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July 11, 2016

Mr. Andrew Lee
Senior Air Quality Engineering Manager
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, California 91765-4178

Subject: AES Huntington Beach, LLC (Facility ID 115389)
Preliminary Determination of Compliance Comments

Dear Mr. Lee:

AES Huntington Beach, LLC (AES) appreciates the efforts by the South Coast Air Quality Management District (SCAQMD) in preparing the Huntington Beach Energy Project's (HBEP) Preliminary Determination of Compliance (PDOC). AES agrees with the conclusions derived by the SCAQMD and provides the following comments on the draft Facility Permit to Operate and the PDOC.

Draft Permit to Operate Comments

There are a few proposed conditions which are either in error or are inconsistent with the information submitted and subsequent analysis included with the PDOC. The proposed changes to the permit conditions provided below have no impact on the conclusions of the analysis, are consistent with the data submitted to the SCAQMD for analysis, and will allow the proposed equipment to operate as required by the local electrical balancing authority.

Page 14 of the Facility Permit to Operate, Condition F2.1 – Under the heading “Contaminant”, the pollutant listed is particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀) and the condition is applicable to only particulate matter with an aerodynamic diameter of 2.5 microns or less (PM_{2.5}).

Page 16 of the Facility Permit to Operate, Condition F52.1 – AES requests that the shutdown of Huntington Beach Generating Station Unit 1 be tied to the start up of the first fire of the combined cycle turbine generators (CCTG) and not tied to a specific date of November 1, 2019. In the event that construction of the CCTG is delayed due to unforeseen events, AES may not be allowed by other state agencies to shutdown Unit 1 until the CCTG units are operational, consistent with paragraph 8 of this condition, which allows 90-days of simultaneous operation of the CCTG and Unit 1.

Page 22 of the Facility Permit to Operate, Condition A195.6 – The sources subject to this condition are D115 and D124. However, the Condition only indicates that source D124 is subject to this condition.

Page 23 of the Facility Permit to Operate, Condition A195.9 – There appears to be a typographical error with language describing ammonia (NH₃) concentration calculations from Condition A195.10 duplicated in Condition A195.9, a condition for carbon dioxide (CO₂) emissions.

Page 26 of the Facility Permit to Operate and Page 76 of the PDOC, Condition C1.7 – The start up restrictions are not consistent with the maximum month emissions, place undue operating restrictions on the equipment without justification, and would result in the equipment being unable to respond to dispatch orders from the local balancing authority. Since the warm and hot start up emissions and durations are identical and are in all cases less than the emissions from a cold start, there should be no restriction on hot and warm starts other than the total monthly and annual limits on any start condition. The following revisions to Condition C1.7 are necessary:

The operator shall limit the number of start ups to no more than 62 in any one calendar month.

The number of cold start ups shall not exceed 15 per month, ~~the number of warm start ups shall not exceed 12 per month, and the number of hot start ups shall not exceed 35 per month.~~ Additionally, the number of cold start ups shall not exceed 80 per year, ~~the number of warm start ups shall not exceed 88 per year, and the total number of hot start ups shall not exceed 332500 per year.~~

For the purposes of this condition: A cold start up is defined as a start up which occurs after the steam turbine has been shutdown for 48 hours or more. A cold start up shall not exceed 60 minutes. Emissions during the 60 minutes that includes a cold start up shall not exceed the following: NOx - 61 lbs., CO – 325 lbs., VOC – 36 lbs.

A ~~non-cold~~warm start up is defined as a start up which occurs after the steam turbine has been shutdown for ~~less than 9~~—48 hours. A ~~warm non-cold~~ start up shall not exceed 30 minutes. Emissions during the 30 minutes that includes a ~~warm non-cold~~ start up shall not exceed the following: NOx - 17 lbs., CO – 137 lbs., VOC – 25 lbs.

