

Black Ranch



April 4, 2022

State Water Resources Control Board

1001 I St.

Sacramento, CA 95814

RE- Black Ranch Local Cooperative Solution for Groundwater- Scott River Watershed

To Deputy Director:

This letter is to affirm the commitment of Black Ranch to voluntarily reduce the volume of ground water used for irrigation in 2020 by 30% in 2022 as further defined within this letter and attached documents. The irrigated acreage operated by Black Ranch is 217+ acres. Because Black Ranch operates less than 400 acres we seek to partner with our immediate neighbor Hurlimann FLP (Hurlimann Ranch) and others using the Siskiyou RCD as the Coordinating Entity. All application forms with the Siskiyou RCD have been submitted. The reduction in ground water used for irrigation will result in financial impact and we seek financial assistance to offset the financial impacts.

Black Ranch: The Black Ranch is a farming entity located within Scott Valley. Approximately 217+ irrigated acres are farmed to grow alfalfa, grass alfalfa, and small grains (wheat and barley). Alfalfa and grain crops are rotated on a roughly 6 year rotation. Sufficient groundwater is always available to irrigate all of our acreage throughout the irrigation season regardless of water year type. Black Ranch is seeking an individual local cooperative solution agreement and we intend to combine with contiguous neighbors to meet the 400 acre minimum in the Order.

The volume of water used in 2020 (690 acre feet) was estimated based on known pumping capacity. One groundwater pump was operated in 2020 and the same groundwater pump will be operated in 2022. A flow meter was installed previously on the pump so the maximum production of the pump is known as well as the volume of water required to operate each 1/4 mile long wheel line (approx 240 gallons per minute). Irrigation system inefficiencies and leak estimates were also accounted into the annual total. Black Ranch estimated monthly use based on dividing the annual usage estimate (690 af) per month. Monthly use estimates in 2020 were determined based on ET rates, crop demand, historical irrigation use and crop type. Monthly estimates were compared considering the number of irrigations per acre/field, duration of the irrigation set, application rate and estimated inefficiencies.

In 2022, Black Ranch will use pumped and pressurized ground water to irrigate the property using 9 wheel lines. Grain and grain hay crops are typically irrigated from early April through early/mid July using 6 irrigation sets. Alfalfa is typically irrigated from early April through late September using 9 or 10 irrigation sets. The number of irrigation sets per crop type will remain the same in 2022.

Proposed Specific Water Conservation Measures: There are several ways to reduce irrigation use including, fallowing, water conservation practices, changing crop type, reducing irrigation application



rates, reducing irrigation duration and ceasing irrigation earlier in the year than typical. We intend to implement a combination of these options described below:

No irrigation using ground water on 12.8 acres that was irrigated with ground water in 2020:

1.) In 2020, we elected to not irrigate 16.4 acres of the 217+ acres and not irrigate the areas throughout the irrigation season with groundwater due to the 2020 drought. In 2022 we elect not irrigate 29.2 of the 217 acres, an increase of 12.8 acres not irrigated with ground water compared to 2020. This will reduce annual irrigation usage by 6.4% compared to 2020. The areas not to be irrigated with ground water are marked on the attached map. Some of the areas slated for no irrigation in 2022 are or will be planted. Some on the areas may be irrigated with surface water from Scott Valley Irrigation District, but the volume of water used on those acreages will be equal or less than the surface water applied in 2020. The reduction in irrigation as a result of this measure will reduce the volume of water used monthly by approximately 6.4% throughout the irrigation season.

Reduction in Wheel Line Irrigation Duration Compared to 2020:

2.) In 2020, the Black Ranch irrigation duration per wheel line set was 11.0 hours. Grain crops were irrigated for 11.0 hours per irrigation set. Grain crops were irrigated 6 times from from 4/10-7/10. Alfalfa crops were irrigated for 11 hours per irrigation set. Alfalfa crops were irrigated 9 to 10 times from 4/10-9/17. We propose to reduce the irrigation duration per irrigation set to a maximum of 9.0 hours throughout the irrigation season in 2022 yielding an 18.2% reduction in ground water use compared to 2020 ( $9.00/11.00=18.2\%$ ). The reduction in irrigation duration per rotation reduces the volume of ground water used for irrigation by 18.2% (see attached chart) throughout the irrigation season. We will either install a timer to turn the pump off or keep a manual log of the length of irrigation sets.

