

OCT 19 2018

Luke Vanderham  
L & J Vanderham  
10635 W Mt. Whitney Ave  
Riverdale, CA 93656

**Re: Notice of Preliminary Decision - Authority to Construct**  
**Facility Number: C-5713**  
**Project Number: C-1173059**

Dear Mr. Vanderham:

Enclosed for your review and comment is the District's analysis of L & J Vanderham's application for an Authority to Construct for the modification to the existing herd size, at 10635 W Mt. Whitney Ave in Riverdale. The modification will result in a change in the maximum herd capacity from 3,088 milk cows, not to exceed 3,808 mature cows (milk and dry), and 1,620 total support stock (heifers, calves, and bulls), to 4,207 milk cows, not to exceed 4,696 mature cows (milk and dry), and 604 support stock (heifers, calves, and bulls).

The notice of preliminary decision for this project will be published approximately three days from the date of this letter. After addressing all comments made during the 30-day public notice period, the District intends to issue the Authority to Construct. Please submit your written comments on this project within the 30-day public comment period, as specified in the enclosed public notice.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Mr. Derek Fukuda of Permit Services at (559) 230-5917.

Sincerely,



Arnaud Marjollet  
Director of Permit Services

AM:df

Enclosures

cc: Tung Le, CARB (w/ enclosure) via email  
cc: Monique Baldiviez, Innovative Ag Services, LLC (w/ enclosure) via email

**Samir Sheikh**

Executive Director/Air Pollution Control Officer

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**San Joaquin Valley Air Pollution Control District**  
**Authority to Construct Application Review**  
Modification of Herd Profile

Facility Name: L & J Vanderham Date: October 3, 2018  
Mailing Address: 10635 W Mt. Whitney Ave Engineer: Derek Fukuda  
Riverdale, CA 93656 Lead Engineer: Jerry Sandhu  
Contact Person: Monique Baldiviez (Consultant)  
Telephone: (559) 587-2800  
E-Mail: [mbaldiviez@innovativeag.net](mailto:mbaldiviez@innovativeag.net)  
Application #s: C-5713-1-3, -2-3, -3-3, and -4-3  
Project #: C-1173059  
Deemed Complete: January 9, 2018

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**I. Proposal**

L & J Vanderham has requested Authority to Construct (ATC) permits to modify their current herd profile as shown in the table below. The proposed modification to the herd profile will not require any changes to the dairy's housing structures.

<b>Herd Type</b>	<b>Pre-Project</b>	<b>Post-Project</b>
Milk Cows	3,088	4,207
Mature Cows*	3,808	4,696
Support Stock**	1,620	604
<b>Total</b>	<b>5,428</b>	<b>5,300</b>

\* Milk and Dry Cows

\*\* Heifers, Calves, and Bulls

Pursuant to Rule 2201, Section 3.25, this expansion constitutes a modification of the milking operation (C-5713-1), cow housing (C-5713-2), liquid manure handling operation (C-5713-3), and solid manure handling operation (C-5713-4), due to an increase in production rates. The current Permits to Operate (PTOs) for these operations are included in Appendix B. The proposed expansion will result in an increase in emissions of volatile organic compounds (VOC) and ammonia (NH<sub>3</sub>).

In this project, the facility is proposing an overall decrease in the number of animals at the dairy. A decrease in the number of animals will not result in an increase in emissions from the feed storage and handling permit (C-5713-5); therefore, the feed storage and handling permit will not be modified in this evaluation.

**II. Applicable Rules**

Rule 1070 Inspections (12/17/92)  
Rule 2010 Permits Required (12/17/92)  
Rule 2201 New and Modified Stationary Source Review Rule (2/18/16)

Rule 2410 Prevention of Significant Deterioration (6/16/11)  
Rule 2520 Federally Mandated Operating Permits (6/21/01)  
Rule 2550 Federally Mandated Preconstruction Review for Major Sources of Air Toxics (6/18/98)  
Rule 4001 New Source Performance Standards (4/14/99)  
Rule 4002 National Emissions Standards for Hazardous Air Pollutants (5/20/04)  
Rule 4101 Visible Emissions (2/17/05)  
Rule 4102 Nuisance (12/17/92)  
Rule 4550 Conservation Management Practices (CMP) (8/19/04)  
Rule 4570 Confined Animal Facilities (CAF) (10/21/10)  
CH&SC 41700 Health Risk Assessment  
CH&SC 42301.6 School Notice  
California Environmental Quality ACT (CEQA)  
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)  
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

### III. Project Location

The facility is located at 10772 W Mt. Whitney Ave in Riverdale, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

### IV. Process Description

L & J Vanderham operates a dairy at this location. The primary function of this facility is the production of milk, which is used to make products for human consumption. Production of milk requires a herd of mature dairy cows that are lactating. In order to produce milk, the cows must be bred and give birth. The gestation period for a cow is 9 months, and dairy cows are bred again 4 months after calving. Thus, a mature dairy cow produces a calf every 12 to 14 months, which is why there will be different ages and types of cows at the dairy, including heifers, lactating milk cows, and dry cows.

#### Milking (Unit C-5713-1):

Milking is a dairy's primary income generating activity. The lactating cows are milked two to four times per day. The milk is chilled and temporarily stored in onsite tanks until it is collected by tanker truck for delivery to a creamery. A purpose-built structure known as the milking barn is used for milking and the associated onsite milk handling activities. The milking barn is located in proximity to, but separate from the lactating cow housing areas. It is designed to facilitate efficient in-and-out movement of groups of cows being milked; and also to allow workers access to individual cows during milking. The first part of the milking barn, known as the holding area, is an open-sided roofed space where cows that are ready for milking are temporarily confined as they enter the milking parlor. The milking occurs in the milking parlor within the barn. There are several different parlor designs, including flat, parallel, herringbone, and rotary. L & J Vanderham uses two double 30 parallel (120 stalls) milking parlors.

Due to food safety regulations, high standards of hygiene must be observed in the milking parlor. The parlor floors are constructed of concrete, and are properly sloped to ensure effective drainage. Any manure that is deposited on the parlor floors during milking is promptly sprayed down with clean water and flushed into the drainage system, from where it is carried through pipes into the manure lagoons.

**Cow Housing (Unit C-5713-2):**

The cows in this dairy are housed in a combination of open corrals, freestall barns, and Saudi-style barns.

An open corral is a large open area where cows are confined, also with unlimited access to feed bunks, water, and possibly an open structure to provide shade.

In freestall barns, cows are grouped in large pens with free access to feed bunks, waterers, and stalls for resting. A standard freestall barn design has a feed alley in the center of the barn separating two feed bunks on each side. A variety of types of bedding materials are used for animal comfort and to prevent animal injury.

The design of a Saudi-style barn was originally crafted for hot weather conditions in desert climates. These structures feature very high ceilings, with a ventilation gap running the length of the barn. The sides of the structure are open, and the high peak (typically 14-18 feet) enhances airflow. Saudi-style barns are very similar to freestall barns with the exception of the freestalls.

Detailed pre-project and post-project housing arrangements are summarized in the following tables and in Appendix F ('PM10 Mitigation Measures' sheet).

<b>Housing Arrangements</b>				
<b>Housing Name</b>	<b>Pre-Project</b>		<b>Post-Project</b>	
	<b>Type of Cow*</b>	<b>Total # of Cows</b>	<b>Type of Cow*</b>	<b>Total # of Cows</b>
Corrals 1 – 7	SS	238	SS	217
Corrals 8 – 11	SS	272	SS	212
Corral 12	Dry	185	Dry	139
Corrals 13 and 14	SS	370	Milk	370
Corral 15	Dry	185	SS	175
Corrals 16 – 19	SS	740	Milk	740
Freestall Barns 20	Milk	330	Milk	339
Freestall Barns 21 - 27	Milk	2,310	Milk	2,450
Saudi Barn 28	Dry	240	Dry	240
Freestall Barn 29	Milk	240	Milk	240
Freestall Barn 30	Milk	140	Dry	55
Freestall Barn 31	Dry	110	Dry	55
Corral 32	Milk	20	Milk	20
Corral 33	Milk	24	Milk	24
Corral 34	Milk	24	Milk	24
<b>Totals</b>		<b>5,428</b>		<b>5,300</b>

\* SS = Support Stock

### **Liquid Manure Handling System (Unit C-5713-3):**

Milk cows generate anywhere from 130 to 150 pounds of manure per day. The manure is deposited primarily in areas where the cows are housed and fed (cow housing), but a small amount is deposited in the milking barn and other transit areas. The manure is collected and managed in liquid and solid forms. Manure with a total solids content of 20% or higher usually can be handled as a solid, while manure with a total solids content of 10% or less can be handled as a liquid.

The liquid manure handling system consists of a processing pit and mechanical solids separator, two settling basins, one lagoon, and land application of treated liquid manure.

#### **Solids Separation:**

Flush water from the milk barn, housing areas, or flushed lanes is collected into a processing pit near the mechanical separator. The flush water is periodically agitated and pumped over the mechanical separator screens. The liquid passes through the screens and flows into the liquid manure lagoon. The solids fall off the bottom of the screen onto a stacking pad, from where they are later removed by a front-end loader and spread out to dry on the drying pads.

#### **Settling Basins**

The liquid manure from the milk barn, housing areas, or flushed lanes will flow to the settling basins for solids separation prior to entering the lagoon. Settling basins are structures designed to separate solids from liquid manure by sedimentation. The inflow of manure is restricted to allow some of the solids to settle out. A settling basin may achieve a solids removal rate of 40-70%. The liquids from the settling basins will gradually drain to the treatment lagoons. Solids remaining in settling basins are left to dry and then are removed. The separated solids will either be incorporated into cropland or stored for use as fertilizer.

#### **Lagoon**

The lagoon is designed to have sufficient volume to hold all of the following: all manure and wastewater accumulated at the dairy for a period of 120 days; normal precipitation and any drainage to the lagoon system minus evaporation from the surface of lagoons; and precipitation during a 25 year, 24 hour storm event. The liquid manure from the lagoon will be used to irrigate crops.

#### **Land Application**

Liquid manure from the storage ponds and lagoon will be applied to cropland as fertilizer/irrigation water. The application is done through flood and furrow irrigation, at agronomic rates in conformance with a nutrient management plan that has been approved by the Regional Water Quality Control Board.

### **Solid Manure Handling System (Unit C-5713-4):**

#### **Manure Stock Piles (Storage)**

The solid manure stockpiled at this dairy will include the separated solids from the mechanical separator. The separated solids will be immediately incorporated into cropland, be dried and used as fertilizer or as bedding in the freestalls, or hauled offsite. The applicant proposes to cover the dry separated solids piles and animal waste piles with weatherproof coverings from October through May, so that the solids will remain dry until they are ready to be used.

## V. Equipment Listing

### Pre-Project Equipment Description

- C-5713-1-2:** 3,088 COW MILKING OPERATION WITH TWO DOUBLE 30 PARALLEL (120 STALLS) MILKING PARLORS
- C-5713-2-2:** COW HOUSING - 3,088 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 3,808 MATURE COWS (MILK AND DRY); 1,620 TOTAL SUPPORT STOCK (HEIFERS, CALVES AND BULLS); AND 5 FREESTALLS WITH FLUSH/SCRAPE SYSTEM
- C-5713-3-2:** LIQUID MANURE HANDLING SYSTEM CONSISTING OF ONE PROCESSING PIT, MECHANICAL SEPARATOR, TWO SETTLING BASINS, AND ONE STORAGE POND
- C-5713-4-2:** SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; WINDROW/AERATED STATIC PILE COMPOSTING; SOLID MANURE APPLICATION TO LAND AND/OR HAULED OFFSITE

### Proposed Modification

The equipment description for the liquid manure handling system has been updated to identify the storage pond as a lagoon.

- C-5713-1-3:** MODIFICATION OF 3,088 COW MILKING OPERATION WITH TWO DOUBLE 30 PARALLEL (120 STALLS) MILKING PARLORS: INCREASE THE HERD SIZE FROM 3,088 MILK COWS TO 4,207 MILK COWS
- C-5713-2-3:** MODIFICATION OF COW HOUSING - 3,088 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 3,808 MATURE COWS (MILK AND DRY); 1,620 TOTAL SUPPORT STOCK (HEIFERS, CALVES AND BULLS); AND 5 FREESTALLS WITH FLUSH/SCRAPE SYSTEM: INCREASE MAXIMUM NUMBER OF COWS TO 4,207 MILK COWS NOT TO EXCEED 4,696 MATURE COWS (MILK AND DRY), AND DECREASE SUPPORT STOCK TO 604 TOTAL SUPPORT STOCK (HEIFERS, CALVES, AND BULLS)
- C-5713-3-3:** MODIFICATION OF LIQUID MANURE HANDLING SYSTEM CONSISTING OF ONE PROCESSING PIT, MECHANICAL SEPARATOR, TWO SETTLING BASINS, AND ONE LAGOON: INCREASE IN LIQUID MANURE DUE TO INCREASE IN MILK COW HERD SIZE AS AUTHORIZED BY AUTHORITY TO CONSTRUCT C-5713-2-3
- C-5713-4-3:** MODIFICATION OF SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; WINDROW/AERATED STATIC PILE COMPOSTING; SOLID MANURE APPLICATION TO LAND AND/OR HAULED OFFSITE: INCREASE IN SOLID MANURE DUE TO INCREASE IN MILK COW HERD SIZE AS AUTHORIZED BY AUTHORITY TO CONSTRUCT C-5713-2-3

### Post-Project Equipment Description

- C-5713-1-3:** 4,207 COW MILKING OPERATION WITH TWO DOUBLE 30 PARALLEL (120 STALLS) MILKING PARLORS
- C-5713-2-3:** COW HOUSING – 4,207 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 4,696 MATURE COWS (MILK AND DRY); 604 TOTAL SUPPORT STOCK (HEIFERS, CALVES AND BULLS); AND 5 FREESTALLS WITH FLUSH/SCRAPE SYSTEM
- C-5713-3-3:** LIQUID MANURE HANDLING SYSTEM CONSISTING OF PROCESSING PIT(S), MECHANICAL SEPARATOR(S), SETTLING BASIN(S), AND ONE LAGOON
- C-5713-4-3:** SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; WINDROW/AERATED STATIC PILE COMPOSTING; SOLID MANURE APPLICATION TO LAND AND/OR HAULED OFFSITE

## **VI. Emission Control Technology Evaluation**

Particulate matter (PM<sub>10</sub>), volatile organic compounds (VOC), hydrogen sulfide (H<sub>2</sub>S) and ammonia (NH<sub>3</sub>) are the major pollutants of concern from dairy operations. PM<sub>10</sub> emissions are generated primarily from the action of cows' hooves on dust and dry manure, which is subsequently picked up by wind and entrained into the atmosphere. VOC emissions are generated from the ruminant digestive process (i.e. enteric emissions), decomposition and fermentation of feed, and decomposition of organic matter in manure. NH<sub>3</sub> and H<sub>2</sub>S emissions are generated from microbial metabolization of nitrogen and sulfur compounds in manure. The quantity of these emissions depends directly on the herd size and profile.<sup>1</sup>

Various management practices are used to control emissions at this dairy. Some of these practices are discussed below:

### **Milking Parlor (Unit C-5713-1):**

#### Frequent Flushing:

A flush/spray system is used to wash out the manure from the milking parlor before, during, or after each group of cows is milked. Frequent flushing creates a moist environment that greatly reduces or eliminates PM<sub>10</sub> emissions. In addition, flush water dissolves NH<sub>3</sub> as well as various water-soluble VOC in the manure, thereby stopping or decelerating the emission of these pollutants directly into the atmosphere. Both manure and dissolved pollutants are subsequently carried by the flush water into the liquid manure handling system for further treatment.

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<sup>1</sup> Herd size refers to the total number of cows, whereas profile refers to the specific categories (e.g. milk, dry, heifer, calf) that constitute the herd.

### **Cow Housing (Unit C-5713-2):**

#### **Feeding Cows in Accordance with the NRC Guidelines:**

All cows will be fed in accordance with National Research Council (NRC) guidelines using routine nutritional analysis for rations. NRC guidelines are intended to optimize nutrient uptake by the cow, which not only increases feed efficiency but also minimizes the excretion of undigested protein and other nutrients in the manure. Since excess manure nutrients are the feedstock for the processes that result in NH<sub>3</sub>, H<sub>2</sub>S and VOC emissions as manure decomposes, the reduction of nutrients in the manure is expected to reduce the emission of these pollutants.

#### **Frequent Flushing:**

Frequent flushing is also used for the removal of manure from the lanes and walkways in the housing barns. Frequent flushing creates a moist environment that greatly reduces or eliminates PM<sub>10</sub> emissions. In addition, flush water dissolves NH<sub>3</sub> as well as various water-soluble VOC in the manure, thereby stopping or decelerating the emission of these pollutants directly into the atmosphere. Both manure and dissolved pollutants are subsequently carried by the flush water into the liquid manure handling system for further treatment.

### **Liquid Manure Handling (Unit C-5713-2):**

#### **Solids Separation using Settling Basin and Mechanical Separator:**

The purpose of the settling basin and mechanical separation is to remove the fibrous materials prior to the liquid manure entering the lagoon. By removing the most fibrous material from the liquid stream prior to entering the lagoon, it is anticipated that the amount of intermediate metabolites released during digestion in the pond may be reduced. Removal of the fibrous material allows for more complete digestion in the lagoon and lower emissions.

Solids remaining in the settling basin are left to dry and then are removed. The separated solids can be immediately incorporated into cropland or spread in thin layers, harrowed, and dried.

#### **Liquid Manure Land Application:**

Liquid manure will be applied to cropland at agronomic rates, in compliance with the dairy's comprehensive nutrient management plan and the requirements of the Regional Water Quality Control Board. These practices are expected to reduce odors and result in faster uptake of nutrients by crops. When applied nutrients are optimally matched with the nutrient needs of developing crops, the excess nutrients that are associated with increased emissions and/or groundwater pollution are minimized.



