
APPENDIX J

Nutrient Management Report and Waste Management Report

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
11020 SUN CENTER DR #200
RANCHO CORDOVA CA 95670-6114

NUTRIENT MANAGEMENT PLAN
PROPOSED CONDITIONS

PREPARED FOR:

CORREIA FAMILY DAIRY
26380 W FAHEY RD
GUSTINE CA 95322

NOTES:

Developed to reflect proposed conditions

PREPARED BY:



MARIANN PEDROSO
PO BOX 906
NEWMAN CA 95360

Nutrient Management Plan Report
General Order No. R5-2007-0035, Attachment C
July 1, 2009 deadline

DAIRY FACILITY INFORMATION

A. NAME OF DAIRY OR BUSINESS OPERATING THE DAIRY: Correia Family Dairy

Physical address of dairy:

26380 W Fahey RD	Gustine	Merced	95322
Number and Street	City	County	Zip Code

Street and nearest cross street (if no address): _____

Date facility was originally placed in operation: 01/01/1984

Regional Water Quality Control Board Basin Plan designation: Sacramento River Basin

County Assessor Parcel Number(s) for dairy facility:

0070-0270-0008-0000 0070-0270-0014-0000

B. OPERATOR NAME: Correia, Ezequiel R Jr Telephone no.: (209) 826-1903 (209) 652-0029
Landline Cellular

26380 W Fahey RD	Gustine	CA	95322
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

OPERATOR NAME: Correia, Ezequiel F Telephone no.: (209) 826-1903 (209) 652-0028
Landline Cellular

26380 W Fahey RD	Gustine	CA	95322
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

OPERATOR NAME: Correia, Maria A Telephone no.: (209) 826-1903 (209) 652-0024
Landline Cellular

26380 W Fahey RD	Gustine	CA	95322
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

C. LEGAL OWNER NAME: Correia, Ezequiel F Telephone no.: (209) 826-1903 (209) 652-0028
Landline Cellular

26380 W Fahey RD	Gustine	CA	95322
Mailing Address Number and Street	City	State	Zip Code

Owner should receive Regional Board correspondence (check): ☒ Yes ☐ No

LEGAL OWNER NAME: Correia, Maria A Telephone no.: (209) 826-1903 (209) 652-0024
Landline Cellular

26380 W Fahey RD	Gustine	CA	95322
Mailing Address Number and Street	City	State	Zip Code

Owner should receive Regional Board correspondence (check): ☒ Yes ☐ No

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D. CONTACT NAME: <u>Pedroso, Mariann</u>	Telephone no.:	<u>(209) 862-4291</u>	<u>(209) 277-2817</u>
		Landline	Cellular
Title: <u>Technical Service Provider</u>			
<u>P.O. Box 906</u>	<u>Newman</u>	<u>CA</u>	<u>95360</u>
Mailing Address Number and Street	City	State	Zip Code

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AVAILABLE NUTRIENTS

A. HERD INFORMATION

The milk cow dairy is currently regulated under individual Waste Discharge Requirements.

Total number of milk and dry cows combined as a baseline value in response to the Report of Waste Discharge (ROWD) request of October, 2005:

3,390 milk and dry cows combined (regulatory review is required for any expansion)

	Milk Cows	Dry Cows	Bred Heifers (15-24 mo.)	Heifers (7-14 mo. to breeding)	Calves (4-6 mo.)	Calves (0-3 mo.)
Present count	3,000	390	830	1,160	415	280
Maximum count	3,000	390	830	1,160	415	280
Avg live weight (lbs)	1,200	1,300	1,000	500		
Daily hours on flush	20	20	16	16	24	24

Predominant milk cow breed: Jersey-Holstein Cross

Average milk production: 72 pounds per cow per day

B. IRRIGATION SOURCES

Irrigation Source Name	Type	Nitrogen (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Discharge Rate
CCID	Surface water (canal, river)	2.10	0.00	0.00	15 cfs
Irrigation Well Big	Groundwater (well)	3.50	0.00	0.00	1,500 gpm
Irrigation Well Little	Groundwater (well)	5.10	0.00	0.00	200 gpm

C. NUTRIENT IMPORTS

No nutrient imports entered.

D. NUTRIENT EXPORTS

Nutrient Type/Name	Quantity	Moisture	Nitrogen	Phosphorus (as P2O5)	Potassium (as K2O)
Separated solids (weeping wall)	9,900.00 ton	81.1%	2.990%	0.730%	0.690%
Separated solids (weeping wall)	5,000.00 ton	81.1%	2.990%	0.730%	0.690%
Corral solids	5,000.00 ton	7.9%	2.130%	0.790%	2.550%
Composted solids	9,000.00 ton	21.2%	1.630%	1.300%	1.000%
Composted solids	6,500.00 ton	21.2%	1.630%	1.300%	1.000%

Total nitrogen exported: 762,752.18 lbs

Total phosphorus exported: 188,538.43 lbs

Total potassium exported: 429,937.66 lbs

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E. STORAGE PERIOD

Storage period is the maximum period of time anticipated between land application of process wastewater (from storage ponds/lagoons) to croplands. A qualified agronomist and civil engineer should collaborate and collectively consider predominant soil types, soil infiltration rates, maximum depth, available water, field capacity, permanent wilting point, allowable depletion, crop water use, evapotranspiration, precipitation, irrigation system capacity, water delivery constraints, crop nutrient requirements, soil nutrient adsorption/desorption, rooting depth, nutrient accumulation/availability for current and future crop needs, facility wide process wastewater storage capacity and other factors as deemed necessary across all croplands where process wastewater is applied in selecting a storage period. In many cases conflicts will arise between crop water demands, crop nutrient demands and insufficient process wastewater storage capacity. Process wastewater may not be the best choice as a source of either water and/or nutrients to meet crop demands throughout the year. Groundwater and surface water vulnerability has been considered.

The storage period selected in this Nutrient Management Plan is consistent with the storage period selected in the Waste Management Plan.

Storage period: 120 days

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APPLICATION AREA

A. ASSESSOR PARCEL NUMBER: 0070-0112-0001-0000

Legal owner of parcel: Owned by Dairy

ASSESSOR PARCEL NUMBER: 0070-0270-0006-0000

Legal owner of parcel: Pereira, Jose Telephone no.: (209) 993-4721
Landline Cellular
36311 Sandalwood ST Newark CA 94560
Mailing Address Number and Street City State Zip Code

ASSESSOR PARCEL NUMBER: 0070-0270-0008-0000

Legal owner of parcel: Owned by Dairy

ASSESSOR PARCEL NUMBER: 0070-0270-0014-0000

Legal owner of parcel: Owned by Dairy

ASSESSOR PARCEL NUMBER: 0070-0270-0015-0000

Legal owner of parcel: Frontella, Mr Telephone no.: (209) 111-1111
Landline Cellular
1 Fahey Rd Gustine CA 95322
Mailing Address Number and Street City State Zip Code

ASSESSOR PARCEL NUMBER: 0070-0270-0110-0000

Legal owner of parcel: Owned by Dairy

ASSESSOR PARCEL NUMBER: 0070-0270-0180-0000

Legal owner of parcel: Owned by Dairy

ASSESSOR PARCEL NUMBER: 0070-0270-0190-0000

Legal owner of parcel: Owned by Dairy

ASSESSOR PARCEL NUMBER: 0070-0270-0200-0000

Legal owner of parcel: Owned by Dairy

ASSESSOR PARCEL NUMBER: 0074-0009-0014-0000

Legal owner of parcel: Vieira, Eugene Telephone no.: (209) 111-1111
Landline Cellular
909 Madison AVE Los Banos CA 93635
Mailing Address Number and Street City State Zip Code

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B. FIELD NAME: 1-2

Cropable acres: 8

Predominant soil type: Loam

Do irrigation system head-to-head flow conditions exist on the field? ☐ Yes ☒ No

Can fresh water for irrigation purposes be delivered to the field year round? ☒ Yes ☐ No

Can process wastewater be delivered to the field at agronomic rates and times? ☒ Yes ☐ No

Tailwater management method: Bermed

Crops grown and rotation:

Crop Type	Plant Date	Harvest Date	Acres Planted
Ryegrass Silage	Middle October	Late May	8
Corn, silage	Middle June	Early October	8

FIELD NAME: 1-3

Cropable acres: 80

Predominant soil type: Clay loam

Do irrigation system head-to-head flow conditions exist on the field? ☐ Yes ☒ No

Can fresh water for irrigation purposes be delivered to the field year round? ☒ Yes ☐ No

Can process wastewater be delivered to the field at agronomic rates and times? ☒ Yes ☐ No

Tailwater management method: Returned to top of field

Crops grown and rotation:

Crop Type	Plant Date	Harvest Date	Acres Planted
Ryegrass Silage	Middle October	Late May	80
Corn, silage	Middle June	Early October	80

FIELD NAME: Frontella

Cropable acres: 40

Predominant soil type: Clay loam

Do irrigation system head-to-head flow conditions exist on the field? ☐ Yes ☒ No

Can fresh water for irrigation purposes be delivered to the field year round? ☒ Yes ☐ No

Can process wastewater be delivered to the field at agronomic rates and times? ☒ Yes ☐ No

Tailwater management method: Bermed

Crops grown and rotation:

Crop Type	Plant Date	Harvest Date	Acres Planted
Wheat, silage, soft dough	Middle October	Late April	40
Corn, silage	Late May	Late September	40

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FIELD NAME: Pavao

Cropable acres: 85

Predominant soil type: Clay loam

Do irrigation system head-to-head flow conditions exist on the field? ☐ Yes ☒ No

Can fresh water for irrigation purposes be delivered to the field year round? ☐ Yes ☒ No

Can process wastewater be delivered to the field at agronomic rates and times? ☒ Yes ☐ No

Tailwater management method: Bermed

Crops grown and rotation:

Crop Type	Plant Date	Harvest Date	Acres Planted
Wheat, silage, soft dough	Middle October	Late April	85
Corn, silage	Late May	Late September	85

FIELD NAME: Pavao Pasture

Cropable acres: 38

Predominant soil type: Clay loam

Do irrigation system head-to-head flow conditions exist on the field? ☐ Yes ☒ No

Can fresh water for irrigation purposes be delivered to the field year round? ☒ Yes ☐ No

Can process wastewater be delivered to the field at agronomic rates and times? ☐ Yes ☒ No

Tailwater management method: Bermed

Crops grown and rotation:

Crop Type	Plant Date	Harvest Date	Acres Planted
Irrigated Pasture	Late October	Late October	38

FIELD NAME: Pereira

Cropable acres: 75

Predominant soil type: Clay loam

Do irrigation system head-to-head flow conditions exist on the field? ☐ Yes ☒ No

Can fresh water for irrigation purposes be delivered to the field year round? ☒ Yes ☐ No

Can process wastewater be delivered to the field at agronomic rates and times? ☒ Yes ☐ No

Tailwater management method: Bermed

Crops grown and rotation:

Crop Type	Plant Date	Harvest Date	Acres Planted
Irrigated Pasture	Late October	Late October	75

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FIELD NAME: Vieira

Cropable acres: 63

Predominant soil type: Clay loam

Do irrigation system head-to-head flow conditions exist on the field? ☐ Yes ☒ No

Can fresh water for irrigation purposes be delivered to the field year round? ☐ Yes ☒ No

Can process wastewater be delivered to the field at agronomic rates and times? ☐ Yes ☒ No

Tailwater management method: Bermed

Crops grown and rotation:

Crop Type	Plant Date	Harvest Date	Acres Planted
Wheat, silage, soft dough	Middle October	Late April	63
Corn, silage	Late May	Late September	63

C. LAND APPLICATION AREA FIELDS AND PARCELS

Field name	Cropable acres	Total harvests	Parcel number
1-2	8	4	0070-0270-00080000
1-3	80	4	0070-0270-00140000
Frontella	40	2	0070-0270-00150000
Pavao	85	2	0070-0270-01100000 0070-0270-01800000 0070-0270-01900000 0070-0270-02000000
Pavao Pasture	38	1	0070-0112-00010000
Pereira	75	1	0070-0270-00060000
Vieira	63	2	0074-0009-00140000
Land application area totals	644	22	

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NUTRIENT BUDGET

A. NUTRIENT BUDGET FOR CROP: 1-2 / Other

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
Pre-irrigation prior to planting (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	1	95.0 50%	14.0 80%	130.0 80%	100.8															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>CCID</td><td>5.8</td><td>0.0</td><td>0.0</td><td>6.5</td></tr><tr><td></td><td>5.8</td><td>0.0</td><td>0.0</td><td></td></tr></table>					Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	CCID	5.8	0.0	0.0	6.5		5.8	0.0	0.0		
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
CCID	5.8	0.0	0.0	6.5																
	5.8	0.0	0.0																	
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	2	74.0 50%	13.0 80%	110.0 80%	155.7															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>Irrigation Well Little</td><td>3.8</td><td>0.0</td><td>0.0</td><td>60.0</td></tr><tr><td></td><td>3.8</td><td>0.0</td><td>0.0</td><td></td></tr></table>					Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	Irrigation Well Little	3.8	0.0	0.0	60.0		3.8	0.0	0.0		
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
Irrigation Well Little	3.8	0.0	0.0	60.0																
	3.8	0.0	0.0																	

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	13.4	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	243.0	40.0	350.0
Other	0.0	0.0	0.0
Atmospheric deposition	10.5		
Nutrients applied	266.9	40.0	350.0
Potential crop nutrient removal	192.0	28.8	252.0
Nutrient balance	74.9	11.2	98.0
Applied to removal ratio	1.39	1.39	1.39

Fresh water applied: 1.56 feet Total harvests: 3

NUTRIENT BUDGET FOR CROP: 1-2 / Corn, silage

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
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NUTRIENT BUDGET FOR CROP (CONTINUED): 1-2 / Corn, silage

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
In season irrigation (no fertilizer) <i>Nutrient source:</i> Water only <i>Application method:</i> Surface	5	0.0 0%	0.0 0%	0.0 0%	17.7															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>CCID</td><td>3.5</td><td>0.0</td><td>0.0</td><td>4.0</td></tr><tr><td></td><td>3.5</td><td>0.0</td><td>0.0</td><td></td></tr></table>					Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	CCID	3.5	0.0	0.0	4.0		3.5	0.0	0.0		
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
CCID	3.5	0.0	0.0	4.0																
	3.5	0.0	0.0																	
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	4	76.0 50%	15.0 80%	69.0 80%	313.2															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>Irrigation Well Big</td><td>2.3</td><td>0.0</td><td>0.0</td><td>7.0</td></tr><tr><td></td><td>2.3</td><td>0.0</td><td>0.0</td><td></td></tr></table>					Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	Irrigation Well Big	2.3	0.0	0.0	7.0		2.3	0.0	0.0		
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
Irrigation Well Big	2.3	0.0	0.0	7.0																
	2.3	0.0	0.0																	

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	26.9	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	304.0	60.0	276.0
Other	0.0	0.0	0.0
Atmospheric deposition	3.5		
Nutrients applied	334.4	60.0	276.0
Potential crop nutrient removal	240.0	45.0	198.0
Nutrient balance	94.4	15.0	78.0
Applied to removal ratio	1.39	1.33	1.39

Fresh water applied: 4.07 feet Total harvests: 1

NUTRIENT BUDGET FOR CROP: 1-3 / Other

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
Pre-irrigation prior to planting (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	1	95.0 50%	14.0 80%	130.0 80%	101.4															
<table><tr><th>Irrigation Source</th><th>N (lbs/acre)</th><th>P (lbs/acre)</th><th>K (lbs/acre)</th><th>Runtime (hrs)</th></tr><tr><td>CCID</td><td>6.4</td><td>0.0</td><td>0.0</td><td>72.0</td></tr><tr><td></td><td>6.4</td><td>0.0</td><td>0.0</td><td></td></tr></table>						Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	CCID	6.4	0.0	0.0	72.0		6.4	0.0	0.0	
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
CCID	6.4	0.0	0.0	72.0																
	6.4	0.0	0.0																	

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NUTRIENT BUDGET FOR CROP (CONTINUED): 1-3 / Other

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	2	76.0 50%	13.0 80%	110.0 80%	154.4															
<table><tr><th>Irrigation Source</th><th>N (lbs/acre)</th><th>P (lbs/acre)</th><th>K (lbs/acre)</th><th>Runtime (hrs)</th></tr><tr><td>Irrigation Well Big</td><td>1.2</td><td>0.0</td><td>0.0</td><td>36.0</td></tr><tr><td></td><td>1.2</td><td>0.0</td><td>0.0</td><td></td></tr></table>						Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	Irrigation Well Big	1.2	0.0	0.0	36.0		1.2	0.0	0.0	
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
Irrigation Well Big	1.2	0.0	0.0	36.0																
	1.2	0.0	0.0																	

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	8.7	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	247.0	40.0	350.0
Other	0.0	0.0	0.0
Atmospheric deposition	10.5		
Nutrients applied	266.2	40.0	350.0
Potential crop nutrient removal	192.0	28.8	252.0
Nutrient balance	74.2	11.2	98.0
Applied to removal ratio	1.39	1.39	1.39

Fresh water applied: 1.36 feet Total harvests: 3

NUTRIENT BUDGET FOR CROP: 1-3 / Corn, silage

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
In season irrigation (no fertilizer) <i>Nutrient source:</i> Water only <i>Application method:</i> Surface	5	0.0 0%	0.0 0%	0.0 0%	19.5
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
CCID	3.9	0.0	0.0	44.0	
	3.9	0.0	0.0		
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	4	76.0 50%	15.0 80%	69.0 80%	309.8
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
Irrigation Well Big	1.4	0.0	0.0	44.0	
	1.4	0.0	0.0		

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	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	25.3	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	304.0	60.0	276.0
Other	0.0	0.0	0.0
Atmospheric deposition	3.5		
Nutrients applied	332.8	60.0	276.0
Potential crop nutrient removal	240.0	45.0	198.0
Nutrient balance	92.8	15.0	78.0
Applied to removal ratio	1.39	1.33	1.39

Fresh water applied: 4.02 feet Total harvests: 1

NUTRIENT BUDGET FOR CROP: Frontella / Wheat, silage, soft dough

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
Pre-irrigation prior to planting (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	1	90.0 50%	16.0 80%	75.0 80%	95.0
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
CCID	5.0	0.0	0.0	28.0	
	5.0	0.0	0.0		
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	2	85.0 50%	13.0 80%	67.0 80%	174.6
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
Irrigation Well Little	2.3	0.0	0.0	182.0	
	2.3	0.0	0.0		

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	9.6	0.0	0.0

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Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	260.0	42.0	209.0
Other	0.0	0.0	0.0
Atmospheric deposition	7.0		
Nutrients applied	276.6	42.0	209.0
Potential crop nutrient removal	198.0	30.6	149.4
Nutrient balance	78.6	11.4	59.6
Applied to removal ratio	1.40	1.37	1.40

