



WREDEN RANCH DAIRY

2023 Annual Report

<input checked="" type="checkbox"/> Report Form	<input type="checkbox"/> NA Attachment H
<input checked="" type="checkbox"/> Attachment A	<input type="checkbox"/> NA Attachment I
<input checked="" type="checkbox"/> Attachment B	<input type="checkbox"/> NA Attachment J
<input checked="" type="checkbox"/> Attachment C	<input type="checkbox"/> NA Manure Tracking Manifests
<input checked="" type="checkbox"/> Attachment D	<input type="checkbox"/> NA New or Revised Waste Water Agreements
<input checked="" type="checkbox"/> Attachment E	<input checked="" type="checkbox"/> X Groundwater Monitoring Samples
<input checked="" type="checkbox"/> Attachment F	<input type="checkbox"/> NA Monitoring Well Report
<input checked="" type="checkbox"/> Attachment G	<input type="checkbox"/> NA Owner/Operator Change Form

Enclosed are the required documents to be submitted to the Regional Water Quality Control Board Central Valley Region in compliance with Order No. R5-2010-0130 Waste Discharge Requirements, General Order for Dairies with Manure Anaerobic Digester or Co-Digester Facilities for July 1, 2024.

(See attached delivery confirmation)

Annual Report

Wreden Ranch Dairy 2023

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Facility Information:

Name of Dairy Wreden Ranch Dairy
Facility Address 8749 Lansing Avenue, Hanford CA 93230

Owner/Operator as of 12/31/2023

Operator Name EJ de Jong
Operator Phone (559) 816-5950
Owner Name EJ de Jong
Owner Phone (559) 816-5950

1. Beginning and end dates of the annual reporting period: crops harvested January 1, 2023 through December 31, 2023.
2. Maximum and average number and type of animals (see Attachment A).
3. Estimated amount of total manure and process wastewater generated by the facility (see Attachment A).
4. Estimated amount of total manure and process wastewater applied to each land application area (see Attachment B).
5. Quantified ratio of total nitrogen applied to land application areas and total nitrogen removed by crop harvest (see Attachment B).
6. Estimated amount of total manure and process wastewater transferred to other persons by the facility (see Attachment C).
7. Total number of acres and the Assessor Parcel Numbers for all land application areas that were not used for application of manure or process wastewater (see Attachment D).
8. Total number of acres and the Assessor Parcel Numbers for all land application areas that were used for land application of manure and process wastewater (see Attachment D).
9. Summary of manure and process wastewater discharges from the production area
Provide a summary of all manure and wastewater discharges from the production area to surface water or to land areas (land application areas or otherwise) when not in accordance with the facility's Nutrient Management Plan, that occurred during the annual reporting period, including the date, time, location, approximate volume, a map showing discharge and sample locations, rationale for sample locations, and method of measuring discharge flows:
 No discharges occurred during the reporting period.
 Yes. _____ Number of discharges occurred (see Attachment H).



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10. Summary of storm water discharges from the production area

Provide a summary of all storm water discharges from the production area to surface water, that occurred during the annual reporting period, including the date, time, approximate volume, duration, location, a map showing discharge and sample locations, rationale for sample locations, and method of measuring discharge flows:

- No discharges occurred during the reporting period.
 Yes. ____ Number of discharges occurred (see Attachment I).

11. Summary of discharges from the land application area

Provide a summary of all discharges from the land application area to surface water, that occurred during the annual reporting period, including the date, time, approximate volume, location, source of discharge (i.e. tailwater, wastewater or blended wastewater), a map showing discharge and sample locations, rationale for sample locations, and method of measuring discharge flows:

- No discharges occurred during the reporting period.
 Yes. ____ Number of discharges occurred (see Attachment J).

12. Nutrient Management Plan update

Has the NMP been updated, and if so, was it updated by a Certified Nutrient Management Specialist?

- No.
 Yes, the new NMP was developed and approved by a Certified Nutrient Management Specialist.

13. Manure/Process Wastewater Tracking Manifests

Did you sell, give away, or otherwise remove manure or process wastewater from your property?

- No.
 Yes, see attached manifests.

14. Written Agreements

Any process wastewater transferred to a third party that receives process wastewater from your dairy for its own use must have a written agreement consistent with State requirements. Attach copies of revised and/or new agreements not submitted previously. Do not resubmit agreements submitted previously.

- Not applicable; no written agreements.
 No changes in agreement(s).
 Yes, a new or revised agreement is attached.

15. Laboratory Analyses for Discharges

If you answered Yes to items #9, 10, or 11 above, attach copies of all laboratory analyses for all discharges (manure, process wastewater or tailwater), surface water (upstream and downstream of a discharge), and storm water, including chain-of-custody forms and laboratory quality assurance/quality control results, as applicable. (Results for Manure and process wastewater, storm water, and/or storm water are provided).

- Not Applicable.
 Yes, provided with Attachment H, I, or J for #9, 10 and 11, respectively.

16. Tabulated Nutrient Analytical Data

Attach tabulated analytical data for samples of manure, process wastewater, irrigation water, soil, and plant tissue. The data shall be tabulated to clearly show sample dates, constituents analyzed, constituent concentrations, and detection limits (see Attachment E).



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17. Record-Keeping Results

Attach results of the Record-Keeping Requirements for the production and land application areas specified in Record-Keeping Requirements. These include:

- * Records documenting any corrective actions taken to correct deficiencies noted as a result of the inspections required in the Monitoring Requirements. Deficiencies not corrected in 30 days must be accompanied by an explanation of the factors preventing immediate correction.
- * Records of the date, time, and estimated volume of any overflow or bypass of the wastewater storage or conveyance structures.
- * Expected and actual crop yields (see Attachment F).
- * Identification of crop, acreage, and dates of planting and harvest for each field (see Attachment F).
- * Dates, locations, and approximate weight and moisture content of manure applied to each field (see Attachment B).
- * Dates, locations, and volume of process wastewater applied to each field (see Attachment B).
- * Whether precipitation occurred, or standing water was present at the time of manure and process wastewater applications and for 24 hours prior to and following applications (see Attachment G).
- * Total amount of nitrogen, phosphorus, and potassium actually applied to each field, including documentation of calculations for the total amount applied (see Attachment B).

18. Groundwater Monitoring Section

Groundwater monitoring results are attached.

Monitoring Well results are attached, if applicable.

A. All dischargers must attach groundwater information for supply wells and subsurface (tile) drainage systems including the location of sample collection and all field and laboratory data, including all laboratory analyses (including chain-of-custody forms and laboratory quality assurance/quality control results).

B. Dischargers who have monitoring well systems shall include all laboratory analyses (including chain-of-custody forms and laboratory quality assurance/quality control results) and tabular and graphical summaries of the monitoring data. Data shall be tabulated to clearly show the sample dates, constituents analyzed, constituent concentrations, detection limits, depth to groundwater and groundwater elevations. Graphical summaries of groundwater gradients and flow directions shall also be included. Each groundwater monitoring report shall include a summary data table for all historical and current groundwater elevations and analytical results. The groundwater monitoring results shall be certified by a California registered professional.

19. Storm Water Reporting Section

No significant discharges of storm water occurred from the land application areas.

Yes, significant discharge(s) of storm water occurred from land application areas. The following information shall be submitted for those discharges.

It was not possible to collect any of the required samples or perform visual observations due to adverse climatic conditions.

20. Mortality Management Practices

* Dead cows are picked up and disposed of by rendering service.

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"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Signature of Operator of Facility

DocuSigned by:

119B1EE7CAF749B
Signature of Owner of Facility

Print Name

Print Name

Title and Date

Title and Date



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Estimated Manure and Nutrients Generated (Attachment A)

Animal Type	Maximum No. of Head	Average No. of Head*	Housing Type	Weight	Total Manure Produced (tons/year)	NITROGEN	PHOSPHORUS	POTASSIUM	SALTS
						Net (LB) Available for Land Application			
Hol Milk Cows	5,800	5,655	Milk Freestall - Flushed	1,400	143,517.61	2,043,434.25	350,892.75	474,737.25	3,727,719.45
Hol Dry Cows	760	741	Flushed	1,450	10,812.76	135,232.50	18,932.55	89,253.45	190,840.10
Hol Heifers(15-24)	2,100	2,047	Flushed	1,000	21,367.66	283,918.90	44,829.30	134,487.90	527,192.57
Hol Calves (0-3)	35	34	Calves Dry Scrape	210	117.90	248.20	124.10	496.40	298.71
	8,695	8,477			175,815.93	2,462,833.85	414,778.70	698,975.00	4,446,050.83

* The Average No. of Head is used to calculate manure and nutrient production

Estimated Amount of Total Process Wastewater and Nutrients Generated

Total Gallons of Process Wastewater Generated***	Average TKN Concentration (mg/L)*	Average Total Phosphorus Concentration (mg/L)*	Average Potassium Concentration (mg/L)*	Average Total Dissolved Solids (mg/L)*	Total Nitrogen Generated (lb)**	Total Phosphorus Generated (lb)**	Total Potassium Generated (lb)**	Total Salt Generated (lb)**
109,729,712	658.67	84.55	733.17	5,848.33	602,053.28	77,282.80	670,149.89	5,345,660.3

* The average Total Kjeldahl Nitrogen, Total Phosphorus, Total Potassium, and Total Salt concentrations are based on an average of all process wastewater sample results for the year.

** The total pounds of Nitrogen, Phosphorus, Potassium and Total Dissolved Solids generated = Average Concentration (mg/L) X Total Gallons of Wastewater Generated X 8.33 X 0.000001.

*** The total gallons of process wastewater generated is calculated as the total gallons of process wastewater applied to all land application areas (Attachment B) plus the total gallons of process wastewater transferred offsite (Attachment C).



Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR20

Wheat, 179 Acres Planted on 11/14/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
12/18/2022	Ground Water: Well Avg	4.00	Acre Inches	0.00		mg/L			0	0	0	36,980		
12/18/2022	Waste Water: Main Lagoon	0.50	Acre Inches	536.00	45.60	810.00	mg/L	2,430,310	10,851	924	16,398	155,073		
01/01/2023	Atmospheric Deposit	14.00	Pounds	100.00		%			2,506					
03/20/2023	Surface Water: Lakeside	4.00	Acre Inches	0.90		mg/L			145	0	0	14,576		
03/20/2023	Waste Water: Main Lagoon	0.75	Acre Inches	486.00	55.60	916.00	mg/L	3,645,465	14,759	1,688	27,817	161,855		
04/18/2023	Surface Water: Lakeside	4.30	Acre Inches	0.90		mg/L			158	0	0	15,670		
04/18/2023	Waste Water: Main Lagoon	0.50	Acre Inches	493.00	80.30	865.00	mg/L	2,430,310	9,981	1,625	17,512	128,148		
05/23/2023	Harvest	20.20	Tons	59.10	1.56	0.36	2.29 %						46,141	
Acre Inches Applied:		14.05		Totals:				8,506,084	38,399	4,237	61,726	512,302	46,141	
Season Nitrogen Ratio:		0.83		Lbs Per Acre:				215	24	345	2,862	258		

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR20

Corn, 179 Acres Planted on 07/02/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)	
06/14/2023	Surface Water: Lakeside	4.50	Acre Inches	0.90			mg/L			165	0	0	16,398		
06/14/2023	Waste Water: Main Lagoon	0.30	Acre Inches	651.00	46.90	604.00	mg/L		1,458,186	7,908	569	7,337	78,347		
07/20/2023	Surface Water: Lakeside	4.80	Acre Inches	0.90			mg/L			175	0	0	17,492		
08/07/2023	Surface Water: Lakeside	4.50	Acre Inches	0.90			mg/L			165	0	0	16,398		
08/07/2023	Waste Water: Main Lagoon	0.35	Acre Inches	651.00	46.90	604.00	mg/L		1,701,217	9,226	664	8,560	91,405		
08/24/2023	Surface Water: Lakeside	4.70	Acre Inches	0.90			mg/L			172	0	0	17,127		
09/08/2023	Surface Water: Lakeside	4.80	Acre Inches	0.90			mg/L			175	0	0	17,492		
09/20/2023	Surface Water: Lakeside	4.20	Acre Inches	0.90			mg/L			154	0	0	15,304		
09/20/2023	Waste Water: Main Lagoon	0.30	Acre Inches	699.00	40.90	712.00	mg/L		1,458,186	8,490	498	8,649	68,022		
10/02/2023	Surface Water: Lakeside	4.20	Acre Inches	0.90			mg/L			154	0	0	15,304		
10/30/2023	Harvest	27.00	Tons	69.30	1.04	0.21	1.01	%						30,861	
Acre Inches Applied:			32.65					Totals:		4,617,589	26,784	1,731	24,546	353,289	30,861
Season Nitrogen Ratio:			0.87					Lbs Per Acre:		150	10	137	1,974	172	



Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR13E

Wheat, 283 Acres Planted on 11/18/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
12/21/2022	Surface Water: Lakeside	4.20	Acre Inches	0.90		mg/L		243		0	0	0	24,196	
12/21/2022	Waste Water: Main Lagoon	0.35	Acre Inches	536.00	45.60	810.00	mg/L		2,689,633	12,008	1,022	18,149	171,620	
01/01/2023	Atmospheric Deposit	14.00	Pounds	100.00		%				3,962				
03/23/2023	Surface Water: Lakeside	4.20	Acre Inches	0.90		mg/L		243		0	0	0	24,196	
03/23/2023	Waste Water: Main Lagoon	0.60	Acre Inches	493.00	80.30	865.00	mg/L		4,610,800	18,936	3,085	33,224	243,122	
04/21/2023	Surface Water: Lakeside	4.40	Acre Inches	0.90		mg/L				255	0	0	25,348	
04/21/2023	Waste Water: Main Lagoon	0.35	Acre Inches	493.00	80.30	865.00	mg/L		2,689,633	11,045	1,800	19,380	141,823	
05/19/2023	Harvest	19.20	Tons	65.60	1.25	0.25	1.06							46,729
Acre Inches Applied:		14.10		Totals:				9,990,067	46,692	5,906	70,753	630,306	46,729	
Season Nitrogen Ratio: 1.00				Lbs Per Acre:				165		21	250	2,227	165	

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR13E

Corn, 283 Acres Planted on 07/04/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
				% Moist.	Nitrogen	Phos.	Potass.							
06/17/2023	Surface Water: Lakeside	4.50	Acre Inches		0.90					260	0	0	25,926	
06/17/2023	Waste Water: Main Lagoon	0.50	Acre Inches		651.00	46.90	604.00	mg/L		3,842,333	20,837	1,500	19,332	206,443
07/23/2023	Surface Water: Lakeside	4.70	Acre Inches		0.90			mg/L			272	0	0	27,077
08/10/2023	Surface Water: Lakeside	4.50	Acre Inches		0.90			mg/L			260	0	0	25,926
08/10/2023	Waste Water: Main Lagoon	0.42	Acre Inches		651.00	46.90	604.00	mg/L		3,227,560	17,504	1,262	16,239	173,411
08/27/2023	Surface Water: Lakeside	4.70	Acre Inches		0.90			mg/L			272	0	0	27,077
09/11/2023	Surface Water: Lakeside	4.50	Acre Inches		0.90			mg/L			260	0	0	25,926
09/23/2023	Surface Water: Lakeside	4.40	Acre Inches		0.90			mg/L			255	0	0	25,348
09/23/2023	Waste Water: Main Lagoon	0.30	Acre Inches		699.00	40.90	712.00	mg/L		2,305,400	13,423	787	13,675	107,543
10/05/2023	Surface Water: Lakeside	4.20	Acre Inches		0.90			mg/L			243	0	0	24,196
10/26/2023	Harvest	29.50	Tons	64.50	1.08	0.15	1.15	%						64,017
Acre Inches Applied:		32.72		Totals:					9,375,294	53,586	3,549	49,245	668,873	64,017
Season Nitrogen Ratio:		0.84		Lbs Per Acre:					189	13	174	2,364	226	



Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR19E

Wheat, 208 Acres Planted on 11/14/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
12/14/2022	Ground Water: Well Avg	4.00	Acre Inches	0.00		mg/L			0	0	0	42,971		
12/14/2022	Waste Water: Main Lagoon	0.50	Acre Inches	536.00	45.60	810.00	mg/L	2,824,047	12,609	1,073	19,055	180,197		
01/01/2023	Atmospheric Deposit	14.00	Pounds	100.00		%			2,912					
	Acre Inches Applied:	4.50					Totals:	2,824,047	15,521	1,073	19,055	223,167		
	Season Nitrogen Ratio:						Lbs Per Acre:			75	5	92	1,073	

Season Notes: Crop failure due to flooding.

