DOCKETED	
Docket Number:	08-AFC-03C
Project Title:	Marsh Landing Generating Station Compliance
TN #:	225750
Document Title:	MARSH LANDING GENERATING STATION, PETITION TO AMEND BLACK START CAPABILITY ENHANCEMENT RESPONSE TO DATA REQUEST 1-6
Description:	AIR QUALITY APPENDIX-1
Filer:	Raquel Rodriguez
Organization:	Marsh Landing LLC
Submitter Role:	Applicant
Submission Date:	11/1/2018 3:33:43 PM
Docketed Date:	11/1/2018

MARSH LANDING GENERATING STATION, DOCKET NO. 08-AFC-3C

PETITION TO AMEND

BLACK START CAPABILITY ENHANCEMENT RESPONSE TO DATA REQUEST 1-6

AIR QUALITY APPENDIX-1

Marsh Landing LLC
Marsh Landing Generating Station
3201-C Wilbur Avenue
P.O. Box 1687
Antioch, CA 94509

October 10, 2018

Keith Winstead,
Planner III/Project Manager
California Energy Commission
Siting, Transmission and Environmental Protection Division
1516 Ninth Street, MS 15
Sacramento, CA 95814-5512

Subject: **Marsh Landing Generating Station (08-AFC-3C)**
Petition to Amend - Black Start Capability Enhancement
Response to Data Requests 1-6

Dear Mr. Winstead:

Marsh Landing LLC's ("Marsh Landing") provides herein responses to California Energy Commissions six Air Quality data requests in response Marsh Landing's Petition to Amend to incorporate black start capability on combustion turbine generator Units 3 and 4. The respective data requests and Marsh Landing's responses follow. Where applicable, attachments that correspond to the respective data requests are included. We look forward to the CEC's review and comments/questions. Please contact me at George.Piantka@nrg.com or at (760) 707-6833 if you have questions.

Sincerely,
On Behalf of Marsh Landing LLC

George L. Piantka, PE
Senior Director, Environmental

cc: Gerry Bemis, CEC
Tao Jiang, CEC
Matt Layton, CEC
Xuna Cai, BAAQMD
Pamela Luong, BAAQMD

Technical Area: Air Quality

Author: Tao Jiang

AIR QUALITY APPLICATION TO THE AIR DISTRICT

BACKGROUND

The proposed modification would require review by the Bay Area Air Quality Management District (District). An application for minor permit revision has been submitted to the District. Staff needs copies of all correspondence between the petitioner and the District in a timely manner in order to stay up to date on any issues that arise prior to completion of the staff's analysis of this petition.

DATA REQUEST

1. ***Please provide copies of all substantive District correspondence regarding the application to the District, including application supplements and e-mails, within one week of submittal or receipt. This request is in effect until the final Commission Decision has been docketed.***

RESPONSE

All substantive District correspondence regarding the application to the District through the date of this response have been provided to the CEC assigned project manager (updated on October 5, 2018) and moving forward, future application supplements and emails will be provided within one week of submittal to the District until the final Commission Decision has been docketed.

EMISSION CALCULATIONS AND IMPACTS DURING CONSTRUCTION

BACKGROUND

The petition states on page 13 that calculations of emissions during construction are provided in Appendix D. However, staff cannot find the construction emissions calculations in Appendix D. In addition, the construction impacts were not modeled.

DATA REQUESTS

2. ***Please provide spreadsheet of construction emissions calculations with the embedded calculations live and intact.***

RESPONSE

Please find enclosed with this submittal the construction emissions calculations spreadsheet.

3. Please provide air quality modeling during the construction phase or justify not including them by comparing to the original facility's construction phase impacts.

RESPONSE

Supplemental air quality modeling during construction phase has not been provided for this petition to amend (PTA), as the construction phase will be significantly less than the original facility's construction. The construction phase will be limited to an approximate 10-month period from the notice to proceed to the contractors to the commercial online date at which black start services would be available. Construction activities are anticipated to take 5-6 months during this period 10-month period and will entailed significantly less equipment, labor, vehicles miles traveled, ground disturbance, and onsite fabrication as compared to the construction of Marsh Landing Generating Station (MLGS). Construction activities for MLGS were conducted over a 27-month period. Construction related emissions for MLGS are summarized in Table 9 of the CEC's June 2010 Revised Staff Assessment.

Currently we anticipate a commercial online date to be November 1, 2019. Construction activities will be limited to a small area east of Unit 4 where the pre-fabricated battery energy storage system (BESS) to be located in container would be installed, as illustrated in the applicant's March 2018 PTA. Construction will include installation of the electrical interconnections and logic controls between the battery and Units 3 and 4 and the control room.

EMISSION CALCULATIONS AND IMPACTS DURING BLACK START SYSTEM COMMISSIONG AND READINESS TESTING

BACKGROUND

The petition provides the emissions calculations during the black start system commissioning and testing in Appendix D. However, the air quality impacts during the commissioning and readiness testing were not modeled.

DATA REQUESTS

4. Please provide the spreadsheet versions of emissions calculations in Appendix D with the embedded calculations live and intact.

RESPONSE

Please find enclosed with this submittal the emissions calculations spreadsheets, including emissions calculations during the black start system commissioning and readiness testing, from the March 2018 air permit application and from updated assumptions discussed with BAAQMD and CEC during September and October 2018. Emissions for an assumed 48-hour black start event are included in the attached spreadsheets and are based on worst case emission factors. The same worst case emission factors have been used for the emissions calculations used for the commissioning and readiness test periods. These calculations have been provided to the District as well, with the most up-to-date versions provided on October 3, 2018. A copy of that communication to the District has been provided to the CEC in response to AQ Data Request #1 above. Note that the applicant revised the estimated durations of commissioning (40 hours,

down from 94 hours) and readiness testing (5 hours, down from 16 hours). These revised emissions estimates were presented to the District and CEC in a joint agency conference call on September 5, 2018. The cumulative turbine operating hours for Units 3 and 4 during the 40-hour commissioning period are estimated to be 63 hours. The cumulative turbine operating hours for Units 3 and 4 during the 5-hour readiness testing period are 8 hours. The applicant also provided a memo to BAAQMD to better clarify the operating assumptions made for the commissioning and readiness periods (see attached September 21, 2018 memo).

5. ***Please provide exhaust stack parameters (including temperature, air pollutant emissions, and vertical velocity) over the black start combustion turbine operating range during commissioning and readiness testing, including periods when operating at emissions levels that exceed the minimum emissions compliance load (MECL).***

RESPONSE

Exhaust stack parameters over the black start combustion turbine operating range during commissioning, readiness testing and potential black start events are provided as an attachment herein and have been provided to BAAQMD, as documented in response to AQ Data Request #1 above.

6. ***Please provide facility air quality modeling during the commissioning and annual readiness testing of black start system. Compare ground level incremental impacts for minimum combustion turbine load and normal operation combustion turbine loads against applicable ambient air quality standards.***

RESPONSE

The applicant has not provided air quality modeling during the commissioning and annual readiness testing. The applicant has compared the duration of the one-time black start commissioning period to the original commissioning assumptions for MLGS, which included full speed no load and partial and full load operations. The original black start commissioning period was estimated to be 93 hours (in the March 2018 BAAQMD air application and CEC PTA) and was subsequently reduced to 40 hours (5 hours of commissioning per day over a 2-week period) of which 63 cumulative turbine operating hours for Units 3 and 4 combined have been calculated. Refer to the September 21, 2018 memo referenced in Response 4, above, that describes in detail the commissioning period. The applicant notes that the daily and hourly emission estimates during black start commissioning have not changed from the original air permit application for the 93-hour commissioning period vs. the revised 40-hour commissioning period during which 63 cumulative turbine hours have been calculated; just the total emissions have been reduced with the reduced duration of black start commissioning. Nonetheless, criteria pollutant emissions for Units 3 and 4 would be less than that estimated for the original commissioning of MLGS where an estimated 232 hours of commissioning operations per turbine had been permitted. See Table 10 of CEC's Revised Staff Assessment for the respective daily and hourly pollutant estimates. Looking at the daily CO, POC, and NOx values, approximately 33,992 pounds, 2,008 pounds, and 3,063 pounds per day per turbine (~68,000

lbs/day, ~4000 lbs/day, and ~6,100 lbs/day for two turbines), respectfully were estimated during the MLGS commissioning. Criteria pollutant levels for black start commissioning for combined Units 3 and 4 were estimated to be 20,697 lbs/day CO, 8 lbs/day POC, and 662 lbs/day NOx, respectively. The hourly criteria pollutant emissions would be comparable or less for black start commissioning as compared to the original MLGS commissioning estimates: original MLGS – 2,405 lbs/hour CO, 145 lbs/hour POC, and 188 lbs/hour NOx vs. black start MLGS – 2,587 lbs/hour CO, 1 lb/hour POC, and 83 lbs/hour NOx. Given that the hourly and daily emissions for black start commissioning would be less or comparable than that of the original MLGS commissioning, It is the applicant's position that modeling black start commissioning for criteria pollutant is not necessary. BAAQMD is conducting a Health Risk Assessment for commissioning which will include toxic air contaminant modeling. It is the applicant's recommendation that the CEC and BAAQMD coordinate the review of the HRA modeling to assess whether any other agency conducted pollutant modeling would be necessary. Based on the analysis and conclusions in the CEC's Revised Staff Assessment and subsequent license for MLGS, BAAQMD's Final Determination of Compliance, and air permit application and PTA for the black start project, we believe the CEC has adequate information from which to complete its evaluation of the air quality and public health related impacts due to the Black Start Capability Enhancement project and conclude that the project would not cause significant impacts that would not otherwise be mitigated by the approved license and air permit conditions and those proposed revisions to the respective license and air permit conditions from this project.

Data Request #2
Construction Emissions Calculations

Data Request #4
Emissions Calculations Spreadsheets

Data Request #5
Exhaust Stack Parameters

AECOM Imagine it. Delivered.

AECOM
999 Town and Country Road
Orange, CA 92868
aecom.com

Project name:
MLGS Black Start Permitting

Project ref:
60564850

To:
George L. Piantka, P.E.
Senior Director
Regulatory Environmental Services
4600 Carlsbad Blvd.
Carlsbad, CA 92008

From:
Todd M. Paxman

Date:
September 21, 2018

CC:
Kelly Bayer, AECOM
Hans Beutelman, AECOM

Memo

Subject: MLGS - Turbine Operational Cycles During Black Start Testing, Commissioning, and Black Start Events

1. Introduction

This memorandum defines the turbine operation during black start readiness testing, black start commissioning, and black start emergency operation for Marsh Landing Generating Station (MLGS). The associated emissions calculations are also described.

2. Shutdown Emissions

Adopting the approach from the August 2010 Final Determination of Compliance (FDOC) for MLGS, emissions are assumed to be released in the first six minutes of shutdown during Black Start Testing and Commissioning. During these operations, emissions are assumed to be identical to Start/Trip from Full Speed No Load (FSNL), because shutdown is from FSNL or Island mode operations rather than from full load as assumed in Table 16 of the FDOC. The last nine minutes of the 15-minute shutdown period are in normal cool-down conditions and result in zero emissions. These assumptions have been incorporated in the emission calculations for Black Start Testing, Black Start Commissioning, and Black Start Emergency Operations.

3. Hourly Emissions Calculations

3.1 Black Start Readiness Testing

Black Start readiness testing has been assumed to take 5 hours during which the two designated black start units (i.e., Units 3 and 4) will have overlapping run hours. The testing period consisting of the two units operating during a single hour is as follows.

- The first unit operating 10 minutes of startup, 5 minutes of FSNL, and 30 minutes of island mode, then 15 minutes of shutdown as described above. This results in a total of 51 minutes with emissions during the testing hour (i.e., 60 minutes less the last 9 minutes of shutdown, which have no emissions).
- The second unit operating 25 minutes on turning gear (no incremental emissions), then 10 minutes of startup, then 10 minutes of FSNL, then 15 minutes of shutdown as described above. This results in a total of 26 minutes with emissions during the testing hour (i.e., 35 minutes of operation, including the last 9 minutes of shutdown that have no emissions).

