODE SECTIONS

Penal Code of the State of California

SECTION 592. Every person who shall, without authority of the owner or managing agent, and with intent to defraud, take water from any canal, ditch, flume or reservoir used for the purpose of holding or conveying water for manufacturing, agriculture, mining, irrigation or generation of power, or domestic use, or who shall without like authority, raise, lower, or otherwise disturb any gate or other apparatus thereof, used for the control or measurement of water, or who shall empty or place, or cause to be emptied or placed, into any such canal, ditch, flume or reservoir, any rubbish, filth, or obstruction to the free flow of the water, is guilty of a misdemeanor.

Water Code of the State of California

SECTION 7000. As used in this chapter "conduit" includes ditch, pipeline, and flume.

SECTION 7001. When two or more persons are associated by agreement in the use of a conduit, well or pumping plant, for the conveyance, obtaining or disposing of water, or are using such conduit, well or pumping plant, or any part thereof, for any lawful purpose, to the construction of which they or their grantors have contributed, each is liable, in the absence of any agreement to the contrary, to the others for the reasonable expenses of maintaining and repairing the same proportionately to the use actually made of such conduit, well or pumping plant, whether used in connection with irrigation or drainage.

SECTION 7002. If any person neglects, after demand in writing, to pay his proportion of the expenses under the next preceding section, he is liable therefor in an action for contribution, and in any judgment obtained against his interest from the time of demand shall be included.

SECTION 7003. The action authorized by this article may be brought by any or all of the parties who have contributed more than his or their just proportion of the expenses, and the plaintiff may recover, as costs, reasonable counsel fees to be fixed by the court.

SECTION 22256. A district may refuse to furnish water to any land to which it holds title by virtue of collector's deeds to the district or to any or all land on which the district has an outstanding unredeemed certificate of sale for the nonpayment of a district assessment.

Section 22257. Each district shall establish equitable rules for distribution and use of water, which shall be printed in convenient form for distribution in the district. A district may refuse to deliver water through a ditch which is not clean or not in suitable condition to prevent waste of water and may determine through which of two or more available ditches it will deliver water.

A district may close a defective gate in a community water distribution system used for irrigation purposes and may refuse to deliver water through the defective gate if the landowner fails to repair the gate or outlet to the satisfaction of the district within a reasonable time after receipt of notice from the board through its authorized water superintendent, manager, or ditch tender to repair the gate or outlet...

Section 22282.1 A district may refuse service to any land if outstanding charges for services already rendered such land have not been paid within a reasonable time.

Section 22283. A district may prescribe reasonable rules to carry out the provisions of this article.

Section 25806. (a) In case any charges for water and other services or either remain unpaid the amount of the unpaid charges may, in the discretion of the district:

(1) ...

(2) Be secured at any time by filing for record in the office of the county recorder of any county, a certificate specifying the amount of such charges and the name and address of the person liable therefore.

From the time of recordation of the certificate, the amount required to be paid together with interest and penalty constitutes a lien upon all real property in the county owned by the person or afterwards, and before the lien expires, acquired by him. The lien has the force, priority, and effect of a judgment lien and shall continue for 10 years from the date of the filing of the certificate unless sooner released or otherwise discharged. The lien may, within 10 years from the filing of the certificate or within 10 years from the date of that last extension of the lien in the manner herein provided, be extended by filing for record a new certificate in the office of the county recorder of any county and from the time of filing the lien shall be extended to the real property in such county for 10 years unless sooner released or otherwise discharged.

1993

Tranquillity Irrigation District

PO Box 487
Tranquillity, CA 93668
Telephone: (559) 698-7225
FAX: (559) 698-5105
www.trqid.com

IRRIGATION WATER STATEMENT

Statement Date	8/31/2009
Account Number	
Previous Balance	9,043.45

Current Transactions:

Payments	Charges	Adjustments	Fines
-9,043.45	3,890.90	0.00	0.00

Current Balance	3,890.90
Total Current Charges Due	9/25/2009
Total Amount Due	**3,890.90**

Tranquillity, CA 93668

Balance Aging:

Current	0-30	31-60	61-90	91+
3,890.90	0.00	0.00	0.00	0.00

TRANSACTION DETAIL

Date	Type	WO	Field	Outlet	Work Order Dates	Meter Readings	AcFt	Correction	Rate	Amount
7/31/2009	Prior Balance									9,043.45
8/1/2009		7968	F 16	L1-1.08	8/ 1/2009 - 8/ 1/2009	678.93 - 682.50	3.57		65.00	232.05
8/1/2009		7973	F M2	A1-.39	8/ 1/2009 - 8/ 1/2009	3,754.00 - 3,771.00	17.00		65.00	1,105.00
8/12/2009		8034	F 15	L1-.59	8/12/2009 - 8/12/2009	934.50 - 946.54	12.04		65.00	782.60
8/13/2009		8035	F 17	L1S4-.01	8/13/2009 - 8/13/2009	1,336.27 - 1,350.20	13.93		65.00	905.45
8/25/2009		8134	F 17	L1S4-.01	8/25/2009 - 8/25/2009	1,350.20 - 1,357.75	7.55		65.00	490.75
8/26/2009	Payment									-9,043.45
8/26/2009		8145	F 15	L1-.59	8/26/2009 - 8/26/2009	946.54 - 952.31	5.77		65.00	375.05

PAYMENT COUPON

Please return this portion along with your payment by the due date

AMOUNT DUE

Account Number	
Total Current Charges Due	9/25/2009
Total Amount Due	**3,890.90**

AMOUNT ENCLOSED

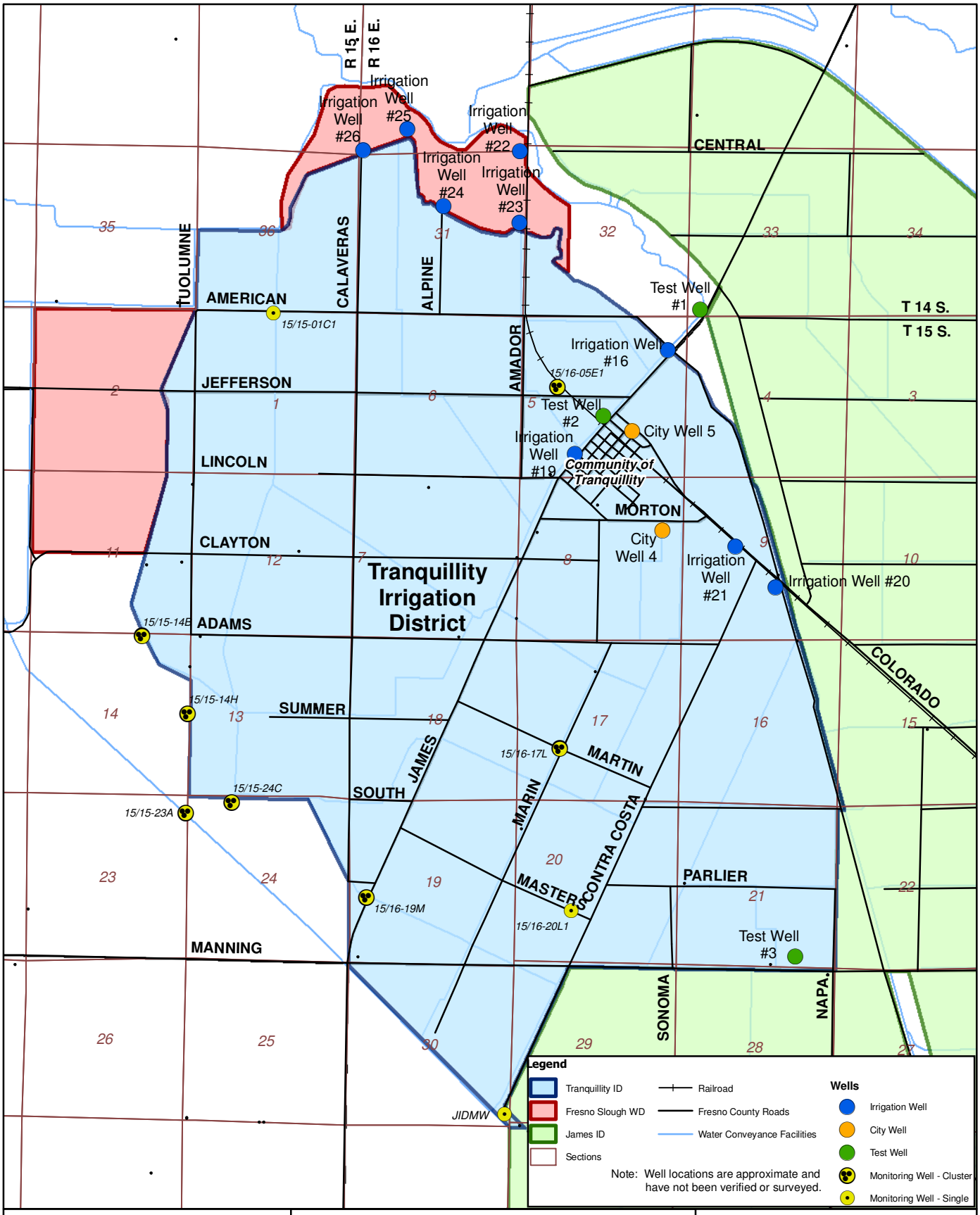
Amount Enclosed

Customer Address

Tranquillity, CA 93668

Tranquillity Irrigation District
PO Box 487
Tranquillity, CA 93668

Attachment E
District Water Shortage Plan
Not Applicable



EST. 1968
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company
286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Tranquillity ID

District
Groundwater Facilities

Attachment F

GROUNDWATER MANAGEMENT PLAN

TRANQUILLITY IRRIGATION DISTRICT
FRESNO SLOUGH WATER DISTRICT

JULY 2009

PROFESSIONAL GEOLOGIST
SHAY WILLIAM OVERTON
No. 8424
Geology
STATE OF CALIFORNIA

Date Signed 7-9-09

PREPARED BY:

PROVOST AND PRITCHARD
ENGINEERING GROUP, INC.

www.ppeng.com
EST. 1968
PROVOST & PRITCHARD INC
ENGINEERING GROUP
An Employee Owned Company

REGISTERED PROFESSIONAL ENGINEER
OWEN KUBIT
No. C66552
EXPIRES 6-30-10
Civil
STATE OF CALIFORNIA

DATE SIGNED: 7-9-09

Attachment G

TABLE OF CONTENTS

Figures

Attachments

Tables

Appendices

List of Abbreviations

AB	Assembly Bill
ACWA	Association of California Water Agencies
AF	Acre-feet
AWMC	Agricultural Water Management Council
BDC	Business Development Corridor
bgs	below ground surface
CRMP	Coordinated Resource Management and Planning
CVP	Central Valley Project
DBCP	dibromochloropropane
DPH	Department of Public Health
DWR	Department of Water Resources
EC	Electrical Conductivity
EPA	Environmental Protection Agency
ET	evapotranspiration
EWMP	Efficient Water Management Practices
FKC	Friant-Kern Canal
FSWD	Fresno Slough Water District
GAC	Groundwater Advisory Committee
gpm	Groundwater Management Plan
GPM	gallons per minute
GPS	Global Positioning System
I-5 BDC	Interstate 5 Business Development Corridor
ID	Irrigation District
IRWMP	Integrated Regional Water Management Plan
JID	James Irrigation District
KRWA	Kings River Water Association
LLC	Limited Liability Company
MCL	Maximum Contaminant Level
NRCS	Natural Resources Conservation Service
PUD	Public Utilities District
RCD	Resource Conservation District
SB	Senate Bill
SJVDP	San Joaquin Valley Drainage Program
SLDMWA	San Luis and Delta-Mendota Water Authority
TDS	total dissolved solids
TID	Tranquillity Irrigation District
USBR	United States Bureau of Reclamation
USGS	United States Geological Survey

1 – INTRODUCTION

This Groundwater Management Plan (GMP or Plan) is a joint effort between Tranquillity Irrigation District (TID) and Fresno Slough Water District (FSWD). From hereon these two agencies will be called the 'plan participants' or the 'Districts'. This GMP also covers the community of Tranquillity, which is within the Tranquillity Irrigation District. The area covered by this GMP will be called the 'plan area'.

This GMP satisfies the requirements for GMPs created by the September 2002 California State Senate Bill No. 1938, which amended Sections 10753 and 10795 of the California Water Code. This Plan also addresses recommended components for a Groundwater Management Plan described in Appendix C of Department of Water Resources Bulletin 118 (2003 Update).

1.1 - Background Information on Districts

Below is a brief description of the origin, physiography, geology, water supplies and facilities in the Districts.

Origin of Districts

Tranquillity Irrigation District (TID) was formed on January 22, 1918, as a public agency designed to serve the local community with water. It is the second oldest such agency in Fresno County. A Board of Directors elected from the District at-large governs the District. The District is responsible for acquisition and delivery of surface water and groundwater for irrigation purposes. Additionally, the District, when formed, established the Community of Tranquillity. When initially established, the District was responsible for domestic water supply, energy production, recreation, streets and roads, and lighting. The District has provided domestic water to the community since at least 1920. Fresno Slough Water District (FSWD) was formed in 1954 and serves surface water and groundwater to agricultural customers.

Geography

TID encompasses approximately 10,750 acres in the west central portion of Fresno County in California's Central San Joaquin Valley. The principal community is the unincorporated community of Tranquillity, which is within the District boundary. FSWD is located on the north and northwestern edge of TID. The District includes 1,459 acres and has approximately 1,030 acres of cropped land consisting primarily of field crops. Refer to **Figure 1** for a vicinity map and **Figure 2** for a map of the Districts.

Climate

The Plan area is characterized by a warm desert climate. Temperatures during summer often exceed 100 degrees F with winter temperature usually 32 degrees F or higher. Annual average precipitation is 7.4 inches. The growing season is long with most precipitation occurring during winter. The highest precipitation occurs during January with about 90 percent of the total precipitation occurring between November and April.

Precipitation is rare during the summer and usually associated with infrequent tropical storms. Prevailing winds are from the northwest and usually less than 10 miles per hour.

Soils and Agronomy

Refer to **Figure 3** for a NRCS (Natural Resources Conservation Service) soils map of TID and FSWD, and Section 2.2 for more details on soils in the Plan area. Approximately 9,600 acres were irrigated in TID in 2005. TID lands are predominately used for the production of irrigated field, row and forage crops. Crops occupying 5 percent or more of the acreage included cotton, sugar beets and canning tomatoes. Other crops grown during 2003 included alfalfa (207 acres), almonds (42 acres), wheat (196 acres), vegetable seed (24 acres), pasture (5 acres), and corn (249 acres). Little information is available on cropping in FSWD, but cropping patterns and irrigation methods are similar to those in TID.

About 80 percent of TID is irrigated using dead level basins with short length of water run, usually 1/8 mile long. Surface drip irrigation is used for the almond plantings. Sprinklers and gated pipe may be used during pre-irrigation. TID turnouts provide large flows, generally 7 to 14 cfs, which allows for rapid flooding of small fields. This approach maximizes on-farm irrigation efficiency in the District.

Groundwater Basin

As defined by the Department of Water Resources, Bulletin 118, TID and FSWD are located in San Joaquin River Hydrologic Region within the San Joaquin Valley Groundwater Basin (**Figure 4**). The Districts are the southernmost extent of the San Joaquin Valley Groundwater Basin and are within the Delta-Mendota subbasin. The Districts are bounded to the south and east by the Kings Groundwater subbasin and to the west by the Westside groundwater subbasin. The groundwater basin boundaries are geo-political, having been determined by a combination of geological and political boundaries.

Refer to Section 2 for more details on the geology in the plan area.

Subsurface Drainage

Some portions of TID and FSWD have been designated by the United States Bureau of Reclamation (USBR) as drainage problem areas. However, the shallow groundwater table is generally 15 feet or deeper beneath District lands and subsurface drainage systems have not been constructed. Furthermore, crops are grown without impact from shallow groundwater. TID has installed monitoring wells to track the elevation of this shallow groundwater table and to determine if lateral subsurface drainage flows from upland areas are impacting District land. To date shallow groundwater has not affected irrigation practices or crop production in the Districts.

Agricultural Water Supplies

TID is geographically adjacent to the Fresno Slough, an historic northern flood outlet of the north fork of the Kings River. Fresno Slough was also a flooded backwater (swamp) of the San Joaquin River. As a result, the District has historic riparian water right claims to water from both the Kings and San Joaquin Rivers. Surface water contracts include 13,800 AF of CVP project water (Contract No. 14-06-200-701-A-LTR1) and 20,200 AF of Schedule II CVP/riparian water (Contract14-06-200-701-A). The CVP water is delivered by USBR from the Shasta Division (Delta water) or Friant Division (San Joaquin River water) according to water supply availability.

Fresno Slough Water District has a Central Valley Project water contract (No. 4019A) for 4,000 AF/year of Schedule II water and a San Joaquin river riparian contract for 866 AF/year.

Today, the Delta-Mendota Canal discharges CVP water into Mendota Pool, and some of this supply flows south into Fresno Slough. The Districts then lifts its allocation of CVP water from the Fresno Slough into its own distribution system.

In addition to surface water, the TID owns five groundwater wells located in FSWD, which are operated to help meet peak demands, and augment surface water supplies when there are shortages. Agricultural wells are typically only run in the summer. In 1992, the CVP was required to provide water for new demands, such as environmental requirements for endangered fish species in the Sacramento-San Joaquin River Delta. Providing CVP water for these new demands has reduced water allocation for south of Delta CVP water users, and has placed pressure on other water sources, including local groundwater.

In 2003, TID used 5,600 AF of CVP water, 20,200 AF of local riparian water and 2,150 AF of groundwater. The Districts do not typically use State water, upslope drain water, transferred water or reclaimed water. No data is available on water use in FSWD.

Community of Tranquillity Water Supplies.

The Districts surface water supplies are delivered through the Delta-Mendota Canal. The canal is offline for maintenance about one month every two years. Such a supply interruption could not be accommodated by the community, and therefore they rely on groundwater supplies. The groundwater currently has high arsenic levels and the Community is investigating ways to treat the water.

Future Water Demands

Water demands are not projected to increase in TID, FSWD or the Community of Tranquillity. Cropping patterns are expected to remain relatively the same. Population growth in Tranquillity is expected to be negligible; currently, growth in the community is limited by the capacity of their wastewater treatment plant.

Facilities

Facilities in the Districts include seven irrigation wells and two municipal wells. There are very few private agricultural and domestic wells in the Districts.

The TID distribution system includes approximately 42 miles of unlined canals, 5 miles of pipeline, two major lift-pump stations, and a series of secondary lifts. The entire irrigation system is metered, which includes water diverted by the District and deliveries to farm turnouts. The system also is automated, which facilitates efficient operation. No information is available on the FSWD facilities.

The District also maintains the domestic water system for the local community as well as the community park. The demand for these urban water uses is provided by groundwater pumping. Water rights and CVP contract waters are used for crop irrigation, with a small amount also used for landscape irrigation at a public park.

For more general information on TID and their facilities refer to the Tranquillity Irrigation District Water Management Plan – 2005 Update.

1.2 - Goals and Objectives of Groundwater Management Plan

The overall purpose of this GMP is to develop a coordinated and comprehensive approach to the evaluation and management of groundwater resources within TID and FSWD.

This GMP documents the existing groundwater management efforts in TID and FSWD and planned efforts to improve groundwater management. Specific groundwater management goals documented in this GMP include the following:

1. Preserve, and, where feasible, enhance the existing quality of the area's groundwater.
2. Preclude surface or ground water exports that would reduce the long-term supply of groundwater.
3. Provide a mechanism for TID and FSWD to share data and ideas and work collaboratively to manage the local groundwater.
4. Coordinate groundwater management efforts between regional water users.
5. Maintain local management of the groundwater resources.
6. Implement a groundwater-monitoring program to provide an "early warning" system to future problems.
7. Stabilize groundwater levels in order to minimize pumping costs and energy use, and provide groundwater reserves for use in droughts.
8. Develop groundwater storage facilities outside of the Plan area to reduce stress on local groundwater reserves during droughts.
9. Maximize the use of surface water, including available flood water, for beneficial use, and thus reduce stress on groundwater resources.
10. Increase knowledge of the local geology and hydrogeology to better understand threats to groundwater quality and quantity.

11. Minimize future land subsidence caused by groundwater pumping through in-lieu groundwater recharge, and wise and conservative use of pumped groundwater.
12. Prevent groundwater degradation by protecting groundwater quality, importing clean surface water, and preventing intrusion of poor quality groundwater from neighboring areas.

In addition, the Districts will take a proactive role in the legislative process. The Districts will participate in development of sound legislation concerning groundwater management if it becomes necessary. The Districts will also take an active role in opposing any legislation that is detrimental to local groundwater management efforts.

1.3 - Statutory Authority for Groundwater Management

California Assembly Bill 3030 (AB 3030), as chaptered, (California Water Code, Division 6, Part 2.75, SEC. 10750-10753.9) grants specified "local agencies" authority to undertake groundwater management. AB 3030 also confers upon local agencies the powers of a water replenishment district. These authorities remained unchanged with the amendments to the law provided by 2002 California Senate Bill 1938 (SB 1938). The GMP has been updated to include components listed in California SB 1938. In addition, agencies adopting a GMP are authorized to enter into agreements with other local agencies or private parties to manage mutual groundwater supplies, including those existing in overlapping areas.

1.4 - Groundwater Management Plan Components

This GMP includes the required and voluntary components for a GMP as identified in California Water Code Section 10753, et. seq. This Plan is also consistent with the recommended elements for a GMP as identified in DWR Bulletin 118 (2003), Appendix C. **Table 1.1** identifies the location within this document where each of the components is addressed.

Table 1.1 – Location of Groundwater Management Plan Components

Description	Plan Section(s)
California Water Code Mandatory Requirements (10750 *et seq.*)	
1. Documentation of public involvement	1.5, Appendix A
2. Groundwater basin management objectives	1.2, 3
3. Monitoring and management of groundwater elevations, groundwater quality, land subsidence, and surface water	5
4. Plan to involve other agencies located in the groundwater basin	4.3
5. Monitoring protocols	5.3
6. Map of groundwater basin and agencies overlying the basin	**Figure 4**
California Water Code Voluntary Components (10750 *et seq.*)	
7. Control of saline water intrusion	6.3
8. Identification and management of wellhead protection areas and recharge areas	6.2, 7.2
9. Regulation of the migration of contaminated groundwater	6.3, 6.4
10. Administration of well abandonment and well destruction program	6.1
11. Mitigation of overdraft conditions	7.1, 7.2
12. Replenishment of groundwater extracted by water users	7.2
13. Monitoring of groundwater levels and storage	5.1, 9.2
14. Facilitating conjunctive use operations	7.3
15. Identification of well construction policies	8.1
16. Construction and operation by local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects	6.4, 7, 8.2
17. Development of relationships with state and federal regulatory agencies	4.2, 4.3
18. Review of land use plans and coordination with land use planning agencies	9.1
Additional Components Recommended by DWR (App. C of Bulletin 118)	
19. Advisory committee of stakeholders	4.1
20. Description of the area to be managed under the Plan	1.1, 2
21. Descriptions of actions to meet management objectives and how they will improve water reliability	4 - 9
22. Periodic groundwater reports	9.2
23. Periodic re-evaluation of Groundwater Management Plan	9.4

1.5 - Adoption of Plan

Refer to **Appendix A** for documentation on the adoption of the GMP and the public process that was followed.

On November 18, 2008 the TID Board of Directors agreed to jointly prepare a GMP, and let TID be the lead agency for the GMP. Refer to **Appendix A** for a copy of the minutes from this meeting. By serving as the lead agency, TID was able to adopt resolutions and publish public notices on behalf of TID and FSWD.

Groundwater Advisory Committee

The TID Board of Directors is comprised of local landowners that are considered representative of the local growers. They are also already familiar with groundwater issues in the Districts. As a result, the TID Board of Directors effectively serves as a Groundwater Advisory Committee. The Board of Directors provided comments throughout the development of the GMP. In addition, the Board members were each given a copy of the draft GMP, with the invitation to provide additional comments.

Public Participation in Plan Development

The public was invited to participate in the development of the updated GMP through newspaper notices and public hearings. These are described below:

Public Notice of Intention to Prepare a Groundwater Management Plan

As required by the California Water Code, a public hearing was duly noticed on November 26, 2008 and December 3, 2008 consistent with California Water Code Section 10753.2(a), and held on December 16, 2008, to discuss the preparation of a GMP. No public comments beyond those offered by the Board of Directors were received at this meeting.

Resolution of Intention to Prepare Groundwater Management Plan

TID adopted a Resolution of Intention to Prepare a Groundwater Management Plan on December 16, 2008. This resolution was then published on February 4 and February 11, 2009 consistent with California Water Code Section 10753.2(a).

Public Notice of Intention to Adopt the Groundwater Management Plan

As required by the California Water Code, a public hearing was duly noticed on _____ and _____, consistent with California Water Code Section 10753.2(a), and held on _____ to discuss adoption of the GMP. No public comments were received at this meeting.

Resolution Adopting the Updated Groundwater Management Plan

TID adopted a Resolution to Adopt the Groundwater Management Plan on _____. This resolution was then published on _____ and _____ consistent with California Water Code Section 10753.2(a).

2 - GEOLOGY AND HYDROGEOLOGY

This section discusses the geology and hydrogeology of TID, the Community of Tranquillity, FSWD, and the surrounding area. The purpose of this section is to provide general background information on the local geology, hydrogeology and water chemistry that will aid in selecting and implementing groundwater management programs. Information in this section was derived primarily from published reports from Davis et al. (1964), Bertoldi (1971), Ireland (1975), USGS (1986), DWR (2003), Sokol (1955) and TID water sampling records prepared by Twining Laboratories (1999).

The following sections include technical discussions on the plan area's groundwater. These are intended to provide geologists, engineers, and water managers a greater understanding of the area's stratigraphy, groundwater conditions, and hydrogeologic parameters. Less technical discussions on groundwater management programs are provided in Sections 3-9 of this document.

2.1 - Regional Geology

The San Joaquin Valley is part of a large, northwest-to-southeast trending asymmetric trough of the Central Valley, which has been filled with up to six vertical miles of sediment. This sediment includes both marine and continental deposits ranging in age from Jurassic to Holocene (recent). The San Joaquin Valley lies between the Coast Ranges on the west, the Sierra Nevada on the east, and extends northwestward from the San Emigdo and Tehachapi Mountains to the Delta near the City of Stockton. The San Joaquin Valley is 250 miles long and 50 to 60 miles wide. The relatively flat alluvial floor is interrupted occasionally by low hills.

