

JUL 20 2016

Danny Iest  
Tri-Iest Dairy Home Ranch  
16500 Avenue 14  
Madera, CA 93637

**Re: Notice of Preliminary Decision - Authority to Construct**  
**Facility Number: C-5160**  
**Project Number: C-1161722**

Dear Mr. Iest:

Enclosed for your review and comment is the District's analysis of Tri-Iest Dairy Home Ranch's application for an Authority to Construct for the installation of a 900 bhp (intermittent) Tier 2 certified diesel-fired emergency standby internal combustion (IC) engine powering an electrical generator, at 16500 Avenue 14, Madera.

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. John Yoshimura of Permit Services at (559) 230-5887.

Sincerely,



Arnaud Marjollet  
Director of Permit Services

AM:JY

Enclosures

cc: Tung Le, CARB (w/ enclosure) via email

**Seyed Sadredin**  
Executive Director/Air Pollution Control Officer

**Northern Region**  
4800 Enterprise Way  
Modesto, CA 95356-8718  
Tel: (209) 557-6400 FAX: (209) 557-6475

**Central Region (Main Office)**  
1990 E. Gettysburg Avenue  
Fresno, CA 93726-0244  
Tel: (559) 230-6000 FAX: (559) 230-6061

**Southern Region**  
34946 Flyover Court  
Bakersfield, CA 93308-9725  
Tel: 661-392-5500 FAX: 661-392-5585

# San Joaquin Valley Air Pollution Control District

## Authority to Construct

### Application Review

#### Agricultural Diesel-Fired Emergency Standby IC Engine

Facility Name: Tri-lest Dairy Home Ranch  
Mailing Address: 16500 Avenue 14  
Madera, CA 93637  
Contact Person: Danny Iest  
Telephone: (559) 673-3293  
Application #: C-5160-10-0  
Project #: C-1161722  
Complete: June 14, 2016

Date: July 12, 2016  
Engineer: John Yoshimura  
Lead Engineer: Joven Refuerzo

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#### I. Proposal

Tri-lest Dairy Home Ranch (Tri-lest) is proposing to install a 900 bhp (intermittent) Tier 2 certified diesel-fired emergency standby internal combustion (IC) engine powering an electrical generator.

#### II. Applicable Rules

Rule 1070 Inspections (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 4001 New Source Performance Standards (4/14/99)  
Rule 4002 National Emission Standards for Hazardous Air Pollutants (5/20/04)  
Rule 4101 Visible Emissions (2/17/05)  
Rule 4102 Nuisance (12/17/92)  
Rule 4201 Particulate Matter Concentration (12/17/92)  
Rule 4701 Stationary Internal Combustion Engines - Phase 1 (8/21/03)  
Rule 4702 Stationary Internal Combustion Engines (11/14/13)  
Rule 4801 Sulfur Compounds (12/17/92)  
CH&SC 41700 Health Risk Assessment  
CH&SC 42301.6 School Notice  
Title 17 CCR, Section 93115 - Airborne Toxic Control Measure (ATCM) for Stationary Compression-Ignition (CI) Engines  
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 16500 Avenue 14 in Madera, 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

The emergency standby engine powers an electrical generator which will be used for the growing of crops and/or animals. Other than emergency standby operation, the engine may be operated up to 100 hours per year for maintenance and testing purposes.

### V. Equipment Listing

C-5160-10-0: 900 BHP (INTERMITTENT) CATERPILLAR MODEL C18 TIER 2 CERTIFIED DIESEL-FIRED EMERGENCY STANDBY IC ENGINE POWERING AN ELECTRICAL GENERATOR

### VI. Emission Control Technology Evaluation

The applicant has proposed to install a Tier 2 certified diesel-fired IC engine that is fired on very low-sulfur diesel fuel.

The proposed engine meets the Tier Certification requirements for the applicable horsepower range; therefore, the engine meets the latest ARB/EPA emissions standards for diesel particulate matter, hydrocarbons, nitrogen oxides, and carbon monoxide (see Appendix C for a copy of the emissions data sheet and/or the ARB/EPA executive order).

The use of very low-sulfur diesel fuel (0.0015% by weight sulfur maximum) reduces SO<sub>x</sub> emissions by over 99% from standard diesel fuel.

### VII. General Calculations

#### A. Assumptions

Emergency operating schedule:	24 hours/day
Non-emergency operating schedule:	100 hours/year
Density of diesel fuel:	7.1 lb/gal
EPA F-factor (adjusted to 60 °F):	9,051 dscf/MMBtu
Fuel heating value:	137,000 Btu/gal
BHP to Btu/hr conversion:	2,542.5 Btu/bhp-hr
Thermal efficiency of engine:	commonly ≈ 35%
PM <sub>10</sub> fraction of diesel exhaust:	0.96 (CARB, 1988)

Pursuant to the Off-Road Compression Ignition Emission Standards (Appendix C), NO<sub>x</sub> and VOC have a combined certified emission factor of 4.8 g/bhp-hr. It will be assumed the NO<sub>x</sub> + VOC emission factor is split 95% NO<sub>x</sub> and 5% VOC (per the Carl Moyer program). However, the facility submitted engine manufacturer

emissions data for NO<sub>x</sub>; therefore, as a worst case scenario, a NO<sub>x</sub> emission factor of 5.8 g/bhp-hr will be used to determine the potential to emit.

**B. Emission Factors**

Emission Factors		
Pollutant	Emission Factor (g/bhp-hr)	Source
NO <sub>x</sub>	5.8	Engine Manufacturer/Applicant Proposed
SO <sub>x</sub>	0.0051	Mass Balance Equation Below
PM <sub>10</sub>	0.15	ARB/EPA Tier 2 Certification*
CO	2.6	ARB/EPA Tier 2 Certification*
VOC	0.24	ARB/EPA Tier 2 Certification*

\*See Appendix C Off-Road Compression Ignition Emission Standards

$$\frac{0.000015 \text{ lb-S}}{\text{lb-fuel}} \times \frac{7.1 \text{ lb-fuel}}{\text{gallon}} \times \frac{2 \text{ lb-SO}_2}{1 \text{ lb-S}} \times \frac{1 \text{ gal}}{137,000 \text{ Btu}} \times \frac{1 \text{ bhp input}}{0.35 \text{ bhp out}} \times \frac{2,542.5 \text{ Btu}}{\text{bhp-hr}} \times \frac{453.6 \text{ g}}{\text{lb}} = 0.0051 \frac{\text{g-SO}_x}{\text{bhp-hr}}$$

**C. Calculations**

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

Since this is a new emissions unit, PE1 = 0.

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

The daily and annual PE are calculated as follows:

$$\text{Daily PE2 (lb-pollutant/day)} = \text{EF (g-pollutant/bhp-hr)} \times \text{rating (bhp)} \times \text{operation (hr/day)} / 453.6 \text{ g/lb}$$

$$\text{Annual PE2 (lb-pollutant/yr)} = \text{EF (g-pollutant/bhp-hr)} \times \text{rating (bhp)} \times \text{operation (hr/yr)} / 453.6 \text{ g/lb}$$

Project Emissions (PE2)						
Pollutant	Emissions Factor (g/bhp-hr)	Rating (bhp)	Daily Hours of Operation (hrs/day)	Annual Hours of Operation (hrs/yr)	Daily PE2 (lb/day)	Annual PE2 (lb/yr)
NO <sub>x</sub>	5.80	900	24	100	276.2	1,151
SO <sub>x</sub>	0.0051	900	24	100	0.2	1
PM <sub>10</sub>	0.15	900	24	100	7.1	30
CO	2.60	900	24	100	123.8	516
VOC	0.24	900	24	100	11.4	48

### 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 Authorities to Construct (ATC) or Permits to Operate (PTO) 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. See Appendix F for detailed SSPE calculations.

Pre-Project Stationary Source Potential to Emit [SSPE1] (lb/year)							
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC	NH <sub>3</sub>	H <sub>2</sub> S
C-5160-1-2	0	0	0	0	2,120	725	0
C-5160-2-2	0	0	106,470	0	89,086	178,793	0
C-5160-3-2	0	0	0	0	21,338	58,089	912
C-5160-4-2	0	0	0	0	4,202	21,761	0
C-5160-5-0	408	0	18	39	22	0	0
C-5160-8-1	0	0	0	0	128,820	0	0
C-5160-9-0	0	0	0	0	59	0	0
<b>Pre-Project SSPE (SSPE1)</b>	<b>408</b>	<b>0</b>	<b>106,488</b>	<b>39</b>	<b>245,647</b>	<b>259,368</b>	<b>912</b>

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

Pursuant to District Rule 2201, the SSPE2 is 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. For this project the change in emissions for the facility is due to the installation of the new emergency standby IC engine. Thus:

Post-Project Stationary Source Potential to Emit [SSPE2] (lb/year)							
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	CO	VOC	NH <sub>3</sub>	H <sub>2</sub> S
C-5160-1-2	0	0	0	0	2,120	725	0
C-5160-2-2	0	0	106,470	0	89,086	178,793	0
C-5160-3-2	0	0	0	0	21,338	58,089	912
C-5160-4-2	0	0	0	0	4,202	21,761	0
C-5160-5-0	408	0	18	39	22	0	0
C-5160-8-1	0	0	0	0	128,820	0	0
C-5160-9-0	0	0	0	0	59	0	0
C-5160-10-0	1,151	1	30	516	48	0	0
<b>Post-Project SSPE (SSPE2)</b>	<b>1,559</b>	<b>1</b>	<b>106,518</b>	<b>555</b>	<b>245,695</b>	<b>259,368</b>	<b>912</b>

## 5. Major Source Determination

### Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. 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 IC engines (i.e. IC engines at a particular site at the facility for less than 12 months)
- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

Since agricultural operations do not fall under any of the specific source categories specified in 40 CFR 51.165, fugitive emissions are not counted when determining if an agricultural operation is a major source.