The figure below illustrates how the turbines operate during each hour of Black Start Readiness Testing, and details when they operate simultaneously.

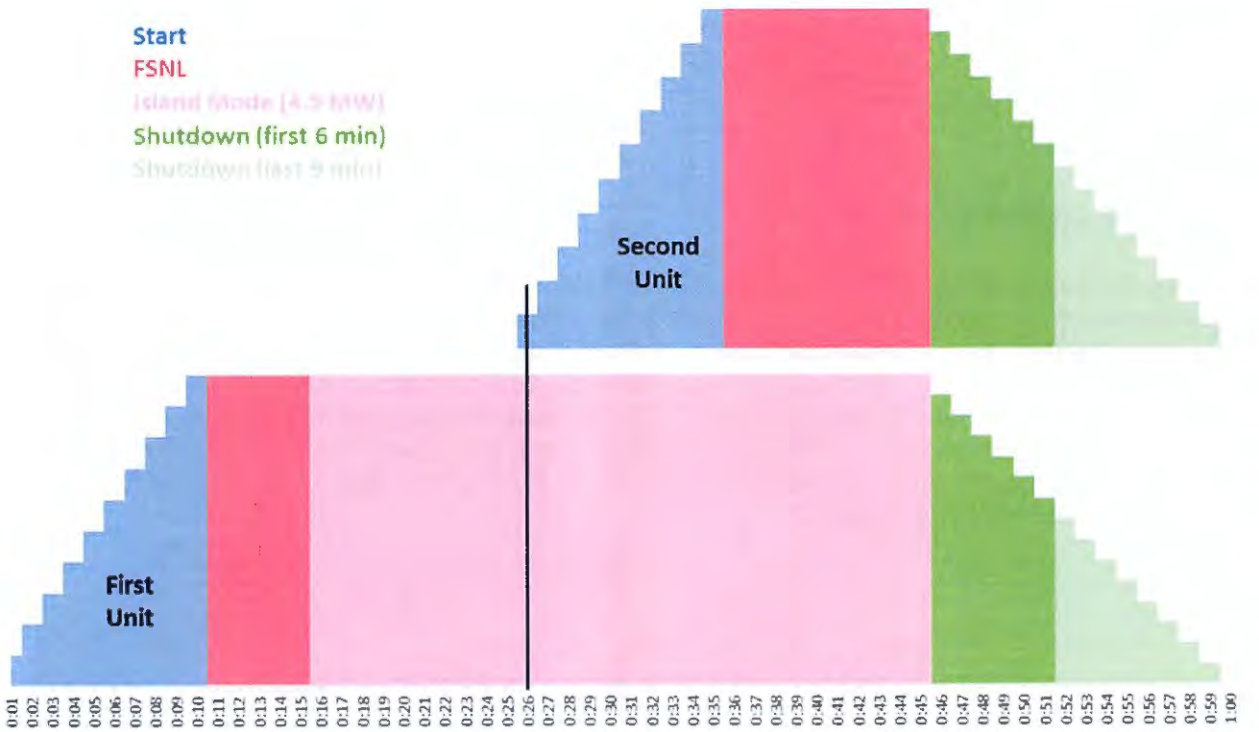


Figure 1. Operational modes during each hour of testing or commissioning

The hourly emissions consist of the sum of all the emissions released during the testing period for both turbines (77 minutes of cumulative operations with emissions each hour). The daily emissions total is calculated by assuming five hours of readiness testing per day that will include Units 3 and 4

operations. Hence, the emissions calculated for one hour as illustrated in Figure 1 are multiplied by a maximum of five hours per day, which account for about 8 hours total of combined turbine operations for readiness testing (see Table 1). The annual emissions account for a maximum of five hours in a year; therefore, the annual potential emissions are the same as the maximum daily emissions.

3.2 Black Start Commissioning

The potential emissions for each hour of Black Start Commissioning are calculated with the same assumptions used for Black Start Readiness Testing. The maximum daily emissions account for up to eight hours of commissioning per day. Hence, the hourly emissions are multiplied by eight hours per day. The annual emissions for commissioning are calculated based on five days of commissioning for the commissioning year (assumed to be during 2019). Hence, during these 40 hours during which Units 3 and 4 will have combined operations, the total combined turbine operating hours during black start commissioning will be about 63 hours (see Table 1). We anticipate the 40 hours of commissioning will occur over a 2-week period.

3.3 Cumulative Testing Hours

Cumulative testing and commissioning operations are summarized in the following table.

Table 1. Total Operation of Both Turbines

Mode	Hours/yr	Unit 3 min/hr	Unit 4 min/hr	Total min/yr	Total hrs/yr
Testing, total	5	60	35	475	7.9
Testing, fired only *	5	51	26	385	6.4
Commissioning, total	40	60	35	3,800	63.3
Commissioning, fired only *	40	51	26	3,080	51.3

** Not including 9 minutes of unfired coasting at end of each shutdown*

4. Black Start Emergency Operations

The simulation of a Black Start Emergency Operation is more complicated. The assumptions relative to shutdown described above are incorporated into the calculations below. Additionally, the operational scenarios assume the two turbines may operate simultaneous, per the following assumptions:

- All turbines are identical and can perform this scenario during a Black Start Emergency operation.
- Units 3 and 4 are considered the primary and secondary units, respectively, for modeling this scenario.
- After a maximum of 48 hours, Black Start Emergency Operations will revert to normal permitted operations.
- The primary turbine (Unit 3 for this example) has three startups and three shut downs per day for the 48 hours of Black Start Emergency Operations.

- The secondary turbine (Unit 4) for this example has four startups and three shut downs during the first day of operation.
- The secondary turbine (Unit 4) has three startups and three shut downs during the second day of operation.

4.1 Primary Turbine Operations

During the Black Start Emergency period, the primary turbine (Unit 3) was modeled as follows for the emissions calculations:

Table 2. Primary Unit (Unit 3) Operational Modes

Day	Start	End	Duration	Description	Operating Conditions
First Day	0:01:00	0:10:00	10 mins	Start-up	Start/FSNL
	0:11:00	1:00:00	50 mins	Island Mode	Island Mode (4.5MW)
	1:01:00	11:45:00	10 hrs 45 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	5:46:00	6:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	6:01:00	6:10:00	10 mins	Start-up	Start/FSNL
	11:46:00	12:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	12:01:00	12:10:00	10 mins	Start-up	Start/FSNL
	12:11:00	23:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	23:46:00	0:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
Second Day	0:01:00	0:10:00	10 mins	Start-up	Start/FSNL
	0:11:00	11:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	5:46:00	6:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	6:01:00	6:10:00	10 mins	Start-up	Start/FSNL
	11:46:00	12:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	12:01:00	12:10:00	10 mins	Start-up	Start/FSNL
	12:11:00	23:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	23:46:00	0:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)

Source: MLGS - Black Start Event 48-hour Emissions Estimate (Assumed Worst Case) 091118.xlsx

4.2 Secondary Turbine Operations

During the Black Start Emergency period, the secondary turbine (Unit 4) was modeled as follows for the emissions calculations:

Table 3. Secondary Unit (Unit 4) Operational Modes

Day	Start	End	Duration	Description	Operating Conditions
First Day	0:01:00	0:20:00	20 mins	Turning Gear	On Turning Gear
	0:21:00	0:30:00	10 mins	Start-up	Start/Trip from FSNL
	0:31:00	0:50:00	20 mins	Turning Gear	Coast to Turning Gear
	0:51:00	1:00:00	10 mins	Start-up	Start/Trip from FSNL
	1:01:00	11:45:00	10 hrs 45 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	5:46:00	6:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	6:01:00	6:10:00	10 mins	Start-up	Start/FSNL
	11:46:00	12:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	12:01:00	12:10:00	10 mins	Start-up	Start/FSNL
	12:11:00	23:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	23:46:00	0:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
Second Day	0:01:00	0:10:00	10 mins	Start-up	Start/FSNL
	0:11:00	11:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	5:46:00	6:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	6:01:00	6:10:00	10 mins	Start-up	Start/FSNL
	11:46:00	12:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	12:01:00	12:10:00	10 mins	Start-up	Start/FSNL
	12:11:00	23:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	23:46:00	0:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)

Source: MLGS - Black Start Event 48-hour Emissions Estimate (Assumed Worst Case) 091118.xlsx

Estimated Pieces of Construction Equipment and Schedules										Yearly Total	Maximum Monthly Weighted HP	Annual Weighted HP
Equipment	% Use	HP	Fuel	2019								
				April	May	June	July	Aug	Sept			
On-Road/Off-Road												
Dump Truck	30%	350	Dsl	3	3					6	31,354	62,708
Concrete Pumper	15%	350	Dsl		1					1	5,226	5,226
Concrete Truck	15%	350	Dsl		5					5	26,128	26,128
Pickup Trucks	18%	325	Gas	4	4	4	4	4	4	24	23,292	139,750
Water truck	12%	350	Dsl	1	1	1	1			4	4,181	16,722
Vacuum truck	18%	350	Dsl		1	1	1			3	6,271	18,813
Off-Road												
Excavator	30%	250	Dsl	1	1					2	7,465	14,931
Backhoe	30%	80	Dsl	1	1					2	2,389	4,778
Flatbed-mounted Utility Crane	30%	300	Dsl			1	1			2	8,958	17,917
Portable Generator and Welding Equipment	30%	25	Dsl		1	1	1			3	747	2,240
Trencher/ditch witch	24%	250	Dsl	1	1	1				3	5,972	17,917
Soil compactor	30%	15	Gas	1	1					2	448	896
Pile driver	30%	500	Dsl		1					1	14,931	14,931
Forklift	30%	40	Gas		1	1	1	1		4	1,194	4,778
										Totals	**138,556**	**347,733**

	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC
Construction Emissions						
2008 Monthly Emissions (tons)	11.23	3.69	0.16	0.15	0.0043	0.69
2019 Month Emissions (tons)	3.25	1.07	0.05	0.04	0.0012	0.20
2008 Yearly Emissions (tons)	85.02	28.7	1.25	1.14	0.034	5.33
2019 Year Emissions (tons)	12.09	4.08	0.18	0.16	0.00	0.76
Fugitive Dust						
2008 Yearly Emissions (tons)	0	0	1.7	0.35	0	0
2019 Yearly Emissions (tons)	0	0	0.34	0.07	0	0

Notes:

To calculate Fugitive Dust 2008 PM10 Emissions:
10 [hr/day] * 22 [day/month] * 12 [month/year] * 5.83 [acres] * 1.3 [lb/hour-acre] * (1 - 0.8323) / 2000 [lbs/ton] = 1.7 tons PM10

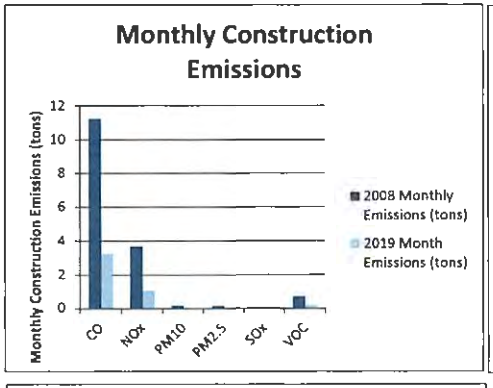
To calculate Fugitive Dust 2019 PM10 Emissions:
10 [hr/day] * 22 [day/month] * 6 [month/year] *10%/25%* 5.83 [acres] * 1.3 [lb/hour-acre] * (1 - 0.8323) / 2000 [lbs/ton] = 0.34 tons PM10

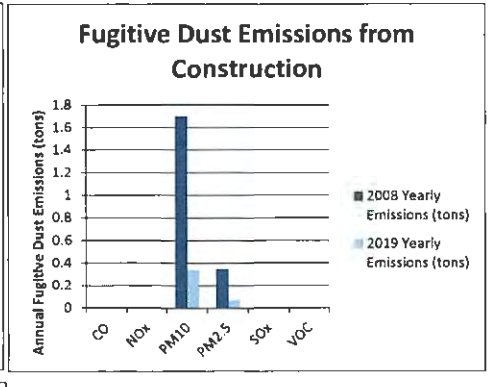
2008 Fugitive Dust PM2.5 Emissions were provided (0.35 tons in 2008). 2019 Fugitive Dust PM2.5 Emissions were calculated by diving 2008 emissions by 2 to account for the duration of construction, and multiplying by 10%/25% to account for the ratio of land being disturbed.