### **Solid Manure Handling (Unit C-5713-4):**

Based on the information currently available, emissions from solid manure applied to cropland are expected to be low. However, to ensure that any possible emissions are minimized, the manure will be promptly incorporated into the soil after application. This will reduce any volatilization of gaseous pollutants, as the soil provides cover from wind and other weather elements that enhance volatilization. In addition, incorporation reduces emissions by biofilter effect, whereby the adsorption of NH<sub>3</sub>, VOC, and other compounds onto soil particles provides an opportunity for oxidation by the action of various microorganisms the soil.<sup>2</sup>

## **VII. General Calculations**

### **A. Assumptions**

- Pre-project potential to emit for the dairy will be based on the maximum herd capacities listed on the current PTO – 3,088 milk cows not to exceed 3,808 mature cows (milk and dry cows), and 1,620 total support stock (heifers, calves, and bulls);
- Post-project potential to emit for the dairy will be based on the proposed maximum herd capacity – 4,207 milk cows not to exceed 4,696 mature cows (milk and dry cows), and 604 total support stock (heifers, calves, and bulls);
- For the dairy, only emissions from the lagoon (unit C-5713-3) and internal combustion engine (unit C-5713-6) will be used in determining if this facility will be a major source since the lagoon and internal combustion engine are considered to be the only non-fugitive emissions at this dairy;
- The PM<sub>10</sub> emission factors for the dairy animals are based on a District document titled “Dairy and Feedlot PM<sub>10</sub> Emissions Factors,” which compiled data from studies performed by Texas A&M ASAE and a USDA/UC Davis report quantifying dairy and feedlot emissions;
- The NH<sub>3</sub> emission factors for milk cows are based on an internal document entitled “*Breakdown of Dairy VOC Emission Factor into Permit Units.*” The NH<sub>3</sub> emission factors for the other cows were developed by taking the ratio of manure generated by the different types of cows to the milk cow and multiplying it by the milk cow emission factor;
- The VOC emission factors for the dairy animals are based on the District document entitled “Air Pollution Control Officer’s Revision of the Dairy VOC Emissions Factor”;
- The pre-project mitigation measures practiced at the dairy as well as the number, type, and size of silage piles are taken from the Rule 4570 Phase II application, processed under District project C-1110945;

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<sup>2</sup> Page 9-38 of U.S. EPA’s draft document entitled “Emissions From Animal Feeding Operations” (<http://www.epa.gov/ttn/chief/ap42/ch09/draft/draftanimalfeed.pdf>)

- The post-project mitigation measures practiced at the dairy will be the same as the pre-project mitigation measures.
- For cow housing calculations, support stock emissions will be calculated using a worst-case emission factor consisting of the VOC and NH<sub>3</sub> emissions from large heifers, and the PM10 emissions from medium heifers.
- The cow housing units at this dairy are not limited to house a specific type of cow (e.g. milk, dry, or support stock); therefore, a worst case cow emission factor consisting of VOC and NH<sub>3</sub> emissions from milk cows, and the highest PM10 emissions for the applicable housing unit will be used in the following calculations:
  - Daily pre and post-project potentials to emit
  - Daily potential to emit calculations for Best Available Control Technology (BACT)
  - Daily and hourly potential emissions used in the Risk Management Review (RMR)

## B. Emission Factors

### PM<sub>10</sub>, VOC, NH<sub>3</sub>, and H<sub>2</sub>S

The emissions calculations shown in Appendix F include the PM<sub>10</sub>, VOC, NH<sub>3</sub>, and H<sub>2</sub>S emission factors from the animals and feed at this facility. These emission factors will be used to calculate the pre-project and post-project PM<sub>10</sub>, VOC, NH<sub>3</sub>, and H<sub>2</sub>S emissions from the dairy.

## C. Calculations

### 1. Pre-Project Potential to Emit (PE1)

The PE1 is based on the maximum permitted capacity for each age category of cows and the controls required and implemented by the applicant. All the emission calculations are included in Appendix F. A summary of the PE1 is shown in the table below:

PE1 Summary								
Permit unit	PM <sub>10</sub>		VOC		NH <sub>3</sub>		H <sub>2</sub> S	
	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year
C-5713-1-2	0.0	0	3.4	1,235	1.2	422	0.0	0
C-5713-2-2	67.3	22,302	146.6	41,375	314.2	81,923	0.0	0
C-5713-3-2	0.0	0	27.7	10,114	80.5	29,394	1.6	545
C-5713-4-2	0.0	0	5.4	1,963	30.0	10,984	0.0	0

### 2. Post-Project Potential to Emit (PE2)

The PE2 is based on the maximum permitted capacity for each age category of cows and the controls required and proposed by the applicant. All the emission calculations are included in Appendix F. A summary of the PE2 is shown in the table below:

PE2 Summary								
Permit unit	PM <sub>10</sub>		VOC		NH <sub>3</sub>		H <sub>2</sub> S	
	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year
C-5713-1-3	0.0	0	4.6	1,683	1.6	576	0.0	0
C-5713-2-3	63.7	14,012	143.2	46,783	306.8	97,468	0.0	0
C-5713-3-3	0.0	0	31.5	11,489	95.9	34,999	1.6	545
C-5713-4-3	0.0	0	6.0	2,225	35.7	13,058	0.0	0

### 3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to District Rule 2201, the SSPE1 is the Potential to Emit (PE) from all units with valid ATCs or PTOs at the Stationary Source and the quantity of Emission Reduction Credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions (AER) that have occurred at the source, and which have not been used on-site. This facility does not have any ERCs. The PE values for units C-5713-1-2 through -5-1 are calculated in Appendix F. The PE for unit C-5713-6-0 is calculated in Appendix G. The SSPE1 is summarized in the table on the following page:

SSPE1 (lb/year)							
Permit unit	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC	NH <sub>3</sub>	H <sub>2</sub> S
C-5713-1-2	0	0	0	0	1,235	422	0
C-5713-2-2	0	0	22,302	0	41,375	81,923	0
C-5713-3-2	0	0	0	0	10,114	29,394	545
C-5713-4-2	0	0	0	0	1,963	10,984	0
C-5713-5-1	0	0	0	0	49,775	0	0
C-5713-6-0	1,984	1	91	603	226	0	0
<b>Totals</b>	<b>1,984</b>	<b>1</b>	<b>22,393</b>	<b>603</b>	<b>104,688</b>	<b>122,723</b>	<b>545</b>

### 4. Post-Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201, the SSPE2 is the sum of the PE from all units with valid ATCs or PTOs at the Stationary Source and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site. This facility does not have any ERCs. The PE values for units C-5713-1-3, -2-3, -3-3, -4-3, and -5-1, are calculated in Appendix F. The PE for unit C-5713-6-0 is calculated in Appendix G. The SSPE2 is summarized in the following table:

SSPE2 (lb/year)							
Permit unit	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC	NH <sub>3</sub>	H <sub>2</sub> S
C-5713-1-3	0	0	0	0	1,683	576	0
C-5713-2-3	0	0	14,012	0	46,783	97,468	0
C-5713-3-3	0	0	0	0	11,489	34,999	545
C-5713-4-3	0	0	0	0	2,225	13,058	0
C-5713-5-1	0	0	0	0	48,746	0	0
C-5713-6-0	1,984	1	91	603	226	0	0
<b>Totals</b>	<b>1,984</b>	<b>1</b>	<b>14,103</b>	<b>603</b>	<b>111,152</b>	<b>146,101</b>	<b>545</b>

## 5. Major Source Determination

### Rule 2201 Major Source Determination

Pursuant to District Rule 2201, a major source is a stationary source with an SSPE2 equal to or exceeding one or more of the major source thresholds shown in Table 3-3. For the purposes of determining major source status the following shall not be included:

- Any ERCs associated with the stationary source
- Emissions from non-road engines (i.e. engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the source categories specified in 40 CFR 51.165

Agricultural operations do not belong to any of the source categories specified in 40 CFR 51.165. Since this facility is an agricultural operation, fugitive emissions shall not be included in determining whether it is a major stationary source.

40 CFR 71.2 defines fugitive emissions as “those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening.” In 2005, the California Air Pollution Control Officers Association (CAPCOA) issued guidance for estimating VOC emissions from dairy farms. This guidance determined that VOC emissions from the milking centers, cow housing areas, corrals, common manure storage areas, and land application of manure are considered fugitive since they are not physically contained and could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening. The guidance also determined that VOC emissions from liquid manure lagoons and storage ponds are not considered fugitive because emission collection technologies for liquid manure systems exist. The District has researched this issue and concurs with the CAPCOA determinations, as discussed in more detail below:

#### Milking Parlor:

The mechanical ventilation system could arguably be utilized to capture emissions from the milking parlor. In order to achieve and maintain the negative pressure required for this purpose, the adjoining holding area would also need to be completely enclosed. However, enclosing the holding area is not practical due to the continuous movement of cows in and out of the barn throughout the day. In addition, the capital outlay required to enclose this large area would be prohibitive. The District therefore determines that emissions from the milking parlor cannot reasonably be captured, and are to be considered fugitive.

#### Cow Housing:

Although there are smaller dairy farms that have enclosed housing barns, such barns are usually not fully enclosed and do not include any systems for the collection of emissions. In addition, the airflow requirements for dairy cows are extremely high, primarily for herd health reasons. Airflow requirements are expected to be even higher in places such as the San Joaquin Valley, where daytime temperatures can exceed 110 degrees for prolonged periods during the summer months. Given the high airflow

rates that will be involved, collection and control of the exhaust from housing barns is not only impractical but also cost prohibitive. The District therefore determines that emissions from housing barns cannot reasonably be captured, and are to be considered fugitive.

#### Manure Storage Areas:

Solid manure is typically stored in the housing areas, as mounds or piles in individual corrals or pens. Some manure may also be stored in piles outside the housing areas while awaiting land application, shipment offsite, or other uses. Thus, manure storage areas are widely distributed over the dairy site, making it impractical to capture emissions from any significant proportion of the solid manure. The District therefore determines that emissions from manure storage areas cannot reasonably be captured, and are to be considered fugitive.

#### Land Application:

Since manure has to be applied over large expanses of cropland (hundreds or even thousands of acres), there is no practical method that can be used to capture the associated emissions. The District therefore determines that emissions from land application of manure cannot reasonably be captured, and are to be considered fugitive.

#### Feed Handling and Storage:

Silage and total mixed rations (TMR) are the primary sources of emissions from feed storage and handling.

Silage is stored in several tarped/covered piles and/or plastic bags. One end/face of the pile/bag that is actively being used to prepare feed rations must remain open to allow extraction of the silage. A front-end loader is used to extract silage from the open face of the pile throughout the day as the feed rations for the various groups or categories of cows are prepared. A significant proportion of silage pile emissions are associated with this open face, which is exposed to the atmosphere and frequently disturbed during silage extraction. Due to the need to access the pile's open face throughout the day, it is not practical to enclose it or equip it with any kind of device or system that could be used to capture of emissions.

TMR is prepared by mixing silage with various additives such as seeds, grains, and molasses. Because the quality of silage degrades fairly rapidly upon exposure to air, TMR is prepared only when needed and promptly distributed to the feed lanes for consumption. Most of the TMR emissions are thus emitted from the feed lanes, which are located inside the housing barns, where the TMR will remain exposed to the air for at least several hours as the cows feed. As previously discussed, collection and control of emissions from housing barns is not only impractical but also cost prohibitive.

The District therefore determines that emissions from feed handling and storage cannot reasonably be captured, and are to be considered fugitive.

As previously stated, emissions from liquid manure lagoons and storage ponds have already been determined to be non-fugitive. The facility's non-fugitive stationary source potential emissions are summarized in the following tables:

<b>Non-Fugitive SSPE1 (lb/year)</b>					
<b>Category</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>CO</b>	<b>VOC</b>
C-5713-3-2 - Lagoons only	0	0	0	0	4,868 <sup>3</sup>
C-5713-6-0 - Engine	1,984	1	94	603	226
<b>Non-Fugitive SSPE1</b>	<b>1,984</b>	<b>1</b>	<b>94</b>	<b>603</b>	<b>5,094</b>

<b>Non-Fugitive SSPE2 (lb/year)</b>					
<b>Category</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>CO</b>	<b>VOC</b>
C-5713-3-3 - Lagoons only	0	0	0	0	5,531 <sup>4</sup>
C-5713-6-0 - Engine	1,984	1	94	603	226
<b>Non-Fugitive SSPE2</b>	<b>1,984</b>	<b>1</b>	<b>94</b>	<b>603</b>	<b>5,757</b>

The Rule 2201 major source determination is summarized in the following table:

<b>Rule 2201 Major Source Determination</b>						
<b>Category</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>CO</b>	<b>VOC</b>
SSPE1 (lb/year)	1,984	1	94	94	603	5,094
SSPE2 (lb/year)	1,984	1	94	94	603	5,757
Major Source Threshold (lb/year)	20,000	140,000	140,000	140,000	200,000	20,000
Major Source?	No	No	No	No	No	No

Note: PM<sub>2.5</sub> assumed to be equal to PM<sub>10</sub>

As shown in the table above, the facility is not an existing major source and is not becoming a major source as a result of this project.

### **Rule 2410 Major Source Determination**

In determining if a stationary source is a PSD major source, the following sources of emissions shall not be included:

- Emissions from non-road engines (i.e. engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the source categories specified in 40 CFR 52.21(b)(1)(iii)

Agricultural operations do not belong to any of the source categories specified in specified in 40 CFR 52.21(b)(1)(i). Since this facility is an agricultural operation, fugitive emissions shall not be included in determining whether it is a PSD major source; and the PSD major

<sup>3</sup> From Appendix F - 'Pre-Project Potential to Emit (PE1)' sheet

<sup>4</sup> From Appendix F - 'Post-Project Potential to Emit (PE2)' sheet

source threshold is 250 tons/year (tpy) for any regulated NSR pollutant.

The non-fugitive stationary source emissions from the preceding section have been converted into tons.<sup>5</sup> The PSD major source determination is summarized in the following table:

PSD Major Source Determination						
Category	NO <sub>2</sub>	VOC	SO <sub>2</sub>	CO	PM	PM <sub>10</sub>
Estimated facility PE before project increase (tpy)	1.0	2.5	0.0	0.3	0.0	0.0
PSD major source threshold (tpy)	250	250	250	250	250	250
PSD major source?	No	No	No	No	No	No

As shown above, the facility is not an existing major source for PSD for any pollutant. Therefore the facility is not an existing major source for PSD.

## 6. Baseline Emissions (BE)

The BE calculation (in lb/year) is performed on a pollutant-by-pollutant basis to determine the amount of offsets required, where necessary, when the SSPE1 is greater than the offset threshold. This project is exempt from offsets pursuant to Rule 2201, Section 4.6.9, which states offsets are not required for agricultural operations that are not Major Sources. As indicated in the section above, this agricultural operation is not a Major Source; therefore, offsets will not be required for any criteria pollutant and BE calculations are not required.

## 7. SB 288 Major Modification

SB 288 Major Modification is defined in 40 CFR Part 51.165 as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."

Since this facility is not a major source for any of the pollutants addressed in this project, this project does not constitute an SB 288 major modification.

## 8. Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

Since this facility is not a Major Source for any pollutants, this project does not constitute a Federal Major Modification.

<sup>5</sup> (lb/yr) / (2,000 lb/ton) = tons/yr (tpy).

## 9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination for sources located in the SJV and which are emitted in this project are: (See 52.21 (b) (23) definition of significant)

- PM
- PM<sub>10</sub>
- Hydrogen sulfide (H<sub>2</sub>S)
- Total reduced sulfur (including H<sub>2</sub>S)

### I. Project Emissions Increase - New Major Source Determination

The post-project potentials to emit from all new and modified units are compared to the PSD major source thresholds to determine if the project constitutes a new major source subject to PSD requirements.

Agricultural operations do not belong to any of the source categories specified in specified in 40 CFR 52.21(b)(1)(i). Since this facility is an agricultural operation, fugitive emissions shall not be included in determining whether it is a PSD major source; and the PSD major source threshold is 250 tons/year (tpy) for any regulated NSR pollutant.

The non-fugitive stationary source emissions for the units in this project (shown in Section VII.C.5) have been converted into tons. The PSD applicability determination is summarized in the following table:

<b>PSD Applicability Determination - New Major Source</b>				
<b>Category</b>	<b>PM</b>	<b>PM<sub>10</sub></b>	<b>H<sub>2</sub>S</b>	<b>S</b>
Total PE from new and modified units (tpy)	0	0	0.3	0.3
PSD Major Source Threshold (tpy)	250	250	250	250
New PSD Major Source?	N	N	N	N

As shown in the table above, the potential to emit for the project, by itself, does not exceed any PSD major source threshold. Therefore Rule 2410 is not applicable and no further analysis is required.

### 10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix F.



## VIII. Compliance Determination

### Rule 1070 Inspections

This rule requires the District to perform inspections for the purpose of obtaining information necessary to determine whether air pollution sources are in compliance with applicable rules and regulations. The rule also authorizes the District to require record keeping, to make inspections and to conduct tests of air pollution sources. The following conditions will be placed on the ATCs as a mechanism to ensure compliance:

- {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
- {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]

### Rule 2010 Permits Required

The provisions of this rule apply to any person who plans to or does operate, construct, alter, or replace any source operation which may emit air contaminants or may reduce the emission of air contaminants.

Pursuant to Section 3.0, any person building, altering or replacing any operation, article, machine, equipment, or other contrivance, the use of which may cause the issuance of air contaminants or the use of which may eliminate or reduce or control the issuance of air contaminants, shall first obtain authorization for such construction from the APCO. An Authority to Construct shall remain in effect until the Permit to Operate the source operation for which the application was filed is granted or denied, or the application is canceled as described in Rule 2050 (Cancellation of Application).

Pursuant to Section 4.0, before any new or modified source operation described in Section 3.0, or any existing source operation so described may be operated, a written permit shall be obtained from the APCO. No Permit to Operate shall be granted either by the APCO or the Hearing Board for any source operation described in Section 3.0 constructed or installed without authorization as required by Section 3.0 until the information required is presented to the APCO and such source operation is altered, if necessary, and made to conform to the standards set forth in Rule 2070 (Standards for Granting Applications) and elsewhere in these rules and regulations.

The facility has obtained a PTO for the existing operation, and has submitted an ATC permit application for the proposed modifications. Continued compliance with the requirements of this rule is therefore expected.

**Rule 2201 New and Modified Stationary Source Review Rule**

**A. Best Available Control Technology (BACT)**

**1. BACT Applicability**

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions\*:

- a. Any new emissions unit with a potential to emit exceeding two pounds per day,
- b. The relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding two pounds per day,
- c. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an Adjusted Increase in Permitted Emissions (AIPE) exceeding two pounds per day, and/or
- d. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

\*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

**a. New emissions units – PE > 2 lb/day**

As discussed in Section I above, there are no new emissions units associated with this project. Therefore BACT for new units with PE > 2 lb/day purposes is not triggered.

**b. Relocation of emissions units – PE > 2 lb/day**

As discussed in Section I above, there are no emissions units being relocated from one stationary source to another; therefore BACT is not triggered.

**c. Modification of emissions units – AIPE > 2 lb/day**

The milking parlor, cow housing, liquid manure handling system, and solid manure handling system (units C-5713-1 through -4) are being modified in this project. Therefore, the AIPE for the emissions units in these permit units must be calculated.

Based on the AIPE values in Appendix F, BACT is triggered for the units listed in the following table:

<b>AIPE Calculation Results</b>		
<b>Permit Unit</b>	<b>Emissions Units Requiring BACT</b>	<b>Pollutants Triggering BACT</b>
C-5713-3 (Liquid Manure Handling)	Lagoon	NH <sub>3</sub>
	Land Application	NH <sub>3</sub>
C-5713-4 (Solid Manure Handling)	Solid Manure Storage	NH <sub>3</sub>
	Solid Manure Land Application	NH <sub>3</sub>

**d. SB 288/Federal Major Modification**

As discussed in Sections VII.C.7 and VII.C.8 above, this project does not constitute an SB 288 and/or Federal Major Modification for any pollutant. Therefore BACT is not triggered for any pollutant.

**2. BACT Guideline**

The BACT Guidelines applicable to the units triggering BACT in this project are listed in the following table and include in Appendix C:

<b>Applicable BACT Guidelines</b>		
<b>Permit Unit</b>	<b>Emissions Units Requiring BACT</b>	<b>BACT Guideline</b>
C-5713-3	Lagoon	BACT Guideline 5.8.6 (Liquid Manure Handling – Lagoon/Storage Pond)
	Land Application	BACT Guideline 5.8.7 (Liquid Manure Handling – Liquid Slurry Land Application)
C-5713-4	Solid Manure Storage	BACT Guideline 5.8.8 (Solid Manure Handling – Storage/Separated Solids Piles)
	Solid Manure Land Application	BACT Guideline 5.8.9 (Solid Manure Handling – Land Application )

**3. Top-Down BACT Analysis**

Per Permit Services policies and procedures for BACT, a top-down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District’s NSR rule.

