

Spring 2015

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### KDWCD Vision Statement

Kaweah Delta Water Conservation District's vision is to protect, conserve, and maintain the Kaweah Basin's water resources through actively pursuing a comprehensive understanding of the region's water resources and through the management of those resources to their fullest potential. The District strives to achieve its vision by engaging in the following core directives:

- Monitoring water resources and demands

- Conserving and enhancing available water resources, both local and regional,

- Investigating and evaluating the Region's water resources,

- Conserving and protecting Kaweah Basin water rights,

- Preventing the interference with/ or diminutions of natural flow, and

- Protecting lands from flood or overflow

### Inside this Issue

New Groundwater Laws:

Hydropower

SCADA

Drought



## New Groundwater Laws: No One is Exempt

When the State Legislature passed and Governor Jerry Brown signed into law the Sustainable Groundwater Management Act of 2014, the combination of three bills rolled into one ensured two things: it will take a long time to implement everything, and no one will be exempt from the new law.

The Sustainable Groundwater Management Act, or SGMA, consists of three bills (AB 1739 - Dickinson, SB 1168 - Pavley, and SB 1319 - Pavley) that commit the State to locally controlled, sustainable groundwater management. The bills also provide resources and for local agencies achieve sustainability goals during a 20-year implementation period.

"There is no question that groundwater sustainability is necessary and, frankly, our future depends on it," said Mark Larsen, general manager of Kaweah Delta Water Conservation District. "And one thing that is clear with SGMA is that the steps to sustainability will require everyone's participation, whether you are living in an urban area or making a living as a farmer."

SGMA gives a process with a 20-year timeline for local agencies to achieve sustainable management of groundwater basins. It also provides tools, authorities and deadlines to ensure the goals are met.

First, Kaweah Delta and other local agencies will need to discuss the formation of a local groundwater sustainability agency, or GSA, within two years. Agencies considered high- or medium-priority will have five to seven years to adopt groundwater sustainability plans, depending on whether the basin is in a critical overdraft situation. Finally, once plans are in place, local agencies have 20 years to fully implement them and achieve their sustainability goals. If local agencies are unable to meet their goals, the State Water Resources Control Board may intervene.

### New Tools for Local Agencies

To help the GSAs reach their sustainability goals, SGMA provides a host of

new tools for agencies to use:

- Groundwater agencies may require registration of groundwater wells and measurements of extractions.
- They may require annual groundwater extraction reports.
- They may impose limits on extractions from private groundwater wells.
- They may assess fees to implement local groundwater management plans.
- They may request a review of basin boundaries, including establishing new sub-basins.

### Creation of Groundwater Sustainability Plans

Local agencies must develop groundwater management plans. They can develop one plan for a specific basin, or they can combine efforts and combine several plans comprised of representing multiple agencies. Plans must include measurable objectives, as well as interim milestones, to achieve the sustainability goals within the 20-year timeframe. Plans must also include:

- A physical description of the basin including groundwater levels.
- Historical and projected data on water use and supplies.
- Monitoring and management provisions.
- A description of how the plan will affect other plans, including the General Plans for the Cities and Counties in the area.

New GW Laws cont' on pg. 3

## Groundwater Management Workshop

Meet with local experts to discuss the new groundwater laws and learn what the new "Sustainable Groundwater Management Act" means for your groundwater rights. Groundwater management agencies must be formed in all local areas by July 2017, time is short!

Speakers to be featured include:

- Dennis Keller, Keller and Wegley Consulting Engineers
- Mark Larsen, Kaweah Delta Water Conservation District
- Aubrey Mauritsen, local attorney and land owner

### Do you want your groundwater managed by Sacramento in 2020?

Topics to include:

- Overview of the Sustainable Groundwater Management Act
- What do landowners need to know in the Kaweah Basin?
- How do landowners stay engaged and informed?
- What steps are taking place now at the local level in the formation of Groundwater Sustainability Agencies

**Please attend!**  
**Wednesday, June 17, 2015**  
**4:00 pm – 6:00 pm**  
**Exeter Memorial Building**  
**324 N. Kaweah Ave.**  
**Exeter, CA 93221**



Tulare County  
 Farm Bureau  
 For info, contact 732-8301

**Hydropower**

Just more than 30 years ago, the Kaweah Delta Water Conservation District (KDWCD) and the Tulare Irrigation District (TID) formed the Kaweah River Power Authority or KRPA, a joint-power authority to construct and manage a hydroelectric power plant at Terminus Dam on Lake Kaweah.

