



Application Form for 2025 Local Cooperative Solution for Overlying or Adjudicated Groundwater Rights in Scott River and Shasta River Watersheds

Please complete this form if you plan to implement a groundwater local cooperative solution (LCS) for the 2025 irrigation season under the Scott River and Shasta River watersheds [emergency regulation](#). Applications must be submitted for at least a full irrigation season. A separate application should be submitted for each type of groundwater LCS proposal. **The form and attachments are due by April 15, 2025.**

How to Submit: To submit your application and associated required materials (see Section 2) you can:

- Use the online form
- Email: DWR-ScottShastaDrought@waterboards.ca.gov
- Mail:

State Water Resources Control Board Division
of Water Rights - Instream Flows Unit
1001 I Street - 14th Floor
Sacramento, CA 95814

Section 1: Applicant Information

Name	
Name of Farm, Ranch, or Business	
Phone Number	[REDACTED]
Email Address	[REDACTED]

By typing or signing your name below and submitting this form to the State Water Resources Control Board (State Water Board) you hereby certify that the submitted information is true and correct to the best of your knowledge.

Name:

Date:

Section 2: Application Checklist

Below is a list of items to include with your application form:

- Application Form (paper or email submittal accepted).
- If working with a Coordinating Entity (Section 4 of application), submit a signed Binding Agreement (paper or email submittal accepted).
- Supporting Information (electronic submittal only). Submit the applicable information based on selected groundwater LCS.
 - Best Management Practices Groundwater LCS (see Section 7 of application)
 - Description of how you will implement all of the required components.
 - Map(s) with each well(s), meter location(s), and field(s) labeled.
 - Graduated Groundwater Cessation Schedule LCS (see Section 8 of application)
 - Description of how you will reduce irrigation compared to standard practices on the property (e.g., practice in a similar unregulated year).
 - Map(s) designating the area where diversions will cease by the required dates, well location(s) and meter location(s), and field(s) labeled.
 - Percent Reduction Groundwater LCS (see Section 9 of application)
 - Description of verifiable water reduction actions that will be implemented.
 - Spreadsheet with monthly volumes for baseline year and current year. Use one row per irrigation method per field.
 - Map(s) with each well(s), meter location(s), and field(s) labeled.
- A description of existing and planned groundwater metering (Section 6 of application), a time schedule for additional installation or information to support a waiver request, and a plan to record metered extractions or applications weekly and to report them monthly to your Coordinating Entity and/or State Water Board.
- Groundwater Well or Metered Application Information (see Section 5 of application) (paper or email submittal accepted).

Section 3: Requirements for All Groundwater LCS Proposals

- **Deadline:** Proposals are due to the State Water Board by April 15, 2025.
- **Implementation:** Proposals must be implemented during the entirety of one or more irrigation seasons (including the time prior to approval), unless the applicant withdraws the application.
- **Metering:** Proposals must include a description of metering that will be used to measure groundwater well extractions or applications covered under the LCS and information on how extractions and/or applications will be recorded weekly and reported monthly to the Deputy Director (or Coordinating Entity, if so agreed). Please note the Coordinating Entity is required to provide this data to the State Water Board.
 - Funding for Meters: The State Water Board has limited funding and technical support available for some amount of metering and those interested in such assistance should promptly contact State Water Board staff using the "Contact Information" at the end of this application.
 - Time Schedule for Metering: All applicants should have the required metering equipment installed and operating before the start of irrigation season so that all groundwater extractions or applications covered by the LCS are metered.
 - Waivers: Proposals may include information requesting waiver of the metering provisions in the following instances:
 - Groundwater wells that irrigate less than 30 acres. Information supporting the request to waive metering provisions must be provided, including the distance of the groundwater well to surface water. The State Water Board may require other information in lieu of monitoring.
 - Metering is not feasible. Substantiation for the infeasibility of installing a meter must be provided. This includes feasibility evaluation of installing a meter at the well(s) and at the place(s) of use (e.g., pivot).

Section 4: Coordinating Entity

Select only one (1) box below. Please note that a Coordinating Entity is not required. If a Coordinating Entity is not selected, parties will work directly with the State Water Board to provide metering data and ensure performance of the groundwater local cooperative solution. For more information on Coordinating Entity provisions, refer to Section 875(f)(1)(G) in the [emergency regulation](#).

California Department of Fish & Wildlife
Contact: Crystal Robinson
(530) 340-0767
crystal.robinson@wildlife.ca.gov

Shasta Valley Resource Conservation District
Contact: Rod Dowse
(530) 598-1253
rdowse@svrcd.org

Siskiyou Resource Conservation District
Contact: Evan Senf
(530) 643-1585
evan@siskiyoucd.com

Scott River Water Trust
Contact: Chris Voigt
(916) 396-0131
chrisb.voigt@gmail.com

Other, I am proposing an Entity not in the provided options. Please provide the name of the Entity, contact information, and description of qualifications in the box below.

I select not to work with a coordinating entity.

Section 6: Metering Information

Please describe the metering plan for all the fields that will be irrigated under the LCS. Remember that meters can be installed at the well head or at the place of use (e.g., pivots). All meters should be installed to manufacturers' specifications and recommendations and measurements should be in the expected accuracy range. Fill in the box below, upload an attachment, or email a document or spreadsheet with the information requested in this section.

- a. Describe how you will record weekly extractions or applications and report monthly volumes. Include a description of all water uses associated with each groundwater well that is part of this groundwater LCS. For each meter include the Well ID the meter is recording, the amount of irrigated acres covered and the crop type. Each meter should have an identifier (e.g., Meter #1) included in the description and in the monthly reports.

For example, "the ranch manager will log meter readings at Well #1 using Meter #1; and for Well #2, the ranch manager will log meter readings at pivots 1 & 2 using Meters #2 and #3." Also note what the water is being used for – "Well #1 irrigates 50 acres of grain on fields A and B, 100 acres of pasture on fields E, G, and Z. Meter #2 will irrigate 75 acres of alfalfa on field Y and Meter #3 will irrigate 25 acres Alfalfa on Field W. The manager will send the logs and photos to the Water Board by no later than the 5th of the month for the preceding month."

- b. For groundwater wells and applications that are NOT currently metered, in the box below please describe the time schedule and plan to install meters, including a description of efforts to obtain a meter before the initiation of groundwater diversions covered by this groundwater LCS, and when such efforts were undertaken. If you want to file for a waiver to the metering requirement, please use the box below and include information on why metering of your well(s) or applications should be waived. Be sure to include total irrigated acres, distance of the well(s) from surface water, a description of why metering is infeasible, if applicable, and any additional information that supports your waiver request.

Select the type of groundwater LCS you are applying for and complete the corresponding sections of the application. A separate application should be submitted for each type of groundwater LCS request.

