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Huntington Beach Energy Project

(12-AFC-02C)

Data Responses

(Response to Workshop Data Request)

Submitted to

California Energy Commission

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Contents

Introduction

Attached are AES Southland Development, LLC's (AES or the Project Owner) responses to the California Energy Commission (CEC) Air Quality staff's comments during the Data Request workshop (held on December 8, 2015) regarding the Huntington Beach Energy Project (HBEP) (12-AFC-02) Petition to Amend (PTA).

Air Quality (A14, A16-A18)

DATA REQUEST

Commissioning PM Impacts Clarification

A14: Both the Petition to Amend (PTA) and Data Responses Set 1 (TN# 206858) provided tables showing commissioning impacts analysis results. These tables not only include nitrogen dioxide (NO_2) and carbon monoxide (CO) impacts, but also include sulfur dioxide (SO_2), particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}), and particulate matter less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$) impacts. The text of Data Responses Set 1 indicates that the short-term SO_2, PM_{10}, and $PM_{2.5}$ impacts were extracted from the operational modeling results. However, the SO_2, PM_{10}, and $PM_{2.5}$ impacts shown in the commissioning impacts table are higher than those shown in the operation impacts table (Table 3-5 in Data Responses Set 1). For example, the 24-hour PM_{10} impact during commissioning is shown as 5.64 microgram(s) per cubic meter ($\mu g/m^3$), while the 24-hour PM_{10} impact during operation is shown as 5.11 $\mu g/m^3$. Staff was not able to find the modeling files for short-term SO_2, PM_{10}, and $PM_{2.5}$ impacts analysis during commissioning.

Please clarify whether the short-term SO_2, PM_{10}, and $PM_{2.5}$ impacts during commissioning were modeled or not. Please clarify why the SO_2, PM_{10}, and $PM_{2.5}$ impacts during commissioning would be higher than those during operation.

Response: The short-term SO_2, and coarse and fine particulate matter (PM_{10} and $PM_{2.5}$) were not modeled as part of commissioning impact analysis.

The SO_2, PM_{10}, and $PM_{2.5}$ commissioning impacts presented were the sum of the maximum simple-cycle gas turbine (SCGT) operational SO_2, PM_{10}, and $PM_{2.5}$ impacts, the maximum combined-cycle gas turbine (CCGT) operational SO_2, PM_{10}, and $PM_{2.5}$ impacts at any receptor point, and the maximum auxiliary boiler operational SO_2, PM_{10}, and $PM_{2.5}$ impacts at any receptor point.

Overlap impacts

A16: District Rule 1313(d) allows a maximum of 90 days as a start-up period for simultaneous operation of an existing source and its replacement. Condition F52.1 (Energy Commission Decision AQ-2) in the Final Determination of Compliance (FDOC) for the licensed HBEP (TN# 202774) allowed 90 days of simultaneous operation:

F52.1 … AES shall cease operation of RB Boilers 6 and 8 within 90 calendar days of the first fire of Units 1A, 1B, or 1C, and AES shall cease operation of HB Boilers 1 and 2 within 90 calendar days of the first fire of Units 2A, 2B, or 2C.

In the responses to Data Request A7 (TN# 206858), AES states that the proposed first-fire date of the proposed combined-cycle block would be 10/1/2019, while Huntington Beach Generation Station (HBGS) Units 1 and 2 would be retired on 11/1/2019 and 12/31/2020 respectively. Thus, both HBGS Units 1 and 2 could operate during construction and commissioning of the combined-cycle block.

The PTA Table 2.2-1 shows that the commercial operation of the combined-cycle block and the demolition of HBGS Units 3 and 4 would start in the first or second quarter of 2020. HBGS Unit 2 could keep operating until 12/31/2020. Therefore, staff believes that operation of HBGS Unit 2 could overlap with operation of the combined-cycle block and demolition of HBGS Units 3 and 4. Staff needs the applicant to provide data in response to the following data requests (TN# 206618).

- For data request A16, please provide modeling analysis to evaluate the overlap impacts due to the operation of the combined-cycle block, demolition of HBGS Units 3 and 4, and operation of HBGS Unit 2.

Response: To evaluate the worst-case air quality impacts from the overlap of operation of the combined-cycle block, the demolition of existing HBGS Units 3 and 4, and operation of existing HBGS Unit 2, the worst-case modeled scenario for the combined-cycle block (emissions and stack parameters) from the operational load analysis for each respective pollutant was modeled with the worst-case onsite emissions from demolition of existing HBGS Units 3 and 4 and operational emissions from existing HBGS Unit 2. Short-term emissions of nitrogen oxides (NO_x), CO, SO_2, PM_{10}, and $PM_{2.5}$ for HBGS Unit 2 were calculated based on maximum heat input (2,021 [million British thermal units] MMBtu/hr) and the emission factors from the 2014 South Coast Air Quality Management District (SCAQMD) Annual Emissions Report (AER). Annual emissions of NO_x, PM_{10}, and $PM_{2.5}$ were the highest total reported in the 2013 or 2014 SCAQMD AER. Stack parameters for existing HBGS Unit 2 were consistent with the stack parameters used for HBGS Units 1 and 2 in the Prevention of Significant Deterioration (PSD) competing source assessment in the HBEP PTA. A summary of emission rates and stack parameters for all sources included in this overlap scenario are presented in Attachment A (Tables 1 and 2).

Table DR16-1 presents a comparison of the maximum overlap impacts to the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). As indicated, the maximum predicted CO, NO_2, SO_2, and $PM_{2.5}$ impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. The 24-hour PM_{10} background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration will be greater than the CAAQS. Additionally, the annual PM_{10} impacts combined with background exceeds the CAAQS. However, the majority of the 24-hour and annual PM_{10} impacts at the maximum receptors are from fugitive dust associated with demolition of HBGS Units 3 and 4. These fugitive impacts will be offset by mitigation measures proposed in Section 5.1.7 of the HBEP PTA. Therefore, impacts associated with operation of the combined-cycle power block, demolition of HBGS Units 3 and 4, and operation of HBGS Unit 2 will be less than significant with mitigation.

It should be noted that this overlap scenario excludes the fact that HBGS Unit 1 will be retired prior to firing fuel in the HBEP combined-cycle gas turbine (CCGT) power block, which is not reflected in either the air dispersion modeling analysis (by modeling the HBGS Unit 1 emissions as a negative value) or by the fact that HBGS Unit 1's air emissions contribute to the values used in the ambient air background concentrations used in this analysis.