KRPA filed for a license to construct a 17 megawatt hydroelectric plant at Terminus Dam. Once approved, KRPA completed the designing and building the plant, which began generating power just 10 years later in 1992 and delivering electrical power to Southern California Edison Company.

Hydropower, simply stated, is electricity generated using the energy of moving water. If you have rafted on white water, or hiked alongside a river during snowmelt, you know about the energy created by moving water.

Harnessing this water is nothing new. In ancient times, Greek farmers used this energy to grind wheat into flour. By placing water wheels in rivers, they used river flows to fill buckets that turned the wheel. The kinetic energy of the river flow turned the water wheel, converting it into mechanical energy to grind the flour.

The first hydroelectric plant built in the U.S. began operation in 1882 on the Fox River in Appleton, Wisconsin. Five years later, the West's first hydroelectric plant began operating in San Bernardino. Today, hydroelectric power provides nearly one-fifth of the world's electricity.

While Terminus Dam's primary purpose is flood control, provid-

**SCADA System Allows Remote Control of Water Delivery System**

Since its inception, Kaweah Delta Water Conservation District has been in the business of monitoring water flows in the Kaweah and St. Johns River systems. Monitoring flows is important when that water serves agricultural customers who rely on the water for irrigating crops and livestock. But monitoring water flows can be time consuming, especially with a system as large as the Kaweah River watershed. Following water from Terminus Dam to an end-of-the-system water user can literally take days.

Understanding the need for efficient water deliveries as well as efficient use of manpower, KDWCD in the early 2000s, upgraded its system, incorporating SCADA, an acronym that stands for Supervisory Control and Data Acquisition. SCADA is a software program that is used to control and gather real time data from remote locations. At the District, the programs are used to monitor power plant operations and water flows in the rivers.

"The benefits from using a SCADA system have been very real for us," said Tony Ramos, power plant supervisor. "Because we are able to remotely monitor our plant and water systems 365 days a year, it saves us from having to drive back and forth to different sites, and we don't have to use a lot of staff resources to monitor the data."

The SCADA system at the power plant based at Terminus Dam helps staff monitor data to keep the plant running efficiently and to ensure water deliveries. The computer hardware collects data, processes it, and presents it to the operator.

"Our system is set up to monitor to critical issues: oil temperature in the plant and water flows," said Ramos. "These two things are critical because if the plant overheats, it shuts down. And because we supply irrigation water, water flow must be monitored to be sure that water is delivered on demand and when it is requested."



**Kaweah River Power Authority (KRPA)**

ing protection for more than half a million acres of farmland and hundreds of thousands of people along the lower Kaweah River, its construction also presented the opportunity for hydroelectricity. The KRPA power plant generates electricity that is distributed by Southern California Edison. Originally designed and constructed as a 17 megawatt (MW) plant, today it has a capacity of 20 MW and has the ability to generate about 40 million kilowatt hours per year. And hydropower is still the cheapest way to generate electricity today. The energy source -- flowing water -- is free, clean, and made new each year by snowmelt and rainfall.

**How a Hydro Power Plant Works**

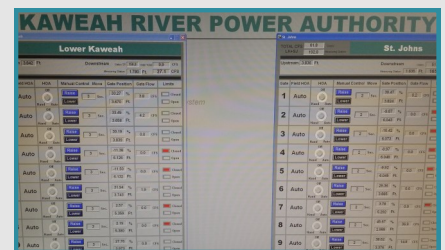
There are three parts to the KRPA hydro power plant:

- ⇒ The electric plant where the electricity is produced;
- ⇒ Terminus Dam gates that can be opened or closed to control water flow; and
- ⇒ Kaweah Reservoir, which stores the water that flows through the intake and causes the turbines to turn, spinning a generator to produce electricity.

The amount of electricity that is produced depends on how far the water drops and how much water moves through the system. The KRPA electricity is sold to Southern California Edison, which transports the power over electric lines to homes, businesses, farms and industries in Tulare County.

At the power plant, which was constructed by the Kaweah River Power Authority, sensors monitor oil temperature, electrical voltages and mechanical functions. If anything goes awry, alarms are triggered and sent directly to plant operators' remote devices. "We are able to respond and access the alarm information from a remote device specialized with SCADA software," Ramos said. "When an alarm is triggered, it calls our device and leaves a message, telling us exactly what the alarm is. Then we can access a computer screen remotely to review the data, make an assessment and perform adjustments."