Best Management Practices Groundwater LCS - Complete sections 7

Graduated Groundwater Cessation Schedule LCS - Complete sections 8

Percent Reduction Groundwater LCS - Complete sections 9

Please indicate the proposed time period for the LCS you are applying for (e.g., one irrigation season or multiple seasons). If multiple seasons, please provide the time period.

Section 7: Best Management Practices Groundwater LCS

1. Provide the total amount of all irrigated acreage (with units) covered under your proposal for a Best Management Practices Groundwater LCS:
2. Write in the box and/or email a description of the irrigation system that will be used under this proposal, specifying details of your low-energy precision application system, soil moisture sensors, and any corners that will be irrigated. (Refer to Section 875(f)(4)(D)(vii) of the [emergency regulation](#).)
3. Please include a map(s) of each field with labels for well(s), meter(s), and field crop type.
4. Certify all of the following by initialing or checking each box:
 - a. I certify the use of a low-energy precision application (LEPA) system on all irrigated acreage covered under this groundwater LCS.
 - b. I certify to not use end guns for irrigation for the duration of the season.
 - c. I certify to cease irrigation of corners after June 15, 2025.
 - d. I certify to use soil moisture sensors to inform irrigation timing, and maintenance of such records, which I will make available for inspection by the Coordinating Entity, if applicable, and/or the State Water Board.
 - e. I certify that I will further limit irrigation based on water year, in the event of the hydrologic condition noted in i or ii below. If this requirement is triggered, the State Water Board will inform all Best Management Practices Groundwater LCS applicants for the applicable watershed(s).
 - i. Scott River Watershed: Snow pack of 80% or less of the Department of Water Resources California Data Exchange Center's first May snow water equivalent station average (or the average of the first April measurement if May snow pack measurements are not gathered) in Scott River watershed.
 - ii. Shasta River watershed: A water year determination of dry or very dry in the Shasta River watershed, as determined under Table 2 of the March 2021 Montague Water Conservation District water operation plan.

Section 8: Graduated Groundwater Cessation Schedule LCS

A Graduated Groundwater Cessation Schedule LCS may be approved if the applicant agrees to a below schedule AND provides evidence that irrigated acreage is reduced compared to standard practice on the property (e.g., practice in a similar unregulated year). Under this groundwater LCS type, the applicant must select one of two potential irrigation schedules, listed below. See section 875(f)(4)(D)(vi) of the [emergency regulation](#).

1. Provide the total amount of irrigated acreage (with units) under your proposal for a Graduated Groundwater Cessation Schedule LCS:
2. Select the irrigation schedule you certify to implement.

Option 1: By the dates below, pumping to irrigate the following percentages of irrigated acres shall cease:

- 15% by July 15,
- 50% by August 15, and
- 90% by August 31, with a maximum of 8 inches of water to be applied to the remaining 10% of irrigated acres during the remainder of the irrigation season. This 10% can be on land previously fallowed.

Option 2: By the dates below, pumping to irrigate the following percentages of irrigated acres shall cease:

- 20% by July 20,
- 50% by August 20, and
- 95% by September 5, with a maximum of 6 inches of water to be applied to the remaining 5% of irrigated acres during the remainder of the irrigation season. This 5% can be on land previously fallowed.

4. Please write in the box or include a description that demonstrates that the proposal reduces irrigation as compared to standard practices on the property (e.g., practice in a similar unregulated year). If applicable, please take crop rotation and number of alfalfa cuttings into account.

5. Please include a map(s) that identifies the well(s), meter(s), and which field(s) are associated with each cessation date covered by this groundwater LCS.

Section 9: Percent Reduction Groundwater LCS

The applicable percent reduction in groundwater pumping noted below must be demonstrated for the Percent Reduction Groundwater LCS consistent with section 875(f)(4)(D)(v) of the [emergency regulation](#), and summarized below.

- **Scott River Watershed:** A net groundwater pumping reduction of at least 30% throughout the irrigation season (April 1 – October 31) and a monthly reduction of at least 30% between July 1 through October 31.
- **Shasta River Watershed:** A net groundwater pumping reduction of at least 15% throughout the irrigation season (March 1 – November 1) and a monthly reduction of at least 15% between June 1 through September 30.
- The relevant water use reduction shall be based on a comparison to a baseline irrigation season (i.e., 2020, 2021, 2022, or 2023).
 - BUT, if the previous year baseline is higher than the following applied water rates:
 - 33 inches per year for alfalfa,
 - 14 inches per year for grain, or
 - 30 inches per year for pasture
 - Then the above values shall be used as the baseline UNLESS the applicant provides sufficient additional information supporting an alternative baseline.
- Please provide the total amount of irrigated acreage (with units) under your proposal for a Percent Reduction Groundwater LCS.
- If you are proposing a Percent Reduction Groundwater LCS, please include the following files to the State Water Board and your Coordinating Entity.
 - a. A description of practices that reduces groundwater pumping and how the State Water Board (or Coordinating Entity, if applicable) can verify those actions.
 - b. A spreadsheet with monthly pumping volumes for the selected baseline year and current year. Use one row per irrigation method per field.
 - c. Map(s) with each field labeled, well locations, and meter locations.

Submission of Groundwater LCS Proposal to State Water Board

A groundwater LCS may require the applicant to attach or email additional information, such as descriptions, spreadsheets, maps, or other relevant information. State Water Board staff request descriptions be submitted as Microsoft Word (.docx, .doc) or Adobe PDF (.pdf) files as these file formats are easiest for staff to work with applicants to review and revise, if needed. For the same reasons, staff request that applicants submit spreadsheets as Microsoft Excel files (.xlsx, .xls).

Submitting documents in other formats, such as photographs of narratives or narratives via traditional mail may lengthen the review process. If you need assistance, please contact your Coordinating Entity (see Section 4) or State Water Board staff identified in the Contact Information section below.

To submit your application with all required materials (see Section 2), you can:

- Use the online form
- Email: DWR-ScottShastaDrought@Waterboards.ca.gov
- Mail:
State Water Resources Control Board
Division of Water Rights - Instream Flows Unit
1001 I Street - 14th Floor
Sacramento, CA 95814

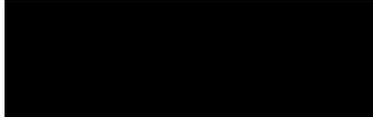
Contact Information for State Water Board Staff

- Rachel Wright
Phone: (916) 322-8420
Email: Rachel.Wright@waterboards.ca.gov
- Robert Solecki
Phone: (916) 341-5400
Email: Robert.Solecki@Waterboards.ca.gov
- Division of Water Rights – Scott-Shasta Phone Line and Email
Phone: (916) 327-3113
Email: DWR-ScottShastaDrought@Waterboards.ca.gov

What's Next?

