

TECHNICAL MEMORANDUM

To: Marti Holland
Reclamation District 2035

From: Davids Engineering, Inc.

Date: 3/27/2024

Subject: **Water Rate Analysis**

1 Executive Summary

The purpose of this Technical Memorandum (TM) is to document the development of updated water rates for Reclamation District 2035 (RD 2035) and to summarize supporting analyses performed by Davids Engineering (DE). Using the same method of analysis previously done, all lands that could receive RD 2035 water are charged Administrative costs and only lands that are receiving water are charged the water delivery costs. The Administrative Rate is designed to recover RD 2035 operating costs when temporary land idling (fallowing) occurs. This results in two rates as described below.

1. Administrative Rate – Fixed costs that are shared equally among all lands that could be irrigated whether or not they are actually irrigated.
2. Water Delivery Rate – Variable costs associated with water delivery that are shared equally among the lands actually irrigated, prorated according to the amounts of water used by different crops and for decomp.

Table 1 shown below, compares the updated water delivery rates by crop to the current Master Water Delivery Rates. The updated rates averaged across all crops are \$26.74 per acre higher (Excluding Decomp). A breakdown of the costs and delivered water volumes used in the analysis is provided in the next section followed by a description of the analyses for development of the Administrative Rate and Water Delivery Rate.

2 Cost and Volume Summary

Historical monthly RD 2035 line-item costs for calendar years 2019 through 2023 were provided by Marti Holland via email correspondence, and then assigned to the same rate from previous analyses. An annual summary of all the itemized costs is provided in Appendix A. Pump Fuel and Utilities line items were assigned to the Water Delivery Rate. Reimbursement from the Western Area Power Administration (WAPA) was credited to the Water Delivery Rate. The remaining items were assigned to the Administrative Rate. The Water Delivery costs were further divided by season, so that those occurring in the winter months (November through February) were assigned to water delivery associated with decomp and those occurring during the irrigation season (March through October) were assigned to the water delivery associated with crop production. Table 2 summarizes the total cost used in each of the analyses. Approximately 74% of the historical costs are assigned to the Administrative Rate, 18% to the Water Delivery Rate and 8% to Water Delivery Rate for decomp.

Table 1. Updated Water Rates Compared to Current Master Water Delivery Rate Sheet

Crop	Administrative Rate	Water Delivery Rate	Total New Water Rate	Current Master Water Delivery Rate	Estimated Rate Increase (Decrease)
RICE	\$77.64	\$33.41	\$111.05	\$82.23	\$28.83
SWEET RICE	\$77.64	\$32.01	\$109.65	\$80.83	\$28.83
WILD RICE	\$77.64	\$30.71	\$108.35	\$79.53	\$28.83
ALFALFA	\$77.64	\$33.73	\$111.38	\$82.47	\$28.91
CORN	\$77.64	\$19.36	\$97.00	\$71.87	\$25.13
SOD	\$77.64	\$36.50	\$114.14	\$84.50	\$29.64
TOMATOES	\$77.64	\$25.59	\$103.24	\$76.46	\$26.77
SUDAN	\$77.64	\$20.66	\$98.30	\$72.83	\$25.47
VINE SEED	\$77.64	\$25.18	\$102.83	\$76.16	\$26.66
BEANS	\$77.64	\$17.16	\$94.81	\$70.25	\$24.56
SQUASH/PUMPKINS	\$77.64	\$25.18	\$102.83	\$76.16	\$26.66
MELONS	\$77.64	\$25.18	\$102.83	\$76.16	\$26.66
SUNFLOWER	\$77.64	\$20.66	\$98.30	\$72.83	\$25.47
OATS/WHEAT	\$77.64	\$7.13	\$84.78	\$62.86	\$21.92
DECOMP*	\$ -	\$ -	\$25.00	\$25.00	\$ -

*Admin cost already paid.

Table 2. Cost Summary for 2019 through 2023

Cost Item	2019	2020	2021	2022	2023	Notes
Admin Costs	\$1,105,681	\$1,043,084	\$995,398	\$1,041,634	\$1,069,693	All Costs except Pump Fuel and Utilities (Jan – Dec)
Water Delivery Cost (Summer Crops)	\$ 185,141	\$ 186,344	\$ 206,139	\$ 346,787	\$ 360,704	Pump Fuel and Utilities minus WAPA Reimbursements (Mar - Oct)
Water Delivery Costs (Winter Decomp)	\$ 86,077	\$ 106,965	\$ 96,107	\$ 135,862	\$ 159,192	Pump Fuel and Utilities minus WAPA Reimbursements (Nov - Feb)
Total Cost	\$1,376,899	\$1,336,393	\$1,297,644	\$1,524,283	\$1,589,589	All Costs minus WAPA Reimbursements

Historical monthly water supply volumes were provided by Marti Holland and Jessie Clark and divided into two groups: water volumes associated with pump and fuel financed by RD 2035 and water volumes associated with pump and fuel financed by Conaway Ranch. Volumes and costs financed by Conaway Ranch were excluded from the rate development analysis consistent with previous analyses. The total water supply was multiplied by the 95% distribution system efficiency to estimate the volume of water delivered to customers. The distribution system efficiency was based on a comparison of the estimated delivery volume, discussed above, and the crop consumptive use. Table 3 provides a summary of water supply volumes and estimated water delivery volumes that were used in the analyses. The Delivery

Volume Summary (financed by RD 2035) was used to develop the crop water delivery rates as described in a subsequent section.

