

FIFTH AMENDED
RULES AND REGULATIONS
OF THE
GREATER KAWEAH GROUNDWATER
SUSTAINABILITY AGENCY

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Article I. General

Section 1.01 Purpose

These rules and regulations are established by the Board of Directors of the Greater Kaweah Groundwater Sustainability Agency (GKGSA) in order to provide for the sustainable management of groundwater within the GKGSA.

Section 1.02 Authority

Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10725.2 expressly states as follows:

“A groundwater sustainability agency may adopt rules, regulations, ordinances, and resolutions for the purpose of this part, in compliance with any procedural requirements applicable to the adoption of a rule, regulation, ordinance, or resolution by the groundwater sustainability agency.”

Section 1.03 Groundwater Sustainability Plan

Pursuant to Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10725, a groundwater sustainability agency may exercise the powers described in Chapter 5 provided the groundwater sustainability agency adopts and submits a groundwater sustainability plan to the Department of Water Resources. These Rules and Regulations are designed to implement the provisions of the GKGSA Groundwater Sustainability Plan (GSP), and may be amended at any time if necessary to achieve consistency with the groundwater sustainability plan and steps needed to achieve sustainability.

Section 1.04 Definitions

“Coordination Agreement” means the Kaweah Subbasin Coordination Agreement developed and agreed to pursuant to Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10727.6, and any amendments or additions thereto.

“Dairy” or “Dairies” means the production facility of a commercial dairy operation that includes the milk barn, feed area, animal housing, and manure storage as permitted as the Dairy Facility Footprint by the local permitting agencies, including but not limited to, the County, local Air District, and State Water Board.

“Farm Unit” means two or more accounts combined by common landowners.

“GKGSA” means Greater Kaweah Groundwater Sustainability Agency.

“GKGSA GSP” means the GKGSA Groundwater Sustainability Plan developed and submitted to the Department of Water Resources pursuant to Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10727, *et al.*

“GKGSA Technical Group” means the GKGSA’s Consulting Engineer, the GKGSA’s designated Hydrogeologist, and the GKGSA’s designated Agronomist, or other qualified consultants(s).

“Operator” means an authorized representative of an owner.

“Overdraft” means the period from 2010-2022 average amount of water consumed prior to SGMA implementation beyond the Sustainable Yield within the Greater Kaweah Management Area.

“Owner” means fee title owner of land within the GKGSA boundaries.

“Processing Plants” means [TBD].

“SGMA” means the Sustainable Groundwater Management Act, pursuant to Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10720, *et seq.*

“Temporary Tier 1 Allocation” or “Tier 1” means groundwater consumed in excess of Sustainable Yield and less than Tier 2 in an amount to be determined accordingly to the methodology established herein.

“Temporary Tier 2 Allocation” or “Tier 2” means groundwater consumed in excess of the Tier 1 and less than Tier 3 in an amount to be determined accordingly to the methodology established herein.

“Transfer” means a voluntary transfer of an allocation from a willing Seller (Owner or Farm Unit) to a willing buyer (Third Party).

“Prohibited Tier 3 Pumping” or “Tier 3” means groundwater consumed in excess of Tier 2.

“Water year” means the 12-month period October 1, for any given year through September 30, of the following year. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1999 is called the "1999" water year.

Section 1.05 Effective Date and Changes

These rules and regulations shall become effective upon adoption and may be added to, amended and/or repealed at any time by resolution of the Board of Directors of the GKGSA and such additions, amendments, and/or repeals shall become effective upon their adoptions or as otherwise specified by the Board of Directors.

Section 1.06 Actions Against the GKGSA

Nothing contained in these Rules and Regulations shall constitute a waiver by the GKGSA or estop the GKGSA from asserting any defenses or immunities from liability as provided in law, including, but not limited to, those provided in Division 3.6 of Title 1 of the Government Code.

Section 1.07 Rights of Access

The GKGSA staff and/or others authorized by the GKGSA's General Manager shall notify and request consent from the owner of any land prior to their entry. Any such entry must be for the sole and exclusive purpose of conducting GKGSA business.

Section 1.08 Severability of Provisions

If any provision of these rules and regulations, or the application thereof to any person or circumstance, is held invalid, the remainder of these rules and regulations, and the application of its provisions to other persons or circumstances, shall not be affected thereby.

Article II. Groundwater Monitoring

Section 2.01 Well Registration

(a) Registration Requirement

Consistent with Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10725.6, all groundwater extraction facilities, excluding de minimis extractors, shall be registered with the GKGSA. For wells constructed after the effective date of these Rules and Regulations, the well shall be registered within 30 days of the completion of drilling activities. The owner or operator of an extraction facility shall register the extraction facility and provide, in full, the information required to complete the form provided by the Agency that includes, but not limited to, the following:

- i. Name and address of the operator(s).
- ii. Name and address of the Owner(s) of the land upon which the extraction facility is located.
- iii. A description of the equipment associated with the extraction facility.
- iv. Location, parcel number and state well number of the water extraction facility.
- v. Whether the well was isused for Agriculture, Domestic, Retired/Non-destroyed, municipal or industrial.
- vi. A Well Completion Report, if available.

(b) Change in Owner or Operator

The name of the owner of each extraction facility, the parcel number on which the facility is located, along with the names of all operators for each extraction facility shall be reported to the Agency within 30 days upon any change of ownership or operators, together with such other information

required by the General Manager.

(c) Penalty

Failure to register within the timeframe provided herein may result in a civil penalty not to exceed one thousand dollars (\$1,000) plus one hundred dollars (\$100) for each additional day on which the violation continues in accordance with Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10725.6.

Section 2.02 Groundwater Use Measurement

In order to enable verification of production, each Owner or operator who uses groundwater must have an accurate method for quantifying use. Use shall be generated based upon one of the following two bases, at the option of the Owner or operator: (1) information provided from flowmeters which have been connected to the relevant well continuously for the preceding year or (2) evapotranspiration information obtained via satellite technology. Subject to Section 3.05 below, and except as otherwise provided in this Section, each owner shall have the option to select the methodology used for measuring or estimating the Owner's groundwater extraction.

If the owner does not (1) communicate an election to use flowmeters to the GKGSA by October 1 of each water year; and (2) provide all relevant information needed for the GKGSA to verify measurements from each flowmeter 30 days from the end of the prior month, then the GKGSA will default to utilize the evapotranspiration data to determine groundwater consumption for that period. If the Owner desires to change his or her election after October 1, he or she may do so by presenting such request to the General Manager who then shall present for approval to the Board of Directors. And owner may only opt to change his or her election once annually.

