

# **2015 Agricultural Water Management Plan**

Prepared Pursuant to Water Code Section 10826

## **Consolidated Irrigation District**

2255 Chandler St  
PO Box 209  
Selma, CA 93662  
Phone (559) 896-1660  
Fax (559) 896-8488

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Board of Directors  
Larry S. Cruff  
Thomas E. Feaver  
Earl Hudson  
Tony Lewis  
Ray Moles

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## Acronyms and Abbreviations

AF	acre-feet
AWMP	Agricultural Water Management Plan
Board	Board of Directors
BPO	Basin Plan Objective
cfs	cubic feet per second
CID	Consolidated Irrigation District
Coalition	Kings River Water Quality Coalition
District	Consolidated Irrigation District
DWR	California Department of Water Resources
ET	Evapotranspiration
GWMP	Groundwater Management Plan
IRWMP	Integrated Regional Water Management Plan
ITRC	California Polytechnic State University San Luis Obispo's Irrigation Training & Research Center
JPA	Joint Powers Authority
KRCD	Kings River Conservation District
MDL	method detection limit
mg/L	milligrams per liter
NTU	Nephelometric Turbidity Unit
PQL	practical quantification limit
ug/L	micro grams per liter
umhos/cm	micro mhos per centimeter
Plan	Agricultural Water Management Plan

## **Section I: Introduction**

### **A. Conjunctive Use District**

Consolidated Irrigation District is a conjunctive use district, meaning the surface water supply available to water users in the District must be augmented by groundwater use to meet total demands within the District. As discussed later in this report, the geologic conditions within the District are predominantly high infiltration sandy soils within an unconfined aquifer with excellent water quality. Flood irrigation methods by growers are considered positive as water in excess of the crop evapotranspiration provides additional recharge to the local aquifer. Accurate measurement is important to the District, however the District does not believe that the installation of meters will cause significant water conservation.

### **B. Description of Previous Water Management Activities**

This Agricultural Water Management Plan (AWMP or Plan) has been prepared by Consolidated Irrigation District (CID or District) to comply with the requirements of the SB X7-7-Water Conservation Act. This AWMP has been prepared in accordance with the requirements identified in the Department of Water Resources (DWR) Guidebook to Assist Agricultural Water Suppliers to Prepare an Agricultural Water Management Plan dated May 11, 2015.

The District has been involved in other water management efforts. Two previous groundwater water management plans (GWMP) have been prepared for or by the District. In 1995, the District prepared a GWMP in accordance with AB 3030 the Groundwater Management Act of 1992). The 1995 plan documented the groundwater management activities that the District has implemented throughout its existence and provided a framework for expanding groundwater management within the District and recommended the following:

1. Establishment of a groundwater level monitoring program.
2. Establishment of a water quality monitoring program.
3. Enactment of a well construction and abandonment policy.
4. Facilitation of conjunctive use operations.
5. Mitigation of groundwater overdraft
6. Replenishment of groundwater extractions
7. Development of relations with state and federal regulatory agencies
8. Coordination with local agencies.

In 2009, the District updated and expanded the 1995 GWMP plan as an effort to define management actions to be implemented by the District to ensure that there is a long-term, sustainable supply for current and future water needs. The 2009 report recommended the following:

1. Reduction of overdraft.
2. Increase in total recharge pond area.
3. Increase in instantaneous recharge capacity of the District system.

The purposes for preparing this AWMP for the District are to (1) document water management activities that the District has implemented throughout its existence and provide a framework for expanding water management within the District, (2) identify areas to improve the efficiency of water use within the District, (3) consider past and future water management strategies to increase the reliability of water deliveries to the District, and (4) document the District's AWMP to its water users and interested parties.

The District is also founding member of the Upper Kings Basin Integrated Regional Water Management (IRWMP) Joint Powers Authority (JPA), which developed the Kings IRWM Plan. The District signed the JPA on 2/11/2009. The entity is now known as the Kings Basin Water Authority, and recently updated its IRWM Plan in 2012. The District adopted the updated IRWMP on 11/14/2012. The vision of the Kings Basin Water Authority is a sustainable supply of the Kings River Basin's finite surface water and groundwater resources through regional planning that is balanced and beneficial for environmental stewardship, overall quality of life, a sustainable economy, and adequate resources for future generations. Fifteen measureable objectives were identified to help meet the region's five primary goals to:

1. Reduce groundwater overdraft,
2. Increase water supply reliability,
3. Improve water quality and drinking water reliability,
4. Enhance flood protection, and
5. Enhance ecosystems and the services they provide.

## C. Coordination Activities

### 1. Notification of AWMP Preparation

Worksheet 1 provides a summary of specific interested parties that were notified and/or requested to provide some level of involvement in the 2015 AWMP during the public review process.

#### Worksheet 1. Summary of Coordination, Adoption, and Submittal Activities

Potential Interested Parties	Notified of Draft AWMP and Public Meeting	Requested Copy of Draft AWMP	Copy of Adopted AWMP Sent	Commented on Draft AWMP	Attended Public Meeting	Copy of Revised AWMP Sent	Revised AWMP Public Meeting Notice	Commented on Revised AWMP
Selma Enterprise	4/29/15 5/06/15						3/30/16 4/6/16	
County of Fresno						3/24/16		
County of Kings						3/24/16		
County of Tulare						3/24/16		
City of Reedley		5/11/15	5/12/15	5/27/15	5/12/15	3/24/16		
City of Kingsburg						3/24/16		
City of Selma						3/24/16		
City of Fowler						3/24/16		
City of Sanger						3/24/16		
City of Parlier						3/24/16		
District Landowners/Water Users	5/17/15						7/13/16	
County Library & State Library						3/24/16		
Department of Water Resources						3/24/16		

## **2. Public Participation**

Prior to adopting the Plan, the District made the proposed Plan available for public inspection, and held a public hearing on the Plan. Prior to the hearing, notice of the time and place of hearing was published in a local newspaper and posted within the District and at the District office.

Exhibit 1 includes copies of the public notifications on the hearing time and place, copies of the notice of availability of the Plan for public review, and how to submit comments. No comments were received as a result of the re-noticing of the Plan in 2016.

## **D. Plan Adoption and Submittal**

### **1. Plan Adoption**

At the Board meeting held on June 17, 2015, the Board of Directors (Board) adopted the Plan. After receiving comments from DWR, the District revised the Plan and it was reconsidered for adoption on July 13, 2016. A copy of the resolution is included as Exhibit 2.

### **2. Plan Submittal**

After adoption, an electronic copy of the Plan was submitted to DWR.

### **3. Plan Availability**

A copy of the plan was made available at the District office and submitted to DWR. A copy will also be made available for public review on DWR's internet website.

## **E. Plan Implementation Schedule**

The Board intends to implement the Plan in 2015 and subsequently update it on a five-year schedule.

## **Section II: Description of the Agricultural Water Supply and Service Area**

### **A. Physical Characteristics**

#### **1. History and Size of the Service Area**

The District was organized on September 8, 1921, in accordance with the California Water Code for Irrigation Districts. A five-member Board governs the District. Board members must be landowners in the District or a designated representative of a landowner.

The District is comprised of 145,000 acres, the majority of which is in agricultural production. Incorporated cities within the boundaries of the District include Fowler, Kingsburg, Parlier, Sanger, Selma, and a small portion of the City of Reedley. Other smaller urban enclaves are found in the unincorporated areas and include Caruthers and Del Rey. Total urban demands are much smaller than the total agricultural demands, but the growing urbanized areas are reliant exclusively on groundwater. The majority of the water demand is to support the agricultural economy. Crop water requirements are met through irrigation application of both surface and groundwater. Surface water delivered to agriculture reduces the reliance on groundwater. Part of the surface water applied to agriculture, that water which is not consumed by the crops, percolates downward and recharges the groundwater basin. The intentional use of surface water in lieu of groundwater pumping is part of the District's conjunctive use operations.

The District has water rights to the flow of the Kings River and storage rights in Pine Flat Reservoir. Surface water is stored in Pine Flat and diverted from the Kings River for distribution through the District's canals. Water flowing down the canals also recharges the groundwater basin. The diverted water is used for surface irrigation on approximately 95,000 acres. Surface water irrigation must be supplemented with groundwater to meet the annual water demands of the crops. The remaining agricultural areas of the District rely exclusively on groundwater. Part of the diverted surface water is also delivered to recharge ponds located throughout the District. The average annual surface water supply is approximately 278,000 acre-feet (AF), but can vary from the low of 13,894 AF in 1975-76, to a high of 563,544 AF in 1968-69. Average pond recharge is approximately 55,000 AF, with an average of 165,000 acre-feet every other three years.

#### **2. Location of the Service Area and Water Management Facilities**

The District is located in the San Joaquin Valley, principally in Fresno County, with minor portions of Kings and Tulare Counties. The City of Fresno is approximately five mile northwesterly of the District's northern boundary. Refer to Exhibit 3 for a location map and Exhibit 4 for a distribution system map of the District.

Surface water deliveries are made through 350 miles of open channels that include constructed ditches and canals and channelized drains and sloughs. There are numerous lateral pipelines and piped portions of the main channels. The headwork of

the water system is a diversion structure on the Kings River. Two main channels, the Fowler Switch and Centerville and Kingsburg Canals, branch out near this location and serve the majority of lateral channels and pipelines that fan out across the District. An additional main channel, the Lone Tree Canal, diverts water from Fresno Irrigation District. A portion of the water delivered through the Lone Tree system is categorized as “Church” water and carries a higher water reliability. Refer to Exhibit 4 for a distribution system map of the District and Worksheet 2 for the itemized water distribution system inventory.

**Worksheet 2. Water Conveyance and Delivery System**

<b>Supply Canals</b>	<b>Length (mi)</b>
Earth Lined Canals	208.5
Lined Canals	13.0
Bottom-only Lined Canals	5.3
Pipelines	80.3
<b>Total</b>	<b>307.2</b>

The District provides two types of water service to its members. The first service is surface water deliveries that are made through the District water delivery system. The annual duration of water supply varies on the storage conditions in Pine Flat Reservoir and on runoff in the Kings River. Typically, surface water supplies are made available in April and end in August. During drier hydrologic conditions, the surface water supplies are provided over a shorter period of time.

