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February 23, 2017

Mike Monasmith
Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Subject: **Mission Rock Energy Center (15-AFC-02)**
Responses to Staff's Data Requests, Set 4 (Nos. 159-168)

Dear Mr. Monasmith:

Mission Rock Energy Center, LLC (the "Applicant") submits the attached responses to Staff's *Data Requests, Set 4 (Nos. 159-168)* issued on February 16, 2017. Included with the responses are the following attachments:

- A compact disk ("CD") containing the air quality modeling input/outputs;
- CalEEMod input and output files;
- Operational delivery truck emissions; and
- A redline version of the revised Appendix 5.1E (Construction Emission Support).

Copies of the compact discs will be hand-delivered to both the Docket Office and to you.

If you have any questions, please contact me at 916-447-2166.

Sincerely,

ELLISON SCHNEIDER HARRIS & DONLAN L.L.P.
Samantha G. Neumyer
Jeffery D. Harris

Attorneys for the Applicant

Attachments

APPLICATION FOR CERTIFICATION
MISSION ROCK ENERGY CENTER (15-AFC-02)

Responses to Staff's Data Requests, Set 4 (Nos. 159-168)

Worst Case Construction Emissions for Impact Analysis

BACKGROUND

Application for Certification (AFC), Appendix 5.1E Table 5.1E-4 provides the estimated maximum daily onsite construction emissions. It is stated that both onsite exhaust and fugitive emissions would occur during Phase 2 (Civil Improvements). Table 5.1E-7 (Attachment to Appendix 5.1E) provides a spreadsheet tab, Onsite Equipment, that describes all onsite vehicle and construction equipment that are expected to be used during the various phases of construction activities, including hours of operation and emissions factors for each piece of equipment. The emission estimates provided for Phase 2 (Civil Improvements) are consistent with the estimated maximum daily onsite construction emissions provided in Table 5.1E-4 (with the exception of PM10 and PM2.5 which were revised in TN 215570, and are discussed in more detail below), and the emission factors used in the air quality impact analysis.

However, Table 5.1E-7 shows that during months 5-8, Phase 2 (Civil Improvements) would overlap with Phase 3 (Plant Construction). The table shows that there would be a larger number of onsite vehicles and construction equipment used during the overlapping construction phases, than what is expected for Phase 2 construction activities alone. Additionally, the combined emissions from these two overlapping phases of construction would result in estimated maximum daily emissions higher than those provided in Table 5.1E-4 and those used in the air quality impact analysis (especially during month 7).

Similarly, the worst case fugitive dust emissions are expected to occur during Phase 2 (Civil Improvements). The fugitive dust emissions presented in Table 5.1E-4 are the sum of fugitive emissions associated with Phase 2 construction (Civil Improvements), storage pile fugitive dust, on-site paved road travel, on-site unpaved road travel, and track out fugitive dust. As discussed above, there would be an overlap between Phase 2 and Phase 3 construction activities that could result in higher estimated daily fugitive dust emissions than those provided in Table5.1E-4 and the emission factors used in the air quality modeling impact analysis.

DATA REQUEST

159. Please update Table5.1E-4 to show the estimated maximum daily onsite construction exhaust and fugitive emissions, accounting for any overlapping construction activities.

Response: Table 5.1E-4 is updated as shown below:

Revised TABLE 5.1E-4 ONSITE CONSTRUCTION EMISSIONS SUMMARY, LBS/DAY (Estimated Maximum Day)							
Category	NOx	CO	VOC	SOx	PM10	PM2.5	CO2
Exhaust[1]	19.57	127	4.51	0.255	0.382	0.382	-
Fugitives	-	-	-	-	3.32	0.643	-
Totals	19.57	127	4.51	0.255	3.70	1.03	-

Notes:

Max day represents the overlap of Phase 2 and Phase 3 (see text below).

[1] same note as Table 5.1E-1.

Onsite construction equipment exhaust, fugitive dust from earth moving activities, cut and fill activity, onsite paved road use, storage pile wind erosion, onsite unpaved road use.

The revisions to the fugitive emissions in the above table show the cumulative totals of PM10 and PM2.5 emissions for both Phase 2 civil improvements and Phase 3 plant construction for the following emissions categories: construction phase dust, onsite paved road dust, onsite unpaved road dust, and windblown dust. These emissions represent the maximum daily emissions during the estimated overlap period. The calculation files (MS Excel spreadsheets) have not changed and were provided in an earlier response to CEC.

The revisions to the exhaust emissions in the above table were derived from the CalEEMod analysis performed by the Applicant. The Applicant ran CalEEMod to provide an estimate of construction equipment emissions with and without mitigation, i.e., use of Tier 4 equipment. The CalEEMod input file was set up using the equipment lists as provided by the Applicant, as well as the construction phase schedule which incorporated the various phase overlaps. CalEEMod does not summarize emissions by month, but rather by year. As such, the Applicant has made the following conservative assumptions to arrive at a reasonable estimate of the maximum daily emissions during the overlap period of Phase 2 and Phase 3.

1. The overlap period (4 months) of Phase 2 and Phase 3 occurs solely within emissions year 2019.
2. CalEEMod has already calculated emissions for 2019 using the equipment lists for both Phase 2 and Phase 3 and the phase schedules, which includes the overlap.
3. The CalEEMod emissions (mitigated) for year 2019 are as follows:

Category	NOx	CO	VOC	SOx	PM10	PM2.5
Exhaust	1.8437	11.9624	0.4244	0.0241	0.0360	0.0357

4. An equal allocation of emissions by month, multiplied by 4 months yields the following emissions normalized for the overlap period:

Category	NOx	CO	VOC	SOx	PM10	PM2.5
Exhaust	0.615	3.99	0.1415	0.008	0.012	0.012

5. Converting the above values to equivalent lbs/day values, results in the following values (based on 88 work days during the 4 month period):

Category	NOx	CO	VOC	SOx	PM10	PM2.5
Exhaust	13.98	90.7	3.22	0.182	0.273	0.273

6. A review of the total engine use rates (hp-hrs) for the phases occurring in 2019 indicates that the Phase 2 values are approximately 38% higher than the Phase 3 values. This value was rounded to 40% for a multiplier of 1.4, resulting in the following estimated maximum daily values for the overlap period. These values are presented in the revised table below.

Category	NOx	CO	VOC	SOx	PM10	PM2.5
Exhaust lbs/day	19.57	127	4.51	0.255	0.382	0.382

The above results are a conservative estimate of maximum daily emissions for the overlap period of Phase 2 and Phase 3. The calculation files (CalEEMod input and output files) have not changed and are included as Attachment A.

160. Please update the air quality impact analysis for construction as a result of the revised emission factors identified in response to Data Request 159 above.

Response: The PM10/2.5 modeling was revised to reflect the updated pounds per day emissions for the 24-hour averaging periods, as shown below in revised summary Table 5.1E-6. The revised summary Table 5.1E-6 below also contains the corrected modeling results that reflect Tier 4 emission estimates from Appendix 5.1E (revised and included with these responses) for all averaging periods and the updated 2013-2015 background concentrations used in the operational impact analyses submitted previously.