3.) In 2020, the Black Ranch irrigated with the irrigation pressure set at 61 psi for wheel line irrigation use. In 2022 we propose to reduce the pump pressure to 52 psi for Wheel line use. This reduces the per nozzle output from 6.85 gpm to 6.31 gpm, which yields a 7.9% reduction in ground water used (see attached chart). The reduction in irrigation as a result of this measure will reduce the volume of water used monthly throughout the irrigation season. The pressure at the pump will remain at 52 PSI or less throughout the season as verified by a pressure gage.

The above commitments result in a 30+% reduction of groundwater use compared to 2020 usage estimates, a year where Black Ranch made voluntary reductions of ground water used through cropping selection and acreage irrigated. The methods selected will result in daily reductions that compound to monthly reductions that will be in effect through the irrigation season resulting in an annual reduction of 30% compared to 2020. To the extent surface water is available by the Scott Valley Irrigation District, the cumulative surface water volume

*Black Ranch*



will not be used to increase volume of water used in the 2022 irrigation season over the volume of water used in the baseline 2020 irrigation season. Surface water will not be used to replace conserved groundwater as a part of this local cooperative solution during 2022.

Black Ranch will also use ground water for fire protection and fish and wildlife by maintaining a reservoir on the eastern portion of the property. The reservoir is heavily used by wildlife as drinking water and habitat including use by Western Pond Turtles and Greater Sandhill Cranes. It is the only source of water for wildlife east of Eastside road for miles in any direction during summer months of drought years. No irrigation will occur from the reservoir and it will be maintained at 50% capacity unless actively used for fire protection. The reservoir was the only source of water for fire protection over the least two years and has been used numerous times as a source of water by helicopters while fighting fire.

Thank you,

Gary Black

Black Ranch

# **BINDING AGREEMENT**



## SISKIYOU RESOURCE CONSERVATION DISTRICT

P.O. Box 268, Etna, CA 96027

PHONE (530) 467-3975 FAX (530) 467-5617

Email: [sisqred@sisqtel.net](mailto:sisqred@sisqtel.net)

Website: [www.siskiyoured.com](http://www.siskiyoured.com)

### Binding Agreement

#### Contractor Contact Information:

Business:	Siskiyou RCD
Contact Person:	Chris Voigt
Address:	P.O. BOX 268/450 Main St., Etna, CA 96027
Phone:	530-467-3975
Email:	Chris@siskiyourcd.com

#### Landowner Contact Information:

Business:	Black Ranch
Contact Person:	Gary Black
Address:	[REDACTED]
Phone:	[REDACTED]
Email:	[REDACTED]

#### Background

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) and Siskiyou Resource Conservation District (SRCD) 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.





## SISKIYOU RESOURCE CONSERVATION DISTRICT

P.O. Box 268, Etna, CA 96027

PHONE (530) 467-3975 FAX (530) 467-5617

Email: [sisqred@sisqtel.net](mailto:sisqred@sisqtel.net)

Website: [www.siskiyourcd.com](http://www.siskiyourcd.com)

### Recitals

1. Section 875(f)(4)(D) of the drought emergency regulation provides a specific type of LCS that was determined to be sufficient for approval by the Deputy Director;
2. For overlying or adjudicated groundwater diversions for irrigated agriculture described in sections 875.5(f)(4)(D)(i)-(iii) [Scott River], the Deputy Director may approve a groundwater-basin-wide, groundwater sub-basin-wide, or any number of individual local cooperative solutions totaling at least 400 acres where:
  - i. The proposal is based on a binding agreement. "Such binding agreement may be made with a coordinating entity with the expertise and ability to evaluate and require performance of the agreement, for example with the California Department of Fish and Wildlife (CDFW), the National Marine Fisheries Service, the Scott Valley and Shasta Valley Watermaster District, a non-profit organization with expertise and experience in water-saving transactions or similarly qualified entity."
  - ii. For the Scott River: "The proposal provides at least: 1) a net reduction in water use of 30 percent throughout the irrigation season (April 1-October 31), as compared to the prior irrigation season; and 2) a monthly reduction of at least 30% in the July 1 through October 31 period, as compared to the prior year or 2020. Such reduction 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. 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."