The other service provided by the District is groundwater recharge. The recharge is provided through two methods: direct recharge and in-lieu recharge. The direct recharge occurs through seepage from the earthen channels when they are used for water delivery and in dedicated recharge basins. The types of soils throughout much of the District allow for relatively rapid infiltration and recharge to the groundwater surface. The dedicated recharge system includes over several dedicated recharge basins with a surface area of approximately 1,350 acres.

In-lieu recharge in the District occurs when growers use surface water instead of groundwater. By foregoing pumping, groundwater can remain in storage or it can be used by other growers that do not have access to surface water or by municipalities that cannot use untreated surface water.

The groundwater recharge benefits provided by the District are realized by users both inside and outside the District boundaries. District users that are eligible to receive surface supplies can augment their irrigation needs by operating their private wells when the canal system is not operating. District users not eligible to receive surface supplies must use their private wells exclusively throughout the year to meet irrigation needs. Without the District’s groundwater recharge program, these users would have higher pump lifts and less replenishment of their supply. Users that are not within the District, such as local cities or adjacent landowners, also receive the benefits of the District’s groundwater recharge program through lower pump lifts and improved water

quality. The District has a plan to expand its recharge program by capturing additional flood water in wet years. The District plans to increase capacity of its facilities west of Clovis Avenue by approximately 50% in order to expand its recharge program and convey more water to lands and planned recharge ponds in portions of the District.

The District maintains a system of approximately 80 groundwater monitoring wells located on a two mile square grid pattern throughout the District. The water levels in these wells have been measured and recorded by District staff since the inception of the District. Typically all wells were read on a monthly basis up until 2001. Since then readings have been taken no less than two times per year. As groundwater levels have fallen or surface conditions have changed, the District has repaired or replaced the monitoring wells to maintain the monitoring program. From the mid-1990s until 2003, the District replaced nearly half of its monitoring wells. New wells were constructed with 4-inch or 6-inch diameter perforated casings and guard posts and lockable caps at the surface. The well replacement program was funded with a combination of District reserves and an AB303 State Grant. These efforts are an indication of the District's on-going commitment to groundwater management.

### 3. Terrain and Soils

The District lies within the Kings River Subbasin (DWR, Bulletin 118 basin 5-22.08) in the San Joaquin Valley Hydrologic Region. The area of the subbasin is approximately 1,500 square miles. The subbasin is bounded on the north by the San Joaquin River, on the east by the Sierra Nevada foothills, on the west by the Westside and Delta-Mendota Subbasins, and on the South by the Kings River and Kaweah Subbasin.

Portions of the easterly and southeasterly boundary of the District follow the existing alignment of the Kings River, which has deposited an alluvial fan throughout the area. The apex of the fan lies near the northeast corner of the District and the fan deposits have spread out radially to the southwest on lands that now make up the District. A major portion of District lands are permeable to moderately permeable younger alluvial deposits from granitic rock eroded and washed down from the Sierra Nevada.

Worksheet 3 lists the names and generalized descriptions for soils found in the District. As shown in the table, over 80% of the District is comprised of soils that are Grade 2 or better; the remainder of the soils are generally poorer drained or more severely sloped, and are generally not farmed. Refer to Exhibit 5 for a soils map of the District.

#### Worksheet 3. Landscape Characteristics

Map Symbol/Soil Name <sup>1</sup>	% of District	Percolation Rate (inch/hour)	Grade	Soil Description
Delhi loamy sand	18.8	5.0-10.0	2	Deep, somewhat excessively drained
Hanford fine sandy loam	18.3	2.5-5.0	1	Deep, well drained
Hanford sandy loam	11.6	2.5-5.0	1	Deep, well drained
Hesperia fine sandy loam	9.9	2.5-5.0	1	Moderately deep, well drained

Hesperia sandy loam	9.4	0.6-2.0	1	Moderately deep, well drained
Delhi sand	7.6	>20.0	3	Deep, somewhat excessively drained
Tujunga loamy sand	4.7	5.0-10.0	2	Deep, somewhat excessively drained
Exeter sandy loam	2.9	2.5-5.0	4	Moderately deep, well drained
Calhi loamy sand	2.3	5.0-10.0	2	Deep, somewhat excessively drained
Ramona sandy loam	1.8	2.5-5.0	1	Moderately deep, well drained
Nord fine sandy loam	1.4	0.6-2.0	1	Moderately deep, moderately well drained
Dello loamy sand	1.4	>20.0	3	Deep, somewhat poorly drained
Greenfield sandy loam	1.1	2.5-5.0	1	Deep, well drained
Other	8.7			
<sup>1</sup> USDA NRCS Web Soil Survey of Eastern Fresno Area, California, accessed August 2014.				

#### 4. Climate

The District's regional climate is semi-arid with hot, dry summers and mild winters. Average daily temperatures vary from 46°F in December to 80°F in July, with typical diurnal ranges of 33°F in the summer to 18°F in the winter. Annual precipitation from 1994 through 2013 averaged 10.48 inches, with 92 percent of the total rainfall received between October and April. Refer to Worksheet 4 for climatology for selected periods.

#### Worksheet 4. Detailed Climate Characteristics

Month	Average Precipitation, Inches <sup>1</sup>	Average Reference Evapotranspiration (ET <sub>o</sub> ), Inches	Average Minimum Temperature, °F	Average Maximum Temperature, °F
January	2.13	1.05	38	56
February	1.68	1.77	40	61
March	1.70	3.56	44	68
April	1.09	5.05	47	73
May	0.39	6.96	53	82
June	0.19	7.80	58	90
July	0.04	8.03	63	96
August	0.09	7.12	61	95
September	0.08	5.28	57	90
October	0.45	3.36	48	78
November	0.87	1.64	41	65
December	1.76	1.00	37	56
<b>Annual</b>	<b>10.48 Total</b>	<b>52.65 Total</b>	<b>48.8 Average</b>	<b>75.9 Average</b>
<b>Wet Season (Oct-Apr)</b>	<b>9.69 Total</b>	<b>17.44 Total</b>	<b>41.9 Average</b>	<b>65.4 Average</b>
<b>Dry Season (May-Sep)</b>	<b>0.79 Total</b>	<b>35.21 Total</b>	<b>58.5 Average</b>	<b>90.4 Average</b>
<sup>1</sup> CIMIS Station 39 (Parlier) 1994-2013.				

## B. Operational Characteristics

### 1. Operating Rules and Regulations

Refer to Exhibit 7 for a copy of the District's Operating Rules and Regulations, adopted in 1988.

### 2. Water Delivery Measurements or Calculations

The delivery system consists of two major canals known respectively as the Fowler Switch Canal which serves the north and western part of the District, and the Centerville/Kingsburg Canal which serves the eastern area. These canals subdivide into smaller ditches and ultimately water is delivered to grower irrigation ditches or pipelines, or to percolation ponds.

The flow of water in the distribution system is measured in most cases by overflow weirs, and a current meter is used at various points throughout the District to verify measurements. The ditch tenders are provided with California Polytechnic State University San Luis Obispo's Irrigation Training & Research Center (ITRC) weir sticks for flow measurement and rating booklets that aid them in converting head measurements to flow rates for control structures within the District.

During the irrigation season, farmers order water directly from their assigned ditch tender. A farm turnout may receive water for periods ranging from a fraction of a day to several weeks per delivery cycle depending on the acreage served by that turnout.

The growers arrange in advance with the ditch tenders when to open and close their valves for a delivery. Farmers operate the turnout valves themselves. This relatively low-cost method of water delivery has worked successfully for many decades.

To measure water usage at the turnout, the District measures the flowrate at check structures upstream and downstream of a turnout when that turnout is in operation, and deducts channel losses to determine the flowrate at a turnout. Field verification of flowrate measurements and channel losses will be performed, and measurement certified by an engineer. During a site tour of District facilities with DWR staff on August 19, 2015, DWR staff determined that this method was acceptable.

Refer to Worksheet 5 for a summary of the District's water measurement devices.

#### Worksheet 5. Water Delivery Measurements

Measurement Device	Frequency of Measurement (Days)	Frequency of Calibration (Months)	Frequency of Maintenance (Months)	Estimated Level of Accuracy
Flumes	Daily	As needed	As needed	± 5%
Weir boards	Daily	As needed	As needed	± 10%

### 3. Description of Water Measurement Best Professional Practices

The District's ditchtenders record daily flow measurement readings using ITRC weir sticks at check structures and measurement locations, as well as at existing flow meter locations. The District is also continuing to develop its telemetry system which records flow measurements at locations within the District. These daily readings are summarized into monthly totals and reviewed by supervisors prior to finalizing. Actual irrigated acres are not calculated by the District as the District's assessment is based on County assessor parcel acreage.

### 4. Documentation of Water Measurement Conversion to Volume

Since the District does not currently have a volumetric pricing structure, the District is not currently in the practice of converting the instantaneous flow measurement readings into a volume calculation. When a volumetric pricing structure is instituted, the District will apply the instantaneous flow measurement to the duration of delivery based on the delivery schedule and the District's rules and regulations. Deliveries are typically made in 24 hour increments, so the instantaneous flowrate (in acre-fee) will be converted to volume based on the number days (or hours) of delivery.

### 5. Water Measurement Corrective Action Plan

The District plans to provide additional in-channel measurement structures in order to provide adequate measurement for each turnout to be measured. Measurements will be calibrated in accordance with the requirements based on measurements taken at the turnout using temporary meters or gate head-loss calculations and certified by an engineer. The District may fund improvements as additional District funds or grant money becomes available, but plans to go through the Proposition 218 process to generate the required funds for the additional measurement improvements. The District anticipates completing the required Engineer's Report for the Proposition 218 election by June of 2017, with voting anticipated to be completed by December 2017. A detailed budget for implementing additional measurement upstream and downstream of turnout gates will be a part of the Engineer's Report, but the District estimates that it will need an estimated \$2,000,000 to construct the required additional structures. The \$2,000,000 estimate is based on a preliminary estimate of the number of locations where improvements are required and is shown in the table below. The District would initiate implementation of the increased measurement locations and devices in 2018, and anticipates a 5-year program for implementation of improved measurement.