Ramos said that the alarm system is set up to allow for travel time to the plant. From the District's main office in Farmersville, the drive to the plant can be 30 to 40 minutes, depending on traffic. As such, certain



**KRPA SCADA Page**

alarms can be set to be more sensitive, allowing operators plenty of time to reach the plant and to avoid full-scale emergencies. In some cases, the plant actually will shut itself down to avoid trouble.

"Monitoring our water system is critical to make sure that when water is released, it gets to where it's going," Ramos said. "Our system is so large, a water release from the plant may take several days to reach the water user. Before SCADA, a ditch tender would have to follow the water flow as it approaches the head gates to make sure it is diverted."

"Now," Ramos said, "the SCADA system reports water and flow levels as water releases travel through the system. Flows are released

**D-R-O-U-G-H-T**

California’s drought grabs headlines in every type of news medium, and both the stories and the drought itself aren’t going away any time soon.

The past four years, starting in 2012, have been the Golden State’s driest years in its recorded history. January 2015 achieved the distressing designation as one of the driest months on record and the March 2015 snowpack measured in at a miserable 5 percent of normal -- the lowest snowpack ever recorded.

Such dismal statistics prompted Governor Jerry Brown in April to issue for the first time ever, mandatory statewide water reductions, as well as several other actions designed to save water, including increased enforcement to prevent wasteful water use, streamlining the state’s drought response, and investing in new technologies to make California more drought resilient.

“(W)e are standing on dry grass where there should be five feet of snow. This historic drought demands unprecedented action,” said Governor Brown at a news conference in the Sierra Nevada in March. “Therefore, I’m issuing an executive order mandating substantial reductions across our state. As Californians, we must pull together and save water in every way possible.”

For the first time in California history, the Governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent. These reductions would amount to approximately 1.5 million acre-feet of water over the next nine months.

To save even more water now, the order also:

- Replaces 50 million square feet of lawns throughout the state with drought tolerant landscaping in partnership with local governments;
- Directs the creation of a temporary, statewide consumer rebate program to replace old appliances with more water and energy efficient models;
- Requires campuses, golf courses, cemeteries and other large landscapes to make significant cuts in water use; and

- Prohibits new homes and developments from irrigating with potable water unless water-efficient drip irrigation systems are used;
- And bans watering of ornamental grass on public street medians.

The Question Is How Much Water Do You “Eat” Every Day?

Breakfast	Gallons of Water to Produce
Orange juice (8 fluid oz)	49.1
One egg	62.7
One toast and butter	56.3
¼ cantaloupe	40.0
<b>Breakfast Total</b>	<b>208.1 gallons</b>

Lunch	Gallons of Water to Produce
BBQ chicken sandwich	
Chicken (4 oz)	115.0
Wheat bread (2 slices)	21.2
Cheese (1 slice)	56.0
Tomato (1 oz)	1.9
Lettuce (1/4 cup)	.7
BBQ Sauce	
Catsup (1/2 oz)	1.6
White sugar (2 oz)l	4.7
Vinegar & spices	* water use unknown
Orange (4.6 oz)	13.8
Water (12 fl oz)	2.0
<b>Lunch Total</b>	<b>215.1 gallons</b>

Dinner	Gallons of Water to Produce
Lasagna	
Pasta (4 oz)	71.8
Tomato sauce (6 oz)	38.7
Cheese (3 oz)	168.0
Ground beef (3 oz)	82.5
Spices	* water use unknown
Garlic bread	
Bread (1 slice)	10.6
Butter (1 pat or .36 oz)	45.7
Garlic	* water use unknown
Salad	
Lettuce (1/2 cup)	1.5
Tomato (2 oz)	3.8
Other vegetables & spices	* water use unknown
Milk (8 fl. oz)	48.3
<b>Dinner Total</b>	<b>470.9 gallons</b>

**Daily Total 894.1 Gallons**

Source: The Water Fact Book: California Agriculture and Its Use of Water, California Farm Water Coalition

**New Groundwater Laws: No One is Exempt** cont' from pg. 1

All Plans will be evaluated every five years.

“Managing groundwater really is nothing new in our area because conserving and protecting the underground waters of the Kaweah River Basin is one of the primary objectives of our water conservation district,” said Larsen. “Fortunately, SGMA -- as it is written - - recognizes the importance of managing groundwater at the local level. Kaweah Delta will have to consider their role in this effort. Keeping groundwater management at the local and regional level is very important.”