Pursuant to the attached top-down BACT analysis (Appendix D), BACT has been satisfied with the requirements listed in the following tables.

**Unit C-5713-3-3 (Liquid Manure Handling):**

BACT Triggered For:

- Lagoons/storage ponds (NH<sub>3</sub>)
- Land application (NH<sub>3</sub>)

<b>Lagoons/Storage Ponds</b>	
<b>NH<sub>3</sub></b>	All animals fed in accordance with NRC or other District-approved guidelines.

<b>Liquid Manure Land Application</b>	
<b>NH<sub>3</sub></b>	All animals fed in accordance with NRC or other District-approved guidelines.

The following condition will be added to the ATC as a mechanism to ensure compliance with the BACT requirements:

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]

**Unit C-5713-4-3 (Solid Manure Handling):**

BACT Triggered For:

- Storage (NH<sub>3</sub>)
- Land Application (NH<sub>3</sub>)

<b>Solid Manure Storage</b>	
<b>NH<sub>3</sub></b>	All animals fed in accordance with NRC or other District-approved guidelines.

<b>Solid Manure Land Application</b>	
<b>NH<sub>3</sub></b>	Rapid incorporation (within 2 hours) of solid manure into the soil after land application, and all animals fed in accordance with NRC or other District-approved guidelines.

The following conditions will be added to the ATC as a mechanism to ensure compliance with the BACT requirements:

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
- {modified 4541} Solid manure shall be incorporated into the soil within two (2) hours of land application. [District Rules 2201 and 4570]
- {modified 4542} Permittee shall maintain records to demonstrate that all solid manure has been incorporated within two (2) hours of land application. [District Rules 2201 and 4570]

**B. Offsets**

**1. Offset Applicability**

Offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals to or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The SSPE2 is compared to the offset thresholds in the following table:

<b>Offset Determination (lb/year)</b>					
	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>PM<sub>10</sub></b>	<b>CO</b>	<b>VOC</b>
SSPE2	1,984	1	14,103	603	111,152
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets triggered?	No	No	No	No	Yes

**2. Quantity of Offsets Required**

As seen above, the SSPE2 is greater than the offset thresholds for VOC. However, per Section 4.6.9 of Rule 2201, offsets are not required for agricultural operations that are not Major Sources. As indicated in Section VII.5 of this application review, this agricultural operation is not a Major Source; therefore, offsets will not be required for any criteria pollutant.

**C. Public Notification**

**1. Applicability**

Public noticing is required for:

- a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
- b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
- c. Any project which results in the offset thresholds being surpassed,
- d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant, and/or
- e. Any project which results in a Title V significant permit modification

**a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications**

New Major Sources are new facilities, which are also Major Sources. Since this is not a new facility, public noticing is not required for this project for New Major Source purposes.

As demonstrated in Sections VII.C.7 and VII.C.8, this project does not constitute an SB 288 or Federal Major Modification; therefore, public noticing for SB 288 or Federal Major Modification purposes is not required.

**b. PE > 100 lb/day**

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. There are no new emissions units associated with this project. Therefore public noticing is not required for this project for PE > 100 lb/day.

**c. Offset Threshold**

The SSPE1 and SSPE2 are compared to the offset thresholds in the following table.

<b>Public Notice - Offset Thresholds</b>				
<b>Pollutant</b>	<b>SSPE1 (lb/year)</b>	<b>SSPE2 (lb/year)</b>	<b>Offset Threshold (lb/year)</b>	<b>Notice Required?</b>
NO <sub>x</sub>	1,984	1,984	20,000	No
SO <sub>x</sub>	1	1	54,750	No
PM <sub>10</sub>	22,302	14,103	29,200	No
CO	603	603	200,000	No
VOC	104,688	111,152	20,000	No

As shown above, no offset thresholds are surpassed due to this project. Public notice for offset threshold purposes is therefore not required.

**d. SSIPE > 20,000 lb/year**

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District policy, the SSIPE = SSPE2 – SSPE1. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table.

<b>SSIPE Public Notice Thresholds</b>					
<b>Pollutant</b>	<b>SSPE2 (lb/year)</b>	<b>SSPE1 (lb/year)</b>	<b>SSIPE (lb/year)</b>	<b>SSIPE Public Notice Threshold</b>	<b>Public Notice Required?</b>
NO <sub>x</sub>	1,984	1,984	0	20,000 lb/year	No
SO <sub>x</sub>	1	1	0	20,000 lb/year	No
PM <sub>10</sub>	14,103	22,393	-8,290	20,000 lb/year	No
CO	603	603	0	20,000 lb/year	No
VOC	111,152	104,687	6,465	20,000 lb/year	No
NH <sub>3</sub>	146,101	122,723	23,376	20,000 lb/year	<b>Yes</b>
H <sub>2</sub> S	545	545	0	20,000 lb/year	No

As demonstrated above, the SSIPE for NH<sub>3</sub> is greater than 20,000 lb/year; therefore public noticing for SSIPE purposes is required.

**e. Title V Significant Permit Modification**

Since this facility does not have a Title V operating permit, this change is not a Title V significant Modification, and therefore public noticing is not required.

**2. Public Notice Action**

As discussed above, public noticing is required for this project for the SSIPE exceeding 20,000 lb-NH<sub>3</sub>/year. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be published in a local newspaper of general circulation prior to the issuance of the ATCs for this equipment.

**D. Daily Emission Limits (DELs)**

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

For dairies, the DEL is satisfied based on the number and types of cows at the dairy and the required emission controls and mitigation measures. The number and types of cows are listed in the permit equipment description for the Cow Housing Permit.

**Proposed Rule 2201 (DEL) Conditions:**

C-5713-1-3 (Milking Operation):

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- {modified 4484} Permittee shall flush or hose down milk parlor immediately prior to, immediately after, or during each milking. [District Rules 2201 and 4570]

C-5713-2-3 (Cow Housing):

- {modified 4486} Permittee shall pave feedlanes, where present, for a width of at least 8 feet along the corral side of the feedlane fence for milk and dry cows and at least 6 feet along the corral side of the feedlane for heifers. [District Rules 2201 and 4570]
- Permittee shall flush, scrape or vacuum freestall lanes immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
- Permittee shall remove manure that is not dry from individual cow freestall beds or shall rake, harrow, scrape, or grade freestall bedding at least once every seven (7) days. [District Rules 2201 and 4570]

- Permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rules 2201 and 4570]
- Permittee shall clean manure from corrals at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean corrals at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
- Permittee shall implement at least one of the following corral mitigation measures: 1) slope the surface of the corrals at least 3% where the available space for each animal is 400 square feet or less and shall slope the surface of the corrals at least 1.5% where the available space for each animal is more than 400 square feet per animal; 2) maintain corrals to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape pens sufficiently to maintain a dry surface except during periods of rainy weather. [District Rules 2201 and 4570]
- Permittee shall scrape, vacuum or flush concrete lanes in corrals at least once every day for mature cows and every seven (7) days for support stock. [District Rules 2201 and 4570]
- Shade structures shall be installed in any of the following ways: 1) constructed with a light permeable roofing material; 2) uphill of any slope in the corral; 3) installed so that the structure has a North/South orientation. OR Permittee shall clean manure from under corral shades at least once every fourteen (14) days, when weather permits access into the corral. [District Rules 2201 and 4570]
- Permittee shall manage corrals such that the manure depth in the corral does not exceed twelve (12) inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible. [District Rules 2201 and 4570]

C-5713-3-3 (Liquid Manure Handling):

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]
- Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rules 2201 and 4570]
- Permittee shall not allow liquid manure to stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]

C-5716-4-3 (Solid Manure Handling):

- {modified 4454} Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]



- Within seventy two (72) hours of removal of solid manure from housing, permittee shall either 1) remove dry manure from the facility, or 2) cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed twenty-four (24) hours per event. [District Rules 2201 and 4570]
- If weatherproof coverings are used, permittee shall maintain records, such as manufacturer warranties or other documentation, demonstrating that the weatherproof covering over dry manure are installed, used, and maintained in accordance with manufacturer recommendations and applicable standards listed in NRCS Field Office Technical Guide Code 313 or 367, or any other applicable standard approved by the APCO, ARB, and EPA. [District Rules 2201 and 4570]
- {modified 4541} Solid manure shall be incorporated into the soil within two (2) hours of land application. [District Rules 2201 and 4570]

## **E. Compliance Assurance**

### **1. Source Testing**

Pursuant to District Policy APR 1705, source testing is not required to demonstrate compliance with Rule 2201.

### **2. Monitoring**

No monitoring is required to demonstrate compliance with Rule 2201.

### **3. Recordkeeping**

Recordkeeping is required to demonstrate compliance with the public notification and daily emission limit requirements of Rule 2201.

#### All Permit Units:

- {modified 4453} Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]

#### C-5713-1-3 (Milking Operation):

- {modified 4485} Permittee shall provide verification that milk parlors are flushed or hosed prior to, immediately after, or during each milking. [District Rules 2201 and 4570]

C-5713-2-3 (Cow Housing):

- Permittee shall maintain records sufficient to demonstrate that freestall lanes are flushed, scraped or vacuumed immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
- Permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow freestall beds or 2) the dates when the freestall bedding is raked, harrowed, scraped, or graded. [District Rules 2201 and 4570]
- Permittee shall maintain records demonstrating that water pipes and troughs are inspected and leaks are repaired at least once every seven (7) days. [District Rules 2201 and 4570]
- Permittee shall demonstrate that manure from corrals are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that corrals are cleaned at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
- Permittee shall either 1) maintain sufficient records to demonstrate that corrals are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours or 2) maintain records of dates pens are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rules 2201 and 4570]
- Permittee shall maintain records demonstrating that concrete lanes in corrals are scraped, vacuumed, or flushed at least once every day for mature cows and at least once every seven (7) days for support stock. [District Rules 2201 and 4570]
- Permittee shall measure and document the depth of manure in the corrals at least once every ninety (90) days. [District Rules 2201 and 4570]
- Permittee shall maintain a record of the number of animals of each species and production group at the facility and shall maintain quarterly records of any changes to this information. [District Rules 2201 and 4570]

C-5713-3-3 (Liquid Manure Handling):

- {modified 4455} Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
- Permittee shall maintain records to demonstrate liquid manure did not stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]

C-5713-4-3 (Solid Manure Handling):

- {modified 4455} Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
- Permittee shall keep records of dates when manure is removed from the facility or permittee shall maintain records to demonstrate that dry manure piles outside the pens are covered with a weatherproof covering from October through May. [District Rules 2201 and 4570]
- {modified 4542} Permittee shall maintain records to demonstrate that solid manure has been incorporated into the soil within two (2) hours of land application. [District Rules 2201 and 4570]

**4. Reporting**

No reporting is required to demonstrate compliance with Rule 2201.

**F. Ambient Air Quality Analysis (AAQA)**

An AAQA is conducted for the purpose of determining whether a new or modified stationary source will cause, or worsen, the violation of an ambient air quality standard (AAQS). The District's Technical Services Division conducted the required analysis. A summary of the results is included in Appendix E of this evaluation.

L & J Vanderham is located in an attainment area for NO<sub>x</sub>, CO, and SO<sub>x</sub>. As shown in the AAQA summary, the modified operation will not cause a violation of an AAQS for NO<sub>x</sub>, CO, or SO<sub>x</sub>.

The facility is located in a non-attainment area for PM<sub>10</sub> (state) and PM<sub>2.5</sub> (state and federal) AAQS. As shown in the AAQA summary, the modified operation will not cause a violation of an AAQS PM<sub>10</sub> or PM<sub>2.5</sub>.

**Rule 2410 Prevention of Significant Deterioration**

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

**Rule 2520 Federally Mandated Operating Permits**

Since this facility's potential emissions do not exceed any major source thresholds of Rule 2201, this facility is not a major source, and Rule 2520 does not apply.

## Rule 2550 Federally Mandated Preconstruction Review for Major Sources of Air Toxics

The provisions of this rule only apply to applications to construct or reconstruct a major air toxics source with Authority to Construct issued on or after June 28, 1998.

Newly constructed facilities or reconstructed units or sources at existing facilities are subject to preconstruction review requirements if they have the potential to emit hazardous air pollutants (air toxics) in "major" amounts (10 tons or more of an individual pollutant or 25 tons or more of a combination of pollutants) and the new units are not already subject to a standard promulgated under Section 112(d), 112(j), or 112(h) of the Clean Air Act." Facilities or sources subject to Rule 2550 would be subject to stringent air pollution control requirements, referred to as Maximum Achievable Control Technology (MACT).

The federal Clean Air Act (Section 112(b)(1)) lists 189 substances as potential hazardous air pollutants (HAPs). The following table outlines the HAPs expected to be emitted from dairies, and their estimated emission rates, based on the best data currently available:

Hazardous Air Pollutant Emissions from Dairies		
HAP	Emission Rate lb/milk cow-year	Source
Methanol	1.35	UC Davis - <i>VOC Emission from Dairy Cows and their Excreta</i> , 2005
Carbon disulfide	0.027	Dr. Schmidt - <i>Dairy Emissions using Flux Chambers (Phase I &amp; II)</i> , 2005
Ethylbenzene	0.003	
o-Xylene	0.005	
1,2-Dibromo-3chloropropane	0.011	
1,2,4-Trichlorobenzene	0.025	
Naphthalene	0.012	
Hexachlorobutadiene	0.012	
Formaldehyde	0.005	
Acetaldehyde	0.029	
Chloroform	0.017	
Styrene	0.01	California State University Fresno (CSUF) - <i>Monitoring and Modeling of ROG at California Dairies</i> , 2005
Vinyl acetate <sup>6</sup>	0.08	Dr. Schmidt - <i>Dairy Emissions using Flux Chambers (Phase I &amp; II)</i> & California State University Fresno (CSUF) - <i>Monitoring and Modeling of ROG at California Dairies</i> , 2005
Toluene <sup>7</sup>	0.162	

<sup>6</sup> 0.01 + 0.07 = 0.08 lbs/hd-yr.

<sup>7</sup> 0.012 + 0.15 = 0.162 lbs/hd-yr.

Cadmium	0.009	Air Resources Board's Profile No. 423, Livestock Operations Dust
Hexavalent Chromium	0.004	
Nickel	0.026	
Arsenic	0.005	
Cobalt	0.003	
Lead	0.033	
<b>Total</b>	<b>1.828</b>	

Since the proposed dairy is subject to Best Available Control Technology (BACT) emissions control requirements and Rule 4570 mitigation measures, many of the pollutants listed above are expected to be controlled significantly. However, in order to ensure that this evaluation is based on the worst-case scenario, no controls will be factored into the HAPs emissions estimates. Please note that a conclusion that MACT requirements are triggered would necessarily involve consideration of controlled emissions levels.

Based on the total emission rate shown in the preceding table, the HAPs emissions calculations for the proposed dairy are summarized in the table below:

HAPs Emissions Calculations						
Category	Number of cows		Emission Rate lb/cow-year <sup>8</sup>		Emissions	
					lb/year	tons/year
Milking Cows	4,207	x	1.828	=	7,690	3.8
Dry Cows	489	x	1.123	=	549	0.3
Support Stock	604	x	0.786	=	475	0.2
<b>Total =</b>					<b>8,714</b>	<b>4.3</b>

As shown above, total HAPs emissions are expected to be less than 10 tons per year. The proposed facility will therefore not be a major air toxics source and the provisions of Rule 2550 are not applicable.

#### Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60. However, no subparts of 40 CFR Part 60 apply to confined animal facilities operations.

#### Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

This rule incorporates NESHAPs from Part 61, Chapter I, Subchapter C, Title 40, CFR and the NESHAPs from Part 63, Chapter I, Subchapter C, Title 40, CFR; and applies to all sources of hazardous air pollution listed in 40 CFR Part 61 or 40 CFR Part 63. However, no subparts of 40 CFR Part 61 or 40 CFR Part 63 apply to confined animal facilities operations.

<sup>8</sup> The emission rate total has been adjusted for each cow category using ratios based on manure production rates.

### **Rule 4101 Visible Emissions**

Rule 4101 states that no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour which is as dark as or darker than Ringelmann 1 (or 20% opacity).

Pursuant to Section 4.12, the requirements of this rule do not apply to emissions subject to or specifically exempt from Regulation VIII (Fugitive PM10 Prohibitions).

Pursuant to Rule 8011, Section 4.4, on-field agricultural sources are exempt from the requirements of Regulation VIII.

The proposed project involves only on-field agricultural sources and is therefore exempt from the requirements of Rule 4101.

### **Rule 4102 Nuisance**

This rule prohibits the discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. According to the District's records, there have been no public nuisance complaints or violations associated with the operations of this facility.

Since the proposed modifications do not fundamentally alter the nature of the facility's operations, continued compliance with the requirements of this rule is expected.

### **California Health & Safety Code 41700 (Health Risk Assessment)**

District Policy APR 1905 – *Risk Management Policy for Permitting New and Modified Sources* specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

An HRA is not required for a project with a total facility prioritization score of less than one. According to the Technical Services Memo for this project (Appendix E), the total facility prioritization score including this project was greater than one. Therefore, an HRA was required to determine the short-term acute and long-term chronic exposure from this project.

The RMR summary for this project is shown below:

RMR Summary <sup>2</sup>						
Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required?	Special Permit Requirements?
Unit 1-3 (Milk Parlor)	0.26	0.00	0.00	8.63E-08	No	No
Unit 2-3 (Cow Housing)	4.66	0.07	0.02	4.75E-07	No	No
Unit 3-3 (Lagoon & Liquid Land Application)	0.00	0.00	0.00	0.00 <sup>1</sup>	No	No
Unit 4-3 (Solid Manure Piles & Land Application)	0.00	0.00	0.00	0.00 <sup>1</sup>	No	No
<b>Project Totals</b>	4.92	0.07	0.02	5.61E-07		
<b>Facility Totals</b>	>1	0.07	0.02	5.61E-07		

<sup>1</sup>The Maximum Individual Cancer Risk was not calculated since there is no risk factor or the risk factor is so low that it has been determined to be insignificant for this type of unit.

<sup>2</sup>This RMR summary was based on a herd size of 4,718 mature cows. The applicant revised the mature herd size to 4,696 mature cows. Since revisions resulted in the reduction of the herd size, a revised RMR would have resulted in a reduction in risk. Therefore, a revised RMR was not performed.

### Discussion of T-BACT

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. As demonstrated above, T-BACT is not required for this project because the HRA indicates that the risk is not above the District's thresholds for triggering T-BACT requirements; therefore, compliance with the District's Risk Management Policy is expected.

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification not have acute or chronic indices, or a cancer risk greater than the District's significance levels (i.e. acute and/or chronic indices greater than 1 and a cancer risk greater than 20 in a million). As outlined by the RMR Summary in Appendix E of this report, the emissions increases for this project were determined to be less than significant.

### Rule 4550 Conservation Management Practices (CMP)

This rule applies to agricultural operation sites located within the San Joaquin Valley Air Basin. The purpose of this rule is to limit fugitive dust emissions from agricultural operation sites.

Pursuant to Section 5.1, effective on and after July 1, 2004, an owner/operator shall implement the applicable CMPs selected pursuant to Section 6.2 for each agricultural operation site.

