
APPENDIX G

Health Risk Assessment and Ambient Air Quality Analysis

Health Risk Assessment and Ambient Air Quality Analysis

Hillcrest Dairy Facility Expansion

**1901 N. Hayden Road
LeGrand, CA 95333
Merced County**

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1. EXECUTIVE SUMMARY

This document contains the health risk assessment (HRA) and ambient air quality analysis (AAQA) performed on behalf of Environmental Planning Partners, Inc. for the Hillcrest Dairy facility operation in Merced County, California. As part of the development requirements for the project, an assessment is required of the potential risk to the population attributable to emissions of hazardous air pollutants from the proposed dairy expansion and an ambient air quality analysis of the criteria pollutants compared to the California and national ambient air quality standards.

Emissions of hazardous air pollutants attributable to proposed construction activities, animal movement, manure management and on-site mobile sources were calculated using generally accepted emission factors and the California Emissions Estimator Model version 2020.4.0 (CalEEMod). Ambient air concentrations were predicted with dispersion modeling to arrive at a conservative estimate of increased individual carcinogenic risk that might occur as a result of continuous exposure over a 70-year lifetime. Similarly, concentrations of compounds with non-cancer adverse health effects were used to calculate hazard indices (HIs), which are the ratio of expected exposure to acceptable exposure.

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has set the level of significance for carcinogenic risk to twenty in one million (20×10^{-6}), which is understood as the possibility of causing twenty additional cancer cases in a population of one million people. The level of significance for acute and chronic non-cancer risk is a hazard index of 1.0. The maximum predicted cancer risk among the modeled receptors is 3.54 in one million, which is below the significance level of twenty in one million. The maximum predicted acute and chronic non-cancer hazard indices among the modeled receptors are 0.055 and 0.031, respectively, which is below the significance level for chronic and acute significance level.

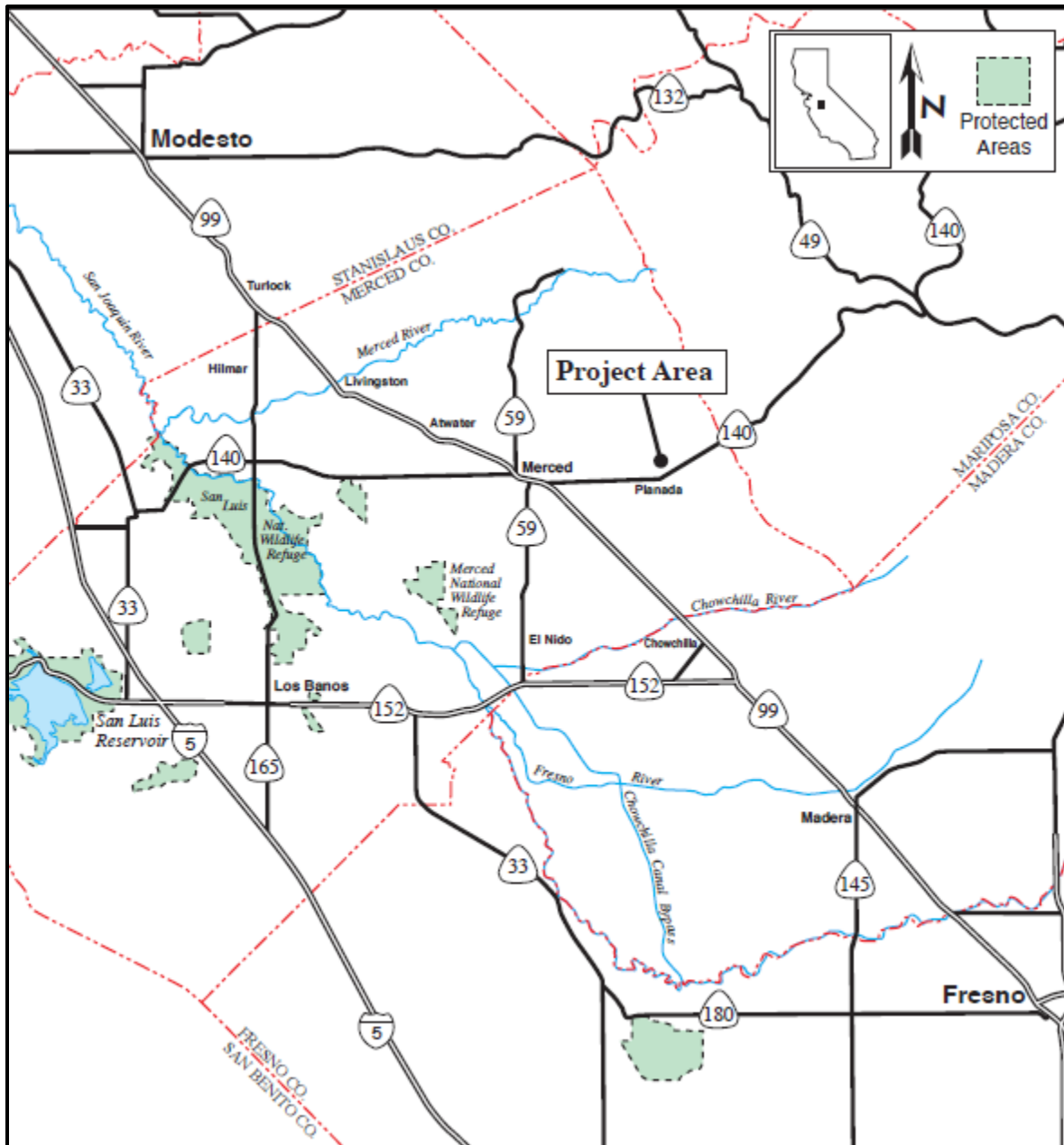
In accordance with the SJVAPCD's *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015a) and policies (SJVAPCD 2015b; SJVAPCD 2015c) the potential health risk attributable to the proposed project is determined to be less than significant.

Emissions of criteria pollutants attributable to proposed construction activities animal movement, manure management and on-site mobile sources were calculated using generally accepted emission factors. The SJVAPCD has developed screening levels for requiring an AAQA. The SJVAPCD recommends that an AAQA be performed for all criteria pollutants when emissions of any criteria pollutant resulting from project construction or operational activities exceed the 100 pounds per day screening level, after compliance with Rule 9510 requirements and implementation of all enforceable mitigation measures. The proposed project's construction and operational activities will not exceed 100 pounds per day of any criteria pollutant that has an ambient air quality standard. Therefore, an AAQA is not required, and the proposed Project is considered less than significant for ambient air quality impacts.

2. INTRODUCTION

This Health Risk Assessment (HRA) is provided as a service of Trinity Consultants, performed on behalf of Environmental Planning Partners, Inc. for the Hillcrest Dairy facility operation in Merced County, California (Figure 2-1). As part of the development requirements for the property, an HRA and AAQA are required.

Figure 2-1. Location Map



2.1. PROJECT DESCRIPTION

The existing dairy is located at 1901 N. Hayden Road in LeGrand, California, which is in the County of Merced. The facility will not be located within 1,000 feet of a K-12 school.

The proposed structure construction would occur within two phases. Construction would include the construction of a new 50,000 square foot free stall barn and four loafing barns totaling 145,678 square feet. Construction of Phase 1 was estimated to take approximately six months and Phase 2 was estimated to take six months occurring at some point with two years after CUP issuance.

After modification, the dairy will house approximately 9,750 head of cattle. The existing and proposed herd configuration is provided in Table 2-1. The dairy will continue to operate 24 hours per day and 365 days per year.

Table 2-1. Herd Configuration – Existing and Proposed

Cow Type	Current	Proposed	Increment
Milk Cows	4,000	5,000	1,000
Dry Cows	750	750	0
Bred Heifers 15-24 mos.	1,400	1,625	225
Heifers 7-14 mos.	500	1,625	1,125
Heifers 4-6 mos.	1,400	750	-650
Calves 0-3 mos.	0	0	0
Bulls	0	0	0
TOTAL	8,050	9,750	1,700

3. AMBIENT AIR QUALITY ANALYSIS

As stated in the GAMAQI (2015, p 96-97), SJVAPCD has developed screening levels for requiring an Ambient Air Quality Analysis (AAQA). The SJVAPCD recommends that an AAQA be performed for all criteria pollutants when emissions of any criteria pollutant resulting from project construction or operational activities exceed the 100 pounds per day screening level, after compliance with Rule 9510 requirements and implementation of all enforceable mitigation measures.

As shown below in **Table 3-1**, average daily emissions for construction and operational activities associated with this Project would not exceed 100 pounds per day for any criteria pollutant that has an ambient air quality standard. *Therefore, an AAQA is not required for this Project.*

Table 3-1. Average Daily Criteria Pollutant Emissions

Emissions Source	Pollutant (lbs/day)				
	NOX	CO	SOX	PM ₁₀	PM _{2.5}
Construction Emissions					
Phase 1	13.49	13.58	0.03	1.28	0.83
Phase 2	17.17	18.91	0.04	2.06	1.21
Max Average Daily Construction Emissions	17.17	18.91	0.04	2.06	1.21
Operational Emissions					
Cow Housing	-	-	-	19.59	2.23
Mobile Sources	0.31	1.59	0.004	0.01	0.01
Total Average Daily Operational Emissions	0.39	2.36	0.004	19.59	2.23
SJVAPCD AAQA Screening Threshold	100	100	100	100	100
Is Threshold Exceeded?	No	No	No	No	No

4. RISK ASSESSMENT METHODOLOGY

This section describes the methodology used to predict the potential health risk to the population attributable to emissions of hazardous air pollutants from the proposed expansion of the dairy operation.

4.1. HAZARD IDENTIFICATION

The basis for evaluating potential health risk is the identification of sources of hazardous air pollutants (HAPs). The proposed dairy will include sources with the potential to emit HAPs.

Construction equipment sources include diesel-fueled dozers, loaders, backhoes, excavators, graders, cranes, forklifts, generator sets, concrete/industrial saws, and welders. CalEEMod default equipment listing for general heavy industrial usages were utilized. Default horsepower, daily operating hours, and load factors were also used. Operational mobile sources include a diesel-fueled feed loading tractor, a manure scraping tractor, a feed delivery tractor, milk tankers, solids manure removal trucks, and commodity delivery trucks. Other diesel-fueled sources that will not have an increase in usage as a result of the Project are bedding delivery tractor and manure loading tractor. There will also be emissions from the housing barns and pens, milk barn, lagoons, solid manure storage and land application areas associated with increased herd size. HRA emission sources are listed in **Table 4-1**.

Table 4-1. Sources of Potential Emissions

Source ID	Description
MTI	Milk Truck Idling
MTT	Milk Truck Travel
SMTI	Solid Manure Truck Idling
SMTT	Solid Manure Truck Travel
CTI	Commodity Truck Idling
CTT	Commodity Truck Travel
FLT	Feed Loading Tractor
DP5-6	Dry Pens (5 and 6)
FDT1-2	Feed Delivery Tractor
MST	Manure Scraping Tractor
HP18_23	Heifer Pens (18-23)
Milk1	Milk Parlor
FSB1, 4, and 5	Free Stall Barns (1, 4 and 5)
SLA1-2	Solid Land Application
LAGOON1-3	Lagoons
SMS1-2	Solid Manure Storage
LLA1-2	Liquid Land Application
CONSTP1-2	Construction Activities

Table 4-2 lists the toxic substances emitted from each of these activities and also presents the classification of these species as to their potential for producing carcinogenic and non-cancer acute or chronic health impacts, if any.