Fresh water applied: 1.20 feet Total harvests: 1

NUTRIENT BUDGET FOR CROP: Frontella / Corn, silage

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
In season irrigation (no fertilizer) <i>Nutrient source:</i> Water only <i>Application method:</i> Surface	5	0.0 0%	0.0 0%	0.0 0%	12.4															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>CCID</td><td>2.5</td><td>0.0</td><td>0.0</td><td>14.0</td></tr><tr><td></td><td>2.5</td><td>0.0</td><td>0.0</td><td></td></tr></table>					Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	CCID	2.5	0.0	0.0	14.0		2.5	0.0	0.0		
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
CCID	2.5	0.0	0.0	14.0																
	2.5	0.0	0.0																	
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	4	76.0 50%	15.0 80%	69.0 80%	313.9															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>CCID</td><td>2.5</td><td>0.0</td><td>0.0</td><td>14.0</td></tr><tr><td></td><td>2.5</td><td>0.0</td><td>0.0</td><td></td></tr></table>					Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	CCID	2.5	0.0	0.0	14.0		2.5	0.0	0.0		
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
CCID	2.5	0.0	0.0	14.0																
	2.5	0.0	0.0																	

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	22.3	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	304.0	60.0	276.0
Other	0.0	0.0	0.0
Atmospheric deposition	7.0		
Nutrients applied	333.3	60.0	276.0
Potential crop nutrient removal	240.0	45.0	198.0

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Nutrient balance	93.3	15.0	78.0
Applied to removal ratio	1.39	1.33	1.39

Fresh water applied: 3.90 feet Total harvests: 1

NUTRIENT BUDGET FOR CROP: Pavao / Wheat, silage, soft dough

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
Pre-irrigation prior to planting (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	1	90.0 50%	16.0 80%	75.0 80%	93.5
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
Irrigation Well Big	3.5	0.0	0.0	113.0	
	3.5	0.0	0.0		
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	2	85.0 50%	13.0 80%	67.0 80%	177.0
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
Irrigation Well Big	3.5	0.0	0.0	113.0	
	3.5	0.0	0.0		

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	10.5	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	260.0	42.0	209.0
Other	0.0	0.0	0.0
Atmospheric deposition	7.0		
Nutrients applied	277.5	42.0	209.0
Potential crop nutrient removal	198.0	30.6	149.4
Nutrient balance	79.5	11.4	59.6
Applied to removal ratio	1.40	1.37	1.40

Fresh water applied: 1.10 feet Total harvests: 1

NUTRIENT BUDGET FOR CROP: Pavao / Corn, silage

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
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NUTRIENT BUDGET FOR CROP (CONTINUED): Pavao / Corn, silage

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)															
In season irrigation (no fertilizer) <i>Nutrient source:</i> Water only <i>Application method:</i> Surface	5	0.0 0%	0.0 0%	0.0 0%	20.0															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>CCID</td><td>4.0</td><td>0.0</td><td>0.0</td><td>48.0</td></tr><tr><td></td><td>4.0</td><td>0.0</td><td>0.0</td><td></td></tr></table>					Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	CCID	4.0	0.0	0.0	48.0		4.0	0.0	0.0		
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
CCID	4.0	0.0	0.0	48.0																
	4.0	0.0	0.0																	
In season irrigation (with fertilizer) <i>Nutrient source:</i> Retention pond (lagoon) <i>Application method:</i> Pipeline	4	76.0 50%	15.0 80%	69.0 80%	309.2															
<table><tr><td>Irrigation Source</td><td>N (lbs/acre)</td><td>P (lbs/acre)</td><td>K (lbs/acre)</td><td>Runtime (hrs)</td></tr><tr><td>Irrigation Well Big</td><td>1.3</td><td>0.0</td><td>0.0</td><td>42.0</td></tr><tr><td></td><td>1.3</td><td>0.0</td><td>0.0</td><td></td></tr></table>					Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	Irrigation Well Big	1.3	0.0	0.0	42.0		1.3	0.0	0.0		
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)																
Irrigation Well Big	1.3	0.0	0.0	42.0																
	1.3	0.0	0.0																	

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	25.2	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	0.0	0.0	0.0
Liquid manure	304.0	60.0	276.0
Other	0.0	0.0	0.0
Atmospheric deposition	7.0		
Nutrients applied	336.2	60.0	276.0
Potential crop nutrient removal	240.0	45.0	198.0
Nutrient balance	96.2	15.0	78.0
Applied to removal ratio	1.40	1.33	1.39

Fresh water applied: 4.05 feet Total harvests: 1

NUTRIENT BUDGET FOR CROP: Pavao Pasture / Other

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
Dry manure <i>Nutrient source:</i> From dairy <i>Application method:</i> Broadcast/incorporate	1	36.0 50%	11.0 80%	84.0 80%	36.0

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NUTRIENT BUDGET FOR CROP (CONTINUED): Pavao Pasture / Other

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
In season irrigation (no fertilizer) <i>Nutrient source:</i> Water only <i>Application method:</i> Surface	9	0.0 0%	0.0 0%	0.0 0%	22.4
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
Irrigation Well Big	2.5	0.0	0.0	36.0	
	2.5	0.0	0.0		

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	22.4	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	36.0	11.0	84.0
Liquid manure	0.0	0.0	0.0
Other	0.0	0.0	0.0
Atmospheric deposition	14.0		
Nutrients applied	72.4	11.0	84.0
Potential crop nutrient removal	52.0	8.0	60.0
Nutrient balance	20.4	3.0	24.0
Applied to removal ratio	1.39	1.38	1.40

Fresh water applied: 2.35 feet Total harvests: 1

NUTRIENT BUDGET FOR CROP: Pereira / Other

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
Dry manure <i>Nutrient source:</i> From dairy <i>Application method:</i> Broadcast/incorporate	1	43.0 50%	11.0 80%	84.0 80%	43.0
In season irrigation (no fertilizer) <i>Nutrient source:</i> Water only <i>Application method:</i> Surface	9	0.0 0%	0.0 0%	0.0 0%	15.3
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
CCID	1.7	0.0	0.0	18.0	
	1.7	0.0	0.0		

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	15.3	0.0	0.0

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Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	43.0	11.0	84.0
Liquid manure	0.0	0.0	0.0
Other	0.0	0.0	0.0
Atmospheric deposition	14.0		
Nutrients applied	72.3	11.0	84.0
Potential crop nutrient removal	52.0	8.0	60.0
Nutrient balance	20.3	3.0	24.0
Applied to removal ratio	1.39	1.38	1.40

Fresh water applied: 2.68 feet Total harvests: 1

NUTRIENT BUDGET FOR CROP: Vieira / Wheat, silage, soft dough

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
Dry manure <i>Nutrient source:</i> From dairy <i>Application method:</i> Broadcast/incorporate	1	263.0 50%	42.0 80%	209.0 80%	263.0
In season irrigation (no fertilizer) <i>Nutrient source:</i> Water only <i>Application method:</i> Surface	2	0.0 0%	0.0 0%	0.0 0%	6.7
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
CCID	3.4	0.0	0.0	30.0	
	3.4	0.0	0.0		

	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	6.7	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	263.0	42.0	209.0
Liquid manure	0.0	0.0	0.0
Other	0.0	0.0	0.0
Atmospheric deposition	7.0		
Nutrients applied	276.7	42.0	209.0
Potential crop nutrient removal	198.0	30.6	149.4
Nutrient balance	78.7	11.4	59.6
Applied to removal ratio	1.40	1.37	1.40

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Fresh water applied: 1.18 feet Total harvests: 1

NUTRIENT BUDGET FOR CROP: Vieira / Corn, silage

Activity / Event	# of Events	N (lbs/acre) % avail.	P (lbs/acre) % avail.	K (lbs/acre) % avail.	Total N (lbs/acre)
Dry manure Nutrient source: From dairy Application method: Broadcast/incorporate	1	308.0 50%	63.0 80%	277.0 80%	308.0
In season irrigation (no fertilizer) Nutrient source: Water only Application method: Surface	9	0.0 0%	0.0 0%	0.0 0%	20.2
Irrigation Source	N (lbs/acre)	P (lbs/acre)	K (lbs/acre)	Runtime (hrs)	
CCID	2.2	0.0	0.0	20.0	
	2.2	0.0	0.0		

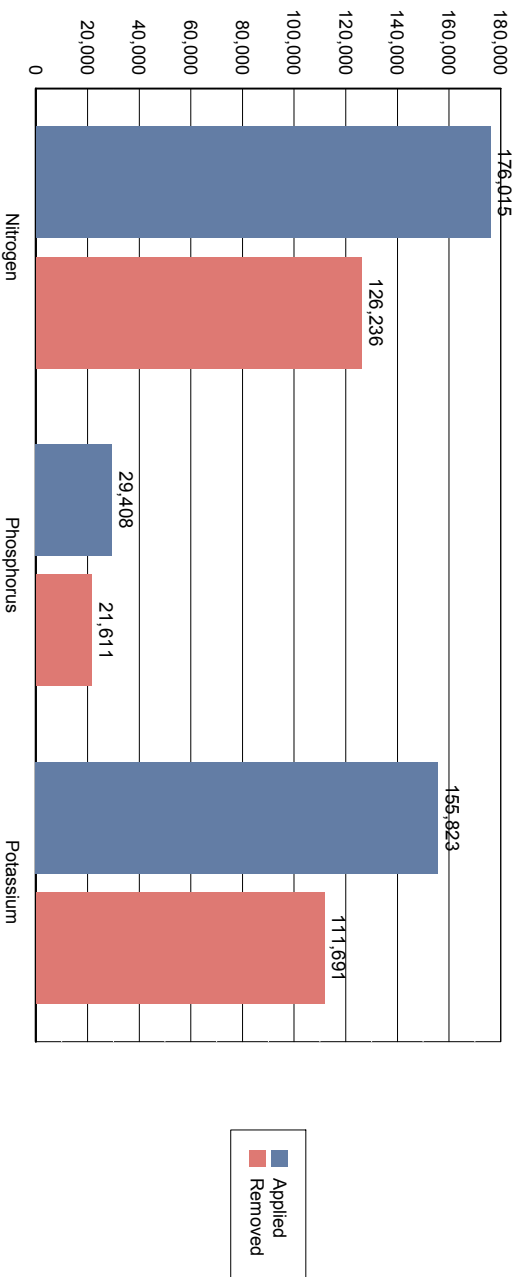
	Total N (lbs/acre)	Total P (lbs/acre)	Total K (lbs/acre)
Irrigation sources	20.2	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	308.0	63.0	277.0
Liquid manure	0.0	0.0	0.0
Other	0.0	0.0	0.0
Atmospheric deposition	7.0		
Nutrients applied	335.2	63.0	277.0
Potential crop nutrient removal	240.0	45.0	198.0
Nutrient balance	95.2	18.0	79.0
Applied to removal ratio	1.40	1.40	1.40

Fresh water applied: 3.54 feet Total harvests: 1

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NUTRIENT APPLICATIONS, POTENTIAL REMOVAL, AND BALANCE

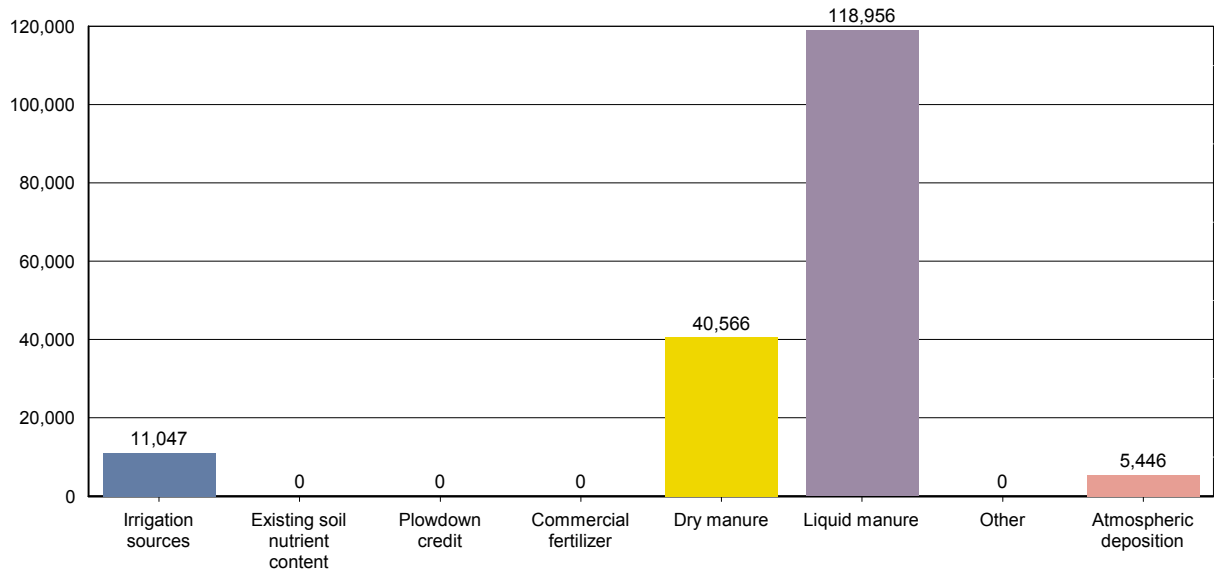
A. POUNDS OF NUTRIENT APPLIED VS. CROP REMOVAL POTENTIAL



	Total N (lbs)	Total P (lbs)	Total K (lbs)
Irrigation sources	11,046.7	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	40,566.0	7,858.0	40,110.0
Liquid manure	118,956.0	21,550.0	115,713.0
Other	0.0	0.0	0.0
Atmospheric deposition	5,446.0		
Nutrients applied to all crops	176,014.7	29,408.0	155,823.0
Potential crop nutrient removal	126,236.0	21,611.2	111,691.2
Nutrient balance	49,778.7	7,796.8	44,131.8
Applied to removal ratio	1.39	1.36	1.40

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B. POUNDS OF NITROGEN APPLIED BY NUTRIENT SOURCE



	Total N (lbs)	Total P (lbs)	Total K (lbs)
Irrigation sources	11,046.7	0.0	0.0
Existing soil nutrient content	0.0	0.0	0.0
Plowdown credit	0.0	0.0	0.0
Commercial fertilizer	0.0	0.0	0.0
Dry manure	40,566.0	7,858.0	40,110.0
Liquid manure	118,956.0	21,550.0	115,713.0
Other	0.0	0.0	0.0
Atmospheric deposition	5,446.0		
Nutrients applied to all crops	176,014.7	29,408.0	155,823.0
Potential crop nutrient removal	126,236.0	21,611.2	111,691.2
Nutrient balance	49,778.7	7,796.8	44,131.8
Applied to removal ratio	1.39	1.36	1.40

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NUTRIENT BALANCE

A. WHOLE FARM BALANCE

	Total N (lbs)	Total P (lbs)	Total K (lbs)
Nutrients in storage from herd*			
Daily gross	3,591.5	591.5	1,584.8
Annual gross	1,310,887.6	215,892.3	578,469.7
Net to pond storage after ammonia losses (30% loss applied)	746,795.2	175,002.2	482,058.1
Net to drylot storage after ammonia losses (30% loss applied)	170,826.1	40,890.0	96,411.6
Net in storage (30% loss applied)	917,621.3	215,892.3	578,469.7
Irrigation sources	11,046.7	0.0	0.0
Atmospheric deposition	5,446.0		
Imports	0.0	0.0	0.0
Exports	762,752.2	188,538.4	429,937.7
Potential crop nutrient removal	126,236.0	21,611.2	111,691.2
Nutrient balance	45,125.8	5,742.6	36,840.8
Nutrient balance ratio	1.36	1.27	1.33

* Potassium excretion from milk cows and dry cows only.

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SAMPLING AND ANALYSIS PLAN

A. MANURE SAMPLING AND ANALYSIS PLAN

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Annually	Annual estimation for total manure dry weight applied to each field will be quantified using the following: Dry weight applied from a source to a crop per application event = weight applied * (1 - (percent moisture / 100)) Dry weight applied to crop per application event = sum of dry weights applied from each source Dry weight applied to a crop = sum of dry weights applied during each application Dry weight applied to a field = sum of dry weights applied to each crop Annual estimation for total manure dry weight exported will be quantified using the following: Dry weight exported from a source per event = weight exported * (1 - (percent moisture / 100)) Dry weight exported per event = sum of dry weights exported from each source Dry weight exported to any offsite destination = sum of dry weights exported per event	List individual manure sources, e.g.: Corral solids Settling basin solids Freestall scrapings	Total dry weight (tons) manure applied annually to each land application area, and total dry weight (tons) manure exported offsite annually	None required

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A. MANURE SAMPLING AND ANALYSIS PLAN (CONTINUED)

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Twice per year	For each manure source, a composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual manure sources, e.g.: Corral solids Settling basin solids Freestall scrapings	None required	Total nitrogen, total phosphorus, total potassium, and percent moisture
Once every two years (biennially)	For each manure source, a composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual manure sources, e.g.: Corral solids Settling basin solids Freestall scrapings	None required	General minerals, including: calcium, magnesium, sodium, sulfate, chloride Fixed solids (ash)
Each application to each land application area	For each applied manure source, a composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected. For each applied manure source, a scaled weight by truckload will be recorded.	List individual manure sources, e.g.: Corral solids Settling basin solids Freestall scrapings	Date applied and total weight (tons) applied	Percent moisture

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A. MANURE SAMPLING AND ANALYSIS PLAN (CONTINUED)

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Each offsite export of manure	For each manure source exported, a composite sample "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected. For each manure source exported, a scaled weight by truckload will be recorded.	List individual manure sources, e.g.: Corral solids Settling basin solids Freestall scrapings	Date exported and total weight (tons) exported	Percent moisture

B. PROCESS WASTEWATER SAMPLING AND ANALYSIS PLAN

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Annually	A composite or grab sample prior to blending with irrigation water per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual ponds, e.g.: Pond 1 Treatment Lagoon 2	None required	pH, total dissolved solids, electrical conductivity, nitrate-nitrogen, ammonium-nitrogen, total Kjeldahl nitrogen, total phosphorus, and total potassium
Once every two years (biennially)	For each pond, a composite or grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual ponds, e.g.: Pond 1 Treatment Lagoon 2	None required	General minerals, including: calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, and chloride

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B. PROCESS WASTEWATER SAMPLING AND ANALYSIS PLAN (CONTINUED)

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Each application	For each pond, a composite or grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual ponds, e.g.: Pond 1 Treatment Lagoon 2	Date applied and volume (gallons or acre-inches) applied	None required
Quarterly during one application event	For field measurement: For each pond, a composite or grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected. For laboratory analyses: For each pond, a composite or grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual ponds, e.g.: Pond 1 Treatment Lagoon 2	Date applied and electrical conductivity	Nitrate-nitrogen (only when pond is aerated), un-ionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, total potassium, and total dissolved solids

C. SOIL SAMPLING AND ANALYSIS PLAN

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes

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C. SOIL SAMPLING AND ANALYSIS PLAN (CONTINUED)