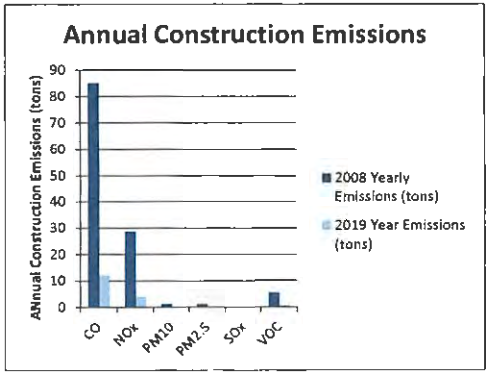
Fugitive Dust Data provided in Appendix J3:

Emission factor 1.30 lb/hr-acre
Hours per day 10.00 hr/day
Days per month 22.00 days/month
Months per year 12.00 months/year
Total acreage disturbed 23 acres
Percent disturbed at any one time 25 %
Average acreage 5.83 acre
Unmitigated PM10 emissions 10.00 tons/year
Unmitigated PM2.5 emissions 2.08 tons/year
Mitigation factor 83.23 percent
Mitigated PM10 emissions 1.68 tons/year
Mitigated PM2.5 emissions 0.35 tons/year

Year	Maximum Monthly Weighted HP	Annual Weighted HP
2008	478,750	2,446,000
2019	138,556	347,733
% change	-71.06%	-85.78%
2019 fraction of 2008 HP	0.289411082	0.142163793







Estimated Pieces of Construction Equipment and Schedules											
Equipment	% Use	HP	Fuel	2009			2010				
				Oct	Nov	Dec	Jan	Feb	Mar	Apr	
				1	2	3	4	5	6	7	
Construction											
On-Road											
Concrete Pumper Truck	15	350	Dsl			1	1	1	1		
Dump Truck	35	300	Dsl			1	1	1	1	10	
Fuel/Lube Truck	25	150	Gas	4	4	4	4	4	4	1	
Pickup Truck	75	150	Gas	2	2	2	2	2	2	2	
Water Truck	50	300	Dsl	2	2	2	2	2	2		
Off-Road											
Air Compressor	80	50	Gas	3	3	3	3	3	4	2	
Artifulating Boom Manlift	70	75	Gas	2	2	2	2	2	6	4	
Backhoe Loader	40	80	Dsl			2	2	2	2	2	
Jumping Jack Compactor	60	7.5	Gas								
Crane, 150-Ton, Crawler	50	300	Dsl	1	1	1		1	1	1	
Crane, 330-Ton, Crawler, M2250	25	500	Dsl						1	1	
Crane, 45-Ton Hydraulic	65	250	Dsl	1	1	1	1	1	1	1	
Crane, 55-Ton Hydraulic	65	300	Dsl	1	1	1	1	1	2	2	
Dozer	80	300	Dsl								
Excavator, Hydraulic	85	250	Dsl	2	2	2	1	1	1	1	
Forklift	75	40	Gas	1	1	1	1	2	2	2	
Front End Loader	70	130	Dsl		1	1	1	1	1	1	
Light Plant	30	25	Gas		1	1	1	1			
Tractor	50	195	Dsl	1	1	1	1	1	1	1	
Vibratory Roller	80	125	Gas			1	1	1	1		
Walk Behind Vibratory Roller	60	25	Gas			1	1	1	1		
Welder (Diesel)	70	25	Dsl	2	2	2	1	1	1	1	
Totals				22	24	30	27	29	35	32	
Total from Appendix J (do not add up correctly)				24	27	35	33	35	40	34	

													20
May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**
8	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
											1	1	1
											1	2	2
1	1	1	1	1	1	1	1	1			1	1	1
2	2	2	2	2	2	2	2	2	2	2	3	3	3
											1	1	1
2	1	1	1	1	1	1	1	1			1	1	1
6	6	12	12	10	10	10	12	12	6	4			
1	1	1	1	1							1	1	1
												1	1
1	1	1	1	1	1								
1													
1	1	1	1	1	1	1	1	1	1	1			
1	1	1	1	1	1	1	1				1	1	1
												1	1
1	1	1	1	1							1	1	2
3	2	2	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1						1	2	2
						1	1	1	1				
1	1	1	1	1	1	1	1	1	1	1	1	1	1
													1
													1
1	2	2	2	2	2	2	2	1	1	1			1
23	21	27	26	24	22	21	23	21	13	10	14	18	22
23	21	27	26	24		22	21	23	21	13	10	15	21

11							2012						Yearly Total
Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		
22	23	24	25	26	27	28	29	30	31	32	33		
1	1	1	1	1	1	1							14
2	2	2	2	2	1	1	1	1					33
1	1	1	1	1	1	1	1	1	1	1	1		49
3	3	3	3	3	3	3	3	3	3	3	2		80
1	1	1	1	1	1	1	1	1	1	1	1		27
1	1	1	1	1	1	1	2	2	2	2	2		51
		1	3	5	9	9	9	9	12	12	12		201
1	1	1	1	1	1	1	1	1	1	1	1		30
2	2	2	2	2	2	2	2	2					20
					1	1	1	1	1	1	1		19
					1	1	1	1	1	1			9
					1	1	1	1	1	1	1		25
1	1	1	1	1	1	1	1	2	2	2	2		36
1	1	1	1										6
2	2	2	2	2	2	2	1	1					35
1	2	2	2	2	2	2	3	3	3	3	2		55
2	2	2	2	2	2	2	2	2					35
													8
1	1	1	1	1	1	1	1	1	1	1	1		33
1	1	1	1	1	1	1	1	1					14
1	2	2	2	2	2	1	1	1	1				20
1	1	1	1	1	1	1	1	2	2	2	2		45
23	25	26	28	29	35	34	34	36	32	31	28		845
22	24	25	26	28	29	34	34	34	36	31	31	28	

Maximum Monthly Weighted HP	Total Weighted HP	Annual Weighted HP
5,250	73,500	26,727
105,000	346,500	126,000
15,000	183,750	66,818
33,750	900,000	327,273
30,000	405,000	147,273
16,000	204,000	74,182
63,000	1,055,250	383,727
6,400	96,000	34,909
900	9,000	3,273
15,000	285,000	103,636
12,500	112,500	40,909
16,250	406,250	147,727
39,000	702,000	255,273
24,000	144,000	52,364
42,500	743,750	270,455
9,000	165,000	60,000
18,200	318,500	115,818
750	6,000	2,182
9,750	321,750	117,000
10,000	140,000	50,909
3,000	30,000	10,909
3,500	78,750	28,636
478,750	**6,726,500**	**2,446,000**

Emissions Summary

Worst Case Emission Rates from Modeling (Siemens Conc. Curves)				Converted to tons/year using Annual Hours	
Parameter	Permit Limit	BS Commissioning	BS Readiness Testing	BS Commissioning	BS Readiness Testing
Daily POC (as CH_4)	4,016.00	3,543.00	3,543.00	6.89	1.18
Daily PM_{10}	470.00	132.36	132.36	0.258	0.044
Daily SOx (as SO_2)	298.00	90.42	90.42	0.18	0.03
Hourly NOx (as NO_2)	376.00	174.61	174.61		
Daily NOx (as NO_2)	6,126.00	4,190.57	4,190.57		
Yearly NOx (as NO2) (tons)	78.57	8.15	1.40	8.15	1.40
Hourly CO	4,810.00	2,141.62	2,141.62		
Daily CO	67,844.00	51,398.93	51,398.93		
Yearly CO (tons)	138.58	100.00	17.13	100.00	17.13
Annual Hours	7,008.00	93.39	16.00	93.39	16.00

Notes:

a. Condition 9 (commissioning) of ATC August 31, 2010 (2 units).

b. Commissioning is anticipated to be performed one unit at a time.

c. Commissioning hours are set at 93.4 combined for Units 3 and 4 to keep CO emissions below the major modification PSD threshold (100 TPY).

d. Commissioning will occur during the first year; additional readiness testing during that year will not be required. Black start readiness testing is anticipated to begin the following year at the earliest, depending on operational and contractual requirements.

[a]Emission Calculation Constants		
Standard Temperature (°F)	ST	70
Standard Pressure (psia)	SP	14.7
Molar Volume (dscf/lbmol)	MV	386.8
Ambient Oxygen Concentration (%)	O2	20.95
Oxygen Concentration of Permit Standard (%)	O2	15.00%
Dry Flue Gas Factor (dscf/MM Btu)	Fd	8743
Natural Gas Higher Heating Value (Btu/dscf)	HHV	1020

Molecular Weights (lb/lbmol)		
Pollutant	**As**	**MW**
NOx	NO2	46.01
CO	CO	28.01
POC	CH4	16.04
SOx	SO2	64.07

Oxidation Catalyst	eff %	45%

[a]Final Determination of Compliance, Appendix A (August 2010)

Acronyms:

FSNL: Full Speed, No Load

MECL: Minimum Emissions-Compliant Load

Equations:

$$E_{uncontrolled} = F_{in} \times E$$

Where:

E = pollutant emission factor (lb/MMBtu)

F_{in} = fuel input (MMBtu/hr)

$$E_{controlled} = E_{uncontrolled} \times (1\text{-eff})$$

Where:

$E_{uncontrolled}$ = uncontrolled emissions (lbs)

eff = oxidation catalyst efficiency (%)

$$E = \frac{\left(C_d \frac{ppm}{10^6}\right) \cdot \left(MW \frac{lb}{lbmol}\right) \cdot \left(F_d \frac{dscf}{MMBtu}\right)}{\left(MV \frac{dscf}{lbmol}\right)} \cdot \frac{(20.9\% - 0.0\%)}{(20.9\% - O_{2_d}\%)}$$

Where:

C_d = pollutant concentration, dry basis (ppm)

MW = molar weight of pollutant (lb/lbmol)

MV = molar volume of pollutant (dscf/lbmol)

F_d = dry flue gas factor (dscf/MM Btu)

O_{2d} = oxygen concentration of permit standard, dry basis (%)

Worst case short-term emission factor for SOx as SO2 assumes 1 gr/100 scf in fuel gas:

$$\frac{lb\ SO_2}{MMBtu} = \left(\frac{1\ grain\ S}{100\ scf}\right) \cdot \left(\frac{1\ lb}{7{,}000\ grain}\right) \cdot \left(\frac{1\ scf}{1{,}020\ Btu}\right) \cdot \left(\frac{10^6\ Btu}{1\ MMBtu}\right) \cdot \left(\frac{64\ lb\ SO_2}{32\ lb\ S}\right)$$