~~A hot start up is defined as a start up which occurs after the steam turbine has been shutdown for less than 9 hours. A hot start up shall not exceed 30 minutes. Emissions during the 30 minutes that includes a hot start up shall not exceed the following: NOx – 17 lbs., CO – 137 lbs., VOC – 25 lbs.~~

The beginning of a start up occurs at initial fire in the combustor and the end of start up occurs when the BACT levels are achieved. If during start up the process is aborted the process will count as one start up.

The operator shall maintain records, in a manner approved by the SCAQMD to demonstrate compliance with this condition.

Page 16 of the Facility Permit to Operate and Page 73 of the PDOC, Condition F52.1, 1st Full Paragraph – AES suggests revising this paragraph as proposed below in order to allow for minor delays in the construction and commissioning schedule:

Within 30 calendar days of actual shutdown, or within 90 days after the first fire of either combined cycle turbine generator unit ~~by no later than November 1, 2019~~, AES shall provide SCAQMD with a notarized statement that HB Beach Boiler 1 and RB Boiler 7 are permanently shutdown and that any re start or operation of the units shall require new Permits to

Construct and be subject to all requirements of non-attainment new source review and the prevention of significant deterioration program.

Page 43 of the Facility Permit to Operate and Page 102 of the PDOC, Condition D29.9 – The Facility Permit to Operate requires carbon monoxide (CO) testing at the inlet of the selective catalytic reduction (SCR) serving this equipment (the auxiliary boiler), whereas the PDOC Condition D29.9 requires CO testing at the outlet of the SCR. Please revise the Facility Permit to Operate Condition D29.9 to require CO testing at the outlet of the SCR.

Page 47 of the Facility Permit to Operate and Page 82 of the PDOC, Condition E193.5 – The hours in this condition should specify “fired” hours as the combustion turbines can be operated without fuel firing for testing purposes, as proposed below:

E193.5

The operator shall install this equipment according to the following requirements:

Total commissioning hours shall not exceed 996 fired hours of operation for each turbine from the date of initial turbine start up. Total commissioning hours without control shall not exceed 216 fired hours of operation for each turbine.

Page 49 of the Facility Permit to Operate and Page 94 of the PDOC, Condition E193.7 – The hours in this condition should specify “fired” hours as the combustion turbines can be operated without fuel firing for testing purposes, as proposed below:

E193.7

The operator shall install this equipment according to the following requirements:

Total commissioning hours shall not exceed 280 fired hours of operation for each turbine from the date of initial turbine start up. Total commissioning hours without control shall not exceed 4 fired hours of operation for each turbine.

Page 53 of the Facility Permit to Operate and Page 83 of the PDOC, Condition I297.1 – Please revise the Facility Permit to Operate Condition I297.1 to be consistent with the PDOC Condition 297.1 as follows:

I297.1

This equipment shall not be operated unless the facility holds 147093 pounds of NOx RTCs in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operation. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held one year from the initial start of operation. If the initial or annual hold amount is partially satisfied by holding RTCs that expire midway through the hold period, those RTCs may be transferred upon their respective expiration dates. This hold amount is in addition to any other amount of RTCs required to be held under other condition(s) stated in this permit.

Page 55 of the Facility Permit to Operate and Page 95 of the PDOC, Condition I297.2 – Please revise the Facility Permit to Operate Condition I297.2 to be consistent with the PDOC Condition 297.2 as follows:

I297.2

This equipment shall not be operated unless the facility holds 26970 pounds of NO_x RTCs in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operation. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held one year from the initial start of operation. If the initial or annual hold amount is partially satisfied by holding RTCs that expire midway through the hold period, those RTCs may be transferred upon their respective expiration dates. This hold amount is in addition to any other amount of RTCs required to be held under other condition(s) stated in this permit.

Page 57 of the Facility Permit to Operate and Page 84 of the PDOC, Condition K67.5 – In light of the comment made to Condition C1.7 regarding the start up definitions, AES suggests deleting the parenthetical “(cold, warm, or hot)” from this condition.

PDOC Comments

AES also offers the following corrections to information contained within the PDOC.