Since emissions at this facility are not actually collected, a determination of whether emissions could be reasonably collected must be made by the permitting authority. The California Air Pollution Control Association (CAPCOA) prepared guidance in 2005 for estimating potential to emit of Volatile Organic Compounds from dairy farms. The guidance states that "VOC emissions from the milking centers, cow housing areas, corrals, common manure storage areas, and land application of manure are not physically contained and could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening. No collection technologies currently exist for VOC emissions from these emissions units. Therefore, the VOC emissions from these sources are considered fugitive." The guidance also concludes that, because VOC collection technologies do exist for liquid waste systems at dairies, "... the VOC emissions from waste lagoons and storage ponds are considered non-fugitive."

The District has researched this issue and concurs with the CAPCOA assessment. All fugitive emissions are excluded from the Major Source determination. SSPE calculations excluding fugitive emissions from the facility are shown in Appendix F.

<b>Rule 2201 Major Source Determination (lb/year)</b>						
	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO	VOC
SSPE1	408	0	18	18	39	10,347
SSPE2	1,559	1	48	48	555	10,395
Major Source Threshold	20,000	140,000	140,000	140,000	200,000	20,000
Major Source?	No	No	No	No	No	No

Note: PM2.5 assumed to be equal to PM10

As seen 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:**

The facility or the equipment evaluated under this project is not listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). Therefore the PSD Major Source threshold is 250 tpy for any regulated NSR pollutant.

PSD Major Source Determination (tons/year)						
	NO2	VOC	SO2	CO	PM	PM10
Estimated Facility PE before Project Increase	0.2	122.8	0.0	0.0	53.2	53.2
PSD Major Source Thresholds	250	250	250	250	250	250
PSD Major Source ? (Y/N)	N	N	N	N	N	N

As shown above, the facility is not an existing PSD major source for any regulated NSR pollutant expected to be emitted at this facility.

**6. Baseline Emissions (BE)**

BE = Pre-project Potential to Emit for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201.

Since this is a new emissions unit, BE = PE1 = 0 for all criteria pollutants.

**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. Additionally, since the facility is not a major source for PM<sub>10</sub> (140,000 lb/year), it is not a major source for PM<sub>2.5</sub> (140,000 lb/year).

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

The project potential to emit, by itself, will not exceed any PSD major source thresholds. Therefore Rule 2410 is not applicable and no further discussion 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 E.

### **VIII. Compliance**

#### **Rule 1070 Inspections**

This rule applies to any source operation, which emits or may emit air contaminants.

This rule allows 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 allows the District to require record keeping, to make inspections and to conduct tests of air pollution sources. Therefore, the following conditions will be listed on each ATC 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 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 for the following\*:



- 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 AIPE exceeding two pounds per day, and/or
- d. Any new or modified emissions unit, in a stationary source project, which results in an SB288 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.

As discussed in Section I, the facility is proposing to install a new emergency standby IC engine. Additionally, as determined in Sections VII.C.7 and VII.C.8, this project does not result in an SB288 Major Modification or a Federal Major Modification, respectively. Therefore, BACT can only be triggered if the daily emissions exceed 2.0 lb/day for any pollutant.

The daily emissions from the new engine are compared to the BACT threshold levels in the following table:

New Emissions Unit BACT Applicability				
Pollutant	Daily Emissions (lb/day)	BACT Threshold (lb/day)	SSPE2 (lb/yr)	BACT Triggered?
NO <sub>x</sub>	276.2	> 2.0	n/a	Yes
SO <sub>x</sub>	0.2	> 2.0	n/a	No
PM <sub>10</sub>	7.1	> 2.0	n/a	Yes
CO	123.8	> 2.0 and SSPE2 ≥ 200,000 lb/yr	555	No
VOC	11.4	> 2.0	n/a	Yes

As shown above, BACT will be triggered for NO<sub>x</sub>, PM<sub>10</sub>, and VOC emissions from the engine for this project.

## 2. BACT Guideline

BACT Guideline 3.1.1, which appears in Appendix B of this report, covers diesel-fired emergency IC engines.

## 3. Top Down BACT Analysis

Per District Policy APR 1305, Section IX, "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 for source categories or classes covered in the BACT Clearinghouse, relevant information under each of the following steps may be simply cited from the Clearinghouse without further analysis."

Pursuant to the attached Top-Down BACT Analysis, which appears in Appendix B of this report, BACT is satisfied with:

NO<sub>x</sub>: Latest Available Tier Certification level for applicable horsepower\*  
VOC: Latest Available Tier Certification level for applicable horsepower\*  
PM<sub>10</sub>: 0.15 g/bhp-hr

\*Note: The certification requirements for emergency engines are as follows:  
50 ≤ bhp < 75 – Tier 4I; 75 ≤ bhp < 750 – Tier 3; ≥ 750 bhp – Tier 2.

## **B. Offsets**

Since emergency IC engines are exempt from the offset requirements of Rule 2201, per Section 4.6.2, offsets are not required for this engine, and no offset calculations are required.

## **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, and/or
- d. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.
- 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.

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

The PE<sub>2</sub> for this new unit is compared to the daily PE Public Notice Thresholds in the following table:

PE > 100 lb/day Public Notice Thresholds			
Pollutant	PE2 (lb/day)	Public Notice Threshold	Public Notice Triggered?
NO <sub>x</sub>	276.2	100 lb/day	Yes
SO <sub>x</sub>	0.2	100 lb/day	No
PM <sub>10</sub>	7.1	100 lb/day	No
CO	123.8	100 lb/day	Yes
VOC	11.4	100 lb/day	No

Therefore, public noticing for PE > 100 lb/day purposes is required.

**c. Offset Threshold**

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

Offset Thresholds				
Pollutant	SSPE1 (lb/year)	SSPE2 (lb/year)	Offset Threshold	Public Notice Required?
NO <sub>x</sub>	408	1,559	20,000 lb/year	No
SO <sub>x</sub>	0	1	54,750 lb/year	No
PM <sub>10</sub>	106,488	106,518	29,200 lb/year	No
CO	39	555	200,000 lb/year	No
VOC	245,647	245,695	20,000 lb/year	No

As detailed above, there were no thresholds surpassed with this project; therefore public noticing is not required for offset purposes.

**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.

SSIPE Public Notice Thresholds					
Pollutant	SSPE2 (lb/year)	SSPE1 (lb/year)	SSIPE (lb/year)	SSIPE Public Notice Threshold	Public Notice Required?
NO <sub>x</sub>	1,559	408	1,151	20,000 lb/year	No
SO <sub>x</sub>	1	0	1	20,000 lb/year	No
PM <sub>10</sub>	106,518	106,488	30	20,000 lb/year	No
CO	555	39	516	20,000 lb/year	No
VOC	245,695	245,647	48	20,000 lb/year	No
NH <sub>3</sub>	259,368	259,368	0	20,000 lb/year	No
H <sub>2</sub> S	912	912	0	20,000 lb/year	No

As demonstrated above, the SSIPEs for all pollutants were less than 20,000 lb/year; therefore public noticing for SSIPE purposes is not 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 NO<sub>x</sub> and CO emissions in excess of 100 lb/day. 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 ATC for this equipment.

### **D. Daily Emissions Limits**

Daily Emissions Limitations (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. Therefore, the following conditions will be listed on the ATC to ensure compliance:

- {4771} Emissions from this IC engine shall not exceed any of the following limits: 5.8 g-NO<sub>x</sub>/bhp-hr, 2.6 g-CO/bhp-hr, or 0.24 g-VOC/bhp-hr. [District Rule 2201 and 17 CCR 93115]
- {4772} Emissions from this IC engine shall not exceed 0.15 g-PM<sub>10</sub>/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102, and 17 CCR 93115]
- {4258} Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201 and 4801, and 17 CCR 93115]

### **E. Compliance Assurance**

#### **1. Source Testing**

Pursuant to District Policy APR 1705, source testing is not required for emergency standby IC engines to demonstrate compliance with Rule 2201.

#### **2. Monitoring**

No monitoring is required to demonstrate compliance with Rule 2201.

#### **3. Recordkeeping**

Recordkeeping requirements, in accordance with District Rule 4702, will be discussed in Section VIII, *District Rule 4702*, of this evaluation.

#### **4. Reporting**

No reporting is required to ensure compliance with Rule 2201.

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

An AAQA shall be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. The District's Technical Services Division conducted the required analysis. Refer to Appendix D of this document for the AAQA summary sheet.