Output_Fuel_Exhaust

Condition/Firing Rate	Fuel MMBtu/hr	NOx (ppm)	NOx lbs/MMBtu	Uncontrolled lbs/hr	CO (ppm)	CO lbs/MMBtu	Uncontrolled lbs/hr	Controlled lbs/hr	POC (CH4) lbs/hr	SOx lbs/MMBtu	SOx lbs/hr	PM lbs/MMBtu	PM lbs/hr	
On Turning Gear	-	-	-	-	-	-	-	-	-		-	-	-	
Coast to Turning Gear	-	-	-	-	-	-	-	-	-		-	-	-	
Start	584.27	30.00	0.11	64.57	2,800.00	6.28	3,669.05	2,017.98	147.63	0.002801	1.64	0.00410	2.40	
Start/Trip from FSNL	584.27	30.00	0.11	64.57	2,800.00	6.28	3,669.05	2,017.98	147.63	0.002801	1.64	0.00410	2.40	
Start/FSNL	584.27	30.00	0.11	64.57	2,800.00	6.28	3,669.05	2,017.98	147.63	0.002801	1.64	0.00410	2.40	
FSNL	584.27	30.00	0.11	64.57	2,800.00	6.28	3,669.05	2,017.98	147.63	0.002801	1.64	0.00410	2.40	
FSNL (or load condition between FSNL and MECL that maximizes stack emissions)				**174.61**				**2,141.62**	**147.63**		**3.77**		**5.51**	**Max Emission Rate**
Island Mode (4.5MW)	582.77	30.00	0.11	64.41	2,800.00	6.28	3,659.65	2,012.81	147.63	0.002801	1.63	0.00410	2.39	
<3%	595.82	30.00	0.11	65.85	2,800.00	6.28	3,741.58	2,057.87	147.63	0.002801	1.67	0.00410	2.44	
5%	620.07	30.00	0.11	68.53	2,800.00	6.28	3,893.86	**2,141.62**	147.63	0.002801	1.74	0.00410	2.54	
10%	666.04	50.00	0.18	122.69	2,000.00	4.49	2,987.55	1,643.15	**147.63**	0.002801	1.87	0.00410	2.73	
15%	735.70	48.00	0.18	130.10	1,600.00	3.59	2,640.00	1,452.00	147.63	0.002801	2.06	0.00410	3.02	
20%	812.26	45.00	0.17	134.66	1,200.00	2.69	2,186.02	1,202.31	147.63	0.002801	2.28	0.00410	3.33	
25%	908.12	45.00	0.17	150.55	1,200.00	2.69	2,444.01	1,344.21	147.63	0.002801	2.54	0.00410	3.72	
30%	975.57	45.00	0.17	161.73	1,200.00	2.69	2,625.55	1,444.05	147.63	0.002801	2.73	0.00410	4.00	
35%	1,053.24	45.00	0.17	**174.61**	700.00	1.57	1,653.51	909.43	147.63	0.002801	2.95	0.00410	4.32	
40%	1,130.19	15.00	0.06	62.45	700.00	1.57	1,774.31	975.87	147.63	0.002801	3.17	0.00410	4.63	
45%	1,224.09	15.00	0.06	67.64	150.00	0.34	411.80	226.49	147.63	0.002801	3.43	0.00410	5.02	
50%	1,281.99	15.00	0.06	70.84	150.00	0.34	431.28	237.20	147.63	0.002801	3.59	0.00410	5.26	
55%	1,345.08	15.00	0.06	74.33	80.00	0.18	241.33	132.73	147.63	0.002801	**3.77**	0.00410	**5.51**	
60%	1,428.17	9.00	0.03	47.35	10.00	0.02	32.03	17.62	147.63	0.002801	4.00	0.00410	5.86	**MECL**
65%	1,482.49	9.00	0.03	49.15	7.00	0.02	23.27	12.80	147.63	0.002801	4.15	0.00410	6.08	
70%	1,551.88	9.00	0.03	51.45	4.00	0.01	13.92	7.66	147.63	0.002801	4.35	0.00410	6.36	
75%	1,625.06	9.00	0.03	53.88	4.00	0.01	14.58	8.02	147.63	0.002801	4.55	0.00410	6.66	
80%	1,714.01	9.00	0.03	56.83	4.00	0.01	15.38	8.46	147.63	0.002801	4.80	0.00410	7.03	
85%	1,796.29	9.00	0.03	59.56	4.00	0.01	16.11	8.86	147.63	0.002801	5.03	0.00410	7.36	
90%	1,866.69	9.00	0.03	61.89	4.00	0.01	16.75	9.21	147.63	0.002801	5.23	0.00410	7.65	
95%	1,944.88	9.00	0.03	64.48	4.00	0.01	17.45	9.60	147.63	0.002801	5.45	0.00410	7.97	
100%	2,025.93	9.00	0.03	67.17	4.00	0.01	18.17	10.00	147.63	0.002801	5.67	0.00410	8.31	

POC per manufacturer's commissioning emission estimates. See Tables 18 and 19 of Final Determination of Compliance (June 2010) - used the maximum 8-hour emissions of 1,181 lbs POC/8hrs commissioning.
SOx per FDOC (August 2010), assuming 1 gr/100 dscf in fuel.
PM per FDOC (August 2010); this represents BACT for simple-cycle gas turbines.

NOx

Scenario	Hour	MLGS Unit 3	
		% of Base Load	Uncontrolled Emissions (lbs)
1	0-10 min	On Turning Gear	-
	10-20 min	On Turning Gear	-
	20-30 min	Start/Trip from FSNL	10.76
	30-40 min	Coast to Turning Gear	-
	40-50 min	Coast to Turning Gear	-
	50-60 min	Start/FSNL	10.76
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
2	0-10 min	On Turning Gear	-
	10-20 min	On Turning Gear	-
	20-30 min	Start/Trip from FSNL	10.76
	30-40 min	Coast to Turning Gear	-
	40-50 min	Coast to Turning Gear	-
	50-60 min	Start/FSNL	10.76
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	10	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	11	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	12	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	13	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	14	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	15	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	16	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	17	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	18	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	19	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	20	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	21	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	22	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	23	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	24	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	25	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61

Scenario	Hour	MLGS Unit 4	
		% of Base Load	Uncontrolled Emissions (lbs)
1	0-10 min	Start/FSNL	10.76
	10-20 min	Island Mode (4.5MW)	10.73
	20-30 min	Island Mode (4.5MW)	10.73
	30-40 min	Island Mode (4.5MW)	10.73
	40-50 min	Island Mode (4.5MW)	10.73
	50-60 min	Island Mode (4.5MW)	10.73
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
2	0-10 min	Start/FSNL	10.76
	10-20 min	Island Mode (4.5MW)	10.73
	20-30 min	Island Mode (4.5MW)	10.73
	30-40 min	Island Mode (4.5MW)	10.73
	40-50 min	Island Mode (4.5MW)	10.73
	50-60 min	Island Mode (4.5MW)	10.73
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	10	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	11	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	12	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	13	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	14	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	15	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	16	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	17	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	18	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	19	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	20	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	21	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	22	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	23	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	24	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61
	25	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	174.61

CO

Scenario	Hour	MLGS Unit 3	
		% of Base Load	Controlled Emissions (lbs)
1	0-10 min	On Turning Gear	-
	10-20 min	On Turning Gear	-
	20-30 min	Start/Trip from FSNL	336.33
	30-40 min	Coast to Turning Gear	-
	40-50 min	Coast to Turning Gear	-
	50-60 min	Start/FSNL	336.33
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
2	0-10 min	On Turning Gear	-
	10-20 min	On Turning Gear	-
	20-30 min	Start/Trip from FSNL	336.33
	30-40 min	Coast to Turning Gear	-
	40-50 min	Coast to Turning Gear	-
	50-60 min	Start/FSNL	336.33
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	10	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	11	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	12	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	13	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	14	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	15	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	16	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	17	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	18	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	19	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	20	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	21	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	22	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	23	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	24	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	25	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62

CO

Scenario	Hour	MLGS Unit 4	
		% of Base Load	Controlled Emissions (lbs)
1	0-10 min	Start/FSNL	336.33
	10-20 min	Island Mode (4.5MW)	335.47
	20-30 min	Island Mode (4.5MW)	335.47
	30-40 min	Island Mode (4.5MW)	335.47
	40-50 min	Island Mode (4.5MW)	335.47
	50-60 min	Island Mode (4.5MW)	335.47
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
2	0-10 min	Start/FSNL	336.33
	10-20 min	Island Mode (4.5MW)	335.47
	20-30 min	Island Mode (4.5MW)	335.47
	30-40 min	Island Mode (4.5MW)	335.47
	40-50 min	Island Mode (4.5MW)	335.47
	50-60 min	Island Mode (4.5MW)	335.47
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	10	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	11	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	12	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	13	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	14	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	15	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	16	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	17	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	18	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	19	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	20	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	21	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	22	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	23	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	24	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62
	25	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	2,141.62

POC (CH4)

Scenario	Hour	MLGS Unit 3	
		% of Base Load	Controlled Emissions (lbs)
1	0-10 min	On Turning Gear	-
	10-20 min	On Turning Gear	-
	20-30 min	Start/Trip from FSNL	24.60
	30-40 min	Coast to Turning Gear	-
	40-50 min	Coast to Turning Gear	-
	50-60 min	Start/FSNL	24.60
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
2	0-10 min	On Turning Gear	-
	10-20 min	On Turning Gear	-
	20-30 min	Start/Trip from FSNL	24.60
	30-40 min	Coast to Turning Gear	-
	40-50 min	Coast to Turning Gear	-
	50-60 min	Start/FSNL	24.60
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	10	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	11	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	12	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	13	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	14	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	15	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	16	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	17	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	18	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	19	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	20	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	21	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	22	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	23	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	24	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	25	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63

POC (CH4)

Scenario	Hour	MLGS Unit 4	
		% of Base Load	Controlled Emissions (lbs)
1	0-10 min	Start/FSNL	24.60
	10-20 min	Island Mode (4.5MW)	24.60
	20-30 min	Island Mode (4.5MW)	24.60
	30-40 min	Island Mode (4.5MW)	24.60
	40-50 min	Island Mode (4.5MW)	24.60
	50-60 min	Island Mode (4.5MW)	24.60
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
2	0-10 min	Start/FSNL	24.60
	10-20 min	Island Mode (4.5MW)	24.60
	20-30 min	Island Mode (4.5MW)	24.60
	30-40 min	Island Mode (4.5MW)	24.60
	40-50 min	Island Mode (4.5MW)	24.60
	50-60 min	Island Mode (4.5MW)	24.60
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	10	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	11	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	12	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	13	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	14	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	15	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	16	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	17	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	18	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	19	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	20	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	21	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	22	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	23	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	24	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63
	25	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	147.63

SOx

Scenario	Hour	MLGS Unit 3		MLGS Unit 4	
		% of Base Load	Uncontrolled Emissions (lbs)	% of Base Load	Uncontrolled Emissions (lbs)
1	0-10 min	On Turning Gear	-	Start/FSNL	0.27
	10-20 min	On Turning Gear	-	Island Mode (4.5MW)	0.27
	20-30 min	Start/Trip from FSNL	0.27	Island Mode (4.5MW)	0.27
	30-40 min	Coast to Turning Gear	-	Island Mode (4.5MW)	0.27
	40-50 min	Coast to Turning Gear	-	Island Mode (4.5MW)	0.27
	50-60 min	Start/FSNL	0.27	Island Mode (4.5MW)	0.27
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
2	0-10 min	On Turning Gear	-	Start/FSNL	0.27
	10-20 min	On Turning Gear	-	Island Mode (4.5MW)	0.27
	20-30 min	Start/Trip from FSNL	0.27	Island Mode (4.5MW)	0.27
	30-40 min	Coast to Turning Gear	-	Island Mode (4.5MW)	0.27
	40-50 min	Coast to Turning Gear	-	Island Mode (4.5MW)	0.27
	50-60 min	Start/FSNL	0.27	Island Mode (4.5MW)	0.27
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	10	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	11	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	12	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	13	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	14	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	15	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	16	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	17	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	18	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	19	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	20	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	21	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	22	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	23	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	24	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77
	25	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	3.77

