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INNOVATIVE
AG SERVICES

Hamstra Dairy

2023 Annual Report

X	Report Form	NA	Attachment H
X	Attachment A	NA	Attachment I
X	Attachment B	NA	Attachment J
X	Attachment C	NA	Manure Tracking Manifests
X	Attachment D	NA	New or Revised Waste Water Agreements
X	Attachment E	X	Groundwater Monitoring Samples
X	Attachment F	NA	Monitoring Well Report
X	Attachment G	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. R5-2013-0122 Waste Discharge Requirements, General Order for Existing Milk Cow Dairies for July 1, 2024.

(See attached delivery confirmation)

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Annual Report

Hamstra Dairy 2023

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Facility Information:

Name of Dairy	Hamstra Dairy
Facility Address	7590 Avenue 260, Tulare CA 93274

Owner/Operator as of 12/31/2023

Operator Name	Greg Hamstra
Operator Phone	(559) 804-9106
Owner Name	Jacob Hamstra
Owner Phone	(559) 686-8725

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:

X 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:

X 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:

X 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.

X 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?

X 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.

X 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).

X 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

X 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

X 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."

DocuSigned by:
Greg Hamstra
C4D4BEAFBEF54CE...
Signature of Operator of Facility

Greg Hamstra
Print Name

6/24/2024
Title and Date

DocuSigned by:
Greg Hamstra
C4D4BEAFBEF54C...
Signature of Owner of Facility

Jacob Hamstra
Print Name

6/24/2024
Title and Date

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Hamstra Dairy 2023

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 Net (LB) Available for Land Application	PHOSPHORUS Net (LB) Available for Land Application	POTASSIUM Net (LB) Available for Land Application	SALTS Net (LB) Available for Land Application
Hol Milk Cows	3,415	3,329	Milk Freestall -	1,400	84,486.32	1,202,934.15	206,564.45	279,469.55	2,194,443.51
Hol Dry Cows	435	424	Flushed	1,450	6,187.06	77,380.00	10,833.20	51,070.80	109,198.66
Hol Heifers(15-24)	1,460	1,423	Flushed	1,000	14,854.02	197,370.10	31,163.70	93,491.10	366,485.11
Hol Heifers (7-14)	720	702	Flushed	750	6,751.33	66,619.80	11,274.12	38,434.50	84,748.07
Hol Calves (4-6)	415	404	Flushed	300	1,400.87	20,644.40	5,898.40	11,796.80	9,673.38
Hol Calves (0-3)	500	487	Calves Dry Scrape	150	1,688.67	3,555.10	1,777.55	7,110.20	4,278.56
	6,945	**6,769**			**115,368.27**	**1,568,503.55**	**267,511.42**	**481,372.95**	**2,768,827.29**

* 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)**
60,879,941	593.50	61.50	758.75	4,740.00	300,981.60	31,188.49	384,784.82	2,403,795.7

* 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).

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 1

Alfalfa, 13 Acres Planted on 11/01/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			182				
05/01/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			261	0	0	5,810	
05/01/2023	Waste Water: Main Lagoon	0.50	Acre Inches		816.00	69.90	951.00	mg/L		176,503	1,200	103	1,398	4,470	
05/29/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			252	0	0	5,607	
06/24/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			266	0	0	5,912	
07/27/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			261	0	0	5,810	
09/07/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			252	0	0	5,607	
10/10/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			257	0	0	5,709	
11/12/2023	Ground Water: Well Avg	5.25	Acre Inches		15.59			mg/L			241	0	0	5,352	
12/01/2023	Harvest	11.05	Tons	7.88	2.77	0.29	2.77	%							7,331
	Acre Inches Applied:	**39.55**						**Totals:**		**176,503**	**3,172**	**103**	**1,398**	**44,277**	**7,331**
Season Nitrogen Ratio:	0.43							**Lbs Per Acre:**			**244**	**8**	**108**	**3,406**	**564**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 2

Alfalfa, 25 Acres Planted on 11/01/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			350				
05/05/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			485	0	0	10,782	
05/05/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			494	0	0	10,978	
05/05/2023	Waste Water: Main Lagoon	0.50	Acre Inches		816.00	69.90	951.00	mg/L		339,429	2,307	198	2,689	8,596	
05/09/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			511	0	0	11,370	
06/24/2023	Ground Water: Well Avg	5.90	Acre Inches		15.59			mg/L			520	0	0	11,566	
07/27/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			502	0	0	11,174	
09/07/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			476	0	0	10,586	
11/12/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			476	0	0	10,586	
12/01/2023	Harvest	13.48	Tons	8.21	2.67	0.27	2.62	%							16,518
	Acre Inches Applied:	**39.80**						**Totals:**		**339,429**	**6,122**	**198**	**2,689**	**85,638**	**16,518**
Season Nitrogen Ratio:	0.37							**Lbs Per Acre:**			**245**	**8**	**108**	**3,426**	**661**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 3

Alfalfa, 38 Acres Planted on 11/01/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			532				
05/03/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			724	0	0	16,091	
05/03/2023	Waste Water: Main Lagoon	0.50	Acre Inches		816.00	69.90	951.00	mg/L		515,932	3,507	301	4,087	13,065	
05/31/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			764	0	0	16,984	
06/25/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			777	0	0	17,282	
07/28/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			764	0	0	16,984	
09/08/2023	Ground Water: Well Avg	5.90	Acre Inches		15.59			mg/L			790	0	0	17,580	
10/11/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			750	0	0	16,687	
11/13/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			737	0	0	16,389	
12/01/2023	Harvest	12.69	Tons	6.69	3.16	0.24	1.72	%							28,437
	Acre Inches Applied:	**40.10**						**Totals:**		**515,932**	**9,345**	**301**	**4,087**	**131,063**	**28,437**
Season Nitrogen Ratio:	0.33							**Lbs Per Acre:**			**246**	**8**	**108**	**3,449**	**748**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 4

Alfalfa, 47 Acres Planted on 11/01/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			658				
05/02/2023	Ground Water: Well Avg	5.25	Acre Inches		15.59			mg/L			870	0	0	19,349	
05/02/2023	Waste Water: Main Lagoon	0.50	Acre Inches		816.00	69.90	951.00	mg/L		638,126	4,338	372	5,055	16,160	
06/01/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			895	0	0	19,902	
06/26/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			945	0	0	21,007	
07/30/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			961	0	0	21,376	
09/09/2023	Ground Water: Well Avg	5.90	Acre Inches		15.59			mg/L			978	0	0	21,744	
10/13/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			961	0	0	21,376	
11/13/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			928	0	0	20,639	
12/01/2023	Harvest	11.70	Tons	7.42	2.87	0.24	1.82	%							29,222
	Acre Inches Applied:	**39.95**						**Totals:**		**638,126**	**11,533**	**372**	**5,055**	**161,551**	**29,222**
Season Nitrogen Ratio:	0.39							**Lbs Per Acre:**			**245**	**8**	**108**	**3,437**	**622**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 5

Wheat, 45 Acres Planted on 10/28/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
11/01/2022	Ground Water: Well Avg	4.50	Acre Inches		10.49			mg/L			481	0	0	10,945	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			630				
03/08/2023	Ground Water: Well Avg	4.60	Acre Inches		15.59			mg/L			730	0	0	16,232	
03/08/2023	Waste Water: Main Lagoon	1.10	Acre Inches		592.00	69.70	940.00	mg/L		1,344,138	6,628	780	10,525	63,261	
04/15/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			762	0	0	16,938	
04/15/2023	Waste Water: Main Lagoon	0.90	Acre Inches		816.00	69.90	951.00	mg/L		1,099,749	7,475	640	8,712	27,849	
05/09/2023	Harvest	27.69	Tons	66.60	1.68	0.29	1.28	%							13,984
	Acre Inches Applied:	**15.90**						**Totals:**		**2,443,887**	**16,706**	**1,421**	**19,237**	**135,225**	**13,984**
Season Nitrogen Ratio:	1.19							**Lbs Per Acre:**			**371**	**32**	**427**	**3,005**	**311**

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Nutrient Applications (Attachment B)

Field Name: 5

Corn, 45 Acres Planted on 06/01/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/15/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			841	0	0	18,702	
06/22/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			873	0	0	19,408	
07/08/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			857	0	0	19,055	
07/08/2023	Waste Water: Main Lagoon	1.10	Acre Inches		485.00	50.20	527.00	mg/L		1,344,138	5,431	562	5,901	60,238	
07/20/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			889	0	0	19,760	
08/01/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			889	0	0	19,760	
08/13/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			873	0	0	19,408	
08/26/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			904	0	0	20,113	
09/15/2023	Harvest	36.19	Tons	69.00	1.40	0.28	1.51	%							14,136
	Acre Inches Applied:	**39.70**						**Totals:**		**1,344,138**	**11,556**	**562**	**5,901**	**196,444**	**14,136**
Season Nitrogen Ratio:	0.82							**Lbs Per Acre:**			**257**	**12**	**131**	**4,365**	**314**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 6

Corn, 56 Acres Planted on 04/18/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			784				
03/24/2023	Ground Water: Well Avg	3.50	Acre Inches		15.59			mg/L			691	0	0	15,369	
05/17/2023	Ground Water: Well Avg	4.90	Acre Inches		15.59			mg/L			968	0	0	21,517	
06/06/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			987	0	0	21,956	
06/18/2023	Ground Water: Well Avg	5.10	Acre Inches		15.59			mg/L			1,007	0	0	22,395	
06/29/2023	Ground Water: Well Avg	5.20	Acre Inches		15.59			mg/L			1,027	0	0	22,834	
06/29/2023	Waste Water: Main Lagoon	1.50	Acre Inches		485.00	50.20	527.00	mg/L		2,280,961	9,215	954	10,013	102,222	
07/11/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			1,086	0	0	24,152	
07/24/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			1,145	0	0	25,469	
08/11/2023	Harvest	39.60	Tons	66.80	1.37	0.25	1.34	%							20,173
	Acre Inches Applied:	**36.50**						**Totals:**		**2,280,961**	**16,910**	**954**	**10,013**	**255,914**	**20,173**
Season Nitrogen Ratio:	0.84							**Lbs Per Acre:**			**302**	**17**	**179**	**4,570**	**360**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 7

Alfalfa, 38 Acres Planted on 11/10/2019

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			532				
04/17/2023	Ground Water: Well Avg	6.00	Acre Inches		15.59			mg/L			804	0	0	17,879	
05/16/2023	Ground Water: Well Avg	6.00	Acre Inches		15.59			mg/L			804	0	0	17,879	
06/12/2023	Ground Water: Well Avg	6.20	Acre Inches		15.59			mg/L			831	0	0	18,474	
07/10/2023	Ground Water: Well Avg	6.50	Acre Inches		15.59			mg/L			871	0	0	19,368	
08/10/2023	Ground Water: Well Avg	6.50	Acre Inches		15.59			mg/L			871	0	0	19,368	
09/10/2023	Ground Water: Well Avg	6.00	Acre Inches		15.59			mg/L			804	0	0	17,879	
10/01/2023	Harvest	12.95	Tons	7.03	3.02	0.23	1.87	%							27,633
	Acre Inches Applied:	**37.20**						**Totals:**			**5,517**	**0**	**0**	**110,847**	**27,633**
Season Nitrogen Ratio:	0.20							**Lbs Per Acre:**			**145**	**0**	**0**	**2,917**	**727**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 8

Wheat, 38 Acres Planted on 10/29/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
11/02/2022	Ground Water: Well Avg	4.00	Acre Inches		10.49			mg/L			361	0	0	8,216	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			532				
03/23/2023	Ground Water: Well Avg	4.20	Acre Inches		15.59			mg/L			563	0	0	12,515	
03/23/2023	Waste Water: Main Lagoon	0.80	Acre Inches		816.00	69.90	951.00	mg/L		825,491	5,611	481	6,539	20,904	
04/17/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			603	0	0	13,409	
05/10/2023	Harvest	22.75	Tons	64.30	1.75	0.30	1.02	%							10,802
	Acre Inches Applied:	**13.50**						**Totals:**		**825,491**	**7,670**	**481**	**6,539**	**55,043**	**10,802**
Season Nitrogen Ratio:	0.71							**Lbs Per Acre:**			**202**	**13**	**172**	**1,449**	**284**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 8

Corn, 38 Acres Planted on 06/03/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/20/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
06/29/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			737	0	0	16,389	
07/14/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			710	0	0	15,793	
07/14/2023	Waste Water: Main Lagoon	1.10	Acre Inches		485.00	50.20	527.00	mg/L		1,135,050	4,586	475	4,983	50,868	
07/26/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			750	0	0	16,687	
08/06/2023	Ground Water: Well Avg	5.10	Acre Inches		15.59			mg/L			683	0	0	15,197	
08/18/2023	Ground Water: Well Avg	5.20	Acre Inches		15.59			mg/L			697	0	0	15,494	
08/18/2023	Waste Water: Main Lagoon	1.00	Acre Inches		485.00	50.20	527.00	mg/L		1,031,863	4,169	432	4,530	46,243	
08/31/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			643	0	0	14,303	
09/19/2023	Harvest	36.64	Tons	73.00	1.42	0.29	2.02	%							10,676
	Acre Inches Applied:	**38.60**						**Totals:**		**2,166,913**	**13,645**	**906**	**9,513**	**205,871**	**10,676**
Season Nitrogen Ratio:	1.28							**Lbs Per Acre:**			**359**	**24**	**250**	**5,418**	**281**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 9

Alfalfa, 37 Acres Planted on 11/15/2020

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			518				
04/17/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
05/16/2023	Ground Water: Well Avg	5.20	Acre Inches		15.59			mg/L			679	0	0	15,087	
06/12/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			731	0	0	16,247	
07/12/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			744	0	0	16,538	
08/11/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			757	0	0	16,828	
09/12/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			717	0	0	15,957	
10/15/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			704	0	0	15,667	
11/01/2023	Harvest	16.44	Tons	7.27	3.14	0.30	2.89	%							35,423
	Acre Inches Applied:	**38.20**						**Totals:**			**5,502**	**0**	**0**	**110,831**	**35,423**
Season Nitrogen Ratio:	0.16							**Lbs Per Acre:**			**149**	**0**	**0**	**2,995**	**957**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 10

Wheat, 35 Acres Planted on 11/29/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/18/2022	Ground Water: Well Avg	4.00	Acre Inches		10.49			mg/L			332	0	0	7,567	
10/30/2022	Corral Solids: Main Corral	4.00	Tons	37.80	2.71	0.72	2.31	%	140		4,720	1,254	4,023	0	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			490				
03/27/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			555	0	0	12,350	
03/27/2023	Waste Water: Main Lagoon	0.80	Acre Inches		816.00	69.90	951.00	mg/L		760,320	5,168	443	6,023	19,254	
04/17/2023	Ground Water: Well Avg	4.30	Acre Inches		15.59			mg/L			531	0	0	11,801	
04/17/2023	Waste Water: Main Lagoon	0.80	Acre Inches		816.00	69.90	951.00	mg/L		760,320	5,168	443	6,023	19,254	
05/19/2023	Harvest	23.81	Tons	58.20	1.79	0.51	2.63	%							12,470
	Acre Inches Applied:	**14.40**						**Totals:**	**140**	**1,520,641**	**16,964**	**2,140**	**16,070**	**70,226**	**12,470**
Season Nitrogen Ratio:	1.36							**Lbs Per Acre:**			**485**	**61**	**459**	**2,006**	**356**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 10

Corn, 35 Acres Planted on 06/15/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
06/01/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			617	0	0	13,722	
06/01/2023	Waste Water: Main Lagoon	0.80	Acre Inches		485.00	50.20	527.00	mg/L		760,320	3,072	318	3,338	34,074	
07/11/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			617	0	0	13,722	
07/25/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			617	0	0	13,722	
07/25/2023	Waste Water: Main Lagoon	0.70	Acre Inches		485.00	50.20	527.00	mg/L		665,280	2,688	278	2,920	29,815	
08/07/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			617	0	0	13,722	
08/21/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			617	0	0	13,722	
09/01/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			617	0	0	13,722	
09/01/2023	Waste Water: Main Lagoon	0.50	Acre Inches		485.00	50.20	527.00	mg/L		475,200	1,920	199	2,086	21,296	
10/05/2023	Harvest	34.26	Tons	63.50	1.51	0.29	1.21	%							13,218
	Acre Inches Applied:	**32.00**						**Totals:**		**1,900,801**	**11,381**	**795**	**8,344**	**167,520**	**13,218**
Season Nitrogen Ratio:	0.86							**Lbs Per Acre:**			**325**	**23**	**238**	**4,786**	**378**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 11

Wheat, 30 Acres Planted on 11/15/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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	37.80	2.71	0.72	2.31	%	120		4,046	1,075	3,448	0	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			420				
02/20/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			508	0	0	11,292	
02/20/2023	Waste Water: Main Lagoon	1.20	Acre Inches		592.00	69.70	940.00	mg/L		977,555	4,821	568	7,654	46,008	
04/19/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			476	0	0	10,586	
05/22/2023	Harvest	27.09	Tons	72.80	1.80	0.58	3.15	%							7,958
	Acre Inches Applied:	**10.50**						**Totals:**	**120**	**977,555**	**10,270**	**1,642**	**11,103**	**67,886**	**7,958**
Season Nitrogen Ratio:	1.29							**Lbs Per Acre:**			**342**	**55**	**370**	**2,263**	**265**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 11

Corn, 30 Acres Planted on 06/22/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
06/02/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			529	0	0	11,762	
06/02/2023	Waste Water: Main Lagoon	0.70	Acre Inches		485.00	50.20	527.00	mg/L		570,240	2,304	238	2,503	25,556	
07/12/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			529	0	0	11,762	
07/25/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			529	0	0	11,762	
07/25/2023	Waste Water: Main Lagoon	0.70	Acre Inches		485.00	50.20	527.00	mg/L		570,240	2,304	238	2,503	25,556	
08/08/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			529	0	0	11,762	
08/21/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			529	0	0	11,762	
09/02/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			529	0	0	11,762	
09/02/2023	Waste Water: Main Lagoon	0.50	Acre Inches		485.00	50.20	527.00	mg/L		407,314	1,646	170	1,788	18,254	
10/19/2023	Harvest	30.50	Tons	69.50	1.24	0.28	1.68	%							6,921
	Acre Inches Applied:	**31.90**						**Totals:**		**1,547,795**	**9,426**	**647**	**6,794**	**139,938**	**6,921**
Season Nitrogen Ratio:	1.36							**Lbs Per Acre:**			**314**	**22**	**226**	**4,665**	**231**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 14

Wheat, 38 Acres Planted on 10/31/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			532				
03/26/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			603	0	0	13,409	
03/26/2023	Waste Water: Main Lagoon	1.25	Acre Inches		816.00	69.90	951.00	mg/L		1,289,829	8,767	751	10,218	32,663	
04/19/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
05/22/2023	Harvest	31.26	Tons	68.80	1.95	0.48	2.39	%							14,454
	Acre Inches Applied:	**10.75**						**Totals:**		**1,289,829**	**10,572**	**751**	**10,218**	**60,970**	**14,454**
Season Nitrogen Ratio:	0.73							**Lbs Per Acre:**			**278**	**20**	**269**	**1,604**	**380**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 14

Corn, 38 Acres Planted on 06/22/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
06/08/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
07/16/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
07/29/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
07/29/2023	Waste Water: Main Lagoon	0.80	Acre Inches		485.00	50.20	527.00	mg/L		825,491	3,335	345	3,624	36,995	
08/10/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
08/10/2023	Waste Water: Main Lagoon	0.80	Acre Inches		485.00	50.20	527.00	mg/L		825,491	3,335	345	3,624	36,995	
08/22/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
09/01/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
09/14/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
10/19/2023	Harvest	33.00	Tons	69.20	1.32	0.26	1.22	%							10,197
	Acre Inches Applied:	**36.60**						**Totals:**		**1,650,981**	**11,359**	**690**	**7,247**	**178,280**	**10,197**
Season Nitrogen Ratio:	1.11							**Lbs Per Acre:**			**299**	**18**	**191**	**4,692**	**268**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 15