Table 4-2. Chemicals of Potential Concern

CAS	Pollutant	Source	Cancer	Non-Cancer	
				Acute	Chronic
9901	Diesel Exhaust, Particulate Matter	Tractors, Diesel Trucks	X		X
9960	Sulfates	Animal Movement		X	X
50000	Formaldehyde	Animal Movement	X	X	X
56235	Carbon tetrachloride	Animal Movement, Lagoons	X	X	X
67630	Isopropyl Alcohol	Animal Movement		X	X
67663	Chloroform	Animal Movement, Lagoons	X	X	X
71432	Benzene	Animal Movement, Lagoons	X	X	X
71556	1,1,1-trichloroethane	Lagoons		X	X
74873	Methyl Chloride	Animal Movement	X	X	X
75003	Ethyl Chloride	Animal Movement			X
75070	Acetaldehyde	Animal Movement	X		X
75150	Carbon disulfide	Animal Movement		X	X
75252	Tribromomethane *	Lagoons			
75694	Trichloromonofluoromethane *	Lagoons			
76131	1,1,2-Trichloro-1,2,2-trifluoroethane	Lagoons			X
78933	Methyl Ethyl Ketone (MEK)	Animal Movement, Lagoons		X	X
79005	1,1,2-Trichloroethane	Animal Movement	X		
79016	Trichloroethylene	Animal Movement, Lagoons	X		X
79345	1,1,2,2-Tetrachloroethane	Animal Movement	X		
91203	Naphthalene	Animal Movement	X		X
95501	1,2-Dichlorobenzene *	Animal Movement, Lagoons			
95636	1,2,4-Trichlorobenzene *	Lagoons			
96128	1,2-Dibromo-3-chloropropane	Animal Movement	X		X
96184	1,2,3-Trichloropropane *	Animal Movement			
98828	Cumene *	Animal Movement			
100414	Ethylbenzene	Animal Movement			X
100425	Styrene	Animal Movement, Lagoons		X	X
100447	Benzyl chloride	Animal Movement	X	X	X
106467	1,4-Dichlorobenzene	Animal Movement, Lagoons	X		X
106934	1,2-Dibromoethane (EDB)	Animal Movement	X		X
106990	1,3-Butadiene	Lagoons	X		X
107062	1,2-Dichloroethane (EDC)	Animal Movement	X		X
107131	Acrylonitrile	Animal Movement	X		X
108054	Vinyl acetate	Animal Movement, Lagoons			X
108101	Methyl Isobutyl Ketone *	Animal Movement, Lagoons			
108883	Toluene	Animal Movement, Lagoons		X	X
108907	Chlorobenzene	Animal Movement			X
110543	Hexane	Animal Movement			X
110827	Cyclohexane *	Animal Movement, Lagoons			
115071	Propylene	Lagoons			X

CAS	Pollutant	Source	Cancer	Non-Cancer	
				Acute	Chronic
120821	1,2,4-Trichlorobenzene *	Animal Movement			
123728	Butyraldehyde *	Animal Movement			
123911	1,4 Dioxane	Animal Movement	X	X	X
127184	Tetrachloroethene	Animal Movement	X	X	X
541731	1,3-Dichlorobenzene *	Animal Movement, Lagoons			
764410	t-1,4-Dichloro-2-butene *	Animal Movement			
1330207	Xylene Isomers	Animal Movement, Lagoons		X	X
4170303	Crotonaldehyde *	Animal Movement			
7429905	Aluminum *	Animal Movement			
7439921	Lead	Animal Movement	X		
7439965	Manganese	Animal Movement			X
7439976	Mercury	Animal Movement		X	X
7440020	Nickel	Animal Movement	X	X	X
7440360	Antimony *	Animal Movement			
7440382	Arsenic	Animal Movement	X	X	X
7440393	Barium *	Animal Movement			
7440439	Cadmium	Animal Movement	X		X
7440473	Chromium *	Animal Movement			
7440508	Copper	Animal Movement		X	X
7440622	Vanadium	Animal Movement	X		
7440666	Zinc	Animal Movement			X
7664417	Ammonia	Animal Movement, Lagoons Wastewater Application		X	X
7723140	Phosphorus *	Animal Movement			
7726956	Bromine	Animal Movement			X
7782492	Selenium	Animal Movement			X
7782505	Chlorine	Animal Movement		X	X
18540299	Hexavalent Chromium	Animal Movement	X	X	X

*Health risk assessment values have not yet been assigned for this chemical.

4.2. EXPOSURE ASSESSMENT

4.2.1. Source Emissions and Characterization

Peak one-hour emission rates and annual-averaged emission rates were calculated for all pollutants for each modeled source. Emissions attribute to animal movement and manure management were estimated by the SJVAPCD using PM₁₀ emission factors and HAPs speciation spreadsheets. The project applicant provided cattle numbers. Emissions for tractors were calculated using the EPA's *Nonroad Compression-Ignition Engines - Exhaust Emission Standards* for the appropriate engine horsepower (HP) and year and load factors for the appropriate engine horsepower from California Emissions Estimator Model (CalEEMod) Appendix D, Tables 3.3 and 3.4. Diesel truck running and idling emissions are based on EMFAC2021 emission factors specific to Merced County for vehicle category "T7 Single Other Class 8." Diesel trucks were assumed to have 15 minutes of idling per visit. The lagoon's H₂S emissions calculations are based on the surface area of the lagoon. As there will be no

increase in the surface area of the existing lagoons, there will be no increase in H₂S emission associated with the proposed expansion.

The actual total construction activities were estimated to be 1 year for Phase 1 and 2. Therefore, a one-year exposure HRA was conducted and added to the operational HRA results. Construction emissions will be restricted to occur between the hours of 7am and 5pm.

The calculation worksheets and CalEEMod output files for the emissions are provided in **Appendix A**. Hourly and annual emissions for each source are also provided in the HARP output files, electronic copies of which are provided in **Appendix B**.

4.2.2. Dispersion Modeling

A version of EPA's AMS/EPA Regulatory Model - AERMOD (recompiled for the Lakes ISC-AERMOD View interface) was used to predict the dispersion of emissions from the proposed dairy. The construction activities, animal housing areas, milk barn, lagoons, solid manure storage and land application areas were modeled as area sources. Unit emission rates for the area sources of 1 g/sec divided by the area of the source were input into AERMOD. The travel route for the feed delivery tractor, solids removal trucks, milk tankers and commodity trucks were modeled as line sources, which represents a series of volume sources, with a unit emission rate of 1 g/sec. The feed loading tractor, manure scraping tractor, solids removal truck idling, milk tanker idling, and commodity truck idling were modeled as point sources, with a unit emission rate of 1 g/sec. Modeled sources are identified in **Table 4-1**.

All of the AERMOD regulatory default parameters were employed. Rural dispersion parameters were used because the facility and surrounding land are considered "rural" under the Auer land use classification method. The AERMOD files are provided in electronic format on a CD in **Appendix B**.

4.2.2.1. Meteorological Data

The SJVAPCD provided meteorological data for Merced County, California to be used for projects within Merced County. SJVAPCD-approved, AERMET processed meteorological datasets for calendar years 2013 through 2017¹ was input into AERMOD. This was the most recent available dataset available at the time the modeling runs were conducted.

4.2.2.2. Receptors

Existing land uses in the area where the proposed dairy will be located are predominantly agriculture. There are scattered rural residences in the general area of the project; most of which are associated with local agricultural operations. There is a more densely populated area south of the facility. A total of 673 off-site receptors of residences and workers were assessed during the preparation of this HRA. Coordinates for the point of maximum impact (PMI) receptors are provided in **Table 4-3**.

4.2.3. HARP Post-Processing

The files generated in AERMOD were uploaded to the Air Dispersion Modeling and Risk Assessment Tool (ADMRT) program in the Hotspots Analysis and Reporting Program Version 2 (HARP 2) (CARB 2015). ADMRT post-processing was used to assess the potential for excess cancer risk and chronic non-cancer effects using the most recent health effects data from the California EPA Office of Environmental Health Hazard Assessment

¹ Provided via website, San Joaquin Valley Air Pollution Control District (SJVAPCD), ftp://12.219.204.27/public/Modeling/Meteorological_Data/AERMET_v16216/Modesto_23258/

(OEHHA). ADMRT site parameters were set for mandatory minimum exposure pathways for carcinogenic risk. The deposition rate was set to 0.02 m/s. Risk reports were generated for carcinogenic risk, non-carcinogenic chronic risk and non-carcinogenic acute risk. Site parameters are included in the HARP output files.

4.3. RISK CHARACTERIZATION

For permitting and CEQA purposes, SJVAPCD has set the level of significance for carcinogenic risk at 20 in one million, which is understood as the possibility of causing twenty additional cancer cases in a population of one million people (SJVAPCD 2015b). The level of significance for chronic and acute non-cancer risk is a hazard index of one (SJVAPCD 2015c).

HARP 2 post-processing was used to assess the potential for the following: excess cancer risk, acute non-cancer effects, and chronic non-cancer effects. Total cancer risk was predicted for inhalation and non-inhalation pathways at each receptor. The hazard index is computed by endpoint as the sum of the hazard indices for all relevant pollutants, the highest of which is designated as the total hazard index.

The carcinogenic risk predicted at the potentially impacted receptors does not exceed the significance level of twenty in one million (20×10^{-6}). The health hazard index (HI) for chronic and acute non-cancer risk is below the significance level of 1.0 at all modeled receptors. The excess cancer risk, acute non-cancer HI, and chronic non-cancer HI for the maximum modeled receptor are provided in **Table 4-3**. The HARP2 output files for cancer, acute, and chronic risks are provided in electronic format on **Appendix B**.

As shown below in **Table 4-3**, the maximum predicted cancer risk is $3.54\text{E-}06$. Cancer risks are primarily attributable to emissions of naphthalene through the inhalation pathway. Carcinogenic risks are tabulated by pollutant in **Table 4-4**.

The maximum predicted acute non-cancer hazard index is 0.055. Acute risks are primarily attributable to emissions of ammonia, which affects the respiratory system and eyes. Acute risks are tabulated by pollutant in **Table 4-5**.

The maximum predicted chronic non-cancer hazard index is 0.031. Chronic risks, tabulated by pollutant in **Table 4-6**, are primarily attributable to emissions of arsenic which affect the cardiovascular, central nervous, reproductive, respiratory and skin systems.

Table 4-3. Risk Predicted By HARP

	Maximum Lifetime Excess Cancer Risk	Maximum Non-Cancer Chronic Hazard Index	Maximum Non-Cancer Acute Hazard Index
Construction	4.44E-07	7.57E-04	0.00E+00
Operational	3.10E-06	2.97E-02	5.46E-02
Total	3.54E-06	3.05E-02	5.46E-02
Receptor #, Name	1, Off-Site Residence	621, Ag Worker	648, Ag Worker
UTM Easting (m)	738979.55	738815.88	738781.39
UTM Northing (m)	4132591.45	4132624.33	4133587.05

Table 4-4. Risk by Pollutant – Maximum Cancer Risk at Receptor #1

CHEM	INHAL	SOIL	DERM	MOTHER	WATER	FISH	CROP	BEEF	DAIRY	PIG	CHICK	EGG	TOTAL
Naphthalene	8.04E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.04E-07
Acrylonitrile	3.95E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.95E-07
Arsenic	7.04E-08	3.09E-07	1.32E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.93E-07
DBCP	2.35E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.35E-07
TetraChEthane	2.18E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E-07
Benzyl Chloride	2.01E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.01E-07
DieselExhPM	6.23E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.23E-07
EDB	1.65E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.65E-07
Cr(VI)	1.31E-07	4.51E-09	6.41E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E-07
Perc	1.25E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-07
p-DiChBenzene	7.95E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.95E-08
1,4-Dioxane	4.71E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.71E-08
Benzene	3.07E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.07E-08
1,1,2TriChEthan	2.30E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.30E-08
Acetaldehyde	2.13E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.13E-08
EDC	1.21E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-08
Formaldehyde	1.11E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-08
CCl4	5.98E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.98E-09
Ethyl Benzene	4.79E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.79E-09
Lead	5.39E-10	3.84E-09	8.18E-11	4.20E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.50E-09
TCE	2.47E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-09
Nickel	2.34E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-09
Chloroform	1.69E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-09
SUM	3.21E-06	3.18E-07	1.33E-08	4.20E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.54E-06

Table 4-5. Risk by Pollutant – Maximum Acute Noncancer Risk at Receptor #648

CHEM	CV	CNS	IMMUN	KIDNEY	GILV	REPRO /DEVEL	RESP	SKIN	EYE	BONE /TEETH	ENDO	BLOOD	ODOR	GENERAL	MAX
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.08E-02	0.00E+00	5.08E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.08E-02
Arsenic	2.39E-03	2.39E-03	0.00E+00	0.00E+00	0.00E+00	2.39E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.39E-03
SULFATES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-03
Benzene	0.00E+00	0.00E+00	1.55E-03	0.00E+00	0.00E+00	1.55E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-03	0.00E+00	0.00E+00	1.55E-03
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-03
Nickel	0.00E+00	0.00E+00	1.04E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-03
Benzyl Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.46E-04	0.00E+00	9.46E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.46E-04
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.89E-04	0.00E+00	5.89E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.89E-04
Mercury	0.00E+00	1.99E-04	0.00E+00	0.00E+00	0.00E+00	1.99E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.99E-04
1,4-Dioxane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.88E-05	0.00E+00	8.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.88E-05
MEK	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.78E-05	0.00E+00	8.78E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.78E-05
CS2	0.00E+00	7.08E-05	0.00E+00	0.00E+00	0.00E+00	7.08E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.08E-05
Chloroform	0.00E+00	6.29E-05	0.00E+00	0.00E+00	0.00E+00	6.29E-05	6.29E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.29E-05
Perc	0.00E+00	6.01E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.01E-05	0.00E+00	6.01E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.01E-05
Isopropyl Alcoh	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.19E-05	0.00E+00	5.19E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.19E-05
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.94E-05
Toluene	0.00E+00	3.19E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.19E-05	0.00E+00	3.19E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.19E-05
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.98E-05	0.00E+00	2.98E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.98E-05
Xylenes	0.00E+00	1.15E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-05	0.00E+00	1.15E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-05
Styrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.33E-06	6.33E-06	0.00E+00	6.33E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.33E-06
CCl4	0.00E+00	2.22E-06	0.00E+00	0.00E+00	2.22E-06	2.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.22E-06
SUM	2.39E-03	2.82E-03	2.60E-03	0.00E+00	2.22E-06	4.28E-03	5.46E-02	0.00E+00	5.42E-02	0.00E+00	0.00E+00	1.55E-03	0.00E+00	0.00E+00	5.46E-02