(a) Criteria for Using Meters

The following criteria and information shall be provided to the GKGSA:

- i. Manufacturer and Model of flowmeter;
- ii. Date Flow Meter Installed;
- iii. Diameter of Pipe and Size of Flow Meter;
- iv. Identification of who installed flowmeter and calibrated flowmeter per manufacturer specifications;
- v. Inspection records will be required to submit to GKGSA per schedule outlined in the manufacturer specifications.
- vi. Pictures to identify flowmeter installed correctly (e.g., adequate straight pipe sections before and after the flowmeter);
- vii. Type of crop, age of crop (if perennial), single/double/triple crop (if annual), irrigation methodology (e.g., flood, drip, sprinkler) for the irrigated acres serviced by the water from the flow meter; and
- viii. If multiple flowmeters on a farm, a map identifying the locations of the various flowmeters and lands serviced collectively by these flowmeters.

Additionally, the owner of the flowmeter will allow access to staff from the GKGSA to physically inspect the flowmeter, if needed.

For each month following an election under this subsection, the owner shall report to the GKGSA, no later than 30 days following the last day of the month, the quantity of groundwater extracted at each parcel for which the election is made, as measured by the flowmeter(s). Failure to timely report the quantity of groundwater extraction to the GKGSA, in accordance with this section, for any parcel to which the election applies for any month shall be deemed a withdrawal of the election as to those parcels for those months, in which case groundwater extraction shall be measured by the evapotranspiration method described in subsection (b) below.

For all wells constructed after the date of the first adoption of the GKGSA Rules and Regulations flowmeters are required.

(b) Criteria for Using Evapotranspiration Method

Groundwater extraction shall be measured according to the evapotranspiration method described in this subsection for any parcels to which a valid election under subsection (a) above has not been made, or for which that election is deemed withdrawn in accordance with subsection (a).

Crop evapotranspiration (ET) is estimated using a combination of remote sensing data and ground-based equipment. The satellite data is entered into a model, which is used to estimate the ET rate and ET spatial distribution of an area in any given time period. When appropriately calibrated to land-based ET and/or climate stations and validated with crop surveys, the satellite-based model provides an estimate of crop ET (i.e., consumptive use).

Article III. Groundwater Accounting/Data Management System

Section 3.01 Authority

Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10726.4, expressly authorizes a groundwater sustainability agency to establish accounting rules to allow unused groundwater extraction allocations to be carried over and transferred.

Section 3.02 Online Water Accounting Dashboard

The GKGSA shall establish an online dashboard for Owners to account for total water use within the GKGSA. Owners may allow operators access and control of their account(s). Owners may combine their accounts which are under common ownership to create Farm Units.

Section 3.03 Categories of Water

The online dashboard shall account for water through the following seven categories:

a) Precipitation

As described in Section 4.03(a) below, Precipitation may be credited to an Owner's account.

b) Surface Water Credits and Debits for Direct Delivery

As described in Section 3.06, an Owner's account may be credited or debited with surface water.

c) Native Sustainable Yield Allocation

As described in Section 4.03(a) below, Native Sustainable Yield may be credited to an Owner's account. Carryover and transfers as described in Section 4.03(c), may be credited and debited from an Owner's account.

d) Temporary Tier 1 Allocation

As described in Section 4.03(b), the account of Owners engaged in irrigation of lands actively used in agricultural production may be allocated an amount for groundwater used above Sustainable Yield, but below Tier 2. Carryover and transfers may be credited and debited from Owner accounts in accordance with Section 4.03(c).

e) Temporary Tier 2 Allocation

As described in Section 4.03(b), the account of Owners engaged in irrigation of lands actively used in agricultural production may be allocated an amount for groundwater used above Tier 1. Carryover and transfers may be credited and debited from Owner accounts in accordance with Section 4.03(c).

f) Groundwater Credits

As described in Section 4.03(c), an Owner's account may be credited or debited with groundwater credits.

g) Recharge and Banking Credits and Debits

As described in 3.07, an Owner's account may be credited or debited with recharge or banking activities. Transfers will be recognized by the GSA when authorized by the applicable surface water entity.

h) Recycled Water

An Owner's account may be credited or debited with recycled water. Prior to a debit or credit proper documentation must be provided and approved by GKGSA staff.

i) Prohibited Tier 3 Pumping

As provided in Sections 4.03(b) and (c), no pumping beyond Tier 2 is allowed. No carryover or transfers are allowed in excess of any Tier 2 Allocation. As further set forth in Section 4.03(c)(iii)(1) and Article V, an Owner who consumes water in excess of all remaining credits shall be liable for a Tier 3 Penalty Rate, reduction in future Tier 1 and Tier 2 Allocations, and shall be subject to any and all other remedies as may be available to the GKGSA in law or in equity.

Section 3.04 Priority of Use

Each owner with multiple categories of credits under these rules and regulations shall have the power to elect which of such credits are to be debited or transferred in connection with such consumption, except for Precipitation and Prohibited Tier 3 Pumping. Precipitation will be debited first from an Owner's account. Prohibited Tier 3 Pumping will only be accounted for after all other available sources of water are exhausted. In order to be effective, Owner must elect priorities no later than thirty (30) days prior to the end of each quarter. Priorities will remain as elected by the Owner until the Owner chooses to change the chosen priority. If the Owner does not timely elect the priority of allocations to be debited by that date, the default priority will follow in order of Section 3.03 (a)-(h) above.

Section 3.05 Net Groundwater Consumptive Use Reporting and Debiting

(a) Methodology

The amount of net groundwater consumptive use will be calculated monthly, within 60 days of the end of the prior month, using one of the measurement methods described in Section 2.02.

If the Owner is using flowmeters, calculations will be prepared by the GKGSA's Consulting Engineer to determine the net groundwater consumed using the following formulas:

$$\text{Net Consumed Groundwater Used} = \text{Gross Groundwater Pumped (Flowmeter)} - \text{Estimated Return Flow}$$

If the Owner is using the evapotranspiration method, the net consumed use will be provided by the GKGSA's qualified consultant.

After the calculation is completed, each month as described in this Section, the net groundwater consumed will be debited from the applicable account.

In the event that a watercourse, including but not limited to canals, ditches, riparian areas, is located within the boundaries of a parcel, the area of such watercourse shall not be evaluated for any consumed use of groundwater.

(b) Appeal Process

Within thirty (30) days of notification of the net consumed groundwater use, any Owner may protest the amount or the method. The written protest must be submitted to the General Manager at the

GKGSA's Main Office.

The General Manager shall investigate matters related to the protest, may consult with the GKGSA Technical Group, and may present any relevant information, along with any recommendation, to the Board within sixty (60) days of receipt of the protest. The Board shall act on the written protest and supporting documentation within sixty (60) days of receipt of all relevant information, including the possibility of authorizing a separate methodology not identified in these Rules and Regulations.