SGMA is one part of a comprehensive water plan for California. Additional components include investments in water conservation,

water recycling, expanded water storage, safe drinking water, and restoration for wetlands and watersheds. The all-inclusive plan is intended to ensure a reliable water supply for California well into the future.

**Key Implementation Dates**

- June 30, 2017: Local groundwater sustainability agencies formed.
- Jan. 31, 2020: Groundwater sustainability plans adopted for critically overdrafted basins.
- Jan. 31, 2022: Groundwater sustainability plans adopted for high- and medium-priority basins not currently in overdraft.
- 20 years after adoption: All high- and medium-priority groundwater basins must achieve sustainability.

**SCADA** cont' from pg. 2

from the plant and go into the diversion at McKay Point. From there the water either flows into the Kaweah River or the St. Johns River.”

“In the old days, a ditch tender would have to follow that water flow to the head gates,” Ramos said. “A lot of manpower was used at the diversions to catch the water flow if it was large. Now that happens remotely and you’re not babysitting the water as it goes down the system. From one computer station, we have a whole overview of

what’s happening in the system.” Ramos continued to say, “As the water flows, we need to know the levels as it gets to the gates because we don’t want a big surge of water.” That could result in a property owner receiving too much water, which means someone else is being shorted. Because of the monitoring, head gates can be operated remotely to ensure that they are adjusted to accommodate water flows at the diversions.



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W  
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VISIT OUR WEBSITE AT [WWW.KDWCD.COM](http://WWW.KDWCD.COM) FOR MORE INFORMATION!

*Kaweah Delta Water Conservation District hopes that you have found the information in this issue of the KDWCD Water Report helpful. It is our goal to provide water resource information that is relevant and useful to those who live, work and farm in the District. As our District strives to protect and enhance the groundwater resources of the Kaweah River Basin, we also would like the landowners, water users and the general public to be informed and knowledgeable about our water resources, so that together we can make the best use of our water now and into the future.*

#### Water/Weather Related Web Links

California Irrigation Management Information System (CIMIS) - <a href="http://www.cimis.water.ca.gov">www.cimis.water.ca.gov</a>	Friant Water Authority (FWA) - <a href="http://www.friantwater.org">www.friantwater.org</a>
National Oceanic Atmospheric Administration (NOAA) - <a href="http://www.noaa.gov">www.noaa.gov</a>	United States Bureau of Reclamation (USBR) - <a href="http://www.usbr.gov">www.usbr.gov</a>
United States Army Corps of Engineers (USACE) - <a href="http://www.usace.army.mil">www.usace.army.mil</a>	Association of California Water Agencies (ACWA) - <a href="http://www.acwa.com">www.acwa.com</a>
California Department of Water Resources (DWR) - <a href="http://www.water.ca.gov">www.water.ca.gov</a>	Water Education Foundation (WEF) - <a href="http://www.watereducation.org">www.watereducation.org</a>
Regional Water Quality Control Board (RWQCB) - <a href="http://www.waterboards.ca.gov">www.waterboards.ca.gov</a>	Water Education Foundation—Aquapedia— <a href="http://www.aquapedia.com">www.aquapedia.com</a>

#### Agricultural Water Management Resources

**CA Agricultural Technology Institute** - A non-profit, educational institution dedicated to improving California agriculture  
**Irrigation and Training Research Center** - An irrigation teaching program through outside activities specializing in training, research, and technical support  
**National Weather Service** - Provides forecasts and warnings for the central U.S.  
**CA Water Institute** - Offers seminars and classes dealing with Regional Water Issues, Irrigation Technology, and Research  
**UC Ag Extension** - Includes farm, nutrition, family and consumer science advisors based in more than 50 county offices, reaching millions of farmers, businesses and residents every year  
**Center for Irrigation Technology (CIT)** - As an independent research and testing facility, CIT assists designers, manufacturers and users of irrigation equipment to make the technological advances required for our growing and ever changing world. Provides pump efficiency testing  
**USDA Farm Service Agency** - Provides contact information as well as a listing of the programs and offices that make up the Farm Service Agency  
**USDA/ARS Water Management Research Laboratory** - The development of water and weed management technologies and practices for irrigated agriculture in water deficit areas that use water efficiently, improve agricultural productivity, sustainability and reduce negative environmental impacts  
**Farm Advisors Office, Agricultural Commissioners' Offices, Tulare and Kings Counties**