Table 4-6. Risk by Pollutant – Maximum Chronic Noncancer Risk at Receptor #621

CHEM	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/ DEVEL	RESP	SKIN	EYE	BONE/ TEETH	ENDO	BLOOD	ODOR	GENERAL	MAX
Arsenic	1.65E-02	1.65E-02	0.00E+00	0.00E+00	0.00E+00	1.65E-02	1.65E-02	1.65E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.65E-02
NH3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E-02
Manganese	0.00E+00	4.59E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.59E-03
EDB	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-03
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-03
Nickel	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-06	2.72E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.72E-04	0.00E+00	0.00E+00	2.72E-04
Perc	0.00E+00	0.00E+00	0.00E+00	2.47E-04	2.47E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-04
Benzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-04	0.00E+00	0.00E+00	1.59E-04
Mercury	0.00E+00	1.53E-04	0.00E+00	1.53E-04	0.00E+00	1.53E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E-04
Acrylonitrile	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-04
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.88E-05
DieselExhPM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.13E-04
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-05
Vinyl Acetate	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-05
CS2	0.00E+00	5.60E-06	0.00E+00	0.00E+00	0.00E+00	5.60E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.60E-06
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E-06
Xylenes	0.00E+00	4.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-06	0.00E+00	4.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-06
p-DiClBenzene	0.00E+00	3.64E-06	0.00E+00	3.64E-06	3.64E-06	0.00E+00	3.64E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.64E-06
Cr(VI)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.91E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-07	0.00E+00	0.00E+00	1.91E-06
CCl4	0.00E+00	1.59E-06	0.00E+00	0.00E+00	1.59E-06	1.59E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-06
Styrene	0.00E+00	1.25E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-06
Chlorobenzn	0.00E+00	0.00E+00	0.00E+00	8.89E-07	8.89E-07	8.89E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.89E-07
1,4-Dioxane	8.87E-07	0.00E+00	0.00E+00	8.87E-07	8.87E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.87E-07
TCE	0.00E+00	8.45E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.45E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.45E-07
Selenium	6.46E-07	6.46E-07	0.00E+00	0.00E+00	6.46E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.46E-07
EDC	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.20E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.20E-07
Chloroform	0.00E+00	0.00E+00	0.00E+00	4.73E-07	4.73E-07	4.73E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.73E-07
Ethyl Benzene	0.00E+00	0.00E+00	0.00E+00	4.15E-07	4.15E-07	4.15E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.15E-07	0.00E+00	0.00E+00	0.00E+00	4.15E-07
Isopropyl Alcoh	0.00E+00	0.00E+00	0.00E+00	2.99E-07	0.00E+00	2.99E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.99E-07
Hexane	0.00E+00	1.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-07
Ethyl Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.56E-08	1.56E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.56E-08
Sum	1.65E-02	2.12E-02	0.00E+00	4.06E-04	2.56E-04	1.79E-02	3.05E-02	1.65E-02	8.95E-06	0.00E+00	4.15E-07	4.31E-04	0.00E+00	0.00E+00	3.05E-02

5. CONCLUSIONS

In accordance with the *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015a) and San Joaquin Valley Air Pollution Control District policies (SJVAPCD 2015b; SJVAPCD 2016c), the unmitigated potential health risk attributable to the Hillcrest Dairy facility for chronic and acute carcinogenic and non- carcinogenic risk is determined to be less than significant based on the following conclusion:

- Potential chronic carcinogenic risk from the proposed facility is *below* the significance level of twenty in one million at each of the modeled receptors.
- The hazard index for the potential chronic non-cancer risk from the proposed facility is *below* the significance level of 1.0 at each of the modeled receptors.
- The hazard index for the potential acute non-cancer risk from the proposed facility is *below* the significance level of 1.0 at each of the modeled receptors.

Additionally, the ambient air quality impact is determined to be less than significant based on the following conclusions:

- The average daily emissions for construction and operational activities associated with this Project would not exceed 100 pounds per day for any criteria pollutant that has an ambient air quality standard.

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APPENDIX A: EMISSION ESTIMATION WORKSHEETS

Pre-Project Facility Information

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

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	4,000				4,000		
Dry Cows				750	750		
Support Stock (Heifers, Calves, and Bulls)				3,300	3,300		
Large Heifers					0		
Medium Heifers					0		
Small Heifers					0		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves							0

Total Herd Summary	
Total Milk Cows	4,000
Total Mature Cows	4,750
Support Stock (Heifers, Calves, and Bulls)	3,300
Total Calves	0
Total Dairy Head	8,050

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

Post-Project Facility Information

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

Post-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	5,000				5,000		
Dry Cows				750	750		
Support Stock (Heifers, Calves, and Bulls)				4,000	4,000		
Large Heifers					0		
Medium Heifers					0		
Small Heifers					0		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves							0

Total Herd Summary	
Total Milk Cows	5,000
Total Mature Cows	5,750
Support Stock (Heifers, Calves, and Bulls)	4,000
Total Calves	0
Total Dairy Head	9,750

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

Control Measure	PM10 Control Efficiency
Shaded corrals (milk and dry cows)	16.7%
Shaded corrals (heifers and bulls)	8.3%
Downwind shelterbelts	12.5%
Upwind shelterbelts	10%
Freestall with no exercise pens and non-manure based bedding	90%
Freestall with no exercise pens and manure based bedding	80%
Fibrous layer in dusty areas (i.e. hay, etc.)	10%
Bi-weekly corral/exercise pen scraping and/or manure removal using a pull type manure harvesting equipment in morning hours when moisture in air except during periods of rainy weather	25%
Sprinkling of open corrals/exercise pens	12.5%
Feeding young stock (heifers and calves) near dusk	10%

Pre-Project PM10 Mitigation Measures

Pre-Project PM10 Mitigation Measures														
Housing Name(s) or #s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
1	Freestall Barn 1	freestall	milk cows	1,500	1,500	1								
2	Freestall Barn 2	freestall	milk cows	1,000	1,000	1								
3	Freestall Barn 3	freestall	dry cows	250	250	1								
4	Freestall Barn 4	freestall	milk cows	1,500	1,500	1								
5	Dry Pen 1	loafing barn	dry cows	100	100	1								
6	Dry Pen 2	open corral	dry cows	100	100	1								
7	Dry Pen 3	loafing barn	dry cows	150	150	1								
8	Dry Pen 4	open corral	dry cows	150	150	1								
9	Heifer Pen 1	open corral	support stock	150	150	1								
10	Heifer Pen 5	open corral	support stock	200	200	1								
11	Heifer Pens 2-4	open corral	support stock	450	450	1								
12	Heifer Pens 6-11	open corral	support stock	1,000	1,000	1								
13	Heifer Pens 12-17	open corral	support stock	1,500	1,500	1								
Pre-Project Total # of Cows			8,050											

Pre-Project PM10 Control Efficiencies and Emission Factors															
Housing Name(s) or #s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	Uncontrolled EF (lb/hd-yr)	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)
1	Freestall Barn 1	freestall	milk cows	1,500	1,500	1,370						15%			1.17
2	Freestall Barn 2	freestall	milk cows	1,000	1,000	1,370						15%			1.17
3	Freestall Barn 3	freestall	dry cows	250	250	1,370						15%			1.17
4	Freestall Barn 4	freestall	milk cows	1,500	1,500	1,370						15%			1.17
5	Dry Pen 1	loafing barn	dry cows	100	100	2,730						15%			2.32
6	Dry Pen 2	open corral	dry cows	100	100	5,460						15%			4.64
7	Dry Pen 3	loafing barn	dry cows	150	150	2,730						15%			2.32
8	Dry Pen 4	open corral	dry cows	150	150	5,460						15%			4.64
9	Heifer Pen 1	open corral	support stock	150	150	10,550						15%			8.97
10	Heifer Pen 5	open corral	support stock	200	200	10,550						15%			8.97
11	Heifer Pens 2-4	open corral	support stock	450	450	10,550						15%			8.97
12	Heifer Pens 6-11	open corral	support stock	1,000	1,000	10,550						15%			8.97
13	Heifer Pens 12-17	open corral	support stock	1,500	1,500	10,550						15%			8.97
Pre-Project Total # of Cows			8,050												

Post-Project PM10 Mitigation Measures

Post-Project PM10 Mitigation Measures														
Housing Name(s) or #s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
1	Freestall Barn 1	freestall	milk cows	1,625	1,625	1								
2	Freestall Barn 2	freestall	milk cows	1,000	1,000	1								
3	Freestall Barn 3	freestall	dry cows	250	250	1								
4	Freestall Barn 4	freestall	milk cows	1,625	1,625	1								
5	Dry Pen 1	loafing barn	dry cows	100	100	1								
6	Dry Pen 2	loafing barn	dry cows	100	100	1								
7	Dry Pen 3	loafing barn	dry cows	100	100	1								
8	Dry Pen 4	loafing barn	dry cows	150	150	1								
9	Dry Pen 5	loafing barn	dry cows	150	150	1								
10	Dry Pen 6	loafing barn	dry cows	150	150	1								
11	Heifer Pens 2-4	open corral	support stock	450	450	1								
12	Heifer Pens 6-11	open corral	support stock	1,000	1,000	1								
13	Heifer Pens 12-17	open corral	support stock	1,500	1,500	1								
Post-Project PM10 Mitigation Measures for New Housing Units at an Expanding Dairy														
Housing Name(s) or #s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	# of Combined Housing Structures in row	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk
1	Freestall Barn 5	freestall	milk cows	500	500	1								
2	Heifer Pens 18-23	open corral	support stock	1,050	1,050	1								
Post-Project Total # of Cows			9,750	(The post-project total includes dairy cows already on-site and new cows from the expansion.)										

Post-Project PM10 Control Efficiencies and Emission Factors															
Housing Name(s) or #s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	Uncontrolled EF (lb/hd-yr)	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)
1	Freestall Barn 1	freestall	milk cows	1,625	1,625	1,370						15%			1.17
2	Freestall Barn 2	freestall	milk cows	1,000	1,000	1,370						15%			1.17
3	Freestall Barn 3	freestall	dry cows	250	250	1,370						15%			1.17
4	Freestall Barn 4	freestall	milk cows	1,625	1,625	1,370						15%			1.17
5	Dry Pen 1	loafing barn	dry cows	100	100	2,730						15%			2.32
6	Dry Pen 2	loafing barn	dry cows	100	100	2,730						15%			2.32
7	Dry Pen 3	loafing barn	dry cows	100	100	2,730						15%			2.32
8	Dry Pen 4	loafing barn	dry cows	150	150	2,730						15%			2.32
9	Dry Pen 5	loafing barn	dry cows	150	150	2,730						15%			2.32
10	Dry Pen 6	loafing barn	dry cows	150	150	2,730						15%			2.32
11	Heifer Pens 2-4	open corral	support stock	450	450	10,550						15%			8.97
12	Heifer Pens 6-11	open corral	support stock	1,000	1,000	10,550						15%			8.97
13	Heifer Pens 12-17	open corral	support stock	1,500	1,500	10,550						15%			8.97
Post-Project PM10 Control Efficiencies and Emission Factors for New Housing Emissions Units															
Housing Name(s) or #s)	Type of Housing	Type of cow	Total # of cows in Each Housing Structure(s)	Maximum Design Capacity of Each Structure	Uncontrolled EF (lb/hd-yr)	Shaded Corrals	Downwind Shelterbelts	Upwind Shelterbelts	No exercise pens, non manure bedding	No exercise pens, manure bedding	Fibrous layer	Bi-weekly scraping Corrals/Pens	Sprinkling Corrals/Pens	Feed Young Stock Near Dusk	Controlled EF (lb/hd-yr)
1	Freestall Barn 5	freestall	milk cows	500	500	1,370						15%			1.17
2	Heifer Pens 18-23	open corral	support stock	1,050	1,050	10,550						15%			8.97

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	Freestall Barn 1	milk cows	1,500	9.86	21.13	1.17	40.5	14,790	86.8	31,692	4.8	1,748
2	Freestall Barn 2	milk cows	1,000	9.86	21.13	1.17	27.0	9,860	57.9	21,128	3.2	1,165
3	Freestall Barn 3	dry cows	250	5.57	10.71	1.17	3.8	1,393	7.3	2,677	0.8	291
4	Freestall Barn 4	milk cows	1,500	9.86	21.13	1.17	40.5	14,790	86.8	31,692	4.8	1,748
5	Dry Pen 1	dry cows	100	5.57	10.71	2.32	1.5	557	2.9	1,071	0.6	232
6	Dry Pen 2	dry cows	100	5.57	10.71	4.64	1.5	557	2.9	1,071	1.3	464
7	Dry Pen 3	dry cows	150	5.57	10.71	2.32	2.3	836	4.4	1,606	1.0	348
8	Dry Pen 4	dry cows	150	5.57	10.71	4.64	2.3	836	4.4	1,606	1.9	696
9	Heifer Pen 1	support stock	150	4.27	5.54	8.97	1.8	641	2.3	830	3.7	1,345
10	Heifer Pen 5	support stock	200	4.27	5.54	8.97	2.3	854	3.0	1,107	4.9	1,794
11	Heifer Pens 2-4	support stock	450	4.27	5.54	8.97	5.3	1,922	6.8	2,491	11.1	4,036
12	Heifer Pens 6-11	support stock	1,000	4.27	5.54	8.97	11.7	4,270	15.2	5,536	24.6	8,968
13	Heifer Pens 12-17	support stock	1,500	4.27	5.54	8.97	17.5	6,405	22.8	8,304	36.9	13,452
Pre-Project Total # of Cows			8,050				158.0	57,711	303.5	110,811	99.6	36,287

*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows.

