DOCKETED	
Docket Number:	20-SPPE-03
Project Title:	Gilroy Backup Generating Facility
TN #:	238820
Document Title:	ADS Supplemental Responses to CEC Data Requests 35 36 and 38 - GBGF
Description:	N/A
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Submitter Role:	Applicant Representative
Submission Date:	7/13/2021 8:48:03 AM
Docketed Date:	7/13/2021

SUPPLEMENTAL RESPONSES TO CEC STAFF DATA REQUEST SET 2 (35, 36 AND 38)

Gilroy Backup Generating Facility (20-SPPE-03)

SUBMITTED TO: CALIFORNIA ENERGY COMMISSION
SUBMITTED BY: **Amazon Data Services, Inc.**

July 13, 2020

DAYZEN LLC

INTRODUCTION

Attached are Amazon Data Services, Inc.'s (ADS's) supplemental responses to California Energy Commission (CEC) Staff Data Request Set No. 2 (35, 36 and 38) for the Gilroy Backup Generation Facility (GBGF) Application for Small Power Plant Exemption (SPPE) (20-SPPE-03). Staff issued Data Request Set No. 2 on June 2, 2021. This response is a follow-up submittal to the initial response provided on June 22, 2021. The responses are presented in the same order as Staff presented them and are keyed to the Data Request numbers (35, 36 and 38).

For context, the text of the Background and Data Request precede each Data Response.

AIR QUALITY AND PUBLIC HEALTH

BACKGROUND: NO2 Impacts for Different Load Conditions

As stated under Table 4-7 in the Revised AQIA (TN 237353), the applicant did not model 1-hour nitrogen dioxide (NO_2) impacts for the 75%, 25%, and 10% load cases as the applicant expects the emissions from these loads will be less than that of the modeled 100% load case (with 0.25 hour of Tier 2 and 0.75 hour of Tier 4F emissions) and 50% load case (with Tier 2 emissions assumed for the whole hour).

However, staff needs to confirm whether the emissions for the 75%, 25%, and 10% load cases would be lower than those estimated for the 100% and 50% load cases. If Tier 4 emission factor is assumed for part of the hour for these load cases, the applicant needs to provide documents/certificates from the vendor of the selective catalytic reduction (SCR) system to verify the warm-up period of the SCR to reach Tier 4 emission rates for these load cases.

In addition, lower exhaust temperatures and slower exhaust velocities at lower loads could result in higher ground-level concentrations, even if the emissions would be lower. Without modeling, staff would not be able to confirm whether the ground-levelimpacts for the 75%, 25%, and 10% load cases would be lower than those for the 100% and 50% load cases.

DATA REQUESTS

35. Please provide nitrogen oxides (NOx) emission calculations for the 75%, 25%, or 10% load cases. If Tier 4 emission rate is assumed for part of the hour for these load cases, please provide documents/certificates from the vendor to verify the warm-up period of the SCR to reach Tier 4 emission rates for these load cases.

RESPONSE TO DATA REQUEST 35

Emission calculations for the 75%, 25%, and 10% load cases were provided with the files uploaded to the CEC's secure SharePoint upload link on June 23, 2021. The emission calculations assume only Tier 2 emission rates for the 25% and 10% load case and conservatively assume Tier 2 emission rates for 40% of an hour (24 minutes) while reflecting Tier 4 emission rates for the remainder of the hour for the 75% load case.

The activation of the SCR is dependent on the engine exhaust flow reaching the ideal temperature for catalytic reduction to take place, which is approximately 300ºC. Once the SCR's temperature sensor detects the SCR-activating exhaust temperature, urea is injected for NOx to chemically reduce to N_2 and O_2. As such, the warm-up period for NOx reduction to occur is dependent on the engine exhaust reaching the activation temperature rather than the SCR reaching the activation temperature. The time frame for the engine exhaust to warm up to the activating temperature at specific loads is dependent on environmental factors outside of engine vendor's control, such as ambient temperature and humidity, and as such, any written document or certificate of this warm-up period would need to include assumptions regarding the environmental conditions. Per discussions with the engine vendor, given the proposed engines' exhaust flow specifications at 75% load, assuming a 24-minute warm up period for the is a conservative estimate. As such, the conservative warm-up period for the 75% load has been applied to the additional modeling analysis provided in Response to Data Request 36.