No.	Item	Quantity	Unit	Cost/unit	Subtotal
1	In-Channel Measurement Improvements	44	ea	35000	\$ 1,540,000
2	Flow Measurement Calibration Devices	2	ea	5493	\$ 10,986
3	Turnout Improvements	30	ea	3856	\$ 115,680
				20% Contingency =	\$ 333,333
				<b>Total =</b>	<b>\$ 1,999,999</b>

## 6. Water Rate Schedules and Billing

The District recovers its operating expenses and retires debt for improvement projects through annual acreage assessments on lands within the District. There are three primary assessment rates which are based on the type of water service available. The District uses a percentage system so the various rates are constant proportions of one another. The current rates have been calculated to a per acre charge and are listed below in Worksheet 6.

### Worksheet 6. Water Rate Basis

Water Service	Rate Calculation (per acre)	Rate
CID Gravity	\$23.00	\$23.00 per acre
Church Gravity	CID Gravity x 120%	\$27.60 per acre
Pump	CID Gravity x 40%	\$9.20 per acre

The District gravity rate is for users that are eligible to receive surface supplies. The pump rate is for users that are not eligible to receive surface supplies. The District gravity rate is higher than the pump rate because the service provided to the District gravity rate users is more valuable than the service to pump users. To provide a given annual irrigation delivery, a District gravity rate user would not have to operate his private well as often as a pump rate user needing the same annual delivery. A typical water run for the District gravity rate users may last a little over three months.

The Church gravity rate is for select users eligible to receive surface supplies through the Lone Tree Canal system. Lands that are eligible to receive the Church water entitlement are based on the historic Church water service area. These lands are not necessarily contiguous and are at scattered locations along the present day Lone Tree Canal system of ditches and laterals. The Church gravity rate is higher than the District gravity rate because the entitlement provides a longer duration of annual deliveries. A typical water run for Church gravity rate users is nearly six months.

The District places other types of assessments on a relatively small acreage of lands within the District. Lands that are typically inundated during heavy rains or flood releases in the Kings River are assessed under the “pond” rate, which is \$0.50 per acre. Land that was formerly within the District, and is now within a City area that has been de-annexed from the District are still allowed to purchase water for \$43.60 per acre (CID water) and \$53.60 per acre (Church water).

The primary source of revenue for the District is acreage assessments on water users. Therefore, the District’s annual income is essentially fixed regardless of the amount of water that is delivered and recharged. Because cities within the District boundary are continually growing and annexing land away from the District, the resulting assessment

revenues actually have declined slightly over time. The current assessment rates have been in place since 2010 while consumer price indices since then have increased significantly. In recent years the District has made substantial reductions in its staff, maintenance programs, and rehabilitation and betterment (R&B) programs in order to minimize its annual budget and operate under the current assessment rates. However, the increasing disparity between operating expenses and revenue has made it necessary to increase the assessment rates.

The District has also entered into a Cooperative Agreement with the cities wholly within its boundaries for groundwater impact mitigation. Each agreement calls for an accounting of the city's net impact on the overall aquifer, and then a compensation amount paid to the District per acre-foot of impact. These compensation funds are set aside by the District to develop groundwater recharge facilities or other suitable mitigation measures within the area.

In order to be in compliance with the requirements, the District anticipates completing preparation of the required Engineer's Report for a Proposition 218 by June of 2017 that will include a recommended volumetric pricing structure in addition to assessment changes. Voting is anticipated to be completed by December 2017. If approved, the District would initiate implementation of the volumetric pricing in 2018.

## **7. Drought Management Plan and Water Shortage Allocation Policy**

Every year, surface water is prorated amongst water users based on the available overall supply and the length of the irrigation season is determined. Within a conjunctive use district such as the District, groundwater is pumped to make up the deficit between surface water supplies and demands. For decades, the District has taken a multi-year approach to drought management by developing and operating numerous recharge basins that capture water in average and wet years. Then, during dry years, growers utilize private wells to meet demands. The District maximizes delivery to growers and recharge within these basins, including the capture of floodwater during wet years. The District is also constructing its first groundwater banking facility that will recharge flood water during wet years and allow for pumping of stored groundwater during dry or drought years.

### Determining Drought Severity

The District is a member of the Kings River Water Association which monitors and reports reservoir levels, stream flows and snowpack and provides that information to the District for water supply availability projections. The District provides early communication to growers regarding drought conditions and the limited supply available to District growers. The District also maintains an extensive groundwater monitoring network and provides annual reporting of groundwater levels.

### Water Shortage Allocation

Rule 7 of the District's Operating Rules and Regulations (Exhibit 7) addresses the allocation of District water supplies:

When sufficient supply make it possible, water will be delivered on request. The water deliveries are scheduled on first come, first served basis after requests to the individual Ditchtender from the water users are approved. When there is insufficient supply, or disputes between water users exist, a rotation schedule will be prepared by the Watermaster for that particular canal or lateral.

When land has received one irrigation turn during a season, a second irrigation turn will be allowed only after all other irrigable land within the District that has requested water has been irrigated. During a season when a shortage is predicted, the water may be prorated among water users.

### Operational Adjustments

During drought periods, the District has prorated deliveries to growers and has minimized delivery to recharge basins. During severe droughts, the District has not received adequate surface water allotment to make a full irrigation delivery to growers, so it has delivered water only to its recharge facilities.

### Demand Management

Rule 12 of the District's Operating Rules and Regulations addresses the wasteful use of District water supplies and describes enforcement methods:

Water users are responsible for the efficient use of water received. Those water users who waste water through carelessness, defective, or inadequate privately owned facilities, or because of inadequate land preparation, may be refused further water service until such conditions are remedied. And waste or improper use of water shall be reported to the Watermaster.

Water users shall be responsible for all water after it leaves any canal, ditch, conduit, or other structure owned by the District. The District shall not be responsible or liable for any damage caused by negligence or careless use of water by any water user or by any water user's failure to maintain any canal, ditch, pipeline or other facility for which he is wholly or in part responsible. It is incumbent on all water users to prevent hazardous conditions, mosquito nuisances, or damage to the property of others.

### Alternative Water Supplies

The District has developed its first groundwater banking facility, which will allow the District to pump banked groundwater during dry years for delivery to growers or exchange. This facility provides an alternative water supply for the District, and the District is considering other additional similar facilities. The District has, and will continue to work with Kings River agencies to exchange water supplies, including agreements such as one previously made with Fresno Irrigation District that banked

groundwater within Consolidated Irrigation District during wet years. The District also continues to engage with the cities within the District to provide stormwater capture, as well as consideration of the use of reclaimed water from wastewater facilities.

#### Stages of Actions

As noted, the District's surface water deliveries are prorated to water users based on allocation for that year and what surface storage may have been carried over from the prior year. During drought periods, the District has prorated deliveries to growers and has minimized delivery to recharge basins. During severe droughts, the District has not received adequate surface water allotment to make a full irrigation delivery to growers, so it has delivered water only to its recharge facilities. The most severe drought stage for the District is no deliveries to users or recharge facilities.

#### Coordination and Collaboration

The cities within the District are solely dependent on groundwater, and until recently have been without mitigation for groundwater pumping. The District now has an agreement with each of the cities wholly within the District to provide groundwater recharge to mitigate for groundwater pumping. Recharge within these areas will help correct groundwater overdraft and allow for improved reliability of supply during dry periods.

#### Revenues and Expenditures

At present, the District's revenue is nearly entirely from land base assessments, so the drought has minimal revenue impacts. Expenditures for aquatic herbicides and other water related operational expenses decrease as water deliveries are reduced.

## Section III: Description of Quantity of Water Uses

### A. Agriculture Water Use

The representative year used in the remainder of the worksheets in this Plan is 2007-08. This year was chosen because it was the only year in the previous ten that was “normal” (between 75% and 125% of average) in each the 10-year, 20-year, 30-year, 40-year, 50-year and 62-year history of diversions.

#### Worksheet 7. Annual Agricultural Water Use (AF)

Source	2007-08	2012-13	2013-14	2014-15 estimated
Agricultural Water Supplier Delivered				
Surface Water <sup>1</sup>	174,250	6,545	40,795	0
Other Water Supplies Used				
Estimated Groundwater	153,424	328,185	304,370	330,158
<b>Total<sup>2</sup></b>	<b>327,674</b>	<b>334,730</b>	<b>345,165</b>	<b>330,158</b>

<sup>1</sup> Worksheet 13 less 24.7% for seepage and evaporation.  
<sup>2</sup> Total crop demand from Worksheet 8 minus effective precipitation from Worksheet 14.

#### Worksheet 8. Agricultural Crop Data

Crop	Total Acreage <sup>1</sup>	ET crop <sup>2</sup> (AF/Ac)	Leaching <sup>3</sup> Requirement (AF/Ac)	Cultural <sup>4</sup> Practices (AF/Ac)	Total Crop Water Needs (AF/Ac)	Total Crop Water Needs (AF)
Grapes	72,088	2.30	0.20	0.00	2.50	180,221
Stone Fruit	28,722	3.16	0.24	0.13	3.53	101,390
Almonds	6,507	3.27	0.28	0.13	3.68	23,974
Citrus	5,070	3.13	0.24	0.13	3.50	17,733
Truck & Nursery	3,097	3.09	0.16	0.00	3.25	10,053
Pasture	2,110	3.77	0.24	0.00	4.01	8,462
Field Crops	891	2.13	0.16	0.00	2.29	2,042
Grain & Hay	773	1.57	0.10	0.00	1.67	1,292
<b>Total Irrigated</b>	<b>119,259</b>	<b>314,348</b>	<b>25,578</b>	<b>5,239</b>		<b>345,165</b>
Non-Farmed	18,801					
<b>Total</b>	<b>138,060</b>					

<sup>1</sup> From 2014 GIS data.  
<sup>2</sup> Crop ET obtained from Etc Table for Irrigation District Water Balances, ITRC, Zone 12 for typical year.  
<sup>3</sup> Leaching requirement developed from Journal of Irrigation and Drainage Division data to maintain 100% yield potential.  
<sup>4</sup> Frost protection water.

### B. Environmental Water Use

The District is a party to an effort to maintain the Kings River Fishery. Known as the Kings River Fisheries Management Program, the program is a cooperative effort between the Kings River Conservation District, California Department of Fish and Wildlife, the Kings River Water Association of which the District is a member. The

District has agreed, along with other Kings River water rights holders, to divert water from storage to maintain minimum flows within the river channel. The program has been in place since 1999, and has been very successful in sustaining the fishery along the river.

### C. Recreational Water Use

No recreational resources are supported by the District's water supplies.

### D. Municipal and Industrial Use

No municipal and industrial resources are supported by the District's water supplies.