Pre-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
8,050	158.0	57,711	303.5	110,811	99.6	36,287

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	Freestall Barn 1	milk cows	1,625	9.86	21.13	1.17	43.9	16,023	94.1	34,334	5.2	1,893
2	Freestall Barn 2	milk cows	1,000	9.86	21.13	1.17	27.0	9,860	57.9	21,128	3.2	1,165
3	Freestall Barn 3	dry cows	250	5.57	10.71	1.17	3.8	1,393	7.3	2,677	0.8	291
4	Freestall Barn 4	milk cows	1,625	9.86	21.13	1.17	43.9	16,023	94.1	34,334	5.2	1,893
5	Dry Pen 1	dry cows	100	5.57	10.71	2.32	1.5	557	2.9	1,071	0.6	232
6	Dry Pen 2	dry cows	100	5.57	10.71	2.32	1.5	557	2.9	1,071	0.6	232
7	Dry Pen 3	dry cows	100	5.57	10.71	2.32	1.5	557	2.9	1,071	0.6	232
8	Dry Pen 4	dry cows	150	5.57	10.71	2.32	2.3	836	4.4	1,606	1.0	348
9	Dry Pen 5	dry cows	150	5.57	10.71	2.32	2.3	836	4.4	1,606	1.0	348
10	Dry Pen 6	dry cows	150	5.57	10.71	2.32	2.3	836	4.4	1,606	1.0	348
11	Heifer Pens 2-4	support stock	450	4.27	5.54	8.97	5.3	1,922	6.8	2,491	11.1	4,036
12	Heifer Pens 6-11	support stock	1,000	4.27	5.54	8.97	11.7	4,270	15.2	5,536	24.6	8,968
13	Heifer Pens 12-17	support stock	1,500	4.27	5.54	8.97	17.5	6,405	22.8	8,304	36.9	13,452
Post-Project # of Cows (non-expansion)			8,200				164.5	60,075	320.1	116,835	91.8	33,438

*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows.

Post-Project Potential to Emit - Cow Housing: New Housing Units at an Expanding 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)
1	Freestall Barn 5	milk cows	500	9.86	21.13	1.17	13.5	4,930	28.9	10,564	1.6	583
2	Heifer Pens 18-23	support stock	1050	4.27	5.54	8.97	12.3	4,484	15.9	5,813	25.8	9,416
Total # of Cows From Expansion			1,550				25.8	9,414	44.8	16,377	27.4	9,999

*Multiple emissions units (freestalls, corrals, calf hutch areas, etc.) are combined in these rows.

Post-Project Totals						
Total # of Cows	VOC (lb/day)	VOC (lb/yr)	NH3 (lb/day)	NH3 (lb/yr)	PM10 (lb/day)	PM10 (lb/yr)
9,750	190.3	69,489	364.9	133,212	119.2	43,437

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)

Increase in Emissions

SSIFE (lb/yr)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	400	137	0
Cow Housing	0	0	7,150	0	11,778	22,401	0
Liquid Manure	0	0	0	0	1,930	7,590	0
Solid Manure	0	0	0	0	620	3,355	0
Feed Handling	0	0	0	0	13,679	0	0
Total	0	0	7,150	0	28,407	33,483	0

Total Daily Change in Emissions (lb/day)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	1.1	0.4	0.0
Cow Housing	0.0	0.0	19.6	0.0	32.3	61.4	0.0
Liquid Manure	0.0	0.0	0.0	0.0	5.2	20.8	0.0
Solid Manure	0.0	0.0	0.0	0.0	1.7	9.2	0.0
Feed Handling	0.0	0.0	0.0	0.0	37.4	0.0	0.0
Total	0.0	0.0	19.6	0.0	77.7	91.8	0.0

Total Annual Change in Non-Fugitive Emissions (Major Source Emissions) (lb/yr)							
	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	0	0	0
Cow Housing	0	0	0	0	0	0	0
Liquid Manure	0	0	0	0	1,170	0	0
Solid Manure	0	0	0	0	0	0	0
Feed Handling	0	0	0	0	0	0	0
Total	0	0	0	0	1,170	0	0

Name

Cow Housing Summary

Applicability

Use this spreadsheet to enter data from the Engineer's Dairy Calculator. Entries here will be linked to other worksheets. After completion, proceed to RMR worksheet for further entries.

*Notes:

Author or updater

Matthew Cegielski

Last Update

September 24, 2018

Facility:
ID#:

Hillcrest Dairy

0

Not Set

Project #:

Potential to Emit - Cow Housing

Housing Name(s) or #(s)	Type of Cow	# of Cows	VOC (lb/hr)	VOC (lb/yr)	NH ₃ (lb/hr)	NH ₃ (lb/yr)	PM ₁₀ (lb/hr)	PM ₁₀ (lb/yr)
Freestall Barn 1	Milk	1625	0.14	1233.00	0.30	2642.00	0.02	145.00
Freestall Barn 2	Milk	1000	0.00	0.00	0.00	0.00	0.00	0.00
Freestall Barn 3	Dry	250	0.00	0.00	0.00	0.00	0.00	0.00
Freestall Barn 4	Milk	1625	0.14	1233.00	0.30	2642.00	0.02	145.00
Freestall Barn 5	Milk	500	0.56	4930.00	1.20	10564.00	0.07	583.00
Dry Pen 1	Dry	100	0.00	0.00	0.00	0.00	0.00	0.00
Dry Pen 2	Dry	100	0.00	0.00	0.00	0.00	-0.03	-232.00
Dry Pen 3	Dry	100	-0.03	-279.00	-0.06	-535.00	-0.02	-116.00
Dry Pen 4	Dry	150	0.00	0.00	0.00	0.00	-0.04	-348.00
Dry Pen 5 (Heifer Pen 1)	Dry	150	0.02	195.00	0.09	776.00	-0.11	-997.00
Dry Pen 6 (Heifer Pen 5)	Dry	150	0.00	-18.00	0.06	499.00	-0.16	-1446.00
Heifer Pens 2-4	Support Stock	450	0.00	0.00	0.00	0.00	0.00	0.00
Heifer Pens 6-11	Support Stock	1000	0.00	0.00	0.00	0.00	0.00	0.00
Heifer Pens 12-17	Support Stock	1500	0.00	0.00	0.00	0.00	0.00	0.00
Heifer Pens 18-23	Support Stock	1050	0.51	4484.00	0.66	5813.00	1.08	9416.00

Copy and paste values from the corresponding table in the Engineer Dairy Calculator's RMR Summary worksheet. Paste values only with matched destination formatting. Ensure the same names are lined up by row number. Zero and null entries will be highlighted in red after entry.

SSIFE RMR Summary

	PM10 lb/hr	PM10 lb/yr	VOC lb/hr	VOC lb/yr	NH3 lb/hr	NH3 lb/yr	H2S lb/yr
Milking Parlor	-	-	0.05	400	0.02	137	-
Cow Housing	0.82	7,150	1.34	11,778	2.56	22,401	-
Liquid Manure	-	-	0.22	1,930	0.87	7,590	-
Solid Manure	-	-	0.07	620	0.38	3,355	-
Feed Handling	-	-	1.56	13,679	-	-	-
Lagoon/Storage Pond	-	-	0.13	1,168	0.14	1,205	0
Land Application (Liquid)	-	-	0.09	767	0.73	6,424	-
Land Application (Solid)	-	-	0.05	402	0.20	1,752	-
Solid Manure Storage	-	-	0.03	219	0.18	1,533	-

SSIFE Total Herd Summary

Change in Milk Cows	1,000
Change in Dairy Head	1,700
Change in Dairy Head (Flushed)	1,000

PM ₁₀ Based Agricultural Emissions from Operations generating Dust from Livestock Soil														
Use this spreadsheet when the emissions are from a Feedlot Soil sources or Cow Housing and the PM ₁₀ rates are known (e.g. Dairy operations). Ammonia and PM ₁₀ Emission rates linked to Cow Housing worksheet. No entries required on this worksheet. Zero and null entries will be highlighted in red after entry.														
Author or updater		Matthew Cegielski												
Last Update		September 24, 2018												
Facility:		Hillcrest Dairy												
ID#:		0												
Project #:		0												
Formula			Freestall Barn 1		Freestall Barn 4		Freestall Barn 5		Dry Pen 5 (Heifer Pen 1)		Dry Pen 6 (Heifer Pen 5)		Heifer Pens 18-23	
Emission are calculated by the multiplication of the PM ₁₀ Rates and the Emission Factors.														
			lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
PM ₁₀ Emissions Rates			1.67E-02	1.45E+02	1.67E-02	1.45E+02	6.67E-02	5.83E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E+00	9.42E+03
Substances	CAS#	Dust* lb/lb PM ₁₀	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR
Aluminum	7429905	4.66E-02	7.77E-04	6.76E+00	7.77E-04	6.76E+00	3.11E-03	2.72E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.01E-02	4.39E+02
Antimony	7440360	1.90E-05	3.17E-07	2.76E-03	3.17E-07	2.76E-03	1.27E-06	1.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.04E-05	1.79E-01
Arsenic	7440382	1.60E-05	2.67E-07	2.32E-03	2.67E-07	2.32E-03	1.07E-06	9.33E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.72E-05	1.51E-01
Barium	7440393	4.69E-04	7.82E-06	6.80E-02	7.82E-06	6.80E-02	3.13E-05	2.73E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.04E-04	4.42E+00
Bromine	7726956	4.40E-05	7.33E-07	6.38E-03	7.33E-07	6.38E-03	2.93E-06	2.57E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.73E-05	4.14E-01
Chromium	7440473	1.40E-05	2.33E-07	2.03E-03	2.33E-07	2.03E-03	9.33E-07	8.16E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.51E-05	1.32E-01
Copper	7440508	1.32E-04	2.20E-06	1.91E-02	2.20E-06	1.91E-02	8.80E-06	7.70E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.42E-04	1.24E+00
Hexavalent Chromium**	18540299	7.00E-07	1.17E-08	1.02E-04	1.17E-08	1.02E-04	4.67E-08	4.08E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.53E-07	6.59E-03
Lead	7439921	3.50E-05	5.83E-07	5.08E-03	5.83E-07	5.08E-03	2.33E-06	2.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.76E-05	3.30E-01
Manganese	7439965	7.59E-04	1.27E-05	1.10E-01	1.27E-05	1.10E-01	5.06E-05	4.42E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.16E-04	7.15E+00
Mercury	7439976	4.00E-06	6.67E-08	5.80E-04	6.67E-08	5.80E-04	2.67E-07	2.33E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.30E-06	3.77E-02
Nickel	7440020	7.00E-06	1.17E-07	1.02E-03	1.17E-07	1.02E-03	4.67E-07	4.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.53E-06	6.59E-02
Phosphorus	7723140	4.01E-02	6.69E-04	5.82E+00	6.69E-04	5.82E+00	2.68E-03	2.34E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.32E-02	3.78E+02
Selenium	7782492	1.00E-06	1.67E-08	1.45E-04	1.67E-08	1.45E-04	6.67E-08	5.83E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-06	9.42E-03
Sulfates	9960	7.28E-03	1.21E-04	1.06E+00	1.21E-04	1.06E+00	4.86E-04	4.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.83E-03	6.86E+01
Vanadium	7440622	3.00E-05	5.00E-07	4.35E-03	5.00E-07	4.35E-03	2.00E-06	1.75E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.23E-05	2.82E-01
Zinc	7440666	3.42E-04	5.70E-06	4.96E-02	5.70E-06	4.96E-02	2.28E-05	1.99E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.68E-04	3.22E+00
Ammonia	7664417		3.04E-01	2.64E+03	3.04E-01	2.64E+03	1.20E+00	1.06E+04	8.75E-02	7.76E+02	5.83E-02	4.99E+02	6.63E-01	5.81E+03

