APPENDIX C

Toste Dairy Air Quality Calculations

VOC

Emission Source	Existing VOC/ ROG Emissions (lbs/yr)	Proposed VOC/ROG Emissions (lbs/yr)	Increment of Increase with Proposed Expansion
Feed and Manure Management	54,055	70,501	
Tons/Year	27.03	35.25	**8.22**

VOC emissions from feed and manure management (including cow housing, liquid manure, and solid manure) were estimated using the SJVAPCD dairy emissions calculator. See this Appendix C for calculator emissions.

PM 10 Emissions

Type of Cow	Existing Total Emissions (lbs/yr)	Proposed Total Emissions (lbs/ yr)	
Animal Movement	25,620	12,415	
Tons/Year	**12.81**	**6.21**	**-6.60**

See this Appendix C for calculator emissions.

Greenhouse Gas Emission Rates for Electricity Use		
eGrid State	Average Output Emission Rate (lb CO2e/MWh)	Average Output Emission Rate (lb CO2e/kWh)
California	422.029	0.422029
Source: eGRID2018. Released 1/28/2020. Accessed at: <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>		

GHG Emissions from Energy Consumption

	Herd Count	Estimated Electricity Use per Cow (kWh/yr/cow)	Average Electricity Use (kWh/yr)	GHG Emission Rate (lbs CO_2e/kWh)	GHG Emissions (lbs CO_2e/yr)	GHG Emissions (metric tons CO_2e/yr)
2018/2019 average PG&E	4,650	354	1,645,690	0.4220	694,529	**315.03**
Expansion Projection	5,950	354	2,105,775	0.4220	888,698	**403.11**
Increment of Increase	1,300	354	460,085	-	194,169	**88.07**

Electricity use provided by the project applicant. The Expansion Projection conservatively assumes the same electricity use per cow.
Source: eGRID2018. Released 1/28/2020. Accessed at: <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>

Total Greenhouse Gas Emissions

	Increased Herd (metric tons CO_2e/yr)	Increased Mobile Source (metric tons CO_2e/yr)	Increased Electricity (metric tons CO_2e/yr)	GHG Emissions (metric tons CO_2/yr)
Toste Dairy Expansion	6,996	83	88	**7,167**

GHG emissions from the herd were estimated using the SJVAPCD dairy emissions calculator. Mobile Source emissions were estimated using CalEEMod. See this Appendix C for calculator and modeling results.

Conversion Factors			
1 megawatt-hour (MWh)		1,000 kilowatt-hour (kWh)	
1 short ton		2,000 pounds (lb)	
1.10231 short ton		1 metric ton	
2.2046 lb		1 kilogram (kg)	

"Remarks" for the Toste Dairy Expansion Project CalEEMod (v.2016.3.2) Model Run

"Remarks" are typically used in California Emissions Estimator Model (CalEEMod) to explain non-default inputs. For the current modeling, this document replaces the "remarks" section of the referenced CalEEMod model to provide more space to both identify non-default inputs and to explain how CalEEMod is used to calculate emissions for the current project. When defaults were retained and no further explanation was necessary, no "remarks" are recorded below.

The proposed project construction emissions and increment of increase of operational emissions were estimated as set forth below.

Toste Dairy Model Run – Construction (2028) and Operation (2029)

Land Use

- The General Light Industrial land use subtype was used to represent the dairy project, an industrial agriculture project. With implementation of the proposed dairy expansion, new structures would consist of approximately 375,500 square feet of construction, and 150,075 square feet of concrete operational areas. Approximately 42,440 square feet of existing buildings would be removed.

Construction Phase

- The proposed dairy expansion would be constructed in two phases. Phase 1 would include construction of the two proposed freestall barns within 8-10 years of project approval. The balance of improvements and herd expansion would likely occur within the subsequent 10 years. To calculate the worst-case scenario, all project components were assumed to be constructed in one phase, with construction beginning in 2028.
- Off-road Equipment - While there would likely be a small construction crew, most default equipment was used since construction details are unknown at this time.

Vehicle Trips

- Since the residential dwellings and employees would not change, these trips were not included in the model as an increment of increase. Animal Confinement Facilities operate 7 days a week. The proposed expanded operations would generate an increase of approximately 9.7 average daily trips (ADTs) (or 0.026 trips per 1,000 square feet).

Operational Off-Road Equipment

- The increase in the number of hours for bedding delivery and feed delivery was used based on estimates from the project applicant.

Area Sources, Energy Use, Water and Wastewater, Solid Waste

- These rates are not applicable to the Toste Dairy, and were not included.

Toste Dairy Construction

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	375.50	1000sqft	8.62	375,500.00	0
Other Non-Asphalt Surfaces	150.07	1000sqft	3.45	150,075.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	3			**Operational Year**	2029
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - See notes

Construction Phase -

Demolition -

Grading - Limited Grading

Vehicle Trips - See notes

Off-road Equipment - Limited demolition

Consumer Products - See notes

Area Coating - No interior coatings

Landscape Equipment - No landscaping

Energy Use - n/a

Water And Wastewater - n/a

Solid Waste - n/a

Operational Off-Road Equipment - Feed loading, Bedding, Manure Scraping, Manure Loading, Feed Delivery

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Interior	563250	0
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblEnergyUse	LightingElect	2.70	0.00
tblEnergyUse	NT24E	4.16	0.00
tblEnergyUse	NT24NG	3.84	0.00
tblEnergyUse	T24E	1.96	0.00
tblEnergyUse	T24NG	17.03	0.00
tblGrading	AcresOfGrading	10.00	5.00
tblLandUse	LandUseSquareFeet	150,070.00	150,075.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	52.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	4.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperHorsePower	97.00	106.00
tblOperationalOffRoadEquipment	OperHorsePower	97.00	139.00
tblOperationalOffRoadEquipment	OperHorsePower	97.00	139.00
tblOperationalOffRoadEquipment	OperHorsePower	97.00	160.00
tblOperationalOffRoadEquipment	OperHorsePower	97.00	140.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	2.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	1.54
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	4.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	0.36
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	4.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	465.62	0.00
tblVehicleTrips	ST_TR	1.32	0.03
tblVehicleTrips	SU_TR	0.68	0.03
tblVehicleTrips	WD_TR	6.97	0.03
tblWater	IndoorWaterUseRate	86,834,375.00	0.00