The San Joaquin Valley is divided into several geomorphic land types including dissected uplands, low alluvial fans and plains, river floodplains and channels, and overflow lands and lake bottoms. The alluvial plains cover most of the valley floor and comprise some of the most intensely developed agricultural lands in the San Joaquin Valley. In general, alluvial sediments of the western and southern parts of the San Joaquin Valley tend to have lower permeability then eastside deposits. The lower permeability in material along the western and southern portions of the valley is mainly attributed to the fine-grained nature of the parent material from which the alluvium is derived. These sediments are predominately marine in origin and consist of the thick sequences of mudstone, claystone, and siltstone that make up the Coast Ranges. Upon weathering and transport down slope along alluvial fans, these sediments readily decrepitate into fine-grained materials consisting mainly of silt and clay found along the axis of the valley trough.

Near the valley trough, fluvial deposits of the east and west sides grade into fine-grained deposits termed Flood-basin deposits by USGS (1986). The San Joaquin Valley has several thick, fine-grained, lacustrine deposits. The Corcoran Clay

Member of the Tulare Formation is the most notable fine-grained deposit in the San Joaquin Valley affecting groundwater quality and creating confined groundwater conditions below. The Corcoran Clay was deposited about 600,000 years ago in the Tulare Lake, also known as Lake Clyde. This clay bed, which is found in the western and southern portions of the valley, separates the upper semi-confined to unconfined aquifer from the lower confined aquifer. The clay bed covers approximately 5,000 square miles and is up to 160 feet thick beneath the present bed of Tulare Lake. A map showing the major clay layers in the area is included as **Figure 8.**

Regional Hydrogeologic Setting

Groundwater in the plan area is divided into three separate non-marine, water bearing zones. These include the lower water-bearing zone, upper water-bearing zone and the perched or shallow zone, as discussed below.

- The **lower water-bearing zone** contains fresh water in the lower section of the Tulare Formation from the base of the E clay (Corcoran Clay) to the base of fresh water or the top of connate, saline marine water. Sokol (1955) terms the base of the fresh water aquifer as the base of the effective ground-water reservoir.

- The **upper water-bearing zone** is from the top of the Corcoran Clay to the upper sections of the Tulare Formation, often considered the bottom of the A clay.

- The **shallow or perched zone** is from the top of the A Clay, if it is present, to the perched groundwater table which is often within 10 feet or less of the ground surface. DWR Bulletin 118 uses 25 feet below ground surface (bgs) as a general vertical depth limit for the base of the perched zone.

Subsidence

Land subsidence in the San Joaquin Valley has been studied extensively in the past by the USGS and DWR. A State-Federal committee on subsidence was formed in the early 1950's and performed research and measured subsidence until 1970. By 1970, 5,200 square miles in the Valley had subsided more than 1 foot. Between 1926 and 1970, a maximum of 29.7 feet of subsidence was measured at a point southwest of Mendota. The compacting forces caused by groundwater level decline squeezed more than 15.6 million acre-feet of water out of valley sediments during the same period.

There are two types of land subsidence due to withdrawal of groundwater resources; elastic and inelastic. Elastic subsidence is not permanent and is largely reversible, if water levels recover to above historic low levels. Recent studies indicate that current subsidence west of the plan area is primarily elastic in nature, and will likely not be inelastic until water levels fall below historic low levels. Inelastic subsidence is permanent and occurs when water is removed from a confined aquifer for the first time,

and is sometimes referred to as virgin subsidence. Between the mid-1920's to about 1980 the San Joaquin Valley experienced inelastic, non-recoverable subsidence .

The most recent reports on land subsidence in the San Joaquin Valley were completed by R.L Ireland of the USGS in 1986 and Arvey A. Swanson of DWR in 1995. Ireland (1986) states that "*Land subsidence to groundwater withdrawal in the San Joaquin Valley that began in the mid-1920's and reached a maximum of 29.7 feet in 1981 has been halted by the importation of surface water through major canals and the California Aqueduct in the 1950's through 1970's.*" This was generally true at the time, because large scale regional subsidence had halted, but smaller-scale local subsidence continued in many areas.

Poland and others (1975) estimated that cumulative non-recoverable land subsidence from 1926 to 1972 in the vicinity of Tranquility was on the order of 8 feet. Their land subsidence contour map shows even higher subsidence (12 feet over the period of record) west of the plan area.

As land subsidence is a function of groundwater pumpage and recharge, it is linked to drops in groundwater levels. DWR Bulletin 118 states that from 1970 to 2000 groundwater levels have increased by an average of 2.2 feet in the Delta-Mendota subbasin. **Figure 5,** discussed below in Section 2.4, is a DWR hydrograph for well 15S16E21Q001M showing that water levels fell by nearly 75 feet from 1939 to 1971, from 1970 to 2000 water levels have been fairly stable, with changes based on surface water allocations. This hydrograph is in general agreement with DWR Bulletin 118, and, since Poland and others (1975) show a direct correlation between subsidence and pumpage, the rate of permanent inelastic subsidence in the Tranquility area likely has slowed.

In a 1996 draft memo, DWR indicated that from 1975 to 1992 subsidence occurred primarily in drought years when groundwater supplies replaced surface water supplies. The most recent record of land subsidence in the area is from Swanson (1995), were he indicates that 2 feet of subsidence occurred along the Outside Canal near Mendota Dam between the years of 1970 and 1994. However, it is not known how much of the 2 feet of subsidence reported by Swanson was residual subsidence from times of high pumpage from the mid-1920's to 1981. Data from 6 extensometers located west of the plan area indicates that subsidence there has been elastic since about 1977, which probably indicates that subsidence in the plan area since about 1977 has been elastic in nature, and will not be permanent subsidence until water levels fall below historic low levels.

Groundwater Basin

TID and FSWD are located in the Delta-Mendota subbasin of the San Joaquin Valley Basin which is part of the San Joaquin River Hydrologic Region (**Figure 4**). In fact, TID is the southernmost extension of the Delta-Mendota subbasin of the San Joaquin Valley Basin. According to DWR Bulletin 118 (2003), the San Joaquin

Valley region is heavily reliant on groundwater with up to 30 percent of agricultural and urban supplies coming from the underground aquifers. Bulletin 118 also identifies eleven basins as being in critical conditions of overdraft. The San Joaquin Valley basin and the Delta-Mendota subbasin are **not** included on the list of basins/subbasins identified as being in a state of critical overdraft.

Local Topography

TID and FSWD lie in the trough of the San Joaquin Valley. Prior to cultivation, the land was swampy and frequently flooded. The ground elevation is from 160 to 175 feet and most of the original micro-relief has been leveled for agricultural purposes. Soils in the area reflect low-lying topographic basins and formed on nearly level, imperfectly drained surfaces subject to frequent flooding and over flow.

Based on topographic maps, the direction of fall is predominately from south to north at about 1 foot per mile. The total fall in that direction is about 14 feet from the northern to southern boundary of the plan area. From east to west the plan area is relatively flat with little slope. The topography results in the need for a series of lift pumps in the TID conveyance/distribution system to provide water service to higher elevation lands.

East of the plan area, the outer edges of the San Joaquin alluvial fan slope southwesterly at 5 feet per mile, while the outer edge of the Westside alluvial fans terminate approximately one mile west of the TID boundary.

2.2 - Stratigraphy

The following discussion focuses on significant hydrogeologic units that could have an impact on the groundwater resources within TID and FSWD. A cross section of the major stratigraphic features in the plan area is shown on **Figure 6**. Most of the information specific to this area is derived from a 1955 USBR report by Dan Sokol. The lower limit of the following discussion is based on the approximate base of the effective groundwater reservoir as defined by Sokol (1955), which is approximately midway through the Tulare Formation and dips southwesterly beneath the plan area from about 1,000 feet bgs near the eastern boundary to about 1,700 feet along the southwestern boundary. From the surface to a depth of approximately 1,700 feet bgs important hydrogeologic units are topsoil, alluvial fan deposits of eastside (Sierran origin), lacustrine clays including the A clay and the Corcoran clay (E clay), alluvial deposits beneath the Corcoran clay, and fan deposits of Westside origin. With the exception of the near surface, recent, alluvial deposits the entire stratigraphic section of interest is within the Tulare Formation. Depth to bedrock is too deep under the plan area to impact groundwater conditions and therefore will not be discussed here.

Topsoils

According to Sokol (1955) the entire plan area (with the exception of a minor percentage of Fresno Slough Water District along the extreme western border mapped

as West side inactive alluvial fan) is mapped as Basin sediments. As described above soils in the plan area have formed on relatively flat, poorly drained, and frequently flooded platforms indicative of soils found along the topographic axis of the San Joaquin Valley (**Figure 3**). The NRCS soil survey data indicates that soil slope ranges from 0 to 1 percent.

The two soil associations in the plan area are generally described as follows:

1) Soils on Basin Floor and Flood Plain: Tachi-Armona-Wekota Association. This association is characterized by very deep, nearly level, very poorly drained and poorly drained, saline-sodic soils formed in alluvium from igneous and/or sedimentary rocks on the west side of the San Joaquin River and Fresno Slough. Soils in this Association that occur in TID include Alta Slough clay, Gepford clay, Tachi clay and Lillis clay soils. These soils cover about 10,153 acres in TID or about 94 percent of the land surface.

2) Soils on Fan Skirts: Tranquillity-Ciervo, saline-sodic Calflax Association. This association is characterized by very deep, nearly level, somewhat poorly and moderately well drained, saline-sodic soils formed on alluvium from calcareous sedimentary rock on the western edge of the basin floor. Soils in this Association that occur in TID and FSWD include Tranquillity-Tranquillity, wet, complex saline-sodic and Calflax series soils. These soils cover about 597 acres in TID or about 6 percent of the land surface.

These soils as mapped by the NRCS have potential limitations such as restricted permeability and native salinity and sodicity. These issues have been addressed by soil reclamation, and ongoing soil and irrigation management approaches. The TID irrigation conveyance/distribution system was designed with consideration for these potential limitations and they do not have an effect on TID water system operation and management.

Subsurface Geology

Sokol (1955) provided the most focused and detailed descriptions of the subsurface geology in the plan area. The following discussion on subsurface geology is based on the descriptions found in the Sokol's report.

Alluvial Fan Deposits of Eastside (Sierran) Origin

Alluvial fan deposits above the Corcoran clay are predominately of eastside origin and comprise lenticular beds of sands and silts derived primarily from granitic rocks with rare clay laminae. The sands vary from fine to medium-grained sizes and coarse sands and gravels are rare. The deposits generally fine westward and fine-grained deposits dominate in the western portion of the area. This alluvial sequence occurs from the surface to depths of 500-600 feet bgs. These sediments, while all Sierran fluvial represent three distinct environments of

deposition. Clays and silt/clay mixtures represent deposition in lakes or marshes, well sorted sands and silts represent deposition in water with current such as streambeds or lake beaches, and poorly-sorted silt and clay fractions indicate floodplain origins.

The A clay is one of seven recognized lacustrine clay beds in the San Joaquin Valley (**Figure 6**). It was deposited in a widespread lake and is found almost continually beneath the topographic axis of the valley. While not comprised of alluvium of eastside origin, stratigraphically it is located within this unit, and thus is discussed here. The top of it is often the base of the perched or shallow ground water zone. The A clay, as mapped by USGS (1972), extends under the majority of the plan area with the exception of the extreme southern and western portions (**Figures 6**). The base is about 60 to 75 feet beneath the land surface and generally it is between 5 to 70 feet thick. Structure contours drawn on the base of the A clay indicate that it is relatively flat beneath the majority of the area. The A clay is an aquitard, not yielding significant water to wells, and in fact is a perching layer stopping the downward migration of water from the surface. This barrier to the vertical movement of groundwater has produced a zone of shallow perched groundwater with elevated salt content, discussed below in the water quality section.

Alluvial Deposits Beneath The Corcoran Clay

Beneath the Corcoran clay a series of granitic sands, silts, and occasional clays extends to depths greater than 3,000 feet. These sediments were deposited by alluvial fans debauching from the Sierra Nevada Mountains and resemble beds of similar origin above the Corcoran clay, but are texturally coarser grained. This unit contains the base of the effective groundwater reservoir, as described below. Most new wells drilled in the area are completed in these deposits. Water quality in this zone is discussed below but generally is of much better quality than water above the Corcoran clay.

Corcoran Clay

The Corcoran Clay, also known as the E clay, is a lacustrine clay bed of lake or swamp origin that effectively underlies the entire plan area. The Corcoran clay has long been recognized as the most significant subsurface deposit in the San Joaquin Valley confining water beneath it. It is the upper most boundary of the confined aquifer and the lower most boundary of the unconfined aquifer. Structure contours drawn on the base show it to be about 560 to 620 feet beneath the surface in the plan area. The structure contours reveal the structure of the clay as a southeast dipping syncline with about 40 feet of dip from the northwest to southeast beneath the area. The thickness is between 50 to 130 feet and it thickens westward. Using an average thickness of 80 feet, the top of it is approximately 480 to 540 feet beneath the surface with the deepest depths found in the southeast part of the plan area. On well completion reports it is commonly described as blue or green clay, claystone, or siltstone. The Corcoran Clay has

been described as greenish-grey, dense, compact, and non-laminated claystone or siltstone. The bottom 20 feet is usually silty and it is a characteristic marker on E logs. A few scattered sand lenses exist and in the eastern portions of the area can make up as much as 30 percent of the clay sequence.

Alluvial Deposits of Westside Origin

The plan area, being near the axis of the valley, has at times been dominated by deposition from the Sierra Nevada and at other times deposition from the Coast Ranges. Contemporaneous deposition from eastside and westside sources is shown in a drill hole located in 15S/16E, Section 17E at depths of 22 feet where Westside deposits overlie eastside deposits. Thus, Westside deposits overlap eastside deposits in the western portions of the area. West of the District a drill cored sediments of coast range origin to depths of 486 feet, under which granitic deposits of eastside origin were found. This indicates that while the sediments from the two sources occur and overlap within the plan area, the westside deposits thin and pinch out easterly.

2.3 - Aquifer Characteristics

Specific Yield

In order to establish the storage capacity of the underground reservoir it is necessary to derive estimates of the specific yield of the sediments. DWR Bulletin 118 estimates that specific yield in the Delta-Mendota basin at 11.8 percent, but does not give estimates of specific yield for the local Tranquillity area. Sokol (1955) derived estimates of specific yield for the upper water-bearing zone within TID. These values are based on specific yield estimates from two separate studies done in similar geologic settings. Sokol defined the upper water-bearing zone as the depth interval between 1948 static water levels in shallow wells and the top of the Corcoran clay (about 30 feet to 480 to 540 feet bgs). Sokol's computations show the average specific yield for TID is 8.9 percent for the sediments above the top of the Corcoran clay. Specific yield contours show a tongue of higher specific yield extends southwestward across the plan area corresponding to eastside alluvial sediments. Specific yields associated with this tongue of sediments range from as much as 22 percent in the northeastern part of the area to as low as 8 percent in the southwest part of the area.

Safe Yield

According to the TID's 2005 Water Management Plan prepared by RB Smith Consulting in 2005, the local aquifer has a safe yield of 2,500 AF/year. The TID 2005 Water Management Plan states that the aquifer beneath the area has a usable capacity (total potential storage) of 4,000 AF. In a memorandum prepared by Provost and Pritchard Engineering for TID the average groundwater pumpage for the period 1989 to 1999 was 2,984 AF/year, but that amount was considered greater than the perennial yield of the aquifer as evidenced by the 0.4 feet per year decline in water levels in well 14S16E33N01. The 2000 Tranquillity Irrigation District Water Needs Assessment-

Calculation of Past Beneficial Use, Current Conditions and Future Demand assumes 2,000 AF/year of groundwater pumped in 2025. The derivation of safe yield for the plan area is beyond the scope of this GMP, however based on the above estimates it is likely between about 2,000 and 2,500 AF/year.

Transmissivity

Transmissivity data for the TID area from the literature is sparse. A study by Davis et al., (1964) summarized numerous specific capacity values from Pacific Gas & Electric pump tests performed across the San Joaquin Valley. Using data from field tests in the TID area, they calculated specific capacities ranging from 44 to 85 gpm per foot. Driscoll (1986) provides an approximate relationship between specific capacity data and transmissivitiy. Using this method, transmissivity values for the District and immediately surrounding areas range from 66,000 to 127,500 gpd/ft. These values of specific capacity and transmissivity are probably valid for the unconfined aquifer, as at the time of the report most wells drilled in the area were most likely completed above the E clay.

Wells Yields and Depths

From 1939 to 2007 the number of agricultural and municipal wells monitored by DWR for an area encompassing TID and extending about 2 miles from the District boundary has varied. In 1939 the number of wells monitored was 6 and by 1962 the number of wells monitored had increased to a high of 31. Currently DWR monitors 3 wells in the area. Active irrigation and community wells within the District boundary are completed to depths of between 555 to 913 feet. There is one domestic well (not owned by the Districts) within district boundaries but the depth is unknown. According to DWR (2003), wells in the Delta-Mendota subbasin can have yields as high as 5,000 gpm averaging between 800-2,000 gpm. According to well logs and development records, active wells in the District have variable yields from 1,176 to 3,000 gpm averaging about 2,100 gpm. A summary of well attributes is included as **Attachment 1**.

2.4 - Groundwater Levels

Drainage Problem Area

TID and FSWD are included in a drainage problem area according to a multi-agency report entitled "*A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley*" (September 1990). However, the Districts have not experienced the shallow water table and water quality problems that occur in other districts included in the report. The Districts have implemented source control measures by requiring the retention of all surface drainage water on land that generates water. Due to the implementation and success of source control measures, subsurface drainage systems i.e. tile drains, have not been constructed on District lands. In addition, land retirement has not been an option exercised in the Districts, drainage water treatment and reuse are not occurring, shallow groundwater pumping is not practiced, and the District do not operate or contain evaporation ponds.

Groundwater Level Measurements

Limited long-term water level information is available for either District. In 1998 Twining Laboratories measured groundwater levels in 21 monitoring wells with depths ranging from 10 to 168 feet (average of 48 feet). This suite of wells and the 1998 Twining data give a fairly accurate snap shot of the perched and shallow groundwater levels in the area at that time. Groundwater depths in the shallow aquifer ranged from 8 to 62 feet bgs, but 8 wells were dry. In addition, DWR (2001) prepared a groundwater contour map showing the groundwater elevation in the plan area ranged from about 90 to 130 feet (**Figure 7**).

Figure 5 is the DWR hydrograph of well 15S/16E-221Q001M and is the most complete well hydrograph available for TID. The hydrograph was obtained from the DWR website. The website includes a graphical interface with hydrographs for other wells in TID and FSWD, and surrounding areas. Most of the hydrographs cover a shorter time period than the well depicted in **Figure 5**, but during periods of temporal overlap with 15S/16E-221Q001M, water level trends are consistent between hydrographs.

Figure 5 shows groundwater levels from about 1940 to 2002 ranging from about 20 to 100 feet bgs. The hydrograph shows a gradual steady decline in water levels until about 1971. The groundwater level then begins to rise but fluctuates substantially based on surface water supplies For instance, during the prolonged drought in the early 1990's the groundwater level fell about 35 feet. The other hydrographs from the area show similar trends; falling water levels with the lowest water levels in the late 1960's through the early 1070's, followed by periods of water level recovery interrupted by the droughts of 1976-77 and the early 1990's.

Well 15S/16E-221Q1M is located in the southeastern corner of TID, but most of TID's historic pumping has been in the northern portion of the District near the Community of Tranquillity, and current pumping is concentrated in the northern portion of FSWD. As a result, future groundwater level monitoring is important so these long-term trends can also be established in and near the pumping centers. Further study is needed to identify historical low groundwater levels, and determine the effect that increased pumpage would have on water levels and the possible non-elastic permanent subsidence.

Groundwater Flow Direction

Based on groundwater contour map, groundwater in the area flows southeast across the plan area. Historical (1962 to 1999) DWR groundwater maps show groundwater flow direction has been to the south/southeast to east across the district towards a prominent groundwater depression that is primarily centered in the vicinity of Helm. In contrast to the recent groundwater maps, Sokol (1955) indicates that groundwater flows from the east to the west beneath the area. Sokol's interpretation was based on geo-chemical evidence and was probably valid for the pre-1955 time period. In addition, Sokol presents data and postulates that a

fault trending northwest exists in the subsurface about 2 miles west of the western boundary of the plan area. If this fault does exist it is distinctly local in nature, but could form an effective hydrogeologic boundary to subsurface flow entering the area from the west. As Sokol only postulates the existence of this fault, and presents arguments against it being a part of a valley wide fault system, further discussion is excluded here.

2.5 - Groundwater Quality

Groundwater quality and type in the plan area reflects the hydrogeological setting from which it originates. Sokol (1955) states that "*a shallow zone of highly saline water is generally present in and near the trough of the Valley, and extends to depths as great as 250 feet.*" As described above, groundwater enters the District from the west primarily from the Diablo Range having flowed through the coalescing alluvial fans deposited along the flanks of the range. Waters that originate from the Coastal Ranges along the western side of the San Joaquin Valley tend to have elevated sodium, chloride and sulfate components. In addition, these waters tend to have higher TDS values than the surface waters being delivered to the District and Coastal derived groundwater is also considerably higher in TDS than water recharged from the Sierra Nevada. Specifically the native groundwater in the vicinity of Tranquillity is transitional in nature reflecting a mixture of coastal derived water and Sierran derived groundwater (Bertoldi, 1971). According to the District's 2005 Water Management Plan, surface water delivered to the District has between 470 to 555 ppm TDS, while groundwater is typically in the range of 800 to 1,000 ppm TDS. District wells are commonly abandoned due to corrosion of the casings and progressively worsening water quality. TID has water quality test results for surface water and about 11 active plan area wells. Those data are available to water users upon request at the District office.

Perched Groundwater Quality

Twining Laboratories (1999) sampled 9 shallow monitoring wells for irrigation suitability in the vicinity of Tranquillity. The results of their sampling shows that while variable, near-surface shallow groundwater quality is generally poor and unsuitable for agriculture or domestic use. Total Dissolved Solids ranged from 800 to 5,100 mg/L averaging about 2,400 mg/L. Specific conductance ranged from 1,700 to 6,100 uS/cm averaging 3,422 uS/cm. Sulfate and sodium concentration were also elevated in most of the samples, which are in agreement with USGS reports that indicate the dominant native groundwater type on the west side of San Joaquin Valley is sodium-sulfate to sodium-chloride in nature.

TID and surrounding areas were included in several studies on drainage impacted lands. These reports, completed by the USGS and a Federal-State Interagency Plan Team, are part of the San Joaquin Valley Drainage Program, which was established to understand and address drainage related issues mainly in the western part of the San Joaquin Valley. The SJVDP report identified several constituents of concern in the agricultural drainage water including selenium, boron, molybdenum, arsenic and salts. Although difficult to assess because of scale, it appears that at the time of publication

selenium concentrations in shallow groundwater in the vicinity of the District were between 50 to 200 ppb, boron concentrations were greater than 8 ppm, molybdenum concentration was from 100 to greater than 1,000 ppb, arsenic concentrations were less than 50 ppb, and salinity was between 5,000 and 20,000 uS/cm.

Unconfined Groundwater Quality

Irrigation suitability water analyses were obtained for Wells 20 and 21, both of which are perforated above the Corcoran clay (**Table 2.1**). The perforated interval for both wells is from 320 to 545 feet below ground surface making them ideally perforated to collect water samples from a zone not impacted from perched or near surface sources of water, and isolated from water occurring below the Corcoran clay. In addition, water chemistry information was obtained for the "Caywood-Olivera" well located near the corner of Clayton and James roads. This well is perforated from 360 to 560 feet below ground surface, again ideally constructed to obtain water chemistry information from above the Corcoran clay and likely not be impacted from near surface sources of water.

According to Bertoldi (1971) water type in the vicinity of Tranquillity in the unconfined zone—termed the upper water-bearing zone in his report—is transitional and ranges from sodium-chloride to sodium-sulfate and sodium-bicarbonate in nature. The concentrations of sodium (13.2 meg/L), sulfate (5.8 meq/L), chloride (4.8 meq/L) and bicarbonate (3.8 meq/L) for the Caywood-Olivera well support Bertoldi's findings indicating water in the vicinity of Tranquillity from above the Cororan clay is sodium-sulfate with high percentages of chloride and bicarbonate. This water type is probably transitional in nature indicating a mix of coastal and Sierran derived water.

The water chemistry results for Wells 20 and 21 also indicate transitional water types high in sodium (11.6 and 17.1 meq/L respectively) and chloride (4.6 and 6.6 meq/L respectively) with high percentages of sulfate (4.2 and 6.2 meq/L respectively) and bicarbonate (3.8 and 3.9 meq/L respectively). The Total Dissolved Solids for these wells ranges from 765 to 1,110 mg/l, which is in general agreement with Bertoldi who gives a range of TDS values for the area of between 500 to 2,000 mg/L for the upper water-bearing zone. In addition, Well 21 has high levels of iron (330 mg/L) and manganese (450 mg/L). Well 20 and the "Caywood-Olivera" well were not tested for these constituents.

Sub Corcoran Groundwater (confined)

In contrast to water above the Corcoran Clay, Bertoldi (1971) indicated that water below the Corcoran clay in the confined aquifer – termed the lower-water bearing zone – in the vicinity of Tranquillity is predominately sodium sulfate in nature with TDS values in the range of 500 to 1,000 mg/L. The chloride concentration at the time of publication was generally below 250 mg/L but sulfate concentrations were greater than 250 mg/L. Water chemistry results were obtained for three wells within District boundaries that are only perforated below the Corcoran clay. These wells are Well 22 (perforated from 540 to 760 bgs), City Well 4 (perforated from 683 to 853 bgs) and City Well 5 (perforated from 663-703 to 773-903 bgs). Well 22 was tested for irrigation suitability in 2006. The

results from Well 22 are in agreement with Bertoldi having a TDS value of 890 mg/L and an electrical conductivity of 1260 uS/cm. The water from Well 22 is sodium sulfate in nature with elevated concentrations of sodium (261 mg/L or 11.4 meq/L) and sulfate concentrations of 416 mg/L (8.7 meq/L). In addition, also in agreement with Bertoldi, the chloride concentration was low at 51 mg/L. City Well 4 was tested for selected constituents including arsenic, iron, manganese, sodium, sulfate, EC, and TDS in 2002. TDS was 720 mg/L and the EC was 1120 uS/cm. Sodium and sulfate concentrations were relatively high at 223 mg/L and 280 mg/L, respectively. In addition, iron concentration were low at 100 ug/L. City Well 5 was tested in 2002 for the same suite of constituents. EC and TDS values were 1,140 uS/cm and 740 mg/L, and sodium and sulfate concentration were very similar to City Well 4 at 221 mg/L and 333 mg/L, respectively.