Field Name: WR19E

Corn, 208 Acres Planted on 07/02/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
06/10/2023	Surface Water: Lakeside	4.50	Acre Inches	0.90		mg/L			191	0	0	19,055		
06/10/2023	Waste Water: Main Lagoon	0.30	Acre Inches	651.00	46.90	604.00	mg/L	1,694,428	9,189	661	8,526	91,040		
07/16/2023	Surface Water: Lakeside	4.80	Acre Inches	0.90		mg/L			204	0	0	20,326		
08/03/2023	Surface Water: Lakeside	4.50	Acre Inches	0.90		mg/L			191	0	0	19,055		
08/03/2023	Waste Water: Main Lagoon	0.35	Acre Inches	651.00	46.90	604.00	mg/L	1,976,833	10,720	772	9,947	106,213		
08/21/2023	Surface Water: Lakeside	4.70	Acre Inches	0.90		mg/L			200	0	0	19,901		
09/05/2023	Surface Water: Lakeside	4.80	Acre Inches	0.90		mg/L			204	0	0	20,326		
09/17/2023	Surface Water: Lakeside	4.20	Acre Inches	0.90		mg/L			179	0	0	17,784		
09/17/2023	Waste Water: Main Lagoon	0.30	Acre Inches	699.00	40.90	712.00	mg/L	1,694,428	9,865	578	10,051	79,042		
10/02/2023	Surface Water: Lakeside	4.20	Acre Inches	0.90		mg/L			179	0	0	17,784		
10/30/2023	Harvest	26.30	Tons	67.10	1.00	0.21	0.99	%						35,924
	Acre Inches Applied:	32.65					Totals:	5,365,690	31,123	2,011	28,523	410,525	35,924	
	Season Nitrogen Ratio:	0.87					Lbs Per Acre:			150	10	137	1,974	173



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Nutrient Applications (Attachment B)

Field Name: WR15N

Wheat, 232 Acres Planted on 11/17/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
12/23/2022	Ground Water: Well Avg	4.00	Acre Inches	0.00		mg/L			0	0	0	47,929		
12/23/2022	Waste Water: Main Lagoon	0.35	Acre Inches	536.00	45.60	810.00	mg/L	2,204,929	9,844	838	14,878	140,692		
01/01/2023	Atmospheric Deposit	14.00	Pounds	100.00		%			3,248					
03/22/2023	Surface Water: Lakeside	4.80	Acre Inches	0.90		mg/L			227	0	0	22,671		
03/22/2023	Waste Water: Main Lagoon	0.40	Acre Inches	486.00	55.60	916.00	mg/L	2,519,919	10,201	1,167	19,228	111,882		
04/13/2023	Surface Water: Lakeside	4.60	Acre Inches	0.90		mg/L			218	0	0	21,724		
04/13/2023	Waste Water: Main Lagoon	0.40	Acre Inches	493.00	80.30	865.00	mg/L	2,519,919	10,350	1,687	18,156	132,873		
05/19/2023	Harvest	19.85	Tons	69.80	1.68	0.37	1.87 %						46,729	
Acre Inches Applied:			14.55	Totals:				7,244,767	34,088	3,691	52,263	477,772	46,729	
Season Nitrogen Ratio:				Lbs Per Acre:				147	16	225	2,059	201		

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR15N

Corn, 232 Acres Planted on 06/20/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
				% Moist.	Nitrogen	Phos.	Potass.							
06/10/2023	Surface Water: Lakeside	4.50	Acre Inches		0.90					213	0	0	21,254	
06/10/2023	Waste Water: Main Lagoon	0.30	Acre Inches		651.00	46.90	604.00	mg/L		1,889,939	10,250	738	9,510	101,544
07/06/2023	Surface Water: Lakeside	4.80	Acre Inches		0.90			mg/L			227	0	0	22,671
07/23/2023	Surface Water: Lakeside	4.60	Acre Inches		0.90			mg/L			218	0	0	21,724
07/23/2023	Waste Water: Main Lagoon	0.35	Acre Inches		651.00	46.90	604.00	mg/L		2,204,929	11,957	861	11,094	118,468
08/09/2023	Surface Water: Lakeside	4.50	Acre Inches		0.90			mg/L			213	0	0	21,254
08/24/2023	Surface Water: Lakeside	4.75	Acre Inches		0.90			mg/L			225	0	0	22,434
08/24/2023	Waste Water: Main Lagoon	0.40	Acre Inches		651.00	46.90	604.00	mg/L		2,519,919	13,665	984	12,679	135,391
09/06/2023	Surface Water: Lakeside	3.50	Acre Inches		0.90			mg/L			165	0	0	16,530
09/17/2023	Harvest	27.00	Tons	68.80	0.96	0.37	2.11	%						37,329
Acre Inches Applied:		27.70		Totals:					6,614,787	37,134	2,582	33,283	481,270	37,329
Season Nitrogen Ratio:		0.99		Lbs Per Acre:					160	11	143	2,074	161	

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR25N

Wheat, 152 Acres Planted on 11/16/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
				% Moist.	Nitrogen	Phos.	Potass.							
10/05/2022	Corral Solids: Main Corral	5.00	Tons	11.80	2.41	0.91	3.07	%	760	32,309	12,200	41,157	0	
10/10/2022	Ground Water: Well Avg	4.15	Acre Inches		0.00			mg/L		0	0	0	32,580	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%		2,128				
Acre Inches Applied:		4.15		Totals:				760	34,437	12,200	41,157	32,580		
Season Nitrogen Ratio:				Lbs Per Acre:					227	80	271	214		

Season Notes: Crop failure due to flooding.

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR36N

Wheat, 141 Acres Planted on 11/12/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
				% Moist.	Nitrogen	Phos.	Potass.							
12/19/2022	Ground Water: Well Avg	4.60	Acre Inches		0.00					0	0	0	33,499	
12/19/2022	Waste Water: Main Lagoon	0.35	Acre Inches		536.00	45.60	810.00	mg/L		1,340,065	5,983	509	9,042	85,507
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			1,974			
Acre Inches Applied:		4.95		Totals:				1,340,065	7,957	509	9,042	119,005		
Season Nitrogen Ratio:				Lbs Per Acre:						56	4	64	844	

Season Notes: Crop failure due to flooding.

**Wreden Ranch Dairy 2023
Nutrient Applications (Attachment B)**

Field Name: WR16NB

Date	Event/Source	Amount Applied/Yield (per Acre) Units	Lab Sample Data	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
01/01/2023	Atmospheric Deposit	14.00 Pounds	100.00 %			210				
	Acre Inches Applied:	0.00			Totals:		210			
Season Nitrogen Ratio:			Lbs Per Acre:			14				
Season Notes:	Fallow.									

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR14NE

Wheat, 97 Acres Planted on 11/16/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data					Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/18/2022	Corral Solids: Main Corral	4.00	Tons	11.80	2.41	0.91	3.07	%	388		16,495	6,228	21,012	0	
10/21/2022	Ground Water: Well Avg	4.50	Acre Inches		0.00			mg/L			0	0	0	22,545	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			1,358				
03/21/2023	Surface Water: Lakeside	4.00	Acre Inches		0.90			mg/L			79	0	0	7,899	
03/21/2023	Waste Water: Digester	0.20	Acre Inches		956.00	203.00	849.00	mg/L		526,793	4,195	890	3,726	24,969	
04/19/2023	Surface Water: Lakeside	4.30	Acre Inches		0.90			mg/L			85	0	0	8,491	
05/11/2023	Harvest	19.00	Tons	71.90	1.57	0.33	1.34	%							16,261
Acre Inches Applied:		13.00		Totals:					388	526,793	22,212	7,119	24,738	63,904	16,261
Season Nitrogen Ratio:		1.37		Lbs Per Acre:							229	73	255	659	168



Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR14NE

Corn, 97 Acres Planted on 06/10/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
				% Moist.	Nitrogen	Phos.	Potass.							
05/20/2023	Surface Water: Lakeside	4.00	Acre Inches		0.90			mg/L		79	0	0	7,899	
05/20/2023	Waste Water: Main Lagoon	0.40	Acre Inches		493.00	80.30	865.00	mg/L		1,053,587	4,327	705	7,591	55,555
06/20/2023	Surface Water: Lakeside	5.00	Acre Inches		0.90			mg/L		99	0	0	9,874	
07/07/2023	Surface Water: Lakeside	4.50	Acre Inches		0.90			mg/L		89	0	0	8,886	
07/07/2023	Waste Water: Main Lagoon	0.60	Acre Inches		651.00	46.90	604.00	mg/L		1,580,380	8,570	618	7,951	84,912
07/24/2023	Surface Water: Lakeside	4.70	Acre Inches		0.90			mg/L		93	0	0	9,281	
08/09/2023	Surface Water: Lakeside	5.00	Acre Inches		0.90			mg/L		99	0	0	9,874	
08/21/2023	Surface Water: Lakeside	4.20	Acre Inches		0.90			mg/L		83	0	0	8,294	
08/21/2023	Waste Water: Main Lagoon	0.40	Acre Inches		651.00	46.90	604.00	mg/L		1,053,587	5,713	411	5,301	56,607
09/05/2023	Surface Water: Lakeside	4.20	Acre Inches		0.90			mg/L		83	0	0	8,294	
09/17/2023	Harvest	27.60	Tons	66.90	1.28	0.28	1.43	%						22,685
Acre Inches Applied:		33.00		Totals:					3,687,554	19,236	1,734	20,843	259,474	22,685
Season Nitrogen Ratio:		0.85		Lbs Per Acre:					198	18	215	2,675	234	



Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR14NW

Wheat, 116 Acres Planted on 11/19/2022

Date	Event/Source	Amount Applied/Yield (per Acre) Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/20/2022	Ground Water: Well Avg	4.30 Acre Inches	0.00		mg/L			0	0	0	25,762		
10/20/2022	Waste Water: Main Lagoon	0.25 Acre Inches	536.00	45.60	810.00	mg/L	787,475	3,516	299	5,313	50,247		
01/01/2023	Atmospheric Deposit	14.00 Pounds	100.00		%			1,624					
02/28/2023	Surface Water: Lakeside	4.40 Acre Inches	0.90		mg/L			104	0	0	10,390		
02/28/2023	Waste Water: Main Lagoon	0.35 Acre Inches	486.00	55.60	916.00	mg/L	1,102,465	4,464	510	8,412	48,949		
04/08/2023	Surface Water: Lakeside	4.50 Acre Inches	0.90		mg/L			107	0	0	10,627		
04/08/2023	Waste Water: Main Lagoon	0.35 Acre Inches	493.00	80.30	865.00	mg/L	1,102,465	4,527	738	7,944	58,132		
05/19/2023	Harvest	19.43 Tons	68.90	1.87	0.43	2.21 %							26,216
Acre Inches Applied:		14.15	Totals:				2,992,404	14,342	1,547	21,669	204,107		26,216
Season Nitrogen Ratio:		0.55	Lbs Per Acre:				124	13	187	1,760			226

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR14NW

Corn, 116 Acres Planted on 06/20/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
				% Moist.	Nitrogen	Phos.	Potass.							
06/14/2023	Surface Water: Lakeside	4.50	Acre Inches		0.90					107	0	0	10,627	
06/14/2023	Waste Water: Main Lagoon	0.30	Acre Inches		651.00	46.90	604.00	mg/L		944,970	5,125	369	4,755	50,772
07/02/2023	Surface Water: Lakeside	4.20	Acre Inches		0.90			mg/L			100	0	0	9,918
07/20/2023	Surface Water: Lakeside	4.80	Acre Inches		0.90			mg/L			114	0	0	11,336
07/20/2023	Waste Water: Main Lagoon	0.30	Acre Inches		651.00	46.90	604.00	mg/L		944,970	5,125	369	4,755	50,772
08/07/2023	Surface Water: Lakeside	4.50	Acre Inches		0.90			mg/L			107	0	0	10,627
08/07/2023	Waste Water: Main Lagoon	0.35	Acre Inches		651.00	46.90	604.00	mg/L		1,102,465	5,979	430	5,547	59,234
08/24/2023	Surface Water: Lakeside	4.70	Acre Inches		0.90			mg/L			111	0	0	11,099
09/08/2023	Surface Water: Lakeside	4.80	Acre Inches		0.90			mg/L			114	0	0	11,336
09/18/2023	Harvest	29.00	Tons	67.10	1.42	0.31	1.39	%						31,431
Acre Inches Applied:		28.45		Totals:					2,992,404	16,880	1,168	15,057	225,720	31,431
Season Nitrogen Ratio:		0.54		Lbs Per Acre:						146	10	130	1,946	271

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR15S

Wheat, 129 Acres Planted on 11/15/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
				% Moist.	Nitrogen	Phos.	Potass.							
10/18/2022	Ground Water: Well Avg	4.00	Acre Inches		0.00					0	0	0	26,650	
10/18/2022	Waste Water: Main Lagoon	0.45	Acre Inches		536.00	45.60	810.00	mg/L		1,576,307	7,038	599	10,636	100,581
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			1,806			
03/20/2023	Surface Water: Lakeside	4.00	Acre Inches		0.90			mg/L			104	0	0	10,504
03/20/2023	Waste Water: Main Lagoon	0.55	Acre Inches		486.00	55.60	916.00	mg/L		1,926,598	7,799	893	14,701	85,539
04/19/2023	Surface Water: Lakeside	4.00	Acre Inches		0.90			mg/L			104	0	0	10,504
04/19/2023	Waste Water: Main Lagoon	0.50	Acre Inches		493.00	80.30	865.00	mg/L		1,751,452	7,193	1,171	12,620	92,352
05/23/2023	Harvest	17.60	Tons	41.40	1.15	0.20	1.52	%						30,600
Acre Inches Applied:		13.50						Totals:	5,254,357	24,046	2,663	37,957	326,131	30,600
Season Nitrogen Ratio:		0.79						Lbs Per Acre:		186	21	294	2,528	237

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR16S

Corn, 202 Acres Planted on 04/15/2023

Date	Event/Source	Amount Applied/Yield (per Acre) Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)	
			% Moist.	Nitrogen	Phos.	Potass.								
01/01/2023	Atmospheric Deposit	14.00 Pounds		100.00		%			2,828					
03/14/2023	Surface Water: Lakeside	4.50 Acre Inches		0.90		mg/L			186	0	0	18,505		
03/14/2023	Waste Water: Main Lagoon	0.30 Acre Inches		486.00	55.60	916.00	mg/L		1,645,551	6,662	762	12,556	73,061	
05/02/2023	Surface Water: Lakeside	5.00 Acre Inches		0.90		mg/L			206	0	0	20,562		
05/28/2023	Surface Water: Lakeside	4.80 Acre Inches		0.90		mg/L			198	0	0	19,739		
05/28/2023	Waste Water: Main Lagoon	0.35 Acre Inches		493.00	80.30	865.00	mg/L		1,919,809	7,884	1,285	13,833	101,230	
06/14/2023	Surface Water: Lakeside	5.00 Acre Inches		0.90		mg/L			206	0	0	20,562		
06/28/2023	Surface Water: Lakeside	4.75 Acre Inches		0.90		mg/L			196	0	0	19,533		
06/28/2023	Waste Water: Main Lagoon	0.38 Acre Inches		651.00	46.90	604.00	mg/L		2,084,364	11,304	814	10,488	111,989	
07/05/2023	Surface Water: Lakeside	4.80 Acre Inches		0.90		mg/L			198	0	0	19,739		
07/31/2023	Harvest	28.20 Tons	69.00	1.59	0.36	2.47	%						56,156	
Acre Inches Applied:		29.88	Totals:						5,649,724	29,868	2,860	36,877	404,921	56,156
Season Nitrogen Ratio:		0.53	Lbs Per Acre:						148	14	183	2,005	278	

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR25S

Wheat, 152 Acres Planted on 11/15/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
				% Moist.	Nitrogen	Phos.	Potass.							
10/05/2022	Corral Solids: Main Corral	5.00	Tons	11.80	2.41	0.91	3.07	%	760	32,309	12,200	41,157	0	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%		2,128				
Acre Inches Applied:		0.00		Totals:				760	34,437	12,200	41,157	0		
Season Nitrogen Ratio:				Lbs Per Acre:						227	80	271	0	

Season Notes: Crop failure due to flooding.



Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR36S

Wheat, 142 Acres Planted on 11/18/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
12/22/2022	Ground Water: Well Avg	4.50	Acre Inches	0.00			mg/L			0	0	0	33,004	
12/22/2022	Waste Water: Main Lagoon	0.25	Acre Inches	536.00	45.60	810.00	mg/L	963,978	4,304	366	6,504	61,509		
01/01/2023	Atmospheric Deposit	14.00	Pounds	100.00			%			1,988				
Acre Inches Applied:		4.75		Totals:				963,978	6,292	366	6,504	94,512		
Season Nitrogen Ratio:				Lbs Per Acre:						44	3	46	666	

Season Notes: Crop failure due to flooding.

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR14SE

Wheat, 134 Acres Planted on 11/20/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
12/17/2022	Ground Water: Well Avg	4.00	Acre Inches	0.00		mg/L		0		0	0	0	27,683	
12/17/2022	Waste Water: Main Lagoon	0.50	Acre Inches	536.00	45.60	810.00	mg/L	1,819,338	8,123	691	12,276	116,088		
01/01/2023	Atmospheric Deposit	14.00	Pounds	100.00		%			1,876					
03/19/2023	Surface Water: Lakeside	4.00	Acre Inches	0.90		mg/L		109		0	0	0	10,912	
03/19/2023	Waste Water: Main Lagoon	0.75	Acre Inches	486.00	55.60	916.00	mg/L	2,729,007	11,048	1,264	20,824	121,165		
04/17/2023	Surface Water: Lakeside	5.00	Acre Inches	0.90		mg/L		137		0	0	0	13,640	
04/17/2023	Waste Water: Main Lagoon	0.50	Acre Inches	493.00	80.30	865.00	mg/L	1,819,338	7,472	1,217	13,109	95,932		
05/11/2023	Harvest	18.90	Tons	71.50	1.72	0.31	1.46 %							24,830
Acre Inches Applied:		14.75		Totals:				6,367,683	28,764	3,172	46,209	385,420	24,830	
Season Nitrogen Ratio: 1.16				Lbs Per Acre:				215	24	345	2,876	185		

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR14SE

Corn, 134 Acres Planted on 06/21/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
				% Moist.	Nitrogen	Phos.	Potass.							
06/04/2023	Surface Water: Lakeside	4.30	Acre Inches		0.90			mg/L		118	0	0	0	11,730
06/04/2023	Waste Water: Main Lagoon	0.40	Acre Inches	651.00	46.90	604.00	mg/L		1,455,470	7,893	568	7,323	78,200	
07/03/2023	Surface Water: Lakeside	5.00	Acre Inches		0.90			mg/L		137	0	0	0	13,640
07/28/2023	Surface Water: Lakeside	4.75	Acre Inches		0.90			mg/L		130	0	0	0	12,958
07/28/2023	Waste Water: Main Lagoon	0.35	Acre Inches	651.00	46.90	604.00	mg/L		1,273,537	6,906	497	6,408	68,426	
08/10/2023	Surface Water: Lakeside	5.20	Acre Inches		0.90			mg/L		142	0	0	0	14,185
08/23/2023	Surface Water: Lakeside	4.80	Acre Inches		0.90			mg/L		131	0	0	0	13,094
08/23/2023	Waste Water: Main Lagoon	0.40	Acre Inches	651.00	46.90	604.00	mg/L		1,455,470	7,893	568	7,323	78,200	
09/04/2023	Surface Water: Lakeside	4.50	Acre Inches		0.90			mg/L		123	0	0	0	12,276
09/18/2023	Harvest	26.80	Tons	69.60	1.50	0.36	1.49	%						32,752
Acre Inches Applied:		29.70		Totals:					4,184,478	23,473	1,633	21,054	302,709	32,752
Season Nitrogen Ratio:		0.72		Lbs Per Acre:					175	12	157	2,259	244	



Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR14SW

Wheat, 120 Acres Planted on 11/16/2022

Date	Event/Source	Amount Applied/Yield (per Acre) Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/19/2022	Ground Water: Well Avg	4.00 Acre Inches	0.00			mg/L		0	0	0	24,791		
10/19/2022	Waste Water: Main Lagoon	0.50 Acre Inches	536.00	45.60	810.00	mg/L	1,629,258	7,274	619	10,993	103,960		
01/01/2023	Atmospheric Deposit	14.00 Pounds	100.00			%		1,680					
03/21/2023	Surface Water: Lakeside	4.00 Acre Inches	0.90			mg/L		97	0	0	9,772		
03/21/2023	Waste Water: Main Lagoon	0.75 Acre Inches	486.00	55.60	916.00	mg/L	2,443,887	9,894	1,132	18,648	108,506		
04/19/2023	Surface Water: Lakeside	4.30 Acre Inches	0.90			mg/L		106	0	0	10,505		
04/19/2023	Waste Water: Main Lagoon	0.50 Acre Inches	493.00	80.30	865.00	mg/L	1,629,258	6,691	1,090	11,740	85,909		
05/19/2023	Harvest	19.25 Tons	53.80	1.56	0.26	1.40 %						33,298	
Acre Inches Applied:		14.05	Totals:				5,702,403	25,742	2,840	41,381	343,442	33,298	
Season Nitrogen Ratio:		0.77	Lbs Per Acre:				215	24	345	2,862	277		

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR14SW

Corn, 120 Acres Planted on 07/03/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
06/14/2023	Surface Water: Lakeside	4.50	Acre Inches	0.90			mg/L			110	0	0	10,993	
06/14/2023	Waste Water: Main Lagoon	0.30	Acre Inches	651.00	46.90	604.00	mg/L	977,555	5,302	382	4,919	52,523		
07/20/2023	Surface Water: Lakeside	4.80	Acre Inches	0.90			mg/L			118	0	0	11,726	
08/07/2023	Surface Water: Lakeside	4.50	Acre Inches	0.90			mg/L			110	0	0	10,993	
08/07/2023	Waste Water: Main Lagoon	0.35	Acre Inches	651.00	46.90	604.00	mg/L	1,140,481	6,185	445	5,738	61,277		
08/24/2023	Surface Water: Lakeside	4.70	Acre Inches	0.90			mg/L			115	0	0	11,482	
09/08/2023	Surface Water: Lakeside	4.80	Acre Inches	0.90			mg/L			118	0	0	11,726	
09/20/2023	Surface Water: Lakeside	4.20	Acre Inches	0.90			mg/L			103	0	0	10,260	
09/20/2023	Waste Water: Main Lagoon	0.30	Acre Inches	699.00	40.90	712.00	mg/L	977,555	5,692	334	5,798	45,601		
10/02/2023	Surface Water: Lakeside	4.20	Acre Inches	0.90			mg/L			103	0	0	10,260	
10/30/2023	Harvest	29.30	Tons	69.70	1.13	0.22	1.03	%						24,077
Acre Inches Applied:			32.65					Totals:	3,095,590	17,956	1,160	16,456	236,842	24,077
Season Nitrogen Ratio:			0.75					Lbs Per Acre:	150	10	137	1,974	201	



Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR13W

Wheat, 258 Acres Planted on 11/16/2022

Date	Event/Source	Amount Applied/Yield (per Acre) Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
01/01/2023	Atmospheric Deposit	14.00 Pounds	100.00 %						3,612				
	Acre Inches Applied:	0.00					Totals:		3,612				
Season Nitrogen Ratio:				Lbs Per Acre:					14				

Season Notes: Crop failure due to flooding.

Field Name: WR13W

Corn, 258 Acres Planted on 06/20/2023

Date	Event/Source	Amount Applied/Yield (per Acre) Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)	
06/08/2023	Surface Water: Lakeside	4.50 Acre Inches	0.90 mg/L					237	0	0	0	23,635		
06/08/2023	Waste Water: Main Lagoon	0.30 Acre Inches	651.00 46.90 604.00 mg/L					2,101,743	11,398	820	10,575	112,924		
07/02/2023	Surface Water: Lakeside	5.20 Acre Inches	0.90 mg/L					273	0	0	0	27,312		
07/27/2023	Surface Water: Lakeside	5.00 Acre Inches	0.90 mg/L					263	0	0	0	26,262		
07/27/2023	Waste Water: Main Lagoon	0.35 Acre Inches	651.00 46.90 604.00 mg/L					2,452,033	13,297	957	12,338	131,745		
08/06/2023	Surface Water: Lakeside	5.10 Acre Inches	0.90 mg/L					268	0	0	0	26,786		
08/26/2023	Surface Water: Lakeside	4.80 Acre Inches	0.90 mg/L					253	0	0	0	25,212		
08/26/2023	Waste Water: Main Lagoon	0.30 Acre Inches	651.00 46.90 604.00 mg/L					2,101,743	11,398	820	10,575	112,924		
09/04/2023	Surface Water: Lakeside	4.70 Acre Inches	0.90 mg/L					248	0	0	0	24,685		
09/15/2023	Harvest	28.70 Tons	66.90	1.51	0.35	1.93 %							74,018	
	Acre Inches Applied:	30.25					Totals:		6,655,519	37,637	2,598	33,488	511,485	74,018
Season Nitrogen Ratio: 0.51				Lbs Per Acre:					146	10	130	1,982	287	



INNOVATIVE AG SERVICES

Wreden Ranch Dairy 2023

Nutrient Applications (Attachment B)

Field Name: WR19W

Wheat, 224 Acres Planted on 11/16/2022

Date	Event/Source	Amount Applied/Yield (per Acre) Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
01/01/2023	Atmospheric Deposit	14.00 Pounds	100.00 %						3,136				
	Acre Inches Applied:	0.00					Totals:		3,136				
	Season Nitrogen Ratio:						Lbs Per Acre:		14				

Season Notes: Crop failure due to flooding.

Field Name: WR19W

Corn, 224 Acres Planted on 07/05/2023

Date	Event/Source	Amount Applied/Yield (per Acre) Units	Lab Sample Data				Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)	
06/16/2023	Surface Water: Lakeside	4.50 Acre Inches	0.90 mg/L						206	0	0	20,521		
06/16/2023	Waste Water: Main Lagoon	0.30 Acre Inches	651.00 46.90 604.00 mg/L					1,824,769	9,896	712	9,182	98,043		
07/18/2023	Surface Water: Lakeside	4.80 Acre Inches	0.90 mg/L						220	0	0	21,889		
08/07/2023	Surface Water: Lakeside	4.50 Acre Inches	0.90 mg/L						206	0	0	20,521		
08/07/2023	Waste Water: Main Lagoon	0.35 Acre Inches	651.00 46.90 604.00 mg/L					2,128,897	11,545	831	10,712	114,383		
08/22/2023	Surface Water: Lakeside	4.65 Acre Inches	0.90 mg/L						213	0	0	21,204		
09/10/2023	Surface Water: Lakeside	4.60 Acre Inches	0.90 mg/L						211	0	0	20,975		
09/22/2023	Surface Water: Lakeside	4.33 Acre Inches	0.90 mg/L						197	0	0	19,746		
09/22/2023	Waste Water: Main Lagoon	0.30 Acre Inches	699.00 40.90 712.00 mg/L					1,824,769	10,624	623	10,824	85,122		
10/07/2023	Surface Water: Lakeside	4.35 Acre Inches	0.90 mg/L						199	0	0	19,837		
10/30/2023	Harvest	28.40 Tons	68.60	1.30	0.21	0.96 %							51,937	
	Acre Inches Applied:	32.68					Totals:		5,778,435	33,517	2,166	30,717	442,241	51,937
	Season Nitrogen Ratio:	0.65					Lbs Per Acre:		150	10	137	1,974	232	



INNOVATIVE AG SERVICES

Wreden Ranch Dairy 2023 Nutrient Applications (Attachment B)

Summary of Nutrient Applications, Removal, and Balance

	<u>Total N (Lbs)</u>	<u>Total P (Lbs)</u>	<u>Total K (Lbs)</u>	<u>Total Salts (Lbs)</u>	<u>Total Manure Applied</u>
Solid Manure	81,113.09	30,627.41	103,326.22	0.00	1,908.00 tons
Process Wastewater	531,857.56	50,089.62	680,372.87	5,846,996.94	109,729,711.67 gallons
Irrigation Water	15,134.35				
Fertilizer / Total Imports	0.00				
Atmospheric Deposition	38,976.00				
Total Nitrogen Applied	667,081.00				
Crop Nitrogen Removal	731,991.59				
Nitrogen Balance	(64,910.59)				
Nitrogen Ratio	0.91				

- Nutrient applications shown in Attachment B are on a crop year basis.
- Lab sample data results for applications are based on the sample taken closest to the application date. Lab sample data results are shown on 100% dry basis for manure applications and harvest events.
- Well Avg: Irrigation source representing the average nutrient values of all irrigation wells sampled for the facility during the reporting year.

** Book Value: No sample data results were available. For manure applications and plant tissue harvests, the calculations were based off book values.



**Wreden Ranch Dairy 2023
Nutrient Applications (Attachment B)**

Summary of Nutrient Applications, Removal, and Balance

	<u>Total N (Lbs)</u>	<u>Total P (Lbs)</u>	<u>Total K (Lbs)</u>	<u>Total Salts (Lbs)</u>	<u>Total Manure Applied</u>	
Solid Manure	81,113.09	30,627.41	103,326.22	0.00	1,908.00	tons
Process Wastewater	531,857.56	50,089.62	680,372.87	5,846,996.94	109,729,711.67	gallons
Irrigation Water	15,134.35					
Fertilizer / Total Imports	0.00					
Atmospheric Deposition	38,976.00					
Total Nitrogen Applied	667,081.00					
Crop Nitrogen Removal	732,633.41					
Nitrogen Balance	(65,552.41)					
Nitrogen Ratio	0.91					

- Nutrient applications shown in Attachment B are on a crop year basis.
- Lab sample data results for applications are based on the sample taken closest to the application date. Lab sample data results are shown on 100% dry basis for manure applications and harvest events.
- Well Avg: Irrigation source representing the average nutrient values of all irrigation wells sampled for the facility during the reporting year.

** Book Value: No sample data results were available. For manure applications and plant tissue harvests, the calculations were based off book values.



