

Proposed Framework and Draft Recommendations for Updating AWMP Requirements
October 17, 2016

(when providing feedback please focus on substantive content and not editorial comments)

Following are draft recommendations and a proposed framework for the updating of Agricultural Water Management Plan (AWMP) requirements per Governor's Executive Order (EO) B-37-16 directive. The EO directs DWR to work with CDFA to update the agricultural water management plan requirements through the following actions:

- 1.) Update requirements to ensure these plans identify and quantify measures to increase water efficiency and to plan for periods of limited water supply (Actions 11 and 13).
- 2.) Require the submittal of agricultural water management plans from suppliers who provide water to more than 10,000 acres of land (Action 12).

The EO B-37-16 also requires DWR, Water Board, and CPUC to develop methods to ensure compliance with the directives of this EO, including technical assistance, oversight, and enforcement by the Water Board, if necessary.

To fulfill the intent of the EO directive, the following actions are recommended by the EO State agencies.

1.) Develop annual water balances for the agricultural water supplier's service area

To make the AWMP a more effective planning document and to help the water supplier identify areas where water efficiency improvements can be made, the proposed updated AWMP requirements would require suppliers to include in their plans annual water balances that account for inflows to and outflows from the water supplier's service area. Including water balances as part of the AWMP provides the following benefits:

- a. Better quantifies the flows of water within the district and better estimates unmeasurable flows such as deep percolation.
- b. Provides the data necessary to quantify water management efficiency within the district
- c. Helps identify and prioritize water loss
- d. Aligns AWMP reporting with Sustainable Groundwater Management reporting

As a part of the water balance, the water suppliers would be required to report all water inflow to and outflow components from their service area. The components of the water balance would include the following:

Water Balance Inflow components-

1. Surface inflow
2. Groundwater pumping in the service area (including private groundwater pumping)
3. Effective Precipitation

Water Balance Outflow components-

1. Surface outflow
2. Deep percolation
3. Evapotranspiration (E and ETc)¹

Agricultural water suppliers are currently required (Water Code §10826) to describe the quantity and quality of their water resources, water uses within the agricultural water supplier's service area, overall water budget, and water use efficiency information. However, the Water Code does not currently require actual quantification of all components sufficient to develop a water balance.

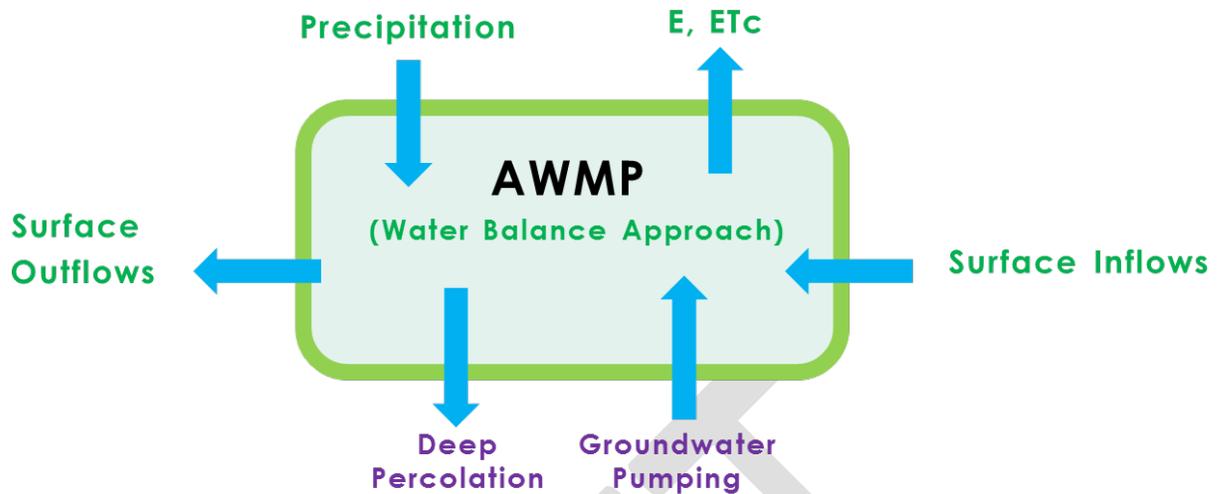
To develop a service area water balance, the proposed revisions to the AWMP requirements would require agricultural water suppliers to quantify all currently reported components and to report on two additional components:

1. Precipitation
2. Private groundwater pumping

The annual water balances would be required to be reported on a water year basis (beginning October 1 and ending September 31)

The following figure illustrates the overall components of the water balance approach.