Section 3.06 Surface Water Reporting

Any Owner within the GKGSA which utilizes surface water shall cause to be reported from the applicable surface water entity, the diversion of surface water to direct irrigation.

Section 3.07 Recharge and Banking Reporting

An Owner within the GKGSA which is performing recharge or banking activities shall report, or cause to be reported, the diversion of surface water to underground storage to the GKGSA. Prior to crediting or debiting the Owner's account, the GKGSA shall ensure the request is consistent with any applicable banking or recharge policy. The GKGSA acknowledges that several special districts, organized and existing under the laws of the State of California for the purpose of facilitating the beneficial use of the waters of the State, operate within GKGSA's boundaries. Several such districts have adopted and implemented banking and recharge policies in order to facilitate the underground storage and beneficial use of surface water. GKGSA shall honor the groundwater banking and recharge policies of all such entities within its jurisdictional boundaries.

Article IV. Allocation of Water

Section 4.01 Purpose

Consistent with Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10726, the purpose of this Article is to provide for the sustainable management of groundwater within the GKGSA jurisdictional area and Kaweah Subbasin, and to fulfill the legislative goals and policies of SGMA. Nothing in this Article shall be used to determine or alter water rights.

Section 4.02 Determination of Allocations

Each year prior to, October 1, or as soon as practical, the GKGSA Technical Group shall determine the allocations available for use within the GKGSA's various Management Areas based on the data and calculations and the approved methodologies provided herein. The General Manager shall cause such determination to be noticed to all affected Owners prior to October 1, or as close as practical.

Section 4.03 Greater Kaweah Agricultural Management Area

(a) Sustainable Yield Allocation

Each year, the GKGSA Technical Group shall establish a use allocation for each agricultural assessor's parcel within the Greater Kaweah Management Area boundary, as defined in the attached

map identified and incorporated by reference as Exhibit A. The allocation for each Owner shall be calculated as follows:

1. Sustainable Yield for the Kaweah Subbasin shall first be calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result. Sustainable Yield for the Kaweah Subbasin shall first be calculated using the methodologies as agreed upon in the Kaweah Subbasin Coordination Agreement, incorporated herein by reference. Total Sustainable Yield allocated to the GKGSA shall be comprised of the following two components:
 - (A) **Native Sustainable Yield.** Native Sustainable Yield is calculated as the long-term average of percolation from rainfall, streambed percolation within the natural tributaries of the Kaweah River, agricultural land irrigation return flow from pumped groundwater, and mountain front recharge assigned to the Greater Kaweah GSA as defined in the Kaweah Subbasin Coordination Agreement, Appendix 3 – Water Accounting Framework.
 - (B) **Precipitation.** Precipitation is calculated as the 25-year rolling average total precipitation for the entire GKGSA jurisdictional area. The long-term average is based on precipitation data collected from calibrated weather stations within and adjacent to the GKGSA, interpolated to lands within the GKGSA. The deep percolation of precipitation is removed from the 25-year rolling average total and accounted for in the Native Sustainable Yield component of Sustainable Yield. Allocations are determined by individual Public Land Survey System Township-Range-Section (PLSS TRS) within the GKGSA. Precipitation allocations by PLSS TRS will be provided by the technical consultant prior to each water year.
2. GKGSA's Total Sustainable Yield shall be the sum of the GKGSA's portion of the total Kaweah Subbasin Native Sustainable Yield based on a gross acreage and Precipitation within the GKGSA.
3. The GKGSA's available Total Sustainable Yield will deduct the sustainable yield allocations for the communities. The remaining balance will be divided by the total acreage within the GSA to establish a per acre allocation for each parcel.
4. Each parcel within the Greater Kaweah Management Area will receive allocations in the amount equal to the gross assessor parcel acreage multiplied by the per acre allocation established in Section 4.03(a)(3).

Native Sustainable Yield allocations shall be made on an annual basis.

**As additional data becomes available and as projects, monitoring, and management actions are implemented, the Sustainable Yield may be adjusted to reflect the new data. The Allocations are not currently based on the aquifer from which the water is pumped, due to lack of data.*

(b) Transitional Tier 1 Penalty Allocation

In addition to the Sustainable Yield Allocation, irrigated parcels as of January 31, 2020, which are identified as enrolled in the Irrigated Lands Regulatory Program, other regulatory programs that document historical irrigation use (i.e., Dairy General Order), or as identified by other certified crop map or Land IQ datasets shall be allocated a Tier 1 and Tier 2 Allocation(s) for only so long as permitted under these Rules and Regulations. Once a parcel has been identified as an irrigated parcel, the parcel will remain in the Transitional Pumping Program until the program expires. If a parcel is not identified as an irrigated parcel as of January 31, 2020, an Owner may file a request to the GKGSA General Manager to be included in the Transitional Pumping Program. For agricultural development of parcels after January 31, 2020, the Owner may also file a request to the GKGSA General Manager to allow such lands to receive a Tier 1 or Tier 2 Allocation(s), which such allocation shall be prorated based on the date of development. GKGSA shall develop forms as needed to assist Owners with the request.

Changes in the total irrigated acres will affect the Tier 1 and/or Tier 2 Allocation(s). To achieve consistency with the GKGSA GSP, the amount of Tier 1 and/or Tier 2 Allocation(s) may vary year to year.

The allocations shall be consistent with the objectives of the GKGSA GSP, and will ramp-down pumping overtime calculated by a percentage of total overdraft as follows:

Water Years	Tier 1	Tier 2	Total Allowable Overdraft
2023-2025	40%	50%	90%
2026-2030	40%	30%	70%
2031-2035	20%	20%	40%
2036-2040	20%	0%	20%

All Temporary Tier 1 and Tier 2 Allocations shall be made on an annual basis.

(c) Carryover and Transfers

(i) Sustainable Yield Allocation

1) Carryover of Native Sustainable Yield

If an Owner uses less than his or her Native Sustainable Yield allocation in a given year, the difference between the allocation amount for that year and the amount of groundwater used and/or transferred for that year shall be carried over to the next year.

If the carryover amount for the year in question continues to remain unused as a groundwater credit, it may be carried over on a five-year rolling basis. The impact of the total quantity of water used in

any five-year period shall be consistent with the provisions of the GKGSA GSP.

Portion of Native Sustainable Yield allocation successfully carried over from the previous year shall be credited to the Owner's account as groundwater credits.

An Owner is not allowed to carryover Precipitation.

Example:

Native Sustainable Yield

Water Year 2023

Unused portion of WY 2023 Native Sustainable Yield allocation → groundwater credit → may be carried over until the end of Water Year 2028.

Water Year 2024

Unused portion of WY 2024 Native Sustainable Yield allocation → groundwater credit → may be carried over until the end of Water Year 2029.