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Once every five years for each land application area (may be distributed over a 5-year period by sampling 20% of the land application areas annually)	For each field, a composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual fields and field size, e.g.: Field 1 - 200 acres Field 2 - 200 acres Field 3 - 200 acres Field 4 - 200 acres Field 5 - 200 acres	None required	Soluble phosphorus

D. PLANT TISSUE SAMPLING AND ANALYSIS PLAN

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Each crop harvest from each land application area	For each field and crop, a composite sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected. For each field and crop, a scaled weight by truckload will be recorded.	List individual fields and crop rotation, e.g.: Field 1 - corn/oat silage Field 2 - corn/oat silage Field 3 - alfalfa Field 4 - alfalfa Field 5 - alfalfa	Date harvested and total weight (tons) of harvested material removed from each land application area	Percent wet weight of harvested plant removed Laboratory analyses for total nitrogen, total phosphorus, total potassium (expressed on a dry weight basis), fixed solids (ash), and percent moisture

E. IRRIGATION WATER SAMPLING AND ANALYSIS PLAN

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Each fresh water irrigation event for each land application area	List individual irrigation sources and the measurement method, e.g.: Irrigation Well 1 - inline totalizing flow meter Irrigation Well 2 - flow rate multiplied by runtime Canal 1 - flow rate multiplied by runtime	List individual irrigation sources, e.g.: Well 1 Canal 1 East River	Date applied and volume (gallons or acre-inches) applied	None required

Nutrient Management Plan Report
General Order No. R5-2007-0035, Attachment C
July 1, 2009 deadline

E. IRRIGATION WATER SAMPLING AND ANALYSIS PLAN (CONTINUED)

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
One irrigation event during each irrigation season during actual irrigation events – for each irrigation water source (well and canal)	For each irrigation source, a grab sample per the “Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies” will be collected. In lieu of sampling the irrigation water, the Discharger may provide equivalent data from the local irrigation district.	List individual irrigation sources, e.g.: Well 1 Canal 1 East River	None required	Electrical conductivity, total dissolved solids, and total nitrogen

F. GROUNDWATER MONITORING SAMPLING AND ANALYSIS PLAN

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Every five years (may be distributed over a 5-year period by sampling 20% of the wells annually)	For each domestic and agricultural supply well, a grab sample per the “Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies” will be collected.	List individual wells, e.g.: Domestic well at milkbarn DWMB1 Irrigation well #7	None required	General minerals, including: calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, chloride Total dissolved solids
Annually	For each subsurface (tile) drainage system discharge point, a grab sample per the “Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies” will be collected.	List individual subsurface (tile) drainage system discharge points, e.g.: Tile drain under Field 7 discharged into TID Lateral 5	Electrical conductivity and ammonium-nitrogen	Nitrate-nitrogen, total phosphorus, and total dissolved solids. If field measurement indicates the presence of ammonium-nitrogen, the Discharger shall collect a sample for laboratory analysis of ammonium-nitrogen.

Nutrient Management Plan Report
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F. GROUNDWATER MONITORING SAMPLING AND ANALYSIS PLAN (CONTINUED)

Frequency	Sampling Methods	Source	Minimum data collection requirements	
			Field Analytes	Lab Analytes
Annually	For each domestic and agricultural supply well, a grab sample per the "Approved Sampling Procedures for Nutrient and Groundwater Monitoring at Existing Milk Cow Dairies" will be collected.	List individual wells, e.g.: Domestic well at milkbarn DWMB1 Irrigation well #7	Electrical conductivity and ammonium-nitrogen	Nitrate-nitrogen. If field measurement indicates the presence of ammonium-nitrogen, the Discharger shall collect a sample for laboratory analysis of ammonium-nitrogen.

NUTRIENT MANAGEMENT PLAN REVIEW

A. NUTRIENT MANAGEMENT PLAN REVIEW

Person who created the NMP: Pedroso, Mariann *See above for contact information.*
Date the NMP was drafted: 04/01/2021
Person who approved the final NMP: Pedroso, Mariann *See above for contact information.*
Date of NMP implementation: 11/01/2023

Nutrient Management Plan Report
General Order No. R5-2007-0035, Attachment C
July 1, 2009 deadline

ATTACHED MAP AND DOCUMENTATION REFERENCES

The following list, based upon user selections and data entries, describes the minimum required attachments that must be submitted with the Nutrient Management Plan for the reporting schedule of 'July 1, 2009'.

A. PRELIMINARY DAIRY FACILITY ASSESSMENT

The NMP will include the initial Preliminary Dairy Facility Assessment (Attachment A) and the annual updates as required by Monitoring and Reporting Program No. R5-2007-0035. Copies of these assessments shall be maintained for 10 years.

B. LAND AREA MAP(S)

Identify each land application area (under the Discharger's control, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient recycling) on a single published base map

1. A field identification system (Assessor's Parcel Number; land application area; crops grown); indication if each land application is owned, rented, or leased by the Discharger; indication of what type of waste is applied (solid manure only, wastewater only, or both solid manure and wastewater); drainage flow direction in each field, nearby surface waters, and storm water discharge points; tailwater and storm water drainage controls; subsurface (tile) drainage systems (including discharge points and lateral extent); irrigation supply wells and groundwater monitoring wells; sampling locations for discharges of storm water and tailwater to surface water from the field.
2. Process wastewater conveyance structures, discharge points and discharge mixing points with irrigation water supplies; pumping facilities; flow meter locations; drainage ditches and canals, culverts, draining controls (berms, levees, etc.), and drainage easements.

Application area map reference number: Land App Map

Identify each field under control of the Discharger and within five miles of the dairy where neither process wastewater nor manure is applied. Each field shall be identified on a single published base map at an appropriate scale by the following:

1. Assessor's Parcel Number.
2. Total acreage.
3. Information on who owns or leases the field

Non-application area map reference number: N/A

Setbacks, Buffers, and Other Alternatives to Protect Surface Water (see Technical Standard VII):

1. Identify all potential surface waters or conduits to surface water that are within 100 feet of any land application area.
2. For each land application area that is within 100 feet of a surface water or a conduit to surface water, identify the setback, vegetated buffer, or other alternative practice that will be implemented to protect surface water (Technical Standard VII).

Setbacks and buffers map reference number: Land App Map

C. PROCESS WASTEWATER WRITTEN AGREEMENTS

Provide copies of written agreements with third parties that receive process wastewater for their own use from the Discharger's dairy (Technical Standards V.A.1 and V.A.3).

Nutrient Management Plan Report
General Order No. R5-2007-0035, Attachment C
July 1, 2009 deadline

SAMPLING AND ANALYSIS PLAN CERTIFICATION

A. DAIRY FACILITY INFORMATION

Name of dairy or business operating the dairy: Correia Family Dairy

Physical address of dairy:

26380 W Fahey RD

Gustine

Merced

95322

Physical Address Number and Street

City

County

Zip Code

Street and nearest cross street (if no address): _____

B. DOCUMENTATION OF QUALIFICATIONS AND PLAN DEVELOPMENT

I certify that I meet the requirements as a certified specialist in developing nutrient management plans as described in Attachment C of Waste Discharge Requirements General Order No. R5-2007-0035 and that I prepared the Sampling and Analysis plan.

Technical Service Provider

TITLE/QUALIFICATIONS OF CERTIFIED NUTRIENT MANAGEMENT SPECIALIST

Mariann Pedrosa

Apr 15, 2021

SIGNATURE OF TRAINED PROFESSIONAL

DATE

Mariann Pedrosa

PRINT OR TYPE NAME

P.O. Box 906; Newman, CA 95360

MAILING ADDRESS

(209) 862-4291

PHONE NUMBER

C. OWNER AND/OR OPERATOR CERTIFICATION

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

[Signature]

[Signature]

SIGNATURE OF OWNER OF FACILITY

SIGNATURE OF OPERATOR OF FACILITY

Ezequiel F Correia

Ezequiel R Correia, Jr

PRINT OR TYPE NAME

PRINT OR TYPE NAME

Apr 15, 2021

Apr 15, 2021

DATE

DATE

Nutrient Management Plan Report
General Order No. R5-2007-0035, Attachment C
July 1, 2009 deadline

NUTRIENT BUDGET CERTIFICATION

A. DAIRY FACILITY INFORMATION

Name of dairy or business operating the dairy: Correia Family Dairy

Physical address of dairy:

26380 W Fahey RD

Gustine

Merced

95322

Number and Street

City

County

Zip Code

Street and nearest cross street (if no address): _____

B. DOCUMENTATION OF QUALIFICATIONS AND PLAN DEVELOPMENT

I certify that I meet the requirements as a certified specialist in developing nutrient management plans as described in Attachment C of Waste Discharge Requirements General Order No. R5-2007-0035 and that I prepared the Nutrient Budget plan.

Technical Service Provider

Mariann Pedrosa
TITLE/QUALIFICATIONS OF CERTIFIED NUTRIENT MANAGEMENT SPECIALIST

Apr 15, 2021

SIGNATURE OF TRAINED PROFESSIONAL

DATE

Mariann Pedrosa

PRINT OR TYPE NAME

P.O. Box 906; Newman, CA 95360

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(209) 862-4291

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C. OWNER AND/OR OPERATOR CERTIFICATION

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



SIGNATURE OF OWNER OF FACILITY

SIGNATURE OF OPERATOR OF FACILITY

Ezequiel F Correia

Ezequiel R Correia, Jr

PRINT OR TYPE NAME

PRINT OR TYPE NAME

Apr 15, 2021

Apr 15, 2021

DATE

DATE

Nutrient Management Plan Report
General Order No. R5-2007-0035, Attachment C
July 1, 2009 deadline

STATEMENTS OF COMPLETION

Waste Discharge Requirements General Order No. R5-2007-0035 for Existing Milk Cow Dairies (General Order) requires owners and operators of existing milk cow dairies (Dischargers) to develop and implement a Nutrient Management Plan for their land application areas (land under control of the Discharger, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient cycling). The Discharger is required to maintain the NMP at the dairy, make the NMP available to Central Valley Water Board staff during their inspections, and submit the NMP to the Executive Officer upon request.

The General Order requires the Discharger to submit two Statements of Completion during development of the NMP. The Discharger may use this form to comply with the General Order requirement to submit one or both of these Statements of Completion. Parts A and E must be completed for each Statement of Completion. Parts B, C and D are to be completed for the Statements of Completion due by 1 July 2008, 31 December 2008 and 1 July 2009, respectively. Both the owner and the operator of the dairy must sign this form in Part E below.

A. DAIRY FACILITY INFORMATION

Name of dairy or business operating the dairy: Correia Family Dairy

<u>26380 W Fahey RD</u>	<u>Gustine</u>	<u>Merced</u>	<u>95322</u>
Number and Street	City	County	Zip Code

Street and nearest cross street (if no address): _____

Operator name: <u>Correia, Ezequiel R Jr</u>	Telephone no.: <u>(209) 826-1903</u>	<u>(209) 652-0029</u>
	Landline	Cellular

<u>26380 W Fahey RD</u>	<u>Gustine</u>	<u>CA</u>	<u>95322</u>
Mailing Address Number and Street	City	State	Zip Code

Legal owner name: <u>Correia, Ezequiel F</u>	Telephone no.: <u>(209) 826-1903</u>	<u>(209) 652-0028</u>
	Landline	Cellular

<u>26380 W Fahey RD</u>	<u>Gustine</u>	<u>CA</u>	<u>95322</u>
Mailing Address Number and Street	City	State	Zip Code

Nutrient Management Plan Report
General Order No. R5-2007-0035, Attachment C
July 1, 2009 deadline

B. STATEMENT OF COMPLETION DUE 1 JULY 2008

I have completed the following items of the Nutrient Management Plan (check the boxes of completed sections), which are due 1 July 2008:

- ☐ **Item I.A.1 Land Application Information**
Identification of land used for manure application and needed information on a facility map.
- ☐ **Item I.B Land Application Information**
Information list for information provided on map above.
- ☐ **Item I.C Land Application Information**
Copies of written third-party process wastewater agreements.
- ☐ **Item I.D Land Application Information**
Identification of fields under control of the discharger within five miles of the dairy where neither process wastewater nor manure is applied.
- ☐ **Item II Sampling and Analysis Plan**
- ☐ **Item IV Setbacks, Buffers, and Other Alternatives to Protect Surface Water**
Identification of all potential surface waters or conduits to surface waters within 100 feet of land application areas and appropriate protection.
- ☐ **Item VI Record-Keeping Requirements**
Identification of monitoring records that will be maintained as required in the production and land application areas.

Has Item II (Sampling and Analysis Plan) of the Nutrient Management Plan been certified by a Certified Nutrient Management Specialist as required in the General Order?

☐ Yes ☐ No

C. STATEMENT OF COMPLETION DUE 31 DECEMBER 2008

I have completed the following items of the Nutrient Management Plan (check the boxes of completed sections), which are due 31 December 2008:

- ☐ **Item V Field Risk Assessment**
Evaluation of the effectiveness of management practices used to control the discharge of waste constituents from land application areas by assessing the water quality monitoring results of discharges of manure, process wastewater, tailwater, subsurface (tile) drainage, or storm water from the land application areas.

D. STATEMENT OF COMPLETION DUE 1 JULY 2009

I have completed the following items of the Nutrient Management Plan (check the boxes of completed sections), which are due 1 July 2009:

- ☐ **Item I.A.2 Land Application Area Information**
Identification of process wastewater conveyance, mixing and drainage information for each land application area on a facility map.
- ☐ **Item III Nutrient Budget**
Established planned rates of nutrient applications by crop based on nutrient monitoring results for each land application area.

Has Item III (Nutrient Budget) of the Nutrient Management Plan been certified by a Certified Nutrient Management Specialist as required in the General Order?

☐ Yes ☐ No

Nutrient Management Plan Report
General Order No. R5-2007-0035, Attachment C
July 1, 2009 deadline

E. CERTIFICATION STATEMENT

I certify under penalty of law that I have completed the items of the Nutrient Management Plan that are checked in Parts B, C and/or D above for the dairy identified in Part A above and that the appropriate certified nutrient management specialist has certified the items requiring such certification as noted in part B and/or D above and that I have personally examined and am familiar with the information submitted in Parts A, B, C and D of this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE OF OWNER OF FACILITY

Ezequiel F Correia

PRINT OR TYPE NAME

Apr 15, 2021

DATE

SIGNATURE OF OPERATOR OF FACILITY

Ezequiel R Correia, Jr

PRINT OR TYPE NAME

Apr 15, 2021

DATE



LAND APPLICATION AREA FIELD INFORMATION ATTACHMENT

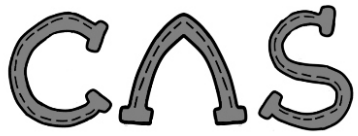
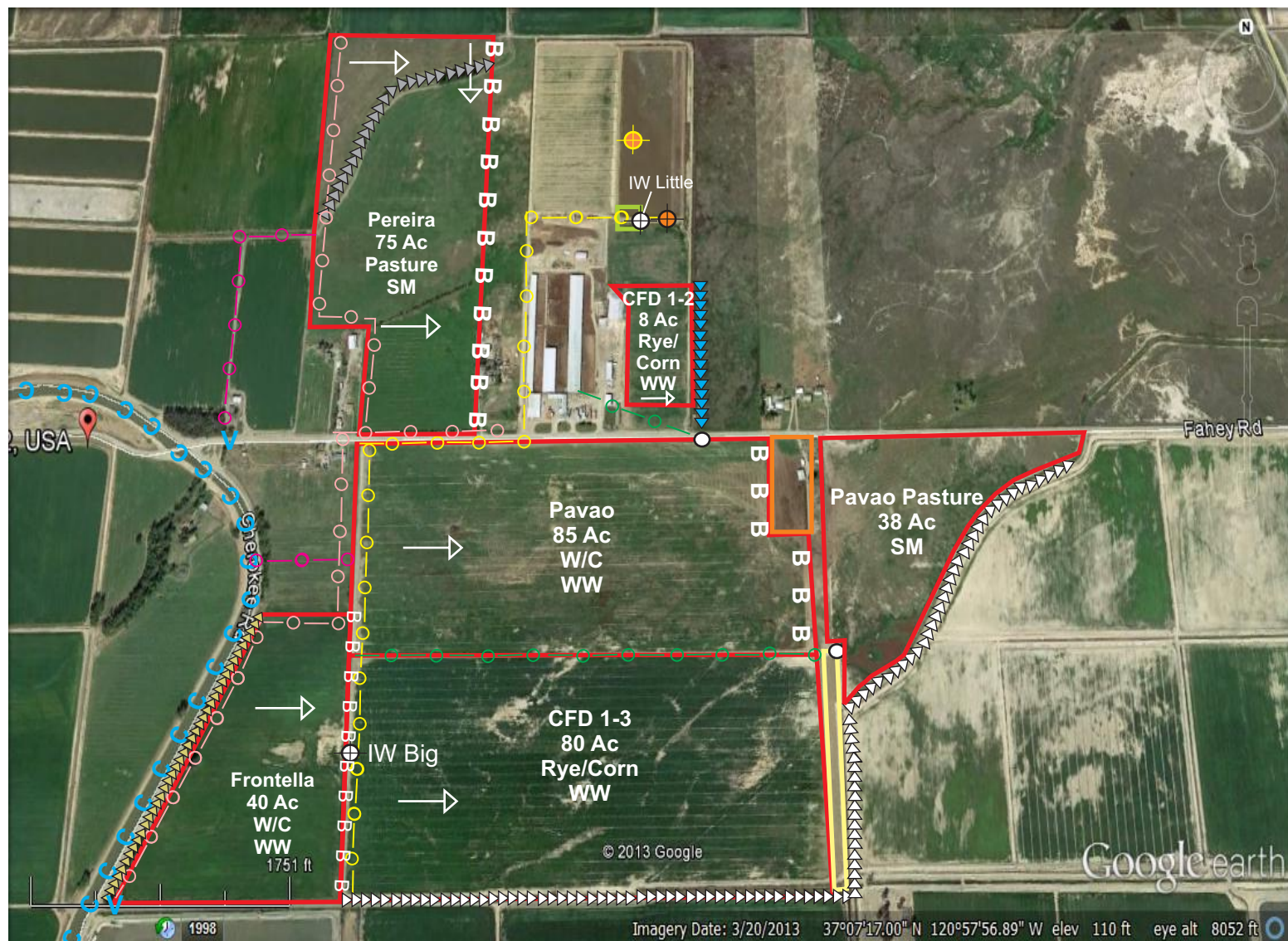
DAIRY NAME: CORREIA FAMILY DAIRY

DAIRY ADDRESS: 26380 W FAHEY RD GUSTINE CA 95322

[illegible]

Legend:

- Field Boundary
- Tailwater Pond
- Flow Direction
- Irrigation Pipeline
- Tailwater Pipeline
- Freshwater Pipeline
- Wastewater Pipeline
- ⊗ Fixed Pump
- ⊗ Floating Pump
- ⊕ Irrigation Well
- ≡≡≡ Cement Ditch
- ≡≡≡ Earthen Ditch
- ≡≡≡ Tailwater Flow
- ≡≡≡ CCID Drain
- C CCID Canal
- B Berm
- V Valve
- Mixing Box
- Lift Pump
- Heifer Corrals
- WW Wastewater
- SM Solid Manure



CARDOSO AG SERVICES

1751 Ft.
Scale

Project No.