TABLE DR16-1
Maximum Modeled Impacts from Combined-Cycle Power Block Operation, HBGS Unit 3 and 4 Demolition, and HBGS Unit 2 Operation

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
CO	1-hour	654	3,321	3,975	23,000	40,000
	8-hour	151	2,519	2,670	10,000	10,000
NO_2 [b]	1-hour (max)	94.3	142	236	339	—
	1-hour (98th percentile) [c]	—	—	126	—	188
	Annual	0.62	21.8	22.4	57	100
SO_2	1-hour (max)	5.80	20.2	26.0	655	—
	1-hour (99th percentile) [d]	4.79	8.80	13.6	—	196
	3-hour	5.03	20.2	25.2	—	1,300
	24-hour	1.69	5.20	6.9	105	—
PM_{10}	24-hour	5.33	51.0	56	50	150
	Annual	1.05	19.3	20.4	20	—
$PM_{2.5}$	24-hour (98th percentile) [e]	2.97	21.3	24.3	—	35
	Annual	0.54	8.60	9.1	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[c] The total predicted concentration for the federal 1-hour NO_2 standard is the 5-year average, high-8th-high modeled

TABLE DR16-1
Maximum Modeled Impacts from Combined-Cycle Power Block Operation, HBGS Unit 3 and 4 Demolition, and HBGS Unit 2 Operation

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³

concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.
[d] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration combined with the 3-year average, 99th percentile background concentration.
[e] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Though the Project Owner maintains that the Mission Viejo PM background monitoring station is more representative of the project area, Table DR16-2 presents modeled PM_{10} and $PM_{2.5}$ impacts combined with background concentrations from the SCAQMD North Long Beach Station from 2011 through 2013. As indicated, the maximum predicted $PM_{2.5}$ impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. The annual PM_{10} background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration will be greater than the CAAQS. Additionally, the 24-hourl PM_{10} impacts combined with background exceeds the CAAQS. However, the majority of the 24-hour and annual PM_{10} impacts at the maximum receptors are from fugitive dust associated with demolition of HBGS Units 3 and 4. These fugitive impacts will be mitigated by the measures proposed in Section 5.1.7 of the HBEP PTA. Therefore, impacts associated with operation of the combined-cycle power block, demolition of HBGS Units 3 and 4, and operation of HBGS Unit 2 will be less than significant with mitigation.

TABLE DR16-2
Maximum Modeled Impacts from Combined-Cycle Power Block Operation, HBGS Unit 3 and 4 Demolition, and HBGS Unit 2 Operation with Background Data from SCAQMD North Long Beach Station

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
PM_{10}	24-hour	5.33	45	50.3	50	150
	Annual	1.05	24.2	25.3	20	—
$PM_{2.5}$	24-hour (98th percentile) [b]	2.97	26.8	29.8	—	35
	Annual	0.54	11.3	11.8	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.
[b] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Overlap impacts

A17: For Data Request A17, please provide modeling analysis to evaluate the overlap impacts due to the operation of HBGS Units 1 and 2 and worst-case emissions from construction/demolition activities for the combined-cycle block.

Response: To evaluate the worst-case air quality impacts from the overlap of construction of the combined-cycle block and operation of existing HBGS Units 1 and 2, the worst-case modeled construction emissions resulting in the impacts shown in Table 5.1-20 of the PTA were combined with operational emissions from existing HBGS Units 1 and 2. Short-term emissions of NO_x, CO, SO_2, PM_{10}, and $PM_{2.5}$ for HBGS Units 1 and 2 were calculated based on maximum load (2,021 MMBtu/hr each) and the emission factors from the 2014 AER. Annual emissions of NO_x, PM_{10}, and $PM_{2.5}$ were the highest total reported in the 2013 or 2014 SCAQMD AER. Stack parameters for existing HBGS Units 1 and 2 were consistent with the stack parameters used for HBGS Units 1 and 2 in the PSD competing

source assessment in the HBEP PTA. A summary of emission rates and stack parameters for all sources is included in this overlap scenario are presented in Attachment A (Tables 5 and 6).

Table DR17-1 presents a comparison of the maximum overlap impacts to the CAAQS and NAAQS. As indicated, the maximum predicted CO, NO_2, SO_2, and $PM_{2.5}$ impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. The 24-hour PM_{10} background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration will be greater than the CAAQS. Additionally, the annual PM_{10} impacts combined with background exceeds the CAAQS. However, the majority of the 24-hour and annual PM_{10} impacts at the maximum receptors are from fugitive dust associated with construction. These fugitive impacts will be mitigated by the proposed measures in Section 5.1.7 of the HBEP PTA. Therefore, impacts associated with construction of the combined-cycle block and operation of existing HBGS Units 1 and 2 will be less than significant with mitigation.

TABLE DR17-1
Maximum Modeled Impacts from Combined-Cycle Power Block Construction and HBGS Unit 1 and 2 Operation

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
CO	1-hour	806	3,321	4,127	23,000	40,000
	8-hour	141	2,519	2,660	10,000	10,000
NO_2 [b]	1-hour (max)	34.4	142	176	339	—
	1-hour (98th percentile) [c]	—	—	121	—	188
	Annual	2.14	21.8	23.9	57	100
SO_2	1-hour (max)	4.27	20.2	24.5	655	—
	1-hour (99th percentile) [d]	0.85	8.80	9.65	—	196
	3-hour	1.43	20.2	21.6	—	1,300
	24-hour	0.33	5.20	5.53	105	—
PM_{10}	24-hour	11.3	51.0	62.3	50	150
	Annual	3.05	19.3	22.3	20	—
$PM_{2.5}$	24-hour (98th percentile) [e]	3.62	21.3	24.9	—	35
	Annual	0.88	8.60	9.48	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[c] The total predicted concentration for the federal 1-hour NO_2 standard is the 5-year average, high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.
[d] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration combined with the 3-year average, 99th percentile background concentration.
[e] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Though the Project Owner maintains that the Mission Viejo PM background monitoring station is more representative of the project area, Table DR17-2 presents modeled PM_{10} and $PM_{2.5}$ impacts combined with background concentrations from the SCAQMD North Long Beach Station from 2011 through 2013. As indicated, the maximum predicted 24-hour $PM_{2.5}$ impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. The annual PM_{10} background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration will be greater than the CAAQS. Additionally, the 24-hour PM_{10} and 24-hour $PM_{2.5}$ impacts combined with background exceeds the CAAQS. However, the majority of the impacts at the maximum receptors are from fugitive dust associated with demolition of HBGS Units 3 and 4. These fugitive impacts will be offset by mitigation measures proposed in Section 5.1.7 of the HBEP PTA. Therefore, impacts associated with operation of the combined-cycle power block, demolition of HBGS Units 3 and 4, and operation of HBGS Unit 2 will be less than significant with mitigation.