Wheat, 37 Acres Planted on 11/03/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/12/2022	Ground Water: Well Avg	4.00	Acre Inches		10.49			mg/L			351	0	0	7,999	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			518				
02/16/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			587	0	0	13,056	
02/16/2023	Waste Water: Main Lagoon	0.80	Acre Inches		592.00	69.70	940.00	mg/L		803,767	3,964	467	6,294	37,829	
04/10/2023	Ground Water: Well Avg	4.20	Acre Inches		15.59			mg/L			548	0	0	12,186	
04/10/2023	Waste Water: Main Lagoon	0.70	Acre Inches		816.00	69.90	951.00	mg/L		703,296	4,780	410	5,571	17,810	
05/10/2023	Harvest	28.49	Tons	71.60	1.49	0.41	1.61	%							8,921
	Acre Inches Applied:	**14.20**						**Totals:**		**1,507,064**	**10,748**	**876**	**11,865**	**88,879**	**8,921**
Season Nitrogen Ratio:	1.20	-						**Lbs Per Acre:**			**290**	**24**	**321**	**2,402**	**241**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 15

Corn, 37 Acres Planted on 06/02/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/16/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
06/26/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
07/12/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
07/12/2023	Waste Water: Main Lagoon	1.20	Acre Inches		485.00	50.20	527.00	mg/L		1,205,651	4,871	504	5,293	54,032	
07/24/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
08/03/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
08/15/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
08/15/2023	Waste Water: Main Lagoon	1.20	Acre Inches		485.00	50.20	527.00	mg/L		1,205,651	4,871	504	5,293	54,032	
08/28/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
09/19/2023	Harvest	41.02	Tons	62.40	1.54	0.27	1.14	%							17,576
	Acre Inches Applied:	**37.40**						**Totals:**		**2,411,302**	**14,308**	**1,009**	**10,586**	**209,610**	**17,576**
Season Nitrogen Ratio:	0.81							**Lbs Per Acre:**			**387**	**27**	**286**	**5,665**	**475**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 16

Wheat, 40 Acres Planted on 10/29/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			560				
01/09/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			635	0	0	14,114	
04/10/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			705	0	0	15,683	
05/10/2023	Harvest	28.88	Tons	64.70	1.87	0.49	2.70	%							15,251
	Acre Inches Applied:	**9.50**						**Totals:**			**1,900**	**0**	**0**	**29,797**	**15,251**
Season Nitrogen Ratio:	0.12							**Lbs Per Acre:**			**48**	**0**	**0**	**745**	**381**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 16

Corn, 40 Acres Planted on 06/21/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
06/04/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			635	0	0	14,114	
06/04/2023	Waste Water: Main Lagoon	1.00	Acre Inches		485.00	50.20	527.00	mg/L		1,086,172	4,388	454	4,768	48,677	
07/15/2023	Ground Water: Well Avg	4.30	Acre Inches		15.59			mg/L			606	0	0	13,487	
07/28/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			677	0	0	15,056	
07/28/2023	Waste Water: Main Lagoon	0.80	Acre Inches		485.00	50.20	527.00	mg/L		868,938	3,510	363	3,814	38,942	
08/09/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			705	0	0	15,683	
08/23/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			748	0	0	16,624	
08/23/2023	Waste Water: Main Lagoon	0.60	Acre Inches		485.00	50.20	527.00	mg/L		651,703	2,633	272	2,861	29,206	
09/03/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			762	0	0	16,938	
09/13/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			790	0	0	17,565	
10/13/2023	Harvest	34.54	Tons	64.10	1.26	0.24	1.19	%							12,499
	Acre Inches Applied:	**37.30**						**Totals:**		**2,606,813**	**15,454**	**1,090**	**11,443**	**226,292**	**12,499**
Season Nitrogen Ratio:	1.24							**Lbs Per Acre:**			**386**	**27**	**286**	**5,657**	**312**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 17

Alfalfa, 37 Acres Planted on 11/14/2020

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			518				
04/17/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
05/16/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			717	0	0	15,957	
06/12/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			731	0	0	16,247	
07/14/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			744	0	0	16,538	
08/15/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			757	0	0	16,828	
09/16/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			704	0	0	15,667	
10/19/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			717	0	0	15,957	
11/01/2023	Harvest	17.91	Tons	7.62	2.69	0.30	2.96	%							32,935
	Acre Inches Applied:	**38.50**						**Totals:**			**5,541**	**0**	**0**	**111,701**	**32,935**
Season Nitrogen Ratio:	0.17							**Lbs Per Acre:**			**150**	**0**	**0**	**3,019**	**890**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 18

Corn, 25 Acres Planted on 06/08/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/24/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			441	0	0	9,802	
05/24/2023	Waste Water: Main Lagoon	0.50	Acre Inches		816.00	69.90	951.00	mg/L		339,429	2,307	198	2,689	8,596	
07/03/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			441	0	0	9,802	
07/18/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			441	0	0	9,802	
07/18/2023	Waste Water: Main Lagoon	0.50	Acre Inches		485.00	50.20	527.00	mg/L		339,429	1,371	142	1,490	15,212	
07/30/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			441	0	0	9,802	
08/08/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			441	0	0	9,802	
08/22/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			441	0	0	9,802	
09/01/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			441	0	0	9,802	
09/25/2023	Harvest	39.88	Tons	64.40	1.39	0.23	1.37	%							9,867
	Acre Inches Applied:	**36.00**						**Totals:**		**678,858**	**6,764**	**340**	**4,179**	**92,420**	**9,867**
Season Nitrogen Ratio:	0.69							**Lbs Per Acre:**			**271**	**14**	**167**	**3,697**	**395**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 19

Alfalfa, 36 Acres Planted on 11/10/2021

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			504				
04/17/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			635	0	0	14,115	
05/16/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			711	0	0	15,808	
06/12/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			736	0	0	16,373	
07/13/2023	Ground Water: Well Avg	5.90	Acre Inches		15.59			mg/L			749	0	0	16,655	
08/13/2023	Ground Water: Well Avg	5.90	Acre Inches		15.59			mg/L			749	0	0	16,655	
09/14/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			711	0	0	15,808	
10/17/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			635	0	0	14,115	
11/01/2023	Harvest	13.88	Tons	7.07	2.65	0.29	3.05	%							24,611
	Acre Inches Applied:	**38.80**						**Totals:**			**5,429**	**0**	**0**	**109,529**	**24,611**
Season Nitrogen Ratio:	0.22							**Lbs Per Acre:**			**151**	**0**	**0**	**3,042**	**684**

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Nutrient Applications (Attachment B)

Field Name: 20

Wheat, 37 Acres Planted on 11/04/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/13/2022	Ground Water: Well Avg	4.60	Acre Inches		10.49			mg/L			404	0	0	9,199	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			518				
02/18/2023	Ground Water: Well Avg	4.60	Acre Inches		15.59			mg/L			600	0	0	13,346	
02/18/2023	Waste Water: Main Lagoon	1.10	Acre Inches		592.00	69.70	940.00	mg/L		1,105,180	5,450	642	8,654	52,015	
04/12/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			626	0	0	13,926	
04/12/2023	Waste Water: Main Lagoon	0.90	Acre Inches		816.00	69.90	951.00	mg/L		904,238	6,146	527	7,163	22,898	
05/10/2023	Harvest	27.57	Tons	68.70	1.62	0.36	1.60	%							10,345
	Acre Inches Applied:	**16.00**						**Totals:**		**2,009,418**	**13,745**	**1,168**	**15,817**	**111,384**	**10,345**
Season Nitrogen Ratio:	1.33							**Lbs Per Acre:**			**371**	**32**	**427**	**3,010**	**280**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 20

Corn, 37 Acres Planted on 06/03/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/21/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
05/21/2023	Waste Water: Main Lagoon	1.10	Acre Inches		816.00	69.90	951.00	mg/L		1,105,180	7,512	643	8,755	27,987	
06/30/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
07/15/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
07/27/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
08/05/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
08/16/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
08/16/2023	Waste Water: Main Lagoon	0.90	Acre Inches		485.00	50.20	527.00	mg/L		904,238	3,653	378	3,969	40,524	
08/29/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			652	0	0	14,507	
09/19/2023	Harvest	35.01	Tons	63.80	1.35	0.29	1.28	%							12,661
	Acre Inches Applied:	**37.00**						**Totals:**		**2,009,418**	**15,731**	**1,022**	**12,724**	**170,057**	**12,661**
Season Nitrogen Ratio:	1.24							**Lbs Per Acre:**			**425**	**28**	**344**	**4,596**	**342**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 21

Alfalfa, 31 Acres Planted on 11/14/2020

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			434				
04/17/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			601	0	0	13,370	
05/16/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			612	0	0	13,613	
06/12/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			601	0	0	13,370	
07/15/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			634	0	0	14,099	
08/17/2023	Ground Water: Well Avg	5.75	Acre Inches		15.59			mg/L			629	0	0	13,977	
09/18/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			601	0	0	13,370	
10/21/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			601	0	0	13,370	
11/01/2023	Harvest	17.20	Tons	7.80	2.83	0.31	3.37	%							27,825
	Acre Inches Applied:	**39.15**						**Totals:**			**4,713**	**0**	**0**	**95,168**	**27,825**
Season Nitrogen Ratio:	0.17							**Lbs Per Acre:**			**152**	**0**	**0**	**3,070**	**898**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 22

Alfalfa, 35 Acres Planted on 11/13/2021

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			490				
04/18/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			679	0	0	15,095	
05/16/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			679	0	0	15,095	
06/12/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			691	0	0	15,369	
07/16/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			716	0	0	15,918	
08/18/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			691	0	0	15,369	
09/20/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			704	0	0	15,644	
10/23/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			679	0	0	15,095	
11/01/2023	Harvest	12.63	Tons	7.71	2.76	0.30	3.47	%							22,520
	Acre Inches Applied:	**39.20**						**Totals:**			**5,328**	**0**	**0**	**107,584**	**22,520**
Season Nitrogen Ratio:	0.24							**Lbs Per Acre:**			**152**	**0**	**0**	**3,074**	**643**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 23

Wheat, 33 Acres Planted on 12/15/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
11/15/2022	Corral Solids: Main Corral	4.00	Tons	37.80	2.71	0.72	2.31	%	132		4,450	1,182	3,793	0	
11/25/2022	Ground Water: Well Avg	4.50	Acre Inches		10.49			mg/L			352	0	0	8,026	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			462				
04/14/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			559	0	0	12,421	
04/14/2023	Waste Water: Main Lagoon	1.20	Acre Inches		816.00	69.90	951.00	mg/L		1,075,310	7,309	626	8,518	27,230	
05/21/2023	Harvest	31.54	Tons	67.90	1.62	0.40	2.13	%							10,825
	Acre Inches Applied:	**10.50**						**Totals:**	**132**	**1,075,310**	**13,132**	**1,808**	**12,312**	**47,677**	**10,825**
Season Nitrogen Ratio:	1.21							**Lbs Per Acre:**			**398**	**55**	**373**	**1,445**	**328**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 23

Corn, 33 Acres Planted on 06/20/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
06/05/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			582	0	0	12,938	
06/05/2023	Waste Water: Main Lagoon	0.90	Acre Inches		485.00	50.20	527.00	mg/L		806,483	3,258	337	3,540	36,143	
07/14/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			582	0	0	12,938	
07/28/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			582	0	0	12,938	
07/28/2023	Waste Water: Main Lagoon	1.10	Acre Inches		485.00	50.20	527.00	mg/L		985,701	3,982	412	4,327	44,174	
08/05/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			582	0	0	12,938	
08/17/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			582	0	0	12,938	
08/17/2023	Waste Water: Main Lagoon	1.20	Acre Inches		485.00	50.20	527.00	mg/L		1,075,310	4,344	450	4,721	48,191	
08/30/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			582	0	0	12,938	
09/07/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			582	0	0	12,938	
10/10/2023	Harvest	34.21	Tons	65.80	1.47	0.25	1.30	%							11,351
	Acre Inches Applied:	**38.20**						**Totals:**		**2,867,494**	**15,658**	**1,199**	**12,588**	**219,076**	**11,351**
Season Nitrogen Ratio:	1.38							**Lbs Per Acre:**			**474**	**36**	**381**	**6,639**	**344**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 24

Alfalfa, 51 Acres Planted on 11/12/2019

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			714				
04/25/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			953	0	0	21,196	
05/24/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			953	0	0	21,196	
06/22/2023	Ground Water: Well Avg	5.90	Acre Inches		15.59			mg/L			1,061	0	0	23,595	
07/26/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			1,043	0	0	23,195	
09/06/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			1,007	0	0	22,395	
10/09/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			971	0	0	21,595	
11/10/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			953	0	0	21,196	
12/01/2023	Harvest	12.07	Tons	8.31	3.16	0.28	1.88	%							35,671
	Acre Inches Applied:	**38.60**						**Totals:**			**7,656**	**0**	**0**	**154,367**	**35,671**
Season Nitrogen Ratio:	0.21							**Lbs Per Acre:**			**150**	**0**	**0**	**3,027**	**699**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 26

Wheat, 20 Acres Planted on 11/29/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/18/2022	Ground Water: Well Avg	4.50	Acre Inches		10.49			mg/L			214	0	0	4,864	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			280				
03/07/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			339	0	0	7,528	
03/07/2023	Waste Water: Main Lagoon	1.10	Acre Inches		592.00	69.70	940.00	mg/L		597,395	2,946	347	4,678	28,116	
04/17/2023	Ground Water: Well Avg	4.70	Acre Inches		15.59			mg/L			331	0	0	7,371	
04/17/2023	Waste Water: Main Lagoon	1.30	Acre Inches		816.00	69.90	951.00	mg/L		706,012	4,799	411	5,593	17,878	
05/19/2023	Harvest	24.52	Tons	61.70	1.91	0.52	2.73	%							7,175
	Acre Inches Applied:	**16.40**						**Totals:**		**1,303,406**	**8,909**	**758**	**10,271**	**65,758**	**7,175**
Season Nitrogen Ratio: 1.24								**Lbs Per Acre:**			**445**	**38**	**514**	**3,288**	**359**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 26

Corn, 20 Acres Planted on 06/14/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/27/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			353	0	0	7,841	
05/27/2023	Waste Water: Main Lagoon	0.80	Acre Inches		816.00	69.90	951.00	mg/L		434,469	2,953	253	3,442	11,002	
07/07/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			353	0	0	7,841	
07/21/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			353	0	0	7,841	
07/21/2023	Waste Water: Main Lagoon	0.80	Acre Inches		485.00	50.20	527.00	mg/L		434,469	1,755	182	1,907	19,471	
08/03/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			353	0	0	7,841	
08/15/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			353	0	0	7,841	
08/27/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			353	0	0	7,841	
08/27/2023	Waste Water: Main Lagoon	0.50	Acre Inches		485.00	50.20	527.00	mg/L		271,543	1,097	114	1,192	12,169	
09/08/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			353	0	0	7,841	
10/04/2023	Harvest	32.38	Tons	67.30	1.41	0.30	1.51	%							5,972
	Acre Inches Applied:	**37.10**						**Totals:**		**1,140,481**	**8,274**	**548**	**6,541**	**97,532**	**5,972**
Season Nitrogen Ratio:	1.39							**Lbs Per Acre:**			**414**	**27**	**327**	**4,877**	**299**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 27

Wheat, 36 Acres Planted on 11/16/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/18/2022	Ground Water: Well Avg	4.80	Acre Inches		10.49			mg/L			410	0	0	9,339	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			504				
03/07/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			571	0	0	12,703	
03/07/2023	Waste Water: Main Lagoon	0.80	Acre Inches		592.00	69.70	940.00	mg/L		782,044	3,857	454	6,124	36,806	
04/17/2023	Ground Water: Well Avg	4.70	Acre Inches		15.59			mg/L			597	0	0	13,268	
04/17/2023	Waste Water: Main Lagoon	1.10	Acre Inches		816.00	69.90	951.00	mg/L		1,075,310	7,309	626	8,518	27,230	
05/19/2023	Harvest	24.52	Tons	67.00	1.68	0.32	1.31	%							9,788
	Acre Inches Applied:	**15.90**						**Totals:**		**1,857,354**	**13,248**	**1,080**	**14,642**	**99,347**	**9,788**
Season Nitrogen Ratio:	1.35							**Lbs Per Acre:**			**368**	**30**	**407**	**2,760**	**272**

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Nutrient Applications (Attachment B)

Field Name: 27

Corn, 36 Acres Planted on 06/14/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/27/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			635	0	0	14,115	
05/27/2023	Waste Water: Main Lagoon	0.50	Acre Inches		816.00	69.90	951.00	mg/L		488,777	3,322	285	3,872	12,378	
07/07/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			635	0	0	14,115	
07/21/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			635	0	0	14,115	
07/21/2023	Waste Water: Main Lagoon	1.00	Acre Inches		485.00	50.20	527.00	mg/L		977,555	3,949	409	4,291	43,809	
08/03/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			635	0	0	14,115	
08/15/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			635	0	0	14,115	
08/27/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			635	0	0	14,115	
08/27/2023	Waste Water: Main Lagoon	0.80	Acre Inches		485.00	50.20	527.00	mg/L		782,044	3,159	327	3,433	35,047	
09/08/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			635	0	0	14,115	
10/04/2023	Harvest	32.38	Tons	68.40	1.44	0.28	1.54	%							10,608
	Acre Inches Applied:	**37.30**						**Totals:**		**2,248,376**	**14,874**	**1,021**	**11,596**	**190,036**	**10,608**
Season Nitrogen Ratio:	1.40							**Lbs Per Acre:**			**413**	**28**	**322**	**5,279**	**295**

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Nutrient Applications (Attachment B)

Field Name: 28

Wheat, 38 Acres Planted on 11/01/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
11/21/2022	Ground Water: Well Avg	4.50	Acre Inches		10.49			mg/L			406	0	0	9,242	
11/21/2022	Waste Water: Main Lagoon	1.00	Acre Inches		480.00	33.20	555.00	mg/L		1,031,863	4,126	285	4,771	58,793	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			532				
02/27/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			643	0	0	14,303	
02/27/2023	Waste Water: Main Lagoon	0.80	Acre Inches		592.00	69.70	940.00	mg/L		825,491	4,071	479	6,464	38,851	
04/11/2023	Ground Water: Well Avg	4.30	Acre Inches		15.59			mg/L			576	0	0	12,813	
04/11/2023	Waste Water: Main Lagoon	0.60	Acre Inches		816.00	69.90	951.00	mg/L		619,118	4,208	361	4,905	15,678	
05/21/2023	Harvest	25.86	Tons	68.30	1.84	0.40	2.65	%							11,463
	Acre Inches Applied:	**16.00**						**Totals:**		**2,476,472**	**14,562**	**1,125**	**16,139**	**149,680**	**11,463**
Season Nitrogen Ratio:	1.27							**Lbs Per Acre:**			**383**	**30**	**425**	**3,939**	**302**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 28

Corn, 38 Acres Planted on 06/20/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
06/08/2023	Ground Water: Well Avg	5.10	Acre Inches		15.59			mg/L			683	0	0	15,197	
06/08/2023	Waste Water: Main Lagoon	0.50	Acre Inches		485.00	50.20	527.00	mg/L		515,932	2,084	216	2,265	23,122	
07/15/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			750	0	0	16,687	
07/31/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			710	0	0	15,793	
07/31/2023	Waste Water: Main Lagoon	0.60	Acre Inches		485.00	50.20	527.00	mg/L		619,118	2,501	259	2,718	27,746	
08/11/2023	Ground Water: Well Avg	5.20	Acre Inches		15.59			mg/L			697	0	0	15,494	
08/11/2023	Waste Water: Main Lagoon	1.10	Acre Inches		485.00	50.20	527.00	mg/L		1,135,050	4,586	475	4,983	50,868	
08/25/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			750	0	0	16,687	
09/05/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			643	0	0	14,303	
09/05/2023	Waste Water: Main Lagoon	0.80	Acre Inches		485.00	50.20	527.00	mg/L		825,491	3,335	345	3,624	36,995	
09/11/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			710	0	0	15,793	
10/13/2023	Harvest	36.64	Tons	65.10	1.39	0.29	1.17	%							13,509
	Acre Inches Applied:	**39.90**						**Totals:**		**3,095,590**	**17,451**	**1,294**	**13,589**	**248,683**	**13,509**
Season Nitrogen Ratio:	1.29							**Lbs Per Acre:**			**459**	**34**	**358**	**6,544**	**355**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 29