36. Please provide modeling analysis for the 1-hour NO_2 impacts for the 75%, 25%, and 10% load cases.

RESPONSE TO DATA REQUEST 36

In addition to ADS' response to Data Request 2 provided on June 22, 2021, ADS is providing the requested NO_2 modeling analysis for comparison to the 1-hour NO_2 NAAQS and CAAQS for the 75%, 25% and 10% load cases. AERMOD model (version 19191) is used with Trinity Consultants' (Trinity's) *BREEZE™ AERMOD Suite* software to calculate concentrations using the regulatory default parameters. Assumptions regarding the coordinate system, terrain elevations, meteorological data, building downwash, receptors, and background concentration data are consistent with the assumptions stated in Section 4.3 and Section 4.6.3 of the Air Quality Impact Assessment (AQIA) submitted on March 29, 2021.

The following scenarios represent the varying load operations of the critical backup generators:

- Scenario A – 100% Load
- Scenario B – 75% Load
- Scenario C – 50% Load
- Scenario D – 25% Load
- Scenario E – 10% Load

The 1-hr NO_2 modeling analysis for the above-mentioned load cases have applied the revised NO_2 background data accordingly as stated in Response to Data Request 38. Note that Mitigation Measure AQ-3, which restricts the security building generator (SEC1G) from operation between 5:00 PM to 7:00 AM, is applied to demonstrate compliance with both the 1-hour NO_2 NAAQS and CAAQS.

Results from the NO_2 analysis are presented in the GBGF AQIA Modeling Outline Excel workbook and are below the NAAQS and CAAQS for each load case. As such, the Project will not result in a significant impact on air quality for all load cases. The aforementioned spreadsheet will be uploaded to a secure SharePoint set up by CEC Staff.

BACKGROUND: NO2 Background

Page 4-3 in the Revised AQIA (TN 237353) states that for the 1-hour NO2 National Ambient Air Quality Standard (NAAQS) analysis, the 98th percentile background is represented using the 3rd-highest value for each season and hour as consistent with EPA Guidance. For the 1-hour NO2 California Air Quality Standard (CAAQS) analysis, the maximum seasonal hour of day (SEASHR) data is used as consistent with the format of the standard. However, staff checked the modeling files and noticed that the seasonal hour-of-day NO2 background data for some of the hours in the fall season used for the CAAQS were lower than those used for the NAAQS analysis (as shown in the following table). In addition, the maximum NO2 background that the applicant used for the 1- hour NO2 CAAQS analysis was 61.8 ppb, which is lower than the maximum monitored values shown in Table 3-5 of the Revised AQIA (i.e. 76.9 ppb, 88 ppb, and 65.1 ppb in 2017, 2018, and 2019 respectively).

Staff needs to understand how the NO2 background data were processed. Staff needs to understand why the maximum seasonal hour-of-day values would be lower than the 3rd-highest values. Staff needs to understand why the maximum NO2 background that the applicant used for the 1-hour NO2 CAAQS analysis is lower than the maximum monitored values in 2017, 2018, and 2019.

Hour	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00
NO2 background for CAAQS (ppb)	42.2	40.2	32.8	35.4	34.8	35.8	38.3	45.7
NO2 background for NAAQS (ppb)	44.23	38.93	36.6	37.47	35.07	36.57	37.33	42.93
Difference (ppb)	**-2.03**	**1.27**	**-3.8**	**-2.07**	**-0.27**	**-0.77**	**0.97**	**2.77**
Hour	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00
NO2 background for CAAQS (ppb)	50.5	51.3	48.7	49.6	42.5	40.9	42.7	44
NO2 background for NAAQS (ppb)	48.77	53.53	48.13	47.7	44.6	45.23	43.43	45.37
Difference (ppb)	**1.73**	**-2.23**	**0.57**	**1.9**	**-2.1**	**-4.33**	**-0.73**	**-1.37**

Hour	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00
NO2 background for CAAQS (ppb)	44.2	48.7	58.1	61.8	51.3	47.6	45.2	46.2
NO2 background for NAAQS (ppb)	45.4	54.83	64.27	61.43	53.23	48.47	48.67	47
Difference (ppb)	**-1.2**	**-6.13**	**-6.17**	**0.37**	**-1.93**	**-0.87**	**-3.47**	**-0.8**

DATA REQUESTS

38. If the NO_2 background data needs to be updated, please update the 1-hour NO_2 CAAQS and/or NAAQS analyses accordingly.

RESPONSE TO DATA REQUEST 38

Please see Response to Data Request 36. The spreadsheet versions of the worksheets used in the Revised AQIA and appendices will be uploaded to a secure SharePoint set up by CEC Staff.