Pursuant to Section 5.2, an owner/operator shall prepare and submit a CMP application for each agricultural operation site to the APCO for approval.

The facility received District approval for its CMP plan on December 10, 2013. Continued compliance with the requirements of District Rule 4550 is expected.

### **Rule 4570 Confined Animal Facilities (CAF)**

This rule applies to Confined Animal Facilities (CAF) located within the San Joaquin Valley Air Basin. The purpose of this rule is to limit emissions of Volatile Organic Compounds (VOC) from Confined Animal Facilities (CAF).

This facility was issued ATC permits to modify their permits to incorporate the Phase II requirements of District Rule 4570 under Project C-1110945. These ATC permits were converted to PTOs on March 15, 2012. The mitigation measures chosen for compliance with the Phase II requirements of District Rule 4570 are contained on the facility's current PTOs, and will be included on the ATCs issued in this project. Continued compliance with this rule is expected.

### **California Health & Safety Code 42301.6 (School Notice)**

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

### **California Environmental Quality Act (CEQA)**

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The District adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities;
- Identify the ways that environmental damage can be avoided or significantly reduced;
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

### **Greenhouse Gas (GHG) Significance Determination**

It is determined that another agency has prepared an environmental review document for the project. The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381). As a Responsible Agency, the District is limited to mitigating or avoiding impacts for which it has statutory authority.



The District does not have statutory authority for regulating greenhouse gas emissions. The District has determined that the applicant is responsible for implementing greenhouse gas mitigation measures, if any, imposed by the Lead Agency.

### **District CEQA Findings**

The County of Fresno (County) is the public agency having principal responsibility for approving the project. As such, the County served as the Lead Agency (CCR §15367). In approving the project, the Lead Agency prepared and adopted a Mitigated Negative Declaration. The Lead agency filed a Notice of Determination, stating that the environmental document was adopted pursuant to the provisions of CEQA and concluding that the project would not have a significant effect on the environment.

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CCR §15381). As a Responsible Agency the District complies with CEQA by considering the environmental document prepared by the Lead Agency, and by reaching its own conclusion on whether and how to approve the project (CCR §15096).

The District has considered the Lead Agency's environmental document. Furthermore, the District has conducted an engineering evaluation of the project, this document, which demonstrates that Stationary Source emissions from the project would be below the District's thresholds of significance for criteria pollutants. Thus, the District finds that through a combination of project design elements, compliance with applicable District rules and regulations, and compliance with District air permit conditions, project specific stationary source emissions will have a less than significant impact on air quality. The District does not have authority over any of the other project impacts and has, therefore, determined that no additional findings are required (CEQA Guidelines §15096(h)).

### **Indemnification Agreement/Letter of Credit Determination**

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit is based on a case-by-case analysis of a particular project's potential for litigation risk, which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

The criteria pollutant emissions and toxic air contaminant emissions associated with the proposed project are not significant. Therefore, an Indemnification Agreement and/or a Letter of Credit will not be required for this project in the absence of expressed public concern.

## **IX. Recommendation**

Compliance with all applicable rules and regulations is expected. Pending a successful NSR Public Noticing period, issue ATC permits C-5713-1-3, -2-3, -3-3, and -4-3 subject to the permit conditions on the attached draft ATCs in Appendix A.

**X. Billing Information**

<b>Annual Permit Fees</b>			
<b>Permit Number</b>	<b>Fee Schedule</b>	<b>Fee Description</b>	<b>Annual Fee</b>
C-5713-1-3	3020-06	Cow Milking Operation	\$122
C-5713-2-3	3020-06	Cow Housing	\$122
C-5713-3-3	3020-06	Liquid Manure Handling	\$122
C-5713-4-3	3020-06	Solid Manure Handling	\$122

**Appendixes**

- A: Draft ATCs
- B: Current PTOs
- C: BACT Guidelines
- D: BACT Analysis
- E: RMR and AAQA Summary
- F: Emissions Calculations
- G: PE Calculations for Unit C-5713-6-0

# **APPENDIX A**

## **Draft ATCs**

San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

**DRAFT**  
ISSUANCE DATE: DRAFT

**PERMIT NO:** C-5713-1-3

**LEGAL OWNER OR OPERATOR:** L & J VANDERHAM  
**MAILING ADDRESS:** 10635 W MT WHITNEY  
RIVERDALE, CA 93656

**LOCATION:** 10772 W MT WHITNEY  
RIVERDALE, CA 93656

**EQUIPMENT DESCRIPTION:**

MODIFICATION OF 3,088 COW MILKING OPERATION WITH TWO DOUBLE 30 PARALLEL (120 STALLS) MILKING PARLORS: INCREASE THE HERD SIZE FROM 3,088 MILK COWS TO 4,207 MILK COWS

**CONDITIONS**

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall flush or hose milk parlor immediately prior to, immediately after, or during each milking. [District Rules 2201 and 4570]
5. Permittee shall provide verification that milk parlors are flushed or hosed prior to, immediately after, or during each milking. [District Rules 2201 and 4570]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

**Arnaud Marjolle, Director of Permit Services**  
C-5713-1-3 Sep 24 2018 10:12AM -- FUKUDAD : Joint Inspection NOT Required

6. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]
7. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

DRAFT

San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

ISSUANCE DATE: DRAFT

PERMIT NO: C-5713-2-3

LEGAL OWNER OR OPERATOR: L & J VANDERHAM  
MAILING ADDRESS: 10635 W MT WHITNEY  
RIVERDALE, CA 93656

LOCATION: 10772 W MT WHITNEY  
RIVERDALE, CA 93656

**EQUIPMENT DESCRIPTION:**

MODIFICATION OF COW HOUSING - 3,088 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 3,808 MATURE COWS (MILK AND DRY); 1,620 TOTAL SUPPORT STOCK (HEIFERS, CALVES AND BULLS); AND 5 FREESTALLS WITH FLUSH/SCRAPE SYSTEM: INCREASE MAXIMUM NUMBER OF COWS TO 4,207 MILK COWS NOT TO EXCEED 4,696 MATURE COWS (MILK AND DRY), AND DECREASE SUPPORT STOCK TO 604 TOTAL SUPPORT STOCK (HEIFERS, CALVES, AND BULLS)

**CONDITIONS**

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall pave feedlanes, where present, for a width of at least 8 feet along the corral side of the feedlane fence for milk and dry cows and at least 6 feet along the corral side of the feedlane for heifers. [District Rules 2201 and 4570]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Arnaud Marjolle, Director of Permit Services

C-5713-2-3 - Sep 24 2018 10:12AM -- FUKUDAD : Joint Inspection NOT Required

5. Permittee shall flush, scrape or vacuum freestall lanes immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
6. Permittee shall maintain records sufficient to demonstrate that freestall lanes are flushed, scraped or vacuumed immediately prior to, immediately after or during each milking. [District Rules 2201 and 4570]
7. Permittee shall remove manure that is not dry from individual cow freestall beds or shall rake, harrow, scrape, or grade freestall bedding at least once every seven (7) days. [District Rules 2201 and 4570]
8. Permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow freestall beds or 2) the dates when the freestall bedding is raked, harrowed, scraped, or graded. [District Rules 2201 and 4570]
9. Permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rules 2201 and 4570]
10. Permittee shall maintain records demonstrating that water pipes and troughs are inspected and leaks are repaired at least once every seven (7) days. [District Rules 2201 and 4570]
11. Permittee shall clean manure from corrals at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean corrals at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
12. Permittee shall demonstrate that manure from corrals are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that corrals are cleaned at least once between April and July and at least once between September and December. [District Rules 2201 and 4570]
13. Permittee shall implement at least one of the following corral mitigation measures: 1) slope the surface of the corrals at least 3% where the available space for each animal is 400 square feet or less and shall slope the surface of the corrals at least 1.5% where the available space for each animal is more than 400 square feet per animal; 2) maintain corrals to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape pens sufficiently to maintain a dry surface except during periods of rainy weather. [District Rules 2201 and 4570]
14. Permittee shall either 1) maintain sufficient records to demonstrate that corrals are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours or 2) maintain records of dates pens are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rules 2201 and 4570]
15. Permittee shall scrape, vacuum or flush concrete lanes in corrals at least once every day for mature cows and every seven (7) days for support stock. [District Rules 2201 and 4570]
16. Permittee shall maintain records demonstrating that concrete lanes in corrals are scraped, vacuumed, or flushed at least once every day for mature cows and at least once every seven (7) days for support stock. [District Rules 2201 and 4570]
17. Shade structures shall be installed in any of the following ways: 1) constructed with a light permeable roofing material; 2) uphill of any slope in the corral; 3) installed so that the structure has a North/South orientation. OR Permittee shall clean manure from under corral shades at least once every fourteen (14) days, when weather permits access into the corral. [District Rules 2201 and 4570]
18. If permittee has selected to comply using shades constructed with a light permeable roofing material, then permittee shall maintain records, such as design specifications, demonstrating that the shade structures are equipped with such roofing material or if permittee has selected to comply by cleaning the manure from under the corral shades, then permittee shall maintain records demonstrating that manure is cleaned from under the shades at least once every fourteen (14) days, as long as weather permits access to corrals. [District Rules 2201 and 4570]
19. Permittee shall manage corrals such that the manure depth in the corral does not exceed twelve (12) inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible. [District Rules 2201 and 4570]
20. Permittee shall measure and document the depth of manure in the corrals at least once every ninety (90) days. [District Rules 2201 and 4570]

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CONDITIONS CONTINUE ON NEXT PAGE

21. Permittee shall maintain a record of the number of animals of each species and production group at the facility and shall maintain quarterly records of any changes to this information. [District Rules 2201 and 4570]
22. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]
23. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

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San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

ISSUANCE DATE: DRAFT  
**DRAFT**

**PERMIT NO:** C-5713-3-3

**LEGAL OWNER OR OPERATOR:** L & J VANDERHAM  
**MAILING ADDRESS:** 10635 W MT WHITNEY  
RIVERDALE, CA 93656

**LOCATION:** 10772 W MT WHITNEY  
RIVERDALE, CA 93656

**EQUIPMENT DESCRIPTION:**

MODIFICATION OF LIQUID MANURE HANDLING SYSTEM CONSISTING OF ONE PROCESSING PIT, MECHANICAL SEPARATOR, TWO SETTLING BASINS, AND ONE LAGOON: INCREASE IN LIQUID MANURE DUE TO INCREASE IN MILK COW HERD SIZE AS AUTHORIZED BY ATC C-5713-2-3

**CONDITIONS**

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

**DRAFT**

Arnaud Marjolle, Director of Permit Services  
C-5713-3-3 Sep 24 2018 10:13AM - FUKUDAD : Joint Inspection NOT Required

5. Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
6. Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rules 2201 and 4570]
7. Permittee shall not allow liquid manure to stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]
8. Permittee shall maintain records to demonstrate liquid manure did not stand in the fields for more than twenty-four (24) hours after irrigation. [District Rules 2201 and 4570]
9. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]
10. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

DRAFT

San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

**ISSUANCE DATE: DRAFT**

**PERMIT NO:** C-5713-4-3

**LEGAL OWNER OR OPERATOR:** L & J VANDERHAM  
**MAILING ADDRESS:** 10635 W MT WHITNEY  
RIVERDALE, CA 93656

**LOCATION:** 10772 W MT WHITNEY  
RIVERDALE, CA 93656

**EQUIPMENT DESCRIPTION:**

MODIFICATION OF SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; WINDROW/AERATED STATIC PILE COMPOSTING; SOLID MANURE APPLICATION TO LAND AND/OR HAULED OFFSITE: INCREASE IN SOLID MANURE DUE TO INCREASE IN MILK COW HERD SIZE AS AUTHORIZED BY ATC C-5713-2-3

**CONDITIONS**

1. {3215} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. {3216} Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. {4452} If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall feed all animals according to National Research Council (NRC) guidelines. [District Rules 2201 and 4570]

CONDITIONS CONTINUE ON NEXT PAGE

**YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT.** This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Arnaud Marjolle, Director of Permit Services

C-5713-4-3 - Sep 24 2018 10:13AM -- FUKUDAD : Joint Inspection NOT Required

5. Permittee shall maintain records of feed content, formulation, and quantity of feed additive utilized, to demonstrate compliance with National Research Council (NRC) guidelines. Records such as feed company guaranteed analyses (feed tags), ration sheets, or feed purchase records may be used to meet this requirement. [District Rules 2201 and 4570]
6. Within seventy two (72) hours of removal of solid manure from housing, permittee shall either 1) remove dry manure from the facility, or 2) cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed twenty-four (24) hours per event. [District Rules 2201 and 4570]
7. Permittee shall keep records of dates when manure is removed from the facility or permittee shall maintain records to demonstrate that dry manure piles outside the pens are covered with a weatherproof covering from October through May. [District Rules 2201 and 4570]
8. If weatherproof coverings are used, permittee shall maintain records, such as manufacturer warranties or other documentation, demonstrating that the weatherproof covering over dry manure are installed, used, and maintained in accordance with manufacturer recommendations and applicable standards listed in NRCS Field Office Technical Guide Code 313 or 367, or any other applicable standard approved by the APCO, ARB, and EPA. [District Rules 2201 and 4570]
9. Solid manure shall be incorporated into the soil within two (2) hours of land application. [District Rules 2201 and 4570]
10. Permittee shall maintain records to demonstrate that all solid manure has been incorporated within two (2) hours of land application. [District Rules 2201 and 4570]
11. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rules 2201 and 4570]
12. {3658} This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

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## **APPENDIX B**

### **Current PTOs**

# San Joaquin Valley Air Pollution Control District

**PERMIT UNIT:** C-5713-1-2

**EXPIRATION DATE:** 12/31/2018

**EQUIPMENT DESCRIPTION:**

3,088 COW MILKING OPERATION WITH TWO DOUBLE 30 PARALLEL (120 STALLS) MILKING PARLORS

## PERMIT UNIT REQUIREMENTS

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1. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall flush or hose milk parlor immediately prior to, immediately after, or during each milking. [District Rule 4570]
5. Permittee shall provide verification that milk parlors are flushed or hosed prior to, immediately after, or during each milking. [District Rule 4570]
6. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rule 4570]
7. This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

These terms and conditions are part of the Facility-wide Permit to Operate.

# San Joaquin Valley Air Pollution Control District

**PERMIT UNIT:** C-5713-2-2

**EXPIRATION DATE:** 12/31/2018

**EQUIPMENT DESCRIPTION:**

COW HOUSING - 3,088 MILK COWS NOT TO EXCEED A COMBINED TOTAL OF 3,808 MATURE COWS (MILK AND DRY); 1,620 TOTAL SUPPORT STOCK (HEIFERS, CALVES AND BULLS); AND 5 FREESTALLS WITH FLUSH/SCRAPE SYSTEM

## PERMIT UNIT REQUIREMENTS

---

1. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall pave feedlanes, where present, for a width of at least 8 feet along the corral side of the feedlane fence for milk and dry cows and at least 6 feet along the corral side of the feedlane for heifers. [District Rule 4570]
5. Permittee shall flush, scrape or vacuum freestall lanes immediately prior to, immediately after or during each milking. [District Rule 4570]
6. Permittee shall maintain records sufficient to demonstrate that freestall lanes are flushed, scraped or vacuumed immediately prior to, immediately after or during each milking. [District Rule 4570]
7. Permittee shall remove manure that is not dry from individual cow freestall beds or shall rake, harrow, scrape, or grade freestall bedding at least once every seven (7) days. [District Rule 4570]
8. Permittee shall record either of the following: 1) the dates when manure that is not dry is removed from individual cow freestall beds or 2) the dates when the freestall bedding is raked, harrowed, scraped, or graded. [District Rule 4570]
9. Permittee shall inspect water pipes and troughs and repair leaks at least once every seven (7) days. [District Rule 4570]
10. Permittee shall maintain records demonstrating that water pipes and troughs are inspected and leaks are repaired at least once every seven (7) days. [District Rule 4570]
11. Permittee shall clean manure from corrals at least four (4) times per year with at least sixty (60) days between each cleaning, or permittee shall clean corrals at least once between April and July and at least once between September and December. [District Rule 4570]
12. Permittee shall demonstrate that manure from corrals are cleaned at least four (4) times per year with at least sixty (60) days between each cleaning or demonstrate that corrals are cleaned at least once between April and July and at least once between September and December. [District Rule 4570]

PERMIT UNIT REQUIREMENTS CONTINUE ON NEXT PAGE

These terms and conditions are part of the Facility-wide Permit to Operate.

13. Permittee shall implement at least one of the following corral mitigation measures: 1) slope the surface of the corrals at least 3% where the available space for each animal is 400 square feet or less and shall slope the surface of the corrals at least 1.5% where the available space for each animal is more than 400 square feet per animal; 2) maintain corrals to ensure proper drainage preventing water from standing more than forty-eight hours; or 3) harrow, rake, or scrape pens sufficiently to maintain a dry surface except during periods of rainy weather. [District Rule 4570]
14. Permittee shall either 1) maintain sufficient records to demonstrate that corrals are maintained to ensure proper drainage preventing water from standing for more than forty-eight hours or 2) maintain records of dates pens are groomed (i.e., harrowed, raked, or scraped, etc.). [District Rule 4570]
15. Permittee shall scrape, vacuum or flush concrete lanes in corrals at least once every day for mature cows and every seven (7) days for support stock. [District Rule 4570]
16. Permittee shall maintain records demonstrating that concrete lanes in corrals are scraped, vacuumed, or flushed at least once every day for mature cows and at least once every seven (7) days for support stock. [District Rule 4570]
17. If permittee has selected to comply using shades constructed with a light permeable roofing material, then permittee shall maintain records, such as design specifications, demonstrating that the shade structures are equipped with such roofing material or if permittee has selected to comply by cleaning the manure from under the corral shades, then permittee shall maintain records demonstrating that manure is cleaned from under the shades at least once every fourteen (14) days, as long as weather permits access to corrals. [District Rule 4570]
18. Shade structures shall be installed in any of the following ways: 1) constructed with a light permeable roofing material; 2) uphill of any slope in the corral; 3) installed so that the structure has a North/South orientation. OR Permittee shall clean manure from under corral shades at least once every fourteen (14) days, when weather permits access into the corral. [District Rule 4570]
19. Permittee shall manage corrals such that the manure depth in the corral does not exceed twelve (12) inches at any time or point, except for in-corral mounding. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. However, permittee must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible. [District Rule 4570]
20. Permittee shall measure and document the depth of manure in the corrals at least once every ninety (90) days. [District Rule 4570]
21. Permittee shall maintain a record of the number of animals of each species and production group at the facility and shall maintain quarterly records of any changes to this information. [District Rule 4570]
22. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rule 4570]
23. This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

These terms and conditions are part of the Facility-wide Permit to Operate.



# San Joaquin Valley Air Pollution Control District

**PERMIT UNIT:** C-5713-3-2

**EXPIRATION DATE:** 12/31/2018

**EQUIPMENT DESCRIPTION:**

LIQUID MANURE HANDLING SYSTEM CONSISTING OF ONE PROCESSING PIT, MECHANICAL SEPARATOR, TWO SETTLING BASINS, AND ONE STORAGE POND

## PERMIT UNIT REQUIREMENTS

---

1. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Permittee shall remove solids with a solid separator system, prior to the manure entering the lagoon. [District Rule 4570]
5. Permittee shall not allow liquid manure to stand in the fields for more than twenty-four (24) hours after irrigation. [District Rule 4570]
6. Permittee shall maintain records to demonstrate liquid manure did not stand in the fields for more than twenty-four (24) hours after irrigation. [District Rule 4570]
7. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rule 4570]
8. This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

These terms and conditions are part of the Facility-wide Permit to Operate.