TABLE DR17-2
Maximum Modeled Impacts from Combined-Cycle Power Block Construction and HBGS Unit 1 and 2 Operation with Background Data from SCAQMD North Long Beach Station

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
PM_{10}	24-hour	11.3	45	56.3	50	150
	Annual	3.05	24.2	27.2	20	—

TABLE DR17-2
Maximum Modeled Impacts from Combined-Cycle Power Block Construction and HBGS Unit 1 and 2 Operation with Background Data from SCAQMD North Long Beach Station

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
$PM_{2.5}$	24-hour (98th percentile) [b]	3.62	26.8	30.4	—	35
	Annual	0.88	11.3	12.2	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.
[b] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Overlap impacts

A18: For a revised Data Request A18, please provide modeling analysis to evaluate the overlap impacts due to the operation of HBGS Units 1 and 2 and commissioning of the combined-cycle block.

Response: To evaluate the worst-case air quality impacts from the overlap of commissioning of the combined-cycle block and operation of existing HBGS Units 1 and 2, the worst-case scenarios associated with commissioning of the combined-cycle block were combined with operational emissions from existing HBGS Units 1 and 2. As noted above, HBGS Unit 1 will be retired prior to firing any fuel in commissioning the combined-cycle gas turbine power block, as such this overlap scenario is overly conservative with respect to HBEP's impacts.

Combined-cycle scenarios associated with CO, 1-hour NO_2 for the state standard, annual NO_2, annual PM_{10}, and annual $PM_{2.5}$ were based on the commissioning scenarios resulting in the impacts shown in Table 5.1-21 of the PTA. Combined-cycle scenarios for 1-hour NO_2 for the federal standard, SO_2, 24-hour PM_{10} and 24-hour $PM_{2.5}$ are based on the worst-case modeled scenario for the combined-cycle block (emissions and stack parameters) from the operational load analysis for each respective pollutant. Modeled impacts for the Federal 1-hour NO_2 standard is based on statistical averaging, and as the high emissions associated with commissioning only occur for a short period of time, it is unlikely to affect compliance with this standard and emissions of SO_2, PM_{10}, and $PM_{2.5}$ are expected to be higher during normal operation than during commissioning activities. Short-term emissions of NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$ for HBGS Units 1 and 2 were calculated based on maximum load (2,021 MMBtu/hr each) and the emission factors from the 2014 AER. Annual emissions of NO_2, PM_{10}, and $PM_{2.5}$ were the highest total reported in the 2013 or 2014 SCAQMD AER. Stack parameters for existing Units 1 and 2 were consistent with the stack parameters used for HBGS Units 1 and 2 in the PSD competing source assessment in the HBEP PTA. A summary of emission rates and stack parameters for all sources included in this overlap scenario are presented in Attachment A (Tables 9 and 10).

Table DR18-1 presents a comparison of the maximum overlap impacts to the CAAQS and NAAQS. As indicated, the maximum predicted CO, NO_2, SO_2, annual PM_{10}, and $PM_{2.5}$ commissioning impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. For PM_{10}, the 24-hour background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration would be greater than the CAAQS. However, the commissioning activity would be finite, and will occur once during the life of the project. Additionally, as described in Section 5.1.7.3 of the PTA, Amended HBEP emissions will be fully offset consistent with SCAQMD Rules. In addition, the permanent retirement of HBGS Units 1 and 2 will further reduce air quality impacts as these units will no longer contribute to the background air quality concentrations. Therefore, impacts from HBEP commissioning will be less than significant.

TABLE DR18-1
Maximum Modeled Impacts from Combined-Cycle Power Block Commissioning and HBGS Unit 1 and 2 Operation

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
CO	1-hour	4,372	3,321	7,693	23,000	40,000
	8-hour	3,018	2,519	5,537	10,000	10,000
NO_2 [b]	1-hour (max)	170	142	312	339	—
	1-hour (98th percentile) [c]	—	—	126	—	188
	Annual	0.72	21.8	22.5	57	100
SO_2	1-hour (max)	5.79	20.2	26.0	655	—
	1-hour (99th percentile) [d]	4.78	8.80	13.6	—	196
	3-hour	5.02	20.2	25.2	—	1,300
	24-hour	1.69	5.20	6.89	105	—
PM_{10}	24-hour	5.14	51.0	56.1	50	150
	Annual	0.60	19.3	19.9	20	—
$PM_{2.5}$	24-hour (98th percentile) [e]	2.95	21.3	24.2	—	35
	Annual	0.60	8.60	9.20	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[c] The total predicted concentration for the federal 1-hour NO_2 standard is the 5-year average, high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.
[d] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration combined with the 3-year average, 99th percentile background concentration.
[e] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Though the Project Owner maintains that the Mission Viejo PM background monitoring station is more representative of the project area, Table DR18-2 presents modeled PM_{10} and $PM_{2.5}$ impacts combined with background concentrations from the SCAQMD North Long Beach Station from 2011 through 2013. As indicated, the maximum predicted $PM_{2.5}$ impacts combined with the background concentrations will be below the ambient air quality standards for each averaging period. The annual PM_{10} background concentration exceeds the CAAQS without adding the modeled concentration. As a result, the predicted impact combined with the background concentration will be greater than the CAAQS. Additionally, the 24-hourl PM_{10} impacts combined with background exceeds the CAAQS. However, the majority of the 24-hour and annual PM_{10} impacts at the maximum receptors are from fugitive dust associated with demolition of HBGS Units 3 and 4. These fugitive impacts will be mitigated by measures proposed in Section 5.1.7 of the HBEP PTA. Therefore, impacts associated with operation of the combined-cycle power block, demolition of HBGS Units 3 and 4, and operation of HBGS Unit 2 will be less than significant with mitigation.

TABLE DR18-2

Maximum Modeled Impacts from Combined-Cycle Power Block Commissioning and HBGS Unit 1 and 2 Operation with Background Data from SCAQMD North Long Beach Station

Pollutant	Averaging Time	Maximum Modeled Concentration, µg/m³	Background Concentration, µg/m³ [a]	Total Predicted Concentration, µg/m³	CAAQS, µg/m³	NAAQS, µg/m³
PM_{10}	24-hour	5.14	45	50.1	50	150
	Annual	0.60	24.2	24.8	20	—
$PM_{2.5}$	24-hour (98th percentile) [b]	2.95	26.8	29.7	—	35
	Annual	0.60	11.3	11.9	12	12

[a] Background concentrations were the highest concentrations monitored during 2011 through 2013.

[b] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average, 98th percentile background concentration.