2) *Transfer of Native Sustainable Yield*

An Owner or Farm Unit may Transfer¹ all or a portion of the Native Sustainable Yield allocation which has been carried over from a previous year and thereby converted to groundwater credits, provided that the transfer satisfies the conditions below. Transferred Native Sustainable Yield shall be credited to the transferee's account as groundwater credits.

1. The proposed transferee will put the allocation to use within the GKGSA;
2. The transfer agreement is memorialized in writing, using a form provided by the GKGSA;
3. Groundwater credits derived from Sustainable Yield Allocations prior to Water Year 2025 shall be subject to the Kaweah Subbasin Analysis Zones and leave behind requirements as stated in the Third Amended Rules and Regulations. No such limitations shall be required for groundwater credits derived from Water Year 2025 allocations and future allocations, unless these Rules and Regulations are amended or changed by the GKGSA Board of Directors.

An Owner is not allowed to transfer Precipitation.

No action shall occur on any proposed transfer unless all past due assessments, interest and penalties owed to the GKGSA by either transferee or transferor have been paid prior to the date that the proposed transfer is submitted to the General Manager and the Owner is compliant with all Rules and Regulations set forth herein. An Owner precluded from transferring may protest to the board, and the board may consider, exceptions to the foregoing on a case-by-case basis.

Any transfers of Sustainable Yield pursuant to this Section 4.03(c)(i)(2) shall be subject to

modification or termination by the GKGSA in the event that the GKGSA determines that the implementation or continued implementation of the transfer in question does or will tend to cause undesirable results.

An Owner will only be permitted to use his or her allocation of Native Sustainable Yield outside of the GKGSA Boundaries where:

1. The parcel upon which the Owner intends to put the allocation to beneficial use is owned or commonly owned by the same Owner;
2. The allocation will be used within the Kaweah Subbasin and within a groundwater sustainability agency which allows similar use outside its GSA boundaries;
3. The use outside the GSA boundaries is memorialized in writing, using a form provided by the GKGSA; and
4. Both the GKGSA and the groundwater sustainability agency of where the water is put to beneficial use are informed of the agreement.

Groundwater credits derived from the transfer of Native Sustainable Yield may be carried over for five years from the Water Year allocation date of the transfer.

Example:

Native Sustainable Yield Transfer
Water Year 2023

Unused portion of WY 2023 Native Sustainable Yield allocation transferred to a separate Owner on October 1, 2025 minus applicable leave behind → groundwater credit → may be carried over until the end of Water Year 2030.

(ii) Temporary Tier 1 and Tier 2 Allocations

1) Carryover of Tier 1 and Tier 2

If an Owner uses less than his or her total Tier 1 and Tier 2 Allocations, the difference between the allocation amount for the relevant period and the amount of the Tier 1 and Tier 2 Allocation used and/or transferred during that period year may be carried over to the next year. An Owner is only entitled to carryover provided Owner pays the GSA within 60 days of the start of the new Water Year, or from the date of annual invoicing, whichever is greater, the applicable Tier 1 or Tier 2 Penalty Rate for the quantity of Tier 1 or Tier 2 sought to be carried over. The applicable Tier 1 or Tier 2 Penalty Rate shall be the rate of the Water Year allocation date. For example, an Owner desiring to carryover 10 acre-feet of Water Year 2023 Tier 1 into Water Year 2024 shall pay the Water Year 2023 rate previously set by the board. The GKGSA General Manager may extend the timeline provided herein on good cause, but in no event will extend the timeline for payment longer than six months. An Owner will not be allowed to pay, and thus not be allowed to carryover any Tier 1 or Tier 2 Allocations unless the Owner is compliant with the Rules and Regulations as set forth herein.

Portions of Tier 1 and Tier 2 allocations successfully carried over from the previous year shall be credited to the Owner’s account as groundwater credits.

If the carryover amount for the year in question continues to remain unused as a groundwater credit, it may be carried over for a total of five years. No Tier 1 or Tier 2 Penalty Allocation may carry over for longer than five years from the date of the allocation. The impact of the total quantity of water used in any five-year period shall be consistent with the provisions of the GKGSA GSP.

Example:

Tier 1 Penalty Allocation Carryover

Water Year 2023

Unused portion of WY 2023 Tier 1 Penalty Allocation → carried over until the end of Water Year 2028.

2) *Transfer of Tier 1 and Tier 2 Allocations*

An Owner or Farm Unit may transfer his or her Tier 1 or Tier 2 Allocation to a Third Party, if all of the following conditions apply:

1. The proposed transferee will put the allocation to use within the GKGSA.
2. The place of use is no further than three zones from where the transferor’s location of allocation; and
3. The transfer agreement is memorialized in writing, using a form provided by the GKGSA identifying the quantity and signed by both parties.

Attached hereto as Exhibit C is the Kaweah Subbasin Analysis Zones. The transfer shall be subject to the following additional leave behind:

	Transfer within Zone	Immediate adjacent Zone from Transferor Place of Use Allocation	Total distance of two zones from Transferor Place of Use Allocation (e.g., Zone 35 to 32)	Total distance of three zones from Transferor Place of Use Allocation (e.g., Zone 35 to 11)
Tier 1	20%	30%	40%	70%
Tier 2	40%	50%	60%	90%

No action shall occur on any proposed transfer unless all past due assessments, interest and penalties

owed to the GKGSA by either transferee or transferor have been paid prior to the date that the proposed transfer is submitted to the General Manager and the Owner is compliant with all Rules and Regulations set forth herein. A transferee may not subsequently transfer the allocation to another individual or entity. An owner precluded from transferring may protest to the board, and the board may consider, exceptions to the foregoing on a case-by-case basis.

Any transfers of Tier 1 or Tier 2 pursuant to this Section 4.03(c)(ii)(2) shall be subject to modification or termination by the GKGSA in the event that the GKGSA determines that the implementation or continued implementation of the transfer in question does or will tend to cause undesirable results

Example:

Water Year 2023

Unused portion of 2023 Tier 1 Penalty Allocation transferred to separate Owner on October 1, 2025
→ may be carried over five years from the date of initial allocation to end of Water Year 2028.

(iii) Prohibited Tier 3 Pumping

1) No Carryover or Transfers

No carryover or transfer of Tier 3 extractions is allowed. In addition to penalties associated with Tier 3 extractions as defined herein, the quantity of Tier 3 water consumed shall be deducted from the owner's Tier 1 and 2 Allocation account the following year(s). If the Owner's Tier 1 and 2 Allocation account is depleted, further enforcement actions may be taken by the GKGSA. An Owner may protest any penalties or restrictions he or she incurs as a result of this Section.