Scenario	Hour	MLGS Unit 3	
		% of Base Load	Uncontrolled Emissions (lbs)
1	0-10 min	On Turning Gear	-
	10-20 min	On Turning Gear	-
	20-30 min	Start/Trip from FSNL	0.40
	30-40 min	Coast to Turning Gear	-
	40-50 min	Coast to Turning Gear	-
	50-60 min	Start/FSNL	0.40
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
2	0-10 min	On Turning Gear	-
	10-20 min	On Turning Gear	-
	20-30 min	Start/Trip from FSNL	0.40
	30-40 min	Coast to Turning Gear	-
	40-50 min	Coast to Turning Gear	-
	50-60 min	Start/FSNL	0.40
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	10	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	11	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	12	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	13	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	14	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	15	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	16	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	17	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	18	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	19	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	20	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	21	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	22	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	23	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	24	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	25	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51

Scenario	Hour	MLGS Unit 4	
		% of Base Load	Uncontrolled Emissions (lbs)
1	0-10 min	Start/FSNL	0.40
	10-20 min	Island Mode (4.5MW)	0.40
	20-30 min	Island Mode (4.5MW)	0.40
	30-40 min	Island Mode (4.5MW)	0.40
	40-50 min	Island Mode (4.5MW)	0.40
	50-60 min	Island Mode (4.5MW)	0.40
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
2	0-10 min	Start/FSNL	0.40
	10-20 min	Island Mode (4.5MW)	0.40
	20-30 min	Island Mode (4.5MW)	0.40
	30-40 min	Island Mode (4.5MW)	0.40
	40-50 min	Island Mode (4.5MW)	0.40
	50-60 min	Island Mode (4.5MW)	0.40
	2	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	3	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	4	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	5	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	6	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	7	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	8	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	9	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	10	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	11	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	12	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	13	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	14	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	15	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	16	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	17	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	18	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	19	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	20	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	21	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	22	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	23	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	24	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51
	25	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)	5.51

ELINK 27.0 (Save-ALL)

Base Case: C:\TFLOW27\MYFILES\NRG\Marsh Landing Black Start\1xSGT6-5000F(4)_ISO_R2_Emissions Load Sweeps.GTM

		Base Case	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Case 12	Case 13	Case 14	Case 15	Case 16
Computation Message ->		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
INPUT VARIABLE DESCRIPTION	**Units**	**Input**	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input
Ambient temperature	F	59.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	75.0	75.0	75.0	75.0	75.0
Ambient relative humidity	%	60.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	54.0	54.0	54.0	54.0	54.0
GT power as % of site rating	%	100.0	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0	0.0	100.0	90.0	80.0	70.0	60.0
Evaporative inlet cooler effectiveness	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTPUT VARIABLE DESCRIPTION	**Units**	**Output**	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output
Plant gross output	kW	194,036	166,581	150,908	134,611	118,186	101,633	84,972	68,164	51,245	34,236	17,154	0	181,677	164,429	146,813	128,883	110,823
Plant net output	kW	187,431	160,008	144,598	128,446	112,176	95,791	79,376	63,063	46,592	29,992	13,285	0	175,082	158,096	140,641	122,874	104,989
Gas turbine exhaust mass flow	kpph	3,988	3,625	3,207	2,933.8	2,664.7	2,398.0	2,182.0	2,175.6	2,169.5	2,163.6	2,157.8	2,152.8	3,823	3,445	3,064	2,778.0	2,494.8
Gas turbine exhaust temperature	F	1,086.8	1,126.1	1,159.3	1,197.8	1,241.2	1,290.7	1,317.5	1,219.9	1,125.9	1,035.1	947.7	871.8	1,104.1	1,128.9	1,177.3	1,220.7	1,270.4
Stack gas (per HRSG) Temperature	F	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0
Dilution air flow	kpph		1473.79	1465.67	1512.31	1550.4	1578.02	1524.66	1188.67	873.71	578.15	301.04	66.32	1395.18	1383.28	1450.09	1493.97	1527.61
Stack gas mass flow (at 850°F dilution)	kpph		5098.42	4672.58	4446.16	4215.07	3976	3706.61	3364.32	3043.25	2741.76	2458.88	2219.11	5218.67	4828.59	4514.33	4271.92	4022.38
Stack gas molecular weight			28.469	28.471	28.478	28.486	28.495	28.504	28.513	28.524	28.538	28.557	28.577	28.472	28.476	28.481	28.49	28.499
Stack gas N2 mole percentage	%		74.805	74.817	74.861	74.911	74.965	75.022	75.076	75.147	75.237	75.351	75.48	74.838	74.858	74.893	74.945	75.003
Stack gas O2 mole percentage	%		14.881	14.917	15.049	15.195	15.356	15.524	15.686	15.894	16.16	16.497	16.879	14.689	14.746	14.852	15.005	15.175
Stack gas CO2 mole percentage	%		2.674	2.658	2.596	2.529	2.454	2.376	2.302	2.205	2.082	1.925	1.749	2.777	2.751	2.701	2.63	2.552
Stack gas H2O mole percentage	%		6.74	6.709	6.593	6.464	6.323	6.175	6.033	5.85	5.617	5.32	4.984	6.796	6.746	6.653	6.518	6.368
Stack gas Ar mole percentage	%		0.9	0.9	0.9	0.901	0.902	0.903	0.903	0.904	0.905	0.907	0.908	0.9	0.9	0.901	0.901	0.902
SCR Stack Height	ft		165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165
SCR Stack Inside Diameter	ft		31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33
SCR Stack Volume Flow	ACFM		2,857,901	2,618,986	2,491,486	2,361,310	2,226,701	2,075,194	1,882,954	1,702,591	1,533,157	1,374,050	1,239,223	2,924,976	2,705,982	2,529,404	2,392,851	2,252,345
SCR Stack Gas Exit Velocity	ft/sec		61.77	56.61	53.85	51.04	48.13	44.85	40.70	36.80	33.14	29.70	26.79	63.22	58.49	54.67	51.72	48.68

ELINK 27.0 (Save-ALL)

Base Case: C:\TFLOW27\MYFILES\NRG\Marsh Landing Black Start\1xSGT6-5000F(4)_ISO_R2_Emissions Load Sweeps.GTM

		Case 17	Case 18	Case 19	Case 20	Case 21	Case 22	Case 23	Case 24	Case 25	Case 26	Case 27	Case 28	Case 29	Case 30	Case 31	Case 32	Case 33
Computation Message ->		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
INPUT VARIABLE DESCRIPTION	**Units**	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input
Ambient temperature	F	75.0	75.0	75.0	75.0	75.0	75.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0
Ambient relative humidity	%	54.0	54.0	54.0	54.0	54.0	54.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
GT power as % of site rating	%	50.0	40.0	30.0	20.0	10.0	0.0	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0	0.0
Evaporative inlet cooler effectiveness	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OUTPUT VARIABLE DESCRIPTION	**Units**	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output
Plant gross output	kW	92,636	74,304	55,855	37,309	18,692	0	194,026	175,474	156,659	137,600	118,358	98,926	79,340	59,632	39,833	19,956	0
Plant net output	kW	87,094	69,268	51,275	33,144	14,908	0	187,419	169,129	150,475	131,589	112,534	93,441	74,364	55,113	35,732	16,239	0
Gas turbine exhaust mass flow	kpph	2,294.8	2,288.0	2,281.4	2,275.1	2,268.9	2,263.5	3,988	3,651	3,263	2,909.5	2,579.5	2,397.3	2,390.2	2,383.3	2,376.6	2,370.2	2,364.5
Gas turbine exhaust temperature	F	1,279.7	1,180.5	1,085.2	993.5	905.7	829.8	1,086.8	1,105.0	1,150.2	1,199.1	1,253.6	1,245.5	1,145.7	1,050.1	958.6	871.2	796.0
Stack gas (per HRSG) Temperature	F	850.0	850.0	850.0	850.0	850.0	829.8	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	796.0
Dilution air flow	kpph	1435.4	1087.31	762.32	458.54	175.5	0	1328.18	1311.2	1385.07	1443	1485.65	1349.48	993.63	662.41	354.24	68.02	0
Stack gas mass flow (at 850°F dilution)	kpph	3730.18	3375.32	3043.77	2733.63	2444.43	2263.53	5316.44	4962.08	4647.63	4352.53	4065.13	3746.82	3383.83	3045.71	2730.86	2438.17	2364.48
Stack gas molecular weight		28.508	28.517	28.53	28.545	28.565	28.593	28.523	28.528	28.534	28.541	28.55	28.56	28.57	28.582	28.599	28.621	28.66
Stack gas N2 mole percentage	%	75.061	75.119	75.195	75.292	75.417	75.594	75.21	75.237	75.276	75.323	75.379	75.438	75.499	75.579	75.684	75.818	76.067
Stack gas O2 mole percentage	%	15.348	15.519	15.742	16.029	16.397	16.922	14.625	14.704	14.817	14.957	15.121	15.293	15.473	15.709	16.016	16.409	17.142
Stack gas CO2 mole percentage	%	2.472	2.392	2.289	2.156	1.985	1.743	2.86	2.824	2.772	2.707	2.631	2.551	2.468	2.358	2.217	2.034	1.695
Stack gas H2O mole percentage	%	6.216	6.066	5.87	5.617	5.293	4.832	6.4	6.33	6.23	6.107	5.962	5.811	5.652	5.444	5.174	4.826	4.181
Stack gas Ar mole percentage	%	0.903	0.904	0.905	0.906	0.907	0.91	0.905	0.905	0.905	0.906	0.907	0.907	0.908	0.909	0.911	0.912	0.915
SCR Stack Height	ft	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165	165
SCR Stack Inside Diameter	ft	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33
SCR Stack Volume Flow	ACFM	2,088,071	1,888,823	1,702,505	1,528,258	1,365,600	1,243,833	2,974,433	2,775,700	2,599,293	2,433,629	2,272,207	2,093,594	1,890,094	1,700,507	1,523,799	1,359,459	1,262,275
SCR Stack Gas Exit Velocity	ft/sec	45.13	40.83	36.80	33.03	29.52	26.88	64.29	60.00	56.18	52.60	49.11	45.25	40.85	36.76	32.94	29.38	27.28

ELINK 27.0 (Save-ALL)

Base Case: C:\TFLOW27\MYFILES\NRG\Marsh Landing Black Start\1xSGT6-5000F(4)_ISO_R2_Emissions Load Sweeps.GTM

		Case 34	Case 35	Case 36	Case 37	Case 38	Case 39	Case 40	Case 41	Case 42	Case 43	Case 44
Computation Message ->		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
INPUT VARIABLE DESCRIPTION	**Units**	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input	Input
Ambient temperature	F	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Ambient relative humidity	%	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0
GT power as % of site rating	%	100.0	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0	0.0
Evaporative inlet cooler effectiveness	%	0	0	0	0	0	0	0	0	0	0	0
OUTPUT VARIABLE DESCRIPTION	**Units**	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output
Plant gross output	kW	217,891	197,013	175,855	154,450	132,836	111,034	89,051	66,921	44,695	22,381	0
Plant net output	kW	211,274	190,665	169,679	148,459	127,042	105,623	84,167	62,502	40,692	18,683	0
Gas turbine exhaust mass flow	kpph	4,287	3,931	3,515	3,132	2,771.2	2,584.4	2,576.3	2,568.6	2,561.3	2,554.2	2,548.1
Gas turbine exhaust temperature	F	1,058.3	1,074.6	1,117.7	1,165.5	1,219.3	1,198.2	1,091.3	991.7	899.8	812.9	739.6
Stack gas (per HRSG) Temperature	F	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	850.0	812.9	739.6
Dilution air flow	kpph	1197.11	1184.9	1268.74	1337.44	1391.54	1218.64	830.84	480.18	166.26	0	0
Stack gas mass flow (at 850°F dilution)	kpph	5484.32	5115.56	4784.23	4469.77	4162.73	3803.01	3407.13	3048.77	2727.54	2554.22	2548.1
Stack gas molecular weight		28.577	28.582	28.588	28.596	28.606	28.615	28.626	28.64	28.658	28.695	28.742
Stack gas N2 mole percentage	%	75.611	75.64	75.681	75.732	75.792	75.851	75.915	76.003	76.12	76.347	76.642
Stack gas O2 mole percentage	%	14.386	14.47	14.59	14.738	14.912	15.084	15.271	15.528	15.871	16.532	17.392
Stack gas CO2 mole percentage	%	3.037	2.998	2.943	2.875	2.794	2.714	2.628	2.509	2.35	2.044	1.646
Stack gas H2O mole percentage	%	6.056	5.982	5.875	5.745	5.591	5.438	5.273	5.046	4.743	4.158	3.397
Stack gas Ar mole percentage	%	0.909	0.91	0.91	0.911	0.912	0.912	0.913	0.914	0.916	0.919	0.922
SCR Stack Height	ft	165	165	165	165	165	165	165	165	165	165	165
SCR Stack Inside Diameter	ft	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33	31.33
SCR Stack Volume Flow	ACFM	3,062,595	2,856,192	2,670,600	2,494,407	2,322,222	2,120,871	1,899,355	1,698,779	1,518,811	1,380,245	1,295,451
SCR Stack Gas Exit Velocity	ft/sec	66.20	61.74	57.72	53.92	50.19	45.84	41.05	36.72	32.83	29.83	28.00