TABLE 5.1E-6 MODELED MAXIMUM CONSTRUCTION IMPACTS

Pollutant	Averaging Time	Maximum Construction Impacts (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	State Standards (µg/m³)	Federal Standards (µg/m³)
NO_2[a]	1-hour 1-hour Annual	23.1 6.4 0.4	75.3 56.4 13.2	98.4 62.8 13.6	339 - 57	- 188 100
SO_2	1-hour 3-hour 24-hour Annual	0.60 0.20 0.04 0.01	10.5 10.5 5.2 2.1	11.1 10.7 5.2 2.1	655 - 105 -	196 1300 365 80
CO	1-hour 8-hour	299.3 42.2	4,581 1,260	4,880 1,302	23,000 10,000	40,000 10,000
PM10	24-hour Annual[b]	19.0 1.4	118 25.6	137 27	50 20	150 -
PM2.5	24-hour Annual	3.68 0.26	19 9.6	23 10	- 12	35 12.0

Notes:
[a] ARM applied for annual average, using national default 0.75 ratio, and OLM for 1-hour averages.
[b] Annual Arithmetic Mean.

Worst Case Commissioning Phase Emissions for Impact Analysis
BACKGROUND

AFC, Appendix 5.1E Table 5.1E-7 explains that commissioning activities would commence in month 17 of construction and continue through month 23. In addition to the onsite service vehicles associated with commissioning activities (i.e. pickup trucks, flat bed delivery truck, service truck, and worker commuter cars), there would be a number of other construction related vehicles and equipment onsite associated with the Building Construction Phase (Phase 4 – months 11 to 22). However, the commissioning impact analysis only included emissions for the testing of the turbines and omitted all other onsite construction activity emissions that would be occurring simultaneously.

DATA REQUEST

161. Please revise the commissioning phase air quality modeling impact analysis to include all emission sources expected to be in concurrent operation during commissioning activities; or, provide a justification for omitting such sources, including a discussion of whether construction related impacts would be cumulatively additive to the worst-case commissioning impacts.

Response: Project schedule item 31 titled "Equipment Firing/Testing and Initial Commissioning" is simply a macro-level descriptor of the defined period noted, i.e., month 17 to month 23. The Applicant's proposed schedule is its best estimate for the proposed project, and may necessarily vary as construction proceeds. From month 17 to month 22, it is anticipated that minor amounts of final construction activities (from Phase 4) will occur while the primary work of system QA/QC checks and other testing of systems such as the fuel system integrity, electrical systems, water systems, pressurized air systems, control panel systems, etc., occurs. These QA/QC and other system checking must occur to ensure these systems are in proper operating order before the turbines can be fired for their commissioning in Phase 5. This sequence is shown in the Phase 5 (Testing and Commissioning) tabulation, which shows no construction equipment on the site except for pickup and delivery trucks, no earth moving activities, and no heavy construction activity. Emissions calculated by CalEEMod for Phase 4 occur in years 2019 and 2020. The year 2020 emissions, which includes the overlap of Phase 4 and Phase 5, represents the lowest emissions year of the project. The yearly emissions (tons) in 2020 are as follows:

Category	NOx	CO	VOC	SOx	PM10	PM2.5
Exhaust	0.3789	2.6242	0.1872	0.0062	0.00686	0.00666

Conversion of these emissions to daily values (lbs/day) is shown in the table which follows, based upon the 8 month period in 2020 (equivalent to 176 construction work days). Fugitive PM10 and PM2.5 emissions have been added to this table for the same period based upon the daily emissions values as calculated for the O&M phase (combination of Phase 4 and Phase 5).

Category	NOx	CO	VOC	SOx	PM10	PM2.5
Exhaust	4.31	29.82	2.13	0.07	0.078	0.076
Fugitive	-	-	-	-	1.59	0.3
Totals	4.31	29.82	2.13	0.07	1.67	0.38

The Applicant anticipates there will be no overlap of physical construction and actual turbine commissioning (firing) activities. The note on the schedule about First Fire Commissioning in May 2020 is very likely optimistic, and the Applicant, at this time, does not plan to be in a position to fire the turbines for commissioning until after the beginning of month 22, which is after the anticipated end of construction activities.

Revised PM10/PM2.5 Construction Exhaust Emissions
BACKGROUND

Revised Appendix 5.1E, Tables 5.1E-1 through 5.1E-4 show new PM10 and PM2.5 emissions based on revised emissions evaluation per CalEEMod2016 assuming the use of Tier 4 engines on all onsite construction equipment. For example, Table 5.1E-4 shows PM10 and PM2.5 exhaust emissions of 0.273 and 0.270 pounds per day (lb/day), respectively, compared to what was previously provided in Table 5.1E-4 of 9.74 lb/day for both PM10 and PM2.5. However, Table 5.1B-4 Modeling Inputs/Results for Mission Rock Construction Impacts still shows PM10/PM2.5 exhaust emission inputs for the air quality impact analysis of 9.74 lb/day. Additionally, the revised modeling files appear to use emission inputs that equate to 9.74 lb/day for PM10/PM2.5 combustion inputs.

As part of the Available Mitigation Measures (page 5.1E-2) the applicant says it will work with the construction contractor to utilize to the extent feasible, EPA-ARB Tier 2/Tier 3 engine compliant equipment for equipment over 100 horsepower. Whereas, the revised PM10 and PM2.5 emissions estimates are based on the use of Tier 4 engines on all onsite construction equipment. Regardless, staff would require the use of Tier 4 engines for equipment over 100 horsepower to the extent feasible.

DATA REQUEST

162. Please explain the use of the revised daily PM10 and PM2.5 construction exhaust emission estimates.

Response: Please see the revised Table 5.1B-4, which reflects the use of Tier 4 emissions for all modeling inputs and results and is consistent with Appendix 5.1E.

163. Please confirm the PM10 and PM2.5 modeling inputs for construction exhaust emissions, and whether the modeling impacts were scaled to reflect the revised daily construction exhaust emission estimates.

Response: See response to Data Request No.162.

164. If the revised PM10 and PM2.5 construction exhaust emissions are to be considered for any part of the analysis, please provide supporting information, including equipment emission factors and calculations similar to what was provided as part of the original Appendix 5.1E (including electronic Excel files where necessary).

Response: Support information in the form of electronic Excel and CalEEMod inputs and outputs are provided with these responses.