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





## SISKIYOU RESOURCE CONSERVATION DISTRICT

P.O. Box 268, Etna, CA 96027

PHONE (530) 467-3975 FAX (530) 467-5617

Email: [sisqrcd@sisqtel.net](mailto:sisqrcd@sisqtel.net)

Website: [www.siskiyourcd.com](http://www.siskiyourcd.com)

### **Binding Agreement Terms**

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

- For the duration of this binding agreement where SRCD is the coordinating entity, the Landowner shall give SRCD 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 SRCD shall provide pre-notification to, and shall obtain approval by the Landowner before accessing the property.
- SRCD 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 SRCD 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.
- SRCD 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. SRCD 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





## SISKIYOU RESOURCE CONSERVATION DISTRICT

P.O. Box 268, Etna, CA 96027

PHONE (530) 467-3975 FAX (530) 467-5617

Email: [sisqrcd@sisqtel.net](mailto:sisqrcd@sisqtel.net)

Website: [www.siskiyoured.com](http://www.siskiyoured.com)

and SRWCB. If a Landowner requests SRCD assistance with an updated LCS, the SRCD and Landowner will enter into a new Binding Agreement and,

### **Payment**

In consideration for the services to be performed by SRCD, the Landowner agrees to pay SRCD at the rate of \$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 SRCD for expenses that are attributable directly to work performed under this Agreement. Any expenses incurred will be approved by the Landowner beforehand. SRCD will submit an itemized statement of Contractor's expenses attached with invoicing.

### **Terms of Payment**

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

### **Term of Agreement**

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

- November 1, 2022, or
- The date a party terminates the binding agreement.
- Monitoring information will be collected by the SRCD and shared with State Water Board as a field report in accordance with their reporting schedule or upon request
- SRCD 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





**SISKIYOU RESOURCE CONSERVATION DISTRICT**

P.O. Box 268, Etna, CA 96027

PHONE (530) 467-3975 FAX (530) 467-5617

Email: [sisqrcd@sisqtel.net](mailto:sisqrcd@sisqtel.net)

Website: [www.siskivourcd.com](http://www.siskivourcd.com)