(d) Opt-Out

An owner who has not received a Transitional Tier 1 Penalty Allocation, but who has received a Sustainable Yield Allocation pursuant to Section 4.03(a) of these Rules and Regulations may elect to opt out of the GKGSA Rules and Regulations for the subsequent water year by submitting a request to the GKGSA. Should the Owner wish to participate in the future, at that time, all current assessments, fees, interest, and penalties will be paid prior to participation. An Owner is not allocated any water during the period in which he or she has chosen to opt out and will not be allocated any prior year's allocation upon choosing to opt in.

(e) Fallowed Lands

Parcels which have received a Tier 1 or Tier 2 Penalty Allocation may fallow lands associated with the allocation. Once verified, the fallowed lands will not be debited for any consumptive use on said lands. All parcels must be maintained to limit the growth of any vegetation. Parcels which have been fallowed during a portion of any water year shall receive a pro rata debit (for example, a parcel which begins fallowing at the beginning of June would still be charged for consumptive use for the period October – May).

Section 4.04 Community Management Areas

[To be determined]

Section 4.05 Special Uses Management Area

A separate management area (“**Special Uses Management Area**”) shall be established for the purpose of accounting for certain water users. The area shall be comprised of lands where dairies and processing plants, are situated (hereinafter “**Special use Parcels**”).

(a) Sustainable Yield, Tier 1 and 2 Allocations

All Special use Parcels shall receive credits in the same manner as parcels within the Greater Kaweah Agricultural Management Area, as described in Section 4.03.

(b) Consumption

The Assessor’s Parcel(s) that includes the production facility shall be debited for the area of the production facility within the parcel, as described below. If there is a remaining balance of said Assessor’s Parcel(s), the consumptive use will be debited pursuant to Section 2.02.

(i) Dairies

The consumptive use of groundwater within the Special Uses Management Area for Dairies shall be achieved by the methodology contained in the attached Exhibit B, “Net Groundwater Consumption Within a Dairy Facility Area”. Alternatively, an Owner may elect to use flowmeters as described in Section 3.05(a).

(ii) Processing Plants

[TBD]

(c) Carryovers and Transfers

All Special Use Parcels shall be permitted to carry-over and transfer groundwater extraction credits as permitted by Section 4.03 of these Rules and Regulations.

Section 4.06 Appeal Process

(a) Notification of Allocations and Extraction Limits

The General Manager shall provide written notice to each Owner and if requested, the operator, of the groundwater allocations described herein.

(b) Protest of Allocation and Extraction Limits

Within thirty (30) days of the date identified in the written notification described in Section 4.05(a), an Owner may protest the extraction allocations and extraction limits identified in the notification. The written protest must be submitted to the General Manager at the GKGSA's Office.

The General Manager shall investigate matters related to the protest, may consult with the GKGSA Technical group, and may present any relevant information, along with any recommendation, to the Board within sixty (60) days of receipt of the protest. The Board shall act on the written appeal and supporting documentation within one hundred and twenty (120) days of receipt of all relevant information.

Section 4.07 Emergency Ordinances

Nothing in this Article shall prevent the GKGSA, in the event of an emergency, from enacting emergency regulations or ordinances to prevent harm to Owners within the GKGSA.

Article V. Fees & Penalties

Section 5.01 Penalties

(a) Penalty for Excess Use

If any Owner within the Greater Kaweah Management Area exceeds his or her Sustainable Yield Allocation, he or she shall be liable for penalties as follows: (1) liability rate in an amount to be determined annually by the Board, for each Tier 1 and Tier 2 Allocation acre-foot consumed; and (2) additional liability rate, in an amount to be determined annually by the Board, for each Tier 3 acre-foot consumed.

(b) SGMA Penalties

Any Owner, operator or other person who violates the provisions of these rules and regulations is subject to the criminal and civil sanctions set forth in SGMA.

(c) Civil Remedies

Upon the failure of any person to comply with any provision of these Rules and Regulations, the GKGSA may petition the Superior Court for a temporary restraining order, preliminary or permanent injunction, or such other equitable relief as may be appropriate. The right to petition for injunctive relief is an additional right to those, which may be provided elsewhere in these Rules and Regulations or otherwise allowed by law. The GKGSA may petition the Superior Court to recover any sums due to the GKGSA.

(d) Protest of Penalty Determination

Within 30 days of the date identified in the written notification described in Section 4.05(a), an Owner or registered operator may appeal a penalty determination in writing. The written appeal must be submitted to the General Manager, at the GKGSA's Main Office.

(e) Submission to Board

Upon receipt of an appeal, the General Manager may request additional information or evidence from the appellant. The General Manager shall then submit the appeal, along with any relevant information and any recommendation, to the Board. The Board may, in its discretion, either issue a decision based upon the written appeal and supporting documentation, or hold a hearing concerning the matter.

Section 5.02 Groundwater Extraction Fees

The Board may propose fees, including groundwater extraction fees, consistent with Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section Sections 10730 through 10730.6, and the California Constitution. The Owner shall pay to the GKGSA all Groundwater Extraction Fees within 60 days of the date of any invoice submitted by the GKGSA.

Section 5.03 Real Property Assessments

The Board may propose land-based assessments consistent with Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10730, and the California Constitution.