3 Administrative Rate Development

The Administrative Rate was calculated by dividing the total water delivery cost excluding pump fuel and utilities by the total land area that could be irrigated in RD 2035 (13,498 acres). The total land area was provided by RD 2035 staff in previous analyses. The average Administrative Rate for the 2019-2023 period is \$77.64 per acre (highlighted yellow in Table 4).

Table 3. Water Volume Summary for 2019 through 2023 (all values in acre-feet)

Water Types	2019	2020	2021	2022	2023
Surface Water	24,255	40,121	26,051	15,658	33,006
Ground Water	8,738	18,944	16,629	21,529	17,029
Total Water Supply	32,993	59,065	42,680	37,187	50,035
Total Water Supply (Financed by RD 2035)	24,255	40,121	26,051	15,658	33,006
Total Water Supply Summer (Financed by RD 2035)	22,791	30,720	18,680	8,665	25,178
Total Water Supply Winter (Financed by RD 2035)	1,464	9,401	7,371	6,993	7,828
Delivery Volume Summer (Financed by RD 2035)*	21,651	29,184	17,746	8,232	23,919
Delivery Volume Winter (Financed by RD 2035)*	1,391	8,931	7,002	6,643	7,437

*Conveyance Efficiency of 90% not applied to recycled water

Table 4. Administrative Rate Analysis*

Item	2019	2020	2021	2022	2023	Average
Administrative Cost	\$1,105,681	\$1,043,084	\$995,398	\$1,041,634	\$1,069,693	\$1,048,054
Administrative Cost Per Acre	\$81.91	\$77.28	\$73.74	\$77.17	\$79.25	\$77.64

*Assumes total area of 13,498 acres

4 Water Delivery Rate Analysis

The Water Delivery Rate for each crop was developed based on historical cropping, and average ET of applied water and on-farm irrigation efficiency by crop (Table 5). Historical cropping was provided by RD 2035. ET of applied water estimates were based on values reported by the California Department of Water Resources (DWR) Simetaw application that are used in various modeling efforts¹. Average irrigation season (March through October) ET of applied water was calculated by Simetaw based on a 2000-2014 period of record. For the purposes of this TM, the ET of applied water values were held constant from the 2019 Water Rate Analysis. Estimated efficiencies of 65% for rice crops and 75% for non-rice crops result in total delivered water volumes approximately matching the reported water supplies multiplied by 95% to account for distribution system losses. The Sweet Rice and Wild Rice rates were decreased from the rice rate proportionately based on current master rate sheet values to account

¹ <https://data.cnra.ca.gov/dataset/cal-simetaw-unit-values>

for their relatively short irrigation season compared to other rice varieties. This was done since there was only one rice variety reported in DWR Simetaw ET of applied water data. The water delivery rate in \$/acre is calculated so that the approximate cost of water in \$/AF is the same for all the crops. Thus, the crops paying the highest rate (in \$/Acre) receive the most water.

Table 5. Crop Water Delivery Rates

Crop	Simetaw ETaw, inches	On-Farm Efficiency	Water Duty, Inches	Water Delivery Rate (\$/Acre)						Final Rates
				2019	2020	2021	2022	2023	Average*	
Rice	30.54	65%	47.0	\$31.57	\$17.54	\$23.78	\$34.24	\$36.45	\$33.41	\$33.41
Sweet Rice	30.54	65%	47.0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$32.01
Wild Rice	30.54	65%	47.0	\$ -	\$17.54	\$ -	\$34.24	\$36.45	\$33.41	\$30.71
Alfalfa	35.58	75%	47.4	\$31.88	\$17.71	\$24.02	\$34.57	\$36.81	\$33.73	\$33.73
Corn	20.42	75%	27.2	\$18.30	\$10.16	\$13.78	\$ -	\$21.12	\$19.36	\$19.36
Sod	38.50	75%	51.3	\$ -	\$19.16	\$25.98	\$ -	\$39.82	\$36.50	\$36.50
Tomatoes	26.99	75%	36.0	\$24.19	\$13.44	\$18.22	\$26.23	\$27.92	\$25.59	\$25.59
Sudan	21.79	75%	29.1	\$ -	\$10.85	\$ -	\$ -	\$ -	\$20.66	\$20.66
Vine Seed	26.56	75%	35.4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$25.18
Beans	18.10	75%	24.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$17.16
Squash/Pumpkins	26.56	75%	35.4	\$23.80	\$13.22	\$17.93	\$25.81	\$27.48	\$25.18	\$25.18
Melons	26.56	75%	35.4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$25.18
Sunflower	21.79	75%	29.1	\$19.52	\$10.85	\$14.71	\$21.17	\$22.54	\$20.66	\$20.66
Oats/Wheat	7.52	75%	10.0	\$ -	\$ -	\$5.08	\$ -	\$ -	\$7.13	\$7.13

*The Average values are not the average of the Water Delivery Rates for each crop but are calculated by using the average for Irrigated Area, Delivered Volume, and Water Rate for each crop.