# San Joaquin Valley Air Pollution Control District

**PERMIT UNIT:** C-5713-4-2

**EXPIRATION DATE:** 12/31/2018

**EQUIPMENT DESCRIPTION:**

SOLID MANURE HANDLING CONSISTING OF MANURE STOCK PILES; WINDROW/AERATED STATIC PILE COMPOSTING; SOLID MANURE APPLICATION TO LAND AND/OR HAULED OFFSITE

## PERMIT UNIT REQUIREMENTS

---

1. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to enter the permittee's premises where a permitted source is located or emissions related activity is conducted, or where records must be kept under condition of the permit. [District Rule 1070]
2. Upon presentation of appropriate credentials, a permittee shall allow an authorized representative of the District to have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit. [District Rule 1070]
3. If a licensed veterinarian or a certified nutritionist determines that any VOC mitigation measure will be required to be suspended as a detriment to animal health or necessary for the animal to molt, the owners/operators must notify the District in writing within forty-eight (48) hours of the determination including the duration and the specific health condition requiring the mitigation measure to be suspended. If the situation is expected to exist longer than a thirty-day (30) period, the owner/operator shall submit a new emission mitigation plan designating a mitigation measure to be implemented in lieu of the suspended mitigation measure. [District Rule 4570]
4. Within seventy two (72) hours of removal of solid manure from housing, permittee shall either 1) remove dry manure from the facility, or 2) cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed twenty-four (24) hours per event. [District Rule 4570]
5. Permittee shall keep records of dates when manure is removed from the facility or permittee shall maintain records to demonstrate that dry manure piles outside the pens are covered with a weatherproof covering from October through May. [District Rule 4570]
6. If weatherproof coverings are used, permittee shall maintain records, such as manufacturer warranties or other documentation, demonstrating that the weatherproof covering over dry manure are installed, used, and maintained in accordance with manufacturer recommendations and applicable standards listed in NRCS Field Office Technical Guide Code 313 or 367, or any other applicable standard approved by the APCO, ARB, and EPA. [District Rule 4570]
7. Permittee shall incorporate all solid manure within seventy-two (72) hours of land application. [District Rule 4570]
8. Permittee shall maintain records to demonstrate that all solid manure has been incorporated within seventy-two (72) hours of land application. [District Rule 4570]
9. Permittee shall keep and maintain all records for a minimum of five (5) years and shall make records available to the APCO and EPA upon request. [District Rule 4570]
10. This permit does not authorize the violation of any conditions established for this facility in the Conditional Use Permit (CUP), Special Use Permit (SUP), Site Approval, Site Plan Review (SPR), or other approval documents issued by a local, state, or federal agency. [Public Resources Code 21000-21177: California Environmental Quality Act]

These terms and conditions are part of the Facility-wide Permit to Operate.

## **APPENDIX C**

### **BACT Guidelines**

San Joaquin Valley  
Unified Air Pollution Control District

**Best Available Control Technology (BACT) Guideline 5.8.6\***

Last Update: 12/18/2013

**Liquid Manure Handling - Lagoon/Storage Pond**

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Anaerobic treatment lagoon designed according to NRCS Guideline, and solids removal/separation system (mechanical separator(s) or settling basin(s)/weeping wall(s))	1) Aerobic treatment lagoon or mechanically aerated lagoon;  2) Covered lagoon digester vented to a control device with minimum 95% control	
NH3	All animals fed in accordance with NRCS or other District-approved guidelines		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

**\*This is a Summary Page for this Class of Source**

San Joaquin Valley  
Unified Air Pollution Control District

**Best Available Control Technology (BACT) Guideline 5.8.7\***

Last Update: 12/18/2013

**Liquid Manure Handling - Liquid/Slurry Land Application**

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Irrigation of crops using liquid/slurry manure from the secondary lagoon/holding/storage pond preceded by an uncovered anaerobic treatment lagoon designed to meet Natural Resources Conservation Service (NRCS) standards	1) Irrigation of crops using liquid manure from an aerobic treatment lagoon or mechanically aerated lagoon (95% VOC control efficiency)  2) Irrigation of crops using liquid manure from a holding/storage pond after being treated in a covered lagoon/digester (80% VOC control efficiency)	
NH3	All animals fed in accordance with NRCS or other District-approved guidelines		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

**\*This is a Summary Page for this Class of Source**

San Joaquin Valley  
Unified Air Pollution Control District

**Best Available Control Technology (BACT) Guideline 5.8.8\***

Last Update: 12/18/2013

**Solid Manure Handling - Storage/Separated Solids Piles**

<b>Pollutant</b>	<b>Achieved in Practice or contained in the SIP</b>	<b>Technologically Feasible</b>	<b>Alternate Basic Equipment</b>
NH3	All animals fed in accordance with NRCS or other District-approved guidelines		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

**\*This is a Summary Page for this Class of Source**

San Joaquin Valley  
Unified Air Pollution Control District

**Best Available Control Technology (BACT) Guideline 5.8.9\***

Last Update: 12/18/2013

**Solid Manure Handling - Land Application**

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Rapid incorporation of solid manure into the soil after land application	<p>1a) Land Application of Solid Manure Processed by Either an Open or Enclosed Negatively-Aerated Static Pile (ASP) Vented to a biofilter (or equivalent) <math>\geq 80\%</math> destruction efficiency With Rapid Incorporation of the Manure Into the Soil After Land Application;</p> <p>1b) Land Application of Solid Manure Processed by In-Vessel/Enclosed Negatively-Aerated Static Piles vented to biofilter <math>\geq 80\%</math> destruction efficiency;</p> <p>2) Land Application of Solid Manure Processed by Open Negatively-Aerated Static Piles vented to biofilter <math>\geq 80\%</math> destruction efficiency;</p> <p>3) Land Application of Solid Manure Processed by an Open Negatively-Aerated Static Piles (ASP) (With Thick Layer of Bulking Agent or Equivalent) With Rapid Incorporation of the Manure Into the Soil After Land Application</p>	
NH3	Rapid incorporation of solid manure into the soil after land application, and all animals fed in accordance with NRCS or other District-approved guidelines		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a State Implementation Plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

**\*This is a Summary Page for this Class of Source**

## **APPENDIX D**

### **Top-Down BACT Analysis**



### **C-5713-3-3 (Liquid Manure Handling):**

For this project, BACT is triggered for the following emissions units in the facility's liquid manure handling operation:

- Lagoons/storage ponds (NH<sub>3</sub>)
- Land application (NH<sub>3</sub>)

The Top-Down BACT analysis for these emissions units are performed below.

#### **I. Top-Down BACT Analysis for the Liquid Manure Handling System - Lagoons & Storage Ponds**

##### **1. NH<sub>3</sub> Emissions**

###### **a. Step 1 - Identify all control technologies**

The following option was identified as a possible control for NH<sub>3</sub> emissions from the lagoons & storage ponds:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

###### **Description of Control Technology**

- 1) All animals fed in accordance with NRC or other District-approved guidelines

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for ammonia emissions can be reduced by reducing the amount of undigested nitrogen compounds in the manure. The level of microbial action in the manure corresponds to the level of organic nitrogen content in the manure; the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia and VOCs.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOCs and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure, which will reduce ammonia emissions from the liquid manure in the lagoon and storage pond.

###### **b. Step 2 - Eliminate technologically infeasible options**

The option listed in Step 1 above is technologically feasible.

### **c. Step 3 - Rank remaining options by control effectiveness**

The remaining option is listed below:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

### **d. Step 4 - Cost Effectiveness Analysis**

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

### **e. Step 5 - Select BACT**

The applicant has proposed to feed all animals in accordance with NRC or other District-approved guidelines. The proposal satisfies BACT for this category.

## **II. Top-Down BACT Analysis for the Liquid Manure Handling System – Liquid Manure Land Application**

### **1. NH<sub>3</sub> Emissions**

#### **a. Step 1 - Identify all control technologies**

The following option has been identified as a possible control option for NH<sub>3</sub> emissions from land application of liquid manure:

- All animals fed in accordance with NRC or other District-approved guidelines

#### **Description of Control Technology**

- 1) All animals fed in accordance with NRC or other District-approved guidelines

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for ammonia emissions can be reduced by reducing the amount of undigested nitrogen compounds in the manure. The level of microbial action in the manure corresponds to the level of organic nitrogen content in the manure; the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia and VOCs.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOCs and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure, which will reduce ammonia emissions from liquid manure applied to cropland.

**b. Step 2 - Eliminate technologically infeasible options**

The option listed in Step 1 above is technologically feasible.

**c. Step 3 - Rank remaining options by control effectiveness**

The remaining option is listed below:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

**d. Step 4 - Cost Effectiveness Analysis**

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

**e. Step 5 - Select BACT**

The applicant has proposed to feed all animals in accordance with NRC or other District-approved guidelines. The proposal satisfies BACT for this category.

## C-5713-4-3 (Solid Manure Handling)

For this project, BACT is triggered for NH<sub>3</sub> from the facility's solid manure handling – storage operation. The Top-Down BACT analysis for this emissions unit is performed below.

### **I. Top-Down BACT Analysis for Solid Manure Storage**

#### **NH<sub>3</sub> Emissions**

##### **a. Step 1 - Identify all control technologies**

The following option has been identified as a possible control option for NH<sub>3</sub> emissions from solid manure storage:

- All animals fed in accordance with NRC or other District-approved guidelines

#### **Description of Control Technology**

##### **1) All animals fed in accordance with NRC or other District-approved guidelines**

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for ammonia emissions can be reduced by reducing the amount of undigested nitrogen compounds in the manure. The level of microbial action in the manure corresponds to the level of organic nitrogen content in the manure; the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia and VOCs.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOCs and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure, which will reduce ammonia emissions from liquid manure applied to cropland.

##### **b. Step 2 - Eliminate technologically infeasible options**

The option listed in Step 1 above is technologically feasible.

##### **c. Step 3 - Rank remaining options by control effectiveness**

The remaining option is listed below:

- 1) All animals fed in accordance with NRC or other District-approved guidelines

##### **d. Step 4 - Cost Effectiveness Analysis**

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

### **e. Step 5 - Select BACT**

The applicant has proposed to feed all animals at the dairy in accordance with NRC or other District-approved guidelines. The proposal satisfies BACT for this category.

## **II. Top-Down BACT Analysis for Solid Manure Land Application**

### **NH<sub>3</sub> Emissions**

#### **a. Step 1 - Identify all control technologies**

The following option has been identified as a possible control option for NH<sub>3</sub> emissions from solid manure land application:

- Rapid incorporation of solid manure into the soil after land application, and all animals fed in accordance with NRCS or other District-approved guidelines

#### **Description of Control Technology**

- 1) Rapid incorporation of solid manure into the soil after land application and all animals fed in accordance with NRC or other District-approved guidelines

Various types of spreading techniques, such as box spreaders, flail type spreaders, side discharge spreaders, and spinner spreaders, are used to apply solid manure to cropland. Regardless of which technique is used, this practice requires the immediate incorporation of the manure into the soil, reducing emissions and surface run-off while minimizing the loss of nitrogen into the atmosphere. Based on a study by a local Valley dairy, there is a great potential of reducing emissions by incorporating slurry manure rapidly into the soil. A similar reduction may be obtained by the rapid incorporation of solid manure. This technology is expected to yield a NH<sub>3</sub> control efficiency ranging from 49% to upwards of 98%.

Nutritional management of dairy feed is routinely practiced to improve milk production and herd health. The potential for ammonia emissions can be reduced by reducing the amount of undigested nitrogen compounds in the manure. The level of microbial action in the manure corresponds to the level of organic nitrogen content in the manure; the lower the level of nitrogen the lower the level of microbial action and the lower the production of ammonia and VOCs.

A diet that is formulated to feed proper amounts of ruminantly degradable protein will result in improved nitrogen utilization by the animal and corresponding reduction in urea and organic nitrogen content of the manure, which will reduce the production of VOCs and ammonia. The latest National Research Council (NRC) guidelines for the selection of an optimal bovine diet should be followed to the maximum extent possible. The diet recommendations made in this publication seek to achieve the maximum uptake of protein by the animal and the minimum carryover of nitrogen into the manure, which will reduce ammonia emissions from liquid manure applied to cropland.

**b. Step 2 - Eliminate technologically infeasible options**

The option listed in Step 1 above is technologically feasible.

**c. Step 3 - Rank remaining options by control effectiveness**

The remaining option is listed below:

- 1) Rapid incorporation of solid manure into the soil after land application, and all animals fed in accordance with NRCS or other District-approved guidelines

**d. Step 4 - Cost Effectiveness Analysis**

The applicant has proposed this option. In addition, this option is achieved in practice. A cost effectiveness analysis is therefore not required.

**e. Step 5 - Select BACT**

The applicant has proposed to incorporate solid manure into the soil within 2 hours of land application, and feed all animals at the dairy in accordance with NRC or other District-approved guidelines. The proposal satisfies BACT for this category.

## **APPENDIX E**

### **RMR and AAQA Summary**

# San Joaquin Valley Air Pollution Control District

## Risk Management Review

### REVISED

To: Derek Fukuda – Permit Services  
 From: Cheryl Lawler – Technical Services  
 Date: September 13, 2018  
 Facility Name: L & J Vanderham  
 Location: 10772 W. Mt. Whitney, Riverdale  
 Application #(s): C-5713-1-3, 2-3, 3-3, 4-3  
 Project #: C-1173059

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#### A. RMR SUMMARY

RMR Summary						
Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required?	Special Permit Requirements?
Unit 1-3 (Milk Parlor)	0.26	0.00	0.00	8.63E-08	No	No
Unit 2-3 (Cow Housing)	4.66	0.07	0.02	4.75E-07	No	No
Unit 3-3 (Lagoons & Liquid Land Application)	0.00	0.00	0.00	0.00 <sup>1</sup>	No	No
Unit 4-3 (Solid Manure Piles & Land Application)	0.00	0.00	0.00	0.00 <sup>1</sup>	No	No
<b>Project Totals</b>	4.92	0.07	0.02	5.61E-07		
<b>Facility Totals</b>	>1	0.07	0.02	5.61E-07		

<sup>1</sup>The Maximum Individual Cancer Risk was not calculated since there is no risk factor or the risk factor is so low that it has been determined to be insignificant for this type of unit.

#### B. RMR REPORT

##### I. Project Description

Technical Services received a request on July 9, 2018, to perform a Risk Management Review (RMR) and an Ambient Air Quality Analysis (AAQA) for modifications to an existing dairy.

##### II. Analysis

Toxic emissions for the cow housing, lagoons, and milk parlor were calculated using emission factors derived from the District's evaluation of dairy research studies conducted



by California colleges and universities. PM based toxic emissions for the cow housing were calculated using emission factors generated from using the worst case composite of the 1997 EPA speciation of Kern County feedlot soil. Emission rates were input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, May 28, 2015), risks from the project were prioritized using the procedures in the 2016 CAPCOA Facility Prioritization Guidelines. The prioritization score for this facility was greater than 1.0 (see RMR Summary Table). Therefore, a refined health risk assessment was required. The AERMOD model was used, with the parameters outlined below and meteorological data for 2011-2013 from Lemoore to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the SHARP Program, which then used the Air Dispersion Modeling and Risk Tool (ADMRT) of the Hot Spots Analysis and Reporting Program Version 2 (HARP 2) to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

<b>Analysis Parameters Unit 1-3 (Milk Parlor)</b>			
<b>Source Type</b>	Area	<b>Location Type</b>	Rural
<b>Approx. Area (m<sup>2</sup>)</b>	5,019	<b>Release Height (m)</b>	1
<b>VOC Emission Rates (lbs)</b>	0.1 hr 452 yr	<b>Ammonia Emission Rates (lbs)</b>	0.018 hr 155 yr

<b>Analysis Parameters Unit 2-3 (Corrals 13 &amp; 14) (each)</b>			
<b>Source Type</b>	Area	<b>Location Type</b>	Rural
<b>Approx. Area (m<sup>2</sup>)</b>	6,792	<b>Release Height (m)</b>	1
<b>VOC Emission Rates (lbs)</b>	0.118 hr 1,034 yr	<b>Ammonia Emission Rates (lbs)</b>	0.329 hr 2,885 yr

<b>Analysis Parameters Unit 2-3 (Corral 15)</b>			
<b>Source Type</b>	Area	<b>Location Type</b>	Rural
<b>Approx. Area (m<sup>2</sup>)</b>	5,531	<b>Release Height (m)</b>	1
<b>PM10 Emission Rates (lbs)</b>	0.083 hr 724 yr		

<b>Analysis Parameters Unit 2-3 (Corrals 16 - 19) (each)</b>			
<b>Source Type</b>	Area	<b>Location Type</b>	Rural
<b>Approx. Area (m<sup>2</sup>)</b>	7,227	<b>Release Height (m)</b>	1
<b>VOC Emission Rates (lbs)</b>	0.118 hr 1,034 yr	<b>Ammonia Emission Rates (lbs)</b>	0.329 hr 2,885 yr

<b>Analysis Parameters Unit 2-3 (Freestalls 20 - 27) (each)</b>			
<b>Source Type</b>	Area	<b>Location Type</b>	Rural
<b>Approx. Area (m<sup>2</sup>)</b>	9,958	<b>Release Height (m)</b>	1
<b>VOC Emission Rates (lbs)</b>	0.0225 hr 197 yr	<b>Ammonia Emission Rates (lbs)</b>	0.0482 hr 423 yr
		<b>PM10 Emission Rates (lbs)</b>	0.0027 hr 23 yr

<b>Analysis Parameters Unit 3-3 (Liquid Manure Handling)</b>			
<b>Source Type</b>	Area	<b>Location Type</b>	Rural
<b>Approx. Area (m<sup>2</sup>)</b>	54,444	<b>Release Height (m)</b>	0
<b>Ammonia Emission Rates (lbs)</b>	0.7 hr 5,730 yr		

<b>Analysis Parameters Unit 4-3 (Solid Manure Handling)</b>			
<b>Source Type</b>	Area	<b>Location Type</b>	Rural
<b>Approx. Area (m<sup>2</sup>)</b>	10,028	<b>Release Height (m)</b>	0
<b>Ammonia Emission Rates (lbs)</b>	0.1 hr 986 yr		

<b>Analysis Parameters (Units 3-3 &amp; 4-3) Land Application*</b>			
<b>Source Type</b>	Area	<b>Location Type</b>	Rural
<b>Approx. Area (m<sup>2</sup>)</b>	16,642,921	<b>Release Height (m)</b>	0
<b>Unit 3-3 Land Application Ammonia (lbs)</b>	0.6 hr 4,855 yr	<b>Unit 4-3 Land Application Ammonia (lbs)</b>	0.1 hr 657 yr

\*Ammonia emissions for both liquid manure and dry manure application was evaluated based on farmland application area. The risk from the type of land application was associated with its respective unit.

### **AAQA**

In addition to the RMR, Technical Services performed modeling for the criteria pollutant PM<sub>10</sub> using AERMOD. The results from the Criteria Pollutant Modeling are as follows:

#### **PM<sub>10</sub> Pollutant Modeling Results\***

Values are in µg/m<sup>3</sup>

<b>Category</b>	<b>24 Hours</b>	<b>Annual</b>
Net Value	4.71	0.42
Interim Significance Level	10.4 <sup>1</sup>	2.08 <sup>1</sup>
Result	Pass	Pass

<sup>1</sup>The District has decided on an interim basis to use a SIL threshold for fugitive dust sources of 10.4 µg/m<sup>3</sup> for the 24-hour average concentration and 2.08 µg/m<sup>3</sup> for the annual concentration.