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					
2028	0.2989	2.5894	2.8595	8.2500e-003	0.3650	0.0818	0.4468	0.1063	0.0764	0.1827	0.0000	740.5034	740.5034	0.1116	0.0000	743.2935
2029	2.7666	1.0653	1.2879	3.7200e-003	0.1701	0.0321	0.2022	0.0458	0.0302	0.0760	0.0000	334.3156	334.3156	0.0446	0.0000	335.4300
Maximum	**2.7666**	**2.5894**	**2.8595**	**8.2500e-003**	**0.3650**	**0.0818**	**0.4468**	**0.1063**	**0.0764**	**0.1827**	**0.0000**	**740.5034**	**740.5034**	**0.1116**	**0.0000**	**743.2935**

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					
2028	0.2989	2.5894	2.8595	8.2500e-003	0.3650	0.0818	0.4468	0.1063	0.0764	0.1827	0.0000	740.5030	740.5030	0.1116	0.0000	743.2931
2029	2.7666	1.0653	1.2879	3.7200e-003	0.1701	0.0321	0.2022	0.0458	0.0302	0.0760	0.0000	334.3154	334.3154	0.0446	0.0000	335.4298
Maximum	**2.7666**	**2.5894**	**2.8595**	**8.2500e-003**	**0.3650**	**0.0818**	**0.4468**	**0.1063**	**0.0764**	**0.1827**	**0.0000**	**740.5030**	**740.5030**	**0.1116**	**0.0000**	**743.2931**

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	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	N20	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-3-2028**	**4-2-2028**	0.7788	0.7788
2	**4-3-2028**	**7-2-2028**	0.7060	0.7060
3	**7-3-2028**	**10-2-2028**	0.7138	0.7138
4	**10-3-2028**	**1-2-2029**	0.7165	0.7165
5	**1-3-2029**	**4-2-2029**	0.6961	0.6961
6	**4-3-2029**	**7-2-2029**	2.0637	2.0637
7	**7-3-2029**	**9-30-2029**	1.0440	1.0440
		Highest	2.0637	2.0637

2.2 Overall Operational

Unmitigated 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	0.0684					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	5.2300e-003	0.0649	0.0568	3.0000e-004	0.0167	2.7000e-004	0.0169	4.4900e-003	2.5000e-004	4.7400e-003	0.0000	27.6005	27.6005	2.0600e-003	0.0000	27.6521
Offroad	0.0223	0.1808	0.4098	6.3000e-004		8.3600e-003	8.3600e-003		7.6900e-003	7.6900e-003	0.0000	54.9031	54.9031	0.0178	0.0000	55.3470
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	**0.0959**	**0.2457**	**0.4665**	**9.3000e-004**	**0.0167**	**8.6300e-003**	**0.0253**	**4.4900e-003**	**7.9400e-003**	**0.0124**	**0.0000**	**82.5036**	**82.5036**	**0.0198**	**0.0000**	**82.9991**

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	0.0684					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	5.2300e-003	0.0649	0.0568	3.0000e-004	0.0167	2.7000e-004	0.0169	4.4900e-003	2.5000e-004	4.7400e-003	0.0000	27.6005	27.6005	2.0600e-003	0.0000	27.6521
Offroad	0.0223	0.1808	0.4098	6.3000e-004		8.3600e-003	8.3600e-003		7.6900e-003	7.6900e-003	0.0000	54.9031	54.9031	0.0178	0.0000	55.3470
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	**0.0959**	**0.2457**	**0.4665**	**9.3000e-004**	**0.0167**	**8.6300e-003**	**0.0253**	**4.4900e-003**	**7.9400e-003**	**0.0124**	**0.0000**	**82.5036**	**82.5036**	**0.0198**	**0.0000**	**82.9991**

	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	N20	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	Demolition	Demolition	1/3/2028	1/28/2028	5	20	
2	Site Preparation	Site Preparation	1/29/2028	2/11/2028	5	10	
3	Grading	Grading	2/12/2028	3/24/2028	5	30	
4	Building Construction	Building Construction	3/25/2028	5/18/2029	5	300	
5	Paving	Paving	5/19/2029	6/15/2029	5	20	
6	Architectural Coating	Architectural Coating	6/16/2029	7/13/2029	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 5

Acres of Paving: 3.45

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 563,250; Non-Residential Outdoor: 187,750; Striped Parking Area: 9,005 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	158	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	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
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	221.00	86.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	44.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2028

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					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0111	0.1012	0.0990	2.0000e-004		4.4300e-003	4.4300e-003		4.1500e-003	4.1500e-003	0.0000	17.4176	17.4176	4.1300e-003	0.0000	17.5209
Total	**0.0111**	**0.1012**	**0.0990**	**2.0000e-004**	**2.0000e-005**	**4.4300e-003**	**4.4500e-003**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**17.4176**	**17.4176**	**4.1300e-003**	**0.0000**	**17.5209**

3.2 Demolition - 2028

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	5.3000e-004	3.1000e-004	3.7300e-003	1.0000e-005	1.8600e-003	1.0000e-005	1.8700e-003	4.9000e-004	1.0000e-005	5.0000e-004	0.0000	1.2677	1.2677	2.0000e-005	0.0000	1.2682
Total	**5.3000e-004**	**3.1000e-004**	**3.7300e-003**	**1.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8700e-003**	**4.9000e-004**	**1.0000e-005**	**5.0000e-004**	**0.0000**	**1.2677**	**1.2677**	**2.0000e-005**	**0.0000**	**1.2682**

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					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0111	0.1012	0.0990	2.0000e-004		4.4300e-003	4.4300e-003		4.1500e-003	4.1500e-003	0.0000	17.4176	17.4176	4.1300e-003	0.0000	17.5209
Total	**0.0111**	**0.1012**	**0.0990**	**2.0000e-004**	**2.0000e-005**	**4.4300e-003**	**4.4500e-003**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**17.4176**	**17.4176**	**4.1300e-003**	**0.0000**	**17.5209**