¹ Where E refers to evaporation and ETc refers to the evapotranspiration of crops. Evapotranspiration is the combined amount of water that enters the atmosphere by plant transpiration and surface evaporation.



The State, through the agricultural water management program or the Sustainable Groundwater Management program, may provide tools and resources to assist suppliers in developing and quantifying existing and new components.

2.) Identify agricultural water supplier's water management objectives

Supplier-specific water management objectives would be identified and reported in the AWMP. From the water balance, agricultural water suppliers would identify and select specific water management objectives to improve water use efficiency or to meet other water management objectives. Additionally, agricultural water suppliers may seek or be required to meet environmental beneficial uses such as instream flows and timing or other water quality improvements. In using outcome- or objective- based planning, specific goals or results are identified (e.g., decrease percolation to saline ground, provide greater flexibility in irrigation deliveries) and then specific efficient water management practices or measures are selected and implemented to achieve the stated outcome or objective.

The proposed water balance approach to the AWMP requirements would help agricultural water suppliers identify and prioritize water loss, identify ways to improve water system management, and identify specific EWMPs to implement in order to reduce water losses and attain other water management objectives.

3.) Quantify measures to increase water use efficiency

The proposed updates to the AWMP requirements would also require agricultural water suppliers to quantify the efficiency of agricultural water use within their service area. Agricultural water suppliers would choose the appropriate method(s) from amongst four efficiency quantification methods provided in the 2012 DWR report to the Legislature titled,

“A Proposed Methodology for Quantifying the Efficiency of Agricultural Water Use”. These methods can be used to calculate the ratio of beneficial water uses to amount of applied water and include: the Crop Consumptive Use Fraction, the Agronomic Water Use Fraction, the Total Water Use Fraction, and the Water Management Fraction. When choosing the appropriate water use fraction to determine water use efficiency, the agricultural water supplier needs to ensure that all water uses are taken into account including crop water use, agronomic water use, environmental water use, groundwater recharge, and recoverable surface flows. The proposed water use fractions (described below) are practical methods for quantifying the efficiency of agricultural water use by irrigated agriculture and other beneficial uses that can help agricultural water suppliers evaluate current conditions and strategies for improving agricultural water management. All four methods described below are applicable for use at the basin- and supplier-scale. At the field-scale, only the first three methods are applicable.

i. **Crop Consumptive Use Fraction (CCUF)**

$$\text{CCUF} = \text{ETAW} / \text{AW}$$

Evapotranspiration of Applied Water (ETAW) is crop evapotranspiration minus the amount of precipitation evapotranspired by the crop

Applied Water (AW) is the total volume of water that is applied within a boundary (e.g., field, supplier service area, or basin) in order to meet the crop evapotranspiration, agronomic, and environmental uses from any source such as surface water (including tailwater² reuse), groundwater (public or private), and the initial soil moisture in the soil profile that is not from precipitation.

ii. **Agronomic Water Use Fraction (AWUF)**

$$\text{AWUF} = (\text{ETAW} + \text{AU}) / \text{AW}$$

Agronomic Use (AU) is the portion of applied water used for water management applications essential for crop production. Examples of essential water management

² Tailwater refers to surface water runoff from a boundary. Tailwater may be captured and reused within (returned to) the boundary.

applications include salinity management, frost control, and winter flooding for straw decomposition.

iii. **Total Water Use Fraction (TWUF)**

$$\text{TWUF} = (\text{ETAW} + \text{AU} + \text{EU})/\text{AW}$$

Environmental Use (EU) is the portion of applied water directed to environmental purposes, including water to produce and/or maintain wetlands, riparian, or terrestrial habitats.

iv. **Water Management Fraction (WMF)**

$$\text{WMF} = (\text{ETAW} + \text{RF})/\text{AW}$$

Recoverable Flows (RF) is the amount of water leaving a given area as surface flows to non-saline bodies or percolation to usable groundwater that is available for supply or reuse.