Agricultural Miscellaneous Emissions from Dairy Operations (Cow Housing)												
Use this spreadsheet to characterize the miscellaneous emissions from Dairy sources when VOC rates are known. VOC emission rates linked to Cow Housing worksheet. No entries required on this worksheet. Zero and null entries will be highlighted in red after entry												
Author or updater		Matthew Cegielski										
Last Update		September 24, 2018										
Facility:		Hillcrest Dairy										
ID#:		0										
Project #:		0										
Formula			Freestall Barn 1		Freestall Barn 4		Freestall Barn 5		Dry Pen 5 (Heifer Pen 1)		Heifer Pens 18-23	
Emissions are calculated by the multiplication of the VOC Rates, and Emission Factors.												
			lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
VOC Emission Rates			1.42E-01	1,233.0	1.42E-01	1,233.0	5.63E-01	4,930.0	2.08E-02	195	5.13E-01	4,484.0
Substances	CAS#	Volatiles (lb/lb VOC)*	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR	LB/HR	LB/YR
1,1,2,2-Tetrachloroethane	79345	8.73E-06	1.24E-06	1.08E-02	1.24E-06	1.08E-02	4.91E-06	4.30E-02	1.82E-07	1.70E-03	4.47E-06	3.91E-02
1,1,2-Trichloroethane	79005	2.26E-04	3.20E-05	2.79E-01	3.20E-05	2.79E-01	1.27E-04	1.11E+00	4.71E-06	4.41E-02	1.16E-04	1.01E+00
1,2,3-Trichloropropane	96184	2.76E-04	3.91E-05	3.40E-01	3.91E-05	3.40E-01	1.55E-04	1.36E+00	5.75E-06	5.38E-02	1.41E-04	1.24E+00
1,2,4-Trichlorobenzene	120821	7.79E-04	1.10E-04	9.61E-01	1.10E-04	9.61E-01	4.38E-04	3.84E+00	1.62E-05	1.52E-01	3.99E-04	3.49E+00
1,2-Dibromo-3-chloropropane	96128	4.94E-05	7.00E-06	6.09E-02	7.00E-06	6.09E-02	2.78E-05	2.44E-01	1.03E-06	9.63E-03	2.53E-05	2.22E-01
1,2-Dichlorobenzene	95501	5.48E-04	7.76E-05	6.76E-01	7.76E-05	6.76E-01	3.08E-04	2.70E+00	1.14E-05	1.07E-01	2.81E-04	2.46E+00
1,3-Dichlorobenzene	541731	4.90E-04	6.94E-05	6.04E-01	6.94E-05	6.04E-01	2.76E-04	2.42E+00	1.02E-05	9.56E-02	2.51E-04	2.20E+00
1,4 Dioxane	123911	1.41E-03	2.00E-04	1.74E+00	2.00E-04	1.74E+00	7.93E-04	6.95E+00	2.94E-05	2.75E-01	7.23E-04	6.32E+00
1,4-Dichlorobenzene	106467	5.19E-04	7.35E-05	6.40E-01	7.35E-05	6.40E-01	2.92E-04	2.56E+00	1.08E-05	1.01E-01	2.66E-04	2.33E+00
Acetaldehyde	75070	2.41E-03	3.41E-04	2.97E+00	3.41E-04	2.97E+00	1.36E-03	1.19E+01	5.02E-05	4.70E-01	1.24E-03	1.08E+01
Acrylonitrile	107131	2.43E-04	3.44E-05	3.00E-01	3.44E-05	3.00E-01	1.37E-04	1.20E+00	5.06E-06	4.74E-02	1.25E-04	1.09E+00
Benzene	71432	3.19E-04	4.52E-05	3.93E-01	4.52E-05	3.93E-01	1.79E-04	1.57E+00	6.65E-06	6.22E-02	1.63E-04	1.43E+00
Benzyl chloride	100447	2.89E-04	4.09E-05	3.56E-01	4.09E-05	3.56E-01	1.63E-04	1.42E+00	6.02E-06	5.64E-02	1.48E-04	1.30E+00
Butyraldehyde	123728	1.14E-04	1.62E-05	1.41E-01	1.62E-05	1.41E-01	6.41E-05	5.62E-01	2.38E-06	2.22E-02	5.84E-05	5.11E-01
Carbon Disulfide	75150	2.49E-03	3.53E-04	3.07E+00	3.53E-04	3.07E+00	1.40E-03	1.23E+01	5.19E-05	4.86E-01	1.28E-03	1.12E+01
Carbon tetrachloride	56235	5.87E-05	8.32E-06	7.24E-02	8.32E-06	7.24E-02	3.30E-05	2.89E-01	1.22E-06	1.14E-02	3.01E-05	2.63E-01
Chlorobenzene	108907	2.72E-04	3.85E-05	3.35E-01	3.85E-05	3.35E-01	1.53E-04	1.34E+00	5.67E-06	5.30E-02	1.39E-04	1.22E+00
Chloroform	67663	1.31E-04	1.86E-05	1.62E-01	1.86E-05	1.62E-01	7.37E-05	6.46E-01	2.73E-06	2.55E-02	6.71E-05	5.87E-01
Chloromethane	74873	7.93E-04	1.12E-04	9.78E-01	1.12E-04	9.78E-01	4.46E-04	3.91E+00	1.65E-05	1.55E-01	4.06E-04	3.56E+00
Crotonaldehyde	4170303	1.41E-04	2.00E-05	1.74E-01	2.00E-05	1.74E-01	7.93E-05	6.95E-01	2.94E-06	2.75E-02	7.23E-05	6.32E-01
Cyclohexane	110827	6.83E-03	9.68E-04	8.42E+00	9.68E-04	8.42E+00	3.84E-03	3.37E+01	1.42E-04	1.33E+00	3.50E-03	3.06E+01
Ethyl Chloride	75003	2.39E-04	3.39E-05	2.95E-01	3.39E-05	2.95E-01	1.34E-04	1.18E+00	4.98E-06	4.66E-02	1.22E-04	1.07E+00
Ethylbenzene	100414	3.47E-04	4.92E-05	4.28E-01	4.92E-05	4.28E-01	1.95E-04	1.71E+00	7.23E-06	6.77E-02	1.78E-04	1.56E+00
Ethylene Dibromide (EDB)	106934	3.06E-04	4.34E-05	3.77E-01	4.34E-05	3.77E-01	1.72E-04	1.51E+00	6.37E-06	5.97E-02	1.57E-04	1.37E+00
Ethylene Dichloride (EDC)	107062	5.89E-05	8.34E-06	7.26E-02	8.34E-06	7.26E-02	3.31E-05	2.90E-01	1.23E-06	1.15E-02	3.02E-05	2.64E-01
Formaldehyde	50000	3.98E-04	5.64E-05	4.91E-01	5.64E-05	4.91E-01	2.24E-04	1.96E+00	8.29E-06	7.76E-02	2.04E-04	1.78E+00
Hexane	110543	8.12E-04	1.15E-04	1.00E+00	1.15E-04	1.00E+00	4.57E-04	4.00E+00	1.69E-05	1.58E-01	4.16E-04	3.64E+00
Isopropyl Alcohol	67630	1.62E-03	2.30E-04	2.00E+00	2.30E-04	2.00E+00	9.11E-04	7.99E+00	3.37E-05	3.16E-01	8.30E-04	7.26E+00
Isopropylbenzene (Cumene)	98828	5.61E-05	7.95E-06	6.92E-02	7.95E-06	6.92E-02	3.16E-05	2.77E-01	1.17E-06	1.09E-02	2.88E-05	2.52E-01
Methyl Ethyl Ketone (2-butanone)	78933	1.46E-02	2.07E-03	1.80E+01	2.07E-03	1.80E+01	8.21E-03	7.20E+01	3.04E-04	2.85E+00	7.48E-03	6.55E+01
Methyl Isobutyl Ketone	108101	7.09E-04	1.00E-04	8.74E-01	1.00E-04	8.74E-01	3.99E-04	3.50E+00	1.48E-05	1.38E-01	3.63E-04	3.18E+00
Napthalene	91203	1.16E-03	1.64E-04	1.43E+00	1.64E-04	1.43E+00	6.53E-04	5.72E+00	2.42E-05	2.26E-01	5.95E-04	5.20E+00
Perchloroethylene	127184	6.51E-04	9.22E-05	8.03E-01	9.22E-05	8.03E-01	3.66E-04	3.21E+00	1.36E-05	1.27E-01	3.34E-04	2.92E+00
Styrene	100425	3.59E-04	5.09E-05	4.43E-01	5.09E-05	4.43E-01	2.02E-04	1.77E+00	7.48E-06	7.00E-02	1.84E-04	1.61E+00
t-1,4-Dichloro-2-butene	764410	8.92E-04	1.26E-04	1.10E+00	1.26E-04	1.10E+00	5.02E-04	4.40E+00	1.86E-05	1.74E-01	4.57E-04	4.00E+00
Toluene	108883	1.07E-03	1.52E-04	1.32E+00	1.52E-04	1.32E+00	6.02E-04	5.28E+00	2.23E-05	2.09E-01	5.48E-04	4.80E+00
Trichlorofluoromethane*	75694	1.08E-07	1.53E-08	1.33E-04	1.53E-08	1.33E-04	6.08E-08	5.32E-04	2.25E-09	2.11E-05	5.54E-08	4.84E-04
Vinyl acetate	108054	1.97E-03	2.79E-04	2.43E+00	2.79E-04	2.43E+00	1.11E-03	9.71E+00	4.10E-05	3.84E-01	1.01E-03	8.83E+00
Xylenes	1330207	1.80E-03	2.55E-04	2.22E+00	2.55E-04	2.22E+00	1.01E-03	8.87E+00	3.75E-05	3.51E-01	9.23E-04	8.07E+00

Name	Agricultural Miscellaneous Emissions from Dairy Operations (Milk Parlors)									
Applicability	Use this spreadsheet to characterize the miscellaneous emissions from Dairy sources when VOC rates are known. VOC emission rates linked to RMR worksheet. Enter VOC and NH ₃ rates if there is more than one Milk Parlor.									
Author or updater	Matthew Cegielski		Last Update	August 26, 2016						
Facility:	Hillcrest Dairy									
ID#:	0									
Project #:	0									
More than one Milk Parlor?	Y		Formula							
Inputs	VOC lb/yr	NH ₃ lb/yr	Select N or Y from the dropdown. If there is more than one Milk Parlor, enter VOC and NH ₃ rates. Toxic emissions are calculated by the multiplication of the VOC Rates and Emission Factors.							
Milk Parlor 1	400	137								
Milk Parlor 2							lb/hr	lb/yr	lb/hr	lb/yr
VOC Emission Rates			4.57E-02	4.00E+02	0.00E+00	0.00E+00				
Substances	CAS#	Toxic EF's (lb/lb VOC)*	LB/HR	LB/YR	LB/HR	LB/YR				
1,1,2,2-Tetrachloroethane	79345	8.73E-06	3.99E-07	3.49E-03	0.00E+00	0.00E+00				
1,1,2-Trichloroethane	79005	2.26E-04	1.03E-05	9.04E-02	0.00E+00	0.00E+00				
1,2,3-Trichloropropane	96184	2.76E-04	1.26E-05	1.10E-01	0.00E+00	0.00E+00				
1,2,4-Trichlorobenzene	120821	7.79E-04	3.56E-05	3.12E-01	0.00E+00	0.00E+00				
1,2-Dibromo-3-chloropropane	96128	4.94E-05	2.26E-06	1.98E-02	0.00E+00	0.00E+00				
1,2-Dichlorobenzene	95501	5.48E-04	2.50E-05	2.19E-01	0.00E+00	0.00E+00				
1,3-Dichlorobenzene	541731	4.90E-04	2.24E-05	1.96E-01	0.00E+00	0.00E+00				
1,4 Dioxane	123911	1.41E-03	6.44E-05	5.64E-01	0.00E+00	0.00E+00				
1,4-Dichlorobenzene	106467	5.19E-04	2.37E-05	2.08E-01	0.00E+00	0.00E+00				
Acetaldehyde	75070	2.41E-03	1.10E-04	9.64E-01	0.00E+00	0.00E+00				
Acrylonitrile	107131	2.43E-04	1.11E-05	9.72E-02	0.00E+00	0.00E+00				
Benzene	71432	3.19E-04	1.46E-05	1.28E-01	0.00E+00	0.00E+00				
Benzyl chloride	100447	2.89E-04	1.32E-05	1.16E-01	0.00E+00	0.00E+00				
Butyraldehyde	123728	1.14E-04	5.21E-06	4.56E-02	0.00E+00	0.00E+00				
Carbon Disulfide	75150	2.49E-03	1.14E-04	9.96E-01	0.00E+00	0.00E+00				
Carbon tetrachloride	56235	5.87E-05	2.68E-06	2.35E-02	0.00E+00	0.00E+00				
Chlorobenzene	108907	2.72E-04	1.24E-05	1.09E-01	0.00E+00	0.00E+00				
Chloroform	67663	1.31E-04	5.98E-06	5.24E-02	0.00E+00	0.00E+00				
Chloromethane	74873	7.93E-04	3.62E-05	3.17E-01	0.00E+00	0.00E+00				
Crotonaldehyde	4170303	1.41E-04	6.44E-06	5.64E-02	0.00E+00	0.00E+00				
Cyclohexane	110827	6.83E-03	3.12E-04	2.73E+00	0.00E+00	0.00E+00				
Ethyl Chloride	75003	2.39E-04	1.09E-05	9.56E-02	0.00E+00	0.00E+00				
Ethylbenzene	100414	3.47E-04	1.58E-05	1.39E-01	0.00E+00	0.00E+00				
Ethylene Dibromide (EDB)	106934	3.06E-04	1.40E-05	1.22E-01	0.00E+00	0.00E+00				
Ethylene Dichloride (EDC)	107062	5.89E-05	2.69E-06	2.36E-02	0.00E+00	0.00E+00				
Formaldehyde	50000	3.98E-04	1.82E-05	1.59E-01	0.00E+00	0.00E+00				
Hexane	110543	8.12E-04	3.71E-05	3.25E-01	0.00E+00	0.00E+00				
Isopropyl Alcohol	67630	1.62E-03	7.40E-05	6.48E-01	0.00E+00	0.00E+00				
Isopropylbenzene (Cumene)	98828	5.61E-05	2.56E-06	2.24E-02	0.00E+00	0.00E+00				
Methyl Ethyl Ketone (2-butanone)	78933	1.46E-02	6.67E-04	5.84E+00	0.00E+00	0.00E+00				
Methyl Isobutyl Ketone	108101	7.09E-04	3.24E-05	2.84E-01	0.00E+00	0.00E+00				
Napthalene	91203	1.16E-03	5.30E-05	4.64E-01	0.00E+00	0.00E+00				
Perchloroethylene	127184	6.51E-04	2.97E-05	2.60E-01	0.00E+00	0.00E+00				
Styrene	100425	3.59E-04	1.64E-05	1.44E-01	0.00E+00	0.00E+00				
t-1,4-Dichloro-2-butene	764410	8.92E-04	4.07E-05	3.57E-01	0.00E+00	0.00E+00				
Toluene	108883	1.07E-03	4.89E-05	4.28E-01	0.00E+00	0.00E+00				
Trichlorofluoromethane*	75694	1.08E-07	4.93E-09	4.32E-05	0.00E+00	0.00E+00				
Vinyl acetate	108054	1.97E-03	9.00E-05	7.88E-01	0.00E+00	0.00E+00				
Xylenes	1330207	1.80E-03	8.22E-05	7.20E-01	0.00E+00	0.00E+00				
Ammonia	7664417		1.56E-02	1.37E+02	0.00E+00	0.0				