State Water Board staff will review each groundwater LCS application. If staff identify errors, a need for additional information, or changes that need to be made, they will contact the applicant. Once staff determine the application is substantially complete, it will be posted as pending on the State Water Board's [Local Cooperative website](#) for the Scott River and Shasta River watersheds emergency regulation.

Newton Family Ranch
Karin Piersall Newton Trust



April 11, 2025

State Water Resources Control Board
1001 I St.
Sacramento, CA 95814

Re: 2025 Local Cooperative Solution

The Newton Family Ranch is providing this letter to further describe its proposed Local Cooperative Solution (LCS) actions for the 2025 irrigation season as authorized by 23 CCR §§ 875(f)(4)(D).

A flow meter has been installed at the pivot point. We have also been approved through NRCS for retrofitting the nozzles on the pivot to the LEPA system this fall.

We will use Preston Harris with Scott River Water Trust as our Coordinating Entity.

Introduction/Historical Irrigation Practices

We irrigate 108 acres of which approximately 77 acres is seasonal pasture for grazing cattle and 31 acres in alfalfa hay which we harvest to feed our cattle in the winter months. Irrigation infrastructure for seasonal pasture and alfalfa includes two agriculture wells that supply the following areas and equipment: (see attachment for land locations and APN)

PIVOT (approximately 63 acres)

Pivot was installed in 2016, replacing three (3) one quarter mile wheelines. The pivot services approximately 63 acres. The end gun (large-nozzle single sprinkler on the end of the pivot) is a Nelson SRNV 100 with a 5 horse power booster pump which is estimated at 130 gpm. (see attached vendor chart)

WHEELINES (approximately 36 acres)

Wheelines (i.e. long mobile pipe sets historically moved manually during irrigation season) service approximately 36 acre. Historically, each wheeline is moved manually at approximately 6am and 6pm resulting in two approximate 11 hour operation periods (22 hours run time) in a 24 hour period

CORNERS AND STRIPS (approximately 9 acres)

Since our irrigated property is irregularly shaped and certain areas cannot be irrigated with pivot or rectangular wheelines systems, the remainder areas are irrigated using a combination of methods including movable big guns (i.e. movable high pressure sprinklers) and handlines (i.e. movable aluminum pipe) . Historically, these big guns and handlines are moved at approximately 6am and 6pm resulting in two approximate 11 hour (22 hours run time) operation periods in a 24 hour period.

Irrigation season for seasonal pasture and alfalfa on our operation , including in 2020 (base year), typically begins about April 1 each year and continues into mid to late October for pasture and mid September for alfalfa. These time frames are subject to variances that depend on annual temperature and precipitation conditions.

Specific Local Conservation Solutions (LCS) for the 2025 Irrigation Season

PIVOT (End Gun shutoff)

We intend to shut the End Gun off on the pivot by July 1, 2025 and leave it off for the remainder of the irrigation season. This practice can be verified by drive-by inspection from the road.

WHEELINES (Reduced set times)

We intend to reduce our two daily wheeline set times from approximately 12 hours each (22 hours run time in 24 hours) to two 11 hours sets in 24 hours . We also intend to maintain a written wheeline log on run times and will present that log to the Cooperating Entity upon request.

CORNER AND STRIPS (Reduced set times)

We intend to reduce our two daily set times on our big guns and handlines from approximately 11 hours each (22 hours run time in 24 hours) to two 8 hour set per day on these systems. We also intend to maintain a written log on run times and will present that log to the Cooperating Entity upon request.

FALL 2025 (Ceasing of all irrigation)

We intend to cease all irrigation on pasture and alfalfa by October 1, 2025. This date is generally weeks sooner than good practices would require for optimal pasture management for cattle grazing. Verification of the cessation of irrigation can be verified by an on site inspection by the Cooperating Entity.

General Comments

Each of these undertakings are at a significant cost to us as a small, generational family livestock and hay producer, resulting in reduced pasture and hay production due to reduced irrigation water. When grazing pastures and hay fields do not receive adequate irrigation throughout the normal irrigation season, which is a consequence of this plan, especially in corners and strips of pasture and end gun coverage areas; 1) grazing opportunity is reduced; 2) grazing season becomes shorter; 3) hay production for our winter cattle feed is reduced; 4) additional supplemental fall/winter feed must be purchased at prices that are historically high this year and; 5) permanent plant damage may likely occur and future productivity of pastures and hay crops may be impaired.

Please note that this conservation plan is offered in good faith in connection with the 2025 irrigation

season only. All rights, claims and defenses with regard to the matters described herein are hereby expressly reserved. Moreover, and as this plan is offered voluntarily (without any current legal obligation to undertake the matters described herein) should any government or NGO funds later become available for any forbearance or improvement efforts to which the Newton Family Ranch would otherwise be entitled, nothing herein shall be construed to limit the availability of such funds to the Newton Family Ranch provided that we materially perform the 2025 undertakings described herein. Water conserved under this proposal will not be transferred to parcels not included under the LCS and we will not knowingly or intentionally otherwise take action outside of the LCS that diminish, in any material way, the overall thirty percent reduction established by this proposal.

In an effort to minimize any liability claims, we would like to request that the Cooperating Entity or any other member of the State Water Resource Control Board be accompanied by a representative from the Newton Family Ranch if they need to access the ranch property to observe our LCS practices.

Please feel free to contact me with any questions.

Karin Newton, Manager



PIVOTS (Alfalfa)
 Total Pivot Acres 25.00
 Pivot Alfalfa % Total Acre 23.15%

GPM with End Gun 685 % Savings with End Gun Off 18.98%
 Gpm without End Gun 555

	2020 Pivot Alfalfa AF (baseline)	2022 Reduction Alfalfa AF
April	6.61	0.00
May	9.92	0.00
June	13.23	0.00
July	18.19	3.45 End Gun OFF
August	21.49	4.08 End Gun OFF
September	16.53	3.14 End Gun OFF
October	6.61	6.61 All Irrigation OFF
Total for irrigation season	92.59	17.28

PIVOTS (Pasture)			
Total Pivot Pasture Acres	38.00		
Pivot Pasture % Total Acres	35.19%		
GPM with End Gun	685	% Savings with End Gun Off	18.98%
Gpm without End Gun	555		

	2020 Pivot Pasture AF (baseline)	2022 Pivot PastureReduction AF
April	10.05	0.00
May	15.08	0.00
June	20.11	0.00
July	27.65	5.25 End Gun OFF
August	32.67	6.20 End Gun OFF
September	25.13	4.77 End Gun OFF
October	10.05	10.05 All Irrigation OFF
Total for irrigation season	140.74	26.27

Wheeline (alfalfa)	
Total Wheeline Alfalfa Acres	6.00
Wheeline Alfalfa Total Acres	5.56%
Savings (moving from two 12 hour sets to two 11	8.40%