Correia Family Dairy
26380 Fahey Road
Gustine, CA 95322

Date:
04/15/2021

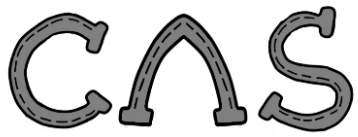
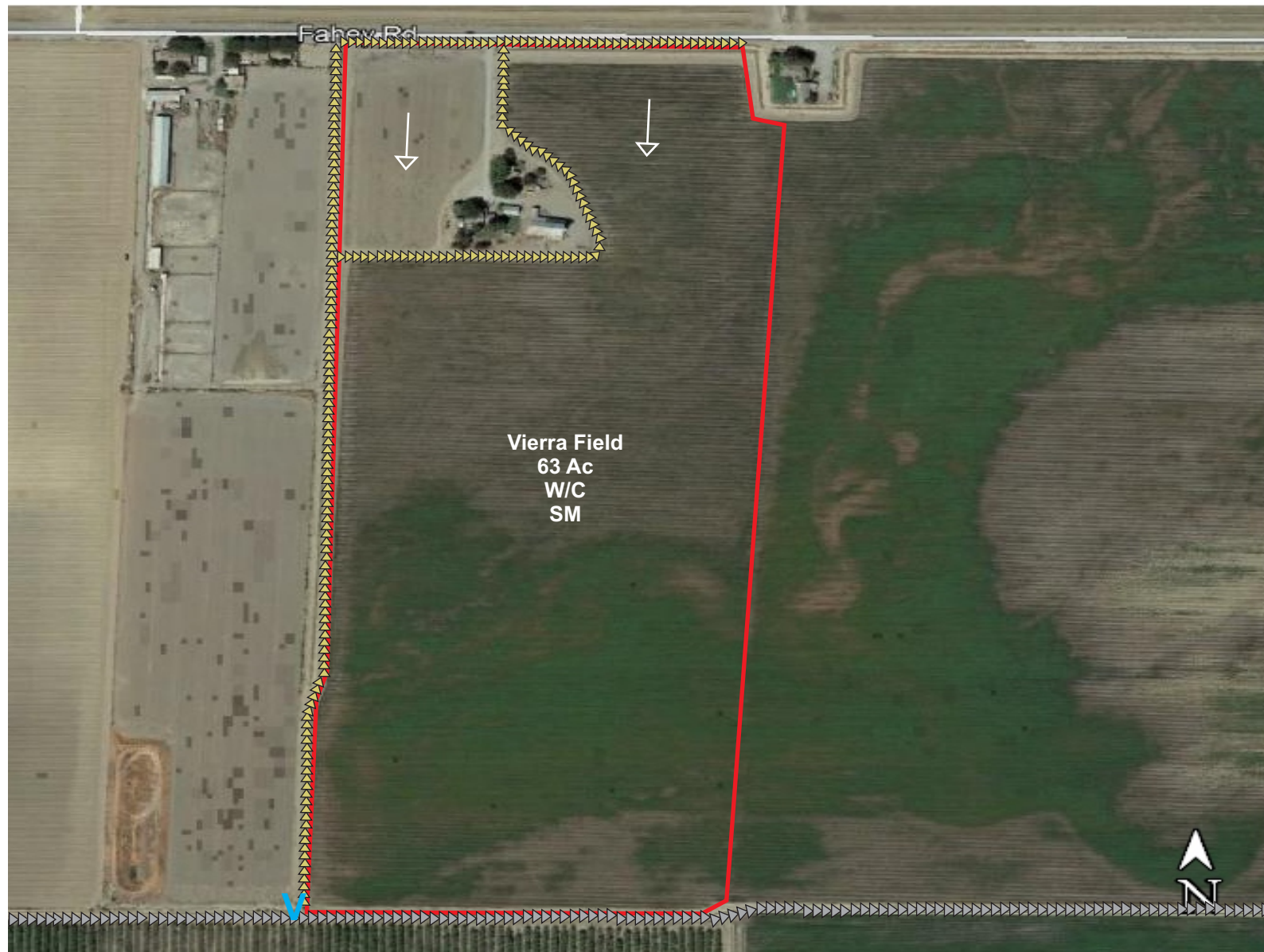
Drawn By:
MD

App By:
MP

Field Map #1

Legend:

- Field Boundary
- Flow Direction
- Cement Ditch
- Earthen Ditch
- Valve



CARDOSO AG SERVICES

1015 Ft.



Scale

Correia Family Dairy
26380 Fahey Road
Gustine, CA 95322

Project No.

Date:
1/20/2020

Drawn By:
MD

App By:
MP

Field Map
Vierra Ranch
APN: 074-009-014

Waste Management Plan For Correia Family Dairy Merced County, CA

Prepared For:
Correia Family Dairy
26380 W. Fahey Road
Gustine, CA 95322





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**WASTE MANAGEMENT PLAN
FOR
CORREIA FAMILY DAIRY
MERCED COUNTY, CA**

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- c. Results and Conclusions

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1. NARRATIVE

INTRODUCTION

This Waste Management Plan (WMP) has been prepared at the request of the subject dairy's owner and/or operator to comply with Section H.1.b., *Waste Management Plan*, of Order No. R5-2013-0122, *Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies*, (Order) adopted by the California Regional Water Quality Control Board (CRWQCB) Central Valley Region. Per the requirements set forth by the Order it is the intent of this plan to provide an evaluation of the existing milk cow facility's design, construction, operation, and maintenance for flood protection and waste containment and to determine whether the facility complies with Prohibition A.14, General Specifications B.1 through B.3, Pond Specifications C.1 through C.3, and Production Area Specifications D.1, D.4, and D.5. Should the evaluation provided by this plan determine that the existing facility does not comply with the requirements of the Order, then modifications will be proposed for the facility that will bring it into compliance and those modifications shall be made a part of this plan.

COMPLIANCE CRITERIA

As required by the Order this plan must evaluate the existing facility's compliance with Prohibition A.14, General Specifications B.1 through B.3, Pond Specifications C.1 through C.3, and Production Area Specifications D.1, D.4, and D.5. The criteria set forth by this Prohibition and General Specifications are as follows:

Prohibition A.14: *"The direct discharge of wastewater into groundwater via backflow through water supply or irrigation supply wells is prohibited."*

The water, irrigation, and wastewater systems of this facility have been examined by a Registered Civil Engineer licensed in the State of California. It has been determined and hereby documented that there are no existing conditions on the project site that would allow for direct discharge of wastewater into groundwater via backflow through water supply or irrigation supply wells.

General Specification B.1: *"The existing milk cow dairy shall have facilities that are designed, constructed, operated, and maintained to retain all facility process wastewater generated during the storage period (maximum period of time anticipated between land application of process wastewater), together with all precipitation on and drainage through manured areas, up to and including during a 25-year, 24-hour storm (see item II of Attachment B, which is attached to and made part of this Order)."*

Section 3.a. of this plan contains calculations that demonstrate the facility's ability to retain all process wastewater and precipitation generated by the 25-year, 24-hour storm. The tributary areas for storm drain runoff were determined by utilizing field measurements and aerial photography. The existing Wastewater Basins (SB1, SB2, and LG1) were field measured.

General Specification B.2: *"In the Sacramento and San Joaquin River Basins, ponds and manured areas at existing milk cow dairies in operation on or before 27 November 1984 shall be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Existing milk cow dairies that were in operation on or before 27 November 1984 and that are protected against 100-year peak stream flows must continue to provide such protection. Existing milk cow dairies built or expanded after 27 November 1984 shall be protected against 100-year peak stream flows (Title 27 Section 22562(c))."*

The facility is in the San Joaquin River Basin and was constructed after 27 November 1984. Therefore, this facility must have protection against the 100-year storm event. The relevant Flood Zone Maps published by the Federal Emergency Management Agency (FEMA) are Panel Nos. 06047C0825G and 06047C0575G. These maps indicate that the existing dairy facility is in Zone X and is thus outside of the 1% annual chance, or 100-year, floodplain.

General Specification B.3: *"In the Tulare Lake Basin, existing milk cow dairies that existed as of 25 July 1975 shall be protected from inundation or washout from overflow from any stream channel during*

20-year peak stream flows and existing milk cow dairies constructed after 25 July 1975 shall be protected from 100-year peak stream flows. Existing milk cow dairies expanded after 8 December 1984 shall be protected from 100-year peak stream flows.”

As the facility is in the San Joaquin River Basin this specification is not applicable.

Pond Specification C.1: *“The level of waste in the process wastewater retention ponds shall be kept a minimum of two (2) feet from the top of each aboveground embankment and a minimum of one (1) foot from the ground surface of each belowground pond. Less freeboard may be approved by the Executive Officer when a Civil Engineer who is registered pursuant to California law, or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work, demonstrates that the structural integrity of the pond will be maintained with the proposed freeboard.*

2' of freeboard has been assigned to the wastewater retention ponds SB1 and LG1 as they have been constructed above grade. 1' of freeboard has been assigned to SB2 as it has been constructed in ground or below grade.

Pond Specification C.2: *“Ponds shall be managed and maintained to prevent breeding of mosquitoes and other vectors. In particular,*

- a. Small coves and irregularities shall not be allowed around the perimeter of the water surface;*
- b. Weeds shall be minimized through control of water depth, harvesting, or other appropriate method;*
- c. Dead algae, vegetation, and debris shall not accumulate on the water surface; and*
- d. Management shall be in accordance with the requirements of the Mosquito Abatement District.”*

An Operations and Maintenance Plan addressing these items has been included in Section 3.a. and is hereby made a part of this plan.

Pond Specification C.3: *“Ponds designated to contain the 25-year, 24-hour storm event runoff must have a depth marker that clearly indicates the minimum capacity necessary to contain the runoff and direct precipitation from a 25-year, 24-hour storm event.”*

A marker meeting this specification will be installed in all the facility's ponds by the compliance date.

Production Area Specification D.1: *“All dirt or unpaved corrals shall be graded to promote drainage. Cow washing areas shall be paved (concrete or equivalent) and sloped to a drain. Water troughs, permanent feed racks, and mangers shall have paved access, and water troughs shall have a drain to carry water away from the corrals. (Cal Code Regs., title 3, § 646.1.).”*

Dirt or unpaved areas are graded to promote drainage. Any areas requiring improvement are noted on Exhibit Sheets 3 and 4 and in Section 3.b.

All cow washing areas are paved with Portland Cement Concrete (PCC) and sloped to a drain which conveys wastewater to the retention ponds.

Water troughs, feed racks, and mangers have access paved with PCC. Water troughs have drains which convey wastewater to the retention ponds.

Production Area Specification D.4: *“All roofs, buildings, and non-manured areas located in the production area of the existing milk cow dairy shall be constructed or otherwise designed so that clean rainwater is diverted away from manured areas and waste containment facilities, unless such drainage is fully contained in the wastewater retention ponds. (Title 27, § 22562(b).)”*

The production area is designed such that rainwater that is not diverted away from manured areas and waste containment facilities is collected and conveyed to the wastewater retention ponds.

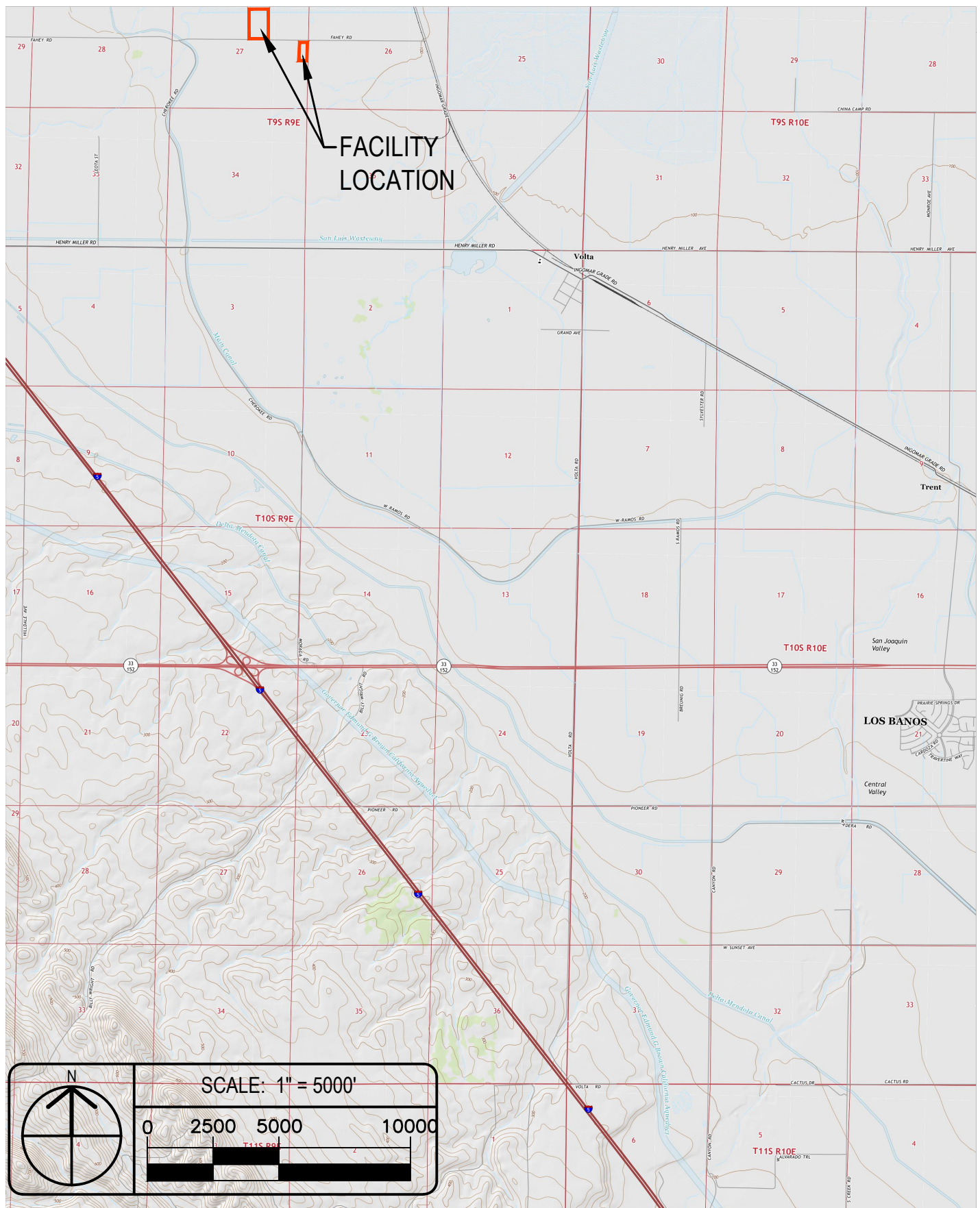
Production Area Specification D.5: *“Roof drainage from barns, milk houses, or shelters shall not drain into the corrals unless the corrals are properly graded and drained. (Cal Code Regs., title 3, § 661).”*

Roof drainage is collected by gutters, downspouts, and drains and is conveyed to the wastewater retention ponds.

RESULTS AND CONCLUSIONS

After conducting a visual inspection of the site, obtaining herd and facility information from the operator, performing the required measurements of facility improvements, and performing the calculations included in Section 3.a. it has been determined that the design, construction, operation, and waste containment of this facility are in compliance with Prohibition A.14 and General Specifications B.1 through B.3 and B.10 through B.16 of Order No. R5-2013-0122, *Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies*.

2. EXHIBITS



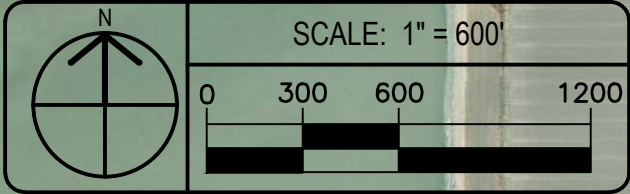
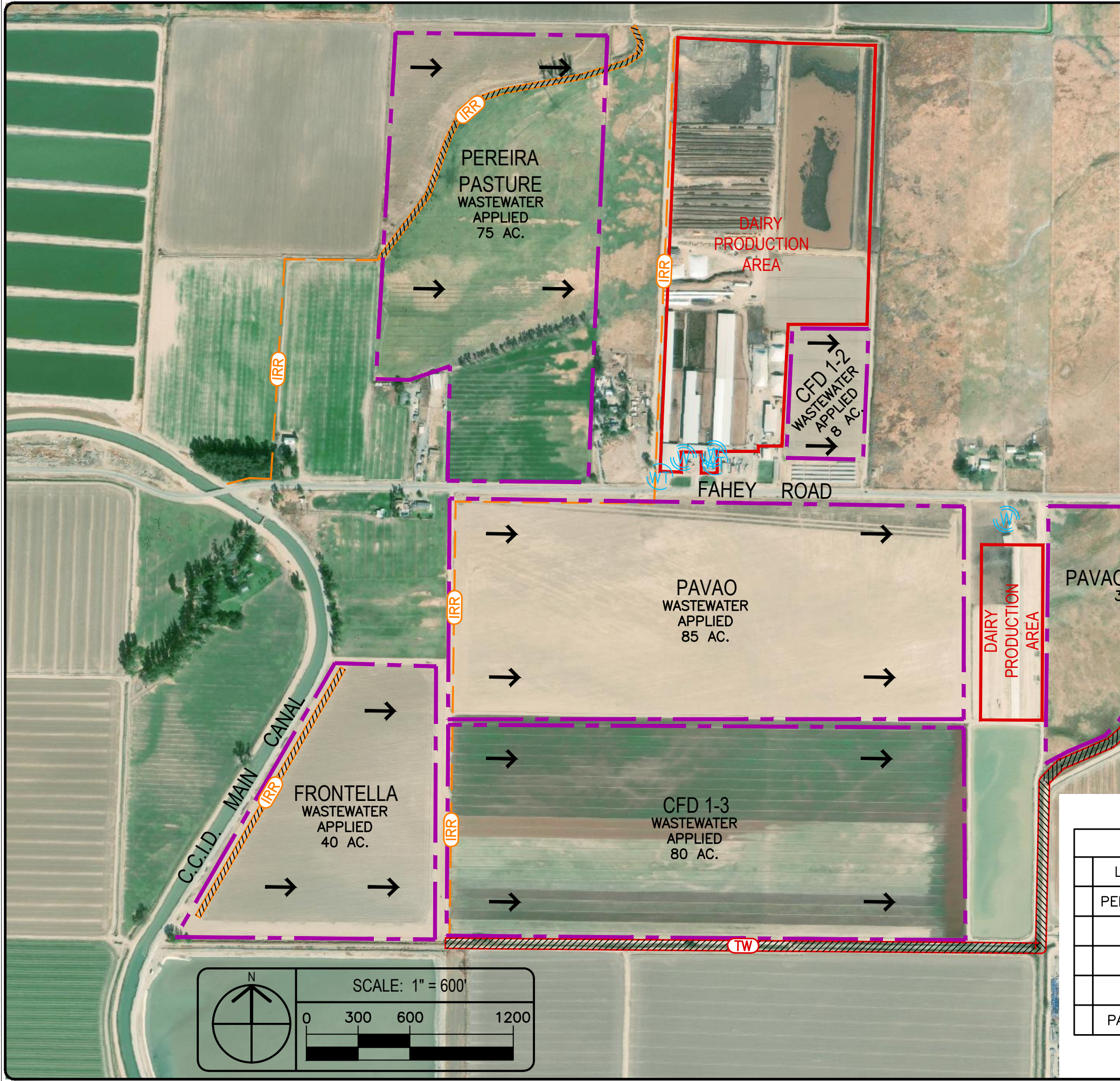
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VICINITY MAP
CORREIA FAMILY DAIRY