3.2 Demolition - 2028

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	5.3000e-004	3.1000e-004	3.7300e-003	1.0000e-005	1.8600e-003	1.0000e-005	1.8700e-003	4.9000e-004	1.0000e-005	5.0000e-004	0.0000	1.2677	1.2677	2.0000e-005	0.0000	1.2682
Total	**5.3000e-004**	**3.1000e-004**	**3.7300e-003**	**1.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8700e-003**	**4.9000e-004**	**1.0000e-005**	**5.0000e-004**	**0.0000**	**1.2677**	**1.2677**	**2.0000e-005**	**0.0000**	**1.2682**

3.3 Site Preparation - 2028

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					0.0181	0.0000	0.0181	9.9300e-003	0.0000	9.9300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1262	0.0896	1.9000e-004		5.4300e-003	5.4300e-003		5.0000e-003	5.0000e-003	0.0000	16.7335	16.7335	5.4100e-003	0.0000	16.8688
Total	**0.0124**	**0.1262**	**0.0896**	**1.9000e-004**	**0.0181**	**5.4300e-003**	**0.0235**	**9.9300e-003**	**5.0000e-003**	**0.0149**	**0.0000**	**16.7335**	**16.7335**	**5.4100e-003**	**0.0000**	**16.8688**

3.3 Site Preparation - 2028

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	3.2000e-004	1.9000e-004	2.2400e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1200e-003	3.0000e-004	1.0000e-005	3.0000e-004	0.0000	0.7606	0.7606	1.0000e-005	0.0000	0.7609
Total	**3.2000e-004**	**1.9000e-004**	**2.2400e-003**	**1.0000e-005**	**1.1200e-003**	**1.0000e-005**	**1.1200e-003**	**3.0000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.7606**	**0.7606**	**1.0000e-005**	**0.0000**	**0.7609**

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					0.0181	0.0000	0.0181	9.9300e-003	0.0000	9.9300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1262	0.0896	1.9000e-004		5.4300e-003	5.4300e-003		5.0000e-003	5.0000e-003	0.0000	16.7335	16.7335	5.4100e-003	0.0000	16.8688
Total	**0.0124**	**0.1262**	**0.0896**	**1.9000e-004**	**0.0181**	**5.4300e-003**	**0.0235**	**9.9300e-003**	**5.0000e-003**	**0.0149**	**0.0000**	**16.7335**	**16.7335**	**5.4100e-003**	**0.0000**	**16.8688**

3.3 Site Preparation - 2028

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	3.2000e-004	1.9000e-004	2.2400e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1200e-003	3.0000e-004	1.0000e-005	3.0000e-004	0.0000	0.7606	0.7606	1.0000e-005	0.0000	0.7609
Total	**3.2000e-004**	**1.9000e-004**	**2.2400e-003**	**1.0000e-005**	**1.1200e-003**	**1.0000e-005**	**1.1200e-003**	**3.0000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.7606**	**0.7606**	**1.0000e-005**	**0.0000**	**0.7609**

3.4 Grading - 2028

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					0.0147	0.0000	0.0147	6.9100e-003	0.0000	6.9100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0435	0.4191	0.3950	9.3000e-004		0.0170	0.0170		0.0156	0.0156	0.0000	81.7593	81.7593	0.0264	0.0000	82.4204
Total	**0.0435**	**0.4191**	**0.3950**	**9.3000e-004**	**0.0147**	**0.0170**	**0.0317**	**6.9100e-003**	**0.0156**	**0.0225**	**0.0000**	**81.7593**	**81.7593**	**0.0264**	**0.0000**	**82.4204**

3.4 Grading - 2028

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	1.0500e-003	6.2000e-004	7.4500e-003	3.0000e-005	3.7200e-003	2.0000e-005	3.7400e-003	9.9000e-004	2.0000e-005	1.0100e-003	0.0000	2.5353	2.5353	5.0000e-005	0.0000	2.5365
Total	**1.0500e-003**	**6.2000e-004**	**7.4500e-003**	**3.0000e-005**	**3.7200e-003**	**2.0000e-005**	**3.7400e-003**	**9.9000e-004**	**2.0000e-005**	**1.0100e-003**	**0.0000**	**2.5353**	**2.5353**	**5.0000e-005**	**0.0000**	**2.5365**

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					0.0147	0.0000	0.0147	6.9100e-003	0.0000	6.9100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0435	0.4191	0.3950	9.3000e-004		0.0170	0.0170		0.0156	0.0156	0.0000	81.7592	81.7592	0.0264	0.0000	82.4203
Total	**0.0435**	**0.4191**	**0.3950**	**9.3000e-004**	**0.0147**	**0.0170**	**0.0317**	**6.9100e-003**	**0.0156**	**0.0225**	**0.0000**	**81.7592**	**81.7592**	**0.0264**	**0.0000**	**82.4203**

3.4 Grading - 2028

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	1.0500e-003	6.2000e-004	7.4500e-003	3.0000e-005	3.7200e-003	2.0000e-005	3.7400e-003	9.9000e-004	2.0000e-005	1.0100e-003	0.0000	2.5353	2.5353	5.0000e-005	0.0000	2.5365
Total	**1.0500e-003**	**6.2000e-004**	**7.4500e-003**	**3.0000e-005**	**3.7200e-003**	**2.0000e-005**	**3.7400e-003**	**9.9000e-004**	**2.0000e-005**	**1.0100e-003**	**0.0000**	**2.5353**	**2.5353**	**5.0000e-005**	**0.0000**	**2.5365**

3.5 Building Construction - 2028

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	0.1367	1.2470	1.6085	2.7000e-003		0.0528	0.0528		0.0496	0.0496	0.0000	231.9195	231.9195	0.0545	0.0000	233.2824
Total	**0.1367**	**1.2470**	**1.6085**	**2.7000e-003**		**0.0528**	**0.0528**		**0.0496**	**0.0496**	**0.0000**	**231.9195**	**231.9195**	**0.0545**	**0.0000**	**233.2824**

3.5 Building Construction - 2028

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	0.0156	0.6491	0.1051	2.1200e-003	0.0515	5.9000e-004	0.0521	0.0149	5.6000e-004	0.0155	0.0000	201.3434	201.3434	0.0176	0.0000	201.7823
Worker	0.0777	0.0457	0.5490	2.0600e-003	0.2741	1.5500e-003	0.2756	0.0728	1.4300e-003	0.0743	0.0000	186.7666	186.7666	3.4600e-003	0.0000	186.8531
Total	**0.0933**	**0.6948**	**0.6541**	**4.1800e-003**	**0.3255**	**2.1400e-003**	**0.3277**	**0.0877**	**1.9900e-003**	**0.0897**	**0.0000**	**388.1100**	**388.1100**	**0.0210**	**0.0000**	**388.6354**