Page 5, Section H – The simple-cycle turbine generator (SCTG) SCR height should be 11.5’, not 11.6’.

Page 6, Section H – The SCTG SCR height should be 11.5’, not 11.6’.

Page 10, Footnote 1 – The maximum annual generation is not correct, as the data used does not match that in the revised air permit application. The CCTG should operate 6,640 hours (including starts and shutdowns) and the SCTG should operate 2,001 hours (including starts and shutdowns). Additionally, the SCTG baseload rating should be 201.6 megawatts (MW).

Page 17, Table 2.7 – The uncontrolled SCTG oxides of nitrogen (NO_x) emission rate is 25 parts per million (ppm), not 9 ppm, as noted in the accompanying text following Table 2.7.

Page 22, Table 3.1 – The CCTG hot and warm start emissions and duration are identical and for clarity the SCAQMD should describe these as a single start type (i.e., non-cold).

Page 24, Table 3.6 – The auxiliary boiler startup volatile organic compound (VOC) emissions for a cold, warm, and hot start should be 4.69, 2.34, and 0.69 pounds per event (lbs/event), respectively, instead of 1.05, 0.52, and 0.15 lbs/event, respectively. This change will also need to be made in Appendix D, Tables D.3 through D.12.

Page 25, Table 3.7 – Table 3.7 assumes that the CCTGs only operate 23 hours per day (including starts and shutdowns), with one hour of downtime (see Appendix A, Table A.9). The maximum CCTG emissions should be based on the CCTGs operating 24 hours per day, at either full load or including 2 starts and 2 shutdowns

Page 25, Table 3.8 – Table 3.8 assumes that the SCTGs only operate 23 hours per day (including starts and shutdowns), with one hour of downtime (see Appendix B, Table B.8). The maximum SCTG emissions should be based on the SCTGs operating 24 hours per day, at either full load or including 2 starts and 2 shutdowns.

Page 26, Table 3.12 – The operating scenario for Table 3.12 should indicate 222.4 hours of normal operation, consistent with Table 3.4.

Page 27, Table 3.13 – In the Alamitos Energy Center permit application (Facility ID 115394), the SCAQMD accepted an oil/water separator (OWS) emission factor of 0.00002 pounds of VOC per 1,000 gallons of throughput. Using this emission factor for the HBEP OWS, conservatively assuming the annual throughput can occur in one month, changes the Table 3.13 OWS VOC emissions to 0.017 pounds for OWS 1 and 0.0022 pounds for OWS 2. The OWS VOC emissions in Appendix F should be revised accordingly.

Page 29, Table 3.17 – The ammonia operating scenario should not include start up and shutdown hours, consistent with Appendix D, Tables D.11 and D.12.

Page 29, Table 3.18 – In the Alamitos Energy Center permit application (Facility ID 115394), the SCAQMD accepted an OWS emission factor of 0.00002 pounds of VOC per 1,000 gallons of throughput. Using this emission factor for the HBEP OWS changes the Table 3.18 OWS VOC emissions to 0.017 pounds for OWS 1 and 0.0022 pounds for OWS 2. The OWS VOC emissions in Appendix F should be revised accordingly.

Page 30, Table 3.19 – The auxiliary boiler hours should include a footnote similar to Appendix D, Table D.11 stating “Based on 71 mmBtu/hr. Note that the unit may operate more hours at a lower heat input rate.”

Page 33, Table 3.25 – The hourly and annual auxiliary boiler greenhouse gas (GHG) emissions data appear incorrect. Based on the hourly and annual fuel consumption presented in Appendix I, the correct auxiliary boiler GHG data is provided in the table below.

Table 3.25 Auxiliary Boiler GHG Emissions

GHG	Emissions	
	Lbs/hr	tons/yr
CO2	8,306.8	11,065.3
CH4	0.16	0.2
N2O	0.02	0.02
Total Mass	8,307.0	11,065.5
CO2e	8,315.4	11,076.7

Based on the revised Table 3.25, Appendix I, Table I.13 should also be revised.