MERCED COUNTY, CA



LEGEND

- LAND APPLICATION AREA
- IRRIGATION LINE
- IRRIGATION DITCH
- TAILWATER DITCH
- DOMESTIC WELL
- WATER TANK
- GENERAL SLOPE AND DIRECTION OF FLOW

DISCHARGE POINTS		
LAND APP. AREA	LATITUDE	LONGITUDE
PEREIRA PASTURE	N37° 07' 34.79"	W120° 58' 21.27"
PAVAO	N37° 07' 12.78"	W120° 58' 07.16"
CFD 1-3	N37° 06' 59.92"	W120° 58' 05.81"
FRONTELLA	N37° 07' 00.59"	W120° 58' 31.36"
PAVAO PASTURE	N37° 07' 14.68"	W120° 57' 35.06"

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DEVELOPMENT - AGRICULTURE

SHEET

2

OF

8

SITE MAP

LAND APPLICATION AREAS -

DAIRY FIELDS

CORREIA FAMILY DAIRY

MERCED COUNTY, CA

DRAWN BY: MS

DATE: 4/14/2021

FILE: 02_site_dairy_fields.dwg

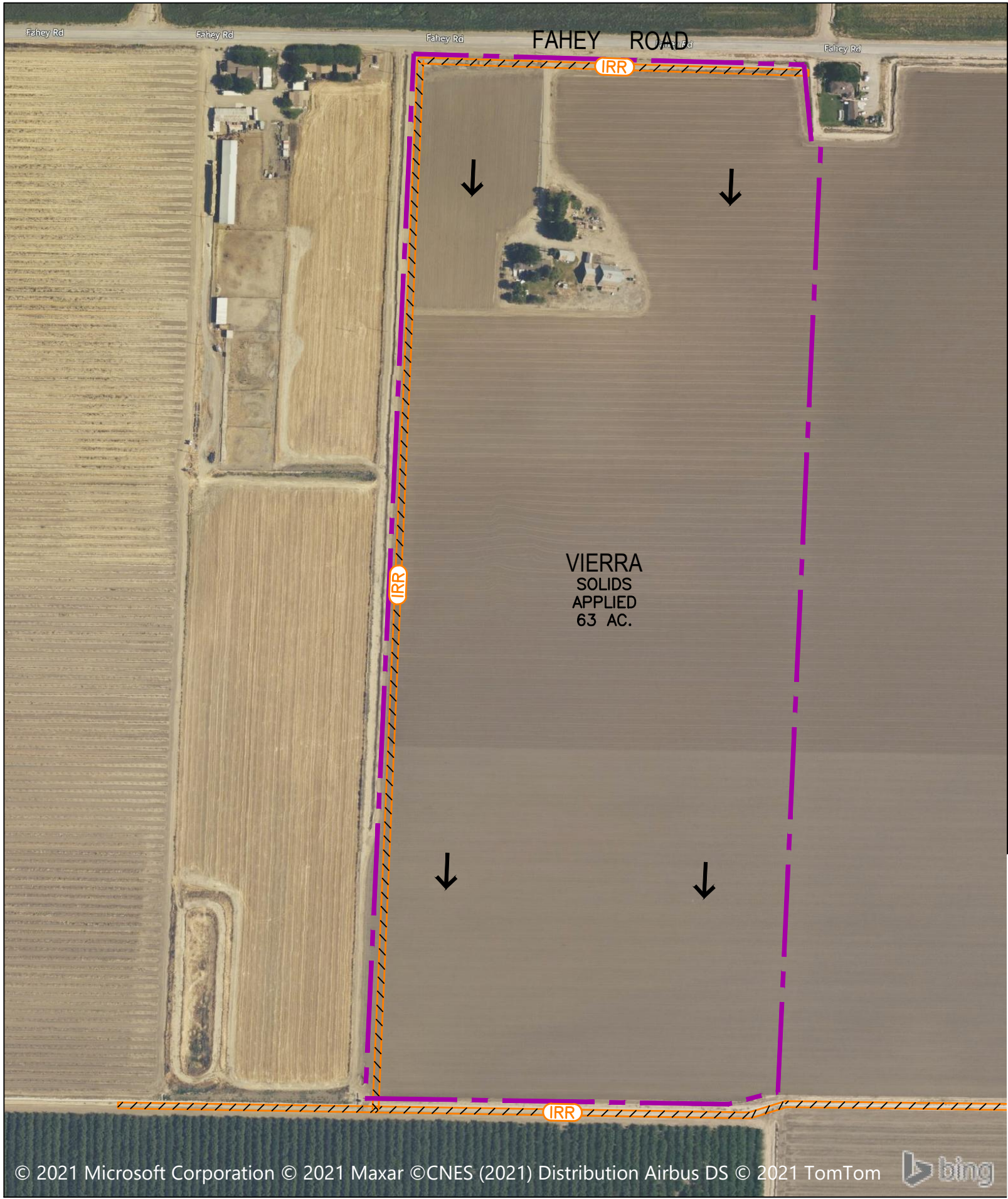
JOB NO.: 2021-002

REVISIONS

SYMBOL

DESCRIPTION

APPD.



LEGEND



LAND APPLICATION AREA

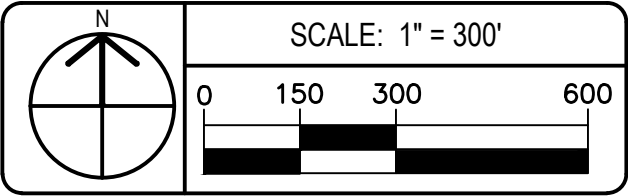


IRRIGATION DITCH

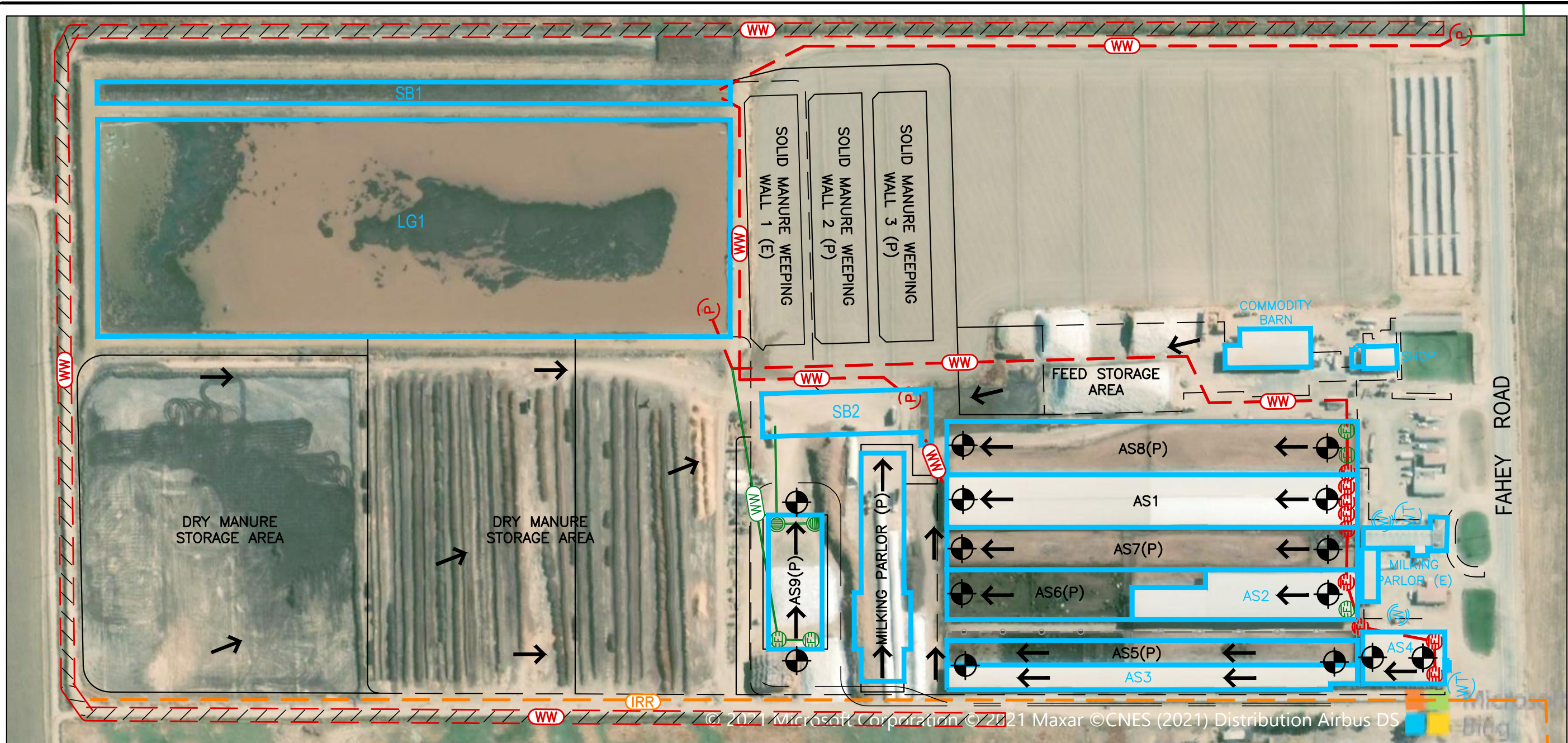


GENERAL SLOPE AND
DIRECTION OF FLOW

DISCHARGE POINTS		
LAND APP. AREA	LATITUDE	LONGITUDE
VIERRA	N37° 07' 06.57"	W120° 59' 57.74"



DATE	BY	REVISIONS	DESCRIPTION	APPD.
4/14/2021	MS			
FILE: 03_site_Vierra.dwg				
JOB NO.: 2021-002				
SYMBOL				



ROOF AREA

ROOF AREA (PROPOSED)

IRRIGATION LINE

WASTEWATER LINE

WASTEWATER SUMP WITH PUMP

FLUSH SYSTEM DRAIN INLET

FLUSH SYSTEM DISCHARGE VALVE

LEGEND

FLUSH SYSTEM DRAIN INLET (PROPOSED)

FLUSH SYSTEM DISCHARGE VALVE (PROPOSED)

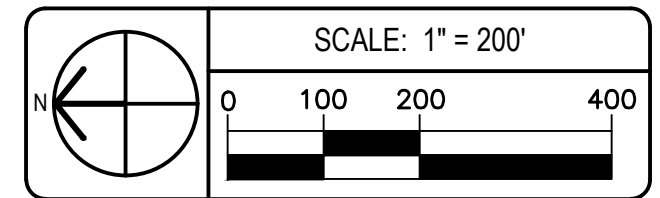
WASTEWATER LINE (PROPOSED)

WELL

WATER TANK

GENERAL SLOPE AND DIRECTION OF FLOW

INSPECTION POINT FOR MONITORING ANIMAL HOUSING AND FLUSH WATER CONVEYANCE SYSTEM



SHEET 4 OF 8

SOUSA

ENGINEERING

INFRASTRUCTURE - DEVELOPMENT - AGRICULTURE

PO BOX 1613
OAKDALE, CA 95361
PH: (209)238-3151
WWW.SOUSAENG.COM

SITE MAP - PRODUCTION AREA - NORTH

CORREIA FAMILY DAIRY

MERCED COUNTY, CA

DRAWN BY: MS

DATE: 8/25/2021

FILE: 04_dpa_dairy.dwg.dwg

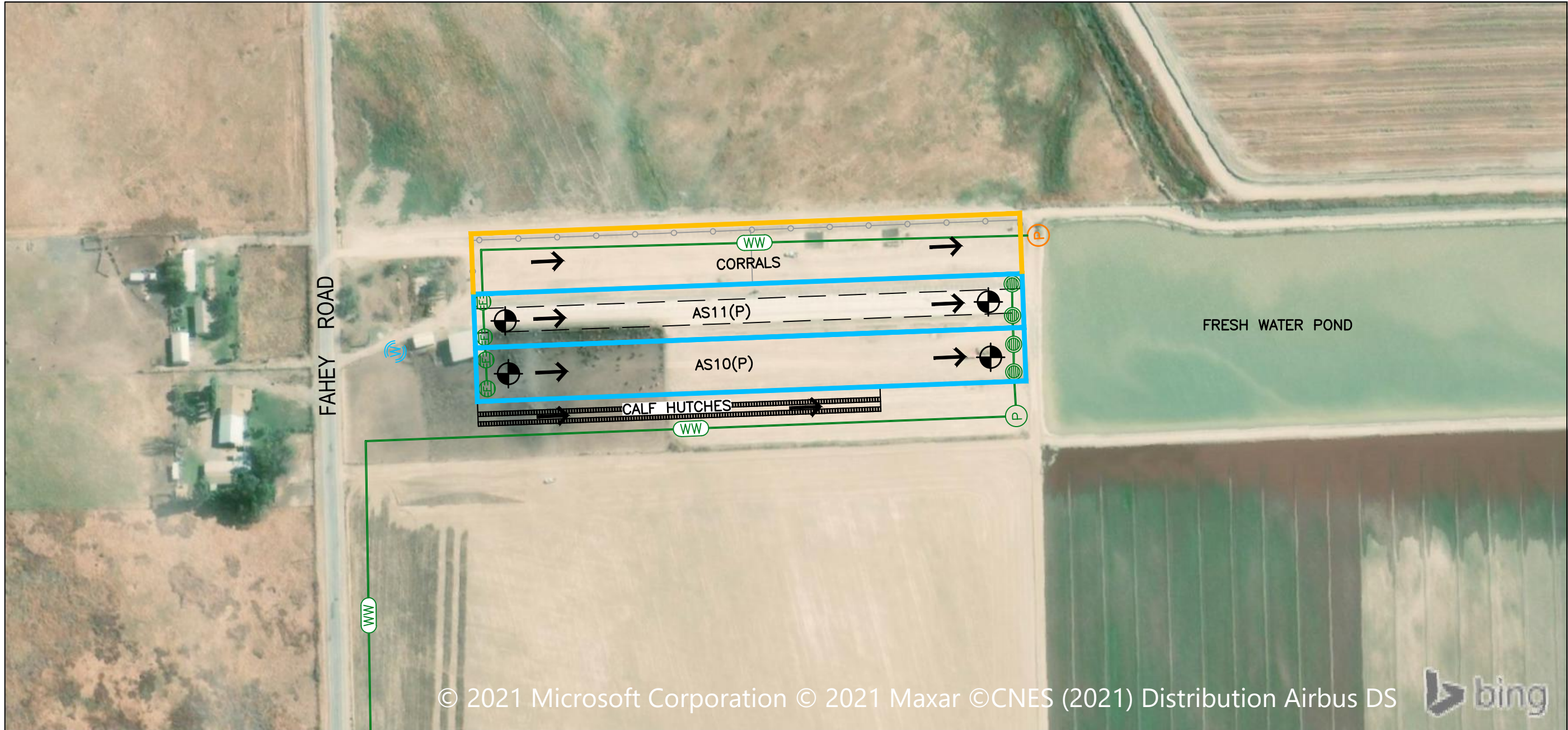
JOB NO.: 2021-002

REVISIONS

SYMBOL

DESCRIPTION

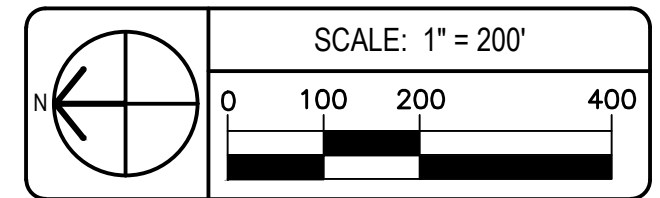
APPD.