The proposed location is in an attainment area for NO<sub>x</sub>, CO, and SO<sub>x</sub>. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for NO<sub>x</sub>, CO, or SO<sub>x</sub>.

The proposed location is in a non-attainment area for the state's PM<sub>10</sub> as well as federal and state PM<sub>2.5</sub> thresholds. As shown by the AAQA summary sheet the proposed equipment will not cause a violation of an air quality standard for PM<sub>10</sub> and PM<sub>2.5</sub>.

#### **Rule 2410 Prevention of Significant Deterioration**

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 to emit does not exceed any major source thresholds of Rule 2201, this facility is not a Major Source, and Rule 2520 does not apply.

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

##### **40 CFR 60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines**

The District has not been delegated the authority to implement Subpart IIII requirements for non-Major Sources; therefore, no requirements shall be included on the permit.

#### **Rule 4002 National Emission Standards for Hazardous Air Pollutants**

##### **40 CFR 63 Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Emissions (RICE)**

The District has not been delegated the authority to implement NESHAP regulations for Area Source requirements for non-Major Sources; therefore, no requirements shall be included on the permit.

**Rule 4101 Visible Emissions**

Rule 4101 states that no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. Therefore, the following condition will be listed on the ATC to ensure compliance:

- {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

**Rule 4102 Nuisance**

Rule 4102 states that no air contaminant shall be released into the atmosphere which causes a public nuisance. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, the following condition will be listed on the ATC to ensure compliance:

- {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

District Policy APR 1905 - Risk Management Policy for Permitting New and Modified Sources (dated 3/2/01) 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. Therefore, a risk management review (RMR) was performed for this project. The RMR results are summarized in the following table, and can be seen in detail in Appendix D.

RMR Results				
Unit	Acute Hazard Index	Chronic Hazard Index	Cancer Risk	T-BACT Required?
C-5160-10-0	N/A <sup>1</sup>	N/A <sup>2</sup>	0.8 in a million	No

1 Prioritization for this unit was not conducted since it has been determined that all diesel-fired IC engines will result in a prioritization score greater than 1.0.

2 Acute and Chronic Hazard Indices were not calculated since there is no risk factor, or the risk factor is so low that the risk has been determined to be insignificant for this type of unit.

The following conditions will be listed on the ATC to ensure compliance with the RMR:

- {4772} Emissions from this IC engine shall not exceed 0.15 g-PM10/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102, and 17 CCR 93115]
- {4775} This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory

purposes shall not exceed 100 hours per calendar year. [District Rules 2201 and 4702]

### Rule 4201 Particulate Matter Concentration

Rule 4201 limits particulate matter emissions from any single source operation to 0.1 g/dscf, which, as calculated below, is equivalent to a PM<sub>10</sub> emission factor of 0.4 g-PM<sub>10</sub>/bhp-hr.

$$0.1 \frac{\text{grain-PM}}{\text{dscf}} \times \frac{\text{g}}{15.43 \text{ grain}} \times \frac{1 \text{ Btu}_{in}}{0.35 \text{ Btu}_{out}} \times \frac{9,051 \text{ dscf}}{10^6 \text{ Btu}} \times \frac{2,542.5 \text{ Btu}}{1 \text{ bhp-hr}} \times \frac{0.96 \text{ g-PM}_{10}}{1 \text{ g-PM}} = 0.4 \frac{\text{g-PM}_{10}}{\text{bhp-hr}}$$

The new engine has a PM<sub>10</sub> emission factor less than 0.4 g/bhp-hr. Therefore, compliance is expected and the following condition will be listed on the ATC:

- {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

### Rule 4701 Internal Combustion Engines - Phase 1

The purpose of this rule is to limit the emissions of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion engines. Except as provided in Section 4.0, the provisions of this rule apply to any internal combustion engine, rated greater than 50 bhp, that requires a PTO.

Section 4.1 of the rule specifically exempts IC engines in agricultural operations used for the growing of crops or raising of fowl or animals. Since the engine(s) are used for the growing of crops or raising of fowl or animals, they are exempt from the requirements of this rule. Therefore, the following condition will be listed on the ATC(s) to ensure compliance.

- {4002} This IC engine shall only be used for the growing and harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. [District Rule 4701 and 17 CCR 93115]

### Rule 4702 Internal Combustion Engines

The following summarizes District Rule 4702 requirements for emergency standby IC engines:

1. Operation of emergency standby engines is limited to 100 hours or less per calendar year for non-emergency purposes. The following condition will be included on the permit:
  - {4775} This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory

purposes shall not exceed 100 hours per calendar year. [District Rules 2201 and 4702]

2. Properly operate and maintain each engine as recommended by the engine manufacturer or emission control system supplier. The following condition will be included on the permit:
  - {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]
3. Monitor the operational characteristics of each engine as recommended by the engine manufacturer or emission control system supplier. The following condition will be included on the permit:
  - {3478} During periods of operation for maintenance, testing, and required regulatory purposes, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]
4. Install and operate a nonresettable elapsed time meter. In lieu of installing a nonresettable elapsed time meter, the operator may use an alternative device, method, or technique, in determining operating time provided that the alternative is approved by the APCO and EPA and is allowed by Permit-to-Operate condition. The operator shall properly maintain and operate the nonresettable elapsed time meter or alternative device in accordance with the manufacturer's instructions.

The following condition shall be used:

- {4749} This engine shall be equipped with a non-resettable hour meter with a minimum display capability of 9,999 hours, unless the District determines that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history. [District Rule 4702 and 17 CCR 93115]
5. Emergency standby engines cannot be used to reduce the demand for electrical power when normal electrical power line service has not failed, or to produce power for the electrical distribution system, or in conjunction with a voluntary utility demand reduction program or interruptible power contract. The following conditions will be included on the permit:
    - {3807} An emergency situation is an unscheduled electrical power outage caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the permittee. [District Rule 4702]



- {3808} This engine shall not be used to produce power for the electrical distribution system, as part of a voluntary utility demand reduction program, or for an interruptible power contract. [District Rule 4702]
6. Records of the total hours of operation, type of fuel used, purpose for operating the engine, all hours of non-emergency and emergency operation, and other support documentation must be maintained. All records shall be retained for a period of at least five years, shall be readily available, and be made available to the APCO upon request. The following conditions will be included on the permit:
- {3496} The permittee shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, the purpose of the operation (for example: load testing, weekly testing, rolling blackout, general area power outage, etc.) and records of operational characteristics monitoring. For units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702 and 17 CCR 93115]
  - {4263} The permittee shall maintain monthly records of the type of fuel purchased. [District Rule 4702 and 17 CCR 93115]
  - {3475} All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702 and 17 CCR 93115]

### Rule 4801 Sulfur Compounds

Rule 4801 requires that sulfur compound emissions (as SO<sub>2</sub>) shall not exceed 0.2% by volume. Using the ideal gas equation, the sulfur compound emissions are calculated as follows:

$$\text{Volume SO}_2 = (n \times R \times T) \div P$$

$$n = \text{moles SO}_2$$

$$T (\text{standard temperature}) = 60 \text{ }^\circ\text{F or } 520 \text{ }^\circ\text{R}$$

$$R (\text{universal gas constant}) = \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot \text{ }^\circ\text{R}}$$

$$\frac{0.000015 \text{ lb-S}}{\text{lb-fuel}} \times \frac{7.1 \text{ lb}}{\text{gal}} \times \frac{64 \text{ lb-SO}_2}{32 \text{ lb-S}} \times \frac{1 \text{ MMBtu}}{9,051 \text{ scf}} \times \frac{1 \text{ gal}}{0.137 \text{ MMBtu}} \times \frac{\text{lb-mol}}{64 \text{ lb-SO}_2} \times \frac{10.73 \text{ psi} \cdot \text{ft}^3}{\text{lb-mol} \cdot \text{ }^\circ\text{R}} \times \frac{520 \text{ }^\circ\text{R}}{14.7 \text{ psi}} \times 1,000,000 = 1.0 \text{ ppmv}$$

Since 1.0 ppmv is  $\leq$  2,000 ppmv, this engine is expected to comply with Rule 4801. Therefore, the following condition will be listed on the ATC to ensure compliance:

- {4258} Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201 and 4801, and 17 CCR 93115]

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

The District has verified that this engine 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.