Attachment A

Amended Huntington Beach Energy Project

Table 1

Combined-Cycle Power Block Operation with HBGS Unit 2 Operation and HBGS Unit 3 and Unit 4 Demolition Stack Parameters

January 2016

Construction Area Poly Sources

Source ID	Base Elevation (m)	Release Height (m)	Number of Vertices	Vertical Dimension (m)	Easting (X1) (m)	Northing (Y1) (m)	Easting (X2) (m)	Northing (Y2) (m)	Easting (X3) (m)	Northing (Y3) (m)	Easting (X4) (m)	Northing (Y4) (m)
FUG	3.66	0.00	4	1.00	409175	3723285	409277	3723213	409206	3723111	409103	3723183

Construction Point Sources

Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
WEST01	Horizontal	409175	3723285	3.66	4.60	533	18.0	0.127
WEST02	Horizontal	409195	3723271	3.66	4.60	533	18.0	0.127
WEST03	Horizontal	409216	3723256	3.66	4.60	533	18.0	0.127
WEST04	Horizontal	409236	3723242	3.66	4.60	533	18.0	0.127
WEST05	Horizontal	409257	3723228	3.66	4.60	533	18.0	0.127
WEST06	Horizontal	409277	3723213	3.66	4.60	533	18.0	0.127
WEST07	Horizontal	409161	3723265	3.66	4.60	533	18.0	0.127
WEST08	Horizontal	409181	3723250	3.66	4.60	533	18.0	0.127
WEST09	Horizontal	409202	3723236	3.66	4.60	533	18.0	0.127
WEST10	Horizontal	409222	3723222	3.66	4.60	533	18.0	0.127
WEST11	Horizontal	409243	3723207	3.66	4.60	533	18.0	0.127
WEST12	Horizontal	409263	3723193	3.66	4.60	533	18.0	0.127
WEST13	Horizontal	409146	3723244	3.66	4.60	533	18.0	0.127
WEST14	Horizontal	409167	3723230	3.66	4.60	533	18.0	0.127
WEST15	Horizontal	409187	3723215	3.66	4.60	533	18.0	0.127
WEST16	Horizontal	409208	3723201	3.66	4.60	533	18.0	0.127
WEST17	Horizontal	409228	3723187	3.66	4.60	533	18.0	0.127
WEST18	Horizontal	409249	3723172	3.66	4.60	533	18.0	0.127
WEST19	Horizontal	409132	3723224	3.66	4.60	533	18.0	0.127
WEST20	Horizontal	409152	3723209	3.66	4.60	533	18.0	0.127
WEST21	Horizontal	409173	3723195	3.66	4.60	533	18.0	0.127
WEST22	Horizontal	409193	3723181	3.66	4.60	533	18.0	0.127
WEST23	Horizontal	409214	3723166	3.66	4.60	533	18.0	0.127
WEST24	Horizontal	409234	3723152	3.66	4.60	533	18.0	0.127
WEST25	Horizontal	409118	3723203	3.66	4.60	533	18.0	0.127
WEST26	Horizontal	409138	3723189	3.66	4.60	533	18.0	0.127
WEST27	Horizontal	409159	3723174	3.66	4.60	533	18.0	0.127
WEST28	Horizontal	409179	3723160	3.66	4.60	533	18.0	0.127
WEST29	Horizontal	409200	3723146	3.66	4.60	533	18.0	0.127
WEST30	Horizontal	409220	3723131	3.66	4.60	533	18.0	0.127
WEST31	Horizontal	409103	3723183	3.66	4.60	533	18.0	0.127
WEST32	Horizontal	409124	3723168	3.66	4.60	533	18.0	0.127
WEST33	Horizontal	409144	3723154	3.66	4.60	533	18.0	0.127
WEST34	Horizontal	409165	3723140	3.66	4.60	533	18.0	0.127
WEST35	Horizontal	409185	3723125	3.66	4.60	533	18.0	0.127
WEST36	Horizontal	409206	3723111	3.66	4.60	533	18.0	0.127

Amended Huntington Beach Energy Project

Table 1

Combined-Cycle Power Block Operation with HBGS Unit 2 Operation and HBGS Unit 3 and Unit 4 Demolition Stack Parameters

January 2016

Operational Point Sources

Pollutant Scenario	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
CO, 1-hour NO_2, 1-hour SO_2	GE 7FA.05-01 Scenario 3	409449	3723146	3.66	45.7	350	12.2	6.10
	GE 7FA.05-02 Scenario 3	409474	3723182	3.66	45.7	350	12.2	6.10
1-hour NO_2 (federal), Annual NO_2, 3-hour SO_2, 24-hour SO_2, PM_{10}, $PM_{2.5}$	GE 7FA.05-01 Scenario 7	409449	3723146	3.66	45.7	350	11.8	6.10
	GE 7FA.05-02 Scenario 7	409474	3723182	3.66	45.7	350	11.8	6.10
All Pollutants	Auxiliary Boiler	409438	3723236	3.66	24.4	432	21.2	0.91
All Pollutants	HBGS Unit 2	409274	3723095	3.66	61.0	367	7.90	6.27

Amended Huntington Beach Energy Project

Table 2

Combined-Cycle Power Block Operation with HBGS Unit 2 Operation and HBGS Unit 3 and Unit 4 Demolition Emission Rates

January 2016

Emission Rates for 1-hour, 3-hour, 8-hour, and 24-hour Modeling

	1-hour NO_2		1-hour NO_2 (federal)		1-hour CO		8-hour CO		1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
Demo Fugitive	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.010	0.082	0.0012	0.0094
Demo Exhaust [a]	0.044	0.35	0.044	0.35	0.48	3.80	0.48	3.80	0.0008	0.0064	0.0008	0.0064	3.4E-04	0.0027	5.4E-04	0.0043	5.4E-04	0.0043
GE 7FA.05-01	7.69	61.0	7.18	57.0	41.0	325	12.0	95.2	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
GE 7FA.05-02	7.69	61.0	7.18	57.0	41.0	325	12.0	95.2	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
Auxiliary Boiler	0.054	0.42	0.054	0.42	0.36	2.83	0.30	2.37	0.018	0.14	0.018	0.14	0.0094	0.075	0.020	0.16	0.020	0.16
HBGS Unit 2 [b]	1.57	12.4	1.57	12.4	46.8	371	46.8	371	0.20	1.62	0.20	1.62	0.20	1.62	0.51	4.04	0.51	4.04
Maximum Month	69		69		69		69		69		69		69		69		69	

Emission Rates for Annual Modeling

	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
Demo Fugitive	-	-	0.0078	0.062	0.0009	0.0071
Demo Exhaust [a]	0.013	0.10	3.9E-04	0.0031	3.9E-04	0.0031
GE 7FA.05-01	1.02	8.12	0.81	6.42	0.81	6.42
GE 7FA.05-02	1.02	8.12	0.81	6.42	0.81	6.42
Auxiliary Boiler	0.030	0.23	0.019	0.15	0.019	0.15
HBGS Unit 2 [b]	0.47	3.76	0.15	1.22	0.15	1.22
Maximum Months	65-76		65-76		65-76	

[a] Emission rates for exhaust sources are the total for all sources.