Wreden Ranch Dairy 2023 Nutrient Applications (Attachment B)

FIELD NITROGEN RATIO Calculation:

"Field Nitrogen Ratio" = "Total Nitrogen Applied to Field" / "Total Nitrogen Extracted from Field at Harvest"

ATMOSHERIC DEPOSITION Applied (Lbs) Calculation:

"Nitrogen Applied (Lbs)" = "14 Lbs (per year) * "Acres Planted"

HARVEST Nitrogen Extraction (Lbs) Calculation:

"Nitrogen Extracted (Lbs)" = ("Yield" (tons per acre) * 2000) * ((100 - "% Moisture") / 100 * "Lab Sample Data Nitrogen Value" / 100) * "Acres Planted"

IRRIGATION Nitrogen and Salts Applied (Lbs) Calculations:

"Nitrogen Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ("Lab Sample Data Nitrogen Value" * 0.000001) * "Acres Planted"

"Salts Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ("Lab Sample Data TDS Value" * 0.000001) * "Acres Planted"

PROCESS WASTEWATER Nitrogen, Phosphorus, Potassium and Salts Applied (Lbs) Calculations:

"Nitrogen Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ("Lab Sample Data Nitrogen Value" * 0.000001) * "Acres Planted"

"Phosphorus Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ("Lab Sample Data Phosphorus Value" * 0.000001) * "Acres Planted"

"Potassium Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ("Lab Sample Data Potassium Value" * 0.000001) * "Acres Planted"

"Salt Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ("Lab Sample Data TDS Value" * 0.000001) * "Acres Planted"

SOLID MANURE (Corral, Separator, or Compost) Nitrogen, Phosphorus, Potassium and Salts Applied (Lbs) Calculations:

"Nitrogen Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ((100 - "% Moisture")/100 * "Lab Sample Data Nitrogen Value"/100) * "Acres Planted"

"Phosphorus Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ((100 - "% Moisture")/100 * "Lab Sample Data Phosphorus Value"/100) * "Acres Planted"

"Potassium Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ((100 - "% Moisture")/100 * "Lab Sample Data Potassium Value"/100) * "Acres Planted"

"Salt Applied (Lbs)" = "Lbs Applied per Acre" (see below) * ((100 - "% Moisture")/100 * "Lab Sample Data Ash Value"/100) * "Acres Planted"

"Lbs Applied per Acre" Calculations:

If "Application Units" = Tons, Then "Lbs Applied per Acre" = "Application Amount" (per Acre) * 2000

If "Application Units" = Acres Inches, Then "Lbs Applied per Acre" = "Application Amount" (per Acre) * 8.33 *27,154.3

If "Application Units" = Acre Feet, Then Lbs Applied per Acre" = "Application Amount" (per Acre) * 8.33 * 325,851

If "Application Units" = Gallons, Then "Lbs Applied per Acre" = "Application Amount" (per Acre) * 8.33

Wreden Ranch Dairy 2023

Estimated Manure and Process Wastewater/Nutrients Transferred Off-Site (Attachment C)

A. ESTIMATED TOTAL MANURE TRANSFERRED OFFSITE

Total Manure Exported (tons)*	Total Nitrogen Exported (lbs)**	Total Phosphorus Exported (lbs)**	Total Potassium Exported (lbs)**	Total Salts Exported (lbs)**

* The Total Manure (tons) should be calculated as the sum of all manure transferred offsite as reported in all the Manure/Process Wastewater Tracking Manifests for the reporting period.

** Total (N, P, K, Salts) (lbs) = Sum of (N, P, K, Salts) for each manure export event based on (Manure(tons) x 2000lb/ton) x ((100-moisture%)/100) x (N, P, K, and Ash) Concentration (%, dry weight) / 100 using the samples closest in date to the export event.

B. ESTIMATED TOTAL PROCESS WASTEWATER TRANSFERRED OFFSITE

Total Process Wastewater Exported (gal)*	Total Nitrogen Exported (lbs)**	Total Phosphorus Exported (lbs)**	Total Potassium Exported (lbs)**	Total TDS Exported (lbs)**

* The Total Manure (gals) should be calculated as the sum of all manure transferred offsite as reported in all the Manure/Process Wastewater Tracking Manifests for the reporting period.

** Total (Nitrogen, Phosphorus, Potassium, TDS) (lbs) = Sum of (Nitrogen, Phosphorus, Potassium, TDS) for each wastewater export event based on (Process Wastewater(gals) x 8.33lb/gal) x (NO₃-N or TKN, P, K, TDS) x 10-6 using the samples closest in date to the export event.



**Wreden Ranch Dairy 2023
Land Application Area Description Technical Report (Attachment D)**

Field Name	Assessor Parcel Number(s)	Acres	Type of Waste Applied
WR20	x028 x260 x018 x000, x028 x260 x046 x000	179	Process Wastewater
WR13E	x028 x260 x019 x000, x028 x260 x045 x000	283	Process Wastewater
WR19E	x028 x260 x018 x000	208	Process Wastewater
WR15N	x028 x260 x005 x000, x028 x260 x033 x000, x028 x260 x039 x000	232	Process Wastewater
WR25N	x028 x300 x009 x000, x028 x300 x010 x000	152	Manure
WR36N	x028 x300 x011 x000	141	Process Wastewater
WR16NB	x028 x260 x005 x000	15	None
WR14NE	x028 x260 x034 x000, x028 x260 x040 x000	97	Both
WR14NW	x028 x250 x018 x000, x028 x250 x021 x000, x028 x260 x034 x000, x028 x260 x040 x000	116	Process Wastewater
WR15S	x028 x260 x005 x000, x028 x260 x039 x000	129	Process Wastewater
WR16S	x028 x260 x005 x000	202	Process Wastewater
WR25S	x028 x300 x010 x000, x028 x300 x011 x000	152	Manure
WR36S	x028 x300 x011 x000	142	Process Wastewater
WR14SE	x028 x260 x040 x000	134	Process Wastewater
WR14SW	x028 x250 x021 x000, x028 x260 x040 x000	120	Process Wastewater
WR13W	x028 x250 x010 x000, x028 x260 x019 x000	258	Process Wastewater
WR19W	x028 x250 x011 x000, x028 x260 x018 x000	224	Process Wastewater
		2,784	

Production Area APN(s): x028 x260 x005 x000



Wreden Ranch Dairy 2023 Lab Results Summary (Attachment E)

Process Wastewater

(mg/l/ppm unless noted otherwise)

Sample Date:	TKN	TP	TK	EC (umhos/cm)	NH4N	NO3N	TDS	pH (units)	General Minerals						
									CA	MG	NA	HCO3	CO3	SO4	CL
02/16/2023	486.00	55.60	916.00	8,030	412.00		5,330.00								
03/17/2023	956.00	203.00	849.00	8,580	518.00		5,690.00								
04/25/2023	493.00	80.30	865.00	9,530	484.00	0.00	6,330.00	7.50							
07/13/2023	651.00	46.90	604.00	9,710	642.00		6,450.00								
07/28/2023	667.00	80.60	453.00	8,570	657.00		5,690.00								
11/07/2023	699.00	40.90	712.00	8,430	694.00		5,600.00								
Averages:	658.67	84.55	733.17	8,808	567.83	0.00	5,848.33	7.50							

Manure - Corral Solids

(Dry Weight Basis)

Sample Date:	TN	TP	TK	Moisture	Ash	CA	MG	NA	S	CL
06/02/2023	2.86	1.31	3.15	15.90						%
11/07/2023	1.70	0.78	2.34	31.30						%
Averages:	2.28	1.05	2.74	23.60						

Plant Tissue

(Dry Weight Basis)

Field:	Crop #:	Crop	Sample Date:	TN (lbs/ton)	TP (lbs/ton)	TK (lbs/ton)	Moisture (%)	Ash (%)



**Wreden Ranch Dairy 2023
Lab Results Summary (Attachment E)**

Plant Tissue

(Dry Weight Basis)

Field:	Crop #:	Crop	Sample Date:	TN (lbs/ton)	TP (lbs/ton)	TK (lbs/ton)	Moisture (%)	Ash (%)
WR20	1	Wheat	05/23/2023	31.20	7.12	45.80	59.10	10.60
WR20	2	Corn	10/30/2023	20.80	4.28	20.20	69.30	5.04
WR13E	1	Wheat	05/19/2023	25.00	5.08	21.20	65.60	8.70
WR13E	2	Corn	10/26/2023	21.60	2.96	23.00	64.50	4.93
WR19E	1	Wheat		11.00	1.70	8.30		BV-C
WR19E	2	Corn	10/30/2023	19.96	4.26	19.76	67.10	4.69
WR15N	1	Wheat	05/19/2023	33.60	7.38	37.40	69.80	11.10
WR15N	2	Corn	09/17/2023	19.10	7.38	42.20	68.80	7.18
WR25N	1	Wheat		11.00	1.70	8.30		BV-C
WR36N	1	Wheat		11.00	1.70	8.30		BV-C
WR16NB	1	FALLOW						
WR14NE	1	Wheat	05/11/2023	31.40	6.56	26.80	71.90	10.20
WR14NE	2	Corn	09/17/2023	25.60	5.54	28.60	66.90	4.79
WR14NW	1	Wheat	05/19/2023	37.40	8.52	44.20	68.90	12.10
WR14NW	2	Corn	09/18/2023	28.40	6.18	27.80	67.10	4.93
WR15S	1	Wheat	05/23/2023	23.00	4.04	30.40	41.40	7.94
WR16S	1	Corn	07/31/2023	31.80	7.14	49.40	69.00	12.00
WR25S	1	Wheat		11.00	1.70	8.30		BV-C



Wreden Ranch Dairy 2023 Lab Results Summary (Attachment E)

Plant Tissue

(Dry Weight Basis)

Field:	Crop #:	Crop	Sample Date:	TN (lbs/ton)	TP (lbs/ton)	TK (lbs/ton)	Moisture (%)	Ash (%)
WR36S	1	Wheat		11.00	1.70	8.30		BV-C
WR14SE	1	Wheat	05/11/2023	34.40	6.16	29.20	71.50	10.50
WR14SE	2	Corn	09/18/2023	30.00	7.14	29.80	69.60	5.62
WR14SW	1	Wheat	05/19/2023	31.20	5.12	28.00	53.80	10.20
WR14SW	2	Corn	10/30/2023	22.60	4.32	20.60	69.70	5.41
WR13W	1	Wheat		11.00	1.70	8.30		BV-C
WR13W	2	Corn	09/15/2023	30.20	7.04	38.60	66.90	7.06
WR19W	1	Wheat		11.00	1.70	8.30		BV-C
WR19W	2	Corn	10/30/2023	26.00	4.18	19.14	68.60	4.77

BV-C: Book Value from Central Valley Regional Water Quality Control Board Website table prepared by Roland D. Meyer, UC Davis (As Received basis)

Well / Irrigation Water

(mg/l/ppm unless noted otherwise)

	Sample Date:	NO3N	TP	EC (umhos/cm)	NH4N *	TDS	TN	General Minerals						
								CA	MG	NA	HCO3	CO3	SO4	CL
Dairy														
W12	01/25/2023	0.00		365		220.00		3.00	0.00	72.00	90.00	90.00	2.30	53.00
Averages:		0.00		365		220.00		3.00	0.00	72.00	90.00	90.00	2.30	53.00



**Wreden Ranch Dairy 2023
Lab Results Summary (Attachment E)**

Well / Irrigation Water

(mg/l/ppm unless noted otherwise)

	Sample Date:	NO3N	TP	EC (umhos/cm)	NH4N *	TDS	TN	General Minerals						
								CA	MG	NA	HCO3	CO3	SO4	CL
Irrigation														
Eaton 1	03/07/2023	0.00		388		220.00	0.00	3.00	0.00	88.00	110.00	10.00	0.00	52.00
Eaton 2	03/07/2023	0.00		324		190.00	0.00	3.00	0.00	68.00	110.00	10.00	0.40	28.00
Eaton 5	07/11/2023	0.00		404		250.00	0.00	3.00	0.00	77.00	110.00	10.00	4.10	53.00
W1								Out of service						
W2								Out of service						
W3								Out of service						
W4								Out of service						
W5								Out of service						
W6								Out of service						
W8	08/23/2023	0.00		471		250.00	0.00	11.00	0.00	89.00	110.00	0.00	13.00	62.00
W9								Out of service						
W13								Did not run						
WS1								Out of service						
WS3	08/17/2023	0.00		443		240.00	0.60							
WS4								Did not run						
WS5								Out of service						
WS6	08/17/2023	0.00		530		320.00	0.90							
WS7								Out of service						
WS8								Out of service						



Wreden Ranch Dairy 2023 Lab Results Summary (Attachment E)

Well / Irrigation Water

(mg/l/ppm unless noted otherwise)

	Sample Date:	NO3N	TP	EC (umhos/cm)	NH4N *	TDS	TN	General Minerals						
								CA	MG	NA	HCO3	CO3	SO4	CL
Irrigation														
	Averages:	0.00		427		245.00	0.25	5.00	0.00	80.50	110.00	7.50	4.38	48.75
Surface Water														
Lakeside (General)	06/28/2023	0.90		158		90.00	0.90							
	Averages:	0.90		158		90.00	0.90							

* NH4N was non-detectable unless a value is shown

Soils

Field	Sample Date:	PO4P (ppm)
WR20	11/10/2023	28.50
WR13E	11/10/2023	21.50
WR19E	11/10/2023	18.00
WR25N	10/05/2023	20.00
WR36N	10/04/2023	21.00
WR14NE	10/05/2023	38.00
WR14NW	10/06/2023	47.00
WR15S	10/06/2023	143.00
WR16S	02/22/2023	57.00
WR16S	10/05/2023	97.00



Wreden Ranch Dairy 2023 Lab Results Summary (Attachment E)

Soils

Field	Sample Date:	PO4P (ppm)
WR25S	10/05/2023	43.00
WR36S	10/04/2023	23.00
WR14SE	10/05/2023	40.00
WR14SW	11/03/2023	35.00
WR13W	10/05/2023	28.00
WR19W	11/10/2023	26.50



Wreden Ranch Dairy 2023
Planting and Harvest Information (Attachment F)

Crop #	Crop	Acres Planted	Plant Date	Harvest Date	Estimated Yield (tons)	Tons Harvested	Actual Yield
Field: WR20							
	1 Wheat	179	11/14/2022	05/23/2023	19.8	3615.8	20.2
	2 Corn	179	07/02/2023	10/30/2023	30.0	4833.0	27.0
Field: WR13E							
	1 Wheat	283	11/18/2022	05/19/2023	19.5	5433.6	19.2
	2 Corn	283	07/04/2023	10/26/2023	30.0	8348.5	29.5
Field: WR19E							
	1 Corn	208	07/02/2023	10/30/2023	25.9	5470.4	26.3
Field: WR15N							
	1 Wheat	232	11/17/2022	05/19/2023	20.6	4605.2	19.8
	2 Corn	232	06/20/2023	09/17/2023	30.0	6264.0	27.0
Field: WR14NE							
	1 Wheat	97	11/16/2022	05/11/2023	20.2	1843.0	19.0
	2 Corn	97	06/10/2023	09/17/2023	30.0	2677.2	27.6
Field: WR14NW							
	1 Wheat	116	11/19/2022	05/19/2023	20.9	2253.9	19.4
	2 Corn	116	06/20/2023	09/18/2023	30.0	3364.0	29.0
Field: WR15S							
	1 Wheat	129	11/15/2022	05/23/2023	18.0	2270.4	17.6
Field: WR16S							
	1 Corn	202	04/15/2023	07/31/2023	30.0	5696.4	28.2
Field: WR14SE							
	1 Wheat	134	11/20/2022	05/11/2023	19.4	2532.6	18.9
	2 Corn	134	06/21/2023	09/18/2023	30.0	3591.2	26.8



Wreden Ranch Dairy 2023
Planting and Harvest Information (Attachment F)

Crop #	Crop	Acres Planted	Plant Date	Harvest Date	Estimated Yield (tons)	Tons Harvested	Actual Yield
Field: WR14SW							
	1 Wheat	120	11/16/2022	05/19/2023	19.5	2310.0	19.2
	2 Corn	120	07/03/2023	10/30/2023	30.0	3516.0	29.3
Field: WR13W							
	1 Corn	258	06/20/2023	09/15/2023	30.0	7404.6	28.7
Field: WR19W							
	1 Corn	224	07/05/2023	10/30/2023	30.0	6361.6	28.4