Wheat, 38 Acres Planted on 11/18/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/18/2022	Ground Water: Well Avg	4.50	Acre Inches		10.49			mg/L			406	0	0	9,242	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			532				
02/25/2023	Ground Water: Well Avg	4.70	Acre Inches		15.59			mg/L			630	0	0	14,005	
02/25/2023	Waste Water: Main Lagoon	1.10	Acre Inches		592.00	69.70	940.00	mg/L		1,135,050	5,597	659	8,888	53,420	
04/10/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			643	0	0	14,303	
04/10/2023	Waste Water: Main Lagoon	0.80	Acre Inches		816.00	69.90	951.00	mg/L		825,491	5,611	481	6,539	20,904	
05/10/2023	Harvest	24.77	Tons	63.30	1.53	0.29	1.48	%							10,570
	Acre Inches Applied:	**15.90**						**Totals:**		**1,960,540**	**13,419**	**1,140**	**15,427**	**111,875**	**10,570**
Season Nitrogen Ratio:	1.27							**Lbs Per Acre:**			**353**	**30**	**406**	**2,944**	**278**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 29

Corn, 38 Acres Planted on 06/02/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/16/2023	Ground Water: Well Avg	5.25	Acre Inches		15.59			mg/L			703	0	0	15,644	
05/16/2023	Waste Water: Main Lagoon	0.80	Acre Inches		816.00	69.90	951.00	mg/L		825,491	5,611	481	6,539	20,904	
06/27/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			750	0	0	16,687	
07/12/2023	Ground Water: Well Avg	5.10	Acre Inches		15.59			mg/L			683	0	0	15,197	
07/12/2023	Waste Water: Main Lagoon	1.20	Acre Inches		485.00	50.20	527.00	mg/L		1,238,236	5,003	518	5,436	55,492	
07/24/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			710	0	0	15,793	
08/03/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			724	0	0	16,091	
08/15/2023	Ground Water: Well Avg	4.90	Acre Inches		15.59			mg/L			657	0	0	14,601	
08/15/2023	Waste Water: Main Lagoon	0.80	Acre Inches		485.00	50.20	527.00	mg/L		825,491	3,335	345	3,624	36,995	
08/29/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			764	0	0	16,984	
09/19/2023	Harvest	35.20	Tons	63.70	1.40	0.22	1.31	%							13,595
	Acre Inches Applied:	**40.05**						**Totals:**		**2,889,218**	**18,940**	**1,344**	**15,599**	**224,387**	**13,595**
Season Nitrogen Ratio:	1.39							**Lbs Per Acre:**			**498**	**35**	**410**	**5,905**	**358**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 30

Alfalfa, 38 Acres Planted on 11/18/2021

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			532				
04/18/2023	Ground Water: Well Avg	6.00	Acre Inches		15.59			mg/L			804	0	0	17,879	
05/16/2023	Ground Water: Well Avg	6.00	Acre Inches		15.59			mg/L			804	0	0	17,879	
06/12/2023	Ground Water: Well Avg	6.50	Acre Inches		15.59			mg/L			871	0	0	19,368	
07/17/2023	Ground Water: Well Avg	6.50	Acre Inches		15.59			mg/L			871	0	0	19,368	
08/20/2023	Ground Water: Well Avg	6.50	Acre Inches		15.59			mg/L			871	0	0	19,368	
09/22/2023	Ground Water: Well Avg	6.00	Acre Inches		15.59			mg/L			804	0	0	17,879	
10/25/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			670	0	0	14,899	
11/15/2023	Harvest	16.65	Tons	7.82	2.56	0.23	2.00	%							29,861
	Acre Inches Applied:	**42.50**						**Totals:**			**6,227**	**0**	**0**	**126,639**	**29,861**
Season Nitrogen Ratio:	0.21							**Lbs Per Acre:**			**164**	**0**	**0**	**3,333**	**786**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 34

Wheat, 50 Acres Planted on 11/03/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
09/20/2022	Corral Solids: Main Corral	4.10	Tons	37.80	2.71	0.72	2.31	%	205		6,911	1,836	5,891	0	
10/05/2022	Ground Water: Well Avg	4.80	Acre Inches		10.49			mg/L			570	0	0	12,972	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			700				
02/16/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			846	0	0	18,820	
04/10/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			794	0	0	17,643	
05/08/2023	Harvest	29.85	Tons	69.50	1.41	0.34	1.22	%							12,837
	Acre Inches Applied:	**14.10**						**Totals:**	**205**		**9,820**	**1,836**	**5,891**	**49,434**	**12,837**
Season Nitrogen Ratio:	0.77							**Lbs Per Acre:**			**196**	**37**	**118**	**989**	**257**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 34

Corn, 50 Acres Planted on 05/29/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/13/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			846	0	0	18,820	
06/21/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			934	0	0	20,780	
06/27/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			988	0	0	21,956	
07/08/2023	Ground Water: Well Avg	5.20	Acre Inches		15.59			mg/L			917	0	0	20,388	
07/20/2023	Fertilize - UN32	40.00	Gallons		32.00	0.00	0.00	%			5,331	0	0	0	
07/20/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			1,022	0	0	22,740	
08/02/2023	Ground Water: Well Avg	5.10	Acre Inches		15.59			mg/L			899	0	0	19,996	
08/14/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			988	0	0	21,956	
08/25/2023	Ground Water: Well Avg	4.90	Acre Inches		15.59			mg/L			864	0	0	19,212	
09/12/2023	Harvest	34.29	Tons	64.80	1.33	0.26	1.12	%							16,053
	Acre Inches Applied:	**42.30**						**Totals:**			**12,790**	**0**	**0**	**165,846**	**16,053**
Season Nitrogen Ratio:	0.80							**Lbs Per Acre:**			**256**	**0**	**0**	**3,317**	**321**

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Nutrient Applications (Attachment B)

Field Name: 35

Corn, 100 Acres Planted on 04/24/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			1,400				
03/31/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			1,869	0	0	41,560	
05/24/2023	Ground Water: Well Avg	5.26	Acre Inches		15.59			mg/L			1,855	0	0	41,246	
06/10/2023	Ground Water: Well Avg	5.10	Acre Inches		15.59			mg/L			1,798	0	0	39,991	
06/22/2023	Fertilize - UN32	40.00	Gallons		32.00	0.00	0.00	%			10,662	0	0	0	
06/22/2023	Ground Water: Well Avg	5.60	Acre Inches		15.59			mg/L			1,975	0	0	43,912	
07/04/2023	Ground Water: Well Avg	5.20	Acre Inches		15.59			mg/L			1,834	0	0	40,775	
07/18/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			1,904	0	0	42,344	
07/29/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			2,045	0	0	45,480	
08/10/2023	Harvest	38.72	Tons	65.20	1.32	0.23	1.08	%							35,573
	Acre Inches Applied:	**37.66**						**Totals:**			**25,342**	**0**	**0**	**295,308**	**35,573**
Season Nitrogen Ratio:	0.71							**Lbs Per Acre:**			**253**	**0**	**0**	**2,953**	**356**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 36

Wheat, 76 Acres Planted on 11/17/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/01/2022	Corral Solids: Main Corral	4.00	Tons	37.80	2.71	0.72	2.31	%	304		10,249	2,723	8,736	0	
10/18/2022	Ground Water: Well Avg	4.50	Acre Inches		10.49			mg/L			812	0	0	18,485	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			1,064				
04/01/2023	Ground Water: Well Avg	4.60	Acre Inches		15.59			mg/L			1,233	0	0	27,414	
04/01/2023	Waste Water: Main Lagoon	0.80	Acre Inches		816.00	69.90	951.00	mg/L		1,650,981	11,222	961	13,079	41,808	
04/26/2023	Ground Water: Well Avg	4.30	Acre Inches		15.59			mg/L			1,152	0	0	25,626	
04/26/2023	Waste Water: Main Lagoon	0.50	Acre Inches		816.00	69.90	951.00	mg/L		1,031,863	7,014	601	8,175	26,130	
05/22/2023	Harvest	24.13	Tons	56.30	1.74	0.44	2.46	%							27,889
	Acre Inches Applied:	**14.70**						**Totals:**	**304**	**2,682,845**	**32,745**	**4,286**	**29,990**	**139,463**	**27,889**
Season Nitrogen Ratio:	1.17							**Lbs Per Acre:**			**431**	**56**	**395**	**1,835**	**367**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 36

Corn, 76 Acres Planted on 06/19/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/30/2023	Ground Water: Well Avg	5.20	Acre Inches		15.59			mg/L			1,394	0	0	30,989	
07/12/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			1,447	0	0	32,181	
07/26/2023	Ground Water: Well Avg	5.10	Acre Inches		15.59			mg/L			1,366	0	0	30,393	
08/07/2023	Fertilize - UN32	40.00	Gallons		32.00	0.00	0.00	%			8,103	0	0	0	
08/07/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			1,474	0	0	32,777	
08/17/2023	Fertilize - UN32	40.00	Gallons		32.00	0.00	0.00	%			8,103	0	0	0	
08/17/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			1,420	0	0	31,586	
08/31/2023	Ground Water: Well Avg	4.90	Acre Inches		15.59			mg/L			1,313	0	0	29,201	
09/11/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			1,287	0	0	28,606	
10/12/2023	Harvest	34.64	Tons	60.10	1.32	0.24	0.94	%							27,731
	Acre Inches Applied:	**36.20**						**Totals:**			**25,908**	**0**	**0**	**215,734**	**27,731**
Season Nitrogen Ratio:	0.93							**Lbs Per Acre:**			**341**	**0**	**0**	**2,839**	**365**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 40N

Alfalfa, 34 Acres Planted on 11/10/2019

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			476				
04/24/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			599	0	0	13,330	
05/24/2023	Ground Water: Well Avg	5.20	Acre Inches		15.59			mg/L			624	0	0	13,864	
06/21/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			647	0	0	14,397	
07/23/2023	Ground Water: Well Avg	5.90	Acre Inches		15.59			mg/L			707	0	0	15,730	
09/02/2023	Ground Water: Well Avg	6.20	Acre Inches		15.59			mg/L			743	0	0	16,530	
10/01/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			695	0	0	15,463	
11/02/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			576	0	0	12,797	
12/01/2023	Harvest	11.41	Tons	8.24	2.39	0.24	2.30	%							17,016
	Acre Inches Applied:	**38.30**						**Totals:**			**5,068**	**0**	**0**	**102,111**	**17,016**
Season Nitrogen Ratio:	0.30							**Lbs Per Acre:**			**149**	**0**	**0**	**3,003**	**500**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 40S

Alfalfa, 33 Acres Planted on 11/05/2020

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			462				
04/24/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			628	0	0	13,974	
05/24/2023	Ground Water: Well Avg	5.50	Acre Inches		15.59			mg/L			640	0	0	14,232	
06/21/2023	Ground Water: Well Avg	5.80	Acre Inches		15.59			mg/L			675	0	0	15,008	
07/24/2023	Ground Water: Well Avg	6.00	Acre Inches		15.59			mg/L			698	0	0	15,526	
09/03/2023	Ground Water: Well Avg	6.00	Acre Inches		15.59			mg/L			698	0	0	15,526	
10/02/2023	Ground Water: Well Avg	5.70	Acre Inches		15.59			mg/L			663	0	0	14,750	
11/02/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			559	0	0	12,421	
12/01/2023	Harvest	13.51	Tons	8.45	2.75	0.26	1.94	%							22,449
	Acre Inches Applied:	**39.20**						**Totals:**			**5,024**	**0**	**0**	**101,437**	**22,449**
Season Nitrogen Ratio:	0.22							**Lbs Per Acre:**			**152**	**0**	**0**	**3,074**	**680**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 41

Wheat, 74 Acres Planted on 11/05/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	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			%			1,036				
01/05/2023	Ground Water: Well Avg	4.50	Acre Inches		15.59			mg/L			1,174	0	0	26,112	
01/05/2023	Waste Water: Main Lagoon	0.90	Acre Inches		592.00	69.70	940.00	mg/L		1,808,476	8,918	1,050	14,161	85,115	
04/08/2023	Ground Water: Well Avg	4.20	Acre Inches		15.59			mg/L			1,096	0	0	24,371	
04/08/2023	Waste Water: Main Lagoon	0.90	Acre Inches		816.00	69.90	951.00	mg/L		1,808,476	12,293	1,053	14,326	45,796	
05/21/2023	Harvest	24.61	Tons	74.00	2.02	0.50	3.05	%							19,129
	Acre Inches Applied:	**10.50**						**Totals:**		**3,616,953**	**24,518**	**2,103**	**28,487**	**181,394**	**19,129**
Season Nitrogen Ratio:	1.28							**Lbs Per Acre:**			**331**	**28**	**385**	**2,451**	**258**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 41

Corn, 74 Acres Planted on 06/19/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
06/07/2023	Ground Water: Well Avg	5.30	Acre Inches		15.59			mg/L			1,383	0	0	30,754	
07/12/2023	Ground Water: Well Avg	5.40	Acre Inches		15.59			mg/L			1,409	0	0	31,335	
07/27/2023	Fertilize - UN32	40.00	Gallons		32.00	0.00	0.00	%			7,890	0	0	0	
07/27/2023	Ground Water: Well Avg	5.20	Acre Inches		15.59			mg/L			1,357	0	0	30,174	
08/06/2023	Fertilize - UN32	40.00	Gallons		32.00	0.00	0.00	%			7,890	0	0	0	
08/06/2023	Ground Water: Well Avg	5.10	Acre Inches		15.59			mg/L			1,331	0	0	29,593	
08/18/2023	Fertilize - UN32	40.00	Gallons		32.00	0.00	0.00	%			7,890	0	0	0	
08/18/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			1,305	0	0	29,013	
08/30/2023	Ground Water: Well Avg	4.80	Acre Inches		15.59			mg/L			1,253	0	0	27,853	
09/12/2023	Ground Water: Well Avg	4.90	Acre Inches		15.59			mg/L			1,279	0	0	28,433	
10/19/2023	Harvest	35.41	Tons	61.40	1.31	0.25	1.08	%							26,500
	Acre Inches Applied:	**35.70**						**Totals:**			**32,986**	**0**	**0**	**207,155**	**26,500**
Season Nitrogen Ratio:	1.24							**Lbs Per Acre:**			**446**	**0**	**0**	**2,799**	**358**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 42

Wheat, 65 Acres Planted on 11/06/2022

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
10/18/2022	Ground Water: Well Avg	4.30	Acre Inches		10.49			mg/L			663	0	0	15,107	
01/01/2023	Atmospheric Deposit	14.00	Pounds		100.00			%			910				
02/18/2023	Ground Water: Well Avg	3.90	Acre Inches		15.59			mg/L			894	0	0	19,878	
02/18/2023	Waste Water: Main Lagoon	0.90	Acre Inches		592.00	69.70	940.00	mg/L		1,588,527	7,834	922	12,438	74,763	
04/14/2023	Ground Water: Well Avg	3.60	Acre Inches		15.59			mg/L			825	0	0	18,349	
04/14/2023	Waste Water: Main Lagoon	0.70	Acre Inches		816.00	69.90	951.00	mg/L		1,235,521	8,398	720	9,788	31,287	
05/13/2023	Harvest	25.46	Tons	68.80	1.47	0.36	1.44	%							15,180
	Acre Inches Applied:	**13.40**						**Totals:**		**2,824,047**	**19,523**	**1,642**	**22,226**	**159,384**	**15,180**
Season Nitrogen Ratio:	1.29							**Lbs Per Acre:**			**300**	**25**	**342**	**2,452**	**234**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Field Name: 42

Corn, 65 Acres Planted on 06/16/2023

Date	Event/Source	Amount Applied/Yield (per Acre)	Units	Lab Sample Data % Moist.	Nitrogen	Phos.	Potass.	Units	Manure Applied (Tons)	Wastewater Applied (Gallons)	Nitrogen Applied (Lbs)	Phosphorus Applied (Lbs)	Potassium Applied (Lbs)	Salt Applied (Lbs)	Nitrogen Extracted (Lbs)
05/31/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			1,146	0	0	25,485	
07/07/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			1,146	0	0	25,485	
07/24/2023	Fertilize - UN32	40.00	Gallons		32.00	0.00	0.00	%			6,930	0	0	0	
07/24/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			1,146	0	0	25,485	
08/03/2023	Fertilize - UN32	40.00	Gallons		32.00	0.00	0.00	%			6,930	0	0	0	
08/03/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			1,146	0	0	25,485	
08/14/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			1,146	0	0	25,485	
08/26/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			1,146	0	0	25,485	
09/03/2023	Ground Water: Well Avg	5.00	Acre Inches		15.59			mg/L			1,146	0	0	25,485	
10/04/2023	Harvest	32.56	Tons	68.90	1.27	0.24	1.35	%							16,718
	Acre Inches Applied:	**35.00**						**Totals:**			**21,882**	**0**	**0**	**178,392**	**16,718**
Season Nitrogen Ratio:	1.31							**Lbs Per Acre:**			**337**	**0**	**0**	**2,744**	**257**

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Hamstra Dairy 2023

Nutrient Applications (Attachment B)

Summary of Nutrient Applications, Removal, and Balance

	Total N (Lbs)	Total P (Lbs)	Total K (Lbs)	Total Salts (Lbs)	Total Manure Applied	
Solid Manure	30,374.90	8,070.42	25,892.30	0.00	901.00	tons
Process Wastewater	314,239.73	30,578.94	380,229.42	2,351,664.59	60,879,940.60	gallons
Irrigation Water	211,616.32					
Fertilizer / Total Imports	69,729.48					
Atmospheric Deposition	19,306.00					
Total Nitrogen Applied	**645,266.43**					
Crop Nitrogen Removal	882,028.20					
Nitrogen Balance	**(236,761.77)**					
Nitrogen Ratio	**0.73**					

- **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.**

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Hamstra 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

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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 (N03-N or TKN, P, K, TDS) x 10-6 using the samples closest in date to the export event.