Routine operating and Commissioning Year Emissions
BACKGROUND

Section 5.1.6.4, page 5.1-34 states "during the first year of operation, plant commissioning activities, which are planned to occur over an estimated 213 hours per turbine, will have higher hourly and daily emissions profiles than during normal operations in the subsequent years of operation". However, it is unclear if the applicant is proposing higher annual emissions during the first year of operation, and if so, what the total first year emissions would be (e.g., total commissioning emissions plus total routine operating year emissions, or total commissioning emissions plus partial year routine operating emissions). The maximum facility emissions for the MREC for a routine operating year (non-commissioning year) listed in Table 5.1-11 are 28.17 tons per year (tpy) of NOx, and 13.09 tpy for PM10/PM2.5. The total facility commissioning emissions listed in Section 5.1.6.4 are 10.33 tons for NOx and 1.77 tons for PM10/PM2.5.

However, the emission rates used in the air quality impact analysis for a routine operating year equate to 28.02 tpy of NOx and 12.61 tpy of PM10/PM2.5, although, the emission rates used in the air quality impact analysis for the first year (commissioning year) equate to 30.45 tpy of NOx and 12.96 tpy of PM10/PM2.5.

DATA REQUEST

165. Please explain the discrepancies between the proposed annual emissions for a routine operating year (non-commissioning year) and the emission factors used for the annual impacts in the air quality impact analysis.

Response: Table 5.1-20 lists the emission rates used in the modeling analysis for MREC. For normal operations, the annual NOx emission rate of 0.161 g/s/turbine in Table 5.1-20 was calculated separately, and with slightly different rounding conventions, than the turbine emission rates given in Table 5.1-8. Without rounding, the value in Table 5.1-20 would be 0.1618 g/s/turbine or a difference of 0.0008 g/s or 0.0063 lb/hr.

For annual PM10/2.5, the modeled emission rate of 0.072 g/s equates to 12.51 tpy. The six-cell wet surface cooled condenser of 0.0027 g/s per cell (0.56 tpy total for all six cells) is then added along with the fire pump annual emissions to produce 13.08 tpy, which is equal to the value of 13.09 tpy given in Table 5.1-10 (after accounting for rounding differences). Thus, the emissions are correct for normal non-commissioning years.

As noted below in the response to Data Request 166, the Applicant is willing to meet the annual average emission limits for normal operations during the first year when commissioning activities take place and therefore not requiring higher annual emissions for the first year of operations.

166. Please provide the proposed emission limits for each criteria pollutant for the first year (commissioning year), including the proposed operating scenario for the subsequent routine operation during the first year.

Response: The emissions during the first year of operation (commissioning year) and all subsequent years of normal (non-commissioning) operations will be the same and identical with the facility limits as specified in Table 5.1-11.

Emission Controls for NO_x
BACKGROUND

Table 5.1-15, Proposed BACT for the Combustion Turbines, has a Dry Low NO_x (DLN) system listed as the proposed BACT system for NOx. However, Section 5.1.1 states that water injection would be used in the turbine combustors to limit NOx production.

DATA REQUEST

167. Please confirm whether the turbines would use water injection or DLN technologies for NO_x control.

Response: The turbines will use water injection for the control of NO_x.

Offsite Emissions During Routine Operation
BACKGROUND

During routine operation, worker trips and material deliveries cause emissions of criteria pollutants from mobile sources operating offsite.

DATA REQUEST

168. Please provide the expected offsite exhaust and fugitive dust emissions from worker commute and material delivery, and the supporting assumptions for such emissions.

Response: Please see the emission inventory of offsite exhaust emissions from worker and material deliveries during routine operation provided as Attachment B. Note that no fugitive dust emissions are anticipated as the worker and delivery routes are on paved road surfaces.

APPLICATION FOR CERTIFICATION
MISSION ROCK ENERGY CENTER (15-AFC-02)

Responses to Staff's Data Requests, Set 4 (Nos. 159-168)

ATTACHMENT A
(CALEEMOD OUTPUT FILES)

MREC Construction

Ventura County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	426.89	1000sqft	9.80	426,890.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	31
Climate Zone	8			**Operational Year**	2020
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

MREC Construction - Ventura County, Annual

Project Characteristics - Construction analysis for onsite equipment emissions only

Land Use - applicant data

Construction Phase - applicant schedule

Off-road Equipment - not needed for the the onsite equip analysis

Off-road Equipment - applicatn data

Off-road Equipment - applicant data

Off-road Equipment - applicant data

Off-road Equipment - applicant data

Off-road Equipment - applicant data

Energy Use -

Construction Off-road Equipment Mitigation - applicant data

Table Name	Column Name	Default Value	New Value
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	OperationalYear	2018	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripNumber	0.00	70.00
tblTripsAndVMT	VendorTripNumber	70.00	0.00
tblTripsAndVMT	VendorTripNumber	70.00	0.00
tblTripsAndVMT	VendorTripNumber	70.00	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					
2018	5.1728	2.4903	1.3669	3.2900e-003		0.1034	0.1690		0.0955	0.1068						302.2524
2019	1.5821	15.6642	10.6223	0.0241		0.6768	1.0870		0.6263	0.7291						2,162.8689
2020	0.3215	1.8476	2.3575	6.2000e-003		0.0774	0.4443		0.0720	0.1695						550.2317
Maximum	**5.1728**	**15.6642**	**10.6223**	**0.0241**		**0.6768**	**1.0870**		**0.6263**	**0.7291**						**2,162.8689**

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					
2018	4.9958	0.3780	1.4967	3.2900e-003		6.1400e-003	0.0718		6.0600e-003	0.0174						302.2521
2019	0.4244	1.8437	11.9624	0.0241		0.0360	0.4462		0.0357	0.1385						2,162.8667
2020	0.1872	0.3789	2.6242	6.2000e-003		6.8600e-003	0.3738		6.6600e-003	0.1041						550.2314
Maximum	**4.9958**	**1.8437**	**11.9624**	**0.0241**		**0.0360**	**0.4462**		**0.0357**	**0.1385**						**2,162.8667**

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	11/1/2018	11/1/2018	5	1	
2	Mobilization	Site Preparation	11/1/2018	1/31/2019	5	66	
3	Civil Phase	Grading	12/1/2018	6/30/2019	5	150	
4	Plant Const	Building Construction	3/1/2019	10/31/2019	5	175	
5	O&M Const	Building Construction	9/1/2019	8/31/2020	5	261	
6	Comm-Testing	Building Construction	3/1/2020	9/30/2020	5	153	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 640,335; Non-Residential Outdoor: 213,445; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	0	6.00	78	0.48
Civil Phase	Excavators	0	8.00	158	0.38
Civil Phase	Concrete/Industrial Saws	0	8.00	81	0.73
Plant Const	Excavators	0	8.00	158	0.38
Mobilization	Cranes	0	7.00	231	0.29
Mobilization	Forklifts	0	8.00	89	0.20
Mobilization	Generator Sets	1	6.00	30	0.74
O&M Const	Pavers	0	8.00	130	0.42
O&M Const	Rollers	0	8.00	80	0.38
Civil Phase	Rubber Tired Dozers	0	8.00	247	0.40