Name		Agricultural Lagoon Emissions from Dairy Operations									
Applicability	Use this spreadsheet when the emissions are from a Dairy Lagoon sources and the VOC rates are known. The VOC rates are linked to the RMR worksheet cells VOC rates in 'Lagoon/Storage Pond row'. Enter values into the Lagoon area calculator on the right to determine area fraction(s). Total ammonia value is linked to the RMR worksheet cells, 'Lagoon/Storage Pond'. Individual Lagoon values are calculated by multiplying the total lagoon ammonia by their area fraction. Entries required in yellow areas, output in gray areas.										
Author or updater	Matthew Cegielski	Last Update	September 12, 2018								
Facility:	Hillcrest Dairy										
ID#:	0										
Project #:	0										
Inputs	lb/hr	lb/yr	Formula								
VOC Rate	0.13	1,168	Emissions are calculated by the multiplication of the VOC rates, area fraction, and emission factors.								
			Lagoon Area Fraction		0.41		0.22		0.37		
Substances	CAS#	Emissions Factors lb/VOC*	LB/HR	LB/YR	Lagoon LB/HR	Lagoon LB/YR	Lagoon 2 LB/HR	Lagoon 2 LB/YR	Lagoon 3 LB/HR	Lagoon 3 LB/YR	
1,1,2,2-Tetrachloroethane	79345	3.44E-02	4.58E-03	4.02E+01	1.90E-03	1.67E+01	1.00E-03	8.76E+00	1.68E-03	1.47E+01	
1,1,2-Trichloroethane	79005	7.94E-03	1.06E-03	9.27E+00	4.39E-04	3.85E+00	2.31E-04	2.02E+00	3.88E-04	3.40E+00	
1,2,4-Trimethylbenzene	95636	2.94E-02	3.92E-03	3.43E+01	1.62E-03	1.42E+01	8.55E-04	7.49E+00	1.44E-03	1.26E+01	
1,2-Dichlorobenzene	95501	6.25E-02	8.33E-03	7.30E+01	3.46E-03	3.03E+01	1.82E-03	1.59E+01	3.06E-03	2.68E+01	
1,3-Dichlorobenzene	541731	4.94E-02	6.58E-03	5.77E+01	2.73E-03	2.39E+01	1.44E-03	1.26E+01	2.42E-03	2.12E+01	
1,3-Dichloropropene	542756	7.44E-03	9.92E-04	8.69E+00	4.11E-04	3.60E+00	2.16E-04	1.90E+00	3.64E-04	3.19E+00	
1,4 Dioxane	123911	2.50E-02	3.33E-03	2.92E+01	1.38E-03	1.21E+01	7.27E-04	6.37E+00	1.22E-03	1.07E+01	
1,4-Dichloro-2-butene	764410	6.88E-02	9.17E-03	8.03E+01	3.80E-03	3.33E+01	2.00E-03	1.75E+01	3.36E-03	2.95E+01	
1,4-Dichlorobenzene	106467	5.19E-02	6.92E-03	6.06E+01	2.87E-03	2.51E+01	1.51E-03	1.32E+01	2.54E-03	2.22E+01	
Acetaldehyde	75070	1.56E-02	2.08E-03	1.83E+01	8.64E-04	7.57E+00	4.55E-04	3.98E+00	7.65E-04	6.70E+00	
Acrylonitrile	107131	7.31E-03	9.75E-04	8.54E+00	4.04E-04	3.54E+00	2.13E-04	1.86E+00	3.58E-04	3.14E+00	
Benzene	71432	2.88E-03	3.83E-04	3.36E+00	1.59E-04	1.39E+00	8.36E-05	7.33E-01	1.41E-04	1.23E+00	
Benzyl chloride	100447	3.13E-02	4.17E-03	3.65E+01	1.73E-03	1.51E+01	9.09E-04	7.96E+00	1.53E-03	1.34E+01	
Carbon disulfide	75150	3.94E-02	5.25E-03	4.60E+01	2.18E-03	1.91E+01	1.15E-03	1.00E+01	1.93E-03	1.69E+01	
Chlorobenzene	108907	1.31E-02	1.75E-03	1.53E+01	7.26E-04	6.36E+00	3.82E-04	3.34E+00	6.42E-04	5.63E+00	
Cumene	98828	1.94E-02	2.58E-03	2.26E+01	1.07E-03	9.39E+00	5.64E-04	4.94E+00	9.48E-04	8.31E+00	
Cyclohexane	110827	8.19E-03	1.09E-03	9.56E+00	4.53E-04	3.97E+00	2.38E-04	2.09E+00	4.01E-04	3.51E+00	
Ethyl Chloride	75003	4.63E-03	6.17E-04	5.40E+00	2.56E-04	2.24E+00	1.35E-04	1.18E+00	2.26E-04	1.98E+00	
Ethylbenzene	100414	1.00E-02	1.33E-03	1.17E+01	5.53E-04	4.84E+00	2.91E-04	2.55E+00	4.89E-04	4.29E+00	
Ethylene Dibromide (EDB)	106934	1.44E-02	1.92E-03	1.68E+01	7.95E-04	6.96E+00	4.18E-04	3.66E+00	7.04E-04	6.16E+00	
Ethylene Dichloride (EDC)	107062	4.06E-03	5.42E-04	4.75E+00	2.25E-04	1.97E+00	1.18E-04	1.04E+00	1.99E-04	1.74E+00	
Formaldehyde	50000	8.13E-03	1.08E-03	9.49E+00	4.49E-04	3.94E+00	2.36E-04	2.07E+00	3.98E-04	3.48E+00	
Hexane	110543	4.31E-03	5.75E-04	5.04E+00	2.38E-04	2.09E+00	1.25E-04	1.10E+00	2.11E-04	1.85E+00	
Isopropyl Alcohol	67630	7.50E-03	1.00E-03	8.76E+00	4.15E-04	3.63E+00	2.18E-04	1.91E+00	3.67E-04	3.22E+00	
Methyl Ethyl Ketone	78933	1.38E-02	1.83E-03	1.61E+01	7.60E-04	6.66E+00	4.00E-04	3.50E+00	6.73E-04	5.90E+00	
Methyl Isobutyl Ketone	108101	1.13E-02	1.51E-03	1.32E+01	6.26E-04	5.48E+00	3.29E-04	2.88E+00	5.54E-04	4.85E+00	
Napthalene	91203	1.88E-01	2.50E-02	2.19E+02	1.04E-02	9.08E+01	5.45E-03	4.78E+01	9.18E-03	8.04E+01	
Perchloroethylene	127184	1.75E-01	2.33E-02	2.04E+02	9.68E-03	8.48E+01	5.09E-03	4.46E+01	8.57E-03	7.50E+01	
Styrene	100425	1.63E-02	2.17E-03	1.90E+01	8.99E-04	7.87E+00	4.73E-04	4.14E+00	7.95E-04	6.97E+00	
Toluene	108883	1.25E-02	1.67E-03	1.46E+01	6.91E-04	6.06E+00	3.64E-04	3.19E+00	6.12E-04	5.36E+00	
Trichloroethylene	79016	1.12E-02	1.49E-03	1.31E+01	6.19E-04	5.42E+00	3.25E-04	2.85E+00	5.48E-04	4.80E+00	
Xylenes	1330207	1.88E-02	2.50E-03	2.19E+01	1.04E-03	9.08E+00	5.45E-04	4.78E+00	9.18E-04	8.04E+00	
Ammonia	7664417				5.703E-02	4.996E+02	3.000E-02	2.628E+02	5.047E-02	4.421E+02	

Table 1. Truck Travel: Diesel Particulate Matter Increased Emissions

Type of Vehicles	Source	Round Trip Distance (mi)	Emission Factor (g/mi)	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/day)
Milk Tankers	MTT	0.53	0.14	730	1.20E-01	3.30E-04
Commodity Delivery	CTT	2.68	0.14	730	6.03E-01	1.65E-03
Manure Transport	SMTT	2.33	0.14	200	1.44E-01	3.94E-04

Note 1: Running emission factors for vehicle category "T7 Single Other Class 8" were obtained from the EMFAC2021 Web Database for Merced County (2021) with an Aggregate Fleet Mix Traveling 10 MPH.

Note 2: Increases in trucks/yr is from the Initial Study, page 17

Table 2. Truck Idling: Diesel Particulate Matter Increased Emissions

Type of Vehicles	Source	Emission Factor (g/hr-vehicle)	Minutes Idling/Truck	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/day)
Milk Tankers	MTI	0.003	15	730	1.27E-03	3.48E-06
Commodity Delivery	CTI	0.003	15	730	1.27E-03	3.48E-06
Manure Transport	SMTI	0.003	15	200	3.48E-04	9.54E-07

Note 1: Running emission factors for vehicle category "T7 Single Other Class 8" were obtained from the EMFAC2021 Web Database for Merced County (2021) with an Aggregate Fleet Mix Idling.

Note 2: Increases in trucks/yr is from the Initial Study, page 17

Table 3. Tractors: Diesel Particulate Matter Increased Emissions

	Source (# Volume Sources)	HP	Load Factor	Hours/Year	Emission Factor (g/hp-hr)	Emissions (lb/yr)	Emissions (lb/day)
Feed Loading	FLT	163	0.37	365	1.49E-02	7.24E-01	1.98E-03
Bedding Delivery		110	0.37	0.00	1.49E-02	0.00E+00	0.00E+00
Manure Scraping	MST	275	0.37	4	1.49E-02	1.34E-02	9.56E-04
Manure Loading			0.37	0.00	1.49E-02	0.00E+00	0.00E+00
Feed Delivery	FDT1-2	284	0.37	730	1.49E-02	2.52E+00	3.46E-03

Note1 : Emissions based on EPA's *Nonroad Compression-Ignition* Engines - Exhaust Emission Standards for the appropriate year and HP

<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf>

Note 2: Increase in hours/day was provided by the project applicant

Table 4. Truck Travel: NOx Increased Emissions

	Source	Round Trip Distance (mi)	Emission Factor (g/mi)	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max hr)
Milk Tankers	MTT	0.53	7.27	730	6.26E+00	8.58E-03
Commodity Delivery	CTT	2.68	7.27	730	3.14E+01	4.30E-02
Manure Transport	SMTT	2.33	7.27	200	7.48E+00	3.74E-02

Note 1: Running emission factors for vehicle category "T7 Single Other Class 8" were obtained from the EMFAC2021 Web Database for Merced County (2021) with an Aggregate Fleet Mix Traveling 10 MPH.

Note 2: Increases in trucks/yr is from the Initial Study, page 17

Table 5. Truck Idling: NOx Increased Emissions

Type of Vehicles	Source	Emission Factor (g/hr-vehicle)	Minutes Idling/Truck	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max hr)
Milk Tankers	MTI	1.00	15	730	4.03E-01	5.52E-04
Commodity Delivery	CTI	1.00	15	730	4.03E-01	5.52E-04
Manure Transport	SMTI	1.00	15	200	1.10E-01	5.52E-04

Note 1: Running emission factors for vehicle category "T7 Single Other Class 8" were obtained from the EMFAC2021 Web Database for Merced County (2021) with an Aggregate Fleet Mix Idling.

Note 2: Increases in trucks/yr is from the Initial Study, page 17

Table 6. Tractors: NOx Increased Emissions

	Source (# Volume Sources)	HP	Load Factor	Hours/day	Days/Year	Emission Factor (g/hp-hr)	Emissions (lb/yr)	Emissions (lb/Max hr)
Feed Loading	FLT	163	0.37	1	365	2.98E-01	1.448E+01	3.97E-02
Bedding Delivery	0	110	0.37	0.00	365	2.98E-01	0.00E+00	0.00E+00
Manure Scraping	MST	275	0.37	0.08	52	2.98E-01	2.68E-01	6.69E-02
Manure Loading	0	0	0.37	0.00	52	2.98E-01	0.00E+00	0.00E+00
Feed Delivery	FDT1-2	284	0.37	2	365	2.98E-01	5.04E+01	6.91E-02

Note1 : Emissions based on EPA's *Nonroad Compression-Ignition* Engines - Exhaust Emission Standards for the appropriate year and HP <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf>

Note 2: Increase in hours/day was provided by the project applicant

Note 3: Load factors from CalEEMod's Appendix D Table 3.3 *OFFROAD Default Horsepower and Load Factors*

Table 7. Truck Travel: SOx Increased Emissions

Type of Vehicles	Source	Round Trip Distance (mi)	Emission Factor (g/mi)	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max 24-hr)	Emissions (lb/Max 3-hr)	Emissions (lb/Max 1-hr)
Milk Tankers	MTT	0.53	0.03	730	2.60E-02	6.06E-04	3.56E-05	3.56E-05
Commodity Delivery	CTT	2.68	0.03	730	1.30E-01	1.78E-03	1.78E-04	1.78E-04
Manure Transport	SMTT	2.33	0.03	200	3.11E-02	8.51E-05	1.55E-04	1.55E-04

Note 1: Running emission factors for vehicle category "T7 Single Other Class 8" were obtained from the EMFAC2021 Web Database for Merced County (2021) with an Aggregate Fleet Mix Traveling 10 MPH.