[b] HBGS Unit 2 short-term emission rates are based on the permitted full load (2,021 MMBtu/hr) and emission factors from the 2014 AER. HBGS Unit 2 annual emissions are based on the maximum emissions reported in either the 2013 or 2014 AERs.

Amended Huntington Beach Energy Project
Table 3
Combined-Cycle Power Block Operation with HBGS Unit 2 Operation and HBGS Unit 3 and Unit 4 Demolition Building Parameters
January 2016

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)
'AIRIN3'	1	-	3.66	21.6	9	409385	3723198	409377	3723187	409384	3723182	409387	3723182	409395	3723177	409401	3723185	409393	3723191	409391	3723194	409385	3723198
'AIRIN4'	1	-	3.66	21.6	9	409426	3723221	409421	3723213	409412	3723218	409409	3723219	409402	3723223	409410	3723234	409416	3723230	409418	3723227	409426	3723221
'HRSG1'	1	-	3.66	25.6	5	409424	3723169	409447	3723152	409443	3723145	409418	3723162	409424	3723169								
'HRSG2'	1	-	3.66	25.6	5	409449	3723205	409473	3723188	409468	3723182	409444	3723198	409449	3723205								
'ACC'	1	-	3.66	33.5	5	409549	3723302	409551	3723173	409512	3723173	409510	3723301	409549	3723302								
'STG'	1	-	3.66	17.9	5	409482	3723251	409490	3723251	409490	3723235	409482	3723235	409482	3723251								
'WALL1'	1	-	3.66	15.2	9	409566	3723274	409567	3723158	409519	3723157	409437	3723109	409436	3723110	409519	3723158	409566	3723159	409565	3723274	409566	3723274
'WALL2'	1	-	3.66	6.10	7	409447	3723302	409427	3723301	409402	3723266	409402	3723265	409427	3723301	409447	3723301	409447	3723301				
'UNIT1L1'	2	1	3.66	23.2	4	409293	3723102	409312	3723128	409335	3723112	409317	3723086										
'UNIT1L2'	-	2	3.66	37.6	4	409301	3723114	409312	3723128	409335	3723112	409326	3723098										
'UNIT2L1'	2	1	3.66	23.2	4	409252	3723127	409272	3723153	409295	3723137	409277	3723111										
'UNIT2L2'	-	2	3.66	37.6	4	409261	3723139	409272	3723153	409295	3723137	409285	3723123										

Cylindical Building Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	61.0	6.27

Amended Huntington Beach Energy Project

Table 4

Combined-Cycle Power Block Operation with HBGS Unit 2 Operation and HBGS Unit 3 and Unit 4 Demolition Results

January 2016

		NO_2 ($\mu g/m^3$)			CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)				PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Source	Year	1-hour [a]	1-hour (federal) [b]	Annual [a]	1-hour	8-hour	1-hour	1-hour (federal) [c]	3-hour	24-hour	24-hour	Annual	24-hour [d]	Annual
ALL	2010	88.4	137	0.56	594	133	5.33	4.74	4.31	1.42	4.46	0.99	2.71	0.48
HBEP		88.2	75.1	0.43	588	108	5.31	4.74	4.28	1.41	4.31	0.45	2.70	0.45
HBGS		13.1	2.37	0.055	487	81.4	2.08	0.41	0.69	0.12	0.31	0.023	0.22	0.023
Demolition		5.80	5.69	0.41	79.6	67.5	0.13	0.13	0.13	0.027	4.42	0.96	0.42	0.12
ALL	2011	84.8	124	0.57	581	113	5.18	4.57	4.46	1.21	5.22	1.01	2.69	0.49
HBEP		84.3	70.5	0.44	562	102	5.10	4.56	4.45	1.19	3.64	0.46	2.60	0.46
HBGS		4.19	2.36	0.061	156	75.6	0.67	0.41	0.37	0.11	0.28	0.026	0.22	0.026
Demolition		5.81	5.70	0.41	79.8	66.6	0.14	0.13	0.13	0.026	5.17	0.97	0.49	0.13
ALL	2012	89.6	130	0.61	625	151	5.52	4.74	5.03	1.69	5.33	1.05	2.88	0.54
HBEP		88.7	72.5	0.48	592	115	5.38	4.72	4.91	1.66	5.07	0.50	2.82	0.50
HBGS		3.48	2.48	0.064	130	70.0	0.55	0.45	0.34	0.15	0.39	0.027	0.24	0.027
Demolition		5.87	5.72	0.42	80.6	62.9	0.14	0.13	0.13	0.027	5.32	1.01	0.47	0.13
ALL	2013	88.4	117	0.62	617	116	5.45	4.88	4.69	1.28	5.05	1.04	3.29	0.54
HBEP		87.4	74.1	0.48	583	104	5.31	4.81	4.67	1.26	3.86	0.50	3.15	0.50
HBGS		3.21	2.36	0.067	120	70.1	0.51	0.40	0.40	0.14	0.35	0.028	0.21	0.028
Demolition		5.87	5.70	0.41	80.7	65.7	0.14	0.13	0.13	0.026	4.73	0.99	0.44	0.13
ALL	2014	94.3	123	0.61	654	128	5.80	5.00	4.65	1.56	4.91	1.00	3.27	0.53
HBEP		93.4	76.0	0.47	623	102	5.66	4.96	4.56	1.53	4.65	0.50	3.19	0.50
HBGS		3.17	2.36	0.065	118	62.4	0.51	0.39	0.44	0.13	0.34	0.028	0.23	0.028
Demolition		5.86	5.77	0.39	80.5	64.8	0.14	0.14	0.13	0.026	4.83	0.94	0.46	0.12

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[b] The total predicted concentration for the federal 1-hour NO_2 standard (source group ALL) is the high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

[c] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration.

[d] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration.