Plant Const	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Plant Const	Graders	0	8.00	187	0.41
Plant Const	Tractors/Loaders/Backhoes	3	8.00	78	0.37
O&M Const	Paving Equipment	0	8.00	132	0.36
Comm-Testing	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Comm-Testing	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Welders	0	8.00	46	0.45
Plant Const	Cranes	0	7.00	231	0.29
O&M Const	Cranes	1	8.00	190	0.29
Comm-Testing	Cranes	0	7.00	231	0.29
Plant Const	Forklifts	1	8.00	230	0.20
O&M Const	Forklifts	1	8.00	230	0.20
Comm-Testing	Forklifts	0	8.00	89	0.20
Plant Const	Generator Sets	2	8.00	30	0.74
O&M Const	Generator Sets	1	8.00	30	0.74
Comm-Testing	Generator Sets	0	8.00	84	0.74
Civil Phase	Graders	0	8.00	187	0.41
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
O&M Const	Tractors/Loaders/Backhoes	2	8.00	78	0.37
Civil Phase	Tractors/Loaders/Backhoes	6	8.00	78	0.37
Plant Const	Welders	0	8.00	46	0.45
O&M Const	Welders	0	8.00	46	0.45
Comm-Testing	Welders	0	8.00	46	0.45
Mobilization	Other General Industrial Equipment	1	6.00	28	0.34
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Mobilization	Off-Highway Trucks	3	8.00	240	0.38

Mobilization	Trenchers	1	8.00	115	0.50
Mobilization	Dumpers/Tenders	1	6.00	28	0.38
Civil Phase	Crawler Tractors	4	8.00	185	0.43
Civil Phase	Generator Sets	2	8.00	30	0.74
Civil Phase	Scrapers	3	8.00	365	0.48
Civil Phase	Graders	3	8.00	185	0.41
Civil Phase	Off-Highway Trucks	5	8.00	240	0.38
Civil Phase	Rollers	4	6.00	350	0.38
Civil Phase	Pavers	2	6.00	173	0.42
Civil Phase	Dumpers/Tenders	5	6.00	28	0.38
Plant Const	Air Compressors	3	8.00	25	0.48
Plant Const	Crawler Tractors	1	8.00	185	0.43
Plant Const	Aerial Lifts	4	8.00	99	0.31
Plant Const	Trenchers	2	6.00	115	0.50
Plant Const	Other Construction Equipment	2	6.00	310	0.42
Plant Const	Forklifts	1	8.00	74	0.20
Plant Const	Aerial Lifts	1	8.00	160	0.31
Plant Const	Dumpers/Tenders	4	6.00	28	0.38
Plant Const	Dumpers/Tenders	1	8.00	28	0.38
Plant Const	Cranes	1	8.00	190	0.29
O&M Const	Air Compressors	1	8.00	25	0.48
O&M Const	Aerial Lifts	1	8.00	99	0.31
O&M Const	Other Construction Equipment	1	8.00	310	0.42
O&M Const	Aerial Lifts	1	8.00	160	0.31
O&M Const	Dumpers/Tenders	3	8.00	28	0.38
Comm-Testing	Dumpers/Tenders	1	8.00	28	0.38

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
Architectural Coating	0	36.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Mobilization	8	20.00	70.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Civil Phase	34	85.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Plant Const	26	179.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
O&M Const	12	179.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Comm-Testing	1	179.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Clean Paved Roads

3.2 Architectural Coating - 2018

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	4.9466					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total	**4.9466**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**						**0.0000**

3.2 Architectural Coating - 2018

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	1.1000e-004	8.0000e-005	8.5000e-004	0.0000		0.0000	2.3000e-004		0.0000	6.0000e-005						0.2033
Total	**1.1000e-004**	**8.0000e-005**	**8.5000e-004**	**0.0000**		**0.0000**	**2.3000e-004**		**0.0000**	**6.0000e-005**						**0.2033**

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	4.9466					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total	**4.9466**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**						**0.0000**

3.2 Architectural Coating - 2018

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	1.1000e-004	8.0000e-005	8.5000e-004	0.0000		0.0000	2.3000e-004		0.0000	6.0000e-005						0.2033
Total	**1.1000e-004**	**8.0000e-005**	**8.5000e-004**	**0.0000**		**0.0000**	**2.3000e-004**		**0.0000**	**6.0000e-005**						**0.2033**

3.3 Mobilization - 2018

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						0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0616	0.5587	0.3127	7.0000e-004		0.0293	0.0293		0.0271	0.0271						64.0626
Total	**0.0616**	**0.5587**	**0.3127**	**7.0000e-004**		**0.0293**	**0.0293**		**0.0271**	**0.0271**						**64.0626**

3.3 Mobilization - 2018

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
Vendor	6.4900e-003	0.1835	0.0505	3.6000e-004		1.5500e-003	0.0106		1.4800e-003	4.1000e-003						34.9605
Worker	2.6100e-003	2.0000e-003	0.0203	5.0000e-005		4.0000e-005	5.4300e-003		4.0000e-005	1.4700e-003						4.8569
Total	**9.1000e-003**	**0.1855**	**0.0708**	**4.1000e-004**		**1.5900e-003**	**0.0160**		**1.5200e-003**	**5.5700e-003**						**39.8175**

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						0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	9.0600e-003	0.0594	0.3726	7.0000e-004		1.1400e-003	1.1400e-003		1.1400e-003	1.1400e-003						64.0626
Total	**9.0600e-003**	**0.0594**	**0.3726**	**7.0000e-004**		**1.1400e-003**	**1.1400e-003**		**1.1400e-003**	**1.1400e-003**						**64.0626**

3.3 Mobilization - 2018

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
Vendor	6.4900e-003	0.1835	0.0505	3.6000e-004		1.5500e-003	0.0106		1.4800e-003	4.1000e-003						34.9605
Worker	2.6100e-003	2.0000e-003	0.0203	5.0000e-005		4.0000e-005	5.4300e-003		4.0000e-005	1.4700e-003						4.8569
Total	**9.1000e-003**	**0.1855**	**0.0708**	**4.1000e-004**		**1.5900e-003**	**0.0160**		**1.5200e-003**	**5.5700e-003**						**39.8175**

3.3 Mobilization - 2019

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						0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0300	0.2678	0.1616	3.8000e-004		0.0139	0.0139		0.0128	0.0128						33.7601
Total	**0.0300**	**0.2678**	**0.1616**	**3.8000e-004**		**0.0139**	**0.0139**		**0.0128**	**0.0128**						**33.7601**

3.3 Mobilization - 2019

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
Vendor	3.1700e-003	0.0926	0.0250	1.9000e-004		7.1000e-004	5.5600e-003		6.8000e-004	2.0800e-003						18.6103
Worker	1.2800e-003	9.5000e-004	9.7700e-003	3.0000e-005		2.0000e-005	2.9000e-003		2.0000e-005	7.8000e-004						2.5273
Total	**4.4500e-003**	**0.0936**	**0.0348**	**2.2000e-004**		**7.3000e-004**	**8.4600e-003**		**7.0000e-004**	**2.8600e-003**						**21.1377**