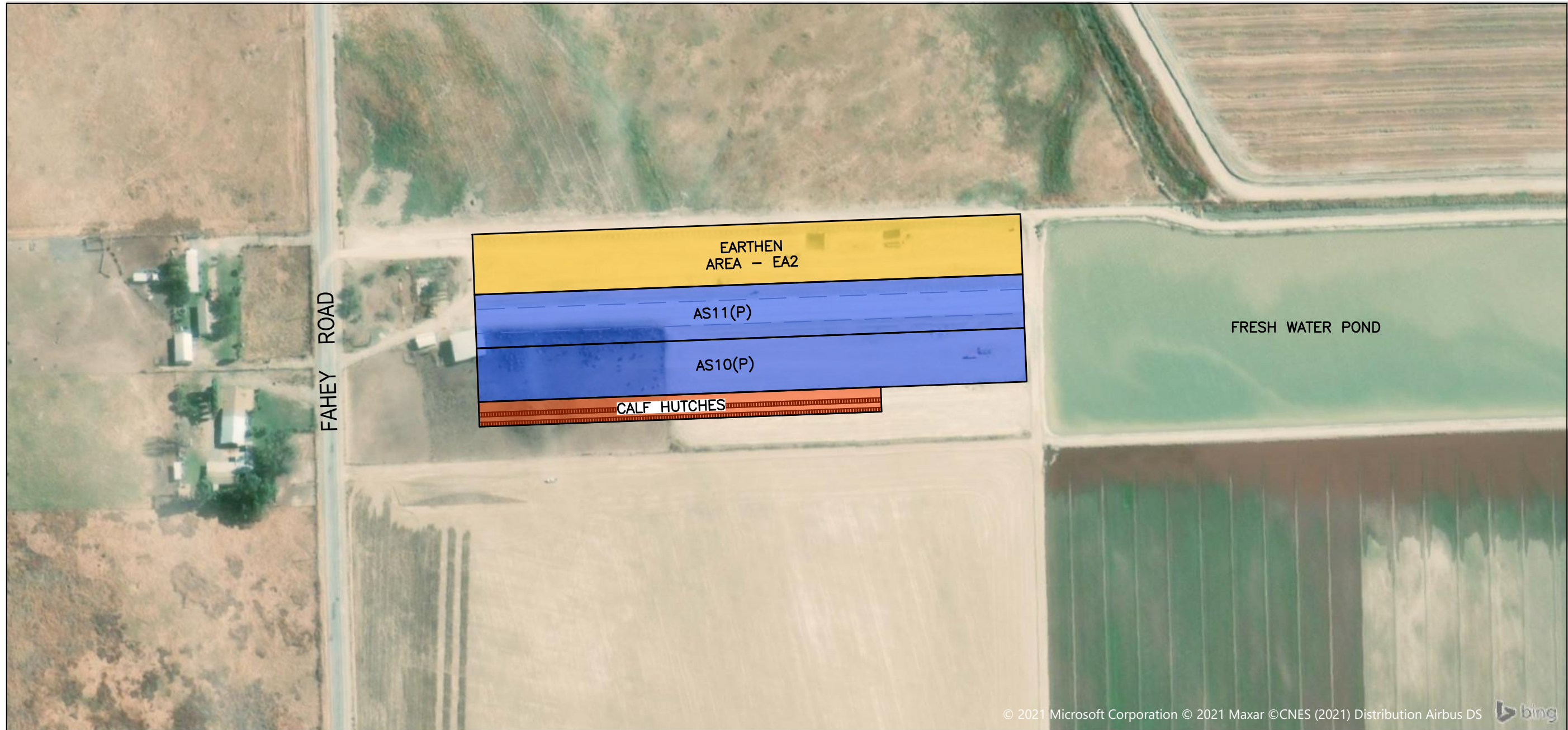
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LEGEND

- (P) ROOF AREA (PROPOSED)
- CORRAL AREA
- WW WASTEWATER LINE (PROPOSED)
- EF FLUSH SYSTEM DRAIN INLET (PROPOSED)
- EF FLUSH SYSTEM DISCHARGE VALVE (PROPOSED)
- W WELL
- GENERAL SLOPE AND DIRECTION OF FLOW
- ⊕ INSPECTION POINT FOR MONITORING ANIMAL HOUSING AND FLUSH WATER CONVEYANCE SYSTEM

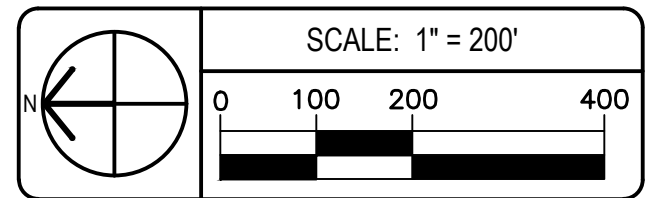


DRAWN BY: MS				
DATE: 4/14/2021				
FILE: 05_dpa_heifers.dwg				
JOB NO.: 2021-002				
SYMBOL	REVISIONS	DESCRIPTION	APPD.	



LEGEND

-  ROOF AREA
-  EARTHEN AREA
-  IMPERVIOUS AREA



DRAWN BY: MS			
DATE: 4/14/2021			
FILE: 07_hydro_south.dwg			
JOB NO.: 2021-002			
SYMBOL	REVISIONS		APPD.
	DESCRIPTION		

PRODUCTION AREA
HYDROLOGIC MAP - SOUTH
CORREIA FAMILY DAIRY
MERCED COUNTY, CA



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National Flood Hazard Layer FIRMMette



120°58'20"W 37°7'47"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **2/23/2021 at 8:07 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMMette



120°58'7"W 37°7'30"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 120°57'30"W 37°7'2"N
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **2/23/2021 at 8:09 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

3. DESIGN, CONSTRUCTION, OPERATION, AND MAINTENANCE DOCUMENTATION

Waste Management Plan Report
General Order No. R5-2007-0035, Attachment B
July 1, 2010 deadline

DAIRY FACILITY INFORMATION

A. NAME OF DAIRY OR BUSINESS OPERATING THE DAIRY: Correia Family Dairy

Physical address of dairy:

26380 W Fahey RD	Gustine	Merced	95322
Number and Street	City	County	Zip Code

Street and nearest cross street (if no address): _____

TRS Data and Coordinates:

9S	9E	27	Mt. Diablo	37° 7' 21.68" N	120° 58' 5.10" W
Township (T_)	Range (R_)	Section (S_)	Baseline meridian	Latitude (N)	Longitude (W)

Date facility was originally placed in operation: 01/01/1984

Regional Water Quality Control Board Basin Plan designation: San Joaquin River Basin

County Assessor Parcel Number(s) for dairy facility:

0070-0270-0008-0000 0070-0270-0011-0000 0070-0270-0019-0000 0070-0270-0020-0000

B. OPERATOR NAME: Correai, Ezequiel R Jr. Telephone no.: (209) 652-0029

Landline Cellular

26380 W Fahey RD	Gustine	CA	95380
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

OPERATOR NAME: Correia, Ezequiel F Telephone no.: (209) 826-1903

Landline Cellular

26380 W Fahey RD	Gustine	CA	95322
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

OPERATOR NAME: Correia, Maria A Telephone no.: (209) 826-1903

Landline Cellular

26380 W Fahey RD	Gustine	CA	95322
Mailing Address Number and Street	City	State	Zip Code

Operator should receive Regional Board correspondence (check): ☒ Yes ☐ No

C. LEGAL OWNER NAME: Correia, Ezequiel F Telephone no.: (209) 826-1903

Landline Cellular

26380 W Fahey RD	Gustine	CA	95322
Mailing Address Number and Street	City	State	Zip Code

Owner should receive Regional Board correspondence (check): ☒ Yes ☐ No

LEGAL OWNER NAME: Correia, Maria A Telephone no.: (209) 826-1903

Landline Cellular

26380 W Fahey RD	Gustine	CA	95322
Mailing Address Number and Street	City	State	Zip Code

Owner should receive Regional Board correspondence (check): ☒ Yes ☐ No

Waste Management Plan Report
General Order No. R5-2007-0035, Attachment B
July 1, 2010 deadline

D. CONTACT NAME: <u>Sousa, Manny</u>		Telephone no.: <u>(209) 238-3151</u>	
Title: <u>Civil Engineer</u>		<u>Landline</u>	<u>Cellular</u>
<u>P.O. Box 1613</u>	<u>Oakdale</u>	<u>CA</u>	<u>95361</u>
Mailing Address Number and Street	City	State	Zip Code

Waste Management Plan Report
General Order No. R5-2007-0035, Attachment B
July 1, 2010 deadline

HERD AND MILKING EQUIPMENT

A. HERD AND MILKING

The milk cow dairy is currently regulated under individual Waste Discharge Requirements.

Total number of milk and dry cows combined as a baseline value in response to the Report of Waste Discharge (ROWD) request of October, 2005:

3,390 milk and dry cows combined (regulatory review is required for any expansion)

Type of Animal	Present Count	Maximum Count	Daily Flush Hours	Avg Live Weight (lbs)
Milk Cows	3,000	3,000	20	1,200
Dry Cows	390	390	20	1,300
Bred Heifers (15-24 mo.)	830	830	16	1,000
Heifers (7-14 mo.)	1,160	1,160	16	500
Calves (4-6 mo.)	415	415	24	
Calves (0-3 mo.)	280	280	24	

Predominant milk cow breed:

Jersey-Holstein Cross

Average milk production:

72 pounds per cow per day

Average number of milk cows per string sent to the milkbarn:

300 milk cows per string

Number of milkings per day:

2.0 milkings per day

Number of times milk tank is emptied/filled each day:

4.0 per day

Number of hours spent milking each day:

20.0 hours per day

B. MILKBARN EQUIPMENT AND FLOOR WASH

Bulk tank wash and sanitizing:

3.0 run cycles/wash

Bulk tank wash vat volume:

36 gallons/cycle

Bulk tank wash wastewater:

432.0 gallons/day

Pipeline wash and sanitizing:

2.0 run cycles/wash

Pipeline wash vat volume:

20 gallons/cycle

Pipeline wash wastewater:

80.0 gallons/day

Reused / recycled water is the source of parlor floor wash water:

☒ Yes ☐ No

Milkbarn / parlor floor wash volume:

15,000 gallons/day

Plate coolers type:

Well Water Cooled (Water Reused/Recycled)

Plate coolers volume:

50,233 gallons/day

Vacuum pumps / air compressors / chillers type:

Mechanically/Air Cooled

Vacuum pumps / air compressors / chillers volume:

0 gallons/day

Milkbarn and equipment wastewater volume generated daily:

50,745 gallons/day

Waste Management Plan Report
General Order No. R5-2007-0035, Attachment B
July 1, 2010 deadline

C. OTHER WATER USES

Reused/recycled water is the source of herd drinking water: ☐ Yes ☒ No

	Milk Cows	Dry Cows	Bred Heifers (15-24 mo.)	Bred Heifers (7-14 mo.)	Calves (4-6 mo.)	Calves (0-3 mo.)
Number of cows drinking from reusable water:	0	0	0	0	0	0
	of 3,000	of 390	of 830	of 1,160	of 415	of 280
Gallons per head per day:	0	0	0	0	0	0

Total reusable water consumed by herd: _____ 0 gallons/day

Reused/recycled water is the source of sprinkler pen water: ☒ Yes ☐ No

Number of sprinklers in the holding pen: _____ 0 sprinklers

Duration of each sprinkler cycle: _____ 0.1 minutes

Number of sprinkler pen runs/milking: _____ 0 cycles/milking

Flow rate for each sprinkler head: _____ 0.1 gallons/minute

Total sprinkler pen wastewater volume: _____ 0 gallons/day

Total fresh water used in manure flush lane system(s): _____ 0 gallons/day

D. MISCELLANEOUS EQUIPMENT

No miscellaneous equipment entered.

E. MILKBARN AND EQUIPMENT SUMMARY

Number of days in storage period: _____ 120 days

Water available for reuse/recycle: _____ 50,233 gallons/day

Recycled water reused: _____ 15,000 gallons/day

Recycled water leaving system: _____ 0 gallons/day

Reusable water balance: _____ 35,233 gallons/day

Volume of milkbarn and equipment wastewater generated for storage period: _____ 6,089,400 gallons/storage period

MANURE AND BEDDING SOLIDS

A. IMPORTED AND FACILITY GENERATED BEDDING

Bedding Type	Imported or Generated (tons)	Density (lbs/cu. ft.)	Applied Separation Efficiency (default)	Solids to Pond (cu. ft./period)
Facility generated bedding	360	40.0	50%	9,000
			Total:	9,000

B. SOLIDS SEPARATION PROCESS

Combined manure solids separation efficiency (weight basis): _____ 40 %

Description of all solids separation equipment used in flushed lane manure management systems:

Solid Manure Weeping Walls.

Waste Management Plan Report
General Order No. R5-2007-0035, Attachment B
July 1, 2010 deadline

C. MANURE AND BEDDING SOLIDS SUMMARY

	cubic feet		gallons	
	day	storage period	day	storage period
Manure generated by the herd (pre-separation):	9,170.31	1,100,438	68,598.70	8,231,844
Manure generated by the herd sent to pond(s):	6,381.94	765,833	47,740.24	5,728,829
Manure generated by the herd sent to dry lot(s):	1,774.23	212,908	13,272.17	1,592,661
Manure solids (herd) removed by separation:	490.94	58,913	3,672.49	440,699
Liquid component in separated solids not sent to pond(s):	523.20	62,784	3,913.80	469,656
Imported and facility generated bedding sent to pond(s):	75.00	9,000	561.04	67,325
Total manure and bedding sent to pond(s):	6,456.94	774,833	48,301.28	5,796,153
Residual manure solids and bedding sent to pond(s) w/factor:	405.71	48,685	3,034.89	364,187
	cubic feet per year		gallons per year	
Residual manure solids and bedding sent to pond(s) w/factor:	148,083		1,107,735	

RAINFALL AND RUNOFF

A. RAINFALL ESTIMATES

Rainfall station nearest the facility: Los Banos

25 year/24 hour storm event (default NOAA Atlas 2, 1973): 2.30 inches/storage period

25 year/24 hour storm event (user-override): inches/storage period

Storage period rainfall (default DWR climate data): 6.03 inches/storage period

Storage period rainfall (user-override): inches/storage period

Flood zone: Zone X

B. IMPERVIOUS AREAS

Name	Surface Area (sq. ft.)	Quantity	25yr/24hr Storm Runoff Coefficient	Storage Period Runoff Coefficient	Runoff Destination
Calf Hutches	34,500	1	0.95	0.50	Drains into pond(s).
Feed Storage Area	93,000	1	0.95	0.50	Drains into pond(s).
Impervious Area 1 - IA1	60,000	1	0.95	0.50	Drains into pond(s).
Impervious Area 2 - IA2	2,500	1	0.95	0.50	Drains into pond(s).
Impervious Area 3 - IA3	2,500	1	0.95	0.50	Drains into pond(s).
Impervious Area 4 - IA4	1,600	1	0.95	0.50	Drains into pond(s).
Solid Manure Weeping Wall	46,300	3	0.95	0.50	Drains into pond(s).

Waste Management Plan Report
General Order No. R5-2007-0035, Attachment B
July 1, 2010 deadline

Surface area that does not run off into pond(s): 0 sq. ft.

Surface area that runs off into pond(s): 333,000 sq. ft.

Total surface area: 333,000 sq. ft.

Runoff from normal storage period rainfall: 625,867 gallons/storage period

Runoff from normal storage period rainfall with 1.5 factor: 938,801 gallons/storage period

25 year/24 hour storm event runoff: 453,572 gallons/storage period

Total surface area runoff: 1,079,439 gallons/storage period

Total surface area runoff with 1.5 factor: 1,392,372 gallons/storage period

C. ROOF AREAS

Name	Surface Area (sq. ft.)	Quantity	Runoff Destination
Animal Shelter 1 - AS1	76,700	1	Wastewater pond
Animal Shelter 10 - AS10	102,200	1	Fresh Water Pond
Animal Shelter 11 - AS11	102,200	1	Fresh Water Pond
Animal Shelter 2 - AS2	34,540	1	Wastewater pond
Animal Shelter 3 - AS3	34,640	1	Wastewater pond
Animal Shelter 4 - AS4	14,840	1	Wastewater pond
Animal Shelter 5 - AS5	35,190	1	Wastewater pond
Animal Shelter 6 - AS6	36,600	1	Wastewater pond
Animal Shelter 7 - AS7	60,435	1	Wastewater pond
Animal Shelter 8 - AS8	76,500	1	Wastewater pond
Animal Shelter 9 - AS9	25,000	1	Wastewater pond
Commodity Barn	10,680	1	Adjacent field
Milking Parlor - Existing	9,970	1	Wastewater pond
Milking Parlor - Proposed	36,700	1	Wastewater pond

Surface area that does not run off into pond(s): 215,080 sq. ft.

Surface area that runs off into pond(s): 441,115 sq. ft.

Total surface area: 656,195 sq. ft.

Runoff from normal storage period rainfall: 1,658,134 gallons/storage period

Runoff from normal storage period rainfall with 1.5 factor: 2,487,201 gallons/storage period

25 year/24 hour storm event runoff: 632,456 gallons/storage period

Total surface area runoff: 2,290,590 gallons/storage period

Total surface area runoff with 1.5 factor: 3,119,657 gallons/storage period

D. EARTHEN AREAS

Name	Surface Area (sq. ft.)	Quantity	25yr/24 Storm Coefficient	Storage Period Coefficient	Runoff Destination
------	------------------------	----------	---------------------------	----------------------------	--------------------

Waste Management Plan Report
General Order No. R5-2007-0035, Attachment B
July 1, 2010 deadline

Earthen Area 1 - EA1	1,064,000	1	0.35	0.20	Drains into pond(s).
Earthen Area 2 - EA2	115,000	1	0.35	0.20	Drains into pond(s).

Surface area that does not run off into pond(s):	<u>0</u> sq. ft.
Surface area that runs off into pond(s):	<u>1,179,000</u> sq. ft.
Total surface area:	<u>1,179,000</u> sq. ft.
Runoff from normal storage period rainfall:	<u>886,363</u> gallons/storage period
Runoff from normal storage period rainfall with 1.5 factor:	<u>1,329,545</u> gallons/storage period
25 year/24 hour storm event runoff:	<u>591,644</u> gallons/storage period
Total surface area runoff:	<u>1,478,007</u> gallons/storage period
Total surface area runoff with 1.5 factor:	<u>1,921,188</u> gallons/storage period

E. TAILWATER MANAGEMENT

No fields with tailwater entered.

Waste Management Plan Report
General Order No. R5-2007-0035, Attachment B
July 1, 2010 deadline

LIQUID STORAGE

A. POND OR BASIN DESCRIPTION: LG1

Pond is rectangular in shape: ☒ Yes ☐ No

Dimensions			
Earthen Length (EL):	<u>1,180</u> ft.	Earthen Depth (ED):	<u>9</u> ft.
Earthen Width (EW):	<u>404</u> ft.	Side Slope (S):	<u>1.5</u> ft. (h:1v)
Free Board (FB):	<u>2</u> ft.	Dead Storage Loss (DS):	<u>1.0</u> ft.
Calculations			
Liquid Length (LL):	<u>1,174</u> ft.	Storage Volume Adjusted for Dead Storage Loss:	<u>2,719,272</u> cu. ft.
Liquid Width (LW):	<u>398</u> ft.		
Pond Surface Area:	<u>476,720</u> sq. ft.	Pond Marker Elevation:	<u>6.4</u> ft.
Storage Volume:	<u>3,156,251</u> cu. ft.	Evaporation Volume:	<u>2,922,616</u> gals/period
		Adjusted Surface Area:	<u>465,809</u> sq. ft.

POND OR BASIN DESCRIPTION: SB1

Pond is rectangular in shape: ☒ Yes ☐ No

Dimensions			
Earthen Length (EL):	<u>1,180</u> ft.	Earthen Depth (ED):	<u>9</u> ft.
Earthen Width (EW):	<u>40</u> ft.	Side Slope (S):	<u>1.5</u> ft. (h:1v)
Free Board (FB):	<u>2</u> ft.	Dead Storage Loss (DS):	<u>0.0</u> ft.
Calculations			
Liquid Length (LL):	<u>1,174</u> ft.	Storage Volume Adjusted for Dead Storage Loss:	<u>191,653</u> cu. ft.
Liquid Width (LW):	<u>34</u> ft.		
Pond Surface Area:	<u>47,200</u> sq. ft.	Pond Marker Elevation:	<u>6.3</u> ft.
Storage Volume:	<u>191,653</u> cu. ft.	Evaporation Volume:	<u>242,381</u> gals/period
		Adjusted Surface Area:	<u>38,631</u> sq. ft.