**Title 17 California Code of Regulations (CCR), Section 93115 - Airborne Toxic Control Measure (ATCM) for Stationary Compression-Ignition (CI) Engines**

The following requirements apply to new engines (those installed after 1/1/05):

Title 17 CCR Section 93115 Requirements for New Emergency IC Engines Powering Electrical Generators	Proposed Method of Compliance with Title 17 CCR Section 93115 Requirements
The requirements in Sections 93115.6, 93115.7, and 93115.10(a) do not apply to new stationary diesel-fueled CI engines used in agricultural operations.	The following condition will be added to the permit: <ul style="list-style-type: none"> <li>{4002} This IC engine shall only be used for the growing and harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. [District Rule 4701 and 17 CCR 93115]</li> </ul>
Emergency engine(s) must be fired on CARB diesel fuel, or an approved alternative diesel fuel.	The applicant has proposed the use of CARB certified diesel fuel. The proposed permit condition, requiring the use of CARB certified diesel fuel, was included earlier in this evaluation.
The engine(s) must meet Table 6 of the ATCM, which requires the Off-road engine certification standard for the specific power rating of the proposed engine on the date of acquisition (purchase date) or permit application submittal to the District, whichever is earliest.	For emergency engines, the Off-road engine certification standards are identified in Table 1 of the ATCM <sup>1</sup> . The applicant has proposed the use of an emergency engine that meets the Table 1 emission standards (Off-road engine certification standards) for the applicable horsepower range).
A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed upon engine installation, or by no later than January 1, 2005, on all engines subject to all or part of the requirements of sections 93115.6, 93115.7, or 93115.8(a) unless the District determines on a case-by-case basis that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history.	The following condition will be included on the permit: <ul style="list-style-type: none"> <li>{4749} This engine shall be equipped with a non-resettable hour meter with a minimum display capability of 9,999 hours, unless the District determines that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history. [District Rule 4702 and 17 CCR 93115]</li> </ul>

<sup>1</sup> Although Section 93115.8 of the ATCM states that new IC engines used in agricultural operations must meet the emissions limits in Table 6, the ATCM Staff Report clarifies that all new emergency standby IC engines must meet the emissions limits specified in Table 1 of the ATCM. This eliminates the requirement that new agricultural emergency standby IC engines would otherwise have to meet the after-treatment based Tier 4 standards specified in Table 6.

An owner or operator shall maintain monthly records of the following: emergency use hours of operation; maintenance and testing hours of operation; hours of operation for emission testing; initial start-up testing hours; hours of operation for all other uses; and the type of fuel used. All records shall be retained for a minimum of 36 months.

Permit conditions enforcing these requirements were shown earlier in the evaluation.

### California Environmental Quality Act (CEQA)

The California Environmental Quality Act (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 San Joaquin Valley Unified Air Pollution Control District (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.
- 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

#### District is a Lead Agency & Facility is Subject to Cap-and-Trade

It is determined that no other agency has prepared or will prepare an environmental review document for the project. Thus the District is the Lead Agency for this project.

On December 17, 2009, the District's Governing Board adopted a policy, APR 2005, *Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*, for addressing GHG emission impacts when the District is Lead Agency under CEQA and approved the District's guidance document for use by other agencies when addressing GHG impacts as lead agencies under CEQA. Under this policy, the District's determination of significance of project-specific GHG emissions is founded on the principal that projects with GHG emission reductions consistent with AB 32 emission reduction targets are considered to have a less than significant impact on global climate change. Consistent with District Policy 2005, projects complying with an approved GHG emission reduction plan or GHG mitigation program, which

avoids or substantially reduces GHG emissions within the geographic area in which the project is located, would be determined to have a less than significant individual and cumulative impact for GHG emission.

The California Air Resources Board (ARB) adopted a Cap-and-Trade regulation as part one of the strategies identified for AB 32. This Cap-and-Trade regulation is a statewide plan, supported by a CEQA compliant environmental review document, aimed at reducing or mitigating GHG emissions from targeted industries. Facilities subject to the Cap-and-Trade regulation are subject to an industry-wide cap on overall GHG emissions. Any growth in emissions must be accounted for under that cap such that a corresponding and equivalent reduction in emissions must occur to allow any increase. Further, the cap decreases over time, resulting in an overall decrease in GHG emissions.

Under District policy APR 2025, *CEQA Determinations of Significance for Projects Subject to ARB's GHG Cap-and-Trade Regulation*, the District finds that the Cap-and-Trade is a regulation plan approved by ARB, consistent with AB32 emission reduction targets, and supported by a CEQA compliant environmental review document. As such, consistent with District Policy 2005, projects complying project complying with Cap-and-Trade requirements are determined to have a less than significant individual and cumulative impact for GHG emissions.

Industries covered by Cap-and-Trade are identified in the regulation under section 95811, Covered Entities:

1. Group 1: Large industrial facilities

These types of facilities are subject to Cap and Trade, and the specific companies covered are listed at <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>, Section 95811 (a), under the "Publically Available Market Information" section (list maintained by the California Air Resources Board).

2. Group 2: Electricity generation facilities located in California, or electricity importers

These types of facilities are subject to Cap and Trade (section 95811, b).

3. Group 3: Suppliers of Natural Gas, Suppliers of Reformulated Gasoline Blendstock for Oxygenate Blending and Distillate Fuel Oil, Suppliers of Liquefied Petroleum Gas, and Suppliers of Blended Fuels

These entities are subject to Cap and Trade compliance obligations which must cover all fuels (except jet fuels) identified in section 95811 (c) through (f) of the Cap-and-Trade regulation delivered to end users in California, less the fuel delivered to covered entities (group 1 above).

This facility is subject to the Cap-and-Trade regulation. Therefore, as discussed above, consistent with District Policies APR 2005 and APR 2025, the District concludes that the GHG emissions increases associated with this project would

have a less than significant individual and cumulative impact on global climate change.

### **District CEQA Findings**

The District is the Lead Agency for this project because there is no other agency with broader statutory authority over this project. The District performed an Engineering Evaluation (this document) for the proposed project and determined that the activity will occur at an existing facility and the project involves negligible expansion of the existing use. Furthermore, the District determined that the activity will not have a significant effect on the environment. The District finds that the activity is categorically exempt from the provisions of CEQA pursuant to CEQA Guideline § 15301 (Existing Facilities), and finds that the project is exempt per the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment (CEQA Guidelines §15061(b)(3)).

To ensure that issuance of this permit does not conflict with any conditions imposed by any local agency permit process, the following permit condition will be listed on each permit as follows:

- 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. *[District Rules 2070 and 2080, and Public Resources Code 21000-21177: California Environmental Quality Act].*

### **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.

Although the proposed project is a potential operation of public concern in the Valley (dairy facility), and triggers Best Available Control Technology (BACT), 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 C-5160-10-0 subject to the permit conditions on the attached draft ATC in Appendix A.

**X. Billing Information**

<b>Billing Schedule</b>			
<b>Permit Number</b>	<b>Fee Schedule</b>	<b>Fee Description</b>	<b>Fee Amount</b>
C-5160-10-0	3020-10-E	900 bhp Tier 2 emergency standby IC engine	\$659

**Appendices**

- A. Draft ATC
- B. BACT Guideline and BACT Analysis
- C. Emissions Data Sheet
- D. RMR Summary and AAQA
- E. QNEC Calculations
- F. SSPE Calculations

Appendix A  
Draft ATC

San Joaquin Valley  
Air Pollution Control District

**AUTHORITY TO CONSTRUCT**

ISSUANCE DATE: DRAFT

PERMIT NO: C-5160-10-0

LEGAL OWNER OR OPERATOR: TRI-EST DAIRY HOME RANCH

MAILING ADDRESS: 16500 AVENUE 14  
MADERA, CA 93637

LOCATION: 16500 AVENUE 14 BETWEEN ROAD 16 & ROAD 17  
MADERA, CA 93637

**EQUIPMENT DESCRIPTION:**

900 BHP (INTERMITTENT) CATERPILLAR MODEL C18 TIER 2 CERTIFIED DIESEL-FIRED EMERGENCY STANDBY IC ENGINE POWERING AN ELECTRICAL GENERATOR

**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. {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]
4. {98} No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
5. {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
6. {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
7. {4002} This IC engine shall only be used for the growing and harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. [District Rules 4701 and 4702, and 17 CCR 93115]

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.

Seyed Sadredin, Executive Director / APCO

Arnaud Marjollet, Director of Permit Services

C-5160-10-0 Jul 12 2016 2:01PM - YOSHIMUJ Joint Inspection NOT Required



8. {1898} The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]
9. {4749} This engine shall be equipped with a non-resettable hour meter with a minimum display capability of 9,999 hours, unless the District determines that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history. [District Rule 4702 and 17 CCR 93115]
10. {4258} Only CARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201 and 4801, and 17 CCR 93115]
11. Emissions from this IC engine shall not exceed any of the following limits: 5.8 g-NOx/bhp-hr, 2.6 g-CO/bhp-hr, or 0.24 g-VOC/bhp-hr. [District Rule 2201 and 17 CCR 93115]
12. Emissions from this IC engine shall not exceed 0.15 g-PM10/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102, and 17 CCR 93115]
13. {4261} This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [District Rule 4702]
14. {3478} During periods of operation for maintenance, testing, and required regulatory purposes, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]
15. {3807} An emergency situation is an unscheduled electrical power outage caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the permittee. [District Rule 4702]
16. {3808} This engine shall not be used to produce power for the electrical distribution system, as part of a voluntary utility demand reduction program, or for an interruptible power contract. [District Rule 4702]
17. {3496} The permittee shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, the purpose of the operation (for example: load testing, weekly testing, rolling blackout, general area power outage, etc.) and records of operational characteristics monitoring. For units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702 and 17 CCR 93115]
18. {4775} This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 100 hours per calendar year. [District Rules 2201 and 4702]
19. {4263} The permittee shall maintain monthly records of the type of fuel purchased. [District Rule 4702 and 17 CCR 93115]
20. {3475} All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702 and 17 CCR 93115]

DRAFT

Appendix B  
BACT Guideline and BACT Analysis

# San Joaquin Valley Unified Air Pollution Control District

**Best Available Control Technology (BACT) Guideline 3.1.1**  
**Last Update: September 10, 2013**  
**Emergency Diesel IC Engine**

Pollutant	Achieved in Practice or in the SIP	Technologically Feasible	Alternate Basic Equipment
CO	Latest EPA Tier Certification level for applicable horsepower range*		
NOX	Latest EPA Tier Certification level for applicable horsepower range*		
PM10	0.15 g/bhp-hr or the latest EPA Tier Certification level for applicable horsepower range, whichever is more stringent (ATCM)		
SOX	Very low sulfur diesel fuel (15 ppmw sulfur or less)		
VOC	Latest EPA Tier Certification level for applicable horsepower range*		

\*Note: The certification requirements are as follows: for emergency engines  $50 \leq \text{bhp} < 75$  - Tier 4 Interim; for emergency engines  $75 \leq \text{bhp} < 750$  - Tier 3; for emergency engines  $\geq 750$  bhp - Tier 2.