Table 2.1 – Water Quality Summary

Well ID	Depth/ Perforations (ft)	Aquifer	TDS (mg/L)	[1]Dominant Water Type	[3]Source
20	555/320-545	unconfined	765	NaCl	Seirran/Transitional
21	555/320-545	unconfined	1,110	NaCl	Seirran/Transitional
Caywood/Olivera	590/360-560	unconfined	864	[2]$NaSo_4$	Seirran/Transitional
City Well 4	863/683-853	confined	720	$NaSo_4$	Coastal/Transitional
City Well 5	913/663-703, 773-903	confined	740	$NaSo_4$	Coastal/Transitional
22	780/540-760	confined	890	$NaSo_4$	Coastal/Transitional

Notes
1 – Dominant Water Type is based on meq/L and is an indication of the waters source
2 – The dominant water type for the Caywood Olivera Well Is Sodium Sulfate, but a high percentage of chloride is also present.
3 – Water chemistry for the above wells indicates a mixture of Sierran and coast ranges derived waters. These water types are transitional in nature and are commonly found along the trough of the valley where subsurface waters from both sources mix. Wells 20, 21, and the Caywood-Olivera Well all have relatively high percentages of bicarbonate which indicates a heavy influence on their water chemistry from a Sierran source. These water types are in general agreement with Bertoldi, 1971.

Community of Tranquillity Water Quality

At this time TID, as the purveyor of water to the community of Tranquillity, is addressing high arsenic problems in City supply wells 4 and 5. Both of these wells are perforated below the Corcoran clay, which indicates that arsenic continues to be a problem there in the confined aquifer. Arsenic has a primary drinking water standard of 10 parts per billion (ppb). The standard was recently changed from 50 ppb to 10 ppb in 2006. For the years between 1998 and 2007 arsenic levels in the well water have exceeded 10 ppb, with the exception of 1999 which was not tested for arsenic, and typically reported values are about 15 ppb. The current regulations mandate treatment by year 2006. Over the same time frame from 1998 to 2007, manganese, sulfate, and Total Dissolved Solids, all with secondary drinking water standards, have elevated reported values or have exceeded MCL's. Secondary drinking water standard MCL's are for contaminants that affect taste, odor, or appearance. These contaminants - both primary and

secondary - are source groundwater issues which will need to be addressed in the near future by the District. One of the options being considered is the feasibility of drilling wells in neighboring James ID and importing the water into TID for community water supply. TID is currently working with the Department of Public Health (formerly Department of Health Services) on identifying solutions to these problems.

The District's "Consumer Confidence Reports" can be found online at www.trqid.com. From 2000 to 2004, the District had monitoring violations for total coliform bacteria for 6 months over the 5 year period. To address the coliform bacteria positive tests, the District has been chlorinating the system continuously and also instituted a program in July 2001 to require air gaps and backflow prevention devices in those locations where tank filling occurs. The system has tested free of coliform bacteria since 2005. Therefore, the violations appear to be due to a compromised distribution system in some unknown location. The system continues to be chlorinated, but the question remains as to what is the cause of the positive tests and violations. One possible source could be leaking pipelines and the inflow of contaminants from the areas surrounding any leaking pipes. Other sources of possible contamination could be cross contamination between the rural private septic systems and leaking District domestic pipelines, or cross contamination between District domestic water and District landscape irrigation water pipelines in the community of Tranquillity. However, a leak test was performed in 2007 and found the distribution system to experience minimal leakage.

3 - BASIN MANAGEMENT OBJECTIVES

The District's Basin Management Objectives are listed below:

1. **Stabilize Water Levels.** Stabilize average long-term groundwater levels to prevent the loss of groundwater reserves, and prevent the need for well deepening or the installation of new wells.

2. **Increase Groundwater Storage.** Increase groundwater storage through the development of groundwater banking project in other areas that have geologic conditions conducive to groundwater recharge and recovery. Develop a partnership in a groundwater bank that can store at least 10,000 AF for the Districts and recover up to 5,000 AF per year when needed.

3. **Prevent Further Land Subsidence.** Prevent further land subsidence that can cause a reduction in groundwater storage space and damage water infrastructure. Prevent land subsidence caused by groundwater withdrawals through efficient use of groundwater supplies and full utilization of surface supplies.

4. **Prevent Groundwater Degradation.** Prevent groundwater degradation by protecting groundwater through proper well construction and abandonment, proper use of agricultural amendments, importing clean high quality surface water, and preventing intrusion of poor quality groundwater from neighboring areas.

5. **Comply with State Water Quality Standards.** Comply with California Department of Public Health water quality standards for municipal water supplies either through treatment process or securing a cleaner water source.

6. **Increase Knowledge of Local Geology and Hydrogeology.** Increase knowledge of the local geology and hydrogeology through technical studies, subsurface investigations, water quality testing, water level monitoring, and land subsidence monitoring. Gain a better understanding of regional groundwater quality and flow conditions, and potential impacts to the Districts from surrounding water sources with poor water quality. Seek funding for these investigations through State and Federal grant programs.

Existing Activities

- All existing and on-going activities described in Sections 4-9 will be maintained, unless stated otherwise. (In Sections 4-9 the Existing Activities are not repeated under Planned Actions, even though they will be continued in the future).

Planned Actions

- All new policies and projects described in Sections 4-9 will be pursued, but their implementation will be subject to available funding and staff time.
- Manage local groundwater resources with an emphasis on meeting the GMPs Basin Management Objectives.

4 - STAKEHOLDER INVOLVEMENT

4.1 - Groundwater Advisory Committee

The TID Board of Directors is comprised of local landowners that are considered representative of the local growers. They are also already familiar with groundwater issues in the Districts. As a result, the TID Board of Directors effectively serves as a Groundwater Advisory Committee. The Board of Directors will be responsible for monitoring and evaluating the technical progress made in achieving the goals of this GMP.

Existing Activities

Assisted with the development of this GMP.

Planned Actions

The Board meets monthly, and will have a special groundwater session at least once each year. The Board will have the following responsibilities related to groundwater management:

- Review trends in groundwater levels and available information on groundwater quality;
- Evaluate the effectiveness of current groundwater management policies and facilities;
- Discuss the need for new groundwater supply/enhancement facilities;
- Educate landowners on groundwater management issues;
- Assess the overall progress in implementing the programs outlined in the Groundwater Management Plan;
- Recommend updates or amendments to the Groundwater Management Plan;
- Identify regional and multi-party groundwater projects; and
- Review and comment on the Annual Groundwater Report.

4.2 - Relationships with Other Agencies

The Districts are located in the Delta-Mendota Groundwater Sub-basin, which extends beyond many political boundaries and includes other municipalities, irrigation districts, water districts, private water companies, and private water users (see **Figure 1**). This emphasizes the importance of inter-agency cooperation, and the Districts have historically made efforts to work conjunctively with many other water management agencies.

Below is a list of some agencies that the Districts have worked with in managing the local groundwater, and in regional water management:

- Kings River Water Association
- Association of California Water Agencies
- Agricultural Water Management Council

- James Irrigation District
- McMullin Recharge Group
- San Luis & Delta-Mendota Water Authority
- Tranquillity Public Utilities District
- I-5 Business Development Corridor
- Mendota Pool Group

A description of each of the organizations follows:

Kings River Water Association
TID is a member of the Kings River Water Association (KRWA), a 28-member group of water agencies that was formed in 1927 to administer and manage water uses on the Kings River. The benefits of KRWA membership include conflict resolution mechanisms, and improved coordination among member agencies. The KRWA opens lines of communication so that members can work together effectively to utilize, trade, and transfer waters from the Kings River. Through their membership in KRWA, TID has rights to divert Kings River floodwater

Association of California Water Agencies
TID is an active member of the Association of California Water Agencies (ACWA). ACWA fosters cooperation among all interest groups concerned with stewardship of the state's water resources.

Agricultural Water Management Council
TID is a member of the Agricultural Water Management Council (AWMC or Council). The AWMC was formed in 1996, following the work of an advisory committee formed by Assembly Bill (AB) 3616, Agricultural Efficient Water Management Act of 1990. The Council consists of members of the agricultural and environmental communities and other interested parties. The members have an expressed goal to voluntarily develop Water Management Plans and implement Efficient Water Management Practices (EWMPs) to further advance water use efficiency, while maintaining and enhancing economic, environmental and social viability and sustainability of soil and crop production. Members sign a Memorandum of Understanding that includes a comprehensive methodology by which each and every EWMP is analyzed and provides a consistent analysis by all participating water suppliers.

James Irrigation District
James Irrigation District (JID) is located along TID's eastern border. In 2007-2008 TID evaluated the feasibility of constructing pipeline interties from TID to FSWD and James Irrigation District. The study was completed in December 2008. The study evaluated seven different locations for connecting the districts. The interties could reduce conveyance losses and improve operational flexibility. In addition, if the Districts participate in James Irrigation District's planned groundwater bank, the interties would provide a mechanism for them to deliver and retrieve water from the groundwater bank.

McMullin Recharge Group

The McMullin Recharge Group (Group) is comprised of James Irrigation District, Mid-Valley Water District, Raisin City Water District, Tranquillity Irrigation District, Terranova Management Co, LLC., and Kings River Conservation District. The Group works cooperatively to investigate groundwater recharge projects in the area of the McMullin Grade, just east of the James Irrigation District, adjacent to the James Irrigation Dsitrict Eastside Wellfield. The group members share information and the TID has acquired valuable knowledge of the local geology as a consequence of their participation. The Group completed a groundwater recharge study in 2004. The study found several sites that are conducive to groundwater recharge, but would have high operating costs.

San Luis & Delta-Mendota Water Authority

TID and FSWD are member agencies of the San Luis & Delta-Mendota Water Authority (SLDMWA), an umbrella organization for 32 water agencies in the Central Valley. The SLDMWA was established in 1992 and represents approximately 2,100,000 acres of federal and exchange water service contractors within the western San Joaquin Valley, San Benito and Santa Clara Counties. The SLDMWA serves the information and representation needs of its members by developing, providing, and disseminating information to legislative, administrative and judicial bodies concerning a variety of issues such as: Sacramento and San Joaquin Delta exports, water supply, water quality, water development, conservation, distribution, drainage, contractual rights, surface and groundwater management, and any other common interest of the member agencies. The SLDMWA also works with other governmental and public agencies to promote the common welfare of the landowners and member water agencies. In 2005, the SLDMWA prepared the Westside Integrated Water Resources Plan. The plan outlined a regional approach to managing water in the SLDMWA service area. The plan also identified numerous multi-agency water projects.

I-5 Business Development Corridor

The I-5 Business Development Corridor (I-5 BDC) is a non-profit corporation that includes the County of Fresno, three of its cities (Firebaugh, Kerman and Mendota) and the community of Tranquillity. Commonly referred to as the I-5 BDC, it is the first major business development district on the Interstate 5 Highway corridor in the heart of California. The I-5 BDC encompasses over 1,300 square miles and is home to more than 42,000 people. Information on the I-5 BDC can be found at this website: www.i5bdc.com

The I-5BDC was formed in 1994 to implement a strategic economic development plan designed for northwestern Fresno County. The plan is a blueprint for creating jobs and improving the quality of life in an area impacted by a significant downturn in agricultural employment. The I-5 Partnership works to attract new businesses to the area and assists existing businesses in solving their problems and achieving success. It receives

ongoing technical assistance from the University Business Center at California State University, Fresno.

The I-5 BDC provides regional services and benefits. Its goal is to become a center for the processing and distribution of food and fiber products and other compatible industries. The area eventually will constitute an "industrial cluster" for businesses with common technologies and markets (similar to the industrial cluster for the electronics industry known as Silicon Valley).

The I5BDS prepared a paper in 1998 entitled "*Water Resources Assessment Plan for the Interstate 5 Business Development Corridor*". The discussion paper was designed to provide a framework for the orderly assessment of water resources in the area and the long-term potential of those resources to serve the needs of the adopted economic strategy and the dependent communities of I-5BDC. The study identified the following as high priorities: 1) Need for a policy statement regarding water transfers out of I-5 BDC; and 2) Compliance with drinking water standards.

Mendota Pool Group

The Mendota Pool Group has been responsible for monitoring surface water quality in the Mendota Pool, and coordinating water exchanges in the Mendota Pool. Both Districts have participated in these efforts.

Existing Activities

- On-going involvement with the agencies and associations listed above.

Planned Actions

None

4.3 - Plan to Involve the Public and Other Agencies

The Districts are already involved with many neighboring and regional agencies on groundwater management projects. Nevertheless, the Districts are always interested in building new relationships with other agencies that share the same groundwater basin. Some other agencies in the Delta-Mendota Groundwater Basin are shown on **Figure 4**.

The Districts will also strive to involve the public in groundwater management decisions. Additional cooperative relationships can be achieved through the sharing of data, inter-agency committees, interagency meetings, memorandums of understandings, formal agreements, and collaborations on groundwater projects.

Existing Activities

- Conducted public hearings to discuss the content of this GMP prior to its adoption.

Planned Actions

- Hold Groundwater Advisory Committee meetings that are open to the public.

- Provide copies of the annual groundwater reports to the public at their request. Notify the public of the availability of the annual reports on the TID website.
- Publish information on groundwater management accomplishments on the TID website.

5 - MONITORING PROGRAM

This section discusses monitoring of groundwater levels, groundwater quality, land surface subsidence, and surface water. Monitoring is considered critical to future management decisions, and the District's monitoring program is intended to:

1. Provide warning of potential future problems;
2. Use data gathered to generate information for water resources evaluations;
3. Develop meaningful long-term trends in groundwater characteristics; and
4. Provide data comparable from place to place in the District.

Well monitoring is performed in a series of dedicated monitoring and recovery wells throughout the Districts (see **Figure 9**). A summary of well attributes can be found in **Attachment 1**.

5.1 - Groundwater Level Monitoring

The Districts have performed periodic, but not consistent, groundwater-level monitoring at their agricultural wells. However, the Districts recognize the importance of a consistent monitoring program. As a result, they collected some baseline data in 2008 and plan to begin semi-annual water level measurements in 2009.

In 2008, TID measured groundwater levels in three wells on a weekly basis from late April to early September. This data helps to show groundwater level trends during an irrigation season. The Districts also have limited data that shows how annual groundwater levels vary with hydrologic conditions. Future monitoring results will be compared to this data and documented in annual Groundwater Reports. Due to the small number of wells a database will not be established, but rather data will be stored in a spreadsheet.

There are only a few wells in the District and these collectively do not provide sufficient data for generating reliable groundwater contours. However, the groundwater levels in each well will be monitored and compared to previous years.

Existing Activities

- Periodic groundwater level monitoring.
- Weekly groundwater level monitoring in the 2008 irrigation season.

Planned Actions

- Measurement of groundwater levels each spring and fall.
- Periodically review the monitoring network to determine if it provides sufficient areal coverage to evaluate groundwater levels.
- Protect wells in monitoring program from being abandoned.
- Encourage landowners and developers to convert unused wells to monitoring wells.
- Collect more detailed information on the attributes of each monitoring well.

- Prepare annual groundwater reports, which will include detailed evaluations of groundwater level trends (see Section 9.2).

5.2 - Groundwater Quality Monitoring

Groundwater quality monitoring is performed on City wells according to DPH requirements. In addition, all new agricultural wells are tested after they are completed. TID also performed weekly pH and TDS testing of numerous wells in 2008.

Groundwater quality-monitoring efforts have one or more of the following objectives:

1) Spatially characterize water quality according to soils, geology, surface water quality, and land use;
2) Establish a baseline for future monitoring;
3) Compare constituent levels at a specific well over time (i.e. years and decades);
4) Determine the extent of groundwater quality problems in specific areas;
5) Identify groundwater quality protection and enhancement needs;
6) Determine water treatment needs;
7) Identify impacts of recharge and banking projects on water quality;
8) Identify suitable crop types that are compatible with the water characteristics; and
9) Monitor the migration of contaminant plumes.

Specific issues of concern are concentrations of arsenic, iron, manganese, and total dissolved solids, and the migration of poor quality water from the west.

Existing Activities

- Monitor city wells according to California Department of Public Health requirements
- Perform general minerals analysis on all newly constructed irrigation wells.

Planned Actions

- Regularly collect new water quality information from other agencies and review it to identify any impending groundwater quality problems.
- Protect wells in monitoring program from being abandoned.
- Prepare groundwater quality maps when sufficient information is available with the aid of a qualified hydrogeologist. Attempt to characterize groundwater quality with depth and provide the information to growers so they can use it when designing and installing wells.
- Measure electrical conductivity and pH at all wells on at least a semi-annual basis.

5.3 - Groundwater Monitoring Protocols

Monitoring protocols are necessary to ensure consistency in monitoring efforts and are required for monitoring evaluations to be valid. Consistency should be reflected in factors such as location of sample points, sampling procedures, testing procedures, and possibly even time of year when the samples were taken. Without such common

ground, comparisons between reports must be carefully considered. Consequently, uniform data gathering procedures will be practiced by the District. The District has developed new water level and water quality monitoring protocols, which can be found in **Appendix C**.

Existing Activities

- Follow California Department of Public Health guidelines for monitoring the domestic groundwater supply.

Planned Actions

- Use the District's new protocols when performing groundwater level and groundwater quality monitoring.

5.4 - Surface Water Monitoring

There are no surface water features in either District, except for the Fresno Slough on the eastern border of TID. Neither District directly monitors surface waters. Several other agencies monitor surface water sources that the Districts use, such as San Joaquin water and water in the Delta Mendota Canal. The Districts regularly review this data. In addition, both Districts store water in the Mendota Pool and participate with the Mendota Pool Group in monitoring the water quality in the Pool. The Mendota Pool Group began continuous and grab samples monitoring at numerous locations in Mendota Pool in 1993. In the fall of 2002, the Group began collecting monthly grab samples at the TID Intake in Mendota Pool.

Existing Activities

Regularly review surface water quality data collected by other agencies.

Planned Actions

Collect and test grab Samples at Fresno Slough No. 2 and Lift Station No. 1 once per week.

5.5 - Land Surface Subsidence Monitoring

Land subsidence results from excessive groundwater pumping beneath laterally extensive confining clay layers. The excessive groundwater pumpage results in water level declines in the confined aquifer and subsequent compaction of the fine-grained layers, and is evident at the ground surface as land subsidence.

Land subsidence has been monitored throughout the San Joaquin Valley for many years. The most serious subsidence occurred north of the Districts, but monitoring efforts have declined in recent years. The Department of Water Resources, Precise Survey Unit has continued to measure subsidence along the California Aqueduct in the winter of 1993-1994, with the most recent survey of Aqueduct completed in 2008. Very little quantitative data has been collected by others since 1970. In TID, there is a

benchmark on TID Lift Station No. 1 that is periodically resurveyed to check for land subsidence.

There is often a time delay in subsidence after groundwater withdrawals, so the District may still be experiencing subsidence, although at much less slower rates than about pre-1977. However groundwater levels can drop appreciably in extended droughts, which could lead to renewed permanent subsidence. On the other hand, it is likely that some of the land subsidence has been arrested with the importation of large volumes of surface water since the Districts established their surface water contracts. Lands within the District will be observed for land subsidence, and, if land subsidence becomes a problem, this Plan will be amended to include preventative and mitigative measures.

Existing Activities
Periodic surveys of the bench mark on TID Lift Station No. 1.

Planned Actions
- Periodic resurvey of control points and local benchmarks to check for land subsidence. The control points and local benchmarks will be checked relative to High Precision Geodetic Network benchmarks.
- Participate in any regional efforts to monitor and evaluate land subsidence.
- Increased water level monitoring, especially in know pumping centers.
- Establish bench marks for the purpose of monitoring land subsidence throughout the plan area, especially in pumping centers.
- Pursue funding to construct and operate a new extensometer within plan area boundaries.
- Offer locations in the plan area to the USGS, Plate Boundary Observatory, National Geodetic Survey, and Scripps Orbit and Permanent Array Center locations to establish Continuous Global Positioning System stations.
- Determine if the plan area is within the boundary of a recently funded USGS subsidence study using Insar satellite based technology, and keep informed on developments from the study.
- Perform a study to determine historic low groundwater levels, areas of know subsidence within the plan area, and future pumping centers.

6 - GROUNDWATER RESOURCES PROTECTION

6.1 - Well Abandonment

Proper destruction of abandoned wells is necessary to protect groundwater resources and public safety. Abandoned or improperly destroyed wells can result in contamination from surface sources, or undesired mixing of water of different chemical qualities from different strata. This is especially important in TID because part of the District has a confined aquifer.

The administration of a well construction, abandonment and destruction program has been delegated to the Counties by the State legislature. Many counties have adopted a permitting program consistent with Department of Water Resources Bulletin 74-81 for well construction, abandonment, and destruction.

The District will properly abandon their own wells when they are no longer useful. In addition, the District will encourage landowners and developers to properly abandon their own wells, or preferably, convert unusable wells to monitor wells so that they can become a part of the District's groundwater monitoring program.

Existing Activities

- When possible, convert unusable production wells to monitor wells.

Planned Actions

- When wells are destroyed, follow County and State standards.

6.2 - Wellhead Protection

Need for Wellhead Protection

Contaminants from the surface can enter an improperly designed or constructed well along the outside edge of the well casing or directly through openings in the well head. A well is also the direct supply source to the customer, and such contaminants entering the well could then be pumped out and discharged directly into the distribution system. Therefore, essential to any wellhead protection program are proper well design, construction, and site grading to prevent intrusion of contaminants into the well from surface sources.

Furthermore, since wells can be a direct conduit to the aquifer, they must be properly destroyed and abandoned or they will provide an unimpaired route for pollutants to enter the groundwater, particularly if pumping equipment is removed from the well and the casing is left uncapped. Well Abandonment is discussed in Section 6.1.

Wellhead Protection Policy

Wells constructed by the District will be designed and constructed in accordance with DWR Bulletin 74-81. In addition, the District will encourage landowners to follow the same standards for privately owned wells. DWR Bulletin 74-81 provides specifications for the following:

- Methods for sealing the well from intrusion of surface contaminants;
- Covering or protecting the boring at the end of each day from potential pollution sources or vandalism;
- Site grading to assure drainage is away from the well head; and
- Set-back requirements from known pollution sources.

In addition, TID also installs fences around all of their wells.

Wellhead Protection Area

As defined in the Federal Safe Drinking Water Act Amendments of 1986, a wellhead protection area is "*the surface and subsurface area surrounding a water well or well field supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or well field.*" Agricultural wells are only located in certain regions of the District (see **Figure 9**). The District will treat areas within one quarter mile of a well as a wellhead protection area.

Existing Activities

- Encourage local growers to incorporate proper wellhead protection into all new wells, and retrofit old wells with proper wellhead protection.

Planned Actions

- Provide wellhead protection on all newly constructed District wells according to County and State standards.

6.3 - Saline Water Intrusion

Underlying the base of the effective groundwater reservoir contained in the regional aquifer system is a zone of brackish, saline waters. These waters originated as connate sea water remaining in the deep valley sediments as the valley filled with younger sediments and the sea water was displaced by fresh water emanating from the Sierra Nevada to the east and the Coast Ranges to the west. The trapped brackish water occurs at a depth of between 1,000 feet bgs in the northeast part of the plan area and deepens to about 1,700 feet bgs in the southwest part of the area (Sokol 1955).

Upconing of saline water can be induced by deep wells that pump from near the saline-fresh water interface. Pumping freshwater by a well located above the transition zone can produce upconing, eventually salinizing the pumped water, forcing shut-off. Following the well's shut-off, the upconed saltwater mound undergoes decay, tending to return to the pre-pumping regime (Zhou, 2004). This

condition could occur in wells that are near or exceed the depth to the base of the effective groundwater reservoir.

Saline groundwater can also intrude the usable aquifer beneath the plan area through improperly destroyed or abandoned wells that have perforations or compromised casings within the shallow or perched aquifer. A comprehensive survey of the wells in the plan area would likely determine if improperly destroyed or abandoned wells exist.

Groundwater is also known to be high in salts to the west of the Districts. Saline water intrusion from this area is a concern, however the Districts lack a clear understanding of the geology and how this water migrates.

Currently, the District strives to prevent the importation of saline surface waters that could ultimately degrade the groundwater. When alternative water sources are available for importation, the District considers not only the cost but also the quality, including salinity, of the water. The District will evaluate all possible alternatives, and, when practical and feasible, select water sources with acceptable levels of salinity.

Existing Activities
None

Planned Actions
- Seek grant funding to study the geology and hydrogeology of the Districts western border, gain a better understanding of groundwater flow conditions into the Districts, and install monitoring wells and perform water quality testing.

6.4 - Migration of Contaminated Groundwater

Groundwater contamination can be human induced (anthropogenic) or caused by naturally occurring processes and chemicals. Anthropogenic sources of groundwater contamination can include irrigation, dairies, improper application of agricultural chemicals, septic tanks, industrial sources, stormwater runoff, and disposal sites.

No specific contaminant plumes are known to exist in the Districts. However, the groundwater does have high arsenic, iron, manganese and salt levels in some areas and at some depths. These are primarily a concern for municipal water wells.

The District will continue to review groundwater quality data from other sources and remain cognizant of the possibility of contaminated groundwater migration into DEID.

Existing Activities
- Regularly review data and reports from regulatory agencies on contaminant plumes to provide warning of potential future problems.

Planned Actions
None

6.5 - Groundwater Quality Protection

The District's surface water allocations cannot support their crop demand alone, and some groundwater will always be necessary. The groundwater, however, will have limited or no use if it has poor quality. Therefore, protecting the quality of the groundwater is a cardinal component of this GMP. Groundwater quality can be protected through proper use of pesticides, herbicides and fertilizers, stormwater quality management, septic system management, and water vulnerability planning and management.

Existing Activities

- Follow State Well Construction Standards (DWR Bulletin 74-81) for wellhead protection to protect groundwater quality.

Planned Actions

- Seek funding to improve security at District water facilities and reduce the potential for contamination from acts of vandalism or terrorism.
- Educate the public through outreach programs that explain how activities at the surface ultimately impact groundwater.

7 - GROUNDWATER SUSTAINABILITY

During years with low surface water allocations, the Districts cannot meet all of their crop demands without pumping groundwater. Most importantly, the Community of Tranquillity relies entirely on groundwater due to a lack of facilities to treat surface water. Therefore, preserving the sustainability of groundwater is essential for the economic well being and livelihood of the growers and Community of Tranquillity.

7.1 - Issues Impacting Groundwater Sustainability

Issues of concern for groundwater sustainability in TID and FSWD are discussed below:

Regional Groundwater Pumping: Regional groundwater pumping to the west of the Districts, in Westlands Water District, and to the northeast of the Districts, in Mid-Valley Water District are expected to increase in time. Westlands Water District has faced serious reductions in surface water supplies and the growers are increasingly relying on groundwater. Large parcels in Mid-Valley Water District that were historically planted in annual crops have been converted to permanent crops, and as a result, these lands will require a relable supply every year, and there is little potential for fallowing the land in dry years. These two situations will place further strain on the regional groundwater supplies, and could cause intrusion of poor quality water from Westlands Water District.