Amended Huntington Beach Energy Project
Table 5
Operation of HBGS Units 1 and 2 and Construction of Combined-Cycle Power Block Stack Parameters
January 2016

Construction Area Poly Sources

Source ID	Base Elevation (m)	Release Height (m)	Number of Vertices	Vertical Dimension (m)	Easting (X1) (m)	Northing (Y1) (m)	Easting (X2) (m)	Northing (Y2) (m)	Easting (X3) (m)	Northing (Y3) (m)
FUG	3.66	0.00	7	1.00	409550	3723300	409550	3723175	409515	3723175

Source ID	Easting (X4) (m)	Northing (Y4) (m)	Easting (X5) (m)	Northing (Y5) (m)	Easting (X6) (m)	Northing (Y6) (m)	Easting (X7) (m)	Northing (Y7) (m)
FUG	409450	3723130	409350	3723200	409425	3723275	409475	3723300

Construction Point Sources

Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
EAST01	Horizontal	409425	3723150	3.66	4.60	533	18.0	0.127
EAST02	Horizontal	409450	3723150	3.66	4.60	533	18.0	0.127
EAST03	Horizontal	409400	3723175	3.66	4.60	533	18.0	0.127
EAST04	Horizontal	409425	3723175	3.66	4.60	533	18.0	0.127
EAST05	Horizontal	409450	3723175	3.66	4.60	533	18.0	0.127
EAST06	Horizontal	409475	3723175	3.66	4.60	533	18.0	0.127
EAST07	Horizontal	409500	3723175	3.66	4.60	533	18.0	0.127
EAST08	Horizontal	409525	3723175	3.66	4.60	533	18.0	0.127
EAST09	Horizontal	409550	3723175	3.66	4.60	533	18.0	0.127
EAST10	Horizontal	409375	3723200	3.66	4.60	533	18.0	0.127
EAST11	Horizontal	409400	3723200	3.66	4.60	533	18.0	0.127
EAST12	Horizontal	409425	3723200	3.66	4.60	533	18.0	0.127
EAST13	Horizontal	409450	3723200	3.66	4.60	533	18.0	0.127
EAST14	Horizontal	409475	3723200	3.66	4.60	533	18.0	0.127
EAST15	Horizontal	409500	3723200	3.66	4.60	533	18.0	0.127
EAST16	Horizontal	409525	3723200	3.66	4.60	533	18.0	0.127
EAST17	Horizontal	409550	3723200	3.66	4.60	533	18.0	0.127
EAST18	Horizontal	409400	3723225	3.66	4.60	533	18.0	0.127
EAST19	Horizontal	409425	3723225	3.66	4.60	533	18.0	0.127
EAST20	Horizontal	409450	3723225	3.66	4.60	533	18.0	0.127
EAST21	Horizontal	409475	3723225	3.66	4.60	533	18.0	0.127
EAST22	Horizontal	409500	3723225	3.66	4.60	533	18.0	0.127
EAST23	Horizontal	409525	3723225	3.66	4.60	533	18.0	0.127
EAST24	Horizontal	409550	3723225	3.66	4.60	533	18.0	0.127
EAST25	Horizontal	409400	3723250	3.66	4.60	533	18.0	0.127
EAST26	Horizontal	409425	3723250	3.66	4.60	533	18.0	0.127
EAST27	Horizontal	409450	3723250	3.66	4.60	533	18.0	0.127
EAST28	Horizontal	409475	3723250	3.66	4.60	533	18.0	0.127
EAST29	Horizontal	409500	3723250	3.66	4.60	533	18.0	0.127
EAST30	Horizontal	409525	3723250	3.66	4.60	533	18.0	0.127
EAST31	Horizontal	409550	3723250	3.66	4.60	533	18.0	0.127
EAST32	Horizontal	409425	3723275	3.66	4.60	533	18.0	0.127
EAST33	Horizontal	409450	3723275	3.66	4.60	533	18.0	0.127
EAST34	Horizontal	409475	3723275	3.66	4.60	533	18.0	0.127
EAST35	Horizontal	409500	3723275	3.66	4.60	533	18.0	0.127
EAST36	Horizontal	409525	3723275	3.66	4.60	533	18.0	0.127
EAST37	Horizontal	409550	3723275	3.66	4.60	533	18.0	0.127
EAST38	Horizontal	409475	3723300	3.66	4.60	533	18.0	0.127
EAST39	Horizontal	409500	3723300	3.66	4.60	533	18.0	0.127
EAST40	Horizontal	409525	3723300	3.66	4.60	533	18.0	0.127
EAST41	Horizontal	409550	3723300	3.66	4.60	533	18.0	0.127

Operational Point Sources

Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
HBGS Units 1 and 2	409274	3723095	3.66	61.0	367	7.90	6.27

Amended Huntington Beach Energy Project
Table 6
Operation of HBGS Units 1 and 2 and Construction of Combined-Cycle Power Block Emission Rates
January 2016

Emission Rates for 1-hour, 3-hour, 8-hour, and 24-hour Modeling

	1-hour NO_2		1-hour CO		8-hour CO		1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
Cons Fugitive	-	-	-	-	-	-	-	-	-	-	-	-	0.020	0.16	0.0077	0.061
Cons Exhaust [a]	0.21	1.63	1.08	8.55	1.08	8.55	0.0018	0.014	0.0018	0.014	0.0008	0.0060	0.0005	0.0043	0.0005	0.0043
HBGS Units 1 and 2 [b]	3.28	26.0	77.3	614	77.3	614	0.41	3.25	0.41	3.25	0.41	3.25	0.96	7.62	0.96	7.62
Maximum Month	39		27		27		27		27		27		16		16	

Emission Rates for Annual Modeling

	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
Cons Fugitive	-	-	0.012	0.097	0.0034	0.027
Cons Exhaust [a]	0.063	0.50	0.0008	0.0060	0.0008	0.0060
HBGS Units 1 and 2 [b]	0.91	7.21	0.27	2.13	0.27	2.13
Maximum Months	36-47		27-38		27-38	

[a] Emission rates for exhaust sources are the total for all sources.

[b] HBGS Unit 1 and 2 short-term emission rates are based on the permitted full load (2,021 MMBtu/hr) and emission factors from the 2014 AER for each boiler. HBGS Unit 1 and 2 annual emissions are based on the maximum emissions reported in either the 2013 or 2014 AERs.