**Signatures**

*Chris Vangit*

\_\_\_\_\_  
SRCD Representative

*4/11/2022*

\_\_\_\_\_  
Date

*[Signature]*

\_\_\_\_\_  
Landowner

*4/6/2022*

\_\_\_\_\_  
Date

# **SUPPORTING INFORMATION**



# Overview

*Black Ranch*

Customer(s): ~~D AND D BLACK 2ND FAMILY LIMITED PARTNERSHIP~~

District: SISKIYOU RESOURCE CONSERVATION DISTRICT

Farm# 551 Tract# 4212

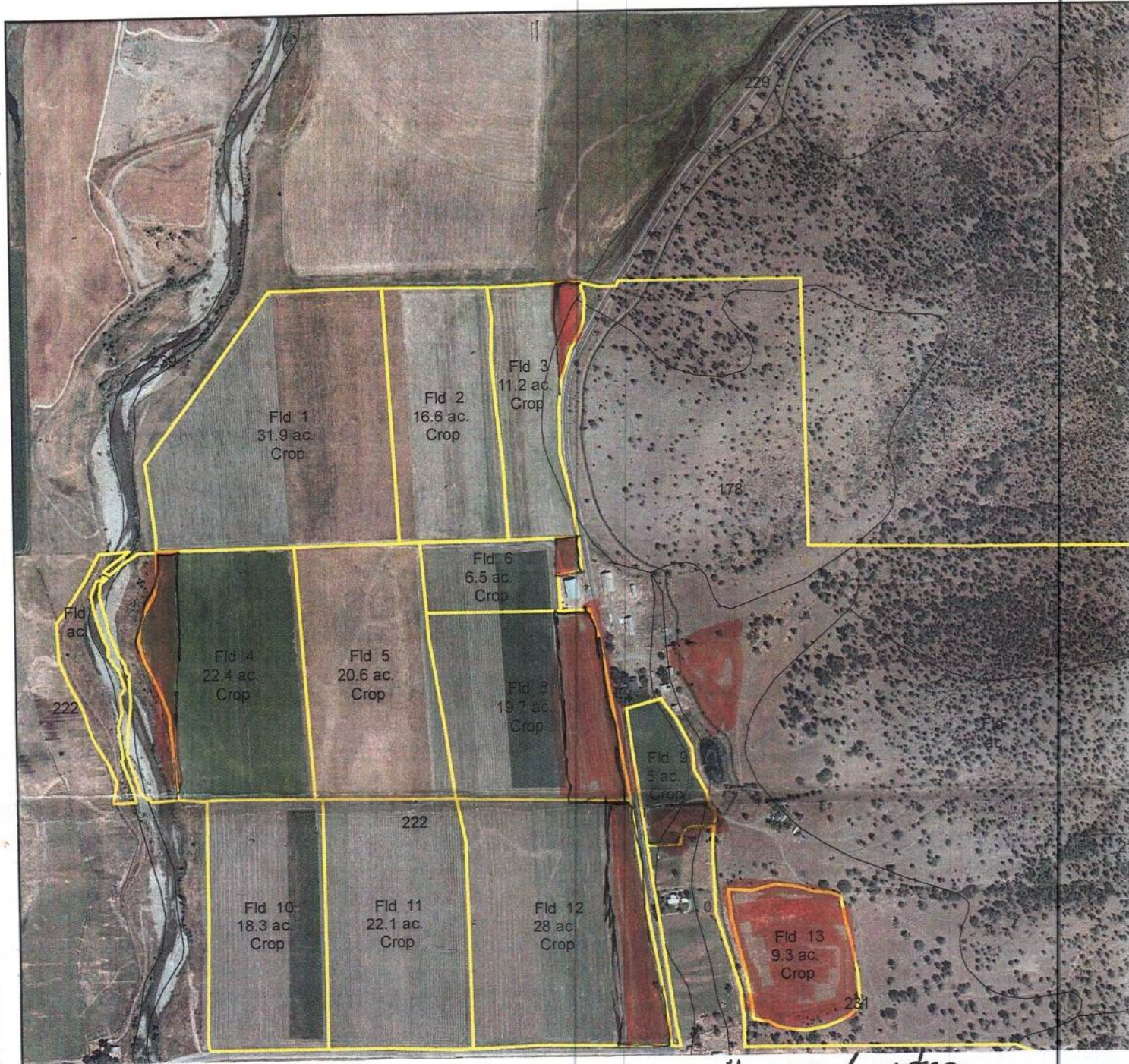
Scale: 9,000


1"=750 feet

Field Office: YI

Agency: USDA

Assisted By: H



 = Areas Slated for No irrigation in 2022 with groundwater



## SPRINKLER IRRIGATION— APPLICATION RATES AND DEPTHS

by Thomas W. Ley, Extension Irrigation Engineer, WSU Prosser

### Procedure

1. Measure sprinkler pressure (psi) using Pitot gauge. Hold gauge in center of jet no more than 1/8" from nozzle face.
2. Measure sprinkler discharge (gallons per minute) using a 5-gallon bucket, hose, and watch. Sprinkler gpm equals 300 divided by time (seconds) to fill 5-gallon bucket. For 2-nozzle heads, measure both.
3. Record nozzle size(s) and check nozzles for wear by inserting shank end of a new drill bit (same size as nozzle) into operating sprinkler. Observe any leakage or spray (amount and distance). Fine-to-coarse spray up to 10 to 15 feet from head may mean at least 15% nozzle wear or 15% more water being discharged.
4. Repeat steps 1, 2, and 3 for at least 3 sprinklers (beginning, middle, and end) on hand, wheel, and permanent systems to get average for lateral. Do same for center pivot, and record sprinkler number.
5. Measure sprinkler spacing on lateral (ft) and lateral spacing on mainline (ft) for handlines, wheel-lines, and permanent systems. Determine total

area irrigated and design or actual gallons (gpm) for center pivots.

6. Compare measured data (nozzle size, pressure, and gpm) with theoretical data in Table 1. Measured discharge vs discharge in Table 1 (at same nozzle size and pressure) indicates amount of nozzle wear. If nozzles are new and pressure is known, use Table 1 to find discharge of sprinkler. For pivots, compare sprinkler number and measured data with pivot design package to determine if pressures and discharges are correct.
7. Average gross application rates for different sprinkler gpm and spacings are given in Table 2. For other spacings or gpm use:

$$\text{Gross Application Rate (inches/hour)} = \frac{\text{GPM} \times 96.3}{\text{sprinkler spacing} \times \text{lateral spacing (or area irrigated, sq ft)}}$$

*Example: 6 gpm heads on 40 x 60 spacing*

$$\text{Average Gross Appl Rate} = \frac{6 \times 96.3}{40 \times 60} = 0.24 \text{ in/hr (or use Table 2)}$$