	2020 Wheeline Alfalfa (baseline)	2022 Wheeline Alfalfa Reduction AF
April	1.59	0.13
May	2.38	0.20
June	3.17	0.27
July	4.37	0.37
August	5.16	2.58
September	3.97	3.97
October	1.59	0.00
Total for irrigation season	22.22	7.51

Wheeline (Pasture)	
Total Wheeline Pasture Acres	30.00
Pivot % Total Acres	27.78%
Savings (moving from two 12 hour sets to c	50.00%

	2020 Wheeline Pasture AF (baseline)	2022 Wheeline Pasture Reduction AF
April	7.94	3.97
May	11.90	5.95
June	15.87	7.94
July	21.83	10.91
August	25.79	12.90
September	19.84	9.92
October	7.94	7.94
Total for irrigation season	111.11	59.52

Handline Pasture	
Total Handline Pasture Acres	1.00
Pivot % Total Acres	0.93%
Savings (moving from two 11 hour per day to two 8 hour sets per d:	27.30%

	2020 Handline Pasture AF (baseline)	2022 Handline Pasture Reduction AF
April	0.26	0.07
May	0.40	0.11
June	0.53	0.14
July	0.73	0.20
August	0.86	0.23
September	0.66	0.18
October	0.26	0.26
Total for irrigation season	3.70	1.20

Gun (Pasture)	
Total Gun Pasture Acres	8.00
Gun Pasture % Total Acres	7.41%
Savings (moving from two 11 hour per day to two 8 hour sets per d:	27.30%

	2020 Gun Pasture AF (baseline)	2022 Gun Pasture Reduction AF
April	2.12	0.58
May	3.17	0.87
June	4.23	1.16
July	5.82	1.59
August	6.88	1.88
September	5.29	1.44
October	2.12	2.12
	29.63	9.63



Scott River Water Trust

P.O. Box 591 ~ Etna, CA 96027
530-643-2395 scottwatertrust@gmail.com

Month, Day, Year

Binding Agreement

Contractor Contact Information:

<i>Business:</i>	Scott River Water Trust
<i>Contact Person:</i>	Chris Voigt
<i>Address:</i>	9933 South State Highway 3, Callahan CA
<i>Phone:</i>	(916) 396-0131
<i>Email:</i>	chrisb.voigt@gmail.com

Landowner Contact Information:

<i>Business:</i>	Newton Family Ranch
<i>Contact Person:</i>	Karin Newton
<i>Address:</i>	[REDACTED]
<i>Phone:</i>	[REDACTED]
<i>Email:</i>	[REDACTED]

Background

On December 19, 2023, the State Water Board adopted a new emergency regulation for the Scott and Shasta River Watersheds. The Office of Administrative Law approved the emergency regulation on January 27, 2025 and is in effect for one year, unless re-adopted or rescinded. Under the 2021 drought emergency regulation instated by the State Water Resources Control Board (SWRCB) that established drought emergency minimum flows in the Scott River, a Local Cooperative Solution (LCS) may be proposed by individuals or groups to submit by petition to the Deputy Director of the SWRCB as an alternative means of reducing water use to meet or preserve drought emergency minimum flows and provide fishery benefits, in lieu of curtailment. This binding agreement between the (Landowner) Scott River Water Trust (SRWT) will monitor the SRWCB approved LCS to achieve 1) a net reduction of water use of 30 percent throughout the irrigation season; and 2) a monthly reduction of at least 30 percent in the July through October 31 period, as compared to 2020, 2021, 2022 or 2023.

Recitals

1. *Local cooperative solutions by individuals or groups may be proposed by petition to the Deputy Director as an alternative means of reducing water use to meet or preserve drought emergency minimum flows, or to provide other fishery benefits (such as cold-water refugia, localized fish passage, or redd protection), in lieu of curtailment as described in this section.*

(A) Petitions to implement local cooperative solutions that coordinate diversions, share water, strategically manage groundwater and/or surface water for fisheries benefits, reduce annual water use, or engage in similar activities may be submitted to the Deputy Director at any time, except as noted in subsection (f)(4)(D)(ii).

(G) A coordinating entity for the purposes of this section shall refer to an entity which possesses the expertise and ability to evaluate and require performance of the commitments made in a local cooperative solution, and which commits that:

(i) Evaluation of local cooperative solution proposals and inspections shall be conducted by representatives who lack a financial or close personal interest in the outcome, and

(ii) Information collected on compliance with local cooperative solutions is provided to the State Water Board monthly and upon request. The entity shall undertake data collection (including metering data) and inspections, either by itself or in coordination with State Water Board staff, sufficient to ensure implementation of local cooperative solutions, including inspection or data collection targeted within two weeks of completion of commitments to cease pumping as of a date certain.

2. *For overlying or adjudicated groundwater diversions for irrigated agriculture described under in section 875.5, subdivision (a)(1)(A)(ix) [Scott River] or section 875.5, subdivision (b)(1)(C) [Shasta River] the Deputy Director may approve a groundwater basin-wide, groundwater-sub-basin-wide, or any number of individual local cooperative solutions where:*

(i) The proposal may be based on a binding agreement made with a coordinating entity with primary responsibility to verify implementation of the local cooperative solution.

(ii) For individual proposals, the proposal must be submitted no later than April 15 and must be implemented during the entirety of the irrigation season (including during pendency of approval), unless the proponent withdraws.

(iii) The proposal includes a description of metering in place for groundwater well extractions, and a proposal to meter and record such extractions daily and report monthly to the Deputy Director or the coordinating entity, as applicable, except as described below. The State Water Board has funding and technical support available to

support some amount of metering, and those interested in such assistance are encouraged to promptly contact the State Water Board.

3. *For percent-based reduction in pumping local cooperative solutions:*
 - a. *For the Scott River: The proposal provides at least:*
 - (i) *A net reduction of water use of 30 percent throughout the irrigation season (April 1 – October 31); and*
 - (ii) *A monthly reduction of 30 percent in the July through October time period.*
 - b. *The relevant water use reduction shall generally be based on a comparison to the 2020, 2021, 2022, or 2023 irrigation season, and may be demonstrated by evidence that provides a reasonable assurance that the change in farming practice or other action results in at least the relevant proportionate reduction in water use. Such evidence may include but is not limited to: pumping reports; actions that will be taken to reduce water use; estimation of water saved from conservation measures or changes in irrigation or planting decisions; and electric bills. However, if evidence for the amount of water applied for the 2020, 2021, 2022, or 2023 irrigation seasons indicates a base rate of applied water that is higher than 33 inches per year for alfalfa, 14 inches per year for grain, or 30 inches per year for pasture, then the base rate of applied water shall be the aforementioned values unless the proponent makes an additional showing that a higher base rate number is an appropriate comparison in light of relevant information that can include but is not limited to multi-year practices, soil type, and irrigation methods.*