### E. Groundwater Recharge Use

#### Worksheet 9. Groundwater Recharge Water Use (AF)

Source	2007-08	2012-13	2013-14	2014-15 estimated
Deliveries to Recharge Basins	1,572	10,333	1,395	0
<b>Total</b>	<b>1,572</b>	<b>10,333</b>	<b>1,395</b>	<b>0</b>
From Worksheet 13, calculated by taking amount delivered to recharge basins in Oct-Mar and Aug-Sept and subtracting 24.7% for seepage and evaporation.				

### F. Transfer and Exchange Use

The District has offered water for exchange or one-time sale with other Kings River water entities. The quantity of water transferred is not included in the Worksheet calculations, as the supply does not enter and then exit the District's service area.

## Section IV: Description of Quantity and Quality of the Water Resources of the Agricultural Water Supplier

### A. Water Supply Quantity

#### 1. Surface Water Supply

The District has water rights to the flow of the Kings River and storage rights in Pine Flat Reservoir. Surface water is stored in Pine Flat and diverted from the Kings River for distribution through the District’s canals. Water flowing down the canals also recharges the groundwater basin. The diverted water is used for surface irrigation on approximately 95,000 acres. Surface water irrigation must be supplemented with groundwater to meet the annual water demands of the crops. The remaining agricultural areas of the District rely exclusively on groundwater. Part of the diverted surface water is also delivered to recharge ponds located throughout the District. The average annual surface water supply is approximately 278,000 AF, but can vary from the low of 13,900 AF in 1976, to the high of 563,544 AF in 1968. Average pond recharge is approximately 55,000 AF, ranging from zero in the dry years, to a maximum of 187,000 AF. Worksheet 10 summarizes water deliveries for the representative year and years 2013-2015.

#### Worksheet 10. Surface Water Supplies (AF)

Source	2007-08	2012-13	2013-14	2014-15 estimated
Headgate Diversions	233,495	22,414	56,029	0
<b>Total Supply</b>	<b>233,495</b>	<b>22,414</b>	<b>56,029</b>	<b>0</b>

#### 2. Groundwater Supply

#### Worksheet 11. Groundwater Supplies (AF)

Source	2007-08	2012-13	2013-14	2014-15 estimated
The District does not currently own/operate any wells. Estimated private pumping (from Worksheet 7).	153,424	328,185	304,370	330,158
<b>Total</b>	<b>153,424</b>	<b>328,185</b>	<b>304,370</b>	<b>330,158</b>

#### 3. Other Water Supplies

The District has no other water supplies.

#### 4. Drainage From the Water Supplier’s Surface Area

Landowners are required by the District to maintain applied water on their lands—privately operated tailwater/spill recovery systems are in place to accomplish this element of water management.

## B. Water Supply Quality

### 1. Surface Water Supply

Surface water within the Kings River watershed continues to meet or exceed Basin quality standards. The Kings River has shown no significant water quality issues since implementation of the surface water monitoring and data collection program. There have been no water quality problems that limit the use of the Kings River water within the District. Worksheet 12 provides recent water quality data.

#### Worksheet 12. Water Supply Quality

2014 Kings River Water Quality Data From KRCD for Gould Canal location (upstream of CID headgates)						
Constituent	BPO	MDL	PQL	Units	Min	Max
Flow				cfs	30	120
EC	700			umhos/cm	28	53
EC dup	700			umhos/cm	27.2	53.1
pH	6.5-8.3			pH	6.72	7.5
pH dup				pH	6.83	7.43
Temperature	var			Celsius	9.2	23.1
Temperature dup				Celsius	9.2	23
Dissolved Oxygen	5 & 7			mg/L	8.65	11.37
Dissolved Oxygen dup				mg/L	8.34	11.29
TDS	450	4.4	10	mg/L	20	32
Turbidity	var	0.035	0.1	NTU	0.38	1.2
Nitrate-Nitrite N		0.02	0.05	mg/L	ND	0.14
Orthophosphate-P		0.006	0.01	mg/L	ND	0.015
Color			1	APHA	5	15
Phosphorus		0.007	0.01	mg/L	0.018	0.044
Boron	700	0.7	10	ug/L	12	20
Cadmium	var	0.04	0.1	ug/L	ND	0.071 B J
Zinc	var	0.7	1	ug/L	1.1	2.8
Molybdenum	10	0.07	0.5	ug/L	1.6	3.2

### 2. Groundwater Quality

As described in the District's Groundwater Management Plan, groundwater in the District is, for the most part, of good quality. Source water from the Sierras is very clean and has low TDS concentrations. TDS concentrations generally increase from east to west and also with depth. The base of fresh groundwater is considered to be where the TDS concentration exceeds 2000 mg/l and is located at a depth of about 1200 to 1800 feet (Page and Leblanc, 1969). However, high TDS concentrations are not generally a problem for most extraction wells in the District. There are some chemicals that have had concentrations above their MCL (maximum contaminant level), including DBCP (Dibromochloropropane), EDB (Ethylene dibromide), Gross Alpha, Nitrate and Uranium.

## **C. Water Quality Monitoring Practices**

### **1. Source Water**

The District is a member of the Kings River Water Quality Coalition (Coalition), and the District's General Manager serves on the Coalition Board. The Coalition was established on January 1, 2009 as a Joint Powers Agency by and between the public agencies and mutual water companies within the Kings River service area. Each of the parties to this Agreement administer and/or deliver irrigation water to growers in or adjacent to the service area of the Kings River in the San Joaquin Valley. As a result, they are vitally interested in preserving the viability of irrigated agriculture within their respective service areas and the watershed as a whole. The Coalition was formed in order to combine resources and reduce the cost of compliance with the Tulare Lake Basin General Order.

The water quality data for the constituents shown in Worksheet 12 is obtained by consultants working for the Kings River Conservation District (KRCD) on a monthly basis at several locations along the Kings River.

## Section V: Water Accounting and Water Supply Reliability

### A. Quantifying the Water Supplier's Water Supplies

Worksheet 13 illustrates the District's water supplies in the representative year and years 2013-2015.

#### 1. Agricultural Water Supplier Water Quantities:

##### Worksheet 13. Surface and Other Water Supplies (AF)

Source	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
<b>2007-08 Supply:</b>													
Headgate Diversions	159	0	0	359	1329	99	6784	68249	75969	80406	141	0	233495
Deliveries:													
To Farms	0	0	0	0	0	0	6784	68249	75969	80406	0	0	231408
To Recharge Basins	159	0	0	359	1329	99	0	0	0	0	141	0	2087
<b>2012-13 Supply:</b>													
Headgate Diversions	2303	2850	2930	2834	2531	274	0	2053	4491	2148	0	0	22414
Deliveries:													
To Farms	0	0	0	0	0	0	0	2053	4491	2148	0	0	8692
To Recharge Basins	2303	2850	2930	2834	2531	274	0	0	0	0	0	0	13722
<b>2013-14 Supply:</b>													
Headgate Diversions	0	0	0	0	0	0	0	0	34586	19590	256	0	56029
Deliveries:													
To Farms	0	0	0	0	0	0	0	0	34586	19590	0	0	54176
To Recharge Basins	0	0	0	0	0	0	0	0	0	0	256	1597	1853
<b>2014-15 Supply:</b>													
Headgate Diversions	0	0	0	0	0	0	0	0					0
Deliveries:													
To Farms	0	0	0	0	0	0	0	0					0
To Recharge Basins	0	0	0	0	0	0	0	0					0

All deliveries from April through July were for irrigation purposes.

## 2. Other Water Sources Quantities:

### Worksheet 14. Effective Precipitation Summary (AF)

	Precipitation (in)	ETo (in)	Grapes 72,088 Ac	Stone Fruit 28,722 Ac	Almonds 6,507 Ac	Citrus 5,070 Ac	Other 6,871 Ac	Total
Dec 07	1.66	1.05	3,664	1,460	331	258	349	6,062
Jan 08	2.32	1.17	6,908	2,753	624	486	658	11,429
<b>Total Oct 07-Sep 08</b>	<b>6.97</b>	<b>57.27</b>	<b>10,573</b>	<b>4,213</b>	<b>954</b>	<b>744</b>	<b>1,008</b>	<b>17,491</b>
Dec 12	1.93	0.88	6,308	2,513	569	444	601	10,435
<b>Total Oct 12-Sep 13</b>	<b>5.12</b>	<b>53.65</b>	<b>6,308</b>	<b>2,513</b>	<b>569</b>	<b>444</b>	<b>601</b>	<b>10,435</b>
<b>Total Oct 13-Sep 14</b>	<b>5.12</b>	<b>58.83</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Dec 14	2.16	0.92	7,449	2,968	672	524	710	12,323
Feb 15	1.92	1.65	1,622	646	146	114	155	2,683
<b>Total Oct 14- Apr15</b>	<b>5.80</b>	<b>18.59</b>	<b>9,071</b>	<b>3,614</b>	<b>819</b>	<b>638</b>	<b>865</b>	<b>15,007</b>
Effective Precipitation Assumptions: 1) Rainfall in excess of potential ET goes into storage. 2) Any storage occurring 2 months prior to planting is considered effective. 3) All precipitation during the crop growing season is considered effective except during the first month when only 1/2 the precipitation is effective because of lack of crop cover, and last month when only 1/2 the precipitation is effective because irrigation has been cut off for harvest								

## B. Quantification of Water Uses

### Worksheet 15. Applied Water (AF)

	2007-08	2012-13	2013-14	2014-15 estimated
<b>Applied Water</b> (from Worksheet 7)	<b>327,674</b>	<b>334,730</b>	<b>345,165</b>	<b>330,158</b>

## Worksheet 16. Quantify Water Use (AF)

Water Use	2007-08	2012-13	2013-14	2014-15 estimated
<b>Crop Water Use</b> (from Worksheet 8)				
Crop Evapotranspiration	314,348	314,348	314,348	314,348
Leaching	25,578	25,578	25,578	25,578
Cultural Practices	5,239	5,239	5,239	5,239
<b>Conveyance &amp; Storage System</b>				
Conveyance seepage (24.3% <sup>1</sup> of headgate diversions <sup>2</sup> )	56,739	5,447	13,615	0
Conveyance evaporation (0.4% <sup>1</sup> of headgate diversions <sup>2</sup> )	934	90	224	0
<b>Conjunctive Use</b>				
Groundwater Recharge (from Worksheet 9)	1,572	10,333	1,395	0
<b>Total</b>	<b>404,410</b>	<b>361,035</b>	<b>360,399</b>	<b>345,165</b>
<b>Outside the District</b>				
Transfers or Exchanges out of the service area <sup>3</sup>	5,000	24,000	5,000	0
<sup>1</sup> From KRCD 1993 CID Surface Water Study. <sup>2</sup> From Worksheet 13. <sup>3</sup> Included for informational purposes only--transfers are not included in District's headgate deliveries and never make it into the service area.				