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Land Application Area Description Technical Report (Attachment D)

Field Name	Assessor Parcel Number(s)	Acres	Type of Waste Applied
1	x118 x060 x018 xxxx	13	Process Wastewater
2	x118 x060 x005 xxxx	25	Process Wastewater
3	x118 x060 x005 xxxx	38	Process Wastewater
4	x119 x130 x011 xxxx, x119 x130 x012 xxxx	47	Process Wastewater
5	x119 x130 x012 xxxx, x119 x130 x014 xxxx	45	Process Wastewater
6	x118 x060 x006 xxxx	56	Process Wastewater
7	x118 x060 x006 xxxx	38	None
8	x119 x130 x007 xxxx	38	Process Wastewater
9	x119 x130 x007 xxxx	37	None
10	x148 x030 x018 xxxx	35	Both
11	x148 x030 x018 xxxx	30	Both
14	x148 x030 x020 xxxx	38	Process Wastewater
15	x148 x030 x021 xxxx	37	Process Wastewater
16	x148 x030 x018 xxxx	40	Process Wastewater
17	x148 x030 x018 xxxx	37	None
18	x148 x030 x023 xxxx	25	Process Wastewater
19	x148 x030 x007 xxxx	36	None
20	x148 x030 x007 xxxx	37	Process Wastewater
21	x148 x030 x002 xxxx, x148 x030 x017 xxxx	31	None
22	x148 x030 x002 xxxx	35	None
23	x148 x030 x002 xxxx, x148 x030 x017 xxxx	33	Both
24	x118 x060 x010 xxxx, x148 x020 x014 xxxx	51	None
26	x148 x020 x014 xxxx	20	Process Wastewater
27	x148 x020 x014 xxxx	36	Process Wastewater
28	x148 x030 x001 xxxx	38	Process Wastewater
29	x148 x030 x001 xxxx	38	Process Wastewater

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Land Application Area Description Technical Report (Attachment D)

Field Name	Assessor Parcel Number(s)	Acres	Type of Waste Applied
30	x148 x030 x001 xxxx	38	None
34	x160 x110 x007 xxxx, x160 x110 x008 xxxx, x160 x110 x016 xxxx	50	Manure
35	x160 x110 x007 xxxx, x160 x110 x008 xxxx, x160 x110 x016 xxxx	100	None
36	x148 x050 x044 xxxx	76	Both
40N	x148 x040 x014 xxxx, x148 x040 x033 xxxx	34	None
40S	x148 x040 x013 xxxx, x148 x040 x014 xxxx	33	None
41	x148 x050 x060 xxxx	74	Process Wastewater
42	x148 x050 x060 xxxx	65	Process Wastewater
		1,404	

Production Area APN(s): x148 x030 x007 xxxx, x148 x030 x020 xxxx, x148 x030 x022 xxxx, x148 x030 x023 xxxx

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Hamstra Dairy 2023

Lab Results Summary (Attachment E)

Process Wastewater

(mgl/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
02/10/2023	592.00	69.70	940.00	8,510	451.00		5,650.00								
04/20/2023	816.00	69.90	951.00	4,580	666.00	0.24	3,040.00	7.56							
07/12/2023	485.00	50.20	527.00	8,100	464.00		5,380.00								
11/06/2023	481.00	56.20	617.00	7,360	478.00		4,890.00								
Averages:	593.50	61.50	758.75	7,138	514.75	0.24	4,740.00	7.56							

Manure - Corral Solids

(Dry Weight Basis)

Sample Date:	TN	TP	TK	Moisture	Ash	CA	MG	NA	S	CL
06/12/2023	2.07	0.59	1.46	3.37						%
11/06/2023	2.74	0.78	2.51	42.10						%
Averages:	2.40	0.68	1.98	22.74						

Plant Tissue

(Dry Weight Basis)

Field:	Crop #:	Crop	Sample Date:	TN (lbs/ton)	TP (lbs/ton)	TK (lbs/ton)	Moisture (%)	Ash (%)
1	1	Alfalfa	12/01/2023	55.40	5.80	55.40	7.88	11.10
2	1	Alfalfa	12/01/2023	53.40	5.40	52.40	8.21	10.90

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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 (%)
3	1	Alfalfa	12/01/2023	63.20	4.82	34.40	6.69	9.37
4	1	Alfalfa	12/01/2023	57.40	4.70	36.40	7.42	9.09
5	1	Wheat	05/09/2023	33.60	5.76	25.60	66.60	10.50
5	2	Corn	09/15/2023	28.00	5.62	30.20	69.00	6.72
6	1	Corn	08/11/2023	27.40	5.08	26.80	66.80	5.72
7	1	Alfalfa	12/01/2023	60.40	4.66	37.40	7.03	10.50
8	1	Wheat	05/10/2023	35.00	6.04	20.40	64.30	10.00
8	2	Corn	09/19/2023	28.40	5.76	40.40	73.00	8.06
9	1	Alfalfa	12/01/2023	62.80	6.04	57.80	7.27	11.50
10	1	Wheat	05/19/2023	35.80	10.24	52.60	58.20	11.00
10	2	Corn	10/05/2023	30.20	5.78	24.20	63.50	5.48
11	1	Wheat	05/22/2023	36.00	11.58	63.00	72.80	12.50
11	2	Corn	10/19/2023	24.80	5.64	33.60	69.50	6.78
14	1	Wheat	05/22/2023	39.00	9.62	47.80	68.80	15.50
14	2	Corn	10/19/2023	26.40	5.26	24.40	69.20	6.88
15	1	Wheat	05/10/2023	29.80	8.28	32.20	71.60	9.18
15	2	Corn	09/19/2023	30.80	5.40	22.80	62.40	5.98
16	1	Wheat	05/22/2023	37.40	9.84	54.00	64.70	10.90

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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 (%)
16	2	Corn	10/13/2023	25.20	4.86	23.80	64.10	5.14
17	1	Alfalfa	12/01/2023	53.80	5.94	59.20	7.62	11.40
18	1	Corn	09/25/2023	27.80	4.52	27.40	64.40	5.39
19	1	Alfalfa	12/01/2023	53.00	5.80	61.00	7.07	10.80
20	1	Wheat	05/10/2023	32.40	7.30	32.00	68.70	9.09
20	2	Corn	09/19/2023	27.00	5.84	25.60	63.80	7.14
21	1	Alfalfa	12/01/2023	56.60	6.18	67.40	7.80	11.70
22	1	Alfalfa	12/01/2023	55.20	6.06	69.40	7.71	12.00
23	1	Wheat	05/21/2023	32.40	8.02	42.60	67.90	11.50
23	2	Corn	10/10/2023	29.40	5.00	26.00	65.80	5.93
24	1	Alfalfa	12/01/2023	63.20	5.50	37.60	8.31	11.40
26	1	Wheat	05/19/2023	38.20	10.34	54.60	61.70	11.40
26	2	Corn	10/04/2023	28.20	5.98	30.20	67.30	6.16
27	1	Wheat	05/19/2023	33.60	6.42	26.20	67.00	10.10
27	2	Corn	10/04/2023	28.80	5.60	30.80	68.40	6.29
28	1	Wheat	05/21/2023	36.80	8.00	53.00	68.30	10.50
28	2	Corn	10/13/2023	27.80	5.76	23.40	65.10	6.15
29	1	Wheat	05/10/2023	30.60	5.80	29.60	63.30	10.10

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Hamstra 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 (%)
29	2	Corn	09/19/2023	28.00	4.38	26.20	63.70	9.27
30	1	Alfalfa	12/01/2023	51.20	4.68	40.00	7.82	9.16
34	1	Wheat	05/08/2023	28.20	6.78	24.40	69.50	8.74
34	2	Corn	09/12/2023	26.60	5.10	22.40	64.80	5.94
35	1	Corn	08/10/2023	26.40	4.68	21.60	65.20	5.54
36	1	Wheat	05/22/2023	34.80	8.86	49.20	56.30	11.30
36	2	Corn	10/12/2023	26.40	4.88	18.78	60.10	4.63
40N	1	Alfalfa	12/01/2023	47.80	4.90	46.00	8.24	14.90
40S	1	Alfalfa	12/01/2023	55.00	5.24	38.80	8.45	11.70
41	1	Wheat	05/21/2023	40.40	9.96	61.00	74.00	12.40
41	2	Corn	10/19/2023	26.20	5.04	21.60	61.40	5.88
42	1	Wheat	05/13/2023	29.40	7.24	28.80	68.80	9.44
42	2	Corn	10/04/2023	25.40	4.82	27.00	68.90	6.21

Well / Irrigation Water
(mgl/ppm unless noted otherwise)

							General Minerals						
Sample Date:	NO3N	TP	EC (umhos/cm)	NH4N *	TDS	TN	CA	MG	NA	HCO3	CO3	SO4	CL

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Lab Results Summary (Attachment E)

Well / Irrigation Water

(mgl/ppm unless noted otherwise)

	Sample Date:	NO3N	TP	EC (umhos/cm)	NH4N *	TDS	TN	General Minerals CA	MG	NA	HCO3	CO3	SO4	CL
Dairy														
NB East	04/06/2023	6.20		242		170.00		20.00	0.00	30.00	80.00	0.00	4.70	10.00
NB West								Out of service.						
OB South	12/13/2023	6.70		244		180.00		17.00	0.00	31.00	70.00	0.00	6.20	11.00
	Averages:	6.45		243		175.00		18.50	0.00	30.50	75.00	0.00	5.45	10.50
Domestic														
D Compound								Out of Service						
D Home	12/21/2023	11.00		437		300.00		58.00	2.00	34.00	170.00	0.00	8.60	14.00
D Shop	01/26/2023	4.20		201		120.00		10.00	0.00	32.00	50.00	0.00	5.50	8.00
D Vineyard								Out of Service						
	Averages:	7.60		319		210.00		34.00	1.00	33.00	110.00	0.00	7.05	11.00

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Hamstra Dairy 2023

Lab Results Summary (Attachment E)

Well / Irrigation Water

(mgl/ppm unless noted otherwise)

							General Minerals						
	Sample Date:	NO3N	TP	EC (umhos/cm)	NH4N *	TDS	TN	CA	MG	NA	HCO3	CO3	SO4	CL
Irrigation														
#1							Out of service							
#2	10/09/2023	18.20		618		400.00	18.20							
#3	10/09/2023	9.30		390		250.00	9.60							
Diesel							Out of Service							
F1							Did not run							
F3							Did not run							
F4							Out of Service							
F5							Out of Service							
F7							Out of Service							
F9							Did not run							
F10	10/20/2023	2.80		178		120.00	3.00	5.00	0.00	34.00	40.00	0.00	6.20	9.00
F14	09/28/2023	49.00		1,210		1,120.00	49.00	195.00	7.00	45.00	170.00	0.00	63.20	61.00
F15							Out of service							
F16							Out of Service							
F21							Did not run							
F27							Out of service							
F30	10/16/2023	15.00		409		300.00	15.00	39.00	0.00	37.00	90.00	0.00	11.70	20.00
F41							Out of service							
F42							Out of service							

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Lab Results Summary (Attachment E)

Well / Irrigation Water

(mgl/ppm unless noted otherwise)

							General Minerals						
	Sample Date:	**NO3N**	**TP**	**EC (umhos/cm)**	**NH4N ***	**TDS**	**TN**	**CA**	**MG**	**NA**	**HCO3**	**CO3**	**SO4**	**CL**
Irrigation														
F20A	10/09/2023	5.30		227		170.00	5.30							
F30E	10/20/2023	29.70		639		510.00	29.70	76.00	0.00	57.00	70.00	0.00	24.90	38.00
F11N								Out of service						
F25N								Did not run						
F11S								Out of service						
F25S								Did not run						
F4W	10/20/2023	2.00		142		110.00	2.00							
W36								Out of service						
W40								Out of Service						
W41	10/27/2023	9.00		260		140.00	9.10							
W40A								Did not run						
	Averages:	15.59		453		346.67	15.66	78.75	1.75	43.25	92.50	0.00	26.50	32.00

* NH4N was non-detectable unless a value is shown

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Hamstra Dairy 2023

Planting and Harvest Information (Attachment F)

	Crop #	Crop	Acres Planted	Plant Date	Harvest Date	Estimated Yield (tons)	Tons Harvested	Actual Yield
Field: 1								
	1	Alfalfa	13	11/01/2022	12/01/2023	11.0	143.6	11.0
Field: 2								
	1	Alfalfa	25	11/01/2022	12/01/2023	10.1	337.0	13.5
Field: 3								
	1	Alfalfa	38	11/01/2022	12/01/2023	10.5	482.2	12.7
Field: 4								
	1	Alfalfa	47	11/01/2022	12/01/2023	10.6	549.9	11.7
Field: 5								
	1	Wheat	45	10/28/2022	05/09/2023	18.3	1246.0	27.7
	2	Corn	45	06/01/2023	09/15/2023	37.4	1628.6	36.2
Field: 6								
	1	Corn	56	04/18/2023	08/11/2023	33.4	2217.6	39.6
Field: 7								
	1	Alfalfa	38	11/10/2019	10/01/2023	11.6	492.1	13.0
Field: 8								
	1	Wheat	38	10/29/2022	05/10/2023	25.3	864.5	22.8
	2	Corn	38	06/03/2023	09/19/2023	33.4	1392.3	36.6
Field: 9								
	1	Alfalfa	37	11/15/2020	11/01/2023	11.2	608.3	16.4
Field: 10								
	1	Wheat	35	11/29/2022	05/19/2023	25.8	833.4	23.8
	2	Corn	35	06/15/2023	10/05/2023	30.6	1199.1	34.3

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Hamstra Dairy 2023

Planting and Harvest Information (Attachment F)

	Crop #	Crop	Acres Planted	Plant Date	Harvest Date	Estimated Yield (tons)	Tons Harvested	Actual Yield
Field: 11								
	1	Wheat	30	11/15/2022	05/22/2023	22.3	812.7	27.1
	2	Corn	30	06/22/2023	10/19/2023	28.4	915.0	30.5
Field: 14								
	1	Wheat	38	10/31/2022	05/22/2023	20.1	1187.9	31.3
	2	Corn	38	06/22/2023	10/19/2023	30.1	1254.0	33.0
Field: 15								
	1	Wheat	37	11/03/2022	05/10/2023	21.0	1054.1	28.5
	2	Corn	37	06/02/2023	09/19/2023	36.3	1517.7	41.0
Field: 16								
	1	Wheat	40	10/29/2022	05/10/2023	18.6	1155.2	28.9
	2	Corn	40	06/21/2023	10/13/2023	28.5	1381.6	34.5
Field: 17								
	1	Alfalfa	37	11/14/2020	11/01/2023	11.2	662.7	17.9
Field: 18								
	1	Corn	25	06/08/2023	09/25/2023	38.1	997.0	39.9
Field: 19								
	1	Alfalfa	36	11/10/2021	11/01/2023	11.2	499.7	13.9
Field: 20								
	1	Wheat	37	11/04/2022	05/10/2023	27.7	1020.1	27.6
	2	Corn	37	06/03/2023	09/19/2023	33.9	1295.4	35.0
Field: 21								
	1	Alfalfa	31	11/14/2020	11/01/2023	11.2	533.2	17.2
Field: 22								
	1	Alfalfa	35	11/13/2021	11/01/2023	11.2	442.0	12.6

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Hamstra Dairy 2023

Planting and Harvest Information (Attachment F)

	Crop #	Crop	Acres Planted	Plant Date	Harvest Date	Estimated Yield (tons)	Tons Harvested	Actual Yield
Field: 23								
	1	Wheat	33	12/15/2022	05/21/2023	25.3	1040.8	31.5
	2	Corn	33	06/20/2023	10/10/2023	33.4	1128.9	34.2
Field: 24								
	1	Alfalfa	51	11/12/2019	12/01/2023	10.0	615.6	12.1
Field: 26								
	1	Wheat	20	11/29/2022	05/19/2023	26.9	490.4	24.5
	2	Corn	20	06/14/2023	10/04/2023	36.4	647.6	32.4
Field: 27								
	1	Wheat	36	11/16/2022	05/19/2023	26.4	882.7	24.5
	2	Corn	36	06/14/2023	10/04/2023	36.0	1165.7	32.4
Field: 28								
	1	Wheat	38	11/01/2022	05/21/2023	28.5	982.7	25.9
	2	Corn	38	06/20/2023	10/13/2023	31.8	1392.3	36.6
Field: 29								
	1	Wheat	38	11/18/2022	05/10/2023	20.0	941.3	24.8
	2	Corn	38	06/02/2023	09/19/2023	40.4	1337.6	35.2
Field: 30								
	1	Alfalfa	38	11/18/2021	11/15/2023	11.2	632.7	16.6
Field: 34								
	1	Wheat	50	11/03/2022	05/08/2023	21.9	1492.5	29.8
	2	Corn	50	05/29/2023	09/12/2023	29.8	1714.5	34.3
Field: 35								
	1	Corn	100	04/24/2023	08/10/2023	29.0	3872.0	38.7

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Planting and Harvest Information (Attachment F)

	Crop #	Crop	Acres Planted	Plant Date	Harvest Date	Estimated Yield (tons)	Tons Harvested	Actual Yield
Field: 36								
	1	Wheat	76	11/17/2022	05/22/2023	20.5	1833.9	24.1
	2	Corn	76	06/19/2023	10/12/2023	30.9	2632.6	34.6
Field: 40N								
	1	Alfalfa	34	11/10/2019	12/01/2023	16.1	387.9	11.4
Field: 40S								
	1	Alfalfa	33	11/05/2020	12/01/2023	11.2	445.8	13.5
Field: 41								
	1	Wheat	74	11/05/2022	05/21/2023	21.4	1821.1	24.6
	2	Corn	74	06/19/2023	10/19/2023	28.4	2620.3	35.4
Field: 42								
	1	Wheat	65	11/06/2022	05/13/2023	28.0	1654.9	25.5
	2	Corn	65	06/16/2023	10/04/2023	32.8	2116.4	32.6

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Hamstra 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

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

March 9, 2023

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

Lab No. : **VI 2340502**
Customer No. : **4018573**
Reference : **40148**

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
D Shop	01/26/2023	01/26/2023	VI 2340502-001	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 except those as listed in the table below. 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.

Samples Over Hold Time

Lab No	Analyte Method	Maximum Hold Time	Actual Hold Time
VI 2340502-001	Nitrate Nitrogen	48 hours	601.0 hours

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: JRD

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2023-03-10

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ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

March 9, 2023

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

Description : D Shop
Project : 0100 Hamstra Dairy

Lab No. : VI 2340502-001
Customer No. : 4018573
Reference : 40148
Sampled On : January 26, 2023 at 10:00
Sampled By : Sean
Received On : January 26, 2023 at 15:53
Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Alkalinity (as CaCO3)	50	10	mg/L		1		02/04/2023	20:41	amm	SM 4500-H+B	02/05/2023	06:21	amm
Bicarbonate	50	10	mg/L		1		02/04/2023	20:41	amm	SM 4500-H+B	02/05/2023	06:21	amm
Carbonate	ND	10	mg/L		1	U	02/04/2023	20:41	amm	SM 4500-H+B	02/05/2023	06:21	amm
Chloride	8	1	mg/L		1	lb	02/20/2023	11:00	ldm	EPA 300.0	02/20/2023	19:25	ldm
Nitrate Nitrogen	4.2	0.1	mg/L		1	T	02/20/2023	11:00	ldm	EPA 300.0	02/20/2023	19:25	ldm
Conductivity	201	1	umhos/cm		1		02/04/2023	20:41	amm	SM 4500-H+B	02/05/2023	06:21	amm
Sulfate Sulfur	5.50	0.17	mg/L		1		02/20/2023	11:00	ldm	EPA 300.0	02/20/2023	19:25	ldm
Solids, Total Dissolved (TDS)	120	20	mg/L		1		01/30/2023	11:50	ctl	SM 2540 C	01/31/2023	12:06	ctl
Calcium	10	1	mg/L		1		02/01/2023	07:05	ejc	EPA 200.7	02/02/2023	19:08	ac
Magnesium	ND	1	mg/L		1	J	02/01/2023	07:05	ejc	EPA 200.7	02/02/2023	19:08	ac
Potassium	ND	1	mg/L		1	J	02/01/2023	07:05	ejc	EPA 200.7	02/02/2023	19:08	ac
Sodium	32	1	mg/L		1		02/01/2023	07:05	ejc	EPA 200.7	02/02/2023	19:08	ac

DQF Flags Definition:
- U Constituent results were non-detect.
- I The MS/MSD did not meet QC criteria.
- b The Blank was positive for constituent but less than the PQL
- T Exceeded method/regulatory-specific holding time.
- 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

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

March 9, 2023
Innovative Ag Services, LLC

Lab No. : VI 2340502
Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	02/01/2023:201094EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	96.7 %	85-115	
			MS	mg/L	12.00	113 %	75-125	
		(SP 2301279-001)	MSD	mg/L	12.00	110 %	75-125	
			MSRPD	mg/L	0.8000	0.3%	≤20.0	
			MS	mg/L	12.00	95.2 %	75-125	
		(CC 2380295-002)	MSD	mg/L	12.00	90.4 %	75-125	
			MSRPD	mg/L	0.8000	0.6%	≤20.0	
Magnesium	200.7	02/01/2023:201094EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	102 %	85-115	
			MS	mg/L	12.00	104 %	75-125	
		(SP 2301279-001)	MSD	mg/L	12.00	101 %	75-125	
			MSRPD	mg/L	0.8000	0.6%	≤20	
			MS	mg/L	12.00	97.0 %	75-125	
		(CC 2380295-002)	MSD	mg/L	12.00	94.2 %	75-125	
			MSRPD	mg/L	0.8000	0.7%	≤20	
Potassium	200.7	02/01/2023:201094EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	95.2 %	85-115	
			MS	mg/L	12.00	104 %	75-125	
		(SP 2301279-001)	MSD	mg/L	12.00	103 %	75-125	
			MSRPD	mg/L	0.8000	0.4%	≤20.0	
			MS	mg/L	12.00	105 %	75-125	
		(CC 2380295-002)	MSD	mg/L	12.00	102 %	75-125	
			MSRPD	mg/L	0.8000	0.9%	≤20.0	
Sodium	200.7	02/01/2023:201094EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	93.2 %	85-115	
			MS	mg/L	12.00	124 %	75-125	
		(SP 2301279-001)	MSD	mg/L	12.00	98.5 %	75-125	
			MSRPD	mg/L	0.8000	1.6%	≤20.0	
			MS	mg/L	12.00	-396 %	<¼	
		(CC 2380295-002)	MSD	mg/L	12.00	-310 %	<¼	
			MSRPD	mg/L	0.8000	1.0%	≤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 analyted. 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.