Surface Water Curtailment. Curtailments to the major surface water supplies are currently occurring in the San Joaquin River and Sacrament-Bay Delta. These will both impact surface water supplies for the Districts and other regional agencies. A reduction in surface water could ultimately cause an increase in groundwater use and groundwater overdraft.

Due to problems with the California Delta smelt, there has been a recent reduction in pumping allowed from the Delta, which is affecting numerous water users throughout the State. The Districts CVP water supplies are directly impacted by these pumping restrictions.

The San Joaquin River Settlement will reduce diversions to many CVP contractors to help restore fisheries in the San Joaquin River. These reductions will not directly impact the Districts, but they will impact many other water agencies in the Central Valley and thus contribute to regional water tensions.

The Districts have a goal of fully recovering from these surface water curtailments through water management programs, including conservation, groundwater banking, and surface water storage projects.

7.2 - Overdraft Mitigation

Groundwater overdraft was a concern in the early part of the 1900's, which was the impetus for the development of the Central Valley Project. However, continued proper management is needed to maintain these stable groundwater levels, and, if possible, raise groundwater levels. Moreover, the Districts are concerned that Delta pumping restrictions may lead to groundwater overdraft.

The following groundwater management policies are also followed to help reduce groundwater overdraft:

Limitations on Pumping

The California Water Code gives water and irrigation districts the power to limit or suspend groundwater extractions. However, such limits will only be implemented if the Districts determine through study and investigation that groundwater replenishment programs, or other alternative sources of water supply, have proved insufficient or infeasible to lessen impacts to groundwater. In the unlikely event that it becomes necessary to reduce groundwater extractions, the Districts intend to accomplish such reductions under a voluntary program, which would likely include suitable incentives to compensate users for reducing their groundwater pumping. The Districts will not attempt to restrict or otherwise interfere with any landowner or water user exercising a valid right to pump and utilize groundwater.

Limitations on the Exportation of Water Supplies

The Districts generally do not support groundwater pumping for export unless it involves a transfer or exchange of water that will not reduce the total water supply available to the Districts. In addition, the Districts usually opposes surface water transfers that are accompanied with increased groundwater pumping used to replace the transferred surface water. However, such transfers will be reviewed on a case-by-case basis and will be permitted if they are approved by the Board of Directors.

Existing Activities

- Restrict groundwater exports from the District, unless they involve an equal exchange of surface water or are performed under special circumstances.

Planned Actions

None

7.3 - Groundwater Replenishment

The natural and artificial forms of groundwater replenishment in the Districts are discussed below:

Streambed infiltration. No streams pass through either District, but the Fresno Slough, a natural channel that conveys Kings River flood flows, is found along the

eastern border of TID and FSWD. Some seepage from Fresno Slough may benefit the Districts, but the volume of seepage has not been quantified.

Deep percolation from precipitation. Deep percolation from precipitation is probably negligible due to the clayey soils and low annual precipitation (7.4 inches).

Artificial recharge. Artificial recharge is not practical in the Districts due to the high percentage of clay in the soils.

In-lieu deliveries. The District views in-lieu deliveries as the most practical and effective means of groundwater replenishment. In-lieu deliveries, also called indirect deliveries, involve the delivery of surface water to landowners and water users who would otherwise have pumped groundwater, thus leaving water in the aquifer for future use. With the importation of up to 40,000 AF of surface water annually, plus an unknown amount of Kings river floodwater, the Districts are performing a significant amount of in-lieu recharge.

Deep percolation from irrigation. Deep percolation occurs when some of the water applied for irrigation percolates beyond the crop root zone and accumulates in the aquifer. The extent of deep percolation varies with the irrigation method, irrigation efficiency, soil type and antecedent moisture condition. Deep percolation from irrigation may not be significant due to the high clay content in many of the soils.

Seepage from distribution facilities. The seepage from distribution facilities is not known well, but it may be low due to the prevalence of clayey soils in the area.

Groundwater Inflow. Groundwater inflow may be the most important form of natural groundwater replenishment. With its location at the San Joaquin Valley trough, groundwater can flow to the Districts from the Coastal Mountain Range and Sierra Mountain Range. However, the amount of groundwater inflow is not precisely known.

Existing Activities
None

Planned Actions

- Investigate groundwater storage projects in other areas that will provide a stored water supply and reduce stress on the local groundwater resources during droughts.

7.4 - Conjunctive Use of Water Resources

Conjunctive use of water is defined as the coordinated use of both subsurface and surface water sources so that the combination will result in optimum benefits. The Districts use both surface and groundwater and regularly practice conjunctive use.

The region must absorb wet year water supplies in order to maintain a reliable and economical water supply. Wet-year water is available on short notice and not always at times when the water can be delivered for an irrigation demand. Therefore, it is important that the Region work cooperatively to increase its ability to absorb surface water when available.

When determined practical and appropriate, these policies below will be followed to encourage and facilitate conjunctive use of the District's water resources:

Transfers to Districts within the Same Groundwater Basin
When the Districts have surplus surface water to transfer, they will make all reasonable attempts to transfer it to other agencies within the same groundwater basin. This will be done since a reduction in pumping in the neighboring districts has a beneficial impact on TID and FSWD groundwater levels.

Regional Conjunctive Use Projects
Existing conjunctive use operations can be expanded by adding interconnections and promoting water supply exchanges between districts that allow for more flexibility in the region's water supply. The region's assets of federal, state, and local water supplies, dewatered groundwater storage, and significant irrigation demand make it an ideal location to regulate surface supplies conjunctively. TID has historically evaluated regional groundwater banks with the McMullin Recharge Group.

Existing Activities
None

Planned Actions
- Support the development of new surface storage and water supply projects that would permit the participants to better utilize surface water supplies.
- Investigate groundwater banking projects and facilities outside of the district.

7.5 - Water Conservation and Education

Water Conservation
Water conservation efforts in the Districts have included the following:

1. Use of flow meters on agricultural turnouts to bill water on a volumetric basis
2. Replacement of some canals with pipelines or compaction of canal bottoms to reduce seepage losses.
3. TID maintains historic water use records for each water user. TID values the usefulness of understanding historic water use to facilitate ongoing water conservation efforts and makes both electronic and archived water use records available to water users at any time.

4. TID policies allow the District to suspend water service to a water user should water waste occur. The policy also provides for a 10 percent surcharge on delivered water should over use occur and the District Board can require a water user to replace wasted or over used water at a 3 to 1 ratio. District policies regarding the wasteful use of water are described in Rules 4, 12 and 13 of the attached Rules and Regulations (**Appendix B**)
5. In the Community of Tranquillity, if a customer repeatedly wastes water, a flow meter will be installed at user expense and the customer charged by volume instead of the present flat rate. Thus far, the District has issued warnings to those wasting water, but no meters have been installed.

Water Education

Water Education efforts have included the following:

- TID maintains a website (www.trqid.org) for informing water users of important news, and educating them on water conservation and water quality issues. A copy of this GMP will be posted on the website.
- Several regional newsletters cover local water issues and are read by many of the Districts growers. These newsletters include the Westside Resource, the USBR Mid-Pacific Region Conservation Connection, and the Panache/Silver Creek Watershed Coordinated Resource Management and Planning Watershed News.
- TID sometimes includes inserts with water bills containing educational information.

Existing Activities

- The District encourages water users to use crop ET data as part of their water management plan.
- Monthly water statements include water use information for each customer.
- Bill inserts with educational information are sometimes included with water bills.
- The District maintains historic water use by turnout. This data is available to water users on request as it could be beneficial in making on-farm water management decisions.

Planned Actions

- Install meters on drinking water system, when possible.

7.6 - Water Recycling

The Districts have not used recycled water due to the lack of a significant source in the area. Reclaimed water is generated by the City of San Joaquin and Community of Tranquillity. The City of San Joaquin sends their reclaimed water to percolation ponds on the TID eastern border. However, the ponds are still several miles from any District wells and they percolate water to the upper aquifer, which is not pumped by TID due to its poor quality.

The Tranquillity Public Utilities District (PUD) generates about 200 AF of wastewater each year. The water is currently sent to evaporation ponds for disposal. Only about half of the water, 100 AF, is available during the irrigation season when there would be demand for the water. The District's consider this volume to small to invest in facilities to divert and convey the water to their system.

Existing Activities
None

Planned Actions
- Remain cognizant of opportunities to purchase recycled water from other municipalities.

8 - GROUNDWATER OPERATIONS

8.1 - Well Construction Policies

Proper well construction is important to ensure reliability, longevity, and protection of groundwater resources from contamination. As a result, the District follows State standards, and has quality assurance procedures and design guidelines.

State Well Standards

The Districts require that all of their wells are constructed according to California State Standards. Department of Water Resources Bulletin 74-81 provides useful guidelines for the construction of groundwater wells. Proper wellhead protection is essential to ensure that contaminants do not inadvertently enter a well. Well construction policies that are intended to ensure proper wellhead protection are discussed in Section 6.2 – Wellhead Protection.

Quality Assurance Procedures

The following quality assurance procedures are followed when constructing District owned wells.

1. Well construction will be performed under contract by a licensed and experienced well driller, in accordance with specifications prepared by a licensed engineer or geologist.
2. A licensed engineer or geologist will oversee construction of the wells.
3. Wells will be constructed according to guidelines in DWR Bulletin 74-81.

Well Design Guidelines

Some wells in the District have experienced corrosion problems. As a result, some wells are constructed with stainless steel casings. In addition, the wells are sometimes backfilled with cement from the top of the perforated pipe up to the annular seal (as opposed to being filled with gravel or drilling cuttings). The cement can help to stabilize the casing if it loses strength from corrosion. These guidelines are not used on all wells and depend on site specific conditions.

Private Well Construction

Individuals and growers do not need permission from the Districts to construct wells, but they are expected to follow State standards, and are encouraged to follow the quality assurance procedures and well design guidelines discussed above. There is a very limited demand for private wells since the District is able to supply the agricultural and domestic needs of the District residents. Private well owners also face some significant water quality problems that can discourage well construction.

Existing Activities

- Construct wells according to DWR Bulletin 74-81.

- Construct wells using qualified and licensed contractors, engineers, and geologists.
- Design wells with appropriate corrosion protection.

Planned Actions
None

8.2 - Operation of Facilities

Groundwater facilities in the Districts include recovery wells and monitoring wells. The Districts regularly inspect and maintain these wells. In addition, the Districts also strive to provide the best facilities for delivery of surface water supplies, since they are used conjunctively with groundwater. Lastly, the Districts realize that the success of conjunctive-use programs is often contingent on the quality of surface water conveyance systems. For instance, if extraction wells are constructed then the distribution system may need local upgrades to allow delivery of the pumped groundwater to growers.

Existing Activities
- Regular inspection and maintenance of monitoring and recovery wells.
- Maintenance and upgrading of conveyance facilities for capacity and stability.

Planned Actions
None

9 - GROUNDWATER PLANNING AND MANAGEMENT

9.1 - Land Use Planning

The intent of this Plan is not to dictate land-use planning policies, but rather to establish some land-use planning goals that can aid in protecting and preserving groundwater resources. TID and FSWD do not have direct land-use planning authority. However, TID does have the opportunity to comment on environmental documents for land-use related activities. TID will attempt to work cooperatively with other agencies to minimize adverse impacts to groundwater supplies and quality as a result of proposed land-use changes. Some specific land-use planning goals include: (1) preserving areas with high groundwater recharge potential for recharge activities; (2) protecting areas sensitive to groundwater contamination; (3) requiring hydrogeologic investigations, water master plans, and proven and sustainable water supplies for all new developments; and (4) requiring appropriate mitigation for any adverse impacts that land use changes have on groundwater resources.

The Community of Tranquillity does not have land-use planning authority and land use planning throughout both districts is governed by Fresno County. Growth in the Community of Tranquillity may spur land use planning discussions. However, growth in Tranquillity is presently low and is limited by the capacity of their wastewater treatment plan. Future growth is expected to be negligible over the next few years.

The historic use of TID and FSWD land has been for the production of irrigated agricultural crops and that use is protected and supported by the current exclusive agriculture (AE) zoning designation. Land use changes would require action by the Fresno County Board of Supervisors or a change to the Land Use Element of the Fresno County General Plan. The actions necessary to allow land use changes in TID and FSWD are not anticipated.

Existing Activities

- Notify residents and agencies of projects that have the potential to impact groundwater within their sphere of influence.
- When appropriate, comment on environmental documents and land-use plans that have the potential to impact groundwater.

Planned Actions

None

9.2 - Groundwater Reports

The Districts have a goal to prepare groundwater reports every year to document groundwater levels, available groundwater storage, historical trends, and other important groundwater related topics. This information will be used to forecast future

problems, plan future groundwater projects, and develop new groundwater policies. Since historical groundwater data is currently limited, an evaluation of long-term trends may not be possible until several annual reports are prepared. The annual report will cover the prior calendar year and will be completed each year by April 30th. See **Attachment 2** for a report outline.

Existing Activities

- TID prepares a Water Management Plan every five years for the United States Bureau of Reclamation as a requirement to maintain their Central Valley Project water supply. The Water Management Plan includes sections on groundwater usage and groundwater projects.

Planned Actions

Prepare an annual Groundwater Report that will include the following:

1. Groundwater level data;
2. Groundwater contour maps and groundwater flow directions;
3. Groundwater storage calculations;
4. Evaluation of one-year and five-year historical trends in groundwater levels, contours, and storage, and perceived reasons for any changes;
5. Estimates of deliveries to recharge basins and banking projects;
6. Groundwater pumping volumes;
7. Summary of important groundwater management actions;
8. Discussion on whether management actions are meeting the management objectives;
9. Summary of proposed management actions for the future;
10. Summary of groundwater related actions taken by other regional groups;
11. Recommendations for changes in the content or format of the annual report;
12. Recommendations for updates to the GMP.

9.3 - Plan Implementation

Implementation of this updated GMP is expected to result in significant amounts of new knowledge and an achievable improvement in groundwater management in TID and FSWD. **Attachment 3** includes an implementation schedule for this GMP from 2010-2014. The schedule does not include existing activities that will be continued; TID and FSWD will maintain all existing programs unless stated otherwise in this GMP. In addition, the schedule does not include proposed actions that are new policies or guidelines, which will be implemented on a continuous basis. Rather, the schedule only includes new tasks and projects.

9.4 - Plan Re-evaluation

The TID Board of Directors will be responsible for monitoring the progress in implementing the GMP objectives. The TID Board of Directors meets on the third Tuesday of each month to discuss district management and water supply issues. The TID Board will also evaluate the effectiveness of the GMP annually. As new policies,

practices, and ordinances become necessary or desirable to enhance the management of the District's groundwater supply, this Plan will be amended as necessary.

Existing Activities
None

Planned Actions
- Update the GMP at least every five years, or more frequently if deemed appropriate.
- Document recommendations for improving or updating the GMP in each annual Groundwater Report.

9.5 - Dispute Resolution

TID has detailed rules and regulations governing water conveyance, sale and management (see **Appendix B**). The rules and regulations are the heart of their dispute resolution process. The primary purpose of the rules and regulations is to help to prevent conflicts and disputes. For instance: the rules and regulations state:

> *"the following rules encompass many of the circumstances and conditions that can assist the District and its customers in finding common ground for continued operation and success."*

The rules and regulations also outline district responsibility, water user responsibilities, and specific dispute resolution procedures.

In addition, TID's Resolution 03-11, Consolidated Requirements for the Administration of the Tranquillity Irrigation District Domestic Drinking Water system, states:

> *"Complaints of any kind against the District or any of its personnel should be made in writing to the manager promptly after acts complained of have occurred. Customers shall have the right to refer any complaints in writing or in person to the Board of Directors of the District."*

There are few private groundwater wells in the Districts, so groundwater disputes with private landowners are unlikely. If disputes did occur they would likely be with neighboring water agencies. No groundwater disputes have occurred in recent years in the Districts to test their dispute resolution process.

Existing Activities
- Resolve disputes through the District's general dispute resolution procedures.

Planned Actions
- Discuss issues of concern at the Board meetings in an effort to prevent future disputes.

9.6 - Program Funding and Fees

Several alternatives are available to the Districts for funding groundwater projects, and are described below:

Water Replenishment Fees

Under AB3030, local agencies have the authority to limit groundwater extractions and implement water replenishment fees based upon the amount of water extracted (extraction based fees must first be approved by majority vote of impacted landowners). Inherent in these powers is the authority to implement metering of private wells. These are considered measures of last resort and TID and FSWD will make any and all efforts to ensure the private, non-metered use of groundwater by the local growers continues.

Capital Improvement Fees

The Districts have the authority to finance capital improvement projects and collect repayment charges from the benefited parties. This process would require a favorable vote from the constituency, and is considered a realistic alternative for large capital projects, such as groundwater recharge or banking projects.

Grants and Loans

The District will pursue available grants and low-interest loans from the Department of Water Resources as well as other State and Federal agencies. The District realizes that funding from State and Federal agencies for groundwater projects will be partially based on their progress in implementing this GMP.

Other Revenue Sources

Groundwater projects can also be financed through water user fees that are collected regularly from all district landowners.

Exiting Activities

- Regularly research grant and loan opportunities from the State and Federal government.

Planned Actions

- Identify beneficial groundwater projects that become economically feasible when costs are shared among two or more participants. This will be done primarily with James Irrigation District, and the agencies in the Westside Regional Water Management Plan.

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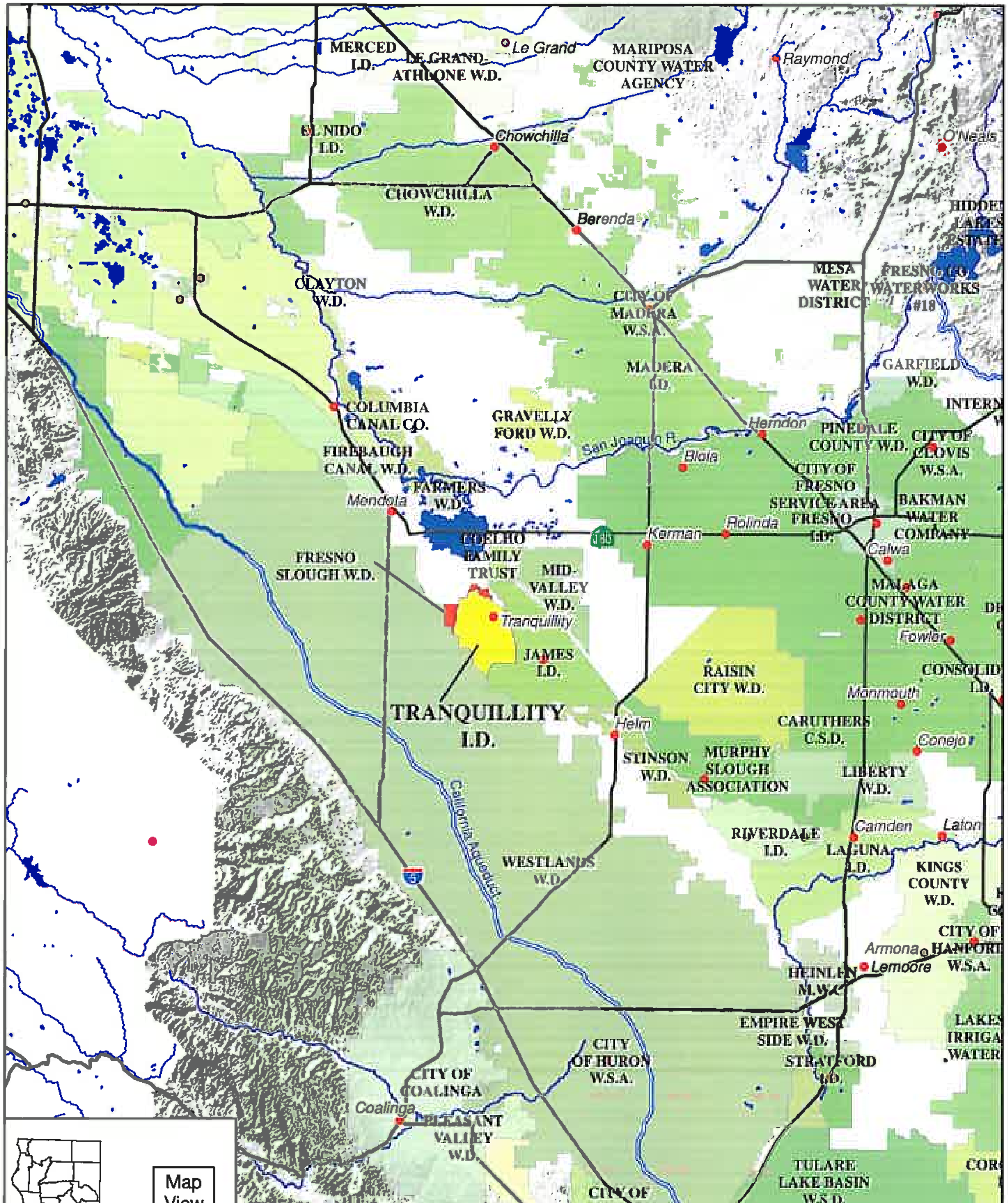

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Tranquillity Irrigation District
Fresno Slough Water District
Vicinity Map
Figure 1

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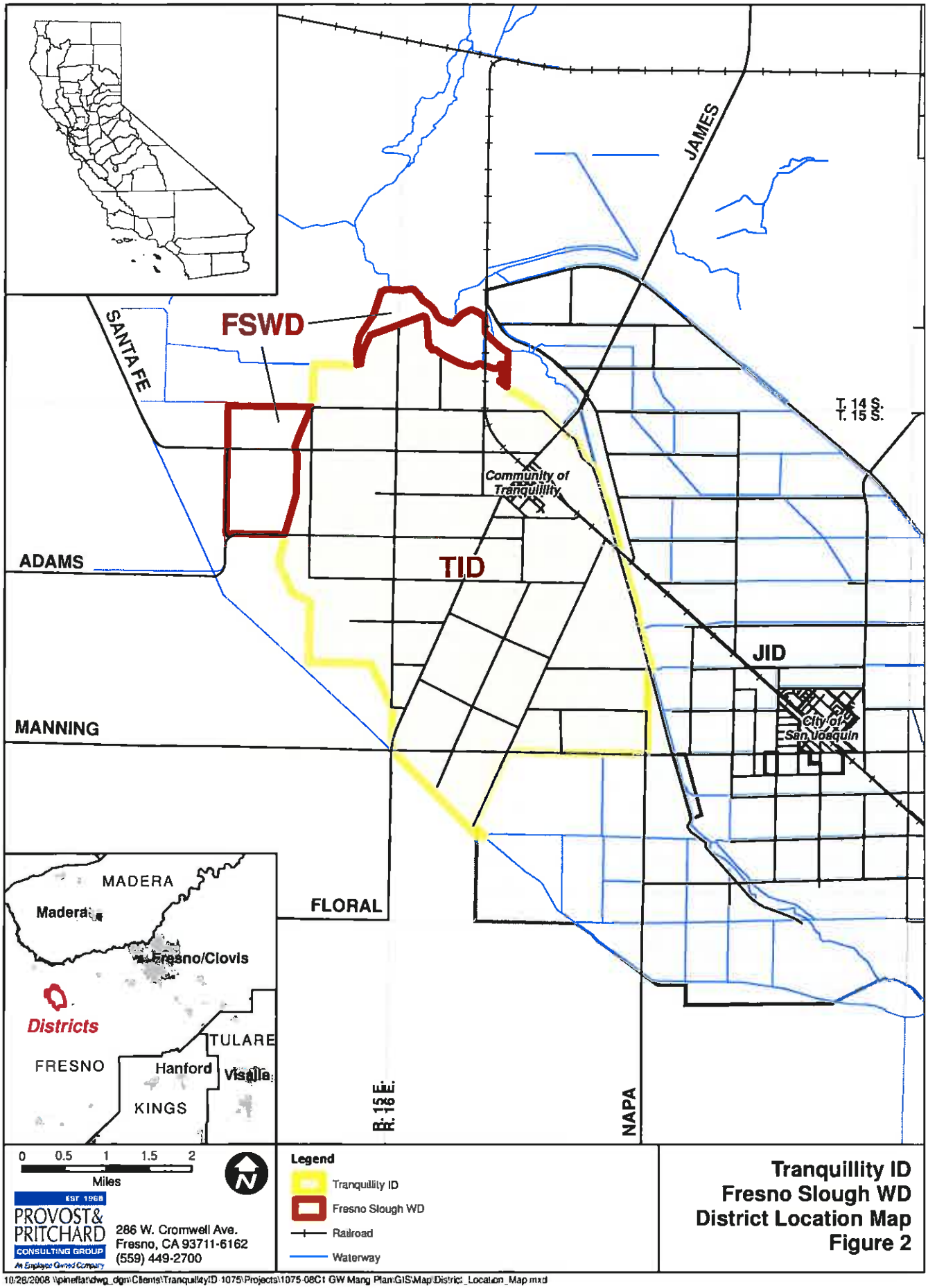
FSWD
TID
JAMES
SANTA FE
ADAMS
MANNING
FLORAL
NAPA
JID
T. 14 S.
T. 15 S.
R. 15 E.
R. 16 E.
Community of Tranquillity
City of San Joaquin
MADERA
Madera
Fresno/Clovis
Districts
TULARE
FRESNO
Hanford
Visalia
KINGS
0 0.5 1 1.5 2
Miles
Legend
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Fresno Slough WD
Railroad
Waterway
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Tranquillity ID
Fresno Slough WD
District Location Map
Figure 2
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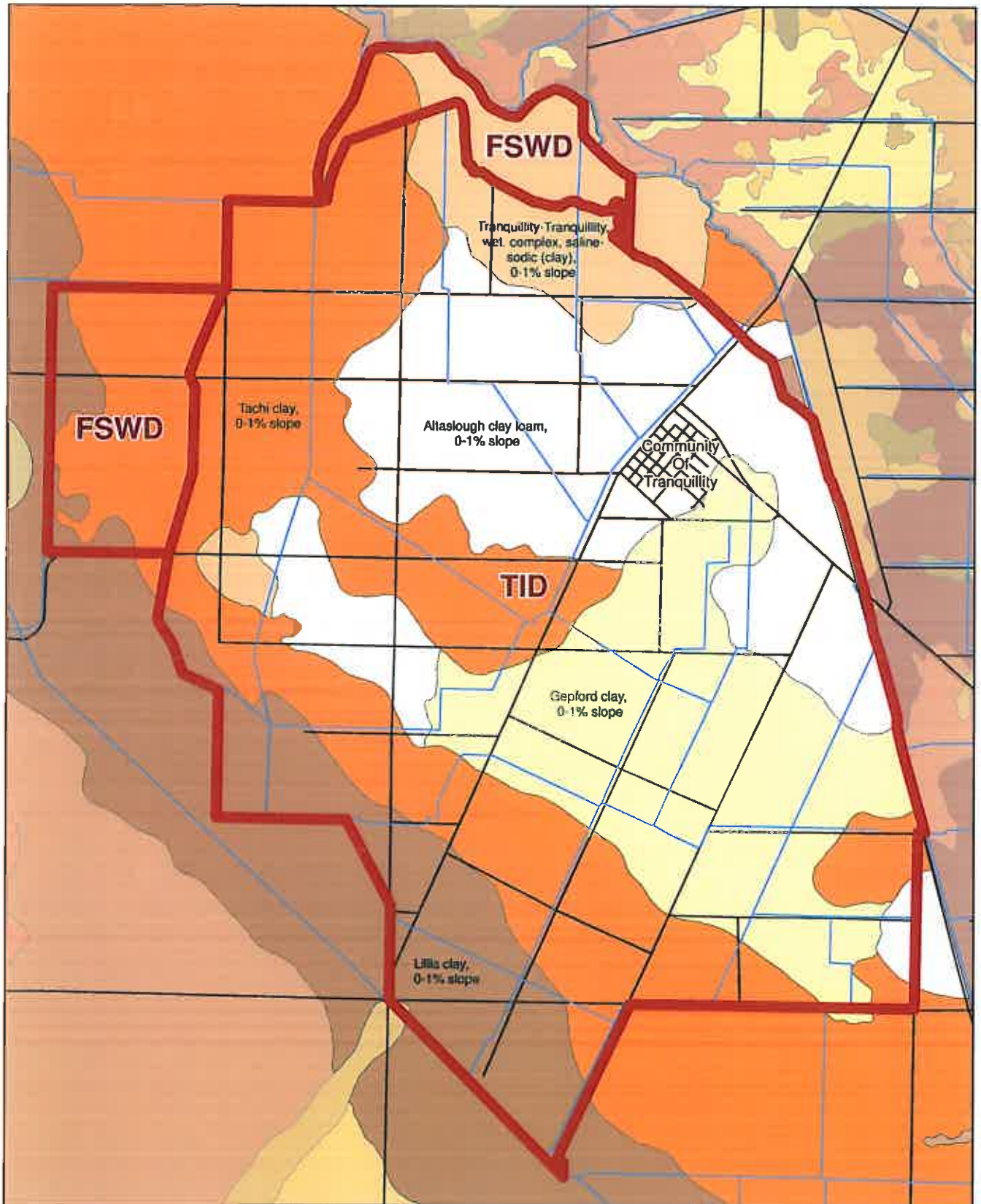