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.

## **Top Down BACT Analysis for the Emergency IC Engine(s)**

BACT Guideline 3.1.1 (September 10, 2013) applies to emergency diesel IC engines. In accordance with the District BACT policy, information from that guideline will be utilized without further analysis.

### **1. BACT Analysis for NO<sub>x</sub> and VOC Emissions:**

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

BACT Guideline 3.1.1 identifies only the following option:

- *Latest EPA Tier Certification level for applicable horsepower range\**

*\*Note: for emergency engines 50 <= bhp < 75, Tier 4 Interim certification is the requirement; for emergency engines 75 <= bhp < 750, Tier 3 certification is the requirement; for emergency engines => 750 bhp, Tier 2 certification is the requirement.*

The proposed engine is rated at 900 hp. Therefore, the applicable control technology option is EPA Tier 2 certification.

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

The control option listed in Step 1 is not technologically infeasible.

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

No ranking needs to be done because there is only one control option listed in Step 1.

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

The applicant has proposed the only control option remaining under consideration. Therefore, a cost effectiveness analysis is not required.

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

BACT for NO<sub>x</sub> and VOC will be the use of an EPA Tier 2 certified engine. The applicant is proposing such a unit. Therefore, BACT will be satisfied.

## **2. BACT Analysis for PM<sub>10</sub> Emissions:**

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

BACT Guideline 3.1.1 identifies only the following option:

- *0.15 g/bhp-hr or the Latest EPA Tier Certification level for applicable horsepower range, whichever is more stringent. (ATCM)*

The latest EPA Tier Certification level for an engine of the proposed model year and horsepower rating is Tier 2.

Please note Tier 2, 3, or 4i IC engines do not have a PM emission standard that is more stringent than 0.15 g/hp-hr. Additionally, the ATCM requires a PM emission standard of 0.15 g/hp-hr for all new emergency diesel IC engines.

Therefore, a PM/PM10 emission standard of 0.15 g/hp-hr is required as BACT.

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

The control option listed in Step 1 is not technologically infeasible.

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

No ranking needs to be done because there is only one control option listed in Step 1.

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

The applicant has proposed the only control option remaining under consideration. Therefore, a cost effectiveness analysis is not required.

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

BACT for PM10 is emissions of 0.15 g/hp-hr or less. The applicant is proposing an engine that meets this requirement. Therefore, BACT will be satisfied.

Appendix C  
Emissions Data Sheet

## Off-Road Compression-Ignition Emission Standards<sup>3</sup>

Power Rating (bhp)	Tier	Model Year	NO <sub>x</sub>	HC	NMHC +NO <sub>x</sub>	CO	PM	
50 ≤ hp < 75	1	1998 - 2003	6.9	-	-	-	-	
	2	2004 - 2007	-		5.6	3.7	0.3	
	4I	2008 - 2012			3.5		0.22	
	4F	2013+			0.022			
75 ≤ hp < 100	1	1998 - 2003		6.9	-		-	-
	2	2004 - 2007	-	5.6		3.7	0.3	
	3	2008 - 2011		3.5				
	4I	2012 - 2014		2.5				0.14
	4F	2015+	0.29					
100 ≤ hp < 175	1	1997 - 2002	6.9	-	-		-	-
	2	2003 - 2006	-		4.9	3.7	0.22	
	3	2007 - 2011			3.0			
	4I	2012 - 2014			2.5			0.14
	4F	2015+	0.29					
175 ≤ hp < 300	1	1996 - 2002	6.9	1.0	-		8.5	0.4
	2	2003 - 2005	-	-	4.9	2.6	0.15	
	3	2006 - 2010		3.0				
	4I	2011 - 2013		1.5	0.14			-
	4F	2014+	0.29					
300 ≤ hp < 600	1	1996 - 2000	6.9	1.0	-		8.5	0.4
	2	2001 - 2005	-	-	4.8	2.6	0.15	
	3	2006 - 2010		3.0				
	4I	2011 - 2013		1.5	0.14			-
	4F	2014+	0.29					

<sup>3</sup> Emission factors in g/bhp-hr. Standards referenced from Title 13 CCR 2423 (converted from g/kw-hr). Internet link to CARB's "Off-Road Compression-Ignition Engine Regulatory and Certification" page: <http://arb.ca.gov/msprog/offroad/ofcie/ofciectp/ofciectp.htm#reg>

Power Rating (bhp)	Tier	Model Year	NO <sub>x</sub>	HC	NMHC +NO <sub>x</sub>	CO	PM
600 ≤ hp < 750	1	1996 - 2001	6.9	1.0	-	8.5	0.4
	2	2002 - 2005	-	-	4.8	2.6	0.15
	3	2006 - 2010			3.0		
	4I	2011 - 2013	1.5	0.14	-		0.01
	4F	2014+	0.29				
≥ 750	1	2000 - 2005	6.9	1.0	-	8.5	0.4
	2	2006 - 2010	-	-	4.8	2.6	0.15
	4I	2011 - 2014	2.6	0.3	-		0.07
	4F	2015+		0.14			0.03
> 750 ≤ 1207 (Generators)	1	2000 - 2005	6.9	1.0	-	8.5	0.4
	2	2006 - 2010	-	-	4.8	2.6	0.15
	4I	2011 - 2014	2.6	0.3	-		0.07
	4F	2015+	0.5	0.14	-		0.02
> 1207 (Generators)	1	2000 - 2005	6.9	1.0	-	8.5	0.4
	2	2006 - 2010	-	-	4.8	2.6	0.15
	4I	2011 - 2014	0.5	0.3	-		0.07
	4F	2015+		0.14	-		0.02



**ELECTRIC POWER - Technical Spec Sheet**  
**STANDARD**



C18 ACERT  
 600 ekW/ 750 kVA/ 60 Hz/ 1800 rpm/ 480 V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: U.S. EPA Certified for Stationary Emergency Use Only (Tier 2 Nonroad Equivalent Emission Standards)

**C18 ACERT**  
**600 ekW/ 750 kVA**  
**60 Hz/ 1800 rpm/ 480 V**

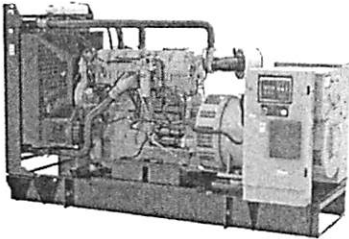


Image shown may not reflect actual configuration

**Metric**                      **English**

Package Performance		
Genset Power Rating with Fan @ 0.8 Power Factor	600 ekW	
Genset Power Rating	750 kVA	
Aftercooler (Separate Circuit)	N/A	N/A

Fuel Consumption		
100% Load with Fan	161.6 L/hr	42.7 gal/hr
75% Load with Fan	129.6 L/hr	34.2 gal/hr
50% Load with Fan	91.7 L/hr	24.2 gal/hr
25% Load with Fan	46.8 L/hr	12.4 gal/hr

Cooling System <sup>1</sup>		
Engine Coolant Capacity	20.8 L	5.5 gal

Inlet Air		
Combustion Air Inlet Flow Rate	47.8 m <sup>3</sup> /min	1687.8 cfm
Max. Allowable Combustion Air Inlet Temp	49 ° C	120 ° F

Exhaust System		
Exhaust Stack Gas Temperature	534.6 ° C	994.3 ° F
Exhaust Gas Flow Rate	135.5 m <sup>3</sup> /min	4784.4 cfm
Exhaust System Backpressure (Maximum Allowable)	10.0 kPa	40.0 in. water

**ELECTRIC POWER - Technical Spec Sheet  
STANDARD**



**C18 ACERT**  
600 kW/ 750 kVA/ 60 Hz/ 1800 rpm/ 480 V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: U.S. EPA Certified for Stationary Emergency Use Only (Tier 2 Nonroad Equivalent Emission Standards)

Heat Rejection		
Heat Rejection to Jacket Water	189 kW	10747 Btu/min
Heat Rejection to Exhaust (Total)	634 kW	36053 Btu/min
Heat Rejection to Aftercooler	153 kW	8700 Btu/min
Heat Rejection to Atmosphere from Engine	86 kW	4902 Btu/min
Heat Rejection to Atmosphere from Generator	41 kW	2332 Btu/min