Wreden Ranch Dairy 2023

Weather Data (Attachment G)

Day	January	February	March	April	May	June	July	August	September	October	November	December
1	Light	None	Light	None	None	None	None	None	None	None	None	None
2	Light	None	None	None	None	None	None	None	None	None	None	None
3	None	None	None	None	None	None	None	None	None	None	None	None
4	Light	None	None	None	Light	None	None	None	None	None	None	None
5	Heavy	Light	Light	None	None	None	None	None	None	None	None	None
6	None	None	None	None	None	None	None	None	None	None	None	None
7	None	None	None	None	None	SWP	None	None	None	None	None	None
8	None	None	None	None	None	None	None	None	None	None	None	None
9	SWP	None	Light	None	None	None	None	None	None	None	None	None
10	Light	None	SWP	None	None	None	None	None	None	None	None	None
11	None	None	None	None	None	None	None	None	None	None	None	None
12	None	None	None	None	None	None	None	None	None	None	None	None
13	None	None	None	None	None	None	None	None	None	None	None	None
14	Heavy	None	SWP	None	None	None	None	None	None	None	None	None
15	Light	None	Heavy	None	None	None	None	None	None	None	None	None
16	Heavy	None	None	None	None	None	None	None	None	None	None	None
17	None	None	None	None	None	None	None	None	None	None	None	None
18	None	None	None	None	None	None	None	None	None	None	None	None
19	None	None	Light	None	None	None	None	Light	None	None	None	None
20	None	None	None	None	None	None	None	SWP	None	None	None	None
21	None	None	SWP	None	None	None	None	None	None	None	None	None
22	None	Light	Light	None	None	None	None	None	None	None	None	None
23	None	None	None	None	None	None	None	None	None	Heavy	None	None
24	None	SWP	None	None	None	None	None	None	None	None	None	None
25	None	SWP	None	None	None	None	None	None	None	None	None	None
26	None	None	None	None	None	None	None	None	None	None	None	None
27	None	Light	None	None	None	None	None	None	None	None	None	None
28	None	Heavy	Light	None	None	None	None	None	None	None	None	None
29	Light		Heavy	None	None	None	None	None	None	None	None	None
30	None		Light	None	None	None	None	None	None	None	None	Light
31	None		None		None		None	None		None		None

*Note: SWP = Standing Water Present





February 13, 2023

Lab No. : VI 2340471
Customer No. : 4018573
Reference : 40146

Innovative Ag Services, LLC
 1201 Delta View Road Suite 5
 Hanford, CA 93230

Laboratory Report

Introduction: This report package contains a total of 4 pages divided into 3 sections:

- | | | |
|-----------------|-----------|---|
| Case Narrative | (1 page) | : An overview of the work performed at FGL. |
| Sample Results | (1 page) | : Results for each sample submitted. |
| Quality Control | (2 pages) | : Supporting Quality Control (QC) results. |

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab No.	Matrix
W12	01/25/2023	01/25/2023	VI 2340471-001	AGW

Sampling and Receipt Information:

The Sample was received in acceptable condition and within temperature requirements, unless noted on the Condition Upon Receipt (CUR) form. The Sample was received, prepared and analyzed within the method specified holding times. All samples arrived on ice. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the associated Chain of Custody and Condition Upon Receipt Form.

Quality Control: All samples were prepared and analyzed according to established quality control criteria. Any exceptions are noted in the Quality Control Section of this report.

Test Summary

EPA 200.7	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 300.0	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 2540 C	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 4500-H+B	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)

Certification: I certify that this data package is in compliance with ELAP standards, both technically and for completeness, except for any conditions listed above and in the QC Section. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature. This report shall not be reproduced except in full, without the written approval of the laboratory.

KD: EHB

Approved By **Kelly A. Dunnahoo, B.S.**  Digitally signed by Kelly A. Dunnahoo, B.S.
 Title: Laboratory Director
 Date: 2023-02-13

Section: Case Narrative

Page 1 of 4

Page 1 of 4

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February 13, 2023

Innovative Ag Services, LLC
 1201 Delta View Road Suite 5
 Hanford, CA 93230

Description : W12
 Project : 0350 Wreden Ranch

Lab No. : VI 2340471-001
 Customer No. : 4018573
 Reference : 40146
 Sampled On : January 25, 2023 at 13:00
 Sampled By : Sean
 Received On : January 25, 2023 at 16:14
 Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
							Date	Time	Who	Method	Date	Time	Who
Dairy Analysis													
Alkalinity (as CaCO ₃)	90	10	mg/L		1		02/05/2023	15:54	amm	SM 4500-H+B	02/06/2023	01:09	amm
Bicarbonate	90	10	mg/L		1		02/05/2023	15:54	amm	SM 4500-H+B	02/06/2023	01:09	amm
Carbonate	10	10	mg/L		1		02/05/2023	15:54	amm	SM 4500-H+B	02/06/2023	01:09	amm
Hydroxide	10	10	mg/L		1		02/05/2023	15:54	amm	SM 4500-H+B	02/06/2023	01:09	amm
Chloride	53	1	mg/L		1	I	01/26/2023	13:22	ldm	EPA 300.0	01/26/2023	19:17	ldm
Nitrate Nitrogen	ND	0.1	mg/L		1	U	01/26/2023	13:22	ldm	EPA 300.0	01/26/2023	19:17	ldm
Conductivity	365	1	umhos/cm		1		02/05/2023	15:54	amm	SM 4500-H+B	02/06/2023	01:09	amm
Sulfate Sulfur	2.30	0.17	mg/L		1		01/26/2023	13:22	ldm	EPA 300.0	01/26/2023	19:17	ldm
Solids, Total Dissolved (TDS)	220	20	mg/L		1		01/27/2023	11:55	ctl	SM 2540 C	01/30/2023	12:35	ctl
Calcium	3	1	mg/L		1		02/01/2023	07:05	ejc	EPA 200.7	02/02/2023	13:45	ac
Magnesium	ND	1	mg/L		1	J	02/01/2023	07:05	ejc	EPA 200.7	02/02/2023	13:45	ac
Potassium	ND	1	mg/L		1	J	02/01/2023	07:05	ejc	EPA 200.7	02/02/2023	13:45	ac
Sodium	72	1	mg/L		1		02/01/2023	07:05	ejc	EPA 200.7	02/02/2023	13:45	ac

DQF Flags Definition:

I The MS/MSD did not meet QC criteria.

U Constituent results were non-detect.

J Reported value is estimated; detected at a concentration below the RL and above the laboratory MDL.

ND=Non-Detected, RL=Reporting Level , Dil.=Dilution



February 13, 2023
Innovative Ag Services, LLC

Lab No. : VI 2340471
 Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	02/01/2023:201093EJC	Blank	mg/L		ND	<1	
		(SP 2301051-001)	LCS	mg/L	12.00	100 %	85-115	
			MS	mg/L	12.00	169 %	<¼	
			MSD	mg/L	12.00	113 %	75-125	
			MSRPD	mg/L	0.8000	3.5%	≤20.0	
		(SP 2301303-001)	MS	mg/L	12.00	78.4 %	75-125	
			MSD	mg/L	12.00	81.6 %	75-125	
			MSRPD	mg/L	0.8000	0.4%	≤20.0	
Magnesium	200.7	02/01/2023:201093EJC	Blank	mg/L		ND	<1	
		(SP 2301051-001)	LCS	mg/L	12.00	106 %	85-115	
			MS	mg/L	12.00	142 %	<¼	
			MSD	mg/L	12.00	111 %	75-125	
			MSRPD	mg/L	0.8000	2.0%	≤20	
		(SP 2301303-001)	MS	mg/L	12.00	98.2 %	75-125	
			MSD	mg/L	12.00	99.0 %	75-125	
			MSRPD	mg/L	0.8000	0.2%	≤20	
Potassium	200.7	02/01/2023:201093EJC	Blank	mg/L		ND	<1	
		(SP 2301051-001)	LCS	mg/L	12.00	97.7 %	85-115	
			MS	mg/L	12.00	138 %	<¼	
			MSD	mg/L	12.00	114 %	75-125	
			MSRPD	mg/L	0.8000	3.7%	≤20.0	
		(SP 2301303-001)	MS	mg/L	12.00	105 %	75-125	
			MSD	mg/L	12.00	105 %	75-125	
			MSRPD	mg/L	0.8000	0.6%	≤20.0	
Sodium	200.7	02/01/2023:201093EJC	Blank	mg/L		ND	<1	
		(SP 2301051-001)	LCS	mg/L	12.00	95.6 %	85-115	
			MS	mg/L	12.00	1060 %	<¼	
			MSD	mg/L	12.00	247 %	<¼	
			MSRPD	mg/L	0.8000	7.4%	≤20.0	
		(SP 2301303-001)	MS	mg/L	12.00	73.8 %	<¼	
			MSD	mg/L	12.00	78.5 %	75-125	
			MSRPD	mg/L	0.8000	0.7%	≤20.0	

Definition

- <¼ : High Sample Background - Spike concentration was less than one forth of the sample concentration.
- Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
- DQO : Data Quality Objective - This is the criteria against which the quality control data is compared.
- LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
- MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
- ND : Non-detect - Result was below the DQO listed for the analyte.

February 13, 2023

Innovative Ag Services, LLC

Lab No. : VI 2340471

Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO ₃)	2320B	02/05/2023:201253AMM	ND	mg/L		1.25%	10	
Bicarbonate	2320B	(VI 2340471-001)	Dup	mg/L		1.70%	10	
Carbonate	2320B	(VI 2340471-001)	Dup	mg/L		0%	10	
E. C.	2320B	(VI 2340471-001)	Dup	umhos/cm		0.8%	5	
Solids, Total Dissolved	2540CE	01/27/2023:200917CTL (SP 2301150-012) (SP 2301150-012)	Blank LCS Dup Dup	mg/L mg/L mg/L mg/L	990.8	ND 101 % 2.9% 0.6%	<20 90-110 5 5	
Chloride	300.0	01/26/2023:200924LDM (VI 2340468-001) (VI 2340471-001)	Blank LCS MS MSD MSRPD MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	25.00 50.00 50.00 10.00 50.00 50.00 10.00	ND 97.6 % 83.7 % 90.8 % 4.4% 79.8 % 84.5 % 2.5%	<1 90-110 85-121 85-121 ≤19 85-121 85-121 ≤19	435 435 435
Nitrate Nitrogen	300.0	01/26/2023:200924LDM (VI 2340468-001) (VI 2340471-001)	Blank LCS MS MSD MSRPD MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	20.00 40.00 40.00 10.00 40.00 40.00 10.00	ND 97.4 % 94.1 % 102 % 8.0% 94.7 % 100 % 5.5%	<0.4 90-110 85-119 85-119 ≤19 85-119 85-119 ≤19	
Sulfate Sulfur	300.0	01/26/2023:200924LDM (VI 2340468-001) (VI 2340471-001)	Blank LCS MS MSD MSRPD MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	50.00 100.0 100.0 10.00 100.0 100.0 10.00	ND 99.0 % 94.4 % 102 % 8.0% 94.8 % 100 % 5.1%	<0.5 90-110 82-124 82-124 ≤23 82-124 82-124 ≤23	

Definition

- Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
- Dup : Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.
- LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
- MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
- ND : Non-detect - Result was below the DQO listed for the analyte.

Explanation

- 435 : Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.



Laboratory Analysis Work Order

ID: # 0350SITE NAME: WREDEN RANCHBilling: IAS

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO₃N (Dom)W2 EC, NO₃N, TDS, TN (Irr)W3 NH₄-N (Ammonium)W4 EC, NO₃N, Ca, Mg, Na, K, HCO₃, CO₃, SO₄S, Cl, TDS (Dom, GM)W5 EC, NO₃N, TDS, TN, Ca, Mg, Na, HCO₃, CO₃, SO₄S, Cl (Irr, GM)W6 NO₃N, NO₂ (Dom ILRP, Annually)W7 Ca, Mg, Na, K, HCO₃, CO₃, SO₄, Cl + Lab Filtering (GWM)

W8 Other: _____

Plant Tissue

P1 TN, NO₃N, PO₄P, K (Mid Season - Wheat)

P2 TN, P, K (Mid-season - Corn)

P3 TN, TP, TK, Ash, %M (At Harvest)

P4 TN, %M

P5 % Moisture

P6 NIR

P7 Other: _____

234047
14.4° P01

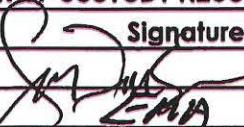
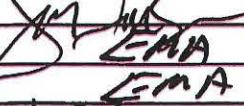
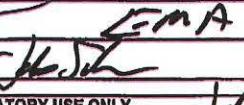
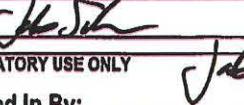
Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS		
					NH ₃ N *	pH	Temp
1 W12	Dom	W4	1/25/23 16:00	SEAN	0		
2							
3							
4							
5							
6							
7							
8							

* Field Test of ammonium nitrogen may only be made by a trained technician. Positive test to be analyzed for ammonium nitrogen by the laboratory.

All samples are to follow the procedures noted in the Sampling & Analysis Plan of the NMP and the RWQCB specifications. Any samples taken outside of these procedures shall provide the procedures on the notes below. Additionally, if any preservatives are used in the collections or processing of samples, please note below.

NOTES:

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1 st		IAS	1/25/23 16:00	1/25/23 3:30
2 nd		FGC	1/25/23 16:00	
3 rd		FGC		1/25/23 16:14
4 th		FGC	1/25/23 16:14	1/25/23 16:14

LABORATORY USE ONLY

Logged In By: Jab Sdm 1-25-23 1614 Total Samples: _____

Laboratory #: _____



April 3, 2023

Innovative Ag Services, LLC
 1201 Delta View Road Suite 5
 Hanford, CA 93230

Lab No. : VI 2341398
Customer No. : 4018573
Reference : 40180

Laboratory Report

Introduction: This report package contains a total of 6 pages divided into 3 sections:

Case Narrative	(1 page)	: An overview of the work performed at FGL.
Sample Results	(2 pages)	: Results for each sample submitted.
Quality Control	(3 pages)	: Supporting Quality Control (QC) results.

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab No.	Matrix
Eaton 1	03/07/2023	03/07/2023	VI 2341398-001	AGW
Eaton 2	03/07/2023	03/07/2023	VI 2341398-002	AGW

Sampling and Receipt Information:

All samples were received in acceptable condition and within temperature requirements, unless noted on the Condition Upon Receipt (CUR) form. All samples were received, prepared and analyzed within the method specified holding times. All samples arrived on ice. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the associated Chain of Custody and Condition Upon Receipt Form.

Quality Control: All samples were prepared and analyzed according to established quality control criteria. Any exceptions are noted in the Quality Control Section of this report.

Test Summary

EPA 200.7	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 300.0	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 351.2	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 2540 C	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 4500-H+B	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)

Certification: I certify that this data package is in compliance with ELAP standards, both technically and for completeness, except for any conditions listed above and in the QC Section. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature. This report shall not be reproduced except in full, without the written approval of the laboratory.

