

Lower Tule River Irrigation District

Water Management Plan | 2017 Criteria

prepared by:



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Section 1: Description of District

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A. History

1. Date district formed: 1950 Date of First Reclamation Contract: 1951
 Original Size of District: 103,086 Current year (last complete calendar Year): 2016

The Lower Tule River Irrigation District (LTRID or District) was organized pursuant to the California Irrigation District Law (Division 11, California Water Code) in 1950. Formation was for the purposes of promoting flood control on the Tule River and to secure a supplemental irrigation supply from the Central Valley Project to sustain and enhance the irrigated agriculture that had developed in the area.

The development of irrigated agriculture in the District started in about 1870. The irrigated area was mainly along the Tule River, Porter Slough and small areas served by the Stockton and Poplar ditches. The central portion of the District was the scene of a "bonanza" wheat farming development during the 1880's. Two attempts were made during this period to form irrigation districts. One attempt was made in what is now the northeastern portion of the present district. This district, known as the Tule River Irrigation District, failed because the farmers along the Tule River and the Porter Slough, who had adequate water, did not support formation. Those farmers away from the streams and had to engage in dry land farming, conversely, did support formation.

The second attempt at formation was in an area around the present community of Tipton. The attempt to form the Tipton Irrigation District failed because of the lack of availability of a firm water supply from the Tule River. Remnants of the canal system serving the Tipton Irrigation District are still evident in the area today. The earliest reliable crop survey record indicates a net irrigated area of 27,327 acres in 1924. The principal crops have historically been cotton and alfalfa.

Currently, the water supply for landowners within the District is derived from the use of groundwater, water rights on the Tule River and surface water diversions from the Friant-Kern Canal under two separate long term surface water contracts for Central Valley Project water with the U. S. Bureau of Reclamation.

The U. S. Army Corps of Engineers completed Success Dam on the Tule River in 1962 which provided much needed flood control and water conservation for the flows of the Tule River. The District owns or controls through agreements, approximately 50 percent of the water rights on the Tule River. These rights yield an average annual supply of approximately 70,000 acre-feet to the District. The District originally entered into a forty-year repayment contract for its share of the cost of the conservation storage space provided by Success Dam and reservoir. The final payment of the capital was made to Reclamation in 2006.

In May, 1951, the District entered into a long-term forty-year water service contract with the U. S. Bureau of Reclamation to provide 61,200 acre-feet of Class 1 water and 238,000 acre-feet of Class 2 water from the San Joaquin River via Friant Dam and the Friant-Kern Canal. This CVP contract has provided the District with a highly variable water supply averaging approximately 164,000 acre-feet per year.

In 1975, the District sold bonds to purchase a share of the Cross Valley Canal, located in Kern County. The District then entered into a three-party contract with the U.S. Bureau of Reclamation and the State of California (for wheeling) to provide an additional water supply from CVP supplies available in the Sacramento-San Joaquin Rivers delta (delta) in the amount of 31,102 acre-feet. The contract supply was initially made available on the east-side through an exchange with the Arvin-Edison Water Storage District, identified as the Cross Valley Canal Exchange Program. This contract provided an additional average water supply of approximately 29,000 acre-feet average per year until 1992. Implementation of CVPIA and environmental constraints related to the delta has significantly impacted the quantity of water available for diversion and subsequent beneficial use. These constraints led to modifications to the original exchange and ultimately, to termination of the exchange.

In 2010, the District entered into a Reclamation Law Section 9d repayment contract with the Bureau of Reclamation for the repayment of capital under Contract No. 175r-2771D (effective date 11/17/2010).

2. Current Size, Population, and Irrigation acres

Current Year	2016
Size	103,086
Population Served (Urban Connections)	0
Irrigated Acres	84,169

3. Water Supplies Received in current Year

Water Source	AF
Size (acres)	103,086
Population Served (Urban Connections)	0
Irrigated Acres	84,169
Federal urban water (Tbl 1)	0
Federal agricultural water (Tbl 1)	74,332
State water (Tbl 1)	0
Other Wholesaler (define) (Tbl 1)	0
Local surface water (Tbl 1)	27,646
Upslope drain water (Tbl 1)	0
District groundwater (Tbl 2)	0
Banked water (Tbl 1)	0
Transferred water (Tbl 1)	19,337
Recycled water (Tbl 3)	0
Other (define) (Tbl 1)	0
Total	121,405

4. Annual entitlement under each right and/or contract

	AF	Source	Contract #	Availability Period(s)
Reclamation Urban AF/Y	0			
Reclamation Agriculture AF/Y	31,200	CVP	14-06-200-8238A	No CVP Wheeling
Reclamation Agriculture AF/Y	61,200	CYP	I175R-2771R	
Reclamation Agriculture AF/Y	238,000	CVP	I75R-2271R	
Other AF/Y	70,000*	Tule River Rights	Pre-1914 Tule River Rights	

*The water received from Lake Success is associated with District's Tule River Rights. The average annual yield of those combined rights is approximately 70,000 AF per year. However, these water rights are currently impaired by limited storage conditions behind Success Dam which are limited by the Army Corps of Engineers due to concerns about the safety of the earthen dam.

5. Anticipated land-use changes

There are no anticipated land use changes for the District.

6. Cropping patterns (agricultural only)

Original Plan (2003)		Previous Plan (2012)		Current Plan (2016)	
Crop Name	Acres	Crop Name	Acres	Crop Name	Acres
Alfalfa hay	23,049	Corn	53,502	Wheat	27,183
Silage	33,954	Alfalfa	20,556	Silage	21,812*
Cotton	11,045	Wheat	18,509	Alfalfa	5,943
		Cotton	4,853	Cotton	2,788
		Almonds	3,106	Sorghums	5,602*
		Walnuts	3,088	Pistachios	5,532
		Pistachios	2,064	Walnuts	2,179
		Vineyards	2,025	Grapes	1,593
		Prunes	1,447	Barley	514
				Prunes/Plums	928
				Oats	450
				Tomato's	150
				Cherries	176
				Pecans	40
				Oranges	237
Other (<5%)		Other (<5%)	2,788	Other (<5%)	49
Total	68,048	Total	111,939	Total	101,337

*Double Cropped

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

Although there is a large difference in cropped acres between the 2012 plan and the plan in 2003, the actual increase in the District is not as drastic. The District's method of data collection changed around 2010. Prior to 2010 the method was to ask growers their cropped acreage information thinking that growers would reliably provide the requested information. Not all growers reported cropped acreage back to the District during this time, so information in the 2003 report reflects only a partial reporting of cropped acres. 2010 information is based on land use surveys completed by the California Department of Water Resources, includes double cropping and provides a more complete view of the cropping in the District.

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

Original Plan (2003)		Previous Plan (2012)		Current Plan (2016)*	
Irrigation Method	Acres	Irrigation Method	Acres	Irrigation Method	Acres
Level basin		Level basin		Level basin	
Furrow	50,655	Furrow	59,209	Furrow	48,607
Sprinkler		Sprinkler	500	Sprinkler	500
Low-volume		Low-volume	2,716	Low-volume	2,716
Multiple		Multiple		Multiple	
Boarder Strip		Boarder Strip	49,514	Boarder Strip	49,514
Flood	12,665				
Micro-sprinkler	12,665				
Other	8,441	Other		Other	
Total	84,426	Total	111,939	Total	101,337

*The District does not collect this data from its growers, it is assumed that irrigation methods have largely stayed the same from the previous plan

The value for irrigated acres in 2003 is noticeably larger than the value of cropped acres in 2003, the reason for this is unknown as values were copied from the previous report. Initially it was thought this discrepancy was due to grower double cropping. Double cropping, however does not account for this large difference in acreages. There was a note in the 2003 report that irrigated acres came from the 1996 report. As previously mentioned, 2010 information is based on land use surveys completed by the California Department of Water Resources, includes double cropping and provides a more complete view of the cropping in the District.

B. Location and Facilities

See Attachment A for a map that shows the general location of the District within Tulare County. Attachment B shows District surface water conveyance facilities (creeks, canals and basins). The District has measurement facilities at diversions from the Friant-Kern Canal (North Ditch, Wood-Central Ditch, Tipton Ditch, and Casa Blanca Canal) and the Tule River (Wood-Central Canal, North Ditch). On the west side of the District, the Tule River continues past the Turnbull Weir, which is the location where the District views surface water is past their ability to divert.

See Attachment C for a map of NRCS Soils within the District. See Attachment B for a map of District control structures and measurement locations. The District does not own or operate any groundwater wells; however, they do regularly monitor groundwater levels in privately owned wells. See Attachment D for a map of the

District groundwater level monitoring network. The District does not have any water quality monitoring locations.

The Lower Tule River Irrigation District (District) includes approximately 103,086 acres of land, situated in the southwestern part of Tulare County on the east side of the San Joaquin Valley. State Highway 99 bisects the District in a north-south direction and the Tule River flows westerly through the entire length of the District. The Friant-Kern Canal is located five to six miles east of the District's boundary on the northeast and adjoins the southeast portion of the District between Avenue 136 and Avenue 128. The unincorporated communities of Woodville, Poplar and Tipton (site of the District office) lie within the boundaries of the District, but are for the most part excluded from the District.

The District has approximately 610 farm service outlets. Water delivery measurements are performed by means of calibrated slide gates (meter gates).

The District does not have any groundwater extraction facilities; therefore, each landowner must provide his own well(s) to sustain irrigation during periods when the District does not have surface water available.

The District's entire distribution system is unlined earth canals with reinforced concrete control structures. Improvement districts were formed to provide local financing for the construction of the distribution systems. After completion, the facilities were turned over to the District for operation and maintenance. Collectively, the District owns or controls approximately 163 miles of canals and approximately 47 miles of river channel. The District has five (5) main canals originating at the Friant-Kern Canal with capacities ranging from 25 cfs to 600 cfs. The main canals run from east to west. The capacity of the sub-laterals branching out from the main canals range from 5 cfs to 100 cfs. The District's distribution system is shown on Attachment B.

In wetter years, the District operates its groundwater recharge/regulating reservoirs and distribution system to recharge the groundwater reservoir. The District maintains and operates eighteen (18) recharge and regulating basins, covering over 3,700 acres. The basins are graded and are compartmentalized into multiple cells for maximum efficiency and flexibility.

1. Incoming flow locations and measurement methods

Location Name	Physical Location	Type of Measurement	Accuracy
Friant-Kern Canal	MP 92.13R	Parshall Flume	± 4 %
Friant-Kern Canal	MP 95.78R	Parshall Flume	± 4 %
Friant-Kern Canal	MP 96.87R	Parshall Flume	± 4 %
Friant-Kern Canal	MP 97.35R	Parshall Flume	± 4 %
Friant-Kern Canal	MP 98.62R	Parshall Flume	± 4 %
Tule River	Porter Slough	Parshall Flume	± 4 %
Tule River	Poplar Ditch	Parshall Flume	± 4 %
Tule River	Woods Central Ditch	Parshall Flume	± 4 %
Tule River	#4 Cross Ditch	Parshall Flume	± 4 %
Tule River	McCarthy Diversion	Parshall Flume	± 4 %
Tule River	Creighton Ranch	Parshall Flume	± 4 %

2. Current year Agricultural Conveyance System

The District's entire distribution system is unlined earth canals with CMP pipe or reinforced concrete control structures. Local financing by District landowners has been used for the construction of the distribution system. Collectively, the District owns or controls approximately 163 miles of canals in addition to the Tule River channel. The District delivers water from the Friant-Kern Canal through five major conveyance facilities and from the Tule River through six major conveyance facilities. The District's distribution system is shown on Attachment B. The additional 47 miles noted in the "Other" category accounts for the Tule River channel that is used outside the District to deliver surface water. Currently the District facilities provide surface water delivery to approximately 103,086 acres within the District.

Miles Unlined - Canal	Miles lined - Canal	Miles Piped	Miles - Other
163	None	None	47 – Tule River

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
Koslov Pit (E)	Earth Embankment	200	Spill Capture
Hare Pit (E)	Earth Embankment	60	Spill Capture
Lapadula Pit (E)	Earth Embankment	150	Spill Capture
County Pit (E)	Earth Embankment	100	Spill Capture
State Pit (E)	Earth Embankment	150	Spill Capture
Hershey Pit (E)	Earth Embankment	400	Spill Capture
Bowsell Pit (E)	Earth Embankment	450	Spill Capture
Dennis Pit (E)	Earth Embankment	25	Spill Capture
Faure Pit (E)	Earth Embankment	50	Spill Capture
Baird Pit (E)	Earth Embankment	400	Spill Capture
Huddleston Pit (E)	Earth Embankment	200	Spill Capture
Gin Pit (E)	Earth Embankment	10	Spill Capture
School Pit (E)	Earth Embankment	50	Spill Capture
Creighton Ranch (E)	Earth Embankment	9,000	Spill Capture
Terry Pit (E)	Earth Embankment	150	Spill Capture
Hewett Pit (E)	Earth Embankment	400	Spill Capture
Keith Pit (E)	Earth Embankment	50	Spill Capture
Toledo Pit (E)	Earth Embankment	800	Spill Capture

E) = Existing; (P) = Proposed

5. Description of the agricultural spill recovery system and outflow points

The District employs terminal basins in some location to capture spill from the District's distribution system, but these facilities then recharge the spill to local groundwater. In other words, the water that enters these facilities cannot be delivered back to other parts of the system.

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

Scheduled	Rotation	Other (Describe)
100%		

7. Restrictions on water source(s)

Source	Restriction	Cause of Restriction	Effect on Operations
CVP	Availability	Pumping from Sacramento-San Joaquin Rivers Delta	Increase in groundwater pumping and purchases from other contractors
CVP	Availability	Reduced available surplus water supplies due to San Joaquin River Restoration Settlement	Increase in groundwater pumping and purchases from other contractors
Tule River*	Availability and Storage	Success Dam is viewed by the Army Corps of Engineers as seismically at risk	Less flood protection to land owners around the Tule River, Reduced ability to store wet season water, Increased in groundwater pumping

*Success Dam Enlargement Project was authorized through the federal Water Resources Development Act of 1999. The project consists of raising the spillway 10 feet, and increasing the storage capacity of the dam to approximately 110,000 acre feet. The Project has been put on hold due to concerns from the United States Army Corps of Engineers regarding safety of the dam. However, the USACE performed a seismic analysis of the dam and determined that there is no longer a safety risk. The project is now ready to proceed.

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

The District is constructing a new pipeline conveyance system between the North and Middle Forks of the Tule River. The new conveyance system will distribute water to farms that are currently underserved by the district. Phase 1, approximately 5.4 miles, is currently under construction and an additional 4.6 miles is being planned once funding is secured for phase 2 of the distribution system project. The district is also constructing an additional 160 acres of recharge basins.

C. Topography and Soils

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

The Lower Tule River Irrigation District (District) occupies part of the eastern floor of the San Joaquin Valley, approximately 6 miles west of the Sierra Nevada foothills. The District area includes: (1) remnants of the original Pleistocene aggraded alluvial surface; (2) floodplain and alluvial fan surfaces built by the present streams; and (3) a portion of the Tulare Lake basin. The surface slopes gently westward from 8 feet per mile on the east to 5 feet per mile near its western boundary. The maximum and minimum elevations within the District are 415 feet and 195 feet, respectively.

Remnants of an old alluvial surface in the eastern portion of the District form isolated outcrops at a slightly higher elevation than the floodplains and alluvial fan surfaces of the present streams.

The Tule River enters the valley floor near Springville and extends west through the central part of the District, a distance of 22 miles. Porter Slough follows a parallel course north of the Tule River. Very little Tule River water passes the City of Porterville in the main river channel, as most of it is diverted for irrigation purposes.

Topographic features cause cold air to drain into the District from two sides. There is little thermal protection for citrus fruits or for truck crops that mature very early or very late, and for that reason groundwater supplies are sometimes used to moderate extreme temperatures in fields

2. District soil association map (Agricultural only)

Soil Association	Estimated Acres	Effect on Water Operations and Management
Colpien loam	22,040.4	Moderately well drained, moderately slow permeability
Akers loam	19,380.2	Well drained, neg. runoff, saline-sodic phases moderately slow permeability
Nord loam	13,042.0	Well drained, moderate permeability, moderately slow in saline-sodic phases
Gambogy-Giggriz	9,737.3	Poorly drained, moderately slow permeability
Tagus loam	8,756.4	Well drained, moderate permeability
Biggriz loam	7,907.6	Somewhat poorly drained, moderately slow permeability
Crosscreek-Kia loam	5,020.5	Well drained, moderately slow permeability above duripan, very slow below
Gambogy loam	4,633.1	Poorly drained, moderately slow permeability
Flamen loam	3,931.3	Moderately well drained, moderate permeability above duripan slow permeability in duripan
Yetter sandy loam	2,366.0	Well drained, moderately rapid permeability
Grangeville sandy loam	1,738.4	Somewhat poorly drained, moderately rapid permeability and moderate permeability in saline-sodic phases

Exeter loam	1,302.9	Moderately well drained; moderately slow permeability above the duripan. Permeability of the duripan is very slow.
Armona sandy loam	708.7	Poorly drained, moderately slow to slow permeability due to sodicity and stratification
Tujunga loamy sand	651.1	Excessively drained, rapid permeability
Calgro loam	475.0	Moderately well drained, moderate permeability above duripan, very slow in duripan, rapid below duripan
Hanford sandy loam	359.5	Well drained, neg. runoff, moderately rapid permeability
Quonal-Lewis loam	103.4	Moderately well drained; permeability is slow above the duripan and very slow in the duripan.
San Joaquin sand	14.2	Well and moderately well drained; very slow permeability.

See Attachment C for a map of NRCS Soils within the District

The soils located on gently sloping flood plains in the east central part of the Lower Tule River Irrigation District (District) and along the Tule River channels, are deep, permeable and are predominately sandy loams and loams. Some lands within the District have slight to moderate alkali problems. These lands have been and continue to be improved through land reclamation activities such as leveling, leaching and the application of amendments. A detailed land classification of the District was completed by the U.S. Bureau of Reclamation in 1952. The U.S. Bureau of Reclamation has an ongoing process of reclassifying all of the District's lands in order to quantify the improved soil conditions as a result of the extensive reclamation activities. The land classes assigned to the District lands represent varying degrees of suitability for irrigation and were determined by evaluation of the factors of soil, topography, and drainage in relationship to adapted crops, productivity and land management. The table in Section 1 C2 presents the original land classification data for the District.

The soil survey for the District area is included in the Soil Survey of the Pixley Area, California, issued April, 1942, by the U.S. Department of Agriculture. An updated study was undertaken by the Soil Conservation Service, however, has never been published.

The soils were developed under distinctly semiarid climatic conditions and therefore have characteristics that are different from those of soils developed where rainfall amounts are higher. With few exceptions, the soils are low in organic matter and distinctly basic in reaction. A large proportion of them effervesce when tested with dilute hydrochloric acid, indicating a high content of lime. As a general rule, the soils of the area are well supplied with most of the principal mineral plant nutrients. Nitrogen is generally low, owing to the low organic matter content. This content can be built up by the incorporation of manure or the plowing under of cover crops. The location and distribution of each soil series is shown on Plate 4, Soil Associations Map.

Soils of the area have the potential to fall into four major soil groups based on development of the soil profile, in which a definite relationship exists between the soil profile and the physiographic landscape. The four major soil groups are: (1) soils with bedrock substrata; (2) soils with permeable subsoils; (3) soils with slightly to moderately

dense subsoils; and (4) soils with hardpan substrata. The first soil group is not represented within the District boundary.

The second soil group can be described as alluvial deposits of the valleys that have been washed from the mountains and foothills and accumulated on alluvial fans, in stream bottoms, or on flat areas of the valley plain. These deposits have given rise to soils unmodified by environmental conditions, or that represent very youthful stages in profile development and are characterized by permeable subsoils. They occupy gently sloping recent and young alluvial fans and flood plains.

District soils of the Hanford, Tujunga, Cajon and Foster series are of recent deposition and undeveloped profile. They differ in parent material, color and lime content. The Hesperia and Chino soils have slightly modified or more mature profiles with profiles with slightly more compact or slightly heavier textured subsoils. These soils are indicated under the second group. In general, they are good to excellent soils, well adapted to a wide range of crops, especially cotton, alfalfa, deciduous fruits, vines and general farm crops.

The third soil group contains soils of the alluvial fans or flood plains that have undergone further development, with the formation of fairly compact to moderately dense heavier textured subsoils. Represented within the District are the Pond, Traver and Tulare series.

The Pond soils occupy the flat alluvial plains in association with Fresno soils in the western part of the area. They are light gray or light brownish gray and have moderately compact subsoils stratified with heavy-textured materials. The surface soils and subsoils are highly calcareous and micaceous. They generally contain alkali and differ from the Fresno soils in the absence of the cemented calcareous hardpan layer.

The Pond soils have light brownish-gray or light-gray compact and somewhat platy surface soils to an average depth of about 8 inches. The material in the topmost 2 or 3 inches is generally vesicular and very fluffy when dry. The organic-matter content is very low. When dry the material is very compact and hard to penetrate. It is not firmly cemented and therefore is penetrated by a few plant roots. The subsoils are relatively impervious to water and have a low water-holding capacity. The land is almost flat with a slope to the west ranging from 5 to 10 feet to the mile. All Pond soils, especially the finer textured types, contain injurious accumulations of alkali.

The surface soils of the Traver series are light gray when dry and become light grayish brown or brown when moist. They are calcareous and micaceous. When dry, they bake and become hard, and they have a vesicular and platy structure in the upper few inches. The Traver soils are developed on broad gently sloping or nearly flat valley plains and old alluvial fan deposits mainly of granitic origin. Surface drainage is rather slow and subdrainage is impaired. Excessive accumulations of salts occur in many places.

The Tulare soils have gray calcareous surface soils. The subsoils are of silty clay texture, fairly compact and highly calcareous. Stratified layers of sandier material contain shells or fragments of shells of fresh-water mollusks. The soils of this series occupy smooth flat lake beds consisting of sediments of mixed origin. The subsoils have a moderate to high content of alkali. Reclamation of these soils is difficult, owing to the heavy and rather impervious subsoils, although not so difficult as that of the Fresno and Pond soils.

The fourth soil group contains soils that occupy higher terraces and old valley plains above the flood plains of the stream bottoms and are remnants of brown soils with a hardpan. These terraces slope gently toward the west.

Included in this group are the soils of the San Joaquin, Madera and Fresno series, which are present within the District. All are characterized by a hardpan layer at a depth ranging from 1 to 4 feet below the surface.

The surface soils of the San Joaquin soils are reddish brown and have a redder heavy-textured subsoil overlaying hardpan. The members of the Madera series have brown surface soils with calcareous subsoils and hardpan that is browner, softer and more calcareous than that of the San Joaquin soils. The San Joaquin and Madera soils are derived from coarse-textured igneous parent material that was laid down originally as alluvial fan and flood plain deposits, but that has been materially weathered and altered since that time.

In the western part of the area and extending between the alluvial fans in flat or shallow basin like areas, soils of the Fresno series occur. They have a calcareous hardpan and normally high content of alkali. The Fresno soils are light gray, are high in lime and have silty cemented calcareous hardpan lenses or thin layers occurring at a depth ranging from 1½ to 3½ feet. The Fresno soils have little value for agriculture because of their content of soluble salts.

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

Soil Problem	Estimated Acres	Effect on Water Operations and Management
Salinity	0	N/A
High-water Table	0	N/A
High or low infiltration rates	0	N/A
Other (define)	0	N/A

*Note Growers within the district do not report limitations from soil problems

Although historic documents for the District note that there were saline and alkaline lands within the District, much successful reclamation of these lands has taken place and currently there are no lands in the District that are viewed as being impaired. It would appear that with proper reclamation the soils in the District are now well drained and that there is not a shallow confining clay layer that causes shallow groundwater. This geologic feature appears to the west of the District and does not limit the use of lands within the District.

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.	1.94	1.69	1.74	1.02	0.43	0.07	0.01	0.01	0.16	0.49	0.97	1.62	10.16
Avg Temp.	44.3	48.7	54.4	57.8	66.8	73.6	79.4	76.5	71.4	61.1	50.4	44.9	60.9
Max Temp.	58	65	75	77	91	92	98	96	92	48	70	60	98
Min Temp.	28	33	38	40	46	53	61	57	52	45	22	32	28
ETo	1.15	1.90	3.59	4.74	6.79	7.63	7.90	7.13	5.31	3.35	1.76	1.11	52.36

Weather station ID: CIMIS Porterville 169Data Period: 2000 to 2016Average Wind Velocity: 3.0Average annual frost-free days: 225

The climate in the area served by the Lower Tule River Irrigation District (District) is representative of that of the entire San Joaquin Valley. During the summer months, the days are generally hot and dry with daytime temperatures typically exceeding 90 degrees Fahrenheit and during the winter months the days are generally mild and damp with daytime temperatures typically averaging 45 degrees Fahrenheit. The mean annual temperature at Porterville, located approximately 10 miles east of the District, is 60.9 degrees Fahrenheit. The average minimum and maximum temperatures are 44.3 degrees and 79.4 degrees Fahrenheit, respectively.

The average seasonal rainfall for the District area is 10.16 inches, based on records published by the California Irrigation Management Information System for the recording station in Porterville. The rain falls principally during the November through April period. The average annual evaporation for the area is 52.4 inches with the greatest evaporation occurring during the months of May, June, July and August.

2. Impact of microclimates on water management within the service area

Microclimates are not a significant factor in the ITRID.

E. Natural and Cultural Resources

1. Natural resource areas within the service area

Name	Estimated Acres	Description
None	None	N/A

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

None.

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

Name	Estimated Acres	Description
None	None	N/A

F. Operating Rules and Regulations

1. Operating rules and regulations

See Appendix B for the District's Water Policy and Operations document.

2. Water allocation policy

See Appendix B for the District's Water Policy and Operations document.

As per the California State Water Code, the District allocates water to growers based on irrigated acreage. However, in this allocation there is always consideration of the federal Reclamation Reform Act given that much of the surface water delivered by the District is from Federal projects and through Federal facilities. Generally, there is greater demand for surface water than the District can supply, so requests for water are provided on a first come first serve basis. Allocation of water is made uniformly throughout the District's surface water service area, except where capacity constraints occur. In some cases, canal prorated requirements may apply.

Allocations will be based on total assessed lands. Only lands within a District facility will receive an allocation and Class 6 soils identified by the Bureau of Reclamation Land Classification map as native, non-farmed, or non-developed are not eligible for allocation.

3. Official and actual lead times necessary for water orders and shut-off

See Appendix B for the District's Water Policy and Operations Document.

Water orders for both turn on and off must be placed 24 hours in advance with the District office. Water orders need to be placed by 9:00 a.m. to be effective for the following day. Water orders for Sunday or Monday by 9:00 a.m. need to be placed on the preceding Saturday.

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

See Appendix B for the District's Surface Water Allocation Policy.

Tailwater recovery systems are encouraged as the District does not allow tail water to re-enter the distribution system. The District will discontinue delivery of water if wasteful use occurs. Growers are not allowed to pump tailwater back into the LTRID canal system. District staff has regularly communicated this policy to growers over the last several years through regular mailers.

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

The District policy on water transfers within the District is that water may be transferred within the District from one landowner to another and from once parcel of land to another. Any landowner may assign for use within the District his right to the whole or any portion of the water apportioned to him per Section 22251 of the California Water Code.

The District's policy on water transfers between districts is that exchanges of water with other Friant districts are permitted with Board approval. The District has and will participate in beneficial transfers that promote sound water management.

The District's policy on transfers by individual growers to non-District parties is that such transfers are not permitted. District staff has regularly communicated this policy to growers over the last several years through regular mailers. However, in order to be consistent, this existing policy will be added to the water information and operating policy document from the District shown in Appendix B Surface Water Allocation Policy.

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers

- a. Number of farms 209
- b. Number of delivery points (turnouts and connections) 610
- c. Number of delivery points serving more than one farm 27
- d. Number of measured delivery points (meters and measurements) 610
- e. Percentage of delivered water that was measured at a delivery point 100
- f. Delivery point measurement device table

Measurement Type	Number	Accuracy (+/-%)	Reading Frequency	Calibration Frequency (Months)	Maintenance Frequency (Months)
Orifices					
Propeller Meter					
Weirs					
Flumes					
Venturi					
Metered gates	610	± 4	Daily	12	12
Acoustic Doppler					
Other (define					
Total					

For the 27 delivery points serving more than one farm, a different turnout and account number is utilized for each user. Under this system, when a user places an order on a shared turnout, the order is placed under his or her unique turnout and account number.

2. Urban Customers (This section not applicable)

- a. Total number of connections none.
- b. Total number of metered connections None.
- c. Total number of connections not billed by quantity None.
- d. Percentage of water that was measured at delivery point None.
- e. Percentage of delivered water that was billed by quantity None.
- f. Measurement device table N/A

3. Agriculture and Urban Customers

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

See Appendix B for the District's Water Policy and Operations document.

The District charges for water by quantity (acre-foot), at a uniform rate. The charges are set on an annual basis by resolution of the Board of Directors. The primary considerations by the Board of Directors in setting water charges are hydrologic conditions, seasonal considerations, status of District reserves, and price of available waters. In the current year the District set a rate of \$25 per acre-foot in February - March, a rate of \$60 per acre-foot in April and a summer rate of \$80 per acre-foot. Water Cost is variable depending on water supply.

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

Fixed Charges			
Charges (\$ unit)	Charge unit (\$/acre) (\$/customer) etc.	Units billed during year (acres, customer) etc.	\$ collected (\$ times units)
\$34.72	Average assessment rate for whole district/acre	97,723.7	\$3,392,966.86

Volumetric Charges			
Charges (\$ unit)	Charge unit (\$/AF) (\$/HCF) etc.	Units billed during year (AF, HCF) etc.	\$ collected (\$ times units)
\$25	Feb – March Sales \$/AF		
\$60	April Sales \$/AF		
\$80	Summer Rate Sales \$/AF	105,966 AF	\$6,040,525*

*\$ collected is descriptive January through June.

See Appendix C for an example of a District Sample Bill. The bill clearly shows how much water was used and that it is billed on a volumetric basis. LTRID can provide extra copies of the bills for the past several years upon grower request.

- c. Describe the contractor's record management system

Water measurements are taken on a daily basis by each water systems operator (ditchtender). They are relayed to District office staff, summarized and billed to each water user on a monthly basis. Any discrepancy must be addressed with the District. The District currently uses TruePoint water accounting software with a turnout and account number for each user.

H. Water Shortage Allocation Policies

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

See Appendix B for the District's Water Policy and Operations document.

The District does not have sufficient surface water resources to deliver amounts close to what crops require throughout the year. Therefore, all growers in the District also have groundwater wells and rely heavily on groundwater resources. The primary component of the District's water shortage response plan is its method of communication with District growers regarding the developing surface water supplies through the year and the reliability of groundwater resources.

2. Current year policies that address wasteful use of water and enforcement methods

See Appendix B for the District's Water Policy and Operations document.

The District has no current year policy that supplements the general policy. Based on the general policy, it is the responsibility of the farm operator to manage their water supply after it is taken from the District facilities. The District encourages consideration of neighboring landowners and responsible management of tailwater. According to Section 22255, of the California Water Code, persons wasting water may be refused water delivery until such conditions are remedied.

I. Evaluate Policies of Regulatory Agencies Affecting the Contractor and Identify Policies that Inhibit Good Water Management.

The District lies within the Tule Subbasin, defined by the California Department of Water Resources as a critically overdrafted basin. To remediate this, in 2014 the State of California passed the Sustainable Groundwater Management Act (SGMA), which regulates the use of groundwater in the State of California. As part of the SGMA process the District has determined that imported surface water should be allocated to landowners on an annual basis. The goal is to allow equal and proportional access of imported surface water to all landowners in the District.

The District will update this policy as conditions warrant, based on operational and policy issues identified as the policy is implemented.

Section II: Inventory of Water Resources

A. Surface Water Supply

1. Surface water supplies in acre feet, imported and originating within the service area, by month

See Appendix A - Water Inventory Tables, Table 1

Local Water Source – Tule River

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

See Appendix A - Water Inventory Tables, Table 8

B. Groundwater Supply

1. Groundwater extracted by the district and delivered

See Appendix A – Water Inventory Tables, Table 2

2. Groundwater basin(s) that underlie the service area

Name	Size (Square Miles)	Usable Capacity (AF)	Safe Yield (AF/Y)
Tule Sub basin	733	14.6 M	Unknown

3. Map of district-operated wells and managed groundwater recharge areas

See Attachment B for a map of Groundwater Monitoring facilities within the DCTRA.

The District does not own any groundwater extraction wells used for supply water to growers. See Table 2 in Appendix A.

4. Description of conjunctive use of surface and groundwater

Within the LTRID, it had been recognized by the Bureau of Reclamation in the LTRID, Chapter IV, Water Supply report of February 1955, that “Utilization of both local and supplemental water as they occur is very necessary so that a hydrologic balance is maintained. Historical hydrologic data indicates that dry cycles are long and every effort should be made in wet years to percolate available surface water not required for crop use into the groundwater reservoir for use in the below-normal years. It is recommended that the District attempt to increase its percolation capacity by providing additional sinking basins and, if necessary, to consider over-irrigation and out-of-season irrigation as further methods of conservation.”

The District overlays two extensive and usable groundwater aquifers. The upper unconfined aquifer is above the well documented Corcoran “A” Clay layer and is very receptive to recharge from locations throughout the District

and extending east into the foothills of the Sierra Nevada Mountains. The lower aquifer is confined under the Corcoran Clay and can most effectively be recharged from areas east of Highway 99.

Approximately 200,000 acre-feet of water per year have been brought into the District's service area since the beginning of District operations. These highly variable supplemental water supplies have, however, required the District to develop and operate a very successful groundwater conjunctive use program. The District owns, or has access by agreements, to approximately 3,700 acres of sinking/re-regulation basins. Most are located within the District boundaries, with some located up slope to the east of the District. These basins, along with the river channels and the District's canals, are used for direct groundwater recharge when surface water supplies are available. The depth to groundwater for the past ten years has averaged 64.5 feet over the District. It is estimated that a third of the water imported by the District has been directly recharged into the underground reservoir by District operations since the District's inception.

The Tule River is the major source of groundwater replenishment within the District. Recharge is accomplished primarily by seepage from the Tule River channels and from distribution canals, by deep percolation from irrigation and by artificial percolation from spreading basins.

5. Groundwater Management Plan

The District is a participant in the Deer Creek and Tule River Authority (DCTRA). This seven member joint powers authority collectively has a groundwater management plan to which all member agencies are a part. See Appendix D for the DCTRA Groundwater Management Plan.

The DCTRA's Groundwater Management Plan was originally developed and adopted in March 1996 under the provisions of California State Assembly Bill (AB) 3030. This plan was later updated to be compliant with California State Senate Bill (SB) 1938 in July 2006.

6. Groundwater Banking Plan

The District does not have a formal groundwater banking plan at this time.

C. Other Water Supplies

1. "Other" water used as part of the water supply – Describe Supply

See Appendix A- Water Inventory Tables, Table 1.

D. Source Water Quality Monitoring Practices

1. Potable water quality (Urban only)

The current groundwater quality within the District is understood to be of excellent quality. However, the District does not own any groundwater wells and only delivers agricultural water so it therefore does not collect groundwater quality information.

2. Agricultural water quality concerns: [] Yes [X] No**(If yes, describe)****3. Description of the agricultural water quality testing program and the role of each participant, including the district, in the program**

LTRID does not have its own surface-water-quality monitoring-program. However, one (1) separate water quality monitoring program has historically been in place. This program has developed a history of water quality sampling events and test results and is still conducted by specific water contractors. As the conducting entity is a public agency, the developed information is a part of the public domain and is thus available to each of the contractors diverting water from the Friant-Kern Canal. While this program is principally designed to address domestic water quality program issues, the generated data covers all the constituents of concern related to agricultural uses. This information is available upon request through the Friant Water Authority (FWA). The District directs grower to the FWA if they ask for water quality information.

The Department of Health Services (DHS) has approved a monitoring program specific to four (4) permitted water systems diverting raw water from the Friant-Kern Canal. The testing frequency is designed to assure compliance with state and federal drinking water quality programs and thus is more than sufficient to insure an adequate testing frequency for agricultural concerns.

The District participated in the Southern San Joaquin Water Quality Coalition on behalf of its growers for compliance with State Water Resource Control Board's agricultural discharge permitting. This coalition tests water quality in a monitoring network across a large area to develop information to show that there are no issues of concern in smaller local areas. <http://www.ssjwqc.org/>

4. Current water quality monitoring programs for surface water by source

Analyses Performed	Frequency	Concentration Range	Average
Title 22 Standard Compliance	Monthly	As per state requirements	Well below state MCLs

Current water quality monitoring programs for groundwater by source

Analyses Performed	Frequency	Concentration Range	Average
None.			

E. Water Uses Within the District

1. Agricultural

See Appendix A – 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	Boarder Strip - Acres	Multiple Methods - Acres
Silage	21,812*		19,493			21,812	
Alfalfa	5,943					5,943	
Wheat	27,183		6,331			20,852	
Cotton	2,788		2,788				
Sorghums	5,602*		11,204				
Pistachios	5,532		5,532				
Walnuts	2,179				2,719		
Grapes	1,593		1,593				
Other (<5%)	2,494		1,994	500			
Total	101,337		48,935	500	2,719	49,183	

* Double Cropped

3. Urban use by customer type in current year

Customer Type	Number of Connections	AF
Single-family	0	0
Multi-family	0	0
Commercial	0	0
Industrial	0	0
Institutional	0	0
Landscape irrigation	0	0
Wholesale	0	0
Recycled	0	0
Other (specify)	0	0
Other (specify)	0	0
Other (specify)	0	0
Unaccounted for	0	0
Total	Not Applicable	Not Applicable

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

Treatment Plant	Treatment Level (1, 2, 3)	AF	Disposal to/Uses
Not Applicable			
Total discharge to ocean and/or saline sink			

5. Groundwater recharge in current year

Recharge Area	Method of Recharge	AF	Method of Retrieval
	Recharge Basins	18,371	
	Channel Losses	85,562	
		103,933	

6. Transfers and exchanges into the service area in current year

From Whom	To Whom	AF	Use
SCID	LTRID	2,400	Class 1 Water
TID	LTRID	2,000	Class 1 Water
TBID	LTRID	12,000	Class 1 Water
TPDWD	LTRID	31	Recap
LTRID Friant	LTRID	539	Recap
DEID Friant	LTRID	606	Recap
Exeter ID Friant	LTRID	47	Recap
SWID Friant	LTRID	279	Recap
SCID Friant	LTRID	43	Recap
IID Friant	LTRID	27	Recap
SSJMUD	LTRID	1,405	Recap

7. Transfers and exchanges out of the service area in current

From Whom	To Whom	AF	Use
LTRID	PIX ID	20,000	URF
LTRID	PIX ID	30,000	Class 2 Water
LTRID	PIX ID	3,060	Class 1 Water
LTRID	SID	3,928	Class 1 or 2 Water
LTRID	PIX ID	20,000	Class 2 Water

*URF: Unrelease Restoration Flows

8. Wheeling, or other transactions in and out of the district boundaries

From Whom	To Whom	AF	Use
Not Applicable			

9. Other uses of water

Other Uses	AF
Not Applicable	

F. Outflow from the District

See Attachment B, Map of District Boundary and Distribution Facilities, for the location of District facilities. The District's only surface water outflow point is where Tule River flows past the Turnbull Weir on the west edge of the District. The District does not have subsurface outflow points or outflow water-quality testing locations (see Appendix A – Water Inventory Tables, Table

In reference to Appendix B, the District acknowledges that it is listed as a drainage problem area within the listed Tulare subarea. However, the area identified in "A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley (09/'90)", being the far west edge of the District has not been viewed as a drainage problem area by the District. These lands are currently in agricultural production, without drainage water collection systems, and are producing consistently with other lands in the District. No drainage water is being produced by these lands and therefore it also does not flow from these lands. The District's belief is that historically this area had soils that did not drain well and they were identified as potentially problematic if they were ever irrigated. However, as this area has been developed and reclaimed soil amendments have increased the permeability of the soils and growers have found that there is not a confining clay layer in this area that would cause shallow groundwater. Instead the depth to water in the area is more than 100 feet. For this reason, the District will not be implementing any of the six recommended water conservation programs to improve conditions in identified drainage problem area. The District does not collect any groundwater quality information.

1. Surface and subsurface drain/outflow

Outflow Point	Location Description	AF	Type of Measurement	Accuracy (%)	% of Outflow	Acres Drained
	Tule River at Turnbull Weir	0	Chart Recorder over weir	4	100	N/A

Outflow Point	Where the Outflow Goes (Drain, River, or Other Location)	Type Reuse
	Tule River flow to downstream Tule and Kaweah River rights holders	Irrigation
	Tule River flow to Tulare Lake Bed	Floodwater (rare)

2. Description of the outflow (surface and subsurface) water quality testing program and the role of each participant in the program

The District does not test the water quality of water flowing out the District. As was described in the previous section, the waters that flow past the District in the Tule River channel are either run-off from the Tule River watershed beyond the District's ability to divert or it is scheduled Friant Division CVP water for downstream water purveyors. These supplies are not surface drainage, subsurface drainage or spill.

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

Analyses Performed	Frequency	Concentration Range	Average	Reuse Limitation
Not applicable				

Outflow (subsurface drainage) Quality Testing Program

Analyses Performed	Frequency	Concentration Range	Average	Reuse Limitation
Not applicable				

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

The District is not responsible for groundwater remediation or contaminant plume management, and therefore they are not involved directly in the 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. The District is a part of the Southern San Joaquin Valley Water Coalition (SSJVWC). This coalition's efforts are to monitor surface water quality and report to the Regional Board. Although the District is a part of the coalition, it does not do any groundwater quality monitoring nor does it receive the data collected by the coalition. Also, the District is not involved with the Regional Board's ag waiver program as that is viewed as the responsibility of individual landowners. LTRID tries to stay informed of contaminant plumes and their management and remediation within District boundaries. Surface water quality information for a few testing locations in local rivers is summarized in an annual report generated by the SSJVWC and can be requested from the SSJVWC Coordinator.

Contact information by which the SSJWQC Coordinator can be reached:

Kings River Conservation District

4886 East Jensen Avenue

Fresno, CA 93725

(559) 237-5567

<http://www.krcd.org/>

G. Water Accounting (Inventory)**1. Water Supplies Quantified**

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

2. Water Used Quantified

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

3. Overall Water Inventory

- a. Appendix A, Table 6

3. Provide or support the availability of water management services to water users

a. On Farm Evaluations

i. 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 2 nd Year in Future
Irrigated Acres					
Number of Farms	209	5%	5%	5%	5%

The District will actively advertise to make growers aware of available mobile lab resources for on-farm efficiency evaluations through their website and regular communications with their growers (newsletter, email service, fliers in direct mailings, etc.). However, the District understands that many growers currently have irrigation and groundwater well consultants that regularly provide this service to growers in the District. For this reason, the District will survey growers within the next year to determine what percentage of them have consultants that provide them with regular evaluations of their irrigation efficiency.

The District has been made aware, by North West Kern Resource Conservation District (NWKRC), that the average price for a typical irrigation system evaluation is approximately \$1,000. The District will make some funds available to increase the availability of these services to growers. LTRID will make \$250 per evaluation (25% of typical cost) available for growers with economic hardships up to a total of \$2,750 per year. This would equate to contributions to 11 potential irrigation system evaluations (5% of District farms).

The criteria for economic hardship will be generated by the District and included in next year's annual update. The District will inform growers of the availability of these funds and the criteria after it is established on the District's website. When economic hardship criteria are met by growers, funding would be provided to NWKRC. The District will also request that system evaluation information be shared with the District to help better inform the District on local irrigation efficiencies.

ii. Timely field and crop-specific water delivery information to the water user

The District refers growers to the Kings River Conservation District website for local timely field and crop-specific water delivery information.

The District's metering of delivered water is at the turnouts from the conveyance system, but private growers systems then convey water to multiple fields owned by the same landowner from that turnout location. The District's conveyance system can be seen in Plate 4 and provides growers access to surface water conveyance facilities, with the distance between these facilities being generally one mile apart. Private conveyance to each field is not reported to the District.

The District has evaluated deliveries by turnout from the District conveyance system to evaluate areas where surface water is being used within the District. This information was evaluated using the District's GIS system.

Also, the District recently undertook a study of the estimated crop water use within the District between 1985 – 2007. This retrospective effort was an effort to evaluate the changing crop conditions within the District over time and gauge where the crop water use for the District was increasing or staying relatively the same. During this effort interviews with growers were conducted to better understand irrigation practices within the District. This effort used GIS based crop maps from DWR within the District’s service area and calculated optimum crop water use based on published crop ET information for this region and accounting for effective precipitation. This study and the topic of irrigation by crop has been discussed several times in the regular public meetings held by the Board of Directors.

The District offers a service to growers that they can submit water orders over the internet, check their water delivery accounts from the District website, and get email water supply update notices from the District.

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

As per this BMP the District has developed and sponsors a local CIMIS station which was constructed with the assistance of the Deer Creek and Tule River Authority members. Before the next annual update the District will update their website with the CIMIS station information and also provide growers with links to the available information on the DWR CIMIS network for crop ET calculations and crop specific irrigation scheduling. (<http://wwwcimis.water.ca.gov/>) With this information growers have the necessary information to convert the real-time ETo information from the local CIMIS station into real-time crop ET and irrigation scheduling information. This information assists growers in managing their water resources more efficiently and helps to reduce energy usage and saves money normally attributed too water and energy usage.

Also, normal year crop ET adjusted for effective precipitation is available through reports at the District office, on the District website and on Cal Poly ITRC’s website. At the Cal Poly ITRC’s website there is information on dry, normal and wet years for varying regions within the state including one covering the District.

The Kings River is approximately 30-40 miles north of the District, but has the same regional climate as the District. An inspection of reference ETo maps published by CIMIS (<http://wwwcimis.water.ca.gov/cimis/images/etomap.jpg>) shows that zone 12 covers an area that is common to the Kings River contractors and the District. Also, rainfall totals between these two areas are historically very similar. For these reasons it is understood that the real-time ET information published by Kings River Conservation District is valid for use in the District’s service area. A link to the real-time ET information for the Kings River Contractors on the KRCD website will be included in the District website update and its use will be discussed in further detail in the next Ag Water Management Plan.

Farmers have reported other sources they use to gain ET information as well, complicating the process for the District to meet this BMP. These other sources range from using soil moisture probes, receiving daily crop ETc values from on-farm services such as John Deere tractor dealerships, local chemical companies, or contracted Pest Control Advisors.

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

The District provides regularly email updates on surface water supplies to District growers, allow District growers to submit water orders on-line and allow growers to access their current water account information using a secure password on the District website.

The District provides current surface water supply information from the Bureau of Reclamation and the Friant Water Authority for Friant Division CVP contract supply availability. The District also provides a water supply calculator on the District website for Tule River water right holders as well as current information on storage behind Success Dam. Current water supply information is available at http://www.ltrid.org/water_supply/

d. Agricultural water management educational programs

Program	Co-Funders (if-any)	Yearly Targets
Friant Water Authority – “Friant Waterline”	Friant Division Contractors	Monthly Mailings
District Newsletter – “Legend”	None	Periodic Email Distribution

The District provides information on weather, crop ET, soil moisture holding capacity, crop characteristics, irrigation scheduling and water-use planning on the District website. <http://www.ltrid.org/links/>

- Links to Cal Poly’s ITRC and Fresno States’ Center for Irrigation Technology websites provide farmers and the public with technical reports and other articles on efficient irrigation techniques employed in this area.
 - <http://www.itrc.org/reports/index.php>;
 - http://cit.cati.csufresno.edu/research_publications/.
- Local weather conditions are reported through the District and DCTRA sponsored CIMIS station.
 - <http://wwwcimis.water.ca.gov/cimis/frontStationDetailInfo.do?stationId=169&src=info>;
- Crop ET information is available through links to the DWR CIMIS network and the available documents at this location on how to calculate crop ET. Also links to normal, wet and dry year crop ET information for the District’s region are available on Cal Poly’s ITRC website.
 - <http://wwwcimis.water.ca.gov/cimis/infoEtoCropCo.jsp>;
 - http://biomet.ucdavis.edu/irrigation_scheduling/bis/BIS.htm;
 - <http://wwwcimis.water.ca.gov/cimis/pdf/21427-KcAgronomicGrassandVeg.pdf>;
 - <http://wwwcimis.water.ca.gov/cimis/pdf/21428-KcTreesandVines.pdf>;
 - <http://www.itrc.org/etdata/irrsched.htm>.
- Links to the DWR CIMIS network make farmers and the public aware of a variety of ag water software that is available to help irrigators with data management and irrigation scheduling.
 - <http://wwwcimis.water.ca.gov/cimis/infoIrrSoftware.jsp>
- Also, links to Cal Poly’s ITRC website and the DWR CIMIS network provide farmers and the public with information on crop water budgets and irrigation scheduling techniques.
 - <http://www.itrc.org/irrevaldata/isedata.htm>;
 - <http://wwwcimis.water.ca.gov/cimis/infoIrrOverview.jsp>;

- <http://www.cimis.water.ca.gov/cimis/infoIrrSchdule.jsp>;
- <http://www.cimis.water.ca.gov/cimis/infoIrrBudet.jsp>;
- Also the District links ACWA's Water Event's and Water Education Foundation's webpages on its website to inform growers and the public about available conferences, webinars, tours and classes on water issues, environmental concerns, existing and developing regulations, as well as irrigation methods and technologies.
 - <http://www.acwa.com/category/event-type/external-meeting>;
 - <http://www.watereducation.org/doc.asp?id=1070>.

The District took on a District-wide water balance study that addressed irrigation efficiencies, cultural practices, and other water issues. Also the District undertook a System Optimization Review Study in partnership with the Bureau of reclamation. Both reports were discussed by staff, the Board of Directors and they were open to the public at public Board meetings. Additional joint Board meetings were held for significant discussions focused on calculated crop water use, irrigation efficiency and conservation.

Discussion on calculated crop water use covered the comparison between ETC and irrigation efficiency fraction and reported applied water from District growers.

Some staff members regularly attend conferences such as the Bureau's Water Users Conference and Association of California Water Agencies where there are seminars on efficient irrigation techniques and after these conferences these individuals share this information with other staff members as well as the Board of Directors.

The District is a member of ACWA and this agency supports a regular program of education with grade school teachers throughout the state, bringing them to agricultural areas like the District and explaining to them how agriculture supports our society and how farmers efficiently use available water supplies to produce our Nation's food supply.

e. Other

4. Pricing Structure- Based at least in part on quantity delivered

Adopt a water pricing structure – based at least in part on quantity delivered

There are a number of factors that go into determining the pricing of water to the farm operator in the District. These factors, including such things as availability, canal side price, District operating costs and costs for computing supplies are all considered by the Board of Directors when they annually set the price of water for sale to the farm operator.

The pricing policy of the District is based on allowing for the delivery of surface water on a price basis which is competitive with groundwater pumping costs. This encourages the use of surface water to meet irrigation demands, when available, thereby preserving the groundwater resource for times when little or no surface water is available. Farm operators have amply indicated and demonstrated that the incentive to decrease the cost of applied water, when applied water does not result in increased yield, is the primary element of cost control. This

parallels the farm operators' desire to improve on-farm efficiency through reduced labor and groundwater pumping costs.

Water pricing policies established by the District are based on a recouping of the costs of securing and delivering the water.

The supply is priced and billed in a fashion that is indicative of the delivered nature of the supply. That is, the District has policies which apply to water which is made available for direct delivery to farm operators with separate policies associated with deliveries for groundwater recharge. As the basic goal for direct surface deliveries is to optimize the conjunctive use capabilities of the District and to deliver in-lieu pumping water when same is available, verification by the District is accomplished on a periodic basis to assure that the price for delivered water is competitive with power costs associated with pumping groundwater within the District. The District tracks by way of external inquiries, as well as farm operator input, the costs associated with groundwater pumping and utilizes this input to verify the competitiveness of the established price for District supplies. The principal mechanism which the District utilizes to price the cost of actual surface deliveries is the annual assessment. The assessment rate is a per acre charge established following adoption of the annual budget. The assessment is divided into four (4) components, each related to District budget items. The billing process is fashioned in such a manner that, for delivered supplies, the farm operators are charged for water on a metered basis and billed following deliveries. In this fashion, farm operators are encouraged only to utilize that water which they need and are not penalized for unused water which may be available.

Water which is not delivered for consumptive purposes, principally due to the non-storable nature of the District's surface supply, is delivered for groundwater recharge. The costs of the water associated with this recharge program are not borne by the water delivery charge income, but by a percentage of the assessment. As previously noted, the District sought and received considerable input with respect to the development of this policy and with further respect to the level of assessment which is established in order to insure that recharge programs are maintained and contributions to the groundwater reservoir are maximized.

With increases in the costs of operation and those associated with water acquisition, the assessment rate has been increased substantially over time. The current level of assessment income is in excess of \$1,427,500 per year, as compared to a mid-1970's level of less than \$300,000.

5. Evaluate and improve efficiencies of district pumps

Not Applicable. The District does not own or operate any pumps

B. Exemptible BMPs for Agricultural Contractors

1. Facilitate alternative land use

Drainage Characteristic	Acreage	Potential Alternate Uses
High Water Table (<5 feet)	0	Not Applicable
Poor Drainage	0	Not Applicable
Groundwater Selenium Concentration > 50 ppd	0	Not Applicable
Poor Productivity	0	Not Applicable

2. Facilitate use of available recycled urban wastewater

Sources of Recycled Urban Waste Water	AF/Y Available	AF/Y Currently Used in District
Tipton Community Service District	Amounts recycled to growers in lieu of District water None for WY 2016	
Poplar Public Utility District		

Tipton CSD and Poplar PUD are under requirements by state agencies to land apply the treated waste stream on property that they control at agronomic rates. Some District growers near Tipton CSD's and Poplar PUD's facilities can contract for this water and therefore it can be used in lieu of District water. It is the responsibility of Tipton PUD and Tipton CSD to ensure that all state standards are met in the land application of this supply. The water from Tipton CSD and Poplar PUD is not a district supply, does not flow through District facilities and for those reasons the District has no records of its delivery. This water is delivered to only one or two growers in the District.

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

Program	Description
Natural Resource Conservation Service Agricultural Water Enhancement Program (AWEP) or Environmental Quality Incentives Program (EQIP)	Available Information

The District maintains a listing of potential funding sources and makes staff available to provide assistance in completing funding application documents. District farmers are notified about potential funding sources by public Board Meetings, information posted on the District's website, and regular email updates. The District will include an example of this information made available to growers in the next annual update.

4. Incentive pricing

The District prices water to be competitive with the average District cost to pump groundwater in normal to wet year intentionally. The goal of this pricing structure is to encourage surface water use and maximize the replenishment of local groundwater through in-lieu recharge. In dry years the District prices surface water in such a way that those with the most usable groundwater will access that first thus leaving the available surface water for those growers with less reliable groundwater (District goal for dry year). Both of these efforts are done under conjunctive use operations that make up the Districts overarching water operation.

5. Line or pipe ditches and canals

Canal/lateral (Reach)	Types of Improvement	Number of Miles in Reach	Estimated Seepage (AF/Y)	Accomplished/Planned Date

Constructive line regulatory reservoirs

Reservoir	Annual Spill in Section (AF/Y)	Estimated Spill Recovery (AF/Y)	Accomplished/ Planned Date
None			

6. Increase flexibility in water ordering by, and delivery to, water users

The District’s water order process is managed by a staff member that is available by phone or by email. Also the District has developed the ability for growers to submit their water orders on-line at the District’s website if they wish. The District continues to look for new ways to serve their growers and provide flexible, timely and consistent water delivery service. Please see appendix F District water Order Form, for an example of the District’s water order form.

7. Construct and operate district spill and tailwater recovery systems

Distribution System Lateral	Annual Spill (AF/Y)	Quantity Recovered and Reused (AF/Y)
There are no District Spills	All supply is contained within the Distribution system	
Total		

The District has a few terminal basins used to capture water at the end of a conveyance system. These facilities recharge this water to the local groundwater aquifer. However, the District does not suffer from spills. Also, the District does not allow tailwater recovery systems to be diverted into District conveyance systems. Private tailwater return systems within the District are used on farms to allow growers to apply large heads of water to fields, thereby increasing the irrigation efficiency, and tailwater is then recirculated back to the head of the field for a second longer application after the field is uniformly wetted up.

Drainage System Lateral	Annual Drainage Outflow (AF/Y)	Quantity Recovered and Reused (AF/Y)
There are no District Drainage Systems		
Total		

Describe facilities that resulted in reduced spill and tailwater

As was previously mentioned, there are no perched groundwater areas within the District and no known subsurface drainage systems within the District. Also, surface drainage in this area is not collected through any systems, as it is the responsibility of landowners to manage stormwater on their own properties. Therefore, there are no District Drainage Systems and no Drainage Outflow or Quantity Recovered.

8. Plan to measure outflow

Total # of outflow (surface) locations/points	1
Total # of outflow (subsurface) locations/points	0
Total # of measured outflow points	1
Percentage of total outflow (volume) measured during the report year	100
Identify locations, prioritize, determine best measurement method/cost, submit funding proposal	

Location & Priority	Estimated Cost (\$1,000s)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Not Applicable					

As was previously discussed, the only outflow from the District is through Tule River, and waters that flow through Tule River past the District are either floodwater or schedule irrigation supplies by downstream water purveyors. For this reason, the District measures one location to gather information on flows past their diversion locations and that covers all of the outflow locations. There are no plans to measure any other locations.

9. Optimize conjunctive use of surface and groundwater

The nature of the contract water supply of the Lower Tule River Irrigation District (District) is based on the maintenance of the groundwater resources of the service area. Historically, the District has supplied water to its farm operators utilizing a long-term Class 1 and Class 2 contract for water from the Friant-Kern Canal. The water pricing policies of the District associated with delivery of this supply are designed to recover the costs associated with obtaining the supply and the maintenance and enhancement of available groundwater resources within the boundaries of the District. The goal of the water pricing policy is to maximize the use of surface water to support the planned conjunctive use of groundwater and Class 2 contract supplies. This is consistent with the goals of the Deer Creek and Tule River Authority groundwater management plan of which the District is a member.

The water supply allocation and pricing procedures of the District have historically been established on an annual basis by the Board. The district conveys water usage, price and payment terms and conditions associated with its water deliveries in its monthly water billing forms.

The pricing procedures of the District are consistent with the adopted conjunctive use/management goals. The District uses two pricing mechanisms to optimize its groundwater resources and send appropriate incentives to irrigators. The two mechanisms are (A) wet vs. dry year variation in pricing and (B) the association of District costs of fixed and variable nature to ensure that the volumetric water prices are consistent with farm operators groundwater pumping costs. These mechanisms are described as follows:

- A. The blending of the cost elements associated with the water supply and the variable nature of the contract supply, leads to a mix where the cost of the supply decreases as the non-storable water supply allocation increases. The decrease in surface water costs during wet years creates incentive for farm

operators to use surface water as a substitute for groundwater, thus minimizing overdraft. Conversely, the cost of the delivered supply increases as the supply decreases. The delivery of a declared supply of less than the Class 1 contract amount reflects the highest cost per acre-foot. Farm operators are sent a price signal which encourages them to utilize less surface water and more groundwater, optimizing the groundwater resource; and

B. The District uses cost allocation of District operations on fixed charges to adjust surface water volume prices to compete with groundwater pumping costs. In addition, the District, by special District vote, has approved a groundwater assessment of \$5.00 per acre to further adjust surface water prices to be in line with groundwater costs. The average price of surface water for the District, depending on the blend of Class 1 and Class 2 is approximately \$35 per acre-foot (2002 water prices) versus an average cost of \$42 per acre-foot for individual groundwater pumping. This pricing adjustment, in conjunction with wet/dry priced variation described above, encourages farm operators to make optimal use of both surface and groundwater resources.

In addition to using incentive pricing to manage conjunctive water use goals, the District encourages intra-district water trading among landowners, further optimizing the District water resources. Internal trading is a formal policy of the District, and is facilitated by District water accounting procedures. Negotiated prices on these trades are an internal matter between the landowners and/or farm operators and are not recorded by the District. The trades are most prevalent in dry years.

10. Automate distribution and/or drainage system structures

There are no planned projects to automate canal structures in the near-term. The District has not studied the potential for automating canal structures, but is using District facilities at the Tule River Weir and the Wood Central Ditch diversion from the Tule River as pilot projects to gage their water management improvement potential. This effort will be reported on in future annual updates.

11. Facilitate or promote water customer pump testing and evaluation

The District provides information to the farm operators relative to the availability of pump testing and efficiency services provided by the serving utility or local pump companies. The involvement of the District with private pump efficiencies is related to water conservation and overall resource management. The fact that a farmer may apply a given amount of water to a field with a pump which is operating at a less than optimum efficiency does affect the application time and the total quantity of water which is being demanded by the crop. This information can be found in the District's Water Information & Operating Policy in Appendix B. The third paragraph below the numbered list references available services. This policy is sent to all growers each year.

12. Mapping

GIS Maps	Estimated Cost (in \$1,000s)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Layer 1- Distribution system	0	0	0	0	0
Layer 2- Drainage system	n/a	n/a	n/a	n/a	n/a
Suggested layers:					
Layer 3- Groundwater info	1.2	1.2	1.2	1.2	1.2
Layer 4- Soils map	0.15	0.15	0.15	0.15	0.15
Layer 5- natural/cultural resources	n/a	n/a	n/a	n/a	n/a
Layer 6- Problem areas	0.15	0.15	0.15	0.15	0.15

The District's current GIS system is very developed. It was developed by a consultant and has transitioned into a usable tool that District staff employs in water management. The current system is populated with information on parcels within the District, the District's conveyance system, the District's SCADA monitoring locations, the District's measurement locations, NRCS soils information in the area and the District's groundwater monitoring network. District staff now regularly uses the GIS System to develop groundwater contour maps of District seasonal groundwater conditions. The GIS system is not currently viewed as having any significant deficiencies and therefore there is no plan to expand capabilities.

C. Provide a 5- Year Budget for Implementing BMP's

1. Amount spent during current year

Year 2017 or Year 1 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	\$1,500	150
A2	Conservation staff	\$600	12
A3	On-farm evaluation/water delivery info	\$2,500	6
	Irrigation Scheduling	\$0	0
	Water Quality	\$0	0
	Agricultural Education Program	\$0	0
A4	Quantity pricing	\$300	6
A5	Contractor's pumps	\$300	6
B1	Alternative land use	\$0	0
B2	Urban recycled water use	N/A	N/A
B3	Financing of on-farm improvements	\$0	0
B4	Incentive pricing	\$450	12
B5	Line or pipe canals/install reservoirs	\$0	0
B6	Increase delivery flexibility	\$210	6
B7	District spill/tailwater recovery systems	\$0	0
B8	Measure outflow	\$0	0
B9	Optimize conjunctive use	\$105	3
B10	Automate canal structures	\$0	0
B11	Customer pump testing	\$75	0
B12	Mapping	\$1,500	0
	Total	\$7,450	201

2. Projected budget summary for the next year

Year 2018 or Year 2 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	\$1,500	150
A2	Conservation staff	\$600	12
A3	On-farm evaluation/water delivery info	\$2,500	6
	Irrigation Scheduling	\$0	0
	Water Quality	\$0	0
	Agricultural Education Program	\$0	0
A4	Quantity pricing	\$300	6
A5	Contractor's pumps	\$300	6
B1	Alternative land use	\$0	0
B2	Urban recycled water use	N/A	N/A
B3	Financing of on-farm improvements	\$0	0
B4	Incentive pricing	\$450	12
B5	Line or pipe canals/install reservoirs	\$0	0
B6	Increase delivery flexibility	\$210	6
B7	District spill/tailwater recovery systems	\$0	0
B8	Measure outflow	\$0	0
B9	Optimize conjunctive use	\$105	3
B10	Automate canal structures	\$0	0
B11	Customer pump testing	\$0	0
B12	Mapping	\$1,500	0
	Total	\$7,465	201

3. Projected budget summary for the 3rd year

Year 2019 or Year 3 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	\$1,500	150
A2	Conservation staff	\$600	12
A3	On-farm evaluation/water delivery info	\$2,500	6
	Irrigation Scheduling	\$0	0
	Water Quality	\$0	0
	Agricultural Education Program	\$0	0
A4	Quantity pricing	\$300	6
A5	Contractor's pumps	\$300	6
B1	Alternative land use	\$0	0
B2	Urban recycled water use	N/A	N/A
B3	Financing of on-farm improvements	\$0	0
B4	Incentive pricing	\$450	12
B5	Line or pipe canals/install reservoirs	\$0	0
B6	Increase delivery flexibility	\$210	6
B7	District spill/tailwater recovery systems	\$0	0
B8	Measure outflow	\$0	0
B9	Optimize conjunctive use	\$105	3
B10	Automate canal structures	\$0	0
B11	Customer pump testing	\$0	0
B12	Mapping	\$1,500	0
	Total	\$7,465	201

4. Projected budget for the 4th year

Year 2020 or Year 4 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	\$1,500	150
A2	Conservation staff	\$600	12
A3	On-farm evaluation/water delivery info	\$2,500	6
	Irrigation Scheduling	\$0	0
	Water Quality	\$0	0
	Agricultural Education Program	\$0	0
A4	Quantity pricing	\$300	6
A5	Contractor's pumps	\$300	6
B1	Alternative land use	\$0	0
B2	Urban recycled water use	N/A	N/A
B3	Financing of on-farm improvements	\$0	0
B4	Incentive pricing	\$450	12
B5	Line or pipe canals/install reservoirs	\$0	0
B6	Increase delivery flexibility	\$210	6
B7	District spill/tailwater recovery systems	\$0	0
B8	Measure outflow	\$0	0
B9	Optimize conjunctive use	\$105	3
B10	Automate canal structures	\$0	0
B11	Customer pump testing	\$0	0
B12	Mapping	1,500	0
	Total	\$7,465	201

5. Projected budget for the 5th year

Year 2021 or Year 5 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	\$1,500	150
A2	Conservation staff	\$600	12
A3	On-farm evaluation/water delivery info	\$2,500	6
	Irrigation Scheduling	\$0	0
	Water Quality	\$0	0
	Agricultural Education Program	\$0	0
A4	Quantity pricing	\$300	6
A5	Contractor's pumps	\$300	6
B1	Alternative land use	\$0	0
B2	Urban recycled water use	N/A	N/A
B3	Financing of on-farm improvements	\$0	0
B4	Incentive pricing	\$450	12
B5	Line or pipe canals/install reservoirs	\$0	0
B6	Increase delivery flexibility	\$210	6
B7	District spill/tailwater recovery systems	\$0	0
B8	Measure outflow	\$0	0
B9	Optimize conjunctive use	\$105	3
B10	Automate canal structures	\$0	0
B11	Customer pump testing	\$0	0
B12	Mapping	\$1,500	0
	Total	\$7,465	201

Section IV: Best Management Practices for Urban Contractors

(Section Not Applicable)

A. Urban BMPs

Foundational BMPs

1. Operations Programs

1.1. Operations Practices

1.1.1. Conservation Coordinator

1.1.2. Water waste prevention

1.1.3. Wholesale agency assistance program

1.2. Water lose control

1.3. Metering with commodity rates for all new connections and retrofit of existing connections

2. Education Programs

2.1. Public Information Programs

2.2. School Education Programs

Programmatic BMPs

3. Residential

3.1. Residential assistance program

3.2. Landscape water survey

3.3. High-efficiency clothes washers (HECWs)

3.4. WaterSense Specification (WSS) toilets

3.5. WaterSense Specificaitons for residential development

4. Commercial, Industrial, and Institutional (CII)

5. Landscape

B. Provide a 5-Year Budget for Expenditures and Staff Effort for BMPs

1. Amount Spent during current year

Year 2017 or Year 1 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utilities Operations		
	1.1 Operations Practices		
	1.2 Water Loss Control		
	1.3 Metering		
	1.4 Retail Conservation Pricing		
2	Education Programs		
	2.1 Public Information Programs		
	2.2 School Education Programs		
3	Residential		
4	CII		
5	Landscape		
	Total		

2. Projected budget summary for 2nd year

Year 2017 or Year 1 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utilities Operations		
	1.1 Operations Practices		
	1.2 Water Loss Control		
	1.3 Metering		
	1.4 Retail Conservation Pricing		
2	Education Programs		
	2.1 Public Information Programs		
	2.2 School Education Programs		
3	Residential		
4	CII		
5	Landscape		
	Total		

3. Projected budget summary for 3rd year

Year 2017 or Year 1 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utilities Operations		
	1.1 Operations Practices		
	1.2 Water Loss Control		
	1.3 Metering		
	1.4 Retail Conservation Pricing		
2	Education Programs		
	2.1 Public Information Programs		
	2.2 School Education Programs		
3	Residential		
4	CII		
5	Landscape		
	Total		

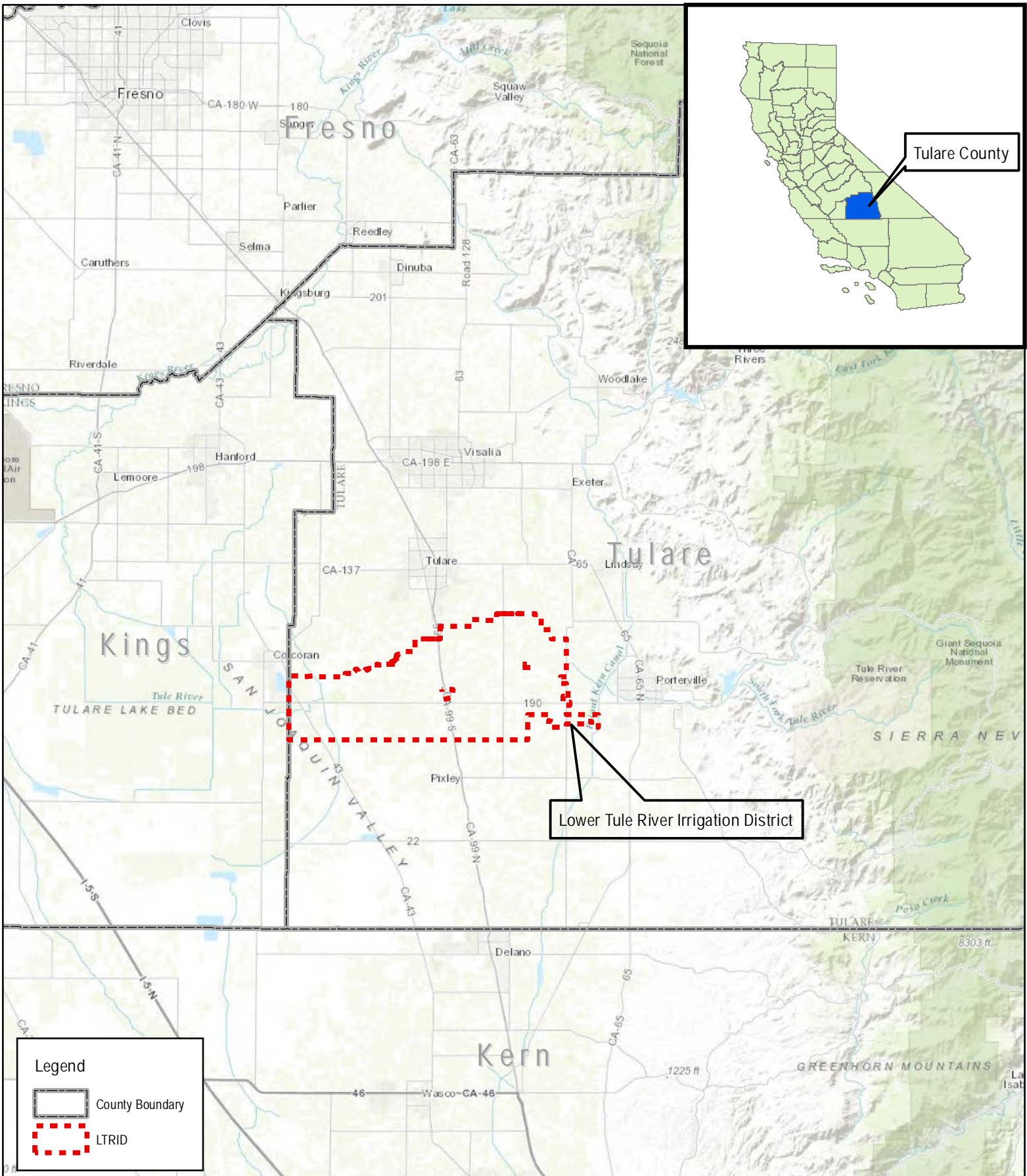
4. Projected budget summary for 4th year

Year 2017 or Year 1 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utilities Operations		
	1.1 Operations Practices		
	1.2 Water Loss Control		
	1.3 Metering		
	1.4 Retail Conservation Pricing		
2	Education Programs		
	2.1 Public Information Programs		
	2.2 School Education Programs		
3	Residential		
4	CII		
5	Landscape		
	Total		

5. Projected budget summary for 5th year

Year 2017 or Year 1 BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
1	Utilities Operations		
	1.1 Operations Practices		
	1.2 Water Loss Control		
	1.3 Metering		
	1.4 Retail Conservation Pricing		
2	Education Programs		
	2.1 Public Information Programs		
	2.2 School Education Programs		
3	Residential		
4	CII		
5	Landscape		
	Total		

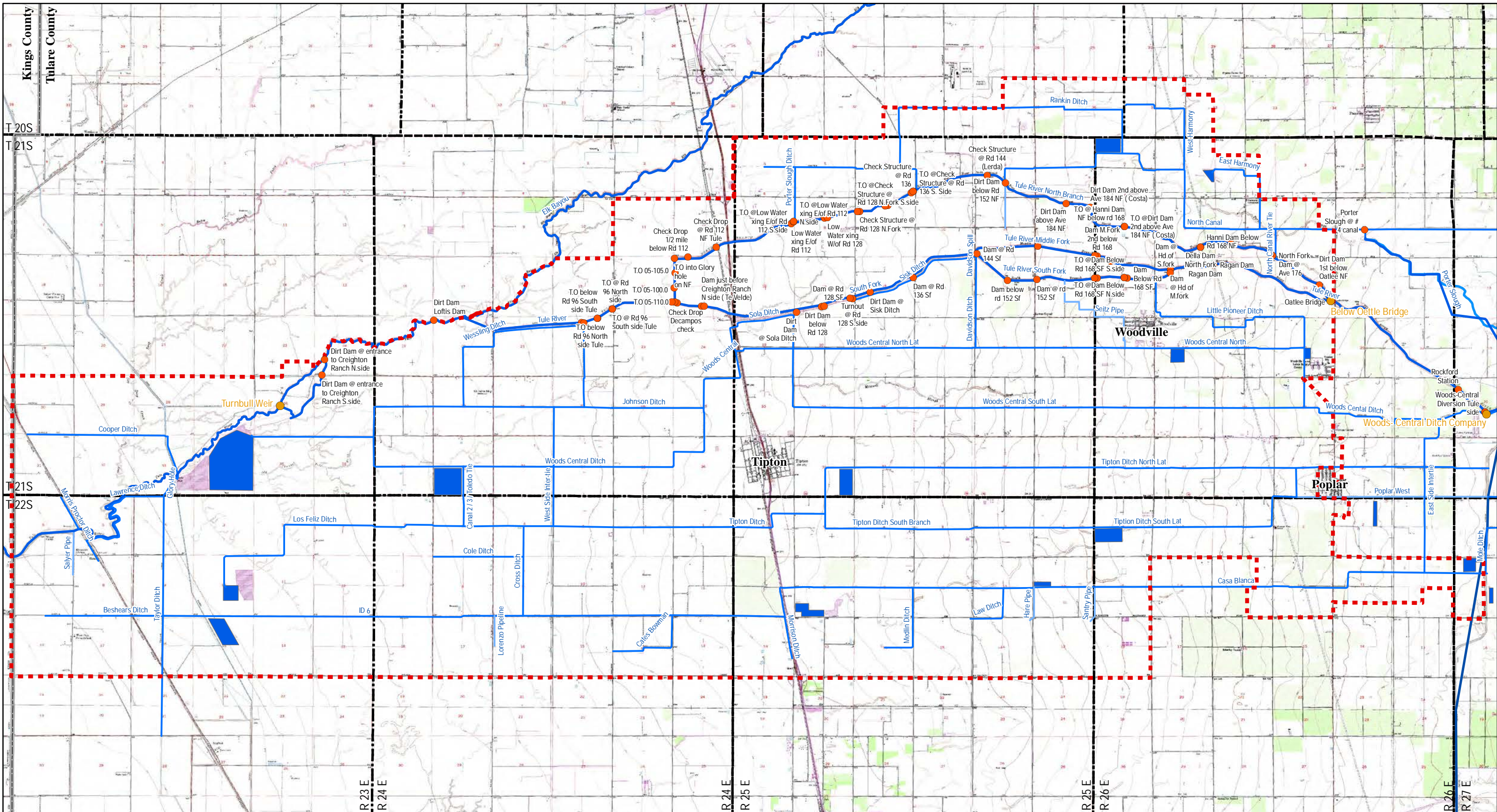
Attachments



Lower Tule River Irrigation District
Vicinity Map

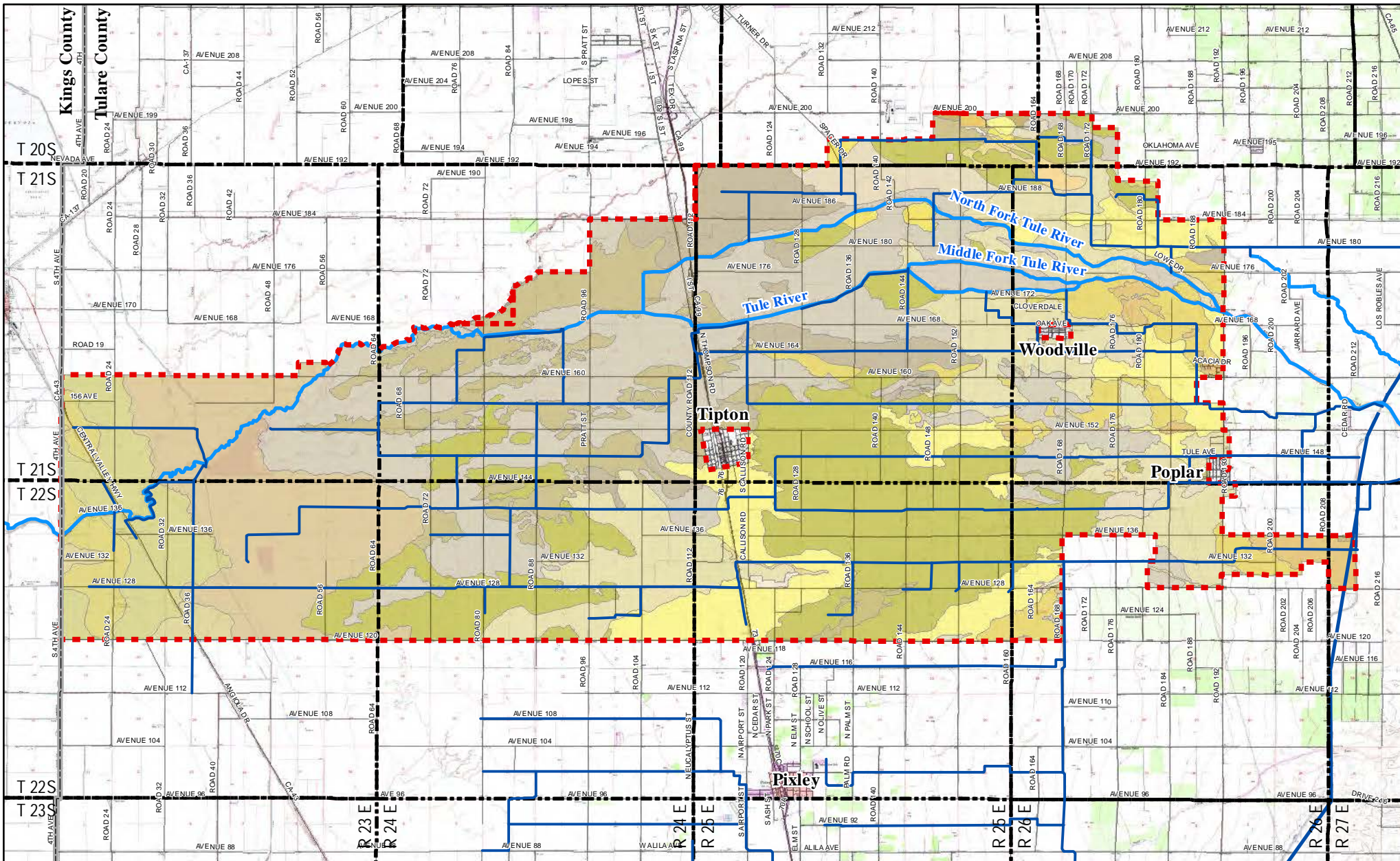


1 in = 10 mi
Attachment A



- Legend**
- County Boundary
 - Townships
 - LTRID
 - Recharge Basins
 - Friant-Kern Canal
 - Pipe
 - Canal
 - River
 - Roads
 - Diversion Headgates & Gaging Stations
 - District Facilities

Lower Tule River Irrigation District
District Facilities Map



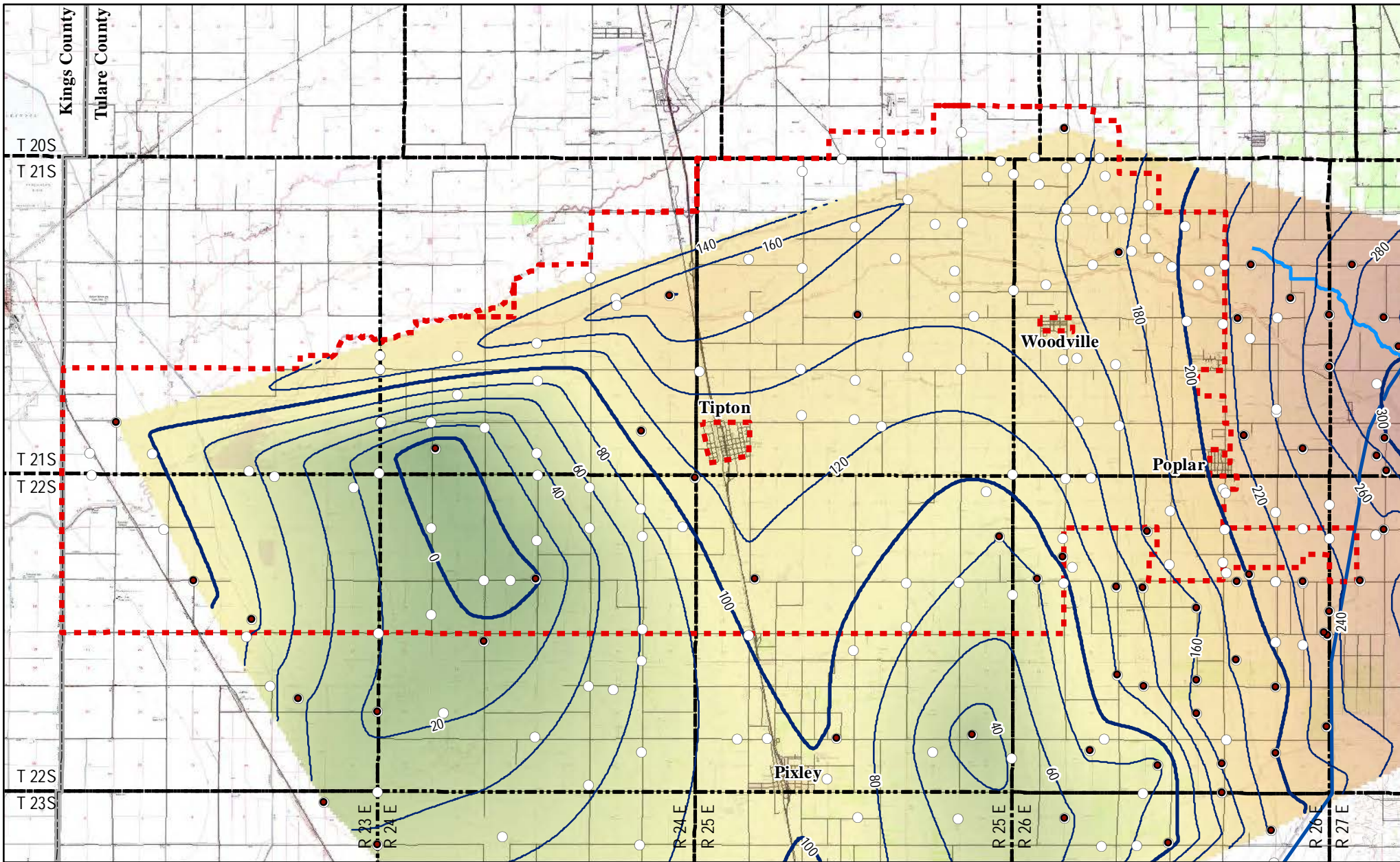
Legend

- County Boundary
- LTRID
- Townships
- Friant-Kern Canal
- Water Ways
- Distribution System
- Roads
- LTRID Soil
- 101 - Akers-Akers, saline-Sodic, complex, 0 to 2 percent slopes
- 102 - Armona sandy loam, partially drained, 0 to 1 percent slopes
- 104 - Biggriz-Biggriz, saline-Sodic, complex, 0 to 2 percent slopes
- 105 - Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes
- 108 - Colpien loam, 0 to 2 percent
- 109 - Crosscreek-Kai association, 0 to 2 percent
- 112 - Dumps
- 114 - Exeter loam, 0 to 2 percent
- 116 - Flamen loam, 0 to 2 percent
- 117 - Gambogy loam, drained, 0 to 1 percent
- 118 - Gambogy-Biggriz, saline-Sodic, association, drained, 0 to 2 percent slopes
- 123 - Grangeville fine sandy loam, saline-sodic, 0 to 1 percent slopes
- 124 - Hanford sandy loam, 0 to 2 percent
- 130 - Nord fine sandy loam, 0 to 2 percent
- 131 - Pits
- 132 - Quonal-Lewis association, 0 to 2 percent
- 134 - Rivenwash
- 135 - San Joaquin loam, 0 to 2 percent
- 137 - Tagus loam, 0 to 2 percent
- 138 - Tujung loamy sand, 0 to 2 percent
- 143 - Yettem sandy loam, 0 to 2 percent
- 145 - Water-perennial

Lower Tule River Irrigation District
Soil Survey Map



1 in = 2.5 mi
Attachment C



Lower Tule River Irrigation District Groundwater Elevation Map

- Legend**
- County Boundary
 - LTRID
 - Townships
 - Friant-Kern Canal
 - Porter Slough
 - Roads
 - Minor Contour (20' Interval)
 - Major Contour (100' Interval)

- DCTRA 2016 Wells Spring (114)
 - DCTRA Wells Not Measured (191)
- Groundwater Elevation**
- High : 536 ft
 - Low : -17 ft

GROUNDWATER MANAGEMENT PLAN

DEER CREEK AND TULE RIVER AUTHORITY

JULY 2006

DENNIS R. KELLER / JAMES H. WEGLEY
CONSULTING CIVIL ENGINEERS

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SECTION 1
PURPOSE
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 1
PURPOSE
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

PLAN OBJECTIVE

The members of the Deer Creek and Tule River Authority (Authority) desire to formalize their existing groundwater management practices for the continuance of local management and to enhance existing monitoring activities in a coordinated manner. Through this Groundwater Management Plan (Plan) the Authority will identify and implement modifications to ongoing practices in order to preserve and enhance groundwater resources. The Authority will organize existing and expanded groundwater management activities to facilitate the implementation of the Plan.

Preservation and enhancement of the groundwater resource is vital to sustaining the local economics which have been built up in reliance, in whole or in part, on this resource. The Authority's objective is to preserve the utility of the groundwater resource, both in terms of quantity and quality at the least possible cost. Enhancement or augmentation of the resource is necessary to mitigate the present level of overdraft and the attendant long-term decline in groundwater levels in the overall groundwater basin. The Plan objectives can be accomplished, at least cost, by joint implementation of the Plan through the Authority as opposed to individual implementation by the Authority members.

AUTHORITY

The Authority is organizing current and proposed groundwater management activities

under provision of Part 2.75 of Division 6 of the California Water Code commencing with Section 10750, otherwise known as AB3030, the Groundwater Management Act of 1992. The 1992 Act was amended in 2002 and 2004 to describe specific requirements for the Plan.

For the purpose of groundwater management, powers granted to an entity which adopts a Plan include the powers of a water replenishment district (Part 4, Division 18, California Water Code), to the extent not already possessed by the entity, but not limited to the following:

1. Acquire and operate facilities, waters and rights needed to replenish the groundwater supplies;
2. Store water in groundwater basins, acquire water rights, import water into the Authority and conserve water;
- 3.. Participate in legal proceedings as required to protect and defend water rights and water supplies and to prevent unlawful exportation of water from the Authority.
4. Under certain conditions to exercise the right of eminent domain;
5. Act jointly with other entities in order to economically perform required activities;
6. Carry out investigations required to implement the Plan;
7. Fix rates for water for replenishment purposes; and
8. Fix the terms and conditions of contracts for use of surface water in-lieu of groundwater.

PLAN ELEMENTS

Part 2.75, Groundwater Management, of the Water Code establishes required (§10753.7) and recommended (§10753.8) elements of a groundwater management plan. Bulletin 118 prepared by the Department of Water Resources (DWR) also provides recommendations for groundwater management plans.

The Authority's Plan has been prepared to address the requirements and recommendations for groundwater management plans. Table 1-1 summarizes these elements and their respective location within the Authority's Plan.

TABLE 1-1
PLAN SUMMARY
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION REFERENCE	SUBJECT	PLAN LOCATION
REQUIRED PLAN ELEMENTS (Water Code §10753.7 (a))		
(1)	Basin management objectives	Section 4
(1)	Monitoring and Management: <ul style="list-style-type: none"> - groundwater levels - groundwater quality - land surface subsidence - changes of surface water flow and quality 	Section 5, Section 6 Section 5, Section 6 Section 5, Section 6 Section 5, Section 6
(2)	Plan to involve other agencies	Section 2, Section 5, Section 7
(3)	Map of groundwater basin and local agencies	Section 2
(4)	Monitoring protocols	Section 6
RECOMMENDED PLAN ELEMENTS (Water Code §10753.8)		
a.	Saline Water Intrusion	Section 5
b.	Wellhead Protection (Recharge Areas)	Section 5
c.	Migration of Contaminated Water	Section 5
d.	Well Abandonment/Destruction	Section 5
e.	Overdraft Mitigation	Section 5
f.	Groundwater Replenishment	Section 5
g.	Groundwater Extractions	Section 5
h.	Groundwater Monitoring	Section 5, Section 6
i.	Conjunctive Use	Section 5
j.	Well Construction Policies	Section 5
k.	Operation of Facilities	Section 5, Section 7
l.	Relationships with Other Agencies	Section 5
m.	Land Use Planning	Section 5

TABLE 1-1 (cont'd)
PLAN SUMMARY
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

ADDITIONAL PLAN ELEMENTS (DWR Bulletin 118, Appendix C) (1)		
(4)	Advisory Committee of Stakeholders	Section 7, Appendix A
(5)	Groundwater basin description: <ul style="list-style-type: none"> - physical features and characteristics - historical data - issues of concern - historical and project water demands and supplies 	Section 2
(8)	Existing and planned management actions	Section 5, Section 6
(10)	Monitoring program features: <ul style="list-style-type: none"> - map of monitoring sites - type and frequency of monitoring 	Section 6
(12)	Groundwater Management Reports	Section 7
(13)	Plan re-evaluation	Section 7

Note: (1) DWR Bulletin 118, Appendix C outlines 14 required and recommended components for groundwater management plans. Required elements have been documented.

PLAN CONTACT INFORMATION

Questions or requests for additional information regarding the Authority's Plan should be directed to the Program Manager at the following address:

Deer Creek and Tule River Authority
357 East Olive Ave.
Tipton, CA 93272
Phone: 559/686-4716 FAX: 559/686-0151

Business Hours: 8:00 a.m. - 4:30 p.m.
Monday through Friday

The Authority meets on the 3rd Friday of each odd-numbered month. Authority meetings are held at above address and are open to the public.

SECTION 2
GENERAL
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 2
GENERAL
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

DESCRIPTION OF AUTHORITY

The Deer Creek and Tule River Authority (Authority) is a joint powers Authority comprised of the following members: Lower Tule River Irrigation District, Pixley Irrigation District, Porterville Irrigation District, Saucelito Irrigation District, Stone Corral Irrigation District, Tea Pot Dome Water District and Terra Bella Irrigation District (Districts). The Authority's primary purpose is the joint exercise of the powers of the Authority members in order to facilitate more efficient operations and management of their activities. Integral to this purpose is the joint conjunctive management of the Authority members surface and groundwater supplies. The Authority will work with its members and other water entities to insure an adequate water supply.

The Districts were originally organized to provide a reliable water supply to their landowners. AB 3030 provides a means for local districts to jointly manage their individual supplies. In order to preserve local management and enhance existing groundwater management programs operated over many years by the Districts, the Board of Directors of the Authority on March 24, 1995, adopted a Groundwater Management Plan (Plan) under provisions of AB 3030. The 1994 Plan enabled the Authority to establish policies that served to enhance the overall management of the water supplies available to the Authority members.

In 2002 and 2004, Senate Bill (SB) 1938 and Assembly Bill (AB) 105, respectively, amended the requirements of groundwater management plans. This Plan incorporates the necessary elements to update the Authority's original 1994 Plan.

AB 3030 provides for the development of a groundwater management plan within the boundaries of the Authority members. The underlying groundwater basin is part of the larger Tulare Lake Basin as identified in State of California Bulletin 118. The management area for the Authority's Plan may include, by agreement, adjacent entities whose activities would influence the common groundwater resource. The Authority's member Districts and the Plan area is shown on Figure 2-1.

Plan Participants

The Authority will be responsible for the implementation of the Plan. The Authority's member Districts comprise the primary Plan Participants. The identification and involvement of additional Plan Participants will result from Plan activities.

The Plan Participants are presented in Appendix A. This Appendix will be revised accordingly to reflect the Plan's current participants.

Stakeholders

For the purposes of the Plan, a stakeholder will be defined as any individual, group, or entity located within the Plan Area that may be affected by the implementation of the Plan. Stakeholders can be Plan Participants.

An initial compilation of groundwater basin stakeholders is presented in Appendix A. Additional stakeholders may be identified through Plan activities.

Advisory Committee

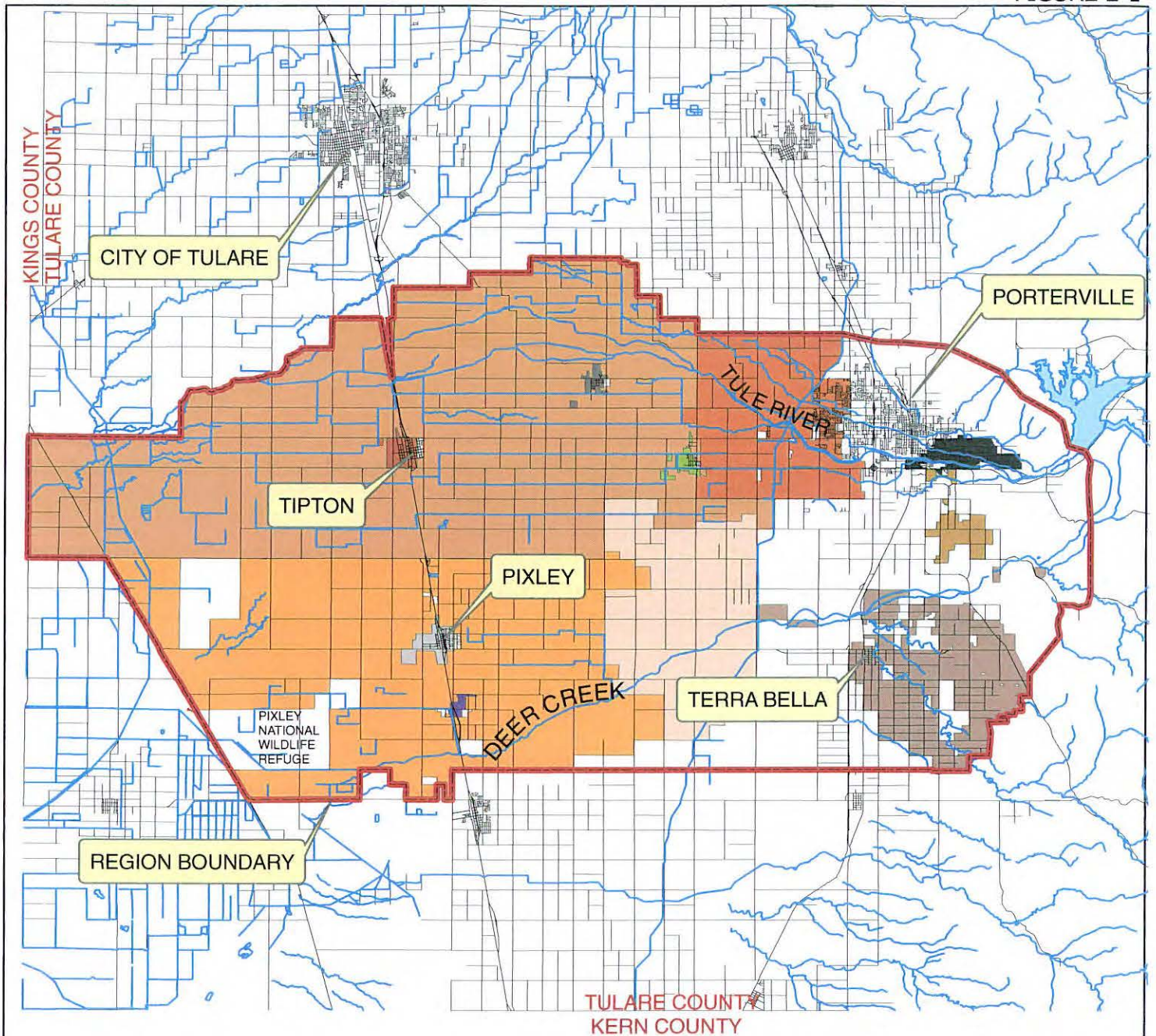
The Authority has created an Advisory Committee to oversee the development, implementation and subsequent refinement of the Plan. The members of the Advisory Committee are presented in Table 2-1.

TABLE 2-1
ADVISORY COMMITTEE MEMBERS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

NAME	TITLE	REPRESENTING DISTRICT
Dan Vink	General Manager	Lower Tule River Irrigation District
Dan Vink	General Manager	Pixley Irrigation District
Dave Hoffman	Manager	Porterville Irrigation District
Dave Hoffman	Manager	Saucelito Irrigation District
Keith Norris	Manager	Tea Pot Dome Water District
Sean Geivet	General Manager	Terra Bella Irrigation District
Dennis R. Keller	Consulting Civil Engineer	Authority Consultant

Additional Advisory Committee members may be identified and included during the implementation of the Authority's Plan.

FIGURE 2-1



SOURCE: TULARE COUNTY GRAPHICAL INFORMATION SYSTEM, 1999

LEGEND

GEOGRAPHICAL INFORMATION

- Boundary - Groundwater Management Plan
- Streams
- Streets
- Lake Success

PUBLIC UTILITY DISTRICTS

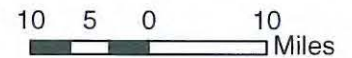
- Pixley Public Utility District
- Porter Vista Public Utility District
- Woodville Public Utility District

COMMUNITY SERVICES DISTRICTS

- Poplar Community Services District
- Teviston Community Services District
- Tipton Community Services District

IRRIGATION DISTRICTS

- Lower Tule River Irrigation District
- Pixley Irrigation District
- Porterville Irrigation District
- Saucelito Irrigation District
- Terra Bella Irrigation District
- Vandalia Irrigation District



PLAN BOUNDARIES
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 3
GROUNDWATER BASIN CHARACTERISTICS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 3
GROUNDWATER BASIN CHARACTERISTICS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

GENERAL

The Deer Creek and Tule River Authority (Authority) is located within the Tule River Sub-basin of the San Joaquin Valley Groundwater Basin (Basin No. 5-22.13). The Tule River Sub-basin is bounded by the following groundwater sub-basins; Kaweah River (north), Tulare Lake (west) and Kern County (south). The groundwater basin includes three major surface drainages: Tule River, Deer Creek and White River.

Typical annual rainfall in the basin is approximately 11 inches. The western portion of the Basin is typically more arid. The eastern edge of the Basin along the mountains experiences higher rainfall amounts.

The region encompassed by the Authority's Groundwater Management Plan (Plan) is shown on Figure 2-1 in Section 2. Table 3-1 summarizes the communities located in the basin and their respective populations.

TABLE 3-1
COMMUNITY POPULATIONS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

COMMUNITY	POPULATION (1)
Pixley	2,589
Poplar/Cotton Center	1,496
Porterville (2)	46,346
Terra Bella	3,466
Tipton	1,790
Woodville	1,678

NOTE: (1) Population based upon Census 2000
Census Designated Place (CDP).
(2) Includes East Porterville CDP (population, 6,730).

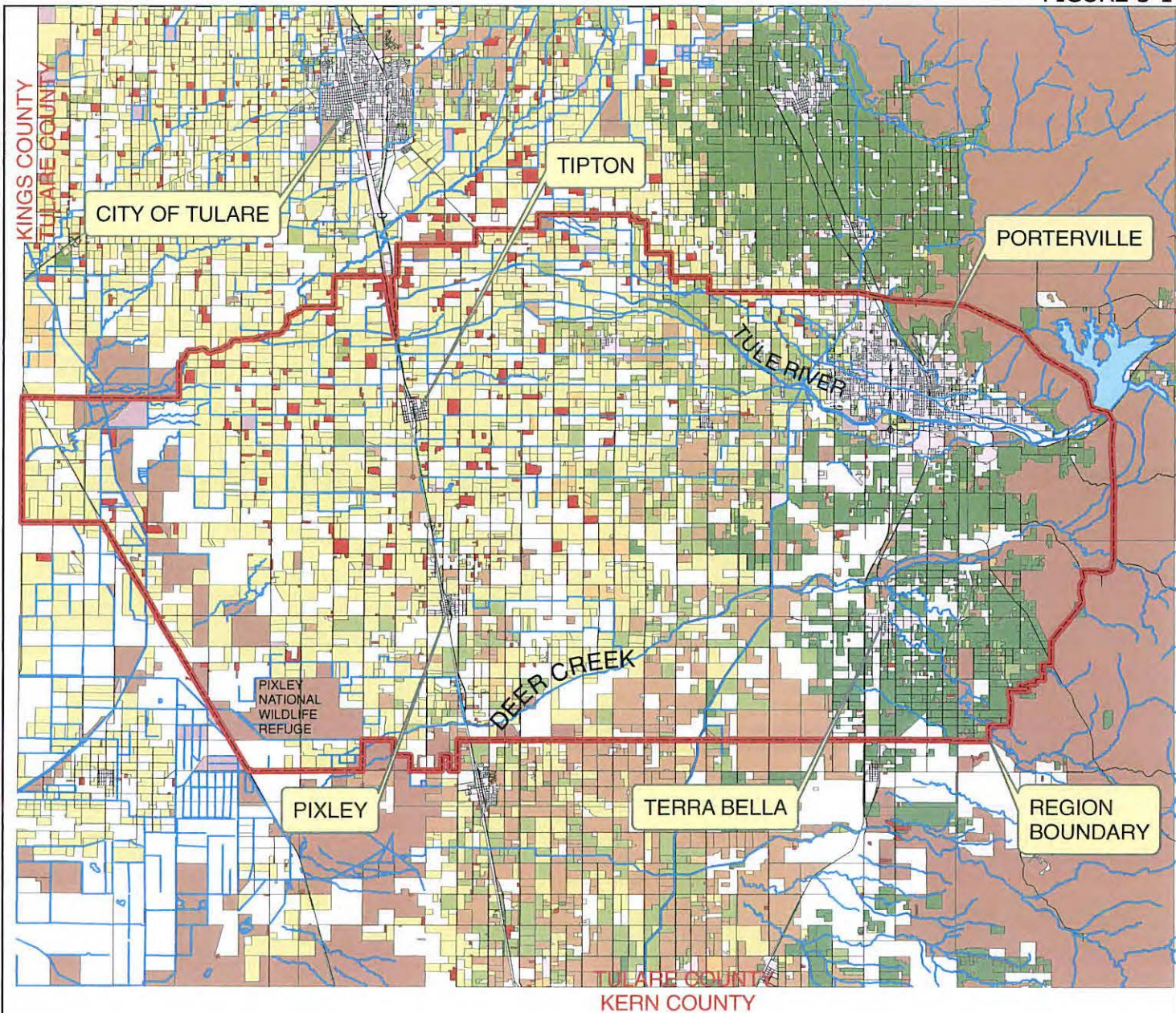
The Basin is rural in nature, dominated by agricultural land use as shown in Figure 3-1.

PHYSICAL CHARACTERISTICS

The physical characteristics of the groundwater basin influence the content of the Plan. In particular, the manner in which groundwater is replenished is directly affected by surface and subsurface characteristics, such as the permeability of the overlying and subsurface soils. The permeability of the soils within the groundwater basin is shown on Figure 3-2. In general, the soils having higher permeability rates are located adjacent to the main surface water drainages.

The Authority members overlies areas of both unconfined and confined aquifers. There are limited areas of perched water and shallow groundwater tables. These conditions result from subsurface geologic conditions. A general depiction of the aquifer and subsurface geologic conditions is presented on Figure 3-3. Figure 3-4 shows the groundwater elevations for spring, 2004, as compiled and prepared by the Department of Water Resources.

FIGURE 3-1



SOURCE: TULARE COUNTY GRAPHICAL INFORMATION SYSTEM, 1999

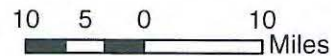
LEGEND

GEOGRAPHICAL INFORMATION

- Boundary - Groundwater Management Plan
- Streams
- Streets
- Lake Success

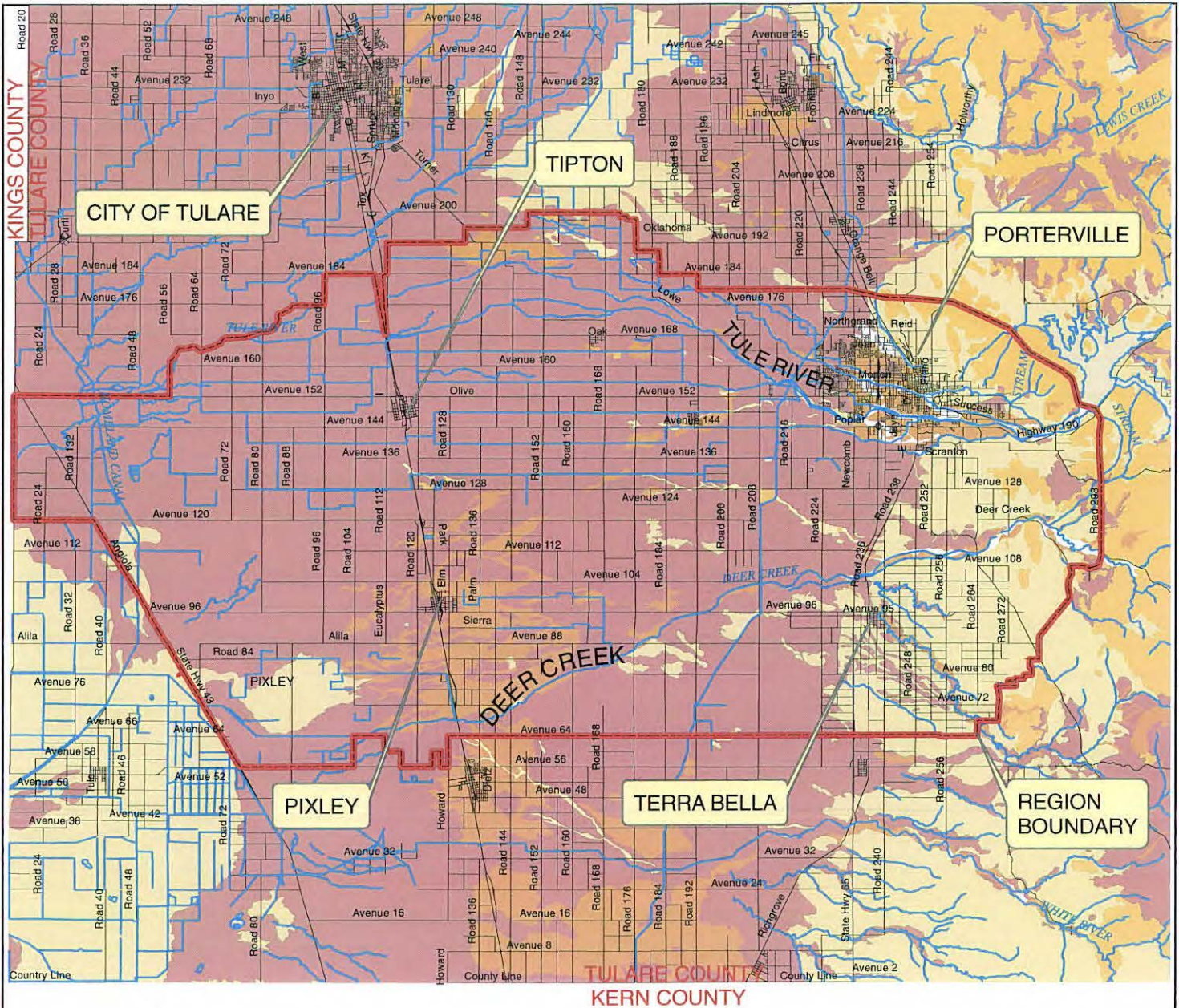
LAND USE

- Citrus
- Deciduous Fruit and Nuts
- Field Crops
- Semi Agricultural: Livestock, Dairies, Etc.
- Truck, Nursery and Berry Crops
- Vineyards
- Native Vegetation
- Water Surfaces
- Urban



LAND USE
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

FIGURE 3-2



SOURCE: TULARE COUNTY GRAPHICAL INFORMATION SYSTEM, 1999

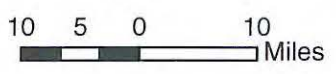
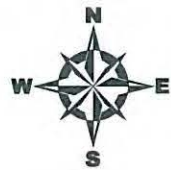
LEGEND

GEOGRAPHICAL INFORMATION

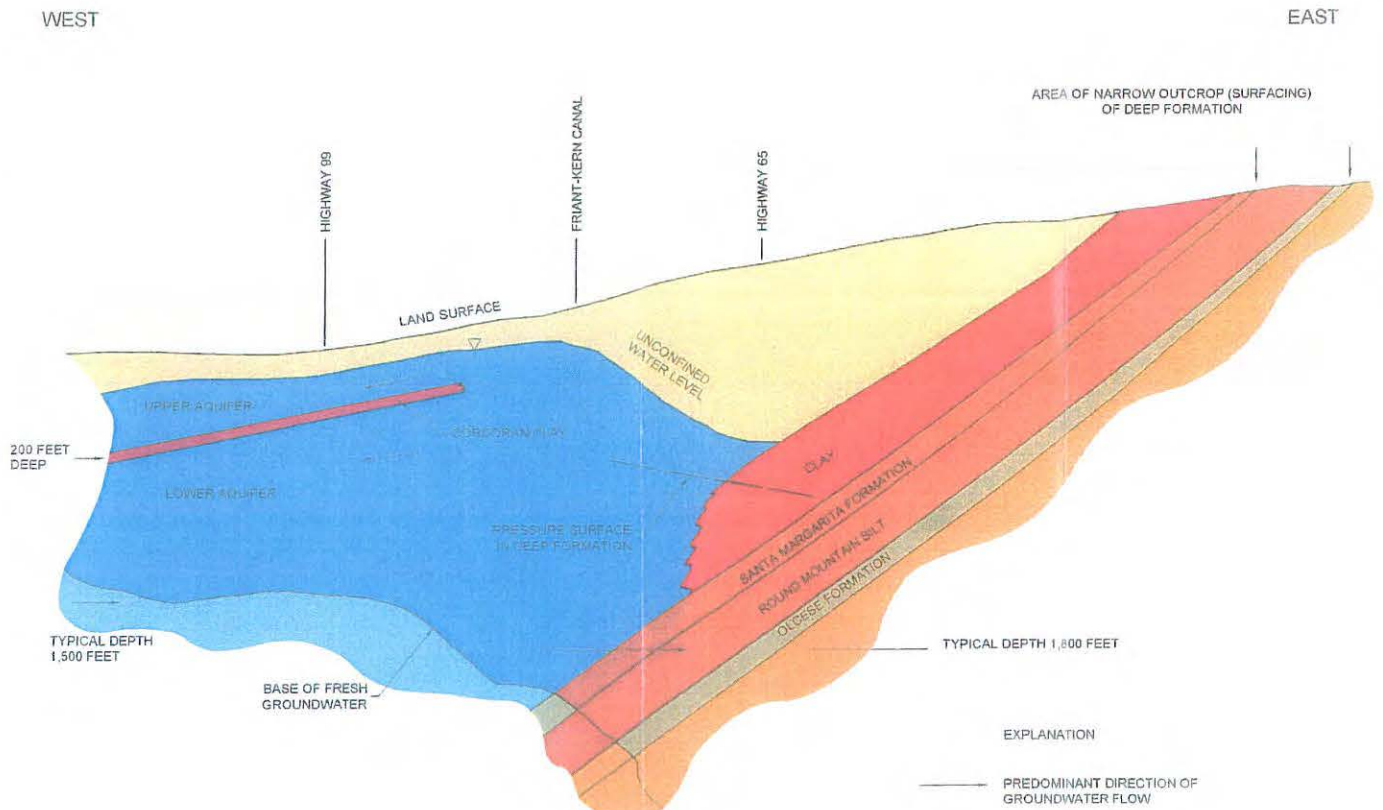
- Boundary - Groundwater Management Plan
- Streams
- Streets
- Lake Success

PERMEABILITY

- Moderate
- Rapid
- Rock
- Slow
- Under Water



SOIL PERMEABILITY
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

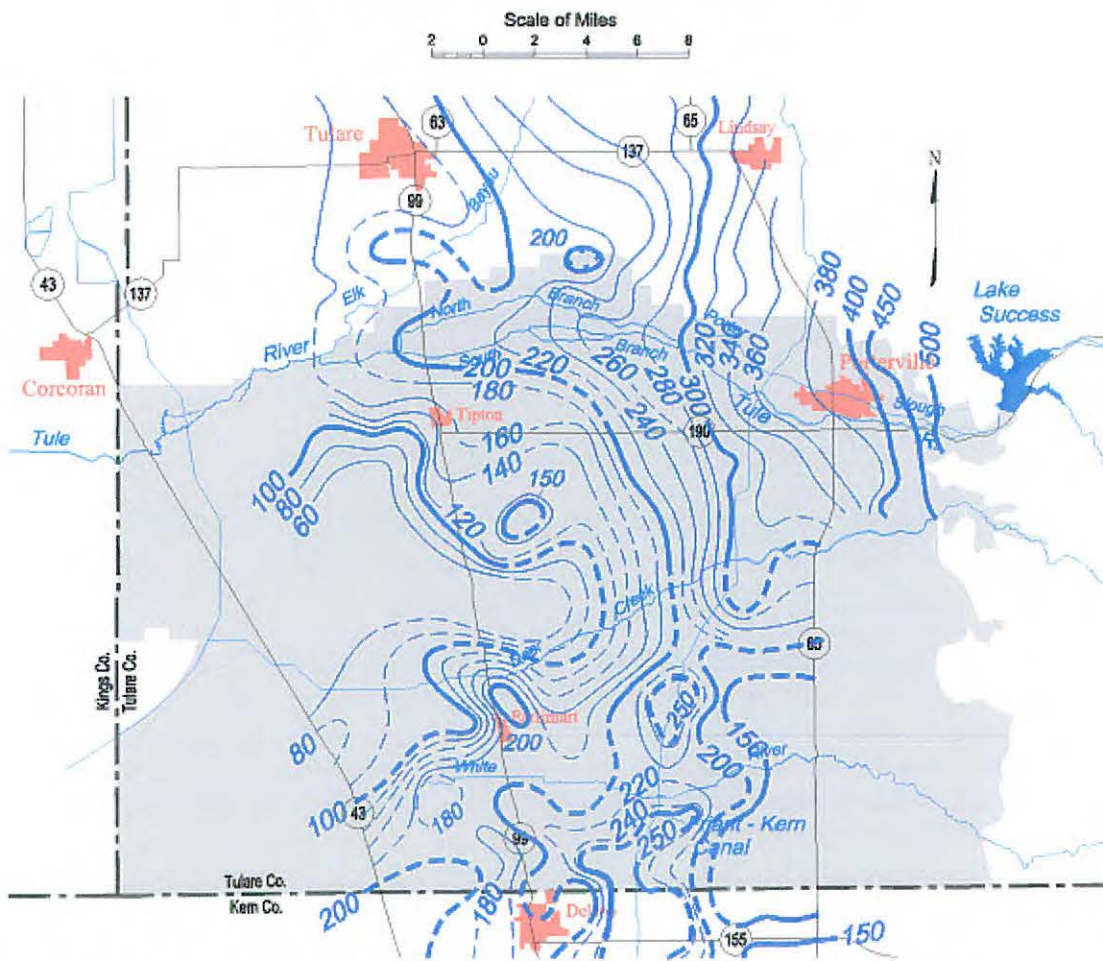


SOURCE: FIGURE 9, ANALYSIS OF GROUNDWATER RESOURCES
 PROVOST AND PRITCHARD 2001.

SURFACE CONDITIONS
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

Tule Groundwater Basin

Spring 2004, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10, 20 and 50 feet.



SOURCE: DEPARTMENT OF WATER RESOURCES

GROUNDWATER ELEVATIONS
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 4
BASIN MANAGEMENT OBJECTIVES
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 4
BASIN MANAGEMENT OBJECTIVES
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

GENERAL

The Deer Creek and Tule River Authority (Authority) has developed five (5) basin management objectives to guide the implementation of the Groundwater Management Plan (Plan). By accomplishing these objectives, the Authority believes that a more reliable groundwater supply for long-term beneficial uses within the Plan area will be realized. The Authority's basin management objectives within the Plan area are:

1. To promote and realize groundwater resource protection;
2. To facilitate groundwater resource sustainability;
3. To develop groundwater resource understanding;
4. To develop groundwater basin understanding; and
5. To promote and facilitate information dissemination regarding the groundwater resource.

Each basin management objective is described below.

GROUNDWATER RESOURCE PROTECTION

Groundwater needs to have water quality that will sustain its beneficial uses to remain a viable water resource within the groundwater basin. This objective focuses the Authority's management strategies to maintain the good water quality of the Plan Area's groundwater. The Authority will utilize the following strategies to achieve this objective:

1. Wellhead/Recharge Area Protection;
2. Migration of Contaminated Water Controls;
3. Well Abandonment and Destruction Policies; and
4. Well Construction Policies.

Protection of the groundwater beneath the Plan Participants ensures that the maximum amount of groundwater remains available. Achieving this basin management objective minimizes the potential to lose groundwater volumes to contamination.

GROUNDWATER RESOURCE SUSTAINABILITY

Groundwater is the primary water supply in the Plan Area for both domestic and agricultural purposes. This objective emphasizes the maintenance and/or increase of the available groundwater supply. The following management strategies will be used toward achieving this objective:

1. Overdraft Mitigation;
2. Groundwater Recharge Policies;
3. Groundwater Extraction Management;
4. Conjunctive use Policies; and
5. Operation of Facilities.

This basin management objective of the Plan will identify and quantify the surface and groundwater supplies available to the Authority members and define the interaction between these supplies. Groundwater storage is affected by groundwater pumping and groundwater recharge as water users attempt to meet their water use demands. The net result of the

interactions between the available water supplies and the demands for water is a change in groundwater storage. This basin management objective is intended to provide the Authority with the information and tools required to maintain and improve the total water supply through coordinated management of groundwater.

GROUNDWATER RESOURCE UNDERSTANDING

The purpose of this basin management objective is to further develop knowledge regarding the Plan Area's groundwater. With detailed information regarding the groundwater resource, improved characterization will lead to future groundwater management decisions. The primary Plan element that will achieve this objective is groundwater monitoring.

Groundwater levels monitored at least annually will indicate the status (availability) of the resource. Groundwater levels also reveal the effectiveness of other strategies, such as groundwater recharge efforts. Monitoring data developed over time will serve as the foundation of conclusions regarding groundwater reliability and management strategy effectiveness.

GROUNDWATER BASIN UNDERSTANDING

This basin management objective gathers basin information to facilitate evaluations regarding basin features and potential groundwater resource impacts.

Changes to the groundwater basin's topographic, geologic and hydrologic conditions may adversely affect the groundwater. Land use development can impact both the quantity and quality of groundwater. The availability of surface water reduces overall demand on the groundwater.

This objective will be achieved through the following management strategies:

1. Land Subsidence Monitoring;
2. Land Use Planning; and
3. Surface Water Management.

Through these strategies, the Authority will remain familiar with the Plan Area's topographic, geologic and hydrologic conditions that may affect the groundwater resource. The Authority will have the capability to react to proposed projects and changing conditions and potentially avoid adverse groundwater impacts.

INFORMATION DISSEMINATION

Groundwater resource and basin information and knowledge will result from the active implementation of this Plan. The Authority will serve as the primary conduit of information regarding the Plan and subsequent results.

This Basin management objective will result from the following plan elements:

1. Groundwater Basin and Resource Information Management;
2. Groundwater Basin and Resource Reports; and
3. Local Agency and Stakeholder Involvement.

The Plan and its management strategies will result in the compilation of various data and information regarding the groundwater basin and its resources. The Authority will compile, manage and disseminate this information to facilitate improved coordination and use of the Plan Area's hydrologic resources. The Plan will also result in various opportunities for the Basin's stakeholders to respond to basin management efforts.

SECTION 5
MANAGEMENT STRATEGIES
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 5
MANAGEMENT STRATEGIES
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

GENERAL

California Water Code Sections 10753.7 and 10753.8 set forth required and recommended elements that establish strategies for groundwater management. Each strategy and the Deer Creek and Tule River Authority's (Authority) planned activities conducted in support of the strategy are described in this section. Some activities have been in use since the adoption of the previous 1994 Groundwater Management Plan (Plan). Planned activities describe proposed Authority efforts that will be utilized during the implementation of this Plan.

SALINE WATER INTRUSION CONTROL

The Tule River Groundwater Basin is a subbasin of the Tulare Lake Hydrologic Region. The western edge of the Plan Area is situated about 90 miles from the Pacific Ocean. The Authority does not consider saline water intrusion controls a management strategy that warrants consideration.

Plan Activities

None - The Authority reserves the right to decide whether or not it will be involved with this strategy in the future as authorized by Water Code Section 10753.8.

WELLHEAD AND RECHARGE AREA PROTECTION

The management strategy consists of the identification, establishment and management of wellhead and recharge protection areas. Areas where groundwater pumping and recharge occur warrant dedicated attention by the Authority. Wells represent a direct conduit to groundwater. Recharge area (basins) are typically constructed in areas exhibiting high soil permeability characteristics.

The Authority will monitor and participate in land use development activities within the Plan Area. The Authority will also consider structural measures such as fencing or land acquisition to protect wellhead or recharge areas.

Plan Activities

1. Land use and development monitoring;
2. Participation in pertinent land use/zoning planning procedures; and
3. Incorporation of security measures such as fencing, as necessary.

MIGRATION OF CONTAMINATED GROUNDWATER CONTROLS

This management strategy incorporates regulations and controls for contaminated groundwater. The Authority has not identified specific plumes of contaminated groundwater. Source specific plumes of contaminated groundwater, such as those from leaking underground storage tanks, fall under the jurisdiction of various state and federal agencies. The Authority is not in a position at this time to pursue regulations regarding unattributed groundwater contamination.

The Authority will develop and implement protocols to obtain and compile information regarding contaminated groundwater. Monitoring of groundwater quality will also be conducted.

Plan Activities

1. Monitoring of regulatory activities and records regarding contaminated groundwater within Plan Area; and
2. Complete an inventory and evaluate available groundwater quality data.

WELL ABANDONMENT/DESTRUCTION POLICIES

Improper well abandonment may allow contamination of the groundwater. Well abandonment must be conducted in conformance with standards adopted by the County of Tulare. The Authority will monitor these activities by reviewing abandonment records compiled by the County. Appropriate information on proper abandonment of wells within the Plan area will be made available through the Authority.

In lieu of well abandonment, the Authority will pursue the conversion of a production well to a monitoring well if such suitable opportunities arise and funding is available.

Plan Activities

1. Establish and maintain a protocol with Tulare County regarding review of well abandonment records;
2. Develop record keeping system/database of abandoned wells;
3. Establish public education activity to inform stakeholders of well standards and policies; and
4. Develop and implement program to convert abandoned production wells to monitoring wells.

WELL CONSTRUCTION POLICIES

The increase in groundwater extraction resulting from the construction of additional wells affects the long-term water balance of the region. Well construction may allow contamination of the groundwater if not done properly. Well construction must be conducted in conformance with standards adopted by the County of Tulare. The Authority will monitor these activities by reviewing well construction records compiled by the County. Appropriate information on proper construction of wells within the Plan area will be made available through the Authority.

Opportunities for additional groundwater monitoring wells may arise through the abandonment of existing production wells. The Authority will consider such a conversion to eliminate the construction of additional wells.

Plan Activities

1. Establish and maintain a protocol with Tulare County regarding review of well construction records;
2. Develop a record keeping system/database of constructed wells;
3. Establish public education activity to inform stakeholders of well construction standards and policies; and
4. Develop guidelines for monitoring well conversion.

OVERDRAFT MITIGATION

The groundwater basin is experiencing groundwater overdraft as evidenced by lower groundwater levels within the Plan Area.

This management strategy is best achieved through the implementation of several companion management strategies. Overdraft mitigation is accomplished through the integration of the following strategies:

1. Groundwater Recharge/Management;
2. Groundwater Extraction Policies;
3. Conjunctive Use Policies; and
4. Surface Water Management.

These strategies will be implemented to attempt to achieve a hydrologic balance within the Plan area, thereby reducing overdraft of the groundwater resource.

GROUNDWATER RECHARGE MANAGEMENT

The replenishment of the underlying groundwater occurs naturally and through deliberate, controlled means. The Authority's groundwater replenishment is achieved by controlled means principally through direct recharge to the underground and through the delivery of surface water, when available, to lands otherwise relying on the groundwater resource.

Direct recharge is achieved through the placement of surface water in channels or basins located on permeable soils for the express purpose of percolation to the underground. Within the area of the Authority, the members use natural channels, unlined ditches and canals and percolation basins for this purpose. It is the intention of the Authority members to expand the current network of recharge facilities. The monitoring of groundwater conditions under this Plan will enable the Authority to identify areas of need in this regard.

Delivery of surface water for irrigation purposes reduces the need for water users to draw on groundwater thereby conserving the water available in the aquifer for later use. The use of surface water in this manner is known as in-lieu recharge and is practiced by all Authority members. An additional benefit is derived when irrigation water applied beyond crop water needs percolates to the underground.

Plan Activities

1. Maintain and/or expand relationships involving networks of groundwater recharge facilities;
2. Maintain and/or expand surface water deliveries within the Plan area.; and
3. Pursue additional surface water supplies for specific purposes of groundwater recharge.

GROUNDWATER EXTRACTION POLICIES

Effective groundwater replenishment and maintenance of groundwater levels involves the management of water supplies available to the basin and extractions from the basin.

Groundwater extractions within the management area are primarily by private wells.

Management of groundwater extractions can best be achieved through economic incentives, rather than through the regulation of extractions. This current practice will continue to be implemented through the pricing of surface water at rates which encourage water users to use surface water in-lieu of pumping groundwater.

Plan Activities

1. Secure surface water quantities and establish subsequent pricing that encourages maximum surface water use;
2. Develop and implement an educational program focused on:
 - a) Timing of use of groundwater;
 - b) Timing of use of surface water; and
3. Evaluate grower incentive based banking program.

CONJUNCTIVE USE POLICIES

Groundwater management in California is rooted in the conjunctive use of surface and groundwater resources. Use of the water supplies from the two sources is integrated to accomplish the optimum utilization of each source.

In years of shortage, that previously stored water is pumped to supplement available surface water. Authority members will be encouraged to maximize the utilization of available facilities and resources for conjunctive use through cooperative management.

Conjunctive use opportunities motivated the Authority members to enter into long-term contracts with the United States beginning in the 1950's for the importation of supplemental surface water supply from the Friant Unit of the CVP.

Water transfers and exchanges are an integral part of the existing conjunctive use programs. Under the Plan, the Authority members will seek to preserve and enhance conjunctive use activities through coordinated use of available supplies made possible by water transfers and exchanges and through expansion of recharge facilities. Enhancement of conjunctive use activities could include the development of water banking arrangements with other agencies by utilizing available groundwater storage capacity for the temporary storage of water.

This management strategy will result from the integration of the following plan elements:

1. Groundwater Recharge Policies;
2. Groundwater Extraction Policies; and
3. Surface Water Management.

SURFACE WATER MANAGEMENT

Surface Water Quantity

The Authority members import surface water supplies from the Central Valley Project through the Friant Division and the Cross Valley Canal exchange program under long-term contracts with the United States and receive local surface supplies from the Tule River and Deer Creek. Also, the Authority members make short-term and year-to-year arrangements to secure additional Central Valley Project (CVP) water and other supplies. The Authority members have in place and operate an extensive system of conveyance, distribution and recharge facilities throughout their service area to make use of available surface supplies. Table 5-1 summarizes the water supply contract amounts of each member District of the Authority.

Under this Plan, the Authority will seek to preserve the existing water rights and contracts and will pursue opportunities to supplement these supplies through importation of additional water supplies for Authority members. Supplemental supplies may be obtained through purchase of additional CVP water from other entities, "Section 215 water" from the United States and through other programs as may be available. Efficient water use and distribution within the management area will be encouraged through the use of transfers and exchanges among Authority members.

Importation of affordable water supplies, in quantities sufficient to achieve a long-term water balance within the service area of the Authority members, is a prerequisite for successful implementation of the recharge groundwater management strategy. All opportunities to supplement the regular supplies of the Authority members through long-term water exchange and banking agreements, hereinafter referred to as Projects, will be evaluated for compatibility with the goals of this Plan pursuant to an adopted evaluation process.

TABLE 5-1
WATER SUPPLY
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

District	Acres	CVP Supply (AF)	Avg CVP Supply (AF)	Conveyance System	Other Notes
Lower Tule River ID	104,000	61,200 Class 1 238,000 Class 2 31,102 CVC	156,240	300 mi. Canals 25 mi. Rivers 5 mi. Piped	Local supply from Tule River 70,000 AF/y average
Pixley ID	70,000	31,102 CVC		46 mi. Canals 14 mi. River	Access to Deer Creek - minor supply
Porterville ID	17,000	16,000 Class 1 30,000 Class 2	27,320	13 mi. Unlined Canals 7 mi. Piped 12 mi. Rivers/Slough	Local supply from Tule River 10,600 AF/y average
Saucelito Irrigation District	19,500	21,200 Class 1 32,800 Class 2	33,300	100% Piped	
Stone Corral ID (1)	6,500	10,000 Class 1	9,200	100% Piped	GW storage is limited- Aquifer thickness <1600'
Terra Bella ID	13,300	29,000 Class 1	26,680	100% Piped	GW storage is limited- Aquifer thickness <1600'

Notes: (1) Not in groundwater basin.

This evaluation process will consist of the following steps:

1. Submittal of written proposal and technical report;
2. Authority Advisory Committee and consultant evaluation;
3. Proponent and Authority Coordination; and
4. Authority Advisory Committee recommendation and Board of Directors action.

For any proposed Project, the Proponent will initiate the process through the transmittal of a written proposal describing the Project, including the anticipated benefits. A technical report will be prepared by the Proponent and evaluated by the Authority. The report must describe:

1. Quantities and sources of water;
2. Structures and other physical features of the proposed Project;
3. Water accounting measures and/or methods;
4. Funding;
5. Schedule, including CEQA compliance;
6. Anticipated benefits; and
7. Proponent's evaluation of compliance with Plan's management objectives.

The Authority Advisory Committee will evaluate the Technical Report prior to any Board determination regarding the proposed Project.

The Authority Advisory Committee will utilize outside consultants, as necessary, for further evaluations. The proposal and technical report will be reviewed for consistency with the Plan's basin management objectives and utilization of adopted management strategies.

The resulting evaluation will be returned to the Project Proponent. The Authority Advisory Committee will coordinate with the Proponent to develop the final proposed Project.

Upon finalization of the proposed Project, the Authority Board of Directors will act to determine the compatibility of the proposed Project with the goals of this Plan. Similarly, water exchange and banking agreements among Authority members will be used where they may enable the Authority members to distribute water to areas identified under this Plan as suffering from groundwater depletion and as being suitable for groundwater storage.

Surface Water Quality

The surface waters of the Plan area are varied. Imported surface water originates in the San Joaquin River watershed (Friant-Kern Canal). Local surface water can be found in the Tule River and Deer Creek. These imported and local surface waters are subject to monitoring programs by various agencies. Current surface water monitoring programs are summarized in Table 5-2. Under this management strategy, the Authority will review results of existing monitoring programs. Additional surface water quality monitoring will be developed if deemed necessary.

Plan Activities

1. Maintain or increase quantities of imported surface water;
2. Preserve existing surface water rights;
3. Promote efficient water use through the use of water exchanges and transfers;
4. Investigate potential for water banking opportunities within the Plan area;
5. Develop additional water storage capacity within the Plan area; and
6. Monitor existing surface water quality testing efforts by other agencies.

TABLE 5-2
SURFACE WATER QUALITY MONITORING
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SURFACE WATER	MONITORING AGENCY	FREQUENCY
Friant-Kern Canal	Reclamation District 770	Annually
	Terra Bella Irrigation District	Varies - monthly to annually
Tule River	Reclamation District 770	Annually
	Tule River Association	Seasonal

OPERATION OF FACILITIES

This management strategy consists of the construction and operation of facilities that address groundwater recharge, storage extraction, conservation contamination clean-up and water recycling. Current efforts primarily address groundwater recharge through percolation basins and unlined irrigation distribution channels. In general, the current projects are implemented individually by member Districts.

Additional groundwater facilities will be needed to sustain the resource as demands placed on the groundwater resource increase. The Authority will evaluate potential projects that will address this need. The current scope of this strategy will be expanded as necessary. Opportunities to incorporate recycling and reclamation and water conservation may be possible through coordination with domestic utility providers.

Plan Activities

1. Maintain policy that encourages the use of unlined channels (where possible);
2. Maintain policy which facilitates maintenance of recharge basins;
3. Develop and implement protocol to identify operations projects; and
4. Upgrade and expand surface water conveyance facilities.

GROUNDWATER MONITORING

Groundwater monitoring will be used by the Authority to assess the quantity and quality of the groundwater resource. The details of this management strategy are described in Section 6.

Each member District of the Authority currently participates in biannual monitoring of groundwater levels. Additional groundwater level information is available from domestic water providers.

In general, regular groundwater quality assessments are conducted by domestic water providers within the region. The Authority will develop a protocol to compile groundwater quality data. Additional groundwater quality monitoring efforts will be developed as needed.

LAND SUBSIDENCE MONITORING

The Authority does not have any substantial information regarding land subsidence within the Plan area. This management strategy consists of developing and implementing monitoring protocols to determine the pressure of land subsidence. The Authority's efforts will establish a starting point for future evaluations.

Plan Activities

1. Identify and establish an elevation control network throughout the Plan area;
and
2. Conduct periodic survey of control network to determine presence, if any, of land subsidence.

LAND USE PLANNING

This management strategy consists of reviewing land use plans and coordination with local planning agencies. Under this strategy, the Authority will review projects and basin activities that affect land use and the potential for groundwater resource impacts.

Plan Activities

1. Develop and maintain protocols to participate in local land use planning efforts;
and
2. Continue participation in California Environmental Quality Act as a responsible agency.

GROUNDWATER BASIN AND RESOURCE INFORMATION MANAGEMENT

Many strategies to be utilized by the Authority will produce groundwater resource and basin data or information. This information will need to be completed and inventoried.

The purpose of this management strategy is to ensure that data and information gathered during the implementation of the Plan is readily available for evaluation purposes. Many Plan efforts could be implemented by Authority member Districts or other Plan Participants.

Centralizing this data and information will be critical to groundwater management.

Under this management strategy, the Authority will also conduct assessments and evaluations of the implementation data. These efforts will serve as the basis of development for the Authority's annual reports and other Plan documents.

In addition, a conjunctive use model for the Tule groundwater basin area was developed for the Department of Water Resources in 2002. The model is a productive tool that is available to the Authority. This tool provides an additional method to evaluate Plan data and conduct groundwater resource assessments.

Plan Activities

1. Establish data management authority and responsibilities;
2. Develop and implement data collection and inventory protocols and standards;
and
3. Conduct periodic refinement and use of predictive groundwater model.

GROUNDWATER BASIN AND RESOURCE REPORTS

This management element consists of the preparation of reports and other documents used by the Authority to disseminate information and findings regarding its efforts under the Plan. Reports will be used to document Plan activities and subsequent effectiveness. These reports will also be used to present new and/or additional knowledge regarding the Basin characteristics and resources.

Detailed information regarding the Authority's reporting efforts can be found in Section 7, Implementation.

Plan Activities

1. Prepare Annual Groundwater Management Plan Report; and
2. Prepare technical memoranda as necessary to disseminate information regarding Plan activities.

LOCAL AGENCY AND STAKEHOLDER INVOLVEMENT

This management strategy consists of efforts to engage individuals and agencies within the Plan area in Plan participation. Three primary elements will form the foundation of this management strategy: Plan participation, Advisory Committee and Public Review. The first element is Plan Participation. There exists many agencies within the Plan area that will realize benefits from the Authority's coordinated Plan efforts to manage the groundwater resource. The Authority will pursue opportunities to engage such agencies as Plan Participants. Additional Plan Participants increase the extent of coordinated groundwater resource management and the amount of resources available to implement the Plan.

The second element of this strategy is the development and utilization of a Plan Advisory Committee (Committee) to address the implementation of the Plan. The Authority will establish the criteria regarding Committee formation and participation. To be effective, the Committee must include individuals and agencies that represent the various resource interests of the Plan area. The Authority will endeavor to enlist sufficient representation for the Committee. Additional committees may be created as necessary to facilitate implementation of the Plan.

The third element of this strategy consists of public participation and review. The meetings of the Authority are open to the public. Public notification will be completed to encourage public participation. During Plan reporting efforts, the public will be afforded opportunity to review and publicly comment on the Plan and its implementation. The Plan will be considered public record and available for inspection.

Plan Activities

1. Pursue Plan participation by local agencies within Plan Area;
2. Maintain advisory committee of Plan Participants and Plan stakeholders; and
3. Establish and maintain public notification and participation procedures regarding Plan activities.

SECTION 6
MONITORING
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 6
MONITORING
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

GENERAL

Optimal use of the groundwater resource is dependent on the acquisition of good basic data respecting both geology and hydrology. The purpose of this element of the Deer Creek and Tule River Authority (Authority) Groundwater Management Plan (Plan) is to monitor conditions within the groundwater basin to identify changing conditions which may require attention. Monitoring includes gathering and analyzing basic data generated from Plan management activities to characterize the basin to provide the information necessary for future management decisions. Existing and proposed management activities in this regard may be enhanced to provide a more complete picture of the condition of the groundwater resource. The Plan's primary monitoring effort will be directed at the groundwater resource. Additional monitoring efforts will result from activities proposed by management strategies.

GROUNDWATER MONITORING

Groundwater monitoring will consist of two components which are groundwater levels and groundwater quality.

Groundwater Levels

Data regarding groundwater levels is used to evaluate groundwater movement and storage conditions. Groundwater contour maps showing lines of equal elevation of the water surface indicate the direction of groundwater movement and can be used to develop estimates of

groundwater flow entering or leaving the management area. Maps of depth to groundwater can provide insight into the distribution of pumping lifts and resulting energy costs for extraction. Maps showing changes in groundwater levels, when used in conjunction with data on specific yield, can also be used to estimate changes in groundwater storage.

The Authority members routinely measure groundwater levels in approximately 200 wells. (The location of these wells is presented in Figure 6-1.) Measurements are made in both spring (February) and fall (October). The present monitoring networks will be maintained or enhanced to assure the availability of sufficient data for the preparation of groundwater contour maps. Measurement of groundwater levels will continue to be performed in both spring and fall in order to show seasonal variations.

Groundwater Quality

Monitoring of groundwater quality provides the information required for determinations of the suitability of groundwater for various uses. Comprehensive groundwater quality data for the Plan area does not exist. The Authority will develop protocols to obtain groundwater quality data from domestic water providers and other sources and consolidate it for management purposes.

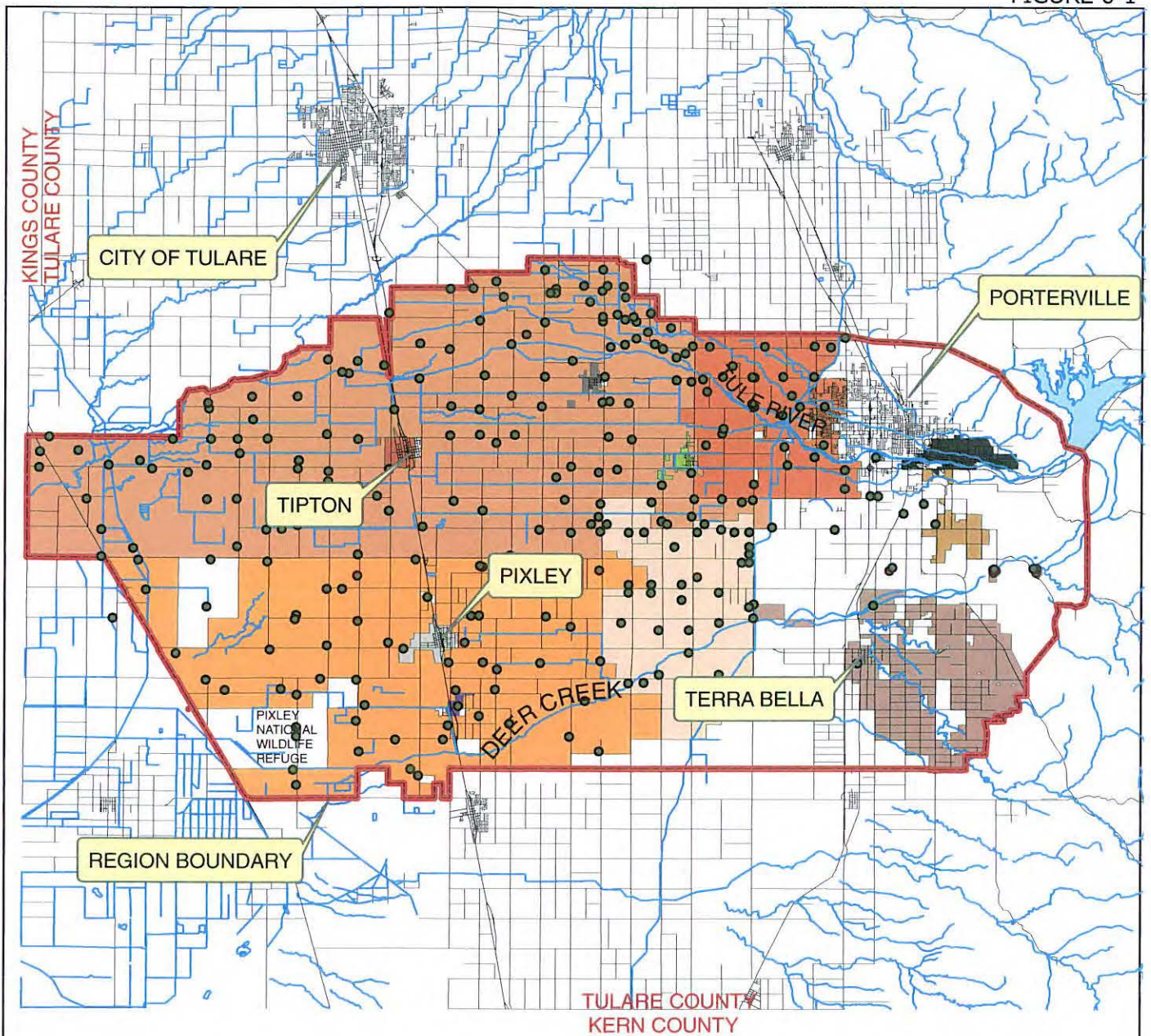
The sampling of the Authority's wells will be expanded, if necessary, to provide sufficient data to allow identification of water quality problem areas. Supplemental sampling may also be performed to better define localized areas of impaired water quality. Testing will typically include standard agricultural type analysis, but may also include additional testing, such as Title 22 parameters, as required.

ADDITIONAL MONITORING

Data related to the hydrologic inventory will be collected annually for quantification and analysis. Components of the inventory include precipitation, runoff, imported supplies, amounts of groundwater replenished and quantities of groundwater extracted. Additional monitoring efforts will result from the following Plan management strategies:

1. Groundwater Recharge Management;
2. Groundwater Extraction Policies;
3. Surface Water Management;
4. Land Use Planning;
5. Well Abandonment/Destruction Policies; and
6. Well Construction Policies.

FIGURE 6-1



SOURCE: TULARE COUNTY GRAPHICAL INFORMATION SYSTEM, 1999

LEGEND

GEOGRAPHICAL INFORMATION

- Boundary - Integrated Regional Management Plan
- Streams
- Streets
- Lake Success

PUBLIC UTILITY DISTRICTS

- Pixley Public Utility District
- Porter Vista Public Utility District
- Woodville Public Utility District

COMMUNITY SERVICES DISTRICTS

- Poplar Community Services District
- Teviston Community Services District
- Tipton Community Services District

IRRIGATION DISTRICTS

- Lower Tule River Irrigation District
- Pixley Irrigation District
- Porterville Irrigation District
- Saucelito Irrigation District
- Terra Bella Irrigation District
- Vandalia Irrigation District

- Monitoring Well



GROUND WATER MONITORING WELL LOCATIONS
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 7
PLAN IMPLEMENTATION
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 7
PLAN IMPLEMENTATION
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

GENERAL

The Deer Creek and Tule River Authority's (Authority) Groundwater Management Plan (Plan) documents will be maintained at the office of the Lower Tule River Irrigation District. The office will act as the Plan's resource center and data clearinghouse. Monitoring Data and information gathered during Plan implementation will be compiled and stored at the office. The Authority will lead Plan activity, report preparation and information dissemination efforts.

PLAN PARTICIPATION

The Plan officially recognizes stakeholders through the execution of a Memorandum of Understanding (MOU). The original stakeholders comprising the Authority executed a MOU to indicate their support of the original Plan. A copy of this MOU is presented in Appendix B. The purpose of the MOU is to document the interests and responsibilities of participants in the adoption and implementation of the Plan. The MOU also promotes the sharing of information, the developing of a course of action and the resolving of differences that may arise regarding the Plan. It is anticipated that stakeholder involvement will increase with time. The Authority will continue to pursue new stakeholder involvement and shall endeavor to enter into agreements with other local agencies. The form of agreement shall be consistent with the existing MOU and shall also be in compliance with California Water Code §10750.8.

DISPUTE RESOLUTION

The Plan acknowledges that controversial issues could arise concerning the groundwater resource. Stakeholders are encouraged to work through the Plan in addressing and resolving differences. When this process proves insufficient, the Authority has a policy in place that can be applied by the Plan. The Plan hereby adopts the Authority's "Alternative Dispute Resolution Policy." Appendix C of the Plan includes the most current version of the policy.

ANNUAL REPORT

Documentation in the form of an annual report will be prepared as required to record the results of the management activities monitoring elements of the Plan. The contents of the annual report will include:

1. Maps and/or tables showing:
 - a. Spring and fall groundwater elevations;
 - b. Changes in the monitor well network;
 - c. Changes in groundwater levels between subsequent spring readings; and
 - d. Groundwater quality;
2. Estimation of the changes in groundwater storage computed using specific yield data and maps of change in groundwater levels;
3. Summary of water resource data; and
4. Assessment of the effectiveness of management activities.

PLAN EVALUATION

The Plan will be re-evaluated annually subsequent to the findings of the Plan's annual report. The Authority's Plan Advisory Committee will be responsible for monitoring the Plan's activities and progress towards its management objectives.

The re-evaluation of the Plan will include an assessment of the effectiveness of Plan activities and a determination of potential modification(s) to the Plan.

ADDITIONAL REPORTS

Additional reports and technical memoranda may be produced as a result of Plan activity, grant funding requirements or other need for documentation. The content of any supplemental documents will address the informational requirements.

SCHEDULE

Implementation of the Authority's Plan will be structured according to the schedule presented in Table 7-1.

TABLE 7-1
IMPLEMENTATION SCHEDULE
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

PLAN ACTIVITY	OCCURRENCE
Plan Management Strategies and Activities	Monthly (As Required)
Advisory Committee	Bi-monthly
Authority General Meeting	Bi-monthly
Plan Report	Annually
Plan Re-evaluation	Annually
Groundwater Monitoring	Semi-Annually (Additional As Required)

PLAN FUNDING

Implementing the Plan will require dedicated funding through the Authority and the Plan Participants. In general, funding for the Plan and its activities will be derived from grants, in-lieu contributions, cost-sharing agreements and/or assessments.

Grants

The Authority will pursue opportunities to fund Plan activities through grants offered by DWR and other agencies. Member Districts may be asked to support grant applications on the Authority's behalf.

Cost-Sharing Agreements

Costs for annual groundwater reports, Plan updates and other reporting efforts will be distributed and collected according to any cost-sharing agreements for Authority project activities.

Additional cost-sharing agreements may be developed as necessary to fund other projects considered during the implementation of the Plan.

In-lieu Contributions

Some Plan activities, such as groundwater monitoring will be funded through the Districts' own operations.

Assessments

Upon adoption of this Plan, the Authority is authorized to levy and collect general groundwater replenishment assessments, as well as water extraction fees based on the amount of groundwater extracted from the aquifer within the Plan Area. Any assessment or fees proposed to be collected by the Authority under this Plan for the purpose of groundwater management must be approved by an area-wide election as provided in the implementing statutory provisions related to AB 3030.

APPENDIX A
PLAN PARTICIPANTS AND BASIN
STAKEHOLDERS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

TABLE A-1
PLAN PARTICIPANTS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

PARTICIPANT
Lower Tule River Irrigation District
Pixley Irrigation District
Porterville Irrigation District
Saucelito Irrigation District
Tea Pot Dome Water District
Terra Bella Irrigation District
Vandalia Irrigation District

TABLE A-2
BASIN STAKEHOLDERS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

STAKEHOLDER	INTEREST
Lower Tule River Irrigation District	District Landowners
Pixley Irrigation District	District Landowners
Porterville Irrigation District	District Landowners
Saucelito Irrigation District	District Landowners
Tea Pot Dome Water District	District Landowners
Terra Bella Irrigation District	District Landowners
Vandalia Irrigation District	District Landowners
Tipton Community Services District	Domestic Water Supply/Use
Poplar Community Services District	Domestic Water Supply/Use
Woodville Public Utility District	Domestic Water Supply/Use
Terra Bella Irrigation District	Domestic Water Supply/Use
Pixley Community Services District	Domestic Water Supply/Use
Tevison Community Services District	Domestic Water Supply/Use
Pixley Wildlife Refuge	Wildlife
Bureau of Reclamation	Surface Water Supplies
Friant Water Authority	Surface Water Supplies
National Resources Conservation Service	Natural Resources
Audubon Society	Wildlife/Monitoring
Tulare County	Land Use/Planning
City of Porterville	Domestic Water Supply/Use

APPENDIX B
PLAN PARTICIPATION AGREEMENT
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

**MEMORANDUM OF UNDERSTANDING BETWEEN
DEER CREEK AND TULE RIVER AUTHORITY
AND _____**

ARTICLE I - AGREEMENT

The articles and provisions contained herein constitute a bilateral and binding agreement by and between DEER CREEK AND TULE RIVER AUTHORITY (hereinafter the "Authority") and _____ (hereinafter "Agency").

ARTICLE II - RECOGNITION

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

ARTICLE III - PURPOSE

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

ARTICLE IV - COORDINATE

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

ARTICLE V - OBLIGATIONS

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

ARTICLE VI - AREA OF PLAN

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

ARTICLE VII - TERM

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

This Memorandum of Understanding is made and entered into this _____ day of _____, 2007.

**DEER CREEK AND
TULE RIVER AUTHORITY**

By: _____

By: _____

Title: _____

Title: _____

By: _____

By: _____

Title: _____

Title: _____

APPENDIX C
ALTERNATIVE DISPUTE RESOLUTION POLICY
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

ALTERNATIVE DISPUTE RESOLUTION POLICY DEER CREEK AND TULE RIVER AUTHORITY

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

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

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

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

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

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

Appendix A
Water Inventory Tables

Section V: Agricultural Water Inventory

Year of Data: 2016

Table 1: Surface Water Supply

Month	Federal Ag Water (acre-feet)	Federal non-Ag Water (acre-feet)	State Water (acre-feet)	Local Water (acre-feet)*	Other Water (acre-feet)	Transfers Into District (acre-feet)	Upslope Drain Water	Total (acre-feet)
Method								
January	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0
March	13,277	0	0	0	0	2,977	0	16,254
April	15,514	0	0	0	0	0	0	15,514
May	0	0	0	0	0	14,400	0	14,400
June	0	0	0	0	0	2,000	0	2,000
July	29,167	0	0	22,219	0	0	0	51,386
August	16,424	0	0	5,427	0	0	0	21,851
September	0	0	0	0	0	0	0	0
October	0	0	0	0	0	0	00	0
November	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0
Total	74,332	0	0	27,646	0	19,377	0	121,405

*Tule River

Table 2: Groundwater Supply

Month	District Groundwater (acre-feet)	Private Agric Groundwater (acre-feet)*
Method	0	
January	0	
February	0	
March	0	
April	0	
May	0	
June	0	
July	0	
August	0	
September	0	
October	0	
November	0	
December	0	
Total	0	28,846

*Private Groundwater is not recorded by the District

Table 3: Total Water Supply

Month	Surface Water Total (acre-feet)	District Groundwater (acre-feet)	Recycled M&I Wastewater (acre-feet)	Total District Water Supply (acre-feet)
Method				
January	0	0	0	0
February	0	0	0	0
March	16,254	0	0	0
April	15,514	0	0	0
May	14,400	0	0	0
June	2,000	0	0	0
July	51,386	0	0	0
August	21,851	0	0	0
September	0	0	0	0
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Total	121,405	0	0	150,251

Table 4: Distribution System**Table 4: Agricultural Distribution System**

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)
Tule River	248,160	12	2,977,920	92	290	0	15,714	16,096
Unlined Canals	887,040	8	7,344,691	226	716	0	69,848	70,790
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
Total		0	10,322,611	317	1,006	0	85,562	86,886

Table 5: Crop Water Needs

Crop	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)
Wheat	27,183	1.35	0	0.34	0.19	40,775
Silage*	21,812	1.35	0	0.34	0.19	32,718
Alfalfa	5,943	4.60	0	0.29	0.29	27,338
Cotton	2,788	2.56	0	0.64	0.00	8,922
Tomatoes	150	3.42	0	0.85	0.14	620
Sorghum*	5,602	1.35	0	0.34	0.19	8,403
Oats	450	1.34	0	0.34	0.19	671
Barley	514	1.34	0	0.34	0.19	766
Pistachios	5,532	3.63	0	0.91	0.06	24,783
Walnuts	2,179	3.63	0	0.91	0.06	9,762
Grapes	1,593	2.58	0	0.65	0.03	5,098
Oranges	237	3.42	0	0.85	0.14	979
Prunes/Plums	928	3.42	0	0.85	0.14	3,833
Pomegranates	18	3.42	0	0.85	0.14	74
Persimmons	31	3.42	0	0.85	0.14	128
Cherries	126	3.24	0	0.85	0.14	498
Pecans	40	3.63	0	0.91	0.06	179
Other (<5%)						
Crop Acres	101,337					206,667

*Double cropped

Table 6: District Water Budget

2016 District Water Inventory			
Water Supply	Table 3		150,251
Riparian ET	Distribution and Drain	minus	0
Groundwater recharge	Intentional - ponds, injection	minus	18,371
Seepage	Table 4	minus	85,562
Evaporation - Precipitation	Table 4	minus	689
Spillage	Table 4	minus	0
Transfers out of District		minus	8,111
Water Available for sale to customers			37,518
Actual Agricultural Water Sales	From District Sales Records		177,821
Private Groundwater	Table 2	plus	28,846
Crop Water Needs	Table 5	minus	206,667
Drainwater outflow	(tail and tile, not recycled)	minus	0
Percolation from Agricultural Land	(calculated)		2,967
Unaccounted for Water	(calculated)		

Table 7: Influence on Groundwater and Saline Sink

2017	
Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence on	182,038
Estimated actual change in groundwater storage, including natural recharge	
Irrigated acres (from Table 5)	101,337
Irrigated acres over a perched water table	0
Irrigated acres draining to saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agric 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)	State Water (acre-feet)	Local Water (acre-feet)	Water (define) (acre-feet)	Transfers into District (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
2005	247,595	0	0	112,596	0	0	0	360,191
2006	196,658	0	0	130,141	0	0	0	326,799
2007	30,535	0	0	19,847	0	0	0	50,382
2008	71,872	0	0	41,614	0	0	0	113,486
2009	125,173	0	0	30,835	0	0	0	156,008
2010	171,428	0	0	89,215	0	0	0	260,643
2011	248,065	0	0	227,290	0	0	0	475,355
2012	46,399	0	0	80,940	0	0	0	127,339
2013	36,983	0	0	26,510	0	0	0	63,493
2014	0	0	0	15,062	0	0	0	15,062
2015	0	0	0	3,737	0	0	0	3,737
2016	74,332	0	0	121,405	0	0	0	195,737
2017	79,686	0	0	0	0	0	0	79,686
Total	1,328,726	0	0	899,192	0	0	0	2,227,918
Average	102,210	0	0	69,169	0	0	0	171,378

Appendix B

LTRID & PIX ID Water Information & Operating Policy

PRORATE OR CANAL ALLOCATION

The need for prorating water use on canals occurs when demand exceeds the design capacity of specific canals. This problem typically occurs only in the summer months and only for short periods. During prorated periods the water users in the affected areas are given an allocation of water to be used within a two-week time frame. Prorates are designed to provide equitable water allocation to all water users. Cooperation when prorated is necessary will greatly assist in providing equal treatment to all District water users. If you have any questions, please contact the District office.

WATER MEASUREMENTS

The Water Systems Operator using one of following three methods take water measurements at the numbered turnout:

1. Pump test rating
2. Gravity Measurement
3. Meter

Pumps will be rated once each season without charge upon request or if any changes are made to the pump station.

Any discrepancy regarding the quantity of water charged to an account must be reviewed with the District prior to the 15th of the month following the date of billing. All charges will be considered correct and final after that date.

Emergency Phone Numbers:

559-686-4716 / 559-752-5050

Follow the instructions to be transferred to the attendant on call.

On behalf of the Board of Directors I want to thank you for your cooperation in providing equitable, reliable water service to the water users of the Lower Tule River & Pixley Irrigation District.

If you have any questions regarding this policy, please feel free to contact the District office at the numbers indicated.



DAN VINK
GENERAL MANAGER



357 E OLIVE AVE

TIPTON CA 93272

559-686-4716

559-686-0151 FAX



357 E OLIVE AVE
TIPTON CA 93272
Phone (559) 686-4716
Fax (559) 686-0151
Email: ltrid@ltrid.org
www.ltrid.org

WATER INFORMATION & OPERATING POLICY

Working together to meet your water needs now and into our future

WATER OPERATING POLICY

In an effort to provide an affordable and reliable water supply, the following guidelines have been adopted by the Board of Directors of the Lower Tule River & Pixley Irrigation District, and are implemented by the staff of the District to insure equitable distribution of water to all water users within the District.

The District's contract water supply is supplemental only and therefore does not provide the sole supply for District wide crop irrigation requirements in all years. Elements of the District's water supply program include:

- o In years when water is available above the amount to meet irrigation demand the District actively recharges the groundwater aquifers through numerous sinking basins and river channels in the District.
- o In water short years, the District's surface water supply is intended to supplement grower owned wells.
- o In certain years water runs may be scheduled at different times throughout the year in order to maximize available supply and to coordinate with irrigation deliveries.

WATER RATES & WATER RUNS

The Board of Directors determines the water rate and establishes water runs. Water rates and water runs are based on the most current information available. The District endeavors to keep water-users notified in advance of any changes. Changes in water runs may occur on short notice due to uncontrollable conditions that affect water supply. Additional information regarding water rates and water runs can be found on the District's web site: www.ltrnd.org

WATER ORDERS

- o All turnouts are numbered either on the gate or on the pump apparatus. Orders for water should be made referencing the turnout number.
- o Water orders for both turn on and turn off must be placed 24 hours in advance with the District office.
- o Water orders need to be placed by 9:00 a.m. to be effective for the following day.
- o Please place water orders for Sunday or Monday by 9:00 a.m. on or before the preceding Saturday.
- o Water orders may be placed in the office during normal office hours from 7:00 a.m. to 4:30 p.m. during the weekdays and 7:00 a.m. to 9:00 a.m. on Saturdays and Holidays during water runs.
- o In order to provide for consistency and accountability, water systems operators cannot take water orders in the field either verbally or through written notes.

It may be necessary for the District to establish specific on/off times by turnout due to operational constraints of the canal system. District canals and check structures are to be operated by District personnel only unless an extreme emergency exists. Turnouts are to be operated by the water user. Please contact the District office for specific turnout numbers and on/off times or if turnout numbers are not present or are illegible.

EMERGENCY PROCEDURE

There is a 24-hour answering service for emergencies that occur outside of regular business hours. The emergency telephone numbers are listed on the back page.

Please do not place water orders with the answering service.

When calling the answering service please leave a name and telephone number along with other pertinent information. An example of an emergency would be a ditch break or anything that alters the flow of water that might cause property damage.

WATER USE STATEMENT

A monthly water statement will be mailed to each water user during the first ten days of each month. The statement will include water use and account balance as of the end of the preceding month.

Delinquency Charge. Payment for water is due upon receipt of the statement. A penalty will be added if payment is not received by the end of the month in which the statement was generated. Penalties will be assessed at 1.5% of the unpaid balance or \$2.50 whichever is greater.



Adopted: December 13,2016
Updated:

Lower Tule River Irrigation District Surface Water Allocation Policy

Background

One of the purposes of the Lower Tule River Irrigation District is to enhance the groundwater resources that underlie the District through the importation of surface water. The District overlies the Tule Subbasin Groundwater Basin, which has been defined by the State of California as being in a state of critical overdraft. Since its formation in 1950, the District has imported as much surface water as possible to offset the use of groundwater for irrigation purposes and to replenish the aquifer through direct recharge via sinking basins, river channels and unlined canals. The District's efforts are funded through assessments and water charges paid by landowners in the District.

In 2014, the State of California passed the Sustainable Groundwater Management Act (SGMA), which regulates the use of groundwater in the State of California. Groundwater Sustainability Plans, under SGMA, are to be implemented by January 1, 2020. As part of the SGMA process the District has determined that imported surface water should be allocated to landowners on an annual basis. The goal is to allow equal and proportional access of imported surface water to all landowners in the District.

The Board of Directors of Lower Tule Irrigation District therefore adopts the following Policy:

Policy

1. Allocations will not apply during flood releases and uncontrolled season or at any other time the District does not have a storable and schedulable supply.
 - Water that does not count towards the District's final allocation will be made available on a first come first serve basis to growers.
 - Fixed District allocations will be allocated to growers.
2. Initial allocation to occur annually on March 1 with continual updates throughout the water season.

3. Transfer of allocations are not permitted. Allocations can only be transferred to lessees under Lease agreements. Upon approval of the District, allocations can also be transferred to other common ownership entities who have an existing joint commercial interest.
 - Landowners will be sent a water order form every January, asking if they want their allocation, or allow their lessee or other entity ownership to use it, or do not want it. This form will be due back to the District by March 1. Proof of lease/lessor, or common ownership relationship will be required.
 - If a landowner does not want, or cannot use their allocation for the year, the District will re-allocate proportionally to all other landowners.
 - Landowner must identify whether the lessee must use the allocation on specified land or can use it on other lands owned/leased by lessee.
4. Allocations will be based on total assessed lands.
 - Class 6 soils not eligible for allocation.
 - Only lands with a turnout from a District facility will receive an allocation.
5. Overuse of allocation will not be allowed. District staff will monitor use and will terminate use to those who have no remaining allocation.

The District Board will update this policy as conditions warrant, based on operational and policy issues identified as the policy is implemented.

Appendix C
District Sample Bill

CUSTOMER BILL



Customer # LTR24425 Bill # 79071
 Bill Date 6/30/2017
 GRAPERY
 PO BOX 970
 SHAFTER, CA 93263

357 E Olive Ave
 Tipton, CA 93272
 (559) 752-5050 or
 (559) 686-4716
 ltrid@ltrid.org

Billing Summary

Account Balance	
Previous Balance	\$5,175.00
Payments/Credits	\$0.00
Penalties	\$0.00
Charges	\$12,738.40
Adjustments	\$0.00
Total Due	\$17,913.40

Water Usage	
Billing Period (June)	6/1/2017 To 6/30/2017
Billed Usage	159.23 Af

Allocations					
Group	Allocation	Adjustments	Total	Consumed	Remaining
LTRID	0.00 Af	0.00 Af	0.00 Af	0.00 Af	0.00 Af
Poplar (LTRID)	0.00 Af	263.28 Af	263.28 Af	298.65 Af	-35.37 Af

Summary

Turnout	Description	Qty	Rate	Amount
01-280.0	Grapes - 01-280.0 - 78.000ac - Poplar (LTRID) Tier: 2	77.680 Af	\$80.00	\$6,214.40
02-1505.0	Grapes - 02-1505.0 - 63.880ac - Poplar (LTRID) Tier: 2	81.550 Af	\$80.00	\$6,524.00
Total		159.230 Af		\$12,738.40

Detach and return the bottom remittance portion with your payment.

Customer # LTR24425 Bill # 79071

GRAPERY
 PO BOX 970
 SHAFTER, CA 93263

Delinquent Date	7/31/2017
Previous Balance	\$5,175.00
Payments/Credits	\$0.00
Penalties	\$0.00
Charges	\$12,738.40
Adjustments	\$0.00
Total Due	\$17,913.40

Amount Enclosed

\$