Alternator <sup>2</sup>	
Motor Starting Capability @ 30% Voltage Dip	1633 skVA
Current	902 amps
Frame Size	LC7024F
Excitation	AR
Temperature Rise	150 ° C

Emissions (Nominal) <sup>3</sup>		
NOx	2798.7 mg/Nm <sup>3</sup>	5.8 g/hp-hr
CO	225.2 mg/Nm <sup>3</sup>	0.5 g/hp-hr
HC	3.8 mg/Nm <sup>3</sup>	0.0 g/hp-hr
PM	13.3 mg/Nm <sup>3</sup>	0.0 g/hp-hr

**DEFINITIONS AND CONDITIONS**

1. For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.
2. UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics. Generator temperature rise is based on a 40° C ambient per NEMA MG1-32.
3. Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77° F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 btu/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

**ELECTRIC POWER - Technical Spec Sheet  
STANDARD**



**C18 ACERT**

**600 ekW/ 750 kVA/ 60 Hz/ 1800 rpm/ 480 V/ 0.8 Power Factor**

**Rating Type: STANDBY**

**Emissions: U.S. EPA Certified for Stationary Emergency  
Use Only (Tier 2 Nonroad Equivalent Emission Standards)**

**Applicable Codes and Standards:**

AS1359, CSA C22.2 No100-04, UL142,UL489, UL869, UL2200,  
NFPA37, NFPA70, NFPA99, NFPA110, IBC, IEC60034-1, ISO3046, ISO8528,  
NEMA MG1-22,NEMA MG1-33, 2006/95/EC, 2006/42/EC, 2004/108/EC.

Note: Codes may not be available in all model configurations. Please consult your local Cat Dealer representative for availability.

**STANDBY:**Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

**Ratings** are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions

**Fuel Rates** are based on fuel oil of 35° API [16° C (60° F)] gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29° C (85° F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.). Additional ratings may be available for specific customer requirements, contact your Cat representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.

[www.Cat-ElectricPower.com](http://www.Cat-ElectricPower.com)

Performance No.: DM8518-04

Feature Code: C18DE6E

Generator Arrangement: 4183897

Date: 05/11/2016

Source Country: U.S.

The International System of Units (SI) is used in this publication. CAT, CATERPILLAR, their respective logos, ADEM, EUI, S-O-S, "Caterpillar Yellow" and the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

Appendix D  
HRA Summary and AAQA

# San Joaquin Valley Air Pollution Control District Risk Management Review

To: John Yoshimura - Permit Services  
 From: Cheryl Lawler - Permit Services  
 Date: July 11, 2016  
 Facility Name: Tri-lest Dairy Home Ranch  
 Location: 16500 Avenue 14, Madera  
 Application #(s): C-5160-10-0  
 Project #: C-1161722

---

## A. RMR SUMMARY

RMR Summary			
Categories	Diesel-Fired IC Engine (Unit 10-0)	Project Totals	Facility Totals
Prioritization Score	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
Acute Hazard Index	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>
Chronic Hazard Index	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>
Maximum Individual Cancer Risk	8.01E-07	8.01E-07	8.01E-07
T-BACT Required?	No		
Special Permit Requirements?	Yes		

- 1 Prioritization for this unit was not conducted since it has been determined that all diesel-fired IC engines will result in a prioritization score greater than 1.0.
- 2 Acute and Chronic Hazard Indices were not calculated since there is no risk factor, or the risk factor is so low that the risk has been determined to be insignificant for this type of unit.

### Proposed Permit Requirements

To ensure that human health risks will not exceed District allowable levels; the following shall be included as requirements for:

1. The PM10 emissions rate shall not exceed 0.15 g/bhp-hr based on US EPA certification using ISO 8178 test procedure.
2. This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 100 hours per calendar year.

**B. RMR REPORT**

**I. Project Description**

Technical Services received a request on June 29, 2016, to perform an Ambient Air Quality Analysis and a Risk Management Review for a 900 bhp diesel-fired emergency IC engine powering an electrical generator.

**II. Analysis**

Diesel exhaust emissions for the engine were calculated using the DICE Screening Risk Tool and then input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). A prioritization for the engine was not conducted since it has been determined that all diesel-fired IC engines will result in a prioritization score greater than 1.0. Therefore, a refined health risk assessment was required. The AERMOD model was used, with the parameters outlined below and meteorological data for 2009-2011 from Madera 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 carcinogenic risk for the project.

The following parameters were used for the review:

<b>Analysis Parameters Unit 10-0</b>			
<b>Source Type</b>	Point	<b>Location Type</b>	Rural
<b>BHP</b>	900	<b>PM<sub>10</sub> g/hp-hr</b>	0.15
<b>Closest Receptor (m)</b>	1006	<b>Type of Receptor</b>	Resident
<b>Max Hours per Year</b>	100		

In addition, Technical Services performed modeling for criteria pollutants CO, NO<sub>x</sub>, SO<sub>x</sub>, and PM10. The AERMOD model was used, with the parameters outlined below and meteorological data for 2009-2011 from Madera to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid.

<b>Analysis Parameters (Unit 10-0)</b>			
<b>Source Type</b>	Point	<b>Nearest Receptor (m)</b>	1006
<b>Stack Height (m)</b>	6.07 <sup>1</sup>	<b>Closest Receptor Type</b>	Resident
<b>Stack Diameter (m)</b>	0.19 <sup>1</sup>	<b>Project Location</b>	Rural
<b>Stack Exit Velocity (m/s)</b>	79.64 <sup>2</sup>	<b>Stack Exit Temperature (K)</b>	808

<sup>1</sup>A stack height and stack diameter were not provided by the applicant; therefore, District approved stack parameters were used.

<sup>2</sup>Modeled using AERMOD's Non-Default Beta Option for "Capped & Horizontal Stack Releases."

Diesel ICE	NO <sub>x</sub> (Lbs.)		SO <sub>x</sub> (Lbs.)		CO (Lbs.)		PM <sub>10</sub> (Lbs.)	
	Hr.	Yr.	Hr.	Yr.	Hr.	Yr.	Hr.	Yr.
10-0	0	1151	0	1	0	516	0	30

The results from the Criteria Pollutant Modeling are as follows:

**Criteria Pollutant Modeling Results\***

Diesel ICE	1 Hour	3 Hours	8 Hours	24 Hours	Annual
CO	NA <sup>1</sup>	X	NA <sup>1</sup>	X	X
NO <sub>x</sub>	NA <sup>1</sup>	X	X	X	Pass
SO <sub>x</sub>	NA <sup>1</sup>	NA <sup>1</sup>	X	NA <sup>1</sup>	Pass
PM <sub>10</sub>	X	X	X	NA <sup>1</sup>	Pass <sup>2</sup>
PM <sub>2.5</sub>	X	X	X	NA <sup>1</sup>	Pass <sup>2</sup>

\*Results were taken from the attached PSD spreadsheet.

<sup>1</sup>The project is an intermittent source as defined in APR-1920. In accordance with APR-1920, compliance with short-term (i.e., 1-hour, 3-hour, 8-hour and 24-hour) standards is not required.

<sup>2</sup>The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2).

**III. Conclusion**

The Cancer Risk associated with the operation of the proposed Diesel IC engine 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) for PM10.

To ensure that human health risks will not exceed District allowable levels; the permit requirements listed on Page 1 of this report must be included for this proposed unit .

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 emissions from the proposed equipment will not cause or contribute significantly to a violation of the State and National AAQS.

**IV. Attachments**

- A. RMR Request Form
- B. Project Related Email
- C. Diesel Exhaust Calculation (DICE Screening Risk Tool)
- D. Convert
- E. Facility Summary
- F. AAQA Summary
- G. AERMOD Non-Default Option Checklist

# Appendix E

## QNEC Calculations



### 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

Since this is a new unit,  $PE1 = 0$  for all pollutants. Thus,  $QNEC = PE2$  (lb/qtr).

Using the PE2 (lb/yr) values calculated in Section VII.C.2, Quarterly PE2 is calculated as follows:

$$PE2_{\text{quarterly}} = PE2 \text{ (lb/yr)} \div 4 \text{ quarters/year} = QNEC$$

QNEC		
Pollutant	PE2 Total (lb/yr)	Quarterly PE2 (lb/qtr)
NO <sub>x</sub>	1,151	287.75
SO <sub>x</sub>	1	0.25
PM <sub>10</sub>	30	7.5
CO	516	129.0
VOC	48	12.0

Appendix F  
SSPE 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?   
Answering "yes" assumes worst case.