Proposed Local Cooperative Solution: *(Specific action plan to be completed by landowner, see attached LCS application form and/or specific landowner curtailment plan)*

Binding Agreement Terms

The Landowner is required to adhere to the LCS, as approved by SWRCB. The Landowner has requested that SRWT serve as the coordinating entity. As such, both parties agree to the following:

- For the duration of this binding agreement where SRWT is the coordinating entity, the Landowner shall give SRWT the right to reasonably access the included parcels for the limited purpose of verifying execution of the LCS. Any individual not directly employed or contracted by SRWT shall provide pre-notification to, and shall obtain approval by the Landowner before accessing the property,
- SRWT will strive to notify the Landowner a day in advance of visiting the parcels and shall provide the Landowner or designee the ability to participate in monitoring activities,
- It is anticipated that SRWT representatives will visit the property approximately twice per month to monitor the approved LCS, unless inadequacies are discovered, in which case additional field visits will occur until inadequacies are rectified. A monitoring inspection may include verification of any or all of the actions described in the conservation plan and may include inspection checklist/notes/reports and photo verification,
- In the (unexpected) event that staffing levels at SRWT are insufficient, SRWT may coordinate with the Landowner and State Water Board staff to allow State Water Board staff to conduct some of the inspections,
- SRWT will submit the information regarding the verification materials and actions described in this agreement, and conservation plan incorporated by reference, to the State Water Board upon request, for the purposes of verifying compliance with the LCS,
- This binding agreement is not intended to preclude, harm, or otherwise interfere with the landowner's ability to secure any funding to mitigate the financial impacts imposed by the emergency regulation or proposed conservation practices. SRWT supports the use of funding programs to ameliorate the costs of implementing the conservation practices described in the proposed conservation plan: planning and cooperation under a voluntary LCS should not undermine the ability to receive such funding,
- This binding agreement may be terminated by either party at any time. Both parties agree to take reasonable measures to resolve any concerns related to the performance of the LCS, negative interpersonal interaction, or any unforeseen circumstance prior to invoking termination,
- As the irrigation season unfolds, there may be reason to change the terms of the LCS or this binding agreement with respect to its implementation and verification. Any such changes to the LCS or service agreement will need to be agreed upon by the landowner and SRWCB requests SRWT assistance with an updated LCS, the SRWT and Landowner will enter into a new Binding Agreement and,

Payment

\$75.00 per hour for initial consultation and \$75.00 per hour for all services rendered after signing of the binding agreement.

Expenses

The Landowner will reimburse SRWT for expenses that are attributable directly to work performed under this Agreement. Any expenses incurred will be approved by the Landowner beforehand. SRWT will submit an itemized statement of Contractor's expenses attached with invoicing.

Terms of Payment

Upon completion of SRWT services under this binding agreement, SRWT will submit an invoice. The Landowner will pay SRWT the compensation described within 30 days of receiving SRWT's invoice.

Term of Agreement

This agreement will become effective when signed by both parties and will terminate on:

- November 1, 2025, or
- The date a party terminates the binding agreement.
- Monitoring information will be collected by the SRWT and shared with State Water Board as a field report in accordance with their reporting schedule or upon request
- SRWT is not authorized to and will not distribute data or other information regarding work done under this contract to any third party without previous written approval by the Landowner
- Landowner agrees that water saved under the LCS will not be transferred to parcels not included under the LCS, and Landowner will not knowingly or intentionally otherwise take actions outside of the LCS that diminish, in any material way, the overall thirty percent reduction established by the actions described in the LCS

Signatures

Christopher Voigt

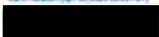
SRWT Representative

Karin Newton
Karin Newton (Apr 08, 2025 4:02 PM)

Landowner

Signature: Karin Newton

Karin Newton (Apr 08, 2025 4:02 PM)

Email: 

Solecki, Robert@Waterboards

From: WB-DWR-ScottShastaFlows <DWR-ScottShastaFlows@Waterboards.ca.gov>
Sent: Tuesday, May 20, 2025 4:50 PM
To: Karin Newton; WB-DWR-ScottShastaFlows
Subject: RE: Request for additional info for Newton Family Ranch 2025 LCS
Attachments: response to SWCB questions 5-20-25.pdf

Hi Karin

Thank you for providing this information quickly so that we can continue processing your 2025 LCS proposal.

As you indicated in your response (attached), you will email the updated 2025 applied water rate spreadsheet and photos of the pump structure when you are available to do so.

Thank you,

Bob Solecki
Scott Shasta Flows Team
916-327-3113

Please note: I will be off duty from 5/21/2025 through 5/27/2025.

From: Karin Newton [REDACTED]
Sent: Tuesday, May 20, 2025 10:08 AM
To: WB-DWR-ScottShastaFlows <DWR-ScottShastaFlows@Waterboards.ca.gov>
Subject: Re: Request for additional info for Newton Family Ranch 2025 LCS

Caution: External Email. Use caution when clicking links or opening attachments. When in doubt, contact DIT or use the Phish Alert Button.

Hi Bob. I am attaching a response to your questions which I worked on this morning and also will attach other documents. The photos of the pumping station will be sent when I have them which will possibly be today. Thanks. Karin

From: "WB-DWR-ScottShastaFlows" <DWR-ScottShastaFlows@Waterboards.ca.gov>
To: "WB-DWR-ScottShastaFlows" <DWR-ScottShastaFlows@Waterboards.ca.gov>, [REDACTED]
Sent: Tuesday, May 20, 2025 9:40:52 AM
Subject: RE: Request for additional info for Newton Family Ranch 2025 LCS

Hi Karin
I'm following up from our phone conversation on 5/19/2025.

You said that you have reached out to your coordinating entity (Scott River Trust) to discuss your 2025 LCS proposal with them so you can respond to all of the questions in the email that I sent to you on 05/15/2025, which is included below.

You said you know some of the answers to the questions in the email below and can respond to them in an email by 5/20/2025.

For Item #1, you said you can provide a description of how you will log water volumes for irrigated acres that do not have a meter. You indicated it's the same method you used last year.

For Item #2, you said the pump specialist's assessment was that it was not reasonable or feasible to add a second flow meter because it required reconfiguration of the pipes, which is very expensive, and a second meter would be for irrigating only 11 acres.

You said you will include photos of the pumping structure in your email response to me.

For Item #3, you said you can provide a copy of your binding agreement.

For Item #4, you need to coordinate with your coordinating entity on the applied water amounts spreadsheet. Then you will update your applied water estimates and provide the updated spreadsheet to the State Water Board.

For Item #5, you plan to use the same justification for your 2020 baseline applied water rates in your 2025 LCS proposal as you did in your 2024 proposal.