### III. Conclusion

The Acute and Chronic Indices are below 1.0, and the Cancer Risk factor associated with each unit is less than 1.0 in a million. **In accordance with the District's Risk Management Policy, the project is approved without Toxic Best Available Control Technology (T-BACT).**

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

The ambient air quality impacts from PM<sub>10</sub> emissions at the dairy does not exceed the District's 24-hour or Annual interim threshold for fugitive dust sources.

### IV. Attachments

- A. RMR Request Form & Attachments
- B. Dairy Toxics Calculator
- C. Prioritization
- D. Risk Results
- E. Facility Summary
- F. AAQA Results

## **APPENDIX F**

### **Emissions Calculations**

### Pre-Project Facility Information

- Does this facility house Holstein or Jersey cows?   
Most facilities house Holstein cows unless explicitly stated on the PTO or application.
- Does the facility have an anaerobic treatment lagoon?
- Does the facility land apply liquid manure?   
Answering "yes" assumes worst case.
- Does the facility land apply solid manure?   
Answering "yes" assumes worst case.
- Is any scraped manure sent to a lagoon/storage pond?   
Answering "yes" assumes worst case.

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	3,020		68		3,088		
Dry Cows	350		370		720		
Support Stock (Heifers, Calves, and Bulls)			1,620		1,620		
Large Heifers					0		
Medium Heifers					0		
Small Heifers					0		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves							0

Total Herd Summary	
Total Milk Cows	3,088
Total Mature Cows	3,808
Support Stock (Heifers, Calves, and Bulls)	1,620
Total Calves	0
Total Dairy Head	5,428

Pre-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn	1	19	40
Alfalfa			
Wheat	1	20	108

### Post-Project Facility Information

- Does this facility house Holstein or Jersey cows?   
Most facilities house Holstein cows unless explicitly stated on the PTO or application.
- Does the facility have an anaerobic treatment lagoon?
- Does the facility land apply liquid manure?   
Answering "yes" assumes worst case.
- Does the facility land apply solid manure?   
Answering "yes" assumes worst case.
- Is any scraped manure sent to a lagoon/storage pond?   
Answering "yes" assumes worst case.
- Does this project result in any new lagoon/storage pond(s) or an increase in surface area for any existing lagoon/storage pond(s)?

Post-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	3,029		1,178		4,207		
Dry Cows	350		139		489		
Support Stock (Heifers, Calves, and Bulls)			604		604		
Large Heifers					0		
Medium Heifers					0		
Small Heifers					0		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves							0

Total Herd Summary	
Total Milk Cows	4,207
Total Mature Cows	4,696
Support Stock (Heifers, Calves, and Bulls)	604
Total Calves	0
Total Dairy Head	5,300

Post-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn	1	19	40
Alfalfa			
Wheat	1	20	108

This spreadsheet serves only as a resource to calculate potential emissions from dairies, and may not reflect the final emissions used by the District due to parameters not addressed in this spreadsheet and/or omissions from the spreadsheet. Any other permissible equipment (e.g. IC engines, gasoline tanks, etc.) at a facility will need to be calculated separately. All final calculations used in permitting projects will be conducted by District staff.

## VOC Mitigation Measures and Control Efficiencies

Milking Parlor				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Enteric Emissions Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(D) Feed according to NRC guidelines	10%	10%
<b>Total Control Efficiency</b>			10%	10%
<b>Milking Parlor Floor Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(D) Feed according to NRC guidelines	10%	10%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(D) Flush or hose milk parlor immediately prior to, immediately after, or during each milking. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF.	0%	0%
<b>Total Control Efficiency</b>			10%	10%

Cow Housing				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Enteric Emissions Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	10%	10%
<b>Total Control Efficiency</b>			10%	10%
<b>Corrals/Pens Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	10%	10%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Inspect water pipes and troughs and repair leaks at least once every seven days. Note: If selected for dairies > 999 milk cows, CE is already included in EF.	0%	0%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Dairies:</b> Clean manure from corrals at least four times per year with at least 60 days between cleaning, or clean corrals at least once between April and July and at least once between September and December. Note: If selected for dairies > 999 milk cows, CE is already included in EF. Note: No additional control given for increased cleaning frequency (e.g. BACT requirement). <b>Heifer/Calf Ranches:</b> Scrape corrals twice a year with at least 90 days between cleanings, excluding in-coral mounds. Note: No additional control given for increased cleaning frequency (e.g. BACT requirement).	0%	0%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Scrape, vacuum, or flush concrete lanes in corrals at least once every day for mature cows and every seven days for support stock, or clean concrete lanes such that the depth of manure does not exceed 12 inches at any point or time. Note: No additional control given for increased cleaning frequency (e.g. BACT requirement).	10%	10%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Implement one of the following: 1) slope the surface of the corrals at least 3% where the available space for each animal is 400 sq ft or less and slope the surface of the corrals at least 1.5% where the available space for each animal is more than 400 sq ft; 2) maintain corrals to ensure proper drainage preventing water from standing more than 48 hrs; 3) harrow, rake, or scrape pens sufficiently to maintain a dry surface. Note: If selected for dairies > 999 milk cows, CE already included in EF.	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Install shade structures such that they are constructed with a light permeable roofing material. Note: If selected for dairies > 999 milk cows, the control efficiency will be 5% since the EF used includes a partial control for this measure.	5%	5%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Install all shade structures uphill of any slope in the corral. Note: If selected for dairies > 999 milk cows, the control efficiency will be 5% since the EF used includes a partial control for this measure.		
<input type="checkbox"/>	<input type="checkbox"/>	Clean manure from under corral shades at least once every 14 days, when weather permits access into corral. Note: If selected for dairies > 999 milk cows, the control efficiency will be 5% since the EF used includes a partial control for this measure.		
<input type="checkbox"/>	<input type="checkbox"/>	Install shade structure so that the structure has a North/South orientation. Note: If selected for dairies > 999 milk cows, the control efficiency will be 5% since the EF used includes a partial control for this measure.		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Manage corrals such that the manure depth in the corral does not exceed 12 inches at any time or point, except for in-coral mounding. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. The manure facility must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF.	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Knockdown fence line manure build-up prior to it exceeding a height of 12 inches at any time or point. Manure depth may exceed 12 inches when corrals become inaccessible due to rain events. The facility must resume management of the manure depth of 12 inches or lower immediately upon the corral becoming accessible.	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Use lime or a similar absorbent material in the corral according to the manufacturer's recommendation to minimize moisture in the corrals.	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Apply thymol to the corral soil in accordance with the manufacturer's recommendation.	0%	0%
<b>Total Control Efficiency</b>			23.05%	23.05%
<b>Bedding Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	10%	10%
<input type="checkbox"/>	<input type="checkbox"/>	Use non-manure-based bedding and non-separated solids based bedding for at least 90% of the bedding material, by weight, for freestalls (e.g. rubber mats, almond shells, sand, or waterbeds).	0%	0%

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	For a large dairy (1,000 milk cows or larger) or a heifer/calf ranch - Remove manure that is not dry from individual cow freestall beds or rake, harrow, scrape, or grade freestall bedding at least once every 7 days.	10%	10%
<input type="checkbox"/>	<input type="checkbox"/>	(D) For a medium dairy only (500 to 999 milk cows) - Remove manure that is not dry from individual cow freestall beds or rake, harrow, scrape, or grade freestall bedding at least once every 14 days.	0%	0%
<b>Total Control Efficiency</b>			<b>19.00%</b>	<b>19.00%</b>
<b>Lanes Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	10%	10%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Pave feedlanes, where present, for a width of at least 8 feet along the corral side of the feedlane fence for milk and dry cows and at least 6 feet along the corral side of the feedlane for heifers. Note: No control efficiency at this time.	0%	0%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Dairies:</b> Flush, scrape, or vacuum freestall flush lanes immediately prior to or after, or during each milking; or flush or scrape freestall flush lanes at least 3 times per day. <b>Heifer/Calf Ranches:</b> Vacuum, scrape, or flush freestalls at least once every seven days.	10%	10%
<input type="checkbox"/>	<input type="checkbox"/>	(D) Have no animals in exercise pens or corrals at any time.	0%	0%
<b>Total Control Efficiency</b>			<b>19.00%</b>	<b>19.00%</b>

<b>Liquid Manure Handling</b>				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Lagoons/Storage Ponds Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	10%	10%
<input type="checkbox"/>	<input type="checkbox"/>	Use phototropic lagoon	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Use an anaerobic treatment lagoon designed according to NRCS Guideline No. 359	0%	0%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Remove solids from the waste system with a solid separator system, prior to the waste entering the lagoon. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF.	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Maintain lagoon pH between 6.5 and 7.5	0%	0%
<b>Total Control Efficiency</b>			<b>10.00%</b>	<b>10.00%</b>
<b>Liquid Manure Land Application Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	10%	10%
<input type="checkbox"/>	<input type="checkbox"/>	Only apply liquid manure that has been treated with an anaerobic or aerobic treatment lagoon, aerobic lagoon, or digester system	0%	0%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Allow liquid manure to stand in the fields for no more than 24 hours after irrigation. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF.	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Apply liquid/slurry manure via injection with drag hose or similar apparatus	0%	0%
<b>Total Control Efficiency</b>			<b>10.00%</b>	<b>10.00%</b>

<b>Solid Manure Handling</b>				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Solid Manure Storage Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	10%	10%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>LARGE CAFO ONLY:</b> Within 72 hours of removal from housing, either a) remove dry manure from the facility, or b) cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed 24 hours per event.	10%	10%
<b>Total Control Efficiency</b>			<b>19.00%</b>	<b>19.00%</b>
<b>Separated Solids Piles Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	10%	10%
<input type="checkbox"/>	<input type="checkbox"/>	<b>LARGE CAFO ONLY:</b> Within 72 hours of removal from the drying process, either a) remove separated solids from the facility, or b) cover separated solids outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed 24 hours per event.	0%	0%
<b>Total Control Efficiency</b>			<b>10.00%</b>	<b>10.00%</b>
<b>Solid Manure Land Application Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	10%	10%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Incorporate all solid manure within 72 hours of land application. Note: If selected for dairies > 999 milk cows, control efficiency is already included in EF. Note: No additional control given for rapid manure incorporation (e.g. BACT requirement).	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Only apply solid manure that has been treated with an anaerobic treatment lagoon, aerobic lagoon or digester system.	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Apply no solid manure with a moisture content of more than 50%	0%	0%
<b>Total Control Efficiency</b>			<b>10.00%</b>	<b>10.00%</b>

<b>Silage and TMR</b>				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Corn/Alfalfa/Wheat Silage Mitigations</b>				
		1. Utilize a sealed feed storage system (e.g. Ag-Bag) for bagged silage, or		
		2. Cover the surface of silage piles, except for the area where feed is being removed from the pile, with a plastic tarp that is at least 5 mils thick (0.005 inches), multiple plastic tarps with a cumulative thickness of at least 5 mils (0.005 inches), or an oxygen barrier film covered with a UV resistant material within 72 hours of last delivery of material to the pile, and implement one of the following:		

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p>a) build silage piles such that the average bulk density is at least 44 lb/cu-ft for corn silage and 40 lb/cu-ft for other silage types, as measured in accordance with Section 7.10 of Rule 4570,</p> <p>b) when creating a silage pile, adjust filling parameters to assure a calculated average bulk density of at least 44 lb/cu-ft for corn silage and at least 40 lb/cu-ft for other silage types, using a spreadsheet approved by the District,</p> <p>c) harvest silage crop at &gt; or = 65% moisture for corn; and &gt;= 60% moisture for alfalfa/grass and other silage crops; manage silage material delivery such that no more than 6 inches of materials are uncompacted on top of the pile; and incorporate the applicable Theoretical Length of Chop (TLC) and roller opening for the crop being harvested.</p> <p>For dairies - implement <u>two</u> of the following: For heifer/calf ranches - implement <u>one</u> of the following:</p> <p><u>Manage Exposed Silage</u> - a) manage silage piles such that only one silage pile has an uncovered face and the uncovered face has a total exposed surface area of less than 2,150 sq. ft., or b) manage multiple uncovered silage piles such that the total exposed surface area of all silage piles is less than 4,300 sq ft.</p> <p><u>Maintain Silage Working Face</u> - a) use a shaver/facer to remove silage from the silage pile, or b) maintain a smooth vertical surface on the working face of the silage pile</p> <p><u>Silage Additive</u> - a) inoculate silage with homolactic acid bacteria in accordance with manufacturer recommendations to achieve a concentration of at least 100,000 colony forming units per gram of wet forage or apply propionic acid, benzoic acid, sorbic acid, sodium benzoate, or potassium sorbate at a rate specified by the manufacturer to reduce yeast counts when forming silage pile; or b) apply other additives at specified rates that have been demonstrated to reduce alcohol concentrations in silage and/or VOC emissions from silage and have been approved by the District and EPA.</p>	39.0%	39.0%
<b>Total Control Efficiency*</b>			39.00%	39.00%

\*Assumes 25% control for density mitigation measures and 10% each for the two optional measures, resulting in an overall control of 39%. The same conservative control efficiency will be applied to the sealed feed storage system (Ag-Bag).

		<b>TMR Mitigations</b>		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(D) Push feed so that it is within 3 feet of feedlane fence within 2 hrs of putting out the feed or use a feed trough or other feeding structure designed to maintain feed within reach of the cows.	10%	10%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(D) Begin feeding total mixed rations within 2 hrs of grinding and mixing rations. Note: If selected for dairies > 999 milk cows, control efficiency already included in EF.	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Feed steam-flaked, dry rolled, cracked or ground corn or other ground cereal grains.	0%	0%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Remove uneaten wet feed from feed bunks within 24 hrs after then end of a rain event.	10%	10%
<input type="checkbox"/>	<input type="checkbox"/>	(D) For total mixed rations that contain at least 30% by weight of silage, feed animals total mixed rations that contain at least 45% moisture.	0%	0%
<input type="checkbox"/>	<input type="checkbox"/>	Feed according to NRC guidelines. Note: If selected for dairies, control efficiency already included in EF.	0%	0%
<b>Total Control Efficiency</b>			19.00%	19.00%



## Ammonia Mitigation Measures and Control Efficiencies

Milking Parlor				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	NH3 Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Milking Parlor Floor Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	28%	28%
<b>Total Control Efficiency</b>			28%	28%

Cow Housing				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	NH3 Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Corrals/Pens Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	28%	28%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Clean manure from corrals at least four times per year with at least 60 days between cleaning, or clean corrals at least once between April and July and at least once between September and December. OR Use lime or a similar absorbent material in the corral according to the manufacturer's recommendation to minimize moisture in the corrals. OR Apply thymol to the corral soil in accordance with the manufacturer's recommendation.	50%	50%
<b>Total Control Efficiency</b>			64%	64%
<b>Bedding Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	28%	28%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Use non-manure-based bedding and non-separated solids based bedding for at least 90% of the bedding material, by weight, for freestalls (e.g. rubber mats, almond shells, sand, or waterbeds). OR For a large dairy only (1,000 milk cows or larger) - Remove manure that is not dry from individual cow freestall beds or rake, harrow, scrape, or grade freestall bedding at least once every 7 days, OR For a medium dairy only (500 to 999 milk cows) - Remove manure that is not dry from individual cow freestall beds or rake, harrow, scrape, or grade freestall bedding at least once every 14 days.	47.7%	47.7%
<b>Total Control Efficiency</b>			62.34%	62.34%
<b>Lanes Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	28%	28%
<b>Total Control Efficiency</b>			28%	28%

Liquid Manure Handling				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	NH3 Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Lagoons/Storage Ponds Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	28%	28%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Use phototropic lagoon OR Remove solids from the waste system with a solid separator system, prior to the waste entering the lagoon.	80%	80%
<b>Total Control Efficiency</b>			85.6%	85.6%
<b>Liquid Manure Land Application Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	28%	28%
<input type="checkbox"/>	<input type="checkbox"/>	Only apply liquid manure that has been treated with an anaerobic treatment lagoon	0%	0%
<b>Total Control Efficiency</b>			28.00%	28.00%

Solid Manure Handling				
Measure Proposed?		Mitigation Measure(s) per Emissions Point	NH3 Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Solid Manure Land Application Mitigations</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed according to NRC guidelines	28%	28%
<input type="checkbox"/>	<input type="checkbox"/>	Incorporate all solid manure within 72 hours of land application. AND Only apply solid manure that has been treated with an anaerobic treatment lagoon, aerobic lagoon or digester system. AND Apply no solid manure with a moisture content of more than 50%	0%	0%
<b>Total Control Efficiency</b>			28.00%	28.00%

Dairy Emission Factors

		Ib/d-y Dairy Emissions Factors for Holstein Cows																				
		Milk Cows			Dry Cows			Large Heifers (12 to 24 months)			Medium Heifers (7 to 14 months)			Small Heifers (2 to 6 months)			Calves (0 - 3 months)					
		Uncontrolled	Controlled	EF1	EF2	Uncontrolled	Controlled	EF1	EF2	Uncontrolled	Controlled	EF1	EF2	Uncontrolled	Controlled	EF1	EF2	Uncontrolled	Controlled	EF1	EF2	
Milking Parlor	VOC	0.43	0.41	0.37	0.37																	
	NH3	0.04	0.03	0.03	0.03																	
	VOC	0.47	0.44	0.40	0.40																	
	NH3	0.19	0.19	0.14	0.14																	
	Total	3.89	3.69	3.32	3.32																	
Cow Housing	VOC	15.78	12.09	9.86	9.86	15.78	12.09	9.86	9.86	15.78	12.09	9.86	9.86	15.78	12.09	9.86	9.86	15.78	12.09	9.86	9.86	
	NH3	41.90	15.08	15.08	15.08	41.90	15.08	15.08	15.08	41.90	15.08	15.08	15.08	41.90	15.08	15.08	15.08	41.90	15.08	15.08	15.08	
	VOC	6.30	2.37	2.37	2.37	6.30	2.37	2.37	2.37	6.30	2.37	2.37	2.37	6.30	2.37	2.37	2.37	6.30	2.37	2.37	2.37	
	NH3	5.10	3.67	3.67	3.67	5.10	3.67	3.67	3.67	5.10	3.67	3.67	3.67	5.10	3.67	3.67	3.67	5.10	3.67	3.67	3.67	
	Total	53.30	21.13	21.13	21.13	53.30	21.13	21.13	21.13	53.30	21.13	21.13	21.13	53.30	21.13	21.13	21.13	53.30	21.13	21.13	21.13	
Liquid Manure Handling	VOC	1.64	1.40	1.26	1.26	1.64	1.40	1.26	1.26	1.64	1.40	1.26	1.26	1.64	1.40	1.26	1.26	1.64	1.40	1.26	1.26	
	NH3	3.16	2.70	2.43	2.43	3.16	2.70	2.43	2.43	3.16	2.70	2.43	2.43	3.16	2.70	2.43	2.43	3.16	2.70	2.43	2.43	
	VOC	9.20	8.20	1.18	1.18	9.20	8.20	1.18	1.18	9.20	8.20	1.18	1.18	9.20	8.20	1.18	1.18	9.20	8.20	1.18	1.18	
	NH3	6.90	8.90	6.41	6.41	6.90	8.90	6.41	6.41	6.90	8.90	6.41	6.41	6.90	8.90	6.41	6.41	6.90	8.90	6.41	6.41	
	Total	17.10	17.10	7.59	7.59	17.10	17.10	7.59	7.59	17.10	17.10	7.59	7.59	17.10	17.10	7.59	7.59	17.10	17.10	7.59	7.59	
Solid Manure Handling	VOC	0.06	0.06	0.05	0.05	0.06	0.06	0.05	0.05	0.06	0.06	0.05	0.05	0.06	0.06	0.05	0.05	0.06	0.06	0.05	0.05	
	NH3	0.39	0.39	0.30	0.30	0.39	0.39	0.30	0.30	0.39	0.39	0.30	0.30	0.39	0.39	0.30	0.30	0.39	0.39	0.30	0.30	
	VOC	0.61	0.54	0.47	0.47	0.61	0.54	0.47	0.47	0.61	0.54	0.47	0.47	0.61	0.54	0.47	0.47	0.61	0.54	0.47	0.47	
	NH3	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
	Total	2.09	2.09	1.50	1.50	2.09	2.09	1.50	1.50	2.09	2.09	1.50	1.50	2.09	2.09	1.50	1.50	2.09	2.09	1.50	1.50	

Type of Cow	Sludge and TMR (Total Mixed Ration) Emissions (ug/m <sup>3</sup> *2-min)	
	Uncontrolled	EF2
Cows in Trenches	34,661	21,155
Manure in Loading Bams	17,559	10,549
Heifers in Loading Bams	40,844	26,745
Cows in Loading Bams	13,056	10,979
Total	103,920	69,428

Assumptions: 1) Each sludge pile is completely covered except for the floor area; 2) Racinos are fed within 48 hours.