Note 2: Increases in trucks/yr is from the Initial Study, page 17

Table 8. Truck Idling: SOx Increased Emissions

Type of Vehicles	Source	Emission Factor (g/hr-vehicle)	Minutes Idling/Truck	Increase in Trucks/Year	Emissions (lb/yr)	Emissions (lb/Max 24-hr)	Emissions (lb/Max 3-hr)	Emissions (lb/Max 1-hr)
Milk Tankers	MTI	0.002	15	730	7.41E-04	2.03E-06	1.01E-06	1.01E-06
Commodity Delivery	CTI	0.002	15	730	7.41E-04	2.03E-06	1.01E-06	1.01E-06
Manure Transport	SMTI	0.002	15	200	2.03E-04	5.56E-07	1.01E-06	1.01E-06

Note 1: Running emission factors for vehicle category "T7 Single Other Class 8" were obtained from the EMFAC2021 Web Database for Merced County (2021) with an Aggregate Fleet Mix Idling.

Note 2: Increases in trucks/yr is from the Initial Study, page 17

Table 9. Tractors: SOx Increase Emissions

	Source (# Volume Sources)	HP	Load Factor	Hours/day	Days/Year	Emission Factor (g/hp-hr)	Emissions (lb/yr)	Emissions (lb/Max 24-hr)	Emissions (lb/Max 3-hr)	Emissions (lb/Max 1-hr)
Feed Loading	FLT	163	0.37	1	365	5.00E-03	2.43E-01	6.65E-04	8.31E-05	2.77E-05
Bedding Delivery	0	110	0.37	0.00	365	5.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manure Scraping	MST	275	0.37	0.08	52	5.00E-03	4.49E-03	8.63E-05	1.08E-05	3.59E-06
Manure Loading	0	0	0.37	0.00	52	5.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Feed Delivery	FDT1-2	284	0.37	2	365	5.00E-03	8.46E-01	2.32E-03	2.90E-04	9.65E-05

Note 1 : Emissions based on CalEEmod's Appendix D, defaults for the appropriate year and HP

Note 2: Increase in hours/day was provided by the project applicant

Note 3: Load factors from CalEEMod's Appendix D Table 3.3 OFFROAD Default Horsepower and Load Factors

Table 10. Truck Travel: CO Increased Emissions

Type of Vehicles	Source	Round Trip Distance (mi)	Emission Factor (g/mi)	Increase in Trucks/Year	Emissions (lb/Max 8-yr)	Emissions (lb/Max hr)
Milk Tankers	MTT	0.53	1.30	730	1.53E-03	1.53E-03
Commodity Delivery	CTT	2.68	1.30	730	7.68E-03	7.68E-03
Manure Transport	SMTT	2.33	1.30	200	6.69E-03	6.69E-03

Note 1: Running emission factors for vehicle category "T7 Single Other Class 8" were obtained from the EMFAC2021 Web Database for Merced County (2021) with an Aggregate Fleet Mix Travel

Note 2: Increases in trucks/yr is from the Initial Study, page 17

Table 11. Truck Idling: CO Increased Emissions

Type of Vehicles	Source	Emission Factor (g/hr-vehicle)	Minutes Idling/Truck	Increase in Trucks/Year	Emissions (lb/Max 8-hr)	Emissions (lb/Max hr)
Milk Tankers	MTI	1.01	15	730	5.55E-04	5.55E-04
Commodity Delivery	CTI	1.01	15	730	5.55E-04	5.55E-04
Manure Transport	SMTI	1.01	15	200	5.55E-04	5.55E-04

Note 1: Running emission factors for vehicle category "T7 Single Other Class 8" were obtained from the EMFAC2021 Web Database for Merced County (2021) with an Aggregate Fleet Mix Idling.

Note 2: Increases in trucks/yr is from the Initial Study, page 17

Table 12. Tractors: CO Increase Emissions

	Source (# Volume Sources)	HP	Load Factor	Hours/day	Days/Year	Emission Factor (g/hp-hr)	Emissions (lb/yr)	Emissions (lb/Max 8-hr)	Emissions (lb/Max hr)
Feed Loading	FLT	163	0.37	1	365	2.61E+00	1.27E+02	3.47E-01	3.47E-01
Bedding Delivery	0	110	0.37	0.00	365.00	3.73E+00	0.00E+00	0.00E+00	0.00E+00
Manure Scraping	MST	275	0.37	0.08	52.00	3.73E+00	3.35E+00	9.17E-03	1.19E-01
Manure Loading	0	0	0.37	0.00	52.00	3.73E+00	0.00E+00	0.00E+00	0.00E+00
Feed Delivery	FDT1-2	284	0.37	2	365	2.61E+00	4.41E+02	1.21E+00	6.05E-01

Note1 : Emissions based on EPA's *Nonroad Compression-Ignition Engines* - Exhaust Emission Standards for the appropriate year and HP

<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100OA05.pdf>

Note 2: Increase in hours/day was provided by the project applicant

Note 3: Load factors from CalEEMod's Appendix D Table 3.3 *OFFROAD Default Horsepower and Load Factors*

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**Hillcrest Dairy Phase 1****Merced County, Annual****1.0 Project Characteristics****1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	63.68	1000sqft	1.46	63,678.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	49
Climate Zone	3			Operational Year	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	CH4 Intensity (lb/MWhr)	0.033	N2O Intensity (lb/MWhr)	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Construction occurs during 6-month period

Trips and VMT -

Grading -

Vehicle Trips - Operational emissions not calculated.

Consumer Products - Operational emissions not calculated.

Area Coating - Operational emissions not calculated.

Landscape Equipment - Operational emissions not calculated.

Energy Use - Operational emissions not calculated.

Water And Wastewater - Operational emissions not calculated.

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Solid Waste - Operational emissions not calculated.

Construction Off-road Equipment Mitigation -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	200.00	116.00
tblConstructionPhase	NumDays	4.00	10.00
tblConstructionPhase	NumDays	2.00	5.00
tblConstructionPhase	PhaseEndDate	1/13/2023	9/30/2022
tblConstructionPhase	PhaseEndDate	4/8/2022	4/21/2022
tblConstructionPhase	PhaseEndDate	4/4/2022	4/7/2022
tblConstructionPhase	PhaseStartDate	4/9/2022	4/22/2022
tblConstructionPhase	PhaseStartDate	4/5/2022	4/8/2022
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	LightingElect	2.70	0.00
tblEnergyUse	NT24E	4.16	0.00
tblEnergyUse	NT24NG	3.84	0.00
tblEnergyUse	T24E	1.75	0.00
tblEnergyUse	T24NG	16.86	0.00
tblLandscapeEquipment	NumberSummerDays	180	0
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	78.96	0.00
tblVehicleTrips	ST_TR	6.42	0.00
tblVehicleTrips	SU_TR	5.09	0.00
tblVehicleTrips	WD_TR	3.93	0.00

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblWater	IndoorWaterUseRate	14,726,000.00	0.00
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2.0 Emissions Summary**2.1 Overall Construction****Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1165	0.8836	0.8892	1.7200e-003	0.0748	0.0399	0.1147	0.0310	0.0383	0.0693	0.0000	146.0465	146.0465	0.0231	2.1400e-003	147.2623
Maximum	0.1165	0.8836	0.8892	1.7200e-003	0.0748	0.0399	0.1147	0.0310	0.0383	0.0693	0.0000	146.0465	146.0465	0.0231	2.1400e-003	147.2623

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1165	0.8836	0.8892	1.7200e-003	0.0437	0.0399	0.0836	0.0160	0.0383	0.0543	0.0000	146.0464	146.0464	0.0231	2.1400e-003	147.2621
Maximum	0.1165	0.8836	0.8892	1.7200e-003	0.0437	0.0399	0.0836	0.0160	0.0383	0.0543	0.0000	146.0464	146.0464	0.0231	2.1400e-003	147.2621

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2022	6-30-2022	0.5065	0.5065
2	7-1-2022	9-30-2022	0.4907	0.4907
		Highest	0.5065	0.5065

Unmitigated Operational

[illegible]

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2022	4/7/2022	5	5	
2	Grading	Grading	4/8/2022	4/21/2022	5	10	
3	Building Construction	Building Construction	4/22/2022	9/30/2022	5	116	

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**Acres of Grading (Site Preparation Phase): 4.69****Acres of Grading (Grading Phase): 10****Acres of Paving: 0****Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	27.00	10.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0157	0.0000	0.0157	7.5100e-003	0.0000	7.5100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2800e-003	0.0366	0.0177	4.0000e-005		1.5600e-003	1.5600e-003		1.4300e-003	1.4300e-003	0.0000	3.7788	3.7788	1.2200e-003	0.0000	3.8094
Total	3.2800e-003	0.0366	0.0177	4.0000e-005	0.0157	1.5600e-003	0.0172	7.5100e-003	1.4300e-003	8.9400e-003	0.0000	3.7788	3.7788	1.2200e-003	0.0000	3.8094

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	9.0000e-005	9.5000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2102	0.2102	1.0000e-005	1.0000e-005	0.2124
Total	1.1000e-004	9.0000e-005	9.5000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2102	0.2102	1.0000e-005	1.0000e-005	0.2124

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.1100e-003	0.0000	6.1100e-003	2.9300e-003	0.0000	2.9300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2800e-003	0.0366	0.0177	4.0000e-005		1.5600e-003	1.5600e-003		1.4300e-003	1.4300e-003	0.0000	3.7788	3.7788	1.2200e-003	0.0000	3.8094
Total	3.2800e-003	0.0366	0.0177	4.0000e-005	6.1100e-003	1.5600e-003	7.6700e-003	2.9300e-003	1.4300e-003	4.3600e-003	0.0000	3.7788	3.7788	1.2200e-003	0.0000	3.8094

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	9.0000e-005	9.5000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2102	0.2102	1.0000e-005	1.0000e-005	0.2124
Total	1.1000e-004	9.0000e-005	9.5000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2102	0.2102	1.0000e-005	1.0000e-005	0.2124

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0354	0.0000	0.0354	0.0171	0.0000	0.0171	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7000e-003	0.0849	0.0461	1.0000e-004		3.7100e-003	3.7100e-003		3.4100e-003	3.4100e-003	0.0000	9.0514	9.0514	2.9300e-003	0.0000	9.1245
Total	7.7000e-003	0.0849	0.0461	1.0000e-004	0.0354	3.7100e-003	0.0391	0.0171	3.4100e-003	0.0205	0.0000	9.0514	9.0514	2.9300e-003	0.0000	9.1245

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.3 Grading - 2022****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	2.2000e-004	2.3700e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5255	0.5255	2.0000e-005	2.0000e-005	0.5309
Total	2.6000e-004	2.2000e-004	2.3700e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5255	0.5255	2.0000e-005	2.0000e-005	0.5309

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0138	0.0000	0.0138	6.6800e-003	0.0000	6.6800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7000e-003	0.0849	0.0461	1.0000e-004		3.7100e-003	3.7100e-003		3.4100e-003	3.4100e-003	0.0000	9.0514	9.0514	2.9300e-003	0.0000	9.1245
Total	7.7000e-003	0.0849	0.0461	1.0000e-004	0.0138	3.7100e-003	0.0175	6.6800e-003	3.4100e-003	0.0101	0.0000	9.0514	9.0514	2.9300e-003	0.0000	9.1245

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	2.2000e-004	2.3700e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5255	0.5255	2.0000e-005	2.0000e-005	0.5309
Total	2.6000e-004	2.2000e-004	2.3700e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5255	0.5255	2.0000e-005	2.0000e-005	0.5309

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0956	0.7252	0.7381	1.2800e-003		0.0342	0.0342		0.0330	0.0330	0.0000	105.3146	105.3146	0.0183	0.0000	105.7732
Total	0.0956	0.7252	0.7381	1.2800e-003		0.0342	0.0342		0.0330	0.0330	0.0000	105.3146	105.3146	0.0183	0.0000	105.7732

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.4 Building Construction - 2022****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2400e-003	0.0299	9.5100e-003	1.1000e-004	3.4700e-003	3.2000e-004	3.8000e-003	1.0000e-003	3.1000e-004	1.3100e-003	0.0000	10.7066	10.7066	7.0000e-005	1.6000e-003	11.1837
Worker	8.2400e-003	6.7400e-003	0.0744	1.8000e-004	0.0194	1.2000e-004	0.0195	5.1600e-003	1.1000e-004	5.2700e-003	0.0000	16.4594	16.4594	5.3000e-004	5.2000e-004	16.6282
Total	9.4800e-003	0.0366	0.0839	2.9000e-004	0.0229	4.4000e-004	0.0233	6.1600e-003	4.2000e-004	6.5800e-003	0.0000	27.1660	27.1660	6.0000e-004	2.1200e-003	27.8119

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0956	0.7252	0.7381	1.2800e-003		0.0342	0.0342		0.0330	0.0330	0.0000	105.3145	105.3145	0.0183	0.0000	105.7731
Total	0.0956	0.7252	0.7381	1.2800e-003		0.0342	0.0342		0.0330	0.0330	0.0000	105.3145	105.3145	0.0183	0.0000	105.7731

Hillcrest Dairy Phase 1 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.4 Building Construction - 2022****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2400e-003	0.0299	9.5100e-003	1.1000e-004	3.4700e-003	3.2000e-004	3.8000e-003	1.0000e-003	3.1000e-004	1.3100e-003	0.0000	10.7066	10.7066	7.0000e-005	1.6000e-003	11.1837
Worker	8.2400e-003	6.7400e-003	0.0744	1.8000e-004	0.0194	1.2000e-004	0.0195	5.1600e-003	1.1000e-004	5.2700e-003	0.0000	16.4594	16.4594	5.3000e-004	5.2000e-004	16.6282
Total	9.4800e-003	0.0366	0.0839	2.9000e-004	0.0229	4.4000e-004	0.0233	6.1600e-003	4.2000e-004	6.5800e-003	0.0000	27.1660	27.1660	6.0000e-004	2.1200e-003	27.8119

Hillcrest Dairy Phase 2 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**Hillcrest Dairy Phase 2****Merced County, Annual****1.0 Project Characteristics****1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	132.00	1000sqft	3.03	132,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	49
Climate Zone	3			Operational Year	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	CH4 Intensity (lb/MWhr)	0.033	N2O Intensity (lb/MWhr)	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Construction occurs during 6-month period

Trips and VMT -

Grading -

Vehicle Trips - Operational emissions not calculated.