Components of these fractions may be empirical (measured or observed), modeled (calculated or estimated), or a combination, based on data availability and system complexity.

4.) Adequately plan for periods of limited supply

The proposed updates to the AWMP requirements would also require agricultural water suppliers to include a Drought Plan (DP). The DP should detail how the water supplier would prepare for droughts and manage water supplies and allocations during drought conditions. Some components or actions may require detailed review of conditions, policy changes, or long term capital improvements. Additionally, as conditions change and new technology and knowledge becomes available, opportunities and constraints will change.

Components of the Drought Plan would include:

Resilience Plan

1. A description and analysis of the agricultural water supplier's customers' vulnerability to drought (e.g., potential for crop fallowing, availability of multiple water sources and resilience of each source, existing water storage options).
2. A description of potential opportunities and constraints to improve drought resilience (e.g., improved groundwater or surface water storage potential, acres of permanent crops, environmental use requirements, overdrafted groundwater basin)
3. A description of actions implemented or planned for implementation to improve drought resilience (e.g., potential for improved on-farm water use efficiency measures, groundwater and surface water conjunctive use management, crop fallowing, development of alternative supplies such as recycled water or tailwater reuse).
4. A description of what hydraulic levels or conditions (reservoir levels, stream flows, groundwater, snowpack etc.) are or should be monitored and measured to determine the water supply available and to identify levels of drought severity.
5. The district's policy and process for declaring a water shortage and for implementing the water shortage allocation policy.
6. Alternative Water Supplies- discuss the potential, if possible, for the district to obtain or use additional water supplies during drought conditions. These supplies could include transfers from another water agency or district, the use of recycled water and desalination of brackish groundwater or drainage water.
7. Revenues and Expenditures- describe the cost for implementing the resilience plan.

Action Plan

1. A description of the water shortage allocation policies as required by the Water Code. Water suppliers shall attach a copy of the policy to their AWMP and describe how water is allocated during a shortage.
2. Operational Adjustments- changes in district water management and district operations to respond to drought, including canal and reservoir operations and groundwater management
3. Demand Management- policies and incentives in addition to the water shortage allocation plan to lower on farm water use.
4. Coordination and Collaboration- include a description on how coordination and collaboration with other local districts and water agencies or regional groups will be used in drought response.
5. Revenues and Expenditures- describe how the drought and lower water allocations will affect the districts revenues and expenditures.

5.) AWMP updated requirements to extend to more water suppliers

The proposed updates to the AWMP requirements would extend the requirement for plans to include agricultural water suppliers supplying more than 10,000 acres of irrigated land, excluding recycled water.

6.) Reporting, Assistance, Compliance, and Enforcement

Reporting

All agricultural water suppliers providing water supplies to 10,000 or more irrigated acres, excluding recycled water, would be required to prepare and adopt an AWMP on or before December 31, 2020 and every five years thereafter. Agricultural water suppliers would continue to be required to submit their plans to DWR within 30 days of adoption.

CVPIA and RRA waters suppliers who submit water conservation plans to USBR may still submit those plans to DWR, along with supplemental information including a Drought Management Plan for all suppliers, and water measurement and volumetric pricing for those water suppliers providing water to 25,000 irrigated acres or more excluding recycled water (California Code of Regulations 597.1(a) and Water Code §10608.48(b))

Assistance

DWR will provide assistance to agricultural water suppliers through:

- (1) AWMP Guidebook: DWR would update the AWMP Guidebook to help agricultural water suppliers better understand the Water Code Agricultural Water Management Plan (AWMP) requirements and assist them in developing an AWMP. The Guidebook would also describe how water conservation plans submitted to the U.S. Bureau of Reclamation can be supplemented to satisfy the Water Code and Agricultural Water Measurement Regulation requirements.
- (2) AWMP Workshops: Prior to finalizing the AWMP Guidebook, DWR would release a draft and hold public workshops to give opportunity for stakeholders to comment on the draft guidelines. Additional workshops would be conducted after releasing the final Guidebook.
- (3) CIMIS: DWR would continue to support and update the California Irrigation Management Information System (CIMIS) to provide climate data and resources

(e.g., precipitation, crop use coefficients) necessary for calculating components of the water balance and water use efficiency fractions.