Type of Cow	PM10 Emission Factors (lb/d-hy)		Source
	Uncontrolled	Controlled	
Cows in Trenches	1.37	1.37	Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy
Manure in Loading Bams	2.72	2.72	SVAP/CD
Heifers in Loading Bams	5.28	5.28	SVAP/CD
Cows in Loading Bams	0.68	0.68	SVAP/CD
Milking in Corrals	5.46	5.46	Based on a USDA/UC Davis report quantifying dairy and feedlot emissions in Tulare & Kern Counties (April 01)
Support Bldgs. (Horse/Bldg) in Open	10.55	10.55	SVAP/CD
Large Heifers in Open Corrals	8.01	8.01	SVAP/CD
Calves in Open Corrals	1.37	1.37	SVAP/CD
Calf feeders 3 to 3,000 corrals	0.43	0.43	SVAP/CD
Calf stock-pens washed	0.069	0.069	SVAP/CD
Calf stock-pens soiled	0.268	0.268	SVAP/CD

The controlled PM10 EF will be calculated based on the specific PM10 mitigation measures, if any, for each freestall, corral, or calf hutch area. See the PM Mitigation Measures for calculations.





Post-Project PM10 Mitigation Measures

Post-Project PM10 Mitigation Measures														
Housing Name(s) or #s	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
1	Corral 1 - 7	support stock	31	31	7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Corral 8 - 11	support stock	53	53	4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Corral 12	dry cows	139	150	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Corral 13 - 14	milk cows	185	185	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Corral 15	support stock	175	175	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Corral 16 - 19	milk cows	185	185	4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Freestall 20	milk cows	339	350	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Freestall 21 - 27	milk cows	350	350	7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Saudi 28	dry cows	240	240	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Freestall 29	milk cows	240	240	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Freestall 30	dry cows	55	55	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Freestall 31	dry cows	55	55	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Corral 32	milk cows	20	20	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Corral 33	milk cows	24	24	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Corral 34	milk cows	24	24	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<b>Post-Project PM10 Mitigation Measures for New Housing Units at an Expanding Dairy</b>											
Total # of cows in Each Housing Structure(s)			5,300	5,300		Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk

Post-Project PM10 Control Efficiencies and Emission Factors															
Housing Name(s) or #s	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	Uncontrolled EF (lb/hd-yr)	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)
1	Corral 1 - 7	support stock	31	31	10,550	8.3%						15%			8.22
2	Corral 8 - 11	support stock	53	53	10,550	8.3%						15%			8.22
3	Corral 12	dry cows	139	150	5,460	16.7%						15%			3.87
4	Corral 13 - 14	milk cows	185	185	5,460	16.7%						15%			3.87
5	Corral 15	support stock	175	175	10,550	8.3%						15%			8.22
6	Corral 16 - 19	milk cows	185	185	5,460	16.7%						15%			3.87
7	Freestall 20	milk cows	339	350	1,370							15%			1.17
8	Freestall 21 - 27	milk cows	350	350	1,370							15%			1.17
9	Saudi 28	dry cows	240	240	1,370							15%			1.17
10	Freestall 29	milk cows	240	240	1,370							15%			1.17
11	Freestall 30	dry cows	55	55	1,370							15%			1.17
12	Freestall 31	dry cows	55	55	1,370							15%			1.17
13	Corral 32	milk cows	20	20	5,460	16.7%						15%			3.87
14	Corral 33	milk cows	24	24	5,460	16.7%						15%			3.87
15	Corral 34	milk cows	24	24	5,460	16.7%						15%			4.64
			<b>Post-Project PM10 Control Efficiencies and Emission Factors for New Housing Emissions Units</b>												
Total # of cows in Each Housing Structure(s)			5,300	5,300		Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non-manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)

**Pre-Project Potential to Emit - Cow Housing**

Pre-Project Potential to Emit - Cow Housing														
Housing Name(s) or #(s)	Type of Cow	# of Cows	Worst Case EF (used for Daily PE)			Specific Cow Type EF (used for Annual PE)			VOC		NH3		PM10	
			Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	Daily PE (lb/day)	Annual PE (lb/yr)	Daily PE (lb/day)	Annual PE (lb/yr)	Daily PE (lb/day)	Annual PE (lb/yr)
1	Corrals 1 - 7	238	9.86	21.13	9.67	4.27	5.54	9.67	6.4	1,016	13.8	1,318	6.3	2,302
2	Corrals 8 - 11	272	9.86	21.13	9.67	4.27	5.54	9.67	7.3	1,161	15.7	1,506	7.2	2,631
3	Corral 12	185	9.86	21.13	9.67	4.27	5.54	9.67	5.0	1,030	10.7	1,381	4.9	841
4	Corral 13 - 14	370	9.86	21.13	9.67	4.27	5.54	9.67	10.0	1,580	21.4	2,048	9.8	3,579
5	Corral 15	185	9.86	21.13	9.67	4.27	5.54	9.67	5.0	1,030	10.7	1,381	4.9	841
6	Corral 16 - 19	740	9.86	21.13	9.67	4.27	5.54	9.67	20.0	3,160	42.8	4,097	19.6	7,159
7	Freestall 20	330	9.86	21.13	1.37	9.86	21.13	1.37	8.9	3,254	19.1	6,972	1.2	452
8	Freestall 21 - 27	2,310	9.86	21.13	1.37	9.86	21.13	1.37	62.4	22,777	133.7	48,806	8.7	3,165
9	Saudi 28	240	9.86	21.13	1.37	5.57	10.71	1.37	6.5	1,337	13.9	2,570	0.9	329
10	Freestall 29	240	9.86	21.13	1.37	9.86	21.13	1.37	6.5	2,366	13.9	5,071	0.9	329
11	Freestall 30	140	9.86	21.13	1.37	9.86	21.13	1.37	3.8	1,380	8.1	2,958	0.5	192
12	Freestall 31	110	9.86	21.13	1.37	5.57	10.71	1.37	3.0	613	6.4	1,178	0.4	151
13	Corral 32	20	9.86	21.13	9.67	9.86	21.13	4.55	0.5	197	1.2	423	0.5	91
14	Corral 33	24	9.86	21.13	9.67	9.86	21.13	4.55	0.6	237	1.4	507	0.6	109
15	Corral 34	24	9.86	21.13	10.55	9.86	21.13	5.46	0.6	237	1.4	507	0.7	131
<b>Pre-Project Total # of Cows</b>									<b>146.6</b>	<b>41,375</b>	<b>314.2</b>	<b>81,923</b>	<b>67.3</b>	<b>22,302</b>

Calculations:

Annual PE1 for each pollutant (lb/yr) = Specific Cow Type Controlled EF (lb/hd-yr) x # of cows (hd)

Daily PE1 for each pollutant (lb/day) = [Worst Case Controlled EF (lb/hd-yr) x # of cows (hd)] ÷ 365 (day/yr)

**Post-Project Potential to Emit - Cow Housing**

Post-Project Potential to Emit - Cow Housing														
Housing Name(s) or #(s)	Type of Cow	# of Cows	Worst Case EF (used for Daily PE)			Specific Cow Type EF (used for Annual PE)			VOC		NH3		PM10	
			Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	Daily PE (lb/day)	Annual PE (lb/yr)	Daily PE (lb/day)	Annual PE (lb/yr)	Daily PE (lb/day)	Annual PE (lb/yr)
1	Corrals 1 - 7	217	9.86	21.13	9.67	4.27	5.54	8.22	5.9	927	12.6	1,201	5.8	1,784
2	Corrals 8 - 11	212	9.86	21.13	9.67	4.27	5.54	8.22	5.7	905	12.3	1,174	5.6	1,743
3	Corral 12	139	9.86	21.13	9.67	5.57	10.71	3.87	3.8	774	8.0	1,489	3.7	537
4	Corral 13 - 14	370	9.86	21.13	9.67	9.86	21.13	3.87	10.0	3,648	21.4	7,817	9.8	1,430
5	Corral 15	175	9.86	21.13	9.67	4.27	5.54	8.22	4.7	747	10.1	969	4.6	1,439
6	Corral 16 - 19	740	9.86	21.13	9.67	9.86	21.13	3.87	20.0	7,296	42.8	15,635	19.6	2,861
7	Freestall 20	339	9.86	21.13	1.37	9.86	21.13	1.17	9.2	3,343	19.6	7,163	1.3	395
8	Freestall 21 - 27	2,450	9.86	21.13	1.37	9.86	21.13	1.17	66.2	24,157	141.8	51,764	9.2	2,854
9	Saudi 28	240	9.86	21.13	1.37	5.57	10.71	1.17	6.5	1,337	13.9	2,570	0.9	280
10	Freestall 29	240	9.86	21.13	1.37	9.86	21.13	1.17	6.5	2,366	13.9	5,071	0.9	280
11	Freestall 30	55	9.86	21.13	1.37	5.57	10.71	1.17	1.5	306	3.2	589	0.2	64
12	Freestall 31	55	9.86	21.13	1.37	5.57	10.71	1.17	1.5	306	3.2	589	0.2	64
13	Corral 32	20	9.86	21.13	9.67	9.86	21.13	3.87	0.5	197	1.2	423	0.5	77
14	Corral 33	24	9.86	21.13	9.67	9.86	21.13	3.87	0.6	237	1.4	507	0.6	93
15	Corral 34	24	9.86	21.13	10.55	9.86	21.13	4.64	0.6	237	1.4	507	0.7	111
<b>Post-Project Total # of Cows</b>									<b>143.2</b>	<b>46,783</b>	<b>306.8</b>	<b>97,468</b>	<b>63.7</b>	<b>14,012</b>

Calculations:

Annual PE2 for each pollutant (lb/yr) = Specific Cow Type Controlled EF (lb/hd-yr) x # of cows (hd)

Daily PE2 for each pollutant (lb/day) = [Worst Case Controlled EF (lb/hd-yr) x # of cows (hd)] ÷ 365 (day/yr)

Pre-Project Potential to Emit (PE1)

Pre-Project Herd Size						
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals	
Milk Cows	3,020	0	68	0	3,088	
Dry Cows	350	0	370	0	720	
Support Stock (Heifers, Calves and Bulls)	0	0	1,620	0	1,620	
Large Heifers	0	0	0	0	0	
Medium Heifers	0	0	0	0	0	
Small Heifers	0	0	0	0	0	
Bulls	0	0	0	0	0	
Calf Hutches					Calf Corrals	
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped
Calves	0	0	0	0	0	0
						Total # of Calves
						0

Silage Information				
Feed Type	Maximum # Open Piles	Maximum Height (ft)	Maximum Width (ft)	Open Face Area (ft <sup>2</sup> )
Corn	1	19	40	640
Alfalfa	0	0	0	0
Wheat	1	20	108	1,617

Milking Parlor				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	3.4	1,235	1.2	422

Cow Housing						
Cow	VOC		NH3		PM10	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Total	146.6	41,375	314.2	81,923	67.3	22,302

Liquid Manure Handling						
Cow	VOC		NH3		H2S*	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	20.6	7,504	64.2	23,438	1.4	497
Dry Cows	2.6	958	7.6	2,765	0.1	30
Support Stock (Heifers, Calves and Bulls)	4.5	1,652	8.7	3,191	0.1	19
Large Heifers	0.0	0	0.0	0	0	0
Medium Heifers	0.0	0	0.0	0	0	0
Small Heifers	0.0	0	0.0	0	0	0
Calves	0.0	0	0.0	0	0	0
Bulls	0.0	0	0.0	0	0	0
Total	27.7	10,114	80.5	29,394	1.6	545

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	4.0	1,451	23.9	8,739
Dry Cows	0.5	187	2.8	1,030
Support Stock (Heifers, Calves and Bulls)	0.9	324	3.3	1,215
Large Heifers	0.0	0	0.0	0
Medium Heifers	0.0	0	0.0	0
Small Heifers	0.0	0	0.0	0
Calves	0.0	0	0.0	0
Bulls	0.0	0	0.0	0
Total	5.4	1,963	30.0	10,984

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	4.0	1,454
Alfalfa Emissions	0.0	0
Wheat Emissions	12.7	4,646
TMR	119.7	43,676
Total	136.4	49,775

Total Daily Pre-Project Potential to Emit (lb/day)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	3.4	1.2	0.0
Cow Housing	0.0	0.0	67.3	0.0	146.6	314.2	0.0
Liquid Manure	0.0	0.0	0.0	0.0	27.7	80.5	1.6
Solid Manure	0.0	0.0	0.0	0.0	5.4	30.0	0.0
Feed Handling	0.0	0.0	0.0	0.0	136.4	0.0	0.0
Total	0.0	0.0	67.3	0.0	319.5	425.9	1.6

Total Annual Pre-Project Potential to Emit (lb/yr)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	1,235	422	0
Cow Housing	0	0	22,302	0	41,375	81,923	0
Liquid Manure	0	0	0	0	10,114	29,394	545
Solid Manure	0	0	0	0	1,963	10,984	0
Feed Handling	0	0	0	0	49,775	0	0
Total	0	0	22,302	0	104,462	122,723	545

Calculations for milking parlor:

Annual PE = (# milk cows) x (EF1 lb-pollutant/hd-yr)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculations for cow housing:

See detailed calculations under Cow Housing Calculations worksheet.

Calculations for liquid manure and solid manure handling:

Annual PE = [(# milk cows) x (EF1 lb-pollutant/hd-yr)] + [(# dry cows) x (EF1 lb-pollutant/hd-yr)] + [(# large heifers) x (EF1 lb-pollutant/hd-yr)] + [(# medium heifers) x (EF1 lb-pollutant/hd-yr)] + [(# small heifers) x (EF1 lb-pollutant/hd-yr)] + [(# calves) x (EF1 lb-pollutant/hd-yr)] + [(# bulls) x (EF1 lb-pollutant/hd-yr)]

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

The H2S emission factor is assumed to be 10% of the NH3 lagoon/storage pond(s) emission factor, for each respective herd size.

Calculations for silage emissions:

Annual PE = (EF1) x (area ft<sup>2</sup>) x (0.0929 m<sup>2</sup>/ft<sup>2</sup>) x (8,760 hr/yr) x (60 min/hr) x 2.20E-9 lb/μg

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculation for TMR emissions:

Annual PE = (# cows) x (EF1) x (0.658 m<sup>2</sup>) x (525,600 min/yr) x (2.20E-9 lb/μg)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calves are not included in TMR calculation.

\*Since there will be no change to the lagoons/storage ponds surface area, no change in H2S emissions is expected. Therefore, it will be assumed that PE1 for H2S emissions is equal to PE2 for H2S emissions.

Major Source Emissions (lb/yr)						
Permit	NOx	SOx	PM10	CO	VOC	H2S
Milk Parlor	0	0	0	0	0	0
Cow Housing	0	0	0	0	0	0
Liquid Manure	0	0	0	0	0	4,868
Solid Manure	0	0	0	0	0	0
Feed Handling	0	0	0	0	0	0
Total	0	0	0	0	0	4,868

Post-Project Potential to Emit (PE2)

Post-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	3,029	0	1,178	0	4,207		
Dry Cows	350	0	139	0	489		
Support Stock (Heifers, Calves, and Bulls)	0	0	604	0	604		
Large Heifers	0	0	0	0	0		
Medium Heifers	0	0	0	0	0		
Small Heifers	0	0	0	0	0		
Bulls	0	0	0	0	0		
Calf Hutches			Calf Corrals				
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	Total # of Calves
Calves	0	0	0	0	0	0	0

Silage Information				
Feed Type	Maximum # Open Piles	Maximum Height (ft)	Maximum Width (ft)	Open Face Area (ft <sup>2</sup> )
Corn	1	19	40	640
Alfalfa	0	0	0	
Wheat	1	20	108	1,617

Milking Parlor				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	4.6	1,683	1.6	576
<b>Total</b>	<b>4.6</b>	<b>1,683</b>	<b>1.6</b>	<b>576</b>

Cow Housing						
	VOC		NH3		PM10	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
<b>Total</b>	<b>143.2</b>	<b>46,783</b>	<b>306.8</b>	<b>97,468</b>	<b>63.7</b>	<b>14,012</b>

Liquid Manure Handling						
Cow	VOC		NH3		H2S	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	28.0	10,223	87.5	31,931	1.4	497
Dry Cows	1.8	650	5.1	1,878	0.1	30
Support Stock (Heifers, Calves, and Bulls)	1.7	616	3.3	1,190	0.1	19
Large Heifers	0.0	0	0.0	0	0	0
Medium Heifers	0.0	0	0.0	0	0	0
Small Heifers	0.0	0	0.0	0	0	0
Calves	0.0	0	0.0	0	0	0
Bulls	0.0	0	0.0	0	0	0
<b>Total</b>	<b>31.5</b>	<b>11,489</b>	<b>95.9</b>	<b>34,999</b>	<b>1.6</b>	<b>545</b>

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	5.4	1,977	32.6	11,906
Dry Cows	0.3	127	1.9	699
Support Stock (Heifers, Calves, and Bulls)	0.3	121	1.2	453
Large Heifers	0.0	0	0.0	0
Medium Heifers	0.0	0	0.0	0
Small Heifers	0.0	0	0.0	0
Calves	0.0	0	0.0	0
Bulls	0.0	0	0.0	0
<b>Total</b>	<b>6.0</b>	<b>2,225</b>	<b>35.7</b>	<b>13,058</b>

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	4.0	1,454
Alfalfa Emissions	0.0	0
Wheat Emissions	12.7	4,646
TMR	116.8	42,646
<b>Total</b>	<b>133.5</b>	<b>48,746</b>

Total Daily Post-Project Potential to Emit (lb/day)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	4.6	1.6	0.0
Cow Housing	0.0	0.0	63.7	0.0	143.2	306.8	0.0
Liquid Manure	0.0	0.0	0.0	0.0	31.5	95.9	1.6
Solid Manure	0.0	0.0	0.0	0.0	6.0	35.7	0.0
Feed Handling	0.0	0.0	0.0	0.0	133.5	0.0	0.0
<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>63.7</b>	<b>0.0</b>	<b>318.8</b>	<b>440.0</b>	<b>1.6</b>

Total Annual Post-Project Potential to Emit (lb/yr)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	1,683	576	0
Cow Housing	0	0	14,012	0	46,783	97,468	0
Liquid Manure	0	0	0	0	11,489	34,999	545
Solid Manure	0	0	0	0	2,225	13,058	0
Feed Handling	0	0	0	0	48,746	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>14,012</b>	<b>0</b>	<b>110,926</b>	<b>146,100</b>	<b>545</b>

Calculations for milking parlor:

Annual PE = (# milk cows) x (EF1 lb-pollutant/hd-yr) x (# dry cows) x (EF2 lb-pollutant/hd-yr)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculations for cow housing:

See detailed calculations under Cow Housing Calculations worksheet.

Calculations for liquid manure and solid manure handling:

Annual PE = [(# milk cows) x (EF1 lb-pollutant/hd-yr)] + [(# dry cows) x (EF2 lb-pollutant/hd-yr)] + [(# large heifers) x (EF2 lb-pollutant/hd-yr)] + [(# medium heifers) x (EF2 lb-pollutant/hd-yr)] + [(# small heifers) x (EF2 lb-pollutant/hd-yr)] + [(# calves) x (EF2 lb-pollutant/hd-yr)] + [(# bulls) x (EF2 lb-pollutant/hd-yr)]

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

The H2S emission factor is assumed to be 10% of the NH3 lagoon/storage pond(s) emission factor, for each respective herd size.

Calculations for silage emissions:

Annual PE = (EF2) x (area ft<sup>2</sup>) x (0.0929 m<sup>2</sup>/ft<sup>2</sup>) x (8,760 hr/yr) x (60 min/hr) x 2.20E-9 lb/μg

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculation for TMR emissions:

Annual PE = (# cows) x (EF2) x (0.658 m<sup>2</sup>) x (525,600 min/yr) x (2.20E-9 lb/μg)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calves are not included in TMR calculation.

Major Source Emissions (lb/yr)					
Permit	NOx	SOx	PM10	CO	VOC
Milking Parlor	0	0	0	0	0
Cow Housing	0	0	0	0	0
Liquid Manure	0	0	0	0	5,531
Solid Manure	0	0	0	0	0
Feed Handling	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,531</b>



BACT Applicability

<b>Milking Parlor</b>					
<b>VOC Emissions</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	4.6	3.4	0.40	0.40	1.2
<b>Total</b>					<b>1.2</b>
<b>NH3 Emissions</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	1.6	1.2	0.14	0.14	0.4
<b>Total</b>					<b>0.4</b>

<b>Cow Housing</b>	
See detailed cow housing AIPE calculations on following pages.	

<b>Liquid Manure Handling</b>					
<b>VOC Emissions - Lagoon/Storage Pond(s)</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	13.5	9.9	1.17	1.17	3.6
Dry Cows	0.9	1.3	0.64	0.64	-0.4
Support Stock (Heifers, Calves, and Bulls)	0.8	2.2	0.49	0.49	-1.4
Large Heifers	0.0	0.0	0.49	0.49	0.0
Medium Heifers	0.0	0.0	0.33	0.33	0.0
Small Heifers	0.0	0.0	0.19	0.19	0.0
Calves	0.0	0.0	0.09	0.09	0.0
Bulls	0.0	0.0	0.30	0.30	0.0
<b>Total</b>					<b>1.8</b>

<b>VOC Emissions - Land Application</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	14.5	10.7	1.26	1.26	3.8
Dry Cows	0.9	1.4	0.69	0.69	-0.5
Support Stock (Heifers, Calves, and Bulls)	0.9	2.3	0.53	0.53	-1.4
Large Heifers	0.0	0.0	0.53	0.53	0.0
Medium Heifers	0.0	0.0	0.36	0.36	0.0
Small Heifers	0.0	0.0	0.20	0.20	0.0
Calves	0.0	0.0	0.10	0.10	0.0
Bulls	0.0	0.0	0.32	0.32	0.0
<b>Total</b>					<b>1.9</b>

<b>NH3 Emissions - Lagoon/Storage Pond(s)</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	13.6	10.0	1.18	1.18	3.6
Dry Cows	0.8	1.2	0.60	0.60	-0.4
Support Stock (Heifers, Calves, and Bulls)	0.5	1.4	0.32	0.32	-0.9
Large Heifers	0.0	0.0	0.32	0.32	0.0
Medium Heifers	0.0	0.0	0.22	0.22	0.0
Small Heifers	0.0	0.0	0.17	0.17	0.0
Calves	0.0	0.0	0.05	0.05	0.0
Bulls	0.0	0.0	0.43	0.43	0.0
<b>Total</b>					<b>2.3</b>

<b>NH3 Emissions - Land Application</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	73.9	54.2	6.41	6.41	19.7
Dry Cows	4.3	6.4	3.24	3.24	-2.1
Support Stock (Heifers, Calves, and Bulls)	2.7	7.3	1.66	1.66	-4.6
Large Heifers	0.0	0.0	1.66	1.66	0.0
Medium Heifers	0.0	0.0	1.22	1.22	0.0
Small Heifers	0.0	0.0	0.94	0.94	0.0
Calves	0.0	0.0	0.27	0.27	0.0
Bulls	0.0	0.0	2.33	2.33	0.0
<b>Total</b>					<b>13.0</b>

<b>H2S Emissions - Lagoon/Storage Pond(s)</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	1.4	1.4	0.12	0.12	0.0
Dry Cows	0.1	0.1	0.06	0.06	0.0
Support Stock (Heifers, Calves, and Bulls)	0.1	0.1	0.03	0.03	0.0
Large Heifers	0.0	0.0	0.03	0.03	0.0
Medium Heifers	0.0	0.0	0.02	0.02	0.0
Small Heifers	0.0	0.0	0.02	0.02	0.0
Calves	0.0	0.0	0.01	0.01	0.0
Bulls	0.0	0.0	0.04	0.04	0.0
<b>Total</b>					<b>0.0</b>

<b>Solid Manure Handling</b>					
<b>VOC Emissions - Solid Manure Storage/Separated Solids Piles</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	2.0	1.5	0.18	0.18	0.5
Dry Cows	0.1	0.2	0.10	0.10	-0.1
Support Stock (Heifers, Calves, and Bulls)	0.1	0.3	0.10	0.07	-0.2
Large Heifers	0.0	0.0	0.07	0.07	0.0
Medium Heifers	0.0	0.0	0.05	0.05	0.0
Small Heifers	0.0	0.0	0.03	0.03	0.0
Calves	0.0	0.0	0.01	0.01	0.0
Bulls	0.0	0.0	0.05	0.05	0.0
<b>Total</b>					<b>0.2</b>

<b>VOC Emissions - Land Application</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	3.4	2.5	0.30	0.30	0.9
Dry Cows	0.2	0.3	0.16	0.16	-0.1
Support Stock (Heifers, Calves, and Bulls)	0.2	0.6	0.12	0.12	-0.4
Large Heifers	0.0	0.0	0.12	0.12	0.0
Medium Heifers	0.0	0.0	0.08	0.08	0.0
Small Heifers	0.0	0.0	0.05	0.05	0.0
Calves	0.0	0.0	0.02	0.02	0.0
Bulls	0.0	0.0	0.07	0.07	0.0
<b>Total</b>					<b>0.4</b>

<b>NH3 Emissions - Solid Manure Storage/Separated Solids Piles</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	15.3	11.3	1.33	1.33	4.0
Dry Cows	0.9	1.3	0.67	0.67	-0.4
Support Stock (Heifers, Calves, and Bulls)	0.6	1.6	0.35	0.35	-1.0
Large Heifers	0.0	0.0	0.35	0.35	0.0
Medium Heifers	0.0	0.0	0.25	0.25	0.0
Small Heifers	0.0	0.0	0.18	0.18	0.0
Calves	0.0	0.0	0.06	0.06	0.0
Bulls	0.0	0.0	0.49	0.49	0.0
<b>Total</b>					<b>2.6</b>

<b>NH3 Emissions - Land Application</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Milk Cows	17.3	12.7	1.50	1.50	4.6
Dry Cows	1.0	1.5	0.76	0.76	-0.5
Support Stock (Heifers, Calves, and Bulls)	0.7	1.8	0.40	0.40	-1.1
Large Heifers	0.0	0.0	0.40	0.40	0.0
Medium Heifers	0.0	0.0	0.28	0.28	0.0
Small Heifers	0.0	0.0	0.22	0.22	0.0
Calves	0.0	0.0	0.06	0.06	0.0
Bulls	0.0	0.0	0.55	0.55	0.0
<b>Total</b>					<b>3.0</b>

<b>Feed Storage and Handling</b>					
<b>VOC Emissions - Silage</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
Corn Silage	4.0	4.0	21,155	21,155	0.0
Alfalfa Silage	0.0	0.0	10,649	10,649	0.0
Wheat Silage	12.7	12.7	26,745	26,745	0.0
<b>Total</b>					<b>0.0</b>

<b>VOC Emissions - TMR</b>					
	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)
TMR	116.8	119.7	10,575	10,575	-2.9
<b>Total</b>					<b>-2.9</b>

Cow Housing - VOC Emissions							
Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)	BACT Triggered?	
1	Corrals 1 - 7	0.8	0.9	9.86	9.86	-0.1	No
2	Corrals 8 - 11	1.4	1.8	9.86	9.86	-0.4	No
3	Corral 12	4.1	5.0	9.86	9.86	-0.9	No
4	Corral 13 - 14	5.0	5.0	9.86	9.86	0.0	No
5	Corral 15	4.7	5.0	9.86	9.86	-0.3	No
6	Corral 16 - 19	5.0	5.0	9.86	9.86	0.0	No
7	Freestall 20	9.5	8.9	9.86	9.86	0.6	No
8	Freestall 21 - 27	9.5	8.9	9.86	9.86	0.6	No
9	Saudi 28	6.5	6.5	9.86	9.86	0.0	No
10	Freestall 29	6.5	6.5	9.86	9.86	0.0	No
11	Freestall 30	1.5	3.8	9.86	9.86	-2.3	No
12	Freestall 31	1.5	3.0	9.86	9.86	-1.5	No
13	Corral 32	0.5	0.5	9.86	9.86	0.0	No
14	Corral 33	0.6	0.6	9.86	9.86	0.0	No
15	Corral 34	0.6	0.6	9.86	9.86	0.0	No
New Units from Expansion							
Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	PE2 (lb/day)	BACT Triggered?	

Cow Housing - NH3 Emissions						
Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)	BACT Triggered?
Corrals 1 - 7	1.8	2.0	21.13	21.13	-0.2	No
Corrals 8 - 11	3.1	3.9	21.13	21.13	-0.8	No
Corral 12	6.7	10.7	21.13	21.13	-2.0	No
Corral 13 - 14	10.7	10.7	21.13	21.13	0.0	No
Corral 15	10.1	10.7	21.13	21.13	-0.6	No
Corral 16 - 19	10.7	10.7	21.13	21.13	0.0	No
Freestall 20	20.3	19.1	21.13	21.13	1.2	No
Freestall 21 - 27	20.3	19.1	21.13	21.13	1.2	No
Saudi 28	13.9	13.9	21.13	21.13	0.0	No
Freestall 29	13.9	13.9	21.13	21.13	0.0	No
Freestall 30	3.2	8.1	21.13	21.13	-4.9	No
Freestall 31	3.2	6.4	21.13	21.13	-3.2	No
Corral 32	1.2	1.2	21.13	21.13	0.0	No
Corral 33	1.4	1.4	21.13	21.13	0.0	No
Corral 34	1.4	1.4	21.13	21.13	0.0	No
New Units from Expansion						
Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	PE2 (lb/day)	BACT Triggered?

\*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows. BACT applicability has been calculated for EACH emissions unit in this row.

Cow Housing - PM10 Emissions							
	Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	AIPE (lb/day)	BACT Triggered?
1	Corrals 1 - 7	0.7	0.9	8.22	9.67	-0.1	No
2	Corrals 8 - 11	1.2	1.8	8.22	9.67	-0.3	No
3	Corral 12	3.4	4.9	8.22	9.67	-0.8	No
4	Corral 13 - 14	4.2	4.9	8.22	9.67	0.0	No
5	Corral 15	3.9	4.9	8.22	9.67	-0.3	No
6	Corral 16 - 19	4.2	4.9	8.22	9.67	0.0	No
7	Freestall 20	1.1	1.2	1.17	1.37	0.1	No
8	Freestall 21 - 27	1.1	1.2	1.17	1.37	0.1	No
9	Saudi 28	0.8	0.9	1.17	1.37	0.0	No
10	Freestall 29	0.8	0.9	1.17	1.37	0.0	No
11	Freestall 30	0.2	0.5	1.17	1.37	-0.2	No
12	Freestall 31	0.2	0.4	1.17	1.37	-0.1	No
13	Corral 32	0.4	0.5	8.22	9.67	0.0	No
14	Corral 33	0.5	0.6	8.22	9.67	0.0	No
15	Corral 34	0.6	0.7	8.97	10.55	0.0	No
New Units from Expansion							
	Housing Name(s) or #(s)	PE2 (lb/day)	PE1 (lb/day)	EF2	EF1	PE2 (lb/day)	BACT Triggered?

\*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows. BACT applicability has been calculated for EACH emissions unit in this row

## Increase in Emissions

SSIFE (lb/yr)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	448	154	0
Cow Housing	0	0	-8,290	0	5,408	15,545	0
Liquid Manure	0	0	0	0	1,376	5,605	0
Solid Manure	0	0	0	0	263	2,074	0
Feed Handling	0	0	0	0	-1,030	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>-8,290</b>	<b>0</b>	<b>6,464</b>	<b>23,378</b>	<b>0</b>

Total Daily Change in Emissions (lb/day)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	1.2	0.4	0.0
Cow Housing	0.0	0.0	-3.6	0.0	-3.4	-7.4	0.0
Liquid Manure	0.0	0.0	0.0	0.0	3.8	15.4	0.0
Solid Manure	0.0	0.0	0.0	0.0	0.6	5.7	0.0
Feed Handling	0.0	0.0	0.0	0.0	-2.9	0.0	0.0
<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>-3.6</b>	<b>0.0</b>	<b>-0.7</b>	<b>14.1</b>	<b>0.0</b>

Total Annual Change in Non-Fugitive Emissions (Major Source Emissions) (lb/yr)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	0	0	0
Cow Housing	0	0	0	0	0	0	0
Liquid Manure	0	0	0	0	664	0	0
Solid Manure	0	0	0	0	0	0	0
Feed Handling	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>664</b>	<b>0</b>	<b>0</b>

### Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

QNEC = PE2 - PE1, where:

- QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr
- PE2 = Post-Project Potential to Emit for each emissions unit, lb/qtr
- PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr

The quarterly PE values are calculated as follows: PE (lb/yr) ÷ 4 (qtr/yr)

Using the annual PE2 and PE1 values previously calculated, the QNEC (lb/qtr) for each permit unit is shown below:

Milking Parlor						
	NOx	SOx	PM10	CO	VOC	NH3
Annual PE2 (lb/yr)	0	0	0	0	1,683	576
Daily PE2 (lb/day)	0.0	0.0	0.0	0.0	4.6	1.6
Quarterly Net Emissions Change (lb/qtr)	1:	0.0	0.0	0.0	111.9	38.3
	2:	0.0	0.0	0.0	111.9	38.3
	3:	0.0	0.0	0.0	111.9	38.3
	4:	0.0	0.0	0.0	111.9	38.3

Cow Housing							
	NOx	SOx	PM10	CO	VOC	NH3	
Annual PE2 (lb/yr)	0	0	14,012	0	46,783	97,468	
Daily PE2 (lb/day)	0.0	0.0	63.7	0.0	143.2	306.8	
Quarterly Net Emissions Change (lb/qtr)	1:	0.0	0.0	-2,072.5	0.0	1,352.0	3,886.3
	2:	0.0	0.0	-2,072.5	0.0	1,352.0	3,886.3
	3:	0.0	0.0	-2,072.5	0.0	1,352.0	3,886.3
	4:	0.0	0.0	-2,072.5	0.0	1,352.0	3,886.3

Liquid Manure Handling							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Annual PE2 (lb/yr)	0	0	0	0	11,489	34,999	545
Daily PE2 (lb/day)	0.0	0.0	0.0	0.0	31.5	95.9	1.6
Quarterly Net Emissions Change (lb/qtr)	1:	0.0	0.0	0.0	343.9	1,401.2	0.0
	2:	0.0	0.0	0.0	343.9	1,401.2	0.0
	3:	0.0	0.0	0.0	343.9	1,401.2	0.0
	4:	0.0	0.0	0.0	343.9	1,401.2	0.0

Solid Manure Handling						
	NOx	SOx	PM10	CO	VOC	NH3
Annual PE2 (lb/yr)	0	0	0	0	2,225	13,058
Daily PE2 (lb/day)	0.0	0.0	0.0	0.0	6.0	35.7
Quarterly Net Emissions Change (lb/qtr)	1:	0.0	0.0	0.0	65.7	518.6
	2:	0.0	0.0	0.0	65.7	518.6
	3:	0.0	0.0	0.0	65.7	518.6
	4:	0.0	0.0	0.0	65.7	518.6

## **APPENDIX G**

**PE Calculations for Unit C-5713-6-0**

**C-5713-6-0:** 900 bhp diesel-fired emergency standby IC engine

Diesel-fired IC Engine Emission Factors			
	lb/hp-hr	g/hp-hr*	Source
NO <sub>x</sub>	0.02205	10.00	Carl Moyer Program
SO <sub>x</sub>	-	0.0051	Mass Balance Equation Below
PM <sub>10</sub>	0.0011	0.475	Carl Moyer Program
CO	0.0068	3.04	AP-42 (10/96) Table 3.3-1
VOC	0.0025	1.14	AP-42 (10/96) Table 3.3-1

\*g/hp-hr is calculated using the lb/hp-hr value multiplied by 453.6 g/lb.

$$0.0015\%S \times \frac{7.11b \cdot fuel}{gallon} \times \frac{2lb \cdot SO_2}{1lb \cdot S} \times \frac{1gal}{137,000 Btu} \times \frac{1hp \ input}{0.35 \ hp \ out} \times \frac{2,542.5 \ Btu}{hp \cdot hr} \times \frac{453.6 \ g}{lb} = 0.0051 \frac{g \cdot SO_x}{hp \cdot hr}$$

The current PTO limits the annual operation of this engine to 100 hours per year.

Annual Potential to Emit (PE)							
NO <sub>x</sub>	10.00	(g/hp-hr) x	900	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	1,984 (lb/yr)
SO <sub>x</sub>	0.0051	(g/hp-hr) x	900	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	1 (lb/yr)
PM <sub>10</sub>	0.475	(g/hp-hr) x	900	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	94 (lb/yr)
CO	3.04	(g/hp-hr) x	900	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	603 (lb/yr)
VOC	1.14	(g/hp-hr) x	900	(hp) x	100	(hr/yr) ÷ 453.6 (g/lb) =	226 (lb/yr)