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Fresno Slough WD

Soils Map
Figure 3

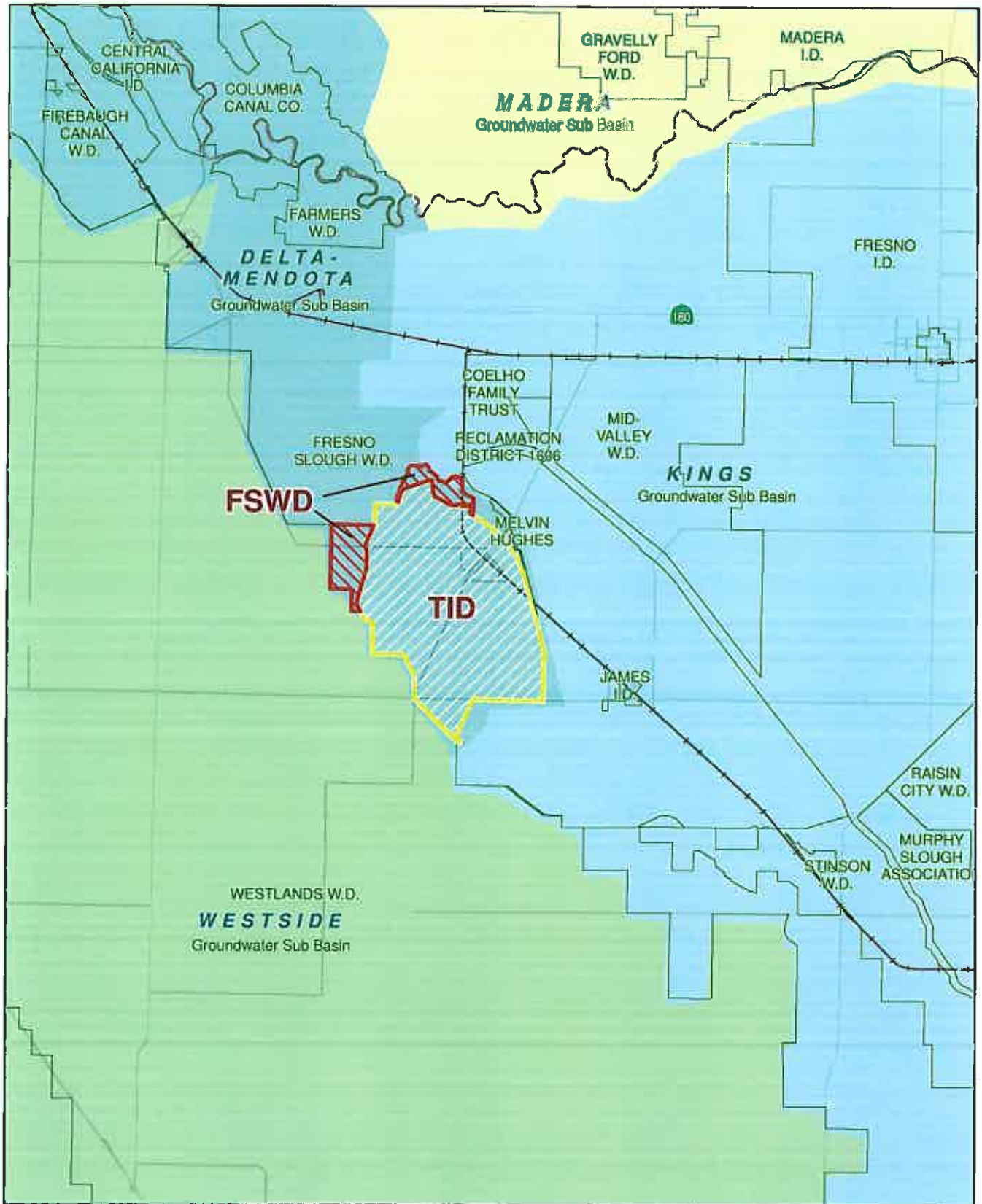

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FIGURE 5

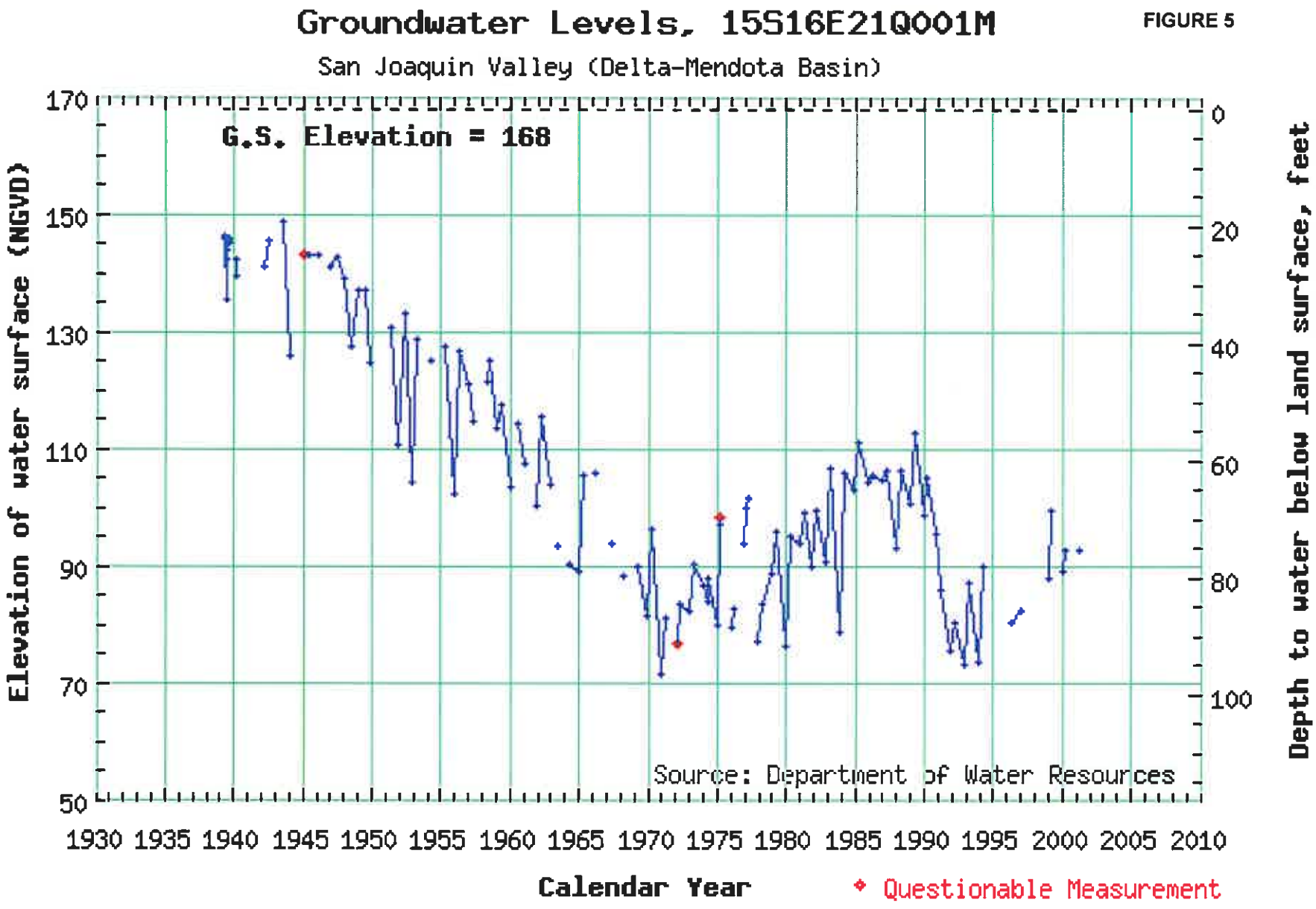
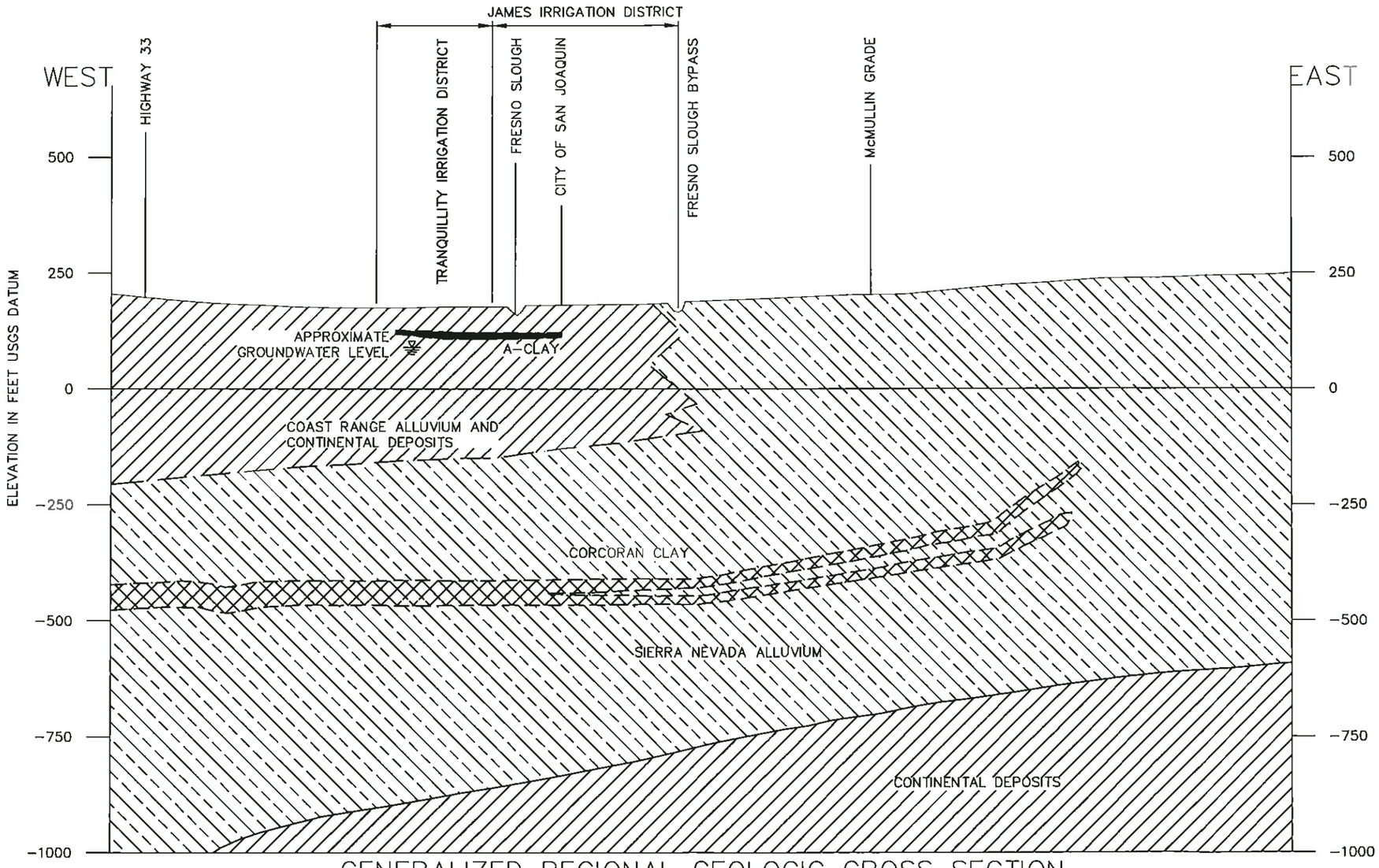

Groundwater Levels, 15S16E21Q001M
San Joaquin Valley (Delta-Mendota Basin)
G.S. Elevation = 168
Elevation of water surface (NGVD)
Depth to water below land surface, feet
170
150
130
110
90
70
50
0
20
40
60
80
100
1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010
Calendar Year
Source: Department of Water Resources
Questionable Measurement

FIGURE 6



GENERALIZED REGIONAL GEOLOGIC CROSS SECTION
THROUGH TRANQUILLITY IRRIGATION DISTRICT

MODIFIED FROM
USGS WATER SUPPLY PAPER 1999-H

NOTE: GROUNDWATER LEVELS VARY THROUGHOUT THE DISTRICT AND OVER TIME

HORIZONTAL SCALE IN MILES

3 0 3 6

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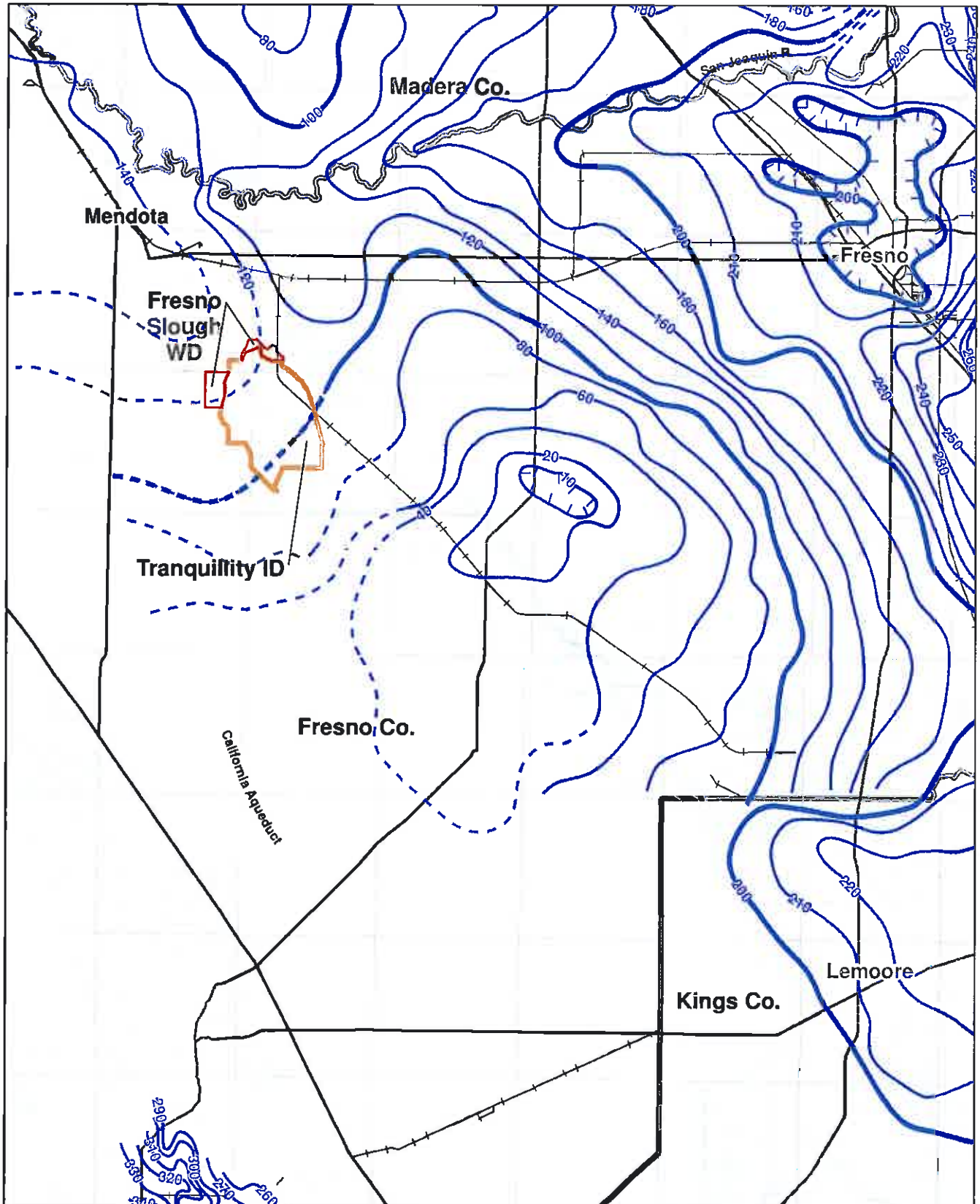

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http://www.sjd.water.ca.gov/groundwater/basin_maps/maps/king_e01/index.cfm

Tranquillity ID
Fresno Slough WD

Regional Groundwater Contours
Figure 7

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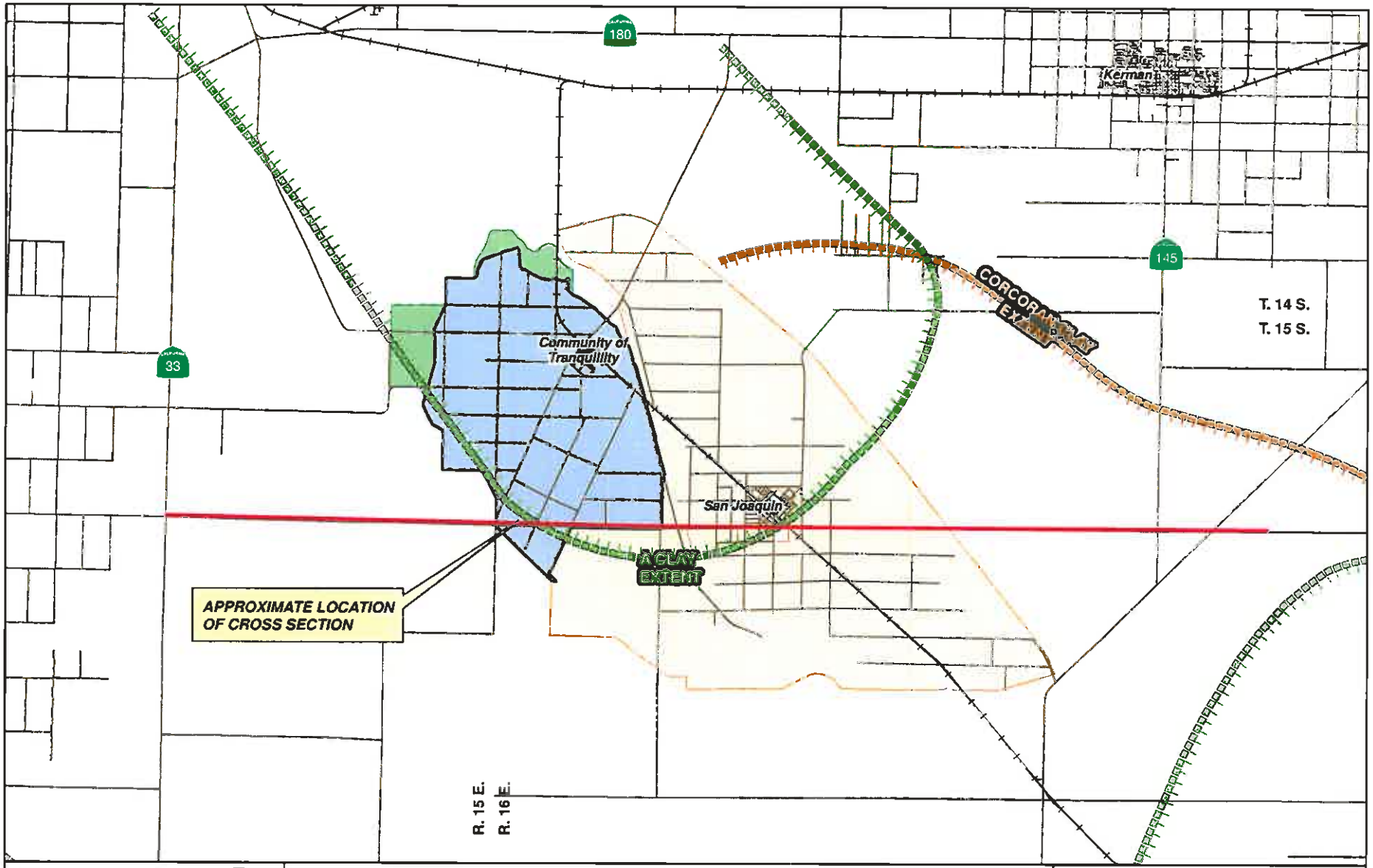

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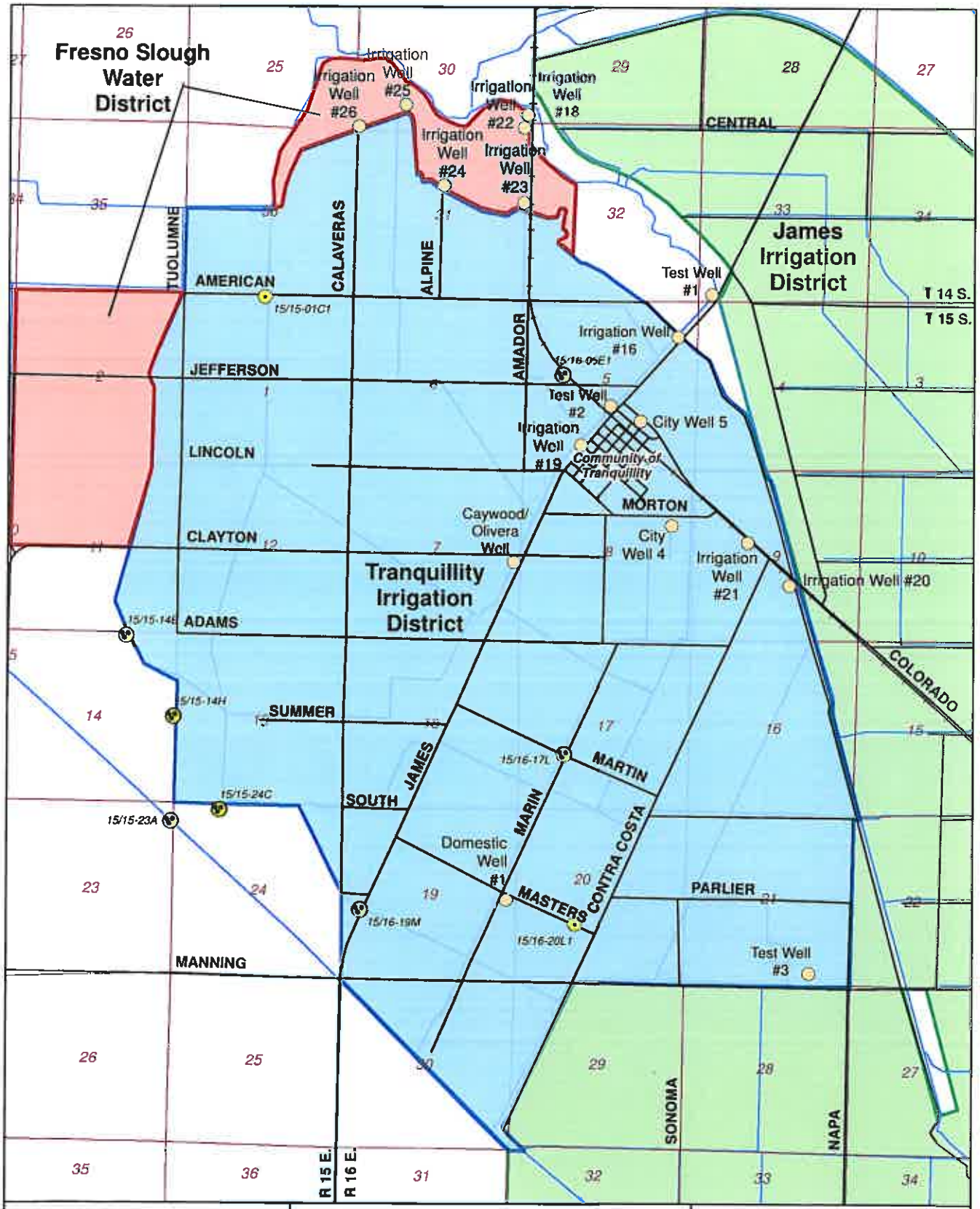
Clay Layers
Figure 8

5/11/2009 \\pnedfat\dwg_dgn\Clients\TranquillityID-1075\Projects\1075-08C1 GW Mang Plan\GIS\Map\xsec_clay_layers.mxd


Fresno Slough Water District
Irrigation Well #25
Irrigation Well #26
Irrigation Well #24
Irrigation Well #22
Irrigation Well #23
Irrigation Well #18
CENTRAL
James Irrigation District
Test Well #1
T 14 S.
T 15 S.
TUOLUMNE
CALAVERAS
ALPINE
AMADOR
AMERICAN
15/15-01C1
JEFFERSON
Irrigation Well #16
15/16-05E1
Test Well #2
City Well 5
Irrigation Well #19
Community of Tranquillity
LINCOLN
MORTON
CLAYTON
Caywood/ Olivera Well
City Well 4
Irrigation Well #21
Irrigation Well #20
Tranquillity Irrigation District
15/15-14E
ADAMS
COLORADO
15/15-14H
SUMMER
15/16-17L
MARTIN
15/15-24C
15/15-23A
SOUTH JAMES
MARIN
CONTRA COSTA
Domestic Well #1
PARLIER
MASTERS
15/16-19M
15/16-20L1
MANNING
Test Well #3
SONOMA
NAPA
R 15 E.
R 16 E.
0 0.5 1
Miles
Legend
Tranquillity ID
Fresno Slough WD
James ID
Sections
Railroad
Fresno County Roads
Water Conveyance Facilities
Wells
Monitoring Well - Cluster
Monitoring Well - Single
Note: Well locations are approximate and have not been verified or surveyed.
EST 1956
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company
286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700
Tranquillity ID
Fresno Slough WD
Well Location Map
Figure 9
5/11/2009 \\pinefs\fsdwg_dgn\Clients\TranquillityID-1075\Projects\1075-08C1 GW Mang Plan\GIS\Map\well_locations_fig9.mxd

Tranquility Irrigation District
Wells Located in Tranquility ID, Fresno Slough Water District, and Community of Tranquility.