- (4) Water Use Efficiency Calculator: DWR will make available the water use efficiency calculator being developed and tested by the University of California through Proposition 50 and Proposition 1 grants.
- (5) EO State agencies recommend that DWR provide the agricultural water suppliers with a calculator to calculate all of the water use efficiency fractions and water balance.
- (6) EO State agencies recommend that DWR, through the Agricultural Water Management Program or the Sustainable Groundwater Management Program, provide additional tools and resources (e.g., remote sensing for measurement of actual evapotranspiration, models or calculators for calculating deep percolation to groundwater) to assist suppliers in developing and quantifying water balance components pertaining to evapotranspiration of applied water and possibly private groundwater pumping.

Compliance

- (1) An updated list of agricultural water suppliers required to submit plans will be provided to the Water Board by February 28, 2020 and every five years thereafter.
- (2) DWR will review each plan for meeting the requirements of the Water Code, including the updated and new components. Plans will be reviewed by DWR as they are received, however review will be expedited for those plans belonging to agricultural water suppliers seeking a State grant or loan. DWR may consult with the Water Board during the review.
- (3) Plan submittal status and review status will be sent to the Water Board and continue to be posted on DWR's Water Use and Efficiency Branch website as plans are received. Plans will also continue to be posted on DWR's Water Use and Efficiency Branch website as plans are received and available to the public.
- (4) If a plan has not been submitted by March 31, 2020 and every 5 years thereafter or is incomplete following review, the agricultural water supplier will be notified and

opportunity will be provided to complete the plan and DWR will negotiate a plan and schedule for completion with the agricultural water supplier.

- (5) If the agricultural water supplier fails to submit a plan by July 31, 2020 and every 5 years thereafter or does not submit a plan within the negotiated plan and schedule for completion, DWR will notify the Water Board of non-compliance for enforcement actions.

Enforcement

Water suppliers will continue to have a current AWMP that has been reviewed by DWR and found to have addressed all the required elements to be eligible for State grant and loan funding.

The Water Board, in addressing agricultural suppliers who have not submitted AWMPs or who have not revised AWMPs missing required elements, may implement a progressive list of mandates and orders which could include fines and civil penalties.

7.) Annual reporting

Assembly Bill (AB) 1404 (Statutes of 2007, Chapter 675) requires that all agricultural water suppliers supplying 2,000 acre-feet or more of surface water annually for agricultural purposes or serving 2,000 or more acres of agricultural land shall submit an annual aggregated farm-gate delivery report to DWR. Per AB 1404, an agricultural water supplier shall:

- (1) Provide DWR with monthly or bimonthly aggregated farm-gate deliveries on an annual basis, along with information on their farm-gate measurement program or practices to document that they are using "Best Professional Practices"; or
- (2) Provide DWR with information that documents that the implementation of a program or practices to measure farm-gate deliveries using Best Professional Practices is not locally cost effective.

However, for the purpose of aligning agricultural water suppliers annual reporting with the Sustainable Groundwater Management Act reporting requirements EO State agencies recommend that the annual aggregated farm-gate delivery reporting requirements be replaced by the following:

Agricultural water suppliers serving more than 10,000 acres of irrigated land, excluding recycled water, would submit an annual report to DWR by April 1 of each year to include the following water balance inflow and outflow components for the preceding water year:

1. Surface inflow
2. Supplier's groundwater pumping in the service area
3. Effective Precipitation
4. Surface outflow
5. Deep percolation

When tools and resources are made available by the State, the annual report would also include the following components:

1. Private groundwater pumping in the service area
2. Evapotranspiration

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