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March 9, 2023
Innovative Ag Services, LLC

Lab No. : VI 2340502
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO3)	2320B	02/04/2023:201239AMM	ND	mg/L		0.2%	10	
Bicarbonate	2320B	(VI 2340484-001)	Dup	mg/L		0.2%	10	
E. C.	2320B	(VI 2340484-001)	Dup	umhos/cm		0.1%	5	
Solids, Total Dissolved	2540CE	01/30/2023:200983CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	990.8	98.2 %	90-110	
		(VI 2340484-001)	Dup	mg/L		0.03%	5	
		(VI 2340484-001)	Dup	mg/L		1.1%	5	
Chloride	300.0	02/20/2023:201848LDM	Blank	mg/L		1	<1	
			LCS	mg/L	25.00	100 %	90-110	
			MS	mg/L	50.00	81.5 %	85-121	435
		(STK2331879-001)	MSD	mg/L	50.00	85.0 %	85-121	
			MSRPD	mg/L	50.00	1.7%	≤19	
			MS	mg/L	50.00	101 %	85-121	
		(STK2332137-001)	MSD	mg/L	50.00	109 %	85-121	
			MSRPD	mg/L	50.00	7.3%	≤19	
Nitrate Nitrogen	300.0	02/20/2023:201848LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	99.9 %	90-110	
			MS	mg/L	40.00	99.2 %	85-119	
		(STK2331879-001)	MSD	mg/L	40.00	104 %	85-119	
			MSRPD	mg/L	50.00	3.7%	≤19	
			MS	mg/L	40.00	103 %	85-119	
		(STK2332137-001)	MSD	mg/L	40.00	112 %	85-119	
			MSRPD	mg/L	50.00	7.9%	≤19	
Sulfate Sulfur	300.0	02/20/2023:201848LDM	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	102 %	90-110	
			MS	mg/L	100.0	87.9 %	82-124	
		(STK2331879-001)	MSD	mg/L	100.0	94.1 %	82-124	
			MSRPD	mg/L	50.00	4.6%	≤23	
			MS	mg/L	100.0	102 %	82-124	
		(STK2332137-001)	MSD	mg/L	100.0	110 %	82-124	
			MSRPD	mg/L	50.00	7.3%	≤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 analyted. 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.

Page 4 of 4

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Laboratory Analysis Work Order

Nº 40148

ID: # 0100 2340502 **LABORATORY:** FGL

SITE NAME: Hanstra Dairy

Billing: IAS

Authorized Copy Release to:

Innnovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO_3N (Dom)
W2 EC, NO_3N, TDS, TN (Irr)
W3 NH_4-N (Ammonium)
W4 EC, NO_3N, Ca, Mg, Na, K, HCO_3, CO_3, SO_4S, Cl, TDS (Dom, GM)
W5 EC, NO_3N, TDS, TN, Ca, Mg, Na, HCO_3, CO_3, SO_4S, Cl (Irr, GM)
W6 NO_3N, NO_2 (Dom ILRP, Annually)
W7 Ca, Mg, Na, K, HCO_3, CO_3, SO_4, Cl + Lab Filtering (GWM)
W8 Other: _____

pH 14.7

Process Waste Water (lagoon)

L1 EC, NH_4N, TKN, TP, TK, TDS (Quarterly)
L2 EC, NO_3N, NH_4N, TKN, TP, TK, TDS, pH (Annually)
L3 L1 + Ca, Mg, Na, HCO_3,CO_3, SO_4S, Cl (Biennially)
L4 Other: _____

Manure

M1 TN, TP, TK, %M (2/year)
M2 TN, TP, K, %M, Ca, Mg, Na, S, Cl, ash (Biennially)
M3 Other: _____

Plant Tissue

P1 TN, NO_3N, PO_4P, 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: _____

Soil

S1 SP%, pH, EC, Ca, Mg, Na, K, ESP, LP, B, NO_3N, PO_4P, K-AA, Zn, Mn, Fe, Cu, SO_4S
S2 S1 + CEC, CaCO3, OM, C:N, TN
S3 NO_3N, NH_4N
S4 Other: _____

	Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS NH_3N *	pH	Temp
1	D.Shop	Dom	W1	1/26/23 10:00	SEAN	∅		
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 sampes, please note below.

NOTES:

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1st	[signature]	IAS		1/26/23 3:00
2nd	AJB	FGL	1/26/23 1535	
3rd	AJB	FGL		1/26/23 1553
4th	[signature]		1/26/23 1553	IAS 1/27/23 13:00

LABORATORY USE ONLY

Logged In By: [signature] **Total Samples:** 1/26/23 1726 **Laboratory #:** 1

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

April 19, 2023

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

Lab No. : **VI 2342098**
Customer No. : **4018573**
Reference : **40373**

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
NB East	04/06/2023	04/06/2023	VI 2342098-001	DW

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: JRD

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2023-04-20

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

April 19, 2023

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

Lab No. : VI 2342098-001
Customer No. : 4018573
Reference : 40373
Sampled On : April 6, 2023 at 12:30
Sampled By : Sean
Received On : April 6, 2023 at 15:53
Matrix : Drinking Water

Description : NB East
Project : 0100 Hamstra Dairy

Sample Results - Inorganic

Constituent	Result	RL	Units	MCL/AL	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Alkalinity (as CaCO3)	60	10	mg/L		1		04/11/2023	14:02	amm	SM 4500-H+B	04/11/2023	21:38	amm
Bicarbonate	80	10	mg/L		1		04/11/2023	14:02	amm	SM 4500-H+B	04/11/2023	21:38	amm
Carbonate	ND	10	mg/L		1	U	04/11/2023	14:02	amm	SM 4500-H+B	04/11/2023	21:38	amm
Hydroxide	ND	10	mg/L		1	U	04/11/2023	14:02	amm	SM 4500-H+B	04/11/2023	21:38	amm
Chloride	10	1	mg/L	500[2]	1		04/07/2023	12:16	ldm	EPA 300.0	04/07/2023	22:00	ldm
Nitrate Nitrogen	6.2	0.1	mg/L	10	1		04/07/2023	12:16	ldm	EPA 300.0	04/07/2023	22:00	ldm
Conductivity	242	1	umhos/cm	1600[2]	1		04/11/2023	14:02	amm	SM 4500-H+B	04/11/2023	21:38	amm
Sulfate Sulfur	4.70	0.17	mg/L		1	l	04/07/2023	12:16	ldm	EPA 300.0	04/07/2023	22:00	ldm
Solids, Total Dissolved (TDS)	170	20	mg/L	1000[2]	1		04/11/2023	09:22	ctl	SM 2540 C	04/12/2023	11:10	ctl
Calcium	20	1	mg/L		1		04/13/2023	07:45	ejc	EPA 200.7	04/14/2023	16:40	ac
Magnesium	ND	1	mg/L		1	Jl	04/13/2023	07:45	ejc	EPA 200.7	04/14/2023	16:40	ac
Potassium	ND	1	mg/L		1	J	04/13/2023	07:45	ejc	EPA 200.7	04/14/2023	16:40	ac
Sodium	30	1	mg/L		1		04/13/2023	07:45	ejc	EPA 200.7	04/17/2023	12:36	ac

DQF Flags Definition:
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.
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
MCL = Maximum Contamination Level. 2 - Secondary Standard. 3 - CDPH Notification Level. AL = Regulatory Action Level.

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

April 19, 2023
Innovative Ag Services, LLC

Lab No. : VI 2342098
Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	04/13/2023:203925EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	92.6 %	85-115	
			MS	mg/L	12.00	172 %	<¼	
		(SP 2305246-001)	MSD	mg/L	12.00	98.4 %	75-125	
			MSRPD	mg/L	4.000	6.7%	≤20.0	
			MS	mg/L	12.00	124 %	75-125	
		(SP 2304924-001)	MSD	mg/L	12.00	119 %	75-125	
			MSRPD	mg/L	4.000	0.9%	≤20.0	
Magnesium	200.7	04/13/2023:203925EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	94.8 %	85-115	
			MS	mg/L	12.00	-122 %	<¼	
		(SP 2305246-001)	MSD	mg/L	12.00	-138 %	<¼	
			MSRPD	mg/L	4.000	4.5%	≤20	
			MS	mg/L	12.00	42.3 %	75-125	435
		(SP 2304924-001)	MSD	mg/L	12.00	39.5 %	75-125	435
			MSRPD	mg/L	4.000	1.3%	≤20	
Potassium	200.7	04/13/2023:203925EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	90.5 %	85-115	
			MS	mg/L	12.00	123 %	75-125	
		(SP 2305246-001)	MSD	mg/L	12.00	117 %	75-125	
			MSRPD	mg/L	4.000	2.1%	≤20.0	
			MS	mg/L	12.00	125 %	75-125	
		(SP 2304924-001)	MSD	mg/L	12.00	120 %	75-125	
			MSRPD	mg/L	4.000	1.7%	≤20.0	
Sodium	200.7	04/13/2023:203925EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	93.5 %	85-115	
			MS	mg/L	12.00	-577 %	<¼	
		(SP 2305246-001)	MSD	mg/L	12.00	-641 %	<¼	
			MSRPD	mg/L	4.000	7.5%	≤20.0	
			MS	mg/L	12.00	-153 %	<¼	
		(SP 2304924-001)	MSD	mg/L	12.00	-156 %	<¼	
			MSRPD	mg/L	4.000	0.5%	≤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 analyted. 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.

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April 19, 2023
Innovative Ag Services, LLC

Lab No. : VI 2342098
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO3)	2320B	04/11/2023:203842AMM	ND	mg/L		0.4%	10	435
Bicarbonate	2320B	(VI 2342017-001)	Dup	mg/L		1.36%	10	
Carbonate	2320B	(VI 2342017-001)	Dup	mg/L		2.90%	10	
E. C.	2320B	(VI 2342017-001)	Dup	umhos/cm		1.95%	5	
Solids, Total Dissolved	2540CE	04/11/2023:203811CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	993.4	99.5%	90-110	
		(SP 2305080-001)	Dup	mg/L		0.3%	5	
		(SP 2305080-001)	Dup	mg/L		0.9%	5	
Chloride	300.0	04/07/2023:203785LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	100 %	90-110	
			MS	mg/L	50.00	97.3 %	85-121	
		(SP 2304777-001)	MSD	mg/L	50.00	92.2 %	85-121	
			MSRPD	mg/L	10.00	3.3%	≤19	
			MS	mg/L	50.00	98.6 %	85-121	
		(CC 2380954-001)	MSD	mg/L	50.00	95.3 %	85-121	
			MSRPD	mg/L	10.00	2.3%	≤19	
Nitrate Nitrogen	300.0	04/07/2023:203785LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	101 %	90-110	
			MS	mg/L	40.00	105 %	85-119	
		(SP 2304777-001)	MSD	mg/L	40.00	99.6 %	85-119	
			MSRPD	mg/L	10.00	4.1%	≤19	
			MS	mg/L	40.00	108 %	85-119	
		(CC 2380954-001)	MSD	mg/L	40.00	104 %	85-119	
			MSRPD	mg/L	10.00	3.4%	≤19	
Sulfate Sulfur	300.0	04/07/2023:203785LDM	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	101 %	90-110	
			MS	mg/L	100.0	86.9 %	82-124	
		(SP 2304777-001)	MSD	mg/L	100.0	80.6 %	82-124	435
			MSRPD	mg/L	10.00	2.6%	≤23	
			MS	mg/L	100.0	92.8 %	82-124	
		(CC 2380954-001)	MSD	mg/L	100.0	89.7 %	82-124	
			MSRPD	mg/L	10.00	1.7%	≤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 analyted. 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.

Page 4 of 4

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Laboratory Analysis Work Order

Nº 40373

2342098

ID: # 0100

LABORATORY: FGL

SITE NAME: HAMSTRA DAIRY

Billing: IAB

Authorized Copy Release to:

Innnovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO_3N (Dom)

W2 EC, NO_3N, TDS, TN (Irr)

W3 NH_4-N (Ammonium)

W4 EC, NO_3N, Ca, Mg, Na, K, HCO_3, CO_3, SO_4S, Cl, TDS (Dom, GM)

W5 EC, NO_3N, TDS, TN, Ca, Mg, Na, HCO_3, CO_3, SO_4S, Cl (Irr, GM)

W6 NO_3N, NO_2 (Dom ILRP, Annually)

W7 Ca, Mg, Na, K, HCO_3, CO_3, SO_4, Cl + Lab Filtering (GWM)

W8 Other: _____

Q01 11.6

Process Waste Water (lagoon)

L1 EC, NH_4N, TKN, TP, TK, TDS (Quarterly)

L2 EC, NO_3N, NH_4N, TKN, TP, TK, TDS, pH (Annually)

L3 L1 + Ca, Mg, Na, HCO_3,CO_3, SO_4S, Cl (Biennially)

L4 Other: _____

Manure

M1 TN, TP, TK, %M (2/year)

M2 TN, TP, K, %M, Ca, Mg, Na, S, Cl, ash (Biennially)

M3 Other: _____

Plant Tissue

P1 TN, NO_3N, PO_4P, 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: _____

Soil

S1 SP%, pH, EC, Ca, Mg, Na, K, ESP, LP, B, NO_3N, PO_4P, K-AA, Zn, Mn, Fe, Cu, SO_4S

S2 S1 + CEC, CaCO3, OM, C:N, TN

S3 NO_3N, NH_4N

S4 Other: _____

	Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS NH_3N*	pH	Temp
1	NB EAST	DOM	W14	4/6/23 12:30	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 sampes, please note below.

NOTES:

GLS 4/7/23

CDA 1234

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1st	[signature]	IAB		4/6/23 2:30
2nd	AJB	FGL	4/6/23 1535	
3rd	AJB	FGL		4/6/23 1653
4th	[signature]	✓	4/6/23 1553	

LABORATORY USE ONLY:

Logged In By: [signature] Total Samples: 4/6/23 1 Laboratory #: _____

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ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

October 16, 2023

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

Lab No. : **VI 2346570**
Customer No. : **4018573**
Reference : **41425**

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
F14	09/28/2023	09/28/2023	VI 2346570-001	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: JRD

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2023-10-16

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

October 16, 2023

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

Description : F14
Project : 0100 Hamstra Dairy

Lab No. : VI 2346570-001
Customer No. : 4018573
Reference : 41425
Sampled On : September 28, 2023 at 08:20
Sampled By : Zeke
Received On : September 28, 2023 at 16:10
Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Alkalinity (as CaCO3)	140	10	mg/L		1		10/01/2023	12:57	amm	SM 4500-H+B	10/01/2023	23:02	amm
Bicarbonate	170	10	mg/L		1		10/01/2023	12:57	amm	SM 4500-H+B	10/01/2023	23:02	amm
Carbonate	ND	10	mg/L		1	U	10/01/2023	12:57	amm	SM 4500-H+B	10/01/2023	23:02	amm
Hydroxide	ND	10	mg/L		1	U	10/01/2023	12:57	amm	SM 4500-H+B	10/01/2023	23:02	amm
Chloride	61	1	mg/L		1		09/29/2023	10:14	ldm	EPA 300.0	09/29/2023	17:58	ldm
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	Ul	10/11/2023	07:25	sta	EPA 351.2	10/13/2023	16:22	lcr
Nitrate Nitrogen	49.0	0.5*	mg/L		6		09/29/2023	10:14	ldm	EPA 300.0	09/30/2023	08:58	ldm
Nitrogen, Total as Nitrogen	49.0	0.5	mg/L		1	l	10/11/2023	07:25	sta	Calc.	10/13/2023	16:22	lcr
Nitrate + Nitrite as N	49.0	0.1*	mg/L		6		09/29/2023	10:14	ldm	EPA 300.0	09/30/2023	08:58	ldm
Kjeldahl Nitrogen	ND	0.5	mg/L		1	Ul	10/11/2023	07:25	sta	EPA 351.2	10/13/2023	16:22	lcr
Conductivity	1210	1	umhos/cm		1		10/01/2023	12:57	amm	SM 4500-H+B	10/01/2023	23:02	amm
Sulfate Sulfur	63.2	1.0*	mg/L		6		09/29/2023	10:14	ldm	EPA 300.0	09/30/2023	08:58	ldm
Solids, Total Dissolved (TDS)	1120	20	mg/L		1		09/29/2023	13:20	ctl	SM 2540 C	10/02/2023	11:20	ctl
Calcium	195	1	mg/L		1		10/03/2023	05:12	ejc	EPA 200.7	10/04/2023	14:55	ac
Magnesium	7	1	mg/L		1		10/03/2023	05:12	ejc	EPA 200.7	10/04/2023	14:55	ac
Sodium	45	1	mg/L		1		10/03/2023	05:12	ejc	EPA 200.7	10/04/2023	14:55	ac

DQF Flags Definition:
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.

ND=Non-Detected, RL=Reporting Level * RL adjusted for dilution, Dil.=Dilution

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October 16, 2023
Innovative Ag Services, LLC

Lab No. : VI 2346570
Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	10/03/2023:211093EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	103%	85-115	
			MS	mg/L	12.00	103%	75-125	
		(VI 2346586-001)	MSD	mg/L	12.00	107%	75-125	
			MSRPD	mg/L		3.2%	≤20.0	
			MS	mg/L	12.00	59.5%	<¼	406
		(VI 2346570-001)	MSD	mg/L	12.00	91.0%	75-125	
			MSRPD	mg/L		1.9%	≤20.0	
Magnesium	200.7	10/03/2023:211093EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	101%	85-115	
			MS	mg/L	12.00	103%	75-125	
		(VI 2346586-001)	MSD	mg/L	12.00	107%	75-125	
			MSRPD	mg/L		3.5%	≤20	
			MS	mg/L	12.00	97.5%	75-125	
		(VI 2346570-001)	MSD	mg/L	12.00	101%	75-125	
			MSRPD	mg/L		2.1%	≤20	
Sodium	200.7	10/03/2023:211093EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	102%	85-115	
			MS	mg/L	12.00	84.8%	75-125	
		(VI 2346586-001)	MSD	mg/L	12.00	104%	75-125	
			MSRPD	mg/L		4.0%	≤20.0	
			MS	mg/L	12.00	92.3%	75-125	
		(VI 2346570-001)	MSD	mg/L	12.00	99.3%	75-125	
			MSRPD	mg/L		1.5%	≤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 analyted. 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.

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October 16, 2023
Innovative Ag Services, LLC

Lab No. : VI 2346570
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO3)	2320B	10/01/2023:210829AMM	ND	mg/L		0.6%	10	406
Bicarbonate	2320B	(VI 2346570-001)	Dup	mg/L		0.6%	10	
E. C.	2320B	(VI 2346570-001)	Dup	umhos/cm		0.08%	5	
Solids, Total Dissolved	2540CE	09/29/2023:210994CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	991.5	100%	90-110	
		(SP 2316442-003)	Dup	mg/L		0.8%	5	
		(SP 2316442-003)	Dup	mg/L		1.66%	5	
Chloride	300.0	09/29/2023:211042LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	102%	90-110	
			MS	mg/L	50.00	99.4%	67-117	
		(SP 2316227-004)	MSD	mg/L	50.00	99.6%	67-117	
			MSRPD	mg/L		0.1%	≤7	
			MS	mg/L	50.00	73.4%	67-117	
		(SP 2316223-001)	MSD	mg/L	50.00	67.8%	67-117	
			MSRPD	mg/L		1.6%	≤7	
Nitrate + Nitrite as N	300.0	09/29/2023:211042LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	102%	90-110	
			MS	mg/L	40.00	101%	86-112	
		(SP 2316227-004)	MSD	mg/L	40.00	101%	86-112	
			MSRPD	mg/L		0.3%	≤7	
			MS	mg/L	40.00	102%	86-112	
		(SP 2316223-001)	MSD	mg/L	40.00	102%	86-112	
			MSRPD	mg/L		0.1%	≤7	
Nitrate Nitrogen	300.0	09/29/2023:211042LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	102%	90-110	
			MS	mg/L	40.00	101%	86-112	
		(SP 2316227-004)	MSD	mg/L	40.00	101%	86-112	
			MSRPD	mg/L		0.3%	≤7	
			MS	mg/L	40.00	102%	86-112	
		(SP 2316223-001)	MSD	mg/L	40.00	102%	86-112	
			MSRPD	mg/L		0.1%	≤7	
Sulfate Sulfur	300.0	09/29/2023:211042LDM	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	102%	90-110	
			MS	mg/L	100.0	99.9%	18-165	
		(SP 2316227-004)	MSD	mg/L	100.0	100%	18-165	
			MSRPD	mg/L		0.2%	≤7	
			MS	mg/L	100.0	101%	18-165	
		(SP 2316223-001)	MSD	mg/L	100.0	101%	18-165	
			MSRPD	mg/L		0.1%	≤7	
Nitrogen, Total Kjeldahl	351.2	10/11/2023:211433STA	Blank	mg/L		ND	<0.5	
			LCS	mg/L	12.00	93.1%	73-124	
			MS	mg/L	12.00	96.2%	90-110	
		(SP 2316536-001)	MSD	mg/L	12.00	94.4%	90-110	
			MSRPD	mg/L		1.8%	≤20	
			MS	mg/L	12.00	81.5%	90-110	435
		(VI 2346585-001)	MSD	mg/L	12.00	85.4%	90-110	435
			MSRPD	mg/L		4.5%	≤20	

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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 analyted. 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.