## C. Overall Water Budget

### Worksheet 17. Quantify Water Supplies (AF)

Water Supplies	2007-08	2012-13	2013-14	2014-15 estimated
Surface Water (summary total from Worksheet 13)	233,495	22,414	56,029	0
Groundwater (from Worksheet 7)	153,424	328,185	304,370	330,158
Annual Effective Precipitation (summary total from Worksheet 14)	17,491	10,435	0	15,007
<b>Total</b>	<b>404,410</b>	<b>361,035</b>	<b>360,399</b>	<b>345,165</b>

### Worksheet 18. Budget Summary (AF)

Water Accounting	2007-08	2012-13	2013-14	2014-15 estimated
Subtotal of Water Supplies (from Worksheet 17)	404,410	361,035	360,399	345,165
Subtotal of Water Uses (from Worksheet 16)	404,410	361,035	360,399	345,165
<b>Excess Deep Percolation</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## D. Water Supply Reliability

Based on an evaluation of the District's historical deliveries for the last 62 years, the District has an average surface supply of 278,000 AF per year.

## Section VI: Climate Change

The District has adopted the Kings IRWMP which includes a chapter on climate change including a vulnerability assessment.

DWR estimates indicate that by 2050 the Sierra Nevada snowpack, which provides 65 percent of California's water supply, will be significantly reduced. Much of the precipitation is expected to fall as rain instead of snow during winter and cannot be stored in our current water system for later use. The climate is also expected to become more variable and extreme, bringing more droughts and floods. The District will need to consider these climate change effects, many of which are already documented in California, and reviewed in the latest State Water Project Reliability Report prepared by DWR. Shorter winters, more hot days and nights, and a longer irrigation season will increase water demand in the District, and increase competition for water by others. Reduced snowpack, shifting spring runoff to earlier in the year has the potential to impact water supply, and will cause need for greater storage.

DWR estimates indicate that by 2050 the Sierra Nevada snowpack, which provides 65 percent of California's water supply, will be significantly reduced. Much of the precipitation is expected to fall as rain instead of snow during winter and cannot be stored in our current water system for later use. The climate is also expected to become more variable and extreme, bringing more droughts and floods. Thus the District will need to be prepared to adapt to greater variability in weather patterns.

### Potential Climate Change Effects

Within the next 20 years, DWR expects that water supplies, water demand, and the occurrence and increased severity of floods will be affected by climate change. Some of these potential changes are presented below. The District will consider these climate change effects, including:

1. Water Demand — Shorter winters, more hot days and nights, and a longer irrigation season will increase water demand in the District and increase competition for water by others.
2. Water Supply and Quality — Reduced snowpack, shifting spring runoff to earlier in the year, has the potential to impact water supply and quality.
3. Disaster — Disasters are predicted to become more frequent as climate change brings increased climate variability, resulting in more extreme droughts and floods.

As the District continues to address near-term periods of water deficiency during this planning cycle, it will factor the following climate change impacts projected by DWR in its longer term plans and plan for:

1. Irrigation demand increasing as temperatures rise and rainfall becomes more variable.

2. Permanent crops are more difficult to shift to alternative crops, causing reduced flexibility for adapting to changing climatic conditions.
3. Expecting flooding risk to increase as a result of more severe rainfall patterns and warmer winter rains. This could affect water supply and conveyance.
4. Diminished snowfall in the mountains and earlier runoff will result in reduced water supply and other sources derived from Sierra Nevada snowpack.

To address these impacts, the District plans to build more groundwater recharge facilities to capture flood water that occurs earlier in the year, as well as consider infrastructure improvements and delivery schedule changes that allow for delivery flexibility.

## **Section VII: Water Use Efficiency Information**

### **A. EWMP Implementation and Reporting**

The District has either already implemented the 14 “conditional” EWMPs identified in Water Code §10608.48 that are cost effective and technically feasible, or implementation is on-going.

#### **Critical EWMP 1 – Water Measurement**

The District currently measures all water diverted into the District from the Kings River, and KRWA also provides calibrated measurement of deliveries. The District has also implemented measurement at critical locations within the District, including measurement over check structures utilizing ITRC weir sticks.

Implementation of measurement at the farmer turnout that meets the State required accuracies has been determined to not be cost effective for the District. An evaluation of turnout measurement alternatives was conducted by the District in 2005. The study estimated the cost to install measurement at each of the turnouts in the District would be more than \$20 million dollars utilizing District staff. The cost is now expected to be more than \$40 million dollars. To implement a program of that cost, the District would need to raise assessments on District landowners by more than double the current assessment, which is not feasible for the District. However the District does not have the authority to raise rates without going through a Proposition 218 election process, which requires a majority approval by landowners. The District is willing to seek grant funding to assist with additional measurement improvements.

The District’s Correction Action Plan for Water Measurement is described earlier in this plan.

The District has developed a schedule for further implementation of this EWMP.

#### **Critical EWMP 2 – Volume Based Pricing**

The District is a conjunctive use District with suitable, shallow, and inexpensive groundwater. Keeping the cost of surface water low is critical incentivizing growers to continue to utilize surface water. Considering the District provides only partial water supplies to its users and desires to maximize surface water deliveries in order to maintain groundwater conditions, price incentives are not effective. In order to be in compliance with the requirements, the District anticipates completing preparation of the required Engineer’s Report for a Proposition 218 by June of 2017 that will include a recommended volumetric pricing structure in addition to assessment changes. Voting is anticipated to be completed by December 2017. If approved, the District would initiate implementation of the volumetric pricing in 2018.

The District has developed a schedule for implementation of this EWMP.

#### **Conditional EWMP 1 – Facilitate Alternative Land Uses**

The District has no lands with exceptionally high shallow water levels or whose irrigation contributes to on-farm or recognized downstream drainage issues.

No action on this EWMP is required.

**Conditional EWMP 2 – Facilitate Use of Recycled Water**

The District does not treat or recycle water. There is presently no water from municipal or industrial uses that is available to or delivered to the District. The District will continue to discuss water supply issues with the other agencies within the District, including the possibility of accepting recycled water should those agencies have acceptably treated water and need District assistance in disposing of, utilizing, or exchanging recycled water.

No action on this EWMP is required.

**Conditional EWMP 3 – Facilitate Financing of Capital Improvements for On-Farm Irrigation Systems**

The District is a water purveyor, not a provider of on-farm capital.

The District does not have the funding necessary to facilitate such improvements, but supports NRCS and grower financing of such improvements. The District does, however, provide information to landowners regarding grant programs, low interest loans, energy efficiency programs, etc. that may be available from time to time.

The District considers that it has adequately implemented this EWMP.

**Conditional EWMP 4 – Implement an Incentive Pricing Structure**

The current pricing structure of the District allocates available water on a per acre basis. Therefore, the price of the water increases in dry years because the landowners receive less water per acre. The price effectively decreases in wet years as there is more water available. In these years, surface water use is encouraged to aid with recharge for future dry years as the District is a conjunctive use entity. The District is implementing this EWMP by promoting conjunctive management of surface water and groundwater supplies by setting water rates below the cost of groundwater pumping to promote surface water to provide direct and in-lieu recharge of the underlying groundwater system.

This EWMP will be addressed with the volumetric pricing implementation that is scheduled as noted within this plan.

**Conditional EWMP 5 – Line or Pipe Ditches and Canals**

Most of the District's irrigation water is distributed in a system of open ditches with seepage from these ditches contributing to groundwater recharge. It is not appropriate for this EWMP to be implemented extensively as the surface water delivery system helps provide needed groundwater recharge for this conjunctive use system. The District has estimated seepage in the channels to be 24.3% (from 1993 KRCD Surface Water Study) of total flow deliveries. Assuming an average delivery of 278,000 AF, the seepage estimate is 67,555 AF per year of recharge.

Since recharge through unlined canals provides the most cost effective recharge capability and is a critical sustainability practice for the District to maintain the aquifer, the District believes that this EWMP is not cost effective for, and is actually detrimental to, the District.

**Conditional EWMP 6 – Increase Flexibility in Water Ordering and Deliveries**

The District operates a modified demand system for water orders and delivery. Landowners contact the ditchtenders on a request basis, who respond in a time period dependent upon system limitations, i.e., system capacities, water supply and water travel distances.

In accordance with Rule 7 of the District’s Rules and Regulations:

When sufficient supply make it possible, water will be delivered on request. The water deliveries are scheduled on first come, first served basis after requests to the individual Ditchtender from the water users are approved. When there is insufficient supply, or disputes between water users exist, a rotation schedule will be prepared by the Watermaster for that particular canal or lateral. When land has received one irrigation turn during a season, a second irrigation turn will be allowed only after all other irrigable land within the District that has requested water has been irrigated. During a season when a shortage is predicted, the water may be prorated among water users.

The District considers that it has adequately implemented this EWMP.

**Conditional EWMP 7 – Construct and Operate Spill and Tailwater Recovery Systems**

Landowners are required by the District to maintain applied water on their lands. There are no direct spills from agricultural land into District facilities. The District has numerous recharge basins that can be utilized to capture and recharge any operational spills.

The District considers that it has adequately implemented this EWMP.

**Conditional EWMP 8 – Optimize Conjunctive Use of Surface and Groundwater**

The District has historically encouraged conjunctive use by its customers. Most District water customers have access to private groundwater sources. This allows each customer to choose to use surface or groundwater based on availability and cost. The District uses multiple strategies to encourage conjunctive use including but not limited to the following:

- Unlined canals, by District policy, promotes groundwater recharge
- Construction and operation of over 1,350 acres of recharge basins
- Development of groundwater banking facility that includes recovery wells to pump groundwater into District facilities for delivery to growers

- Tiered pricing assessment rate structure to incentivize conjunctive water use
- Ongoing seasonal groundwater monitoring program with more than 100 volunteer well owners
- District plans to increase capacity of its facilities west of Clovis Avenue by approximately 50% in order to expand its recharge program and convey more water to lands and existing recharge ponds in the west portion of the District, as well as additional recharge facilities

Most of these efforts are ongoing and part of the District's comprehensive conjunctive use program. Additional groundwater recharge facilities will provide additional supply (water savings) to the region by allowing the capture of flood water historically lost to the District.