**Table 1. Sprinkler discharge gpm (gallons per minute) for nozzle size (inches) and pressures (psi) (pounds per square inch).**

psi	Nozzle Size (in)										
	3/32	7/64	1/8	9/64	5/32	11/64	3/16	13/64	7/32	15/64	1/4
20	1.17	1.60	2.09	2.65	3.26	3.92	4.69	5.51	6.37	7.32	8.34
25	1.31	1.78	2.34	2.96	3.64	4.38	5.25	6.16	7.13	8.19	9.32
30	1.44	1.95	2.56	3.26	4.01	4.83	5.75	6.80	7.86	8.97	10.21
35	1.55	2.11	2.77	3.50	4.31	5.18	6.21	7.30	8.43	9.69	11.03
40	1.66	2.26	2.96	3.74	4.61	5.54	6.64	7.80	9.02	10.35	11.79
45	1.76	2.39	3.13	3.99	4.91	5.91	7.03	8.30	9.60	10.99	12.50
50	1.85	2.52	3.30	4.18	5.15	6.19	7.41	8.71	10.10	11.58	13.18
55	1.94	2.64	3.46	4.37	5.39	6.48	7.77	9.12	10.50	12.15	13.82
60	2.03	2.76	3.62	4.50	5.65	6.80	8.12	9.56	11.05	12.68	14.44
65	2.11	2.88	3.77	4.76	5.87	7.06	8.45	9.92	11.45	13.21	15.03
70	2.19	2.99	3.91	4.96	6.10	7.34	8.78	10.32	11.95	13.70	15.59
75	2.27	3.09	4.05	5.12	6.30	7.58	9.08	10.66	12.32	14.19	16.14
80	2.35	3.19	4.18	5.29	6.52	7.84	9.39	11.02	12.74	14.64	16.67
85	2.42	3.29	4.31	5.45	6.71	8.07	9.67	11.35	13.11	15.10	17.18
90	2.49	3.38	4.43	5.61	6.91	8.31	9.95	11.69	13.51	15.53	17.68
100	2.62	3.57	4.67	5.91	7.29	8.76	10.50	12.32	14.23	16.37	18.64
110	2.75	3.74	4.89	6.19	7.63	9.24	11.00	12.90	14.97	17.17	19.55
120	2.87	3.91	5.10	6.46	7.97	9.65	11.48	13.47	15.63	17.93	20.42
130	2.99	4.07	5.31	6.72	8.30	10.04	11.95	14.02	16.27	18.66	21.25

Note: Figures given are approximate maximum discharge rates for given nozzle size and pressure.



8. Table 3 gives the average *net* depth of irrigation for different set times and application rates assuming a 70% application efficiency. For efficiencies other than 70%, multiply the values in Table 3 by the factors given in Table 4.

Example: 0.24 in/hr application rate  
70% efficiency  
12-hour set

$$\text{Av Net Depth} = (0.24 \text{ in/hr}) \times (12 \text{ hr}) \times 70\% = 2.02 \text{ in (or use Table 3)}$$

If 80% efficiency, multiply by 1.14 (from Table 4)

$$\begin{aligned} \text{Av Net Depth (at 80\% efficiency)} &= 1.14 \times 2.02 \\ &= 2.3 \text{ in} \end{aligned}$$

Example: Center pivot: 1,200 gpm system on 130 acres; 24-hour revolution; 80% efficiency.

$$\text{Av Gross Application Rate} = \frac{1,200 \times 96.3}{130 \text{ ac} \times 43,560 \text{ sq ft/ac}} = 0.02 \text{ in/hr}$$

$$\text{Av Net Depth} = (0.02 \text{ in/hr}) \times (24 \text{ hr}) \times 80\% = 0.38 \text{ in}$$

**Table 2. Average gross application rate (in/hr).**

Spacing (ft)	Gallons per minute from each sprinkler									
	1	2	3	4	5	6	7	8	9	10
20 x 20	0.24	0.48	0.72	0.96	1.20	1.44	1.70	1.93	2.16	2.40
20 x 30	.16	.32	.48	.64	0.80	0.96	1.12	1.28	1.43	1.60
20 x 40	.12	.24	.36	.48	.60	.72	0.84	0.96	1.08	1.20
30 x 30	.11	.21	.32	.43	.54	.64	.75	.86	0.96	1.07
30 x 40	.08	.16	.24	.32	.40	.48	.56	.64	.72	0.80
30 x 50	.06	.13	.19	.25	.32	.38	.45	.51	.58	.64
40 x 40	.06	.12	.18	.24	.30	.36	.42	.48	.54	.60
40 x 50	.05	.10	.14	.19	.24	.29	.34	.38	.43	.48
40 x 60	0.04	0.08	0.12	0.16	0.24	0.24	0.28	0.32	0.36	0.40