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						0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	4.8500e-003	0.0318	0.1993	3.8000e-004		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004						33.7601
Total	**4.8500e-003**	**0.0318**	**0.1993**	**3.8000e-004**		**6.1000e-004**	**6.1000e-004**		**6.1000e-004**	**6.1000e-004**						**33.7601**

3.3 Mobilization - 2019

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
Vendor	3.1700e-003	0.0926	0.0250	1.9000e-004		7.1000e-004	5.5600e-003		6.8000e-004	2.0800e-003						18.6103
Worker	1.2800e-003	9.5000e-004	9.7700e-003	3.0000e-005		2.0000e-005	2.9000e-003		2.0000e-005	7.8000e-004						2.5273
Total	**4.4500e-003**	**0.0936**	**0.0348**	**2.2000e-004**		**7.3000e-004**	**8.4600e-003**		**7.0000e-004**	**2.8600e-003**						**21.1377**

3.4 Civil Phase - 2018

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						0.0000	0.0398		0.0000	4.2900e-003						0.0000
Off-Road	0.1500	1.7419	0.9405	2.0600e-003		0.0724	0.0724		0.0668	0.0668						188.0881
Total	**0.1500**	**1.7419**	**0.9405**	**2.0600e-003**		**0.0724**	**0.1122**		**0.0668**	**0.0711**						**188.0881**

3.4 Civil Phase - 2018

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	5.4100e-003	4.1500e-003	0.0422	1.1000e-004		8.0000e-005	0.0113		7.0000e-005	3.0400e-003						10.0810
Total	**5.4100e-003**	**4.1500e-003**	**0.0422**	**1.1000e-004**		**8.0000e-005**	**0.0113**		**7.0000e-005**	**3.0400e-003**						**10.0810**

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						0.0000	0.0398		0.0000	4.2900e-003						0.0000
Off-Road	0.0255	0.1288	1.0103	2.0600e-003		3.3300e-003	3.3300e-003		3.3300e-003	3.3300e-003						188.0878
Total	**0.0255**	**0.1288**	**1.0103**	**2.0600e-003**		**3.3300e-003**	**0.0431**		**3.3300e-003**	**7.6200e-003**						**188.0878**

3.4 Civil Phase - 2018

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	5.4100e-003	4.1500e-003	0.0422	1.1000e-004		8.0000e-005	0.0113		7.0000e-005	3.0400e-003						10.0810
Total	**5.4100e-003**	**4.1500e-003**	**0.0422**	**1.1000e-004**		**8.0000e-005**	**0.0113**		**7.0000e-005**	**3.0400e-003**						**10.0810**

3.4 Civil Phase - 2019

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						0.0000	0.0398		0.0000	4.2900e-003						0.0000
Off-Road	0.8494	9.7456	5.4843	0.0126		0.3968	0.3968		0.3660	0.3660						1,137.0479
Total	**0.8494**	**9.7456**	**5.4843**	**0.0126**		**0.3968**	**0.4366**		**0.3660**	**0.3703**						**1,137.0479**

3.4 Civil Phase - 2019

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0305	0.0226	0.2329	6.7000e-004		4.8000e-004	0.0692		4.5000e-004	0.0187						60.2438
Total	**0.0305**	**0.0226**	**0.2329**	**6.7000e-004**		**4.8000e-004**	**0.0692**		**4.5000e-004**	**0.0187**						**60.2438**

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						0.0000	0.0398		0.0000	4.2900e-003						0.0000
Off-Road	0.1566	0.7912	6.2063	0.0126		0.0205	0.0205		0.0205	0.0205						1,137.0465
Total	**0.1566**	**0.7912**	**6.2063**	**0.0126**		**0.0205**	**0.0603**		**0.0205**	**0.0248**						**1,137.0465**

3.4 Civil Phase - 2019

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0305	0.0226	0.2329	6.7000e-004		4.8000e-004	0.0692		4.5000e-004	0.0187						60.2438
Total	**0.0305**	**0.0226**	**0.2329**	**6.7000e-004**		**4.8000e-004**	**0.0692**		**4.5000e-004**	**0.0187**						**60.2438**

3.5 Plant Const - 2019

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	0.4434	4.4671	3.0789	6.0300e-003		0.2195	0.2195		0.2041	0.2041						531.2908
Total	**0.4434**	**4.4671**	**3.0789**	**6.0300e-003**		**0.2195**	**0.2195**		**0.2041**	**0.2041**						**531.2908**

3.5 Plant Const - 2019

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0872	0.0645	0.6653	1.9000e-003		1.3800e-003	0.1978		1.2700e-003	0.0534						172.1054
Total	**0.0872**	**0.0645**	**0.6653**	**1.9000e-003**		**1.3800e-003**	**0.1978**		**1.2700e-003**	**0.0534**						**172.1054**

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	0.0796	0.6724	3.5470	6.0300e-003		9.4300e-003	9.4300e-003		9.4300e-003	9.4300e-003						531.2902
Total	**0.0796**	**0.6724**	**3.5470**	**6.0300e-003**		**9.4300e-003**	**9.4300e-003**		**9.4300e-003**	**9.4300e-003**						**531.2902**

3.5 Plant Const - 2019

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0872	0.0645	0.6653	1.9000e-003		1.3800e-003	0.1978		1.2700e-003	0.0534						172.1054
Total	**0.0872**	**0.0645**	**0.6653**	**1.9000e-003**		**1.3800e-003**	**0.1978**		**1.2700e-003**	**0.0534**						**172.1054**

3.6 O&M Const - 2019

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	0.0939	0.9709	0.6338	1.3800e-003		0.0433	0.0433		0.0403	0.0403						121.7222
Total	**0.0939**	**0.9709**	**0.6338**	**1.3800e-003**		**0.0433**	**0.0433**		**0.0403**	**0.0403**						**121.7222**

3.6 O&M Const - 2019

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0434	0.0321	0.3308	9.5000e-004		6.9000e-004	0.0983		6.3000e-004	0.0266						85.5610
Total	**0.0434**	**0.0321**	**0.3308**	**9.5000e-004**		**6.9000e-004**	**0.0983**		**6.3000e-004**	**0.0266**						**85.5610**

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	0.0178	0.1356	0.7460	1.3800e-003		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003						121.7221
Total	**0.0178**	**0.1356**	**0.7460**	**1.3800e-003**		**2.1600e-003**	**2.1600e-003**		**2.1600e-003**	**2.1600e-003**						**121.7221**

3.6 O&M Const - 2019

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0434	0.0321	0.3308	9.5000e-004		6.9000e-004	0.0983		6.3000e-004	0.0266						85.5610
Total	**0.0434**	**0.0321**	**0.3308**	**9.5000e-004**		**6.9000e-004**	**0.0983**		**6.3000e-004**	**0.0266**						**85.5610**