Amended Huntington Beach Energy Project
Table 7
Operation of HBGS Units 1 and 2 and Construction of Combined-Cycle Power Block Building Parameters
January 2016

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)
'UNIT1L1'	2	1	3.66	23.2	4	409293	3723102	409312	3723128	409335	3723112	409317	3723086
'UNIT1L2'	-	2	3.66	37.6	4	409301	3723114	409312	3723128	409335	3723112	409326	3723098
'UNIT2L1'	2	1	3.66	23.2	4	409252	3723127	409272	3723153	409295	3723137	409277	3723111
'UNIT2L2'	-	2	3.66	37.6	4	409261	3723139	409272	3723153	409295	3723137	409285	3723123
'UNIT3L1'	2	1	3.66	23.2	4	409187	3723175	409206	3723202	409229	3723186	409211	3723159
'UNIT3L2'	-	2	3.66	37.6	4	409195	3723187	409206	3723202	409229	3723186	409220	3723172
'UNIT4L1'	2	1	3.66	23.2	4	409146	3723201	409165	3723228	409188	3723212	409170	3723185
'UNIT4L2'	-	2	3.66	37.6	4	409154	3723213	409165	3723228	409188	3723212	409179	3723198

Cylindical Building Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	61.0	6.27
Stack34	3.66	409165	3723168	61.0	6.27

Amended Huntington Beach Energy Project
Table 8
Operation of HBGS Units 1 and 2 and Construction of Combined-Cycle Power Block Model Results
January 2016

		NO_2 ($\mu g/m^3$)			CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)				PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Source	Year	1-hour [a]	1-hour (federal) [b]	Annual [a]	1-hour	8-hour	1-hour	1-hour (federal) [c]	3-hour	24-hour	24-hour	Annual	24-hour [d]	Annual
ALL		34.4	122	2.07	806	139	4.27	0.86	1.43	0.26	10.71	2.97	3.58	0.85
Construction	2010	26.6	26	2.00	175	136	0.29	0.29	0.27	0.06	10.63	2.94	3.38	0.83
HBGS		34.1	6	0.11	804	134	4.27	0.85	1.42	0.25	0.58	0.04	0.41	0.04
ALL		26.6	121	2.09	262	140	1.37	0.85	0.76	0.24	10.13	2.94	3.44	0.85
Construction	2011	26.5	26	2.00	174	140	0.29	0.29	0.27	0.06	9.89	2.91	3.24	0.82
HBGS		10.9	6	0.12	258	125	1.37	0.84	0.75	0.22	0.52	0.05	0.42	0.05
ALL		26.8	120	2.14	218	141	1.14	0.92	0.71	0.33	10.82	3.05	3.63	0.88
Construction	2012	26.8	26	2.05	176	131	0.29	0.29	0.27	0.06	10.70	3.01	3.43	0.85
HBGS		9.1	6	0.12	214	116	1.14	0.92	0.70	0.32	0.74	0.05	0.44	0.05
ALL		26.9	121	2.10	200	139	1.05	0.83	0.82	0.30	10.93	3.05	3.71	0.88
Construction	2013	26.9	26	2.00	177	139	0.30	0.29	0.28	0.06	10.82	3.01	3.51	0.85
HBGS		8.4	6	0.13	198	116	1.05	0.82	0.82	0.28	0.66	0.05	0.40	0.05
ALL		27.0	121	2.02	199	135	1.04	0.81	0.91	0.27	11.29	2.88	3.73	0.84
Construction	2014	27.0	26	1.92	177	134	0.30	0.29	0.28	0.06	11.14	2.84	3.54	0.80
HBGS		8.3	6	0.13	195	103	1.04	0.81	0.90	0.27	0.63	0.05	0.43	0.05

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.

[b] The total predicted concentration for the federal 1-hour NO_2 standard (source group ALL) is the high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.

[c] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration.

[d] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration.

Amended Huntington Beach Energy Project
Table 9
Operation of HBGS Unit 2 and Commissioning of Combined-Cycle Power Block Stack Parameters
January 2016

Commissioning Point Sources [a]

Scenario	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
GE 7FA.05,	7FA01	409449	3723146	3.66	45.7	361	9.33	6.10
10% Load	7FA02	409474	3723182	3.66	45.7	361	9.33	6.10
GE 7FA.05,	7FA01	409449	3723146	3.66	45.7	359	11.9	6.10
40% Load	7FA02	409474	3723182	3.66	45.7	359	11.9	6.10
GE 7FA.05,	7FA01	409449	3723146	3.66	45.7	366	16.1	6.10
80% Load	7FA02	409474	3723182	3.66	45.7	366	16.1	6.10

Operational Point Sources

Pollutant Scenario	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
1-hour SO_2	GE 7FA.05-01 Scenario 3	409449	3723146	3.66	45.7	350	12.2	6.10
	GE 7FA.05-02 Scenario 3	409474	3723182	3.66	45.7	350	12.2	6.10
1-hour NO_2 (federal), Annual NO_2, 3-hour SO_2, 24-hour SO_2, PM_{10}, $PM_{2.5}$	GE 7FA.05-01 Scenario 7	409449	3723146	3.66	45.7	350	11.8	6.10
	GE 7FA.05-02 Scenario 7	409474	3723182	3.66	45.7	350	11.8	6.10
All Pollutants	Auxiliary Boiler	409438	3723236	3.66	24.4	432	21.2	0.91
All Pollutants	HBGS Unit 2	409274	3723095	3.66	61.0	367	7.90	6.27

[a] Commissioning-specific stack parameters are for modeling of CO and 1-hour NO_2 (state standard only). All other pollutants were modeled using the worst-case load scenario shown in the Operational Stack Parameters Table.

Amended Huntington Beach Energy Project
Table 10
Operation of HBGS Unit 2 and Commissioning of Combined-Cycle Power Block Emission Rates
January 2016

Emission Rates for 1-hour, 3-hour, 8-hour, and 24-hour Modeling [a]

	1-hour NO_2		1-hour NO_2 (federal)		1-hour CO		8-hour CO		1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
GE 7FA.05-01 (10% Load)	16.4	130	-	-	239	1,900	239	1,900	-	-	-	-	-	-	-	-	-	-
GE 7FA.05-02 (10% Load)	16.4	130	-	-	239	1,900	239	1,900	-	-	-	-	-	-	-	-	-	-
GE 7FA.05-01 (40% Load)	8.60	68.3	-	-					-	-	-	-	-	-	-	-	-	-
GE 7FA.05-02 (40% Load)	8.60	68.3	-	-	Emission rates are captured by another				-	-	-	-	-	-	-	-	-	-
GE 7FA.05-01 (80% Load)	7.94	63.0	-	-	modeled commissioning or operation scenario				-	-	-	-	-	-	-	-	-	-
GE 7FA.05-02 (80% Load)	7.94	63.0	-	-					-	-	-	-	-	-	-	-	-	-
GE 7FA.05-01 (Operational Worst-Case)	-	-	7.18	57.0	-	-	-	-	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
GE 7FA.05-02 (Operational Worst-Case)	-	-	7.18	57.0	-	-	-	-	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
Auxiliary Boiler	0.054	0.42	0.054	0.42	0.36	2.83	0.30	2.37	0.018	0.14	0.018	0.14	0.0094	0.075	0.020	0.16	0.020	0.16
HBGS Unit 2 [b]	1.57	12.4	1.57	12.4	46.8	371	46.8	371	0.20	1.62	0.20	1.62	0.20	1.62	0.51	4.04	0.51	4.04

Emission Rates for Annual Modeling [c]

	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
GE 7FA.05-01	1.42	11.3	0.93	7.38	0.93	7.38
GE 7FA.05-02	1.42	11.3	0.93	7.38	0.93	7.38
Auxiliary Boiler	0.030	0.23	0.019	0.15	0.019	0.15
HBGS Unit 2 [c]	0.47	3.76	0.15	1.22	0.15	1.22

[a] Short-term commissioning-specific emission rates are only considered for CO and 1-hour NO_2 (state standard only). Commissioning scenario times are small enough to not affect the statisitcal averaging associated with the federal 1-hour NO_2 standard and emissions of SO_2, PM_{10}, and $PM_{2.5}$ are expected to be higher during normal operation compared to commissioning.