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows				5,300	5,300		
Dry Cows				1,200	1,200		
Support Stock (Heifers, Calves, and Bulls)				6,728	6,728		
Large Heifers					0		
Medium Heifers					0		
Small Heifers					0		
Bulls					0		
				Calf Hutches		Calf Corrals	
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	Total # of Calves
Calves							0

Total Herd Summary	
Total Milk Cows	5,300
Total Mature Cows	6,500
Support Stock (Heifers, Calves, and Bulls)	6,728
Total Calves	0
Total Dairy Head	13,228

Pre-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn	1	30	200
Alfalfa			
Wheat	1	30	200

### 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?   
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				5,300	5,300		
Dry Cows				1,200	1,200		
Support Stock (Heifers, Calves, and Bulls)				6,728	6,728		
Large Heifers					0		
Medium Heifers					0		
Small Heifers					0		
Bulls					0		
				Calf Hutches		Calf Corrals	
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	Total # of Calves
Calves							0

Total Herd Summary	
Total Milk Cows	5,300
Total Mature Cows	6,500
Support Stock (Heifers, Calves, and Bulls)	6,728
Total Calves	0
Total Dairy Head	13,228

Post-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn	1	30	200
Alfalfa			
Wheat	1	30	200

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

Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Milking Parlor</b>				
<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%

Measure Proposed?		Mitigation Measure(s) per Emissions Point	VOC Control Efficiency (%)	
Pre-Project	Post-Project		Pre-Project	Post-Project
<b>Cow Housing</b>				
<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-corral 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.		
<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.	5%	5%
<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-corral 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 type="checkbox"/>	<input 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.	0%	0%
<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>10.00%</b>	<b>10.00%</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 type="checkbox"/>	<input 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.	0%	0%
<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>10.00%</b>	<b>10.00%</b>

Liquid Manure Handling				
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>

Solid Manure Handling				
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 type="checkbox"/>	<input type="checkbox"/>	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.	0%	0%
<b>Total Control Efficiency</b>			<b>10.00%</b>	<b>10.00%</b>
<b>Separated Solids Piles 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"/>	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.	10%	10%
<b>Total Control Efficiency</b>			<b>19.00%</b>	<b>19.00%</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>

Silage and TMR				
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).

		TMR Mitigations		
<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 checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Feed steam-flaked, dry rolled, cracked or ground corn or other ground cereal grains.	10%	10%
<input type="checkbox"/>	<input type="checkbox"/>	Remove uneaten wet feed from feed bunks within 24 hrs after the end of a rain event.	0%	0%
<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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Milking Parlor Floor Mitigations</b>		
		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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Corrals/Pens Mitigations</b>		
		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%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Bedding Mitigations</b>		
		Feed according to NRC guidelines	28%	28%
<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). 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.	0.0%	0.0%
<b>Total Control Efficiency</b>			28.00%	28.00%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Lanes Mitigations</b>		
		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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Lagoons/Storage Ponds Mitigations</b>		
		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%
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Liquid Manure Land Application Mitigations</b>		
		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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<b>Solid Manure Land Application Mitigations</b>		
		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%





Emission Category	Sub-category	Milk Cows		Dry Cows		Individual Dairy Emission Factors for Holstein Cows						Cows (0 - 3 months)		Bulls				
		Large Herds (15 to 24 months)		Medium Herds (7 to 14 months)		Small Herds (3 to 6 months)		Uncontrolled		Controlled		Uncontrolled		Controlled				
		1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr	1000 lbs milk/cow/yr		
Milling Parlor	VOC	Enteric Emissions in Milking Parlor	0.43	0.41	0.37	0.37	-	-	-	-	-	-	-	-	-	-	-	
		Milking Parlor Floor	0.04	0.03	0.03	0.03	-	-	-	-	-	-	-	-	-	-	-	
		Total	0.47	0.44	0.40	0.40	-	-	-	-	-	-	-	-	-	-	-	
Milk Cows	VOC	Enteric Emissions in Cow	0.19	0.18	0.14	0.14	-	-	-	-	-	-	-	-	-	-	-	
		Manure	0.09	0.08	0.06	0.06	-	-	-	-	-	-	-	-	-	-	-	
		Total	0.28	0.26	0.20	0.20	-	-	-	-	-	-	-	-	-	-	-	
Milk Cows	NH3	Enteric Emissions in Cow	1.00	0.98	0.74	0.74	-	-	-	-	-	-	-	-	-	-	-	
		Manure	0.09	0.08	0.06	0.06	-	-	-	-	-	-	-	-	-	-	-	
		Total	1.09	1.06	0.80	0.80	-	-	-	-	-	-	-	-	-	-	-	
Cows Housing	VOC	Enteric Emissions in Cow Housing	3.69	3.69	3.32	3.32	2.33	2.23	2.01	2.01	1.81	1.71	1.54	1.54	1.23	1.17	1.05	1.05
		Manure	0.09	0.08	0.06	0.06	-	-	-	-	-	-	-	-	-	-	-	-
		Total	3.78	3.77	3.38	3.38	2.33	2.23	2.01	2.01	1.81	1.71	1.54	1.54	1.23	1.17	1.05	1.05
Cows Housing	NH3	Enteric Emissions in Cow Housing	41.00	41.00	15.00	15.00	21.20	21.20	7.43	7.43	11.00	11.00	3.06	3.06	3.00	3.00	2.84	2.84
		Manure	6.30	6.30	4.54	4.54	3.20	3.20	2.30	2.30	1.70	1.70	1.20	1.20	0.80	0.80	0.75	0.75
		Total	47.30	47.30	19.54	19.54	24.40	24.40	9.73	9.73	12.70	12.70	4.26	4.26	3.80	3.80	3.59	3.59
Cows Housing	VOC	Enteric Emissions in Cow Housing	1.52	1.30	1.17	1.17	0.82	0.71	0.64	0.64	0.54	0.49	0.49	0.43	0.43	0.37	0.33	0.33
		Manure	0.09	0.08	0.06	0.06	-	-	-	-	-	-	-	-	-	-	-	-
		Total	1.61	1.38	1.23	1.23	0.82	0.71	0.64	0.64	0.54	0.49	0.49	0.43	0.43	0.37	0.33	0.33
Cows Housing	NH3	Enteric Emissions in Cow Housing	1.64	1.40	1.26	1.26	0.80	0.70	0.60	0.60	0.50	0.43	0.43	0.41	0.41	0.36	0.36	0.36
		Manure	0.09	0.08	0.06	0.06	-	-	-	-	-	-	-	-	-	-	-	-
		Total	1.73	1.48	1.32	1.32	0.80	0.70	0.60	0.60	0.50	0.43	0.43	0.41	0.41	0.36	0.36	0.36
Liquid Manure Handling	VOC	Liquid Manure Land Application	17.10	17.10	7.28	7.28	8.70	8.70	3.84	3.84	4.80	4.80	1.97	1.97	3.20	3.20	1.44	1.44
		Liquid Manure Land Application	0.16	0.15	0.14	0.14	0.08	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
		Total	17.26	17.25	7.42	7.42	8.78	8.77	3.91	3.91	4.86	4.86	1.97	1.97	3.20	3.20	1.44	1.44
Liquid Manure Handling	NH3	Liquid Manure Land Application	8.20	8.20	2.43	2.43	4.20	4.20	0.60	0.60	2.20	2.20	0.32	0.32	1.50	1.50	0.22	0.22
		Liquid Manure Land Application	0.06	0.06	0.05	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	
		Total	8.26	8.26	2.48	2.48	4.23	4.23	0.63	0.63	2.23	2.23	0.35	0.35	1.53	1.53	0.25	0.25
Solid Manure Handling	VOC	Solid Manure Storage	0.05	0.05	0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
		Solid Manure Land Application	0.30	0.33	0.30	0.30	0.21	0.18	0.16	0.16	0.14	0.14	0.12	0.12	0.11	0.09	0.08	
		Total	0.35	0.38	0.35	0.35	0.23	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.13	0.13	0.13	
Solid Manure Handling	NH3	Solid Manure Storage	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
		Solid Manure Land Application	2.00	2.00	1.50	1.50	1.00	1.00	0.76	0.76	0.55	0.55	0.40	0.40	0.30	0.28	0.28	
		Total	2.20	2.20	1.70	1.70	1.20	1.20	0.96	0.96	0.75	0.75	0.60	0.60	0.50	0.48	0.48	

Silage and TMR (Total Mixed Ration) Emissions (µg/m <sup>3</sup> -min)	Stage Type		Emission Factor	
	Uncontrolled	Controlled	EF1	EF2
Corn Silage	34.661	21.155	21.155	21.155
Alfalfa Silage	17.450	10.840	10.840	10.840
Wheat Silage	43.944	26.775	26.775	26.775
TMR	13.006	10.575	10.575	10.575

PM10 Emission Factors (lb/hr-dry)

Type of Cow	Dairy EF	Source
Cows in Freestalls	1.37	Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy
Hand/On in Corrals	5.46	Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy
Hand/On in Open Corrals	10.55	Based on a Summer 2003 study by Texas A&M ASAE at a West Texas Dairy
Call (Under 3 mo) Open Corrals	1.37	SAVPCD
Call on-ground hatches	0.343	SAVPCD
Call above-ground hatched	0.099	SAVPCD
Call above-ground stabled	0.206	SAVPCD

The controlled PM10 EF will be calculated based on the specific PM10 mitigation measure, if any, for each freestall, corral, or call hatch area. See the PM Mitigation Measures for calculation.