KD: EHB

Approved By **Kelly A. Dunnahoo, B.S.**

Digitally signed by Kelly A. Dunnahoo, B.S.
 Title: Laboratory Director
 Date: 2023-04-04

Section: Case Narrative

Page 1 of 6

Page 1 of 6

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 FAX: (559)734-8435
 CA ELAP Certification No. 2810



April 3, 2023

Innovative Ag Services, LLC
 1201 Delta View Road Suite 5
 Hanford, CA 93230

Description : Eaton 1
 Project : 0350 Wreden Ranch

Lab No. : VI 2341398-001
 Customer No. : 4018573
 Reference : 40180
 Sampled On : March 7, 2023 at 11:30
 Sampled By : Sean
 Received On : March 7, 2023 at 15:55
 Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
							Date	Time	Who	Method	Date	Time	Who
Dairy Analysis													
Alkalinity (as CaCO ₃)	110	10	mg/L		1		03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:32	amm
Bicarbonate	110	10	mg/L		1		03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:32	amm
Carbonate	10	10	mg/L		1	I	03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:32	amm
Hydroxide	10	10	mg/L		1	I	03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:32	amm
Chloride	52	1	mg/L		1	bh	03/08/2023	16:14	ldm	EPA 300.0	03/09/2023	06:59	ldm
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	U	03/21/2023	08:22	sta	EPA 351.2	03/27/2023	18:08	lcr
Nitrate Nitrogen	ND	0.1	mg/L		1	Uh	03/08/2023	16:14	ldm	EPA 300.0	03/09/2023	06:59	ldm
Nitrogen, Total as Nitrogen	ND	0.5	mg/L		1	Uh	03/21/2023	08:22	sta	EPA 351.2	03/27/2023	18:08	lcr
Nitrate + Nitrite as N	ND	0.1	mg/L		1	Uh	03/08/2023	16:14	ldm	EPA 300.0	03/09/2023	06:59	ldm
Kjeldahl Nitrogen	ND	0.5	mg/L		1	U	03/21/2023	08:22	sta	EPA 351.2	03/27/2023	18:08	lcr
Conductivity	388	1	umhos/cm		1		03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:32	amm
Sulfate Sulfur	ND	0.17	mg/L		1	Uh	03/08/2023	16:14	ldm	EPA 300.0	03/09/2023	06:59	ldm
Solids, Total Dissolved (TDS)	220	10	mg/L		1		03/10/2023	13:00	ctl	SM 2540 C	03/13/2023	11:31	ctl
Calcium	3	1	mg/L		1	h	03/10/2023	05:15	ejc	EPA 200.7	03/13/2023	21:08	ac
Magnesium	ND	1	mg/L		1	Jh	03/10/2023	05:15	ejc	EPA 200.7	03/13/2023	21:08	ac
Sodium	88	1	mg/L		1		03/10/2023	05:15	ejc	EPA 200.7	03/13/2023	21:08	ac

DQF Flags Definition:

- I The RPD for the laboratory duplicate exceeded laboratory criteria.
- b The Blank was positive for constituent but less than the PQL.
- h The MS/MSD did not meet QC criteria.
- U Constituent results were non-detect.
- J Reported value is estimated; detected at a concentration below the RL and above the laboratory MDL.

ND=Non-Detected, RL=Reporting Level , Dil.=Dilution



April 3, 2023

Innovative Ag Services, LLC
 1201 Delta View Road Suite 5
 Hanford, CA 93230

Description : Eaton 2
 Project : 0350 Wreden Ranch

Lab No. : VI 2341398-002
 Customer No.: 4018573
 Reference : 40180
 Sampled On : March 7, 2023 at 11:45
 Sampled By : Sean
 Received On : March 7, 2023 at 15:55
 Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
							Date	Time	Who	Method	Date	Time	Who
Dairy Analysis													
Alkalinity (as CaCO ₃)	120	10	mg/L		1		03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:42	amm
Bicarbonate	110	10	mg/L		1		03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:42	amm
Carbonate	10	10	mg/L		1	I	03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:42	amm
Hydroxide	10	10	mg/L		1	I	03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:42	amm
Chloride	28	1	mg/L		1	bh	03/08/2023	16:14	ldm	EPA 300.0	03/09/2023	05:56	ldm
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	U	03/21/2023	08:22	sta	EPA 351.2	03/27/2023	18:09	lcr
Nitrate Nitrogen	ND	0.1	mg/L		1	Uh	03/08/2023	16:14	ldm	EPA 300.0	03/09/2023	05:56	ldm
Nitrogen, Total as Nitrogen	ND	0.5	mg/L		1	Uh	03/21/2023	08:22	sta	EPA 351.2	03/27/2023	18:09	lcr
Nitrate + Nitrite as N	ND	0.1	mg/L		1	Uh	03/08/2023	16:14	ldm	EPA 300.0	03/09/2023	05:56	ldm
Kjeldahl Nitrogen	ND	0.5	mg/L		1	U	03/21/2023	08:22	sta	EPA 351.2	03/27/2023	18:09	lcr
Conductivity	324	1	umhos/cm		1		03/12/2023	21:45	amm	SM 4500-H+B	03/13/2023	01:42	amm
Sulfate Sulfur	0.40	0.17	mg/L		1	h	03/08/2023	16:14	ldm	EPA 300.0	03/09/2023	05:56	ldm
Solids, Total Dissolved (TDS)	190	10	mg/L		1		03/10/2023	13:00	ctl	SM 2540 C	03/13/2023	11:32	ctl
Calcium	3	1	mg/L		1	h	03/10/2023	05:15	ejc	EPA 200.7	03/13/2023	23:00	ac
Magnesium	ND	1	mg/L		1	Jh	03/10/2023	05:15	ejc	EPA 200.7	03/13/2023	23:00	ac
Sodium	68	1	mg/L		1		03/10/2023	05:15	ejc	EPA 200.7	03/13/2023	23:00	ac

DQF Flags Definition:

- I The RPD for the laboratory duplicate exceeded laboratory criteria.
- b The Blank was positive for constituent but less than the PQL.
- h The MS/MSD did not meet QC criteria.
- U Constituent results were non-detect.
- J Reported value is estimated; detected at a concentration below the RL and above the laboratory MDL.

ND=Non-Detected, RL=Reporting Level , Dil.=Dilution



April 3, 2023

Innovative Ag Services, LLC

Lab No. : VI 2341398
 Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	03/10/2023:202605EJC	Blank	mg/L		ND	<1	
		(STK2332850-001)	LCS	mg/L	12.00	102 %	85-115	
			MS	mg/L	12.00	142 %	75-125	435
			MSD	mg/L	12.00	133 %	75-125	435
		(CC 2380727-001)	MSRPD	mg/L	0.8000	2.5%	≤20.0	
			MS	mg/L	12.00	80.6 %	75-125	
			MSD	mg/L	12.00	112 %	75-125	
			MSRPD	mg/L	0.8000	5.4%	≤20.0	
Magnesium	200.7	03/10/2023:202605EJC	Blank	mg/L		ND	<1	
		(STK2332850-001)	LCS	mg/L	12.00	104 %	85-115	
			MS	mg/L	12.00	138 %	75-125	435
			MSD	mg/L	12.00	130 %	75-125	435
		(CC 2380727-001)	MSRPD	mg/L	0.8000	2.3%	≤20	
			MS	mg/L	12.00	98.0 %	75-125	
			MSD	mg/L	12.00	114 %	75-125	
			MSRPD	mg/L	0.8000	5.2%	≤20	
Sodium	200.7	03/10/2023:202605EJC	Blank	mg/L		ND	<1	
		(STK2332850-001)	LCS	mg/L	12.00	99.7 %	85-115	
			MS	mg/L	12.00	212 %	<1/4	
			MSD	mg/L	12.00	183 %	<1/4	
		(CC 2380727-001)	MSRPD	mg/L	0.8000	2.9%	≤20.0	
			MS	mg/L	12.00	67.1 %	<1/4	
			MSD	mg/L	12.00	144 %	<1/4	
			MSRPD	mg/L	0.8000	5.1%	≤20.0	

Definition

- <1/4 : High Sample Background - Spike concentration was less than one forth of the sample concentration.
- Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
- DQO : Data Quality Objective - This is the criteria against which the quality control data is compared.
- LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
- MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
- ND : Non-detect - Result was below the DQO listed for the analyte.

Explanation

- 435 : Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.

April 3, 2023

Innovative Ag Services, LLC

Lab No. : VI 2341398
 Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO3)	2320B	03/12/2023:202678AMM	ND	mg/L		3.64%	10	435
Bicarbonate	2320B	(VI 2341468-009)	Dup	mg/L		5.33%	10	
Carbonate	2320B	(VI 2341468-009)	Dup	mg/L		13.8%	10	440
E. C.	2320B	(VI 2341468-009)	Dup	umhos/cm		0.3%	5	
Solids, Total Dissolved	2540CE	03/10/2023:202661CTL (SP 2303556-001) (SP 2303556-001)	Blank	mg/L	992.0	ND	<10	
			LCS	mg/L		97.9%	90-110	
			Dup	mg/L		1.70%	12.2	
			Dup	mg/L		6.47%	12.2	
Chloride	300.0	03/08/2023:202613LDM (CH 2371551-001) (SP 2303396-001)	Blank	mg/L	25.00 50.00 50.00 10.00 50.00 50.00 10.00	1	<1	
			LCS	mg/L		99.5 %	90-110	
			MS	mg/L		128 %	85-121	435
			MSD	mg/L		121 %	85-121	
			MSRPD	mg/L		4.9%	≤19	
			MS	mg/L		101 %	85-121	
			MSD	mg/L		97.6 %	85-121	
			MSRPD	mg/L		2.5%	≤19	
			MS	mg/L				
Nitrate + Nitrite as N	300.0	03/08/2023:202613LDM (CH 2371551-001) (SP 2303396-001)	Blank	mg/L	20.00 40.00 40.00 10.00 40.00 40.00 10.00	ND	<0.4	
			LCS	mg/L		99.3 %	90-110	
			MS	mg/L		128 %	85-119	435
			MSD	mg/L		122 %	85-119	435
			MSRPD	mg/L		4.6%	≤19	
			MS	mg/L		103 %	85-119	
			MSD	mg/L		99.2 %	85-119	
			MSRPD	mg/L		2.5%	≤19	
			MS	mg/L				
Nitrate Nitrogen	300.0	03/08/2023:202613LDM (CH 2371551-001) (SP 2303396-001)	Blank	mg/L	20.00 40.00 40.00 10.00 40.00 40.00 10.00	ND	<0.4	
			LCS	mg/L		99.3 %	90-110	
			MS	mg/L		128 %	85-119	435
			MSD	mg/L		122 %	85-119	435
			MSRPD	mg/L		4.6%	≤19	
			MS	mg/L		103 %	85-119	
			MSD	mg/L		99.2 %	85-119	
			MSRPD	mg/L		2.5%	≤19	
			MS	mg/L				
Sulfate Sulfur	300.0	03/08/2023:202613LDM (CH 2371551-001) (SP 2303396-001)	Blank	mg/L	50.00 100.0 100.0 10.00 100.0 100.0 10.00	ND	<0.5	
			LCS	mg/L		99.2 %	90-110	
			MS	mg/L		129 %	82-124	435
			MSD	mg/L		122 %	82-124	
			MSRPD	mg/L		5.0%	≤23	
			MS	mg/L		105 %	82-124	
			MSD	mg/L		101 %	82-124	
			MSRPD	mg/L		2.7%	≤23	
			MS	mg/L				
Nitrogen, Total Kjeldahl	351.2	03/21/2023:202994STA (CC 2380755-001) (VI 2341385-002)	Blank	mg/L	12.00 12.00 12.00 12.00 12.00 12.00 12.00	ND	<0.5	
			LCS	mg/L		91.9%	73-124	
			MS	mg/L		89.3%	54-136	
			MSD	mg/L		87.6%	54-136	
			MSRPD	mg/L		1.9%	≤27	
			MS	mg/L		94.6%	54-136	
			MSD	mg/L		90.0%	54-136	
			MSRPD	mg/L		4.8%	≤27	
			MS	mg/L				

Definition

Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.

Dup : Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.

LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.

MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.

MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.

MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.

ND : Non-detect - Result was below the DQO listed for the analyte.

Explanation

435 : Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.

440 : Sample nonhomogeneity may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.



Laboratory Analysis Work Order

ID: # 03502341398SITE NAME: INREDEN RANCHBilling: JIR

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

- QD 14.1
- W1 EC, NO₃N (Dom)
 - W2 EC, NO₃N, TDS, TN (Irr)
 - W3 NH₄-N (Ammonium)
 - W4 EC, NO₃N, Ca, Mg, Na, K, HCO₃, CO₃, SO₄S, Cl, TDS (Dom, GM)
 - ~~W5~~ EC, NO₃N, TDS, TN, Ca, Mg, Na, HCO₃, CO₃, SO₄S, Cl (Irr, GM)
 - W6 NO₃N, NO₂ (Dom ILRP, Annually)
 - W7 Ca, Mg, Na, K, HCO₃, CO₃, SO₄, Cl + Lab Filtering (GWM)
 - W8 Other: _____

Plant Tissue

- P1 TN, NO₃N, PO₄P, K (Mid Season - Wheat)
- P2 TN, P, K (Mid-season - Corn)
- P3 TN, TP, TK, Ash, %M (At Harvest)
- P4 TN, %M
- P5 % Moisture
- P6 NIR
- P7 Other: _____

Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS		
					NH ₃ N *	pH	Temp
1 EATUN 1	IRR	W5	3/7/23 11:30	SEAN	0		
2 EATUN 2	IRR	W5	3/7/23 11:45	SEAN	0		
3							
4							
5							
6							
7							
8							

* Field Test of ammonium nitrogen may only be made by a trained technician. Positive test to be analyzed for ammonium nitrogen by the laboratory.

All samples are to follow the procedures noted in the Sampling & Analysis Plan of the NMP and the RWQCB specifications. Any samples taken outside of these procedures shall provide the procedures on the notes below. Additionally, if any preservatives are used in the collections or processing of samples, please note below.

NOTES:

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1 st	<u>JIR</u>	<u>F6C</u>		3/7/23 12:30
2 nd	<u>JIR</u>	<u>F6C</u>	3-7-23 15:40	
3 rd	<u>JIR</u>	<u>F6C</u>		3-7-23 15:55
4 th	<u>JIR</u>		3/7/23 15:55	

LABORATORY USE ONLY

Logged In By: GJTotal Samples: 7/83Laboratory #: 60



August 3, 2023

Lab No. : VI 2344528
Customer No. : 4018573
Reference : 40668

Innovative Ag Services, LLC
 1201 Delta View Road Suite 5
 Hanford, CA 93230

Laboratory Report

Introduction: This report package contains a total of 5 pages divided into 3 sections:

- | | | |
|-----------------|-----------|---|
| Case Narrative | (1 page) | : An overview of the work performed at FGL. |
| Sample Results | (1 page) | : Results for each sample submitted. |
| Quality Control | (3 pages) | : Supporting Quality Control (QC) results. |

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab No.	Matrix
Eaton 5	07/11/2023	07/11/2023	VI 2344528-001	AGW

Sampling and Receipt Information:

The Sample was received in acceptable condition and within temperature requirements, unless noted on the Condition Upon Receipt (CUR) form. The Sample was received, prepared and analyzed within the method specified holding times. All samples arrived on ice. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the associated Chain of Custody and Condition Upon Receipt Form.

Quality Control: All samples were prepared and analyzed according to established quality control criteria. Any exceptions are noted in the Quality Control Section of this report.

Test Summary

EPA 200.7	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 300.0	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 351.2	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 2540 C	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 4500-H+B	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)

Certification: I certify that this data package is in compliance with ELAP standards, both technically and for completeness, except for any conditions listed above and in the QC Section. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature. This report shall not be reproduced except in full, without the written approval of the laboratory.