ATTACHMENT 1

Well #	State ID#	Location	Location (Lat. Long.)	Diameter Casing (IN)	Casing Material	Depth	Perforated Interval	Date Constructed	Capacity (GPM)	Horse Power*	Notes
Irrigation											
19	T15S R16E Sec. 5	SW Jefferson & James	-	-	-	-	295-535	1993	1800-2800	100	
20	T15S R16E Sec. 9	50' N. Levee Rd & 75' W. Colorado	-	18 5/8	5/16" Steel	555	320-545	4/13/1995	1500-2500	-	
21	T15S R16E Sec. 9	1/4 Mi. S. Morton & 80' S. Colorado	-	18 5/8	5/16" Steel	555	320-405, 425-545	4/12/2000	3000	250	
22	T14S R16E Sec. 31	1 Mi. N. American & 1/2 Mi. E. Calaveras	-	18	5/16" Steel	780	540-760	7/1/2003	-	300	
23	T14S R16E Sec. 31	2638' E Alpine & 2823' N. American	36.40.133 N & 120 15 677 W	18	5/16" Steel	760	540-760	5/30/2007	-	200	
24	T19S R16E Sec. 31	NW of American & Alpine		18	-	780	540-760	4/29/2008	-	200	No Motor Installed Yet
25	T14S R16E Sec. 31	NW of Well 24		18	-	780	540-760	4/24/2008	-	250	No Motor Installed Yet
26	T14S R16E Sec. 31	1.46 Mi N. Jefferson & 1 Mile W. Amador	36.40.545 N & 120.16.757W	18	5/16" Steel	780	540-760	7/25/2008	-	-	Private Ag Well
Municipal											
CW #4	T15S R16E Sec. 8	SE James & Jefferson		16, 14	Steel & SS	862.5	683-853	9/16/1970	1176	100	City Well
CW #5	T15S R16E Sec. 5	80' S. Colorado & 1000' E. James		16, 14	Steel & SS	913	663-703, 773-903	8/24/1980	-	-	City Well
Domestic											
DW #1	T15S 16E Sec. 19	SE Masters & Marin	-	-	-	-	-	-	-	-	

TRANQUILLITY IRRIGATION DISTRICT AND FRESNO SLOUGH WATER DISTRICT
2009 ANNUAL GROUNDWATER REPORT

Table Of Contents

ATTACHMENT 3

Tranquillity Irrigation District and Fresno Slough Water District
Groundwater Management Plan
Implementation Schedule

Task No.	Task[1]	2009				2010				2011				2012				2013				2014			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Groundwater Advisory Committee meetings																								
2	Prepare Annual Groundwater Reports																								
3	Measure Waler Levels																								
4	Groundwater Quality Testing																								
5	Discuss Groundwater Banking Opportunities in James Irrigation District																								
6	Construct Intertie with James Irrigation District																								
7	Investigate Groundwater Banking Project with McMullin Recharge Group																								
8	Investigate Groundwater Banking Opportunities in Fresno Irrigation District																								
9	Update Groundwater Management Plan																								

Notes:
1 - Only proposed new projects are shown in this schedule. Existing and on-going projects are not shown. Also, new policies and guidelines that will be implemented on a continuous basis are not shown.
2 - Implementation of these projects may depend on the Districts success in securing grant funds.

TRANQUILLITY IRRIGATION DISTRICT
FRESNO SLOUGH WATER DISTRICT

GROUNDWATER MANAGEMENT PLAN

APPENDIX A – PUBLIC PARTICIPATION

WEST SIDE ADVANCE
14693 W. Whitesbridge Ave.
P.O. Box 336
Kerman, CA 93630
Telephone: 559-846-6689

This space is for the County Clerk's Filing Stamp

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of Fresno,

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer of the **West Side Advance**, a newspaper of general circulation, printed and published weekly in the City of Kerman, County of Fresno, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Fresno, State of California, under the date of February 9, 1956, Case Number 45745; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following date, to-wit:

February 4, 11

all in the year 20 09. I Certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Kerman, California this 11th

day of February, 20 09

Kathy A. Mattix

Signature

Proof of Publication

Public Notice
Tranquillity Irrigation District

PUBLIC NOTICE

Tranquillity Irrigation District Resolution 2008-09

For Intention To Prepare A Groundwater Management Plan

WHEREAS, the California Water Code permits the adoption and implementation of Groundwater Management Plans to encourage authorized local agencies to manage groundwater resources within their service areas; and

WHEREAS, Fresno Slough Water District has agreed to jointly prepare a Groundwater Management Plan with Tranquillity Irrigation District and allow Tranquillity Irrigation District to serve as the lead agency for the plan; and

WHEREAS, preparing a Groundwater Management Plan is in furtherance of and consistent with the Districts' goals and objectives and will be in the best interests of the Districts' landowners and water users; and

WHEREAS, a public hearing was held on December 16, 2008, to discuss preparing a Groundwater Management Plan;

NOW THEREFORE BE IT RESOLVED, by the Board of Directors that it is the intention of the Districts to prepare a Groundwater Management Plan in accordance with Senate Bill No. 1938, that this resolution shall be deemed a resolution of intention in accordance with California Water Code Section 10753.2 and that the Board hereby authorizes its officers to execute all documents and take any other action necessary or advisable to carry out the purposes of this resolution.

PASSED AND ADOPTED at a meeting of the Board of Directors of the Tranquillity Irrigation District on December 16, 2008.

The Board of Directors adopted the foregoing at a regular meeting on a voice count as follows:

Approval: Ayes = 3

Date: December 16, 2008

Signed: President: Jerry Salvador

Attested: Elizabeth Reeves, Secretary

0522 WSA 5-6

TRANQUILLITY IRRIGATION DISTRICT

RESOLUTION 2008-09

FOR INTENTION TO PREPARE A GROUNDWATER MANAGEMENT PLAN

WHEREAS, the California Water Code permits the adoption and implementation of Groundwater Management Plans to encourage authorized local agencies to manage groundwater resources within their service areas; and

WHEREAS, Fresno Slough Water District has agreed to jointly prepare a Groundwater Management Plan with Tranquillity Irrigation District and allow Tranquillity Irrigation District to serve as the lead agency for the plan; and

WHEREAS, preparing a Groundwater Management Plan is in furtherance of and consistent with the Districts' goals and objectives and will be in the best interests of the Districts' landowners and water users; and

WHEREAS, a public hearing was held on December 16, 2008, to discuss preparing a Groundwater Management Plan;

NOW THEREFORE BE IT RESOLVED, by the Board of Directors that it is the intention of the Districts to prepare a Groundwater Management Plan in accordance with Senate Bill No. 1938, that this resolution shall be deemed a resolution of intention in accordance with California Water Code Section 10753.2 and that the Board hereby authorizes its officers to execute all documents and take any other action necessary or advisable to carry out the purposes of this resolution.

PASSED AND ADOPTED at a meeting of the Board of Directors of the Tranquillity Irrigation District on December 16, 2008.

The Board of Directors adopted the foregoing at a regular meeting on a voice count as follows:

Approval: Ayes 3; Noes_____; Absent_____; Abstained_____

Date: December 16, 2008

Signed _____
President; Jerry Salvador

Attested _____
Elizabeth Reeves, Secretary

(District Seal)

MINUTES OF THE REGULAR MEETING
OF THE
TRANQUILLITY IRRIGATION DISTRICT
BOARD OF DIRECTORS

December 16, 2008

PRESENT: President Jerry Salvador, Director William Pucheu, Director George Ayerza, General Manager Danny M Wade, Counsel Mark Blum, WaterMaster Rod Wade, & Secretary/Treasurer Liz Reeves

ABSENT - none

Board President Jerry Salvador called the meeting to order at 8:37 am.

ADDITIONS OR DELETIONS TO AGENDA - None

MINUTES
The minutes of the regular meeting on November 18, 2008 were approved on a voice count. Director Pucheu motioned and Director Ayerza seconded the motion. Motion carried.

PUBLIC COMMENTS - none

PUBLIC HEARING – Preparation of Groundwater Management Plan
Hearing opened at 8:40 am. None present, no comments – hearing closed at 8:40 am.

ENGINEERING

a. Update on the SRF Grant – the grant has been approved at the local office and the state. A request for more paperwork has been received from the state and will be taken care of right away. By the next board meeting it is expected that we will have a contract and a resolution ready. The question right now is whether or not the money will be there – with the current economic conditions. The sampling program will start after the first of the year.
b. Update on actions related to the EPA inquiry on Arsenic and non compliance – we haven't heard back from the EPA with regards this matter and we have submitted the quarterly response as requested yesterday.
c. Findings of the Interconnection study funded by the USBR Field Services program – the draft documents will be ready for review next week. The interconnection between FSWD and TID is a 50/50 grant.
d. CDBG – the first grant for $20k is done and needs to be signed. The second grant for $155k is going to the county today and will bid out for the summer.
e. Groundwater Management – approval of **Resolution 2008-09** Intention to prepare Groundwater Management Plan was approved. *Director Pucheu motioned for approval and Director Ayerza seconded the motion.*
f. Consider and take action to authorize the Board President to sign and execute both Community Development Block Grants in the absence of the General Manager. The first grant was in the amount of $10,000.00 and then was amended to a total of $20,000.00. The

second is in the amount of $155,653.00. *Director Pucheu motioned for approval to authorize the Board President to sign and execute the CDB Grants in the absence of the General Manager. Director Ayerza seconded the motion.*

g. Consider and Take Action to authorize Grant application for Equipment/Improvements regarding the District's park in Tranquillity. A newly available Grant may be available for funding for equipment with a minimum application for $100,000. The board unanimously approved checking into this grant. Also there are some other USBR programs that will be out in January. They are 50/50 grants; Conservation = $300k, Planning = $300k, and the Field Services Program = $25k. The board approved looking into these grants as well.

SECRETARY-TREASUERER'S REPORT
The Cash Flow statement was presented for the month of November 2008 including the payments and balances on long-term debts. The Cash Disbursements were also presented for review. The receivables for both city water and irrigation water accounts were reviewed. Director Pucheu approved and Director Ayerza seconded the Treasurer's report.

CSDA 2009 dues – question was raised as to why we are with this organization and if we should continue paying dues. Board requested that we look into it and determine if we need to continue with this program. If not – we are approved to cancel membership.

DIRECTOR'S REPORT
Director Pucheu asked the other board members to come to the next SLDMWA meeting. He also advised that the rates at the Water Authority will be increasing by 15%. He talked about the Bay Delta Bypass Project which is an environmental study. The cost will be $150 million which will be split between the State and Federal contractors. The numbers will be finalized in January.

COUNSEL'S REPORT
Delta Task Force has been assembled to determine how best to obtain more water for the Delta. The Sacramento Superior Court is seeking to put more land out of commission because of runoff that is polluting the Delta. They feel that it is a waste to put the water on the land that they feel isn't worth farming.
Newspaper Headline – State Supply cut by 50%. With regards the Delta Smelt study – requests are being made to look at other options like perhaps looking at the fish issues together rather than individually.

Approval for execution of the Real Property Waiver submitted by Bank of the West in connection with District lands leased to Jon Caywood. *Director Pucheu motioned for approval to authorize the Board President to sign the Real Property Waiver on behalf of the District. Director Ayerza seconded the motion.*

MANAGER'S REPORT - none

WATERMASTER'S REPORTS

a. Water use – irrigation and drinking water: Rod reported on the usage totals for the month of November, the well pumping, and the Mendota pool reporting.
b. Rod reported on various maintenance projects; equipment and facility status, wells, pumps, mobile equipment, canals and distribution systems, weed control, buildings and other District properties.
c. Fresno Slough Water District and TPUD water operations were presented.

CLOSED SESSION

a. Closed Session Pursuant to California Government Code Subdivision (a) of Section 54956.9
CONFERENCE WITH LEGAL COUNSEL--EXISTING LITIGATION
Name of case: NRDC v. Bureau of Reclamation and others.
No reportable action

The Board adjourned @ 10:08 AM

The next regular meeting will be held 8:30 am on January 20, 2009 at the TID Office.

Respectfully Submitted,

Elizabeth Reeves,
Secretary/Treasurer

Approved By,

Jerry Salvador,
Board President

TRANQUILLITY IRRIGATION DISTRICT
TRANQUILLITY, CALIFORNIA

REGULAR MEETING OF THE BOARD OF DIRECTORS
At the offices of the District

Tuesday Dec 16, 2008
8:30 AM

PROPOSED AGENDA

1. ADDITIONS OR DELETIONS AND ADOPTION OF THE PROPOSED AGENDA

2. MINUTES for the regular meeting on Nov 18, 2008 for review and approval.

3. PUBLIC COMMENTS – Comments at this time are limited to items not on this agenda and within the Board's scope of responsibility. Speakers may be limited to 3 minutes.

4. PUBLIC HEARING – Preparation of Groundwater Management Plan

5. ENGINEERING
   a) Update on the SRF Grant – review and discuss activities for the previous month
   b) Update on actions related to the EPA inquiry on Arsenic and non compliance
   c) Findings of the Interconnection study funded by the USBR Field Services program
   d) CDBG – update on the status for completion of initial valve replacement and update on the larger valve replacement program.
   e) Groundwater Management – approval of Resolution 2008-09 Intention to prepare Groundwater Management Plan
   f) Consider and take action to authorize the Board President to sign and execute both Community Development Block Grants in the absence of the General Manager. The first grant was in the amount of $10,000.00 and then was amended to a total of $20,000.00. The second is in the amount of $155,653.00 .
   g) Consider and Take Action to authorize Grant application for Equipment/Improvements regarding the District's park in Tranquillity. A newly available Grant may be available for funding for equipment with a minimum application for $100,000.

6. SECRETARY-TREASURER'S REPORT
   a) Cash Flow Statement.
   b) Accounts payable, and Accounts receivable – past due irrigation accts.
   c) Reserve fund and asset status; cash and property, long-term debt status including; 92-1 Bond Payment, State Water Conservation Loan, and West America Loan.
   d) CSDA 2009 dues

7. DIRECTOR REPORTS

8. COUNSEL'S REPORT
   a) Status of legal matters potentially affecting the District
   b) Approval for execution of the Real Property Waiver submitted by Bank of the West in connection with District lands leased to Jon Caywood.

9. MANAGER'S REPORT

10. WATERMASTER'S REPORTS
    Operations and maintenance – The Board will receive reports on all water operations in Tranquillity and TID Fresno Slough property as well as all related maintenance activities completed during the previous month.
    1) Water use – irrigation and drinking water.
    2) Other maintenance; equipment and facility status, wells, pumps, mobile equipment, canals and distribution systems, weed control, buildings and other District properties.
    3) Fresno Slough Water District and TPUD water operations.

11. CLOSED SESSION
    1. Closed Session Pursuant to California Government Code Subdivision (a) of Section 54956.9
       CONFERENCE WITH LEGAL COUNSEL--EXISTING LITIGATION
       Name of case: NRDC v. Bureau of Reclamation and others.

NOTE: The agenda items may not be presented in the order they are listed. Persons wishing to discuss an item that was taken out of order will have the opportunity to do so. All agenda items listed are considered to be discussion and/or action items. Materials related to an item on this agenda that are public documents and are submitted after distribution and posting of the agenda are available for public inspection in the District's office at 25390 W. Silveira Street, Tranquillity, during normal business hours. Documents that are public documents provided by others during a meeting will be available at the same location during business hours after the meeting.

Individuals needing special assistance in order to participate in this meeting should contact the District Secretary for such assistance or accommodation prior to the meeting.

Tranquillity Irrigation District

Board Meeting Notice
December 16, 2008

Jerry Salvador, Director]

William Pucheu, Director]

George Ayerza, Jr., Director]

Mark Blum, District Counsel]

Gentlemen,

Please be advised that there will be a meeting of the Tranquillity Irrigation District Board of Directors to be held on, **Tuesday December 16th, at 8:30 AM,** in the Tranquillity Irrigation District office, at 25390 W Silveira St., Tranquillity, California. Enclosed is a copy of the proposed agenda and the minutes from the November 18th board meeting for your review and approval at the meeting.

Sincerely,

Liz Reeves
Board Secretary/Treasurer

P.O. Box 487, Tranquillity, CA 93668
Telephone (559) 698-7225- Fax (559) 698-5105
E-mail contact@trqid.com- www.trqid.com

WEST SIDE ADVANCE
14693 W. Whitesbridge Ave.
P.O. Box 336
Kerman, CA 93630
Telephone: 559-846-6689

This space is for the County Clerk's Filing Stamp

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of Fresno,

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer of the **West Side Advance**, a newspaper of general circulation, printed and published weekly in the City of Kerman, County of Fresno, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Fresno, State of California, under the date of February 9, 1956, Case Number 45745; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following date, to-wit:

Nov 26, Dec 3

all in the year 20 08. I Certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Kerman, California this 3rd

day of December, 2008

Kathy A. Mallon

Signature

Proof of Publication

Notice of Hearing on Intention To Prepare Groundwater Management Plan

NOTICE OF HEARING ON INTENTION TO PREPARE A GROUNDWATER MANAGEMENT PLAN FOR TRANQUILLITY IRRIGATION DISTRICT AND FRESNO SLOUGH WATER DISTRICT

NOTICE IS HEREBY GIVEN that at 8:30am on December 16, 2008 at 25390 W. Silveira St., Tranquility, CA, a public hearing will be held to discuss whether or not the Tranquillity Irrigation District and Fresno Slough Water District should jointly prepare a Groundwater Management Plan in compliance with California Senate Bill No. 1938.

Part 2.75 of Division 6 of the California Water Code permits the adoption and implementation of Groundwater Management Plans to encourage authorized local agencies to manage groundwater resources within their service areas.

Landowners within these agency boundaries and other interested parties are invited to attend the hearing. Opportunity for public questions and input will be provided at the hearing. In compliance with Water Code § 10753.4 (b), landowners and other interested parties who wish to participate in preparing the Groundwater Management Plan may do so by attending the hearing and indicating their interest or by submitting a written letter to Danny Wade, General Manager, Tranquillity Irrigation District, P.O. Box 487, Tranquility, CA 93668

Danny M Wade
General Manager

MINUTES OF THE REGULAR MEETING
OF THE
FRESNO SLOUGH WATER DISTRICT
BOARD OF DIRECTORS

December 8, 2008
8:30 AM

PRESENT- President Anthony Carvalho, Director Nino Carvalho, Director Jerry Salvador, Counsel Mark Blum, Watermaster Rodney Wade, Manager-Secretary Elizabeth Reeves.

ABSENT- Director Danny M Wade

Chairman Anthony Carvalho called the meeting to order at 8:35 am.

AGENDA
The agenda was approved upon a voice count.

MINUTES
The minutes of the November meeting were unanimously approved on a voice count. Director Carvalho motioned and Director Salvador seconded the motion.

SECRETARY-TREASURERS REPORT
The financial reports for November were presented. The Treasurers report was approved on voice count. Director Salvador motioned and Director Carvalho seconded the motion.

WATERMASTER'S REPORT
Rod reported on the Irrigation water usage totals for the month; the well pumping, and the Mendota pool reporting.

MANAGERS REPORT
Manager Reeves requested the board to take action with regards the Groundwater Management Plan that will be for both Tranquillity Irrigation District (TID) and Fresno Slough Water District (FSWD). Motion was made to accept that TID and FSWD agree to jointly prepare a Groundwater Management Plan. TID will be the lead agency and will prepare resolutions and public notices on behalf of both agencies. Director Carvalho motioned for approval and Director Salvador seconded the motion.

COUNSELS REPORT
Counsel reported that there have been no changes in the status of legal matters affecting the District.

DIRECTORS REPORT - none

PUBLIC COMMENTS – None

FSWD Board Meeting Minutes
December 2008

CLOSED SESSION
Closed Session Pursuant to California Government Code Subdivision (a) of Section 54956.9
CONFERENCE WITH LEGAL COUNSEL--PENDING LITIGATION Name of case: NRDC v. Bureau of Reclamation and others.
(No reportable action)

There being no further business the Fresno Slough Water District Board adjourned the regular meeting @ 8:58 AM.

The next regular board meeting will be held February 9, 2009.

Respectfully Submitted,

Elizabeth Reeves
Manager-Secretary

Approved By:

Anthony Carvalho,
Board President

MINUTES OF THE REGULAR MEETING
OF THE
TRANQUILLITY IRRIGATION DISTRICT
BOARD OF DIRECTORS

November 18, 2008

PRESENT: President Jerry Salvador, Director William Pucheu, Director George Ayerza, General Manager Danny M Wade, Counsel Mark Blum, WaterMaster Rod Wade, & Secretary/Treasurer Liz Reeves

ABSENT - none

Board President Jerry Salvador called the meeting to order at 8:35 am.

ADDITIONS OR DELETIONS TO AGENDA - None

MINUTES
The minutes of the Special Joint Meeting with FSWD on October 14, 2008 and the Special Meeting on November 5, 2008 were approved on a voice count. Director Ayerza motioned and Director Pucheu seconded the motion. Motion carried.

PUBLIC COMMENTS - none

WACHOVIA
Representatives came to provide the Board with an update on the Reserve account and the Employee Retirement account. Fred Bayles talked about the status of the stock market in regards to the current downturn. Kellie Frasier explained about the 401k and how it is doing. She will later talk to the employees to explain what is happening in the stock market and the effect it is having on the 401k.

ENGINEERING
The Board was asked to consider and take action to accept the preparation of the Joint Groundwater Management Plan with Fresno Slough Water District. TID will be the lead agency and will prepare the resolutions and the public notices on behalf of both agencies. Director Pucheu motioned to approve the Joint Groundwater Management Plan and President Salvador seconded the motion.

City Water Grant Update – DHS accepted the application. The grant will be for $6 million and a structured plan is required. There will be 2 phases – first, the feasibility study and second, the actual construction. The State will not approve the application until February 2009. No construction work can be done until approval is acquired but the feasibility study can be done now. We would have to fund the project and then be reimbursed once the application has been approved. If the project is not started until Feb 2009 – the completion will not be until December 2010 but we currently have an EPA deadline of June 30, 2010 to correct the arsenic problem. The question was asked whether we want to wait for the grant funding contract to be

signed or do we want to fund the project and wait for reimbursement. The feasibility study will run about $25 thousand in total. Then in Feb the test holes can be drilled as long as the contract gets signed. The Board agreed that we should proceed with the feasibility portion with the understanding that this will be at TID's expense until reimbursement in March 09. Motion to approve was made by Director Pucheu and Director Ayerza seconded the motion.

SECRETARY-TREASUERER'S REPORT
The Cash Flow statement was presented for the month of October 2008 including the payments and balances on long-term debts. The Cash Disbursements were also presented for review. The receivables for both city water and irrigation water accounts were reviewed. Director Pucheu approved and Director Ayerza seconded the Treasurer's report.

Prepay accounts – one of the prepay customer requested that they be removed from the prepay list. The board approved but if the customer was late once they will go back on the list.

Approval was granted unanimously to sign the loan application for the $250,000 line of credit for the City Water Grant Project. President Salvador first, Director Pucheu second and Director Ayerza third.

DIRECTOR'S REPORT
Director Pucheu advised that the SLDMWA meeting was scheduled for Friday.

COUNSEL'S REPORT
Counsel reported that there has been no decision yet from Judge Wanger with regards the Bureau CVP Contracts. The DWR has voted to take additional restrictions on imports for the long-fin delta smelt which will be effective the first of December through the end of February. Not sure what the end result will be on our current pumping restrictions. The San Joaquin River Settlement has been postponed until January.

MANAGER'S REPORT
a) 2008 Salary & Benefits Survey from ACWA was used to do a comparison with other districts for setting employee wages for the 2009 year. Discussion about the wages was held in closed session. Manager Wade asked the board if a new contract for the District Manager position will need to be made. The board agreed that no contract will be necessary at this time.
b) 2009 budget proposal was reviewed with the electric/diesel portion being highlighted. A more in depth review will be made in January 2009 when approval will be requested of the final budget. This review was to assist with a determination of what the 2009 water rates should be set to. The general board feel was to set the rates at $70.00. Final approval will be made in January 2009.
c) Water rate increase news announcement was posted at $75.00 regular rate and $85.00 for excess ground rate. This was to let farmers know the highest point the rates could be set at.
d) Well water rate for outside District farmers - $85.00 electric & $145.00 diesel. This will be the charges to F&S Farms if next year remains a drought year and we have to supplement F&S water needs. TID will bill F&S directly for any well water needed. The Board unanimously approved the new well water rates as presented.

e) Well 24, 25 will be converting to electric (PG&E); Well 26 is being developed by Cal West Rain and will remain on diesel as a backup well.
f) Restrooms at the City Park will need to be torn down but President Salvador requested that we try to keep the roof and the corner beams there if possible. If the townsfolk want to use the park they will be required to provide Porto-potties for whatever function they wish to hold. The District will not be providing this service.
g) TID Growers Luncheon 2008-2009 went very well and we would like to do it again next year.
h) TID property dedicated for Fresno County Library – Nov 7,2008 in memory of Frank Miller as first manager of TID

WATERMASTER'S REPORTS

a. Water use – irrigation and drinking water: Rod reported on the usage totals for the month of October, the well pumping, and the Mendota pool reporting.
b. Rod reported on various maintenance projects; equipment and facility status, wells, pumps, mobile equipment, canals and distribution systems, weed control, buildings and other District properties.
c. Fresno Slough Water District and TPUD water operations were presented.