Consumer Products - Operational emissions not calculated.

Area Coating - Operational emissions not calculated.

Landscape Equipment - Operational emissions not calculated.

Energy Use - Operational emissions not calculated.

Water And Wastewater - Operational emissions not calculated.

Hillcrest Dairy Phase 2 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Solid Waste - Operational emissions not calculated.

Construction Off-road Equipment Mitigation -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	230.00	115.00
tblConstructionPhase	NumDays	8.00	10.00
tblConstructionPhase	PhaseEndDate	9/6/2023	3/31/2023
tblConstructionPhase	PhaseEndDate	10/19/2022	10/21/2022
tblConstructionPhase	PhaseStartDate	10/20/2022	10/22/2022
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	LightingElect	2.70	0.00
tblEnergyUse	NT24E	4.16	0.00
tblEnergyUse	NT24NG	3.84	0.00
tblEnergyUse	T24E	1.75	0.00
tblEnergyUse	T24NG	16.86	0.00
tblLandscapeEquipment	NumberSummerDays	180	0
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	163.68	0.00
tblVehicleTrips	ST_TR	6.42	0.00
tblVehicleTrips	SU_TR	5.09	0.00
tblVehicleTrips	WD_TR	3.93	0.00
tblWater	IndoorWaterUseRate	30,525,000.00	0.00

2.0 Emissions Summary

Hillcrest Dairy Phase 2 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**2.1 Overall Construction****Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0694	0.6122	0.6147	1.1900e-003	0.1064	0.0294	0.1358	0.0483	0.0275	0.0757	0.0000	105.1845	105.1845	0.0214	2.0100e-003	106.3180
2023	0.0605	0.5041	0.6144	1.2100e-003	0.0265	0.0231	0.0495	7.1300e-003	0.0217	0.0288	0.0000	106.2509	106.2509	0.0185	2.4300e-003	107.4382
Maximum	0.0694	0.6122	0.6147	1.2100e-003	0.1064	0.0294	0.1358	0.0483	0.0275	0.0757	0.0000	106.2509	106.2509	0.0214	2.4300e-003	107.4382

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0694	0.6122	0.6147	1.1900e-003	0.0548	0.0294	0.0842	0.0224	0.0275	0.0499	0.0000	105.1844	105.1844	0.0214	2.0100e-003	106.3179
2023	0.0605	0.5041	0.6143	1.2100e-003	0.0265	0.0231	0.0495	7.1300e-003	0.0217	0.0288	0.0000	106.2508	106.2508	0.0185	2.4300e-003	107.4381
Maximum	0.0694	0.6122	0.6147	1.2100e-003	0.0548	0.0294	0.0842	0.0224	0.0275	0.0499	0.0000	106.2508	106.2508	0.0214	2.4300e-003	107.4381

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	10-1-2022	12-31-2022	0.6900	0.6900
2	1-1-2023	3-31-2023	0.5603	0.5603
		Highest	0.6900	0.6900

Unmitigated Operational

[illegible]

Hillcrest Dairy Phase 2 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	10/1/2022	10/7/2022	5	5	
2	Grading	Grading	10/8/2022	10/21/2022	5	10	
3	Building Construction	Building Construction	10/22/2022	3/31/2023	5	115	

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**Acres of Grading (Site Preparation Phase): 7.5****Acres of Grading (Grading Phase): 10****Acres of Paving: 0****Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	158	0.38
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	55.00	22.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0491	0.0000	0.0491	0.0253	0.0000	0.0253	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9300e-003	0.0827	0.0492	1.0000e-004		4.0300e-003	4.0300e-003		3.7100e-003	3.7100e-003	0.0000	8.3599	8.3599	2.7000e-003	0.0000	8.4274
Total	7.9300e-003	0.0827	0.0492	1.0000e-004	0.0491	4.0300e-003	0.0532	0.0253	3.7100e-003	0.0290	0.0000	8.3599	8.3599	2.7000e-003	0.0000	8.4274

Hillcrest Dairy Phase 2 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	1.9000e-004	2.1400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4730	0.4730	2.0000e-005	1.0000e-005	0.4778
Total	2.4000e-004	1.9000e-004	2.1400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4730	0.4730	2.0000e-005	1.0000e-005	0.4778

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0192	0.0000	0.0192	9.8500e-003	0.0000	9.8500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9300e-003	0.0827	0.0492	1.0000e-004		4.0300e-003	4.0300e-003		3.7100e-003	3.7100e-003	0.0000	8.3598	8.3598	2.7000e-003	0.0000	8.4274
Total	7.9300e-003	0.0827	0.0492	1.0000e-004	0.0192	4.0300e-003	0.0232	9.8500e-003	3.7100e-003	0.0136	0.0000	8.3598	8.3598	2.7000e-003	0.0000	8.4274

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	1.9000e-004	2.1400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4730	0.4730	2.0000e-005	1.0000e-005	0.4778
Total	2.4000e-004	1.9000e-004	2.1400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4730	0.4730	2.0000e-005	1.0000e-005	0.4778

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0354	0.0000	0.0354	0.0171	0.0000	0.0171	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7400e-003	0.1043	0.0764	1.5000e-004		4.7000e-003	4.7000e-003		4.3300e-003	4.3300e-003	0.0000	13.0274	13.0274	4.2100e-003	0.0000	13.1327
Total	9.7400e-003	0.1043	0.0764	1.5000e-004	0.0354	4.7000e-003	0.0401	0.0171	4.3300e-003	0.0215	0.0000	13.0274	13.0274	4.2100e-003	0.0000	13.1327

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	3.2000e-004	3.5600e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.4000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7883	0.7883	3.0000e-005	2.0000e-005	0.7964
Total	3.9000e-004	3.2000e-004	3.5600e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.4000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7883	0.7883	3.0000e-005	2.0000e-005	0.7964

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0138	0.0000	0.0138	6.6800e-003	0.0000	6.6800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.7400e-003	0.1043	0.0764	1.5000e-004		4.7000e-003	4.7000e-003		4.3300e-003	4.3300e-003	0.0000	13.0274	13.0274	4.2100e-003	0.0000	13.1327
Total	9.7400e-003	0.1043	0.0764	1.5000e-004	0.0138	4.7000e-003	0.0185	6.6800e-003	4.3300e-003	0.0110	0.0000	13.0274	13.0274	4.2100e-003	0.0000	13.1327

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	3.2000e-004	3.5600e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.4000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7883	0.7883	3.0000e-005	2.0000e-005	0.7964
Total	3.9000e-004	3.2000e-004	3.5600e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.4000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7883	0.7883	3.0000e-005	2.0000e-005	0.7964

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0427	0.3904	0.4091	6.7000e-004		0.0202	0.0202		0.0190	0.0190	0.0000	57.9313	57.9313	0.0139	0.0000	58.2783
Total	0.0427	0.3904	0.4091	6.7000e-004		0.0202	0.0202		0.0190	0.0190	0.0000	57.9313	57.9313	0.0139	0.0000	58.2783

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1800e-003	0.0283	9.0200e-003	1.1000e-004	3.2900e-003	3.1000e-004	3.6000e-003	9.5000e-004	2.9000e-004	1.2500e-003	0.0000	10.1528	10.1528	6.0000e-005	1.5100e-003	10.6053
Worker	7.2400e-003	5.9200e-003	0.0653	1.6000e-004	0.0171	1.0000e-004	0.0172	4.5300e-003	1.0000e-004	4.6300e-003	0.0000	14.4519	14.4519	4.6000e-004	4.6000e-004	14.6001
Total	8.4200e-003	0.0343	0.0743	2.7000e-004	0.0203	4.1000e-004	0.0208	5.4800e-003	3.9000e-004	5.8800e-003	0.0000	24.6047	24.6047	5.2000e-004	1.9700e-003	25.2053

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0427	0.3904	0.4091	6.7000e-004		0.0202	0.0202		0.0190	0.0190	0.0000	57.9312	57.9312	0.0139	0.0000	58.2782
Total	0.0427	0.3904	0.4091	6.7000e-004		0.0202	0.0202		0.0190	0.0190	0.0000	57.9312	57.9312	0.0139	0.0000	58.2782

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1800e-003	0.0283	9.0200e-003	1.1000e-004	3.2900e-003	3.1000e-004	3.6000e-003	9.5000e-004	2.9000e-004	1.2500e-003	0.0000	10.1528	10.1528	6.0000e-005	1.5100e-003	10.6053
Worker	7.2400e-003	5.9200e-003	0.0653	1.6000e-004	0.0171	1.0000e-004	0.0172	4.5300e-003	1.0000e-004	4.6300e-003	0.0000	14.4519	14.4519	4.6000e-004	4.6000e-004	14.6001
Total	8.4200e-003	0.0343	0.0743	2.7000e-004	0.0203	4.1000e-004	0.0208	5.4800e-003	3.9000e-004	5.8800e-003	0.0000	24.6047	24.6047	5.2000e-004	1.9700e-003	25.2053

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0511	0.4675	0.5279	8.8000e-004		0.0227	0.0227		0.0214	0.0214	0.0000	75.3365	75.3365	0.0179	0.0000	75.7846
Total	0.0511	0.4675	0.5279	8.8000e-004		0.0227	0.0227		0.0214	0.0214	0.0000	75.3365	75.3365	0.0179	0.0000	75.7846

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.4 Building Construction - 2023****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-004	0.0300	0.0101	1.3000e-004	4.2800e-003	1.9000e-004	4.4700e-003	1.2400e-003	1.8000e-004	1.4200e-003	0.0000	12.7301	12.7301	5.0000e-005	1.8900e-003	13.2954
Worker	8.5800e-003	6.6500e-003	0.0763	2.0000e-004	0.0222	1.3000e-004	0.0223	5.8900e-003	1.2000e-004	6.0100e-003	0.0000	18.1842	18.1842	5.3000e-004	5.4000e-004	18.3582
Total	9.3800e-003	0.0366	0.0864	3.3000e-004	0.0265	3.2000e-004	0.0268	7.1300e-003	3.0000e-004	7.4300e-003	0.0000	30.9143	30.9143	5.8000e-004	2.4300e-003	31.6537

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0511	0.4675	0.5279	8.8000e-004		0.0227	0.0227		0.0214	0.0214	0.0000	75.3365	75.3365	0.0179	0.0000	75.7845
Total	0.0511	0.4675	0.5279	8.8000e-004		0.0227	0.0227		0.0214	0.0214	0.0000	75.3365	75.3365	0.0179	0.0000	75.7845

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**3.4 Building Construction - 2023****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-004	0.0300	0.0101	1.3000e-004	4.2800e-003	1.9000e-004	4.4700e-003	1.2400e-003	1.8000e-004	1.4200e-003	0.0000	12.7301	12.7301	5.0000e-005	1.8900e-003	13.2954
Worker	8.5800e-003	6.6500e-003	0.0763	2.0000e-004	0.0222	1.3000e-004	0.0223	5.8900e-003	1.2000e-004	6.0100e-003	0.0000	18.1842	18.1842	5.3000e-004	5.4000e-004	18.3582
Total	9.3800e-003	0.0366	0.0864	3.3000e-004	0.0265	3.2000e-004	0.0268	7.1300e-003	3.0000e-004	7.4300e-003	0.0000	30.9143	30.9143	5.8000e-004	2.4300e-003	31.6537

APPENDIX B: AERMOD AND HARP2 ELECTRONIC FILES