The District considers that it has adequately implemented this EWMP. The District plans to construct additional recharge facilities, subject to completion of a Proposition 218 election that would include additional recharge facilities and would be implemented within a 7 year period following the election.

#### **Conditional EWMP 9 – Automate Canal Structures**

The District has installed automated gate control at its headgates at the Kings River on both the Fowler Switch and C&K Canals, as well as the head of the Elkhorn and Harlan-Stevens Canals. The District has installed a telemetry system to allow for automated control and remote monitoring and will be continuing to add additional sites each year as budgetary conditions allow.

The District considers that it has adequately implemented this EWMP and will continue to develop additional sites.

#### **Conditional EWMP 10 – Facilitate Customer Pump Testing and Evaluation**

While the District does not have technical staff available to implement this EWMP, pump testing and evaluation is locally available (and partially subsidized) through Pacific Gas & Electric's Advanced Pumping Efficiency Program. The Kings River Conservation District continues to offer pump testing to those that pump groundwater within their district, including those within the District. Funding for some level of pump testing is also available through the Energy Commission and through California State University, Fresno's Center for Irrigation Technology.

The District considers that this EWMP is adequately implemented. There has been no demand for implementation of a separate District provided pump testing program as growers have other services available to them at affordable rates, therefore the District believes implementation of a separate program is not necessary or cost effective for the District.

#### **Conditional EWMP 11 – Designate a Water Conservation Coordinator**

The District has designated Phillip Desatoff as water conservation coordinator. The coordinator will implement the water management plan and prepare progress reports as required.

Phillip Desatoff, Consolidated Irrigation District  
PO Box 209 (559) 896-1660 (office)  
Selma CA 93662 (559) 896-8488 (fax)  
pdesatoff@cidwater.com (email)

The District considers that it has adequately implemented this EWMP.

**Conditional EWMP 12 – Support Availability of Water Management Services to Water Users**

While the District does not have technical staff available to implement this EWMP, water management services are locally available through the Kings River Conservation District’s Agricultural Water Enhancement Program, On-Farm Water Management Program, and its AgLine Information System.

The District considers that this EWMP is adequately implemented. There has been no demand for implementation of a separate water management program as growers have other services available to them at affordable rates, therefore the District believes implementation of a separate program is not necessary or cost effective for the District.

**Conditional EWMP 13 – Evaluate the Need for Changes in Policies**

Two District representatives serve on the Executive Board of the Kings River Water Association, which oversees Kings River entitlements and deliveries, and protects water quality while enhancing the environment. In this role, the District has ample opportunity to evaluate, direct and implement policy changes as needed.

The District considers that it has adequately implemented this EWMP.

**Conditional EWMP 14 – Evaluate and Improve Pump Efficiencies**

The District recently constructed two groundwater wells that it operates. The District will conduct monitor pump performance and will conduct regular pump efficiency tests as pump efficiencies appear to have changed. The District operates no other wells or lift pumps. The District considers that it has adequately implemented this EWMP.

## **Section VIII: Supporting Documentation**

### **Agricultural Water Measurement Regulation Documentation (as applicable)**

#### **A. Legal Certification and Apportionment Required for Water Measurement— Lack of Legal Access to Farm-gate**

The District does not currently measure at the farm-gate (turnout). The cost to develop measurement has been determined to be unfeasible at this time, and would require an increase in rates that must be approved by voters in the District.

#### **B. Engineer Certification and Apportionment Required for Water Measurement—Technically Infeasible**

The District currently measures at critical locations up and downstream of laterals within District. Additional locations are being considered.

#### **C. Description of Water Measurement Best Professional Practices**

District ditchtenders measure water level over weir boards on the upstream and downstream of laterals to determine the flow rate of water being diverted to a lateral.

#### **D. Documentation of Water Measurement Conversion to Volume**

Not applicable.

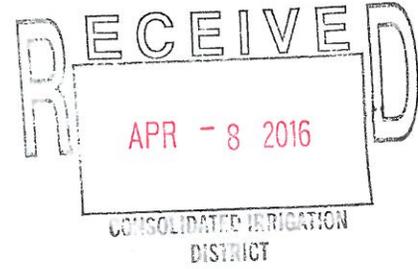
#### **E. Device Corrective Action Plan Required for Water Measurement**

The District will continue to pursue improved and appropriate measurement for a conjunctive use District, including but not limited to, additional flow measurement devices along the District laterals, automation and SCADA for remote control and measurement.

**Exhibit 1. Public Notifications \*\*\* Proof of Publication \*\*\***

The Sentinel  
Lee Central California Newspapers  
P.O. Box 9  
Hanford, CALIFORNIA 93232  
PHONE 888-790-0915  
Sentinel\_Finance@lee.net

CONSOLIDATED IRRIGATION DIST  
PO BOX 209  
SELMA, CA 93662



ORDER NUMBER 57826

Publication- The Selma Enterprise Kingsburg Recorder

State of California

County of Fresno

I am a citizen of the United States and a resident of the county  
forsaied; I am over the age of eighteen years, and not a part to or  
interested in the above-entitled matter. I am the principal clerk of The  
Selma Enterprise Kingsburg Recorder, a newspaper of general  
circulation, printed and published daily in the city of Selma and  
Kingsburg, County of Fresno, and which newspaper has been  
adjudged a newspaper of general circulation by the superior court of  
the County of Fresno, State of California, under the date of July 8,  
1952, case number 86769(Selma), and September 20, 1953, case  
number 84716 (Kingsburg).

That I know from my own personal knowledge the notice, of which the  
annexed is a printed copy (set in type not smaller than nonpareil), has  
been published in each regular and entire issue of said nespaper and  
not in any supplement thereof on the following dates, to wit:

PUBLISHED ON: 03/30/2016, 04/06/2016

TOTAL AD COST: 102.32

FILED ON: 4/6/2016

I certify (or declare) under penalty of perjury that the foregoing is true  
and correct.

Dated at Fresno County, California

This Day 6 of April 2016.

Signature [Handwritten Signature]

AD#57826  
NOTICE OF PREPARATION  
CONSOLIDATED IRRIGATION DISTRICT  
2015 AGRICULTURAL WATER MANAGEMENT PLAN  
NOTICE is hereby given that Consolidated Irrigation District has revised its 2015  
Agricultural Water Management Plan. Any person wishing to review a copy of the plan  
may telephone the office of the District at (559) 896-1660 and ask for Phillip Desatoff,  
Water Conservation Coordinator.  
In addition, the District will be holding a public meeting to review and consider comments  
on the Plan on May 11, 2016 at 2:00 p.m. at the District office.  
Phillip Desatoff, Water Conservation Coordinator  
Consolidated Irrigation District  
PUBLISH: MARCH 30 & APRIL 6, 2016

**Exhibit 2. Resolution of Plan Adoption**

**RESOLUTION NO. 2016- 07-05**

**RESOLUTION OF THE BOARD OF DIRECTORS  
OF CONSOLIDATED IRRIGATION DISTRICT  
REGARDING ADOPTION OF THE  
2016 AGRICULTURAL WATER MANAGEMENT PLAN**

**WHEREAS**, an Agricultural Water Management Plan for the District (“Plan”) has been developed to comply with the requirements of Senate Bill SB X7-7-Water Conservation Act (Steinberg Statute of 2009), (Section 1, Part 2055, Division 6 of the California Water Code), the associated Agricultural Water Management Planning Act (Section 1, Part 2.8, Division 6 of the Water Code), and the subsequent Agricultural Water Measurement Regulation requirements (described in Title 23 California Code of Regulations); and

**WHEREAS**, this Board fixed May 11, 2016, at the hour of 2:00 P.M., at the District Office, 2255 Chandler Street, Selma, California, as the time and place where the public was invited to review and discuss the Plan; and

**WHEREAS**, the Secretary of this Board caused publication of notice of preparation of the Plan and of the time and place of said public meeting in the Selma Enterprise, a newspaper of general circulation published in the County of Fresno, State of California, posted such notice in the District Office, and faxed such notice to various local government agencies; and

**WHEREAS**, this Board met as scheduled on May 11, 2016, at 2:00 P.M. to receive public comments on the Plan; and

**WHEREAS**, no public comments were received; and

**WHEREAS**, the Board met on July 13, 2016 and reviewed the Plan and considers its adoption to be in the best interest of the District and its landowners.

**NOW, THEREFORE, BE IT RESOLVED**, that this District adopts the 2016 Agricultural Water Management Plan and directs its President and/or Manager to submit the Plan to the Department of Water Resources and other interested parties as described in the Plan.

**PASSED AND ADOPTED** this 13<sup>th</sup> day of July, 2016.

CERTIFICATE OF SECRETARY

The undersigned hereby certifies that I am the Secretary of Consolidated Irrigation District and that the foregoing Resolution was authorized by the Board of Directors of said District at a meeting thereof, duly and regularly held on July 13, 2016, at which meeting a quorum of the Board of Directors was at all times present and acting.

IN WITNESS THEREOF, I have set my hand this 13th day of July, 2016.