Black Start Emergency Operation Emissions Calculations Assumptions - Conservative Scenario for Calculating Maximum Offsets Required

- All turbines are identical and can perform this scenario during a Black Start Emergency operation.
- Turbine 3 and 4 are considered the primary and secondary units, respectfully, for modeling this scenario.
- After a maximum of 48 hours, Black Start Emergency Operations will revert to normal permitted operations.
- The primary turbine (T3) has three start ups and three shut downs per day for the 48 hours of Black Start Emergency Operations.
- The secondary turbine (T4) has four start ups and three shut downs during the first day of operation.
- The secondary turbine (T4) has three start ups and three shut downs during the second day of operation.
- According to the FDOC from August 2010, emissions are released in the first six minutes of shutdown during Black Start Testing and Commissioning. The last nine minutes of the 15-minute shutdown period are in normal steady-state cool-down conditions and result in zero emissions. These assumptions have been incorporated in the emission calculations for Black Start Emergency Operations.

During the Black Start Emergency period, two turbines operate simultaneously as follows:

Primary Unit (Turbine 3)

	Start Time	End Time	Duration	Description	Operating Condition
First Day	0:01:00	0:10:00	10 mins	Start-up	Start/FSNL
	0:11:00	1:00:00	50 mins	Island Mode	Island Mode (4.5MW)
	1:01:00	11:45:00	10 hrs 45 m	Worst Case	FSNL (or load condition between FSNL & MECL that maximizes stack emissions)
	5:46:00	6:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	6:01:00	6:10:00	10 mins	Start-up	Start/FSNL
	11:46:00	12:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	12:01:00	12:10:00	10 mins	Start-up	Start/FSNL
	12:11:00	23:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	23:46:00	0:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
Second Day	0:01:00	0:10:00	10 mins	Start-up	Start/FSNL
	0:11:00	11:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	5:46:00	6:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	6:01:00	6:10:00	10 mins	Start-up	Start/FSNL
	11:46:00	12:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	12:01:00	12:10:00	10 mins	Start-up	Start/FSNL
	12:11:00	23:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	23:46:00	0:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)

Secondary Unit (Turbine 4)

	Start Time	End Time	Duration	Description	Operating Condition
First Day	0:01:00	0:20:00	20 mins	Turning Gear	On Turning Gear
	0:21:00	0:30:00	10 mins	Start-up	Start/Trip from FSNL
	0:31:00	0:50:00	20 mins	Turning Gear	Coast to Turning Gear
	0:51:00	1:00:00	10 mins	Start-up	Start/Trip from FSNL
	1:01:00	11:45:00	10 hrs 45 min	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	5:46:00	6:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	6:01:00	6:10:00	10 mins	Start-up	Start/FSNL
	11:46:00	12:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	12:01:00	12:10:00	10 mins	Start-up	Start/FSNL
	12:11:00	23:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	23:46:00	0:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
Second Day	0:01:00	0:10:00	10 mins	Start-up	Start/FSNL
	0:11:00	11:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	5:46:00	6:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	6:01:00	6:10:00	10 mins	Start-up	Start/FSNL
	11:46:00	12:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)
	12:01:00	12:10:00	10 mins	Start-up	Start/FSNL
	12:11:00	23:45:00	11 hrs 35 mins	Worst Case	FSNL (or load condition between FSNL and MECL that maximizes stack emissions)
	23:46:00	0:00:00	15 mins	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)

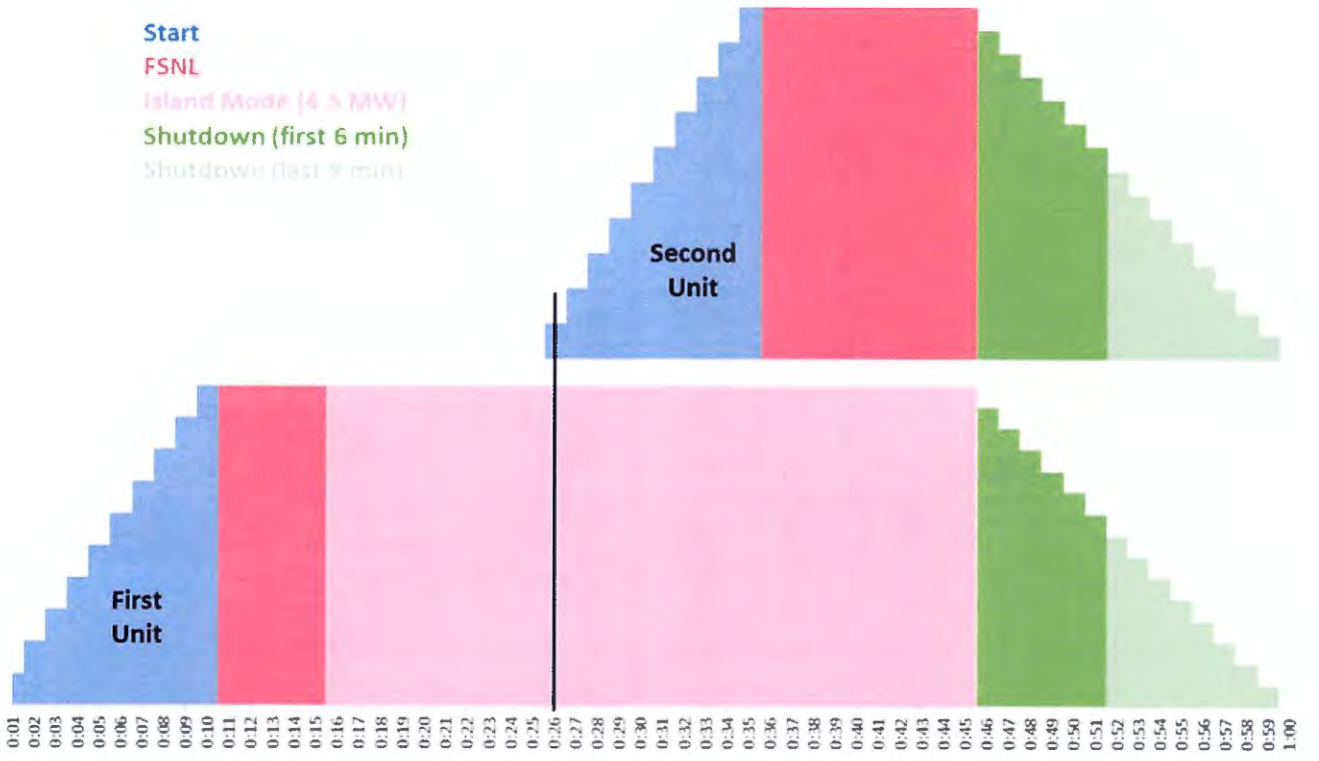
Testing and Commissioning Emissions Calculations Assumptions - Conservative Scenario for Calculating Maximum Offsets Required

- Black Start readiness testing has been assumed to take 5 hours during which the two designated black start units (i.e., Units 3 and 4) will have overlapping run hours. The testing period consists of two units operating simultaneously during a single hour.
- The first unit operating 10 minutes of startup, 5 minutes of FSNL, and 30 minutes of island mode, then 15 minutes of shutdown. This results in a total of 51 minutes with emissions during the testing hour (i.e., 60 minutes less the last 9 minutes of shutdown, which have no emissions). See figure to the right for the hourly operation during Black Start Readiness Testing.
- The second unit operating 25 minutes on turning gear (no incremental emissions), then 10 minutes of startup, then 10 minutes of FSNL, then 15 minutes of shutdown. This results in a total of 26 minutes with emissions during the testing hour (i.e., 35 minutes of operation, including the last 9 minutes of shutdown that have no emissions).
- The potential emissions for each hour of Black Start Commissioning are calculated with the same assumptions used for Black Start Readiness Testing. The maximum daily emissions account for up to eight hours of commissioning per day. Hence, the hourly emissions are multiplied by eight hours per day. The annual emissions for commissioning are calculated based on five days of commissioning for the commissioning year (assumed to be during 2019). Hence, during these 40 hours during which Units 3 and 4 will have combined operations, the total combined turbine operating hours during black start commissioning will be about 63 hours (see Table 1). We anticipate the 40 hours of commissioning will occur over a 2-week period.

During the Testing and Commissianing period, two turbines operate simultaneously as follows:

	Primary Unit (Turbine 3)				
	Start Time	**End Time**	**Duration**	**Description**	**Operating Condition**
Per Hour	0:01:00	0:15:00	15 M	Start-up	Start/FSNL
	0:16:00	0:45:00	30 M	Island Mode	Island Mode (4.5MW)
	0:46:00	1:00:00	15 M	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)

	Secondary Unit (Turbine 4)				
	Start Time	**End Time**	**Duration**	**Description**	**Operating Condition**
Per Hour	0:01:00	0:25:00	25 M	Turning Gear	On Turning Gear
	0:26:00	0:45:00	20 M	Start-up	Start/FSNL
	0:46:00	1:00:00	15 M	Shut down	Shutdown (first 6 min) / Shutdown (last 9 min)



Marsh Landing Generating Station Plant No. 19169
Conservative Scenario for Calculating Maximum Offsets Required

Criteria Pollutant Emissions

TABLE 1

Criteria Pollutants	Black Start Readiness Testing			Black Start Commissioning			Black Start Emergency Operation			
	Emissions lbs/hour	Emissions lbs/day	Emissions tons/year	Emissions lbs/hour	Emissions lbs/day	Emissions tons/year	Emissions lbs/max hour	Emissions lbs/max day	Emissions tons/year	
NOx	82.79	413.93	0.21	82.79	662.30	1.66	349.21	8,047.93	7.93	
CO	2,587.15	12,935.76	6.47	2,587.15	20,697.22	51.74	4,283.24	100,672.57	99.89	<-- less than 100
SOx	2.10	10.49	0.01	2.10	16.79	0.04	7.54	174.04	0.17	
PM	3.07	15.36	0.01	3.07	24.57	0.06	11.03	254.76	0.25	
POC	0.99	4.93	0.00	0.99	7.89	0.02	3.54	81.83	0.08	
Hours represented in this column:	1	5	5	1	8	40	1	24	48	

TABLE 2

Limits from FDOC and Permits	Maximum Permitted [1]		Emissions Modeled in FDOC			Black Start Emergency Operation Comparisons				
	Emissions [2] lbs/max day	Emissions [3] tons/year	Emissions [4] lbs/max hour	Emissions [4] lbs/max day	Emissions [3] tons/year	> Permitted lbs/day?	> Permitted tons/yr?	> Modeled lbs/hour?	> Modeled lbs/day?	> Modeled tons/year?
NOx	2,941.0	78.6	376.0	6,126.0	78.6	TRUE	FALSE	FALSE	TRUE	FALSE
CO	8,378.0	138.6	4,810.0	67,844.0	138.6	TRUE	FALSE	FALSE	TRUE	FALSE
SOx	596.0	4.9	24.8	596.0	4.9	FALSE	FALSE	FALSE	FALSE	FALSE
PM	864.0	31.5	36.0	864.0	31.5	FALSE	FALSE	FALSE	FALSE	FALSE
POC	693.0	14.2	167.3	4,016.0	14.2	FALSE	FALSE	FALSE	FALSE	FALSE