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Laboratory Analysis Work Order

Nº 41425

ID: # 0100 2316570

SITE NAME: HAMSTRA DAIRY

Billing: IAS

LABORATORY: FGL

Authorized Copy Release to:

Innnovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO_3N (Dom)
W2 EC, NO_3N, TDS, TN (Irr)
W3 NH_4-N (Ammonium)
W4 EC, NO_3N, Ca, Mg, Na, K, HCO_3, CO_3, SO_4S, Cl, TDS (Dom, GM)
W5 EC, NO_3N, TDS, TN, Ca, Mg, Na, HCO_3, CO_3, SO_4S, Cl (Irr, GM)
W6 NO_3N, NO_2 (Dom ILRP, Annually)
W7 Ca, Mg, Na, K, HCO_3, CO_3, SO_4, Cl + Lab Filtering (GWM)
W8 Other: _____

Process Waste Water (lagoon)

L1 EC, NH_4N, TKN, TP, TK, TDS (Quarterly)
L2 EC, NO_3N, NH_4N, TKN, TP, TK, TDS, pH (Annually)
L3 L1 + Ca, Mg, Na, HCO_3,CO_3, SO_4S, Cl (Biennially)
L4 Other: _____

Manure

M1 TN, TP, TK, %M (2/year)
M2 TN, TP, K, %M, Ca, Mg, Na, S, Cl, ash (Biennially)
M3 Other: _____

Plant Tissue

P1 TN, NO_3N, PO_4P, 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: _____

Soil

S1 SP%, pH, EC, Ca, Mg, Na, K, ESP, LP, B, NO_3N, PO_4P, K-AA, Zn, Mn, Fe, Cu, SO_4S
S2 S1 + CEC, CaCO3, OM, C:N, TN
S3 NO_3N, NH_4N
S4 Other: _____

	Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS NH_3N*	pH	Temp
1	F14	IRR	W5	9-28 / 8:20	Zeke			
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 sampes, please note below.

NOTES: 2.9% RDI TH401 GLS 9/29/23 CDA 1133

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1st		IAS		9-28-23 / 3:25
2nd		FGL	9-28-23 15:50	
3rd		FGL		9-28-23 16:18
4th		FGL	9.28.23 1610	

LABORATORY USE ONLY

Logged In By: GLS 9/28/23 1730 Total Samples: _____ Laboratory #: _____

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

November 6, 2023

Lab No. : **VI 2346838**
Customer No. : **4018573**
Reference : **41505**

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	(3 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
2	10/09/2023	10/09/2023	VI 2346838-001	AGW
3	10/09/2023	10/09/2023	VI 2346838-002	AGW
F20A	10/09/2023	10/09/2023	VI 2346838-003	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 2320 B	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-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: JRD

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2023-11-06

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

November 6, 2023

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

Description : 2
Project : 0100 Hamstra Dairy

Lab No. : VI 2346838-001
Customer No. : 4018573
Reference : 41505
Sampled On : October 9, 2023 at 10:40
Sampled By : Frank
Received On : October 9, 2023 at 16:10
Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	Ul	10/20/2023	11:25	sta	EPA 351.2	10/26/2023	19:36	lcr
Nitrate Nitrogen	18.2	0.4	mg/L		1		10/10/2023	13:00	lfs	SM 4500-NO3 F	10/10/2023	15:18	lfs
Nitrogen, Total as Nitrogen	18.2	0.5	mg/L		1	l	10/20/2023	11:25	sta	Calc.	10/26/2023	19:36	lcr
Nitrate + Nitrite as N	18.2	0.4	mg/L		1		10/10/2023	13:00	lfs	SM 4500-NO3 F	10/10/2023	15:18	lfs
Kjeldahl Nitrogen	ND	0.5	mg/L		1	Ul	10/20/2023	11:25	sta	EPA 351.2	10/26/2023	19:36	lcr
Conductivity	618	1	umhos/cm		1		10/19/2023	09:41	krh	SM 2320 B	10/19/2023	13:08	krh
Solids, Total Dissolved (TDS)	400	20	mg/L		1		10/11/2023	13:00	ctl	SM 2540 C	10/12/2023	11:00	ctl

DQF Flags Definition:
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.

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

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ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

November 6, 2023

Innovative Ag Services, LLC
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Hanford, CA 93230

Description : 3
Project : 0100 Hamstra Dairy

Lab No. : VI 2346838-002
Customer No. : 4018573
Reference : 41505
Sampled On : October 9, 2023 at 10:50
Sampled By : Frank
Received On : October 9, 2023 at 16:10
Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	Ul	10/20/2023	11:25	sta	EPA 351.2	10/26/2023	18:51	lcr
Nitrate Nitrogen	9.3	0.4	mg/L		1		10/10/2023	13:00	lfs	SM 4500-NO3 F	10/10/2023	15:21	lfs
Nitrogen, Total as Nitrogen	9.6	0.5	mg/L		1	l	10/20/2023	11:25	sta	Calc.	10/26/2023	18:51	lcr
Nitrate + Nitrite as N	9.6	0.4	mg/L		1		10/10/2023	13:00	lfs	SM 4500-NO3 F	10/10/2023	15:21	lfs
Kjeldahl Nitrogen	ND	0.5	mg/L		1	Ul	10/20/2023	11:25	sta	EPA 351.2	10/26/2023	18:51	lcr
Conductivity	390	1	umhos/cm		1		10/19/2023	09:41	krh	SM 2320 B	10/19/2023	14:42	krh
Solids, Total Dissolved (TDS)	250	20	mg/L		1		10/11/2023	13:00	ctl	SM 2540 C	10/12/2023	11:00	ctl

DQF Flags Definition:
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.

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

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

November 6, 2023

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

Description : F20A
Project : 0100 Hamstra Dairy

Lab No. : VI 2346838-003
Customer No. : 4018573
Reference : 41505
Sampled On : October 9, 2023 at 10:00
Sampled By : Frank
Received On : October 9, 2023 at 16:10
Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	Ul	10/20/2023	11:25	sta	EPA 351.2	10/26/2023	18:54	lcr
Nitrate Nitrogen	5.3	0.4	mg/L		1		10/10/2023	13:00	lfs	SM 4500-NO3 F	10/10/2023	15:23	lfs
Nitrogen, Total as Nitrogen	5.3	0.5	mg/L		1	l	10/20/2023	11:25	sta	Calc.	10/26/2023	18:54	lcr
Nitrate + Nitrite as N	5.3	0.4	mg/L		1		10/10/2023	13:00	lfs	SM 4500-NO3 F	10/10/2023	15:23	lfs
Kjeldahl Nitrogen	ND	0.5	mg/L		1	Ul	10/20/2023	11:25	sta	EPA 351.2	10/26/2023	18:54	lcr
Conductivity	227	1	umhos/cm		1		10/19/2023	09:41	krh	SM 2320 B	10/19/2023	14:53	krh
Solids, Total Dissolved (TDS)	170	20	mg/L		1		10/12/2023	10:50	ctl	SM 2540 C	10/13/2023	10:00	ctl

DQF Flags Definition:
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.

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

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November 6, 2023
Innovative Ag Services, LLC

Lab No. : VI 2346838
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
E. C.	2320B	(CC 2383472-001)	Dup	umhos/cm		0%	5	
		(VI 2346815-001)	Dup	umhos/cm		0.1%	5	
Solids, Total Dissolved	2540CE	10/11/2023:211446CTL	Blank	mg/L	-	ND	<20	
			LCS	mg/L	991.5	98.4%	90-110	
		(SP 2317040-001)	Dup	mg/L		0.9%	5	
		(SP 2317040-001)	Dup	mg/L		0.8%	5	
	2540CE	10/12/2023:211502CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	991.5	103%	90-110	
		(SP 2317036-001)	Dup	mg/L		0.03%	5	
		(SP 2317036-001)	Dup	mg/L		1.33%	5	
Nitrogen, Total Kjeldahl	351.2	10/20/2023:211875STA	Blank	mg/L		ND	<0.5	
			LCS	mg/L	12.00	90.8%	73-124	
			MS	mg/L	12.00	70.2%	<¼	406
		(VI 2346838-002)	MSD	mg/L	12.00	69.2%	<1/4	
			MSRPD	mg/L		1.4%	≤20	
			MS	mg/L	12.00	83.6%	90-110	435
		(VI 2346838-003)	MSD	mg/L	12.00	76.6%	90-110	435
			MSRPD	mg/L		8.6%	≤20	
Nitrate + Nitrite as N	4500NO3F	10/10/2023:211413LFS	Blank	mg/L		ND	<0.4	
			LCS	mg/L	11.22	92.8%	80-120	
			MS	mg/L	5.609	94.9%	66-125	
		(CH 2378613-001)	MSD	mg/L	5.609	97.6%	66-125	
			MSRPD	mg/L		2.8%	≤30.4	
Nitrate Nitrogen	4500NO3F	10/10/2023:211413LFS	Blank	mg/L		ND	<0.4	
			LCS	mg/L	11.22	92.8%	80-120	
			MS	mg/L	5.609	94.9%	66-125	
		(CH 2378613-001)	MSD	mg/L	5.609	97.6%	66-125	
			MSRPD	mg/L		2.8%	≤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 analyted. 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.

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Laboratory Analysis Work Order

Nº 41505

ID: # 0100 2316838

LABORATORY: FGL

SITE NAME: Hamstra Dairy

Billing: IAS

Authorized Copy Release to:

Innnovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO_3N (Dom)

W2 EC, NO_3N, TDS, TN (Irr)

W3 NH_4-N (Ammonium)

W4 EC, NO_3N, Ca, Mg, Na, K, HCO_3, CO_3, SO_4S, Cl, TDS (Dom, GM)

W5 EC, NO_3N, TDS, TN, Ca, Mg, Na, HCO_3, CO_3, SO_4S, Cl (Irr, GM)

W6 NO_3N, NO_2 (Dom ILRP, Annually)

W7 Ca, Mg, Na, K, HCO_3, CO_3, SO_4, Cl + Lab Filtering (GWM)

W8 Other: _____

Process Waste Water (lagoon)

L1 EC, NH_4N, TKN, TP, TK, TDS (Quarterly)

L2 EC, NO_3N, NH_4N, TKN, TP, TK, TDS, pH (Annually)

L3 L1 + Ca, Mg, Na, HCO_3,CO_3, SO_4S, Cl (Biennially)

L4 Other: _____

Manure

M1 TN, TP, TK, %M (2/year)

M2 TN, TP, K, %M, Ca, Mg, Na, S, Cl, ash (Biennially)

M3 Other: _____

Plant Tissue

P1 TN, NO_3N, PO_4P, 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: _____

Soil

S1 SP%, pH, EC, Ca, Mg, Na, K, ESP, LP, B, NO_3N, PO_4P, K-AA, Zn, Mn, Fe, Cu, SO_4S

S2 S1 + CEC, CaCO3, OM, C:N, TN

S3 NO_3N, NH_4N

S4 Other: _____

	Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS NH_3N *	pH	Temp
1	2	Irr	W2	10/9 10:40	Frank			
2	3			10:50				
3	F20A			10:00				
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 sampes, please note below.

NOTES:

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1st		IAS		10/9/23 3:00
2nd		FGL	10-9-23 15:55	
3rd		FGL		10-9-23 16:10
4th			10/9/23 1610	

LABORATORY USE ONLY

Logged In By: _____ Total Samples: 10/9/23 1720 Laboratory #: 10/10/23 1130

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ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

November 6, 2023

Lab No. : **VI 2346977**
Customer No. : **4018573**
Reference : **41546**

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
F30	10/16/2023	10/16/2023	VI 2346977-001	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: JRD

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2023-11-08

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

November 6, 2023

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

Description : F30
Project : 0100 Hamstra Dairy

Lab No. : VI 2346977-001
Customer No. : 4018573
Reference : 41546
Sampled On : October 16, 2023 at 07:40
Sampled By : Zeke
Received On : October 16, 2023 at 16:10
Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Alkalinity (as CaCO3)	80	10	mg/L		1		10/17/2023	17:45	amm	SM 4500-H+B	10/17/2023	22:58	amm
Bicarbonate	90	10	mg/L		1		10/17/2023	17:45	amm	SM 4500-H+B	10/17/2023	22:58	amm
Carbonate	ND	10	mg/L		1	U	10/17/2023	17:45	amm	SM 4500-H+B	10/17/2023	22:58	amm
Hydroxide	ND	10	mg/L		1	U	10/17/2023	17:45	amm	SM 4500-H+B	10/17/2023	22:58	amm
Chloride	20	1	mg/L		1		10/17/2023	10:09	ldm	EPA 300.0	10/17/2023	18:39	ldm
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	Ul	10/27/2023	07:29	sta	EPA 351.2	11/03/2023	16:56	lcr
Nitrate Nitrogen	15.0	0.1	mg/L		1		10/17/2023	10:09	ldm	EPA 300.0	10/17/2023	18:39	ldm
Nitrogen, Total as Nitrogen	15.0	0.5	mg/L		1	l	10/27/2023	07:29	sta	Calc.	11/03/2023	16:56	lcr
Nitrate + Nitrite as N	15.0	0.1	mg/L		1		10/17/2023	10:09	ldm	EPA 300.0	10/17/2023	18:39	ldm
Kjeldahl Nitrogen	ND	0.5	mg/L		1	Ul	10/27/2023	07:29	sta	EPA 351.2	11/03/2023	16:56	lcr
Conductivity	409	1	umhos/cm		1		10/17/2023	17:45	amm	SM 4500-H+B	10/17/2023	22:58	amm
Sulfate Sulfur	11.7	0.17	mg/L		1		10/17/2023	10:09	ldm	EPA 300.0	10/17/2023	18:39	ldm
Solids, Total Dissolved (TDS)	300	20	mg/L		1		10/17/2023	14:45	ctl	SM 2540 C	10/18/2023	11:00	ctl
Calcium	39	1	mg/L		1		10/18/2023	07:45	ejc	EPA 200.7	10/19/2023	11:19	ac
Magnesium	ND	1	mg/L		1	U	10/18/2023	07:45	ejc	EPA 200.7	10/19/2023	11:19	ac
Sodium	37	1	mg/L		1		10/18/2023	07:45	ejc	EPA 200.7	10/19/2023	11:19	ac

DQF Flags Definition:
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.

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

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

November 6, 2023
Innovative Ag Services, LLC

Lab No. : VI 2346977
Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	10/18/2023:211755EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	102%	85-115	
			MS	mg/L	12.00	103%	75-125	
		(SP 2317486-001)	MSD	mg/L	12.00	95.9%	75-125	
			MSRPD	mg/L		3.0%	≤20.0	
			MS	mg/L	12.00	133%	<¼	406
		(SP 2317488-001)	MSD	mg/L	12.00	106%	75-125	
			MSRPD	mg/L		1.1%	≤20.0	
Magnesium	200.7	10/18/2023:211755EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	101%	85-115	
			MS	mg/L	12.00	112%	75-125	
		(SP 2317486-001)	MSD	mg/L	12.00	107%	75-125	
			MSRPD	mg/L		3.5%	≤20	
			MS	mg/L	12.00	533%	<¼	406
		(SP 2317488-001)	MSD	mg/L	12.00	-156%	<1/4	
			MSRPD	mg/L		6.6%	≤20	
Sodium	200.7	10/18/2023:211755EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	104%	85-115	
			MS	mg/L	12.00	197%	<¼	406
		(SP 2317486-001)	MSD	mg/L	12.00	177%	<1/4	
			MSRPD	mg/L		2.7%	≤20.0	
			MS	mg/L	12.00	1730%	<¼	406
		(SP 2317488-001)	MSD	mg/L	12.00	4470%	<1/4	
			MSRPD	mg/L		2.8%	≤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 analyted. 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.

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November 6, 2023
Innovative Ag Services, LLC

Lab No. : VI 2346977
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO3)	2320B	10/17/2023:211747AMM	ND	mg/L		0.8%	10	406
Bicarbonate	2320B	(VI 2346976-001)	Dup	mg/L		0%	10	
Carbonate	2320B	(VI 2346976-001)	Dup	mg/L		4.08%	10	
E. C.	2320B	(VI 2346976-001)	Dup	umhos/cm		0.3%	5	
Solids, Total Dissolved	2540CE	10/17/2023:211713CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	991.5	103%	90-110	
		(VI 2346950-002)	Dup	mg/L		2.09%	5	
		(VI 2346950-002)	Dup	mg/L		0.6%	5	
Chloride	300.0	10/17/2023:211776LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	102%	90-110	
			MS	mg/L	50.00	89.8%	67-117	
		(SP 2317504-001)	MSD	mg/L	50.00	90.1%	67-117	
			MSRPD	mg/L		0.2%	≤7	
			MS	mg/L	50.00	97.5%	67-117	
		(SP 2317495-001)	MSD	mg/L	50.00	97.4%	67-117	
			MSRPD	mg/L		0.0%	≤7	
Nitrate + Nitrite as N	300.0	10/17/2023:211776LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	101%	90-110	
			MS	mg/L	40.00	97.8%	86-112	
		(SP 2317504-001)	MSD	mg/L	40.00	98.0%	86-112	
			MSRPD	mg/L		0.1%	≤7	
			MS	mg/L	40.00	102%	86-112	
		(SP 2317495-001)	MSD	mg/L	40.00	102%	86-112	
			MSRPD	mg/L		0.1%	≤7	
Nitrate Nitrogen	300.0	10/17/2023:211776LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	101%	90-110	
			MS	mg/L	40.00	97.8%	86-112	
		(SP 2317504-001)	MSD	mg/L	40.00	98.0%	86-112	
			MSRPD	mg/L		0.1%	≤7	
			MS	mg/L	40.00	102%	86-112	
		(SP 2317495-001)	MSD	mg/L	40.00	102%	86-112	
			MSRPD	mg/L		0.1%	≤7	
Sulfate Sulfur	300.0	10/17/2023:211776LDM	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	102%	90-110	
			MS	mg/L	100.0	91.7%	18-165	
		(SP 2317504-001)	MSD	mg/L	100.0	91.7%	18-165	
			MSRPD	mg/L		0.0%	≤7	
			MS	mg/L	100.0	73.7%	18-165	
		(SP 2317495-001)	MSD	mg/L	100.0	76.6%	18-165	
			MSRPD	mg/L		1.5%	≤7	
Nitrogen, Total Kjeldahl	351.2	10/27/2023:212161STA	Blank	mg/L		ND	<0.5	
			LCS	mg/L	12.00	92.2%	73-124	
			MS	mg/L	12.00	78.8%	<¼	406
		(STK2354204-006)	MSD	mg/L	12.00	82.0%	<1/4	
			MSRPD	mg/L		4.1%	≤20	
			MS	mg/L	12.00	87.2%	90-110	435
		(STK2354204-008)	MSD	mg/L	12.00	88.1%	90-110	435
			MSRPD	mg/L		1.0%	≤20	

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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 analyted. 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.

Page 5 of 5

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Laboratory Analysis Work Order

Nº 41546

ID: # 0100 2346977

LABORATORY: FGL

SITE NAME: HAMSTRA DAIRY

Billing: IAS

Authorized Copy Release to:

Innnovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO_3N (Dom)
W2 EC, NO_3N, TDS, TN (Irr)
W3 NH_4-N (Ammonium)
W4 EC, NO_3N, Ca, Mg, Na, K, HCO_3, CO_3, SO_4S, Cl, TDS (Dom, GM)
W5 EC, NO_3N, TDS, TN, Ca, Mg, Na, HCO_3, CO_3, SO_4S, Cl (Irr, GM)
W6 NO_3N, NO_2 (Dom ILRP, Annually)
W7 Ca, Mg, Na, K, HCO_3, CO_3, SO_4, Cl + Lab Filtering (GWM)
W8 Other: _____

801 1.3C IDH THM7

Process Waste Water (lagoon)

L1 EC, NH_4N, TKN, TP, TK, TDS (Quarterly)
L2 EC, NO_3N, NH_4N, TKN, TP, TK, TDS, pH (Annually)
L3 L1 + Ca, Mg, Na, HCO_3,CO_3, SO_4S, Cl (Biennially)
L4 Other: _____

Manure

M1 TN, TP, TK, %M (2/year)
M2 TN, TP, K, %M, Ca, Mg, Na, S, Cl, ash (Biennially)
M3 Other: _____

Plant Tissue

P1 TN, NO_3N, PO_4P, 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: _____

Soil

S1 SP%, pH, EC, Ca, Mg, Na, K, ESP, LP, B, NO_3N, PO_4P, K-AA, Zn, Mn, Fe, Cu, SO_4S
S2 S1 + CEC, CaCO3, OM, C:N, TN
S3 NO_3N, NH_4N
S4 Other: _____

	Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS NH_3N *	pH	Temp
1	F30	IRR	W5	10-16 / 7:40	Zeke			
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 sampes, please note below.