For Item #6, you said that the pivot with the meter irrigates 63 acres.

Please confirm that what I've summarized in this email is correct.

Thank you,

Bob Solecki
Scott Shasta Flows Team
916-327-3113

From: WB-DWR-ScottShastaFlows <DWR-ScottShastaFlows@Waterboards.ca.gov>

Sent: Thursday, May 15, 2025 9:35 AM

To: [REDACTED]

Cc: WB-DWR-ScottShastaFlows <DWR-ScottShastaFlows@Waterboards.ca.gov>

Subject: Request for additional info for Newton Family Ranch 2025 LCS

Hi Karin,

Waterboard staff have received and started reviewing your proposed 2025 groundwater local cooperative solution (LCS). To continue processing your application, we require the following information.

Please provide the following items as soon as possible:

1. For the irrigated acres that do not have a meter, please describe how you will log water volumes and submit data to the State Water Board by the 10th of each month.
2. In your cover letter you indicate Newton Family Ranch has been approved through NRCS for retrofitting the nozzles on the pivot to the LEPA system this fall. Does the NRCS approval also include an additional flow meter as mentioned in your 2024 LCs application?
3. Please provide a signed copy of your binding agreement with your selected coordinating entity.

4. In the spreadsheet you submitted with your application (Karin Conservation Plan updated), you have estimated applied water amounts for 2022. Are the estimated water amounts the same in 2025? If not, please resubmit a spreadsheet showing the applied water amounts for 2025.
5. In your 2024 LCS proposal, you provided two documents by the Scott Valley Agriculture Water Alliance to justify the 2020 baseline water rates that you used for Newton Family Ranch. Please confirm whether you plan to use the same justification for your 2025 LCS proposal.
6. In section 6 of your 2025 LCS application, you indicate that the pivot irrigates 75 acres of alfalfa and pasture. However, your cover letter and conservation plan spreadsheet included in your submittal indicate the pivot irrigates 63 acres. Please clarify how much approximate acreage the pivot irrigates and acres for each crop type.

Please let me know if you have any questions.

Thank you,

Bob Solecki
Scott Shasta Flows Team

Bob Solecki

5-20-2025

I will try to answer your questions as clearly as possible.

- 1) For acres that are not metered (approx 11 to 14 acres)) we will keep a written log to indicate dates and run times as we have done in the past.
- 2) We were approved through NRCS to fund the flow meter we installed at the pivot (which we self funded but will be reimbursed for this fall) and for retrofitting the pivot nozzles this fall. The configuration of our well and iron pipes going different directions would require major work and re-configuration to put a flow meter on a system that was put in approximately in 1985. In an e-mail from Shay Richardson from SWCB on 2-19-2025 it was determined in her words that "a flow meter on the pivot would be fine for our purposes". We feel that a meter at the pump would not be a reasonable request given the major re-configuration and expense it would require, especially for the small amount of acres to be metered (approx. 11 to 14 acres). Again, we will keep a written log on the small acreage not metered that we irrigate.
- 3) I will attach the binding agreement with our coordinating entity.
- 4) As per our phone conversation yesterday about our spreadsheet from 2022 I have reached out to a couple of sources to have them take a look at this with me. In the meantime, the estimated water amounts will be the same in 2025 as they have been since we have not changed any practices and our plan has been approved each year.
- 5) The two documents by Scott Valley Agriculture Water Alliance that we used to justify our 2020 baseline water rates for our Newton Family Ranch will also be used for our 2025 LCS proposal. I will attach these documents.
- 6) The pivot irrigates approx. 63 acres according to the specs, however there are approx 75 acres of pasture and alfalfa so there are some acres not irrigated by the pivot. Approx. 28 acres are alfalfa and 35 acres are pasture that are irrigated by the pivot.

I hope this answers some of your questions.

Thanks

Karin Newton

Calculating Baseline Irrigation Application Amounts FOR WATER YEAR 2020 - Scott Valley Irrigated ALFALFA

Scott Valley Agriculture Water Alliance

4/15/24

Sources:

1. California Water Data Exchange Center (CDEC). Department of Water Resources. Monthly average precipitation at Fort Jones, CA. www.cdec.water.ca.gov.
2. Orloff, S., Harter, T., Snyder, R., and Hanson, B. UC Cooperative Extension Siskiyou County and LAWR UC Davis. [Alfalfa Water Use in the Scott Valley: Resolving the Discrepancy Between Theory and Practice](#). PowerPoint presentation. 2011-2012.
3. University of California Agriculture and Natural Resources. [Drought Tip: Field Irrigation Water Management in a Nutshell](#). September 2019.
4. Zaccaria, Daniele, PhD. Agriculture Water Management Specialist, UC Davis. Personal communication, 4/12/24.

Overview: Approximate irrigation baselines for Scott Valley irrigated alfalfa can be determined based on four factors:

1. The evapotranspiration (ET) of alfalfa (how much water the plants use) during growing season.
2. Rainfall occurring during the growing season (and resulting infiltrated rainfall into the crop root zone).
3. Soil moisture that can be accessed by the roots.
4. Irrigation application efficiency rates for different irrigation systems.

Approximate baseline for water application can be determined by dividing crop ET (minus effective rainfall, minus existing stored soil moisture) by the application efficiency rate.

Establishing Alfalfa evapotranspiration (ET): Alfalfa ET was determined in 8 fields across 4 years in the Scott and Shasta valleys by Orloff et al. (2007-2010). See Figure 1 below. The average cumulative alfalfa ET for Scott and Shasta was on average 37 inches for the growing season over the course of the study period.

Region	Site	Year	Age of Alfalfa	Seasonal ET (inches)	Reference ET (inches)
Scott Valley/Shasta Valley	EN	2007	2	39.6	44
	EN	2008	3	32.8	42.6
	EN	2009	4	33.8	40.4
	FI	2009	5	36.1	37.4
	SH	2009	4	38.8	40.4
	AP	2010	5	37.3	37.4
	FI	2010	2	34.7	37.4
	FA	2010	6	38.8	41.1
				Ave: 36.5	Ave. 40.1

Figure 1. Orloff et al recordings of Alfalfa ET and Reference grass ET (ET_o) for Scott and Shasta valleys at 8 sites between 2007-2010.

Establishing application efficiency: The UC Davis Drought Tips Fact Sheet titled “Irrigation water management in a nutshell” outlines application efficiency rates for various irrigation systems. See Figure 2 below. Efficiencies range from 90 percent (LEPA pivot systems) to 45 percent (furrow irrigation). “Side-roll” refers to “wheel line” systems.

Box 1 – Application Efficiency

Some extra water must be added to the soil in addition to the amount needed to adequately replenish water used by the crop since the last irrigation or rainfall. Such extra water is required to compensate for losses from the irrigation systems that occur through deep percolation, surface runoff, evaporation, wind-drift, and nonuniform water application. Because of losses occurring during irrigation application, application efficiency is always less than 100 percent.