CLOSED SESSION

a. Closed Session Pursuant to California Government Code Subdivision (a) of Section 54956.9
CONFERENCE WITH LEGAL COUNSEL--EXISTING LITIGATION
Name of case: NRDC v. Bureau of Reclamation and others.
No reportable action

b. Closed Session Pursuant to California Government Code Section 54957.6
CONFERENCE WITH LABOR NEGOTIATORS
Agency designated representatives: Danny Wade, General Manager
Unrepresented Employees: WaterMaster, Office Supervisor, Field Foreman, Canal Operator (3) **No reportable action**

The Board returned from closed session at 11:53 am to approve Resolution 2009-01 – 2009 full time employee wages. The raises that are requested for the employees will not change the budget value from 2008 budget year to the 2009 budget year. Motion for approval of Resolution 2009-01 was made by Director Pucheu and seconded by Director Ayerza.

The Board adjourned @ 11:55 AM

The next regular meeting will be held 8:30 am on December 16, 2008 at the TID Office.

Respectfully Submitted,

Elizabeth Reeves,
Secretary/Treasurer

Approved By,

Jerry Salvador,
Board President

TRANQUILLITY IRRIGATION DISTRICT
TRANQUILLITY, CALIFORNIA

REGULAR MEETING OF THE BOARD OF DIRECTORS
At the offices of the District

Tuesday November 18, 2008
8:30 AM

PROPOSED AGENDA

1. ADDITIONS OR DELETIONS AND ADOPTION OF THE PROPOSED AGENDA

2. MINUTES for the Special Joint Meeting with FSWD On Oct 14, 2008 and the Special Meeting on Nov 5, 2008 approved.

3. PUBLIC COMMENTS – Comments at this time are limited to items not on this agenda and within the Board's scope of responsibility. Speakers may be limited to 3 minutes.

4. ENGINEERING
   a) Consider and take action to accept preparation of Joint Groundwater Management Plan with Fresno Slough Water District
   b) City Water Grant update

5. WACHOVIA – representatives to update board on Reserve account and Retirement account

6. SECRETARY-TREASURER'S REPORT
   a) Cash Flow Statement.
   b) Accounts payable, and Accounts receivable – past due irrigation accts.
   c) Reserve fund and asset status; cash and property, long-term debt status including; 92-1 Bond Payment, State Water Conservation Loan, and West America Loan.
   d) Prepay accounts
   e) Approval to sign loan application for $250,000 line of credit for CW grant project

7. DIRECTOR REPORTS

8. COUNSEL'S REPORT
   a) Status of legal matters potentially affecting the District

7. MANAGER'S REPORT

a) 2008 Salary & Benefits Survey – ACWA
   1. *Closed Session – See Below item "b" (closed session)*
      a. Resolution 2009-01 – approval of 2009 full time employee wages
   2. Contract for District Manager
b) Review 2009 budget proposal
c) Water rate increase news announcement
d) Well Rate outside District - $85.00 electric & $145.00 diesel
e) Well 24, 25 – electric PG&E, Well 26 – Cal West Rain, diesel
f) Restrooms – city park
g) TID Growers Luncheon 2008-2009
h) TID property dedicated for Fresno County Library – Nov 7,2008 in memory of Frank Miller as first manager of TID

8. WATERMASTER'S REPORTS

Operations and maintenance – The Board will receive reports on all water operations in Tranquillity and TID Fresno Slough property as well as all related maintenance activities completed during the previous month.

1) Water use – irrigation and drinking water.
2) Other maintenance; equipment and facility status, wells, pumps, mobile equipment, canals and distribution systems, weed control, buildings and other District properties.
3) Fresno Slough Water District and TPUD water operations.

9. CLOSED SESSION

a) Closed Session Pursuant to California Government Code Subdivision (a) of Section 54956.9

   CONFERENCE WITH LEGAL COUNSEL–EXISTING LITIGATION
   Name of case: NRDC v. Bureau of Reclamation and others.

b) Closed Session Pursuant to California Government Code Section 54957.6

   CONFERENCE WITH LABOR NEGOTIATORS
   Agency designated representatives: Danny Wade, General Manager
   Unrepresented Employees: WaterMaster, Office Supervisor, Field Foreman, Canal Operator (3)

NOTE: The agenda items may not be presented in the order they are listed. Persons wishing to discuss an item that was taken out of order will have the opportunity to do so. All agenda items listed are considered to be discussion and/or action items. Materials related to an item on this agenda that are public documents and are submitted after distribution and posting of the agenda are available for public inspection in the District's office at 25390 W. Silveira Street, Tranquillity, during normal business hours. Documents that are public documents provided by others during a meeting will be available at the same location during business hours after the meeting.

Individuals needing special assistance in order to participate in this meeting should contact the District Secretary for such assistance or accommodation prior to the meeting.

Tranquillity Irrigation District

Board Meeting Notice
November 18, 2008

Jerry Salvador, Director]

William Pucheu, Director]

George Ayerza, Jr., Director]

Mark Blum, District Counsel]

Gentlemen,

Please be advised that there will be a meeting of the Tranquillity Irrigation District Board of Directors to be held on, **Tuesday November 18th, at 8:30 AM,** in the Tranquillity Irrigation District office, at 25390 W Silveira St., Tranquillity, California. Enclosed is a copy of the proposed agenda and the minutes from the October 14th and November 5th board meetings for your review and approval at the meeting.

Sincerely,

Liz Reeves
Board Secretary/Treasurer

P.O. Box 487, Tranquillity, CA 93668
Telephone (559) 698-7225- Fax (559) 698-5105
E-mail contact@trqid.com- www.trqid.com

TRANQUILLITY IRRIGATION DISTRICT
FRESNO SLOUGH WATER DISTRICT

GROUNDWATER MANAGEMENT PLAN

APPENDIX B – TRANQUILLITY IRRIGATION DISTRICT RULES AND REGULATIONS

Rules and Regulations of Tranquillity Irrigation District

TRANQUILLITY IRRIGATION DISTRICT

Celebrating Our 75th Year
1918-1993

WM. PUCHEU
J.D. FAIRLESS
J.F. SALVADOR
Directors

SARGEANT GREEN
Manager

JEANNIE FAIRLESS
Secretary-Treasurer

NICK FLOCCHINI
Watermaster

Burn down your cities and they will spring up again as if by magic; but destroy our farms and the grass will grow in the streets of every city in the country.

RULES AND REGULATIONS

of

TRANQUILLITY IRRIGATION DISTRICT

Governing the Distribution and Use of Irrigation Water

Introduction

Tranquillity Irrigation District, hereafter called District, is a State agency governed by a Board of Directors elected by the people. It operates under the Water Code of the State of California. The District is a "General Act District", that is, it operates under the Water Code sections that apply to Irrigation Districts and has no special powers granted to it under any special act of the State Legislature. The Water Code Sections that empower the District are contained in Division 11, Sections 20500 to 29999.

The District irrigation water supplies come from various sources but principally include; exchange and contract surface water supplied through the Mendota Pool by the United States Bureau of Reclamation, Kings River flood water when it is available and ground water underlying the District extracted by wells.

The District makes no profit and is operated for the sole benefit of the lands and people within its boundaries. The benefits the people can derive from the District will be measured by the extent to which they cooperate to make it a success. The following rules encompass many of the circumstances and conditions that can assist the District and its customers in finding common ground for continued cooperation and success.

RULE 1

Management

The operations and maintenance of the irrigation system of the District shall be under the exclusive control of the Manager, acting under policies set by the Board of Directors.

The manager shall employ such personnel as may be required and authorized by the Board of Directors for the operation, maintenance and improvement of the system.

RULE 2

Control of Work

All diversion works, canals, ditches, headgates, and other structures belonging to the District will be operated and maintained by the District and their control and operations will be under the exclusive control of the authorized agents of the District. Upon application, the District shall construct, or cause to be constructed, water service outlets for the purpose of delivering water from a District conduit. The service outlet (customarily a "headgate" or "gate") shall be constructed in such a manner as to conform to standards established by the District, and once constructed, shall become the sole property of the District. All costs for materials and/or labor, including that of an adequate measuring device, shall be paid for by the District and reflected in the costs of water to all users, therefore, frequent alterations shall be discouraged and subject to the approval of the Board of Directors. Maintenance of such works shall be at the expense of the District. In such cases when the user or landowner is responsible for extraordinary needed maintenance and/or replacement (such as when a landowner requests a replacement when the existing facility is adequate or accidental damage or abuse by field operators is determined by the District to be beyond the boundary of normal wear and tear), the costs shall be born by the user or landowner. Such extraordinary work will require a written application by the operator or landowner and construction will be integrated into the maintenance program schedule at the discretion of the Manager. The location and number of "gates" for the distribution of water from the District's canals and the manner of delivery from such facilities, so as to secure safe and efficient operation, shall be ultimately determined by the Manager, subject to the approval of the Board of Directors.

RULE 3

Tampering and Damage to District Facilities

Manipulation of District weirs, headgates and other structures is forbidden, unless permission is given by the Watermaster or other authorized employee of the District. Cutting canal or ditch banks and/or placing dams or other obstructions in District-owned canals or ditches is prohibited.

Removal of dirt from, or other use, of the District-owned property such as, but not limited to, the utilization of the canal bank on which to turn farm equipment, the placing of toe ditches, drainage ditches, fences, trees or other crops, pumping plants, structures or other obstructions upon the District's rights-of-way are also prohibited, unless done with specific written permission and in accord with any conditions imposed by the District.

Water users or others, shall not permit their livestock to feed or trespass upon the rights-of-way of District-owned canals, drains or ditches except with specific permission of the District. In cases where it is necessary to cross the right-or-way, or to move livestock from one point to another along District rights-or-way, permission to use the rights-of-way for that purpose must be obtained from the Manager in advance. Any damage done to canal or ditch banks in using them for a roadway , whether moving livestock, farm equipment, or other vehicles, shall be the responsibility of those making use of the property. If it is found necessary for the District to repair such damage, those responsible shall pay all cost of such repairs.

RULE 4

Operation and Maintenance of Private Ditches or Laterals

The term "ditch" as used in this Rule, includes all gates, structures or other diversion works within a private ditch or lateral.

The operation and maintenance of privately owned ditches or laterals shall be the sole responsibility of the individuals who use the private ditch or lateral. "Use" of such ditch or lateral means irrigating from it, draining into it, or allowing the grazing or watering of stock therein, or taking or permitting any action of any nature which affects the condition of the ditch or causes any impairment of flow of water therein.

Privately owned ditches or laterals must be kept in reasonable repair and reasonably free from weeds and other obstructions, and be of sufficient capacity at all times to carry an adequate amount of water to irrigate the lands under them.

In the event that water is ordered in excess of the capacity of a privately owned ditch, only amounts up to the capacity of the ditch as determined by the District will be delivered. If the ditch is in such unclean or otherwise unsuitable condition that a usable amount of water cannot be delivered safely, or waste of water would result, delivery will be refused until such conditions are remedied.

Landowners shall construct and maintain adequate drainage facilities so that adjacent or lower lying lands will not be damaged, and no irrigator shall be delivered a greater amount of water than he can economically and beneficially use without waste, and with due regard to the needs of other irrigators.

The District will not be responsible for any loss or damage resulting from open ditch or drainage cuts, or improperly closed ditch or drainage cuts made by the user in any privately owned ditch or lateral, or for the improper functioning of any gate, structure or other diversion works therein.

Agreements may be entered into by the District, leasees and the landowners owning a particular ditch or section thereof, for the construction, reconstruction, and/or maintenance thereof under appropriate sections of the Water Code.

The legal provisions of the Water Code governing maintenance of privately owned ditches, and the District's power with respect thereto, are set forth in Appendix A of these Rules and Regulations.

RULE 5

Liability for Damage

The District will not be liable for any damage caused by the negligence or carelessness of any user in the use of water or for failure on his part to maintain any ditch or structure therein for which he is responsible - either wholly or in part. A waiver of such liability will be incorporated in an annual application for water (Rule 8). Each operator or owner will sign such a waiver or be subject to forfeiture of any rights or priveleges the District is legally entitled to grant.

RULE 6

Access to District Property and Rights-of-Way

Use of District property and right-of-way is by permission only. The use of canal banks or other real properties is limited to activities related to agricultural operations and other uses deemed appropriate by the Manager under Board direction. Any user or any other individual entering upon District property does so at his own risk.

RULE 7

Irrigation of Excessively High Ground

The District will not raise water to an excessive height in canals or ditches in order to give service to lands or ditches of unreasonable elevation, as determined by the District.

RULE 8

Application for Water

At the beginning of each irrigation season, each user shall submit to the Manager a properly completed written application for irrigation water in the specified year. The aplication form will be furnished by the District and will require the following: the number of acres to be irrigated and if deemed necessary by the District, proof of the rights to irrigate said land (deed, lease or other appropriate instrument), the kind of crops and the number of acres to be devoted to each crop, as nearly as can be determined, and such other information as the Manager may require to enable him to plan properly for distribution of water. If the applicant is part of a partnership or corporation, the other responsible officers must co-sign the application thereby signifying an understanding of their responsibilities and the requirements and rules of the District. The landowner, if different from the water user, shall receive a copy of the water application, informing him of his responsibility for payment of any unpaid charges incurred on his property.

RULE 9

Irrigation Season

The District's annual irrigation season shall commence with the filling of the canal system starting on or about February 1st of each year, and terminate on November 15th of each year. However, the District reserves the right at its sole discretion to deviate from these dates, both as to the canal system as a whole, or any portion thereof, based upon irrigation water requirements, climatic conditions, construction and maintenance requirements, or for any other reason.

During the period November 16th to January 31st of the following year, or such other non-irrigation period as may be determined by the District, irrigation service may be given, at the sole discretion of the District, by the use of available gravity entitlement surface water supply, or by the use of District wells, where physically and economically feasible, and where such service does not in any manner interfere with the District's contractual obligations, or with maintenance, construction or other activities of the District necessary to properly operate district canals and facilities.

RULE 10

Charges for Water, Materials and Services

Charges for water, materials and services including the transportation of foreign (non-District) water, will be fixed and the date or dates of payment of the same shall be determined by the Board of Directors. Such charges are in addition to any assessments that may be levied by the Board of Directors under the provisions of the Water Code.

The charges to the water user or users of water service (usually well water) during the non-irrigation season shall include all appropriate costs of the use of physical facilities required (such as power at lift pumps), and a flat charge per acre foot for all well water costs as may be determined and established by the Board of Directors.

The charges for all waters, regardless of source, will reflect a pro-rata share of system conveyance losses which will be reviewed periodically in an independent evaluation by an engineer or equivalent professional.

RULE 11

Unpaid Charges and Refusal of Service

All invoices for water, work orders, materials, and permanent maintenance agreements are due and payable by the 25th day of the month after receipt of the service. All past due bills shall be subject to a penalty of one and one half percent (1 1/2 %) per month, compounded monthly with a fifty cent ($ 0.50) handling charge.

Any charges that are not paid in full prior to February 1 of the following year will be declared delinquent, and the person who is responsible for those charges may be required to pay all water, delinquent or other charges for the succeeding year in advance of service, or face termination of service. Any users who are consistently delinquent for water charges (for more than two consecutive years), at the sole discretion of the Board of Directors, will be charged in advance of services. The water charges will be paid on or about February 1 (before water service can begin) for subsequent irrigations and on June 1 for the balance of the anticipated irrigation amounts or allocation, whichever is appropriate. If for any reason an allocation is adjusted upward, users under the advance payment schedule shall make the necessary payments to cover the adjustment within ten days of the District announcement or forfeit the entitlement.

Because landowners are ultimately responsible to the District for all unpaid bills incurred by themselves or tenants, the Manager shall notify all landowners of all outstanding bills against their particular property as soon as practical after December 31st of each year. However, failure to so notify the landowner will not eliminate the ultimate legal responsibility of the landowner for such payment.

The District reserves the right to refuse or discontinue service to any user who is in default in the payment of any District assessment or charge of any nature, and also to any land on which any such payment is delinquent, in accordance with Sections 22256 and 22282.1 of the Water Code of the State of California. In addition, the amount of any delinquent charges may be recorded as a lien against the user's or land owner's property, in accordance with Section 25806 of the Water Code.

All claims for overcharges or errors must be made in person or in writing and filed with the District within thirty days from the date the bill is received.

RULE 12

Delivery of Water

During the irrigation season, the hours of 7:00 a.m. to 9:00 p.m. shall be considered normal business hours for the Watermaster/Operations staff. Telephone calls during that time may be answered by a telephone recording device. Routine calls will be promptly acknowledged, and emergencies will be responded to as quickly as possible. All water orders will be recorded on a form provided by the District. These service orders must be signed by the water user, his representative or a District representative in the case of a phone order. All such signed service orders obligate the user to pay any charges associated with the order.

Water should be ordered at least 48 hours in advance, and the District will attempt to deliver water to the District's headgate as timely as possible. In order to provide timely service and to minimize waste of water, the Watermaster or Operations staff must be given an approximate shut-off date and time. A 10% surcharge on the water used during a delivery will be charged if the user fails to specify a shut-off date and time.

Water will be delivered as ordered within lateral areas as equitably as possible. Any consumer not able to use water at the time requested may receive water upon the completion of the deliveries in his lateral area, provided no undue loss of water is involved and there is no interference with deliveries to other irrigators. Heads or flow rates applied for may be altered by the District when necessary. Users should apply the water continuously day and night until irrigation is completed and without waste at any time.

Foreign water brought into the District by a user will be distributed by the District the same as District water. However, foreign water will be assessed its approximate share of losses as determined in an engineering report (Rule 10) and lift costs attributed to the District system as determined by the Manager and approved by the Board of Directors. Foreign water that is unused after completion of an irrigation season shall be lost unless the user makes arrangements for storage with agents acceptable to the District.

RULE 13

Basis of Allocation, Shortage of Water and Overuse

Each consumer shall be entitled to his proportionate share of the quantity of water available in accordance with the provisions of the Water Code of the State of California. Requests for delivery of water during shortages should be made at least five days prior to the date water is wanted. However, water will be delivered on requests made less than five days before the date water is wanted provided water is available and deliveries can be made without interference with other users and without undue waste of water or undue manipulations of weirs and gates. In the event that during any irrigation season there is an anticipated shortage of water, or an actual shortage of water occurs, the District will pro-rate the available supply among all consumers. In pro-rating the water the District may reduce the length of time of each run of water, and/or the amount of water delivered during each run of water, or the amount of water delivered during the period of shortage. The District will attempt to provide notice of any anticipated shortage, but assumes no responsibility for any inconvenience, damage, loss or injury arising from a failure to provide such advance notice.

In the event of overuse of allocated water during shortages, a penalty of three times the amount of water used in excess of the user's allocation will be deducted from the user's allocation for the next succeeding year. Alternate arrangements can be made to replace the water, however all such written transactions must be completed by August 15 of the instant irrigation season. In addition, users who consume water in excess of their allocation shall have a surcharge of 10% applied to the charges for amounts of water delivered which exceed the user's allocation, unless the District has received the advance notice of a transfer of water for an amount of water equal to or greater than the excess delivery.

Carryover of District water from one year to the next is prohibited.

The District reserves the right to suspend service during any period of time when it is necessary to take water out of the canals for public safety, emergencies, cleaning or other maintenance, repair or reconstruction work.

RULE 14

Transfers of Water

Transfers of allocated water within the District during times of shortage will be permitted. However, advance notice of such transfers shall be given to the District in written form not later than August 15 of any irrigation season so as to allow the District to make proper arrangements for delivery and determine availability and impacts of such transfers. The District reserves the right to refuse such transfers if the re-scheduling and re-allocation adversely impacts the ability of the District to serve other users or comply with other contractual commitments or requirements.

Transfers of District water outside of the District as authorized or controlled by Federal or State law or on the District's own volition, will be permitted when all the requirements of the laws or subsequent regulations have been met or all needs internal to the District and its users have been satisfied and the water declared by the Board of Directors surplus to those needs. The Board of Directors has found and declares that the priority for utilizing transferrable water should first be District operators and landowners, then others. The cost of the water will be determined by the Board of Director's but in all cases will as a minimum recover all reasonble District costs. The Board reserves the right to review the appropriateness of any transfer request and may require certain information necessary to determine the appropriateness and to the degree possible, prevent transfers which will result in any undue consideration or benefits to the receiving party or third parties. Delinquent users and their principals are not eligible to exercise any outside transfers.

All transfer related charges and fees must be paid in full before the execution of any outside transfer.

RULE 15

Point of Delivery

All measurements and deliveries of water shall be made at the point where the consumer's lateral or ditch connects with the canal or ditch owned by the District, at which point the District shall install and operate a controlled outlet box or headgate as provided for in Rule 2. The time of delivery will start when the headgates to such laterals or ditches are opened and expire when said headgates are closed. Exceptions to this rule may be made by the District to fit operating conditions.

RULE 16

Unauthorized Taking of Water

Persons interfering with the regulation of water in the canals or ditches of the District are subject to criminal prosecution. If any person takes water without permission of the Watermaster, he shall not only be subject to criminal prosecution, but may also forfeit his right to water, in addition to any other penalties or liabilities which may accrue as a consequence of such conduct.

District penalties will include as a minimum all charges and remedies described for overuse (Rule 13).

RULE 17

Transportation of Well and/or Government Water

The Board of Directors reserves the right to adopt such policies and/or rules and regulations on the transportation of well and/or Government owned waters through District owned canals and ditches as may be to the best interest of the District and its users.

RULE 18

Ownership of Water

All water in District owned canals, drains or ditches, regardless of source, except water being transported therein by written permission of the District, is District water and is subject to diversion and use by the District.

RULE 19

Limitation on Drainage

No drainage waters shall be introduced into District owned canals, drains or ditches, either directly or indirectly, without the specific written permission of the District.

RULE 20

Access to Land

The authorized agents or employees of the District shall have reasonable access at all times to all lands irrigated from the District system for the purpose of examining any ditches, laterals or drains serving such lands and/or the flow of water therein, for the purpose of ascertaining the acreage of crops on lands irrigated or to be irrigated, or for any other District purpose.

RULE 21

Nuisances

No material or substance of any nature, and particularly those that are or may become offensive to the senses or injurious to health or which do or may injuriously affect the quality of water, obstruct the flow of water, or result in the scattering of seeds or noxious weeds, plants or grasses, shall be placed or dumped in any ditch or on any right-of-way of the District, or be placed or left so as to roll, slide, flow, or be washed or blown into any ditch or onto any right-of-way. Any violation of this rule will subject the offender to criminal prosecution and/or civil liability. All employees of the District shall promptly report any violation of this rule, and the users of the District are especially urged to cooperate in its enforcement.

RULE 22

Complaints of District Customers

Complaints of any kind against the District or any of its personnel should be made in writing to the manager promptly after acts complained of have occurred. Customers shall have the right to refer any complaints in writing or in person to the Board of Directors of the District, which meets at 8:30 a.m., on the second, and when necessary to complete the Board's business, fourth Tuesdays of each month, at the office of the District, 25390 W. Silveira Street, Tranquillity, California. Nothing in this rule abrogates any provision contained in California Government Code Section 810, et. seq., pertaining to claims and complaints against the District.

RULE 23

Stock Water

The District shall not be required to furnish water for the exclusive purpose of watering stock.

RULE 24

Pumping and Pipelines

All water users who elect to pump water from the canals or conveying water by means of pipelines or closed conduits using their own equipment and facilities, shall nonetheless be governed in all respects by the rules and regulations applicable to consumers under gravity ditch service. Pumping by users of District transported or Government water is done at the user's risk, and the District, its officers and employees, assume no liability for damages to pumping equipment or to pipelines, or other damages as a result of turbid water, chemical quality, shortage or excess of water, or other causes.

RULE 25

Penalty for Non-Compliance

Refusal to comply with the requirements herein, or transgression of any of the foregoing rules and regulations, or any interference with the discharge of the duties of any employee of the District, shall be sufficient cause for shutting off the water, and water will not again be furnished until full compliance has been made with all requirements hereof. Nothing contained in these rules shall be construed as a limitation of the rights of the District. Any remedies and rights stated herein are in addition to any rights or remedies otherwise available to the District.

RULE 26

Changes in Rules and Regulations

The Board of Directors reserves the right to change these Rules and Regulations by majority action of the Board at any regular or special meeting, by adopting an appropriate resolution and publishing such resolution in the minutes of the District, a public record. Publications and disseminations of such changes by the printing of revised Rules and Regulations will be limited to economically feasible intervals as determined by the Board.

There shall be maintained at the office of the District, however, a master copy of these Rules and Regulations, including all changes made by the Board of Directors, which copy will be open to inspection at any time during normal office hours of the District.

APPENDIX A -- SELECTED CODE SECTIONS

Penal Code of the State of California

SECTION 592. Every person who shall, without authority of the owner or managing agent, and with intent to defraud, take water from any canal, ditch, flume or reservoir used for the purpose of holding or conveying water for manufacturing, agriculture, mining, irrigation or generation of power, or domestic use, or who shall without like authority, raise, lower, or otherwise disturb any gate or other apparatus thereof, used for the control or measurement of water, or who shall empty or place, or cause to be emptied or placed, into any such canal, ditch, flume or reservoir, any rubbish, filth, or obstruction to the free flow of the water, is guilty of a misdemeanor.

Water Code of the State of California

SECTION 7000. As used in this chapter "conduit" includes ditch, pipeline, and flume.

SECTION 7001. When two or more persons are associated by agreement in the use of a conduit, well or pumping plant, for the conveyance, obtaining or disposing of water, or are using such conduit, well or pumping plant, or any part thereof, for any lawful purpose, to the construction of which they or their grantors have contributed, each is liable, in the absence of any agreement to the contrary, to the others for the reasonable expenses of maintaining and repairing the same proportionately to the use actually made of such conduit, well or pumping plant, whether used in connection with irrigation or drainage.

SECTION 7002. If any person neglects, after demand in writing, to pay his proportion of the expenses under the next preceding section, he is liable therefor in an action for contribution, and in any judgment obtained against his interest from the time of demand shall be included.

SECTION 7003. The action authorized by this article may be brought by any or all of the parties who have contributed more than his or their just proportion of the expenses, and the plaintiff may recover, as costs, reasonable counsel fees to be fixed by the court.

SECTION 22256. A district may refuse to furnish water to any land to which it holds title by virtue of collector's deeds to the district or to any or all land on which the district has an outstanding unredeemed certificate of sale for the nonpayment of a district assessment.

Section 22257. Each district shall establish equitable rules for distribution and use of water, which shall be printed in convenient form for distribution in the district. A district may refuse to deliver water through a ditch which is not clean or not in suitable condition to prevent waste of water and may determine through which of two or more available ditches it will deliver water.

A district may close a defective gate in a community water distribution system used for irrigation purposes and may refuse to deliver water through the defective gate if the landowner fails to repair the gate or outlet to the satisfaction of the district within a reasonable time after receipt of notice from the board through its authorized water superintendent, manager, or ditch tender to repair the gate or outlet...

Section 22282.1 A district may refuse service to any land if outstanding charges for services already rendered such land have not been paid within a reasonable time.