NOTES:

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1st		IAS		10-16-23 / 3:00
2nd		FGL	10-16-23 15:56	
3rd		FGL		10-16-23 16:10
4th			10/16/23 1610	

LABORATORY USE ONLY

Logged In By: _____ Total Samples: 10/16/23 1710 Laboratory #: _____

GLS 10/17/23 1150

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

November 6, 2023

Lab No. : **VI 2347129**
Customer No. : **4018573**
Reference : **41641**

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

Laboratory Report

Introduction: This report package contains a total of 7 pages divided into 3 sections:

Case Narrative	(1 page)	: An overview of the work performed at FGL.
Sample Results	(3 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
F30E	10/20/2023	10/20/2023	VI 2347129-001	AGW
F10	10/20/2023	10/20/2023	VI 2347129-002	AGW
F4W	10/20/2023	10/20/2023	VI 2347129-003	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)
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: JRD

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2023-11-07

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ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

November 6, 2023

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

Description : F30E
Project : 0100 Hamstra Dairy

Lab No. : VI 2347129-001
Customer No. : 4018573
Reference : 41641
Sampled On : October 20, 2023 at 08:20
Sampled By : Zeke
Received On : October 20, 2023 at 15:52
Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Alkalinity (as CaCO3)	60	10	mg/L		1		11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:29	amm
Bicarbonate	70	10	mg/L		1	I	11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:29	amm
Carbonate	ND	10	mg/L		1	UI	11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:29	amm
Hydroxide	ND	10	mg/L		1	UI	11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:29	amm
Chloride	38	1	mg/L		1		10/31/2023	17:00	ldm	EPA 300.0	10/31/2023	21:50	ldm
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	UI	11/01/2023	13:01	sta	EPA 351.2	11/03/2023	18:06	lcr
Nitrate Nitrogen	29.7	0.4	mg/L		1		10/24/2023	13:00	lfs	SM 4500-NO3 F	10/24/2023	15:40	lfs
Nitrogen, Total as Nitrogen	29.7	0.5	mg/L		1	I	11/01/2023	13:01	sta	Calc.	11/03/2023	18:06	lcr
Nitrate + Nitrite as N	29.7	0.4	mg/L		1		10/24/2023	13:00	lfs	SM 4500-NO3 F	10/24/2023	15:40	lfs
Kjeldahl Nitrogen	ND	0.5	mg/L		1	UI	11/01/2023	13:01	sta	EPA 351.2	11/03/2023	18:06	lcr
Conductivity	639	1	umhos/cm		1		11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:29	amm
Sulfate Sulfur	24.9	0.17	mg/L		1		10/31/2023	17:00	ldm	EPA 300.0	10/31/2023	21:50	ldm
Solids, Total Dissolved (TDS)	510	20	mg/L		1		10/24/2023	13:00	ctl	SM 2540 C	10/25/2023	11:00	ctl
Calcium	76	1	mg/L		1		10/24/2023	06:50	ejc	EPA 200.7	10/24/2023	15:30	ac
Magnesium	ND	1	mg/L		1	U	10/24/2023	06:50	ejc	EPA 200.7	10/24/2023	15:30	ac
Sodium	57	1	mg/L		1		10/24/2023	06:50	ejc	EPA 200.7	10/24/2023	15:30	ac

DQF Flags Definition:
I The RPD for the laboratory duplicate exceeded laboratory criteria.
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.

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

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

November 6, 2023

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

Description : F10
Project : 0100 Hamstra Dairy

Lab No. : VI 2347129-002
Customer No. : 4018573
Reference : 41641
Sampled On : October 20, 2023 at 07:50
Sampled By : Zeke
Received On : October 20, 2023 at 15:52
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 CaCO3)	40	10	mg/L		1		11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:20	amm
Bicarbonate	40	10	mg/L		1	I	11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:20	amm
Carbonate	ND	10	mg/L		1	UI	11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:20	amm
Hydroxide	ND	10	mg/L		1	UI	11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:20	amm
Chloride	9	1	mg/L		1		11/01/2023	13:03	ldm	EPA 300.0	11/01/2023	16:36	ldm
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	Ul	11/01/2023	13:01	sta	EPA 351.2	11/03/2023	18:09	lcr
Nitrate Nitrogen	2.8	0.4	mg/L		1		10/24/2023	13:00	lfs	SM 4500-NO3 F	10/24/2023	15:42	lfs
Nitrogen, Total as Nitrogen	3.0	0.5	mg/L		1	l	11/01/2023	13:01	sta	Calc.	11/03/2023	18:09	lcr
Nitrate + Nitrite as N	3.0	0.4	mg/L		1		10/24/2023	13:00	lfs	SM 4500-NO3 F	10/24/2023	15:42	lfs
Kjeldahl Nitrogen	ND	0.5	mg/L		1	Ul	11/01/2023	13:01	sta	EPA 351.2	11/03/2023	18:09	lcr
Conductivity	178	1	umhos/cm		1		11/01/2023	18:07	amm	SM 4500-H+B	11/01/2023	19:20	amm
Sulfate Sulfur	6.2	0.17	mg/L		1		11/01/2023	13:03	ldm	EPA 300.0	11/01/2023	16:36	ldm
Solids, Total Dissolved (TDS)	120	20	mg/L		1		10/24/2023	13:00	ctl	SM 2540 C	10/25/2023	11:00	ctl
Calcium	5	1	mg/L		1		10/24/2023	06:50	ejc	EPA 200.7	10/24/2023	16:03	ac
Magnesium	ND	1	mg/L		1	U	10/24/2023	06:50	ejc	EPA 200.7	10/24/2023	16:03	ac
Sodium	34	1	mg/L		1		10/24/2023	06:50	ejc	EPA 200.7	10/24/2023	16:03	ac

DQF Flags Definition:
I The RPD for the laboratory duplicate exceeded laboratory criteria.
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.

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

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ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

November 6, 2023

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

Description : F4W
Project : 0100 Hamstra Dairy

Lab No. : VI 2347129-003
Customer No. : 4018573
Reference : 41641
Sampled On : October 20, 2023 at 08:10
Sampled By : Zeke
Received On : October 20, 2023 at 15:52
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	ND	0.5	mg/L		1	Ul	11/01/2023	13:01	sta	EPA 351.2	11/03/2023	18:11	lcr
Nitrate Nitrogen	2.0	0.4	mg/L		1		10/24/2023	13:00	lfs	SM 4500-NO3 F	10/24/2023	15:45	lfs
Nitrogen, Total as Nitrogen	2.0	0.5	mg/L		1	l	11/01/2023	13:01	sta	Calc.	11/03/2023	18:11	lcr
Nitrate + Nitrite as N	2.0	0.4	mg/L		1		10/24/2023	13:00	lfs	SM 4500-NO3 F	10/24/2023	15:45	lfs
Kjeldahl Nitrogen	ND	0.5	mg/L		1	Ul	11/01/2023	13:01	sta	EPA 351.2	11/03/2023	18:11	lcr
Conductivity	142	1	umhos/cm		1		11/03/2023	07:56	krh	SM 4500-H+B	11/03/2023	10:20	krh
Solids, Total Dissolved (TDS)	110	20	mg/L		1		10/24/2023	13:00	ctl	SM 2540 C	10/25/2023	11:00	ctl

DQF Flags Definition:
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.

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

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November 6, 2023
Innovative Ag Services, LLC

Lab No. : VI 2347129
Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	10/24/2023:211991EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	98.0%	85-115	
			MS	mg/L	12.00	3180%	<¼	406
		(SP 2317842-001)	MSD	mg/L	12.00	1650%	<1/4	
			MSRPD	mg/L		8.0%	≤20.0	
			MS	mg/L	12.00	73.6%	<¼	406
		(SP 2317843-001)	MSD	mg/L	12.00	155%	<1/4	
			MSRPD	mg/L		8.0%	≤20.0	
Magnesium	200.7	10/24/2023:211991EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	91.9%	85-115	
			MS	mg/L	12.00	2510%	<¼	406
		(SP 2317842-001)	MSD	mg/L	12.00	89.7%	75-125	
			MSRPD	mg/L		75.0%	≤20	435
			MS	mg/L	12.00	83.0%	75-125	
		(SP 2317843-001)	MSD	mg/L	12.00	114%	75-125	
			MSRPD	mg/L		7.8%	≤20	
Sodium	200.7	10/24/2023:211991EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	93.6%	85-115	
			MS	mg/L	12.00	6330%	<¼	406
		(SP 2317842-001)	MSD	mg/L	12.00	3280%	<1/4	
			MSRPD	mg/L		7.8%	≤20.0	
			MS	mg/L	12.00	55.3%	<¼	406
		(SP 2317843-001)	MSD	mg/L	12.00	158%	<1/4	
			MSRPD	mg/L		10.3%	≤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 analyted. 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.

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November 6, 2023
Innovative Ag Services, LLC

Lab No. : VI 2347129
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO3)	2320B	11/01/2023:212416AMM	ND	mg/L		6.95%	10	435
Bicarbonate	2320B	(VI 2347129-002)	Dup	mg/L		13.6%	10	440
Carbonate	2320B	(VI 2347129-002)	Dup	mg/L		10.9%	10	440
E. C.	2320B	(VI 2347129-002)	Dup	umhos/cm		0%	5	
	2320B	(VI 2347281-001)	Dup	umhos/cm		0.1%	5	
Solids, Total Dissolved	2540CE	10/24/2023:212021CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	991.5	105%	90-110	
		(STK2354565-001)	Dup	mg/L		0.6%	5	
		(STK2354565-001)	Dup	mg/L		0.6%	5	
Chloride	300.0	10/31/2023:212367LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	95.9%	90-110	
			MS	mg/L	50.00	93.3%	67-117	
		(VI 2347247-001)	MSD	mg/L	50.00	94.1%	67-117	
			MSRPD	mg/L		0.6%	≤7	
			MS	mg/L	50.00	98.6%	67-117	
		(STK2353550-002)	MSD	mg/L	50.00	98.6%	67-117	
			MSRPD	mg/L		0.1%	≤7	
	300.0	11/01/2023:212421LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	97.6%	90-110	
			MS	mg/L	50.00	97.4%	67-117	
		(STK2354790-002)	MSD	mg/L	50.00	97.4%	67-117	
			MSRPD	mg/L		0.1%	≤7	
			MS	mg/L	50.00	100%	67-117	
		(VI 2347129-002)	MSD	mg/L	50.00	100%	67-117	
			MSRPD	mg/L		0.0%	≤7	
Sulfate Sulfur	300.0	10/31/2023:212367LDM	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	96.3%	90-110	
			MS	mg/L	100.0	98.0%	18-165	
		(VI 2347247-001)	MSD	mg/L	100.0	98.7%	18-165	
			MSRPD	mg/L		0.6%	≤7	
			MS	mg/L	100.0	97.3%	18-165	
		(STK2353550-002)	MSD	mg/L	100.0	97.4%	18-165	
			MSRPD	mg/L		0.1%	≤7	
	300.0	11/01/2023:212421LDM	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	98.5%	90-110	
			MS	mg/L	100.0	100%	18-165	
		(STK2354790-002)	MSD	mg/L	100.0	100%	18-165	
			MSRPD	mg/L		0.1%	≤7	
			MS	mg/L	100.0	100%	18-165	
		(VI 2347129-002)	MSD	mg/L	100.0	101%	18-165	
			MSRPD	mg/L		0.3%	≤7	
Nitrogen, Total Kjeldahl	351.2	11/01/2023:212413STA	Blank	mg/L		ND	<0.5	
			LCS	mg/L	12.00	92.7%	73-124	
			MS	mg/L	12.00	89.4%	90-110	435
		(VI 2347084-006)	MSD	mg/L	12.00	90.9%	90-110	
			MSRPD	mg/L		1.6%	≤20	
			MS	mg/L	12.00	81.1%	90-110	435
		(VI 2347084-007)	MSD	mg/L	12.00	79.4%	90-110	435
			MSRPD	mg/L		2.0%	≤20	
Nitrate + Nitrite as N	4500NO3F	10/24/2023:212033LFS	Blank	mg/L		ND	<0.4	

Page 6 of 7

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November 6, 2023
Innovative Ag Services, LLC

Lab No. : VI 2347129
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
			LCS	mg/L	11.22	98.9%	80-120	
			MS	mg/L	5.609	96.1%	66-125	
		(VI 2347156-001)	MSD	mg/L	5.609	91.3%	66-125	
			MSRPD	mg/L		1.9%	≤30.4	
Nitrate Nitrogen	4500NO3F	10/24/2023:212033LFS	Blank	mg/L		ND	<0.4	
			LCS	mg/L	11.22	98.9%	80-120	
			MS	mg/L	5.609	96.1%	66-125	
		(VI 2347156-001)	MSD	mg/L	5.609	91.3%	66-125	
			MSRPD	mg/L		1.9%	≤30.4	

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 analyted. 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.

Page 7 of 7

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Laboratory Analysis Work Order

Nº 41641

ID: # 0100 2347129

LABORATORY: FGL

SITE NAME: HAMSTRA DAIRY

Billing: IAS

Authorized Copy Release to:

Innnovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO_3N (Dom)
W2 EC, NO_3N, TDS, TN (Irr)
W3 NH_4-N (Ammonium)
W4 EC, NO_3N, Ca, Mg, Na, K, HCO_3, CO_3, SO_4S, Cl, TDS (Dom, GM)
W5 EC, NO_3N, TDS, TN, Ca, Mg, Na, HCO_3, CO_3, SO_4S, Cl (Irr, GM)
W6 NO_3N, NO_2 (Dom ILRP, Annually)
W7 Ca, Mg, Na, K, HCO_3, CO_3, SO_4, Cl + Lab Filtering (GWM)
W8 Other: _____

Process Waste Water (lagoon)

L1 EC, NH_4N, TKN, TP, TK, TDS (Quarterly)
L2 EC, NO_3N, NH_4N, TKN, TP, TK, TDS, pH (Annually)
L3 L1 + Ca, Mg, Na, HCO_3,CO_3, SO_4S, Cl (Biennially)
L4 Other: _____

Manure

M1 TN, TP, TK, %M (2/year)
M2 TN, TP, K, %M, Ca, Mg, Na, S, Cl, ash (Biennially)
M3 Other: _____

Plant Tissue

P1 TN, NO_3N, PO_4P, 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: _____

Soil

S1 SP%, pH, EC, Ca, Mg, Na, K, ESP, LP, B, NO_3N, PO_4P, K-AA, Zn, Mn, Fe, Cu, SO_4S
S2 S1 + CEC, CaCO3, OM, C:N, TN
S3 NO_3N, NH_4N
S4 Other: _____

	Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS NH_3N *	pH	Temp
1	F30E	IRR	W5	10-20/ 8:20	Zeke			
2	F10	↓	W5	10-20/ 7:50	↓			
3	F4W	↓	W2	10-20/ 8:10	↓			
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 sampes, please note below.

NOTES:

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1st		IAS		10-20-23 / 1:35
2nd	EMA	FGL	10/20/23 18:36	
3rd	EMA	FGL		10/20/23 15:52
4th			10/20/23 1552	

LABORATORY USE ONLY

Logged In By: GLS Total Samples: Laboratory #:

GLS 10/21/23 1252 JAW

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

November 15, 2023

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

Lab No. : **VI 2347305**
Customer No. : **4018573**
Reference : **41710**

Laboratory Report

Introduction: This report package contains a total of 3 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	(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
W41	10/27/2023	10/27/2023	VI 2347305-001	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 351.2	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 2510 B	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-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: JRD

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2023-11-15

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

November 15, 2023

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

Description : W41
Project : 0100 Hamstra Dairy

Lab No. : VI 2347305-001
Customer No. : 4018573
Reference : 41710
Sampled On : October 27, 2023 at 10:15
Sampled By : Zeke
Received On : October 27, 2023 at 16:00
Matrix : Ag Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Nitrogen, Total Kjeldahl	ND	0.5	mg/L		1	Ul	11/08/2023	07:53	sta	EPA 351.2	11/12/2023	18:59	lcr
Nitrate Nitrogen	9.0	0.4	mg/L		1		10/31/2023	10:00	lfs	SM 4500-NO3 F	10/31/2023	12:34	lfs
Nitrogen, Total as Nitrogen	9.1	0.5	mg/L		1	l	11/08/2023	07:53	sta	Calc.	11/12/2023	18:59	lcr
Nitrate + Nitrite as N	9.1	0.4	mg/L		1		10/31/2023	10:00	lfs	SM 4500-NO3 F	10/31/2023	12:34	lfs
Kjeldahl Nitrogen	ND	0.5	mg/L		1	Ul	11/08/2023	07:53	sta	EPA 351.2	11/12/2023	18:59	lcr
Conductivity	260	1	umhos/cm		1		11/06/2023	09:14	krh	SM 2510 B	11/06/2023	10:01	krh
Solids, Total Dissolved (TDS)	140	20	mg/L		1		10/31/2023	13:55	ctl	SM 2540 C	11/01/2023	11:00	ctl

DQF Flags Definition:
U Constituent results were non-detect.
l The MS/MSD did not meet QC criteria.

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

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November 15, 2023
Innovative Ag Services, LLC

Lab No. : VI 2347305
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
E. C.	2510B	11/06/2023:212564KRH	Blank	umhos/cm		ND	<1	
		(STK2354846-005)	Dup	umhos/cm		0.2%	5	
Solids, Total Dissolved	2540CE	10/31/2023:212336CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	991.5	98.6%	90-110	
		(SP 2318194-001)	Dup	mg/L		1.30%	5	
		(SP 2318194-001)	Dup	mg/L		1.89%	5	
Nitrogen, Total Kjeldahl	351.2	11/08/2023:212672STA	Blank	mg/L		ND	<0.5	
			LCS	mg/L	12.00	90.4%	73-124	
			MS	mg/L	12.00	86.6%	90-110	435
		(CH 2379367-003)	MSD	mg/L	12.00	87.0%	90-110	435
			MSRPD	mg/L		0.4%	≤20	
			MS	mg/L	12.00	85.9%	90-110	435
		(CH 2379367-005)	MSD	mg/L	12.00	86.9%	90-110	435
			MSRPD	mg/L		1.1%	≤20	
Nitrate + Nitrite as N	4500NO3F	10/31/2023:212354LFS	Blank	mg/L		ND	<0.4	
			LCS	mg/L	11.22	98.7%	80-120	
			MS	mg/L	5.609	88.1%	66-125	
		(SP 2318215-001)	MSD	mg/L	5.609	91.5%	66-125	
			MSRPD	mg/L		1.5%	≤30.4	
Nitrate Nitrogen	4500NO3F	10/31/2023:212354LFS	Blank	mg/L		ND	<0.4	
			LCS	mg/L	11.22	98.7%	80-120	
			MS	mg/L	5.609	88.1%	66-125	
		(SP 2318215-001)	MSD	mg/L	5.609	91.5%	66-125	
			MSRPD	mg/L		1.5%	≤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 analyted. 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.

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Laboratory Analysis Work Order

Nº 41710

2347305

ID: # 0100

LABORATORY: FGL

SITE NAME: HAMSTRA DAIRY

Authorized Copy Release to:

Billing: IAS

Innnovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO_3N (Dom)
W2 EC, NO_3N, TDS, TN (Irr)
W3 NH_4-N (Ammonium)
W4 EC, NO_3N, Ca, Mg, Na, K, HCO_3, CO_3, SO_4S, Cl, TDS (Dom, GM)
W5 EC, NO_3N, TDS, TN, Ca, Mg, Na, HCO_3, CO_3, SO_4S, Cl (Irr, GM)
W6 NO_3N, NO_2 (Dom ILRP, Annually)
W7 Ca, Mg, Na, K, HCO_3, CO_3, SO_4, Cl + Lab Filtering (GWM)
W8 Other: _____

Process Waste Water (lagoon)

L1 EC, NH_4N, TKN, TP, TK, TDS (Quarterly)
L2 EC, NO_3N, NH_4N, TKN, TP, TK, TDS, pH (Annually)
L3 L1 + Ca, Mg, Na, HCO_3,CO_3, SO_4S, Cl (Biennially)
L4 Other: _____

Manure

M1 TN, TP, TK, %M (2/year)
M2 TN, TP, K, %M, Ca, Mg, Na, S, Cl, ash (Biennially)
M3 Other: _____

Plant Tissue

P1 TN, NO_3N, PO_4P, 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: _____

Soil

S1 SP%, pH, EC, Ca, Mg, Na, K, ESP, LP, B, NO_3N, PO_4P, K-AA, Zn, Mn, Fe, Cu, SO_4S
S2 S1 + CEC, CaCO3, OM, C:N, TN
S3 NO_3N, NH_4N
S4 Other: _____

	Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS NH_3N*	pH	Temp
1	W41	IRR	W2	10-27/ 10:15	Zeke			
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 sampes, please note below.