Waste Management Plan Report
General Order No. R5-2007-0035, Attachment B
July 1, 2010 deadline

POND OR BASIN DESCRIPTION: SB2

Pond is rectangular in shape: ☒ Yes ☐ No

Dimensions			
Earthen Length (EL):	<u>230</u> ft.	Earthen Depth (ED):	<u>2</u> ft.
Earthen Width (EW):	<u>108</u> ft.	Side Slope (S):	<u>0.1</u> ft. (h:1v)
Free Board (FB):	<u>1</u> ft.	Dead Storage Loss (DS):	<u>0.0</u> ft.
Calculations			
Liquid Length (LL):	<u>230</u> ft.	Storage Volume Adjusted for Dead Storage Loss:	<u>24,739</u> cu. ft.
Liquid Width (LW):	<u>108</u> ft.		
Pond Surface Area:	<u>24,840</u> sq. ft.	Pond Marker Elevation:	<u>0.4</u> ft.
Storage Volume:	<u>24,739</u> cu. ft.	Evaporation Volume:	<u>155,302</u> gals/period
		Adjusted Surface Area:	<u>24,752</u> sq. ft.

Potential storage losses (due to dead storage): 436,979.0 cubic feet - or - 3,268,829.9 gallons

Liquid storage surface area: 531,940 sq. ft.

Rainfall onto retention pond(s): 2,062,767 gallons/storage period

Rainfall runoff into retention pond(s): 3,170,364 gallons/storage period

Normal rainfall onto retention pond(s) with 1.5 factor: 3,094,151 gallons/storage period

Normal rainfall runoff into retention pond(s) with 1.5 factor: 4,755,546 gallons/storage period

Storage period evaporation (default): 13.42 inches/storage period

Storage period evaporation (user-override): inches/storage period

Storage period evaporation volume: 3,320,299 gallons/storage period

Manure and bedding sent to pond(s): 5,796,153 gallons/storage period

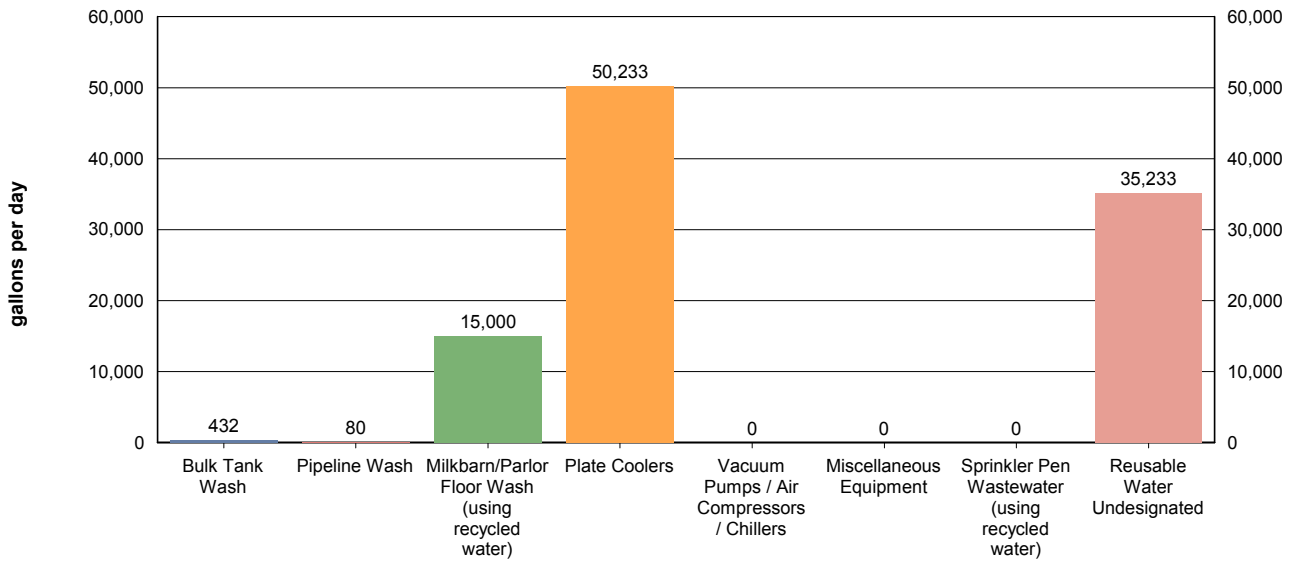
Milkbarn water sent to pond(s): 6,089,400 gallons/storage period

Fresh flush water for storage period: 0 gallons/storage period

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CHARTS

A. MILKBARN WASTEWATER SENT TO POND(S)



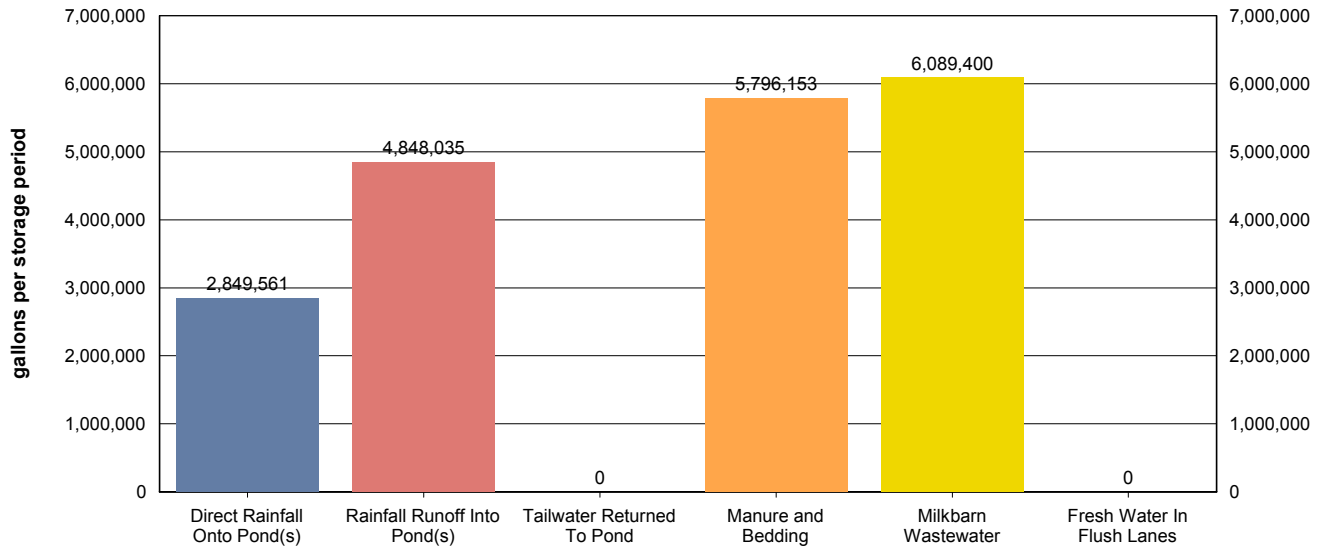
Values shown in chart are approximate values per day.

Total milkbarn wastewater generated daily: 50,745 gallons/day

Total milkbarn wastewater generated per period: 6,089,400 gallons/storage period

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B. PROCESS WASTEWATER (NORMAL PRECIPITATION)



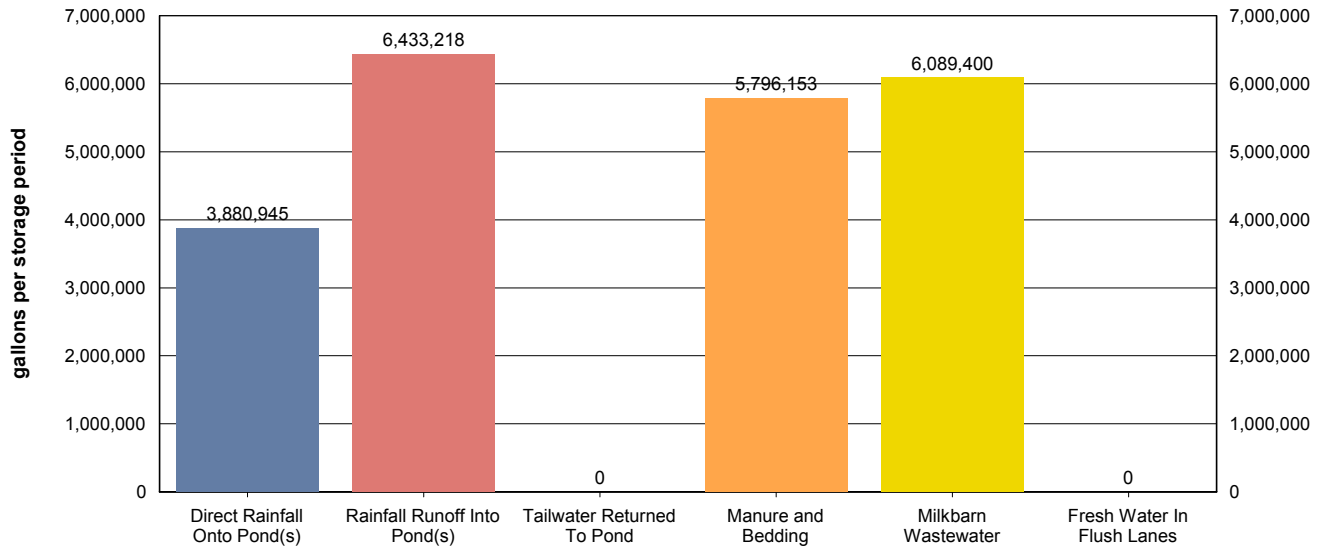
Values shown in chart are approximate values for storage period.

Storage period:	<u>120 days</u>
Total process wastewater generated daily:	<u>163,193 gallons/day</u>
Total process wastewater generated per period:	<u>19,583,150 gallons/storage period</u>
Total process wastewater removed due to evaporation:	<u>3,320,299 gallons/storage period</u>
Total storage capacity required:	<u>16,262,851 gallons</u>
	<u>2,174,027 cu. ft.</u>
Existing storage capacity (adjusted for dead storage loss):	<u>21,960,292 gallons</u>
	<u>2,935,664 cu. ft.</u>

Considering normal precipitation, existing capacity meets estimated storage needs: ☒ Yes ☐ No

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C. PROCESS WASTEWATER (NORMAL PRECIPITATION WITH 1.5 FACTOR)



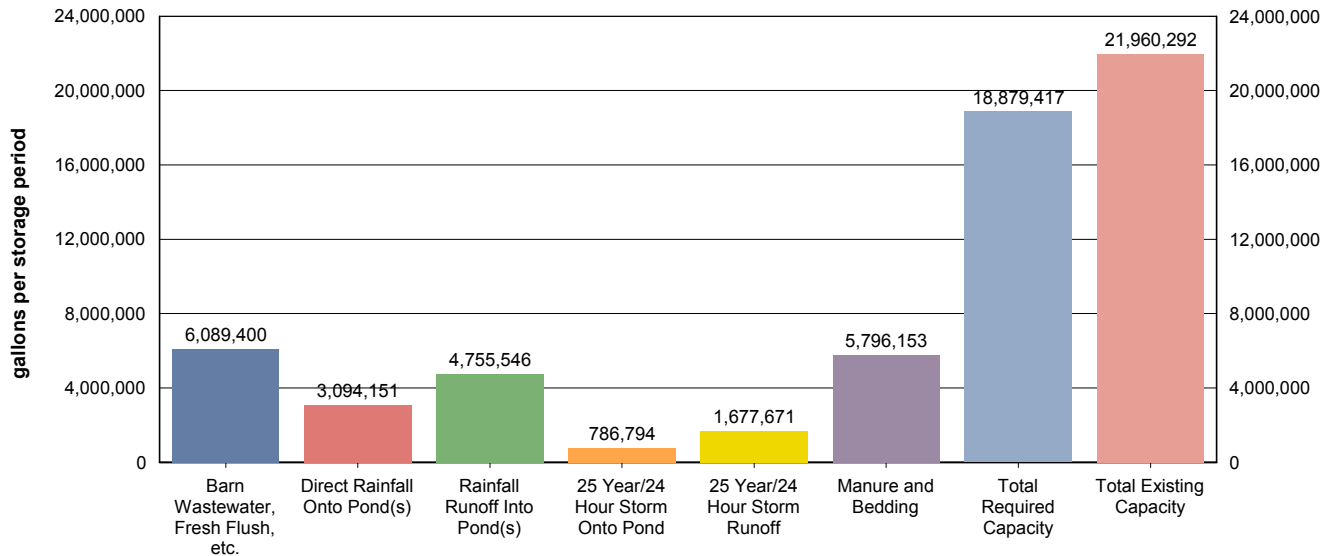
Values shown in chart are approximate values for storage period.

Storage period:	<u>120 days</u>
Total process wastewater generated daily:	<u>184,998 gallons/day</u>
Total process wastewater generated per period:	<u>22,199,716 gallons/storage period</u>
Total process wastewater removed due to evaporation:	<u>3,320,299 gallons/storage period</u>
Total storage capacity required:	<u>18,879,417 gallons</u>
	<u>2,523,811 cu. ft.</u>
Existing storage capacity (adjusted for dead storage loss):	<u>21,960,292 gallons</u>
	<u>2,935,664 cu. ft.</u>

Considering factored precipitation, existing capacity meets estimated storage needs: ☒ Yes ☐ No

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D. STORAGE VOLUME ASSESSMENT (NORMAL PRECIPITATION WITH 1.5 FACTOR)



Values shown in chart are approximate values for storage period.

Storage period:	<u>120 days</u>
Barn wastewater, fresh flush water, and tailwater:	<u>6,089,400</u> gallons/storage period
Manure and bedding sent to pond:	<u>5,796,153</u> gallons/storage period
Precipitation onto pond:	<u>3,094,151</u> gallons/storage period
Precipitation runoff:	<u>4,755,546</u> gallons/storage period
25 year/24 hour storm onto pond:	<u>786,794</u> gallons/storage period
25 year/24 hour storm runoff:	<u>1,677,671</u> gallons/storage period
Residual solids after liquids have been removed (liquid equivalent):	<u>364,187</u> gallons/storage period
Total process wastewater removed due to evaporation:	<u>3,320,299</u> gallons/storage period
Total required capacity:	<u>18,879,417</u> gallons/storage period
Total existing capacity:	<u>21,960,292</u> gallons/storage period
Existing capacity meets estimated storage needs:	☒ Yes ☐ No

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OPERATION AND MAINTENANCE PLAN

The goal of the Operation and Maintenance Plan is to eliminate discharges of waste or storm water to surface waters from the production area and the protection of underlying soils and ground water.

A. POND MAINTENANCE

i. FREEBOARD MONITORING

1. Freeboard will be monitored monthly from June 1 through September 1 (dry season) and weekly from October 1 through May 31 (wet season). The results will be recorded on a Dairy Production Area Visual Inspection Form.
2. Freeboard will be monitored during and after each significant storm event and the results recorded on a Production Area Significant Storm Event Inspection Form.
3. Ponds will be photographed on the first day of each month. Pond photos will be labeled and maintained with the dairy's monitoring records.

ii. PREPARATION FOR MAINTAINING WINTER STORAGE CAPACITY

1. The retention pond(s) will begin to be lowered to the minimum operating level on or before a designated date each year.
2. The minimum operating level will include the necessary storage volume as identified in Section II.A in Attachment B of the General Order.

iii. OTHER POND MONITORING

1. At the time of each monitoring for freeboard, the pond(s) will be inspected for evidence of excessive odors, mosquito breeding, algae, or equipment damage; and issues with berm integrity, including cracking, slumping, erosion, excess vegetation, animal burrows, and seepage. Any issues identified and corrective actions performed will be recorded on a Dairy Production Area Visual Inspection Form - Other Pond Monitoring.
2. At the time of each monitoring during and after each significant storm event, the ponds will be inspected for evidence of any discharge and issues with berm integrity, including cracking, slumping, erosion, excess vegetation, animal burrows, and seepage. Any issues identified and corrective actions performed will be recorded on a Production Area Significant Storm Event Inspection Form.

iv. SOLIDS REMOVAL PROCEDURES

1. The average thickness of the solids accumulated on the bottom of the pond(s) will be measured on the designated interval using the owner, operator, and/or designer specified procedure.
2. Once solids/sludge on the bottom of the pond(s) reach the owner, operator, and/or designer specified critical thickness, solids/sludge will be removed so that adequate capacity is maintained.
3. When necessary, solids/sludge will be removed using the owner, operator, and/or designer specified methods for protecting any pond liner.

OPERATIONS AND MAINTENANCE PLAN FOR POND: LG1

Dry season freeboard monitoring will occur on the 1st of each month.

Wet season freeboard monitoring will occur every Monday of each week.

Process wastewater pond contents will be lowered to the minimum operating level (elevation) of 1.0 feet above the pond invert beginning in August of each year.

Sludge accumulation will be measured annually.

The following method will be used to measure solids/sludge accumulation:

Solids will be measured manually after lowering of liquid pond level.

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When solids/sludge accumulate to a thickness of 2.0 feet, the following method will be used to maintain adequate storage capacity while protecting any pond liner:

Solids and/or sludge will be removed with an excavator.

OPERATIONS AND MAINTENANCE PLAN FOR POND: SB1

Dry season freeboard monitoring will occur on the 1st of each month.

Wet season freeboard monitoring will occur every Monday of each week.

Process wastewater pond contents will be lowered to the minimum operating level (elevation) of 0.0 feet above the pond invert beginning in August of each year.

Sludge accumulation will be measured annually.

The following method will be used to measure solids/sludge accumulation:

Solids will be measured manually after lowering of liquid pond level.

When solids/sludge accumulate to a thickness of 8.0 feet, the following method will be used to maintain adequate storage capacity while protecting any pond liner:

Solids and/or sludge will be removed with an excavator.

OPERATIONS AND MAINTENANCE PLAN FOR POND: SB2

Dry season freeboard monitoring will occur on the 1st of each month.

Wet season freeboard monitoring will occur every Monday of each week.

Process wastewater pond contents will be lowered to the minimum operating level (elevation) of 0.0 feet above the pond invert beginning in August of each year.

Sludge accumulation will be measured annually.

The following method will be used to measure solids/sludge accumulation:

Solids will be measured manually after lowering of liquid pond level.

When solids/sludge accumulate to a thickness of 1.0 feet, the following method will be used to maintain adequate storage capacity while protecting any pond liner:

Solids will be removed with a backhoe, excavator, or loader.

B. RAINFALL COLLECTION SYSTEM MAINTENANCE

i. Annually, rainfall collection systems will be assessed to ensure:

1. Conveyances are free of debris and operating within designer/manufacturer specifications.
2. Components are properly fastened according to designer/manufacturer specifications.
3. All downspouts and related infrastructure are connected to conveyances that divert water away from manured areas.
4. Water from the rainfall collection system(s) is diverted to an appropriate destination.