**Table 3. Net applied depth (in) at 70% efficiency.**

Set time (hrs)	Application rate (in/hr)											
	0.10	0.12	0.14	0.16	0.18	0.20	0.24	0.28	0.32	0.36	0.45	0.60
1	.07	.08	.10	.11	.13	.14	.17	.20	.22	.25	.32	.42
2	.14	.17	.20	.22	.25	.28	.34	.39	.45	.50	.63	0.84
3	.21	.25	.29	.34	.38	.42	.50	.59	.67	0.76	0.95	1.26
4	.28	.34	.39	.45	.50	.56	.67	.78	0.90	1.01	1.26	1.68
5	.35	.42	.49	.56	.63	.70	0.84	0.98	1.12	1.26	1.58	2.10
6	.42	.50	.59	.67	.76	.84	1.01	1.18	1.34	1.51	1.89	2.52
7	.49	.59	.69	.78	0.88	0.98	1.18	1.37	1.57	1.76	2.21	2.94
8	.56	.67	.79	0.90	1.01	1.12	1.34	1.57	1.79	2.02	2.52	3.36
9	.63	.76	.88	1.01	1.13	1.26	1.51	1.76	2.02	2.27	2.84	3.78
10	.70	0.84	0.98	1.12	1.26	1.40	1.68	1.96	2.24	2.52	3.15	4.20
12	0.84	1.01	1.18	1.34	1.51	1.68	2.02	2.35	2.69	3.02	3.78	5.04
18	1.26	1.51	1.76	2.02	2.27	2.52	3.02	3.53	4.03	4.54	5.67	7.56
24	1.68	2.02	2.35	2.69	3.02	3.36	4.03	4.70	5.38	6.05	7.56	10.08
36	2.52	3.02	3.53	4.03	4.54	5.04	6.05	7.06	8.06	9.07	11.34	15.12
48	3.36	4.03	4.70	5.38	6.05	6.72	8.06	9.41	10.75	12.10	15.12	20.16

**Table 4. Adjustment factor to use with values in Table 3 for other than 70% efficiency.**

Efficiency	Multiply by	Efficiency	Multiply by
55	0.79	75	1.07
60	0.86	80	1.14
65	0.93	85	1.21



Black Ranch 2020	Acreage	Crops in 2020	Inches per rotation in 2020	# of Rotations	Annual Application/Feet	AFA per field
Field #1A	16	Alfalfa	5.41	10	4.51	72.18
Field #1	15.9	Aflalfa	5.41	10	4.51	71.72
Field #2	16.6	Grain Hay	5.41	6	2.71	44.93
Field #3	11.2	Grain Hay	5.41	6	2.71	30.31
Field #4	22.4	Barley	5.41	6	2.71	60.63
Field #5	20.6	Alfalfa	5.41	9	4.06	83.63
Field #6 and 8	26.2	Barley	5.41	6	2.71	70.91
Field #9	5	Barley	5.41	6	2.71	13.53
Field #10	16.3	Alfalfa	5.41	10	4.51	73.53
Field #11	22.1	Alfalfa	5.41	9	4.06	89.72
Field #12	28	Grain Hay	5.41	6	2.71	75.78
Field #13	9.3	Fallow	5.41	0		0.00
Field #14	7.1	Fallow	5.41	0		0.00
Total	200.3					686.88

In 2020, 200.3 acres were irrigated with wheel lines 11/64" nozzles operating at 61 PSI or 6.85 gpm per nozzle, which applies .2805" per hour at 60% efficiency or 5.14" per 11.0 hr set