Margaret Macias, Secretary  
Consolidated Irrigation District

### Exhibit 3. District Location Map

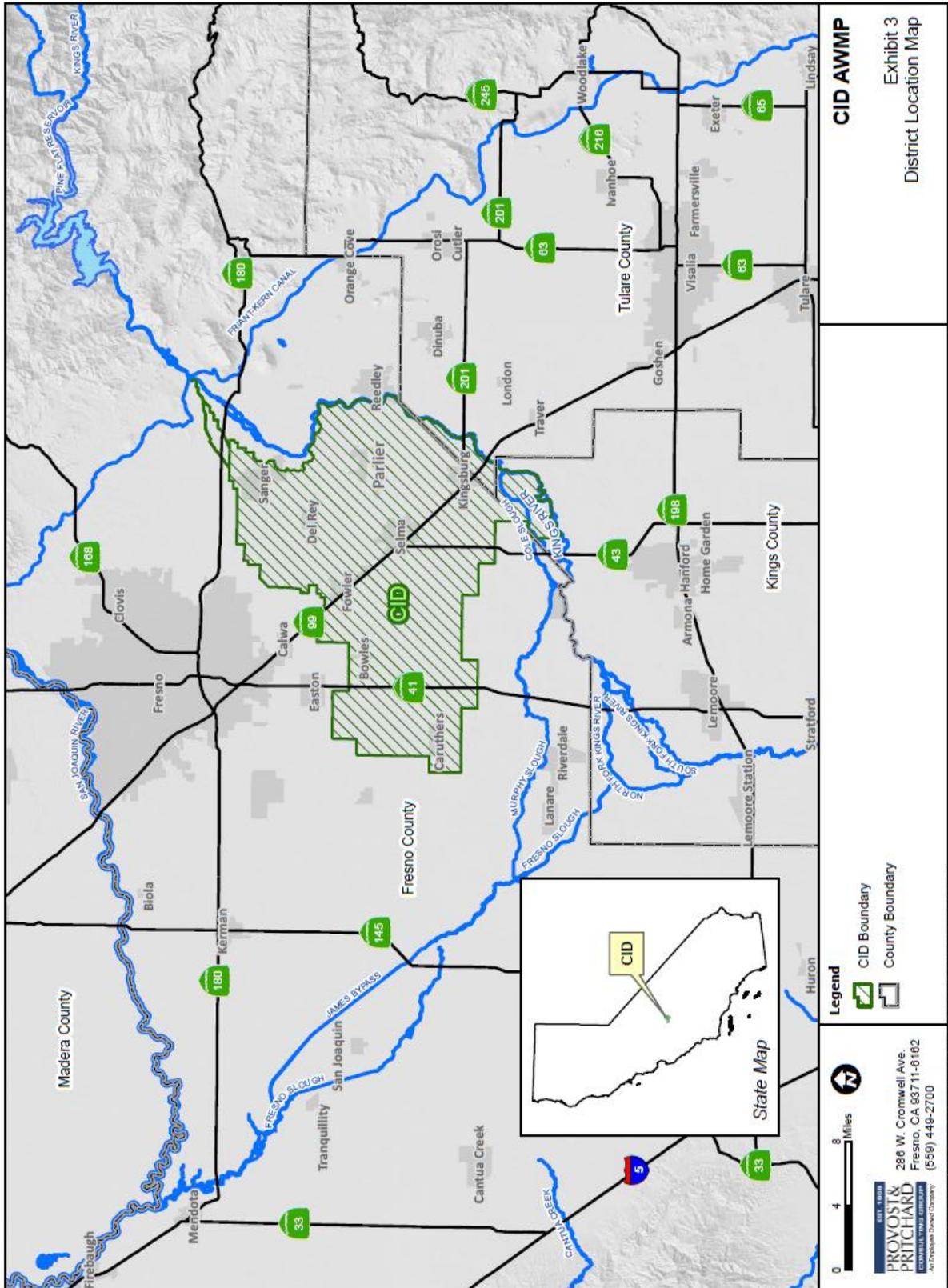
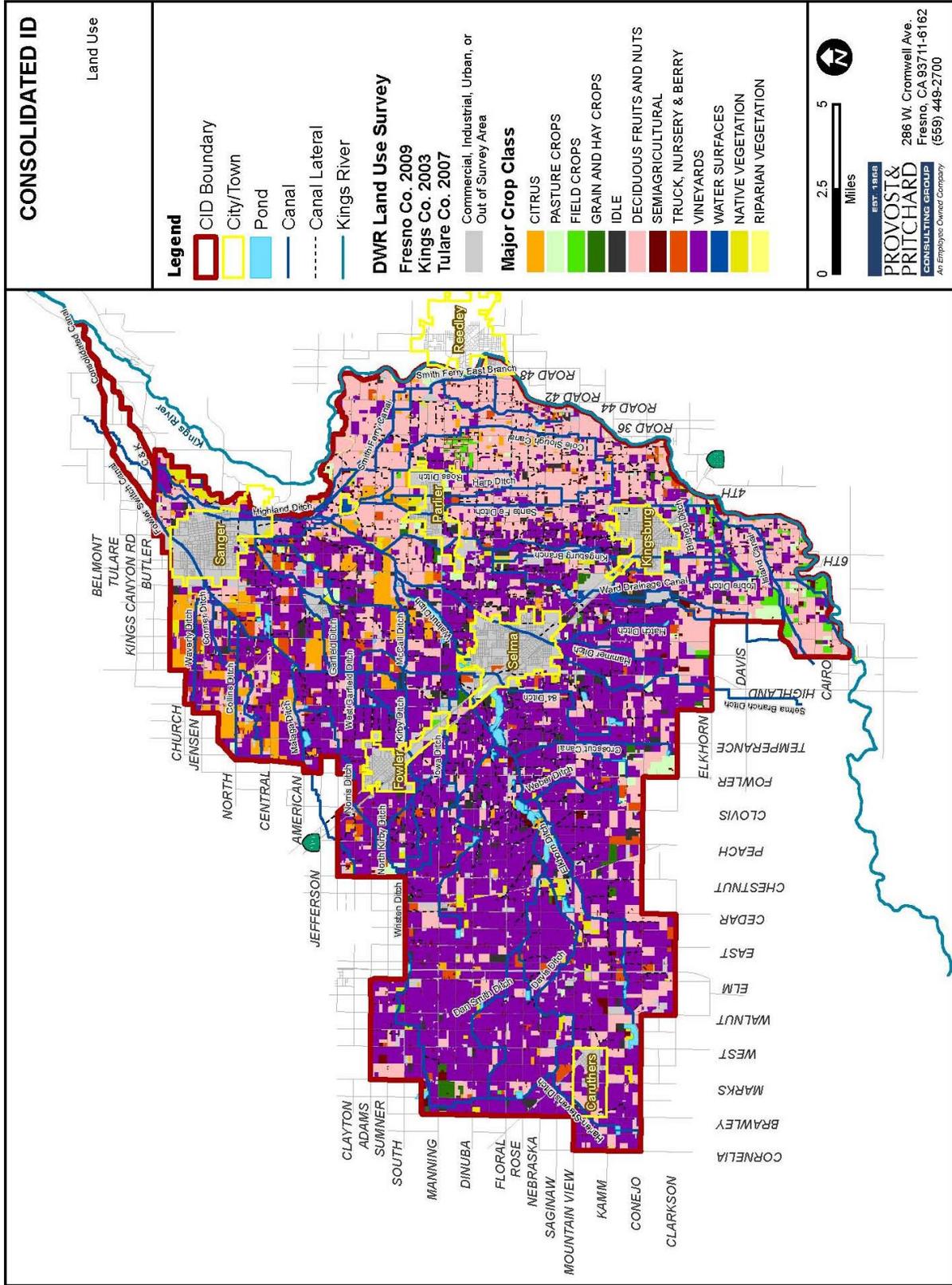






Exhibit 6. District Land Use Map



## **Exhibit 7. District Operating Rules and Regulations**

### **HISTORY AND INTRODUCTION TO CONSOLIDATED IRRIGATION DISTRICT**

Consolidated Irrigation District is a political subdivision of the State of California. Water is diverted from the Kings River above Centerville and delivered to some 151,000 acres of farm land. The delivery system consists of two major canals known respectively as the Fowler Switch Canal which serves the north and western part of the District and the Centerville/Kingsburg Canal which serves the eastern area.

These canals subdivide into smaller ditches and ultimately water is delivered to grower irrigation ditches or pipelines, or to percolation ponds.

The building of canals and ditches was started in 1872 by privately owned canal companies. In 1922 the District was formed and purchased approximately 500 miles of Class "A" ditches and pipelines which range in capacity from 2000 second feet down to two second feet; which are used to divert and deliver water. The District also delivers water through many miles of Class "B" laterals which are owned and maintained by the individual land owners whom they serve. The District also owns more than 1,400 acres of ponding area, plus 8 miles of the Wards Drain. The largest single pond encompasses 190 acres.

The Consolidated Irrigation District was established for the purpose of providing irrigation water to farms within the District boundaries. A secondary benefit is recharge of the underground aquifer from which water is pumped for agricultural, commercial and residential uses. As such, all residents of the District benefit from the District operations. Funds to finance these operations are accumulated by charges against all real property inside District boundaries.

Consolidated Irrigation District has the ability to store 143,000 acre feet of water in Pine Flat and other upstream reservoirs. When the District's Kings River entitlement exceeds demand water can be stored and released as needed to extend the irrigation season. Pine Flat Dam construction was completed in 1954. A share of the Pine Flat construction cost chargeable to storage benefits is being repaid by the District under a 40 year contract with the Bureau of Reclamation.

The District operates under the Irrigation District Section of the California Water Code. These laws provide for five persons who live in the District to be elected to a Board of Directors. The Board is the governing body of the District. Each director must live in his/her division during his/her four year term of office. Directors are elected by division, (by all qualified voters in their division) or may be appointed by the County Board of Supervisors if there are no opposing candidates at the time of election. The Board of Directors adopts the rules and regulations to govern the operation, maintenance and control of all District facilities and sets the policies by which the District is governed, and closely supervises budgetary and fiscal matters. The Board appoints a Manager to be

the chief administrative officer of the District, and he/she and his/her staff are responsible for carrying out the policies and enforcing the rules and regulations adopted by the Board.

As a matter of policy the Board of Directors has determined that as a commodity, the water rights belong to the land, therefore they cannot be sold or permanently transferred.

For increased efficiency, water deliveries are scheduled on a first come, first served basis (as opposed to a designated day of the month for each turn). With the "first come, first served" policy the Board feels that a more efficient use of the water can be attained. Requests for such deliveries will be coordinated between the water user and the individual ditchtender.

## AUTHORIZATION

Section 22257 of the California Water Code states in part that: "Each District shall establish equitable rules for the distribution and use of the water which shall be printed in convenient form for distribution in the District." These Rules and Regulation are as follows and supersede any and all previous Rules and Regulations adopted and or printed by the District.

Refusal to comply with the requirements of the stated Rules and Regulation may result in sanctions, including but not limited to legal action or denial of water service being imposed by the District until full compliance has been made.

## RULES AND REGULATIONS

As adopted by the Board of Directors of Consolidated Irrigation District in 1988.