<i>Buildings with rooftop rainfall collection systems</i>	Quantity	Surface Area (sq. ft.)
Animal Shelter 1 - AS1	1	76,700
Animal Shelter 10 - AS10	1	102,200
Animal Shelter 11 - AS11	1	102,200
Animal Shelter 2 - AS2	1	34,540

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Animal Shelter 3 - AS3	1	34,640
Animal Shelter 4 - AS4	1	14,840
Animal Shelter 5 - AS5	1	35,190
Animal Shelter 6 - AS6	1	36,600
Animal Shelter 7 - AS7	1	60,435
Animal Shelter 8 - AS8	1	76,500
Animal Shelter 9 - AS9	1	25,000
Commodity Barn	1	10,680
Milking Parlor - Existing	1	9,970
Milking Parlor - Proposed	1	36,700

Assessment for buildings with rooftop rainfall collection systems will occur on or before: 1st of October

Assessment for other rainfall collections systems will occur on or before: 1st of October

Description of how rainfall collection systems will be assessed:

Gutters, downspouts, inlets, and piping will be inspected and repaired as required prior to the rain season.

C. CORRAL MAINTENANCE

- i. Monthly from June 1st through September 30th (dry season) and weekly from October 1st through May 31st (wet season), the perimeter of the corrals and pens will be assessed to ensure that runoff controls such as berms are functioning correctly, and that all water that contacts waste is collected and diverted into the wastewater retention pond (s). Any issues identified and corrective actions performed will be recorded on a Dairy Production Area Visual Inspection Form - Corrals.
- ii. The corrals will be assessed by the designated date to determine:
 1. Whether manure needs to be removed from the corrals based on the owner, operator, and/or designer specified conditions.
 2. Whether there are depressions within the corrals that should be filled/groomed to prevent ponding.
- iii. Removal of manure and/or regrading, when necessary, will be completed on or before the designated month/day of each year.

Day of the month dry season assessment will occur: 1st of each month

Day of the week wet season assessment will occur: Monday

Solid manure removal and regrading assessment will occur on or before: 1st of October

Conditions requiring manure removal and/or regrading:

Solids will be removed from corrals a minimum of once annually as needed. After solids removal corrals will be graded to promote drainage.

Solid manure removal and/or regrading will occur on or before: 1st of November

D. FEED STORAGE AREA MAINTENANCE

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- i. During the dry season and prior to the wet season, the perimeter of storage areas will be assessed to ensure all runoff controls such as berms are functioning correctly and runoff and leachate from the areas are collected and diverted into the wastewater pond(s). Any issues identified and corrective actions performed will be recorded on a Dairy Production Area Visual Inspection Form - Manure and Feed Storage Areas.
- ii. During the wet season, feed storage area(s) will be assessed to determine if there are depressions within any feed storage area that should be filled or repaired to prevent ponding.
- iii. Any necessary regrading/resurfacing and berm/conveyance maintenance will be completed on an annual basis.

Day of the month dry season assessment will occur: 1st of each month

Day of the week wet season assessment will occur: Monday

Regrading/resurfacing and berm maintenance assessment will occur on or before: 1st of October

Regrading/resurfacing and berm maintenance completion will occur on or before: 1st of November

E. SOLID MANURE STORAGE AREA MAINTENANCE

- i. During the dry season and prior to the wet season, the perimeter of manure storage areas will be assessed to ensure all runoff controls such as berms are functioning correctly and runoff and leachate from the areas are collected and diverted into the wastewater pond(s). Any issues identified and corrective actions performed will be recorded on a Dairy Production Area Visual Inspection Form - Manure and Feed Storage Areas.
- ii. During the wet season, manure storage area(s) will be assessed to determine if there are depressions within any manure storage area that should be filled to prevent ponding.
- iii. Any necessary regrading/resurfacing and berm/conveyance maintenance will be completed on an annual basis.

Day of the month dry season assessment will occur: 1st of each month

Day of the month wet season assessment will occur: Monday

Regrading/resurfacing and berm maintenance assessment will occur on or before: 1st of October

Regrading/resurfacing and berm maintenance completion will occur on or before: 1st of November

F. ANIMAL HOUSING AND FLUSH WATER CONVEYANCE SYSTEM MAINTENANCE

- i. A map will be attached that identifies critical points for monitoring the animal housing and flush water conveyance system to verify that water is being managed as identified in this Waste Management Plan. These points will be maintained at owner, operator, and/or designer specified intervals.

Animal housing area assessment will occur on or before: 1st of October

Animal housing drainage system maintenance will occur on or before: 1st of October

Animal housing area drainage system assessment and maintenance methods:

Animal housing drainage systems will be inspected, cleaned, and repaired as required daily during operating hours.

G. MORTALITY MANAGEMENT

- i. Dead animals will be stored, removed, and disposed of properly.

Rendering company or landfill name: Darling International

Rendering company or landfill telephone number: (559) 268-5325

H. ANIMALS AND SURFACE WATER MANAGEMENT

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- i. A system will be in place, monitored, and maintained to prevent animals from entering any surface waters when a stream or other surface water crosses or adjoins the corral(s).

Does a stream or any other surface water cross or adjoin the corrals? ☐ Yes ☒ No

I. MONITORING SALT IN ANIMAL RATIONS

- i. The combined quantity of minerals as salt in animal drinking water and feed rations will be reviewed by a qualified nutritionist on a routine basis to verify that minerals are limited to the amount required to maintain animal health and optimum production . As feed rations change, mineral content may change.

Assessment interval: Annually

J. CHEMICAL MANAGEMENT

- i. Chemicals and other contaminants handled at the facility will not be disposed of in any manure or process wastewater, storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants.

No chemicals entered.

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REQUIRED ATTACHMENTS

The following list, based upon user selections and data entries, describes the minimum required attachments that must be submitted with the Waste Management Plan for the reporting schedule of 'July 1, 2010'.

A. SITE MAP(S)

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of the features of the production area including the following in sufficient detail: structures used for animal housing, milk parlor, and other buildings; corrals and ponds; solids separation facilities (settling basins or mechanical separators); other areas where animal wastes are deposited or stored; feed storage areas; drainage flow directions and nearby surface waters; all water supply wells (domestic, irrigation, and barn wells) and groundwater monitoring wells.

Production area map reference number: Exhibit Sheets 4 & 5

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of the features of all land application areas (land under the Discharger's control, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient recycling) including the following in sufficient detail: a field identification system (Assessor's Parcel Number; field by name or number; total acreage of each field; crops grown; indication if each field is owned, leased, or used pursuant to a formal agreement); indication of what type of waste is applied (solid manure only, wastewater only, or both solid manure and wastewater); drainage flow direction in each field, nearby surface waters, and storm water discharge points; tailwater and storm water drainage controls; subsurface (tile) drainage systems (including discharge points and lateral extent); irrigation supply wells and groundwater monitoring wells; sampling locations for discharges of storm water and tailwater to surface water from the field.

Application area map reference number: Exhibit Sheets 2 & 3

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of all cropland (land that is part of the dairy but not used for dairy waste application) including the following in sufficient detail: Assessor's Parcel Number, total acreage, crops grown, and information on who owns or leases the field. The Waste Management Plan shall indicate if such cropland is covered under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Order No. R5-2006-0053 for Coalition Group or Order No. R5-2006-0054 for Individual Discharger, or updates thereto).

Non-application area map reference number: n/a

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of all off-property domestic wells within 600 feet of the production area or land application area(s) associated with the dairy and the location of all municipal supply wells within 1,500 feet of the production area or land application area(s) associated with the dairy.

Well area map reference number: Exhibit Sheets 4 & 5

Provide a site map (or maps) of appropriate scale to show property boundaries and a vicinity map, north arrow and the date the map was prepared. The map shall be drawn on a published base map (e.g., a topographic map or aerial photo) using an appropriate scale that shows sufficient details of all facilities.

Vicinity map reference number: Exhibit Sheet 1

B. PROCESS WASTEWATER MAP(S)

Provide a site map (or maps) of appropriate scale to show property boundaries and the location of the features of the production area including the following in sufficient detail: process wastewater conveyance structures, discharge points, and discharge /mixing points with irrigation water supplies; pumping facilities and flow meter locations; upstream diversion structures, drainage ditches and canals, culverts, drainage controls (berms/levees, etc.), and drainage easements; and any additional components of the waste handling and storage system.

Production infrastructure system area map reference number: Exhibit Sheets 3 & 4

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Provide a site map (or maps) of appropriate scale to show property boundaries and the location of the features of all land application areas (land under the Discharger's control, whether it is owned, rented, or leased, to which manure or process wastewater from the production area is or may be applied for nutrient recycling) including the following in sufficient detail: process wastewater conveyance structures, discharge points and discharge mixing points with irrigation water supplies; pumping facilities; flow meter locations; drainage ditches and canals, culverts, drainage controls (berms, levees, etc.), and drainage easements.

Land application infrastructure system area map reference number: Exhibit Sheet 2

C. EXCESS PRECIPITATION CONTINGENCY REPORT

There were no attachment references entered or required for this attachment section.

D. OPERATION AND MAINTENANCE PLAN

Attach a map that identifies critical points for monitoring the system to verify that water is being managed as identified in this Waste Management Plan (see Attachment B, Pg B-7 V.F, V.G, and V.H for additional requirements).

Animal housing assessment map reference number: Exhibit Sheet 3

E. FLOOD PROTECTION / INUNDATION REPORT

Provide a published flood zone map that shows the facility is outside the relevant flood zones.

Flood zone map and/or document reference number: Exhibit Sheet 8

F. BACKFLOW PROTECTION

Attach documentation from a trained professional (i.e. a person certified by the American Backflow Prevention Association, an inspector from a state or local governmental agency who has experience and/or training in backflow prevention, or a consultant with such experience and/or training), as specified in Required Reports and Notices H.1 of Waste Discharge Requirements General Order No. R5-2007-0035, that there are no cross-connections that would allow the backflow of wastewater into a water supply well, irrigation well, or surface water as identified on the Site Map.

Backflow documentation reference number: WMP Section 1.b.

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CERTIFICATION

A. DAIRY FACILITY INFORMATION

Name of dairy or business operating the dairy: Correia Family Dairy

Physical address of dairy:

26380 W Fahey RD

Gustine

Merced

95322

Number and Street

City

County

Zip Code

Street and nearest cross street (if no address): _____

B. DOCUMENTATION OF QUALIFICATIONS AND PLAN DEVELOPMENT

I have reviewed the portion of the waste management plan that is related to storage capacity facility and design specifications in accordance with Item II, Attachment B of the Waste Discharge Requirements General Order for Existing Milk Cow Dairies - Order No. R5-2007-0035 and certify that this plan was prepared by, or under the responsible charge of, and certified by a civil engineer who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work.

Storage capacity is:

Insufficient

- ☐ Retrofitting Plan/Schedule/Design Criteria attached in accordance with Attachment B, II.B. 1-5 and Attachment B, II. C.

Sufficient

- ☒ Certification 1 - Certified in accordance with Attachment B, II. A. 1-8. (no contingency plan)
- ☐ Certification 2 - Certified in accordance with Attachment B, II. A. 1-8, II. C. (with contingency plan attached)



CIVIL ENGINEER'S WET STAMP

8/25/2021

SIGNATURE OF CIVIL ENGINEER

DATE

Manny Sousa

PRINT OR TYPE NAME

P.O. Box 1613; Oakdale, CA 95361

MAILING ADDRESS

(209) 238-3151

PHONE NUMBER

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C. OWNER AND/OR OPERATOR CERTIFICATION

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



SIGNATURE OF OWNER

Ezequiel F Correia

PRINT OR TYPE NAME

8/25/2021

DATE



SIGNATURE OF OPERATOR

Ezequiel R Correia, Jr.

PRINT OR TYPE NAME

8/25/2021

DATE



Sousa
ENGINEERING
INFRASTRUCTURE-DEVELOPMENT-
AGRICULTURE

PO BOX 1613
OAKDALE, CA 95361
PHONE: (209)238-3151
www.sousaeng.com

**VECTOR CONTROL PLAN
FOR
CORREIA FAMILY DAIRY
MERCED COUNTY, CA**

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- 2. BEST MANAGEMENT PRACTICES**
 - a. Land Application Areas
 - b. Dairy Production Area (DPA)
- 3. CONTACT INFORMATION**

1. INTRODUCTION

Vector control is an important aspect of disease prevention and public health. Without proper management, agricultural production facilities can create or enhance opportunities for vectors to develop and proliferate. Certain land management practices can reduce vector populations thereby reducing long-term vector treatment costs, reducing the amount of pesticides used in vector control operations, helping to protect public health, and contributing to an integrated pest management (IPM) approach to vector control.

Integrated Pest Management is an approach that focuses on site-specific, scientifically sound decisions to manage pest populations by matching a wide variety of techniques with the conditions found on site. These techniques are commonly grouped into four categories:

1. Source reduction or physical control—environmental manipulation that results in a reduction of vector development sites.
2. Biological Control—use of biological agents to limit vector populations
3. Chemical Control—larvicides (materials that kill immature larval vectors and mosquitoes) and adulticides (materials that kill adult vectors and mosquitoes)
4. Cultural Control—change the behavior of people so that their actions prevent the development of vectors or the transmission of vector-borne disease.

Through the adoption of these policies and procedures, this Plan will provide an outline to effectively control vectors by physical, cultural, and biological means.

The Vector Reduction Best Management Practices (BMPs) referred to in this document are the recommended land management practices that can provide a reduction in vector populations by various means including: reducing or eliminating breeding areas, increasing the efficacy of biological controls, increasing the efficacy of chemical controls, and improving access for control operations.

While it is generally accepted that vector production from all sources may be reduced through the widespread implementation of vector Reduction BMPs, these policies specifically target the most severe vector problems with the greatest likelihood of responding through the use of BMPs.

2. **BEST MANAGEMENT PRACTICES (BMPs)**

- a. **Land Application Areas:** for Land Application Areas, the following are areas of concern and recommended BMPs for vector control:

Common Vector Development Areas

- Vegetated ditches
- Seepage or flooding of fallow fields
- Irrigation tail water return sumps
- Blocked ditches or culverts
- Leaky water control structures
- Irrigated pastures
- Low areas caused by improper grading
- Broken or leaky irrigation pipes or valves

Special Concerns

Agricultural practices vary among growers, locations, and conventional or organic production methods. Pesticide regulations can affect the ability to use chemical control. The Best Management Practices below are offered as tools to balance the economic and agronomic requirements of the growers and land owners with the need for effective vector control.

General Vector Reduction Principles

1. Prevent or eliminate unnecessary standing water that stands for more than 72 –96 hours during mosquito season which can start as early as March and extend through October depending on weather.
2. Maintain access for Abatement District staff to monitor and treat mosquito breeding sources.
3. Minimize emergent vegetation and surface debris on the water.
4. Contact the County Department of Environmental Health or Mosquito Abatement District for technical guidance or assistance in implementing vector reduction BMPs.

Vector Reduction BMPs for Land Application Areas

Ditches and Drains

- DD-1** Construct or improve ditches with at least 2:1 slopes and a minimum 4-foot bottom. Consider a 3:1 slope or greater to discourage burrowing animal damage, potential seepage problems, and prevent unwanted vegetation growth. Other designs may be approved by the MVCD based on special circumstances.
- DD-2** Keep ditches clean and well-maintained. Periodically remove accumulated sediment and vegetation. Maintain ditch grade to prevent areas of standing water.

- DD-3** Design irrigation systems to use water efficiently and drain completely to avoid standing water.

Irrigated Pastures

- IP-1** Grade field to achieve efficient use of irrigation water. Use NRCS guidelines for irrigated pastures. Initial laser leveling and periodic maintenance to repair damaged areas are needed to maintain efficient water flow.
- IP-2** Irrigate only as frequently as is needed to maintain proper soil moisture. Check soil moisture regularly until you know how your pasture behaves
- IP-3** Do not over fertilize. Excess fertilizers can leach into irrigation tail water, making mosquito production more likely in ditches or further downstream
- IP-4** Apply only enough water to wet the soil to the depth of rooting.
- IP-5** Drain excess water from the pasture within 24 hours following each irrigation. This prevents scalding and reduces the number of weeds in the pasture. good check slopes are needed to achieve drainage. A drainage ditch may be used to remove water from the lower end of the field.
- IP-6** Inspect fields for drainage and broken checks to see whether re-leveling or reconstruction of levees is needed. Small low areas that hold water can be filled and replanted by hand. Broken checks create cross-leakage that provide habitat for vectors.
- IP-7** Keep animals off the pasture while the soil is soft. An ideal mosquito habitat is created in irrigated pastures when water collects in hoof prints of livestock that were run on wet fields or left in the field during irrigation. Keeping animals off wet fields until soils stiffen also protects the roots of the forage crop and prevents soil compaction that interferes with plant growth.
- IP-8** Break up pastures into smaller fields so that the animals can be rotated from one field to another. This allows fields to dry between irrigations and provides a sufficient growth period between grazings. It also prevents hoof damage (pugging), increases production from irrigated pastures, and helps improve water penetration into the soil by promoting a better root system.

- b. Dairy Production Area (DPA):** for the Dairy Production Area, the following are areas of concern and recommended BMPs for vector control:

Common Vector Development Areas

- Wastewater lagoons
- Animal washing areas

- Drain ditches
- Sumps/ponds
- Watering troughs

Special Concerns

Dairy and associated agricultural practices vary; however, these practices need to consider mosquito and vector control issues. The Best Management Practices for Vector Reduction below offer options to balance the requirements of the dairy operators with the need for effective vector control.

General Vector Control Principles

1. Prevent or eliminate unnecessary standing water that remains for more than 72 –96 hours during mosquito season which can start as early as March and extend through October depending on weather.
2. Maintain access for Abatement District staff to monitor and treat mosquito breeding sources.
3. Minimize emergent vegetation and surface debris on the water.
4. Contact the County Department of Environmental Health or Mosquito Abatement District for technical guidance or assistance in implementing vector reduction BMPs.

Vector Reduction BMPs for Dairy Production Area

- DA-1 All holding ponds should be surrounded by lanes of adequate width to allow safe passage of vector control equipment. This includes keeping the lanes clear of any materials or equipment (e.g. trees, calf pens, hay stacks, silage, tires, equipment, etc.).
- DA-2 If fencing is used around the holding ponds, it should be placed on the outside of the lanes with gates provided for vehicle access.
- DA-3 It is recommended that all interior banks of the holding ponds should have a grade of at least 2:1.
- DA-4 An effective solids separation system should be utilized such as a mechanical separator or two or more solids separator ponds. If ponds are used, they should not exceed sixty feet in surface width.
- DA-5 Drainage lines should not by-pass the separator ponds whenever possible, except those that provide for normal corral run-off and do not contain solids. All drain inlets must be sufficiently graded to prevent solids accumulation.
- DA-6 Floating debris should be minimized in all ponds; mechanical agitators may be used to break up crusts.

- DA-7 Vegetation should be controlled regularly to prevent emergent vegetation and barriers to access. This includes access lanes, interior pond embankments and any weed growth that might become established within the pond surface.
- DA-8 Dairy wastewater discharged for irrigation purposes should be managed so that it does not stand for more than three days.
- DA-9 All structures and water management practices should meet current California Regional Water Quality Control Board requirements.
- DA-10 Tire sidewalls or other objects that will not hold water should be used to hold down tarps (e.g. on silage piles). Whole tires or other water-holding objects should be replaced.

3. CONTACT INFORMATION

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