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	0.1367	1.2470	1.6085	2.7000e-003		0.0528	0.0528		0.0496	0.0496	0.0000	231.9192	231.9192	0.0545	0.0000	233.2821
Total	**0.1367**	**1.2470**	**1.6085**	**2.7000e-003**		**0.0528**	**0.0528**		**0.0496**	**0.0496**	**0.0000**	**231.9192**	**231.9192**	**0.0545**	**0.0000**	**233.2821**

3.5 Building Construction - 2028

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	0.0156	0.6491	0.1051	2.1200e-003	0.0515	5.9000e-004	0.0521	0.0149	5.6000e-004	0.0155	0.0000	201.3434	201.3434	0.0176	0.0000	201.7823
Worker	0.0777	0.0457	0.5490	2.0600e-003	0.2741	1.5500e-003	0.2756	0.0728	1.4300e-003	0.0743	0.0000	186.7666	186.7666	3.4600e-003	0.0000	186.8531
Total	**0.0933**	**0.6948**	**0.6541**	**4.1800e-003**	**0.3255**	**2.1400e-003**	**0.3277**	**0.0877**	**1.9900e-003**	**0.0897**	**0.0000**	**388.1100**	**388.1100**	**0.0210**	**0.0000**	**388.6354**

3.5 Building Construction - 2029

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	0.0684	0.6235	0.8042	1.3500e-003		0.0264	0.0264		0.0248	0.0248	0.0000	115.9597	115.9597	0.0273	0.0000	116.6412
Total	**0.0684**	**0.6235**	**0.8042**	**1.3500e-003**		**0.0264**	**0.0264**		**0.0248**	**0.0248**	**0.0000**	**115.9597**	**115.9597**	**0.0273**	**0.0000**	**116.6412**

3.5 Building Construction - 2029

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	7.6400e-003	0.3226	0.0507	1.0600e-003	0.0258	2.9000e-004	0.0260	7.4400e-003	2.8000e-004	7.7200e-003	0.0000	100.2654	100.2654	9.0500e-003	0.0000	100.4916
Worker	0.0359	0.0208	0.2554	1.0000e-003	0.1370	7.2000e-004	0.1377	0.0364	6.6000e-004	0.0371	0.0000	90.6764	90.6764	1.5700e-003	0.0000	90.7157
Total	**0.0435**	**0.3434**	**0.3061**	**2.0600e-003**	**0.1628**	**1.0100e-003**	**0.1638**	**0.0439**	**9.4000e-004**	**0.0448**	**0.0000**	**190.9418**	**190.9418**	**0.0106**	**0.0000**	**191.2073**

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	0.0684	0.6235	0.8042	1.3500e-003		0.0264	0.0264		0.0248	0.0248	0.0000	115.9596	115.9596	0.0273	0.0000	116.6411
Total	**0.0684**	**0.6235**	**0.8042**	**1.3500e-003**		**0.0264**	**0.0264**		**0.0248**	**0.0248**	**0.0000**	**115.9596**	**115.9596**	**0.0273**	**0.0000**	**116.6411**

3.5 Building Construction - 2029

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	7.6400e-003	0.3226	0.0507	1.0600e-003	0.0258	2.9000e-004	0.0260	7.4400e-003	2.8000e-004	7.7200e-003	0.0000	100.2654	100.2654	9.0500e-003	0.0000	100.4916
Worker	0.0359	0.0208	0.2554	1.0000e-003	0.1370	7.2000e-004	0.1377	0.0364	6.6000e-004	0.0371	0.0000	90.6764	90.6764	1.5700e-003	0.0000	90.7157
Total	**0.0435**	**0.3434**	**0.3061**	**2.0600e-003**	**0.1628**	**1.0100e-003**	**0.1638**	**0.0439**	**9.4000e-004**	**0.0448**	**0.0000**	**190.9418**	**190.9418**	**0.0106**	**0.0000**	**191.2073**

3.6 Paving - 2029

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	9.1500e-003	0.0858	0.1458	2.3000e-004		4.1900e-003	4.1900e-003		3.8500e-003	3.8500e-003	0.0000	20.0193	20.0193	6.4700e-003	0.0000	20.1811
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.1500e-003**	**0.0858**	**0.1458**	**2.3000e-004**		**4.1900e-003**	**4.1900e-003**		**3.8500e-003**	**3.8500e-003**	**0.0000**	**20.0193**	**20.0193**	**6.4700e-003**	**0.0000**	**20.1811**

3.6 Paving - 2029

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	4.9000e-004	2.8000e-004	3.4700e-003	1.0000e-005	1.8600e-003	1.0000e-005	1.8700e-003	4.9000e-004	1.0000e-005	5.0000e-004	0.0000	1.2309	1.2309	2.0000e-005	0.0000	1.2314
Total	**4.9000e-004**	**2.8000e-004**	**3.4700e-003**	**1.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8700e-003**	**4.9000e-004**	**1.0000e-005**	**5.0000e-004**	**0.0000**	**1.2309**	**1.2309**	**2.0000e-005**	**0.0000**	**1.2314**

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	9.1500e-003	0.0858	0.1458	2.3000e-004		4.1900e-003	4.1900e-003		3.8500e-003	3.8500e-003	0.0000	20.0192	20.0192	6.4700e-003	0.0000	20.1811
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.1500e-003**	**0.0858**	**0.1458**	**2.3000e-004**		**4.1900e-003**	**4.1900e-003**		**3.8500e-003**	**3.8500e-003**	**0.0000**	**20.0192**	**20.0192**	**6.4700e-003**	**0.0000**	**20.1811**

3.6 Paving - 2029

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	4.9000e-004	2.8000e-004	3.4700e-003	1.0000e-005	1.8600e-003	1.0000e-005	1.8700e-003	4.9000e-004	1.0000e-005	5.0000e-004	0.0000	1.2309	1.2309	2.0000e-005	0.0000	1.2314
Total	**4.9000e-004**	**2.8000e-004**	**3.4700e-003**	**1.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8700e-003**	**4.9000e-004**	**1.0000e-005**	**5.0000e-004**	**0.0000**	**1.2309**	**1.2309**	**2.0000e-005**	**0.0000**	**1.2314**