### Rule #1 re: CONTROL OF THE SYSTEM

All matters relating to the distribution of water and maintenance of the District's canals, ditches, conduits, pipelines, headgates, and other structures and facilities shall be under the authority and direction of the Board of Directors.

### Rule #2 re: DITCHTENDER RESPONSIBILITIES

Ditchtenders will be assigned to operational areas and will have the responsibility of enforcing District rules and scheduling deliveries to water users under the direction and guidance of the Watermaster.

Ditchtenders will make every effort to maintain adequate flow of water in each of their respective systems to meet anticipated demands. However, changes in water use due

to temperature variation, improper coordination of upstream users during water changes, local runoff from precipitation, spill water from other lateral systems, canal breaks, and other emergencies may cause unavoidable fluctuations in water flow. A spirit of cooperation is expected between water users and District employees to determine the cause of such fluctuations or interruptions and the solutions to them.

#### Rule #3 re: SERVICE TO PRIVATE LATERALS

It shall be the duty of the Ditchtender to regulate the flow of water from Class A Canals (District owned and operated) to Class B (privately owned and operated) Canals, ditches and conduits. The Ditchtender shall have full access to Class B Canals and or conduits and to the land irrigated by them to enable him to schedule the water and to inspect the condition of these facilities. The same authority and jurisdiction granted to Ditchtenders in the operation of canals, ditches, and conduits owned by the District is applicable to those that are privately owned. Cleaning, maintaining and repairing of each Class B canal is the responsibility of the water users served by that canal.

Water services will be refused to any Class B Canal that is not free from leaks, reasonably clean, or that has any other condition of obstruction that will interfere with the flow of water.

#### Rule #4 re: HANDLING OF DIPUTES

When water users cannot resolve differences between themselves and other water users, the Ditchtender, or the Watermaster, they are expected to discuss the problem with the General Manager prior to seeking final determination by the Board of Directors. The Board of Directors reserves the right to be the final authority in resolving differences and controversies between the aforementioned parties.

#### Rule #5 re: WATER ENTITLEMENT

There are two types of water entitlements within the District, Consolidated entitlement and Church entitlement. The consolidated entitlement is 2 cfs (898 gpm) for each 10 acres of land on water service for a period of 24 hours per turn. The Church entitlement is 1 ½ cfs (673 gpm) for each 10 acres of land on water service for a period of 24 hours per turn. The land with Church Water entitlement normally has a longer “water season” than land with Consolidated Irrigation District entitlement. Water entitlements were determined through past diversion histories and cannot arbitrarily be changed or sold. “Water entitlement” runs “with the land.”

#### Rule #6 re: WATER ENTITLEMENT EXCEPTIONS

Certain lands that have historical water rights, but that have been removed from the District by annexation to a city, may purchase the right to use gravity water; the assessment charges and water deliveries will be based upon whichever water entitlements the land had prior to annexation.

#### Rule #7 re: WATER DISTRIBUTION SCHEDULES

When sufficient supply make it possible, water will be delivered on request. The water deliveries are scheduled on first come, first served basis after requests to the individual Ditchtender from the water users are approved. When there is insufficient supply, or disputes between water users exist, a rotation schedule will be prepared by the Watermaster for that particular canal or lateral.

When land has received one irrigation turn during a season, a second irrigation turn will be allowed only after all other irrigable land within the District that has requested water has been irrigated. During a season when a shortage is predicted, the water may be prorated among water users.

#### Rule #8 re: DETERMINATION OF SAFE OPERATING LEVELS IN CANALS

The water level in any District canal, ditch, pond or conduit shall not be raised to an unsafe level for the purpose of providing gravity water service to high elevation lands or delivery systems. The Watermaster or Ditchtender shall determine the safe levels to which water may be raised for the purpose of providing gravity water service. Diversions that jeopardize the safe operations of District facilities or interfere with service to others shall not be permitted.

#### Rule #9 re: LIFT PUMPS

All water users who pump from District canals, ditches, conduits, or ponds for the purpose of irrigating land that is too high to receive gravity water service shall be governed in all respects by the rules and regulations applicable to water users under gravity water service. The District will not be responsible for any trash or debris in the water or any interference or decrease in the operating capacity of any private pump installations or pipelines. The exact location and "tie-in" are subject to approval by the District Manager. Low flow shutoff switches should be installed for the water user's protection. A restart switch is required to minimize canal overflows. Both switches shall be installed at the landowner's expense.

#### Rule #10 re: WATER DELIVERIES

Water deliveries shall be made on the basis of continuous and steady use of water during all days and nights, including weekends and holidays. No additional irrigation time will be granted to water users who fail to use available water continuously during the allotted time.

#### Rule #11 re: SCHEDULING OF WATER DELIVERIES

All water users shall, at all times, make their request to the Ditchtender and receive approval 24 hours prior to turning on or shutting off the water. In the event of a genuine

emergency, water users shall immediately notify the Ditchtender of any changes. Any water user taking water out of turn or without properly notifying the respective Ditchtender may have his water turned off and be required to wait until all other water users on his canal have finished irrigating before his delivery is resumed. Legal action may also result therefrom.

#### Rule #12 re: LANDOWNER/WATER USER RESPONSIBILITIES

Water users are responsible for the efficient use of water received. Those water users who waste water through carelessness, defective, or inadequate privately owned facilities, or because of inadequate land preparation, may be refused further water service until such conditions are remedied. And waste or improper use of water shall be reported to the Watermaster.

Water users shall be responsible for all water after it leaves any canal, ditch, conduit, or other structure owned by the District. The District shall not be responsible or liable for any damage caused by negligence or careless use of water by any water user or by any water user's failure to maintain any canal, ditch, pipeline or other facility for which he is wholly or in part responsible. It is incumbent on all water users to prevent hazardous conditions, mosquito nuisances, or damage to the property of others.

#### Rule #13 re: PERSONAL LIABILITY

Any person entering District property or District rights-of-way does so at his own risk and assumes all risks associated with such entrance and by such action accepts responsibility for any damage to himself, the District, or private property resulting therefrom.

#### Rule #14 re: TRASH OR DEBRIS

No tires, trash, debris, litter, garbage, prunings, brush, grass, dairy waste, dead animals, herbicides, pesticides, or any other material that is offensive to the senses or injurious to health, or that is deleterious to fish and aquatic life, or that pollutes or degrades the quality of water or that obstructs the flow of water, shall be placed, emptied, discharged, thrown or be allowed to slide, flow, wash or be blown into any canal, ditch conduit, pond, or other structure or facility belonging to the District. All District employees shall promptly report any violations of this rule to the Watermaster. The District reserves the right to take appropriate legal action and seek restitution in incidents of this nature.

#### Rule # 15 re: DISCHARGE INTO CANAL

No person, company, corporation, firm or agency shall be permitted to pump, siphon, or drain storm water, wastewater, surplus irrigation water, or any other water, including but not limited to well water, into any District canal, ditch, conduit, or pond without express written consent from the Board of Directors. Any such written authorization shall include

the manner, method, limitations, terms and provisions for the District's control and regulation of the approved discharge.

#### Rule # 16 re: BOARD OF EQUALIZATION

Any landowner may request to appear before the Board of Equalization at its annual meeting, (date to be announced annually by the Board generally in July or August) to discuss concerns pertinent to his or her property. An appointment to appear before the Board of Equalization shall be made well in advance with a minimum of thirty days before said annual meeting to allow the District staff sufficient time to investigate and assemble all data pertinent to those concerns.

#### Rule #17 re: RIGHTS-OF-WAY

Rights-of-way and easements for canals, ditches, and pipelines owned by the District include the land actually occupied by the canal, ditch, or pipeline and such land on both sides thereof as is reasonably necessary for the maintenance and operation of such canals, ditches, and pipelines. Widths of easements vary with the size of the canal and other factors. Questions regarding the specifications and location of various easements may be addressed to the District's administration office.

#### Rule # 19 re: ACCESS TO LANDS

The authorized agents and employees of the District shall have reasonable access at all times to all the land irrigated from the District's distribution system for the purpose of maintaining, operating, or inspecting the canals, ditches, and conduits and the flow of water therein and for the purpose of ascertaining the acreage of crops on lands irrigated or to be irrigated. If the District holds a right-of-way or easement across private land for the operation agricultural maintenance of a canal or other facilities, the law provides that the District shall have certain secondary rights, such as the right to enter upon the property on which the right-of-way or easement is located to make repairs and do such things reasonably necessary for the full exercise of the easement rights.

#### Rule # 20 re: UNAUTHORIZED INSTALLATIONS

No delivery gate, pipe, siphon, or any other structure or device shall be installed or placed in any District canal, roadway, ditch, conduit, or other structure or facility without express written authorization from the General Manager. Authorized installations must be installed in strict compliance with the plans and specifications approved by the General Manager or the District engineering consultants. Any unauthorized installations may be removed by the District at the expense of the owner.

#### Rule #21 re: TAMPERING WITH FACILITIES

Landowners or water users who, by opening, closing, or otherwise interfering with regulating gates of devices, cause any fluctuations in the flow of water in the District's

distribution system or cause any over flows, breaks, or damage of any kind, shall be responsible to the District for the expense and damage caused thereby. In case of an emergency when immediate adjustment or other corrective action will prevent overflows, breaks, crop loss, or other property damage or when instructed by an authorized District representative to make adjustments or to take corrective actions, the person making the adjustments or taking corrective actions will not be in violation of this rule, provided that such emergency action or adjustment is reported immediately to the Ditchtender or Watermaster.

#### Rule #22 re: DAMAGING FACILITIES

No person shall damage any gates or cut any locks or chains belonging to the District. No person shall make an opening, cut plow, or disc down or otherwise damage or weaken any District canal, ditch, roadway/right-of-way conduit, or other structure or facility without written approval of the General Manager. Any such approval to open, cut, plow, or disc down or otherwise disturb any District canal, ditch conduit, or other structure or facility shall contain requirements for the restoration of such canal, ditch conduit, or other structure or facility to its original condition or better. The District reserves the right to seeks restoration and monetary damages as provided by law for any unauthorized damage caused to its system.

State of California

s.s.

County of Fresno

I hereby certify that the foregoing Rules and Regulations were adopted by the Board of Directors of the Consolidated Irrigation District at a regular meeting held

\_\_\_\_\_.

Seal

Secretary of the Board of Directors  
Consolidated Irrigation District