Article VI. Surface Water Recharge in the Underground

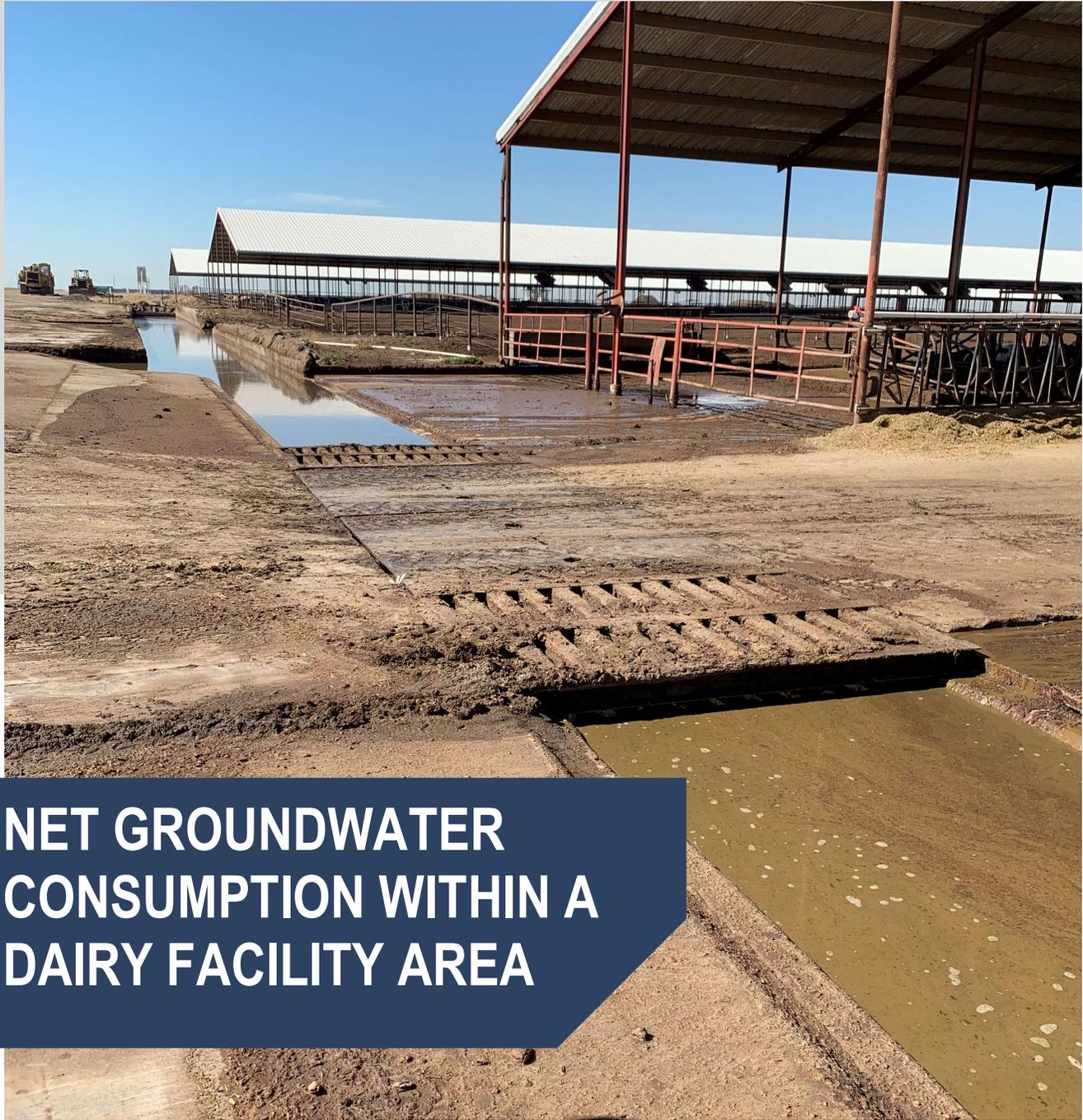
Section 6.01 Recharge

Owners may use existing facilities to store surface water underground within the GKGSA boundaries. An owner who stores surface water pursuant to this Section may subsequently put such water to his or her own beneficial use within the GKGSA boundaries, or may transfer the water to another owner for use within the GKGSA boundaries. The use of stored water pursuant to this Section must be achieved utilizing on-farm activities. All water stored pursuant to this Section must be used within the GKGSA boundaries. Each Owner who stores surface water pursuant to this Section shall provide accurate, verifiable records of the quantity and source of surfacewater stored for recharge, confirmed by the district or entity that supplied the surface water.

The Owner shall adhere to any rules promulgated by any district or entity supplying the surface water. Surface water stored and documented in compliance with the requirements of this Section shall be credited to the relevant owner's account as a surface water credit. Each Owner shall be solely responsible for locating, purchasing, accessing, or otherwise acquiring surface water for the purposes of recharge pursuant to this Section. This policy applies only to all non-districted lands

and districted lands which choose to adhere to this Article VI.

[end of document]



NET GROUNDWATER CONSUMPTION WITHIN A DAIRY FACILITY AREA

4CREEKS

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OVERVIEW OF NET GROUNDWATER CONSUMPTION WITHIN A DAIRY FACILITY

I. Introduction

Dairy Operations are a vital component of the overall agriculture economy within the San Joaquin Valley of California, and efficient water management is a key element of successful dairy operations.

The recent implementation activities of the Sustainable Groundwater Management Act (SGMA) require an accurate accounting for the net groundwater *consumed* within dairy operations. Therefore, all dairy facility water imports and exports must be accurately measured and reported. Compliance with SGMA requires that the net groundwater *consumed* by a dairy facility cannot exceed the “Sustainable Yield” per acre limit for groundwater consumption as defined by the dairy facility’s Groundwater Sustainability Agency (GSA).

Dairy facilities *use* a significant amount of water as an integral component of the dairy’s milk and beef production process. However, as the analysis in this document shows, dairy facilities *consume* very little water. Almost all the water *used* within a dairy facility is recycled to be *consumed* on the farm for growing crops (crop ET).

II. Explanation of the SGMA Water Accounting Requirements

The Sustainable Groundwater Management Act (SGMA) is enforced by the rules and regulations of a Groundwater Sustainability Agency (GSA) formed to represent landowners in a designated area. Although there is variation in GSA implementations of the SGMA requirements, a common thread is the creation of GSA-managed water accounts for landowners. These water accounts allow landowners to manage their GSA water allocations in the same way they would manage a bank account.

Here's how it works: The GSA deposits water credits (in units of acre-feet) into each landowner’s GSA water account every year. The number of water credits deposited is determined solely by the number of acres owned by the landowner and on local hydrology

and surface water availability. Water credits are withdrawn from the landowner's water account based on water consumed by crops grown on the landowner's property. If the landowner requires more water credits for the landowners' crops than allocated by the GSA, the landowner may purchase additional water credits from the GSA and deposit these into his water account. But the GSA limits how many additional water credits the landowner can purchase. The landowner is prohibited from using more water credits than are deposited in the GSA water account and may be penalized if water credit withdrawals exceed deposits.

How is crop water consumption measured? There are two ways. The first method is to meter the groundwater-pumped irrigation water applied to the crop. Then measurements and additional calculations are required to determine how much of the applied irrigation water was returned to the groundwater source. The difference is the *net* water consumed by the crop, and it is called evapotranspiration (ET). The second (and simpler) method is to allow the GSA to measure the ET water consumption of crops directly using satellite data.

How is dairy facility water consumption measured? Satellite data cannot be used solely to measure the net water consumption of dairy facilities. However, dairy records (meter readings that measure water use, feed deliveries, milk shipments, beef shipments) can be used to calculate net dairy facility *groundwater* consumption. These calculations, supported by dairy records, can be used to show compliance with SGMA regulatory requirements. In general, this is how industries and communities that recycle water compute net water consumption to show regulatory compliance.

The computation of a dairy facility's net *groundwater* consumption requires a separate boundary to be drawn around the perimeter of the dairy facility. All water imports that cross this boundary (which includes all pumped groundwater) are metered, measured, recorded, or otherwise counted. Similarly, all water exports that cross this boundary are also counted.