3.6 O&M Const - 2020

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	0.1698	1.7400	1.2253	2.7600e-003		0.0748	0.0748		0.0697	0.0697						238.8279
Total	**0.1698**	**1.7400**	**1.2253**	**2.7600e-003**		**0.0748**	**0.0748**		**0.0697**	**0.0697**						**238.8279**

3.6 O&M Const - 2020

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0807	0.0573	0.6024	1.8300e-003		1.3500e-003	0.1966		1.2400e-003	0.0531						165.7011
Total	**0.0807**	**0.0573**	**0.6024**	**1.8300e-003**		**1.3500e-003**	**0.1966**		**1.2400e-003**	**0.0531**						**165.7011**

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	0.0356	0.2712	1.4921	2.7600e-003		4.3200e-003	4.3200e-003		4.3200e-003	4.3200e-003						238.8276
Total	**0.0356**	**0.2712**	**1.4921**	**2.7600e-003**		**4.3200e-003**	**4.3200e-003**		**4.3200e-003**	**4.3200e-003**						**238.8276**

3.6 O&M Const - 2020

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0807	0.0573	0.6024	1.8300e-003		1.3500e-003	0.1966		1.2400e-003	0.0531						165.7011
Total	**0.0807**	**0.0573**	**0.6024**	**1.8300e-003**		**1.3500e-003**	**0.1966**		**1.2400e-003**	**0.0531**						**165.7011**

3.7 Comm-Testing - 2020

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	0.0000	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**

3.7 Comm-Testing - 2020

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0710	0.0504	0.5297	1.6100e-003		1.1900e-003	0.1729		1.0900e-003	0.0467						145.7027
Total	**0.0710**	**0.0504**	**0.5297**	**1.6100e-003**		**1.1900e-003**	**0.1729**		**1.0900e-003**	**0.0467**						**145.7027**

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	0.0000	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**

3.7 Comm-Testing - 2020

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
Vendor	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Worker	0.0710	0.0504	0.5297	1.6100e-003		1.1900e-003	0.1729		1.0900e-003	0.0467						145.7027
Total	**0.0710**	**0.0504**	**0.5297**	**1.6100e-003**		**1.1900e-003**	**0.1729**		**1.0900e-003**	**0.0467**						**145.7027**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

APPLICATION FOR CERTIFICATION

MISSION ROCK ENERGY CENTER (15-AFC-02)

Responses to Staff's Data Requests, Set 4 (Nos. 159-168)

ATTACHMENT B

(INVENTORY OF ONSITE DELIVERY EMISSIONS EMISSIONS)

OPERATIONS PHASE - Truck Delivery and Employee Commute Vehicle Emissions Estimates												
Project:	MREC Operations											
Delivery/Hauling Vehicle Use Rates							Emissions Factors (lbs/vmt)					
Delivery Roundtrip Distance:		12.3	miles		NOx	CO	VOC	SOx	PM10	CO2	PM2.5	
Avg Deliveries per Week:		4			0.012748	0.0053224	0.0011062	0.0000396	0.00155	4.20541	0.000661	HDDT
Total Deliveries per Year:		208			0.008318	0.0079962	0.001224	0.00002733	0.001251	2.8515	0.0004233	MDGT
Fraction of Deliveries-Diesel:		0.10	HDDT									
Fraction of Deliveries-Gas:		0.90	MDGT		**NOx**	**CO**	**VOC**	**SOx**	**PM 10**	**CO2**	**PM 2.5**	
Total Delivery VMT/Yr:		2558					Tons/Yr					
Total Period VMT-Diesel		256			0.0016	0.0007	0.0001	0.0000	0.0002	0.5380	0.0001	HDDT
Total Period VMT-Gasoline		2303			0.0096	0.0092	0.0014	0.0000	0.0014	3.2829	0.0005	MDGT
Employee Commute Data (LDPs gasoline)							Emissions Factors (lbs/vmt)					
# of Employee FTEs:		15			**NOx**	**CO**	**VOC**	**SOx**	**PM 10**	**CO2**	**PM 2.5**	
Avg roundtrip commute distance:		12.3	miles		0.0004051	0.004442	0.000525	0.0000107	0.000996	1.10456	0.000215	LDPs
Days/wk:		5										
Weeks/yr:		52					Tons/Yr					
Total Employee Commute VMT/yr:		47970			0.0117	0.1278	0.0151	0.0003	0.0287	31.7914	0.0062	LDPs
Adjusted Commute VMT/Yr:		57564										
Notes ***												
Emissions Factors - SCAQMD website, CEQA documents (2/2017).												
1. On road passenger and MDGT (delivery trucks), EMFAC 2007 (Ver 2.3)												
2. On road HHDT delivery/haul trucks, EMFAC 2007, (Ver 2.3)												
3. Applicant data (2017)												
a. Avg RT distance from site to Oxnard is 16 miles, avg RT distance to Santa Paula is 8.6 miles. Assumes 50% of all VMT is from Oxnard and 50% from Santa Paula.												
Avg RT distance for all deliveries and commute is 12.3 miles.												
b. 5 day work weeks are staggered for some employees												
4. Worker commute adjusted by 20% to account for non-routine commute trips by all employees on an annual basis.												
5. PM10/2.5 EFs include exhaust, tire wear, and paved road fugitives (per AP-42, Section 13.2.1, 9/2008).												

APPLICATION FOR CERTIFICATION
MISSION ROCK ENERGY CENTER (15-AFC-02)

Responses to Staff's Data Requests, Set 4 (Nos. 159-168)
ATTACHMENT C

(REDLINE VERSION OF THE REVISED APPENDIX 5.1E- CONSTRUCTION EMISSION SUPPORT)

APPENDIX 5.1E

Construction Emissions and Impact Analysis

Construction Phases

Construction of MREC is expected to last approximately 23 months. The construction will occur in the following four main phases:

- Mobilization and site preparation;
- Foundation work;
- Construction/installation of major structures; and,
- Installation of major equipment.
- Commissioning

The main site is approximately 9.8 acres in size and is essentially flat. A laydown yard will be located on the main site. The total acreage for purposes of calculating on-site emissions will be approximately 9.8 acres. The site is currently in use as a vehicle salvage/dismantling and transfer yard. The site is currently level, and as such, the site will require only minimum grading and leveling prior to construction of the power block and support systems. Site preparation includes finish grading, excavation of footings and foundations, and backfilling operations. After site preparation is finished, the construction of the foundations and structures is expected to begin. Once the foundations and structures are finished, installation and assembly of the mechanical and electrical equipment are scheduled to commence.

Fugitive dust emissions from the construction of MREC will result from:

- Dust entrained during site preparation and finish grading/excavation at the construction site;
- Dust entrained during onsite travel on paved and unpaved surfaces;
- Dust entrained during aggregate and soil loading and unloading operations; and
- Wind erosion of areas disturbed during construction activities.