Assumptions: 1) Each stage per a completely covered except for the roof face and 2) Reasons are not within 48 hours

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

Pre-Project Potential to Emit - Cow Housing												
Housing Name(s) or #s	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)	
1	milk	milk cows	5,300	10.02	23.29	5.46	145.5	53,106	338.2	123,448	79.3	28,938
2	dry	dry cows	1,200	5.65	11.81	5.46	18.6	6,780	38.8	14,170	18.0	6,552
3	support	support stock	6,728	4.34	6.12	10.55	80.0	29,200	112.8	41,175	194.5	70,980
<b>Pre-Project Total # of Cows</b>		<b>13,228</b>					<b>244.1</b>	<b>89,086</b>	<b>489.8</b>	<b>178,793</b>	<b>291.8</b>	<b>106,470</b>

Pre-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
13,228	244.1	89,086	489.8	178,793	291.8	106,470

**Calculations:**  
 Annual PE 1 for each pollutant (lb/yr) = Controlled EF (lb/hd-yr) x # of cows (hd)  
 Daily PE1 for each pollutant (lb/day) = [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	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)	
1	milk	milk cows	5,300	10.02	23.29	5.46	145.5	53,106	338.2	123,448	79.3	28,938
2	dry	dry cows	1,200	5.65	11.81	5.46	18.6	6,780	38.8	14,170	18.0	6,552
3	support	support stock	6,728	4.34	6.12	10.55	80.0	29,200	112.8	41,175	194.5	70,980
<b>Post-Project # of Cows (non-expansion)</b>		<b>13,228</b>					<b>244.1</b>	<b>89,086</b>	<b>489.8</b>	<b>178,793</b>	<b>291.8</b>	<b>106,470</b>

Post-Project Potential to Emit - Cow Housing: New Freestalls at Existing Dairy											
Housing Name(s) or #s	Type of Cow	# of Cows	Controlled VOC EF (lb/hd-yr)	Controlled NH3 EF (lb/hd-yr)	Controlled PM10 EF (lb/hd-yr)	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
<b>Total # of Cows From Expansion</b>		<b>0</b>				<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0</b>

Post-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
13,228	244.1	89,086	489.8	178,793	291.8	106,470

**Calculations:**  
 Annual PE 2 for each pollutant (lb/yr) = Controlled EF (lb/hd-yr) x # of cows (hd)  
 Daily PE2 for each pollutant (lb/day) = [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	0	0	0	5,300	5,300		
Dry Cows	0	0	0	1,200	1,200		
Support Stock (Heifers, Calves and Bulls)	0	0	0	6,728	6,728		
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							
	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*2)
Corn	1	30	200	4,350
Alfalfa	0	0	0	0
Wheat	1	30	200	4,350

Milking Parlor				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	5.8	2,120	2.0	725

Cow Housing					
Cow	VOC		NH3		PM10
	lb/day	lb/yr	lb/day	lb/yr	lb/day
Total	244.1	89,086	489.8	178,793	291.8

Liquid Manure Handling						
Cow	VOC		NH3		H2S*	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	35.3	12,879	110.2	40,227	1.7	626
Dry Cows	4.4	1,596	12.6	4,608	0.2	73
Support Stock (Heifers, Calves and Bulls)	18.8	6,863	36.3	13,254	0.6	213
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	56.5	21,338	159.1	58,089	2.5	912

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	7.0	2,544	41.1	14,999
Dry Cows	0.9	312	4.7	1,716
Support Stock (Heifers, Calves and Bulls)	3.7	1,346	13.8	5,046
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	11.6	4,202	59.6	21,761

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	27.1	9,885
Alfalfa Emissions	0.0	0
Wheat Emissions	34.2	12,497
TMR	291.6	106,437
Total	352.9	128,820

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	5.8	2.0	0.0
Cow Housing	0.0	0.0	291.8	0.0	244.1	489.8	0.0
Liquid Manure	0.0	0.0	0.0	0.0	58.5	159.1	2.5
Solid Manure	0.0	0.0	0.0	0.0	11.6	59.6	0.0
Feed Handling	0.0	0.0	0.0	0.0	34.2	0.0	0.0
Total	0.0	0.0	291.8	0.0	354.2	710.5	2.5

Total Annual Pre-Project Potential to Emit (lb/yr)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	2,120	725	0
Cow Housing	0	0	106,470	0	89,086	178,793	0
Liquid Manure	0	0	0	0	21,338	58,089	912
Solid Manure	0	0	0	0	4,202	21,761	0
Feed Handling	0	0	0	0	128,820	0	0
Total	0	0	106,470	0	245,565	259,368	912

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>3</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
Milking Parlor	0	0	0	0	0
Cow Housing	0	0	0	0	0
Liquid Manure	0	0	0	0	10,266
Solid Manure	0	0	0	0	0
Feed Handling	0	0	0	0	0
Emergency ICE (-5-0)	408	0	18	39	22
GDO (-9-0)	0	0	0	0	59
Total	408	0	18	39	10,347

Post-Project Potential to Emit (PE2)

Post-Project Herd Size						
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals	
Milk Cows	0	0	0	5,300	5,300	
Dry Cows	0	0	0	1,200	1,200	
Support Stock (Heifers, Calves, and Bulls)	0	0	0	6,728	6,728	
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		Total # of Calves
Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves	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	30	200	4,350
Alfalfa	0	0	0	0
Wheat	1	30	200	4,350

Milking Parlor				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	5.8	2,120	2.0	725
Total	5.8	2,120	2.0	725

Cow Housing					
	VOC		NH3		PM10
	lb/day	lb/yr	lb/day	lb/yr	lb/yr
Total	244.1	89,086	489.8	178,793	291.8

Liquid Manure Handling						
Cow	VOC		NH3		H2S	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	35.3	12,879	110.2	40,227	1.7	626
Dry Cows	4.4	1,596	12.6	4,608	0.2	73
Support Stock (Heifers, Calves, and Bulls)	18.8	6,863	36.3	13,254	0.6	213
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	58.5	21,338	159.1	58,089	2.5	912

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	7.0	2,544	41.1	14,999
Dry Cows	0.9	312	4.7	1,716
Support Stock (Heifers, Calves, and Bulls)	3.7	1,346	13.8	5,046
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	11.6	4,202	59.6	21,761

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	27.1	9,885
Alfalfa Emissions	0.0	0
Wheat Emissions	34.2	12,497
TMR	291.6	106,437
Total	352.9	128,820

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	5.8	2.0	0.0
Cow Housing	0.0	0.0	291.8	0.0	244.1	489.8	0.0
Liquid Manure	0.0	0.0	0.0	0.0	58.5	159.1	2.5
Solid Manure	0.0	0.0	0.0	0.0	11.6	59.6	0.0
Feed Handling	0.0	0.0	0.0	0.0	34.2	0.0	0.0
Total	0.0	0.0	291.8	0.0	354.2	710.5	2.5

Total Annual Post-Project Potential to Emit (lb/yr)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	2,120	725	0
Cow Housing	0	0	106,470	0	89,086	178,793	0
Liquid Manure	0	0	0	0	21,338	58,089	912
Solid Manure	0	0	0	0	4,202	21,761	0
Feed Handling	0	0	0	0	128,820	0	0
Total	0	0	106,470	0	245,665	259,368	912

Calculations for milking parlor:

$$\text{Annual PE} = (\# \text{ milk cows}) \times (\text{EF2 lb-pollutant/hd-yr})$$

$$\text{Daily PE} = (\text{Annual PE lb/yr}) \div (365 \text{ day/yr})$$

Calculations for cow housing:

See detailed calculations under Cow Housing Calculations worksheet.

Calculations for liquid manure and solid manure handling:

$$\text{Annual PE} = ((\# \text{ milk cows}) \times (\text{EF1 lb-pollutant/hd-yr})) + ((\# \text{ dry cows}) \times (\text{EF2 lb-pollutant/hd-yr})) + ((\# \text{ large heifers}) \times (\text{EF2 lb-pollutant/hd-yr})) + ((\# \text{ medium heifers}) \times (\text{EF2 lb-pollutant/hd-yr})) + ((\# \text{ small heifers}) \times (\text{EF2 lb-pollutant/hd-yr})) + ((\# \text{ calves}) \times (\text{EF2 lb-pollutant/hd-yr})) + ((\# \text{ bulls}) \times (\text{EF2 lb-pollutant/hd-yr}))$$

$$\text{Daily PE} = (\text{Annual PE lb/yr}) \div (365 \text{ day/yr})$$

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:

$$\text{Annual PE} = (\text{EF2}) \times (\text{area ft}^2) \times (0.0929 \text{ m}^2/\text{ft}^2) \times (8,760 \text{ hr/yr}) \times (60 \text{ min/hr}) \times 2.20\text{E-}9 \text{ lb}/\mu\text{g}$$

$$\text{Daily PE} = (\text{Annual PE lb/yr}) \div (365 \text{ day/yr})$$

Calculation for TMR emissions:

$$\text{Annual PE} = (\# \text{ cows}) \times (\text{EF2}) \times (0.658 \text{ m}^3) \times (525,600 \text{ min/yr}) \times (2.20\text{E-}9 \text{ lb}/\mu\text{g})$$

$$\text{Daily PE} = (\text{Annual PE lb/yr}) \div (365 \text{ day/yr})$$

Calves are not included in TMR calculation.

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	10,266
Solid Manure	0	0	0	0	0	0
Feed Handling	0	0	0	0	0	0
Emergency ICE (-5-0)	408	0	18	39	22	
GDO (-9-0)	0	0	0	0	59	
Emergency ICE (-10-0)	1,151	1	30	516	48	
Total	1,559	1	48	555	10,395	