

DRAFT

KERN GROUNDWATER AUTHORITY COORDINATION AGREEMENT COMPONENTS WHITE PAPER SERIES

Item C Surface Water Supply Data

Introduction

There are seven components to Groundwater Sustainability Plan (GSP) coordinating agreements. The coordination components are further described in the Department of Water Resources (DWR)'s GSP regulations, which were released in draft form in February, 2016. The seven components are:

- a. **Groundwater Elevation Data.**
- b. **Groundwater Extraction Data.**
- c. **Surface Water Supply.**
- d. **Total Water Use.**
- e. **Change in Groundwater Storage.**
- f. **Water Budget.**
- g. **Sustainable Yield.**

The Kern Coordination Committee of the Kern Groundwater Authority (KGA) is preparing a series of white papers addressing each of the coordination elements identified above. This white paper addresses *Item c) Surface Water Supply*. The information presented in this white paper provides a suggested methodology and protocols for the consistent collection of surface water supply data throughout the Kern Subbasin. The intent of this white paper is to advance the dialogue between participating members of the KGA on the development of a coordination agreement required under the Sustainable Groundwater Management Act (SGMA). The information presented herein is draft and subject to the input and revision from members of the Coordination Committee.

Water Budget Components

Water budgets calculate change in groundwater storage by comparing supplies to consumptive uses and outflows. This section explains the supply and consumptive use components that need to be considered when developing a water budget for the Kern Subbasin. Figure 1 shows the summary equation.



Supply can be calculated by documenting and adding together water supply inputs into the Kern Subbasin, which include:

- Kern River
- Minor streams
- CVP imports
- SWP imports
- Precipitation
- Groundwater inflows from small watersheds
- Groundwater inflows from the Tule Subbasin
- Groundwater inflows from Tulare Lake Subbasin
- Produced water from oil extraction
- Withdrawals from groundwater storage (groundwater extractions)

Consumptive use can be calculated by documenting and adding together consumptive uses and outflows, which include:

- Managed habitat evapotranspiration
- Undeveloped land evapotranspiration
- Soil moisture evapotranspiration
- Agriculture evapotranspiration
- Groundwater outflows to small watersheds
- Groundwater outflows to Tule Subbasin
- Groundwater outflows to Tulare Lake Subbasin
- Municipal consumptive use (Municipal use minus municipal discharge)
- Evaporation during energy production
- Contributions to groundwater storage (deep percolation)

This white paper discusses methods that can be used to measure or estimate surface water supplies. Other components of the water budget are discussed in other white papers.

Surface Water Supply Data and Monitoring Protocols

This section describes elements of the surface water supply data component of coordination agreements. This white paper identifies a number of potential sources of information for documenting surface water supplies. These methods are proposed as potentially viable methods that KGA participating member can collectively agree to be used to document surface water supplies. Establishing common, defined methods for determination of surface water supplies, is important to establishing a creditable coordination agreement between Groundwater Sustainability Agencies within the Kern Subbasin and KGA participating members.

Surface Water Supply

Surface water supplies are currently documented and aggregated by a number of sources in the Kern Subbasin. Available sources include:

- **Kern County Water Agency (KCWA)** - KCWA releases annual water supply reports which document water supplies in Kern County. Water supplies documented in the annual water supply reports include State Water Project (SWP), Central Valley Project (CVP), Kern River, minor streams, precipitation, recycled water, and oilfield produced water sources. KCWA's annual water supply reports include data at a district level.
- **Individual District Records** - Districts also measure surface water deliveries to verify supplies diverted from the CVP, SWP, and local surface water sources, as well as to document deliveries to individual irrigators within the districts.
- **Kern River Report** – The Kern River Report may also be a strong source of surface water supply information.

The data sources may be used together to verify or dispute the amounts included in other reports. Discrepancies between reports can be investigated and resolved if necessary.

Reporting of Surface Water Data

SGMA requires annual reporting of groundwater elevation data, groundwater extraction, surface water use, total water use, and change in groundwater storage. Surface water data is reported on a monthly basis, and can easily be compiled into an annual report for use in SGMA reporting.

Quality Control and Assurance

Surface water data can be compared for accuracy against values prepared in Agricultural Water Management Plans (AWMP)s. If data from AWMPs is significantly different than the reported surface water data, the AWMP and/or the calculated extraction can be reviewed. Potential changes in irrigation practices and land use may be the cause of the difference and should be investigated.