Combustion emissions during construction will result from:

- Exhaust from the Diesel construction equipment used for site preparation, grading, excavation, and construction of onsite structures;
- Exhaust from water trucks used to control construction dust emissions;
- Exhaust from Diesel-powered welding machines, electric generators, air compressors, and water pumps;
- Exhaust from pickup trucks and Diesel trucks used to transport workers and materials around the construction site;
- Exhaust from Diesel trucks used to deliver concrete, fuel, and construction supplies to the construction site; and,

- Exhaust from automobiles used by workers to commute to the construction site.

To determine the potential worst-case daily construction impacts, exhaust and dust emission rates have been evaluated for each source of emissions. Worst-case daily dust emissions are expected to occur during months 2-8 of construction when site preparation occurs. The worst-case daily exhaust emissions are expected to occur during the middle of the construction schedule during the installation of the major mechanical equipment. Annual emissions are based on the average equipment mix during the 23 month construction period.

Available Mitigation Measures

The following mitigation measures are proposed to control fugitive dust and exhaust emissions from the diesel heavy equipment used during construction of MREC:

- The applicant will have an on-site construction mitigation manager who will be responsible for the implementation and compliance of the construction mitigation program. The documentation of the ongoing implementation and compliance with the proposed construction mitigations will be provided on a periodic basis.

- All unpaved roads and disturbed areas in the project and laydown construction sites will be watered as frequently as necessary to control fugitive dust. The frequency of watering will be on a minimum schedule of four (4) times during the daily construction activity period. Watering may be reduced or eliminated during periods of precipitation.

- Onsite vehicle speeds will be limited to 5 miles per hour on unpaved areas within the project construction site.

- The construction site entrance(s) will be posted with visible speed limit signs.

- All construction equipment vehicle tires will be inspected and cleaned as necessary to be free of dirt prior to leaving the construction site via paved roadways.

- Gravel ramps will be provided at the tire cleaning area.

- All unpaved exits from the construction site will be graveled or treated to reduce track-out to public roadways.

- All construction vehicles will enter the construction site through the treated entrance roadways, unless an alternative route has been provided.

- Construction areas adjacent to any paved roadway will be provided with sandbags or other similar measures as specified in the construction Storm Water Pollution Prevention Plan (SWPPP) to prevent runoff to roadways.

- All paved roads within the construction site will be cleaned on a periodic basis (or less during periods of precipitation), to prevent the accumulation of dirt and debris.

- The first 300 feet of any public roadway exiting the construction site will be cleaned on a periodic basis (or less during periods of precipitation), using wet sweepers or air filtered dry vacuum sweepers, when construction activity occurs or on any day when dirt or runoff from the construction site is visible on the public roadways.

- Any soil storage piles and/or disturbed areas that remain inactive for longer than 10 days will be covered, or shall be treated with appropriate dust suppressant compounds.

- All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions will be covered, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to minimize fugitive dust emissions. A minimum freeboard height of two (2) feet will be required on all bulk materials transport.

- Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) will be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition will remain in place until the soil is stabilized or permanently covered with vegetation.

- Disturbed areas will be re-vegetated as soon as practical.

To mitigate exhaust emissions from construction equipment, the applicant is proposing the following:

- The applicant will work with the construction contractor to utilize to the extent feasible, EPA-ARB ~~Tier 2/Tier 3~~ Tier 4 engine compliant equipment for equipment over 100 horsepower.

- Insure periodic maintenance and inspections per the manufacturers specifications.

- Reduce idling time through equipment and construction scheduling.

- Use California low sulfur diesel fuels (<=15 ppmw S).

Estimation of Emissions with Mitigation Measures

Tables 5.1E-1 through 5.1E-5 show the estimated maximum period, monthly, and daily heavy equipment exhaust and fugitive dust emissions with recommended mitigation measures. Detailed emission calculations are included in Table 5.1E-7, including estimates of PM2.5 and CO2e.

TABLE 5.1E-1 ONSITE CONSTRUCTION EMISSIONS SUMMARY, TONS/PERIOD

Category	NOx	CO	VOC	SOx	PM10	PM2.5	CO2
Exhaust[1]	2.6	16.1	5.61	0.034	0.049	0.048	3015
Fugitives	-	-	-	-	0.463	0.0862	-

Totals	2.6	16.1	5.61	0.034	0.512	0.134	3015

Notes: Construction period is 23 months.

[1] Onsite equipment exhaust based on revised emissions evaluation per CalEEMod2016, 10/25/16, assuming the use of Tier 4 engines on all onsite construction equipment (emissions reported are mitigated values).

Onsite const equipment exhaust, fugitive dust from earth moving activities, cut and fill activity, onsite paved road use, storage pile wind erosion, onsite unpaved road use.

TABLE 5.1E-2 ONSITE CONSTRUCTION EMISSIONS SUMMARY, LBS/MONTH (Normalized for 23 months)

Category	NOx	CO	VOC	SOx	PM10	PM2.5	CO2
Exhaust[1]	226	1400	488	2.96	4.26	4.17	-
Fugitives	-	-	-	-	40.3	7.5	-
Totals	226	1400	488	2.96	44.6	11.7	-

Notes: Construction period is 23 months.

[1] same note as Table 5.1E-1.

Onsite const equipment exhaust, fugitive dust from earth moving activities, cut and fill activity, onsite paved road use, storage pile wind erosion, onsite unpaved road use.

TABLE 5.1E-3 ONSITE CONSTRUCTION EMISSIONS SUMMARY, LBS/DAY (Normalized for 506 workdays)

Category	NOx	CO	VOC	SOx	PM10	PM2.5	CO2
Exhaust[1]	10.3	63.6	22.2	0.134	0.194	0.190	-
Fugitives	-	-	-	-	1.83	0.341	-
Totals	10.3	63.6	22.2	0.134	2.02	0.53	-

Notes: 23 months @ 22 days/month = 506 days/period

[1] same note as Table 5.1E-1.

Onsite const equipment exhaust, fugitive dust from earth moving activities, cut and fill activity, onsite paved road use, storage pile wind erosion, onsite unpaved road use.

TABLE 5.1E-4 ONSITE CONSTRUCTION EMISSIONS SUMMARY, LBS/DAY (Estimated Maximum Day)

Category	NOx	CO	VOC	SOx	PM10	PM2.5	CO2
Exhaust[1]	~~14.4~~19.57	~~89.0~~127	~~31.14~~.51	~~0.19~~0.255	~~0.27~~0.382	~~0.27~~0.382	-
Fugitives	-	-	-	-	~~2.56~~3.32	~~0.48~~0.643	-
Totals	~~14.4~~19.57	~~89.0~~127	~~31.14~~.51	~~0.19~~0.255	~~2.83~~3.70	~~0.75~~1.03	-

Notes:

Max day represents the overlap of Phase 2 and Phase 3.~~Max day estimated to be 40% higher than average day values.~~

[1] same note as Table 5.1E-1.

Onsite const equipment exhaust, fugitive dust from earth moving activities, cut and fill activity, onsite paved road use, storage pile wind erosion, onsite unpaved road use.