3.7 Architectural Coating - 2029

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					
Archit. Coating	2.6420					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0115	0.0181	3.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5567
Total	**2.6437**	**0.0115**	**0.0181**	**3.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5567**

3.7 Architectural Coating - 2029

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	1.4300e-003	8.3000e-004	0.0102	4.0000e-005	5.4600e-003	3.0000e-005	5.4800e-003	1.4500e-003	3.0000e-005	1.4800e-003	0.0000	3.6107	3.6107	6.0000e-005	0.0000	3.6122
Total	**1.4300e-003**	**8.3000e-004**	**0.0102**	**4.0000e-005**	**5.4600e-003**	**3.0000e-005**	**5.4800e-003**	**1.4500e-003**	**3.0000e-005**	**1.4800e-003**	**0.0000**	**3.6107**	**3.6107**	**6.0000e-005**	**0.0000**	**3.6122**

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					
Archit. Coating	2.6420					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0115	0.0181	3.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5567
Total	**2.6437**	**0.0115**	**0.0181**	**3.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5567**

3.7 Architectural Coating - 2029

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	1.4300e-003	8.3000e-004	0.0102	4.0000e-005	5.4600e-003	3.0000e-005	5.4800e-003	1.4500e-003	3.0000e-005	1.4800e-003	0.0000	3.6107	3.6107	6.0000e-005	0.0000	3.6122
Total	**1.4300e-003**	**8.3000e-004**	**0.0102**	**4.0000e-005**	**5.4600e-003**	**3.0000e-005**	**5.4800e-003**	**1.4500e-003**	**3.0000e-005**	**1.4800e-003**	**0.0000**	**3.6107**	**3.6107**	**6.0000e-005**	**0.0000**	**3.6122**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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					
Mitigated	5.2300e-003	0.0649	0.0568	3.0000e-004	0.0167	2.7000e-004	0.0169	4.4900e-003	2.5000e-004	4.7400e-003	0.0000	27.6005	27.6005	2.0600e-003	0.0000	27.6521
Unmitigated	5.2300e-003	0.0649	0.0568	3.0000e-004	0.0167	2.7000e-004	0.0169	4.4900e-003	2.5000e-004	4.7400e-003	0.0000	27.6005	27.6005	2.0600e-003	0.0000	27.6521

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	11.27	11.27	11.27	43,522	43,522
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	11.27	11.27	11.27	43,522	43,522

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.498498	0.030090	0.155509	0.109662	0.018147	0.004601	0.015536	0.154991	0.002397	0.002156	0.006230	0.001554	0.000628
Other Non-Asphalt Surfaces	0.498498	0.030090	0.155509	0.109662	0.018147	0.004601	0.015536	0.154991	0.002397	0.002156	0.006230	0.001554	0.000628

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	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					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0	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
Other Non-Asphalt Surfaces	0	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
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**

Mitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0	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
Other Non-Asphalt Surfaces	0	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
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**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	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					
Mitigated	0.0684					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0684					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	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
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0684					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0684**					**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.2 Area by SubCategory

Mitigated

	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
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0684					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0684**					**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Tractors/Loaders/Backhoes	1	2.00	365	106	0.37	Diesel
Tractors/Loaders/Backhoes	1	1.54	52	139	0.37	Diesel
Tractors/Loaders/Backhoes	1	4.00	4	139	0.37	Diesel
Tractors/Loaders/Backhoes	1	0.36	365	160	0.37	Diesel
Tractors/Loaders/Backhoes	1	4.00	365	140	0.37	Diesel

UnMitigated/Mitigated

	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
Equipment Type	tons/yr										MT/yr					
Tractors/Loaders/ Backhoes	0.0223	0.1808	0.4098	6.3000e-004		8.3600e-003	8.3600e-003		7.6900e-003	7.6900e-003	0.0000	54.9031	54.9031	0.0178	0.0000	55.3470
Total	**0.0223**	**0.1808**	**0.4098**	**6.3000e-004**		**8.3600e-003**	**8.3600e-003**		**7.6900e-003**	**7.6900e-003**	**0.0000**	**54.9031**	**54.9031**	**0.0178**	**0.0000**	**55.3470**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Rev. May 8, 2018

Pre-Project Facility Information

1. Does this facility house Holstein or Jersey cows? Holstein
   Most facilities house Holstein cows unless explicitly stated on the PTO or application.
2. Does the facility have an anaerobic treatment lagoon? no
3. Does the facility land apply liquid manure? yes
   Answering "yes" assumes worst case.
4. Does the facility land apply solid manure? yes
   Answering "yes" assumes worst case.
5. Is any scraped manure sent to a lagoon/storage pond? yes
   Answering "yes" assumes worst case.

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	1,500				1,500		
Dry Cows			450		450		
Support Stock (Heifers, Calves, and Bulls)					0		
Large Heifers					0		
Medium Heifers			400	2,100	2,500		
Small Heifers			200		200		
Bulls					0		
	Calf Hutches				Calf Corrals		
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	Total # of Calves
Calves							0

Total Herd Summary	
Total Milk Cows	1,500
Total Mature Cows	1,950
Support Stock (Heifers, Calves, and Bulls)	2,700
Total Calves	0
Total Dairy Head	4,650

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

Post-Project Facility Information

1. Does this facility house Holstein or Jersey cows? Holstein
   Most facilities house Holstein cows unless explicitly stated on the PTO or application.
2. Does the facility have an anaerobic treatment lagoon? no
3. Does the facility land apply liquid manure? yes
   Answering "yes" assumes worst case.
4. Does the facility land apply solid manure? yes
   Answering "yes" assumes worst case.
5. Is any scraped manure sent to a lagoon/storage pond? yes
   Answering "yes" assumes worst case.

NOTE: An increase in total lagoon/storage pond surface area may result in an increase in H2S emissions. The District's Technical Services Division may need to conduct H2S modeling.

