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KRCD
Kings River Conservation District

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Water. Power. Environment.

Reliable resources for the Valley.

IRRIGATION NEWS

The Conditional Waiver and You

The Regional Water Quality Control Board (Regional Board) recently adopted a conditional waiver for regulation of agricultural discharges from irrigated fields. The conditional waiver affects any grower who applies irrigation water (regardless of source) upon the land, as such land is at risk for offsite movement of the materials the Regional Board seeks to control. These include "earthen materials, including soil, silt, sand, clay, rock; inorganic materials, (such as metals, salts, boron, selenium, potassium, nitrogen, etc.); organic materials, (such as organic pesticides) that enter or threaten to enter the waters of the state."

Three options are available to growers, two of which fall under the conditional waiver. Outside of the waiver, a grower can file for an individual waste discharge permit (WDR), a set of regulations that are typically used to govern industrial sites. The grower's farm would be considered a "point source," similar to that of a wastewater treatment facility or other industrial site. The price for such a decision is potentially enormous, including the cost of a WDR permit and the costs for the development of monitoring and management programs for risk reduction.

The first option under the waiver has the individual grower file a Notice of Intent (NOI) with the Regional Board, thus avoiding the permitting fees required under a WDR. If the grower chooses to do some of the monitoring themselves, the estimated costs for the development of a monitoring and management plan would be approximately $10,000 plus an annual cost of around $6,000.

The second option is to knowingly elect to be a member of a watershed coalition (coalition). As such, the development costs of monitoring plans on a regional basis could be spread across all the affected growers on a per acre basis. Management plans would be promoted to those areas that are at higher risk of discharge (high slopes, finer textured soils, etc.). The costs to the individual grower would be much less, usually based on acres farmed. The staff of the Regional Board has stated that the coalition must maintain a list of members available for their review.

The third option requires growers wanting to individually comply with the waiver to file a NOI. This NOI includes the following information: Name, business name, address, parcel number(s), distance to nearest surface water (natural or man-made), acres, crops, water source and usage, plus a map of the property showing potential discharge sites.

At this point, the grower must decide how to proceed. The easiest and least cost prohibitive approach is to join a coalition.Under the Southern San Joaquin Water Quality Coalition (SSJWQC) umbrella of which KRCD is a member, management and monitoring plans would be developed on a regional basis, with the larger issues handled by the coalition as a whole.

The Southern San Joaquin Valley Water Quality Coalition serves the majority of the Tulare Lake Basin watershed from the San Joaquin River south to the Tehachapi Mountains. Historically, this watershed has not been influenced by significant water quality issues and is hydrologically unique and separate from the Delta. Members of the Coalition include:

Kings River Conservation District
Kings River Water Association
Friant Water Users Authority (units south of San Joaquin River)
Kaweah-Delta Water Conservation District
Kaweah and St. Johns Rivers Association
Tule River Association
Kern County Water Agency
Kern Delta Water District
North Kern Water Storage District
Buena Vista Water Storage District

These agencies are committed to working with the Regional Board to insure that growers concerns are adequately addressed, and that the regulations for Waiver compliance are reasonable.

Preliminary Signup for Water Quality Coalition

Until the State Board makes a final decision on coalition signup requirement, the SSJWQC encourages individual growers to simply call and leave their name and number at (559) 237-5567, ext 126 or ext 117, or mail in this section. The State Board is currently leaning toward reinstating this requirement with a 6-month time frame for compliance.

Name:

Address:

Phone Number(s):

This information is being collected by KRCD as a lead agency for the Southern San Joaquin Water Quality Coalition.

Soil Moisture and Irrigation Scheduling

The relationship between plants and their environment is a dynamic one. A key aspect to this relationship is in the ability of the soil to hold and supply the moisture necessary to sustain the plant. This issue of Irrigation News will look at the basics of this complex process.

There are over 118 distinct soil types within the Kings River Conservation District. These soils vary considerably in their infiltration rate (an important factor in irrigation method selection) and available water capacity within the root zone (important for scheduling). A summary of the soils found within the district is found in Table One.

The rate that a soil can absorb water from any source is called its infiltration rate. Infiltration rates vary due to changes in soil pore size, soil chemistry and biological activity. Soil pores are created during soil formation, and can be modified by tillage practices, chemical amendments and cropping patterns or other biotic factors.

During irrigation, water fills the available pore spaces, displacing the air within the root zone. Once the flow of water within the soil due to gravity stops (about three days after an irrigation in most soils), field capacity (FC) is achieved. This is the maximum amount of water a soil can hold. Permanent wilting point (PWP) is that level of soil moisture where the soil's ability to hold the water is greater than a plant's ability to extract it, and the plant will not recover if irrigated. The difference between FC and PWP is called the available water capacity (AWC). This value is critical to irrigation scheduling as it indicates the amount of water that can be used between irrigations.

Water use from the soil profile follows a specific pattern, regardless of soil type. Each quarter of the root zone has 10 percent less demand than the layer above. The top quarter typically yields 40 percent of the total evapotranspiration (ET) for that crop, the next quarter 30 percent, and so on. Therefore, the top half of the root zone accounts for 70 percent of the water used by the crop.

Lets assume the ET for a given crop is 0.25 inches/day. If the root zone were four feet deep, then the crop would use 40 percent of the ET from the top foot, or 0.1 inches/day. The roots would extract 0.075 inches (30%) from the second foot, 0.05 inches from the third foot, and 0.025 inches from the fourth foot (total 0.25 inches).

If a soil can hold 0.2 inches of water per inch of soil (2.4 inches/foot), then a 48-inch root zone has an AWC of 9.6 inches of water (48 inches * 0.2 inches/inch = 9.6 inches). It is generally not a good idea to reduce the AWC below a certain threshold. By creating a point of maximum allowable depletion (MAD), a grower can create a reserve of water within the soil to protect his crop against unexpected environmental stresses or mechanical difficulties. Typically, the MAD is set at 40 and 50 percent of AWC.

With a MAD of 40 percent in the above soil, the maximum usage would be 3.84 inches (9.6 inches * 0.4 = 3.84 inches), which would last approximately 15 days at an ET rate of 0.25 inches/day (3.84 inches / 0.25 inches/day = 15.36 days).

The MAD should be adjusted to reflect local conditions. If the soil is especially sandy or has a high salt content, the MAD should be reduced. This will keep the water readily available to the plants without undue stress. A MAD greater than 50 percent should be discouraged unless the goal is to completely deplete the soil moisture prior to harvest. This practice is common in many annual field crops, as well as some moisture sensitive seed crops.

If you are curious about what AWC of your property is or have any other irrigation related questions, please contact Eric Athorp at 237-5567 ext 117.

Table One: Summary of Soil Characteristics within KRCD

Soil Texture	Count	Permeability	Available Water Capacity
		inches per hour	*inches per inch of soil*
Clay	14	0.05-0.20	0.10-0.30
Clay Loam	12	0.05-2.5	0.02-0.22
Loam	27	0.8-5.0	0.10-0.28
Loamy Sand	8	2.0-10.0	0.04-0.12
Sandy Clay Loam	2	0.2-0.8	0.18-0.21
Sandy Loam	51	0.2-10.0	0.10-0.20
Silt Loam	3	0.2-2.5	0.13-0.32
Silty Clay	1	0.06-0.20	0.14-0.17

Based on Fresno and Kings County Soil Surveys

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For more information contact
Eric Athorp at
(559) 237-5567 ext 117
www.krcd.org

Kings River Conservation District
4886 E. Jensen Avenue
Fresno, CA 93725-1899

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