KD: EHB

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
 Title: Laboratory Director
 Date: 2023-08-03

Section: Case Narrative

Page 1 of 5

Page 1 of 5

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 FAX: (559)734-8435
 CA ELAP Certification No. 2810



August 3, 2023

Innovative Ag Services, LLC
 1201 Delta View Road Suite 5
 Hanford, CA 93230

Description : Eaton 5
 Project : 0350 Wreden Ranch Dairy

Lab No. : VI 2344528-001
 Customer No. : 4018573
 Reference : 40668
 Sampled On : July 11, 2023 at 13:35
 Sampled By : Henry
 Received On : July 11, 2023 at 15:35
 Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
							Date	Time	Who	Method	Date	Time	Who
Dairy Analysis													
Alkalinity (as CaCO ₃)	110	10	mg/L		1		07/17/2023	15:13	amm	SM 4500-H+B	07/18/2023	00:07	amm
Bicarbonate	110	10	mg/L		1		07/17/2023	15:13	amm	SM 4500-H+B	07/18/2023	00:07	amm
Carbonate	10	10	mg/L		1		07/17/2023	15:13	amm	SM 4500-H+B	07/18/2023	00:07	amm
Hydroxide	10	10	mg/L		1		07/17/2023	15:13	amm	SM 4500-H+B	07/18/2023	00:07	amm
Chloride	53	1	mg/L		1		07/12/2023	15:00	ldm	EPA 300.0	07/13/2023	13:22	krh
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	U	07/28/2023	08:46	sta	EPA 351.2	07/31/2023	20:03	lcr
Nitrate Nitrogen	ND	0.1	mg/L		1	U	07/12/2023	15:00	ldm	EPA 300.0	07/13/2023	13:22	krh
Nitrogen, Total as Nitrogen	ND	0.5	mg/L		1	U	07/28/2023	08:46	sta	Calc.	07/31/2023	20:03	lcr
Nitrate + Nitrite as N	ND	0.1	mg/L		1	U	07/12/2023	15:00	ldm	EPA 300.0	07/13/2023	13:22	krh
Kjeldahl Nitrogen	ND	0.5	mg/L		1	U	07/28/2023	08:46	sta	EPA 351.2	07/31/2023	20:03	lcr
Conductivity	404	1	umhos/cm		1		07/17/2023	15:13	amm	SM 4500-H+B	07/18/2023	00:07	amm
Sulfate Sulfur	4.10	0.17	mg/L		1		07/12/2023	15:00	ldm	EPA 300.0	07/13/2023	13:22	krh
Solids, Total Dissolved (TDS)	250	20	mg/L		1		07/14/2023	10:00	ctl	SM 2540 C	07/17/2023	11:10	ctl
Calcium	3	1	mg/L		1		07/14/2023	06:55	ejc	EPA 200.7	07/14/2023	18:36	ac
Magnesium	ND	1	mg/L		1	U	07/14/2023	06:55	ejc	EPA 200.7	07/14/2023	18:36	ac
Sodium	77	1	mg/L		1		07/14/2023	06:55	ejc	EPA 200.7	07/14/2023	18:36	ac

DQF Flags Definition:

U Constituent results were non-detect.

ND=Non-Detected, RL=Reporting Level , Dil.=Dilution



August 3, 2023

Innovative Ag Services, LLC

Lab No. : VI 2344528

Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	07/14/2023:207699EJC (CC 2382234-001)	Blank LCS MS MSD MSRPD (SP 2311901-001) MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	12.00 12.00 12.00 12.00 0.6% 12.00 12.00 8.0%	ND 103% 76.5% 79.5% 0.6% 117% 97.4% ≤20.0	<1 85-115 75-125 75-125 ≤20.0 75-125 75-125 ≤20.0	
Magnesium	200.7	07/14/2023:207699EJC (CC 2382234-001)	Blank LCS MS MSD MSRPD (SP 2311901-001) MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	12.00 12.00 12.00 12.00 0.9% 12.00 12.00 7.3%	ND 106% 80.0% 83.5% 0.9% 114% 101% ≤20	<1 85-115 75-125 75-125 ≤20 75-125 75-125 ≤20	
Sodium	200.7	07/14/2023:207699EJC (CC 2382234-001)	Blank LCS MS MSD MSRPD (SP 2311901-001) MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	12.00 12.00 12.00 12.00 1.9% 12.00 12.00 7.9%	ND 103% 37.4% 56.8% 1.9% 253% 87.8% ≤20.0	<1 85-115 <1/4 <1/4 ≤20.0 <1/4 75-125 ≤20.0	406 406

Definition

- Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
- DQO : Data Quality Objective - This is the criteria against which the quality control data is compared.
- LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
- MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
- ND : Non-detect - Result was below the DQO listed for the analyte.

Explanation

- 406 : Matrix Spike (MS) not within the Acceptance Range (AR) because of high analyte concentration in the sample. Data was accepted based on the LCS or CCV recovery.

August 3, 2023
Innovative Ag Services, LLC

Lab No. : VI 2344528
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO3)	2320B	07/17/2023:207798AMM	ND	mg/L		0.2%	10	406
Bicarbonate	2320B	(CC 2381960-001)	Dup	mg/L		0.2%	10	
Carbonate	2320B	(CC 2381960-001)	Dup	mg/L			10	
E. C.	2320B	(CC 2381960-001)	Dup	umhos/cm		0.1%	5	
Solids, Total Dissolved	2540CE	07/14/2023:207703CTL (SP 2311840-005) (SP 2311840-005)	Blank	mg/L		ND	<20	
			LCS	mg/L	993.7	99.0%	90-110	
			Dup	mg/L		1.59%	5	
			Dup	mg/L		2.13%	5	
Chloride	300.0	07/12/2023:207721LDM (STK2339189-001) (VI 2344462-001)	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	102 %	90-110	
			MS	mg/L	50.00	104 %	85-121	
			MSD	mg/L	50.00	102 %	85-121	
			MSRPD	mg/L	10.00	1.9%	≤19	
			MS	mg/L	50.00	92.0 %	85-121	
			MSD	mg/L	50.00	91.0 %	85-121	
			MSRPD	mg/L	10.00	0.6%	≤19	
			MS	mg/L	40.00	103 %	85-119	
			MSD	mg/L	40.00	102 %	85-119	
Nitrate + Nitrite as N	300.0	07/12/2023:207721LDM (STK2339189-001) (VI 2344462-001)	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	101 %	90-110	
			MS	mg/L	40.00	105 %	85-119	
			MSD	mg/L	40.00	103 %	85-119	
			MSRPD	mg/L	10.00	2.0%	≤19	
			MS	mg/L	40.00	103 %	85-119	
			MSD	mg/L	40.00	102 %	85-119	
			MSRPD	mg/L	10.00	1.3%	≤19	
			MS	mg/L	40.00	103 %	85-119	
			MSD	mg/L	40.00	102 %	85-119	
Nitrate Nitrogen	300.0	07/12/2023:207721LDM (STK2339189-001) (VI 2344462-001)	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	101 %	90-110	
			MS	mg/L	40.00	105 %	85-119	
			MSD	mg/L	40.00	103 %	85-119	
			MSRPD	mg/L	10.00	2.0%	≤19	
			MS	mg/L	40.00	103 %	85-119	
			MSD	mg/L	40.00	102 %	85-119	
			MSRPD	mg/L	10.00	1.3%	≤19	
			MS	mg/L	40.00	103 %	85-119	
			MSD	mg/L	40.00	102 %	85-119	
Sulfate Sulfur	300.0	07/12/2023:207721LDM (STK2339189-001) (VI 2344462-001)	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	103 %	90-110	
			MS	mg/L	100.0	104 %	82-124	
			MSD	mg/L	100.0	102 %	82-124	
			MSRPD	mg/L	10.00	1.9%	≤23	
			MS	mg/L	100.0	101 %	82-124	
			MSD	mg/L	100.0	99.4 %	82-124	
			MSRPD	mg/L	10.00	1.2%	≤23	
			MS	mg/L	100.0	103 %	82-124	
			MSD	mg/L	100.0	99.4 %	82-124	
Nitrogen, Total Kjeldahl	351.2	07/28/2023:208341STA (SP 2311944-003) (SP 2311944-004)	Blank	mg/L		ND	<0.5	
			LCS	mg/L	12.00	94.9%	73-124	
			MS	mg/L	12.00	94.6%	54-136	
			MSD	mg/L	12.00	94.6%	54-136	
			MSRPD	mg/L		0.0%	≤27	
			MS	mg/L	12.00	93.8%	54-136	
			MSD	mg/L	12.00	92.6%	54-136	
			MSRPD	mg/L		1.2%	≤27	
			MS	mg/L	12.00	93.8%	54-136	
			MSD	mg/L	12.00	92.6%	54-136	

Definition

- Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
- Dup : Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.
- LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
- MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
- ND : Non-detect - Result was below the DQO listed for the analyte.

Explanation

- 406 : Matrix Spike (MS) not within the Acceptance Range (AR) because of high analyte concentration in the sample. Data was accepted based on the LCS or CCV recovery.



2344528
Laboratory Analysis Work Order

Nº 40668

ID: #0350

SITE NAME: Wreden Ranch Dairy

Billing: TAS

R01
21.4°C**ANALYSIS TO BE COMPLETED:****Irrigation/Ground Water (ELAP Standards)**

- W1 EC, NO₃N (Dom)
- W2 EC, NO₃N, TDS, TN (Irr)
- W3 NH₄-N (Ammonium)
- W4 EC, NO₃N, Ca, Mg, Na, K, HCO₃, CO₃, SO₄S, Cl, TDS (Dom, GM)
- W5 EC, NO₃N, TDS, TN, Ca, Mg, Na, HCO₃, CO₃, SO₄S, Cl (Irr, GM)
- W6 NO₃N, NO₂ (Dom ILRP, Annually)
- W7 Ca, Mg, Na, K, HCO₃, CO₃, SO₄, Cl + Lab Filtering (GWM)
- W8 Other: _____

Plant Tissue

- P1 TN, NO₃N, PO₄P, K (Mid Season - Wheat)
- P2 TN, P, K (Mid-season - Corn)
- P3 TN, TP, TK, Ash, %M (At Harvest)
- P4 TN, %M
- P5 % Moisture
- P6 NIR
- P7 Other: _____

Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS		
					NH ₃ N*	pH	Temp
1	Eaton 5	Irr	W/5 1:35 7/11	Henry	—		
2							
3							
4							
5							
6							
7							
8							

* Field Test of ammonium nitrogen may only be made by a trained technician. Positive test to be analyzed for ammonium nitrogen by the laboratory.

All samples are to follow the procedures noted in the Sampling & Analysis Plan of the NMP and the RWQCB specifications. Any samples taken outside of these procedures shall provide the procedures on the notes below. Additionally, if any preservatives are used in the collections or processing of samples, please note below.

NOTES:

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1 st		TAS		7/11/23 15:30
2 nd		FGL	7/11/23 15:30	
3 rd		FGL		7/11/23 15:35
4 th	 SRO	FGL	7/11/23 15:35	
LABORATORY USE ONLY				
Logged In By: _____		Total Samples: _____	Laboratory #:	THE PRINTER INC. - 559-992-5127



September 7, 2023

Lab No. : VI 2345497**Customer No.** : 4018573**Reference** : 41242

Innovative Ag Services, LLC
1201 Delta View Road
Suite 5
Hanford, CA 93230

Laboratory Report

Introduction: This report package contains a total of 4 pages divided into 3 sections:

- | | | |
|-----------------|-----------|---|
| Case Narrative | (1 page) | : An overview of the work performed at FGL. |
| Sample Results | (2 pages) | : Results for each sample submitted. |
| Quality Control | (1 page) | : Supporting Quality Control (QC) results. |

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab No.	Matrix
WS3	08/17/2023	08/17/2023	VI 2345497-001	AGW
WS6	08/17/2023	08/17/2023	VI 2345497-002	AGW

Sampling and Receipt Information:

All samples were received in acceptable condition and within temperature requirements, unless noted on the Condition Upon Receipt (CUR) form. All samples were received, prepared and analyzed within the method specified holding times. All samples arrived on ice. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the associated Chain of Custody and Condition Upon Receipt Form.

Quality Control: All samples were prepared and analyzed according to established quality control criteria. Any exceptions are noted in the Quality Control Section of this report.

Test Summary

EPA 351.2	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 2540 C	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 4500-H+B	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 4500-NO3 F	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)

Certification: I certify that this data package is in compliance with ELAP standards, both technically and for completeness, except for any conditions listed above and in the QC Section. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature. This report shall not be reproduced except in full, without the written approval of the laboratory.

KD: EHB

Approved By **Kelly A. Dunnahoo, B.S.**  Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2023-09-09



September 7, 2023

Innovative Ag Services, LLC
 1201 Delta View Road
 Suite 5
 Hanford, CA 93230

Description : WS3
 Project : 0350 Wreden Ranch Dairy

Lab No. : VI 2345497-001
 Customer No.: 4018573
 Reference : 41242
 Sampled On : August 17, 2023 at 11:45
 Sampled By : Alex
 Received On : August 17, 2023 at 15:45
 Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
							Date	Time	Who	Method	Date	Time	Who
Dairy Analysis													
Nitrogen, Total Kjeldahl	0.6	0.5	mg/L		1	I	08/30/2023	08:34	sta	EPA 351.2	09/05/2023	18:40	lcr
Nitrate Nitrogen	ND	0.4	mg/L		1	U	08/18/2023	12:55	lfs	SM 4500-NO3 F	08/18/2023	14:13	lfs
Nitrogen, Total as Nitrogen	0.6	0.5	mg/L		1	I	08/30/2023	08:34	sta	Calc.	09/05/2023	18:40	lcr
Nitrate + Nitrite as N	ND	0.4	mg/L		1	U	08/18/2023	12:55	lfs	SM 4500-NO3 F	08/18/2023	14:13	lfs
Kjeldahl Nitrogen	0.6	0.5	mg/L		1	I	08/30/2023	08:34	sta	EPA 351.2	09/05/2023	18:40	lcr
Conductivity	443	1	umhos/cm		1		08/22/2023	15:45	amm	SM 4500-H+B	08/22/2023	18:56	amm
Solids, Total Dissolved (TDS)	240	20	mg/L		1		08/21/2023	15:00	ctl	SM 2540 C	08/22/2023	11:00	ctl

DQF Flags Definition:

- I The MS/MSD did not meet QC criteria.
- U Constituent results were non-detect.

ND=Non-Detected, RL=Reporting Level , Dil.=Dilution



September 7, 2023

Innovative Ag Services, LLC
 1201 Delta View Road
 Suite 5
 Hanford, CA 93230

Description : WS6
 Project : 0350 Wreden Ranch Dairy

Lab No. : VI 2345497-002
 Customer No.: 4018573
 Reference : 41242
 Sampled On : August 17, 2023 at 11:25
 Sampled By : Alex
 Received On : August 17, 2023 at 15:45
 Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
							Date	Time	Who	Method	Date	Time	Who
Dairy Analysis													
Nitrogen, Total Kjeldahl	0.9	0.5	mg/L		1	I	08/30/2023	08:34	sta	EPA 351.2	09/05/2023	18:42	lcr
Nitrate Nitrogen	ND	0.4	mg/L		1	U	08/18/2023	12:55	lfs	SM 4500-NO3 F	08/18/2023	14:15	lfs
Nitrogen, Total as Nitrogen	0.9	0.5	mg/L		1	I	08/30/2023	08:34	sta	Calc.	09/05/2023	18:42	lcr
Nitrate + Nitrite as N	ND	0.4	mg/L		1	U	08/18/2023	12:55	lfs	SM 4500-NO3 F	08/18/2023	14:15	lfs
Kjeldahl Nitrogen	0.9	0.5	mg/L		1	I	08/30/2023	08:34	sta	EPA 351.2	09/05/2023	18:42	lcr
Conductivity	530	1	umhos/cm		1		08/22/2023	15:45	amm	SM 4500-H+B	08/22/2023	18:02	amm
Solids, Total Dissolved (TDS)	320	20	mg/L		1		08/21/2023	15:00	ctl	SM 2540 C	08/22/2023	11:00	ctl

DQF Flags Definition:

- I The MS/MSD did not meet QC criteria.
- U Constituent results were non-detect.