Application efficiency is defined as the ratio of **water beneficially used by the crop to the total water applied**, where “beneficial use” includes water used for crop evapotranspiration, frost protection, salt leaching, canopy cooling, etc. Application efficiency provides an indication of how well an irrigation system performs its objective of applying water in adequate amounts and uniformly throughout the field, and allowing it to be stored in the crop root zone to meet the crop water requirements. No irrigation system can achieve 100% application efficiency, but adequate system design, regular maintenance, and careful irrigation management can minimize water losses, thus increasing the relative portion of applied water that is beneficially used by plants. Some irrigation methods perform relatively better than others in terms of the water application rate matching the soil intake rate and for the evenness with which water is distributed throughout the field (distribution uniformity). Table 3 shows potential values of application efficiency for properly-designed and well-managed irrigation systems.

Table 3. Ranges of potential application efficiency (Eff_A) of well-designed and well-managed irrigation systems

Irrigation method/system	Potential Eff _A (%)
Sprinkler	
LEPA	80–90
linear move	75–85
center pivot	75–90
traveling gun	65–75
side-roll	65–85
hand-move	65–85
solid-set	70–85
Surface	
furrow (conventional)	45–65
furrow (surge)	55–75
furrow (with tailwater reuse)	60–80
basin	60–75
precision level basin	65–80
Microirrigation	
bubbler (low head)	80–90
microspray	85–90
micropoint source	85–90
microline source	85–90
surface drip	85–95
subsurface drip	90–95

Source: Adapted from Howell 2003.

Figure 2. Application efficiency rates as found in UC-ANR Drought Tips Fact Sheet published in 2019.

Establishing total water needs of alfalfa: The equation for calculating total water needs during the growing season is: alfalfa ET (which Orloff et al established as 37 inches during the growing season) minus “effective rainfall” (the rain that percolates and doesn’t run-off), minus stored soil moisture.

Establishing effective rainfall for Scott Valley during 2020 growing season: According to California Data Exchange Center, 2020 was a very dry year: 7.38 inches total for the water year (Oct 2019-Oct 2020) (see Figure 3). During the growing season we got 3.08 inches. That means effective rainfall of 1.8 inches (60% of total in-season rainfall).

Water Year (WY)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY Total
2017				7.44	6.65	2.57	1.86	0.58	0.58	0.01	1.00	0.16	20.85
2018	0.36	2.42	0.59	2.21	0.63	1.91	1.83	2.17	0.04	0.02	0.00	0.00	12.18
2019	0.46	2.83	3.36	3.42	5.30	1.20	1.38	1.27	0.00	0.00	0.58	1.01	20.81
2020	0.32	0.65	2.54	0.79	0.00	0.00	0.58	1.08	0.88	0.40	0.14	0.00	7.38
2021	0.00	1.95	2.22	2.70	1.83	0.97	0.15	0.14	0.20	0.26	0.02	0.86	11.30
2022	2.32	0.94	3.48	1.38	0.06	0.74	1.26	1.60	0.98	0.22	0.04	0.18	13.20
2023	0.04	1.21	4.85	4.33	1.38	4.57	0.78	1.15	0.50	0.00	0.42	0.64	19.87
2024	0.46	1.00	2.23	4.64									8.33

Water Years 2023 and 2024 (to date) in Fort Jones (bottom two rows), according to CDEC.

Establishing water supplied through existing soil moisture: Soil moisture content could reasonably be expected to be 60% of the winter rainfall, which was 8.3 inches. 60% of 8.3= 5 inches. Alfalfa roots systems can vary, but 4 feet can be used as an estimate. Orloff determined root systems extract about 2 inches of water per foot of roots. Thus, alfalfa could reasonably be expected to extract all the soil moisture available (5 inches) in the 2024 growing season.

Calculating applied water needs for alfalfa: crop ET – effective rainfall – soil moisture / application efficiency rate.

Scenario 1: alfalfa irrigated by a wheel line sprinkler system that is 75% efficient. This % can vary.

Crop ET: 37 inches

Total water need (subtracting rain and soil moisture): 37 inches – 1.8 inches – 2.6 inches = 32.6 inches.

Application efficiency rate: 75%

Total irrigation water needed for growing season (32.6 / .75) = 43.5 inches

Scenario 2: alfalfa irrigated by center pivot sprinkler system that is 80% efficient. This % can vary.

Crop ET: 37 inches

Total water need (subtracting rain and soil moisture): 37 inches – 1.8 inches – 2.6 inches = 32.6 inches.

Application efficiency rate: 80%

Total irrigation water needed for growing season (32.6 / .80) = 40.8 inches

Scenario 3: alfalfa irrigated by flood irrigation (basin irrigation)* that is 55% efficient. This % can vary.

Crop ET: 37 inches

Total water need (subtracting rain and soil moisture): 37 inches – 1.8 inches – 2.6 inches = 32.6 inches.

Application efficiency rate: 55%

Total irrigation water needed for growing season (32.6 / .55) = 59.3 inches

*Note that flood irrigation often applies more water, but has no wind drift and can have low evaporation loss. If runoff rates are low, then a high percentage of water unused as ET will percolate back into the water table.

Scenario 4: alfalfa corners irrigated by K-line or traveling gun that is 75% efficient. This % can vary.

Crop ET: 37 inches

Total water need (subtracting rain and soil moisture): 37 inches – 1.8 inches – 2.6 inches = 32.6 inches.

Application efficiency rate: 75%

Total irrigation water needed for growing season (32.6 / .75) = 43.5 inches

Calculating Baseline Irrigation Application Amounts FOR WATER YEAR 2020 - Scott Valley Irrigated PASTURE

Scott Valley Agriculture Water Alliance

4/15/24

Sources:

1. California Water Data Exchange Center (CDEC). Department of Water Resources. Monthly average precipitation at Fort Jones, CA. www.cdec.water.ca.gov.
2. Orloff, S., Harter, T., Snyder, R., and Hanson, B. UC Cooperative Extension Siskiyou County and LAWR UC Davis. [Alfalfa Water Use in the Scott Valley: Resolving the Discrepancy Between Theory and Practice](#). PowerPoint presentation. 2011-2012.
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1. The evapotranspiration (ET) of pasture (how much water the plants use) during growing season.
2. Rainfall occurring during the growing season (and resulting infiltrated rainfall into the crop root zone).
3. Soil moisture that can be accessed by the roots.
4. Irrigation application efficiency rates for different irrigation systems.

Approximate baseline for water application can be determined by dividing crop ET (minus effective rainfall, minus existing stored soil moisture) by the application efficiency rate.