6. Does this project result in any new lagoon/storage pond(s) or an increase in surface area for any existing lagoon/storage pond(s)? yes

Post-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	2,500				2,500		
Dry Cows			500		500		
Support Stock (Heifers, Calves, and Bulls)					0		
Large Heifers					0		
Medium Heifers	1,800			750	2,550		
Small Heifers			200	200	400		
Bulls					0		
	Calf Hutches				Calf Corrals		
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	Total # of Calves
Calves							0

Total Herd Summary	
Total Milk Cows	2,500
Total Mature Cows	3,000
Support Stock (Heifers, Calves, and Bulls)	2,950
Total Calves	0
Total Dairy Head	5,950

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

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

Pre-Project Potential to Emit (PE1)

Pre-Project Herd Size					
Herd	**Flushed Freestalls**	**Scraped Freestalls**	**Flushed Corrals**	**Scraped Corrals**	**Total # of Animals**
Milk Cows	1,500	0	0	0	1,500
Dry Cows	0	0	450	0	450
Support Stock (Heifers, Calves and Bulls)	0	0	0	0	0
Large Heifers	0	0	0	0	0
Medium Heifers	0	0	400	2,100	2,500
Small Heifers	0	0	200	0	200
Bulls	0	0	0	0	0

	Calf Hutches				Calf Corrals		
	Aboveground Flushed	**Aboveground Scraped**	**On-Ground Flushed**	**On-Ground Scraped**	**Flushed**	**Scraped**	**Total # of Calves**
Calves	0	0	0	0	0	0	0

Silage Information				
Feed Type	Maximum # Open Piles	Maximum Height (ft)	Maximum Width (ft)	Open Face Area (ft^2)
Corn	0	0	0	
Alfalfa	0	0	0	
Wheat	0	0	0	

Milking Parlor				
Cow	VOC		NH3	
Milk Cows	lb/day	lb/yr	lb/day	lb/yr
	1.6	**600**	**0.6**	**205**

Cow Housing						
Cow	VOC		NH3		PM10	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Total	**70.7**	**25,781**	**234.6**	**85,586**	**70.1**	**25,620**

Liquid Manure Handling						
Cow	VOC		NH3		H2S*	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	10.0	3,645	50.6	18,465	N/A	N/A
Dry Cows	1.6	599	7.7	2,817	N/A	N/A
Support Stock (Heifers, Calves and Bulls)	0.0	0	0.0	0	N/A	N/A
Large Heifers	0.0	0	0.0	0	N/A	N/A
Medium Heifers	4.7	1,725	15.8	5,750	N/A	N/A
Small Heifers	0.2	76	1.0	360	N/A	N/A
Calves	0.0	0	0.0	0	N/A	N/A
Bulls	0.0	0	0.0	0	N/A	N/A
Total	**16.5**	**6,045**	**75.1**	**27,392**	**N/A***	**N/A***

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	2.0	735	11.6	4,245
Dry Cows	0.3	117	1.8	644
Support Stock (Heifers, Calves and Bulls)	0.0	0	0.0	0
Large Heifers	0.0	0	0.0	0
Medium Heifers	1.0	350	3.6	1,325
Small Heifers	0.0	16	0.2	80
Calves	0.0	0	0.0	0
Bulls	0.0	0	0.0	0
Total	**3.3**	**1,218**	**17.2**	**6,294**

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	0.0	0
Alfalfa Emissions	0.0	0
Wheat Emissions	0.0	0
TMR	126.6	46,192
Total	**126.6**	**46,192**

Calculations for milking parlor:

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

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

Calculations for cow housing:

See detailed calculations under Cow Housing Calculations worksheet.

Calculations for liquid manure and solid manure handling:

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

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

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

Calculations for silage emissions:

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

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

Calculation for TMR emissions:

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

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

Calves are not included in TMR calculation.

Notes:

*Since there is a change in lagoon/storage pond surface area, H2S emissions will be calculated separately.

Total Daily Pre-Project Potential to Emit (lb/day)							
Permit	**NOx**	**SOx**	**PM10**	**CO**	**VOC**	**NH3**	**H2S**
Milking Parlor	0.0	0.0	0.0	0.0	1.6	0.6	0.0
Cow Housing	0.0	0.0	70.1	0.0	70.7	234.6	0.0
Liquid Manure	0.0	0.0	0.0	0.0	16.5	75.1	N/A*
Solid Manure	0.0	0.0	0.0	0.0	3.3	17.2	0.0
Feed Handling	0.0	0.0	0.0	0.0	126.6	0.0	0.0
Total	**0.0**	**0.0**	**70.1**	**0.0**	**218.7**	**327.5**	**0.0**

Major Source Emissions (lb/yr)					
Permit	**NOx**	**SOx**	**PM10**	**CO**	**VOC**
Milk Parlor	0	0	0	0	0
Cow Housing	0	0	0	0	0
Liquid Manure	0	0	0	0	2,905
Solid Manure	0	0	0	0	0
Feed Handling	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**2,905**

Total Annual Pre-Project Potential to Emit (lb/yr)							
Permit	**NOx**	**SOx**	**PM10**	**CO**	**VOC**	**NH3**	**H2S**
Milking Parlor	0	0	0	0	600	205	0
Cow Housing	0	0	25,620	0	25,781	85,586	0
Liquid Manure	0	0	0	0	6,045	27,392	N/A*
Solid Manure	0	0	0	0	1,218	6,294	0
Feed Handling	0	0	0	0	46,192	0	0
Total	**0**	**0**	**25,620**	**0**	**79,836**	**119,477**	**0**

Post-Project Potential to Emit (PE2)

Post-Project Herd Size					
Herd	**Flushed Freestalls**	**Scraped Freestalls**	**Flushed Corrals**	**Scraped Corrals**	**Total # of Animals**
Milk Cows	2,500	0	0	0	2,500
Dry Cows	0	0	500	0	500
Support Stock (Heifers, Calves, and Bulls)	0	0	0	0	0
Large Heifers	0	0	0	0	0
Medium Heifers	1,800	0	0	750	2,550
Small Heifers	0	0	200	200	400
Bulls	0	0	0	0	0

	Calf Hutches				Calf Corrals		
	Aboveground Flushed	**Aboveground Scraped**	**On-Ground Flushed**	**On-Ground Scraped**	**Flushed**	**Scraped**	**Total # of Calves**
Calves	0	0	0	0	0	0	0

Silage Information				
Feed Type	Maximum # Open Piles	Maximum Height (ft)	Maximum Width (ft)	Open Face Area (ft^2)
Corn	0	0	0	
Alfalfa	0	0	0	
Wheat	0	0	0	

Milking Parlor				
Cow	VOC		NH3	
Milk Cows	lb/day	lb/yr	lb/day	lb/yr
Total	**2.7**	**1,000**	**0.9**	**342**

Cow Housing						
	VOC		NH3		PM10	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Total	**100.7**	**36,774**	**210.3**	**76,749**	**33.8**	**12,415**

Liquid Manure Handling						
Cow	VOC		NH3		H2S	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	16.6	6,075	84.3	30,775	N/A	N/A
Dry Cows	1.8	665	8.6	3,130	N/A	N/A
Support Stock (Heifers, Calves, and Bulls)	0.0	0	0.0	0	N/A	N/A
Large Heifers	0.0	0	0.0	0	N/A	N/A
Medium Heifers	4.8	1,760	16.1	5,865	N/A	N/A
Small Heifers	0.4	152	2.0	720	N/A	N/A
Calves	0.0	0	0.0	0	N/A	N/A
Bulls	0.0	0	0.0	0	N/A	N/A
Total	**23.6**	**8,652**	**111.0**	**40,490**	**N/A***	**N/A***

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	3.4	1,225	19.4	7,075
Dry Cows	0.4	130	2.0	715
Support Stock (Heifers, Calves, and Bulls)	0.0	0	0.0	0
Large Heifers	0.0	0	0.0	0
Medium Heifers	1.0	357	3.7	1,352
Small Heifers	0.1	32	0.4	160
Calves	0.0	0	0.0	0
Bulls	0.0	0	0.0	0
Total	**4.9**	**1,744**	**25.5**	**9,302**

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	0.0	0
Alfalfa Emissions	0.0	0
Wheat Emissions	0.0	0
TMR	161.9	59,106
Total	**161.9**	**59,106**

Calculations for milking parlor:

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

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

Calculations for cow housing:

See detailed calculations under Cow Housing Calculations worksheet.

Calculations for liquid manure and solid manure handling:

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

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

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

Calculations for silage emissions:

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

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

Calculation for TMR emissions:

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

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

Calves are not included in TMR calculation.

Notes:

*Since there is a change in lagoon/storage pond surface area, H2S emissions will be calculated separately.

Total Daily Post-Project Potential to Emit (lb/day)							
Permit	**NOx**	**SOx**	**PM10**	**CO**	**VOC**	**NH3**	**H2S**
Milking Parlor	0.0	0.0	0.0	0.0	2.7	0.9	0.0
Cow Housing	0.0	0.0	33.8	0.0	100.7	210.3	0.0
Liquid Manure	0.0	0.0	0.0	0.0	23.6	111.0	N/A*
Solid Manure	0.0	0.0	0.0	0.0	4.9	25.5	0.0
Feed Handling	0.0	0.0	0.0	0.0	161.9	0.0	0.0
Total	**0.0**	**0.0**	**33.8**	**0.0**	**293.8**	**347.7**	**0.0**

Major Source Emissions (lb/yr)					
Permit	**NOx**	**SOx**	**PM10**	**CO**	**VOC**
Milk Parlor	0	0	0	0	0
Cow Housing	0	0	0	0	0
Liquid Manure	0	0	0	0	4,161
Solid Manure	0	0	0	0	0
Feed Handling	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**4,161**

Total Annual Post-Project Potential to Emit (lb/yr)							
Permit	**NOx**	**SOx**	**PM10**	**CO**	**VOC**	**NH3**	**H2S**
Milking Parlor	0	0	0	0	1,000	342	0
Cow Housing	0	0	12,415	0	36,774	76,749	0
Liquid Manure	0	0	0	0	8,652	40,490	N/A*
Solid Manure	0	0	0	0	1,744	9,302	0
Feed Handling	0	0	0	0	59,106	0	0
Total	**0**	**0**	**12,415**	**0**	**107,275**	**126,883**	**0**

Uncontrolled GHG Emission Factors (lbs/hd-yr)						
Animal Type	CH4 (Anaerobic Treatment Lagoon)	CH4 (Lagoon)	CH4 (Manure Spreading)	CH4 (Solid Manure Storage)	CH4 (Enteric)	CO2 Equivalent Multiplier for CH4
Milk Cows	513	307.8	3.5	27.7	271.5	21
Dry Cows	513	307.8	3.5	27.7	271.5	21
Support Stock*	110.4	110.4	1.6	--	151.6	21
Large Heifers	110.4	110.4	1.6	--	151.6	21
Medium Heifers	110.4	110.4	1.6	--	100.5	21
Small Heifers	110.4	110.4	1.6	--	100.5	21
Calves	--	--	--	--	--	--
Bulls*	110.4	110.4	1.6	--	151.6	21

Uncontrolled GHG Emission Factors (lbs/hd-yr)					
Animal Type	N2O (Anaerobic Treatment Lagoon)	N2O (Manure Spreading)	N2O (Solid Manure Storage)	N2O (Enteric)	CO2 Equivalent Multiplier for N2O
Milk Cows	1.5	0	2.6	0	310
Dry Cows	1.5	0	2.6	0	310
Support Stock*	1.4	0	--	0	310
Large Heifers	1.4	0	--	0	310
Medium Heifers	1.4	0	--	0	310
Small Heifers	1.4	0	--	0	310
Calves	--	0	--	0	--
Bulls*	1.4	0	--	0	310

*Emission factors for Suppot Stock and Bulls assumed to be the same as Large Heifers.