TABLE 3

Greenhouse Gases	GWP[5]	Black Start Readiness Testing			Black Start Commissioning			Black Start Emergency Operation		
		CO2e lbs/max hour	CO2e lbs/max day	CO2e MT/year	CO2e lbs/max hour	CO2e lbs/max day	CO2e MT/year	CO2e lbs/max hour	CO2e lbs/max day	CO2e MT/year
CH4	36.0	53.5	267.5	0.1	53.5	428.0	1.1	192.2	4,438.4	4.0
N2O	298.0	49.2	246.1	0.1	49.2	393.7	1.0	176.7	4,082.2	3.7
CO2	1.0	87,309.8	436,549.0	218.3	87,309.8	698,478.4	1,746.2	313,560.4	7,242,461.4	6,482.5
Total	CO2e	87,412.5	437,062.6	218.5	87,412.5	699,300.1	1,748.3	313,929.3	7,250,981.9	6,490.1
Hours represented in this column:		1	5	5	1	8	40	1	24	48

(1) Maximum permitted emissions from all 4 Gas Turbines, including emissions generated during gas tubine startups, combuster tuning, shutdowns, and combustor tuning events to exceed the following limits during calendar day on which a tuning event occurs. (Basis: Cumulative Increase)

(2) MFR Permit No. B9169, 11/3/2015, VI. Permit Conditions, Condition 21 (a-e)
- 21.a. NO (as NO2) 2,941 pounds per calendar day
- 21.b. CO 8,378 pounds per calendar day
- 21.c. POC (as CH4) 693 pounds per calendar day
- 21.d. PM10 864 pounds per calendar day
- 21.e. SO2 596 pounds per calendar day

(3) MFR Permit No. B9169, 11/3/2015, VI. Permit Conditions, Condition 22 (a-e)
- 21.a. NO (as NO2) 78.57 tons per year
- 21.b. CO 138.57 tons per year
- 21.c. POC (as CH4) 14.21 tons per year
- 21.d. PM10 31.54 tons per year
- 21.e. SO2 4.94 tons per year

(4) Emissions were calculated with Table 18 Commissioning Period Emissions Limits from the FDOC or with the permit condition limits (see note 1). The highest emission calculated was used. The district is imposing a restriction on commissioning activites that limit the facility to operating no more than two turbines without abatement equipment at any one time. (Section 5.8 FDOC)

Air Pollutant	Commissioning Period Emissions Limits for Simple-Cycle Gas Turbines	
NO2	3,063 lb/day	188 lb/hr
CO	33,922 lb/day	2,405 lb/hr
POC	2,008 lb/day	
PM10	235 lb/day	
SO2	149 lb/day	

Time	Mode T3 Turbine 3	Fuel_Input T3 MMBtu/min	NOx T3 lbs/min	CO T3 lbs/min	POC T3 lbs/min	SOx T3 lbs/min	PM T3 lbs/min	CO2 T3 lbs/min	N2O T3 lbs/min	CH4 T3 lbs/min	Mode T4 Turbine 4	Fuel_Input T4 MMBtu/min	NOx T4 lbs/min
Minute	T3_Mode	Fuel_Input_T3	NOx_T3	CO_T3	POC_T3	SOx_T3	PM_T3	CO2_T3	N2O_T3	CH4_T3	T4_Mode	Fuel_Input_T4	NOx_T4
0:01:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:02:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:03:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:04:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:05:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:06:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:07:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:08:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:09:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:10:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:11:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:12:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:13:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:14:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:15:00	Start/FSNL	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-
0:16:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:17:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:18:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:19:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:20:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:21:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:22:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:23:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:24:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:25:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	On Turning Gear	-	-
0:26:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:27:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:28:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:29:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:30:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:31:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:32:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:33:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:34:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:35:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:36:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:37:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:38:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:39:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:40:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:41:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:42:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:43:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:44:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:45:00	Island Mode (4.5MW)	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193	Start/FSNL	9.7378	1.0762
0:46:00	Shutdown (first 6 min)	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	9.7378	1.0762
0:47:00	Shutdown (first 6 min)	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	9.7378	1.0762
0:48:00	Shutdown (first 6 min)	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	9.7378	1.0762
0:49:00	Shutdown (first 6 min)	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	9.7378	1.0762

0:50:00 Shutdown (first 6 min)	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	9.7378	1.0762
0:51:00 Shutdown (first 6 min)	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	9.7378	1.0762
0:52:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-
0:53:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-
0:54:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-
0:55:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-
0:56:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-
0:57:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-
0:58:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-
0:59:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-
1:00:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-
Total	**495.88**	**54.80**	**1,712.70**	**0.65**	**1.39**	**2.03**	**57,799.13**	**0.11**	**0.98**		**253.18**	**27.98**
						GWP	1.00	298.00	36.00			
								CO2e (lbs/hr)	57,867.13			
						lbs/MT	2204.64	CO2e (MT/hr)	**26.25**			

CO T4 lbs/min	POC T4 lbs/min	SOx T4 lbs/min	PM T4 lbs/min	CO2 T4 lbs/min	N2O T4 lbs/min	CH4 T4 lbs/min	Fuel_Input Total MMBtu/min	NOx Total lbs/min	CO Total lbs/min	POC Total lbs/min	SOx Total lbs/min	PM Total lbs/min	CO2 Total lbs/min	N2O Total lbs/min	CH4 Total lbs/min
CO_T4	POC_T4	SOx_T4	PM_T4	CO2_T4	N2O_T4	CH4_T4	Fuel_Input	NOx	CO	POC	SOx	PM	CO2	N2O	CH4
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7378	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	-	-	-	-	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193
-	-	-	-	-	-	-	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193
-	-	-	-	-	-	-	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193
-	-	-	-	-	-	-	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193
-	-	-	-	-	-	-	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193
-	-	-	-	-	-	-	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193
-	-	-	-	-	-	-	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193
-	-	-	-	-	-	-	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193
-	-	-	-	-	-	-	9.7129	1.0735	33.5468	0.0128	0.0272	0.0398	1,132.1195	0.0021	0.0193
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4507	2.1497	67.1798	0.0256	0.0545	0.0797	2,267.1453	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4757	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4757	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4757	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4757	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386

33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4757	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	19.4757	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
874.46	**0.33**	**0.71**	**1.04**	**29,510.67**	**0.06**	**0.50**	**749.07**	**82.79**	**2,587.15**	**0.99**	**2.10**	**3.07**	**87,309.80**	**0.17**	**1.49**
			GWP	1.00	298.00	36.00						GWP	1.00	298.00	36.00
					CO2e (lbs/hr)	29,545.39								CO2e (lbs/hr)	87,412.51
			lbs/MT	2204.64	CO2e (MT/hr)	**13.40**						lbs/MT	2204.64	CO2e (MT/hr)	**39.65**

		Lead Turbine	NOx	CO	POC	SOx	PM	CO2	N2O	CH4	Lag Turbine	NOx	CO	POC	SOx	PM
		Primary Unit	T3	T3	T3	T3	T3	T3	T3	T3	Secondary Unit	T4	T4	T4	T4	T4
Day	Time	Assume Turbine 3	lbs/min	lbs/min	lbs/min	lbs/min	lbs/min	lbs/min	lbs/min	lbs/min	Assume Turbine 4	lbs/min	lbs/min	lbs/min	lbs/min	lbs/min
Day	Minute	T3_Mode	NOx_T3	CO_T3	POC_T3	SOx_T3	PM_T3	CO2_T3	N2O_T3	CH4_T3	T4_Mode	NOx_T4	CO_T4	POC_T4	SOx_T4	PM_T4
1	0:01:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	0:02:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	0:03:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	0:04:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	0:05:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	0:06:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	0:07:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	0:08:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	0:09:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	0:10:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	On Turning Gear	-	-	-	-	-
1	5:46:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	5:47:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	5:48:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	5:49:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	5:50:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	5:51:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	5:52:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	5:53:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	5:54:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	5:55:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	5:56:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	5:57:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	5:58:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	5:59:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	6:00:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	6:01:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	6:02:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	6:03:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	6:04:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	6:05:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	6:06:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	6:07:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	6:08:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	6:09:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	6:10:00	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	11:46:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	11:47:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	11:48:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	11:49:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	11:50:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	11:51:00	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	11:52:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	11:53:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	11:54:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	11:55:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	11:56:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-

1	11:57:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	11:58:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	11:59:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	12:00:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	12:01:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	12:02:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	12:03:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	12:04:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	12:05:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	12:06:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	12:07:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	12:08:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	12:09:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	12:10:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
1	23:46:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	23:47:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	23:48:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	23:49:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	23:50:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	23:51:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
1	23:52:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	23:53:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	23:54:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	23:55:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	23:56:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	23:57:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	23:58:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	23:59:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
1	0:00:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	0:01:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	0:02:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	0:03:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	0:04:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	0:05:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	0:06:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	0:07:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	0:08:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	0:09:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	0:10:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	5:46:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	5:47:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	5:48:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	5:49:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	5:50:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	5:51:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	5:52:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	5:53:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	5:54:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	5:55:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	5:56:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	5:57:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-

2	5:58:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	5:59:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	6:00:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	6:01:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	6:02:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	6:03:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	6:04:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	6:05:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	6:06:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	6:07:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	6:08:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	6:09:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	6:10:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	11:46:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	11:47:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	11:48:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	11:49:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	11:50:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	11:51:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	11:52:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	11:53:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	11:54:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	11:55:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	11:56:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	11:57:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	11:58:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	11:59:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	12:00:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	12:01:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	12:02:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	12:03:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	12:04:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	12:05:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	12:06:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	12:07:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	12:08:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	12:09:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	12:10:00 Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Start/FSNL	1.0762	33.6329	0.0128	0.0273	0.0399
2	23:46:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	23:47:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	23:48:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	23:49:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	23:50:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	23:51:00 Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193	Shutdown (first 6 min)	1.0762	33.6329	0.0128	0.0273	0.0399
2	23:52:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	23:53:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	23:54:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	23:55:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	23:56:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	23:57:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	23:58:00 Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-

2	23:59:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
2	0:00:00	Shutdown (last 9 min)	-	-	-	-	-	-	-	-	Shutdown (last 9 min)	-	-	-	-	-
Total			**7,956.10**	**#########**	**81.00**	**172.26**	**252.15**	**7,168,417.20**	**13.56**	**122.03**		**7,913.19**	**99,224.21**	**80.49**	**171.18**	**250.56**

CO2 T4 lbs/min	N2O T4 lbs/min	CH4 T4 lbs/min	NOx Total lbs/min	CO Total lbs/min	POC Total lbs/min	SOx Total lbs/min	PM Total lbs/min	CO2 Total lbs/min	N2O Total lbs/min	CH4 Total lbs/min
CO2_T4	N2O_T4	CH4_T4	NOx	CO	POC	SOx	PM	CO2	N2O	CH4
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
-	-	-	1.0762	33.6329	0.0128	0.0273	0.0399	1,135.0257	0.0021	0.0193
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
1,135.0257	0.0021	0.0193	2.1525	67.2659	0.0256	0.0546	0.0799	2,270.0515	0.0043	0.0386
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
7,123,161.48	**13.47**	**121.26**	**########**	**199,789.43**	**161.48**	**343.44**	**502.71**	**############**	**27.03**	**243.28**