NOTES: R01 8.5°C ID# TH2407

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1st	[illegible]	IAS		10-27-23 / 2:30
2nd	[illegible]	FGL	10-27-23 15:45	
3rd	[illegible]	FGL		10-27-23 16:00
4th	SRO	FGL	10.27.23 1600	
	SRO	~~FGL~~	~~10.17.23 1730~~	
	GLS	GLS	10.17.23 1730	

LABORATORY USE ONLY

Logged In By: GLS 10/28/23 1410 Total Samples: _____ Laboratory #: _____

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

December 22, 2023

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

Lab No. : **VI 2348523**
Customer No. : **4018573**
Reference : **42170**

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
OB South	12/13/2023	12/13/2023	VI 2348523-001	DW

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: 2023-12-26

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

December 22, 2023

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

Description : OB South
Project : 0100 Hamstra Dairy

Lab No. : VI 2348523-001
Customer No. : 4018573
Reference : 42170
Sampled On : December 13, 2023 at 07:15
Sampled By : Zeke
Received On : December 13, 2023 at 16:19
Matrix : Drinking Water

Sample Results - Inorganic

Constituent	Result	RL	Units	MCL/AL	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Alkalinity (as CaCO3)	60	10	mg/L		1		12/19/2023	17:12	amm	SM 4500-H+B	12/20/2023	05:53	amm
Bicarbonate	70	10	mg/L		1		12/19/2023	17:12	amm	SM 4500-H+B	12/20/2023	05:53	amm
Carbonate	ND	10	mg/L		1	U	12/19/2023	17:12	amm	SM 4500-H+B	12/20/2023	05:53	amm
Hydroxide	ND	10	mg/L		1	U	12/19/2023	17:12	amm	SM 4500-H+B	12/20/2023	05:53	amm
Chloride	11	1	mg/L	500[2]	1	h	12/14/2023	15:59	ldm	EPA 300.0	12/15/2023	04:06	ldm
Nitrate Nitrogen	6.7	0.1	mg/L	10	1		12/14/2023	15:59	ldm	EPA 300.0	12/15/2023	04:06	ldm
Conductivity	244	1	umhos/cm	1600[2]	1		12/19/2023	17:12	amm	SM 4500-H+B	12/20/2023	05:53	amm
Sulfate Sulfur	6.2	0.17	mg/L		1		12/14/2023	15:59	ldm	EPA 300.0	12/15/2023	04:06	ldm
Solids, Total Dissolved (TDS)	180	20	mg/L	1000[2]	1		12/15/2023	09:50	ctl	SM 2540 C	12/18/2023	11:00	ctl
Calcium	17	1	mg/L		1		12/18/2023	07:55	ejc	EPA 200.7	12/19/2023	11:35	ac
Magnesium	ND	1	mg/L		1	U	12/18/2023	07:55	ejc	EPA 200.7	12/19/2023	11:35	ac
Potassium	ND	1	mg/L		1	U	12/18/2023	07:55	ejc	EPA 200.7	12/19/2023	11:35	ac
Sodium	31	1	mg/L		1		12/18/2023	07:55	ejc	EPA 200.7	12/19/2023	11:35	ac

DQF Flags Definition:
U Constituent results were non-detect.
h The MS/MSD did not meet QC criteria.

ND=Non-Detected, RL=Reporting Level , Dil.=Dilution
MCL = Maximum Contamination Level. 2 - Secondary Standard. 3 - CDPH Notification Level. AL = Regulatory Action Level.

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

December 22, 2023
Innovative Ag Services, LLC

Lab No. : VI 2348523
Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	12/18/2023:214203EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	99.1%	85-115	
			MS	mg/L	12.00	95.7%	75-125	
		(VI 2348524-001)	MSD	mg/L	12.00	75.8%	75-125	
			MSRPD	mg/L		3.1%	≤20.0	
			MS	mg/L	12.00	123%	75-125	
		(SP 2320618-001)	MSD	mg/L	12.00	92.7%	75-125	
			MSRPD	mg/L		3.2%	≤20.0	
Magnesium	200.7	12/18/2023:214203EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	97.8%	85-115	
			MS	mg/L	12.00	103%	75-125	
		(VI 2348524-001)	MSD	mg/L	12.00	99.2%	75-125	
			MSRPD	mg/L		3.1%	≤20	
			MS	mg/L	12.00	112%	75-125	
		(SP 2320618-001)	MSD	mg/L	12.00	92.4%	75-125	
			MSRPD	mg/L		5.1%	≤20	
Potassium	200.7	12/18/2023:214203EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	98.4%	85-115	
			MS	mg/L	12.00	100%	75-125	
		(VI 2348524-001)	MSD	mg/L	12.00	97.3%	75-125	
			MSRPD	mg/L		3.0%	≤20.0	
			MS	mg/L	12.00	105%	75-125	
		(SP 2320618-001)	MSD	mg/L	12.00	100%	75-125	
			MSRPD	mg/L		3.0%	≤20.0	
Sodium	200.7	12/18/2023:214203EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	93.7%	85-115	
			MS	mg/L	12.00	101%	75-125	
		(VI 2348524-001)	MSD	mg/L	12.00	85.0%	75-125	
			MSRPD	mg/L		2.9%	≤20.0	
			MS	mg/L	12.00	158%	<¼	406
		(SP 2320618-001)	MSD	mg/L	12.00	56.2%	<1/4	
			MSRPD	mg/L		6.2%	≤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 analyted. 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.

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December 22, 2023
Innovative Ag Services, LLC

Lab No. : VI 2348523
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO3)	2320B	12/19/2023:214317AMM	ND	mg/L		0.9%	10	406
Bicarbonate	2320B	(STK2356929-003)	Dup	mg/L		0.9%	10	
E. C.	2320B	(STK2356929-003)	Dup	umhos/cm		0.7%	5	
Solids, Total Dissolved	2540CE	12/15/2023:214116CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	991.5	101%	90-110	
		(VI 2348528-001)	Dup	mg/L		1.39%	5	
		(VI 2348528-001)	Dup	mg/L		2.52%	5	
Chloride	300.0	12/14/2023:214301LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	101%	90-110	
			MS	mg/L	50.00	99.9%	67-117	
		(VI 2348523-001)	MSD	mg/L	50.00	100%	67-117	
			MSRPD	mg/L		0.3%	≤7	
			MS	mg/L	50.00	226%	67-117	435
		(STK2356930-004)	MSD	mg/L	50.00	227%	67-117	435
			MSRPD	mg/L		0.4%	≤7	
Nitrate Nitrogen	300.0	12/14/2023:214301LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	101%	90-110	
			MS	mg/L	40.00	91.2%	86-112	
		(VI 2348523-001)	MSD	mg/L	40.00	91.9%	86-112	
			MSRPD	mg/L		0.4%	≤7	
			MS	mg/L	40.00	104%	86-112	
		(STK2356930-004)	MSD	mg/L	40.00	104%	86-112	
			MSRPD	mg/L		0.1%	≤7	
Sulfate Sulfur	300.0	12/14/2023:214301LDM	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	102%	90-110	
			MS	mg/L	100.0	101%	18-165	
		(VI 2348523-001)	MSD	mg/L	100.0	102%	18-165	
			MSRPD	mg/L		0.4%	≤7	
			MS	mg/L	100.0	128%	18-165	
		(STK2356930-004)	MSD	mg/L	100.0	128%	18-165	
			MSRPD	mg/L		0.0%	≤7	

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 analyted. 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.

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Laboratory Analysis Work Order

Nº 42170

ID: # 0100

2318523

SITE NAME: Hamstra Dairy

Billing: IAS

LABORATORY: FGL

Authorized Copy Release to:

Innnovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

W1 EC, NO_3N (Dom)
W2 EC, NO_3N, TDS, TN (Irr)
W3 NH_4-N (Ammonium)
W4 EC, NO_3N, Ca, Mg, Na, K, HCO_3, CO_3, SO_4S, Cl, TDS (Dom, GM)
W5 EC, NO_3N, TDS, TN, Ca, Mg, Na, HCO_3, CO_3, SO_4S, Cl (Irr, GM)
W6 NO_3N, NO_2 (Dom ILRP, Annually)
W7 Ca, Mg, Na, K, HCO_3, CO_3, SO_4, Cl + Lab Filtering (GWM)
W8 Other: _____

Plant Tissue

P1 TN, NO_3N, PO_4P, 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: _____

Process Waste Water (lagoon)

L1 EC, NH_4N, TKN, TP, TK, TDS (Quarterly)
L2 EC, NO_3N, NH_4N, TKN, TP, TK, TDS, pH (Annually)
L3 L1 + Ca, Mg, Na, HCO_3,CO_3, SO_4S, Cl (Biennially)
L4 Other: _____

Manure

M1 TN, TP, TK, %M (2/year)
M2 TN, TP, K, %M, Ca, Mg, Na, S, Cl, ash (Biennially)
M3 Other: _____

Soil

S1 SP%, pH, EC, Ca, Mg, Na, K, ESP, LP, B, NO_3N, PO_4P, K-AA, Zn, Mn, Fe, Cu, SO_4S
S2 S1 + CEC, CaCO3, OM, C:N, TN
S3 NO_3N, NH_4N
S4 Other: _____

	Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS NH_3N *	pH	Temp
1	OB SOUTH	DOM	W4	12-13 / 7:15	Zeke			
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 sampes, please note below.

NOTES:

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1st	[illegible]	IAS		12-13-23 / 3:25
2nd	ADB	FGL	12/13/23 1556	
3rd	ADB	FGL		12/13/23 1619
4th	[illegible]	FGL	12/13/23 1619	

LABORATORY USE ONLY

Logged In By: MMC EAS 12/13/23 1730 Total Samples: _____ Laboratory #: [illegible] 12/14/23 1316

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ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

January 4, 2024

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

Lab No. : **VI 2348780**
Customer No. : **4018573**
Reference : **42234**

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
D Home	12/21/2023	12/21/2023	VI 2348780-001	DW

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: JRD

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2024-01-04

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ENVIRONMENTAL FGL AGRICULTURAL
Analytical Chemists

January 4, 2024

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

Description : D Home
Project : 0100 Hamstra Dairy

Lab No. : VI 2348780-001
Customer No. : 4018573
Reference : 42234
Sampled On : December 21, 2023 at 11:30
Sampled By : Frank
Received On : December 21, 2023 at 15:57
Matrix : Drinking Water

Sample Results - Inorganic

Constituent	Result	RL	Units	MCL/AL	Dil.	DQF	Sample Preparation			Sample Analysis			
Dairy Analysis							Date	Time	Who	Method	Date	Time	Who
Alkalinity (as CaCO3)	140	10	mg/L		1		12/27/2023	20:13	amm	SM 4500-H+B	12/27/2023	22:58	amm
Bicarbonate	170	10	mg/L		1		12/27/2023	20:13	amm	SM 4500-H+B	12/27/2023	22:58	amm
Carbonate	ND	10	mg/L		1	U	12/27/2023	20:13	amm	SM 4500-H+B	12/27/2023	22:58	amm
Hydroxide	ND	10	mg/L		1	U	12/27/2023	20:13	amm	SM 4500-H+B	12/27/2023	22:58	amm
Chloride	14	1	mg/L	500[2]	1		12/22/2023	12:54	ldm	EPA 300.0	12/22/2023	23:15	ldm
Nitrate Nitrogen	11	0.1	mg/L	10	1		12/22/2023	12:54	ldm	EPA 300.0	12/22/2023	23:15	ldm
Conductivity	437	1	umhos/cm	1600[2]	1		12/27/2023	20:13	amm	SM 4500-H+B	12/27/2023	22:58	amm
Sulfate Sulfur	8.6	0.17	mg/L		1		12/22/2023	12:54	ldm	EPA 300.0	12/22/2023	23:15	ldm
Solids, Total Dissolved (TDS)	300	20	mg/L	1000[2]	1		12/26/2023	11:55	ctl	SM 2540 C	12/27/2023	11:45	ctl
Calcium	58	1	mg/L		1		12/26/2023	06:55	ejc	EPA 200.7	12/27/2023	19:18	ac
Magnesium	2	1	mg/L		1		12/26/2023	06:55	ejc	EPA 200.7	12/27/2023	19:18	ac
Potassium	ND	1	mg/L		1	U	12/26/2023	06:55	ejc	EPA 200.7	12/27/2023	19:18	ac
Sodium	34	1	mg/L		1		12/26/2023	06:55	ejc	EPA 200.7	12/27/2023	19:18	ac

DQF Flags Definition:
U Constituent results were non-detect.

ND=Non-Detected, RL=Reporting Level , Dil.=Dilution
MCL = Maximum Contamination Level. 2 - Secondary Standard. 3 - CDPH Notification Level. AL = Regulatory Action Level.

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January 4, 2024
Innovative Ag Services, LLC

Lab No. : VI 2348780
Customer No. : 4018573

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Calcium	200.7	12/26/2023:214542EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	112%	85-115	
			MS	mg/L	12.00	229%	<¼	406
		(SP 2320991-001)	MSD	mg/L	12.00	21.7%	<1/4	
			MSRPD	mg/L		1.4%	≤20.0	
			MS	mg/L	12.00	85.9%	75-125	
		(SP 2320957-001)	MSD	mg/L	12.00	86.0%	75-125	
			MSRPD	mg/L		0.0%	≤20.0	
Magnesium	200.7	12/26/2023:214542EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	113%	85-115	
			MS	mg/L	12.00	164%	<¼	406
		(SP 2320991-001)	MSD	mg/L	12.00	101%	75-125	
			MSRPD	mg/L		1.6%	≤20	
			MS	mg/L	12.00	97.7%	75-125	
		(SP 2320957-001)	MSD	mg/L	12.00	98.7%	75-125	
			MSRPD	mg/L		0.3%	≤20	
Potassium	200.7	12/26/2023:214542EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	110%	85-115	
			MS	mg/L	12.00	112%	75-125	
		(SP 2320991-001)	MSD	mg/L	12.00	122%	75-125	
			MSRPD	mg/L		2.7%	≤20.0	
			MS	mg/L	12.00	104%	75-125	
		(SP 2320957-001)	MSD	mg/L	12.00	105%	75-125	
			MSRPD	mg/L		0.4%	≤20.0	
Sodium	200.7	12/26/2023:214542EJC	Blank	mg/L		ND	<1	
			LCS	mg/L	12.00	113%	85-115	
			MS	mg/L	12.00	429%	<¼	406
		(SP 2320991-001)	MSD	mg/L	12.00	-225%	<1/4	
			MSRPD	mg/L		1.2%	≤20.0	
			MS	mg/L	12.00	537%	<¼	406
		(SP 2320957-001)	MSD	mg/L	12.00	630%	<1/4	
			MSRPD	mg/L		3.1%	≤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 analyted. 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.

Page 3 of 4

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January 4, 2024
Innovative Ag Services, LLC

Lab No. : VI 2348780
Customer No. : 4018573

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Alkalinity (as CaCO3)	2320B	(SP 2320955-002)	Dup	mg/L		1.50%	10	
Bicarbonate	2320B	(SP 2320955-002)	Dup	mg/L		1.51%	10	
E. C.	2320B	(SP 2320955-002)	Dup	umhos/cm		0.1%	5	
Solids, Total Dissolved	2540CE	12/26/2023:214543CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	991.5	98.8%	90-110	
		(SP 2320948-001)	Dup	mg/L		0.7%	5	
		(SP 2320948-001)	Dup	mg/L		1.32%	5	
Chloride	300.0	12/22/2023:214468LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	99.1%	90-110	
			MS	mg/L	50.00	83.9%	67-117	
		(VI 2348673-001)	MSD	mg/L	50.00	83.8%	67-117	
			MSRPD	mg/L		0.1%	≤7	
			MS	mg/L	50.00	88.9%	67-117	
		(SP 2320480-001)	MSD	mg/L	50.00	89.0%	67-117	
			MSRPD	mg/L		0.1%	≤7	
Nitrate Nitrogen	300.0	12/22/2023:214468LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	99.5%	90-110	
			MS	mg/L	40.00	91.0%	86-112	
		(VI 2348673-001)	MSD	mg/L	40.00	91.0%	86-112	
			MSRPD	mg/L		0.0%	≤7	
			MS	mg/L	40.00	102%	86-112	
		(SP 2320480-001)	MSD	mg/L	40.00	102%	86-112	
			MSRPD	mg/L		0.0%	≤7	
Sulfate Sulfur	300.0	12/22/2023:214468LDM	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	100%	90-110	
			MS	mg/L	100.0	92.7%	18-165	
		(VI 2348673-001)	MSD	mg/L	100.0	92.8%	18-165	
			MSRPD	mg/L		0.1%	≤7	
			MS	mg/L	100.0	97.9%	18-165	
		(SP 2320480-001)	MSD	mg/L	100.0	98.0%	18-165	
			MSRPD	mg/L		0.1%	≤7	

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 analyted. 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.

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Laboratory Analysis Work Order

Nº 42234

ID: # 100 2348786 LABORATORY: FGL

SITE NAME: Hamstra Dairy

Billing: IAS

Authorized Copy Release to:

Innnovative Ag Services LLC

(559) 587-2800

ANALYSIS TO BE COMPLETED:

Irrigation/Ground Water (ELAP Standards)

- EC, NO_3N (Dom)
- **W2** EC, NO_3N, TDS, TN (Irr)
- **W3** NH_4-N (Ammonium)
- **W4** EC, NO_3N, Ca, Mg, Na, K, HCO_3, CO_3, SO_4S, Cl, TDS (Dom, GM)
- **W5** EC, NO_3N, TDS, TN, Ca, Mg, Na, HCO_3, CO_3, SO_4S, Cl (Irr, GM)
- **W6** NO_3N, NO_2 (Dom ILRP, Annually)
- **W7** Ca, Mg, Na, K, HCO_3, CO_3, SO_4, Cl + Lab Filtering (GWM)
- **W8** Other: _____

Process Waste Water (lagoon)

- **L1** EC, NH_4N, TKN, TP, TK, TDS (Quarterly)
- **L2** EC, NO_3N, NH_4N, TKN, TP, TK, TDS, pH (Annually)
- **L3** L1 + Ca, Mg, Na, HCO_3,CO_3, SO_4S, Cl (Biennially)
- **L4** Other: _____

Manure

- **M1** TN, TP, TK, %M (2/year)
- **M2** TN, TP, K, %M, Ca, Mg, Na, S, Cl, ash (Biennially)
- **M3** Other: _____

Plant Tissue

- **P1** TN, NO_3N, PO_4P, 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: _____

Soil

- **S1** SP%, pH, EC, Ca, Mg, Na, K, ESP, LP, B, NO_3N, PO_4P, K-AA, Zn, Mn, Fe, Cu, SO_4S
- **S2** S1 + CEC, CaCO3, OM, C:N, TN
- **S3** NO_3N, NH_4N
- **S4** Other: _____

	Sample ID	Description	Analysis	Date/Time	Sampled by	IAS USE ONLY: FIELD TESTS NH_3N *	pH	Temp
1	D Home	Dom	W4	12/21 11:30	Frank	—		
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 sampes, please note below.

NOTES:

CHAIN OF CUSTODY RECORDING

	Signature	Company	Received Date & Time	Relinquished Date & Time
1st	[signature]	IAS		12/21/23 3:00
2nd	AJB	FGL	12/21/23 1535	
3rd	AJB	FGL		12/21/23 1557
4th	[signature]		12/21/23 1557	

LABORATORY USE ONLY

Logged In By: [signature] Total Samples: 12/21/23 1730 Laboratory #: [signature] 12/21/23 1111