Page 42, Table 4.8 – Table 4.8 indicates that best available control technology (BACT) for VOC emissions is not required for the auxiliary boiler. However, Table 4.15 (Page 52) notes that VOC BACT for the auxiliary boiler is “Combustion Design”. For consistency, SCAQMD should consider including “Combustion Design” for the auxiliary boiler BACT in Table 4.8.

Page 43, Table 4.9 – Table 4.9 indicates that BACT for VOC emissions is not proposed for the auxiliary boiler. However, the Project Owner has proposed the use of clean burning natural gas

and good combustion design to control VOC emissions from the auxiliary boiler. Therefore, SCAQMD should consider including "Combustion Design" for the auxiliary boiler BACT in Table 4.9.

Pages 47 and 48, Rule 1304.1 – The Crep values listed at the bottom of Page 47 do not match the calculated value shown at the top of Page 48. The C2yr value used in the fee calculations does not reflect the existing units' megawatt-hours (MWh), as calculated in Appendix Q. The correct C2yr value is 909,616 MWh. The corrected calculations are below:

$$\text{FPM10} = [(997 \times 100/895.5) + 3,986 \times (895.5 - 100)/895.5] \times 1.0 \times 731 \times [(4,584,980 - 909,616)/4,584,980] = \$2,140,116$$

$$\text{FVOC} = [(47 \times 100/895.5) + 185 \times (895.5 - 100)/895.5] \times 1.2 \times 639 \times [(4,584,980 - 909,616)/4,584,980] = \$104,242$$

$$\text{Total Fee} = \$2,140,116 + \$104,242 = \$2,244,358$$

Page 55, 1st Paragraph – The annual PM10 Class I impact of 0.32 $\mu\text{g}/\text{m}^3$ is incorrect; the correct value is 0.006 $\mu\text{g}/\text{m}^3$ (refer to the memo from Ian MacMillan to Andrew Lee dated May 18, 2016).

Page 63, Thermal Efficiency – The HBEP heat rates and GHG performance presented in the table need to be updated. The combined-cycle and simple-cycle heat rates are 6,774 British thermal units per kilowatt-hour (btu/kWh) and 8,907 btu/kWh, respectively, based on Appendix I, Tables I.7 and I.11. The GHG performance should be 0.381 metric tons carbon dioxide per megawatt-hour (MtCO₂/MWh), based on the emissions presented in Appendix I, Tables I.5, I.10, and I.13, corrected per the above comments. The footnote for this table should also be updated to reference Appendix I.

Page 64, Step 5 – Select BACT, 4th Paragraph – The SCTG GHG emission rate of 1,359 lb CO₂/net MWh should be 1,378 lb CO₂/net MWh, consistent with Appendix I.

Page 64, Step 5 – Select BACT, 5th Paragraph – The CCTG emission limit of 870,251 tons CO₂ per year should be 873,035, consistent with Table 3.23. The SCTG emission limit of 103,578 tons CO₂ per year should be 103,576, consistent with Table 3.24.

Page 69, VOC, Requirements Bullet – The reference to Condition D12.7 should be Condition D12.10 and the minimum oxidation catalyst temperature should be 570 degrees Fahrenheit (°F), consistent with Table 2.4.

Pages 109 and 110, Table A.2, 1st Row – The ambient conditions shown on the first row are slightly different.

Page 110, Table A.2 – The Stack Exhaust Flow units are shown as dscfm but are shown as 10³ acfm on the previous page.

Page 114, Table A.9 – The daily CCTG emissions incorporate a 1 hour downtime in the calculations. AES suggests increasing the normal operating hours per day to 21.5 hours.

Page 115, Table A.10 – The daily CCTG emissions incorporate a 1 hour downtime in the calculations. AES suggests increasing the normal operating hours per day to 21.5 hours.

Page 115, Table A.11 – Update Table A.11 to reflect the elimination of the 1 hour downtime assumption, based on changes recommended for Tables A.9 and A.10.