Output_Fuel_Exhaust

Operating_Condition	Fuel_Input	NOx_Conc	NOx_EF	NOx	CO_Conc	CO_EF	Uncontrolled_CO	CO	POC_EF	POC	SOx_EF	SOx
Firing Rate	MMBtu/hr	(ppm)	(lbs/MMBtu)	(lbs/hr)	(ppm)	(lbs/MMBtu)	(lbs/hr)	(lbs/hr)	(lbs/MMBtu)	(lbs/hr)	(lbs/MMBtu)	(lbs/hr)
On Turning Gear	-	-	-	-	-	-	-	-	-	-	-	-
Coast to Turning Gear	-	-	-	-	-	-	-	-	-	-	-	-
Start	584.27	30.00	0.11	64.57	2,800.00	6.28	3,669.05	2,017.98	0.102692	60.00	0.002801	1.64
Shutdown (first 6 min)	584.27	30.00	0.11	64.57	2,800.00	6.28	3,669.05	2,017.98	0.001317	0.77	0.002801	1.64
Shutdown (last 9 min)	-	-	-	-	-	-	-	-	-	-	-	-
Start/Trip from FSNL	584.27	30.00	0.11	64.57	2,800.00	6.28	3,669.05	2,017.98	0.001317	0.77	0.002801	1.64
Start/FSNL	584.27	30.00	0.11	64.57	2,800.00	6.28	3,669.05	2,017.98	0.001317	0.77	0.002801	1.64
FSNL	584.27	30.00	0.11	64.57	2,800.00	6.28	3,669.05	2,017.98	0.001317	0.77	0.002801	1.64
FSNL (or load condition between FSNL and MECL that maximizes stack emissions)				**174.61**				**2,141.62**		**1.77**		**3.77**
Island Mode (4.5MW)	582.77	30.00	0.11	64.41	2,800.00	6.28	3,659.65	2,012.81	0.001317	0.77	0.002801	1.63
<3%	595.82	30.00	0.11	65.85	2,800.00	6.28	3,741.58	2,057.87	0.001317	0.78	0.002801	1.67
5%	620.07	30.00	0.11	68.53	2,800.00	6.28	3,893.86	2,141.62	0.001317	0.82	0.002801	1.74
10%	666.04	50.00	0.18	122.69	2,000.00	4.49	2,987.55	1,643.15	0.001317	0.88	0.002801	1.87
15%	735.70	48.00	0.18	130.10	1,600.00	3.59	2,640.00	1,452.00	0.001317	0.97	0.002801	2.06
20%	812.26	45.00	0.17	134.66	1,200.00	2.69	2,186.02	1,202.31	0.001317	1.07	0.002801	2.28
25%	908.12	45.00	0.17	150.55	1,200.00	2.69	2,444.01	1,344.21	0.001317	1.20	0.002801	2.54
30%	975.57	45.00	0.17	161.73	1,200.00	2.69	2,625.55	1,444.05	0.001317	1.28	0.002801	2.73
35%	1,053.24	45.00	0.17	174.61	700.00	1.57	1,653.51	909.43	0.001317	1.39	0.002801	2.95
40%	1,130.19	15.00	0.06	62.45	700.00	1.57	1,774.31	975.87	0.001317	1.49	0.002801	3.17
45%	1,224.09	15.00	0.06	67.64	150.00	0.34	411.80	226.49	0.001317	1.61	0.002801	3.43
50%	1,281.99	15.00	0.06	70.84	150.00	0.34	431.28	237.20	0.001317	1.69	0.002801	3.59
55%	1,345.08	15.00	0.06	74.33	80.00	0.18	241.33	132.73	0.001317	1.77	0.002801	3.77
60%	1,428.17	9.00	0.03	47.35	10.00	0.02	32.03	17.62	0.001317	1.88	0.002801	4.00
65%	1,482.49	9.00	0.03	49.15	7.00	0.02	23.27	12.80	0.001317	1.95	0.002801	4.15
70%	1,551.88	9.00	0.03	51.45	4.00	0.01	13.92	7.66	0.001317	2.04	0.002801	4.35
75%	1,625.06	9.00	0.03	53.88	4.00	0.01	14.58	8.02	0.001317	2.14	0.002801	4.55
80%	1,714.01	9.00	0.03	56.83	4.00	0.01	15.38	8.46	0.001317	2.26	0.002801	4.80
85%	1,796.29	9.00	0.03	59.56	4.00	0.01	16.11	8.86	0.001317	2.37	0.002801	5.03
90%	1,866.69	9.00	0.03	61.89	4.00	0.01	16.75	9.21	0.001317	2.46	0.002801	5.23
95%	1,944.88	9.00	0.03	64.48	4.00	0.01	17.45	9.60	0.001317	2.56	0.002801	5.45
100%	2,025.93	9.00	0.03	67.17	4.00	0.01	18.17	10.00	0.001317	2.67	0.002801	5.67

CO catalyst efficiency is assumed at 45%; see "Constants" tab for CO efficiency footnote.

POC startup per Table 13 discussion; others per Table A-1 (emissions) of FDOC.

SOx per FDOC (August 2010), assuming 1 gr/100 dscf in fuel.

PM per FDOC (August 2010); this represents BACT for simple-cycle gas turbines.

Shutdown (first 6 min) is assumed to be identical to Start/Trip from FSNL; during testing and commissioning shutdown is from FSNL or Island Mode, not from full load.

PM_EF (lbs/MMBtu)	PM (lbs/hr)	CO2_EF (kg/MMBtu)	CO2_EF2 (lbs/MMBtu)	CO2 (lbs/hr)	N2O_EF (g/MMBtu)	N2O_EF3 (lbs/MMBtu)	N2O (lbs/hr)	CH4_EF (g/MMBtu)	CH4_EF4 (lbs/MMBtu)	CH4 (lbs/hr)
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
0.00410	2.40	52.87	116.56	68,101.54	0.10	0.000220462	0.129	0.90	0.00198416	1.16
0.00410	2.40	52.87	116.56	68,101.54	0.10	0.000220462	0.129	0.90	0.00198416	1.16
-	-	-	-	-	-	-	-	-	-	-
0.00410	2.40	52.87	116.56	68,101.54	0.10	0.000220462	0.129	0.90	0.00198416	1.16
0.00410	2.40	52.87	116.56	68,101.54	0.10	0.000220462	0.129	0.90	0.00198416	1.16
0.00410	2.40	52.87	116.56	68,101.54	0.10	0.000220462	0.129	0.90	0.00198416	1.16
	5.51			**156,780.20**			**0.297**			**2.67**
0.00410	2.39	52.87	116.56	67,927.17	0.10	0.000220462	0.128	0.90	0.00198416	1.16
0.00410	2.44	52.87	116.56	69,447.77	0.10	0.000220462	0.131	0.90	0.00198416	1.18
0.00410	2.54	52.87	116.56	72,274.28	0.10	0.000220462	0.137	0.90	0.00198416	1.23
0.00410	2.73	52.87	116.56	77,632.97	0.10	0.000220462	0.147	0.90	0.00198416	1.32
0.00410	3.02	52.87	116.56	85,752.22	0.10	0.000220462	0.162	0.90	0.00198416	1.46
0.00410	3.33	52.87	116.56	94,675.03	0.10	0.000220462	0.179	0.90	0.00198416	1.61
0.00410	3.72	52.87	116.56	105,848.37	0.10	0.000220462	0.200	0.90	0.00198416	1.80
0.00410	4.00	52.87	116.56	113,710.57	0.10	0.000220462	0.215	0.90	0.00198416	1.94
0.00410	4.32	52.87	116.56	122,764.15	0.10	0.000220462	0.232	0.90	0.00198416	2.09
0.00410	4.63	52.87	116.56	131,732.61	0.10	0.000220462	0.249	0.90	0.00198416	2.24
0.00410	5.02	52.87	116.56	142,678.20	0.10	0.000220462	0.270	0.90	0.00198416	2.43
0.00410	5.26	52.87	116.56	149,426.75	0.10	0.000220462	0.283	0.90	0.00198416	2.54
0.00410	5.51	52.87	116.56	156,780.20	0.10	0.000220462	0.297	0.90	0.00198416	2.67
0.00410	5.86	52.87	116.56	166,464.82	0.10	0.000220462	0.315	0.90	0.00198416	2.83
0.00410	6.08	52.87	116.56	172,795.91	0.10	0.000220462	0.327	0.90	0.00198416	2.94
0.00410	6.36	52.87	116.56	180,884.36	0.10	0.000220462	0.342	0.90	0.00198416	3.08
0.00410	6.66	52.87	116.56	189,414.35	0.10	0.000220462	0.358	0.90	0.00198416	3.22
0.00410	7.03	52.87	116.56	199,781.84	0.10	0.000220462	0.378	0.90	0.00198416	3.40
0.00410	7.36	52.87	116.56	209,372.65	0.10	0.000220462	0.396	0.90	0.00198416	3.56
0.00410	7.65	52.87	116.56	217,577.64	0.10	0.000220462	0.412	0.90	0.00198416	3.70
0.00410	7.97	52.87	116.56	226,691.51	0.10	0.000220462	0.429	0.90	0.00198416	3.86
0.00410	8.31	52.87	116.56	236,138.92	0.10	0.000220462	0.447	0.90	0.00198416	4.02

Emission Calculation Constants[1]		
Standard Temperature (°F)	ST	70
Standard Pressure (psia)	SP	14.7
Molar Volume (dscf/lbmol)	MV	386.8
Ambient Oxygen Concentration (%)	O2	20.95
Oxygen Concentration of Permit Standard (%)	O2	15.00%
Dry Flue Gas Factor (dscf/MM Btu)	Fd	8743
Natural Gas Higher Heating Value (Btu/dscf)	HHV	1020

Molecular Weights (lbs/lbmol)		
Pollutant	**As**	**MW**
NOx	NO2	46.01
CO	CO	28.01
POC	CH4	16.04
SOx	SO2	64.07

CO Catalyst[2]	eff %	45%

1. Final Determination of Compliance, Appendix A (August 2010)
2. Johnson-Mathley has provided data that indicate the oxidation catalyst will function in the range of 45 to 50 percent in firing range of the black start commissioning operations. The more conservative value of 45 percent was used to estimate the control efficiency (page 10 of the Application for Minor Permit Revision on 3/13/2018, equation 6).

Acronyms:

FSNL: Full Speed, No Load

MECL: Minimum Emissions-Compliant Load (60%)

Emission Equations:

$$E_{uncontrolled} = F_{in} \times \mathrm{E}$$

Where:

E = pollutant emission factor (lb/MMBtu)

F_{in} = fuel input (MMBtu/hr)

$$E_{controlled} = E_{uncontrolled} \times (1\text{-eff})$$

Where:

Uncontrolled = uncontrolled emissions (lbs)

eff = oxidation catalyst efficiency (%)

$$E = \frac{\left(C_d \frac{ppm}{10^6}\right) \cdot \left(MW \frac{lb}{lbmol}\right) \cdot \left(F_d \frac{dscf}{MMBtu}\right)}{\left(MV \frac{dscf}{lbmol}\right)} \cdot \frac{(20.9\% - 0.0\%)}{(20.9\% - O_{2_d}\%)}$$

Where:

C_d = pollutant concentration, dry basis (ppm)

MW = molar weight of pollutant (lb/lbmol)

MV = molar volume of pollutant (dscf/lbmol)

F_d = dry flue gas factor (dscf/MM Btu)

O_{2d} = oxygen concentration of permit standard, dry basis (%)

Worst case short-term emission factor for SOx as SO2 assumes 1 gr/100 scf in fuel gas:

$$\frac{lb\ SO_2}{MMBtu} = \left(\frac{1\ grain\ S}{100\ scf}\right) \cdot \left(\frac{1\ lb}{7{,}000\ grain}\right) \cdot \left(\frac{1\ scf}{1{,}020\ Btu}\right) \cdot \left(\frac{10^6\ Btu}{1\ MMBtu}\right) \cdot \left(\frac{64\ lb\ SO_2}{32\ lb\ S}\right)$$