5 Decomp Water Delivery Rate Analysis

The Water Delivery Rate for decomp was estimated based on total water volumes delivered in the winter months (November through February) and an RD 2035 estimated land area of 5,685 acres applying decomp water (Table 6). This results in an average decomp rate of \$20.55 per acre. It is recommended that the existing rate of \$25.00 per acre be continued.

Table 6. Decomp Rate Analysis (based on an assumed area of 5,685 acres applying decomp water each year)

Item	2019	2020	2021	2022	2023	Average
Water Delivery Costs (Winter Decomp)	\$86,077	\$106,965	\$96,107	\$135,862	\$159,192	\$116,841
Water Delivery Cost Per Acre	\$15.14	\$18.82	\$16.91	\$23.90	\$28.00	\$20.55

6 Recommendations

After completing the 2019-2023 Water Rate Analysis and in an effort to further refine subsequent water rate analysis, DE recommends RD 2035 consider the following items:

1. The Simetaw dataset used as part of this analysis and the prior 2019 effort is limited and outdated. DE recommends a new ET analysis using OpenET or similar platform ahead of completing the next water rate analysis.
2. For the purposes of this water rate analysis, the water delivered to customers is estimated as a percentage of the total water supply. Implementation of turnout flow measurement would reduce the uncertainty with this assumption. While turnout flow measurement is a significant commitment, a phased approach is recommended and commonly adopted by water suppliers.
3. To help improve both the timeliness and accuracy of future water rate analysis, DE recommends development of an automated script that pulls the relevant data and post processes it in a repeatable and predictable manner. The upfront cost of script development is higher than this effort, but doing so would seek to streamline (time and cost) future efforts.

Appendix A. Annual Itemized Cost Summary (\$)

Item	2019	2020	2021	2022	2023
Regular Employees-WD	77,315	118,812	113,084	137,240	131,932
401K Contribution-WD	5,418	6,955	8,232	9,914	10,351
Payroll Taxes-FICA/Med - WD	6,548	9,751	8,905	10,271	11,160
Payroll Processing Exp - WD	1,071	2,000	1,616	1,725	2,027
Group Insurance - WD	14,699	14,884	13,837	17,048	15,622
Unemployment Ins. - WD	269	0	0	0	0
Workers Compensation - WD	6,515	14,408	12,155	17,847	18,123
Other Employee Benefits-WD	-93	0	0	0	0
Communications-WD	5,986	3,630	3,700	4,837	5,016
Insurance-WD	20,164	24,045	25,409	28,095	33,566
River Pump Intake-WD	150,360	154,427	160,003	192,542	189,051
Maintenance-Equip-WD	7,243	31,084	11,791	12,749	9,390
Maintenance-Bldgs. & Improvements-WD	1,910	537	3,147	1,677	2,416
Maintenance-Bldgs. & Grounds-WD	1,277	524	163	616	1,340
Maintenance Supplies-WD	3,704	1,884	2,086	6,213	8,831
Pump Maintenance-WD	55,862	37,843	30,750	15,716	38,937
General Maintenance-WD	655	1,052	0	0	0
Memberships-WD	22,212	44,119	40,658	43,417	29,278
Miscellaneous-WD	1,130	1,582	2,509	2,177	0
Office Expense-WD	1,875	5,336	2,427	3,088	4,343
Overhead-WD	4,104	957	2,106	2,618	4,469
Auditing & Fiscal Services-WD	9,628	20,874	19,846	10,710	10,760
Information Technology-WD	1,215	2,219	2,621	3,976	2,887
Legal Services-WD	14,846	23,993	17,070	19,259	29,474
Arch, Eng. & Planning - WD	56,034	5,387	2,025	399	0
Levee Maintenance-WD	8,075	0	0	711	0
Ditch Maintenance-WD	91,818	22,935	30,222	0	0
Lobbying-Fish Screen - WD	-16,000	0	0	0	0
SCADA Project-WD	15,194	3,724	206	4,058	6,800
Rents & Leases Equipment-WD	3,215	7,010	4,585	0	0
Transportation & Travel-WD	4,095	1,175	196	237	645
Pump Fuel-WD*	20,270	15,741	43,411	40,929	24,240
Vehicle Fuel-WD	4,781	4,755	5,117	6,696	5,896
Utilities-WD*	609,246	630,736	633,385	1,018,497	1,124,330
Interest Exp - Short term WD	0	405	2,073	1,407	1,017
Depreciation Exp-WD	524,556	476,777	468,859	486,391	496,363
Grand Total	\$1,424,914	\$1,352,618	\$1,324,051	\$1,407,115	\$1,512,111
WAPA Reimbursements	\$358,298	\$353,167	\$374,550	\$576,777	\$628,674
Total Annual Cost (Grand Total Minus WAPA Reimbursements)	\$1,376,899	\$1,336,393	\$1,297,644	\$1,524,283	\$1,589,589

*Water Delivery Rate (Variable) costs.