[b] HBGS Unit 2 short-term emission rates are based on the permitted full load (2,021 MMBtu/hr) and emission factors from the 2014 AER. HBGS Unit 2 annual emissions are based on the maximum emissions reported in either the 2013 or 2014 AERs.

[c] GE 7FA.05 annual emissions include emissions from commissioning as well as annual operation.

Amended Huntington Beach Energy Project
Table 11
Operation of HBGS Unit 2 and Commissioning of Combined-Cycle Power Block Building Parameters
January 2016

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)
'AIRIN3'	1	-	3.66	21.6	9	409385	3723198	409377	3723187	409384	3723182	409387	3723182	409395	3723177	409401	3723185	409393	3723191	409391	3723194	409385	3723198
'AIRIN4'	1	-	3.66	21.6	9	409426	3723221	409421	3723213	409412	3723218	409409	3723219	409402	3723223	409410	3723234	409416	3723230	409418	3723227	409426	3723221
'HRSG1'	1	-	3.66	25.6	5	409424	3723169	409447	3723152	409443	3723145	409418	3723162	409424	3723169								
'HRSG2'	1	-	3.66	25.6	5	409449	3723205	409473	3723188	409468	3723182	409444	3723198	409449	3723205								
'ACC'	1	-	3.66	33.5	5	409549	3723302	409551	3723173	409512	3723173	409510	3723301	409549	3723302								
'STG'	1	-	3.66	17.9	5	409482	3723251	409490	3723251	409490	3723235	409482	3723235	409482	3723251								
'WALL1'	1	-	3.66	15.2	9	409566	3723274	409567	3723158	409519	3723157	409437	3723109	409436	3723110	409519	3723158	409566	3723159	409565	3723274	409566	3723274
'WALL2'	1	-	3.66	6.10	7	409447	3723302	409427	3723301	409402	3723266	409402	3723265	409427	3723301	409447	3723301	409447	3723301				
'UNIT1L1'	2	1	3.66	23.2	4	409293	3723102	409312	3723128	409335	3723112	409317	3723086										
'UNIT1L2'	-	2	3.66	37.6	4	409301	3723114	409312	3723128	409335	3723112	409326	3723098										
'UNIT2L1'	2	1	3.66	23.2	4	409252	3723127	409272	3723153	409295	3723137	409277	3723111										
'UNIT2L2'	-	2	3.66	37.6	4	409261	3723139	409272	3723153	409295	3723137	409285	3723123										
'UNIT3L1'	2	1	3.66	23.2	4	409187	3723175	409206	3723202	409229	3723186	409211	3723159										
'UNIT3L2'	-	2	3.66	37.6	4	409195	3723187	409206	3723202	409229	3723186	409220	3723172										
'UNIT4L1'	2	1	3.66	23.2	4	409146	3723201	409165	3723228	409188	3723212	409170	3723185										
'UNIT4L2'	-	2	3.66	37.6	4	409154	3723213	409165	3723228	409188	3723212	409179	3723198										

Cylindrical Building Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	61.0	6.27
Stack34	3.66	409165	3723168	61.0	6.27

Amended Huntington Beach Energy Project
Table 12
Operation of HBGS Unit 2 and Commissioning of Combined-Cycle Power Block Model Results
January 2016

		NO_2 (µg/m^3)			CO (µg/m^3)		SO_2 (µg/m^3)				PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
Source	Year	1-hour [a,b]	1-hour (federal) [c]	Annual [a]	1-hour	8-hour	1-hour	1-hour (federal) [d]	3-hour	24-hour	24-hour	Annual	24-hour [e]	Annual
ALL		160	137	0.64	4,121	3,018	5.33	4.74	4.31	1.42	4.33	0.53	2.71	0.53
HBEP	2010	159	75.1	0.58	4,094	3,000	5.30	4.74	4.28	1.41	4.31	0.51	2.70	0.51
HBGS		14.7	2.37	0.055	487	81.4	2.08	0.41	0.69	0.12	0.31	0.023	0.22	0.023
ALL		151	124	0.66	4,012	2,740	5.17	4.56	4.46	1.21	3.68	0.55	2.69	0.55
HBEP	2011	151	70.5	0.60	3,993	2,734	5.09	4.55	4.44	1.19	3.64	0.52	2.60	0.52
HBGS		3.44	2.36	0.061	156	75.6	0.67	0.41	0.37	0.11	0.28	0.026	0.22	0.026
ALL		162	130	0.72	4,342	3,007	5.51	4.74	5.02	1.69	5.14	0.60	2.88	0.60
HBEP	2012	161	72.5	0.66	4,309	2,972	5.37	4.72	4.90	1.66	5.07	0.57	2.82	0.57
HBGS		3.47	2.48	0.064	130	70.0	0.55	0.45	0.34	0.15	0.39	0.027	0.24	0.027
ALL		170	117	0.72	4,282	2,814	5.44	4.87	4.69	1.28	3.90	0.60	3.21	0.60
HBEP	2013	169	74.1	0.66	4,249	2,807	5.30	4.81	4.66	1.26	3.86	0.57	3.15	0.57
HBGS		3.49	2.36	0.067	120	70.1	0.51	0.40	0.40	0.14	0.35	0.028	0.21	0.028
ALL		170	123	0.71	4,372	2,806	5.79	4.99	4.64	1.56	4.73	0.59	3.25	0.59
HBEP	2014	169	76.0	0.65	4,341	2,787	5.66	4.96	4.56	1.53	4.65	0.57	3.19	0.57
HBGS		3.13	2.36	0.065	118	62.4	0.50	0.39	0.44	0.13	0.34	0.028	0.23	0.028

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[b] 1-hour NO_2 impacts were modeled using the Plume Volume Molar Ratio Method.
[c] The total predicted concentration for the federal 1-hour NO_2 standard is the high-8th-high modeled concentration paired with 98th percentile seasonal hour-of-day background concentrations for 2010 through 2012.
[d] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration.
[e] The total predicted concentration for the federal 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration.