Tulelake Irrigation District

Water Management Plan

2017 Criteria

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Section I: Description of the District

District Name: *Tulelake Irrigation District*

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Located within the Upper Klamath Basin, Tulelake Irrigation District's (TID) northern boundary is contiguous to the border between California and Oregon, as shown on Figure A-1, and extends from the Oregon-California state line south about 14 miles to the lava beds. TID includes lands in both Modoc and Siskiyou Counties and is bounded on the west by High Rim and Barn Top Mountains and extends east about 12 miles. The exterior boundary includes 96,000 acres. Tule Lake and the Tule Lake National Wildlife Refuge (TLNWR) lie within the boundaries of TID.

Prior to the authorization of the Klamath Project by the Secretary of the Interior and construction of the Klamath Project in 1906, most of the lands located within the current boundary of TID were submerged during certain times of the year, depending upon hydrologic conditions. The submergence of this land created a body of water known as Tule Lake. In October 1909, two outlets were constructed at the southern end of Tule Lake and reclamation of lands submerged by Tule Lake began. The flow to drain Tule Lake into the lava beds continued until 1912 when the level of the lake became too low to continue utilizing the outlets.

Construction of the Klamath Basin Project continued during the early 1900s, and by 1910 Clear Lake Dam was completed. By the spring of 1912, the Lost River Diversion Dam and Channel were complete. These facilities diverted water from the Lost River to the Klamath River and reduced flows into Tule Lake. In 1916, work began on the Tule Lake unit with the construction of a distribution and drainage systems for exposed lands along the northern portion of Tule Lake. By 1916, approximately 5,900 acres within the previously submerged region of Tule Lake had been exposed. In 1917, the first Tule Lake lands opened to homestead entry. In 1920, Anderson-Rose Dam was constructed. Work also began on the J-Canal which was completed in 1923. During the 1920s and 1930s, work continued on the distribution levee and drainage systems within the Tule Lake area. By 1923, the continued diversion of Lost River water into the Klamath River and diversion for irrigation resulted in approximately 85,000 acres of the previously 90,000 acres of submerged Tule Lake being available for farming. During the late 1920s, as much as 50,000 acres were being farmed.

Reclaimed lands were made available to settlers, and homesteaded under public notices issued from the 1920s to 1940s. Lands were typically leased to private individuals prior to homestead entry. In 1940, work began on the D-Pumping Plant. This pumping plant and the Tule Lake Tunnel were completed in November 1941. During World War II, about 44,000 acres owned by the United States within Tule Lake were leased for farming. The Copic Bay region of Tule Lake was opened to homesteading in 1947 and 1948. By the 1950s, about 44,000 acres had been homesteaded.

In 1950, the U.S. Bureau of Reclamation (Reclamation) required the organization of an irrigation district in the Tule Lake area. By 1952, TID had been formed and was holding regular meetings. On September 10, 1956, TID entered into a contract with Reclamation for repayment of the construction charges and to transfer to TID the operation and maintenance of the facilities used to deliver water to TID lands. Following the formation of TID, and the execution of Contract No. 14-06-200-5954 between TID and the United States, TID began providing water service to lands within TID. The Klamath River water rights for the Project are currently being adjudicated by the State of Oregon. Contractually, Reclamation recognizes certain lands within TID as having a higher priority to Project supplies than other lands. TID is an active participant in the ongoing Klamath River Adjudication.

A. History

1. Date district formed: 1952 *Date of first Reclamation contract*: 9/10/1956

Original size (acres): 85,000 *Current year (last complete calendar year)*: 2016

2. Current size, population, and irrigated acres

	2016
Size (acres)	96,000
Population served (urban connections)	0
Irrigated acres	60,357

3. Water supplies received in current year

Water Source	*AF*
Federal urban water (Tbl 1)	0
Federal agricultural water (Tbl 1)	63,302
State water (Tbl 1)	0
Other Wholesaler (define) (Tbl 1)	0
Local surface water (Tbl 1)	0
Upslope drain water (Tbl 1)	132,847
District groundwater (Tbl 2)	1,289
Banked water (Tbl 1)	0
Transferred water (Tbl 1)	0
Recycled water (Tbl 3)	0
Other (define) (Tbl 1)	0
Total	197,438

4. Annual entitlement under each right and/or contract

	AF	*Source*	*Contract #*	*Availability period(s)*
Reclamation Agriculture	420,370	Klamath River	14-06-200-5954	Irrigation Season
Other	See Below	Lost River	See Below	

Two contracts with irrigation districts in the Klamath Project were made pursuant to the 1902 Act and related authority to serve lands in the "Main Division" and "Modoc Division" of the Klamath Project. The "Modoc Division" is in the Tulelake Division, and the contract with TID was made pursuant to the

1902 Act and Section 9(d) of the Reclamation Project Act of 1939 and other legislation. The TID contract does not specify a duty or rate of diversion. Rather, it provides for the repayment of the construction costs of the Klamath Project by the district in consideration for the right to divert and deliver to their members that amount of water that can be applied to the crops beneficially and without waste.

Oregon State water rights were issued through the Final Order of Determination of the Klamath Adjudication. The Final Order of Determination was issued in 2013, with amendments and corrections incorporated during 2014. Following the release of the Final Order of Determination, the adjudicatory judicial process will continue with an uncertain end date. TID was associated with the consolidated claim (Claim No. 321-17, 293, 323-3) and Claims 312 and 317. The claim numbers, description, and associated acreages are as follows:

Claim #	Description/Acres
293	215,559.4 acres agriculture & refuge lands + 15,659.00 acres of inchoate lands
312	35,000 acre-feet of water per year for irrigation of up to a maximum of 10,000 acres per year within a place of use totaling 25,881.7 acres within Lower Klamath National Wildlife Refuge
317	49,902.3 acre-feet of water per year for irrigation of up to a maximum of 16,000 acres per year within a place of use totaling 17,967.3 acres within Tule Lake National Wildlife Refuge
321	178,857.81 acres 3280cfs from Upper Klamath Lake (UKL), Lake Ewauna, Link River, & Klamath River including LRDC & all tributaries to Klamath River
323	735,500 Acre Feet storage in UKL, Agency Lake, & Lake Ewauna 18,500 Acre feet

The water rights acquired for the Project are for the benefit of all Project lands including those lands within TID and the other entities served by the canal system operated and maintained by Project districts.

As part of the Final Order of Determination, the total amount of water that could be diverted by the combined irrigation system of Klamath Irrigation District (KID) and TID was estimated based on the history of the use of water from the combined KID/TID system between 1961 and 2000. The total quantity of water for the KID/TID system includes water delivered to federal lands, namely Tule Lake National Wildlife Refuge, under Claim 317. This estimate includes the March l through October 31 season, and the February 15 through November 15 season recognized for use of water from Station 48 and the No. l Drain Gate.

In addition, lands within TID have rights to use water from Lost River. Although some Lost River water rights were adjudicated in 1918, a recent court decision ruled that the 1918 process had not adjudicated water rights in the Project. There is some uncertainty on this issue. Some lands may possess California riparian rights to Lost River or Tule Lake.

5. Anticipated land-use changes. For Ag contractors, also include changes in irrigated acres.

TID does not anticipate a change in long-range water demand projections. TID has no intent to provide deliveries for municipal or domestic uses; and therefore, projected demand will remain constant and is based on agricultural deliveries within TID.

6. Cropping patterns (Agricultural only)

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

Original Plan 2005		*Previous Plan (N/A)*		*Current Plan (2016)*	
Crop Name	*Acres*	*Crop Name*	*Acres*	*Crop Name*	*Acres*
Alfalfa	16,928			Barley	10,860
Cereal Grains	22,578			Wheat	11,205
Mint	2,226			Alfalfa	21,061
Onions	2,668			Other Hay	2,300
Potatoes	7,536			Potatoes	7,842
Pasture	1,641			Onions	2,616
Other (<5%)	9,777			Mint	2,379
				Other (<5%)	2,094
Total	63,354	*Total*		*Total*	60,357

(See Planner, Chapter 3, Addendum D for list of crop names)

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

Original Plan (2005)		*Previous Plan (N/A)*		*Current Plan (2016)*	
Irrigation Method	*Acres*	*Irrigation Method*	*Acres*	*Irrigation Method*	*Acres*
Level Basin	See Below	Level Basin		Level Basin	0
Furrow		Furrow		Furrow	145
Sprinkler		Sprinkler		Sprinkler	10,649
Low-volume		Low-volume		Low-volume	0
Multiple		Multiple		Multiple	49,563
Other		*Other*		*Other*	0
Total		*Total*		*Total*	60,357

TID's "Original Plan" was a Water Management and Conservation Plan developed and submitted to Oregon Water Resources Department. The "Original Plan" does not include a summary of major irrigation methods.

B. Location and Facilities

See Attachment A for maps containing the following: incoming flow locations, turnouts (internal flow), and outflow (spill) points, conveyance system, storage facilities, operational loss recovery system, district wells and lift pumps, water quality monitoring locations, and groundwater facilities.

1. Incoming flow locations and measurement methods

Location Name	*Physical Location*	*Type of Measurement Device*	*Accuracy*
Station 48	Klamath River	Rated Section	Unknown
No. 1 Drain Gate	Klamath River	Free-flow Gate Equation	Unknown
Anderson-Rose Dam	Lost River	Submerged Orifice Equation	Unknown
D-Canal	Within TID	Weir	Unknown
Drain 9	Within KID	Estimated	Unknown
Drain 10	Within KID	Estimated	Unknown
Drain 11	Within KID	Estimated	Unknown
Drain 46-C	Within TID	Estimated	Unknown
Drain 46-N-1-a	Within TID	Estimated	Unknown
Drain 46-S	Within TID	Estimated	Unknown

The majority of TID's surface water supply is from the Klamath River and is directed to TID through an intertie between the Klamath River and the Lost River, known as the Lost River Diversion Channel. Klamath River water is diverted at locations on the Lost River Diversion Channel known as Station 48 and the No. 1 Drain during the irrigation season. These diversions provide Klamath River flows to TID and other water users. TID also receives tailwater from Klamath River water users located north of the California-Oregon State Line including lands within the KID. At times, the Lost River provides some surface water to TID.

The Anderson-Rose Dam is operated to deliver surface water into TID's J-Canal, which distributes water to more than one-half of TID's irrigated lands through turnouts and lateral canals. The J Canal also conveys water to other canal systems for delivery to other lands within TID. Water not diverted by TID at Anderson-Rose Dam flows through the Lost River and into the Tule Lake Sumps.

Additional points of inflow represent return flow from KID into TID. As identified above, this includes D-Canal, and drains 9, 10, 11, 46-C, 46-N-1-a, and 46-S. USBR is currently in the process of updating the measurement devices at the drainage locations; and therefore, inflow measurements are not available. However, historic inflow measurements identify that on average approximately 65,000 acre-feet of additional water supplies are available from KID facilities in a given year.

Reuse of water diverted initially to other areas of the Project represents a major source of supply available in TID, approximately 70% of the surface water supply available on average during the 2002 through 2009 time period. Direct diversion of Klamath River natural flow, Lost River natural flow, and diversion of stored water from Upper Klamath Lake (UKL) and Lake Ewauna make up the remainder of the available surface water supply.

The majority of inflow to TID is measured and includes water from all sources. TID participated in a Reclamation funded program to improve the inflow measurement to TID from KID. As a result, SonTek Ultrasonic Doppler Flow Meters were installed within five drainage canals from KID, replacing the weir configuration historically used to estimate inflow. Unfortunately, the measurement and monitoring program through Reclamation was discontinued. Due to the replacement of the previous method of

inflow measurement, TID does not have inflow measurements from this source. USBR is currently evaluating the potential to redeploy the devices and begin measuring and monitoring inflow at these locations. TID will continue to work with the Reclamation to improve inflow measurement from upstream irrigators, specifically inflow into TID from KID.

2. Current year Agricultural Conveyance System

Miles Unlined - Canal	*Miles Lined - Canal*	*Miles Piped*	*Miles - Other*
231.0	5.5	6.5	0

3 Current year Urban Distribution System

Miles AC Pipe	*Miles Steel Pipe*	*Miles Cast Iron Pipe*	*Miles - Other*
0	0	0	0

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

Name	*Type*	*Capacity (AF)*	*Distribution or Spill*
UKL	Reservoir	515,000	Distribution
Lake Ewauna	Regulatory Reservoir	N/A	Distribution
Tule Lake	Regulatory Reservoir	25,600	Distribution and Spill

The Final Order of Determination identifies the source of water in Lake Ewauna is Upper Klamath Lake via the Link River. Therefore it is treated as a regulating reservoir rather than as a source of water. In addition by granting Claim 294, the Final Order of Determination recognizes Tule Lake Sump as a regulating reservoir. Tule Lake Sump's natural storage role should be recognized within the context of Project operations.

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

Klamath water, Lost River water, and return flow are diverted from the Lost River channel at the Anderson-Rose Dam into J-Canal which has a capacity of 800 cfs. Spill at Anderson-Rose Dam flows into Tule Lake. Tule Lake acts as a large regulating reservoir for TID. Water is rediverted from Tule Lake at multiple locations. The operational spills and tailwater resulting from irrigation within TID are conveyed through TID's extensive drainage system, which utilizes gravity and pumped discharge into portions of the canal system or into the Tule Lake Sumps. Water regulated and stored within the Tule Lake Sumps may be diverted or rediverted for irrigation within TID or discharged by TID's D-Pumping Plant to the P-Canal, which serves the Lower Klamath National Wildlife Refuge (LKNWR) and the water users on the P-Canal system of the Project.

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

Scheduled	*Rotation*	*Other (describe)*
X	X	

In general, all water users must order water for delivery and advise the water office or ditch tender when water should be shut off. This requirement applies to gravity diverters and those who pump water for sprinkler systems. TID may use a rotation system during years of water shortage.

7. Restrictions on water source(s)

Source	*Restriction*	*Cause of Restriction*	*Effect on Operations*
UKL	Operational elevation between 4143.3 and 4137.0 feet	1956 agreement between Reclamation and PacifiCorp	Minimal
UKL	Elevations to maintain habitat for endangered sucker	Biological Opinions issues by the U.S. Fish & Wildlife Service (USFWS)	Reduction in the availability of water from UKL in the late part of growing seasons during drought
Klamath River	Flow prescriptions to maintain habitat for coho salmon	USFWS and National Marine Fisheries service (NMFS)	Reduced supplies available for irrigation
Tule Lake Sumps	Elevation requirements: April 1 – September 30 shall be at least 4034.60 feet October 1 - March 31 shall be at least 4034.00 feet	Biological Opinion to protect endangered sucker Rules and Regulations relative to flood control	BO restrictions are incorporated and considered for TID's annual operation plans
KID	Uncontrolled tailwater	KID operations	Minimal to none

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

TID is in the process of upgrading each of the 65 pumps within the district. The goal is to replace at least one pump per year. In addition, TID intends to automate portions of laterals and canal gates every 2-3 years. In years when TID is not installing an automation project, TID intends to install automated trash screens at key locations within the conveyance and drainage system in order to minimize damage to pump facilities and improve system efficiency.

C. Topography and Soils

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

The topography of TID is extremely flat with some exception in the northeast portion. Most of the lands within TID are within the original historical bed of Tule Lake, with the lowest portion being near the current Tule Lake sump. The topography facilitates efficient management of water supplies. The supply canals are located near the boundaries and most water from these canals and laterals flows toward Tule Lake. The topography also directs drainage and return flows toward Tule Lake. From Tule Lake, water is rediverted for additional use.

2. District soil association map (Agricultural only)
See Attachment A, District Soils Map

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

Soil Problem	*Estimated Acres*	*Effect on Water Operations and Management*
Salinity	61,000	TID attempts to maintain outflow through D-Plant in order to minimize adverse effects of salt buildup
High Water Table	61,000	High Water Table makes it difficult to maintain water table below root zone
Low infiltration rates	61,000	Low infiltration rates make it difficult to maintain water table below root zone

The predominant soil type within TID is Tulebasin mucky silty clay loam. As defined by the National Resources Conservation Service (NRCS), Tulebasin soils are generally 60 inches deep. The first 14 inches is a mucky silty clay loam. The following 18 inches is generally silty clay which is followed by another 28 inches of either silty clay or silty clay loam. Drainage is very poor and the depth to the water table is typically less than one foot if not ponded. Because of the poor drainage characteristics of the soil, landowners must carefully regulate application of irrigation water. The biggest challenge in the majority of TID is maintaining the water table below the root zone.

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.	1.1	1.0	1.1	1.2	1.2	0.7	0.3	0.3	0.3	0.8	1.1	1.4	10.5
Avg Temp.	31.1	34.0	39.0	44.0	52.2	59.0	65.9	63.9	57.1	46.3	35.9	30.1	46.5
Max. Temp.	43.0	47.0	53.0	58.0	66.3	74.0	83.0	82.5	76.6	64.1	49.7	41.3	61.5
Min. Temp	20.6	21.8	24.6	28.5	36.1	41.4	46.2	43.2	36.5	28.9	24.0	19.7	31.0
ETo	0.9	1.5	3.0	4.2	5.8	6.8	7.4	6.6	4.8	2.8	1.2	0.7	45.6
Avg. Wind Speed	4.5	5.2	6.0	6.4	6.3	5.5	4.4	4.2	4.2	4.3	4.4	4.6	5.0

Weather station ID CIMIS 91 *Data period: Year* 1990 *to Year* 2016

ET Station ID CIMIS 91 *Average annual frost-free days:* 222

Frost Free Days - According to National Oceanic and Atmospheric Administration (NOAA), frost free days are days with temperatures greater than 28 degrees Fahrenheit.

The average elevation within TID is about 4,030 feet. The climate is cold in winter with mild summer temperatures. Typically, the growing season begins in mid–April and ends in early October. Summer temperatures average about 60 degrees with some highs above 90 degrees.

Below freezing temperatures can and do occur in the summer at night. The average winter temperatures range from the low 30s to occasional lows below –10 degrees. Although there is normally a growing season of 100 days, there is no month that is frost free.

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

Microclimates are not a significant factor within TID.

E. Natural and Cultural Resources

1. Natural resource areas within the service area

Name	*Estimated Acres*	*Description*
Tule Lake National Wildlife Refuge (TLNWR)	39,116	See below

TLNWR primarily consists of four "sumps," two of which act as regulating reservoirs within TID (Sumps 1A and 1B). The other two sumps (Sumps 2 and 3) have been reclaimed and are farmed as lease and co-op lands. Lease lands are administered by Reclamation, and farmers completely harvest crops grown. Co-op lands are seasonally farmed by individuals and administered by USFWS. Farmers must leave a portion of the crop unharvested. These lands are typically planted to cereal grains that supply migratory birds with feed during the fall and spring migrations. Priority for the option to farm these lands is based on enrollment/participation in the flood fallow program. Approximately 2,500 acres in the Tule Lake area are designated as "co-op" land, of which approximately 600 acres are within the flood fallow program. Approximately 17,300 acres are "lease lands," of which a portion are within the flood fallow program and the co-op land. These lease lands are within the reclaimed portion of the Tule Lake Sumps 2 and 3. The flood fallow program requires participation for 2 to 4 years. Recent participation has been approximately 2,500 acres at Tule Lake (split between refuge and private lands). The program is a benefit to farmers because the pre-irrigation process of flooding fields greatly assists with weed and nematode control, while providing waterfowl habitat. In addition, the program provides for a given farmer to certify their land as organic. According to refuge staff, participation in the program has been strong and, in general, can add a $100 to $150 value per acre to participating lands at the completion of the 2-year period (Mauser, 2011, personal communication).

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

TID surrounds TLNWR, which includes Tule Lake and adjacent lands. Many of the lands within the TLNWR are leased for farming, wildlife feed production, and to provide wildlife habitat. In addition, water discharged through the D-Pumping Plant, which is used to control water levels within Tule Lake, provides water to P-Canal lands within the LKNWR. TID does not directly manage the refuges; but delivers the water, provides drainage, and maintains a good working relationship with the refuges which are managed by the U.S. Fish & Wildlife Service. TID is responsible for managing the water surface elevation of the sumps within TLNWR to meet requirements and demands.

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

Name	*Estimated Acres*	*Description*
TLNWR	39,116 acres	Includes a 10-mile interpretive auto tour route, viewing platforms, and interpretive walks; waterfowl and pheasant hunting; kayaking and canoeing

TLNWR provides many outdoor activities for visitors. Additional information is available at https://www.fws.gov/refuge/Tule_Lake/.

F. Operating Rules and Regulations

1. Operating rules and regulations
See Attachment B, District Rules and Regulations (water related)

2. Water allocation policy (Agricultural only)
See Attachment B, Page 1
Summary – TID delivers water on a call system. Under the circumstance that demand exceeds the capacity of a particular ditch, water is delivered to those orders first received by TID. If TID is presented with a water supply shortage, it will follow California irrigation district law to appropriately share the available supply with TID landowners. (Water Code Sections 22250 – 22252.3). Also, in circumstance of insufficient overall supply, water rental agreements are limited; and there are contractual priorities with respect to other Reclamation contractors to whom TID delivers water.

There are general requirements of California law pertaining to administration of shortage. In general, TID seeks to use a rotation system for a normal water shortage. Development of detailed rules and regulations is difficult in light of uncertainties associated with operation of the Klamath Project. However, through the development of the On Project Plan (OPP), a process has been defined in which Project irrigators will have a better understanding of how to best manage the water supply allocation.

3. Official and actual lead times necessary for water orders and shut-off (Agricultural only)
See Attachment B, Page 1
Summary – Water orders are to be placed with TID prior to 3:00 p.m. the day before delivery is requested. However, TID may accept orders submitted later than 3:00 pm based on the ability to deliver water. The water user is to utilize the water within two hours after the time for which delivery was requested. TID reserves the right to defer delivery for up to three days from the date requested when required by the capacities of the system and to provide more efficient service.

All orders taken are considered valid orders unless cancelled by 8:00 a.m. on the date for which delivery was confirmed. If special arrangements are not made, or if orders are not cancelled in time, the water user may be subject to a $25.00 penalty. All penalties invoked will be reviewed by the Board of Directors.

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

See Attachment B, Page 1

Summary – TID's extensive recirculation and reuse system makes an official policy regarding return flows unnecessary. In addition there has not been a consistent history of problems leading to a lack of urgency to develop an official policy.

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

Summary – There is no official policy regarding water transfers. However, water supply reliability is TID's main purpose and concern relative to providing water to landowners within the service area. Since 2001 and the installation of TID's groundwater wells, TID, in addition to individual landowners, have participated in water bank programs and activities in order to reduce surface water diversions. Prior to the construction of its groundwater wells, this participation was limited to cropland idling or dryland farming. Following the construction of the groundwater wells, TID participated in groundwater substitution. Acreage enrolled in the groundwater substitution water bank management strategy received groundwater in lieu of surface water deliveries. The participation in water bank programs decreased Project demand (from the Klamath River) and the amount of water diverted at the main facilities for delivery within TID.

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers

Approximately 400 customers are served by TID. Refer to Section III BMP A.1. Information on water measurement for agricultural contractors is completed under BMP A.1 on page 20.

2. Urban Customers

Not applicable.

3. Agricultural and Urban Rates

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

See Attachment D

The billing rates for 2016 are summarized in the table below. Through adoption of Resolutions 2014-4 and 2015-02, TID employs a volumetric water charge to cover the cost of deliveries above a defined water delivery threshold, as set forth in the *Report Detailing the Cost of Service for Delivery In Excess of Threshold Water Quantity*. TID determined that growers that take delivery of water in excess of 3.0 acre-feet per irrigated acre (af/ac) between March 1 and October 31 will pay a volumetric charge for the portion of any water deliveries in excess of that threshold during that period. The per acre-foot rates for the volumetric water charge for any year are equal to the O&M Rates and Rental Lands Rate for specific land categories in the year divided by 3.0 af/ac. Growers are sent a bill for the upcoming irrigation season in January of each year, payment of which is due in June. Following the irrigation season, water users who used in excess of 3 af/ac are sent a bill for the excess.

b. Annual charges collected from agricultural customers

Fixed Charges			
Charges ($ by unit)	*Charge units $/acre, etc.*	*Units billed during year acres, etc.*	*Total $ collected ($ times units)*
Private	$66/acre	42,698.5	$2,818,101.00
Oregon J Private	$60.50/acre	2,177	$131,708.50
Public	$100/acre	17,302	$1,730,200.00

Volumetric charges			
Charges ($ by unit)	*Charge units $/AF, etc.*	*Units billed during year AF, etc.*	*Total $ collected ($ times units)*
Volumetric over 3 AF/ac	$22/AF	297.71	$6,549.62

See Attachment D, Page 1, District Sample Bills

c. Describe the contractor's record management system

Water order forms are collected from every unit owner and kept for five years in TID's records. TID uses spreadsheets to collect and track the data from the water order forms to determine the quantity of water delivered to each unit. The district also maintains a watermaster operations folder. Records include daily quantities at each of the system headworks, "spill" from one canal system to another, and supplies available in each lateral. These daily records are compiled to monthly values. The TID watermaster tracks daily operations on a handwritten spreadsheet.

H. Water Shortage Allocation Policies

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

See Attachment E, 2015 Drought Plan – Klamath Project, Oregon-California

TID has no formal polices for water shortages or reduced water allocations due, in part, to the extensive use of recirculated water. In the event of a shortage in Project water supplies, Reclamation determines the allocation of the available supply in accordance with the terms of the contracts between Reclamation and districts and individual water users. There are four general types of these contracts within the Project: settlement contracts, repayment contracts, Warren Act contracts, and annual water rental agreements. In accordance with the authority for the respective contracts and their explicit terms, these contracts create a system of priorities among Project contracts, within the Project, in the event of a shortage in the available Project water supplies. During years of shortage, Reclamation publishes an Annual Drought Plan. The most recent Annual Drought Plan was published in 2015, which is included as Attachment E for reference. Copies of recent Annual Drought Plans are available at: https://www.usbr.gov/mp/kbao/programs/ops-planning.html

2. Current year policies that address wasteful use of water and enforcement methods
See Attachment B, page 1-3

However, TID reserves the right to stop delivery of water at any time if water is running into the barrow pits or drains or subbing adjacent lands. TID may defer delivery of water if a field is not adequately ditched or checked up to take the water or to make efficient use of the water ordered. The ditchriders are to regulate the checks and headworks and ensure no one takes water without authorization. Water users are not to adjust headgates or checks without prior discussion with the ditchrider or the watermaster. At any time when water is cut back to a ditch without notice to the ditchrider or the watermaster's office, TID reserves the right to either restrict the delivery of water for the remainder of the three-day irrigation period or discontinue delivery until the next time the farm unit is entitled to receive water.

TID also encourages efficient water use by implementing volumetric pricing for any use of water over 3 acre feet per acre on private units. For 2016, tenants were charged $22.00 per acre foot over the allotted 3 acre feet per acre.

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

Discuss possible modifications to policies and solutions for improved water management.

Historically, water supplies were sufficient to meet needs within the District. Reclamation adopted a Drought Plan in 1992 which provides for allocation of water in times of shortage based on contract priorities. However, this plan assumes early announcements of overall project water availability. Past years of shortage within the project have made planning within TID extremely difficult. For example, in 1992, shortages were announced late in the summer, and TID responded to manage the supply under the circumstances. In April 2001, it was announced that there would be no Klamath water; then in July, 70,000 acre-feet was delivered to the Project as a whole. Over the past decade, greater uncertainty relative to Project deliveries has been experienced by Project irrigators, including TID. Landowners within TID have participated in water bank programs in order to decrease Project demand.

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 (Table 1).
See Chapter 5, Water Inventory Tables, Table 1

2. Amount of water delivered to the district by each of the district sources for the last 10 years
See Chapter 5, Water Inventory Tables, Table 8.

B. Groundwater Supply

1. Groundwater extracted by the district and delivered, by month (Table 2)
See Chapter 5, Water Inventory Tables, Table 2

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

Name	*Size (Square Miles)*	*Usable Capacity (AF)*	*Safe Yield (AF/Y)*
Upper Klamath Basin	253	Undetermined	

TID is located entirely within the Tule Lake Subbasin of the Upper Klamath Lake Basin. In hydrogeologic terms, Tule Lake Subbasin extends north into Oregon. For the purposes of groundwater management in California, the northern boundary of the subbasin is the California-Oregon state line as described by Bulletin 118. This boundary was updated in 2016 by the Department of Water Resources (DWR). Implementation of the Sustainable Groundwater Management Act (SGMA) is currently underway. TID, in coordination with other local agencies, will be developing a Groundwater Sustainability Plan (GSP) pursuant to the requirements of SGMA. Through SGMA implementation, it is hoped to better define the useable capacity and safe yield of the subbasin.

3. Map of district-operated wells and managed groundwater recharge areas
See Attachment A, for District Map of Groundwater Facilities

Attachment A-4 includes the Tule Lake Subbasin as defined by the 2016 update to Bulletin 118.

4. Description of conjunctive use of surface and groundwater
(Please review Guidebook definition of conjunctive use)

TID drilled 10 groundwater wells in 2001 in order to provide a supplemental water supply during dry years to land within its service area. TID developed a conjunctive use plan in order to integrate groundwater supplies into its surface water system during years of surface water shortages, which is further described in TID's Groundwater Management Plan (GWMP) included as Attachment F. The use of groundwater wells within TID remains a supplemental supply for use during dry years and periods of surface water curtailment. TID works cooperatively with DWR in order to monitor groundwater elevations within the groundwater wells. As part of this cooperation, TID has enrolled in the California Statewide Groundwater Elevation Monitoring (CASGEM) authorized by SBX7-6, enacted in November

2009. Through these efforts, and future efforts related to the implementation of SGMA, TID and DWR will continue to evaluate the potential effects and sustainability of groundwater use within Tule Lake.

Groundwater recharge is generally greatest in upland areas where the largest amount of precipitation occurs. The principle recharge areas in the Upper Klamath Basin are the Cascade Range and uplands within and on the eastern margin of the Upper Klamath Basin. Irrigation activities also can result in groundwater recharge. Irrigation canals typically lose some water to the shallow parts of the groundwater system. Additional information regarding groundwater recharge is included in Attachment F.

5. Groundwater Management Plan
See Attachment F, Groundwater Management Plan

The attached Groundwater Management Plan, dated April 2013, was prepared based on the description of the Tule Lake Subbasin as described in the 2003 update to Bulletin 118. As mentioned above, the subbasin boundary and description was modified in 2016. The GSP to be developed pursuant to SGMA will rely upon the 2016 update to Bulletin 118.

6. Groundwater Banking Plan

TID does not participate in groundwater banking. TID is not aware of any current plans for a water bank. However, in past years of shortage within the Klamath Project, Reclamation has facilitated the implementation of water banks aimed at buying water for enhanced environmental actions. Since 2001 and the installation of TID's groundwater wells, TID, in addition to individual landowners, have participated in water bank programs and activities.

C. Other Water Supplies

1. "Other" water used as part of the water supply – Describe supply
See Chapter 5, Water Inventory Tables, Table 1

TID's system utilizes operational spill and drainage as a component of its water supply. A large amount of water delivered to canal systems is reused within TID by pumping drain water back into the conveyance system at key locations. TID can also reuse and recirculate water from the Tule Lake Sumps. The quantity of recirculation and reuse is calculated based on the total supply available at the canal headworks (J-Canal System, M and South N System, Q and R System, and North N System) and the irrigation deliveries.

D. Source Water Quality Monitoring Practices

1. Potable Water Quality (Urban only)

Not applicable.

2. Agricultural water quality concerns: *Yes* √ *No* _____

Reuse of water within TID is causing additional concentration of salts within the soil profile with each reuse of water (see "Simulating Spatially Distributed Water and Salt Balances" by L. Mateos, C.A. Young, W.W. Wallender and H.L. Carlson; Journal of Irrigation and Drainage Engineering, Sep/Oct 2000; Vol. 126, No. 5). It, therefore, is important to recognize that greater reuse would further concentrate salts within the soil profile.

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

TID conducts continuing programs to ensure that TID's system operates efficiently while minimizing losses. These include maintenance of the canal system together with weed control in the canals and on the canal banks, pump rehabilitation, and salt balance monitoring.

The water banks, further described below, have resulted in monitoring efforts by Reclamation, including measurements of groundwater quality parameters in approximately thirty (30) wells during 2001. Groundwater quality field parameters have not been continuously collected in more recent years at all of these locations. Water quality data has historically (from 2001-present) been collected by DWR, Reclamation and the USGS within the GWMP area. Some groundwater quality data is maintained by DWR and the USGS, but there is no regular groundwater quality monitoring program that covers the GWMP area. TID works cooperatively with these agencies.

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

Analyses Performed	*Frequency*	*Concentration Range*	*Average*
None performed by TID			

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

Analyses Performed	*Frequency*	*Concentration Range*	*Average*
None performed by TID			

E. Water Uses within the District

1. Agricultural

See Chapter 5, Water Inventory Tables, Table 5 - Crop Water Needs

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

Crop name	*Total Acres*	*Level Basin - acres*	*Furrow - acres*	*Sprinkler – acres*	*Low Volume - acres*	*Multiple methods - acres*
Barley	10,860	0	0	0	0	10,860
Wheat	11,205	0	0	0	0	11,205
Oats	405	0	0	0	0	405
Peas	15	0	0	15	0	0
Alfalfa	21,061	0	0	0	0	21,061
Other Hay	2,300	0	0	0	0	2,300
Pasture	987	0	0	0	0	987
Potatoes	7,842	0	0	7,842	0	0
Onions	2,616	0	0	2,616	0	0
Garlic	40	0	0	40	0	0
Mint	2,379	0	0	0	0	2,379
Carrots	136	0	0	136	0	0
Corn	145	0	145	0	0	0
Horseradish	366	0	0	0	0	366
TOTAL	60,357	0	145	10,649	0	49,563

3. *Urban use by customer type in current year*

Customer Type	*Number of Connections*	*AF*
Single-family	NONE	
Multi-family	NONE	
Commercial	NONE	
Industrial	NONE	
Institutional	NONE	
Landscape irrigation	NONE	
Wholesale	NONE	
Recycled	NONE	
Other (specify)	NONE	
Other (specify)	NONE	
Other (specify)	NONE	
Unaccounted for	NONE	
Total	NONE	

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

Treatment Plant	*Treatment Level (1, 2, 3)*	*AF*	*Disposal to / uses*
NONE			
	Total		
Total discharged to ocean and/or saline sink			

5. Groundwater recharge in current year (Table 6)

Recharge Area	*Method of Recharge*	*AF*	*Method of Retrieval*
NONE			
	Total		

*6a. Transfers and exchanges **into** the service area in current year – (Table 1)*

From Whom	*To Whom*	*AF*	*Use*
NONE			
	Total		

*6b. Transfers and exchanges **out** of the service area in current year – (Table 6)*

From Whom	*To Whom*	*AF*	*Use*
NONE			
	Total		

7. Wheeling, or other transactions in and out of the district boundaries – (Table 6)

From Whom	*To Whom*	*AF*	*Use*
TID	LKNWR	29,496	Refuge
	Total	29,496	

8. Other uses of water

Other Uses	*AF*
NONE	

F. Outflow from the District (Agricultural only)

See Facilities Map, Attachment A, for the location of surface and subsurface outflow points, outflow measurement points, outflow water-quality testing locations

1. Surface and subsurface drain/outflow

Outflow point	*Location description*	*AF*	*Type of measurement*	*Accuracy (%)*	*% of total outflow*	*Acres drained*
1	D Pumping Plant	29,496	Pump Rating Curve	Unknown	100	96,000

Outflow point	*Where the outflow goes (drain, river or other location)*	*Type Reuse (if known)*
1	LKNWR	Natural Resource/Environmental

Water from D-Plant is conveyed through the Tule Lake tunnel (a tunnel drilled through Sheepy Ridge) and discharges into the P-Canal, which furnishes water to water users as well as to LKNWR. Water delivered to the P-Canal and not used by the P-Canal users or the LKNWR enters the Klamath Straits Drain and is returned by pumping into the Klamath River at the outlet of the Klamath Straits Drain. Reclamation operates the pumping plants on the Klamath Straits Drain.

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

USGS engaged in a three year study of water quality at TID which is now complete. In addition USBR operates a water quality testing program which monitors the entire Klamath project. TID works cooperatively with these agencies.

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

Analyses Performed	*Frequency*	*Concentration Range*	*Average*	*Reuse limitation?*
None performed by TID				

Outflow (subsurface drainage) Quality Testing Program

Analyses Performed	*Frequency*	*Concentration Range*	*Average*	*Reuse limitation?*
None performed by TID				

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

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

Not applicable.

G. Water Accounting (Inventory)

Go To Chapter 5 for Agricultural Water Inventory Tables and Instructions.

Go To Chapter 6 for Urban Water Inventory Tables and Instructions.

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

A. Critical Agricultural BMPs

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

   a. *Number of delivery points (turnouts and connections)* 1,040

   b. *Number of delivery points serving more than one farm* 162

   c. *Number of measured delivery points (meters and measurement devices)* *950*

   d. *Percentage of water delivered to the contractor that was measured at a delivery point* 100%

   e. *Total number of delivery points not billed by quantity* *1,028 (see notes below)*

   f. *Delivery point measurement device table*

Measurement Type	*Number*	*Accuracy* (+/- %)*	*Reading Frequency (Days)*	*Calibration Frequency (Months)*	*Maintenance Frequency (Months)*
Orifices					
Propeller meter	125	Unknown	2x/year	Private	Private
Weirs					
Flumes					
Venturi					
Metered gates	925	Unknown	Twice daily during irrigation	Unknown	As needed
Acoustic doppler					
Other (define)					
Total					

**Documentation verifying the accuracy of measurement devices must be submitted with Plan and included in Attachment C.*

TID adopted a Water Measurement Program on December 19, 2014. As resources permit, TID will evaluate the measurement accuracy of the Armco metergates at TID turnouts, as well as customer irrigation pump meters and private turnout water measurement devices. TID will use trained field inspectors to determine the volumetric accuracy of each type of device under standard conditions, and confirm that each device is installed and maintained to the manufacturer's recommendations, design specifications, or industry recognized standards. Also, TID will review current operation and maintenance practices to ensure they meet best professional practices.

TID encourages irrigators to install flow measurement meters, however the district does not own or maintain any of the meters. The total volume delivered is read from every meter on March 1st. Only 12 delivery points in TID were billed by quantity in 2016 due to the volumetric pricing structure used in the district as described in previous sections.

A copy of the Water Measurement Program is included in Attachment C.

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

Name: Brad Kirby *Title:* General Manager

Address: *2717 Havlina Tulelake, CA*

Telephone: 530-667-2249 *E-mail:* tid@cot.net

It is the responsibility of the water conservation coordinator to prepare each five-year plan, implement aspects of the Plan, and complete annual updates. The water conservation coordinator will work with a consultant to prepare these documents and implement the Plan, as needed. The duties of the water conservation coordinator are assigned to TID's General Manager.

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

a. On-Farm Evaluations

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

TID cooperates with the Intermountain Research and Extension Center (IREC) located in Tulelake (http://irec.ucanr.edu/). IREC conducts an On-Farm Efficiency Program which can assist with efficiency improvements. TID does not require its water users to conduct on-farm evaluation. TID will inform customers of the availability of evaluation services and facilitate evaluations as appropriate. Information regarding evaluation services will be provided on request.

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

Evapotranspiration rates are available from the California Irrigation Management Information System (CIMIS) for Tulelake. IREC also provides a summary of estimated crop water use in the Klamath Basin. Currently, water users can request copies of order forms for water delivery information.

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

TID will provide information regarding the WATERIGHT website (http://www.waterright.org/index.asp) to its water users on request. This website provides irrigation scheduling information that can be used by growers within TID. IREC also provides an irrigation scheduling tool.

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

Water quantity data is available upon request. Information regarding water quality and studies performed by other agencies are available from those sources.

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

TID's continued cooperation with the IREC On-Farm Efficiency Program has provided for on-farm efficiency improvements. TID has also worked cooperatively with Intermountain Research and Extension Center to evaluate salt balances within the district and concerns associated with the high reuse of tailwater within TID. The district will continue working with these entities to facilitate educational programs for staff and Project water users.

e. Other

None.

4. Pricing structure - based at least in part on quantity delivered

Through adoption of Resolutions 2014-4 and 2015-02, TID employs a volumetric water charge to cover the cost of deliveries above a defined water delivery threshold, as set forth in the *Report Detailing the Cost of Service for Delivery In Excess of Threshold Water Quantity*. TID determined that growers that take delivery of water in excess of 3.0 acre-feet per irrigated acre (af/ac) between March 1 and October 31 will pay a volumetric charge for the portion of any water deliveries in excess of that threshold during that period. The per acre-foot rates for the volumetric water charge for any year are equal to the O&M Rates and Rental Lands Rate for specific land categories in the year divided by 3.0 af/ac.

5. Evaluate and improve efficiencies of district pumps

	Total in district	*# surveyed last year*	*# surveyed in current year*	*# projected for next year*
Wells	10	0	0	0
Lift pumps	65	1	1	1

TID monitors all pumps daily in order to verify pump performance and evaluate the need for pump repair on an as-needed basis. There is currently a plan to replace at least one pump every year based primarily on this performance data. TID has installed variable frequency drives (VFD) at A Plant, and Pumping Plants G, H, W, and Y in order to improve energy use efficiency and decrease energy costs. TID is researching future funding opportunities to install additional VFD controllers at key locations within the conveyance and drainage system to improve the efficiency of the water recovery system.

B. Exemptible BMPs for Agricultural Contractors

(See Planner, Chapter 2, Addendum B for examples of exemptible conditions)

1. Facilitate alternative land use

Drainage Characteristic	*Acreage*	*Potential Alternate Uses*
High water table (<5 feet)	NONE	
Poor drainage	NONE	
Groundwater Selenium concentration > 50 ppb	NONE	
Poor productivity	NONE	

2. Facilitate use of available recycled urban wastewater

Sources of Recycled Urban Waste Water	*AF/Y Available*	*AF/Y Currently Used in District*
NONE		
NONE		

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

Program	*Description*
NONE	
NONE	
NONE	

4. Incentive pricing

TID encourages efficient water use by implementing volumetric pricing for any use of water over 3 acre feet per acre on private units.

5. a) Line or pipe ditches and canals

Canal/Lateral (Reach)	*Type of Improvement*	*Number of Miles in Reach*	*Estimated Seepage (AF/Y)*	*Accomplished/ Planned Date*
J Canal	Concrete Lining	1.8	Unknown	Original Construction
J Canal	Geomembrane Lining	0.2	Unknown	9/2011
M Canal	Geomembrane Lining	3.5		9/2011
M Canal	HDPE Pipeline	1.8		9/2011
N Canal	HDPE Pipeline	4.5		9/2011
R Canal	HDPE Pipeline	0.2		9/2011

The District lined a total of 19,650 feet with geomembrane lining. The installation of the geomembrane resulted in reduced seepage losses within high loss reaches within the conveyance system. However, the maintenance associated with the geomembrane lining has proven problematic in some areas within TID. Tearing of the geomembrane lining due to equipment falling into the canal, or the clearing of debris from the canal by heavy machinery during annual maintenance has resulted in a significant amount of time and expense spent repairing the damaged areas. In addition, rodent and animal activity has also contributed to continual maintenance and repairs. Due to the many issues experienced with the geomembrane lining, TID pursued installing pipe. TID applied for a Reclamation program which provided Hancor N-12 HDPE pipe for installation along high loss reaches of the conveyance system. TID obtained the pipe from Reclamation and completed the installation. In some cases, TID provided the pipe to individual farmers within the service area, specifically the Copic Bay region for installation by landowners. TID has currently installed an additional 34,142 feet of pipe which have resulted in reduced losses. There are currently no plans to install additional lining or pipes. However if the opportunity arose or it was warranted, TID would explore the option of installing additional lining or

pipe. It is difficult to determine the estimate seepage due to the extensive use of recirculated and reused water within TID.

b) Construct/line regulatory reservoirs

Reservoir Name	*Location*	*Describe improved operational flexibility and AF savings*
NONE		

The only reservoirs within the service area are the Tule Lake Sumps. These sumps are part of the TLNWR and cannot be lined.

6. Increase flexibility in water ordering by, and delivery to, water users
See Attachment G, contractor 'agricultural 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)*
Total		

Drainage System Lateral	*Annual Drainage Outflow (AF/Y)*	*Quantity Recovered and reused (AF/Y)*
Total		

See Section B.5 above regarding the recovery systems. TID has a drainage system for its irrigated lands. This drainage system maintains the water table below the root zone and also provides for flows being returned to the irrigation system. TID believes this BMP has been fully implemented; however, maintenance projects are ongoing.

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 report year 100%

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

Location & Priority	*Estimated cost (in $1,000s)*				
	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*

As described in Section I.F.1, there is one outflow point in TID. Outflow is measured/estimated based on pump rating curves.

9. Optimize conjunctive use of surface and groundwater

TID developed a conjunctive use plan in order to integrate groundwater supplies into its surface water system during years of surface water shortages. TID continues to make infrastructure improvements to integrate the groundwater and surface water system. It is important to emphasize, the use of groundwater wells within TID remains a supplemental supply for use during dry years and periods of surface water curtailment. In order to meet peak demand during the last few years, well site 14 was operated for approximately 2-3 weeks due to operation constraints in the surrounding region. TID continues to work cooperatively with the California Department of Water Resources (DWR) in order to monitor groundwater elevations within the groundwater wells. As part of this cooperation, TID has enrolled in the California Statewide Groundwater Elevation Monitoring (CASGEM) authorized by SBX7 6, enacted in November 2009. Through these efforts TID and DWR will continue to evaluate the potential effects and sustainability of groundwater use within Tule Lake.

The potential exists to integrate private wells into TID's conveyance system. As a result of recent surface water curtailments within the Klamath Basin, TID and individual landowners within its service area have participated in water bank programs. TID will evaluate the benefits of potential integration of individual groundwater wells into the conveyance system, as necessary to meet demand.

10. Automate distribution and/or drainage system structures
Identify locations where automation would increase delivery flexibility and reduce spill and losses. Describe program to achieve these benefits and estimate the annual water savings.

TID has installed automated control structures to improve delivery system timing and efficiency. These automated control structures include check structures to control water levels within the canal system and gates which control flows. In addition, TID is replacing automated control structures already in place in order to improve distribution system efficiency and maintain infrastructure reliability. There are a total of 56 automated gates within TID. Telemetry equipment is installed on 17 of TID's automated control structures. This allows TID personnel to monitor and/or control water levels and flows at these structures from TID's office. TID continues to update telemetry equipment on an as-needed basis within the conveyance system and continues to pursue funding opportunities for additional telemetry locations.

TID has installed six automated trash screens at key locations within the conveyance and drainage system in order to minimize damage to pump facilities and improve system efficiency. These installations have removed vegetation along with other debris that has caused significant damage to TID pumps. An additional trash screen is located at the R-Canal headworks, which is owned by the U.S. Fish and Wildlife Service and operated by TID.

11. Facilitate or promote water customer pump testing and evaluation

TID provides information to individual pump owners regarding incentives for upgrading upon request. TID refers the owners to an incentive program operated by Pacific Power which offers payback for VFDs, nozzles, gaskets, and etc.

12. *Mapping*

GIS maps	*Estimated cost*				
	Year 1	*Year 2*	*Year 3*	*Year 5*	*Year 6*
Layer 1 – Distribution system					
Layer 2 – Drainage system					
Suggested layers:					
Layer 3 – Groundwater information	$2,500	$2,500	$2,500	$2,500	$2,500
Layer 4 – Soils map					
Layer 5 – Natural & cultural resources					
Layer 6 – Problem areas					

TID has extensive mapping of the irrigation district including the items listed above. TID uses an outside company to maintain a mapping system databased. Layers are updated as changes occur. See Attachment A for maps.

C. Provide a 5-Year Budget for Implementing BMPs

1. Amount actually spent during current year.

Year 2016 or Year 1

BMP #		***BMP Name***	***Actual Expenditure***	***Staff Hours***
A	*1*	*Measurement*	$4,000	160
	2	*Conservation staff*	N/A	See Note Below
	3	*On-farm evaluation /water delivery info*	N/A	0
		Irrigation Scheduling	$0	0
		Water quality	$0	0
		Agricultural Education Program	$0	0
	4	*Quantity pricing*	Included in cost and time for measurement	
	5	*Contractor's pumps*	$63,000	8
B	*1*	*Alternative land use*	N/A	0
	2	*Urban recycled water use*	N/A	0
	3	*Financing of on-farm improvements*	N/A	0
	4	*Incentive pricing*	Included in cost and time for measurement	
	5	*Line or pipe canals/install reservoirs*	N/A	0
	6	*Increase delivery flexibility*	Included in budget for automation	
	7	*District spill/tailwater recovery systems*	Implemented	
	8	*Measure outflow*	$0	1
	9	*Optimize conjunctive use*	Implemented	
	10	*Automate canal structures*	$30,000	160
	11	*Customer pump testing*	N/A	0
	12	*Mapping*	$2,500	0
		Total	**$99,500**	**329**

Note: TID considers its entire staff as conservation staff. It is the intent of TID to operate as efficiently as possible; therefore, all staff hours include conservation efforts.

2. Projected budget summary for the next year.

Year 2017 or Year 2

BMP #		***BMP Name***	***Actual Expenditure***	***Staff Hours***
A	*1*	*Measurement*	$4,000	160
	2	*Conservation staff*	N/A	See Note Below
	3	*On-farm evaluation /water delivery info*	N/A	0
		Irrigation Scheduling	$0	0
		Water quality	$0	0
		Agricultural Education Program	$0	0
	4	*Quantity pricing*	Included in cost and time for measurement	
	5	*Contractor's pumps*	$69,000	8
B	*1*	*Alternative land use*	N/A	0
	2	*Urban recycled water use*	N/A	0
	3	*Financing of on-farm improvements*	N/A	0
	4	*Incentive pricing*	Included in cost and time for measurement	
	5	*Line or pipe canals/install reservoirs*	N/A	0
	6	*Increase delivery flexibility*	Included in budget for automation	
	7	*District spill/tailwater recovery systems*	Implemented	
	8	*Measure outflow*	$0	1
	9	*Optimize conjunctive use*	Implemented	
	10	*Automate canal structures*	$75,000	160
	11	*Customer pump testing*	N/A	0
	12	*Mapping*	$2,500	0
		Total	**$150,500**	**329**

3. Projected budget summary for 3rd year.

Year 2018 or Year 3

BMP #		***BMP Name***	***Actual Expenditure***	***Staff Hours***
A	*1*	*Measurement*	$4,000	160
	2	*Conservation staff*	N/A	See Note Below
	3	*On-farm evaluation /water delivery info*	N/A	0
		Irrigation Scheduling	$0	0
		Water quality	$0	0
		Agricultural Education Program	$0	0
	4	*Quantity pricing*	Included in cost and time for measurement	
	5	*Contractor's pumps*	$66,000	8
B	*1*	*Alternative land use*	N/A	0
	2	*Urban recycled water use*	N/A	0
	3	*Financing of on-farm improvements*	N/A	0
	4	*Incentive pricing*	Included in cost and time for measurement	

	5	*Line or pipe canals/install reservoirs*	N/A	0
	6	*Increase delivery flexibility*	Included in budget for automation	
	7	*District spill/tailwater recovery systems*	Implemented	
	8	*Measure outflow*	$0	1
	9	*Optimize conjunctive use*	Implemented	
	10	*Automate canal structures*	$30,000	160
	11	*Customer pump testing*	N/A	0
	12	*Mapping*	$2,500	0
		Total	**$102,500**	**329**

4. Projected budget summary for 4th year.

Year 2019 or Year 4

BMP #		***BMP Name***	***Actual Expenditure***	***Staff Hours***
A	*1*	*Measurement*	$4,000	160
	2	*Conservation staff*	N/A	See Note Below
	3	*On-farm evaluation /water delivery info*	N/A	0
		Irrigation Scheduling	$0	0
		Water quality	$0	0
		Agricultural Education Program	$0	0
	4	*Quantity pricing*	Included in cost and time for measurement	
	5	*Contractor's pumps*	$150,000	160
B	*1*	*Alternative land use*	N/A	0
	2	*Urban recycled water use*	N/A	0
	3	*Financing of on-farm improvements*	N/A	0
	4	*Incentive pricing*	Included in cost and time for measurement	
	5	*Line or pipe canals/install reservoirs*	N/A	0
	6	*Increase delivery flexibility*	Included in budget for automation	
	7	*District spill/tailwater recovery systems*	Implemented	
	8	*Measure outflow*	$0	1
	9	*Optimize conjunctive use*	Implemented	
	10	*Automate canal structures*	$77,000	160
	11	*Customer pump testing*	N/A	0
	12	*Mapping*	$2,500	0
		Total	**$233,500**	**481**

5. Projected budget summary for 5th year.

Year 2020 or Year 5

BMP #		***BMP Name***	***Actual Expenditure***	***Staff Hours***
A	*1*	*Measurement*	$4,000	160
	2	*Conservation staff*	N/A	See Note Below
	3	*On-farm evaluation /water delivery info*	N/A	0
		Irrigation Scheduling	$0	0
		Water quality	$0	0
		Agricultural Education Program	$0	0

	4	*Quantity pricing*	Included in cost and time for measurement	
	5	*Contractor's pumps*	$75,000	8
B	*1*	*Alternative land use*	N/A	0
	2	*Urban recycled water use*	N/A	0
	3	*Financing of on-farm improvements*	N/A	0
	4	*Incentive pricing*	Included in cost and time for measurement	
	5	*Line or pipe canals/install reservoirs*	N/A	0
	6	*Increase delivery flexibility*	Included in budget for automation	
	7	*District spill/tailwater recovery systems*	Implemented	
	8	*Measure outflow*	$0	1
	9	*Optimize conjunctive use*	Implemented	
	10	*Automate canal structures*	$30,000	160
	11	*Customer pump testing*	N/A	0
	12	*Mapping*	$2,500	0
		Total	**$111,500**	**329**

Section V: District Water Inventory Tables

Table 1

Surface Water Supply

2016 Month	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water Recirc/Reuse (acre-feet)	Transfers into District (acre-feet)	Water Spill / Drain (acre-feet)	Total (acre-feet)
Method	M2			C2-E2		C2-E2	
January	0	0	0	335	0	3,566	3,901
February	0	0	0	0	0	2,517	2,517
March	604	0	0	1,552	0	1,567	3,723
April	2,317	0	0	1,503	0	11,170	14,990
May	5,491	0	0	434	0	22,929	28,854
June	17,830	0	0	14,116	0	18,032	49,978
July	17,095	0	0	10,383	0	17,517	44,995
August	14,395	0	0	10,188	0	21,431	46,014
September	4,760	0	0	3,967	0	18,029	26,756
October	685	0	0	0	0	10,702	11,387
November	125	0	0	1,637	0	3,259	5,021
December	0	0	0	0	0	2,128	2,128
TOTAL	63,302	0	0	44,115	0	132,847	240,264

Table 2

Ground Water Supply

2016 Month	Groundwater (acre-feet)	Agric Groundwate (acre-feet)
Method		
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	665	0
July	133	0
August	491	0
September	0	0
October	0	0
November	0	0
December	0	0
TOTAL	1,289	0

Table 3

Total Water Supply

2016 Month	Surface Water Total (acre-feet)	Groundwater (acre-feet)	M&I Wastewater (acre-feet)	District Water (acre-feet)
Method				
January	3,901	0	0	3,901
February	2,517	0	0	2,517
March	3,723	0	0	3,723
April	14,990	0	0	14,990
May	28,854	0	0	28,854
June	49,978	665	0	50,643
July	44,995	133	0	45,128
August	46,014	491	0	46,505
September	26,756	0	0	26,756
October	11,387	0	0	11,387
November	5,021	0	0	5,021
December	2,128	0	0	2,128
TOTAL	240,264	1,289	0	241,553

2016 Precipitation Worksheet

	inches precip	ft precip	acres	AF/Year
Jan	1.69	0.14	294.55	260.92
Feb	0.91	0.08	9,292.00	8,231.16
Mar	1.58	0.13	3,326.00	2,946.28
Apr	0.61	0.05	0.00	0.00
May	0.95	0.08	0.00	0.00
Jun	1.42	0.12	0.00	0.00
Jul	0.07	0.01	0.00	0.00
Aug	0.00	0.00	0.00	0.00
Sept	0.04	0.00	0.00	0.00
Oct	1.46	0.12	0.00	0.00
Nov	0.50	0.04	0.00	0.00
Dec	1.40	0.12		
TOTAL	**10.63**	**0.89**		

2016 Evaporation Worksheet

	inches evap	ft evap	acres	AF/YEAR
Jan	0.95	0.08	294.55	1,231.20
Feb	1.67	0.14	9,292.00	38,840.56
Mar	3.25	0.27	3,326.00	13,902.68
Apr	4.67	0.39	0.00	0.00
May	6.38	0.53	0.00	0.00
Jun	7.45	0.62	0.00	0.00
Jul	8.14	0.68	0.00	0.00
Aug	7.26	0.60	0.00	0.00
Sept	5.23	0.44	0.00	0.00
Oct	3.07	0.26	0.00	0.00
Nov	1.28	0.11	0.00	0.00
Dec	0.81	0.07		
TOTAL	**50.16**	**4.18**		

Table 4

Agricultural Distribution System

2016 Canal, Pipeline, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitation (acre-feet)	Evaporation (acre-feet)	Spillage (acre-feet)	Seepage[1] (acre-feet)	Total (acre-feet)
TID Irrigation Systen	1,283,040	10	12,830,400	260.9	1,231.2	0	1,940	(2,910)
Tulelake Sump 1A	--	--	404,759,520	8,231.2	38,840.6	0	0	(30,609)
Tulelake Sump 1B	--	--	144,880,560	2,946.3	13,902.7	0	0	(10,956)
	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	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				11,438.4	53,974.4	0	1,940	(44,476)

1: Seepage is a calculated value based on measured volume diverted at the headworks and the total available supply

Table 5

Crop Water Needs

2016 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Requirement (AF/Ac)	Cultural Practices (AF/Ac)	Precipitation (AF/Ac)	Appl. Crop Water Use (acre-feet)
Barley	10,860	1.55	0.0	0.0	0.0	16,317
Wheat	11,205	1.71	0.0	0.0	0.0	18,656
Oats	405	1.71	0.0	0.0	0.0	674
Peas	15	1.48	0.0	0.0	0.2	20
Alfalfa	21,061	1.55	0.0	0.0	0.1	30,040
Other Hay	2,300	1.55	0.0	0.0	0.1	3,281
Pasture	987	2.41	0.0	0.0	0.2	2,153
Potatoes	7,842	1.55	0.0	0.0	0.2	10,610
Onions	2,616	1.55	0.0	0.0	0.1	3,665
Garlic	40	1.55	0.0	0.0	0.1	56
Mint	2,379	1.68	0.0	0.0	0.2	3,626
Carrots	136	1.55	0.0	0.0	0.1	190
Corn	145	1.48	0.0	0.0	0.2	192
Horseradish	366	1.48	0.0	0.0	0.2	484
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
Crop Acres	60,357					89,965

Total Irrig. Acres 60,357 (If this number is larger than your known total, it may be due to double cropping)

Table 6

2016 District Water Inventory

Water Supply	Table 3		241,553
Riparian ET	(Distribution and Drain)	minus	0
Groundwater recharge	intentional - ponds, injection	minus	0
Seepage	Table 4	minus	1,940
Evaporation - Precipitation	Table 4	minus	42,536
Spillage	Table 4	minus	0
D Plant Pumping to LKNWR[1]		minus	29,496
Water Available for sale to customers			167,581
Actual Agricultural Water Sales 2016	From District Sales Records[2]		88,627
Private Groundwater	Table 2	plus	0
Crop Water Needs	Table 5	minus	89,965
Drainwater outflow	(tail and tile, not recycled)	minus	0
Percolation from Agricultural Land	(calculated)		(1,338)
Unaccounted for Water	(calculated)		78,954

1: Water from D-Plant is conveyed to LKNWR, located outside of TID

2: TID believes an error occurred in the district's sales records, resulting in a lower than expected quantity being reported above

Table 7

Influence on Groundwater and Saline Sink

2016

Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence	651
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	60,357
Irrigated acres over a perched water table	0
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agri seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	0
Portion of Dist. Sys. seep/leaks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	0

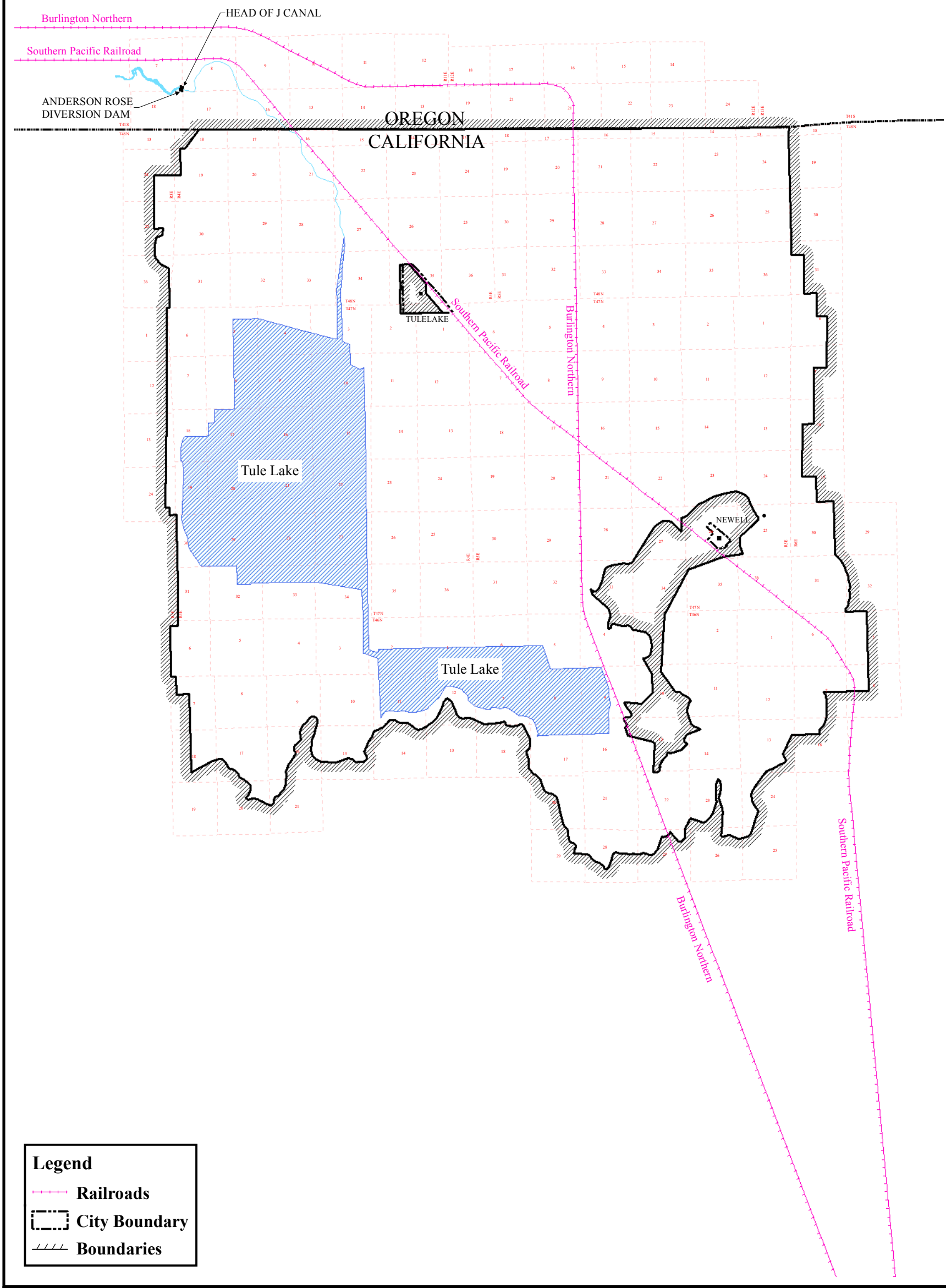
Table 8

Annual Water Quantities Delivered Under Each Right or Contract

Year	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Recirc/Reuse (acre-feet)	Transfers into District (acre-feet)	Upslope Drain Water (acre-feet)	Total (acre-feet)
2007	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0
2013	50,086	0	0	46,034	0	133,578	229,698
2014	48,711	0	0	49,764	0	127,419	225,894
2015	51,897	0	0	45,123	0	128,787	225,807
2016	63,302	0	0	44,115	0	132,847	240,264
Total	213,996	0	0	185,036	0	522,631	921,663
Average	21,400	0	0	18,504	0	52,263	92,166

Attachment A

District Maps



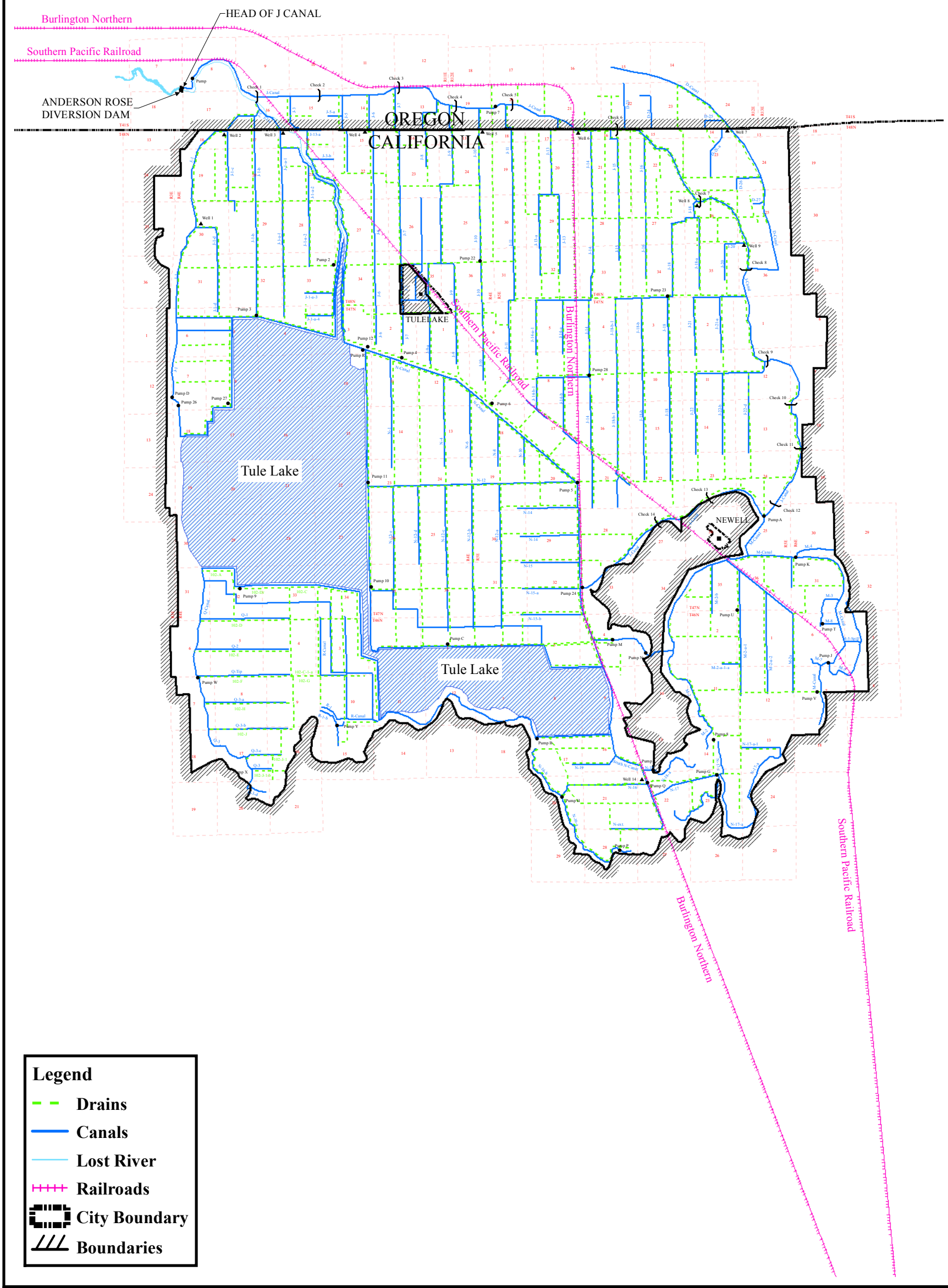
Bar Length On Original Drawing Equals One Inch. Adjust Accordingly.

SCALE: 1" = 2 Miles
JOB NUMBER: 5201
REQUESTED BY: CB
DRAWN BY: MB
DATE: May\ 2017

Tulelake Irrigation District WMCP 2017 Update

Figure A-1 - Location Map

MBK ENGINEERS
455 University Avenue, Suite 100
Sacramento, California 95825-6579
(916)456-4400



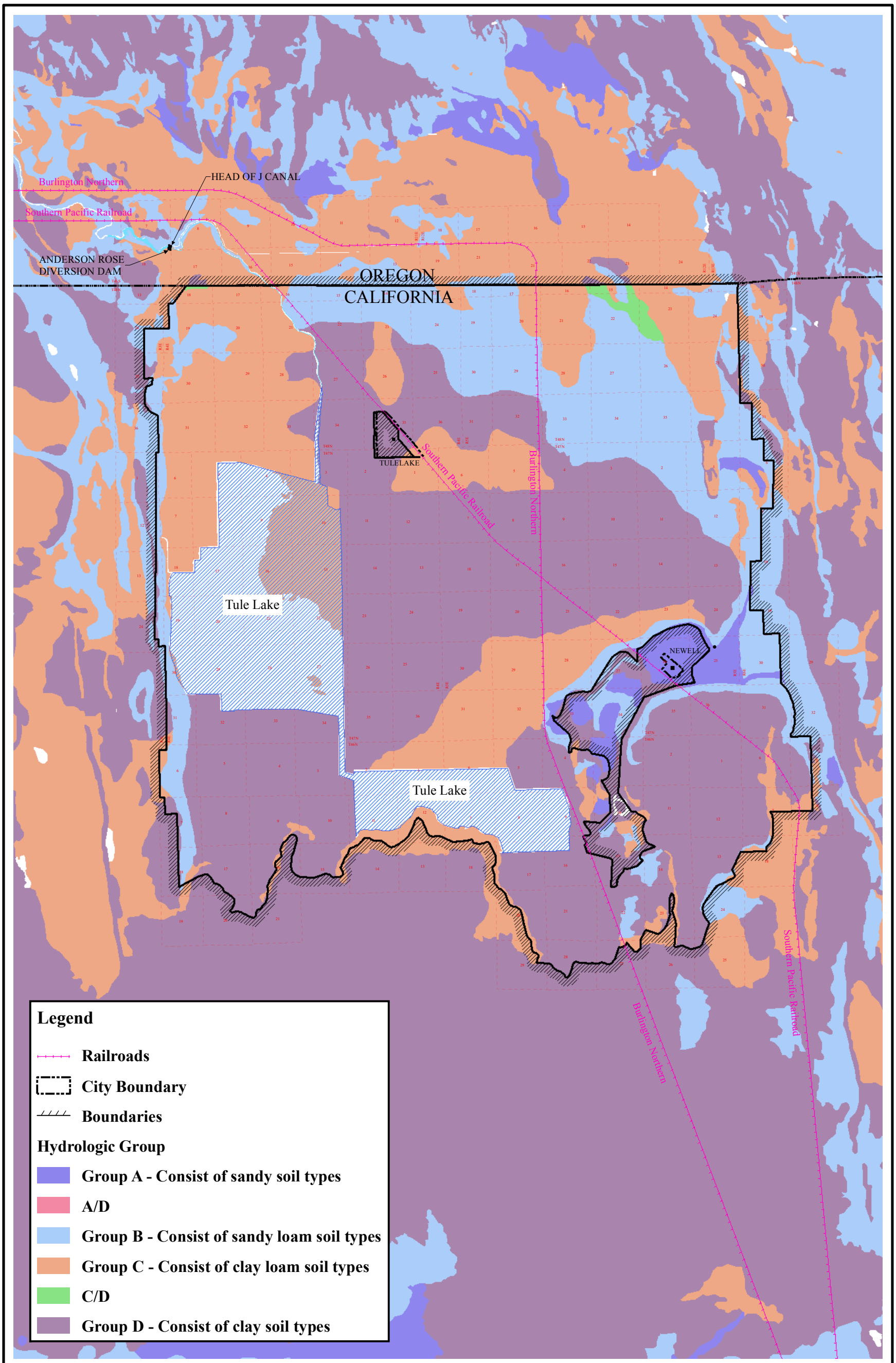
Bar Length On Original Drawing Equals One Inch. Adjust Accordingly.

SCALE: 1" = 2 Miles
JOB NUMBER: 5201
REQUESTED BY: CB
DRAWN BY: MB
DATE: May 2017

Tulelake Irrigation District WMCP 2017 Update

Figure A-2 - Conveyance and Facilities Map

MBK ENGINEERS
455 University Avenue, Suite 100
Sacramento, California 95825-6579
(916)456-4400



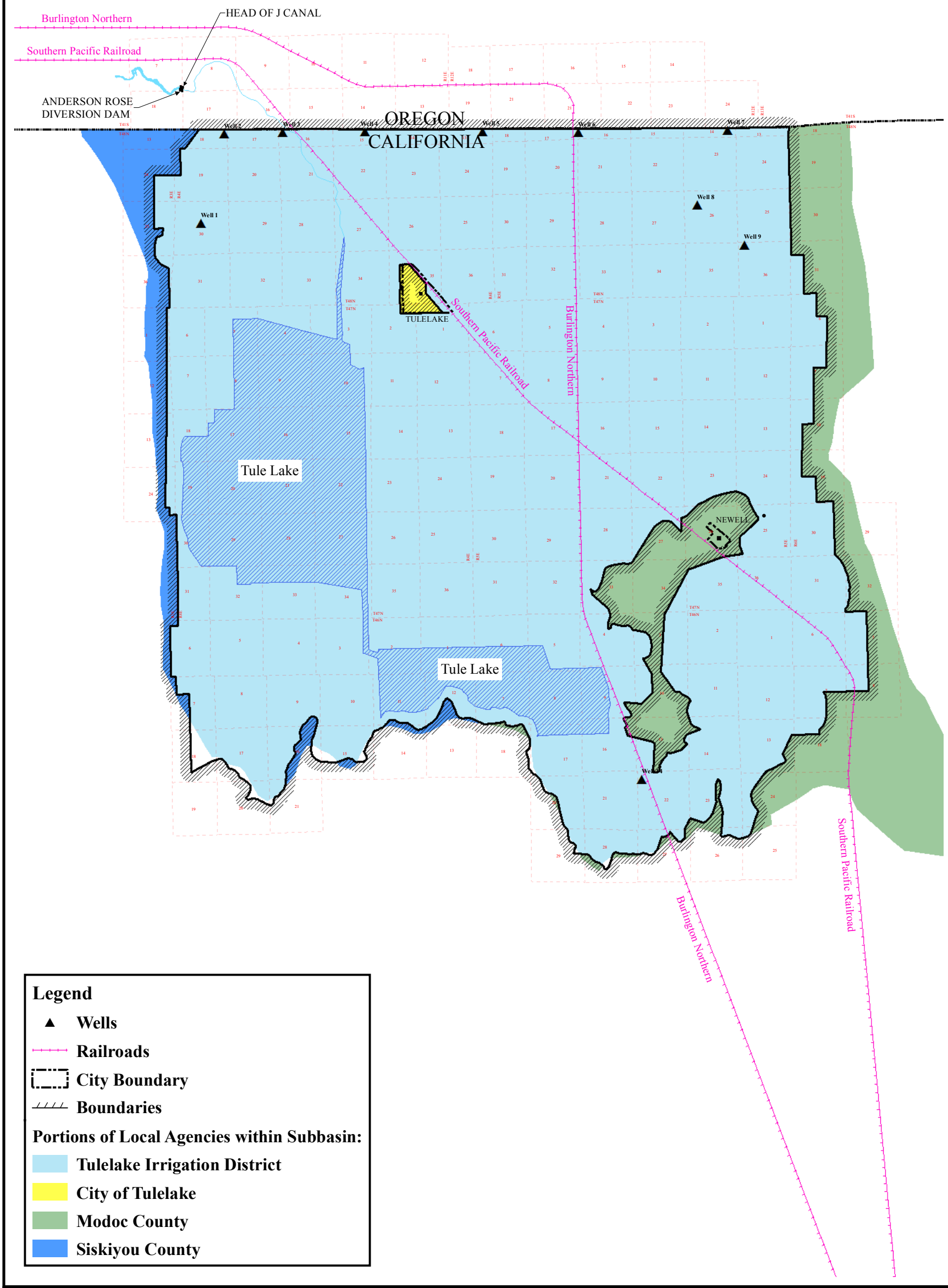
Bar Length On Original Drawing Equals One Inch. Adjust Accordingly.

DATE: May\ 2017
DRAWN BY: MB
REQUESTED BY: CB
JOB NUMBER: 520
SCALE: 1" = 2 Miles

Tulelake Irrigation District WMCP 2017 Update

Figure A-3 - Soils Map

MBK ENGINEERS
455 University Avenue, Suite 100
Sacramento, California 95825-6579
(916)456-4400



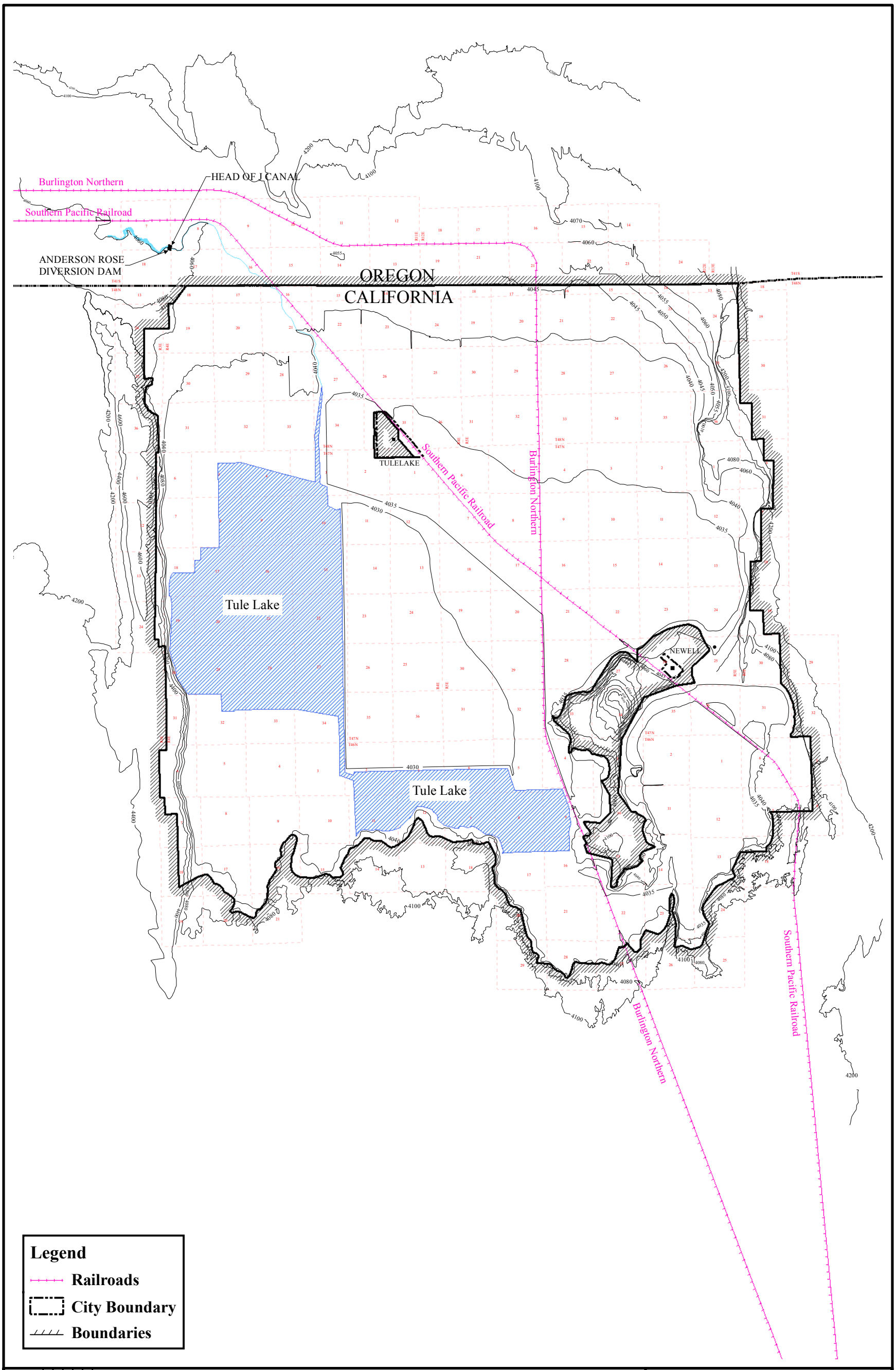
Bar Length On Original Drawing Equals One Inch. Adjust Accordingly.

SCALE: 1" = 2 Miles
JOB NUMBER: 5201
REQUESTED BY: CB
DRAWN BY: MB
DATE: May\ 2017

Tulelake Irrigation District WMCP 2017 Update

Figure A-4 - Groundwater Facilities Map

MBK ENGINEERS
455 University Avenue, Suite 100
Sacramento, California 95825-6579
(916)456-4400



Bar Length On Original Drawing Equals One Inch. Adjust Accordingly.

SCALE:	1" = 2 Miles
JOB NUMBER:	5201
REQUESTED BY:	CB
DRAWN BY:	MB
DATE:	May 2017

Tulelake Irrigation District WMCP 2017 Update

Figure A-5 - Topography Map

MBK ENGINEERS
455 University Avenue, Suite 100
Sacramento, California 95825-6579
(916)456-4400

Attachment B

District Rules and Regulations

TULELAKE IRRIGATION DISTRICT

RULES AND REGULATIONS

DELIVERY OF WATER

Revised August 1989

A. The District will deliver water on the basis of a system known as the call system. Under the circumstance that demand exceeds capacity of a particular ditch, water will be delivered to those orders first received by the District. Water orders should be placed with the District prior to 3:00 p.m. the day before delivery is requested. Confirmation of orders placed with the District after the time noted above will be subject to the District's ability to honor the late order. Confirmed water orders must be utilized by the water user within two hours after the time for which delivery was requested. When such deferment by the District will provide more efficient overall service, the District reserves the right to defer delivery for up to three days from the date requested when required by the capacities of the system.

B. All orders taken are considered valid orders unless cancelled by 8:00 a.m. on the date for which delivery was confirmed. If special arrangements are not made, or if orders are not cancelled as stated herein, the water user will be subject to a $25.00 penalty. Exceptions to this rule will be made in case of wind, rain or frost. All penalties invoked will be reviewed by the Board of Directors.

C. The District reserves the right to stop delivery of water at any time a water user is running water into the barrow pits or drains or subbing adjacent lands. The District may defer delivery when a field is not adequately ditched or checked up to take the water or to make efficient use of the water ordered.

D. Advance orders for a specific day are encouraged. However, advance orders in excess of three days will not be allowed. Exceptions may be made if the water user will be out of the basin during the three-day period prior to a scheduled irrigation. Under this exception, orders will be post-dated to comply with the three-day limit.

E. No one will be permitted to take water without authorization. The ditchriders are to regulate the checks and headworks. Water users shall not adjust headgates or checks without prior discussion with the ditchrider or the watermaster.

F. Sprinkler heads are delivered under the same rules and regulations as flood heads. Irrigation water will not be intentionally spilled to a drain for supplemental supply of a sprinkler system without prior authorization from the District.

G. All drain discharges must be made into the water area of the drain so as not to cause erosion. No trash or animals may be placed in the waterways. Anyone placing refuse in a District waterway or creating a silt block through improper drain discharge will be subject to prosecution and/or cost of removing the material.

H. Under special arrangement made with the District, stock grazing right-of-ways to control weeds may be allowed. However, excessive damage to the ditch banks as a result of such grazing must be repaired at the farmer's expense. Cattle guards may be required to permit access. No gates across canal banks and access roads will be allowed during the irrigation season. Gates may be allowed during the off season with prior approval of the management. All gates used during the off season must be designed to easily open for access of District personnel.

I. The District reserves the right to shut down a lateral for control of aquatic weed growth or other maintenance purposes that are necessary for efficient operation of the system. Shutdowns will be scheduled around irrigation demands as much as possible.

J. Water users shall not abuse or threaten District employees.

K. To the extent that it is practical, the District will provide irrigation water for frost protection purposes. This service is furnished without liability on the part of the District to the entity requesting it for lack of water supply from any cause.

L. This District does not guarantee the delivery of water at any particular time. Due to natural causes, human error and equipment failure, no guarantee can be made that the water delivery can be made at the time requested. It also cannot be guaranteed that water flows can be maintained at sufficient quantities to maintain irrigation requirements. This District assumes no liability for damages caused to crops or equipment resulting from insufficient water supplies.

M. At any time when water is cut back to a ditch without notice to the ditchrider or the watermaster's office, the District reserves the right to either restrict the delivery of water for the remainder of the three-day irrigation period or

discontinue delivery until the next time the farm unit is entitled to receive water.

N. The following rules will apply when the District is unable to deliver water for a lengthy period of time:

1. At times when it appears that the District is required to defer the start of irrigation to any water user in any system for more than three days, the District reserves the right to limit the quantity of water for each water user to one c.f.s. per ten acres for which water is ordered for a period of not longer than 3 days (72 hours). This quantity of water, 0.6 acre-foot per acre irrigated, may, to the extent that facilities are available, be delivered in a shorter period of time. The foregoing shall be known as the "Rotation System", whereby one irrigation head shall be distributed between a specified number of water users until orders within the particular "block unit" have been fulfilled.

2. An exception to this rule shall exist when the following two conditions are present:

   a. Every farm unit within the particular "block unit" has irrigated for at least one three-day period; and

   b. A farm unit or units within an adjacent "block unit" has experienced a minimum six-day delay in delivery of the first summer irrigation. Then under the above, the head may be taken out of a "block unit" which all farm units have been irrigated at least once and placed in an adjacent "block unit" for a maximum of three days, whereupon the head will be returned to the original "block unit".

3. The District will attempt to deliver this quantity of water, but in the event of a failure in the facilities of the District resulting in delivery of less than 0.5 acre-feet per acre, the District may extend the period of application so that from 0.5 to 0.6 acre-feet of water per acre is delivered. In the event that a water user believes he is not receiving his allotted quantity, he is obligated to notify the District promptly. Under the above criteria, service to sprinkler systems will be limited to 0.33 c.f.s. per ten acres for a period of not longer than seven days, resulting in a total quantity of 0.46 acre-feet per acre delivered during the seven-day period.

4. In all cases requested, the District will investigate the measurement of water; and in all instances, the District will be the final authority on the quantity of water delivered.

APPROVED BY the Board of Directors this 14th day of August, 1989.

Edward J. Bailey, President

Earl C. Danosky, Manager

RULES AND REGULATIONS FOR OPERATION AND MAINTENANCE OF KLAMATH PROJECT WORKS TRANSFERRED TO TULELAKE IRRIGATION DISTRICT UNDER CONTRACT NO. 14-06-200-5954

Pursuant to Article 7(d) of Contract No. 14-06-200-5954 between the United States and the Tulelake Irrigation District, hereinafter referred to as the District, these rules and regulations shall be observed by the District in its operation and maintenance of the project works transferred under that contract.

PART A--OPERATION OF TRANSFERRED WORKS

Anderson-Rose Dam

During the irrigation season, this dam shall be operated to divert irrigation water into the J-Canal system and to pass irrigation water, to meet Project irrigation needs, into the Tule Lake Primary Sump. During the period from approximately November 1 to May 1, this dam shall be operated primarily to pass flood flows to the Tule Lake Primary Sump.

In accordance with a Biological Opinion completed by the Fish & Wildlife Service dated July 13, 1998, the following procedures will be followed:

> *A minimum flow of at least 30 cubic feet per second must be maintained in the Lost River below Anderson-Rose Dam every year beginning on or about April 15th for at least 4 weeks to allow spawning and migration of adult and larval suckers. These flows may be terminated before the 4 week period has elapsed if a Reclamation or Service fishery biologist observes that hatching and downstream movement of larval suckers has occurred, and the Service concurs. Reclamation shall maintain sucker spawning habitat in the Lost River below Anderson-Rose Dam by channel modifications, adding gravel substrate, or other suitable methods.*

Distribution and Drainage Systems

Canals, laterals, drains, and pumping plants, other than Plant D, shall be operated to adequately serve irrigation and drainage requirements of Project lands in the Tule Lake Division, including public lands comprising Part 3, as well as privately-owned lands comprising Parts 1 and 2.

Pumping Plant D

This plant shall be operated under the procedures and criteria described in this Part and Part B in order to control the water surface elevation in the Tule Lake sumps. Operation of Pumping Plant D shall be coordinated with the operation of other features of the Klamath Project, both as to water coming into the Tule Lake Division and as to water being carried away from the Tule Lake Division. Except in emergency cases, changes in pumping operations at Plant D shall be made only after 24 hours notice to the Bureau of Reclamation, hereinafter referred to as the Bureau, and the Fish and Wildlife Service, hereinafter referred to as the Service.

All water pumped at Plant D is received by the P-Canal system. Sale of such water for irrigation purposes by the Bureau shall be on the basis that delivery will be made only when water is in that system as the result of pumping to control the water level in the Tule Lake Primary Sump.

If irrigation water is required at other times, special pumping will be requested and if such requests are approved by the Bureau, the water sold shall be measured at Pumping Plant D rather than at the farm turnouts from the P-Canal system.

If during the months of May through October, the sump water level drops greater than one-tenth of one foot below wildlife objective levels due to special pumping, the District shall release replacement water into the sumps. Such replacement water shall be released at Anderson-Rose Dam in quantities and rates of flow sufficient to maintain wildlife objective levels in the sumps, but should not exceed the volume of water recorded as special pumping. As determined by the Bureau, the release of replacement water may not be required when there is insufficient supply available in Upper Klamath Lake.

Tule Lake Primary Sump

This sump shall be operated (1) to collect and contain drainage water and flood flows and to supply irrigation water, and (2) to maintain the objective water levels of the Service for wildlife refuge purposes to the extent such objective levels are attainable by the use of Project works, natural inflows[1], and irrigation return flows as set out in this Part A, and by following the procedures and criteria set out in Part B hereof. In terms of elevation above sea level (USBR datum), the District shall maintain objective levels as follows:

May 1	4034.60

[1]As used in these rules and regulations, the term “natural inflow” means unavoidable spill at Lost River Diversion Dam plus unavoidable inflow to the sump due to runoff below the dam.

June 1	4034.60
July 1	4034.60
August 1	4034.60
September 1	4034.60
October 10	4034.75
November 1	4034.75

Levels are not prescribed solely for the first day of each month. Ideally, the water surface elevation during the month of April should gradually approach the May 1 objective level of elevation 4034.60, which level is to be maintained through August, the objective being to provide a constant water surface elevation May 1 to September 1. It is not intended to permit wide interim fluctuations.

Objective water levels for accommodating wildlife operations are not prescribed for the period between November 1 and April 30. During this period the sump shall be drawn down as necessary to handle flood inflows in accordance with the operating and inflow estimating procedures and criteria described in Part B.

Water needed for irrigation, as determined by the Bureau, shall not be used solely for the purpose of raising the water level in the sump to meet wildlife objective levels. Downward water level deviations, because of anticipated flood inflow, shall be permissible to the extent necessary to avoid or minimize flooding of a secondary sump as determined by use of the operating and inflow estimating procedures described in Part B.

PART B--OPERATING PROCEDURES AND CRITERIA

Operating Procedure

The operating procedure for Tule Lake Primary Sump and Secondary Sumps during each period of the year shall be as follows:

May through August. Pumping at Plant D shall proceed at a rate necessary to maintain the wildlife objective water levels for this period. If unavoidable deviations greater than one-tenth of one foot above or below the wildlife objective levels occur at any time during this period, the District shall maintain during the remainder of this period such revised objective levels as may be furnished to the District by the Bureau after consultation with the Service. Whether such deviations for any purpose are unavoidable shall be determined by the Bureau.

September through October. Beginning on September 1, the water level in the sump shall be allowed to rise with natural inflow and irrigation return flows, and with Pumping Plant D operating as necessary to achieve the wildlife objective level by October 10.

After October 10, to the extent attainable with natural inflows, irrigation return flows, and capacity of Pumping Plant D, that level when reached shall be maintained until the November drawdown date.

November through April. Beginning on November 1, the sump water level shall be lowered as rapidly as the available capacity at Pumping Plant D will permit until the drawdown elevation 4033.5 is reached. The 4033.5 drawdown elevation may be temporarily raised as high as 4034.0 by the Bureau under the following conditions: (1) The District requests the change due to watershed conditions, (2) The Bureau approves of the change, and (3) The Bureau may change the required drawdown elevation back to 4033.5 at any time. When the drawdown elevation is reached, pumping at Plant D shall then be continued at full capacity, reduced, or stopped as necessary to maintain approximately that sump water level until January 1. Between January 1 and April 30, pumping at Plant D shall proceed at rates indicated by estimates of prospective net inflows, irrigation diversions, and required pumping quantities as determined by procedures described in this Part B.

Estimates of Prospective Net Inflow to the Tule Lake Primary Sump

Prospective net inflow is comprised of (1) the uncontrollable spill at Lost River Diversion Dam, plus (2) net inflow to the sump from the watersheds of Lost River and Tule Lake downstream from Lost River Diversion Dam, both as estimated for the period in prospect. Estimates of uncontrollable spill at Lost River Diversion Dam are based on prospects of runoff from watersheds above Clear Lake and Gerber storage dams and Lost River Diversion Dam; and on anticipated operation of these works and the Lost River Diversion Channel as coordinated with the operation of Link River Dam by the Pacific Power & Light Company. Estimates of uncontrollable spill, required for determining the prospective net inflows for sump operating purposes, shall be made by the Bureau and furnished to the District and the Service. Estimates of net inflow to the sump from the watersheds of Lost River and Tule Lake downstream from Lost River Diversion Dam shall be made by the District. For the purpose of operating the sump during the period January 1 to April 30, inclusive, estimates of net inflow from the watershed below the Lost River Diversion Dam from the date of forecast shall be made by use of relationships shown on Plate 1 attached hereto. Determination of antecedent precipitation and inflow quantities shall be made as described on Plate 1.

Prospective net inflow estimates used in determining pumping rates at Plant D for flood control purposes shall be made by the District in accordance with the procedures described in this Part B. Such estimates shall have the concurrence of the Bureau before being used. Estimates shall be made as frequently as prospective runoff conditions warrant, but not less than once every 30 days, beginning on January 1 and continuing as necessary for proper and safe operation.

Pumping Estimates

Estimates of quantities that are required to be pumped during any ensuing 30-day period to insure proper flood control, consistent with the wildlife objective levels, shall be made by use of Plates 2 and 3 attached hereto.

Secondary Sumps

Adjoining the Tule Lake Primary Sump are three secondary sumps, namely, Sump 2, Sump 3, and Winema Farms (Colonial Realty Company contract area). Flood control releases shall be made from the Tule Lake Primary Sump into secondary sumps whenever prospective net inflows and projected operations indicate that the Tule Lake Primary Sump water level cannot be prevented from rising above elevation 4035.5 without releases into secondary sumps. Plans to make such releases shall not be put into effect without prior concurrence by the Bureau. The sequence of flooding secondary sumps shall be as follows: Sump 2, first; Sump 3, second; Winema Farms, third. Water levels in the secondary sumps shall not be permitted to rise above 4035.5. Removal of flood waters from the secondary sumps shall be accomplished as rapidly as possible. When inflows are too large to allow simultaneous dewatering, the removal should be in the reverse order of that given above, or as otherwise directed by the Bureau. Plans for dewatering secondary sumps shall have approval of the Bureau prior to beginning such operations.

PART C--RECORDING AND REPORTING OPERATING DATA

Daily operating data as listed in this Part C shall be furnished to the Bureau and the Service not less than once each week. Except for emergency situations, the District shall report the operations data for each day of the past seven-day period, Monday through Sunday, to reach the Bureau office no later than Tuesday.

The data in the District's report will include the following:

1. Discharge of Lost River below Anderson-Rose Dam in ft^3/sec.
2. Diversion to J-Canal at headworks, in ft^3/sec.
3. Climatological data at Tule Lake station including precipitation in inches, and snow depth, in inches on ground.
4. Elevation of water at 8 a.m. in Tule Lake Primary Sump.
5. Pumping Plant D operating data:
    a. Units operating
    b. Hours each unit operated
    c. Acre feet pumped.
    d. Projected operation for ensuing week.

The weekly report covering the end of the month shall include the following data for the month just ended:

1. Daily maximum and minimum temperatures.
2. Evaporation measurements as recorded.
3. Original recorder chart of Tule Lake Primary Sump.

The District shall, upon its own initiative, or upon telephone request by the Bureau, furnish to the Bureau any data needed to coordinate the operations of the Project works.

Operating information available from other Klamath Project facilities shall be supplied to the District from Bureau records, on request. The District shall be furnished a copy of the Bureau's Report of Daily Operations, for each calendar week.

PART D--MAINTENANCE OF DIKES AND BUFFER STRIPS

Maintenance of Dikes

The maximum safe capacity of the Project's dikes surrounding the Tule Lake Primary Sump is at water level elevation 4035.5 feet (USBR datum). The dikes shall be maintained by the District to retain water safely at that elevation.

The Service shall provide the necessary vegetation and control of vegetative cover on dikes surrounding the Tule Lake Primary Sump water areas and on its buffer strips (depredations control areas) within the Tule Lake Wildlife Refuge. Use of herbicides, burning, or other destruction of vegetative cover, and the construction, removal, or alteration of structures including overhead power lines, on such dikes or buffer strips by the District shall be subject to approval of the Service and the Bureau.

PART E--JURISDICTION OF THE SERVICE

The District, in accomplishing the physical operation and maintenance of the transferred works, shall comply with the agreements of January 8, 1942, June 28, 1946, and August 2, 1977, between the Bureau and the Service.

The Service shall have complete authority to control, manage, and protect all wildlife resources within the refuge.
Establishment and enforcement of rules concerning access to and use of areas within the refuge by hunters, conservationists, photographers, and others concerned with activities of the Service shall be the responsibility of that Service. District personnel shall not be exempt from

compliance with laws and regulations relating to management of the refuge and to hunting of waterfowl.

H:\PUBLIC\O&M\TULESUMP\Modified Rules & Regulation for Tule Lake Sump 1999.wpd

Attachment C

Water Measurement Program

TULELAKE IRRIGATION DISTRICT
SBx7-7 WATER MEASUREMENT PROGRAM

I. PURPOSE

This SBx7-7 Water Measurement Program (Program) has been developed by the Tulelake Irrigation District (TID) consistent with the requirements of California Water Code section 10608.48(b). The Program will also become a component of TID's Agricultural Water Management Plan under the California Water Code, or its Water Management and Conservation Plan (WMCP) under the Reclamation Reform Act of 1982.

Water Code section 10608.48(a) states that agricultural water suppliers shall implement efficient water management practices pursuant to subdivision (b).

Subdivision (b) identifies the following two *"critical efficient water management practices:*

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered."

Water Code section 531.10(a) states that "[a]n agricultural water supplier shall submit an annual report to the department that summarizes aggregated farm-gate delivery data, on a monthly or bimonthly basis, using best professional practices." "Aggregated farm-gate delivery data" is defined as "information reflecting the total volume of water an agricultural water supplier provides to its customers and is calculated by totaling its deliveries to individual customers."

TID, as an agricultural water supplier, is subject to Water Code section 10608.48(a). Implementation of the Program, as outlined in this document, will satisfy and provide measurements with sufficient accuracy for the purposes required by Water Code section 10608.48(a).

II. WATER MEASUREMENT PROGRAM

A. Program Scope

TID will measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph 2 of Water Code § 10608.48(b) as provided in the Program below, for all lands to which TID delivers water. Water Code section 10608.48(i)(1) required the California

Department of Water Resources (DWR) to adopt regulations "that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in" Water Code section 10608.48(b)(1). On July 11, 2012, DWR approved section 597 of Title 23 of the California Code of Regulations (CCR). The agricultural water measurement provisions set forth in Sections 597.1-597.4, however, do not apply to TID because TID conveys and delivers water through facilities owned by a federal agency. (See 23 CCR § 597.1(f).)

TID delivers water through facilities owned by the United States Department of the Interior, Bureau of Reclamation (Reclamation). In 1956, TID and Reclamation executed Contract No. 14-06-200-5954. Contract No. 14-06-200-5954 transferred the care, operation and maintenance of the following facilities to TID for irrigation purposes: (1) the entire J Canal and lateral system; (2) the entire M and N Canal and lateral systems; (3) pumping plant D and inlet channel and Tule Lake Tunnel; and (4) dikes and sumps located within TID. (Contract No. 14-06-200-5954, art. 7, pp. 10-11.) Reclamation has retained title to all works that it transferred to TID. (Contract No. 14-06-200-5954, art. 39, p. 38.) TID delivers water through these transferred facilities. (See WMCP, § 1.3, p. 4) Therefore, the exclusion set forth in 23 CCR section 597.1(f) applies to TID, and there are no DWR regulations applicable to TID specifically.

TID will follow the statutory requirement to "measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph 2 [of Water Code § 10608.48(b)]." Also, TID will, as resources permit, evaluate the accuracy of the water measurement devices used by TID and TID water users (referred to here as "customers").

B. Measurement Program

TID's WMCP broadly describes its water delivery measurements. Currently, TID measures total irrigation deliveries within TID as the sum of the inflow to the lateral canal system: J-Canal, M and South N System, Q and R System, and North N System. TID also measures flows at control gates and turnouts into laterals. During irrigation season, TID monitors spills from laterals at least twice a day to make adjustments at the headworks, but spills are not quantified. TID measures the quantity of drain water that it pumps back into its delivery system. With TID's extensive water reuse, overall effective water-use efficiency is about 90-95 percent.

TID's Program provided here includes three components to measure deliveries to individual customers. TID customers divert water from laterals through three general types of devices: TID-maintained turnouts; private pumps; and private turnouts. TID will measure, or obtain measurements of, deliveries through all such devices, determine the total volume delivered to customers based on these measurements, and submit an annual report to DWR that summarizes this data on a monthly or bimonthly basis. TID will use the same information, as the quantity "delivered", for any volumetric pricing of water under Water Code section 10608.48(b)(2).

1. TID Turnouts – Armco Metergate Measurements

TID will measure and record deliveries for flood irrigation using an Armco metergate located at the TID turnout to each customer's farm. TID will calculate the volume of water delivered to each customer through the TID turnout by multiplying the flow rate of each Armco metergate by the duration of each diversion event at each metergate. TID will determine the flow rate at each turnout by using standard discharge tables for Armco metergates. As appropriate, TID will follow guidelines for metergate measurements developed by researchers at the Cal Poly Irrigation Training & Research Center. If a customer provides an alternative to an Armco metergate that is capable of measuring flow through the turnout with equal or greater accuracy than an Armco metergate, TID will use the customer's alternative device for water delivery accounting.

2. Pump Measurements

Some customers divert water from TID laterals and other facilities by using pumps. Each customer pumping from a lateral or the J-1 Canal extension is required to install and maintain a flow meter at each pump site, and allow TID employees access to each pump site to read the meter and inspect meters for accuracy. Based on these meter readings, TID will determine the volume of water pumped by each customer, which will be considered the delivery amount for the acres served through the pump. For any pump site without a functioning flow meter, TID will determine the amount of water diverted at that pump site, and by failure to install and maintain a functioning flow meter or failure to allow TID access, the customer waives the right to dispute the amount TID has determined. TID's determination will be the delivery amount for all purposes for which delivery is relevant. If TID is required to determine deliveries by this means, TID will calculate the amount of water delivered based upon the flow rate associated with the irrigation method (e.g., solid set sprinklers, wheel line, etc.) and the duration of the irrigation event. Also, failure to install and maintain a functioning flow meter at each pump site, or provide TID access to each pump site, will entitle TID to terminate water service to the lands of such customer until such customer fully complies with these requirements.

3. Private Turnout Measurements

Each customer that flood irrigates directly from a lateral or the J-1 Canal extension through a private turnout without pumping water from a stilling well downstream of the private turnout is required to install and maintain a water measurement device at each such turnout with measurement accuracy comparable to an Armco metergate. Measured amounts will be considered the delivery amounts for the acres served through the turnout. Each customer is required to allow TID employees access to each private turnout to calculate the volume of water delivered to the customer through the private turnout and to inspect the measurement device for accuracy. For any private turnout without a functioning measurement device, TID will determine the amount of water diverted at that turnout, and by failure to install and maintain a functioning measurement device or failure to allow TID access, the customer waives the

right to dispute TID's determination. TID's determination will be the delivery amount for all purposes for which delivery is relevant. If TID is required to determine deliveries, TID will calculate the amount of water delivered based upon the flow rate associated with the private turnout and the duration of the irrigation event. Also, failure to install and maintain a flow measurement device at each private turnout, or provide TID access to each private turnout, will entitle TID to terminate water service to the lands of such customer until such customer fully complies with these requirements.

Based on the Armco metergate measurements at TID turnouts, meter readings at pump sites, and diversion measurements at private turnouts, and any other necessary factors or calculations, TID will determine aggregated farm-gate deliveries.

4. Water Measurement Accuracy

As resources permit, TID will evaluate the measurement accuracy of the Armco metergates at TID turnouts, as well as customer irrigation pump meters and private turnout water measurement devices. TID will use trained field inspectors to determine the volumetric accuracy of each type of device under standard conditions, and confirm that each device is installed and maintained to the manufacturer's recommendations, design specifications, or industry recognized standards. Also, TID will review current operation and maintenance practices to ensure they meet best professional practices.

TULELAKE IRRIGATION DISTRICT
RESOLUTION NO. 2014-3

RESOLUTION TO ADOPT TULELAKE IRRIGATION DISTRICT'S
SBx7-7 WATER MEASUREMENT PROGRAM
AND IMPLEMENTING RULES AND REGULATIONS

WHEREAS, Water Code section 10608.48(b)(1) requires an agricultural water supplier to measure the volume of water delivered to customers with sufficient accuracy to comply with Water Code section 531.10 and Water Code section 10608.48(b)(2);

WHEREAS, Water Code section 10608.12(a) defines an "agricultural water supplier" as a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water;

WHEREAS, the Tulelake Irrigation District (District) has prepared a Water Measurement Program in satisfaction of the requirements contained in Water Code section 10608.48(b)(1);

WHEREAS, certain rules and regulations governing pump metering and private turnout measurement requirements are necessary and appropriate to implement the District's Water Measurement Program;

WHEREAS, applicable law, including but not limited to California Water Code sections 22257 and 22283 authorize the District to prescribe reasonable rules related to its distribution of water and the use of water; and

WHEREAS, the District's Water Measurement Program will become a component of the District's next Agricultural Water Management Plan, or its next Water Management and Conservation Plan (WMCP) and WMCP Update as applicable.

NOW, THEREFORE, BE IT RESOLVED, DETERMINED, AND DIRECTED as follows:

1. The Board of Directors hereby adopts the SBx7-7 Water Measurement Program attached hereto as Exhibit A and directs the manager of the District to incorporate the Water Measurement Program into the District's WMCP Update not later than the next required update.

2. For the purpose of implementing the District's Water Measurement Program, the Board of Directors hereby adopts, as rules and regulations governing pump site metering, the following:

Each water user pumping from a lateral or the J-1 Canal extension is required to install and maintain a flow meter at each pump site, and allow District employees access to each pump site to read the meter and inspect the meter for accuracy. For any pump site without a functioning flow meter, the District will determine the amount of water diverted at that pump site, which determination shall be considered as the measured value of diversion, delivery, or both for all purposes for which measurement is relevant. By failure to install and maintain a functioning flow meter or failure to allow the District access, the water user waives the right to dispute the District's determination. If the District is required to determine the diversion or delivery amount, it will calculate the amount of water delivered based upon a flow rate associated with the irrigation method (e.g., solid set sprinklers, wheel line, etc.) and the duration of the irrigation event. Further, if the water user fails to install and maintain a functioning flow meter at each pump site, or provide District employees access to each pump site, the District shall be entitled to terminate water service or delivery to the lands of the water user until the water user fully complies with these requirements.

3. For the purpose of implementing the District's Water Measurement Program, the Board of Directors hereby adopts, as rules and regulations governing measurement of water diversions through private turnouts for direct flood irrigation, the following:

Each water user that flood irrigates by diverting water from a lateral or the J-1 Canal extension directly through a private turnout without pumping water from a stilling well downstream of the private turnout is required to install and maintain a water measurement device at each such turnout with measurement accuracy comparable to an Armco metergate. Each water user is required to allow District employees access to each private turnout to calculate the volume of water delivered to the water user through each private turnout and to inspect the measurement device for accuracy. For any private turnout without a functioning measurement device, the District will determine the amount of water diverted at that turnout, which determination shall be considered as the measured value of diversion, delivery, or both for all purposes for which measurement is relevant. By failure to install and maintain a functioning measurement device or failure to allow the District access, the water user waives the right to dispute the District's determination. If the District is required to determine the diversion or delivery amount, it will calculate the amount of water delivered based upon the flow rate associated with the private turnout and the duration of the irrigation event. Further, if the water user fails to install and maintain a flow measurement device, or provide District employees access to each private turnout, the District shall be entitled to terminate water service or delivery to the lands of the water user until the water user fully complies with these requirements.

4. The rules and regulations adopted under paragraphs 2 and 3 above are incorporated into the District's Rules and Regulations for Delivery of Water.

PASSED AND ADOPTED by unanimous vote of the Board of Directors on December 19, 2014.

I hereby certify that I am the Secretary of the Tulelake Irrigation District and that the foregoing resolution was duly adopted by the Board of Directors of said District at a meeting thereof duly held on December 19, 2014, at which meeting a quorum of said Board of Directors was at all times present and acting.

IN WITNESS WHEREOF, I have set my hand and the seal of the District this 19th day of December 2014.

Earl Danosky, Secretary
Board of Directors
Tulelake Irrigation District

Attachment D

District Sample Bill

TULELAKE IRRIGATION DISTRICT
P O BOX 699
TULELAKE, CA 96134

Voice: 530 667-2249
Fax: 530 667-4228

2016 O & M BILL

Invoice Number: 5167

Invoice Date: Jan 1, 2016

Bill To:

[redacted]

Billing Period: 01/01/2016 through 12/31/2016
Full payment is due before delivery of water, but not later than June 3, 2016.

Farm Unit #	Payment Terms	Due Date
4357		6/5/16

Acres	Item	Description	Unit Price	Amount
69.40	PRIVATE	Private Land O & M Tolls	66.00	4,580.40

Total Invoice Amount 4,580.40

Check/Credit Memo No: [redacted]

Payment/Credit Applied

TOTAL **4,580.40**

A 5% Penalty will be added if not paid by due date.

Tulelake Irrigation District

P. O. Box 699 * 2717 Havlina Road * Tulelake, CA 96134
Phone: 530-667-2249 * Fax: 530-667-4228 * Email: tid@cot.net

Earl C. Danosky, Manager
Brad C. Kirby, Asst. to the Mgr.
Kraig D. Beasly, Engineer
Grace E. Phillips, Office Mgr.
John F. Crawford, President
James E. Havlina, V. President
William J. Heiney, Director
Sidney W. Staunton, Director
Gary A. Wright, Director

December 29, 2014

Re: Notice of Public Hearing on Resolution to Impose Water Charge

Dear Landowners and Tenants:

NOTICE IS HEREBY GIVEN that Tulelake Irrigation District (TID) will hold a **Public Hearing on February 24, 2015 at 10:00 a.m. at the Tulelake Volunteer Fire Department, 1 Ray Oehlerich Way, Tulelake, California 96134**, to consider the adoption of a resolution that will impose a water charge that would be applicable to the parcel(s) for which you are shown to be the "record owner". "Record owner" means either the landowner or a tenant that would be directly liable for payment.

In brief, currently, landowners or tenants of parcels served by TID must pay acreage-based assessments, a dollars-per-acre assessment in amounts established each year by the TID Board of Directors, for operation and maintenance of irrigation delivery and drainage works and related services (O&M Rates). Also, some landowners, under what is known a water "rental" arrangement, pay a dollars-per-acre payment, for water delivery (Rental Lands Rates). Under the proposed charge, landowners or tenants who take delivery of water in excess of three acre-feet per irrigated acre on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st would also pay a charge for any water delivery above three acre-feet per acre. TID, through this proceeding, proposes to adopt maximum rates for its proposed charge as shown in Table 1 of this notice. Each year, TID will determine the actual rates based on the budget prepared for that year, which rates will not exceed the maximum rates. Funds collected from the volume-based charges would be applied to reduce, in subsequent years, the O&M Rates and Rental Lands Rates of all landowners or tenants served by TID, as determined by the TID Board of Directors in setting the annual O&M Rates and Rental Lands Rates. The proposed water charge and the basis upon which the maximum rates are calculated are described in more detail in this notice below the caption "Proposed Charge."

The rights and procedures for written protest of the proposed charge are described under the heading titled "Right to Make Written Protest Against the Proposed Charge; and Procedures that Must Be Followed to Make a Valid Protest." The record owners entitled to protest are the record owners of parcels in TID homesteaded as part of the Tule Lake Division of the Klamath Project (Homestead Lands), record owners of parcels subject to Contract No. Ilr-971 between Colonial Realty Company and the United States dated October 20, 1936 (Colonial Realty Lands), and record owners of parcels that receive *only* "rental" water on an annual basis (Rental Lands). At the public hearing, TID, through its Board of Directors, will consider all written protests against the proposed new water charge, which applies to water deliveries above 3.0 acre-feet of water per irrigated acre (af/ac) on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st, including maximum rates for such a charge (Water Charge). If a majority of record owners have not submitted valid written protests, TID will be authorized to adopt the Water Charge and will determine whether to do so.

In compliance with article XIII D of the California Constitution, which was added to the constitution pursuant to Proposition 218, this letter provides important information for affected landowners and tenants. Specifically, this notice and the enclosed *Report Detailing the Cost of Service* provide information on both the substantive water rate proposal and the procedures for protesting this proposal.

Tulelake Irrigation District

P. O. Box 699 * 2717 Havlina Road * Tulelake, CA 96134
Phone: 530-667-2249 * Fax: 530-667-4228 * Email: tid@cot.net

PROPOSED CHARGE

TID proposes to adopt a new water charge for water deliveries above 3.0 acre-feet per irrigated acre on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st, including maximum rates for such a charge. TID will measure or determine water deliveries at each point of delivery (i.e., point of diversion or place of measurement) for each parcel or farm unit as applicable consistent with TID's Water Measurement Program adopted on December 19, 2014, or any subsequent amendments to that program. If one point of delivery serves more than one parcel or farm unit, TID will assess water delivery at that point of delivery, based on the number of acres served from that point of delivery. TID will measure and charge for water delivery by the tenth (1/10th) of the acre-foot. For the purpose of calculating water deliveries on a per-acre basis, the irrigated acres for each parcel or farm unit in any year will equal the number of cropped acres that TID uses in creating the report that TID submits to the United States Bureau of Reclamation (Reclamation) for that year pursuant to the Contract Between the United States and the Tulelake Irrigation District, Contract No. 14-06-200-5954 dated September 10, 1956 (Reclamation Contract). The irrigated acres may be less than the total number of acres in a parcel or farm unit.

TID has selected 3.0 acre-feet per irrigated acre as the water delivery threshold by evaluating applied water requirements for the TID service area. "Applied water" is commonly determined and is analogous to water "delivery" because applied water represents the amount of water that a grower diverts/pumps per acre to irrigate a crop. TID's proposed new charge is a volumetric water charge intended to assign a greater portion of TID's expenses to landowners and tenants taking delivery of more water than is within a defined threshold for land served by TID. All landowners and tenants will continue to pay an O&M Rate or Rental Lands Rate as applicable; the volumetric charge would be an additional charge, applicable to delivered water in excess of 3.0 af/ac between March 1st and October 31st.

Through this proceeding, TID proposes to establish maximum rates for its Water Charge. TID proposes maximum rates to provide flexibility and minimize long-term administrative costs. The notice and protest process is expensive and time consuming and TID believes it is most efficient not to repeat this process, if possible, in any year that the rate for the Water Charge needs to be increased.

TID has calculated the maximum rates for its Water Charge by considering its projected cost of service including service for deliveries greater than 3.0 af/ac on lands served by TID. TID has calculated the maximum rates for its Water Charge on a per acre-foot basis by dividing TID's established maximum O&M Rates for the lands known as the Homestead Lands, and Colonial Realty Lands by 3.0 af/ac, and dividing its effective maximum Rental Lands Rate for the lands known as the Rental Lands by 3.0 af/ac. TID proposes to adopt the maximum rates as shown in **Table 1**.

Table 1
Maximum Rates for Water Charge

Land Category	**Maximum Rate for Delivery Greater Than 3.0 af/ac between March 1st-Oct. 31st**
Homestead Lands	$38.00/acre-foot
Colonial Realty Lands	$28.50/acre-foot
Rental Lands	$38.00/acre-foot

The Table 1 rates for the charge are the maximum rates that TID could use to calculate the Water Charge in any year. The maximum rates could not increase unless TID followed another public notice and protest process similar to this one.

Tulelake Irrigation District

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Each year, TID will determine the actual rates for the charge based on the budget prepared for that year. The per acre-foot rates for the charge for any year will be 1/3 times the O&M Rates or the Rental Lands Rate for the respective land categories in the year, not to exceed the maximum rates for the land categories. TID will calculate the amount of the charge by multiplying the rate for the parcel, or the farm unit, times the number of acre-feet per acre of water delivered that is in excess of three acre-feet per irrigated acre on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st times the number of acres being served.

For 2015, if TID adopts the proposed Water Charge, TID will calculate the Water Charge rates applicable in 2015 as follows, with the following results. For the Homestead Lands, TID would multiply the 2015 private O&M Rate of $66.00 by 1/3, resulting in a rate of $22.00 acre-foot for use greater than 3.0 acre-feet per irrigated acre. Since the Rental Lands Rate is based on the private O&M rate, the Water Charge for 2015 for the Rental Lands would be the same as the Homestead Lands - i.e., $22.00 acre-foot for use greater than 3.0 acre-feet per irrigated acre. The Water Charge rate for the Colonial Realty Lands would be based on the 2015 O&M Rate for Colonial Realty Lands, which is 75% of the private O&M Rate. Thus, the Water Charge rate for parcels in the Colonial Realty Lands would be 1/3 times $49.50, or $16.50 acre-foot for use greater than 3.0 acre-feet per irrigated acre.

TID will apply any revenue it collects from the Water Charge in the fiscal year following the year that the revenue is collected. Any revenue that TID collects from the Water Charge will be applied to reduce the O&M Rates and Rental Lands Rate to the extent determined appropriate by the Board of Directors while ensuring revenues from the O&M Rates, the Rental Lands Rate and the Water Charge are sufficient to cover expenses in the fiscal year following collection of the Water Charge. (For further analysis, see the enclosed *Report Detailing Cost of Service.*)

TID does not consider the charge to be a sale of water. TID considers the charge to be an additional or alternative method for collecting funds for some of the cost of water delivery or operation and maintenance of the relevant delivery system.

REASON FOR PROPOSED CHARGE

TID's Water Charge is explained in the enclosed *Report Detailing Cost of Service,* and addresses recent changes in state law that require agricultural water suppliers to adopt a pricing structure for water customers based at least in part on quantity delivered. The Water Charge will provide revenues that: (1) recover costs reasonably borne in providing TID's services; (2) are equitable to all customer classes; and (3) are proportionate to the cost of service attributable to the parcels and farm units served.

RIGHT TO MAKE WRITTEN PROTEST AGAINST PROPOSED CHARGE; AND PROCEDURES THAT MUST BE FOLLOWED TO MAKE A VALID PROTEST

The record owners entitled to protest are the record owners of parcels in TID homesteaded as part of the Tule Lake Division of the Klamath Project (Homestead Lands), record owners of parcels subject to Contract No. Ilr-971 between Colonial Realty Company and the United States dated October 20, 1936 (Colonial Realty Lands), and record owners of parcels that receive *only* "rental" water on an annual basis (Rental Lands). You do not need to submit anything if you agree with the Water Charge. As the record owner of a parcel identified to be subject to the proposed water charge, you may submit a written protest against the Water Charge. Pursuant to Government Code section 53755(b), "one written protest per parcel, filed by an owner or tenant of the parcel, shall be counted in calculating a majority protest to a proposed new or increased fee or charge . . . ."

Tulelake Irrigation District

P. O. Box 699 * 2717 Havlina Road * Tulelake, CA 96134
Phone: 530-667-2249 * Fax: 530-667-4228 * Email: tid@cot.net

Each protest must: (1) be in writing; (2) provide the location of the identified parcel(s) (by either TID parcel number or the county assessor's parcel number); and (3) include the original signature of the landowner or tenant submitting the protest. If you need assistance identifying the parcel number(s), please contact TID at (530) 667-2249. You are entitled to protest with respect to each parcel as to which you are the record owner. If you submit a protest without identifying the parcel number(s), TID will assume that your protest applies for each parcel as to which you are record owner.

Protests submitted by e-mail, facsimile, or other electronic means will not be accepted. Written protests may be submitted by mail to **Tulelake Irrigation District, P.O. Box 699,** or dropped off at the TID office at **2717 Havlina Road, Tulelake, California 96134**, or delivered in person at the public hearing, so long as they are received prior to the conclusion of the public hearing. Please identify on the front of the envelope for any written protest, whether mailed or submitted in person, that the enclosed letter is for the "Public Hearing on the Proposed Water Charge." Only those written protests actually received by TID prior to the close of the hearing on **February 24, 2015**, will be considered.

PUBLIC HEARING AND EFFECT OF PROTESTS

At the conclusion of the public hearing, TID will consider adopting the Water Charge. Oral comments at the public hearing will not qualify as a formal protest unless accompanied by a written protest. If, at the close of the public hearing, a majority of the record owners do not present protests, TID will be authorized to adopt the charge and expects to consider adoption of a resolution to impose the Water Charge. If TID adopts the Water Charge, TID will be authorized to adopt charges for water delivery above 3.0 acre-feet per irrigated acre on any parcel to which water is applied between March 1st and October 31st, with rates not to exceed the maximum rates established through this proceeding. Such a charge would be in effect beginning in the year 2015, and remain in effect during subsequent irrigation seasons.

If a majority of the parcels identified submit timely written protests, then the TID Board of Directors will not adopt the charge as proposed. If that occurs, TID may begin this process again, and the Board and TID staff will solicit additional input from landowners and tenants regarding the need for a charge and the amount of the charge.

Answers to any questions you may have regarding the charge may be obtained by calling TID at (530) 667-2249. As always, you are entitled and encouraged to attend TID Board meetings at any time.

The TID Board of Directors appreciates your consideration of this issue.

Sincerely,

Earl Danosky
General Manager

Enclosure

REPORT DETAILING THE COST OF SERVICE FOR WATER DELIVERY IN EXCESS OF THRESHOLD WATER QUANTITY

BACKGROUND

Tulelake Irrigation District (TID) is a special district public agency formed and operating under Division 11 of the California Water Code. There are about 96,000 gross acres within TID's boundaries. Approximately 64,000 acres are irrigated annually, of which nearly 16,000 acres are owned by the United States (within an area of 18,000 acres of federal land subject to irrigation). Crops grown include alfalfa, grains, mint, onions, potatoes, and pasture. TID receives water through facilities of the Klamath Project.

The majority of TID's surface water supplies are from the Klamath River. During the irrigation season, TID diverts surface water from the Klamath River, as well as Lost River, at locations on the Lost River Diversion Channel known as Station 48 and the No. 1 Drain. TID also receives tailwater from lands located within Klamath Irrigation District and from other Klamath Project water users in Oregon.

TID operates and maintains the Anderson-Rose Dam, located on the channel of the Lost River. TID operates the Anderson-Rose Dam to deliver water into TID's J-Canal, which distributes water to more than one-half of TID's irrigated lands through turnouts and lateral canals. The J-Canal conveys water to other canal systems for delivery to other lands within TID. Water not diverted at Anderson-Rose Dam flows through to the Tule Lake Sumps, where TID may divert and redivert the water for irrigation within TID. Operational spills and tailwater resulting from irrigation within TID are conveyed through TID's extensive drainage system for reuse within TID. TID employs full- and part-time staff. TID is governed by a five-member Board of Directors elected by TID landowners.

COST OF WATER SERVICE

TID intends to employ a new water charge for water delivery above 3.0 acre-feet per irrigated acre (af/ac) on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st, and maximum rates for such a charge (Water Charge). For the purpose of calculating water deliveries on a per-acre basis, the irrigated acres for each parcel or farm unit in any year will equal the number of cropped acres that TID uses in creating the report that TID submits to the United States Bureau of Reclamation for that year pursuant to the Contract Between the United States and the Tulelake Irrigation District, Contract No. 14-06-200-5954 dated September 10, 1956.

This Cost of Service Report details the cost of delivering water in excess of 3.0 af/ac to lands in TID homesteaded as part of the Tule Lake Division of the Klamath Project (Homestead Lands), lands subject to Contract No. I1r-971 between Colonial Realty Company and the United States dated October 20, 1936 (Colonial Realty Lands), and lands that receive *only* "rental" water on an annual basis (Rental Lands)[1]. This Cost of Service Report supports imposition of the Water Charge on parcels in these land categories.

[1] The vast majority of parcels and farm units served by TID, including some or all of the areas of parcels and farm units comprising the Homestead Lands, benefit by contractual rights of delivery under perpetual contracts. Lands of any sort not served under permanent contract can receive delivery under what is known as water "rental" arrangement.

To comply with the mandates of article XIII D of the California Constitution, the Water Charge must not exceed the cost of service. TID provides irrigation, drainage, and flood control services to each parcel and farm unit through integrated diversion, conveyance, drain, and tailwater redistribution systems. To provide such services, TID incurs expenses throughout each year associated with various activities including: district administration, transportation, pumping plant operations, professional services, organizational memberships, equipment depreciation, use of electrical power, and maintenance and operation of lift pumps, drainage pumps, canals, and drains. Other expenses include legal, engineering, and other professional services. TID also faces expenses for Reclamation's operation and maintenance of specific Klamath Project facilities (Reserved Works). To cover these expenses, TID imposes assessments and charges on private and public lands on a dollars-per-acre basis (O&M Rates), and also requires a dollars-per-acre payment for water delivery under what is known as water "rental" arrangement (Rental Lands Rate). For the most part, O&M Rates and the Rental Lands Rate equally distribute these costs across private and public lands on the basis of acreage for both private and public lands, respectively. (For further information, see TID's *Engineer's Report for the 2006 Tulelake Irrigation District Assessment Adjustment (Engineer's Report)*. Prospectively, TID intends to employ the Water Charge to cover a portion of these expenses, with the Water Charge being a charge that would be paid in addition to the O&M Rates and Rental Lands Rate determined for a year.

TID's volumetric charge will apply to water delivery greater than 3.0 af/ac between March 1st and October 31st. The period between March 1st through October 31st constitutes the standard irrigation season for the most common crops produced on lands served by TID. Any expenses incurred by TID for water deliveries outside this period are minimal, and are offset by the benefits of the ground being pre-wet for the following irrigation season, and availability of winter water pumped off fields and into sumps for reuse during the irrigation season. Both reduce TID's irrigation season diversion requirements and associated costs, and will help reduce peak system demands.

TID will measure or determine water deliveries at each point of delivery (i.e., point of diversion or place of measurement) for each parcel or farm unit consistent with TID's Water Measurement Program adopted on December 19, 2014, or any subsequent amendments to that program. TID will measure and charge for water delivery by the tenth (1/10th) of the acre-foot.

TID selected 3.0 af/ac as the delivery threshold based on an evaluation of applied water requirements for the TID service area. "Applied water" is commonly determined and is analogous to water "delivery" because applied water represents the amount of water that a grower diverts/pumps per acre to irrigate a crop. TID evaluated applied water data from several sources including: (1) TID's 2011 Water Management and Conservation Plan; (2) Technical Memorandum 3, Irrigation and Water Requirements/Demands for the On-Project Plan Area, April 2012 (Klamath Water and Power Agency); (3) written testimony of Marc Van Camp, P.E., in the Klamath River Adjudication; and (4) 2012-2014 Crop Water Use Estimates, University of California, Intermountain Research and Extension Center. TID also considered the *Engineer's Report*. Applied water values vary based on crop selection, irrigation technology, weather, irrigation efficiency, and other variables. Based on these sources, applied water has historically ranged from about 2.0-5.0 af/ac. Essentially uniform (by land category), O&M Rates and the Rental Lands Rate have covered the full range of deliveries. However, an incremental cost associated with increased delivery can be assigned or identified above a certain threshold based on an ordinary range of delivery. The ranges and consideration of crops and TID operations support selection of 3.0 af/ac as the threshold for imposition of the proposed Water Charge. TID selected 3.0 af/ac as the limit of the ordinary

range such that an additional charge for water delivery above this threshold is a reasonable means to cover TID's cost of service for such deliveries. TID's new charge is a volumetric water charge that will assign a greater portion of TID's expenses to all applications of more than 3.0 af/ac.

TID calculated the maximum rates for its Water Charge by evaluating its projected cost of service for deliveries greater than 3.0 af/ac. As a basis for its projected cost of service, TID relied on the *Engineer's Report.* The *Engineer's Report* projected TID's cost of service through the year 2025 by determining annual expenses for water delivery, drainage, flood control and related operations (including a budget reserve), as well as protection of water rights and other matters. The *Engineer's Report* estimated minimum and maximum annual private assessment and public charge rates (O&M Rates) for both private and public lands sufficient to cover TID's projected cost of service. The *Engineer's Report* estimated O&M Rate ranges by dividing total annual projected expenses for private and public lands, respectively, by the total acreage of private and public lands, respectively.

Based on the analysis in the *Engineer's Report*, the Siskiyou County Superior Court subsequently confirmed TID's authority to impose a maximum private O&M Rate of $114 per acre for Homestead Lands. The Court also confirmed TID's authority to impose a maximum O&M Rate of $85.50 per acre for the Colonial Realty Lands. The payment for the Rental Lands is governed by the Reclamation Contract. Under the Reclamation Contract, TID has the right to charge Rental Lands "the same as the annual O&M charges per acre for other lands in the District." Therefore, the maximum rate for payment for water delivery to the Rental Lands is effectively the same as the maximum O&M Rate for the Homestead Lands.

TID has calculated the maximum rates for its Water Charge on a per acre-foot basis by dividing its maximum O&M Rates for the lands known as the Homestead Lands and Colonial Realty Lands by 3.0 af/ac, and dividing its effective maximum charge for the lands known as the Rental Lands by 3.0 af/ac. The maximum rates for TID's Water Charge are as shown in **Table 1**.

Table 1
Maximum Rates for Water Charge

Land Category	Maximum Rate for Delivery Greater Than 3.0 af/ac between March 1st-Oct. 31st
Homestead Lands	$38.00/acre-foot
Colonial Realty Lands	$28.50/acre-foot
Rental Lands	$38.00/acre-foot

Each year, TID will determine the actual rates for the charge based on the budget prepared for that year. The rates for the charge for any year will be 1/3 times the O&M Rates or Rental Lands Rate for the respective land categories in the year, not to exceed the maximum rates for the land categories. TID will calculate the amount of the charge by multiplying the rate for the parcel or farm unit times the number of acre-feet per acre of water delivered that is in excess of three acre-feet per irrigated acre on any parcel, or on any farm unit where the farm unit contains more than one parcel, to which water is applied between March 1st and October 31st times the number of acres being served. TID will apply any revenue it collects from the Water Charge in the fiscal year following the year that the revenue is collected. Any

revenue that TID collects from the Water Charge will be applied to reduce the O&M Rates and Rental Lands Rate to the extent determined appropriate by the Board while ensuring revenues from the O&M Rates, the Rental Lands Rate and the Water Charge are sufficient to cover expenses in the fiscal year following collection of the Water Charge. In this respect, TID's revenues, including those realized from its O&M Rates, its Rental Lands Rate, and its Water Charge, will not exceed the cost of TID's services.

REVENUES USED SOLELY FOR TID'S EXPENSES

The revenue that TID collects from its Water Charge will be used solely for TID's costs associated with diversion, delivery, and redistribution of water. Growers taking delivery of more than 3.0 acre-feet per acre will pay a greater share of these expenses based on the amount above 3.0 af/ac that is delivered.

PROPORTIONALITY OF WATER CHARGE TO SERVICE PROVIDED

Charges subject to article XIII D must also be proportional to the cost of the service provided. Historically, TID has charged its landowners O&M Rates and Rental Lands Rates based on the cost for operating and maintaining the facilities that TID uses to deliver water, manage tailwater, and provide flood control services. Prospectively, TID intends to employ: (1) an O&M rate; (2) a Rental Lands Rate; and (3) a volumetric charge for water delivery in excess of 3.0 acre-feet per irrigated acre on any parcel, or on any farm unit where the farm unit contains more than one parcel, to which water is applied between March 1st and October 31st, including maximum rates for such a charge.

TID has historically delivered water for reasonable and beneficial uses on private and public lands throughout the TID service area. Water deliveries vary from grower to grower, but all growers benefit equally from TID's interdependent facilities. O&M charges have historically been the same for all private land and for all public land served by TID. It is reasonable to assume, however, that TID's cost of service is greater for those parcels and farm units that take delivery of more water than is within the specifically defined range for lands served by TID as compared to those that take delivery of a quantity within the defined range. These parcels and farm units drive greater operations and maintenance expenses and power costs, consume more TID staff time, and get a greater portion of the benefits attributable to all of the professional services and other expenses incurred by TID to protect landowner water supplies.

It is reasonable and prudent to charge for delivery of more than 3.0 af/ac for the costs associated with TID's activities necessary to deliver water greater than this amount. TID's O&M Rates and Rental Lands Rate are derived by averaging annual expenses across acreage throughout TID. This results in O&M Rates and a Rental Lands Rate that capture the costs of water deliveries within the ordinary range up to 3.0 af/ac for lands served by TID, as well as associated drainage and flood control services. TID has used its O&M Rates to calculate the cost of its services on a per acre-foot basis and intends to impose a charge at the calculated per acre-foot rates. When the charge is applied to water delivery in excess of the selected applied water quantity, such charge will be directly proportional to TID's costs. Further, the amount due under the Water Charge will increase in proportion to the increase in water delivery above the threshold water quantity. In this respect, the Water Charge will be proportional to the cost of those services necessary to deliver water supplies greater than 3.0 af/ac to a given parcel or a farm unit.

TULELAKE IRRIGATION DISTRICT
RESOLUTION NO. 2014-4

RESOLUTION TO CONDITIONALLY ADOPT VOLUMETRIC WATER CHARGE FOR DELIVERY TO CERTAIN LANDS AND APPROVE MAILING OF LANDOWNER NOTICE FOR VOLUMTERIC WATER CHARGE FOR DELIVERY TO ALL OTHER LANDS SERVED BY TULELAKE IRRIGATION DISTRICT

THE BOARD OF DIRECTORS OF THE TULELAKE IRRIGATION DISTRICT (DISTRICT) HEREBY FINDS AND DECLARES AS FOLLOWS:

WHEREAS, the District was duly formed, and at all times has been operating under the Irrigation District Law at Water Code section 20500 et seq;

WHEREAS, the District has historically imposed per-acre assessments on private and public lands (O&M Rates) and a per-acre payment rate for water delivery under what is known as water "rental" arrangement (Rental Lands Rate), based on the District's actual costs for water deliveries, drainage, flood control and associated services;

WHEREAS, the District's O&M Rates and Rental Lands Rates have covered the cost of all water deliveries by the District;

WHEREAS, Water Code sections 22280(a)(1) and 22280(b) authorize the District, in lieu in whole or in part of levying assessments, to fix and collect charges for the use of water, and for delivery of water for irrigation in excess of a specified quantity per unit of land;

WHEREAS, the District desires to employ a new volumetric water charge to cover the cost of deliveries that are above a defined water delivery threshold;

WHEREAS, the District has evaluated applied water requirements and practices for the most common crops grown on lands served by the District, using various data sources, including those referenced in the Cost of Service Report included with Exhibit A hereto;

WHEREAS, based on the applied water requirements and practices, the District has determined that 3.0 acre-feet of water per irrigated acre (af/ac) is a reasonable and appropriate water delivery threshold above which water delivery should be subject to a charge to cover the District's cost of service for such deliveries;

WHEREAS, the District has determined that growers that take delivery of water in excess of 3.0 af/ac on any parcel, or on any farm unit where a farm unit includes more than one parcel or is federal lease land, to which water is applied between March 1st and October 31st should pay a volumetric water charge (Water Charge) for the portion of any such water deliveries in excess of that threshold during that period;

WHEREAS, the District has determined that the rates for the Water Charge in each year should be based on the budget prepared for that year;

WHEREAS, the District has determined that the per acre-foot rates for the Water Charge for any year should be 1/3 times the O&M Rates and Rental Lands Rate for specific land categories in the year;

WHEREAS, the District has determined that the amount of the charge for a parcel or farm unit should be calculated by multiplying the rate for the land category where the parcel or farm unit is located times the number of acre-feet per acre of water delivery that is in excess of three acre-feet per irrigated acre on any parcel or farm unit to which water is applied between March 1st and October 31st times the number of acres being served;

WHEREAS, the District desires to impose the Water Charge on landowners and tenants in the following land categories: (1) parcels in the District homesteaded as part of the Tule Lake Division of the Klamath Project (Homestead Lands); (2) parcels subject to Contract No. Ilr-971 between Colonial Realty Company and the United States dated October 20, 1936 (Colonial Realty Lands); (3) parcels that receive *only* "rental" water on an annual basis (Rental Lands); (4) lands located within the District that are owned by the United States and leased to growers (Federal Lease Lands); and (5) parcels the District delivers water to that are located in Klamath Irrigation District (KID) and served through the J Canal (Oregon J Lands);

WHEREAS, the Contract Between the United States and the Tulelake Irrigation District, Contract No. 14-06-200-5954 dated September 10, 1956 (Reclamation Contract) directs the District to deliver water to Federal Lease Lands and to charge the United States for irrigation and drainage at cost of service rates, and the United States typically passes such costs through directly to lease holders in their leases;

WHEREAS, the Reclamation Contract provides that the District shall deliver water to the Oregon J Lands and that Klamath Irrigation District (KID) shall pay the actual costs associated with such deliveries;

WHEREAS, the Contract Between Tulelake Irrigation District and Klamath Irrigation District to Provide for Irrigation Service to Oregon J Lands and California D Lands authorizes the District to charge KID for the costs associated with water service to Oregon J Lands at the same "Annual Assessment" that the District charges the Homestead Lands;

WHEREAS, the District has determined that "record owners" (i.e., landowners and tenants that would be directly liable for payment) in the following categories must receive notice and an opportunity to protest the Water Charge pursuant to article XIII D of the California Constitution: (1) Homestead Lands; (2) Colonial Realty Lands; and (3) Rental Lands;

WHEREAS, the District has prepared the Notice of Public Hearing, and the Cost of Service Report attached hereto as Exhibit A for distribution to those landowners and tenants entitled to notice and protest pursuant to article XIII D;

WHEREAS, landowners and tenants in the following land categories are not entitled to receive notice and an opportunity to protest the Water Charge under the procedures of article XIII D: (1) Federal Lease Lands; and (2) Oregon J Lands, although they otherwise have rights under applicable law to express objection or opposition to the Water Charge;

WHEREAS, the Water Charge, as applied to Federal Lease Lands, is appropriately based on the private O&M Rate, rather than the public O&M Rate, because a discrete and substantial portion of the public O&M Rate is attributable to operating D Pumping Plant, an activity that does not result in water deliveries to such lands;

WHEREAS, the private O&M Rate for 2015 is $66.00 per acre;

WHEREAS, the District does not consider the Water Charge to be a sale of water, but considers the Water Charge to be an additional or alternative method for collecting funds for some of the cost of water delivery or operation and maintenance of the relevant delivery system; and

WHEREAS, if the District adopts and implements the Water Charge as provided herein, its adopted pricing structure for customers will be based in part on quantity delivered.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the District to adopt this Resolution as follows:

1. Water Charge for Federal Lease Lands for 2015. The Board of Directors hereby conditionally approves, for 2015 on the Federal Lease Lands, a volumetric water charge of $22.00 per acre-foot of water delivered in excess of 3.0 acre-feet per irrigated acre on any parcel, or on any farm unit, to which water is applied between March 1st and October 31st.

2. Water Charge for Oregon J Lands for 2015. The Board of Directors hereby conditionally approves, for 2015, for the Oregon J Lands, a volumetric water charge of $22.00 per acre-foot of water delivered in excess of 3.0 acre-feet per irrigated acre on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st.

3. Water Charge After 2015 for Federal Lease Lands and Oregon J Lands. The Board of Directors, for all years after 2015, hereby conditionally approves a water charge for the Federal Lease Lands and Oregon J Lands that applies to water delivery in excess of 3.0 acre-feet per irrigated acre on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and

October 31st. The District will determine the actual rates for the charge in each year based on the budget prepared for that year. The District will calculate the per acre-foot rates for the charge as 1/3 times the private O&M Rates. The District will determine the amount of the charge for each parcel or farm unit by multiplying the rate times the number of acre-feet per acre of water delivered that is in excess of three acre-feet per irrigated acre on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st times the number of acres served.

4. Determination of Irrigated Acres. For the purpose of calculating water deliveries on a per-acre basis, the irrigated acres for each parcel or farm unit in any year will equal the number of cropped acres that the District uses in creating the report that the District submits to the United States Bureau of Reclamation for that year pursuant to the Contract Between the United States and the Tulelake Irrigation District, Contract No. 14-06-200-5954 dated September 10, 1956.

5. Determination of Water Delivered. The amount of water delivered to each parcel or farm unit shall be the amount measured or determined to be delivered at the point of delivery for the parcel in accordance with the District's Water Measurement Program adopted on December 19, 2014 and any subsequent amendments or modifications of that program. The District will measure and charge for water delivery by the tenth ($1/10^{th}$) of the acre-foot.

6. Conditional Approval. The approvals in paragraphs 1, 2, and 3 will be effective only if there is not a majority protest of the Water Charge described in Exhibit A hereto by those record owners entitled to notice and protest pursuant to article XIII D, and the District approves imposition of the Water Charge for those lands where record owners are entitled to protest.

7. Revenue from Water Charge. The District will apply any revenue it collects from the Water Charge in the fiscal year following the year that the revenue is collected. Any revenue that the District collects from the Water Charge will be applied to reduce O&M Rates and Rental Lands Rates in subsequent fiscal years to the extent determined appropriate by the Board of Directors.

8. Approval of Notice of Public Hearing and Cost of Service Report. The Board of Directors hereby approves the Notice of Public Hearing and Cost of Service Report attached hereto as Exhibit A and directs the Manager to timely mail both to persons entitled to notice and protest pursuant to article XIII D.

PASSED AND ADOPTED by unanimous vote of the Board of Directors on December 29, 2014.

I hereby certify that I am the Secretary of the Tulelake Irrigation District and that the foregoing resolution was duly adopted by the Board of Directors of said District at a meeting thereof duly held on December 29, 2014, at which meeting a quorum of said Board of Directors was at all times present and acting.

IN WITNESS WHEREOF, I have set my hand and the seal of the District this 29th day of December, 2014.

Earl Danosky, Secretary
Board of Directors
Tulelake Irrigation District

EXHIBIT A

December 29, 2014

Re: Notice of Public Hearing on Resolution to Impose Water Charge

Dear Landowners and Tenants:

NOTICE IS HEREBY GIVEN that Tulelake Irrigation District (TID) will hold a **Public Hearing on February 24, 2015 at 10:00 a.m. at the Tulelake Volunteer Fire Department, 1 Ray Oehlerich Way, Tulelake, California 96134**, to consider the adoption of a resolution that will impose a water charge that would be applicable to the parcel(s) for which you are shown to be the "record owner". "Record owner" means either the landowner or a tenant that would be directly liable for payment.

In brief, currently, landowners or tenants of parcels served by TID must pay acreage-based assessments, a dollars-per-acre assessment in amounts established each year by the TID Board of Directors, for operation and maintenance of irrigation delivery and drainage works and related services (O&M Rates). Also, some landowners, under what is known a water "rental" arrangement, pay a dollars-per-acre payment, for water delivery (Rental Lands Rates). Under the proposed charge, landowners or tenants who take delivery of water in excess of three acre-feet per irrigated acre on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st would also pay a charge for any water delivery above three acre-feet per acre. TID, through this proceeding, proposes to adopt maximum rates for its proposed charge as shown in Table 1 of this notice. Each year, TID will determine the actual rates based on the budget prepared for that year, which rates will not exceed the maximum rates. Funds collected from the volume-based charges would be applied to reduce, in subsequent years, the O&M Rates and Rental Lands Rates of all landowners or tenants served by TID, as determined by the TID Board of Directors in setting the annual O&M Rates and Rental Lands Rates. The proposed water charge and the basis upon which the maximum rates are calculated are described in more detail in this notice below the caption "Proposed Charge."

The rights and procedures for written protest of the proposed charge are described under the heading titled "Right to Make Written Protest Against the Proposed Charge; and Procedures that Must Be Followed to Make a Valid Protest." The record owners entitled to protest are the record owners of parcels in TID homesteaded as part of the Tule Lake Division of the Klamath Project (Homestead Lands), record owners of parcels subject to Contract No. Ilr-971 between Colonial Realty Company and the United States dated October 20, 1936 (Colonial Realty Lands), and record owners of parcels that receive *only* "rental" water on an annual basis (Rental Lands). At the public hearing, TID, through its Board of Directors, will consider all written protests against the proposed new water charge, which applies to water deliveries above 3.0 acre-feet of water per irrigated acre (af/ac) on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st, including maximum rates for such a charge (Water Charge). If a majority of record owners have not submitted valid written protests, TID will be authorized to adopt the Water Charge and will determine whether to do so.

TID's established maximum O&M Rates for the lands known as the Homestead Lands, and Colonial Realty Lands by 3.0 af/ac, and dividing its effective maximum Rental Lands Rate for the lands known as the Rental Lands by 3.0 af/ac. TID proposes to adopt the maximum rates as shown in **Table 1**.

Table 1
Maximum Rates for Water Charge

Land Category	Maximum Rate for Delivery Greater Than 3.0 af/ac between March 1st-Oct. 31st
Homestead Lands	$38.00/acre-foot
Colonial Realty Lands	$28.50/acre-foot
Rental Lands	$38.00/acre-foot

The Table 1 rates for the charge are the maximum rates that TID could use to calculate the Water Charge in any year. The maximum rates could not increase unless TID followed another public notice and protest process similar to this one.

Each year, TID will determine the actual rates for the charge based on the budget prepared for that year. The per acre-foot rates for the charge for any year will be 1/3 times the O&M Rates or the Rental Lands Rate for the respective land categories in the year, not to exceed the maximum rates for the land categories. TID will calculate the amount of the charge by multiplying the rate for the parcel, or the farm unit, times the number of acre-feet per acre of water delivered that is in excess of three acre-feet per irrigated acre on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st times the number of acres being served.

For 2015, if TID adopts the proposed Water Charge, TID will calculate the Water Charge rates applicable in 2015 as follows, with the following results. For the Homestead Lands, TID would multiply the 2015 private O&M Rate of $66.00 by 1/3, resulting in a rate of $22.00 acre-foot for use greater than 3.0 acre-feet per irrigated acre. Since the Rental Lands Rate is based on the private O&M rate, the Water Charge for 2015 for the Rental Lands would be the same as the Homestead Lands - i.e., $22.00 acre-foot for use greater than 3.0 acre-feet per irrigated acre. The Water Charge rate for the Colonial Realty Lands would be based on the 2015 O&M Rate for Colonial Realty Lands, which is 75% of the private O&M Rate. Thus, the Water Charge rate for parcels in the Colonial Realty Lands would be 1/3 times $49.50, or $16.50 acre-foot for use greater than 3.0 acre-feet per irrigated acre.

TID will apply any revenue it collects from the Water Charge in the fiscal year following the year that the revenue is collected. Any revenue that TID collects from the Water Charge will

in person at the public hearing, so long as they are received prior to the conclusion of the public hearing. Please identify on the front of the envelope for any written protest, whether mailed or submitted in person, that the enclosed letter is for the "Public Hearing on the Proposed Water Charge." Only those written protests actually received by TID prior to the close of the hearing on **February 24, 2015**, will be considered.

PUBLIC HEARING AND EFFECT OF PROTESTS

At the conclusion of the public hearing, TID will consider adopting the Water Charge. Oral comments at the public hearing will not qualify as a formal protest unless accompanied by a written protest. If, at the close of the public hearing, a majority of the record owners do not present protests, TID will be authorized to adopt the charge and expects to consider adoption of a resolution to impose the Water Charge. If TID adopts the Water Charge, TID will be authorized to adopt charges for water delivery above 3.0 acre-feet per irrigated acre on any parcel to which water is applied between March 1st and October 31st, with rates not to exceed the maximum rates established through this proceeding. Such a charge would be in effect beginning in the year 2015, and remain in effect during subsequent irrigation seasons.

If a majority of the parcels identified submit timely written protests, then the TID Board of Directors will not adopt the charge as proposed. If that occurs, TID may begin this process again, and the Board and TID staff will solicit additional input from landowners and tenants regarding the need for a charge and the amount of the charge.

Answers to any questions you may have regarding the charge may be obtained by calling TID at (530) 667-2249. As always, you are entitled and encouraged to attend TID Board meetings at any time.

The TID Board of Directors appreciates your consideration of this issue.

Sincerely,

Earl Danosky
General Manager

Enclosure

REPORT DETAILING THE COST OF SERVICE FOR WATER DELIVERY IN EXCESS OF THRESHOLD WATER QUANTITY

BACKGROUND

Tulelake Irrigation District (TID) is a special district public agency formed and operating under Division 11 of the California Water Code. There are about 96,000 gross acres within TID's boundaries. Approximately 64,000 acres are irrigated annually, of which nearly 16,000 acres are owned by the United States (within an area of 18,000 acres of federal land subject to irrigation). Crops grown include alfalfa, grains, mint, onions, potatoes, and pasture. TID receives water through facilities of the Klamath Project.

The majority of TID's surface water supplies are from the Klamath River. During the irrigation season, TID diverts surface water from the Klamath River, as well as Lost River, at locations on the Lost River Diversion Channel known as Station 48 and the No. 1 Drain. TID also receives tailwater from lands located within Klamath Irrigation District and from other Klamath Project water users in Oregon.

TID operates and maintains the Anderson-Rose Dam, located on the channel of the Lost River. TID operates the Anderson-Rose Dam to deliver water into TID's J-Canal, which distributes water to more than one-half of TID's irrigated lands through turnouts and lateral canals. The J-Canal conveys water to other canal systems for delivery to other lands within TID. Water not diverted at Anderson-Rose Dam flows through to the Tule Lake Sumps, where TID may divert and redivert the water for irrigation within TID. Operational spills and tailwater resulting from irrigation within TID are conveyed through TID's extensive drainage system for reuse within TID. TID employs full- and part-time staff. TID is governed by a five-member Board of Directors elected by TID landowners.

COST OF WATER SERVICE

TID intends to employ a new water charge for water delivery above 3.0 acre-feet per irrigated acre (af/ac) on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st, and maximum rates for such a charge (Water Charge). For the purpose of calculating water deliveries on a per-acre basis, the irrigated acres for each parcel or farm unit in any year will equal the number of cropped acres that TID uses in creating the report that TID submits to the United States Bureau of Reclamation for that year pursuant to the Contract Between the United States and the Tulelake Irrigation District, Contract No. 14-06-200-5954 dated September 10, 1956.

This Cost of Service Report details the cost of delivering water in excess of 3.0 af/ac to lands in TID homesteaded as part of the Tule Lake Division of the Klamath Project (Homestead Lands), lands subject to Contract No. I1r-971 between Colonial Realty Company and the United States dated October 20, 1936 (Colonial Realty Lands), and lands that receive *only* "rental" water

Memorandum 3, Irrigation and Water Requirements/Demands for the On-Project Plan Area, April 2012 (Klamath Water and Power Agency); (3) written testimony of Marc Van Camp, P.E., in the Klamath River Adjudication; and (4) 2012-2014 Crop Water Use Estimates, University of California, Intermountain Research and Extension Center. TID also considered the *Engineer's Report*. Applied water values vary based on crop selection, irrigation technology, weather, irrigation efficiency, and other variables. Based on these sources, applied water has historically ranged from about 2.0-5.0 af/ac. Essentially uniform (by land category), O&M Rates and the Rental Lands Rate have covered the full range of deliveries. However, an incremental cost associated with increased delivery can be assigned or identified above a certain threshold based on an ordinary range of delivery. The ranges and consideration of crops and TID operations support selection of 3.0 af/ac as the threshold for imposition of the proposed Water Charge. TID selected 3.0 af/ac as the limit of the ordinary range such that an additional charge for water delivery above this threshold is a reasonable means to cover TID's cost of service for such deliveries. TID's new charge is a volumetric water charge that will assign a greater portion of TID's expenses to all applications of more than 3.0 af/ac.

TID calculated the maximum rates for its Water Charge by evaluating its projected cost of service for deliveries greater than 3.0 af/ac. As a basis for its projected cost of service, TID relied on the *Engineer's Report.* The *Engineer's Report* projected TID's cost of service through the year 2025 by determining annual expenses for water delivery, drainage, flood control and related operations (including a budget reserve), as well as protection of water rights and other matters. The *Engineer's Report* estimated minimum and maximum annual private assessment and public charge rates (O&M Rates) for both private and public lands sufficient to cover TID's projected cost of service. The *Engineer's Report* estimated O&M Rate ranges by dividing total annual projected expenses for private and public lands, respectively, by the total acreage of private and public lands, respectively.

Based on the analysis in the *Engineer's Report*, the Siskiyou County Superior Court subsequently confirmed TID's authority to impose a maximum private O&M Rate of $114 per acre for Homestead Lands. The Court also confirmed TID's authority to impose a maximum O&M Rate of $85.50 per acre for the Colonial Realty Lands. The payment for the Rental Lands is governed by the Reclamation Contract. Under the Reclamation Contract, TID has the right to charge Rental Lands "the same as the annual O&M charges per acre for other lands in the District." Therefore, the maximum rate for payment for water delivery to the Rental Lands is effectively the same as the maximum O&M Rate for the Homestead Lands.

TID has calculated the maximum rates for its Water Charge on a per acre-foot basis by dividing its maximum O&M Rates for the lands known as the Homestead Lands and Colonial Realty Lands by 3.0 af/ac, and dividing its effective maximum charge for the lands known as the Rental Lands by 3.0 af/ac. The maximum rates for TID's Water Charge are as shown in **Table 1**.

more than one parcel, to which water is applied between March 1st and October 31st, including maximum rates for such a charge.

TID has historically delivered water for reasonable and beneficial uses on private and public lands throughout the TID service area. Water deliveries vary from grower to grower, but all growers benefit equally from TID's interdependent facilities. O&M charges have historically been the same for all private land and for all public land served by TID. It is reasonable to assume, however, that TID's cost of service is greater for those parcels and farm units that take delivery of more water than is within the specifically defined range for lands served by TID as compared to those that take delivery of a quantity within the defined range. These parcels and farm units drive greater operations and maintenance expenses and power costs, consume more TID staff time, and get a greater portion of the benefits attributable to all of the professional services and other expenses incurred by TID to protect landowner water supplies.

It is reasonable and prudent to charge for delivery of more than 3.0 af/ac for the costs associated with TID's activities necessary to deliver water greater than this amount. TID's O&M Rates and Rental Lands Rate are derived by averaging annual expenses across acreage throughout TID. This results in O&M Rates and a Rental Lands Rate that capture the costs of water deliveries within the ordinary range up to 3.0 af/ac for lands served by TID, as well as associated drainage and flood control services. TID has used its O&M Rates to calculate the cost of its services on a per acre-foot basis and intends to impose a charge at the calculated per acre-foot rates. When the charge is applied to water delivery in excess of the selected applied water quantity, such charge will be directly proportional to TID's costs. Further, the amount due under the Water Charge will increase in proportion to the increase in water delivery above the threshold water quantity. In this respect, the Water Charge will be proportional to the cost of those services necessary to deliver water supplies greater than 3.0 af/ac to a given parcel or a farm unit.

TULELAKE IRRIGATION DISTRICT
RESOLUTION NO. 2015-02

RESOLUTION OF THE TULELAKE IRRIGATION DISTRICT BOARD OF DIRECTORS TO: 1) APPROVE A VOLUMETRIC WATER CHARGE FOR WATER DELIVERY TO CERTAIN LANDS, AND 2) ADOPT THE 2015 VOLUMETRIC WATER CHARGE RATES FOR DELIVERY TO SUCH LANDS

THE BOARD OF DIRECTORS OF THE TULELAKE IRRIGATION DISTRICT (DISTRICT) HEREBY FINDS, DECLARES, AND RESOLVES AS FOLLOWS:

WHEREAS, the District was duly formed, is organized, and at all times has been acting as and exercising the rights of an irrigation district under the provisions of the Irrigation District Law (Division 11 of the California Water Code); and

WHEREAS, the District has historically imposed per-acre assessments on private and public lands (O&M Rates) and a per-acre payment rate for water delivery under what is known as water "rental" arrangement (Rental Lands Rate), based on the District's actual costs for water deliveries, drainage, flood control and associated services; and

WHEREAS, the private O&M Rate and the Rental Lands Rate for 2015 is $66.00 per acre; and

WHEREAS, the O&M Rate for the parcels subject to Contract No. Ilr-971 between Colonial Realty Company and the United States dated October 20, 1936 (Colonial Realty Lands) is three-fourths the private O&M Rate; and

WHEREAS, Water Code sections 22280(a)(1) and 22280(b) authorize the District, in lieu in whole or in part of levying assessments, to fix and collect charges for the use of water, and for delivery of water for irrigation in excess of a specified quantity per unit of land; and

WHEREAS, the District desires, commencing immediately, to employ a new volumetric water charge to cover the cost of deliveries that are above a defined water delivery threshold, establish maximum rates for such a charge, and establish the rates that will apply specifically in 2015; and

WHEREAS, the District has determined that growers that take delivery of water in excess of 3.0 acre-feet per irrigated acre (af/ac) on any parcel, or on any farm unit where a farm unit includes more than one parcel or is federal lease land, to which water is applied between March 1st and October 31st should pay a volumetric water charge for the portion of any such water deliveries in excess of that threshold during that period; and

WHEREAS, the District has determined that the per acre-foot rates for the volumetric water charge for any year should be equal to the O&M Rates and Rental Lands Rate for specific land categories in the year divided by 3.0 af/ac; and

WHEREAS, usage-based water rates are subject to the provisions of article XIII of the California Constitution, and therefore, the District desires to approve a volumetric water charge in compliance with the applicable requirements of article XIII D; and

WHEREAS, the District determined that, under article XIII D, record owners in the following land categories were required to receive notice and an opportunity to protest the District's proposed volumetric water charge: (1) parcels in the District homesteaded as part of the Tule Lake Division of the Klamath Project (Homestead Lands); (2) Colonial Realty Lands; and (3) parcels that receive only "rental" water on an annual basis (Rental Lands); and

WHEREAS, at the December 29, 2014 duly noticed meeting of the District Board of Directors, the Board reviewed and approved a landowner notice letter with its enclosed *Report Detailing the Cost of Service for Delivery In Excess of Threshold Water Quantity*, a copy of which is attached hereto as Exhibit A and incorporated herein, and the Board directed staff to proceed with mailing out the landowner notice letters and setting February 24, 2015, as the date for a public hearing; and

WHEREAS, the notice under article XIII D was mailed on or before January 9, 2015, to 324 owners of record of the Homestead Lands, Colonial Realty Lands, and parcels that receive only rental water on an annual basis; and

WHEREAS, collectively, the land owned and managed by these 324 record owners includes 777 parcels; and

WHEREAS, the notice explained that record owners had the opportunity to submit written protests at any time prior to the close of the public hearing on February 24, 2015; and

WHEREAS, the written protest of an owner of record of any parcel has been treated as a protest of the proposed charge as to all parcels with respect to which that person or entity is an owner of record, unless the owner of record specified otherwise; and

WHEREAS, at the February 24, 2015 duly noticed meeting of the District Board of Directors, the District held a public hearing regarding the proposed volumetric water charge. During this hearing, public comments were taken, and record owners were afforded the opportunity to submit written protests at the hearing. At the close of the public comment portion of the hearing on February 24, 2015, the District clerk tallied all written protests received, including those received before and at the public hearing, and found there to be 1 protests against the District water charge, which does not constitute a majority protest.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the District to adopt this Resolution as follows:

Section 1. Authority. This resolution is enacted pursuant to the District's power to impose charges set forth in Water Code section 22280 and in full conformance with the provisions of article XIII D of the California Constitution.

Section 2. Approval of Cost of Service Analysis. The Board of Directors hereby approves the cost of service analysis and determinations set forth in the *Report Detailing the Cost of Service for Delivery In Excess of Threshold Water Quantity*, and finds and declares that the volumetric water charge, including maximum rates for such a charge, fully complies with the provisions of article XIII D of the California Constitution.

Section 3. Approval of Volumetric Water Charge. The Board of Directors hereby approves the volumetric water charge, including maximum rates for such a charge, set forth in the attached *Report Detailing the Cost of Service for Delivery In Excess of Threshold Water Quantity*. The volumetric water charge is a charge for water delivery above 3.0 af/ac on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st. The rates for the charge in any year will be equal to the O&M Rates and Rental Lands Rate for specific land categories in the year divided by 3.0 af/ac, and will not exceed the maximum rates unless the District subsequently approves higher rates in compliance with applicable law. TID will calculate the amount of the charge by multiplying the rate for the parcel or farm unit times the number of acre-feet per acre of water delivered that is in excess of 3.0 af/ac on any parcel, or on any farm unit where the farm unit contains more than one parcel, to which water is applied between March 1st and October 31st times the number of acres being served.

Section 4. Determination of Irrigated Acres. For the purpose of calculating water deliveries on a per-acre basis, the irrigated acres for each parcel or farm unit in any year will equal the number of cropped acres that the District uses in creating the report that the District submits to the United States Bureau of Reclamation for that year pursuant to the Contract Between the United States and the Tulelake Irrigation District, Contract No. 14-06-200-5954 dated September 10, 1956.

Section 5. Determination of Water Delivered. The amount of water delivered to each parcel or farm unit shall be the amount measured or determined to be delivered at the point of delivery for the parcel in accordance with the District's Water Measurement Program adopted on December 19, 2014 and any subsequent amendments or modifications of that program. The District will measure and charge for water delivery by the tenth ($1/10^{th}$) of the acre-foot.

Section 6. Volumetric Water Charge Rate for Homestead Lands for 2015. The Board of Directors hereby approves, for 2015 on the Homestead Lands, a volumetric water charge rate of $22.00 per acre-foot. This rate will be used to calculate the charge for water delivery to the Homestead Lands consistent with Sections 3-5 above.

Section 7. Volumetric Water Charge Rate for Colonial Realty Lands for 2015. The Board of Directors hereby approves, for 2015, for the Colonial Realty Lands, a volumetric water charge rate of $16.50 per acre-foot. This rate will be used to calculate the charge for water delivery to the Colonial Realty Lands consistent with Sections 3-5 above.

Section 8. Volumetric Water Charge Rate for Rental Lands for 2015. The Board of Directors hereby approves, for 2015, for the Rental Lands, a volumetric water charge rate of $22.00 per acre-foot. This rate will be used to calculate the charge for water delivery to the Rental Lands consistent with Sections 3-5 above.

Section 9. Severability. If any provision of this resolution is found to be illegal, unconstitutional or unenforceable for any reason whatsoever, that provision shall be severed from the remaining provisions of this resolution, which shall remain in full force and effect.

PASSED AND ADOPTED by unanimous vote of the Board of Directors on February 24, 2015.

* * *

I hereby certify that I am the Secretary of the Tulelake Irrigation District and that the foregoing resolution was duly adopted by the Board of Directors of said District at a meeting thereof duly held on February 24, 2015, at which meeting a quorum of said Board of Directors was at all times present and acting.

IN WITNESS WHEREOF, I have set my hand and the seal of the District this 24th day of February, 2015.

Earl Danosky, Secretary
Board of Directors
Tulelake Irrigation District

EXHIBIT A

REPORT DETAILING THE COST OF SERVICE FOR WATER DELIVERY IN EXCESS OF THRESHOLD WATER QUANTITY

BACKGROUND

Tulelake Irrigation District (TID) is a special district public agency formed and operating under Division 11 of the California Water Code. There are about 96,000 gross acres within TID's boundaries. Approximately 64,000 acres are irrigated annually, of which nearly 16,000 acres are owned by the United States (within an area of 18,000 acres of federal land subject to irrigation). Crops grown include alfalfa, grains, mint, onions, potatoes, and pasture. TID receives water through facilities of the Klamath Project.

The majority of TID's surface water supplies are from the Klamath River. During the irrigation season, TID diverts surface water from the Klamath River, as well as Lost River, at locations on the Lost River Diversion Channel known as Station 48 and the No. 1 Drain. TID also receives tailwater from lands located within Klamath Irrigation District and from other Klamath Project water users in Oregon.

TID operates and maintains the Anderson-Rose Dam, located on the channel of the Lost River. TID operates the Anderson-Rose Dam to deliver water into TID's J-Canal, which distributes water to more than one-half of TID's irrigated lands through turnouts and lateral canals. The J-Canal conveys water to other canal systems for delivery to other lands within TID. Water not diverted at Anderson-Rose Dam flows through to the Tule Lake Sumps, where TID may divert and redivert the water for irrigation within TID. Operational spills and tailwater resulting from irrigation within TID are conveyed through TID's extensive drainage system for reuse within TID. TID employs full- and part-time staff. TID is governed by a five-member Board of Directors elected by TID landowners.

COST OF WATER SERVICE

TID intends to employ a new water charge for water delivery above 3.0 acre-feet per irrigated acre (af/ac) on any parcel, or on any farm unit where a farm unit includes more than one parcel, to which water is applied between March 1st and October 31st, and maximum rates for such a charge (Water Charge). For the purpose of calculating water deliveries on a per-acre basis, the irrigated acres for each parcel or farm unit in any year will equal the number of cropped acres that TID uses in creating the report that TID submits to the United States Bureau of Reclamation for that year pursuant to the Contract Between the United States and the Tulelake Irrigation District, Contract No. 14-06-200-5954 dated September 10, 1956.

This Cost of Service Report details the cost of delivering water in excess of 3.0 af/ac to lands in TID homesteaded as part of the Tule Lake Division of the Klamath Project (Homestead Lands), lands subject to Contract No. I1r-971 between Colonial Realty Company and the United States dated October 20, 1936 (Colonial Realty Lands), and lands that receive *only* "rental" water on an annual basis (Rental Lands)[1]. This Cost of Service Report supports imposition of the Water Charge on parcels in these land categories.

To comply with the mandates of article XIII D of the California Constitution, the Water Charge must not exceed the cost of service. TID provides irrigation, drainage, and flood control services to each parcel and farm unit through integrated diversion, conveyance, drain, and tailwater redistribution systems. To provide such services, TID incurs expenses throughout each year associated with various activities including:

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[1] The vast majority of parcels and farm units served by TID, including some or all of the areas of parcels and farm units comprising the Homestead Lands, benefit by contractual rights of delivery under perpetual contracts. Lands of any sort not served under permanent contract can receive delivery under what is known as water "rental" arrangement.

district administration, transportation, pumping plant operations, professional services, organizational memberships, equipment depreciation, use of electrical power, and maintenance and operation of lift pumps, drainage pumps, canals, and drains. Other expenses include legal, engineering, and other professional services. TID also faces expenses for Reclamation's operation and maintenance of specific Klamath Project facilities (Reserved Works). To cover these expenses, TID imposes assessments and charges on private and public lands on a dollars-per-acre basis (O&M Rates), and also requires a dollars-per-acre payment for water delivery under what is known as water "rental" arrangement (Rental Lands Rate). For the most part, O&M Rates and the Rental Lands Rate equally distribute these costs across private and public lands on the basis of acreage for both private and public lands, respectively. (For further information, see TID's *Engineer's Report for the 2006 Tulelake Irrigation District Assessment Adjustment (Engineer's Report).* Prospectively, TID intends to employ the Water Charge to cover a portion of these expenses, with the Water Charge being a charge that would be paid in addition to the O&M Rates and Rental Lands Rate determined for a year.

TID's volumetric charge will apply to water delivery greater than 3.0 af/ac between March 1st and October 31st. The period between March 1st through October 31st constitutes the standard irrigation season for the most common crops produced on lands served by TID. Any expenses incurred by TID for water deliveries outside this period are minimal, and are offset by the benefits of the ground being pre-wet for the following irrigation season, and availability of winter water pumped off fields and into sumps for reuse during the irrigation season. Both reduce TID's irrigation season diversion requirements and associated costs, and will help reduce peak system demands.

TID will measure or determine water deliveries at each point of delivery (i.e., point of diversion or place of measurement) for each parcel or farm unit consistent with TID's Water Measurement Program adopted on December 19, 2014, or any subsequent amendments to that program. TID will measure and charge for water delivery by the tenth (1/10th) of the acre-foot.

TID selected 3.0 af/ac as the delivery threshold based on an evaluation of applied water requirements for the TID service area. "Applied water" is commonly determined and is analogous to water "delivery" because applied water represents the amount of water that a grower diverts/pumps per acre to irrigate a crop. TID evaluated applied water data from several sources including: (1) TID's 2011 Water Management and Conservation Plan; (2) Technical Memorandum 3, Irrigation and Water Requirements/Demands for the On-Project Plan Area, April 2012 (Klamath Water and Power Agency); (3) written testimony of Marc Van Camp, P.E., in the Klamath River Adjudication; and (4) 2012-2014 Crop Water Use Estimates, University of California, Intermountain Research and Extension Center. TID also considered the *Engineer's Report.* Applied water values vary based on crop selection, irrigation technology, weather, irrigation efficiency, and other variables. Based on these sources, applied water has historically ranged from about 2.0-5.0 af/ac. Essentially uniform (by land category), O&M Rates and the Rental Lands Rate have covered the full range of deliveries. However, an incremental cost associated with increased delivery can be assigned or identified above a certain threshold based on an ordinary range of delivery. The ranges and consideration of crops and TID operations support selection of 3.0 af/ac as the threshold for imposition of the proposed Water Charge. TID selected 3.0 af/ac as the limit of the ordinary range such that an additional charge for water delivery above this threshold is a reasonable means to cover TID's cost of service for such deliveries. TID's new charge is a volumetric water charge that will assign a greater portion of TID's expenses to all applications of more than 3.0 af/ac.

TID calculated the maximum rates for its Water Charge by evaluating its projected cost of service for deliveries greater than 3.0 af/ac. As a basis for its projected cost of service, TID relied on the *Engineer's Report.* The *Engineer's Report* projected TID's cost of service through the year 2025 by determining annual expenses for water delivery, drainage, flood control and related operations (including a budget reserve), as well as protection of water rights and other matters. The *Engineer's Report* estimated minimum and maximum annual private assessment and public charge rates (O&M Rates) for both private and public lands

sufficient to cover TID's projected cost of service. The *Engineer's Report* estimated O&M Rate ranges by dividing total annual projected expenses for private and public lands, respectively, by the total acreage of private and public lands, respectively.

Based on the analysis in the *Engineer's Report*, the Siskiyou County Superior Court subsequently confirmed TID's authority to impose a maximum private O&M Rate of $114 per acre for Homestead Lands. The Court also confirmed TID's authority to impose a maximum O&M Rate of $85.50 per acre for the Colonial Realty Lands. The payment for the Rental Lands is governed by the Reclamation Contract. Under the Reclamation Contract, TID has the right to charge Rental Lands "the same as the annual O&M charges per acre for other lands in the District." Therefore, the maximum rate for payment for water delivery to the Rental Lands is effectively the same as the maximum O&M Rate for the Homestead Lands.

TID has calculated the maximum rates for its Water Charge on a per acre-foot basis by dividing its maximum O&M Rates for the lands known as the Homestead Lands and Colonial Realty Lands by 3.0 af/ac, and dividing its effective maximum charge for the lands known as the Rental Lands by 3.0 af/ac. The maximum rates for TID's Water Charge are as shown in **Table 1**.

Table 1
Maximum Rates for Water Charge

Land Category	Maximum Rate for Delivery Greater Than 3.0 af/ac between March 1st-Oct. 31st
Homestead Lands	$38.00/acre-foot
Colonial Realty Lands	$28.50/acre-foot
Rental Lands	$38.00/acre-foot

Each year, TID will determine the actual rates for the charge based on the budget prepared for that year. The rates for the charge for any year will be 1/3 times the O&M Rates or Rental Lands Rate for the respective land categories in the year, not to exceed the maximum rates for the land categories. TID will calculate the amount of the charge by multiplying the rate for the parcel or farm unit times the number of acre-feet per acre of water delivered that is in excess of three acre-feet per irrigated acre on any parcel, or on any farm unit where the farm unit contains more than one parcel, to which water is applied between March 1st and October 31st times the number of acres being served. TID will apply any revenue it collects from the Water Charge in the fiscal year following the year that the revenue is collected. Any revenue that TID collects from the Water Charge will be applied to reduce the O&M Rates and Rental Lands Rate to the extent determined appropriate by the Board while ensuring revenues from the O&M Rates, the Rental Lands Rate and the Water Charge are sufficient to cover expenses in the fiscal year following collection of the Water Charge. In this respect, TID's revenues, including those realized from its O&M Rates, its Rental Lands Rate, and its Water Charge, will not exceed the cost of TID's services.

REVENUES USED SOLELY FOR TID'S EXPENSES

The revenue that TID collects from its Water Charge will be used solely for TID's costs associated with diversion, delivery, and redistribution of water. Growers taking delivery of more than 3.0 acre-feet per acre will pay a greater share of these expenses based on the amount above 3.0 af/ac that is delivered.

PROPORTIONALITY OF WATER CHARGE TO SERVICE PROVIDED

Charges subject to article XIII D must also be proportional to the cost of the service provided. Historically, TID has charged its landowners O&M Rates and Rental Lands Rates based on the cost for

operating and maintaining the facilities that TID uses to deliver water, manage tailwater, and provide flood control services. Prospectively, TID intends to employ: (1) an O&M rate; (2) a Rental Lands Rate; and (3) a volumetric charge for water delivery in excess of 3.0 acre-feet per irrigated acre on any parcel, or on any farm unit where the farm unit contains more than one parcel, to which water is applied between March 1st and October 31st, including maximum rates for such a charge.

TID has historically delivered water for reasonable and beneficial uses on private and public lands throughout the TID service area. Water deliveries vary from grower to grower, but all growers benefit equally from TID's interdependent facilities. O&M charges have historically been the same for all private land and for all public land served by TID. It is reasonable to assume, however, that TID's cost of service is greater for those parcels and farm units that take delivery of more water than is within the specifically defined range for lands served by TID as compared to those that take delivery of a quantity within the defined range. These parcels and farm units drive greater operations and maintenance expenses and power costs, consume more TID staff time, and get a greater portion of the benefits attributable to all of the professional services and other expenses incurred by TID to protect landowner water supplies.

It is reasonable and prudent to charge for delivery of more than 3.0 af/ac for the costs associated with TID's activities necessary to deliver water greater than this amount. TID's O&M Rates and Rental Lands Rate are derived by averaging annual expenses across acreage throughout TID. This results in O&M Rates and a Rental Lands Rate that capture the costs of water deliveries within the ordinary range up to 3.0 af/ac for lands served by TID, as well as associated drainage and flood control services. TID has used its O&M Rates to calculate the cost of its services on a per acre-foot basis and intends to impose a charge at the calculated per acre-foot rates. When the charge is applied to water delivery in excess of the selected applied water quantity, such charge will be directly proportional to TID's costs. Further, the amount due under the Water Charge will increase in proportion to the increase in water delivery above the threshold water quantity. In this respect, the Water Charge will be proportional to the cost of those services necessary to deliver water supplies greater than 3.0 af/ac to a given parcel or a farm unit.

Attachment E

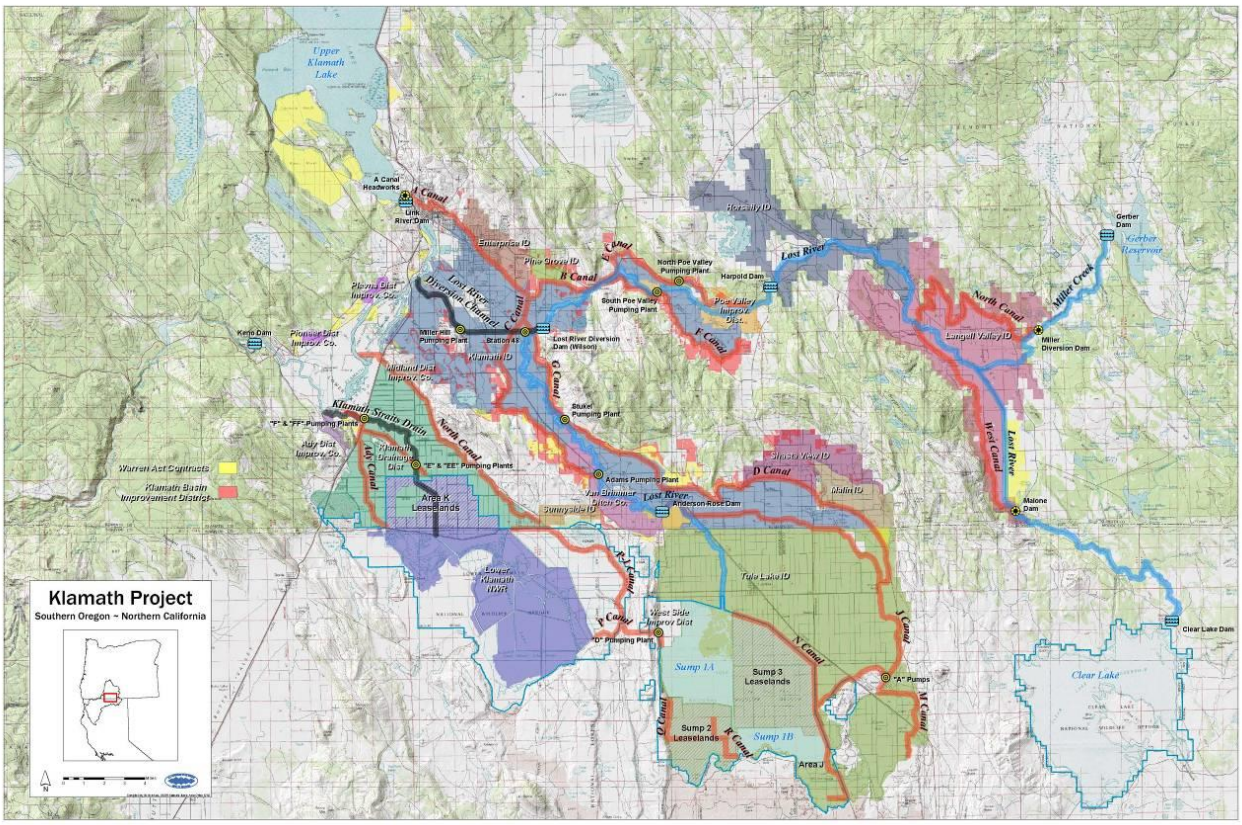
District Water Shortage Plan

RECLAMATION

Managing Water in the West

2015 Drought Plan

Klamath Project, Oregon-California
Mid-Pacific Region



U.S. Department of the Interior
Bureau of Reclamation

April 2015

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Introduction

The Klamath Project (Project) delivers water for irrigation purposes to over 200,000 acres in Southern Oregon and Northern California. The Project relies upon several primary water sources to meet irrigation demands: live flow into and stored water from Upper Klamath Lake (UKL), Klamath River, Clear Lake Reservoir, Gerber Reservoir, and the Lost River. The Project's water supplies have been impacted by the severe drought conditions currently affecting California and Southern Oregon. This 2015 Drought Plan describes the background for and the process of allocating the available Project water supplies during the 2015 spring-summer irrigation season (March 1, to November 15), consistent with the system of contractual priorities that exist within the Project.

It is important to note that if average snowpack and the resulting inflow to Project reservoirs had been realized for this water year, Project deliveries would have been sufficient to meet all of the agricultural irrigation needs within the Project.

2015 Drought Planning

On April 7, 2015, the Bureau of Reclamation is issued the 2015 Annual Operations Plan (Operations Plan), which identifies the estimated available Project water supplies for the 2015 spring-summer irrigation season, consistent with the biological opinions issued jointly by National Oceanic and Atmospheric Administration's National Marine Fisheries Service and the U.S. Fish and Wildlife Service on May 31, 2013.

As the Operations Plan describes, the Project water supply available from UKL and the Klamath River is approximately 254,500 AF, which is 65 percent of the historical full demand during the spring-summer irrigation season (390,000 AF historical full demand).

In response to the estimated below average Project water supplies, the Operations Plan identifies a series of drought mitigation measures to minimize involuntary shortages among Project contractors. These measures included active conservation efforts, the Klamath Water and Power Agency's (KWAPA) Water Users Mitigation Program (WUMP), voluntary transfers among Project water users, and state water rights administration.

Another factor affecting the allocation of the available Project Supply is the indication by the Klamath Drainage District (KDD) that it intends to divert up to 23,081.2 AF during the spring-summer irrigation season. This volume is in excess of the allocation, as provided below, that Reclamation has determined is available to KDD under the current drought conditions and in accordance with its Warren Act contract. However, since Reclamation does not currently have a means

to limit diversions by KDD, other than by directing compliance with its contract, Reclamation must take KDD's anticipated excess diversions into account in determining the volume of Project Supply it can reasonably expect to be able to deliver to the other Project contractors.

Contractual Priorities

Project Water Contracts

In the event of a shortage in Project water supplies, Reclamation determines the allocation of the available supply in accordance with the terms of the contracts between Reclamation and districts and individual water users. There are four general types of these contracts within the Project: 1) settlement contracts; 2) repayment contracts; 3) Warren Act contracts; and 4) annual water rental agreements. In accordance with the authority for the respective contracts and their explicit terms, these contracts create a system of priorities among Project contracts, within the Project, in the event of a shortage in the available Project water supplies.

1. Settlement Contracts

Settlement contracts describe agreements between the United States and water users with state water rights that were acquired independent of Reclamation's notices and filings made in connection with the Klamath Project. Each of these agreements is unique and governed by the specific terms of the contract.

2. Repayment Contracts

The term repayment contract covers contracts executed pursuant to either the *Reclamation Act of 1902* (32 Stat. 388, 43 U.S.C. §§ 371 et seq.), or section 9(d) of the *Reclamation Act of 1939* (53 Stat. 1193, 43 U.S.C. § 485h(d)). The lands covered by repayment contracts are exclusively within the Klamath Irrigation District (KID) and Tulelake Irrigation District (TID). In the event of a shortage, these contracts obligate Reclamation to reduce and/or terminate deliveries to Warren Act contractors prior to reducing deliveries to KID or TID.

3. Warren Act Contracts

Warren Act contracts include all contracts executed pursuant to the Warren Act (36 Stat. 925, 43 U.S.C. §§523-525), which provide for a supply of Project water that is secondary to the contractual rights of repayment contractors. Consistent with the Warren Act, deliveries under these contracts are subject to being curtailed if necessary when there is not an adequate supply for lands covered by repayment and settlement contracts.

To the extent that there is Project water available in addition to the needs of repayment and settlement contractors, Reclamation will apportion the remaining available Project supply among Warren Act contracts on a pro rata (i.e., proportional) basis, based on the number of acres under each contract.

Many of the Warren Act contracts on the Project also expressly limit the contracted Project supply to a specified amount of water, such as 2.0 or 2.5 acre-feet (AF) per irrigable acre. These contracts also commonly include a limitation on the monthly rate of diversions (e.g., no more than 0.6 AF per irrigable acre per month). Such limitations apply independent of any restrictions that may exist under state law.

4. Annual Water Rental Agreements

Annual water rental agreements provide water if and when there is excess water beyond the needs of lands under settlement, repayment, and Warren Act contracts. Reclamation executes annual water rental agreements in various locations, depending on the availability of surplus water supplies. KID and TID are also authorized to enter into annual water rental agreements, if such water is available, through their respective delivery control points, with Project water users. Generally, if Project water supplies are limited among settlement, repayment, and Warren Act contracts, Reclamation will not make water available for annual water rental agreements.

Contractual Allocation

In allocating the available Project water supply from UKL and the Klamath River, the first consideration is the 1909 Settlement Contract between the United States and the Van Brimmer Ditch Company (VBDC). This contract obligates Reclamation to deliver fifty (50) cubic feet per second (cfs) of water from April 15 to October 1 of each year through the C Canal, in satisfaction of the water rights VBDC originally claimed to waters from Lower Klamath Lake and the Klamath River. Reclamation interprets this settlement contract as requiring that VBDC's right to 50 cfs must first be satisfied before water is made available to the remainder of the Project. VBDC's demand generally represents a small portion of total Project demand.

Following VBDC's 50 cfs as described above, Reclamation is contractually obligated to provide a sufficient supply for the Project's repayment contractors, KID and TID. The amount of Project surface water from UKL and Klamath River needed to satisfy the demands of KID and TID is based on a number of factors, such as current and projected hydrologic conditions, anticipated return flow patterns, particularly through the Lost River drainage, and existing cropping patterns.

Based on historical diversion records in similar dry years and currently anticipated acreage participating in demand management measures, and after coordination with

KID and TID, Reclamation anticipates KID and TID's demand to be between approximately 275,000 and 300,000 AF.

The 2015 anticipated demand of KID and TID is less than what might otherwise be anticipated under certain conditions. This figure is subject to change based on a variety of factors. For example, in-season precipitation and air temperatures directly influence the demand for Project water. Voluntary drought mitigation measures, like those in the Klamath Water and Power Agency's (KWAPA) Water Users Mitigation Program (WUMP), also affect KID and TID water demands. The WUMP is designed to reduce surface water demand within the Project, through agreements with landowners to temporarily forgo the use of surface water and potentially produce supplemental groundwater supplies for Project use.

Currently, KWAPA is in the process of accepting applications for Project irrigators to participate in the WUMP for the 2015 spring-summer irrigation season. Applications currently scheduled to be accepted through April 10, 2015. Following the deadline, KWAPA will submit contracts to landowners, who will then have until early May to decide whether to sign and complete the contract.

KWAPA has also yet to announce if, and to what amount, groundwater may be produced in connection with the WUMP, although a reasonable estimate is upwards of 40,000 AF. It is unknown, however, to what extent groundwater will be applied to lands within KID and TID. The level of groundwater pumping is further uncertain given recent groundwater depletion trends and the possibility for state regulation. Accordingly, at this time, the extent to which the WUMP will reduce water demands within KID and TID remains uncertain.

Overall, given current and projected hydrologic conditions, and ongoing voluntary drought mitigation measures, Reclamation estimates that the current available Project water from UKL and the Klamath River is insufficient to meet the full irrigation demands of KID and TID.

Accordingly, Project water from UKL and the Klamath River is not available for lands served under either Warren Act contracts or water rental agreements. KID and TID, which are responsible for the operation and maintenance of certain Project facilities, will also be notified to limit surface water deliveries to Warren Act contractors served through these facilities consistent with this allocation, except under approved voluntary transfer agreements, as discussed in the Operations Plan.

This allocation is subject to change based on several factors, including: changes in hydrologic conditions and anticipated water demands, participation in drought mitigation measures, state water rights administration, and voluntary water rights transfers. Reclamation will update the current allocation as needed based on available information.

Reclamation will also recalculate the Project supply available from UKL and the Klamath River following the May 1 and June 1 inflow forecasts from the Natural Resources Conservation Service (NRCS). This recalculation could cause the estimated Project supply available from UKL and the Klamath River to change. As a result, following the NRCS' May 1 and June 1 inflow forecasts, Reclamation will update the current allocation, based on the hydrologic information available at that time. The Klamath Project 2015 Drought Plan will not be revised and reissued following these scheduled updates, but Reclamation will directly notify Project water users of any change in the current allocation.

Monitoring & Enforcement

In the event that Reclamation discovers or receives a complaint of an unauthorized use of Project water, Reclamation and/or its contractors will investigate, as deemed appropriate by the Area Manager of the Klamath Basin Area Office. Reclamation will coordinate with Project water users, the Oregon Water Resources Department (OWRD), and other stakeholders concerning any alleged unauthorized water use.

Violations of state water rights will be referred to the OWRD's district watermaster. Use of Project water contrary to individual contracts with Project water users will result in a written notification to the landowner, the respective district, and/or KWAPA (as applicable). The letter will explain the basis for the alleged unauthorized use and the required remedies. Failure to comply may result in further enforcement action.

For more information, please visit http://www.usbr.gov/mp/kbao/ and or contact Jason Cameron at 541-883-6935 or via e-mail at jcameron@usbr.gov.

Attachment F

Groundwater Management Plan

Tulelake Irrigation District

Groundwater Management Plan

April 2013

TULELAKE IRRIGATION DISTRICT

GROUNDWATER MANAGEMENT PLAN

2013

Prepared by

MBK ENGINEERS

April 2013

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Acronyms and Abbreviations

AMSL	Above mean sea level
CASGEM	California Statewide Groundwater Elevation Monitoring
DWR	California Department of Water Resources
District	Tulelake Irrigation District
Ft	Feet
GWMP	Groundwater Management Plan
KBRA	Klamath Basin Restoration Agreement
KWAPA	Klamath Water and Power Agency
OPP	On-Project Plan
OPPA	On-Project Plan Area
Reclamation	U.S. Bureau of Reclamation
SWN	State Well Number
USGS	U.S. Geological Survey
WDL	Water Data Library

Section 1 - Introduction

Tulelake Irrigation District (District) is preparing a Groundwater Management Plan (GWMP) as authorized by sections 10753-10753.11 of the California Water Code. The preparation of the GWMP will include the development of appropriate groundwater "Management Objectives" within the GWMP area (District boundary) and the corresponding monitoring to assure that the Management Objectives are being met. California Water Code Section 10750 et seq. (SB 1938) authorizes local agencies which provide water to a service area overlaying a groundwater basin to adopt and implement a GWMP for that basin. The District held a hearing on August 29, 2011 to discuss the development and adoption of a GWMP with interested parties. On September 12, 2011, the District adopted a resolution of intention to draft a GWMP (Resolution 2011-02) and published the Resolution in the Herald and News (see Appendix A). The District is now in a position to consider all of the components set forth in Water Code Section 10753.7 and select those components which are appropriate for inclusion in the District's GWMP. The primary goal in developing the GWMP is to work cooperatively with landowners within the District to most efficiently monitor the groundwater resources and to continue with an efficient and effective conjunctive use program during years where surface water supplies are limited or not available.

The District has been working with interested parties including local, county, state and federal representatives to develop the "Management Objectives" of the GWMP and define the "Elements" of the GWMP that will facilitate achievement of the Management Objectives. In October of 2012 the District transmitted a fact sheet and statement to interested parties informing them of the opportunity for involvement in the development of the GWMP (see Appendix A). The first of a series of public meetings was held on November 15, 2012. A second public meeting was held on February 27, 2013 to provide a Draft GWMP to interested parties for review and comment prior to finalizing the GWMP. Comments to the Draft GWMP were received from the Klamath Basin Area Office (KBAO), US Bureau of Reclamation (Reclamation). No additional comments were received. The comments provided by KBAO were reviewed and incorporated into this GWMP. A second hearing to consider the adoption of the GWMP is scheduled for April 25, 2013. A copy of the letter to interested parties informing them of the second public hearing is also included in Appendix A.

Section 2 - Tulelake Irrigation District

The following section provides information on the background and development of the District and briefly described the water rights/contracts, infrastructure, and available water supplies (surface water and groundwater) and the proposed GWMP area.

In 1902, Congress enacted the Reclamation Act (Act of June 17, 1902, ch. 1093, 32 Stat. 388). Construction of the Klamath Reclamation Project began in 1906. Prior to the construction of the Klamath Reclamation Project most of the lands within the current boundary of the District were submerged. The submergence of this land created a body of water known as Tule Lake. To reclaim this area and drain Tule Lake, two outlets were constructed at the southern end of the lake that would direct the flow into lava beds. The flow to drain Tule Lake began in October 1909 and continued until 1912 when the lake level dropped below the elevation of the drains.

Construction of the Klamath Reclamation Project continued during the early 1900s, and by 1910 Clear Lake Dam was completed. By the spring of 1912, the Lost River Diversion Dam and Channel were complete. These facilities diverted water from the Lost River to the Klamath River and reduced flows into Tule Lake. By 1916, approximately 5,900 acres within the previously submerged region of Tule Lake had been exposed and work began on the Tule Lake portion of the Klamath Reclamation Project (Tule Lake Unit) with the construction of a distribution and drainage systems for exposed lands along the northern portion of the lake. In 1917, the first Tule Lake lands opened to homestead entry. By 1921, the exposed lakebed had increased to about 20,000 acres.

In 1920, Anderson-Rose Dam was constructed. Work also began on the J-Canal which was completed in 1923. During the 1920s and 1930s, work continued on the distribution, levee and drainage systems within the Tule Lake Unit. By 1923, the continued diversion of Lost River water to the Klamath River and diversions for irrigation resulted in approximately 85,000 of the 90,000 previously submerged acres within the Tule Lake Unit being available for farming. During the late 1920s, as much as 50,000 acres were being farmed.

Reclaimed lands were made available to settlers, and homesteaded under public notices issued from the 1920s to 1940s. Lands were typically leased to private individuals prior to homestead entry.

In 1940, work began on the D-Pumping Plant. This pumping plant and the Tule Lake Tunnel were completed in November 1941. During World War II, about 44,000 acres owned by the United States within Tule Lake were leased for farming. The Copic Bay region of Tule Lake was opened to homesteading in 1947 and 1948. By the 1950s, about 44,000 acres had been homesteaded.

In 1952 the District was formed. On September 10, 1956, the District entered into a contract with U.S. Bureau of Reclamation (Reclamation) for repayment of the construction charges and the transfer of the District operation and maintenance of the facilities used to deliver water to the District lands. Figure 1 identifies the development timeline for the District.

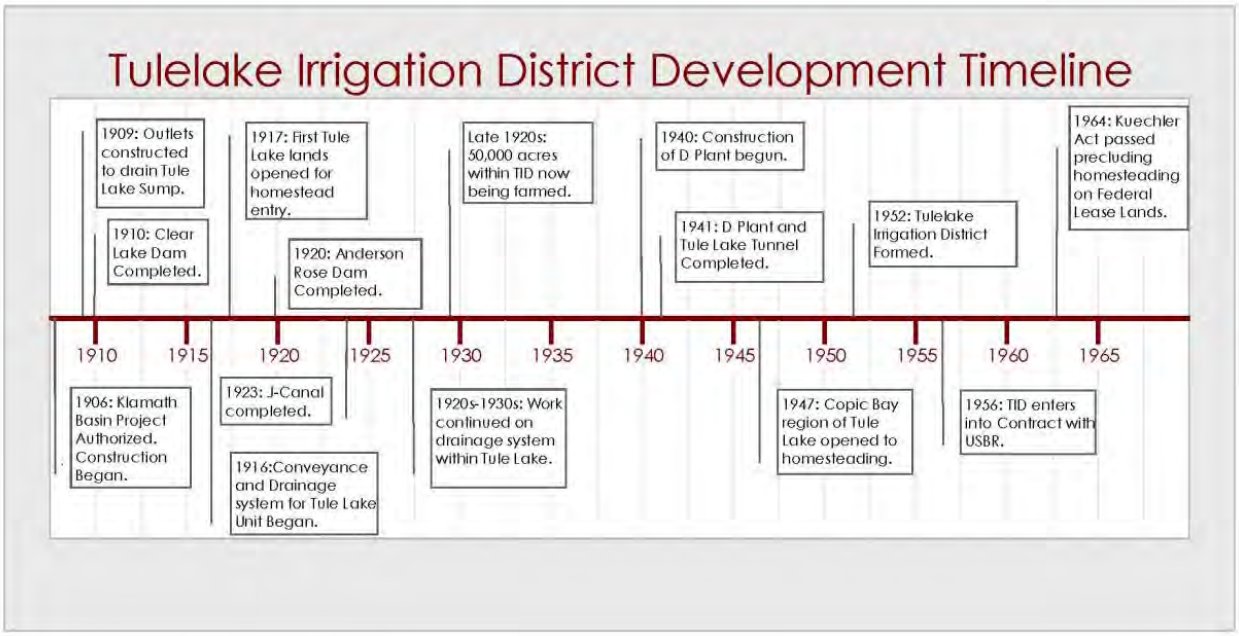


Figure 1 Tulelake Irrigation District development timeline

The District currently encompasses 96,000 acres, of which Tule Lake and the Tule Lake National Wildlife Refuge are included. The irrigable acreage of the District is approximately 64,000 acres, of which approximately 18,000 acres are Federal Lease Lands owned by the United States. In addition to the Federal Lease Lands, the Public Lands include areas utilized by the U.S. Fish and Wildlife Service for farming and other uses.

Typical crop types produced within District include alfalfa, cereal grains, mint, onion, pasture, and potatoes. The general mix of crops within the District is identified in Table 1.

Table 1. Representative cropping pattern (2005)

Crop Type	Acres	Percentage of Total Acres Irrigated
Alfalfa	16,928	26.7%
Cereal Grains [1/]	22,578	35.6%
Mint	2,226	3.5%
Onions	2,668	4.2%
Potatoes	7,536	11.9%
Pasture	1,641	2.6%
Other [2/]	9,777	15.4%
Total	63,354	100%

[1/] Cereal grains consist of acreage planted to barley, wheat, oats, and rye.
[2/] Other crops include peas, horseradish and hay (mostly grasses)

Water Rights and Contracts

Prior to the formation of the District, water was delivered by Reclamation to homesteaders and other landowners. Following the formation of the District, and the execution of Contract No. 14-06-200-5954 with United States, the District began providing water service to lands within the District. The Klamath River water rights for the Klamath Reclamation Project are currently being adjudicated by the State of Oregon. Contractually, Reclamation recognizes certain lands within the District as having a higher contractual priority to Klamath Reclamation Project supplies than other lands. The District is an active participant in the on-going Klamath River Adjudication.

Lands within the District also have rights to use water from Lost River. Although some Lost River water rights were adjudicated in 1918, a recent court decision ruled that the 1918 process had not adjudicated water rights in the Klamath Reclamation Project. There is some uncertainty on this issue. Some lands within the District may possess California riparian rights to Lost River or Tule Lake.

Infrastructure

The majority of the District's surface water supply is from the Klamath River and is directed to the District through an intertie between the Klamath River and the Lost River, known as the Lost River Diversion Channel. Klamath River water is diverted at locations on the Lost River Diversion Channel known as Station 48 and the No. 1 Drain during the irrigation season. These diversions provide Klamath River flows to the District and other water users. The District also receives tailwater from Klamath River water users located north of the California-Oregon State Line including lands within the Klamath Irrigation District. At times, the Lost River provides some surface water to the District.

The District operates and maintains a diversion dam on the channel of the Lost River, known as the Anderson-Rose Dam, located less than one mile north of the California-Oregon State Line. The Anderson-Rose Dam is operated to deliver surface water into the District's J-Canal, which distributes water to more than one-half of the District's irrigated lands through turnouts and lateral canals. The J-Canal also conveys water to other canal systems for delivery to additional lands within the District. Water not diverted by the District at Anderson-Rose Dam flows through the Lost River and into the Tule Lake Sumps. Water regulated and stored within the Tule Lake Sumps may be diverted or re-diverted for irrigation within the District or discharged by the District's D-Pumping Plant to the P-Canal, which serves the Lower Klamath National Wildlife Refuge (LKNWR) and the water users on the P-Canal system of the Project.

The operational spills and tailwater resulting from irrigation within the District are conveyed through the District's extensive drainage system, which utilizes gravity and pumped discharge into portions of the canal system or into the Tule Lake Sumps.

Figure 2 identifies the major facilities within the District, including the conveyance and drainage system.

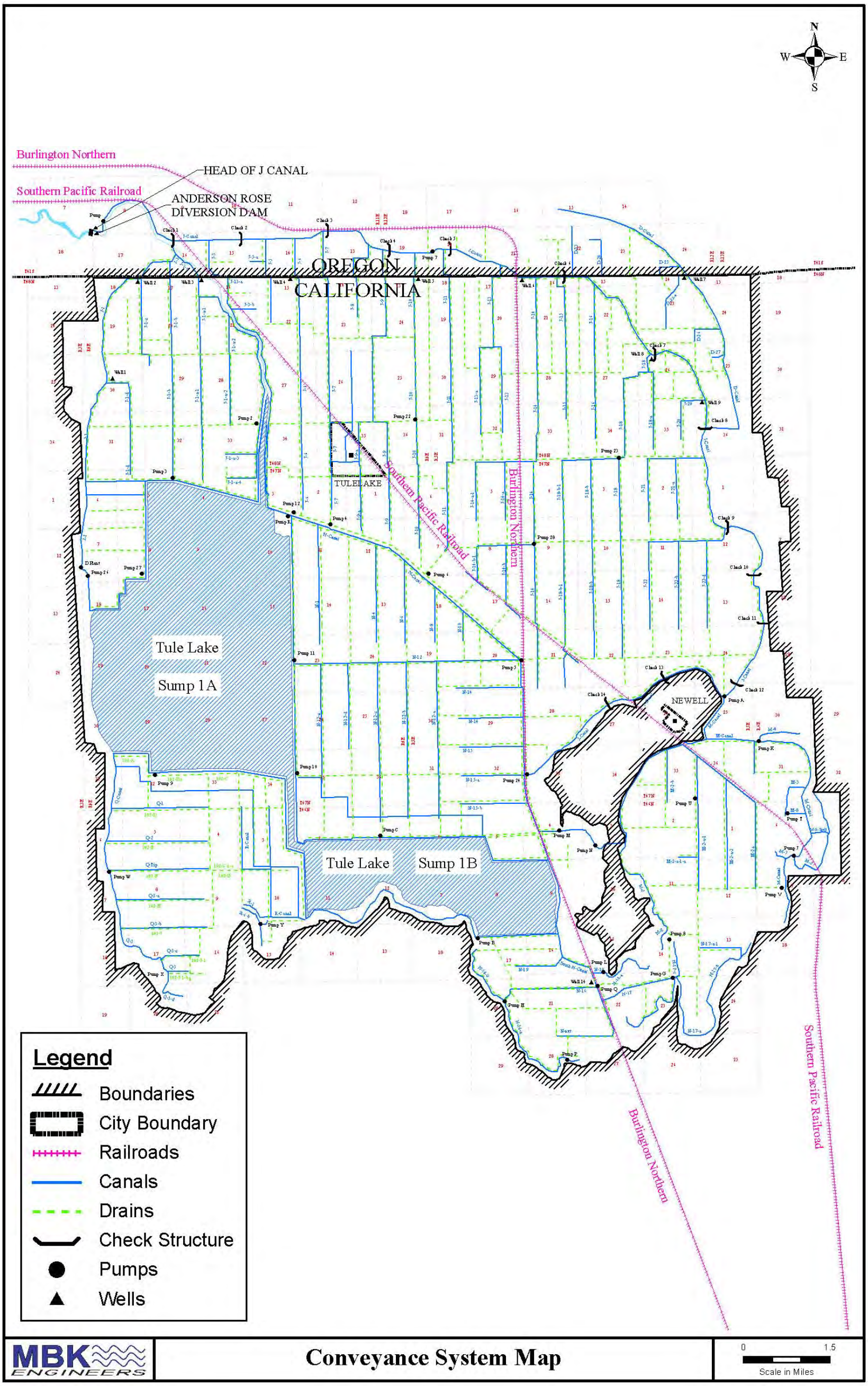


Figure 2. Tulelake Irrigation District conveyance system map

Available Water Supplies

The surface water supplies available to the District include natural flow from the Klamath River, stored water from Upper Klamath Lake and Lake Ewauna, return flows from upstream irrigation, and flow from the Lost River under some conditions. In addition, in 2001, the District constructed 10 groundwater wells to provide supplemental water supplies during dry years. Groundwater is only utilized within the District during dry years and represents a small portion of the total water supplies available in any given year. Table 2 provides a summary of information for the 10 wells owned and operated by the District.

Table 2. District owned and operated groundwater wells

State Well Number (SWN)	District Groundwater Well No.	Well Capacity (cfs)	Well Horse Power	Well Depth	Well Casing (inches)
48N04E30F002M	1	22.3	300	734	24
48N04E18J001M	2	24.5	600	1,541	16 & 14
48N04E16M001M	3	17.8	600	1,681	12
48N04E15K001M	4	24.5	600	1,433	14
48N04E13K001M	5	20.1	600	1,565	14
48N05E16P001M	6	11.6	400	2,380	12
48N05E14R001M	7	9.6	500	2,020	14
48N05E26D001M	8	8.9	400	1,807	14
48N05E36D001M	9	15.6	600	2,043	12
46N05E22D001M	14	27.9	500	567	24

It is important to note that individuals within the District own and operate groundwater wells for domestic, municipal, and irrigation purposes to supplement surface water supplies. Limited data exists in regards to the number and location of the privately owned wells within the District, except those wells that have been monitored by the California Department of Water Resources (DWR) for groundwater elevation or quality. The location, and number of groundwater wells within the District area is further discussed in the *Existing Groundwater Conditions* Section of this GWMP.

Area Covered by GWMP

As further described in *Existing Groundwater Conditions* Section of this GWMP, the District is located within the southeastern region of the Upper Klamath Basin, within the Tule Lake Subbasin. The Tule Lake Subbasin, as defined by DWR Bulletin 118, has a northern boundary contiguous to the California-Oregon border. In general, the District boundary is equivalent to the Tule Lake Subbasin boundary (as defined by Bulletin 118) and for the purposes of this GWMP, the District boundary represents the GWMP area. The GWMP area includes lands in Modoc and Siskiyou Counties. Figure 3 identifies the location of the GWMP area, including pertinent entity boundaries and borders.

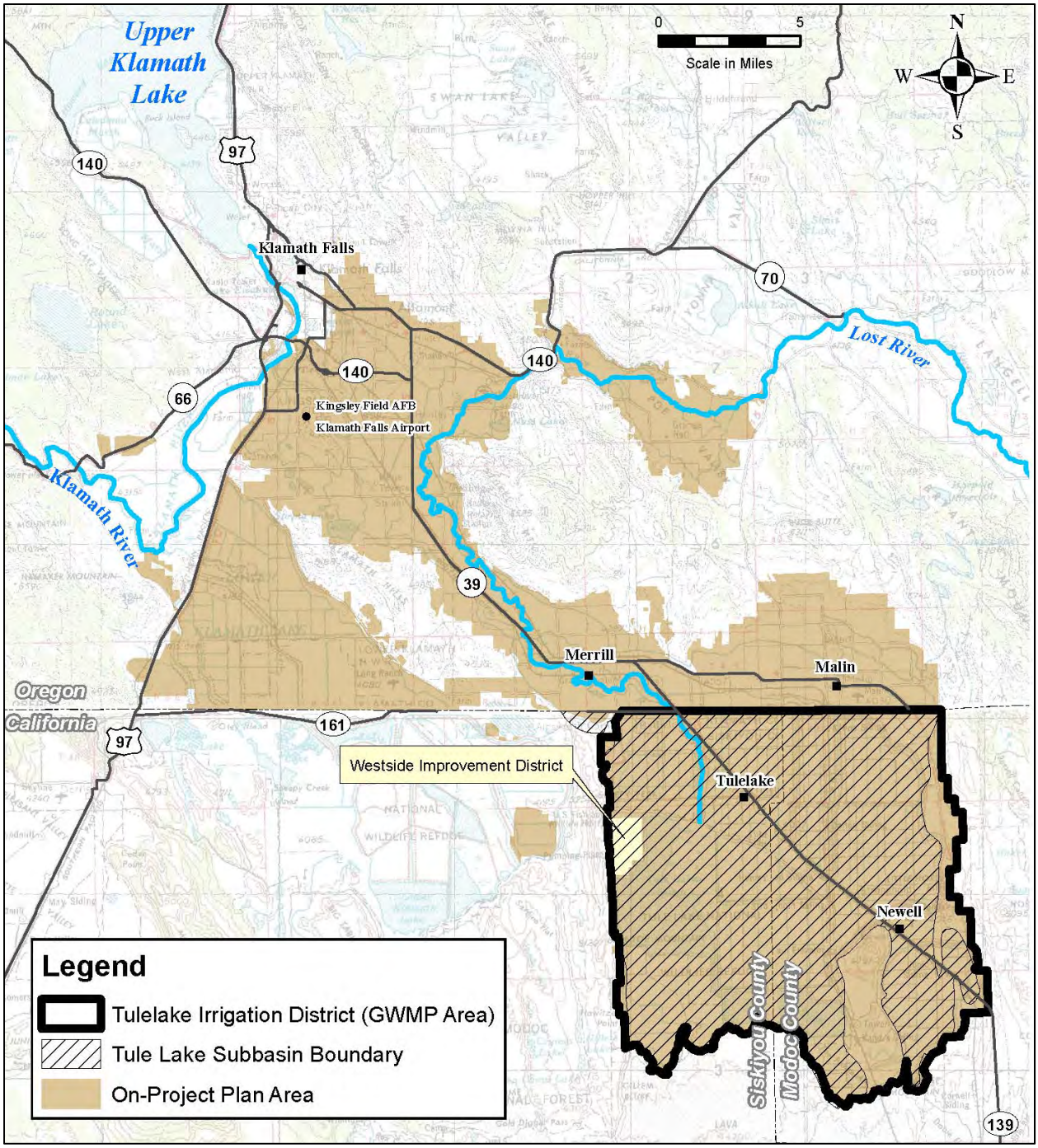


Figure 3. Location of the GWMP area and pertinent entity boundaries

Section 3 - Water Code Provisions Related to Groundwater Management, County Ordinances, Legislation and Agreements

In 1992, the California State Legislature adopted Assembly Bill 3030 (AB 3030) and in 2002 Senate Bill 1938 (SB 1938) was enacted. These two pieces of legislation have been incorporated into the California Water Code (Water Code), Section 10750 et seq., to encourage local public agencies/water purveyors to voluntarily adopt formal plans to manage groundwater resources within their jurisdictions. In 2011 a subsequent piece of legislation, Assemble Bill 359 (AB 359) was adopted amending Sections 10752, 10753, 10753.2, 10753.4, 10753.5, and 10753.7 of the Water Code, relating to groundwater. AB 359 also added Section 10753.11 to, the Water Code. The District has prepared a GWMP to be compliant with AB 3030 and revisions to the Water Code pursuant to SB 1938 and AB 359.

As identified in Section 10753.7 (a)(1-6) of the Water Code a GWMP is required to include the following components:

- Identification of basin Management Objectives for the groundwater basin that is subject to the GWMP,
- Components relating to the monitoring and management of groundwater levels within the groundwater basin, groundwater quality degradation, inelastic land surface subsidence, changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping in the groundwater basin, and a description of how recharge areas identified in the GWMP substantially contribute to the replenishment of the groundwater basin.
    - A map detailing the area of the groundwater basin, as defined in DWR Bulletin 118, and the area of the local agency, that will be subject to the GWMP, as well as boundaries of other local agencies that overlie the basin in which the agency is developing a GWMP, and
    - A map identifying the recharge areas for the groundwater basin,

In accordance with Section 10753.7 (a) (5) the local agency (District) shall adopt monitoring protocols that are designed to detect changes in the groundwater levels, water quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater pumping in the basin. These monitoring protocols shall be designed to generate information that promotes efficient and effective groundwater management.

As provided in Water Code Section 10753.8, a GWMP may include the following components:

- control of saline water intrusion
- identification and management of wellhead protection areas and recharge areas
- regulation of the migration of contaminated groundwater
- administration of a well abandonment and well destruction program
- mitigation of conditions of overdraft

- replacement of groundwater extracted by water producers
- monitoring of groundwater levels and storage
- facilitating conjunctive use operations
- identification of well construction policies
- construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects
- development of relationships with state and federal regulatory agencies
- review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination.

Of the groundwater management components listed in the Water Code, those already being investigated and actively implemented by the District include monitoring of groundwater elevations, facilitating conjunctive use during years when surface water is limited or not available, and development of relationships with local county, state, and federal agencies. The historical focus of groundwater management within the District has been on maintaining the groundwater water supply, in respect to both quantity and quality, and to avoid conditions of overdraft, primarily by developing a supplemental groundwater pumping program specifically during dry years. The District's objective is to continue to deliver surface water supplies to individuals within the GWMP area and to limit the use of groundwater to times when surface water supplies are insufficient to meet demand.

Groundwater management components identified in Water Code Section 10753.8 (recommended components) that have not been implemented or included in the GWMP are applicable to groundwater quality and contamination issues that are not relevant to the GWMP area, e.g. control of saline water intrusion, and control or cleanup of groundwater contamination.

In summary, the District has prepared this GWMP to be compliant with the AB 3030, SB 1938, and AB 359 requirements embedded in the Water Code and its interest in developing and sustaining reliable water supplies. This GWMP identifies three (3) Basin Management Objectives (Management Objectives). In order to meet these objectives, applicable components of AB 3030, SB 1938, and AB 359 have been included within the GWMP in the form of "Elements" which will provide the framework to meet the Management Objectives. These Elements may be a single component as identified in the guidelines for preparation of a GWMP, or they may capture multiple components, as further described in the *Groundwater Management Plan Elements* section of this GWMP.

County Ordinances

Siskiyou and Modoc Counties have provisions in their ordinances for groundwater management and use. In general, these county ordinances which outline a permit process for groundwater extraction for use outside of each respective county do not apply to the District and the GWMP area. There are specific provisions in each county ordinance that allow for the use of water within the boundaries of a district which is in part located within one County and in part in another County (or Counties) where such extraction quantities and use are consistent with

historical practices of a district. These provisions are consistent with current District operations.

California Statewide Groundwater Elevation Monitoring

The California Statewide Groundwater Elevation Monitoring program (CASGEM) is a statewide initiative to collect groundwater elevations and facilitate collaboration between local monitoring entities and DWR. The purpose of the program is to identify seasonal and long-term trends in groundwater levels within California's groundwater basins by regularly and systematically monitoring groundwater elevations in California's alluvial basins and subbasins. CASGEM was approved for implementation on November 9, 2009, and the program began on January 1, 2012. The statute requires, under the guidance of DWR, that local monitoring entities collect and report monitoring data as available using an existing network of monitoring wells, as well as existing established monitoring programs, if relevant. DWR may require that additional monitoring wells be constructed only if funds are specifically provided.

DWR's main role in administering the CASGEM program is to provide public outreach, create and maintain data submittal, and support the local entities through the process of becoming a monitoring entity and preparing their monitoring plans. One of the primary goals of CASGEM is to provide to the public a readily available database for use in water supply planning and management.

The District enrolled in the CASGEM program on behalf of its landowners in 2010. In addition, the District prepared and submitted a Groundwater Monitoring Plan to DWR which defines a groundwater well monitoring network and the frequency and procedure relative to collection of groundwater data (see Appendix B).

Klamath Basin Restoration Agreement

The District is a party to the Klamath Basin Restoration Agreement (KBRA), a broad agreement among many interests covering many subjects. One element of the KBRA is the requirement that Klamath Water and Power Agency (KWAPA), a joint exercise of powers agency of which the District is a member, prepare the so-called "On-Project Plan" (OPP). The OPP generally will cover the major irrigated lands of the Klamath Project that use Klamath River water, which includes lands within the District. The purpose of the OPP is to align water supply and demand within the On-Project Plan Area (OPPA). Implementation of the OPP would be based on federal funding. There are negotiated constraints on the extent to which KWAPA will use, or bring about the use of, groundwater. The development of a GWMP by the District is not part of the OPP process or required by or intended to assist in implementation of the KBRA. However, this GWMP is not expected to be incompatible with the OPP when adopted.

Section 4 - Management Objectives for the GWMP Area

Over the past decade there has been increased development and use of groundwater supplies within the GWMP area. As part of the District's long-term water supply management, the District installed 10 groundwater production wells and began conjunctive use operations in 2001. Since that time the District has integrated groundwater with the available surface water supplies to meet demand during years when surface water availability has been limited.

Following the installation of the District's wells, groundwater elevation, quality and related data have been collected to progressively define and understand basin conditions, and to continue to provide an understanding of potential effects of groundwater pumping within the GWMP area. Information derived from the monitoring and management efforts to date has allowed the District and various individual pumpers in the GWMP area to continue to rely on groundwater to augment the surface water supply to meet local demand during dry periods.

This GWMP provides a management framework for maintaining a high quality, reliable, and sustainable supply of groundwater to the GWMP area. The District has identified the following Management Objectives, for the GWMP area:

Management Objective 1: Development of conjunctive use of groundwater, to support years when surface water is limited or not available to meet demand.

Management Objective 2: Avoidance of overdraft and associated undesirable effects such as declining groundwater elevations, and land subsidence; in effect continue the successful integrated use of groundwater as a supplemental water supply.

Management Objective 3: Preservation of groundwater quality for beneficial use in the GWMP area.

The District's primary purpose is to provide a sufficient water supply to meet all demands within the District boundary and GWMP area. It is the District's intent to continue delivering surface water to landowners as the primary water supply source. During periods where there is limited or no surface water availability, the District and landowners within the GWMP area have and will continue to rely on groundwater pumping to meet demand.

Quantitatively, the preceding goals translate into general provisions for monitoring groundwater levels and quality, including fluctuations in seasonal demands and varying local hydrologic conditions (wet and dry periods). Specific issues to be considered include the evaluation of available groundwater storage capacity, determination of sustainable groundwater yield, and avoidance of land subsidence.

Section 5 - Existing Groundwater Conditions

The following section provides a brief background of the geology and hydrology of the Upper Klamath Basin and the portion of the Upper Klamath Basin that is covered by the GMPW area (Tule Lake Subbasin). In addition, this section summarizes available data relative to groundwater elevations, groundwater quality, and surface level subsidence within the GWMP area. As further described below, limited water quality and groundwater elevation data exists for the GWMP area, in terms of both the spatial and temporal distribution of data collection. Where possible, observations were provided to qualify the short term trends (from 2001 to 2011) in order to provide additional explanation and background. These observations were then used during the development of the GWMP Elements.

Upper Klamath Basin Regional Geologic Setting

The Upper Klamath Basin is approximately 8,000 square miles and is located in south central Oregon and northeastern California on the east side of the Cascade Mountain Range. Figure 4 identifies the location of the Upper Klamath Basin. As further described in this section, the Tule Lake Subbasin is located in the southeastern portion of the Upper Klamath Basin. The following section briefly describes the geologic settings of the Upper Klamath Basin, including hydrologic units, direction of groundwater flow, and locations where recharge to the Upper Klamath Basin is occurring.

Figure 4. Upper Klamath Basin boundary and Tule Lake Subbasin boundary

Volcanic and tectonic activity formed most of the Upper Klamath Basin. The main geologic provinces are the Cascades Range to the west of the Upper Klamath Basin, consisting of relatively low-permeability rocks, and the Basin and Range fault-block mountains and sediment-filled basins farther to the east. The rock formations that comprise the groundwater basin include brecciated lava flows, volcanic vent deposits, and coarse-grained facies of volcaniclastic sedimentary deposits (MBK Engineers et al, 2012a).

A key feature of the rock formations of the groundwater basin are the deformations caused by multiple generations of Basin and Range faulting, which further complicate the stratigraphy. The faulting causes vertical displacement of the strata, thereby enhancing the interconnectedness of the permeable layers within the groundwater basin. The region consists of extensive block faulting that forms north-to-northwest trending graben valleys separated by large horst mountain blocks (Jenks and Beaulieu, 2001). In general, the rock formations of the groundwater basin are a series of interconnected productive aquifers intermixed with less permeable basalt and layers of low-permeability volcaniclastic sediment.

Hydrologic units in the area mainly consist of Tertiary volcanic flows and Quaternary alluvial sediments that fill the lake basins and fluvial valleys (Gates, 2001). Figure 5 identifies the hydrologic units of the Upper Klamath Basin, Oregon and California.

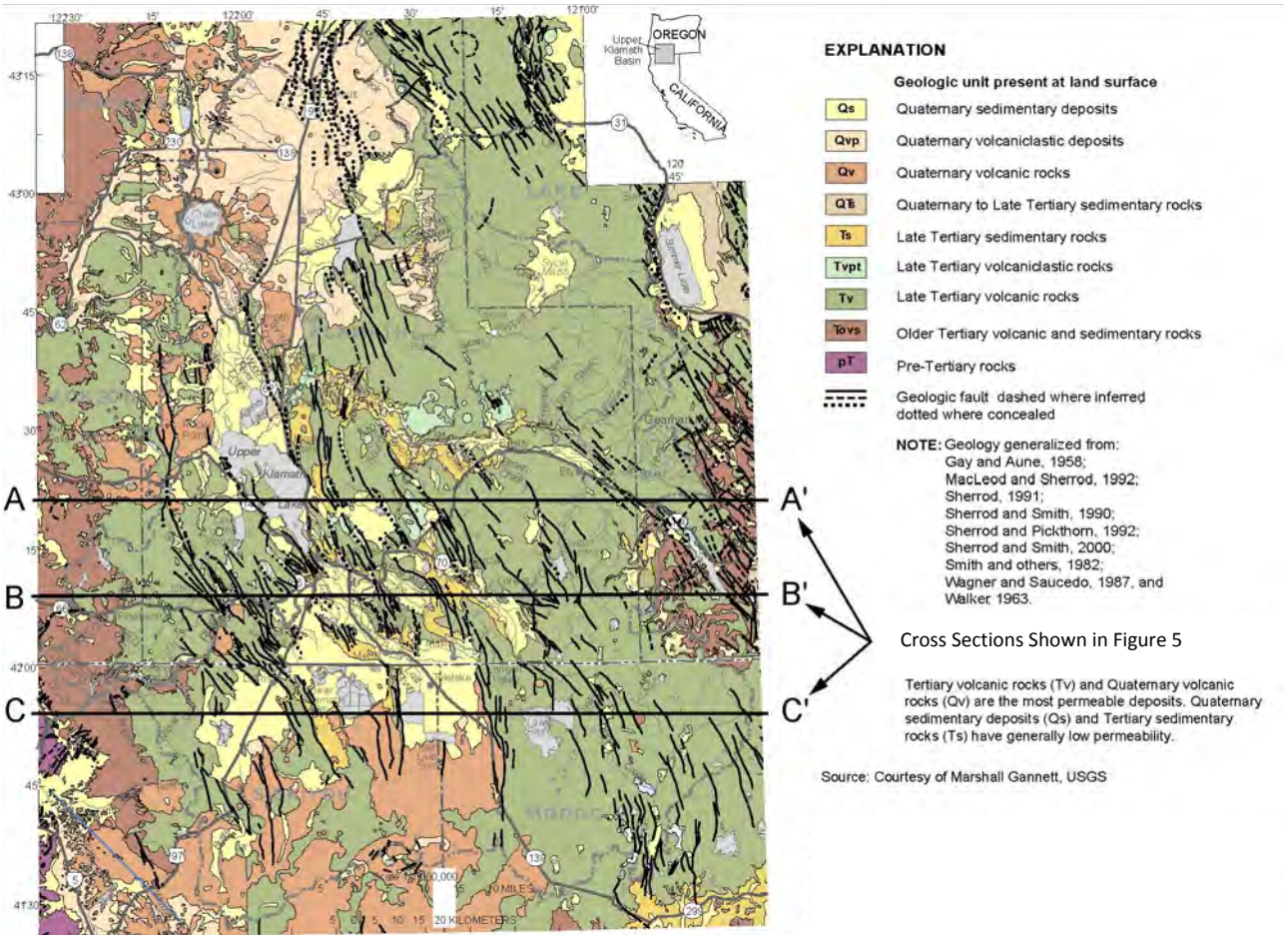


Figure 5. Hydrologic Units of the Upper Klamath Basin, Oregon and California

Figure 6 shows a series of west-to-east geologic cross sections through the central part of the Upper Klamath Basin. These cross sections show the late tertiary volcanic rock units as well as older tertiary volcanic rock units of the groundwater basin and the quaternary and tertiary sedimentary aquifers.

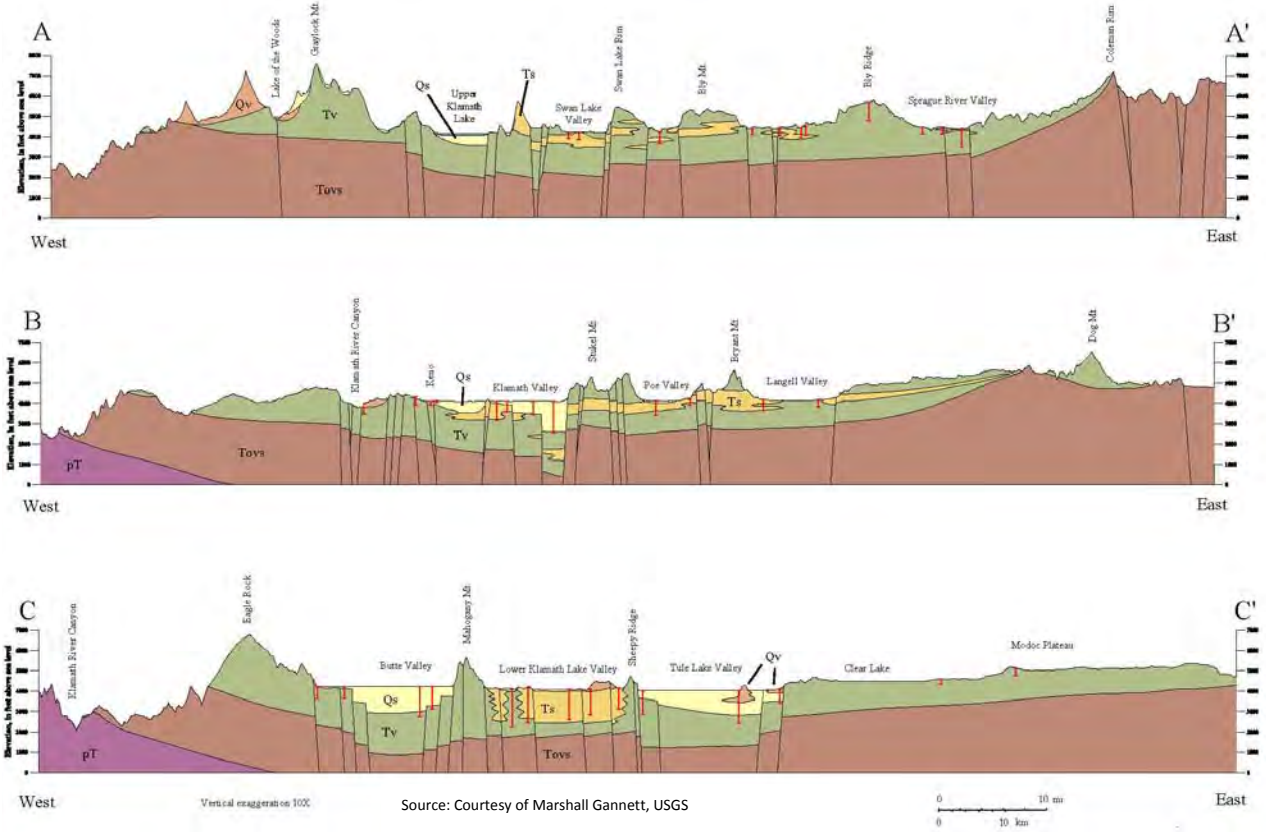
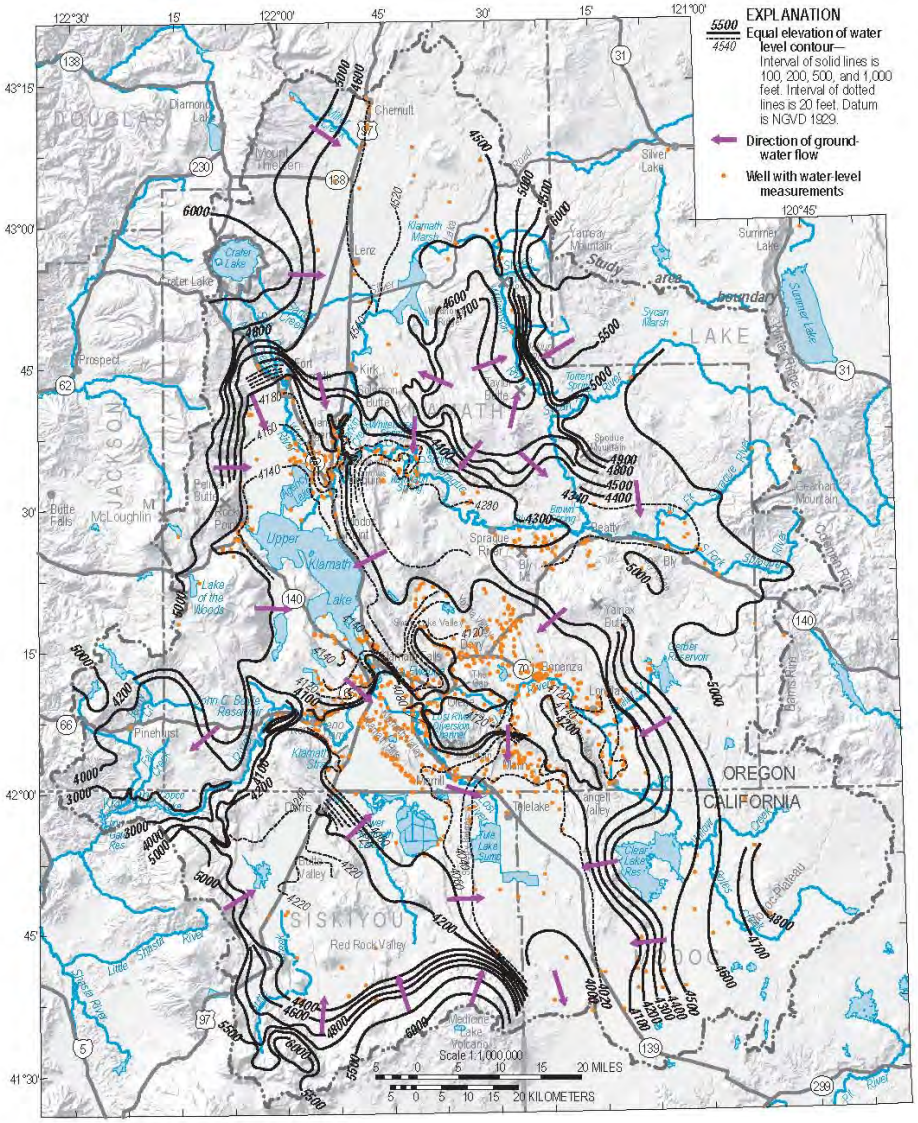


Figure 6. Generalized Geographic Sections through the Central Part of the Upper Klamath Basin

Geothermal resources are present within the Upper Klamath Basin as indicated by hot springs and hundreds of geothermal wells in and near Klamath Falls, near and south of Olene Gap, and areas near the Klamath Hills. Other geothermal areas include Swan Lake Valley; Langell Valley southwest of Lorella, Oregon; and several other areas within the Upper Klamath Basin. There are no known regions of geothermal resources underlying the GWMP area.

The location and quantity of groundwater movement, including migration and recharge within any groundwater basin is difficult to quantify, as there are various factors that affect each of the components. In many cases, limited data regarding one aspect of the movement of groundwater can make it difficult to develop a comprehensive understanding of the groundwater basin. In order to better understand groundwater in the Upper Klamath Basin, a groundwater simulation and management model (Model) was developed by the USGS, in collaboration with Oregon Water Resources Department, and Reclamation. This Model provides improved understanding of how groundwater and surface-water system responds to varying hydrologic conditions and groundwater pumping within the Upper Klamath Basin. In order to develop this Model, the USGS relied on countless reports compiled within the Upper Klamath Basin relative to surface and groundwater. One of these reports, titled *Ground-water*

*Hydrology of the Upper Klamath Basin, Oregon and California (*Gannett et al, 2007) describes that groundwater flow in the Upper Klamath Basin is influenced by topography, geologic composition, stream system geometry, recharge of precipitation and applied water, and groundwater production from wells. The groundwater flow system receives large amounts of recharge from deep percolation of precipitation and snowmelt in the Cascades Range and upland areas within and on the eastern margins of the basin. The primary components of groundwater discharge include discharge to streams through a complex of springs within the Upper Klamath Basin interior and discharge to wells at various locations and depths. Groundwater in the Upper Klamath Basin generally flows toward Upper Klamath Lake, the Klamath River Canyon, and the Tule Lake Subbasin (see Figure 7; Gannett et al., 2007).

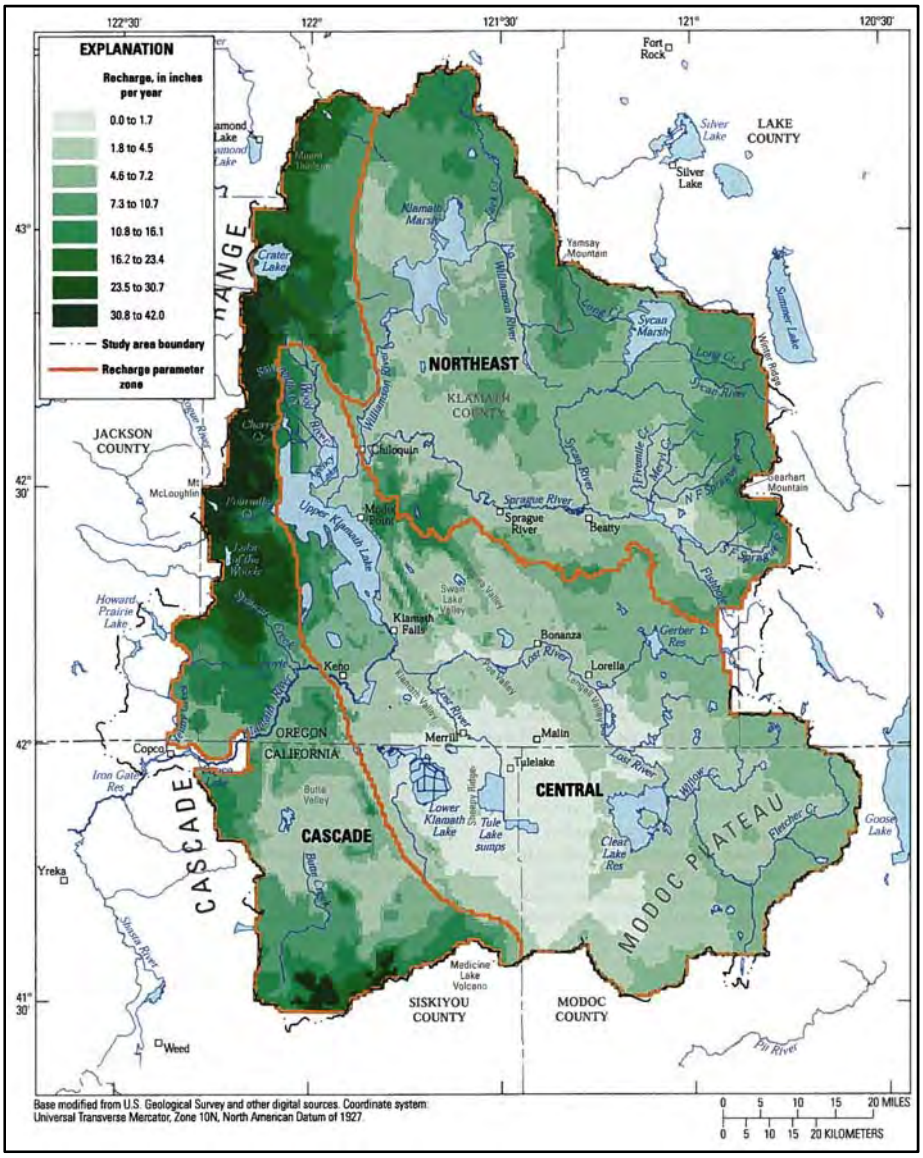


Gannett, Marshall W., Kenneth E. Lite, Jr., Jonathan L. LaMarche, Bruce F. Fisher, and Daniel J. Polette. 2007. *Ground-Water Hydrology of the Upper Klamath Basin, Oregon and California.* USGS Scientific Investigations Report 2007-5050, Version 1.1.

Figure 7. Generalized Water-Level Contours and Approximate Directions of Regional Groundwater Flow within the Upper Klamath Basin, Oregon and California

Groundwater Recharge within the Upper Klamath Basin

Groundwater recharge is generally greatest in upland areas where the largest amount of precipitation occurs. The principle recharge areas in the Upper Klamath Basin are the Cascade Range and uplands within and on the eastern margin of the Upper Klamath Basin. During the development of the Model, the quantity and location of groundwater recharge was estimated within the Upper Klamath Basin, based on representative parameter values applied to the Model. Figure 8 identifies the estimated quantity and distribution of recharge in the Upper Klamath Basin, Oregon and California. The average annual recharge from precipitation is estimated to be approximately 2.6 million acre-feet per year within the Upper Klamath Basin (Gannett et al, 2012).



Source: Gannett et al. *Ground-Water Hydrology of the Upper Klamath Basin, Oregon and California,* 2012.

Figure 8. Estimated mean annual groundwater recharge from precipitation in the Upper Klamath Basin, Oregon and California, 1970-2004, in inches, and recharge parameter zones

Irrigation activities also can result in groundwater recharge. Irrigation canals typically lose some water to the shallow parts of the groundwater system. No data are available to determine the amount of ground-water recharge from canal leakage and deep percolation of irrigation water in the Upper Klamath Basin (Gannett et al, 2007). However, groundwater recharge from irrigation activities is indicated because the water table in the shallow aquifers in the Klamath Reclamation Project area rises during the irrigation season, and 2001 measurements showed the shallow water table decline when irrigation was severely curtailed during that irrigation season (Gannett et al, 2007).

Tule Lake Subbasin

The Tule Lake Subbasin as defined by DWR Bulletin 118 (Basin No. 1-2.01, Bulletin 118-2003) covers 76,000 acres within the southeastern portion of the Upper Klamath Basin, bounded to the west by Sheepy Ridge, to the south by low lying volcanic fields of the north slope of the Medicine Lake Highlands, to the east by the Bryant Mountain Highlands, and to the north by the California and Oregon state line. It is acknowledged by DWR that the northern portion of the Tule Lake Subbasin physically extends into Oregon, and is bounded by Stukel Mountain and Buck Butte Highlands areas. However, for the purposes of the development of this GWMP, only the portion of the subbasin as identified by Bulletin 118 is included in the GWMP area. The location of the Tule Lake Subbasin boundary as compared to the Upper Klamath Basin boundary is identified in Figure 4.

The geology in the Tule Lake Subbasin is consistent with the regional geologic setting described in the *Upper Klamath Basin Regional Geologic Setting* sub-section of the GWMP. The Tule Lake Subbasin is formed mainly by faults within the area, the exception being the southern boundary which is the low-lying volcanic fields of the Medicine Lake Highlands. This area is a large shield volcano where Medicine Lake occupies the crater at the peak. The Gillems Bluff Fault is the Tule Lake Subbasin's western boundary. This fault is a major feature of the Medicine Lake volcanic highlands and forms the escarpment of Sheepy Ridge which creates the separation of the Tule Lake and Lower Klamath Subbasins. The eastern boundary of the Tule Lake Subbasin is the Big Crack fault which forms the mountains between Tule Lake and Clear Lake Reservoir. The physical northern boundary of the Tule Lake Subbasin is made up of northwest trending faults. However as previously described, and for the purposes of this GWMP, the California and Oregon border represents the northern extent of the Tule Lake Subbasin.

Water Bearing Formations

DWR Bulletin 118 includes descriptions of the subsurface water bearing materials in the Tule Lake Subbasin. The principal formations include Tertiary to Quaternary lake deposits and volcanics.

Pleistocene Upper Basalt – These basalt flows border the subbasin on the south (to the west of the Peninsula) following the north flank of the Medicine Lake Highlands and outcrop as a boundary to the southeast of Coptic Bay. The unit is unweathered, vesicular, and olivine which is highly permeable. The flows are above the saturated zone, but due to fracturing, some areas readily yield water to wells and also allow for recharge.

Pleistocene Intermediate Basalt – These rocks border the subbasin to the south and east. The unit is thin-bedded flows of diabasic olivine basalt and generally highly permeable due to jointing and bedding planes. However, in some areas extensive cross faulting has created low yields; however, in area of sufficient fractures, interconnections, and saturated depths, wells can yield moderate to large quantities of water. High yields are found in the Panhandle region where the unit is greater than 400 feet thick with well yields up to 9,500 gallons per minute (gpm). Moderate yields are found in the area of Prisoners Rock and the Peninsula. In this vicinity, the unit reaches up to 400 feet thick with well yields ranging from 500 to 3,100 gpm.

Pliocene to Holocene Lake Deposits – The lake deposits are found away from the boundaries of the subbasin and consist of sand, silt, clay, ash, lenses of diatomaceous earth, and semi-consolidated shale. These deposits have a low permeability and may act as a confining layer. Wells in the deposits would yield approximately 30 gpm and be less than 150 feet deep.

Pliocene to Miocene Lower Basalt – This older unit of basalt forms the northeastern barrier of the subbasin and is exposed to the surface to the east and west. Where the unit is exposed it exhibits fracturing and is an important source of recharge for the basin. The material ranges from ophitic olivine basalt to porphyritic basalt which exhibits weak columnar jointing. The aquifer is highly permeable and mainly confined within the subbasin where it underlies lake sediments. The basalt is ranges in depth from 810 on the east side of the basin to 1,190 feet mid-basin and 190 feet on the far west side of the subbasin. Well yields on the east side range from 4,000 to 7,000 gpm; well yields from the mid-basin west range from 9,000 to 12,000 gpm.

Groundwater Pumping

Groundwater pumping within California is not regulated by the State. Instead it is limited by rules of correlative rights and reasonable use that ordinarily are applied in litigation settings. Due to the lack of available data, there is uncertainty as to the precise quantity of groundwater that is pumped within the GWMP area. DWR has estimated annual extractions from the groundwater basin within the GWMP area of approximately 8,500 acre-feet (i.e., non-dry year pumping) (DWR, 2011). This groundwater pumping is primarily for domestic, stockwatering, and municipal supplies (e.g., City of Tule Lake).

Larger scale pumping in the GWMP area has been due to participation in water bank programs during years where surface water supplies have been limited. DWR has estimated that groundwater pumping during the 2001 through 2009 period ranged from approximately 10,000 acre-feet to 70,000 acre-feet within the GWMP area (DWR, 2011). This pumping estimate includes the 8,500 acre-feet of estimated pumping for domestic, stockwatering, and municipal supplies.

A significant reduction in available surface water supplies in 2010 to the Klamath Reclamation Project (including deliveries to the District) resulted in the greatest quantity of groundwater pumped for participation in the 2010 Water User Mitigation Program (WUMP) as compared to previous water bank programs. Therefore, groundwater pumping during the 2010 irrigation season for participation in the 2010 WUMP was reviewed.

Approximately 101,200 acre-feet of groundwater was pumped for participation in the 2010 WUMP within the Klamath Reclamation Project, of which approximately 54,400 acre-feet was pumped within the District (GWMP area). The remaining 47,800 acre-feet of groundwater was pumped within the Oregon portion of the Klamath Reclamation Project.

Groundwater extractions in 2010 represent the largest exercise of the groundwater basin underlying the Klamath Reclamation Project (and GWMP area), and as such the potential effects, including the drawdown and recovery, are significant to understanding the groundwater basin response to pumping. A report titled Groundwater Efficiency Use Analysis Task 2 and 3 prepared for Klamath Water and Power Agency in 2011. This report identified the location and quantity of groundwater pumping and defined regions for analysis. Only those areas where wells participated in the 2010 WUMP were divided into regions. Therefore, the large area in the middle and southwest corner of the District were not included in a region, as no wells within these areas participated in the 2010 WUMP. Figure 9 identifies the various regions within the GWMP area and the wells within those regions.

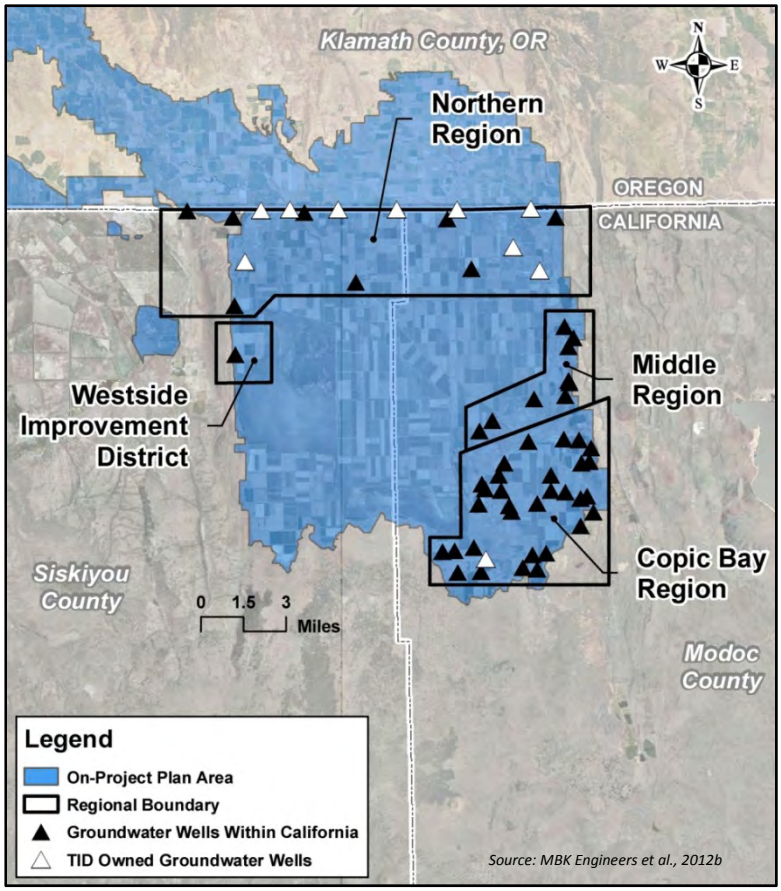


Figure 9. Subregions within Tulelake Irrigation District

The volume of groundwater pumping within each region during 2010 is identified in Table 3.

Table 3. Groundwater Pumping within GWMP area during 2010

Region	Quantity Pumped (acre-feet)	Percentage of Pumping within each Region
Northern	23,960	44%
Middle	2,943	5%
Copic Bay	27,361	50%
Westside Improvement District	99	>1%
Total	54,363	100%

As identified in Table 3 the majority of the pumping within the GWMP area in 2010 occurred within the Northern and Copic Bay region. This distribution identifies approximately half of the groundwater pumping within the GWMP area occurred in the southeastern portion of the District during 2010. This pumping distribution may be representative of potential future pumping if surface water is not available to meet the demand within the GWMP area.

Groundwater Elevations

Groundwater elevation data has been collected by DWR and the USGS beginning in the 1980's within the GWMP area. Prior to 1999, DWR monitored groundwater elevations in five wells twice each year (spring and fall). In 1999, an expanded groundwater monitoring program was developed through a contract with Reclamation to increase the monitoring well network from five wells to thirty five (35) wells. By the mid 2000's the monitoring well network had expanded to an average of seventy (70) wells monitored on a monthly basis within the Tule Lake Subbasins and an adjacent subbasin (the Lower Klamath Subbasin).

The groundwater elevation data collected by DWR and other entities, including the District is uploaded to the DWR Water Data Library (WDL): http://www.water.ca.gov/waterdatalibrary/index.cfm. Table 4 identifies the State Well Number (SWN), location, depth, depth of perforations, use type, and period of monitoring of the approximately 70 wells monitored within the Tule Lake Subbasin on a monthly basis.

Table 4. Wells monitored for groundwater elevations within and near the GWMP area

State Well Number	Well Location		Well Depth (ft)	Perforations (ft)		Well Use	Period of Record	
	UTM East	UTM North		Top	Bottom		Begin	End
48N05E36K001M	636857	4646373	66	21	66	Stock	11/9/2001	Present
48N05E36A002M	637472	4646826	528			Irrigation	9/16/1998	Present
48N05E35F001M	634950	4646522	32	25	32	Domestic	8/22/1987	Present
48N05E33H001M	632533	4646676	57			Irrigation	9/10/1998	Present
48N05E26D001M (TID Well No. 8)	634823	4648412	1810	1250	1802	Irrigation	9/12/2001	Present
48N05E25Q002M	637118	4647239				Domestic	11/9/2001	Present
48N05E24P001M	636676	4649183	112			Domestic	9/9/1998	Present
48N05E22L001M	633295	4649188	65			Stock	9/10/1998	Present
48N05E22H001M	634129	4649916	203	36	203	Irrigation	7/23/2002	Present
48N05E16P001M (TID Well No. 6)	631643	4650575	2600	823	2358	Irrigation	8/10/2001	Present
48N05E14R001M (TID Well No. 7)	635760	4650660	2030	814	2020	Irrigation	8/16/2001	Present
48N05E13R003M	637344	4650713				Domestic	4/25/2002	2/25/2010
48N04E35C001M	625776	4646739	2790	2561	2761	Municipal	12/22/2003	Present
48N04E35G001M	626538	4646542	220			Irrigation	8/13/1998	Present
48N05E36D001M (TID Well No. 9)	636270	4647161	2043			Irrigation	9/05/2001	Present
48N04E31N002M	618801	4645596	337	292	337	Domestic	10/17/1995	Present
48N04E31M001M	618885	4645689	40			Domestic	8/20/1998	Present
48N04E30F004M	619471	4647993				Domestic	11/7/2001	Present
48N04E30F002M (TID Well No. 1)	619583	4647681	740	260	700	Irrigation	6/27/2001	Present
48N04E30F001M	619526	4647740	142			Industrial	8/20/1998	Present
48N04E30E001M	619060	4647474	185	19	185	Domestic	9/30/1998	Present
48N04E30C002M	619503	4648378	84	69	74	Domestic	11/2/2001	Present
48N04E28D001M	622541	4648128	140			Irrigation	8/20/1998	Present
48N04E22M001M	623798	4649129	135	31	135	Domestic	11/8/2001	Present
48N04E19C001M	619377	4649996	38	22	38	Domestic	11/7/2001	Present
48N04E18L003M	619372	4650598	110	98	110	Domestic	8/19/1998	Present
48N04E18J001M (TID Well No. 2)	620463	4650579	1550	1260	1540	Irrigation	8/27/2001	Present
48N04E17C001M	621254	4650589	159	89	129	Domestic	11/8/2007	Present
48N04E16M001M (TID Well No. 3)	622152	4650599	1710	1053	1681	Irrigation	8/16/2001	Present
48N04E16L002M	623088	4650624	150	50	150	Industrial	8/1/1998	Present
48N04E15K001M (TID Well No. 4)	624805	4650629	1440	1212	1433	Irrigation	8/10/2001	Present
48N04E14M001M	625532	4650579	127			Stock	9/16/1998	Present
48N04E13K001M (TID Well No. 5)	628217	4650610	1570	935	1557	Irrigation	8/12/2001	Present
48N03E34N001M	614107	4645584	262			Stock	9/1/1998	Present

State Well Number	Well Location		Well Depth (ft)	Perforations (ft)		Well Use	Period of Record	
	UTM East	UTM North		Top	Bottom		Begin	End
48N03E14M001M	615964	4650542	454			Irrigation	9/11/1998	3/29/2010
48N02E14J001M	607580	4650361	203	21	200	Domestic	8/17/1998	4/21/2010
47N06E30H001M	639048	4638513	680	198	650	Irrigation	9/15/1998	Present
47N06E19D002M	637956	4640502	245			Irrigation	9/3/1998	Present
47N06E06N002M	637707	4644032	1575			Irrigation	9/3/1998	Present
47N06E06N001M	637714	4644033	85			Irrigation	9/3/1998	Present
47N05E33F001M	631976	4637066	54			Industrial	8/18/1998	Present
47N05E26F001M	635184	4638313	105	78	98	Irrigation	8/18/1998	Present
47N05E04M001M	631148	4644392	71	68	72	Industrial	10/28/1987	Present
47N05E01N001M	636509	4643988	65	49	65	Domestic	10/28/1987	Present
47N05E01H001M	637501	4644971	1000			Stock	3/18/1999	Present
47N04E07Q001M	619097	4642356	1170	146	289	Irrigation	9/2/1998	Present
46N06E08E001M	639424	4633481	213			Irrigation	9/8/1998	Present
46N06E07K002M	638839	4633192	100			Domestic	9/8/1998	Present
46N05E24P002M	636799	4629838	188	140	188	Irrigation	8/18/1998	Present
46N05E23G002M	635418	4630333	209	150	190	Irrigation	8/14/1998	Present
46N05E22D001M (TID Well No. 14)	633266	4630751	571	114	554	Irrigation	7/31/2001	Present
46N05E21M001M	631682	4630060	325	32	100	Irrigation	7/24/2002	Present
46N05E21J001M	632719	4630034	32			Domestic	11/9/2001	Present
46N05E16N001M	631419	4631249				Domestic	11/9/2001	Present
46N05E09J003M	632842	4633205	132			Industrial	8/18/1998	Present
46N05E03P001M	633424	4634509	173	10	89	Monitoring	9/3/1998	Present
46N05E03M003M	633203	4634749				Irrigation	7/23/2008	Present
46N05E03M002M	632965	4635144	252			Irrigation	9/4/1998	Present
46N05E03M001M	632976	4635138	126			Irrigation	9/4/1998	Present
46N05E01P001M	636763	4634300	101	87	101	Domestic	10/25/1994	Present
46N05E01B001M	636943	4635559	140			Irrigation	5/24/2001	Present
41S12E23H001W	634935	4651610	150			Industrial	11/9/2001	Present
41S12E22Q001W	632785	4650754	600			Industrial	11/8/2001	Present
41S12E21Q001W	631062	4651080				Domestic	11/8/2001	Present
41S12E19Q001W	627992	4650692	300			Domestic	11/8/2001	Present
41S12E16J001W	631556	4652891	380			Municipal	11/8/2001	Present
41S12E15M002W	631946	4652420	84			Municipal	11/8/2001	Present
41S11E16R002W	622342	4650776	70			Industrial	8/28/2002	Present
41S11E16R001W	622046	4650694	27			Domestic	11/8/2001	Present

Note: Additional groundwater elevation measurements are available for District owned wells beginning in January, 2001. These data have not been uploaded to the WDL.

Figure 10 identifies the distribution of groundwater wells actively monitored for groundwater elevations within and near the GWMP area. The wells shown on this figure include groundwater wells drilled to depths such that extraction may occur from the alluvial aquifer or from the deeper, more productive volcanic aquifer. For the purposes of this GWMP, wells that most likely pump from the alluvial aquifer (those with shallow perforation and depths less than 500 feet) are described as "shallow groundwater wells". Wells with depths greater than 500 feet and deep perforations most likely pump from the deeper volcanic aquifer and are described as "deep groundwater wells". Well depth and construction information, including perforations are not available for all groundwater wells monitored for elevations within the GWMP area. Some wells with unknown depths are also shown on Figure 10.

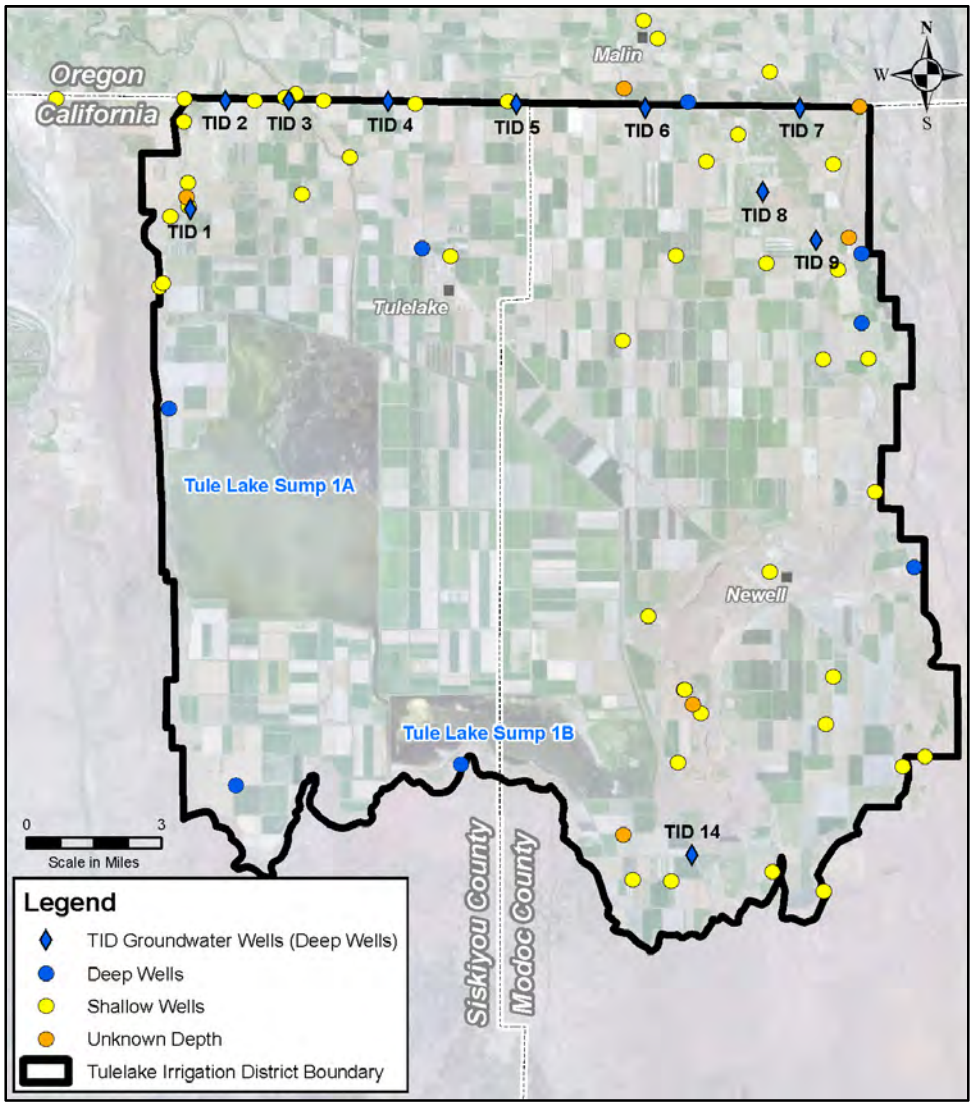


Figure 10. Wells monitored for groundwater elevations within and near the GWMP area

The reduction in available surface water supplies beginning in 2001 has resulted in an increase in groundwater extraction within the Klamath Reclamation Project and the GWMP area. As a result, recent trends in groundwater elevation are reflective of not only climatic conditions and surface water recharge, but also the generally increased, although varying, levels of annual

groundwater extraction. Figure 11 identifies the location of the wells where groundwater elevation data was reviewed and represented in hydrographs include (Figures 12 through 20) as further described below.

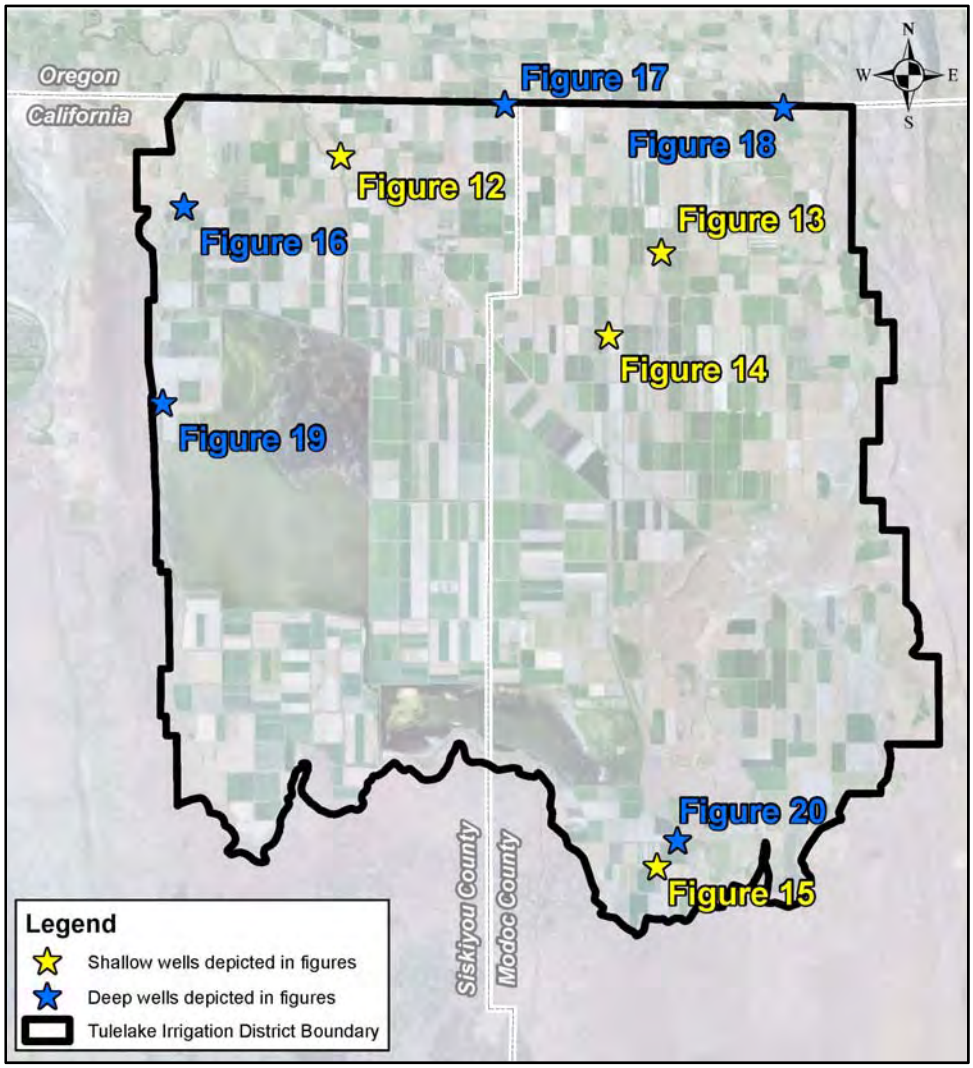


Figure 11. Wells monitored for groundwater elevations within and near the GWMP area represented in Figure 12 though Figure 20

Figures 12 through 15 include wells described previously as relatively shallow groundwater wells, those with drilling depths of less than 500 feet. Figures 16 through 20 include wells described as deep groundwater wells, i.e., those with well depths greater than 500 feet.

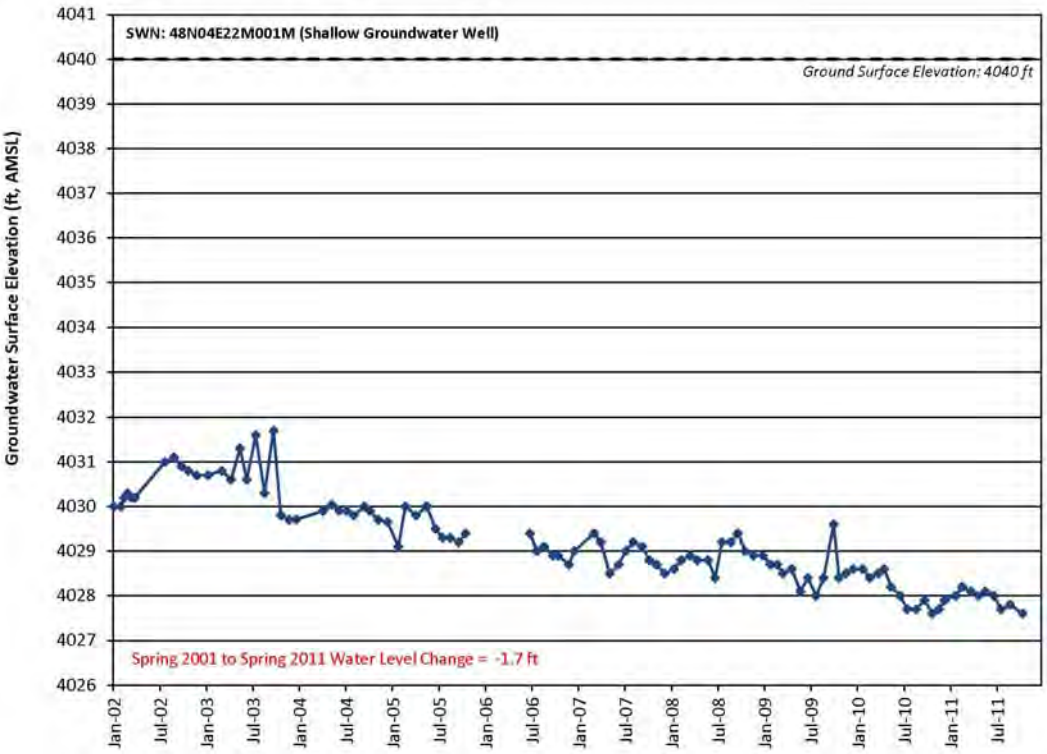


Figure 12. Groundwater hydrograph for SWN: 48N04E22M001M

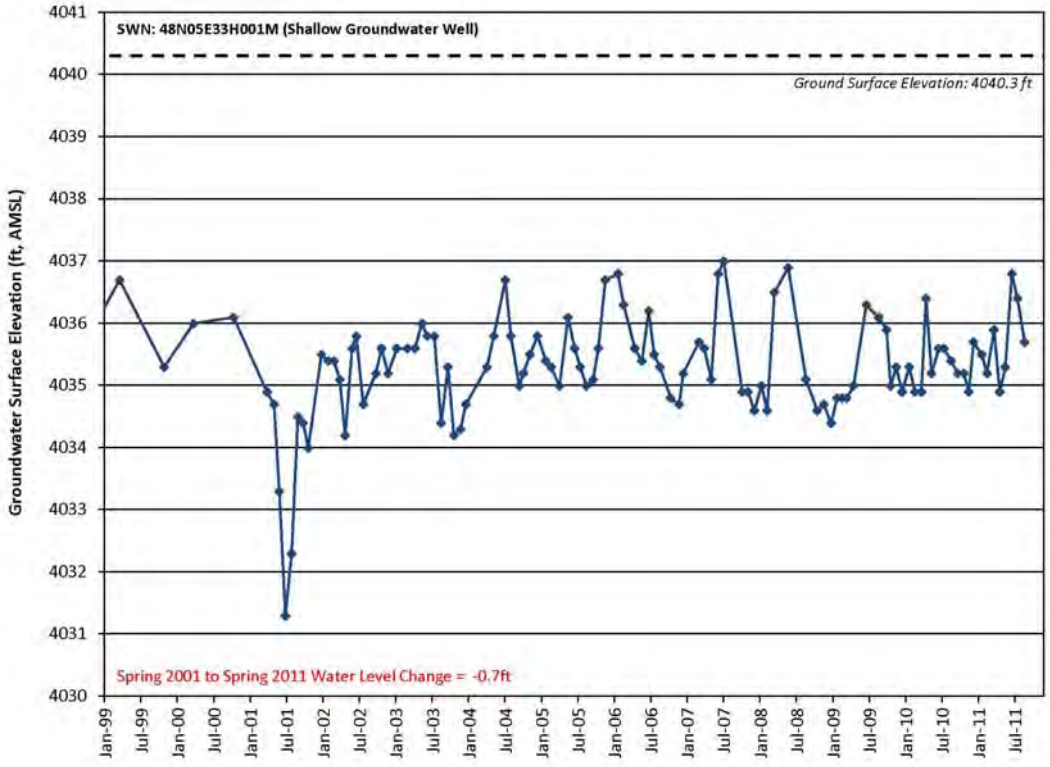


Figure 13. Groundwater hydrograph for SWN: 48N05E33H001M

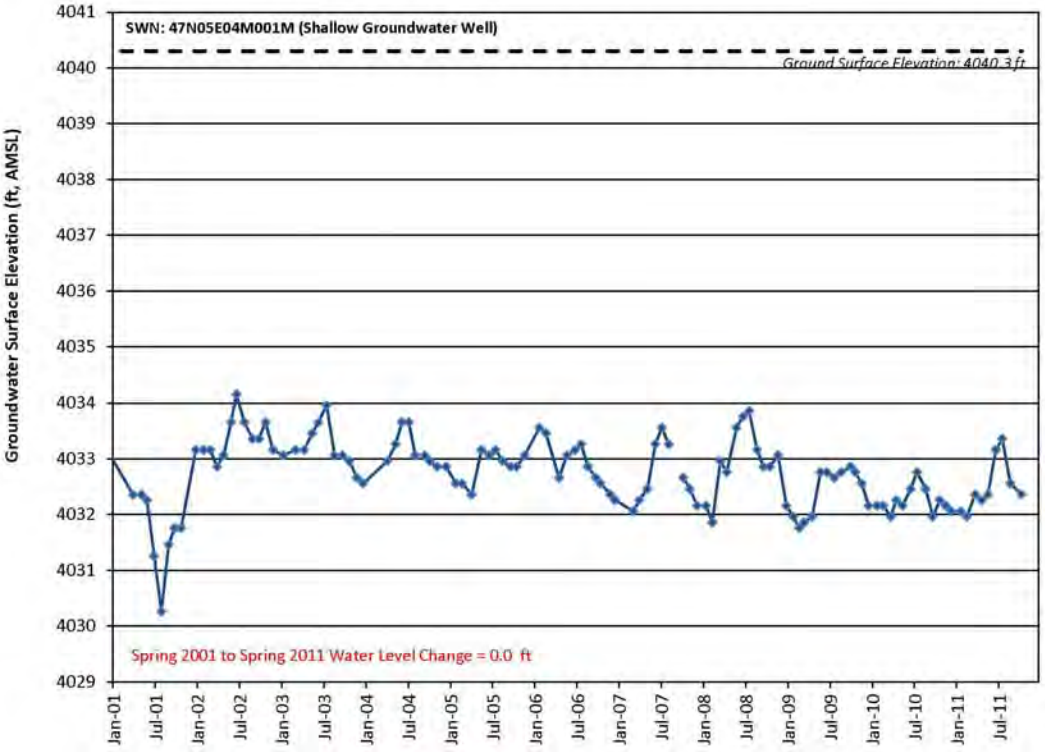


Figure 14. Groundwater hydrograph for SWN: 47N05E04M001M

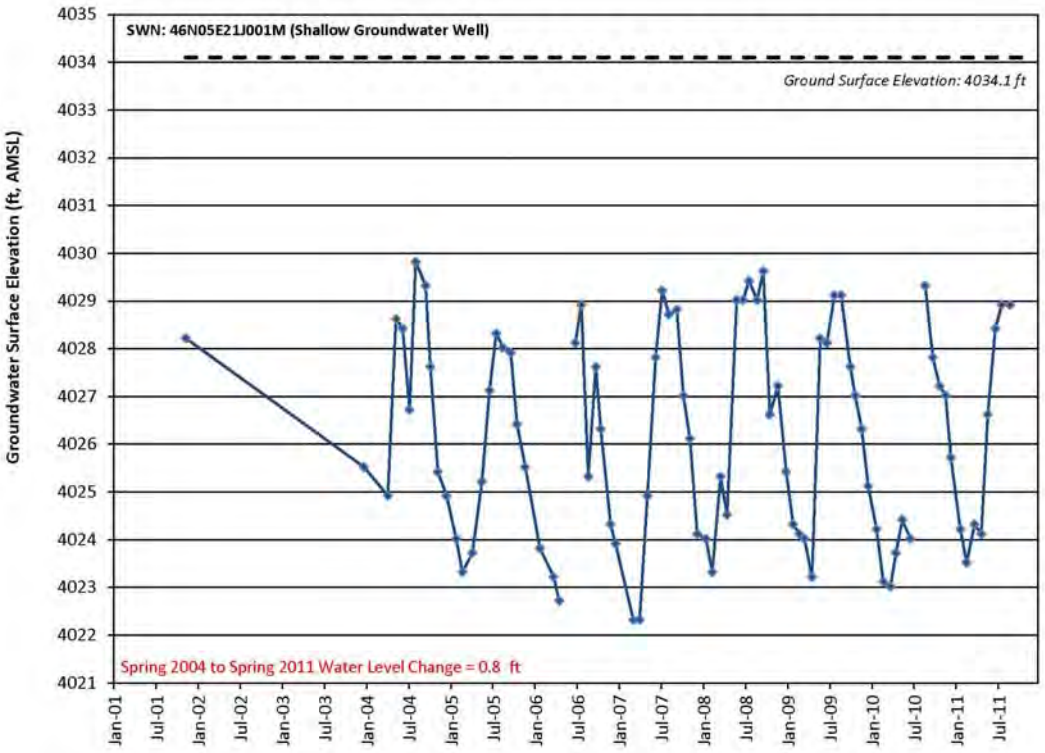


Figure 15. Groundwater hydrograph for SWN: 46N05E21J001M

As indicted in Figures 12 through 15 relatively shallow groundwater wells within the GMWP area show minimal changes (less than 2 feet) in groundwater elevations when comparing spring 2001 to spring 2011 groundwater elevations. This is indicative of these wells pumping from the alluvial (shallow) aquifer which is likely recharged through local precipitation, deep percolation of irrigation flows, and canal seepage. Hydrographs of shallow wells throughout the GWMP area identify a similar (minimal) change in groundwater elevations during this time period.

In order to identify potential changes in groundwater elevations within the volcanic aquifer underlying the GMWP area, hydrographs of deeper groundwater wells (drilled deeper than 500 feet) are identified in Figures 16 through 20.

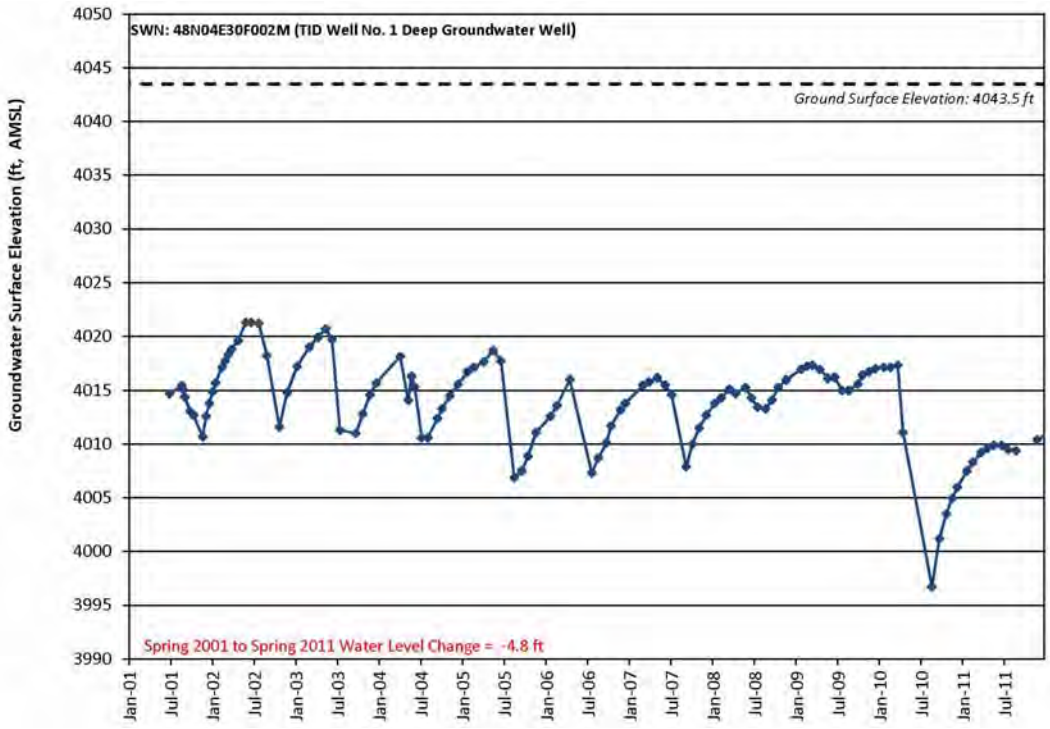


Figure 16. Groundwater hydrograph for SWN: 48N04E30F002M (TID Well No. 1)

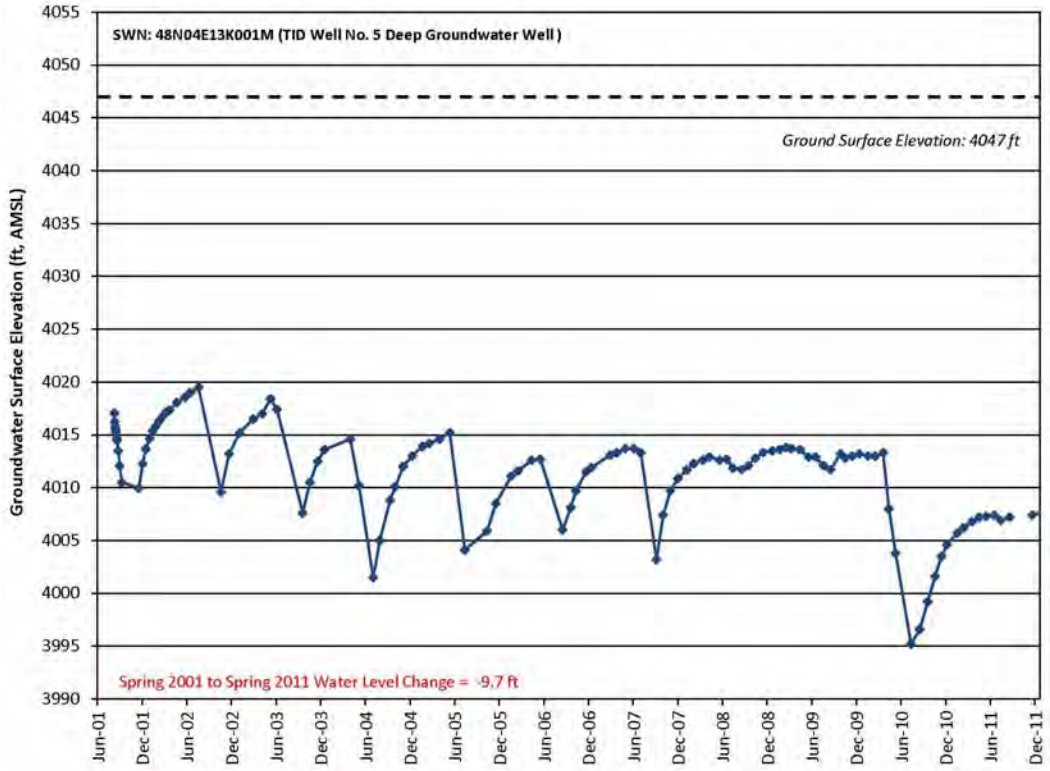


Figure 17. Groundwater hydrograph for SWN: 48N04E13K001M (TID Well No. 5)

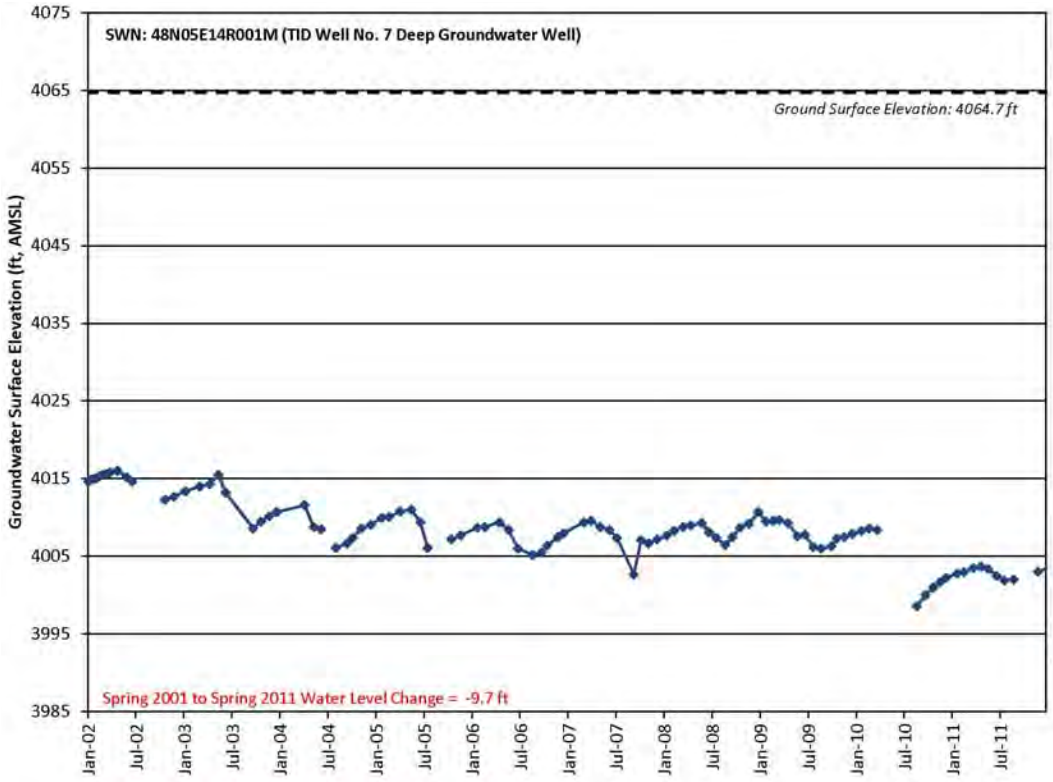


Figure 18. Groundwater hydrograph for SWN: 48N05E14R001M (TID Well No. 7)

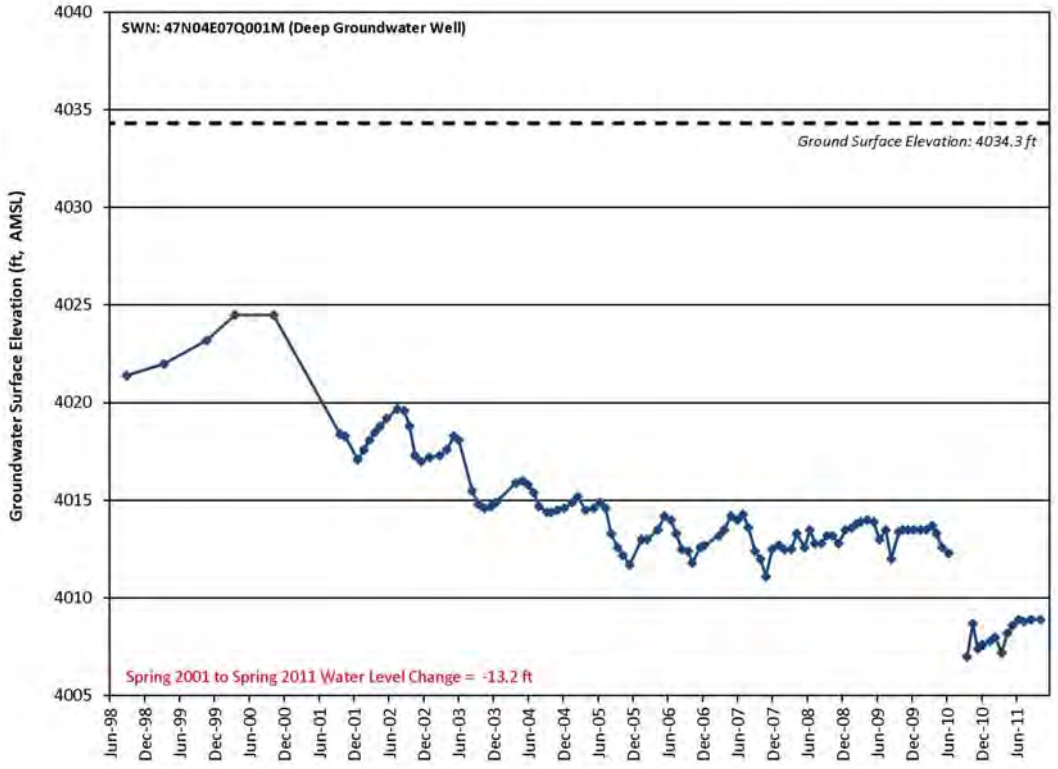


Figure 19. Groundwater hydrograph for SWN: 47N04E07Q001M

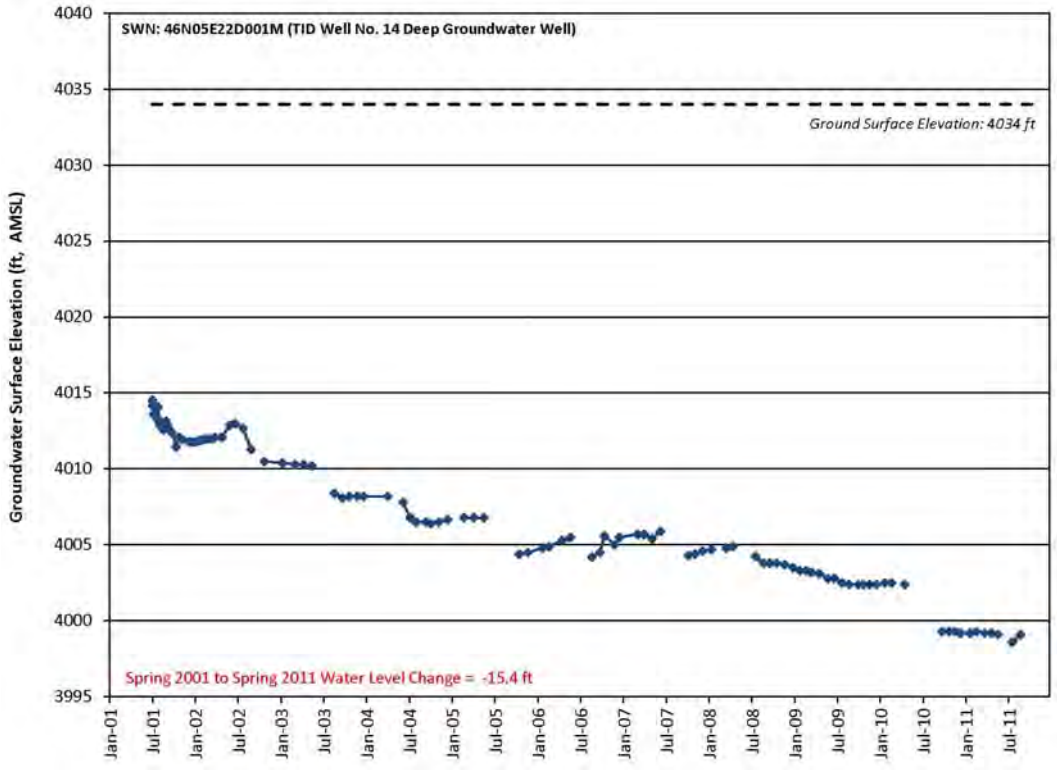


Figure 20. Groundwater hydrograph for SWN: 46N05E22D001M (TID Well No. 14)

The hydrographs for deeper groundwater wells show a greater change in the groundwater elevations from spring 2001 to spring 2011 as compared to the hydrographs for the shallow groundwater wells. This deeper volcanic aquifer appears to be primarily recharged through precipitation and the groundwater movement of flows from north to south within the Upper Klamath Basin. The change in spring 2001 to spring 2011 elevation at these groundwater wells ranges from approximately -5 feet to approximately -15 feet.

It is important to note, that the deeper aquifer is likely recharged from precipitation; and therefore, groundwater elevation trends may be more directly impacted through the quantity of groundwater extracted and climatic conditions. Since the increased level of monitoring and groundwater extraction that has occurred in 2001, there has not been a period of more than one consecutive year of above average precipitation in the Upper Klamath Basin. Unfortunately, limited data exists in regards to groundwater elevation data prior to 2001, during wet and dry hydrologic periods in order to better qualify historic fluctuations in groundwater elevations within the deeper volcanic aquifer.

The following figures represent groundwater elevation data from deep groundwater wells (deeper than 500 feet), as these wells indicate the potential effects from both dry hydrologic conditions and groundwater pumping within the deeper volcanic aquifer.

Figure 21 identifies groundwater elevations and contours within the GWMP area for spring 2001, prior to the groundwater pumping during the subsequent irrigation season (ft, AMSL). For the purposes of developing the contours, spring 2001 and 2010 elevations observed during the months of March and April were utilized. However, for the development of the spring 2001 contour, data from January for the District's wells was the only elevation data available; and therefore, these January data were also utilized to develop the figures.

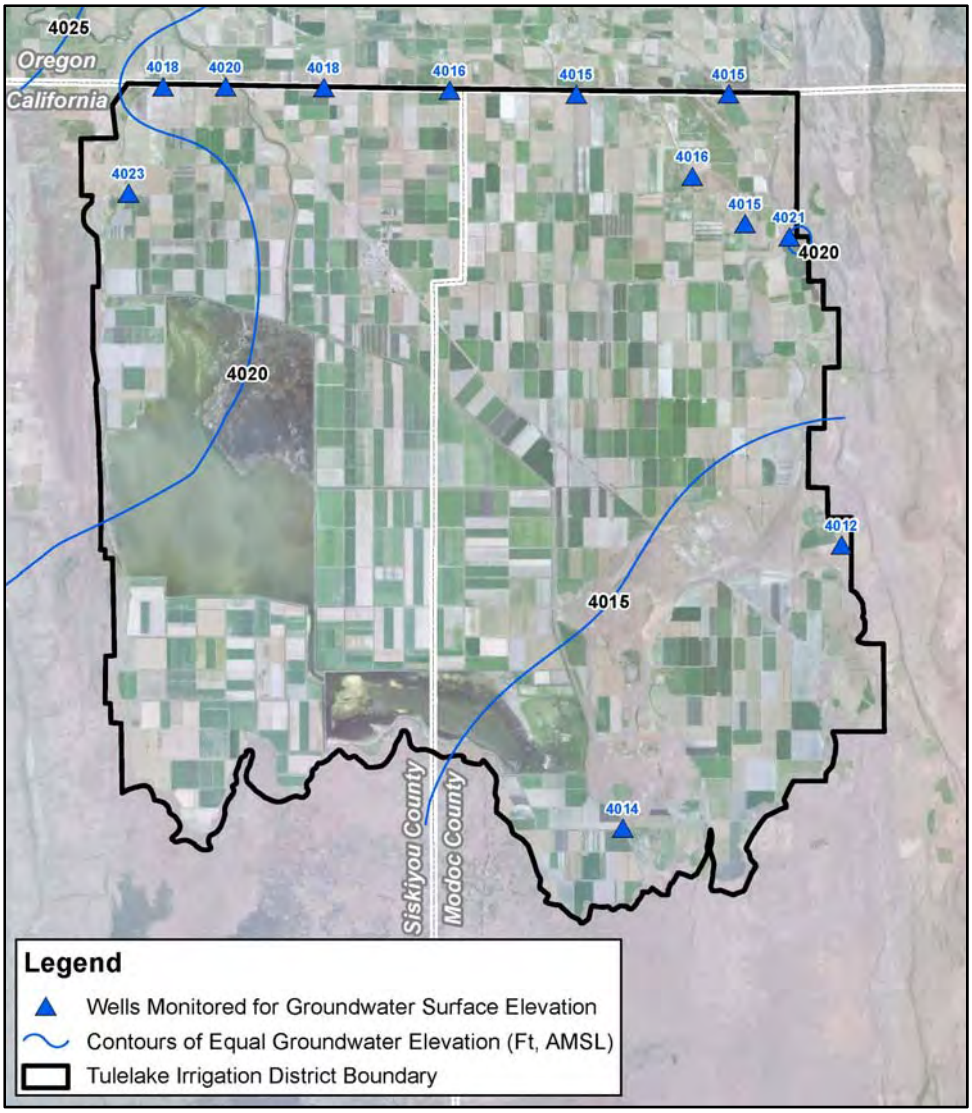


Figure 21. Spring 2001 groundwater surface elevations.

As previously stated, 2001 surface water deliveries were limited. This resulted in an increase in groundwater pumping during the 2001 irrigation season. Additional reductions in available surface water supplies following 2001, specifically during the years 2002-2007, and 2010 resulted in increased groundwater pumping within the GWMP area in those years.

Figure 22 shows spring 2010 groundwater elevations and contours within the GWMP area.

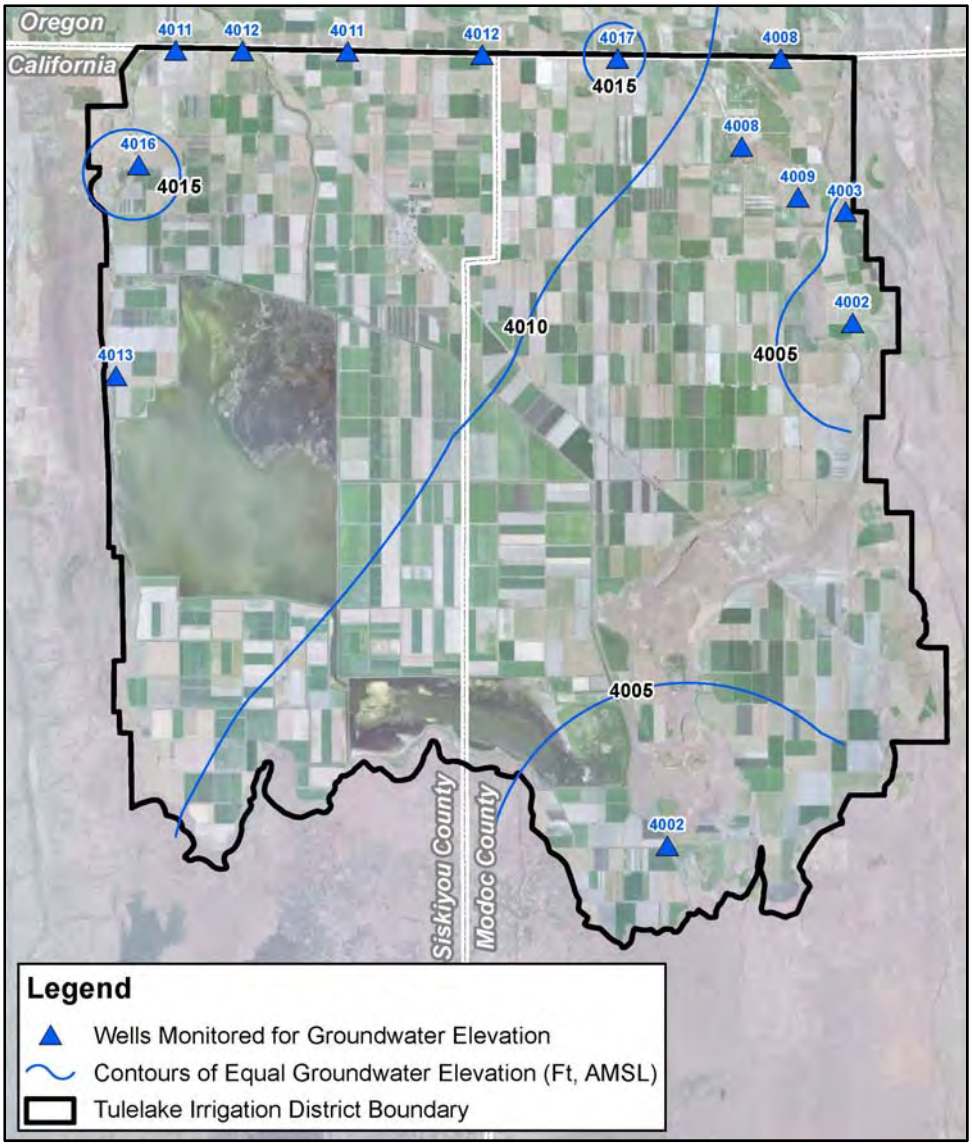


Figure 22. Spring 2010 groundwater surface elevations.

Significant surface water curtailments during the 2010 irrigation season resulted in an additional increase in groundwater pumping within the GWMP area, as compared to recent pumping (post 2001). Figure 23 shows fall 2010 groundwater elevations and contours within the GWMP area.

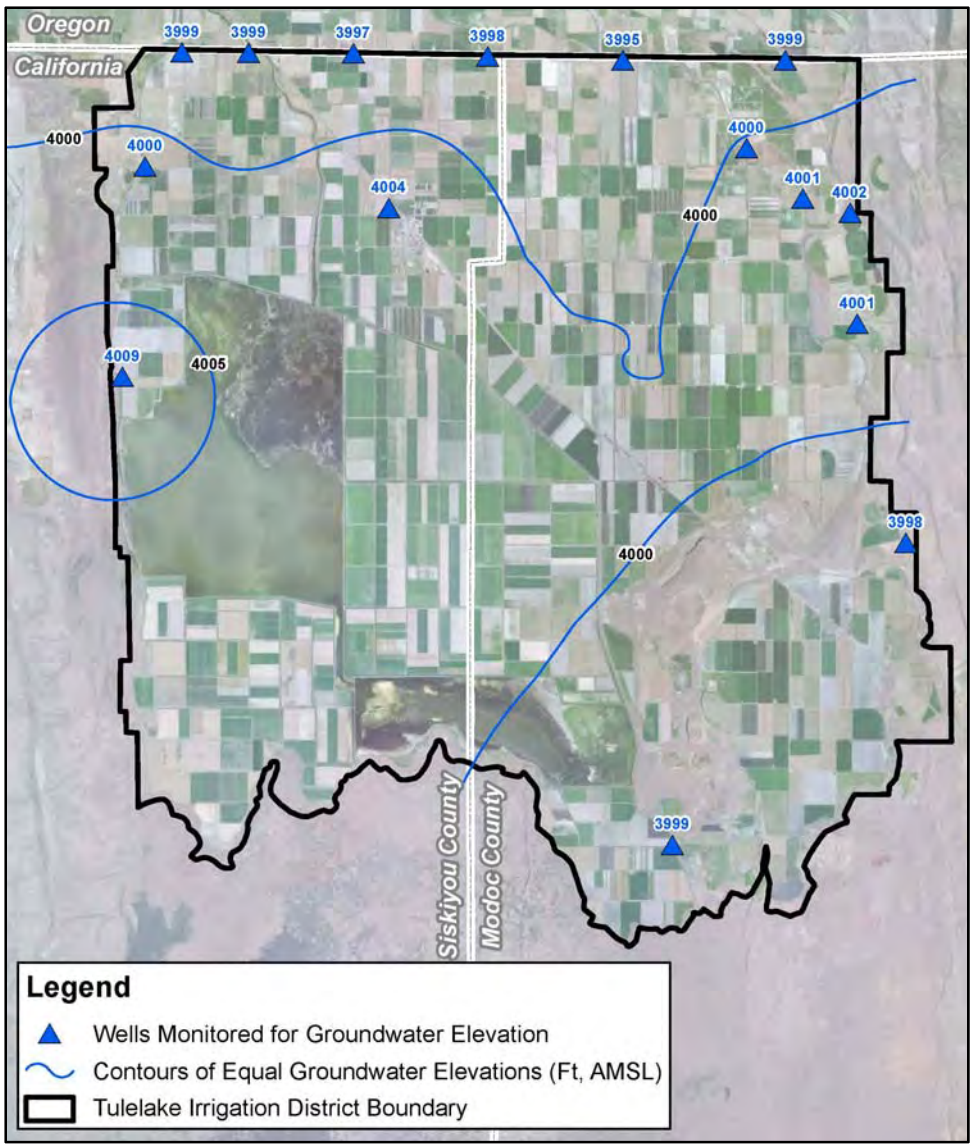


Figure 23. Fall 2010 groundwater surface elevations.

Figure 24 shows the relative change in groundwater elevations between the spring of 2010 and fall of 2010.

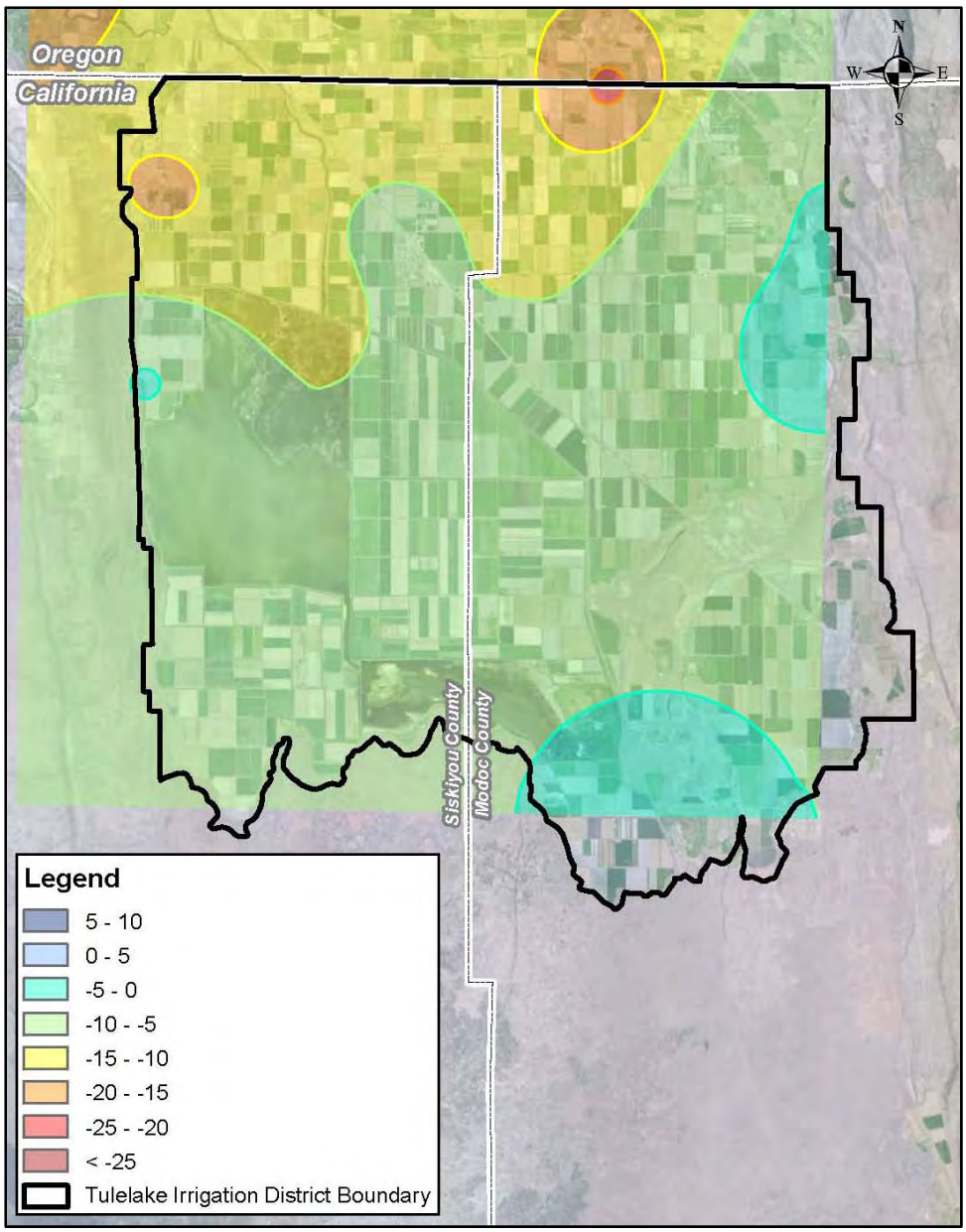


Figure 24. Change in groundwater surface elevations from spring 2010 to fall 2010.

Localized cones of depression appear to be the result of pumping within the northern region of the GWMP area. As depicted in Figure 24, cones of depression identify declines in groundwater elevations of approximately 0 to -20 feet.

Figure 25 identifies the spring 2011 groundwater elevations and contours within the GWMP area.

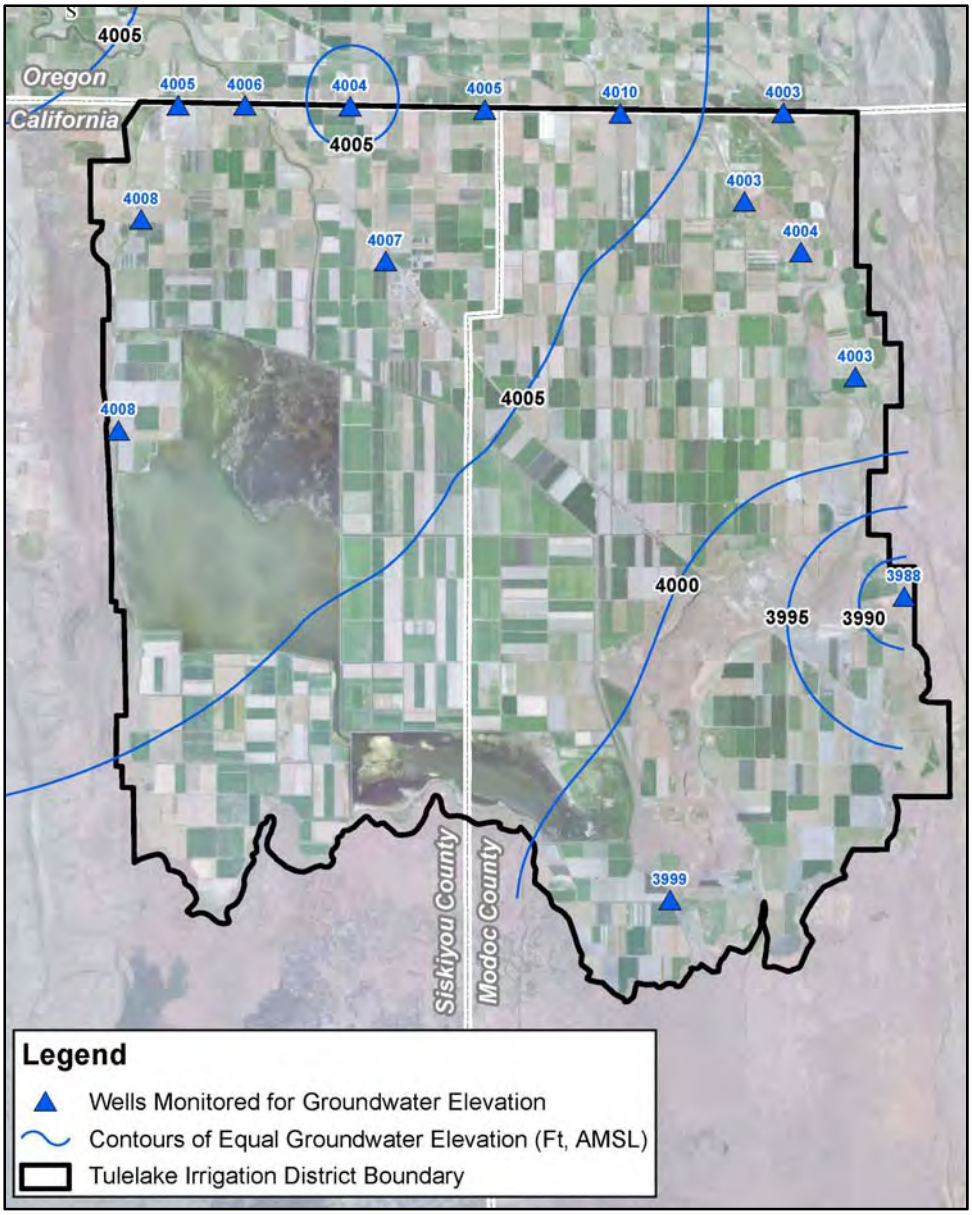


Figure 25. Spring 2011 groundwater surface elevations.

As depicted in Figure 25, groundwater elevations underlying the northern portion of the GWMP area increased slightly (by an average of approximately +5) from the fall of 2010 to the spring of 2011. The wells in the south eastern portion of the GWMP area do not indicate similar recovery occurred during this period.

Land Subsidence

Land subsidence is the lowering of the ground surface though compaction of compressible, fine-grained strata. Compaction can be fully reversible (elastic) or permanent (inelastic). Elastic compaction and expansion generally occur in response to seasonal groundwater level fluctuations. Inelastic compaction is more likely to occur when prolonged dewatering of clay

units occur during periods when the aquifer is not fully recharged and groundwater levels reach historic lows.

Monitoring of land subsidence within the Upper Klamath Basin, and Tule Lake Subbasin has been limited. Historically land subsidence was monitored along transects by comparing periodic spirit level surveys conducted by the USGS and the National Geodetic Survey (NGS). In the mid-1980s, a transition was made from the spirit level surveys to global positioning system (GPS) surveys. Like spirit level transects, GPS monitoring of subsidence relies on periodic resurveying of a network of monuments. In 2001, DWR defined a network of monuments and preformed a GPS survey of the ground surface elevation. In 2011, DWR re-surveyed the monuments to identify any potential land subsidence. Although the final report summarizing the results of the survey has not been published, preliminary reports and conversations with DWR Northern District staff have identified that there is no evidence of land subsidence within the Tule Lake Subbasin (personal communication: Lawrence, 2011).

Groundwater Quality

Limited groundwater monitoring data are available within Tule Lake Subbasin for the parameters typically used to assess quality for irrigation purposes. In addition, many of the groundwater wells have not been monitored frequently, with many wells being sampled only once during the period of record for a parameter.

DWR Bulletin 118 generally describes the water quality of the groundwater within the Tule Lake Subbasin as ranging widely in response to the source and proximity to sources of surface and subsurface impairment. Water quality for wells constructed in the unconfined volcanic rocks within and adjacent to the Tule Lake Subbasin is good with a sodium-bicarbonate character and a total dissolved solids (TDS) ranging from 150 to 270 mg/L. A shift in water quality is observed with the unconfined volcanics that are proximate to lake sediments. The character shifts to a sodium/calcium/magnesium-bicarbonate/sulfate water that is much higher in total dissolved solids (600 to 800 mg/L), which generally increases in proportion to the penetrated thickness of interfingering lake deposits (DWR, 2004).

For the purposes of this GWMP general water quality thresholds identified for each of the groundwater quality parameters below are based on the *Water Quality for Agriculture, FAO Irrigation and Drainage Paper 29 Rev 1.* Although it is recognized that the guidelines for interpretations of water quality for irrigation identified in the *Water Quality for Agriculture* (FAO, 1985) are general guidelines for the understanding of potential affects (decreased yields) for sensitive crops, these values have been referenced as a conservative assumption.

It is important to note that groundwater is utilized as a supplemental water supply within the GWMP area, and when available, irrigators rely on surface water supplies or a combination (blending) of surface and groundwater supplies to irrigate crops.

Total Dissolved Solids (TDS)

Within the Tule Lake Subbasin, levels of TDS are higher in areas closer to the lake deposits and are proportional to the thickness of the deposit layer. Water from the wells in volcanic rocks several miles from the lake deposits or from deep wells developed beneath the confining lake

deposits typically contain low to moderate TDS (DWR 2004). TDS concentrations above 450 mg/L may be undesirable for sensitive crops (FAO, 1985). The maximum TDS concentrations observed in wells with TDS data during the period 1999 through 2011 in the vicinity of the GWMP area are illustrated in Figure 26.

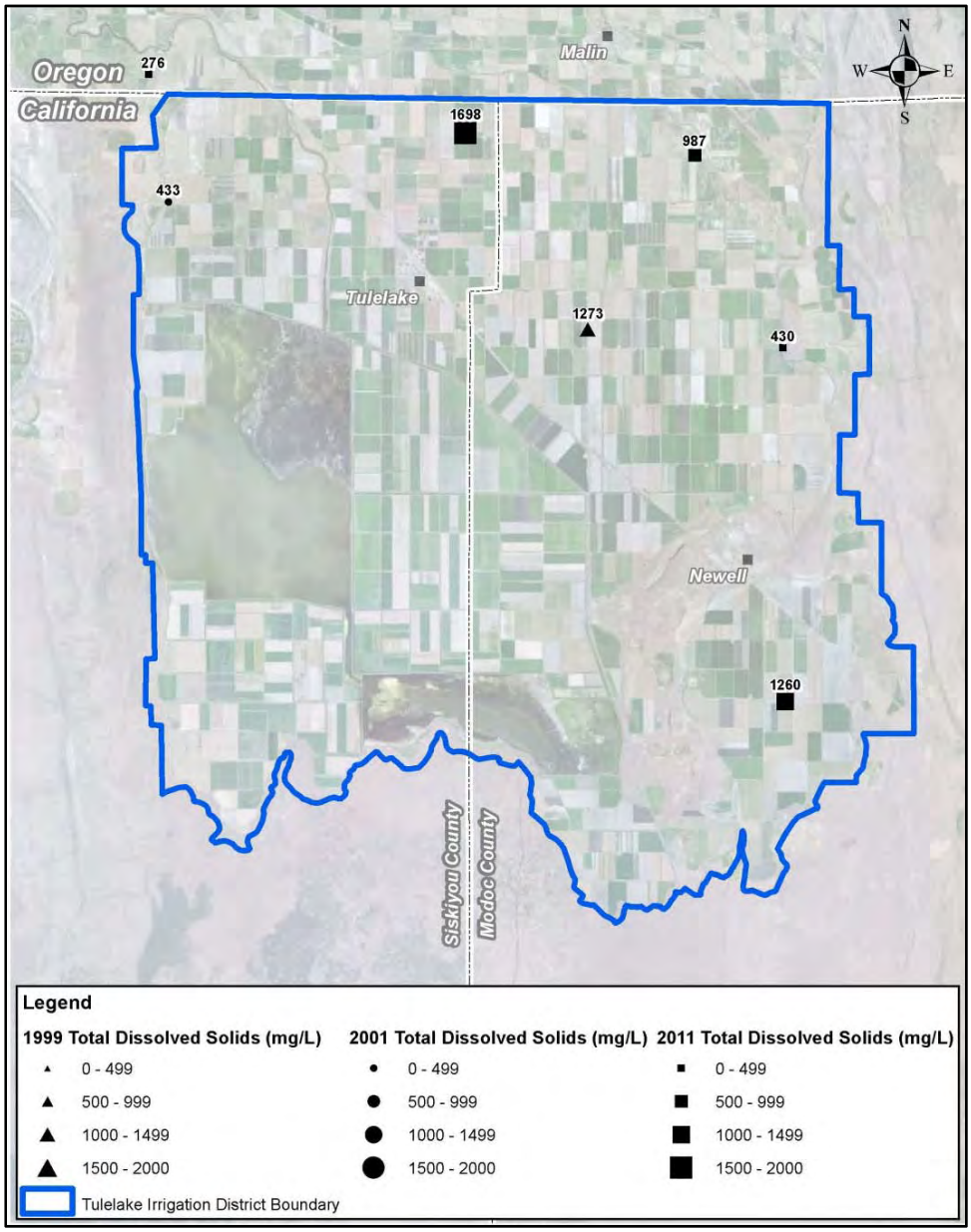


Figure 26. Total Dissolved Solids (TDS) concentration within and near GWMP area (mg/L)

As shown on Figure 26, limited water quality data exists in the GWMP area for all parameters, including TDS.

Chloride

Chloride concentrations above 142 mg/L for surface irrigation applications and 106 mg/l for sprinkler applications have been identified as potentially affecting sensitive crops (FAO, 1985). The maximum concentration of chloride in wells with water quality data between 1999 and

2011 in and around the GWMP area indicate, with the exception of one anomalous well where chloride was reported to be 193 mg/L, historical concentrations of less than 106 mg/L with most below 42 mg/L.

Sodium

Sodium is a naturally occurring mineral in groundwater because most rocks and soils contain sodium compounds from which sodium is easily dissolved. The FAO identified sensitive crops may be affected by sodium concentrations greater than 69 mg/L (FAO, 1985). The maximum concentrations of sodium reported between 1999 and 2010 indicate that the majority of the wells are below the 69 mg/L concentration; however, sodium concentrations as high as 292 mg/L were reported at some well locations.

Boron

The FAO identified sensitive crops may be affected by boron concentration greater than 0.7 mg/L (FAO, 1985). Although boron concentrations at two groundwater wells have been reported at slightly elevated (1.2 and 1.9 mg/L) concentrations within and near the GWMP area have historically been less than 0.7 mg/L. Boron concentrations reported for the majority of the wells have been below what is referred to as the "reporting limit" (i.e., below the concentration detectable by the water quality measurement device).

Observations

Based on the relatively short period of record and limited data for the Tule Lake Subbasin it is difficult to identify trends relative to changes in elevation or water quality. This section provides general observations which describe changes in elevations observed within the GWMP area. Due to the limited availability of water quality data (samples at most wells were only collected once), groundwater quality trends are not addressed. However, examination of the limited available data indicates that the groundwater quality is suitable for agricultural purposes. There have been no indications from growers within the District of water quality concerns or adverse impacts to crop yields.

As previously described the most influential source of groundwater recharge for the Upper Klamath Basin is precipitation. Since the increased level of monitoring and groundwater extraction that has occurred since 2001, there has not been a period of more than one consecutive year of having above average precipitation in the Upper Klamath Basin. Subsurface flows of groundwater within the Upper Klamath Basin generally flow from north to south toward the Tule Lake Subbasin. The increase in groundwater pumping due to dry hydrologic conditions throughout the Upper Klamath Basin have influenced (decreased) the subsurface flow of groundwater to the Tule Lake Subbasin and therefore limited the recharge potential within the southern extent of the Tule Lake Subbasin.

Many of the hydrographs indicate that as of spring of 2011 groundwater elevations at wells within the GWMP area are generally within a few feet of the pre-2001 groundwater elevations observed within the GWMP area. These wells are predominantly shallow groundwater wells (with drilling depths of less than 500 feet) that experience relatively small fluctuations of seasonal drawdown. Deeper wells (including the District's wells) indicate groundwater

elevation changes of up to a maximum of -15 feet (spring 2001 to spring 2011). Wetter hydrologic conditions resulted in minimal groundwater pumping in 2011. Preliminary groundwater elevation data collected by the District for spring of 2012 shows additional recovery of approximately 1 to 5 feet above the 2011 levels.

The limited data and relatively recent increase in groundwater pumping does not provide for sufficient information to identify long term trends within the GWMP area. It is understood that continued monitoring of the groundwater basin is necessary to make informed decisions and to manage and protect the groundwater resource. The following GWMP Elements provide the framework to monitor and manage the groundwater resource to meet the GWMP Management Objectives.

Section 6 - Groundwater Management Plan Elements

As previously identified, this GWMP provides a management framework for maintaining a high quality, reliable, and sustainable supply of groundwater within the GWMP area. In order to understand and provide guidance for operation of its groundwater wells and for other relevant purposes, the District has identified the following Management Objectives:

Management Objective 1: Development of conjunctive use of groundwater, to support years where surface water is limited or not available to meet demand

Management Objective 2: Avoidance of overdraft and associated undesirable effects such as declining groundwater elevations, migration of poor groundwater quality, and land subsidence; in effect continue the successful integrated use of groundwater as a supplemental water supply.

Management Objective 3: Preservation of groundwater quality for beneficial use in the GWMP area.

To accomplish those goals, this GWMP incorporates a number of components recommended in the AB 3030 and SB 1938 GWMP guidelines. For simplicity and consistency with the District's Management Objectives, these recommended components have been organized and defined in the following ten (10) GWMP "Elements". As previously identified components not included in the Elements are not applicable to the District or GWMP area (e.g., saline intrusion).

The Elements formally recognize the effectiveness of a number of ongoing water resource management activities, and they recognize the need for additional activity, to meet the Management Objectives of this GWMP. The Elements also reflect a wider focus on local groundwater management, such as continuing cooperation between land owners and the District, as well as with other water resource management entities in the region to address regional resource opportunities and/or challenges. In summary, this GWMP is intended to enable the District, individual landowners, and their regional neighbors to continue use of local groundwater as a supplemental water supply during years of surface water shortages, and to work with other agencies via implementation of the following Elements.

Element 1: Monitoring of Groundwater Elevation, Storage, Quality, Pumping and Land Subsidence

Element 2: Monitoring and Management of Surface Water Flows and Quality

Element 3: Determination of Sustainable Yield and Avoidance of Overdraft

Element 4: Continuation of Conjunctive Use to Supplement Surface Water Supplies during Years of Surface Water Shortages

Element 5: Agency Coordination, Stakeholder Involvement, and Public Outreach

Element 6: Public Education and Water Conservation Programs

Element 7: Well Construction, Abandonment and Destruction Policies

Element 8: Management and Protection of Recharge Areas and Wellhead Protection Areas

Element 9: Provisions to Update the Groundwater Management Plan

Element 10: Implementation Procedures

Each of the Elements is discussed below.

Element 1 - Monitoring of Groundwater Elevations, Quality, Pumping, and Land Subsidence

Prior to 2001 and the installation of groundwater wells by the District, landowners within the District relied on surface water deliveries from the Klamath Reclamation Project and locally owned private groundwater wells. Since 2001, the supplemental groundwater supply has become an important component of overall water supply in the District, particularly during periods of surface water shortages. The development and use of groundwater within the area has resulted in the collection of some amount of groundwater level data, beginning in the 1980's. However, the collection of groundwater elevation data within the GWMP area has in most cases been inconsistent in both location and frequency of sampling. As a result of the installation of the District's groundwater wells in 2001 and individual landowner participation in water bank programs and activities, a more comprehensive data set has been collected. The following data are currently being collected.

Groundwater Elevations

The District has established a groundwater monitoring network consisting of the District owned wells, USFW dedicated monitoring wells, and private landowner wells. These 15 wells within the District's boundary are identified on Figure 27. The District may also request voluntary reporting by landowners who wish to do so. The District monitors the well network on a monthly basis during the year and on a weekly basis when the pumps are operating. The District has enrolled in the CASGEM program and prepared and submitted a groundwater monitoring plan to DWR (See Appendix B).

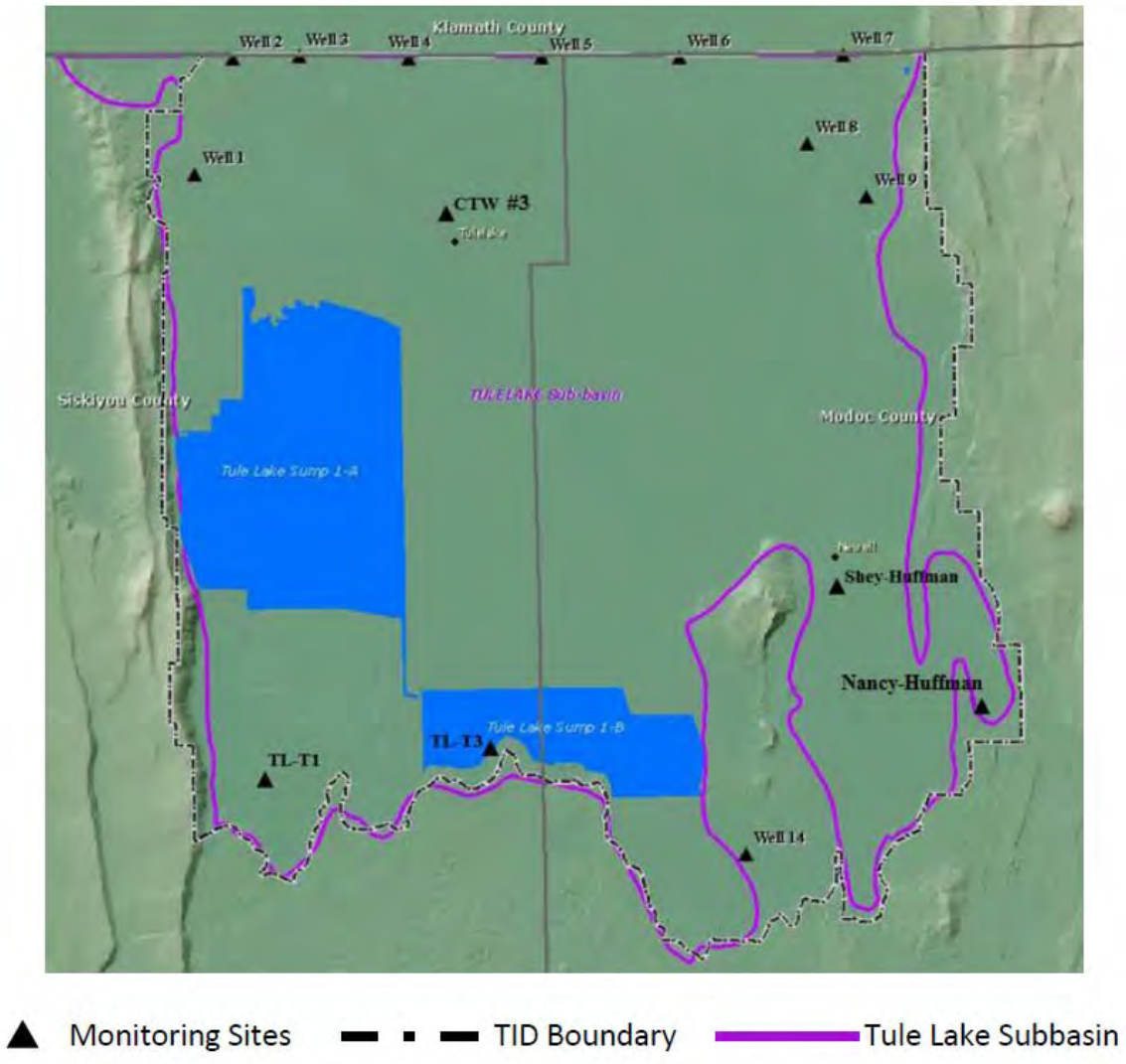


Figure 27. Tulelake Irrigation District groundwater monitoring network.

Groundwater Quality

Water quality data has historically (from 2001-present) been collected by DWR, Reclamation and the USGS within the GWMP area. Some groundwater quality data is maintained by DWR and the USGS, but there is no regular groundwater quality monitoring program that covers the GWMP area.

The District has participated in water bank programs beginning in 2001, which has resulted in monitoring efforts by Reclamation, including measurements of groundwater quality parameters in approximately thirty (30) wells during 2001. Groundwater quality field parameters have not been continuously collected in more recent years at all of these locations. As one of the Management Objectives, the publicly available groundwater quality data will be compiled and complemented by future efforts to monitor groundwater quality. Indicator parameters (e.g. TDS, pH, EC, Boron, etc.) will be collected in order to monitor groundwater quality in selected

wells, consistent with the District's Management Objectives on a location and frequency to be determined by the District.

Groundwater Pumping

Part of this GWMP is to incorporate the efforts of others including the USGS and DWR to estimate District-wide groundwater pumping, to track over time, and to incorporate the data into an analysis described in other Elements of this GWMP. It is unclear at this time the precise amount of groundwater pumped by individual landowners within the GWMP area in a given year. Estimates of the relative magnitude of groundwater pumping within the GWMP area may be derived from the quantities of water pumped for participation in water bank program activities. Although this may not provide the exact quantity of groundwater pumped within the District, it may provide a general magnitude of groundwater pumping which may be beneficial for future planning efforts and to meet the Management Objectives of this GWMP. The District may also request voluntary reporting of quantities pumped by landowners who wish to do so.

Land Subsidence

Subsidence has not been an issue within the GWMP area, and the preliminary results of a recent study by DWR, have identified that no subsidence has occurred during the study period of 2001 through 2011.

Continuation and potential expansion of groundwater level and groundwater quality data collection, continuation of land subsidence data collection, and initiation of an effort to estimate the groundwater pumping during dry periods are key to accomplishing the Management Objectives in this GWMP. Monitored groundwater levels and quality, and estimated pumping, along with subsidence data, will be organized into a computerized database (Microsoft Excel spreadsheet or similar tool) for the entire District. This information will be the basis for defining groundwater basin conditions and developing operational protocols that allow conjunctive use to support the ongoing supplemental groundwater supply while avoiding undesirable conditions such as chronically depressed groundwater levels, degraded groundwater quality, and inelastic subsidence.

The first Element of this GWMP is to continue to implement the CASGEM groundwater monitoring program that is comprised of a network of wells, such as those illustrated in Figure 27, for groundwater level monitoring. That data will be complemented by ongoing water quality and subsidence monitoring by DWR, Reclamation and the USGS and by annual estimates of groundwater pumping based on participation in water bank program activities. The frequencies and types of groundwater data collection will vary as a function of specific Management Objectives as they may be identified in various parts of the groundwater basin.

Element 2: Monitoring and Management of Surface Water Flows and Quality

Groundwater is readily recharged by a combination of precipitation, natural surface water flow, and return flow from applied agricultural irrigation, as well as subsurface inflow from other areas. The District operates the Tule Lake Sumps 1A and 1B as a recirculation reservoir which also provides opportunity for groundwater recharge in the groundwater basin (Tule Lake Subbasin).

Surface water flows to the GWMP area are measured at the Anderson Rose Dam as both spill to the Tule Lake Sumps via the Lost River and diversions to the J-Canal for delivery within the District. Additional surface water inflow from an upstream irrigation district (Klamath Irrigation District) was measured historically; however, in recent years (post 2007) measurement at these locations are no longer available. The District is currently working with Reclamation to redeploy measurement devices at these locations to measure inflow to the District.

Ongoing monitoring of surface water storage and flows within the Upper Klamath Basin, and GWMP area are an important component in understanding recharge to the groundwater basin. The flows in concert with surface water and groundwater quality data will be essential to incorporating surface water considerations into management of the underlying aquifer system. Therefore, monitoring of surface water quality will also be part of this GMWP, and the resultant data will be incorporated into the database for analysis and understanding of groundwater effects on surface water. The District will continue to work with Reclamation to install measurement devices at the drainage inflow locations to the GWMP area and continue to measure inflow at Anderson Rose Dam and deliveries to the J-Canal. Additional critical measurement locations are outside of the District; and therefore, the District will continue to coordinate with other entities to obtain and understand surface water storage and flows within the Upper Klamath Basin.

The frequencies and collection of surface water quality data will vary as a function of specific Management Objectives for the GWMP area.

Element 3 – Determination of Sustainable Yield and Avoidance of Overdraft

Historic long-term data regarding groundwater conditions in the GWMP area are limited. During the recent period of groundwater pumping (2001-2010) there were, and continue to be, short-term fluctuations in groundwater levels have been observed that are basically related to variations in local hydrological conditions and associated fluctuations in recharge and pumping. Such fluctuations are typical of groundwater basin conditions in any conjunctive use setting; groundwater is utilized from storage during dry years, or dry periods, and that storage is replenished during subsequent wet years, or periods.

While historical operating experience, complemented by observed groundwater conditions, will remain an appropriate basis for general planning for available sustainable groundwater supplies, it is possible to more precisely analyze basin conditions to determine values or ranges of yield under varying hydrologic conditions, and to assess the impacts of various management actions that might be implemented in the basin. The ultimate intent of this GWMP Element is to develop an understanding of the sustainable yield of the basin, under varying hydrologic conditions and developing local cultural practices, so that groundwater development and use can be managed in such a way to meet an appropriate fraction of total water demand during periods of surface water shortages while avoiding levels of groundwater use that would result in overdraft conditions.

A major consideration in achieving the goals of this GWMP will be to develop a working understanding of the groundwater basin and the continued conjunctive use of supplemental surface water supplies while avoiding groundwater overdraft. Toward that goal, the monitoring

described in Elements 1 and 2 will be interpreted in Element 3 to analyze projected results, i.e. groundwater levels, and storage in order to design the optimal distribution of pumping or to refine the range of dry period pumping volumes. The result will facilitate planning for supplemental groundwater water supplies, and proactive recharge activities to augment basin yield to meet water supply demand. This Element will be coordinated through the USGS modeling efforts, and other entities that are continuing to analyze the groundwater basin.

Element 4 – Continuation of Conjunctive Use to Supplement Surface Water Supplies during Years of Surface Water Shortages

Conjunctive use consists of meeting water demands primarily through surface water supplies and during dry years pumping groundwater to supplement water shortages. Conjunctive use of local groundwater and surface water will continue to be a key Element in meeting all of the goals for the GWMP area, most notably utilizing groundwater as a supplemental water supply without over-drafting the Tule Lake Subbasin. Recent experience with groundwater pumping and aquifer response to varying hydrologic conditions has shown that the groundwater basin can support variations in pumping during dry periods.

As part of conjunctively using surface water and groundwater, it is recognized that there will continue to be year to year variations in the need for supplemental groundwater. Similarly, there are expected to be variations in local groundwater conditions as a function of local hydrologic conditions which affect, among other things, the magnitude of the natural recharge to the groundwater basin from year to year. Thus, conjunctive use management is necessary to ensure that the groundwater basin is maintained as a component of water supply during dry periods. Conjunctive use management is similarly important to ensure that local groundwater system can be replenished, via reduced pumping and/or as a result of wetter local hydrologic conditions, during periods of wet/normal surface water availability.

A major consideration in this GWMP will be accomplishing this Element in concert with Element 3, i.e. determination of sustainable yield and avoidance of overdraft. Toward that goal, the monitoring described in Elements 1 and 2 will be interpreted in Element 3 to understand basin response to variations in the amounts and distribution of pumping throughout the District.

The results of the monitoring and interpretation of Elements 1 through 3 will facilitate ongoing distribution of surface water, as well as planning for continuation of the supplemental groundwater supplies, and evaluating the potential for proactive recharge activities to augment basin yield to meet the Management Objectives. Thus, implementation of this Element, within the confines of Element 3, will be essential to accomplishment of the first Management Objective for the groundwater basin.

Element 5 - Agency Coordination, Stakeholder Involvement, and Public Outreach

The District has a working relationship with DWR for coordinated groundwater monitoring in the GWMP area. In addition, the District coordinates with the Oregon Water Resources Department (OWRD), the USGS, county, and local government (e.g., irrigation districts) entities for coordinated groundwater monitoring efforts. This GWMP envisions continued cooperation with these entities and other interested parties to continue and improve groundwater monitoring in the GWMP area.

This GWMP element is primarily included to formalize the historical local and state agency working relationships as part of comprehensively managing local groundwater, in concert with currently developed surface water, to accomplish all the Management Objectives for the GWMP area.

The District will work with other County, State and Federal regulatory agencies when appropriate to protect the groundwater basin and achieve broader local and regional benefits. The District will review land use plans as they are available and coordinate with land use planning agencies to assess activities which create a reasonable risk of impacts to the groundwater basin within the GWMP area.

Element 6 - Public Education and Water Conservation Programs

As part of its water delivery operations, the District solicits land use and cropping plans from landowners who receive surface water from the District each year. The resultant data are utilized to estimate water requirements and to identify the need for additional supplemental groundwater pumping to meet District demand. Part of that allocation effort includes public education about the extent and availability of surface water. GWMP Element 6 is included to reflect a direction toward expanded public education regarding groundwater and surface water conditions, all relative to irrigation water requirements and the Management Objectives to avoid overdraft and any related undesirable effects.

Element 7 - Well Construction, Abandonment, and Destruction Policies

Well construction permitting within the Tule Lake Subbasin is administered by the Modoc and Siskiyou County Health Departments, which effectively implement the State Well Standards for water wells and monitoring wells. Permitting of municipal supply wells is also within the purview of the State Department of Public Health. One Management Objective of this GWMP is the protection and preservation of groundwater quality for domestic, municipal and agricultural purposes. This Management Objective requires that all wells be properly constructed and maintained during their operational lives. Additional wells must be properly destroyed after their useful lives, so that they do not adversely affect groundwater quality by, for example, serving as conduits for movement of contaminants from the ground surface and/or from a poor quality aquifer to one of good quality. Toward that end, GWMP Element 7 is included in the GWMP to support well construction and destruction policies, and to participate in their implementation throughout the GWMP area, particularly with regard to surface and inter-aquifer well sealing and proper well destruction, which are critical in the management of an aquifer system.

Element 8 - Management and Protection of Recharge Areas and Wellhead Protection Areas

Aquifers beneath the GWMP area are recharged by precipitation, streamflow, applied irrigation water, and subsurface inflow from other areas. Land use within the area has historically been primarily agricultural.

GWMP Element 8 includes groundwater management activities such as continued monitoring of land uses and associated impacts on groundwater recharge, potentially leading to participation in land use planning to protect critical recharge areas. Similarly, wellhead protection areas within which pumping of individual wells directly affects groundwater flow

towards those wells, will be analyzed and mapped as appropriate with the intent to protect them if necessary. This is not expected to be of major importance in light of prevailing good groundwater quality and as local groundwater use continues to be primarily for irrigation supply.

Element 9 - Provisions to Update the Groundwater Management Plan

The elements of this GWMP reflect the current understanding of the occurrence of groundwater in the overall GWMP area. The Management Objectives are designed to achieve certain goals to protect and preserve groundwater quantity and quality for overlying beneficial use into the foreseeable future. At the same time, the Management Objectives of this GWMP are intended to continue the opportunity for conjunctive use during years of surface water shortage.

Ultimately, it is recognized that, while the GWMP provides a framework for present and future actions, new data will be developed as a result of implementation of the GWMP. That new data could identify conditions which will require modifications to currently definable management actions. As a result, this GWMP is intended to be a flexible document which can be updated to modify existing Elements and/or incorporate new Elements as appropriate in order to recognize and respond to future groundwater conditions and to address changing Management Objectives as they evolve in the GWMP area.

Element 10 - Implementation Procedures

Once the GWMP is adopted by the District's Board of Directors, its implementation will begin. The District will continue collecting groundwater elevation data at the defined monitoring well network and continue to coordinate with local, county, and federal entities to monitor conditions and identify potential changes in the groundwater basin.

Section 7 - References

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Gannett, Marshall W., Brian J. Wagner, and Kenneth E. Lite, Jr. 2012.*Groundwater Simulation and Management Model for the Upper Klamath Basin, Oregon and California*. USGS Scientific Investigations Report 2012-5062.

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Appendix A

TULELAKE IRRIGATION DISTRICT

BOARD OF DIRECTORS RESOLUTION NO. 2011-2

INTENTION TO DRAFT AN AB 3030 GROUNDWATER MANAGEMENT PLAN

BE IT RESOLVED by the Board of Directors of the TULELAKE IRRIGATION DISTRICT that, in accordance with Section 10750-10756 of the California Water Code, it Intends to Draft a Groundwater Management Plan (GMP) for the purpose of further developing the Counties' water resources. This Water Code Section was created by the 1992 Assembly Bill 3030 (AB 3030). GMPs developed in accordance with AB 3030 are known as AB 3030 Groundwater Management Plans.

WHEREAS, the plan area of Tulelake Irrigation District's AB 3030 GMP is the Tule Lake Subbasin (1-2.01) located in the Upper Klamath River Groundwater Basin (1-2 – California Department of Water Resources Bulletin 118 for the North Coastal Hydrologic Study Area) of Siskiyou and Modoc Counties, and

WHEREAS, technical information and reports have been compiled for a comprehensive plan for the development of an AB 3030 GMP for the Tule Lake Subbasin,

NOW, THEREFORE, BE IT FURTHER RESOLVED that the General Manager of TULELAKE IRRIGATION DISTRICT is hereby authorized and directed to file its Intention to Draft an AB 3030 Groundwater Management Plan with the California Department of Water Resources.

PASSED AND ADOPTED by the Board of Directors of the TULELAKE IRRIGATION DISTRICT, State of California, on this 12th day of September, 2011, by the following vote:

AYES: Directors Crawford, Havlina, Staunton and Wright
NOES:
ABSENT: Director Heiney
ABSTAIN:

ATTEST:

Earl C. Danosky

Earl C. Danosky, Secretary/General Manager

AFFIDAVIT OF PUBLICATION
STATE OF OREGON,
COUNTY OF KLAMATH

I, Jeanine P. Day, Finance Director, being duly sworn, depose and say that I am the principle clerk of the publisher of the Herald and News, a newspaper in general circulation, as defined by Chapter 193 ORS, printed and published at Klamath Falss in the aforesaid county and state; that I know from my personal knowledge that the
Legal#13752 RESOLUTION 2011-2
TULELAKE IRRIGATION DISTR
a printed copy of which is hereto annexed, was published in the entire issue of said newspaper for: 2

Insertion(s) in the following issues:
09/20/2011 09/27/2011

Total Cost: $248.06

Jeanine P Day

Subscribed and sworn by Jeanine P Day before me on:
27th day of Septemberin the year of 2011

Notary Public of Oregon
My commision expires on May 15, 2012

OFFICIAL SEAL
DEBRA A. GRIBBLE
NOTARY PUBLIC - OREGON
COMMISSION NO. 429083
MY COMMISSION EXPIRES MAY 15, 2012

TULELAKE IRRIGATION DISTRICT
BOARD OF DIRECTORS RESOLUTION NO. 2011-2
INTENTION TO DRAFT AN AB 3030
GROUNDWATER MANAGEMENT PLAN

BE IT RESOLVED by the Board of Directors of the TULELAKE IRRIGATION DISTRICT that, in accordance with Section 10750-10756 of the California Water Code, it Intends to Draft a Groundwater Management Plan (GMP) for the purpose of further developing the Counties' water resources. This Water Code Section was created by the 1992 Assembly Bill 3030 (AB 3030). GMPs developed in accordance with AB 3030 are known as AB 3030 Groundwater Management Plans.

WHEREAS, the plan area of Tulelake Irrigation District's AB 3030 GMP is the Tule Lake Subbasin (1-2.01) located in the Upper Klamath River Groundwater Basin (1-2 California Department of Water Resources Bulletin 118 for the North Coastal Hydrologic Study Area) of Siskiyou and Modoc Counties, and

WHEREAS, technical information and reports have been compiled for a comprehensive plan for the development of an AB 3030 GMP for the Tule Lake Subbasin,

NOW, THEREFORE, BE IT FURTHER RESOLVED that the General Manager of TULELAKE IRRIGATION DISTRICT is hereby authorized and directed to file its Intention to Draft an AB 3030 Groundwater Management Plan with the California Department of Water Resources.

PASSED AND ADOPTED by the Board of Directors of the TULELAKE IRRIGATION DISTRICT, State of California, on this 12th day of September, 2011, by the following vote:
AYES: Directors Crawford, Havlina, Staunton and Wright
NOES:
ABSENT: Director Heiney
ABSTAIN:
ATTEST:
/s/ Earl C. Danosky, Secretary/General Manager
#13752 September 20, 27, 2011.

Tulelake Irrigation District

P. O. Box 699 * 2717 Havlina Road * Tulelake, CA 96134
Phone: 530-667-2249 * Fax: 530-667-4228 * Email: tid@cot.net

***Earl C. Danosky,* Manager**
***Gerald D. Pyle,* Asst. Mgr.**
***Brad C. Kirby,* Asst. to the Mgr.**
***Grace E. Phillips,* Office Mgr.**
***John F. Crawford,* President**
***James E. Havlina,* V. President**
***William J. Heiney,* Director**
***Sidney W. Staunton,* Director**
***Gary A. Wright,* Director**

Subject: Preparation of Tulelake Irrigation District's Groundwater Management Plan

Tulelake Irrigation District (TID) is preparing a Groundwater Management Plan (Plan) as authorized by sections 10753-10753.11 of the California Water Code. The preparation of the Plan will include the development of appropriate groundwater management objectives within the Plan area (Tule Lake Subbasin) and the corresponding monitoring to assure that the management objectives are being met.

TID's Board of Directors adopted a resolution of intention to adopt a groundwater management plan on September 12, 2011 (Resolution 2011-02). Objectives for the Plan include to comply with existing legislation, educate water users relative to groundwater resources, develop and meet management objectives and to provide a monitoring program to inform water users of the groundwater conditions in the Plan area.

TID encourages public participation in development of the Plan. The following describes how interested parties may participate in developing the Plan:

1. TID will establish and maintain a list of persons interested in receiving notices regarding Plan preparation, meeting announcements, and availability of draft Plans, maps, and other relevant documents. If you wish to be placed on this list of interested persons, please submit a request in writing, to the address below.
2. TID welcomes your submittal of technical or other information that may be useful for the development of the Plan. Please submit any such information to the address below.
3. TID's staff is available to discuss the development of the Plan with interested persons. Please call the office at the number below to make an appointment, or visit during office hours and staff will accommodate you if possible at that time.
4. Attend the public meetings described in the attached fact sheet, and provide your input.

The First Public Meeting will be held on November 15th, 2012 at 10 A.M. at the Tulelake Fire Hall.
(1 Ray Oehlerich Way, Tulelake, CA 96134)

The attached brief fact sheet provides more information and other references. To be placed on the list of interested persons or for other information, please contact Brad Kirby at the following:

Phone: (530) 667-2249 e-mail: tid@cot.net

Mailing Address:
P.O. Box 699
Tulelake, CA 96134

Physical Address:
2717 Havlina Rd
Tulelake, CA 96134

Sincerely,

Brad C. Kirby
Assistant to the Manager
Tulelake Irrigation District

Tulelake Irrigation District Groundwater Management Plan Fact Sheet

Contact:

Brad Kirby
Assistant to the Manager
Tulelake Irrigation District

(530) 667-2249

tid@cot.net

Mailing Address:
P.O. Box 699
Tulelake, CA 96134

Physical Address:
2717 Havlina Rd
Tulelake, CA 96134

Current Schedule:

Nov 2012 – Public Meeting

November 15th, 2012

10 A.M.

Tulelake Fire Hall

1 Ray Oehlerich Way

Tulelake, CA 96134

Feb 2013– Public Meeting

TBD

Mar 2013 – Public Hearing

TBD

May 2013 – Consider Approval

TBD

Interested Party Participation

Tulelake Irrigation (TID) is preparing a Groundwater Management Plan as authorized under the California Water Code (sections 10753-10753.11) .The preparation of the Plan will include the development of appropriate groundwater management objectives within the Plan area (Tule Lake Subbasin) and corresponding monitoring to assure that the management objectives are being met. The management objectives will be developed through coordination and discussions with interested parties including but not limited to landowners/growers, public agencies, and Ca. Department of Water Resources. TID will facilitate participation of interested parties in the development of the Plan. In addition, TID will hold public meetings to inform interested parties of the development of the Plan and provide opportunity for public participation and comment.

The Plan is not a requirement of, and is not being developed for, the Klamath Basin Restoration Agreement (KBRA) or the "On-Project Plan" of the KBRA. The Plan should, however, be compatible with these separate activities.

The Purpose of a Groundwater Management Plan

The purpose of the Groundwater Management Plan is to meet management objectives within the groundwater basin. The general purpose, scope and benefits of developing a groundwater management plan are as follows:

- Meet management objectives of long-term, sustainable, reliable and good quality groundwater supply
- Facilitate conjunctive use of groundwater as a supplemental water supply
- Establish monitoring protocols and define a monitoring well network to track changes in the groundwater basin conditions
- Eligibility for application of funding through the Ca. Department of Water Resources for groundwater projects including but not limited to groundwater level and quality monitoring, new well construction, reconstruction of existing wells, and well deconstruction

This Groundwater Management Plan will not regulate groundwater within the Plan area, nor is it TID's intent to impose assessments on groundwater users under the Plan.

Additional Resources:

The Ca. Department of Water Resources provides useful information on the development of groundwater management plans, which are often referred to as "AB 3030 Plans" and groundwater monitoring within California. Available information and resources are identified below:

http://www.water.ca.gov/groundwater/gwmanagement/sb_1938.cfm

http://www.water.ca.gov/groundwater/gwmanagement/ab_3030.cfm

http://www.water.ca.gov/groundwater/bulletin118/update2003.cfm

http://www.water.ca.gov/groundwater/casgem/

Tulelake Irrigation District

P. O. Box 699 * 2717 Havlina Road * Tulelake, CA 96134
Phone: 530-667-2249 * Fax: 530-667-4228 * Email: tid@cot.net

Subject: Tulelake Irrigation District's Groundwater Management Plan

On April 25, 2013, at 10:00 a.m., at the Tulelake Firehouse (1 Ray Oehlerich Way, Tulelake, CA 96134), Tulelake Irrigation District (TID) will hold a public hearing to consider whether to adopt a groundwater management plan (Plan) for TID's service area, including the area within the boundaries of TID in Siskiyou and Modoc Counties, California. The Plan under consideration has been developed under the authority of California Water Code section 10750 et seq. for the Plan Area of the state's Tule Lake Subbasin (1-2.01) of the Upper Klamath River Groundwater Basin. Copies of the Plan and any maps prepared under Part 2.75 of Division 6 of the California Water Code may be obtained for the cost of reproduction at TID's office (2717 Havlina Road, Tulelake, CA 96134), or via e-mail upon request (tid@cot.net).

In summary, the Plan includes the following: (a) descriptions of TID, its water rights and contracts, relevant infrastructure, available water supplies, and area covered by the Plan; (b) description of various provisions of the California Water Code applicable to groundwater management plans, as well as descriptions of local ordinances (such as county ordinances) related to groundwater, and legislation and agreements; (c) management objectives for the Plan area; (d) description of existing groundwater conditions, including geologic conditions, groundwater quantity and quality; and, (e) Plan elements including element 1 related to monitoring of groundwater elevations, quality, pumping, and land subsidence; element 2 related to monitoring and management of surface water flows and quality; element 3 related to determination of sustainable yield and avoidance of overdraft; element 4 related to continuation of conjunctive use to supplement surface supplies during years of surface water shortage; element 5 related to agency coordination, stakeholder involvement, and public outreach; element 6 related to public education and water conservation programs; element 7 related to well construction, abandonment, and destruction policies; element 8 related to management and protection of recharge areas; element 9 related to provisions to update the Plan; and element 10 pertaining to implementation procedures. The Plan under consideration does not propose that TID levy fees or become a regulator of groundwater extraction.

At any time prior to the conclusion of the April 25 hearing, any landowner within TID may file a protest to the adoption of the Plan in accordance with California Water Code sections 10753.5 and 10753.6. Such protests should be filed with TID at 2717 Havlina Road, Tulelake, CA 96134. If a majority protest is not filed by the conclusion of the hearing, TID may, within 35 days of the conclusion of the hearing, adopt the proposed Plan.

Interested parties should plan to attend the public hearing, April 25, 2013, at 10:00 a.m. For further information call the Tulelake Irrigation District at (530) 667-2249.

Sincerely,

Brad C. Kirby
Assistant to the Manager
Tulelake Irrigation District

Appendix B

TULELAKE IRRIGATION DISTRICT

GROUNDWATER MONITORING PLAN

TABLE OF CONTENTS

INTRODUCTION

The purpose of this groundwater monitoring plan is to provide a reference and procedural basis for groundwater monitoring in the Tule Lake Subbasin (1-2.01). Using the policies and procedures set forth in this plan the Tulelake Irrigation District, hereafter referred to as TID, will regularly and systematically monitor groundwater elevations at designated monitoring sites. With the data collected under this plan, along with the existing data that TID has compiled since 2001, TID will be able to demonstrate seasonal and long-term trends of groundwater elevations in the Tule Lake Subbasin. The information gathered will be reported to the California Department of Water Resources (DWR) under the California Statewide Groundwater Elevation Monitoring (CASGEM) program.

MONITORING PLAN RATIONALE

TULE LAKE SUBBASIN (1-2.01)

TID lies within the Tule Lake Subbasin of the Upper Klamath River Groundwater Basin. TID's boundary encompasses most of, if not the entire, California portion of the Tule Lake Subbasin. The Tule Lake Subbasin is located within the California portion of the Klamath Basin, approximately 30 miles southeast of the City of Klamath Falls, OR, and is split by the boundary of Siskiyou County and Modoc County. The subbasin is bounded to the west by the Gillems Bluff Fault that forms the steep eastern slope of Sheepy Ridge, which separates the Tule Lake and Lower Klamath subbasins. The subbasin is bounded to the east by the Big Crack Fault that forms the western edge of the block faulted mountains between Tule Lake and Clear Lake Reservoir. The subbasin is bounded to the south by the low-lying volcanic fields on the north slope of the Medicine Lake Highlands. As stated in Bulletin 118, the subbasin is bounded to the north by the state boundary of Oregon and California.

The principal water-bearing formations in the Tule Lake Subbasin include Tertiary to Quaternary lake deposits and volcanics.

There are two principal sources of recharge in the subbasin: underflow from the rapidly replenished and permeable unconfined system of adjacent volcanic rocks, and infiltration of surface water through marginally permeable sedimentary deposits. The area surrounding the subbasin consists of mainly Holocene and Miocene volcanic rocks that capture most of the incipient precipitation and intermittent stream flow by infiltration through fractures. This source of recharge is believed to be the most significant for the subbasin due to the very slow infiltration rates in the sedimentary deposits.

HISTORY OF GROUNDWATER MONITORING IN THE TULE LAKE SUBBASIN (1-2.01)

TID has been monitoring groundwater levels within the Tule Lake Subbasin since 2001. The 2001 to present data has been collected from the ten wells that TID owns within the district, and more recently, TID has collected data from five additional privately owned sites. DWR also measures about fifty wells in the Tule Lake Subbasin including the ten TID wells. The DWR monitored wells throughout the subbasin are a mixture of domestic, irrigation, industrial, monitoring, municipal, and stock wells of varying depths. All of the wells are measured by DWR during spring, summer, and fall of every year. A map of the DWR monitoring sites can be found in Appendix A.

WELL NETWORK

The well network that TID monitors consists of 15 wells which are spread throughout the Tule Lake Subbasin within the District's boundary. The sites that were selected by TID were done so in order to provide the best overall coverage available of the Tule Lake Subbasin. A map of the well network is shown in Figure 1 below.

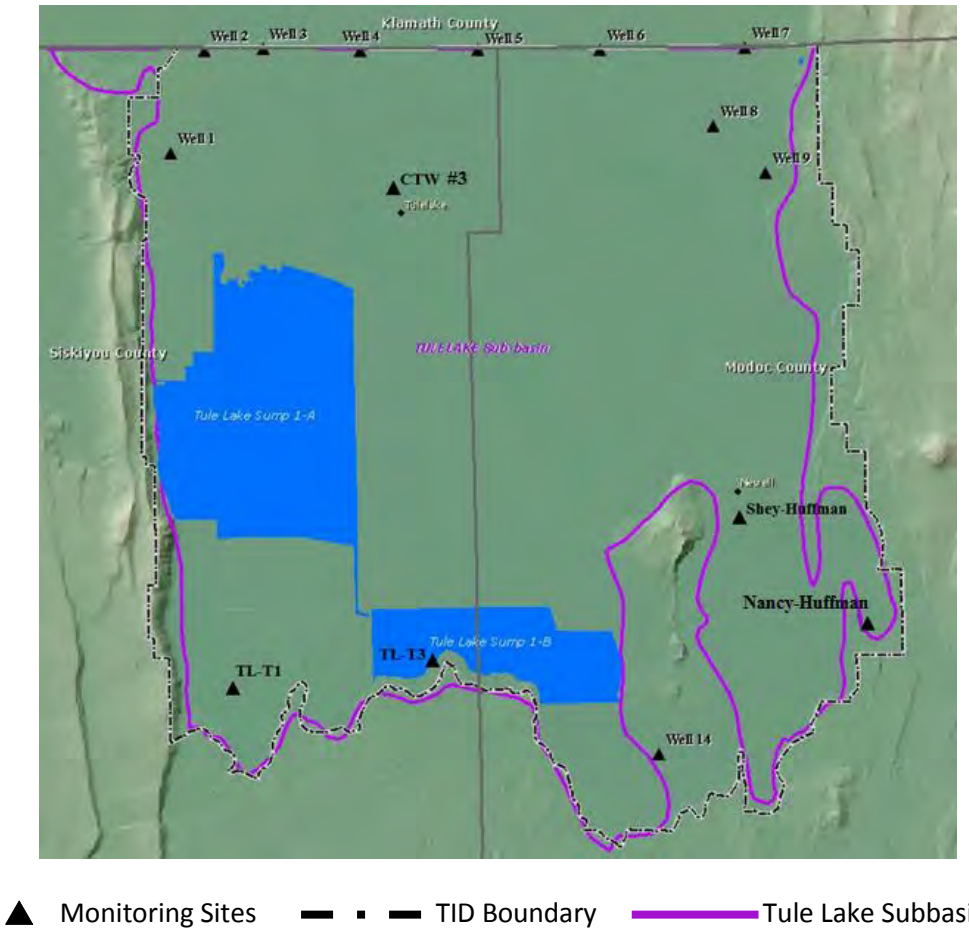


Figure 1. TID Groundwater Monitoring Network

Of the 15 monitoring sites, 10 of them are owned and operated by TID. They are most commonly known as TID 1 through 9 and TID 14. Most of these wells are positioned in the northern most part of the California portion of the Tule Lake Subbasin, with the exception of TID 14 which is located in the southern section in an area known as the Panhandle. The additional five wells that TID monitors under the CASGEM program are privately owned sites. The site shown on the map as CTW #3 is the newest well drilled by the City of Tulelake located at the northern tip of the city limits. The sites depicted as TL-T1 and TL-T3 are well test sites drilled by the U.S. Fish and Wildlife Service within the confines of the Tule Lake National Wildlife Refuge. The remaining two wells are situated in the southeast portion of the Tule Lake Subbasin in an area known as Copic Bay, and both are owned by a local farming entity identified as the Huffman Brothers. All 10 of TID's wells, as well as the two wells owned by the U.S. Fish and Wildlife Service, are designated as CASGEM wells. The wells known as CTW #3, Shey-Huffman, and

Nancy-Huffman are designated as Voluntary due to a confidentiality agreement between TID and the owners. All pertinent well information for each of the TID monitoring sites can be found in Appendix B.

MONITORING SCHEDULE

TID's monitoring of the groundwater elevation of each of the monitoring sites is done on a monthly basis. Collection and documentation of groundwater elevation data of all monitoring sites is conducted within a single day within the first full week of each month of the year. This gives a sufficient month by month picture of the groundwater fluctuation. In the case of temporary inaccessibility to any of the sites due to weather conditions, or any other conditions, collection of the data for those sites is done as soon as possible when the conditions improve.

FIELD METHODS

REFERENCE POINT

All reference point (RP) information for each of TID's monitoring sites can be found in the table in Appendix B. A photograph and written description of the reference point for each monitoring site can be found in Appendix C.

RECORDING DEPTH TO WATER MEASUREMENTS

TID's method for recording depth to water measurements is the Electric Sounding Tape Method. All measurements for a single recording period are recorded on a single TID Groundwater Field Data Sheet, of which an example can be found in Appendix D.

DEPTH TO WATER MEASUREMENT INSTRUCTIONS

BEFORE MAKING A MEASUREMENT:

- Inspect the electric sounding tape and electrode probe before using it in the field. Check the tape for wear, kinks, frayed electrical connections and possible stretch; the cable jacket tends to be subject to wear and tear. Test that the battery and replacement batteries are fully charged.

- Check the distance from the electrode probe's sensor to the nearest foot marker on the tape, to ensure that this distance puts the sensor at the zero foot point for the tape. If it does not, a correction must be applied to all depth-to-water measurements. Record this correction on the TID Groundwater Field Data Sheet.

- Check the circuitry of the electric sounding tape before lowering the electrode probe into the well. To determine proper functioning of the tape mechanism, dip the electrode probe into tap water and observe whether the indicator light and beeper indicate a closed circuit.

- Wipe down the electrode probe and 5 to 10 feet of the tape with a disinfectant wipe, rinse with de-ionized or tap water, and dry.

MAKING A MEASUREMENT:

- Identify the appropriate site on the TID Groundwater Field Data Sheet and record whether or not the well is running, the pumping rate, and the accumulated acre-feet meter reading in the designated columns for the site.

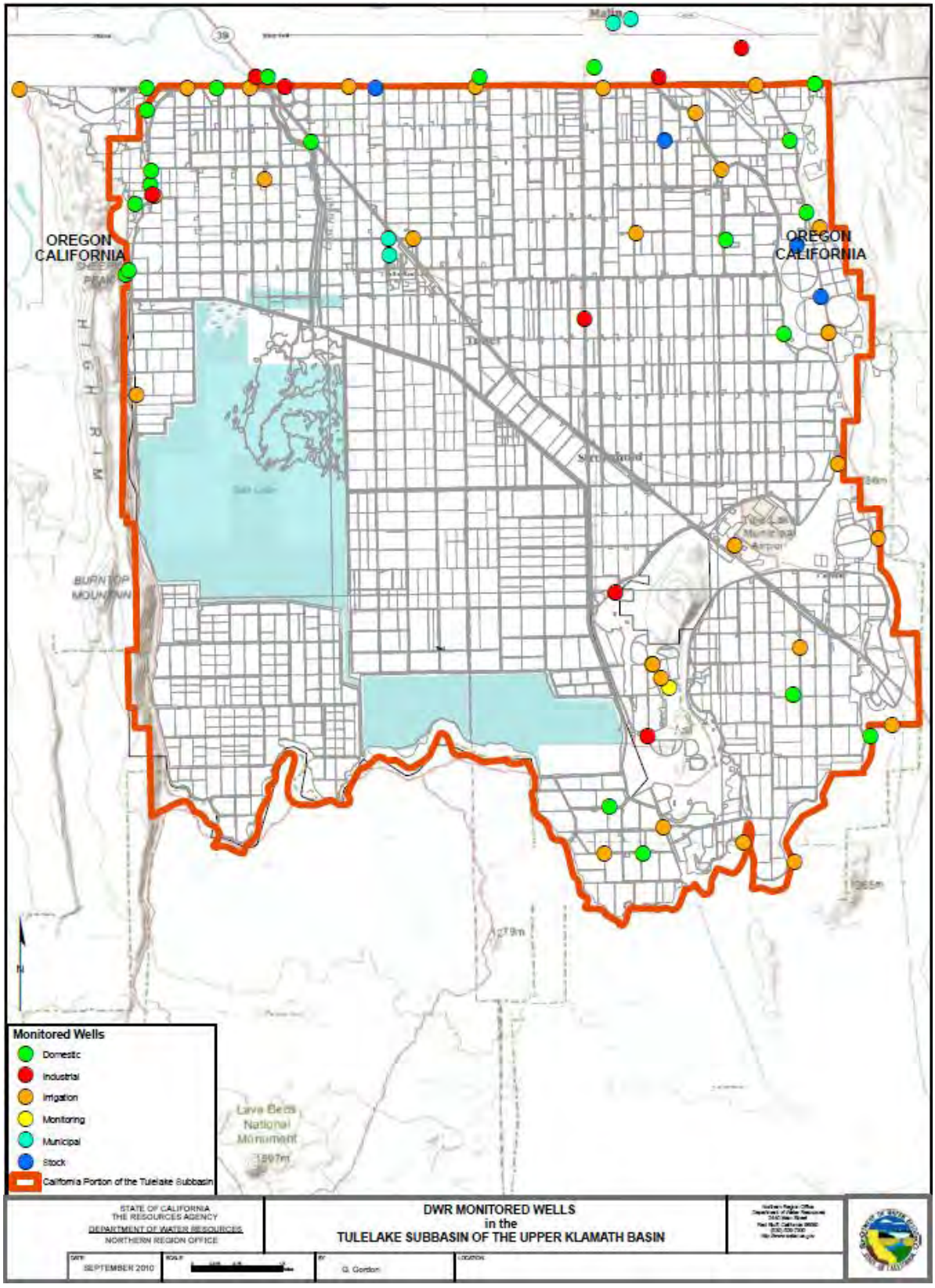
- Lower the electrode probe slowly into the well until the indicator shows that the circuit is closed and contact with the water surface is made. Avoid letting the tape rub across the top of the well casing. Place the tip or nail of the index finger on the insulated wire at the RP and read the depth to water to the nearest 0.1 foot. Record this value in the "DEPTH to WATER" column of the TID Groundwater Field Data Sheet for the appropriate site.

- Record any notable comments, problems, or inaccuracies in the "COMMENT" section for the appropriate site.

AFTER MAKING A MEASUREMENT:

- Wipe down the electrode probe and the section of the tape that was submerged in the well water, using a disinfectant wipe and rinse thoroughly with de-ionized or tap water. Dry the tape and probe and rewind the tape onto the tape reel. Do not rewind or otherwise store a dirty or wet tape.

APPENDIX A: DWR TULE LAKE SUBBASIN MONITORING MAP



APPENDIX B: TID MONITORING WELL INFORMATION

Local Well ID	TID #1	TID #2	TID #3	TID #4
State Well Number	48N04E30F002M	48N04E18J001M	48N04E16M001M	48N04E15K001M
Reference Point ELEV	4047.75	4057.99	4056.23	4051.35
Ground Surface ELEV	4047.05	4056.02	4055.73	4049.60
Well Use	Irrigation	Irrigation	Irrigation	Irrigation
Well Status	Active	Active	Active	Active
Well Coordinates	E 121.5567 N 41.9721	E 121.5455 N 41.9980	E 121.5251 N 41.9979	E 121.4931 N 41.9978
Well Completion Type	Single	Single	Single	Single
Total Well Depth / Drilled Depth	740 / 740	1545 / 1550	1680.57 / 1710	1432.8 / 1440
Screen Interval #1	260-700	1260-1540	1153.1-1292.32	1211.65-1432.8
Screen Interval #2	--	--	1334.44-1354.46	--
Screen Interval #3	--	--	1375.49-1455.58	--
Screen Interval #4	--	--	1476.62-1536.82	--
Screen Interval #5	--	--	1599.89-1680.57	--
Screen Interval #6	--	--	--	--
Well Completion Report Number	751108	751109	751110	751111
Groundwater Basin of Well	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01

Local Well ID	TID #5	TID #6	TID #7	TID #8
State Well Number	48N04E13K001M	48N05E16P001M	48N05E14R001M	48N05E26D001M
Reference Point ELEV	4051.44	4054.28	4068.45	4050.29
Ground Surface ELEV	4050.50	4052.38	4068.29	4049.10
Well Use	Irrigation	Irrigation	Irrigation	Irrigation
Well Status	Active	Active	Active	Active
Well Coordinates	E 121.4519 N 41.9971	E 121.4106 N 41.9962	E 121.3609 N 41.9963	E 121.3727 N 41.9762
Well Completion Type	Single	Single	Single	Single
Total Well Depth / Drilled Depth	1566.83 / 1570	2380 / 2600	2020 / 2030	1807.35 / 1810
Screen Interval #1	935.18-955.18	822.61-1084.77	814.26-1155.03	1247.45-1647.47
Screen Interval #2	1015.44-1035.51	1375.28-1719.34	1255.65-1336.09	1662.23-1802.35
Screen Interval #3	1075.71-1095.63	1805.29-2108.14	1396.6-1436.85	--
Screen Interval #4	1135.79-1556.81	2257.02-2358.1	1497.24-1537.37	--
Screen Interval #5	--	--	1577.66-1617.78	--
Screen Interval #6	--	--	1678.47-2020	--
Well Completion Report Number	751112	751113	751114	751115
Groundwater Basin of Well	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01

Local Well ID	TID #9	TID #14	TL-T1 Q3B	TL-T3 GP
State Well Number	48N05E36D001M	46N05E22D001M	--	--
Reference Point ELEV	4049.25	4037.78	4034.1	4047.1
Ground Surface ELEV	4047.91	4037.47	4032.7	4045.6
Well Use	Irrigation	Irrigation	Observation	Observation
Well Status	Active	Active	Inactive	Inactive
Well Coordinates	E 121.3555 N 41.9647	E 121.3955 N 41.8174	E 121.5420 N 41.8341	E 121.4697 N 41.8391
Well Completion Type	Single	Single	--	--
Total Well Depth / Drilled Depth	2043.04 / 2060	567 / 571	500/500	500/500
Screen Interval #1	1060.46-1941.59	114.11-234.16	Open Hole 20-500	Open Hole 20-500
Screen Interval #2	1982.49-2022.54	254.14-314.16	--	--
Screen Interval #3	--	334.14-554.25	--	--
Screen Interval #4	--	--	--	--
Screen Interval #5	--	--	--	--
Screen Interval #6	--	--	--	--
Well Completion Report Number	751116	751117	--	--
Groundwater Basin of Well	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01

Local Well ID	Shey-Huffman	Nancy-Huffman	CTW #3
State Well Number	--	--	--
Reference Point ELEV	4045.2	4048.8	4038.2
Ground Surface ELEV	4044.9	4047.7	4037.6
Well Use	Irrigation	Irrigation	Municipal
Well Status	Active	Active	Active
Well Coordinates	E 121.3650 N 41.8774	E 121.3255 N 41.8492	E 121.4815 N 41.9605
Well Completion Type	Single	Single	Single
Total Well Depth / Drilled Depth	520/520	212/212	2761 / 2790
Screen Interval #1	80-245	Open Hole 20-212	2560.5-2761
Screen Interval #2	Open Hole 245-520	--	--
Screen Interval #3	--	--	--
Screen Interval #4	--	--	--
Screen Interval #5	--	--	--
Screen Interval #6	--	--	--
Well Completion Report Number	962868	782127	797943
Groundwater Basin of Well	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01	Tule Lake Subbasin 1-2.01

APPENDIX C: TID MONITORING WELL REFERENCE POINT INFORMATION

Reference points for all monitoring sites are marked with fluorescent orange paint.

TID #1: The reference point is the lip of the sounding tube located on the west side of the well casing

TID #2: The reference point is the lip of the sounding tube located on the south side of the well casing

TID #3: The reference point is the lip of the sounding tube located on the west side of the well casing

TID #4: The reference point is the lip of the sounding tube located on the south side of the well casing

TID #5: The reference point is the lip of the sounding tube located on the west side of the well casing

TID #6: The reference point is the lip of the sounding tube located on the north side of the well casing

TID #7: The reference point is the lip of the sounding tube located on the south side of the well casing


TID #8: The reference point is the lip of the sounding tube located on the west side of the well casing


TID #9: The reference point is the lip of a hole in the casing located on the north side of the well casing


TID #14: The reference point is the lip of the sounding tube located on the west side of the well casing


Shey-Huffman: The reference point is the lip of the sounding tube located on the west side of the well casing


Nancy-Huffman: The reference point is the lip of a hole in the casing located on the south side of the well casing


TL-T1: The reference point is the lip of a hole in the top of the well casing

TL-T3: The reference point is the lip of a hole in the top of the well casing

CTW #3: The reference point is the lip of a hole in the casing located on the north side of the well casing

APPENDIX D: TID GROUNDWATER FIELD DATA SHEET

DATE: _____ **TID GROUNDWATER FIELD DATA SHEET YEAR:** _____

WELL SITE	CA STATE WELL #	TIME	R/NR	GPM	ACRE FEET	DEPTH to WATER	COMMENTS
TID #1	48N04E30F002M						
TID #2	48N04E18J001M						
TID #3	48N04E16M001M						
TID #4	48N04E15K001M						
TID #5	48N04E13K001M						
TID #6	48N05E16P001M						
TID #7	48N05E14R001M						
TID #8	48N05E26D001M						
TID #9	48N05E36D001M						
TID #14	46N05E22D001M						
Q-3-B							
Gazebo Point							
Shey-Huffman							
Nancy-Huffman							
City of Tulelake							

Attachment G

Water Order Form

Owner's Name	Irrigator's Name	Farm Unit

Date Ordered	Starting Date	Starting Time	Lateral

Approx. Time Needed	Ride	Confirms	Crop

CFS	TYPE IRRIGATION SYSTEM	Acres
	Gravity	
	Solid Set	Telephone No.
	Wheel Line No. Lines	
	Hand Line No. Lines	R.O.
	Pivot / Linear	Start / Finish

DATE	STEM OPENING	T.O. SIZE	NET HEAD	C.F.S.	HOURS RAN	ACRE FEET	EXPLAIN REASONS IF FLOW EST.

Remarks:

TOTAL A. F.

	PAID	NOT PAID

Attachment H

Public Hearing Notice
and Resolution to Adopt Plan

AFFIDAVIT OF PUBLICATION
STATE OF OREGON,
COUNTY OF KLAMATH

I, Pat Bergstrom, Legal Specialist, being duly sworn, depose and say that I am the principle clerk of the publisher of the Herald and News, a newspaper in general circulation, as defined by Chapter 193 ORS, printed and published at 2701 Foothills Blvd, Klamath Falls, OR 97603 in the aforesaid county and state; that I know from my personal knowledge that the Legal#17895 PUBLIC HEARING
DATE: SEPTEMBER 11, 2017
a printed copy of which is hereto annexed, was published in the entire issue of said newspaper for: 2

Insertion(s) in the following issues:
08/27/2017 09/03/2017

Total Cost: $125.24

Pat Bergstrom

Subscribed and sworn by Pat Bergstrom before me on:
5th day of September in the year of 2017

Debra A Gribble

Notary Public of Oregon
My commision expires on May 11, 2020

OFFICIAL STAMP
DEBRA A. GRIBBLE
NOTARY PUBLIC - OREGON
COMMISSION NO. 950420
My Commission Expires MAY 11, 2020

NOTICE OF PUBLIC HEARING
TULELAKE IRRIGATION DISTRICT AGRICULTURAL WATER MANAGEMENT PLAN
SEPTEMBER 11, 2017

Notice is hereby given that Tulelake Irrigation District (TID) has updated its Agricultural Water Management Plan (Plan). The TID Board of Directors will hold a public hearing to consider adoption of the Plan on September 11, 2017 at 7:45 PM. The hearing will be held at the TID office (2717 Havlina Rd., Tulelake, CA 96134).
Copies of the updated plan are available for review and may be obtained at the TID office.
For further information contact Brad Kirby at (530) 667-2249.
#17895 August 27, September 03, 2017.

TULELAKE IRRIGATION DISTRICT
RESOLUTION NO. 2017-5

RESOLUTION OF THE TULELAKE IRRIGATION DISTRCT TO ADOPT THE 2017 WATER MANAGEMENT AND CONSERVATION PLAN AND APPROVE SUBMITTAL TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES

WHEREAS, Tulelake Irrigation District (District) is required to submit a Water Management and Conservation Plan (WMCP) to the U.S. Bureau of Reclamation (USBR) pursuant to the Reclamation Reform Act (RRA) of 1982;

WHEREAS, the District has previously adopted, and the USBR has accepted, the District's 2003 WMCP and 2011 WMCP;

WHEREAS, the District has prepared a further update to its WMCP, hereinafter known as the "2017 WMCP Update," attached hereto as Exhibit A;

WHEREAS, the California Legislature has codified the Agricultural Water Management Planning Act (AWMPA), at Water Code sections 10800-10853, thereby requiring certain agricultural water suppliers to prepare and adopt an Agricultural Water Management Plan (AWMP) to conserve water;

WHEREAS, the AWMPA defines an "agricultural water supplier" as a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water, and requires an agricultural water supplier serving water to at least 25,000 acres to prepare an AWMP;

WHEREAS, an agricultural water supplier must adopt an AWMP consistent with the provisions of Water Code section 10826 and submit the AWMP and any amendments or changes to the AWMP to the California Department of Water Resources (DWR);

WHEREAS, an agricultural water supplier, pursuant to Water Code section 10608.48(d), must include within its AWMP, a report regarding efficient water management practices, including a water measurement program;

WHEREAS, an agricultural water supplier that is required to submit a water conservation plan to the USBR pursuant to the RRA of 1982 may submit its plan to DWR in satisfaction of the substantive AWMP requirements contained in Water Code sections 10826 and 10608.48(d) if both: (1) the agricultural water supplier has adopted and submitted the water conservation plan to the USBR, and (2) the USBR has accepted the water conservation plan as adequate;

WHEREAS, on September 8, 2014, the District submitted its 2011 WMCP to DWR in satisfaction of its obligations under Water Code sections 10826 and 10608.48(d);

WHEREAS, the District has submitted its 2017 WMCP Update to the USBR in satisfaction of its water conservation plan obligations under the RRA of 1982; and

WHEREAS, upon the USBR's acceptance of the 2017 WMCP Update, the District intends to submit the 2017 WMCP Update to DWR in satisfaction of the District's obligations under Water Code sections 10826 and 10608.48(d).

NOW, THEREFORE, be it RESOLVED, by the TID Board of Directors as follows:

1. TID herby adopts the 2017 WMCP Update attached hereto as Exhibit A.

2. The Manager shall revise the 2017 WMCP Update to address any recommendations offered by USBR.

3. The Manager shall, upon USBR's acceptance of the 2017 WMCP Update, transmit the 2017 WMCP Update to DWR in satisfaction of the District's obligations under Water Code sections 10826 and 10608.48(d).

PASSED AND ADOPTED at a regular meeting of the TID Board of Directors on September 11, 2017 by the following vote:

AYES: Directors Crawford, Havlina, Staunton and Wright
NOES:
ABSTAINED:
ABSENT: Director Heiney

* * *

I hereby certify that I am the Secretary of the Tulelake Irrigation District and that the foregoing resolution was duly adopted by the Board of Directors of said District at a meeting thereof duly held on September 11, 2017, at which meeting a quorum of said Board of Directors was at all times present and acting.

IN WITNESS WHEREOF, I have set my hand and the seal of the District this 11th day of September, 2017.

Brad C. Kirby, Secretary
Board of Directors
Tulelake Irrigation District

Attachment I

2013 – 2015 District Water Inventory Tables

Table 1

Surface Water Supply

2013 Month	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water Recirc/Reuse (acre-feet)	Transfers into District (acre-feet)	Water Spill / Drain (acre-feet)	Total (acre-feet)
Method	M2			C2-E2		C2-E2	
January	0	0	0	1,179	0	1,444	2,623
February	0	0	0	0	0	1,511	1,511
March	941	0	0	1,325	0	1,045	3,311
April	5,089	0	0	3,874	0	8,601	17,564
May	9,421	0	0	4,970	0	25,581	39,972
June	13,432	0	0	15,986	0	22,227	51,645
July	10,656	0	0	8,791	0	20,357	39,804
August	4,118	0	0	6,176	0	22,371	32,665
September	1,556	0	0	1,379	0	20,853	23,788
October	2,226	0	0	0	0	8,255	10,481
November	2,647	0	0	2,207	0	672	5,526
December	0	0	0	147	0	661	808
TOTAL	50,086	0	0	46,034	0	133,578	229,698

Table 2

Ground Water Supply

2013 Month	Groundwater (acre-feet)	Agric Groundwate *(acre-feet)
Method		
January	0	0
February	0	0
March	0	0
April	0	0
May	3,269	0
June	7,118	0
July	11,197	0
August	6,464	0
September	6,830	0
October	0	0
November	0	0
December	0	0
TOTAL	34,878	0

Table 3

Total Water Supply

2013 Month	Surface Water Total (acre-feet)	Groundwater (acre-feet)	M&I Wastewater (acre-feet)	District Water (acre-feet)
Method				
January	2,623	0	0	2,623
February	1,511	0	0	1,511
March	3,311	0	0	3,311
April	17,564	0	0	17,564
May	39,972	3,269	0	43,241
June	51,645	7,118	0	58,763
July	39,804	11,197	0	51,001
August	32,665	6,464	0	39,129
September	23,788	6,830	0	30,618
October	10,481	0	0	10,481
November	5,526	0	0	5,526
December	808	0	0	808
TOTAL	229,698	34,878	0	264,576

2013 Precipitation Worksheet				
	inches precip	**ft precip**	**acres**	**AF/Year**
Jan	0.45	0.04	294.55	165.44
Feb	0.60	0.05	9,292.00	5,219.01
Mar	0.27	0.02	3,326.00	1,868.10
Apr	0.75	0.06	0.00	0.00
May	1.19	0.10	0.00	0.00
Jun	1.20	0.10	0.00	0.00
Jul	0.00	0.00	0.00	0.00
Aug	0.30	0.03	0.00	0.00
Sept	1.42	0.12	0.00	0.00
Oct	0.06	0.01	0.00	0.00
Nov	0.33	0.03	0.00	0.00
Dec	0.17	0.01		
TOTAL	**6.74**	**0.56**		

2013 Evaporation Worksheet				
	inches evap	**ft evap**	**acres**	**AF/YEAR**
Jan	1.05	0.09	294.55	1,274.40
Feb	1.84	0.15	9,292.00	40,203.39
Mar	3.58	0.30	3,326.00	14,390.49
Apr	5.04	0.42	0.00	0.00
May	6.63	0.55	0.00	0.00
Jun	7.82	0.65	0.00	0.00
Jul	8.50	0.71	0.00	0.00
Aug	6.90	0.57	0.00	0.00
Sept	4.98	0.42	0.00	0.00
Oct	3.09	0.26	0.00	0.00
Nov	1.63	0.14	0.00	0.00
Dec	0.87	0.07		
TOTAL	**51.92**	**4.33**		

Table 4

Agricultural Distribution System

2013 Canal, Pipeline, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitation (acre-feet)	Evaporation (acre-feet)	Spillage (acre-feet)	Seepage[1] (acre-feet)	Total (acre-feet)
TID Irrigation Syst	1,283,040	10	12,830,400	165.4	1,274.4	0	1,380	(2,489)
Tulelake Sump 1A	--	--	404,759,520	5,219.0	40,203.4	0	0	(34,984)
Tulelake Sump 1B	--	--	144,880,560	1,868.1	14,390.5	0	0	(12,522)
	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	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				7,252.5	55,868.3	0	1,380	(49,996)

1: Seepage is a calculated value based on measured volume diverted at the headworks and the total available supply

Table 5

Crop Water Needs

2013 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Requirement (AF/Ac)	Cultural Practices (AF/Ac)	Precipitation (AF/Ac)	Appl. Crop Water Use (acre-feet)
Barley	6,422	1.55	0.0	0.0	0.1	9,572
Wheat	18,807	1.71	0.0	0.0	0.1	31,088
Oats	87	1.71	0.0	0.0	0.1	144
Rye	40	1.71	0.0	0.0	0.1	66
Alfalfa	17,754	1.55	0.0	0.0	0.1	25,101
Other Hay	3,493	1.55	0.0	0.0	0.1	4,939
Pasture	1,042	2.41	0.0	0.0	0.2	2,254
Potatoes	7,529	1.55	0.0	0.0	0.2	10,100
Onions	2,899	1.55	0.0	0.0	0.2	4,038
Garlic	18	1.55	0.0	0.0	0.2	25
Mint	2,306	1.68	0.0	0.0	0.2	3,470
Sunflowers	404	1.48	0.0	0.0	0.2	533
Horseradish	462	1.48	0.0	0.0	0.2	609
	0	0.00	0.0	0.0	0.0	0
Crop Acres	61,263					91,939

Total Irrig. Acres	61,263	(If this number is larger than your known total, it may be due to double cropping)

Table 6

2013 District Water Inventory

Water Supply	Table 3		264,576
Riparian ET	(Distribution and Drain)	minus	0
Groundwater recharge	intentional - ponds, injection	minus	0
Seepage	Table 4	minus	1,380
Evaporation - Precipitation	Table 4	minus	48,616
Spillage	Table 4	minus	0
D Plant Pumping to LKNWR[1]		minus	16,187
Water Available for sale to customers			198,393
Actual Agricultural Water Sales 2013	From District Sales Records		114,144
Private Groundwater	Table 2	plus	0
Crop Water Needs	Table 5	minus	91,939
Drainwater outflow	(tail and tile, not recycled)	minus	0
Percolation from Agricultural Land	(calculated)		22,205
Unaccounted for Water	(calculated)		84,249

1: Water from D-Plant is conveyed to LKNWR, located outside of TID

Table 7

Influence on Groundwater and Saline Sink

2013

Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence	(33,498)
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	61,263
Irrigated acres over a perched water table	0
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agri seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	0
Portion of Dist. Sys. seep/leaks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	0

Table 1

Surface Water Supply

2014 Month	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water Recirc/Reuse (acre-feet)	Transfers into District (acre-feet)	Water Spill / Drain (acre-feet)	Total (acre-feet)
Method	M2			C2-E2		C2-E2	
January	0	0	0	0	0	760	760
February	0	0	0	0	0	1,180	1,180
March	2,315	0	0	1,034	0	1,436	4,785
April	5,437	0	0	5,866	0	8,744	20,047
May	6,281	0	0	3,814	0	23,909	34,004
June	13,015	0	0	14,149	0	19,365	46,529
July	10,427	0	0	9,588	0	21,127	41,142
August	4,538	0	0	4,503	0	21,401	30,442
September	3,465	0	0	2,965	0	17,561	23,991
October	1,657	0	0	1,871	0	8,600	12,128
November	1,576	0	0	5,974	0	1,202	8,752
December	0	0	0	0	0	2,134	2,134
TOTAL	48,711	0	0	49,764	0	127,419	225,894

Table 2

Ground Water Supply

2014 Month	Groundwater (acre-feet)	Agric Groundwate *(acre-feet)
Method		
January	0	0
February	0	0
March	0	0
April	7,409	0
May	7,882	0
June	13,235	0
July	10,064	0
August	10,320	0
September	5,014	0
October	0	0
November	0	0
December	0	0
TOTAL	53,924	0

Table 3

Total Water Supply

2014 Month	Surface Water Total (acre-feet)	Groundwater (acre-feet)	M&I Wastewater (acre-feet)	District Water (acre-feet)
Method				
January	760	0	0	760
February	1,180	0	0	1,180
March	4,785	0	0	4,785
April	20,047	7,409	0	27,456
May	34,004	7,882	0	41,886
June	46,529	13,235	0	59,764
July	41,142	10,064	0	51,206
August	30,442	10,320	0	40,762
September	23,991	5,014	0	29,005
October	12,128	0	0	12,128
November	8,752	0	0	8,752
December	2,134	0	0	2,134
TOTAL	225,894	53,924	0	279,818

2014 Precipitation Worksheet				
	inches precip	**ft precip**	**acres**	**AF/Year**
Jan	0.33	0.03	294.55	269.51
Feb	1.59	0.13	9,292.00	8,502.18
Mar	1.46	0.12	3,326.00	3,043.29
Apr	0.49	0.04	0.00	0.00
May	0.68	0.06	0.00	0.00
Jun	0.31	0.03	0.00	0.00
Jul	0.03	0.00	0.00	0.00
Aug	0.84	0.07	0.00	0.00
Sept	0.49	0.04	0.00	0.00
Oct	1.21	0.10	0.00	0.00
Nov	0.98	0.08	0.00	0.00
Dec	2.57	0.21		
TOTAL	**10.98**	**0.92**		

2014 Evaporation Worksheet				
	inches evap	**ft evap**	**acres**	**AF/YEAR**
Jan	1.21	0.10	294.55	1,291.14
Feb	1.75	0.15	9,292.00	40,731.48
Mar	3.53	0.29	3,326.00	14,579.52
Apr	5.23	0.44	0.00	0.00
May	7.11	0.59	0.00	0.00
Jun	8.02	0.67	0.00	0.00
Jul	8.36	0.70	0.00	0.00
Aug	6.93	0.58	0.00	0.00
Sept	5.34	0.44	0.00	0.00
Oct	3.12	0.26	0.00	0.00
Nov	1.38	0.11	0.00	0.00
Dec	0.64	0.05		
TOTAL	**52.602**	**4.38**		

Table 4

Agricultural Distribution System

2014 Canal, Pipeline, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitation (acre-feet)	Evaporation (acre-feet)	Spillage (acre-feet)	Seepage[1] (acre-feet)	Total (acre-feet)
TID Irrigation Syst	1,283,040	10	12,830,400	269.5	1,291.1	0	1,722	(2,744)
Tulelake Sump 1A	--	--	404,759,520	8,502.2	40,731.5	0	0	(32,229)
Tulelake Sump 1B	--	--	144,880,560	3,043.3	14,579.5	0	0	(11,536)
	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	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				11,815.0	56,602.1	0	1,722	(46,509)

1: Seepage is a calculated value based on measured volume diverted at the headworks and the total available supply

Table 5

Crop Water Needs

2014 Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Requirement (AF/Ac)	Cultural Practices (AF/Ac)	Precipitation (AF/Ac)	Appl. Crop Water Use (acre-feet)
Barley	5,062	1.55	0.0	0.0	0.0	7,674
Wheat	13,305	1.71	0.0	0.0	0.0	22,332
Alfalfa	18,901	1.55	0.0	0.0	0.1	27,507
Other Hay	3,881	1.55	0.0	0.0	0.1	5,648
Pasture	924	2.41	0.0	0.0	0.2	2,039
Potatoes	8,409	1.55	0.0	0.0	0.2	11,537
Onions	2,916	1.55	0.0	0.0	0.1	4,304
Mint	2,423	1.68	0.0	0.0	0.1	3,778
Strawberries	108	1.48	0.0	0.0	0.1	151
Horseradish	430	1.48	0.0	0.0	0.1	602
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
Crop Acres	56,359					85,573

Total Irrig. Acres 56,359 (If this number is larger than your known total, it may be due to double cropping)

Table 6

2014 District Water Inventory

Water Supply	Table 3		279,818
Riparian ET	(Distribution and Drain)	minus	0
Groundwater recharge	intentional - ponds, injection	minus	0
Seepage	Table 4	minus	1,722
Evaporation - Precipitation	Table 4	minus	44,787
Spillage	Table 4	minus	0
D Plant Pumping to LKNWR[1]		minus	9,901
Water Available for sale to customers			223,408
Actual Agricultural Water Sales 2014	From District Sales Records		100,938
Private Groundwater	Table 2	plus	0
Crop Water Needs	Table 5	minus	85,573
Drainwater outflow	(tail and tile, not recycled)	minus	0
Percolation from Agricultural Land	(calculated)		15,365
Unaccounted for Water	(calculated)		122,470

1: Water from D-Plant is conveyed to LKNWR, located outside of TID

Table 7

Influence on Groundwater and Saline Sink

2014

Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence	(52,202)
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	56,359
Irrigated acres over a perched water table	0
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agri seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	0
Portion of Dist. Sys. seep/leaks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	0

Table 1

Surface Water Supply

2015 Month	Federal Ag Water (acre-feet)	Federal non-Ag Water. (acre-feet)	State Water (acre-feet)	Local Water Recirc/Reuse (acre-feet)	Transfers into District (acre-feet)	Water Spill / Drain (acre-feet)	Total (acre-feet)
Method	M2			C2-E2		C2-E2	
January	0	0	0	0	0	1,347	1,347
February	0	0	0	0	0	2,265	2,265
March	1,230	0	0	1,128	0	1,172	3,530
April	5,009	0	0	2,771	0	9,093	16,873
May	2,752	0	0	1,023	0	21,719	25,494
June	12,468	0	0	13,726	0	18,185	44,379
July	9,526	0	0	5,742	0	19,681	34,949
August	13,460	0	0	8,406	0	20,554	42,420
September	2,909	0	0	4,342	0	19,332	26,583
October	3,115	0	0	3,093	0	11,577	17,785
November	1,428	0	0	4,170	0	1,861	7,459
December	0	0	0	722	0	2,001	2,723
TOTAL	51,897	0	0	45,123	0	128,787	225,807

Table 2

Ground Water Supply

2015 Month	Groundwater (acre-feet)	Agric Groundwate *(acre-feet)
Method		
January	0	0
February	0	0
March	0	0
April	1,982	0
May	3,661	0
June	10,167	0
July	2,303	0
August	104	0
September	0	0
October	0	0
November	0	0
December	0	0
TOTAL	18,217	0

Table 3

Total Water Supply

2015 Month	Surface Water Total (acre-feet)	Groundwater (acre-feet)	M&I Wastewater (acre-feet)	District Water (acre-feet)
Method				
January	1,347	0	0	1,347
February	2,265	0	0	2,265
March	3,530	0	0	3,530
April	16,873	1,982	0	18,855
May	25,494	3,661	0	29,155
June	44,379	10,167	0	54,546
July	34,949	2,303	0	37,252
August	42,420	104	0	42,524
September	26,583	0	0	26,583
October	17,785	0	0	17,785
November	7,459	0	0	7,459
December	2,723	0	0	2,723
TOTAL	225,807	18,217	0	244,024

2015 Precipitation Worksheet				
	inches precip	**ft precip**	**acres**	**AF/Year**
Jan	0.39	0.03	294.55	258.95
Feb	1.34	0.11	9,292.00	8,169.22
Mar	1.40	0.12	3,326.00	2,924.11
Apr	0.18	0.02	0.00	0.00
May	1.23	0.10	0.00	0.00
Jun	0.60	0.05	0.00	0.00
Jul	1.46	0.12	0.00	0.00
Aug	0.06	0.01	0.00	0.00
Sept	0.27	0.02	0.00	0.00
Oct	0.68	0.06	0.00	0.00
Nov	0.73	0.06	0.00	0.00
Dec	2.21	0.18		
TOTAL	**10.55**	**0.88**		

2015 Evaporation Worksheet				
	inches evap	**ft evap**	**acres**	**AF/YEAR**
Jan	1.19	0.10	294.55	1,260.09
Feb	2.16	0.18	9,292.00	39,751.95
Mar	3.73	0.31	3,326.00	14,228.91
Apr	5.30	0.44	0.00	0.00
May	5.82	0.48	0.00	0.00
Jun	8.20	0.68	0.00	0.00
Jul	7.78	0.65	0.00	0.00
Aug	7.25	0.60	0.00	0.00
Sept	4.83	0.40	0.00	0.00
Oct	3.05	0.25	0.00	0.00
Nov	1.31	0.11	0.00	0.00
Dec	0.74	0.06		
TOTAL	**51.337**	**4.28**		

Table 4

Agricultural Distribution System

2015 **Canal, Pipeline, Lateral, Reservoir**	**Length** (feet)	**Width** (feet)	**Surface Area** (square feet)	**Precipitation** (acre-feet)	**Evaporation** (acre-feet)	**Spillage** (acre-feet)	**Seepage**[1] (acre-feet)	**Total** (acre-feet)
TID Irrigation Syst	1,283,040	10	12,830,400	259.0	1,260.1	0	1,963	(2,964)
Tulelake Sump 1A	--	--	404,759,520	8,169.2	39,752.0	0	0	(31,583)
Tulelake Sump 1B	--	--	144,880,560	2,924.1	14,228.9	0	0	(11,305)
	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	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				11,352.3	55,240.9	0	1,963	(45,852)

1: Seepage is a calculated value based on measured volume diverted at the headworks and the total available supply

Table 5

Crop Water Needs

2015 **Crop Name**	**Area** (crop acres)	**Crop ET** (AF/Ac)	**Requirement** (AF/Ac)	**Cultural Practices** (AF/Ac)	**Precipitation** (AF/Ac)	**Appl. Crop Water Use** (acre-feet)
Barley	6,292	1.55	0.0	0.0	0.1	9,366
Wheat	12,008	1.71	0.0	0.0	0.1	19,825
Oats	84	1.71	0.0	0.0	0.1	139
Rye	52	1.71	0.0	0.0	0.1	86
Alfalfa	21,237	1.55	0.0	0.0	0.2	29,325
Other Hay	2,847	1.55	0.0	0.0	0.2	3,931
Pasture	925	2.41	0.0	0.0	0.2	2,021
Potatoes	7,981	1.55	0.0	0.0	0.2	10,655
Onions	2,307	1.55	0.0	0.0	0.1	3,344
Garlic	27	1.55	0.0	0.0	0.1	39
Mint	2,381	1.68	0.0	0.0	0.2	3,572
Strawberries	94	1.48	0.0	0.0	0.2	122
Horseradish	408	1.48	0.0	0.0	0.2	531
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
	0	0.00	0.0	0.0	0.0	0
Crop Acres	56,643					82,956

Total Irrig. Acres 56,643 (If this number is larger than your known total, it may be due to double cropping)

Table 6

2015 District Water Inventory

Water Supply	Table 3		244,024
Riparian ET	(Distribution and Drain)	minus	0
Groundwater recharge	intentional - ponds, injection	minus	0
Seepage	Table 4	minus	1,963
Evaporation - Precipitation	Table 4	minus	43,889
Spillage	Table 4	minus	0
D Plant Pumping to LKNWR[1]		minus	7,802
Water Available for sale to customers			190,370
Actual Agricultural Water Sales 2015	From District Sales Records		99,041
Private Groundwater	Table 2	plus	0
Crop Water Needs	Table 5	minus	82,956
Drainwater outflow	(tail and tile, not recycled)	minus	0
Percolation from Agricultural Land	(calculated)		16,085
Unaccounted for Water	(calculated)		91,329

1: Water from D-Plant is conveyed to LKNWR, located outside of TID

Table 7

Influence on Groundwater and Saline Sink

2015

Agric Land Deep Perc + Seepage + Recharge - Groundwater Pumping = District Influence	(16,254)
Estimated actual change in ground water storage, including natural recharge)	0
Irrigated Acres (from Table 5)	56,643
Irrigated acres over a perched water table	0
Irrigated acres draining to a saline sink	0
Portion of percolation from agri seeping to a perched water table	0
Portion of percolation from agri seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	0
Portion of Dist. Sys. seep/leaks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	0