ND=Non-Detected, RL=Reporting Level , Dil.=Dilution



September 7, 2023

Innovative Ag Services, LLC

Lab No. : VI 2345497

Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
E. C.	2320B	(VI 2345472-003) (VI 2345478-003)	Dup Dup	umhos/cm umhos/cm		0.4% 0.5%	5 5	
Solids, Total Dissolved	2540CE	08/21/2023:209366CTL (CC 2382774-002) (CC 2382774-002)	Blank LCS Dup Dup	mg/L mg/L mg/L mg/L	991.5	ND 95.4% 1.21% 2.03%	<20 90-110 5 5	
Nitrogen, Total Kjeldahl	351.2	08/30/2023:209713STA (STK2351326-003) (STK2351326-004)	Blank LCS MS MSD MSRPD MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	12.00 12.00 12.00 1.7% 12.00 12.00 0.8%	ND 88.9% 91.8% 90.1% 89.3% 88.6% ≤20	<0.5 73-124 90-110 90-110 90-110 90-110 ≤20	
Nitrate + Nitrite as N	4500NO3F	08/18/2023:209244LFS (VI 2345499-001)	Blank LCS MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L	11.22 5.609 5.609 98.6% 3.2%	ND 96.1% 95.4% 98.6% ≤30.4	<0.4 80-120 66-125 66-125 ≤30.4	
Nitrate Nitrogen	4500NO3F	08/18/2023:209244LFS (VI 2345499-001)	Blank LCS MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L	11.22 5.609 5.609 98.6% 3.2%	ND 96.1% 95.4% 98.6% ≤30.4	<0.4 80-120 66-125 66-125 ≤30.4	

Definition

- Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
- DQO : Data Quality Objective - This is the criteria against which the quality control data is compared.
- Dup : Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.
- LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
- MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
- ND : Non-detect - Result was below the DQO listed for the analyte.

Explanation

- 435 : Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.



Laboratory Analysis Work Order

Nº 41242

ID: # 0350

2345497

LABORATORY: FGL

SITE NAME: Wreden Ranch Dairy

Billing: IAS

Authorized Copy Release to:

Innovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO₃N (Dom)W2 EC, NO₃N, TDS, TN (Irr)W3 NH₄-N (Ammonium)W4 EC, NO₃N, Ca, Mg, Na, K, HCO₃, CO₃, SO₄S, Cl, TDS (Dom, GM)W5 EC, NO₃N, TDS, TN, Ca, Mg, Na, HCO₃, CO₃, SO₄S, Cl (Irr, GM)W6 NO₃N, NO₂ (Dom ILRP, Annually)W7 Ca, Mg, Na, K, HCO₃, CO₃, SO₄, Cl + Lab Filtering (GWM)

W8 Other: _____

(Handwritten notes: QD, G.D., DD, 7/14/07)

Plant Tissue

P1 TN, NO₃N, PO₄P, K (Mid Season - Wheat)

P2 TN, P, K (Mid-season - Corn)

P3 TN, TP, TK, Ash, %M (At Harvest)

P4 TN, %M

P5 % Moisture

P6 NIR

P7 Other: _____

Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS		
					NH ₃ N *	pH	Temp
1 W53	Irr	W2	8/17 11:45	Alex			
2 W55	+	+	8/17 11:25	+			
3							
4							
5							
6							
7							
8							

* Field Test of ammonium nitrogen may only be made by a trained technician. Positive test to be analyzed for ammonium nitrogen by the laboratory.

All samples are to follow the procedures noted in the Sampling & Analysis Plan of the NMP and the RWQCB specifications. Any samples taken outside of these procedures shall provide the procedures on the notes below. Additionally, if any preservatives are used in the collections or processing of samples, please note below.

NOTES: _____

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1 st	Abbot R	IAS		8/17/23 2:00
2 nd	SAC	FGL	8-17-23 15:35	
3 rd	SCD	FGL		8-17-23 15:45
4 th	ADH		8/17/23 1545	
LABORATORY USE ONLY				
Logged In By:	615	Total Samples:	1/1/23	8/10/23 10:55



September 14, 2023

Innovative Ag Services, LLC
 1201 Delta View Road
 Suite 5
 Hanford, CA 93230

Lab No. : VI 2345630
Customer No. : 4018573
Reference : 41215

Laboratory Report

Introduction: This report package contains a total of 5 pages divided into 3 sections:

- | | | |
|-----------------|-----------|---|
| Case Narrative | (1 page) | : An overview of the work performed at FGL. |
| Sample Results | (1 page) | : Results for each sample submitted. |
| Quality Control | (3 pages) | : Supporting Quality Control (QC) results. |

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab No.	Matrix
W8	08/23/2023	08/23/2023	VI 2345630-001	AGW

Sampling and Receipt Information:

The Sample was received in acceptable condition and within temperature requirements, unless noted on the Condition Upon Receipt (CUR) form. The Sample was received, prepared and analyzed within the method specified holding times. All samples arrived on ice. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the associated Chain of Custody and Condition Upon Receipt Form.

Quality Control: All samples were prepared and analyzed according to established quality control criteria. Any exceptions are noted in the Quality Control Section of this report.

Test Summary

EPA 200.7	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 300.0	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 351.2	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 2540 C	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 4500-H+B	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)

Certification: I certify that this data package is in compliance with ELAP standards, both technically and for completeness, except for any conditions listed above and in the QC Section. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature. This report shall not be reproduced except in full, without the written approval of the laboratory.

KD: EHB

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
 Title: Laboratory Director
 Date: 2023-09-14

Section: Case Narrative

Page 1 of 5

Page 1 of 5

Corporate Offices & Laboratory
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 Santa Paula, CA 93060
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 Env FAX: (805)625-4172 / Ag FAX: (805)392-2063
 CA ELAP Certification No. 1573

Office & Laboratory
 2500 Stagecoach Road
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 TEL: (209)842-0182
 FAX: (209)842-0423
 CA ELAP Certification No. 1563

Office & Laboratory
 563 E. Lindo Avenue
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 TEL: (530)343-5818
 FAX: (530)343-3807
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 San Luis Obispo, CA 93401
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 CA ELAP Certification No. 2775

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 9415 W. Goshen Avenue
 Visalia, CA 93291
 TEL: (559)734-9473
 FAX: (559)734-8435
 CA ELAP Certification No. 2810



September 14, 2023

Innovative Ag Services, LLC

1201 Delta View Road
Suite 5
Hanford, CA 93230

Description : W8

Project : 0350 Wreden Ranch Dairy

Lab No. : VI 2345630-001

Customer No.: 4018573

Reference : 41215

Sampled On : August 23, 2023 at 13:50

Sampled By : Alex

Received On : August 23, 2023 at 15:57

Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
							Date	Time	Who	Method	Date	Time	Who
Dairy Analysis													
Alkalinity (as CaCO ₃)	90	10	mg/L		1		08/29/2023	10:16	amm	SM 4500-H+B	08/29/2023	11:24	amm
Bicarbonate	110	10	mg/L		1		08/29/2023	10:16	amm	SM 4500-H+B	08/29/2023	11:24	amm
Carbonate	ND	10	mg/L		1	U	08/29/2023	10:16	amm	SM 4500-H+B	08/29/2023	11:24	amm
Hydroxide	ND	10	mg/L		1	U	08/29/2023	10:16	amm	SM 4500-H+B	08/29/2023	11:24	amm
Chloride	62	1	mg/L		1	b	08/24/2023	14:31	ldm	EPA 300.0	08/25/2023	00:14	ldm
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	Ul	09/06/2023	10:10	sta	EPA 351.2	09/11/2023	19:33	lcr
Nitrate Nitrogen	ND	0.1	mg/L		1	U	08/24/2023	14:31	ldm	EPA 300.0	08/25/2023	00:14	ldm
Nitrogen, Total as Nitrogen	ND	0.5	mg/L		1	Ul	09/06/2023	10:10	sta	Calc.	09/11/2023	19:33	lcr
Nitrate + Nitrite as N	ND	0.1	mg/L		1	U	08/24/2023	14:31	ldm	EPA 300.0	08/25/2023	00:14	ldm
Kjeldahl Nitrogen	ND	0.5	mg/L		1	Ul	09/06/2023	10:10	sta	EPA 351.2	09/11/2023	19:33	lcr
Conductivity	471	1	umhos/cm		1		08/29/2023	10:16	amm	SM 4500-H+B	08/29/2023	11:24	amm
Sulfate Sulfur	13.0	0.17	mg/L		1		08/24/2023	14:31	ldm	EPA 300.0	08/25/2023	00:14	ldm
Solids, Total Dissolved (TDS)	250	20	mg/L		1		08/25/2023	12:45	ctl	SM 2540 C	08/28/2023	10:45	ctl
Calcium	11	1	mg/L		1		08/31/2023	07:12	ejc	EPA 200.7	09/05/2023	21:03	ac
Magnesium	ND	1	mg/L		1	U	08/31/2023	07:12	ejc	EPA 200.7	09/05/2023	21:03	ac
Sodium	89	1	mg/L		1		08/31/2023	07:12	ejc	EPA 200.7	09/05/2023	21:03	ac

DQF Flags Definition:

U Constituent results were non-detect.

b The Blank was positive for constituent but less than the PQL

l The MS/MSD did not meet QC criteria.

ND=Non-Detected, RL=Reporting Level , Dil.=Dilution



September 14, 2023

Innovative Ag Services, LLC

Lab No. : VI 2345630

Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	08/31/2023:209761EJC	Blank	mg/L		ND	<1	
		(VI 2345631-002)	LCS	mg/L	12.00	113%	85-115	
			MS	mg/L	12.00	66.8%	<¼	406
			MSD	mg/L	12.00	81.8%	75-125	
			MSRPD	mg/L		2.7%	≤20.0	
		(CH 2377307-001)	MS	mg/L	12.00	114%	75-125	
			MSD	mg/L	12.00	117%	75-125	
			MSRPD	mg/L		1.5%	≤20.0	
Magnesium	200.7	08/31/2023:209761EJC	Blank	mg/L		ND	<1	
		(VI 2345631-002)	LCS	mg/L	12.00	115%	85-115	
			MS	mg/L	12.00	107%	75-125	
			MSD	mg/L	12.00	106%	75-125	
			MSRPD	mg/L		1.3%	≤20	
		(CH 2377307-001)	MS	mg/L	12.00	116%	75-125	
			MSD	mg/L	12.00	117%	75-125	
			MSRPD	mg/L		0.9%	≤20	
Sodium	200.7	08/31/2023:209761EJC	Blank	mg/L		ND	<1	
		(VI 2345631-002)	LCS	mg/L	12.00	111%	85-115	
			MS	mg/L	12.00	31.3%	<¼	406
			MSD	mg/L	12.00	57.7%	<1/4	
			MSRPD	mg/L		3.0%	≤20.0	
		(CH 2377307-001)	MS	mg/L	12.00	117%	75-125	
			MSD	mg/L	12.00	120%	75-125	
			MSRPD	mg/L		1.4%	≤20.0	

Definition

- Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
- DQO : Data Quality Objective - This is the criteria against which the quality control data is compared.
- LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
- MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
- ND : Non-detect - Result was below the DQO listed for the analyte.

Explanation

- 406 : Matrix Spike (MS) not within the Acceptance Range (AR) because of high analyte concentration in the sample. Data was accepted based on the LCS or CCV recovery.

September 14, 2023
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Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
E. C.	2320B	08/29/2023:209673AMM	ND	umhos/cm		4.59%	5	406
Solids, Total Dissolved	2540CE	08/25/2023:209549CTL (VI 2345629-003) (VI 2345629-003)	Blank LCS Dup Dup	mg/L mg/L mg/L mg/L	991.5	ND 98.3 % 2.7% 1.4%	<20 90-110 5 5	
Chloride	300.0	08/24/2023:209577LDM (CH 2376952-001)	Blank LCS MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L	25.00 50.00 50.00 10.00	1 100 % 101 % 101 % 0.2%	<1 90-110 67-117 67-117 ≤7	
Nitrate + Nitrite as N	300.0	08/24/2023:209577LDM (VI 2345630-001) (CH 2376952-001)	Blank LCS MS MSD MSRPD MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	20.00 40.00 40.00 10.00 40.00 40.00 40.00 10.00	ND 101 % 101 % 102 % 0.2% 105 % 105 % 0.2%	<0.4 90-110 86-112 86-112 ≤7 86-112 86-112 ≤7	
Nitrate Nitrogen	300.0	08/24/2023:209577LDM (VI 2345630-001) (CH 2376952-001)	Blank LCS MS MSD MSRPD MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	20.00 40.00 40.00 10.00 40.00 40.00 40.00 10.00	ND 101 % 101 % 102 % 0.2% 105 % 105 % 0.2%	<0.4 90-110 86-112 86-112 ≤7 86-112 86-112 ≤7	
Sulfate Sulfur	300.0	08/24/2023:209577LDM (VI 2345630-001) (CH 2376952-001)	Blank LCS MS MSD MSRPD MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	50.00 100.0 100.0 10.00 100.0 100.0 100.0 10.00	ND 101 % 96.6 % 96.8 % 0.2% 105 % 105 % 0.2%	<0.5 90-110 18-165 18-165 ≤7 18-165 18-165 ≤7	
Nitrogen, Total Kjeldahl	351.2	09/06/2023:209952STA (VI 2345582-001) (VI 2345630-001)	Blank LCS MS MSD MSRPD MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	12.00 12.00 12.00 12.00 mg/L 12.00 12.00 mg/L	ND 92.8% 90.5% 88.5% 2.2% 84.9% 88.2% 3.6%	<0.5 73-124 90-110 90-110 435 ≤20 90-110 435 90-110 435 ≤20	

Definition

Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.

Dup : Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.

LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.

MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.

MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.

MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.

ND : Non-detect - Result was below the DQO listed for the analyte.

Explanation

406 : Matrix Spike (MS) not within the Acceptance Range (AR) because of high analyte concentration in the sample. Data was accepted based on the LCS or CCV recovery.

435 : Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.



Laboratory Analysis Work Order

Nº 41215

ID: # 03502815630LABORATORY: FGLSITE NAME: Wreden Ranch DairyBilling: IAS
ANALYSIS TO BE COMPLETED:
Irrigation/Ground Water (ELAP Standards)

- W1 EC, NO₃N (Dom)
W2 EC, NO₃N, TDS, TN (Irr)
W3 NH₄-N (Ammonium)
W4 EC, NO₃N, Ca, Mg, Na, K, HCO₃, CO₃, SO₄S, Cl, TDS (Dom, GM)
W5 EC, NO₃N, TDS, TN, Ca, Mg, Na, HCO₃, CO₃, SO₄S, Cl (Irr, GM)
W6 NO₃N, NO₂ (Dom ILRP, Annually)
W7 Ca, Mg, Na, K, HCO₃, CO₃, SO₄, Cl + Lab Filtering (GWM)
W8 Other: _____

Plant Tissue

- P1 TN, NO₃N, PO₄P, K (Mid Season - Wheat)
P2 TN, P, K (Mid-season - Corn)
P3 TN, TP, TK, Ash, %M (At Harvest)
P4 TN, %M
P5 % Moisture
P6 NIR
P7 Other: _____

Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS		
					NH ₃ N *	pH	Temp
1 WB	Irr	W5	8/23 1:50	Alex	—		
2							
3							
4							
5							
6							
7							
8							

* Field Test of ammonium nitrogen may only be made by a trained technician. Positive test to be analyzed for ammonium nitrogen by the laboratory.

All samples are to follow the procedures noted in the Sampling & Analysis Plan of the NMP and the RWQCB specifications. Any samples taken outside of these procedures shall provide the procedures on the notes below. Additionally, if any preservatives are used in the collections or processing of samples, please note below.

NOTES: _____

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1 st	Alex R	IAS		8/23/23 3:00
2 nd	AB	FGL	8/23/23 1535	
3 rd	ASB	FGL		8/23/23 1551
4 th	ADH	J	8/23/23 1557	
LABORATORY USE ONLY				
Logged In By: <u>611</u>			Total Samples: <u>1</u>	Laboratory #: <u>601</u> goulds <u>1155</u>