Section 22283. A district may prescribe reasonable rules to carry out the provisions of this article.

Section 25806. (a) In case any charges for water and other services or either remain unpaid the amount of the unpaid charges may, in the discretion of the district:

(1) ...

(2) Be secured at any time by filing for record in the office of the county recorder of any county, a certificate specifying the amount of such charges and the name and address of the person liable therefore.

From the time of recordation of the certificate, the amount required to be paid together with interest and penalty constitutes a lien upon all real property in the county owned by the person or afterwards, and before the lien expires, acquired by him. The lien has the force, priority, and effect of a judgment lien and shall continue for 10 years from the date of the filing of the certificate unless sooner released or otherwise discharged. The lien may, within 10 years from the filing of the certificate or within 10 years from the date of that last extension of the lien in the manner herein provided, be extended by filing for record a new certificate in the office of the county recorder of any county and from the time of filing the lien shall be extended to the real property in such county for 10 years unless sooner released or otherwise discharged.

RESOLUTION 03-11

ATTACHMENT A

CONSOLIDATED REQUIREMENTS FOR THE ADMINISTRATION OF THE TRANQUILLITY IRRIGATION DISTRICT DOMESTIC DRINKING WATER SYSTEM

INTRODUCTION

Tranquillity Irrigation District operates and maintains the drinking water system for the citizens of the community of Tranquillity. In order to properly administer the system, the Board of Directors finds it necessary to establish certain requirements so as to be fair and equitable in apportioning the costs of operating the system and protect the public's resources. This consolidated set of requirements and conditions is the District's primary structure for meeting that goal. However, it is difficult to anticipate every eventuality in the development of such a system, therefore, where the requirements are silent or subject to interpretation, the final decision on any and all matters rests solely with the Board of Directors of the District. However, the Board does grant to the District Manager the necessary discretion to implement the intent of these requirements. The following constitutes the District's requirements and conditions for participation in the use of the drinking water system.

APPLICATION

For the convenience of the District and its customers, all transactions begin with making application to the District for domestic water service. The District may require certain information in the application, including but not limited to; permission for the applicant to occupy the premises to be served, other permits or licenses for occupancy from other agencies such as Fresno County, and any other information deemed necessary by the Board to establish bonafide connections to the system. Failure to provide the necessary documents or proof of occupancy could result in denial of connection or termination of connection to the system. The District application is included herein as a part of these requirements. The application will be reviewed as needed for relevancy and compliance with the laws of the State and federal government, especially with regard to the regulation of drinking water systems and consumer protection. Questions or concerns regarding the application should be directed in writing to the Manager of the District.

CONNECTION

Each hookup to the water system is deemed a connection. A connection is any location where water service is provided to a single domestic unit or its equivalent. A connection is not tied to a single parcel of land, property owner, or head of household. However, a connection at any single family residence is limited to the immediate family. Residences with more than one family living as a family will be considered as a commercial connection and subject to the special conditions noted below. The Board reserves the right to finally determine what is a connection whenever a dispute arises. A full connection includes an average house and landscaped yard/lot in the community of Tranquillity. Anything less than a full connection, such as to a home without a distinct, separate yard or to a temporary facility, will be charged a one-half connection. Half connections will be limited to facilities that have no landscape watering, no more than one bathroom equivalent of various sink and lavatory facilities and no washing machines or similar high water use hookups. If these conditions are met, the location qualifies for a review and determination of eligibility by the District manager. Adverse decisions by the manager will be subject to an appeal to the Board of Directors.

Certain connections are deemed "special" and subject to individual treatment regarding charges, equipment and expansion. "Special" connections will be analyzed by the manager and presented to the Board for consideration and approval. These special circumstances may require alternate calculations of the use of water that are related to the volume of use or potential impacts on quality. For instance, the District may require meters for large industrial or commercial users, or backflow prevention devices to prevent contamination of the community supply. The connections subject to these special circumstances may have a customized application documenting the circumstances necessary for the connection to the system. In addition, the District may declare some connections to pose a threat to the integrity of the drinking water system and specifically a threat to the health and well being of the community. The District at its own discretion, upon making such a finding, reserves the right to disconnect any such connection and require the health threat be cured before re-connecting the user to the system. Remedies may include requiring new service lines after the curb stop or backflow prevention equipment, whichever provides the most appropriate degree of protection to the system. Backflow prevention devices or any other remedy will be at the expense of the user, including any ongoing inspection of the device by a certified backflow tester.

CONNECTION FEES AND CHARGES

Fees and charges will be reviewed and established by Resolution at the first Board of Directors' meeting of each calendar year. The fees and charges include the following:

1. Connection fee for new construction of a connection (tapping of main, curb stop, meter box, etc.) to eligible properties - includes a refundable connection fee established by the Board. Work necessary to make the connection, (materials and labor) will be charged against the fee. Costs incurred above the connection fee will be added to the first regular monthly charge, or special arrangements can be made to equalize payments for up to one year. If construction costs are less than the original connection fee, the balance will be applied to the required account deposit first, then monthly charges for not more than 3 month's charges and any remaining balance would be returned to the applicant. Eligible properties are those that are within a reasonable distance (500ft.) from a serviceable distribution line already installed near the property.

2. Regular connections - domestic water connections are a service the District provides for charges. Payment of charges are necessary to maintain the connection. The following describes the charges and penalty process.

a. Account deposit - all accounts started after November 1996, will be subject to three months of charges in advance as a deposit (Brewer Bill impact, AB 1770, January 1997 minute order). Upon terminating service, the deposit will be applied to any remaining unpaid balance first, then the remainder will be rebated to the customer within 60 days of account closure. In no case will any user be allowed to become delinquent to the extent the deposit is in jeopardy of descending to a zero balance, such accounts will be subject to the shutoff procedure. Connections that are landowner occupied and become delinquent are subject to Water Code Section 25806 provisions of adding the unpaid charges to the annual assessment levied upon the land (Resolution 1976-2).

b. Monthly charge - each account will be subject to a monthly charge due and payable immediately following the month of use. Such payments will be considered delinquent after the 25th day of the month succeeding use (Resolution 1976-2).

c. Interest charges and penalties - charges that are past due more than thirty days are subject to penalties and interest. The late charge penalty is fifty cents. In addition, an interest charge of one and one-half percent per month is levied on the unpaid balance (Resolution 1977-1, March 1992 minutes).

d. Shutoff procedure - accounts that are delinquent more than 90 days are subject to a shutoff procedure. The procedure involves the customer receiving a two-week shutoff notice followed by a 48 hour notification running concurrently. Failure to pay by 10 AM on the morning of the day after 48 hours has gone by will result in turning off of the service. A disconnect and re-connect fee is charged

when the account is brought current. The Board establishes the disconnect and re-connect fee and each fee is generally the same as the monthly charge for service. The disconnect and re-connect fee covers the staff time to lock off and then turn on the valve serving the customer (Terms and Conditions, November 1996).

e. Consistent delinquencies - if an account is delinquent more than three times in any twelve month period, the user is required to pay the District in advance of the service in addition to maintaining any required deposit.

f. Account inquiries - all information regarding accounts is privileged and confidential. Questions regarding the status of an account, or arrangements for alternate payment methods, should be addressed to the manager or his designee in person in the District office or in writing to the District mailing address. Alternate payment arrangements will be subject to review and approval by the Board of Directors.

g. Pre-payment of charges - six months (or more) pre-payment of charges entitles the user to a 10% discount (Resolution 1976-1). Notification of the opportunity to pre-pay is sent to all users in normal billings or by postcard.

h. Termination - delinquent accounts subject to the disconnect and re-connect charges are considered terminated. Unauthorized connections (no application, hose hookups, digging and attaching without informing the District) will also be subject to termination. Terminated accounts will be shut-off immediately. Terminated connections may also be subject to re-application and prior approval by the Board of Directors before re-connection (Resolution 1973-7, March 1995 minute order).

WATER CONSERVATION

It is the goal of the District to provide reasonable amounts of water for use at all legally permitted connections. Waste or flagrant misuse will be discouraged by implementing the following.

1. The District will respond to complaints of waste of water by other users or conduct casual visual inspections (by staff). When it is clear the complaint is valid or the inspection confirms the overuse, the user will be notified in writing of the District staff's findings and warned to curtail use. Clear overuse includes landscape irrigation resulting in high amounts of water leaving the user's property and entering the roads, gutters and storm drains or complaints from the local utility district that excessive amounts of water are entering the sewer system. After a user has been warned three times in writing, the District will install a water meter at the user's expense and begin charging the user for water consumed rather than a flat rate. The volumetric rate will be established by the District Board of Directors.

2. No domestic drinking water will be allowed for the irrigation of pasture used for animal husbandry (Resolution 1976-1).

SYSTEM EXPANSION AND ADDITIONS

From time to time the District is asked to evaluate the possibility of extending service to properties that for one reason or another had not previously been serviced by the District. It is the District's intent to attempt to reasonably serve all lands within the sphere of influence of the District. Any landowner within the sphere can petition the District to investigate the feasibility of providing such service. The feasibility of providing service includes evaluating the impact of the new service on the existing system and the required facilities to provide the new service. If any applicants wish to proceed based on such feasibility, they must contract to pay the cost of the investigation, findings, recommendations and construction. When more than one applicant is involved, each must pay their proportionate share of the costs. Should such projects proceed, any subsequent new users in the area of the addition must reimburse their proportionate share to the original proponents for up to ten years after completion of the addition. After ten years, no further reimbursements will be made. All additions and expansions shall be District property to the point of individual connections.

ACCESS AND LIABILITY

The District's water service connection will be located as conveniently as possible for all parties involved. However, in most instances the connection and meter box will remain in the right-of-way claimed by the County of Fresno or other public agency. All appurtenances beyond the right-of-way will be the responsibility of the property owner. From time to time, certain properties may require the installation of the District equipment on private property. Such circumstances will lead to the need for the District to: (1) obtain an easement from the property owner, or; (2) require the property owner to sign an access provision on the application for service. Such access will be necessary to maintain the serviceability of the District connection.

The District will also request the applicants for water service understand and sign a provision of the application that recognizes the District is not liable for damages from the failure of any landowner's or user's water distribution facilities past the District's connection.

Enclosure: Application for Domestic Drinking Water Service Connection

TRANQUILLITY IRRIGATION DISTRICT
FRESNO SLOUGH WATER DISTRICT

GROUNDWATER MANAGEMENT PLAN

APPENDIX C –

GROUNDWATER MONITORING PROTOCOLS

GROUNDWATER MONITORING PROTOCOLS

GENERAL SCOPE

The purpose of this document is to insure that the sampling and analytical methods are adequately documented and appropriate for the project scope and purpose by individuals responsible for implementing the monitoring program. Examples of all required forms are presented at the end of this section.

In general, measurements of the static water level will be taken from the top of each casing, and then the monitoring wells will be purged and sampled. A detailed description of these procedures follows.

EQUIPMENT USED DURING SAMPLING

Water level sounding equipment and field meter probes (pH, dissolved oxygen, conductivity, temperature, and turbidity) will be thoroughly rinsed with deionized/distilled water before and after each reading. All field meters will be calibrated according to manufacturer's guidelines and specifications before and after every day of field use.

The monitoring wells will be equipped with a dedicated sampling well pump or sampling activities will utilize disposable bailing equipment. All non-dedicated sampling equipment (in contact with sample) shall be thoroughly cleaned prior to each sampling event to prevent cross-contamination between samples and to ensure accurate representation of analytes of interest in each sample. All sample containers and sampling equipment shall be sterilized and transported to the field under conditions to preserve its sterility. Personnel performing decontamination shall wear gloves, eye-protection, and such other safety equipment as needed. The analytical laboratory as part of their agreement shall provide all sample containers, container preparation services, preservatives, and field blanks.

EQUIPMENT DECONTAMINATION PROCEDURES

All equipment that comes into contact with potentially contaminated water will be decontaminated. Disposable equipment intended for one-time use will not be decontaminated, but will be packaged for appropriate disposal. Decontamination will occur prior to and after each use of a piece of equipment. The following, to be carried out in sequence, is the recommended procedure.

- Non-phosphate detergent and tap water wash, using a brush if necessary;
- Tap water rinse; and
- Deionized/distilled water rinse.

WATER LEVEL MEASUREMENT PROCEDURES

Water levels will be measured in wells that have the least amount of known contamination first. Wells with known or suspected contamination will be measured last.

If wellheads are accessible, all wells will be sounded for depth to water from top of casing and total well depth prior to purging. An electronic sounder, accurate to the nearest +/- 0.01-ft, will be used to measure depth to water in each well. When using an electronic sounder, the probe is lowered down the casing to the top of the water column, the graduated markings on the probe wire or tape are used to measure the depth to water from the surveyed point on the rim of the well casing. Total well depth will be sounded from the surveyed top of casing by lowering the weighted probe to the bottom of the well. The weighted probe will sink into silt, if present, at the bottom of the well screen. Total well depths will be measured by lowering the weighted probe to the bottom of the well and recording the depth to the nearest 0.1-ft. Depth to water and total well depth will be recorded on a Monitoring Well Purging and Sampling Record as presented at the end of this section.

WELL PURGING

The wells will be sampled no sooner than 48 hours after well development. All wells will be purged prior to sampling. If the well casing volume is known, a minimum of three casing volumes of water will be purged using the dedicated well pump, if present, or a bailer, hand pump, or submersible pump depending on the diameter and configuration of the well. When a submersible pump is used for purging, clean flexible Teflon tubes will be used for groundwater extraction. Pumps will be placed 2 to 3 ft from the bottom of the well to permit reasonable draw down while preventing cascading conditions.

Water will be collected into a measured bucket to record the purge volume. Casing volumes will be calculated based on total well depth, standing water level, and casing diameter. One casing volume will be calculated as $\mathbf{V = \pi\ r^2\ h\ 7.48}$ where **V** is the volume of one well casing of water in gallons ($1ft^3$ = 7.48 gallons); π = 3.14; **r** is the radius of the inner well casing (in ft); and **h** is the total height of the water column in the well (in ft).

It is most important to obtain a representative sample from the well. Stable water quality parameter field measurements (temperature, pH, and specific conductivity [EC]) indicate representative sampling is obtainable. Water quality is considered stable if for three consecutive readings:

- Temperature range is no more than +1/C;
- pH varies by no more than 0.2 pH units; and
- EC readings are within 10% of the average.

If the well casing volume is known, measurements will be taken before the start of purging, in the middle of purging, and at the end of purging each casing volume. If the well casing volume is NOT known, measurements will be taken every 2.5 minutes after flow starts. If water quality parameters are not stable after 5 casing volumes or 30 minutes, purging will cease, which will be noted in the field notes, and ground water samples will be taken. The depth to water, water quality field measurements, and purge volumes will be recorded on a Monitoring Well Purging and Sampling Record as presented at the end of this section.

If a well dewaters during purging and three casing volumes are not purged, that well will be allowed to recharge up to 80% of the static water column and dewatered once more. After water levels have recharged to 80% of the static water column, groundwater samples will be collected.

WATER LEVEL MEASUREMENT AND WELL PURGING RECORDS

During the collection of each sample, the following information will be recorded on a Monitoring Well Purging and Sampling Record as presented at the end of this section:

- Well identification;
- Sampler's name(s);
- Date and time of sample collection;
- Designation of sample as composite or grab, if applicable;
- Type of sampling equipment used;
- Field instrument readings and calibration;
- Field observations and details related to analysis or integrity of samples (e.g., conditions in nearby waterways, weather conditions, noticeable odors, colors, etc.);
- Preliminary sample descriptions (e.g., clear with strong ammonia-like odor);
- Time of arrival/entry on site and time of site departure; and
- Deviations from sampling plans.

PURGED WATER DISPOSAL

Purged and excess groundwater collected for sample container filling may be disposed on site or in the sampling area by dispersing onto the ground, or at the owner's direction.

ANALYTICAL METHODS AND REPORTING LIMITS

Requested analytes are provided in the following table. Reporting limits are laboratory specific based on the type of equipment each laboratory uses. Analytical methods and holding times are listed by analyte below.

Analyte	Standard Method	EPA Method	Holding Time
PH	4500H-B	150.1	24 hours
EC	2510B	120.1	28 days
Alkalinity	2320B	310.1	14 days
Ammonium	4500NH4	350.1	28 days
Bicarbonate	2320B	310.1	14 days
Carbonate	2320B	310.1	14 days
Chloride	4500Cl	300.0	28 days
Iron	3120B	200.7	6 months
Magnesium	3120B	200.7	6 months
Manganese	3120B	200.7	6 months
Nitrate as N	4500NO3	353.2; 300.0	48 hours
Nitrite as N	4500NO2	353.2; 300.0	48 hours
Phosphorus	4500P	365	28 days
Potassium	3120B	200.7	6 months
Sodium	3120B	200.7	6 months
Sulfate	4500SO4	300.0	28 days
TDS	2540C	160.1	7 days
TKN	4500-NH3	351	28 days

SAMPLE CONTAINERS AND PRESERVATIVES

Sample containers are generally available directly from the laboratory. All containers will be one-liter polyethylene, precleaned, and analyte specific. Groundwater samples for TKN and ammonia will be collected in containers containing H_2SO_4 as a preservative. The remaining samples need not be preserved. If a preservative is present, the bottle will be capped and lightly shaken to mix in the preservative. Samples from each location that require the same preservative may be placed in the same bottle if being analyzed by the same laboratory. Samples to be analyzed for dissolved metals must be filtered prior to preservation and analysis.

SAMPLING PROCEDURES

Water samples will be collected from each well and placed into laboratory prepared containers, sealed with tight fitting caps, labeled, and stored in a cool ice chest. Water

used for field measurements of temperature, pH, and EC shall not be used as sample water. The following are the recommended sample collection procedures:

- Rinse the tubing with one liter of sample prior to sample collection;
- If no preservative is present, rinse sample bottles three times with a small amount of sample;
- Collect sample directly into the sample bottle;
- Allow sample containers to be open for the shortest time possible to prevent contamination;
- Do not touch the inside of bottles, lids, or tubes. Hold the bottle lid with the inside facing down to prevent contaminating the inside of the lid;
- Allow the sample water to flow into the bottle from above;
- Close bottle tightly,
- Samples will be chilled to 4 C^{o} immediately upon collection; and
- Transport samples to the lab as soon as possible.

At each sampling location, all bottles designated for a particular analysis will be filled sequentially before bottles designated for the next analysis are filled. If a duplicate sample is to be collected at this location, all bottles designated for a particular analysis will be filled sequentially before bottles for another analysis are filled.

All samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. Every sample, including samples collected from a single location but going to separate laboratories, will be pre-assigned an identifiable, unique sample number. The following is an example sample label:

Sample #:	**Well ID:**
Analytes:	**Date:**
Collected by:	**Time:**

It will be possible to identify each unique sample by recording the following information on the Monitoring Well Purging and Sampling Record:

- Sample identification numbers and any explanatory codes;
- Sample date and time;
- Lot numbers of the sample containers;
- Chain-of-custody form numbers;
- Shipping arrangements (overnight air bill number); and
- Name(s) of recipient laboratory (ies).

CHAIN-OF-CUSTODY

A chain-of-custody (COC) record will be completed and accompany all sample shipments for each laboratory and each shipment. If multiple coolers are sent to a

single laboratory on a single day, COCs will be completed and sent with the samples for each cooler. Generally, the laboratory will supply blank COCs. An example COC is included at the end of this section.

The COC will identify the contents of each shipment and maintain the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. The sampling team leader or designee will sign the COC in the "relinquished by" box and note date, time, and air bill number.

SAMPLE HANDLING AND TRANSPORT

The following outlines the packaging procedures for sample delivery to a California Certified Environmental Laboratory Accreditation Program (ELAP) laboratory:

- Pack ice in zip-locked, double plastic bags. Seal the drain plug of the cooler with tape to prevent melting ice from leaking out;
- Line the bottom of the cooler with bubble wrap to prevent breakage during shipment;
- Check screw caps for tightness;
- Seal all container tops with tape;
- Secure sample labels onto the containers with clear tape;
- Wrap all glass sample containers in bubble wrap to prevent breakage;
- Seal all sample containers in heavy-duty plastic zip-lock bags with the sample numbers written on the outside of the bags with indelible ink;
- Place samples in a sturdy cooler(s) lined with a large plastic trash bag. Enclose the appropriate COC(s) in a zip-lock plastic bag affixed to the underside of the cooler lid;
- Fill empty space in the cooler with bubble wrap or Styrofoam peanuts to prevent movement and breakage during shipment;
- Double seal ice in two ziplock plastic bags and place on top and around the samples;
- Secure each ice chest with strapping tape; and
- Secure address and shipping labels to cooler.

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Monitoring Well Purging and Sampling Record

Client: _____ Date: _____
Project Name: _____ County: _____
Project Address: _____
Project Manager: _____ Job No: _____ Phase(s): _____
Regulatory Contact: _____ Telephone: _____
Sample Containers: _____ Air Temp (F): _____
Preservatives: _____ Precipitation: _____
Instrumentation: _____ Wind (dir/speed): _____
Date Last Calibrated/By: _____ Sampler Signature: _____

Well Number						
Well Elevation (ft)						
Well Diameter (in)						
Slotted Interval (ft)						
DTW (ft)						
GW Elevation (ft)						
Sounding Depth (ft)						
Well Volumes (gal)						
Notes:						
Well Volume Purged (1st)						
Time						
Temp (C°)						
pH						
EC						
Volume Removed (gal)						
Well Volume Purged (2nd)						
Time						
Temp (C°)						
pH						
EC						
Volume Removed (gal)						
Well Volume Purged (3rd)						
Time						
Temp (C°)						
pH						
EC						
Volume Removed (gal)						
Sample Depth (ft)						
Sample Time						

Equipment used:

Remarks:

2" Well Volume = 0.163 x height of water column 4" Well Volume = 0.653 x height of water column

Attachment H
Groundwater Banking Plan
Not Applicable

Attachment I
Annual Potable Water Quality Report – Urban
Not Applicable

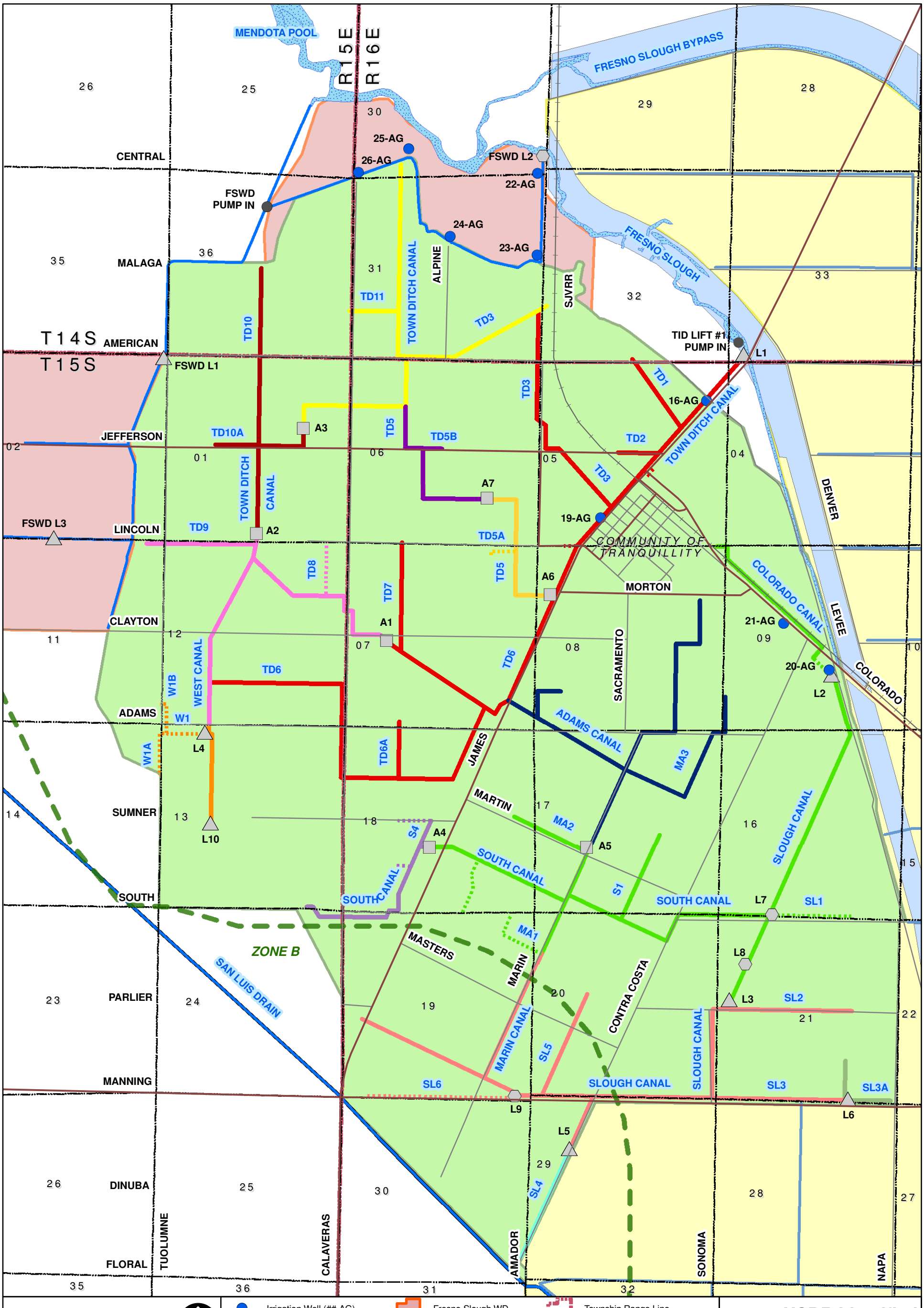
Attachment J
Notices of District Education Programs and Services Available to Customers
Not Applicable

Attachment K
District Agricultural Water Order form
Not Applicable

Attachment L – Drainage Problem Area Report

The USBR claims that a small portion of the southwest of Tranquillity ID is in a drainage impacted area with shallow groundwater and water quality problems in "A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley" (September 1990), commonly known as the "Rainbow Report" (see attached map). The District is not aware of there being any problems in the USBR identified area. The suggested programs of source control, land retirement, drainage water treatment, drainage water reuse, shallow groundwater pumping, and evaporation ponds have not been implemented since the District has not experienced drainage problems.

However, a portion of the area is being investigated through a grant funded by the California Department of Water Resources Local Groundwater Assistance Fund obtained by Tranquillity's neighbor James Irrigation District. Tranquillity ID is collaborating with James ID in the study by allowing James to install a monitor well (JID MW, shown on **Attachment F**) on their property near Contra Costa Avenue and the San Luis Drain. The study is expected to be finalized in November 2010.



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USBR Identified Drainage Problem Area

Tranquillity Irrigation District

Attachment L