The difference between the water imports and exports are the net water consumed by the dairy facility. However, SGMA requires that the computations show the net *groundwater* consumption at a dairy facility. Therefore, water imports and exports are divided into two categories; those whose source is groundwater, and those whose source is not groundwater.

Then, the net *groundwater* consumption for a dairy facility is computed by subtracting the groundwater exports from the various water imports.

The remaining sections of this report explain in detail the quantity and sources of water imported to the dairy facility, and the quantity and destinations of water exported from the dairy facility. From these water sources, the net *groundwater* water consumption is computed for a typical Dairy Production Facility in the Central Valley of California.

III. Efficient Water Usage on Dairy Facilities

At dairy production facilities, utilizing water efficiently to prevent unnecessary groundwater pumping and losses to evaporation is important for SGMA compliance. Following is a general, not exclusive, list of practices and equipment often used by dairies to improve the efficient use of water and to keep groundwater pumping and evaporation losses to a minimum.

- **Air Cooling for Refrigerator Compressors:** Water-based refrigeration compressors are replaced with air cooling fans. This reduces groundwater pumping.
- **Solenoid Valve for Stage 1 Plate Cooler:** An open/close valve that cycles with the milk pump is added to the stage 1 plate cooler water source to reduce water usage. This reduces the amount of water flowing through the plate cooler to match the flow of milk rather than running water continuously through the plate cooler. This reduces groundwater pumping.
- **Barn Flush Timer / Automation:** A timer is added to minimize the number of barn flushes during each milking. This prevents workers from flushing more often than necessary. Flush water is water collected and recycled from the plate cooler

after the water is used to cool the milk. Therefore, preventing the amount of water used for flushing from exceeding plate cooler water usage reduces groundwater pumping.

- **Sensors on Soakers:** Add sensors to soakers to only operate when a cow is standing next to the soaker. This reduces groundwater pumping.

IV. Summary of Dairy Production Facility Water Imports

Water must be imported to the dairy facility for dairy animals to drink, maintain body fluids, metabolize nutrients, and produce milk. Water is also used on dairy facilities for cleaning equipment, flushing concrete surfaces, cooling milk equipment, cooling the milk cows, and washing the milk cows.

However, the water imports to a dairy facility are efficiently used. For example, the water imported for cooling the milk is captured and then reused for washing the cows and cleaning equipment. This same water is then recaptured and reused again for flushing concrete surfaces. This is important to keep in mind when counting water usage on a dairy facility. Much of the imported water is used two or three times before the residual water is exported to the farm.

Therefore, care must be taken to avoid double-counting dairy facility water usage. As mentioned previously, double counting the various internal uses of dairy facility water is avoided when a separate boundary is drawn around the perimeter of the dairy facility. Only water that crosses this boundary is counted as an import or export for the purpose of computing net dairy facility consumption.

Dairy Facility Water Import Sources:

1. **Pumped Groundwater:** Groundwater is pumped to a pressure tank that is the source for all water used on the dairy facility. Excess water is drained to wastewater storage pond(s).
2. **Precipitation:** Dairy facilities are designed (and regulated) to divert all rainfall runoff into the wastewater storage pond(s).

3. **Feed Imports:** All feed consumed by the animals is imported from sources outside the dairy facility. All imported feed is tested for water content, which generally ranges from 10% to 80%. Some feed is sourced from forages grown on the lands adjacent or near to the dairy (e.g., corn silage, wheat silage, alfalfa). The remaining feed consists of grains purchased from the Midwest, alfalfa which is often purchased from other states, and many by-products purchased from local agricultural crops (e.g., Cottonseed, Almond Hulls, Citrus, Grape Pomace, Whey). The water imported through the feed is consumed by the cattle. A portion of this water is excreted by the cow and diverted to the wastewater storage pond(s).

V. Summary of Dairy Production Facility Water Exports

As previously mentioned, most of the water imported to a dairy facility is not consumed. It is used and then exported. The exported water destinations are listed below.

Dairy Facility Water Export Destinations:

1. **Farm Ground for Crop Irrigation:** The wastewater collected in the wastewater holding pond is exported to adjacent or nearby farm ground for crop irrigation through pipelines or utilizing tanker trucks. The wastewater application replaces groundwater pumping because the wastewater application to crops offsets water that would otherwise be pumped from groundwater. However, it is important to understand that the dairy's wastewater is consumed by the crops and not recharged. Wastewater application is regulated by the California Regional Water Quality Control Board (CRWQCB) and wastewater application rates are reported annually to the CRWQCB under the dairy's Nutrient Management Plan.
2. **Evaporation:** As water is used on the dairy facility for various purposes (cow washing, lane flushing, etc.), evaporation occurs. This evaporation is counted as a destination for water exported from the dairy facility.
3. **Milk Shipments:** Each day, the milk produced on a dairy facility is picked up by truck and hauled to a processing plant. Shipped liquid milk, which is primarily water, is counted as a destination for water exported from the dairy facility.

4. **Beef Shipments:** When dairy animals get old, sick, injured, or die, these animals are hauled offsite to beef or rendering plants. The water content within these animals is counted as a water export from the dairy facility.
5. **ET Consumption from Vegetative Growth.** Dairies usually have little water-consuming vegetation growth (landscaping) within the production facility. Therefore, the water exported to this destination is assumed to be negligible.
6. **Domestic Water Use:** The majority of the domestic water use is diverted to septic systems and leach lines, thus recycled back into the groundwater system. However, the water exported to this destination is assumed to be negligible.

VI. Computation of Dairy Facility Net Groundwater Consumption

The computation of the net groundwater consumed per acre for a dairy facility is illustrated in the example below. The example assumes a dairy facility housing 1,000 Animal Equivalents on 30 acres (e.g., Freestall dairies house milk cows different than an open lot and housing type will vary the area of the facility). The water imports and exports are for a period of one year. Typical dairy volumes for groundwater pumping, other water imports, and water exports are assumed. The example of the dairy in the chart below shows that the net groundwater consumption for a typical dairy is likely to be negligible.