1 short ton = 0.9072 metric ton

CO2e from CH4 = [CH4 (anaerobic treatment) lagoon + CH4 manure spreading + CH4 solid manure storage + CH4 enteric] x 21 x 0.9072 metric tons/short tons ÷ 2000 lb/ton

CO2e from N2O= [N20 anearobic treatment lagoon + N2O manure spreading + N20 solid manure storage + N2O enteric] x 310 x 0.9072 metric tons/short tons ÷ 2000 lb/ton

Pre-Project CO2e Emissions

Pre-Project Lagoon CO2e Emissions from CH4 (metric tons/yr)				
Animal Type	Number of Cows	CH4 Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	1,500	307.8	21.0	4,398
Dry Cows	450	307.8	21.0	1,319
Support Stock	0	110.4	21.0	0
Large Heifers	0	110.4	21.0	0
Medium Heifers	2,500	110.4	21.0	2,629
Small Heifers	200	110.4	21.0	210
Calves	0	--	--	0
Bulls	0	110.4	21.0	0

Pre-Project Non-Lagoons CO2e Emissions from CH4 (metric tons/yr)						
Animal Type	Number of Cows	CH4 Manure Spreading (lbs/hd-yr)	CH4 Solid Manure Storage (lbs/hd-yr)	CH4 Enteric (lbs/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	1,500	3.5	27.7	271.5	21.0	4,325
Dry Cows	450	3.5	27.7	271.5	21.0	1,298
Support Stock	0	1.6	--	151.6	21.0	0
Large Heifers	0	1.6	--	151.6	21.0	0
Medium Heifers	2,500	1.6	--	100.5	21.0	2,431
Small Heifers	200	1.6	--	100.5	21.0	195
Calves	0	--	--	--	--	0
Bulls	0	1.6	--	151.6	21.0	0

Pre-Project Lagoon CO2e Emissions from N2O (metric tons/yr)				
Animal Type	Number of Cows	N2O Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	1,500	0.0	310.0	0
Dry Cows	450	0.0	310.0	0
Support Stock	0	0.0	310.0	0
Large Heifers	0	0.0	310.0	0
Medium Heifers	2,500	0.0	310.0	0
Small Heifers	200	0.0	310.0	0
Calves	0	0.0	--	0
Bulls	0	0.0	310.0	0

Pre-Project Non-Lagoons CO2e Emissions from N2O (metric tons/yr)						
Animal Type	Number of Cows	N2O Manure Spreading (lbs/hd-yr)	N2O Solid Manure Storage (lbs/hd-yr)	N2O Enteric (lbs/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	1,500	0.0	2.6	0.0	310.0	548
Dry Cows	450	0.0	2.6	0.0	310.0	165
Support Stock	0	0.0	--	0.0	310.0	0
Large Heifers	0	0.0	--	0.0	310.0	0
Medium Heifers	2,500	0.0	--	0.0	310.0	0
Small Heifers	200	0.0	--	0.0	310.0	0
Calves	0	0.0	--	0.0	--	0
Bulls	0	0.0	--	0.0	310.0	0

Total Pre-Project CO2e Emissions (metric tons/yr)			
Animal Type	CO2e from CH4	CO2e from N2O	Total
Milk Cows	8,723	548	9,271
Dry Cows	2,617	165	2,781
Support Stock	0	0	0
Large Heifers	0	0	0
Medium Heifers	5,060	0	5,060
Small Heifers	405	0	405
Calves	0	0	0
Bulls	0	0	0
		Total	**17,518**

Post-Project CO2e Emissions

Post-Project Lagoon CO2e Emissions from CH4 (metric tons/yr)				
Animal Type	Number of Cows	CH4 Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	2,500	307.8	21.0	7,330
Dry Cows	500	307.8	21.0	1,466
Support Stock	0	110.4	21.0	0
Large Heifers	0	110.4	21.0	0
Medium Heifers	2,550	110.4	21.0	2,682
Small Heifers	400	110.4	21.0	421
Calves	0	--	--	0
Bulls	0	110.4	21.0	0

Post-Project Non-Lagoons CO2e Emissions from CH4 (metric tons/yr)						
Animal Type	Number of Cows	CH4 Manure Spreading (lbs/hd-yr)	CH4 Solid Manure Storage (lbs/hd-yr)	CH4 Enteric (lbs/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	2,500	3.5	27.7	271.5	21.0	7,208
Dry Cows	500	3.5	27.7	271.5	21.0	1,442
Support Stock	0	1.6	--	151.6	21.0	0
Large Heifers	0	1.6	--	151.6	21.0	0
Medium Heifers	2,550	1.6	--	100.5	21.0	2,480
Small Heifers	400	1.6	--	100.5	21.0	389
Calves	0	--	--	--	--	0
Bulls	0	1.6	--	151.6	21.0	0

Post-Project Lagoon CO2e Emissions from N2O (metric tons/yr)				
Animal Type	Number of Cows	N2O Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	2,500	0.0	310.0	0
Dry Cows	500	0.0	310.0	0
Support Stock	0	0.0	310.0	0
Large Heifers	0	0.0	310.0	0
Medium Heifers	2,550	0.0	310.0	0
Small Heifers	400	0.0	310.0	0
Calves	0	0.0	--	0
Bulls	0	0.0	310.0	0

Post-Project Non-Lagoons CO2e Emissions from N2O (metric tons/yr)						
Animal Type	Number of Cows	N2O Manure Spreading (lbs/hd-yr)	N2O Solid Manure Storage (lbs/hd-yr)	N2O Enteric (lbs/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	2,500	0.0	2.6	0.0	310.0	914
Dry Cows	500	0.0	2.6	0.0	310.0	183
Support Stock	0	0.0	--	0.0	310.0	0
Large Heifers	0	0.0	--	0.0	310.0	0
Medium Heifers	2,550	0.0	--	0.0	310.0	0
Small Heifers	400	0.0	--	0.0	310.0	0
Calves	0	0.0	--	0.0	--	0
Bulls	0	0.0	--	0.0	310.0	0

Total Post-Project CO2e Emissions (metric tons/yr)			
Animal Type	CO2e from CH4	CO2e from N2O	Total
Milk Cows	14,538	914	15,452
Dry Cows	2,908	183	3,090
Support Stock	0	0	0
Large Heifers	0	0	0
Medium Heifers	5,162	0	5,162
Small Heifers	810	0	810
Calves	0	0	0
Bulls	0	0	0
		Total	**24,514**

Change in CO2e Emissions

Change in Project GHG Emissions			
Animal Type	Pre-Project CO2e (metric tons/yr)	Post-Project CO2e (metric tons/yr)	Change (metric tons/yr)
Milk Cows	9,271	15,452	6,181
Dry Cows	2,781	3,090	309
Support Stock	0	0	0
Large Heifers	0	0	0
Medium Heifers	5,060	5,162	101
Small Heifers	405	810	405
Calves	0	0	0
Bulls	0	0	0
		Total	**6,996**