TABLE 5.1E-5 OFFSITE CONSTRUCTION EMISSIONS SUMMARY, TONS/PERIOD

Category	NOx	CO	VOC	SOx	PM10	PM2.5	CO2
Exhaust	7.0	8.45	1.35	0.044	0.62	0.62	2139
Fugitives	-	-	-	-	0.832	0.137	-
Totals	7.0	8.45	1.35	0.044	1.45	0.76	2139

Notes: Offsite construction of linears occurs at various periods with the overall 23 month construction period.

Delivery and hauling exhaust, offsite const equipment exhaust, const site support vehicle exhaust, worker travel exhaust, worker bus exhaust, offsite paved road fugitives, and trackout.

Total CO2e emissions from all construction related activities, both on and off site is estimated to be 8,524 tons per the construction period.

Analysis of Ambient Impacts from Facility Construction

Ambient air quality impacts from emissions during the construction of MREC were estimated using an air quality dispersion modeling analysis. The modeling analysis considers the construction site location, the surrounding topography, and the sources of emissions during construction, including vehicle and equipment exhaust emissions and fugitive dust.

Existing Ambient Levels

As with the modeling analysis of project operating impacts (Section 5.1), monitoring stations delineated in Section 5.1 were used to establish the ambient background levels for the construction impact modeling analysis. Table 5.1-17 showed the maximum concentrations of NO_x, SO_2, CO, PM2.5, and PM10 recorded for ~~2012~~ 2013 through ~~2014~~ 2015 at those monitoring stations.

Dispersion Model

As in the analysis of project operating impacts, the USEPA-approved model AERMOD (version 15181) was used to estimate ambient impacts from construction activities, consistent with the facility operational impact analyses and the version of AERMET used by SJVAPCD to process the meteorological data. A detailed discussion of the AERMOD dispersion model and the associated processing programs AERSURFACE, AERMET, and AERMAP is included in Section 5.1.6. As with the operational impact analysis, the ~~El Rio air quality monitoring site~~ Camarillo ASOS meteorology were processed by SJVAPCD in accordance with USEPA guidance.

The emission sources for the construction site were grouped into two categories: exhaust emissions and dust emissions. Combustion equipment exhaust emissions were modeled as eighteen (18) 3.048 meter high point sources (exhaust parameters of 750 Kelvins, 64.681 m/s exit velocity, and 0.1524 meter stack diameter) placed at regular 150-foot intervals around the construction area. Construction fugitive dust emissions were modeled as an area source covering the construction area with an effective plume height of 0.5 meters. Combustion and fugitive emissions were assumed to occur for 10 hours/day (7 AM to 5 PM) consistent with the expected period of onsite construction activities generating both exhaust emissions and fugitive dust. The construction impacts modeling analysis generally used the same receptor locations and meteorological data as used for the project operating impact analysis. Exceptions were that only the 10-meter fenceline and 20-meter downwash receptor grids were modeled since maximum impacts will occur in the immediate project vicinity and the ~~FASTALL~~ FASTAREA option was utilized to minimize runtimes for the area source ~~and the larger number of point sources~~ modeled. A detailed discussion of the receptor locations and meteorological data is included in Section 5.1.6. To determine the construction impacts on short-term ambient standards (24 hours and less), the maximum daily onsite construction

emission levels shown in Table 5.1E-4 were used. For pollutants with annual average ambient standards, the normalized monthly emission levels as shown in Table 5.1E-2 were used, multiplied by 12 months/year to derive annual emissions.

Modeling Results

Based on the emission rates of NO_x, SO_2, CO, PM2.5, and PM10, the modeling options, receptor grids, and meteorological data, AERMOD calculates short-term and annual ambient impacts for each pollutant. As mentioned above, the modeled 1-hour, 3-hour 8-hour, and 24-hour ambient impacts are based on the worst-case daily emission rates of NO_x, SO_2, CO, PM2.5, and PM10 spread over the estimated daily hours of operation. The annual impacts are based on the annual emission rates of these pollutants.

The annual average concentrations of NO_2 were computed following the revised USEPA guidance for computing these concentrations (August 9, 1995 Federal Register, 60 FR 40465). The annual average was calculated using the ambient ratio method (ARM) with the national default value of 0.75 for the annual average NO_2/NO_x ratio. The 1-hour NO2 impacts were modeled using the ozone limiting method (OLM) as described in the Section 5.1.6 for the commissioning impacts.

The modeling analysis results are shown in Table 5.1E-6. Also included in the table are the maximum background levels that have occurred in the last three years and the resulting total ambient impacts. As shown in Table 5.1E-6, modeled construction impacts due to facility emissions alone for all pollutants are expected to be below the most stringent state and Federal standards.

TABLE 5.1E-6 MODELED MAXIMUM CONSTRUCTION IMPACTS

Pollutant	Averaging Time	Maximum Construction Impacts (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	State Standards (µg/m³)	Federal Standards (µg/m³)
NO_2[a]	1-hour 1-hour Annual	~~198.0~~23.1 ~~75.1~~ 6.4 ~~6.6~~ 0.4	~~107.2~~75.3 ~~60.2~~56.4 ~~–~~13.2	~~305.2~~98.4 ~~135.3~~62.8 ~~19.8~~13.6	339 - 57	- 188 100
SO_2	1-hour 3-hour 24-hour Annual	~~–~~ 0.~~77~~60 ~~–~~ 0.~~30~~20 ~~–~~ 0.~~11~~04 0.01	~~–~~10.5 ~~–~~10.5 ~~–~~ 5.2 2.1	~~11.27~~11.1 ~~10.80~~10.7 ~~5.31~~ 5.2 2.1	655 - 105 -	196 1300 ~~-~~ 365 80
CO	1-hour 8-hour	~~268.0~~299.3 ~~64.7~~42.2	4,581 1,260	~~4,849~~4,880 ~~1,325~~1,302	23,000 10,000	40,000 10,000
PM10	24-hour Annual[b]	~~10.1~~19.0 ~~1.6~~1.4	~~57~~118 ~~24.3~~25.6	~~67~~137 ~~26~~ 27	50 20	150 -
PM2.5	24-hour Annual	~~2.73~~3.68 ~~0.59~~0.26	~~18~~19 ~~9.4~~9.6	~~21~~23 10	- 12	35 12.0

Notes:
[a] ARM applied for annual average, using national default 0.75 ratio, and OLM for 1-hour averages.
[b] Annual Arithmetic Mean.

For maximum modeled ambient concentrations when added to background concentrations, standards are only exceeded for the state PM_{10} standards since the background

concentrations already exceed the CAAQS. All other maximum modeled construction impacts when added to background concentrations are less than the applicable state or Federal standards. Modeled MREC construction particulate impacts shown are not unusual in comparison to the modeling results for most construction projects; actual impacts for construction sites that use good dust suppression techniques and low-emitting vehicles typically would not be expected to cause exceedances of air quality particulate standards. The input and output modeling files are being provided electronically to the appropriate agencies.