Dairy Water Calculator - Production Facility Net Consumption

Assumption: 1,000 Animal Equivalents (AE)
 Production Facility: 30 acres

WATER IMPORTS TO DAIRY FACILITY

	per Animal Equivalent (gal/day)	per Animal Equivalent (gal/yr)	Total Pumped Groundwater (gal/yr)	Total Pumped Groundwater (ac-ft/yr)
Water Pumped from Groundwater:	100	36,500	36,500,000	112.01
Water from Feed Imports:	Usage (tons/yr)	Moisture Content (%)	Equivalent Water (gal)	Equivalent Water (ac-ft/yr)
Silage (Wheat/Corn)	12,000	65%	1,747,200	5.36
Hay	1,000	10%	22,400	0.07
Supplemental Ingredients	7,500	35%	588,000	1.80
				7.24
Water from Precipitation:	8 inches (average)			
	20.00	ac-ft/yr		
TOTAL WATER IMPORTS:	139.25	ac-ft/yr		

WATER EXPORTS FROM DAIRY FACILITY

Wastewater Pumped to Crops:	98.36	ac-ft/yr		
Water Lost to Evaporation/Transpiration (ET):				
ET (estimated from LandSAT):	12 inches/yr			
<i>(includes storage pond evaporation, feed, flush)</i>	30.00	ac-ft/yr		
Water Shipped as Milk Production:				
Volume of Milk	80 lbs/Cow/Day			
	3,499,401 Gallons per year			
	10.74	Ac-ft/yr		
Water Shipped as Beef:				
Cull Rate	42%			
Number per year	420			
Average Weight	1,000 lbs			
	120 gallons/animal			
	0.154	Ac-ft/yr		
TOTAL WATER EXPORTS:	139.25	ac-ft/yr		

SUMMARY

Total Water Imports from Groundwater:	112.01	ac-ft/yr
Total Water Exports to Crops:	98.36	ac-ft/yr
Net Groundwater Consumption	13.66	ac-ft/yr
	0.46	ac-ft/yr/acre

VII. Summary

Dairy production facilities don't consume much groundwater. This is despite the fact that dairies use a significant amount of water during the milk and beef production process. However, when all water imports to the dairy facility are considered, and when the fact that dairy wastewater exports reduce groundwater pumping for growing crops is considered, the conclusion is the net water used in the dairy facility is minimal.

On a net basis, dairy production facilities consume little (if any) groundwater. Based on this analysis, the recommendation is to apply 6" of Consumed Water to a Dairy Production Facility.

This conclusion is surprising but verifiable. Meters can be installed to measure groundwater pumped into the dairy, and to measure wastewater exported from the dairy. Milk volume shipped from the dairy can be verified with creamery records, and beef weights verified with purchase receipts. The water content of feed ingredients imported to the dairy can be verified with nutritionist laboratory test reports, and the tonnage verified with sales invoices. Precipitation data totals are widely available, and weather data to confirm evaporation rates are published daily.

The dairy milk and beef production process uses groundwater, adds nutrients to it, then (in effect) returns the water in lieu to offset the need to pump additional groundwater for crop irrigation.

VIII. Study for Validation

To validate the conclusion of this analysis, a **study is currently underway to confirm the results**, with data to be collected on a quarterly basis and reported annually. For the various dairies selected for the study, meters are installed on the pumped groundwater import source and on the dairy's wastewater export destination. Dairy records will be collected to confirm other water sources and destinations. Over the next several years, as data is collected, the analysis within this report can be refined to better predict dairy

facility net water consumption and understand variations between different dairy operations.

Exhibit C
Kaweah Subbasin Analysis Zones

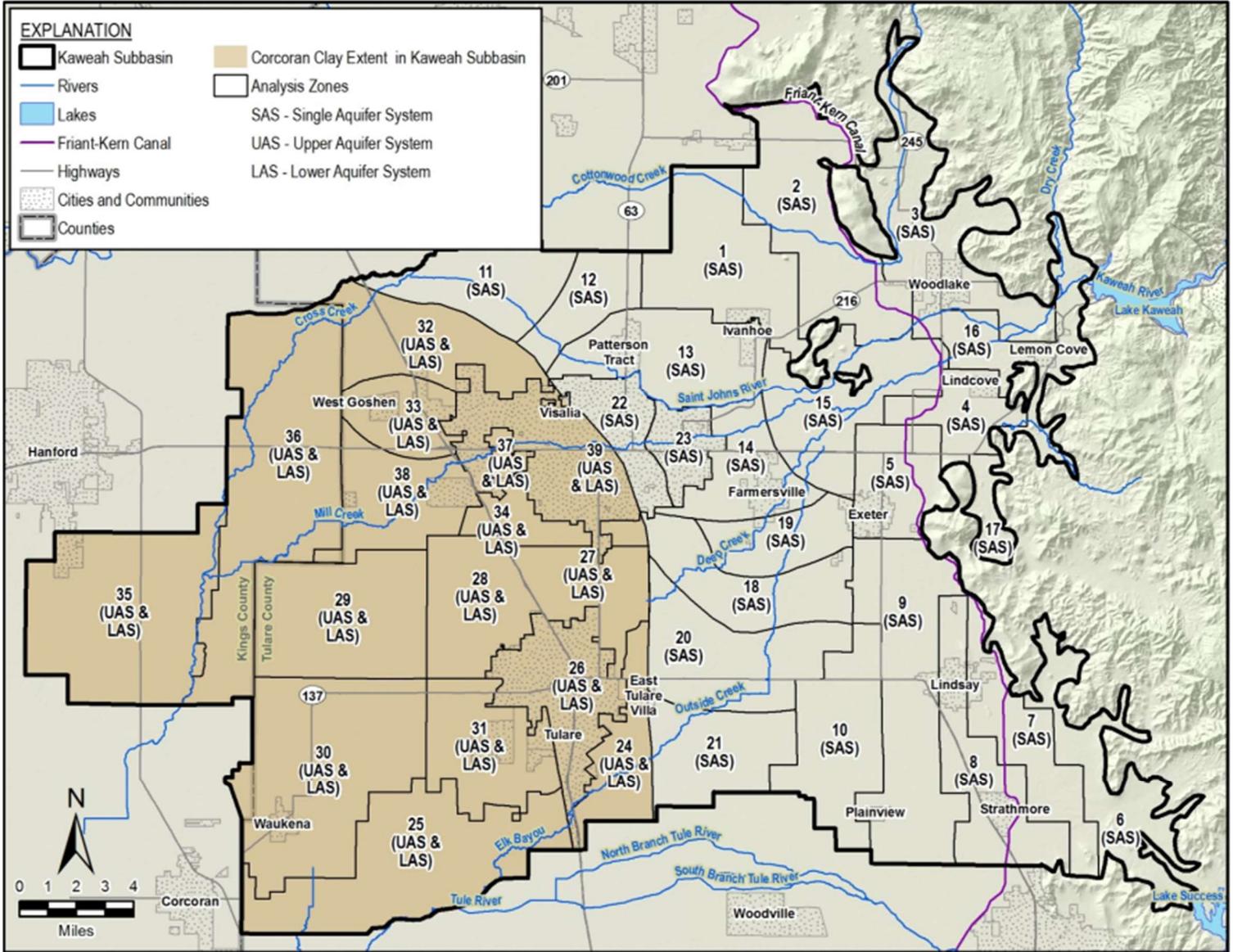


Figure 5. Kaweah Subbasin Analysis Zones