Establishing Pasture evapotranspiration (ET): Pasture ET was determined in 8 fields across 4 years in the Scott and Shasta valleys by Orloff et al. (2007-2010). See Figure 1 below. Because “Reference ET” (far right column) is a determination of well-watered, unstressed, irrigated grass pasture, it can be used synonymously with “pasture ET.” The average cumulative pasture ET for Scott and Shasta was on average 40 inches for the growing season over the course of the study period. This is the amount of water the irrigated grass pasture used during the growing season under well-watered, non-stressed conditions.

Region	Site	Year	Age of Alfalfa	Seasonal ET (inches)	Reference ET (inches)
Scott Valley/Shasta Valley	EN	2007	2	39.6	44
	EN	2008	3	32.8	42.6
	EN	2009	4	33.8	40.4
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Application efficiency is defined as the ratio of **water beneficially used by the crop to the total water applied**, where “beneficial use” includes water used for crop evapotranspiration, frost protection, salt leaching, canopy cooling, etc. Application efficiency provides an indication of how well an irrigation system performs its objective of applying water in adequate amounts and uniformly throughout the field, and allowing it to be stored in the crop root zone to meet the crop water requirements. No irrigation system can achieve 100% application efficiency, but adequate system design, regular maintenance, and careful irrigation management can minimize water losses, thus increasing the relative portion of applied water that is beneficially used by plants. Some irrigation methods perform relatively better than others in terms of the water application rate matching the soil intake rate and for the evenness with which water is distributed throughout the field (distribution uniformity). Table 3 shows potential values of application efficiency for properly-designed and well-managed irrigation systems.

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side-roll	65–85
hand-move	65–85
solid-set	70–85
Surface	
furrow (conventional)	45–65
furrow (surge)	55–75
furrow (with tailwater reuse)	60–80
basin	60–75
precision level basin	65–80
Microirrigation	
bubbler (low head)	80–90
microspray	85–90
micropoint source	85–90
microline source	85–90
surface drip	85–95
subsurface drip	90–95

Source: Adapted from Howell 2003.

Figure 2. Application efficiency rates as found in UC-ANR Drought Tips Fact Sheet published in 2019.

Establishing total water needs of pasture: The equation for calculating total water needs during the growing season is: pasture ET (which Orloff et al established as 40 inches during the growing season) minus “effective rainfall” (the rain that percolates and doesn’t run-off), minus stored soil moisture.

Establishing effective rainfall for Scott Valley during 2020 growing season: According to California Data Exchange Center, 2020 was a very dry year: 7.38 inches total for the water year (Oct 2019-Oct 2020) (see Figure 3). During the growing season we got 3.08 inches. That means effective rainfall of 1.8 inches (60% of total in-season rainfall).

Water Year (WY)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY Total
2017	6.19	2.34	4.10	7.44	6.65	2.57	1.86	0.58	0.58	0.01	1.00	0.16	33.48
2018	0.36	2.42	0.59	2.21	0.63	1.91	1.83	2.17	0.04	0.02	0.00	0.00	12.18
2019	0.46	2.83	3.36	3.42	5.30	1.20	1.38	1.27	0.00	0.00	0.58	1.01	20.81
2020	0.32	0.65	2.54	0.79	0.00	0.00	0.58	1.08	0.88	0.40	0.14	0.00	7.38
2021	0.00	1.95	2.22	2.70	1.83	0.97	0.15	0.14	0.20	0.26	0.02	0.86	11.30
2022	2.32	0.94	3.48	1.38	0.06	0.74	1.26	1.60	0.98	0.22	0.04	0.18	13.20
2023	0.04	1.21	4.85	4.33	1.38	4.57	0.78	1.15	0.50	0.00	0.42	0.64	19.87

Water Year (WY)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY Total
2017				7.44	6.65	2.57	1.86	0.58	0.58	0.01	1.00	0.16	20.85
2018	0.36	2.42	0.59	2.21	0.63	1.91	1.83	2.17	0.04	0.02	0.00	0.00	12.18
2019	0.46	2.83	3.36	3.42	5.30	1.20	1.38	1.27	0.00	0.00	0.58	1.01	20.81
2020	0.32	0.65	2.54	0.79	0.00	0.00	0.58	1.08	0.88	0.40	0.14	0.00	7.38
2021	0.00	1.95	2.22	2.70	1.83	0.97	0.15	0.14	0.20	0.26	0.02	0.86	11.30
2022	2.32	0.94	3.48	1.38	0.06	0.74	1.26	1.60	0.98	0.22	0.04	0.18	13.20
2023	0.04	1.21	4.85	4.33	1.38	4.57	0.78	1.15	0.50	0.00	0.42	0.64	19.87
2024	0.46	1.00	2.23	4.64									8.33

Figure 3. CDEC rainfall data for [Water Year 2020](#) at Fort Jones. Not pictured here is rainfall for October 2020, which was 0.

Establishing water supplied through existing soil moisture: Soil moisture content could reasonably be expected to be 60% of the winter rainfall, which was 4.3 inches. Pasture roots systems can vary, but 12 inches can be used as an estimate. Orloff determined root systems extract about 2 inches of water per foot of roots.

Calculating applied water needs for pasture: crop ET – effective rainfall – soil moisture / application efficiency rate.

Scenario 1: pasture irrigated by a wheel line sprinkler system that is 75% efficient. This % can vary.

Crop ET: 40 inches

Total water need (subtracting rain and soil moisture): 40 inches – 1.8 inches – 2 inches = 36.2 inches.

Application efficiency rate: 75%

Total irrigation water needed for growing season $(36.2 / .75) = 48.3$ inches

Scenario 2: pasture irrigated by center pivot sprinkler system that is 80% efficient. This % can vary.

Crop ET: 40 inches

Total water need (subtracting rain and soil moisture): 40 inches – 1.8 inches – 2 inches = 36.2 inches.

Application efficiency rate: 80%

Total irrigation water needed for growing season $(36.2 / .80) = 45.3$ inches

Scenario 3: pasture irrigated by flood irrigation (basin irrigation)* that is 55% efficient. This % can vary.

Crop ET: 40 inches

Total water need (subtracting rain and soil moisture): 40 inches – 1.8 inches – 2 inches = 36.2 inches.

Application efficiency rate: 55%

Total irrigation water needed for growing season $(36.2 / .55) = 65.8$ inches

*Note that flood irrigation often applies more water, but has no wind drift and can have low evaporation loss. If runoff rates are low, then a high percentage of water unused as ET will percolate back into the water table.

Scenario 4: pasture corners irrigated by K-line or traveling gun that is 75% efficient. This % can vary.

Crop ET: 40 inches

Total water need (subtracting rain and soil moisture): 40 inches – 1.8 inches – 2 inches = 36.2 inches.

Application efficiency rate: 75%

Total irrigation water needed for growing season $(36.2 / .75) = 48.3$ inches