Black Ranch 2022	Acreage	Crops in 2022	Inches per rotation in 2022	# of Rotations	Annual Application/feet	AFA per field
Field #1A	13	Alfalfa	3.92	9	2.94	38.18
Field #1	19	Grain hay	3.92	6	1.96	37.20
Field #2	16.6	Alfalfa	3.92	9	2.94	48.75
Field #3	10	Alfalfa	3.92	9	2.94	29.37
Field #4	17	Alfalfa	3.92	9	2.94	49.93
Field #5	24	Grain hay	3.92	6	1.96	46.99
Field #6 and 8	21	Alfalfa	3.92	9	2.94	61.67
Field #9	4.5	Grain Hay	3.92	6	1.96	8.81
Field #10	16.3	Alfalfa	3.92	9	2.94	47.87
Field #11	22.1	Alfalfa	3.92	9	2.94	64.90
Field #12	24	Alfalfa/Grain hay	3.92	6.3	2.06	49.34
Field #13	9.3	Fallow	3.92	0	0.00	0.00
Field #14	7.1	Fallow	3.92	0	0.00	0.00
Total	187.5					483.01

In 2022, 187.5 acres will be irrigated with wheel lines using 11/64" nozzles operating at 52 PSI or 6.31 gpm per nozzle, which applies .248" per hour at 60% efficiency or 3.72" per 9.0 hr set





**REDUCE IRRIGATION PRESSURE IN WHEEL LINES FROM 61 PSI IN 2020 TO 52 PSI IN 2022**

Total acres where Irrigation Pressure will be reduced 187.50  
 % Total Acres where pressure will be reduced 93.61%

	2020 Wheel line (baseline) AF	2022 PSI Water Reduction AF	2022 Wheelline Monthly Water Use AF (with 11 hour sets)	% Reduction
April	93.61	7.40	86.21	7.9
May	131.05	10.35	120.70	7.9
June	131.05	10.35	120.70	7.9
July	121.69	9.61	112.08	7.9
August	102.97	8.13	94.84	7.9
September	65.53	5.18	60.35	7.9
<b>Total</b>	<b>645.91</b>	<b>51.03</b>	<b>594.88</b>	<b>7.9</b>

This conservation measure will occur on all fields (total of 187.5 acres) receiving irrigation from ground water throughout the season  
 Reduce irrigation pressure in wheel lines from 61 psi (produces 6.85 gallons per nozzle) to 52 psi (produces 6.31 gallons per nozzle)  
 6.31gpm/6.85gpm=7.9% reduction in volume of water per nozzle  
 Number of irrigation rotations will not increase compared to 2020

**REDUCE IRRIGATION DURATION SETS ON WHEELINES FROM 11.00 HRS IN 2020 TO 9.00 HRS IN 2022**

TOTAL ACRES WHERE IRRIGATION DURATION IS REDUCED in 2022 187.50  
 % OF TOTAL ACRES WHERE DURATION WAS REDUCED 93.61%

Reduce all sets from 11.0 hours in 2020 to a maximum of 9.0 hours in 2022, resulting in a 18.2% reduction in groundwater use (9.00 hrs/11.00-1.0=18.2%)

Reduce Duration of Irrigation Sets	2022 Wheel line AF (with 11 hour sets)	2022 Shortened Set Reduction AF	2022 Wheel line Monthly Water Use AF	% Reduced
April	86.21	15.69	70.52	18.2
May	120.70	21.97	98.73	18.2
June	120.70	21.97	98.73	18.2
July	112.08	20.40	91.68	18.2
August	94.84	17.26	77.58	18.2
September	60.35	10.98	49.37	18.2
<b>Total</b>	<b>594.88</b>	<b>108.27</b>	<b>486.61</b>	<b>18.2</b>

This conservation measure will occur on all fields (total of 187.5 acres) receiving irrigation from ground water throughout the season  
 Number of irrigation rotations will not increase compared to 2020



**ACRES NOT IRRIGATED WITH GROUNDWATER IN 2022 COMPARED TO 2022**

Acres not irrigated with ground water/Fallow in 2022 compared to 2020 12.80  
 Not irrigated with ground water % Total Acres 100.00%

	2020 AF Irrigated with ground water on 12.8 fallow acres	2022 Fallowing Reduction AF	2022 Fallowing Monthly Water Use AF
April	8.00	8.00	0.00
May	9.00	9.00	0.00
June	7.00	7.00	0.00
July	10.00	10.00	0.00
August	8.00	8.00	0.00
September	7.00	7.00	0.00
<b>Total</b>	<b>49.00</b>	<b>49.00</b>	<b>0.00</b>

If surface water from SVID is used on all or a portion of the 12.8 acres not irrigated with ground water in 2022, it will not be more than the volume of surface water used in 2020  
 The 12.8 acres included in this conservation measure was irrigated with groundwater in 2020 but will not be irrigated with ground water in 2022.