Page 117, Table A.18 – The table footnote needs to be revised as follows:

SOx for annual emissions is based on 0.25 gr/100 scf:

0.25 grains/100 scf fuel converts to SOx per mmcf fuel as follows: $0.25 \text{ grains}/100 \text{ scf} (\text{lb}/7000 \text{ grains}) (64 \text{ lbs}/\text{lb-mole SO}_2/32 \text{ lbs}/\text{lb-mole S}) (1\text{E}6 \text{ cf}/\text{mmcf}) = 0.71 \text{ lbs SO}_2/\text{mmcf fuel}$.

Pages 120 and 121, Table B.2, 1st Row – The ambient conditions shown on the first row are slightly different.

Page 121, Table B.2, Simple Cycle Gas Turbine Hourly Emissions, PM10 – The 110 °F hourly particulate matter (PM) emission rate should be 6.24 pounds per hour (lb/hr) instead of 5.92 lb/hr.

Page 122, Table B.3, Sample Calculation – The sample calculation shown for oxides of sulfur (SOx) is incorrect as the italics equation should result in a value of 2.14 lbs SO₂/MMcf fuel, not 2.02.

Page 124, Table B.8, Downtime Row – The daily SCTG emissions incorporate a 1 hour downtime. AES suggests increasing the normal operating hours per day to 22.57 hours.

Page 124, Table B.9, Downtime Row – The daily SCTG emissions incorporate a 1 hour downtime. AES suggests increasing the normal operating hours per day to 22.57 hours.

Page 125, Table B.10 – Update Table B.10 to reflect the elimination of the 1 hour downtime assumption, based on changes recommended for Tables B.8 and B.9.

Page 129, Table C.1, Fuel Use Columns – The reported fuel use for each activity is inconsistent with AES's March 16, 2016 permit application Appendix A, Table 1, assuming a heat content of 1,050 million British thermal units per million standard cubic feet (MMBtu/MMscf). Please revise the fuel use accordingly (see revised table in Attachment 1). This change will need to be reflected in the commissioning emission rate presented in Condition A63.6.

Page 129, Table C.1, Verify STG on Turning Gear, Combined Blows, Finalize Bypass Valve Tuning Row, NOx emissions – The correct total NOx emissions for this activity is 2,328 pounds, not 2,338.

Page 131, Table C.3, Fuel Use Columns – The reported fuel use for each activity is inconsistent with AES's March 16, 2016 permit application Appendix A, Table 2, assuming a heat content of 1,050 MMBtu/MMscf. Please revise the fuel use accordingly (see revised table in Attachment 1). This change will need to be reflected in the commissioning emission rate presented in Condition A63.9.

Page 146, Appendix F – As noted in the comments on Table 3.18, the SCAQMD accepted an OWS emission factor of 0.00002 pounds of VOC per 1,000 gallons of throughput in the Alamos Energy Center permit application. Using this emission factor for the HBEP OWS results in OWS VOC emissions of 0.017 pounds for OWS 1 and 0.0022 pounds for OWS 2.

Page 164, Table H.19A – Acute maximally exposed individual worker (MEIW) and sensitive receptor values are incorrect. The correct acute MEIW value is 0.032. The correct acute sensitive receptor value is 0.0091.

Page 164, Table H.19C – The MEIW cancer risk is incorrect. The correct MEIW cancer risk is 0.005 in one million.

Page 183, Table O.3, HBEP CO₂e PTE – The reported HBEP carbon dioxide equivalent (CO₂e) potential to emit (PTE) of 1,965,939 tons does not match the value shown in Table O.2 of 1,966,317.

Page 195, Appendix T, Review of Criteria Pollutant BACT Levels for Recent Projects – For completeness, AES suggests including the SCAQMD's BACT determinations for sulfur dioxide (SO₂) and PM, consistent with the discussions on PDOC Pages 41-43 and 50-53.

Should you have any questions regarding the comments provided please do not hesitate to call me at 562-493-7840. We appreciate your attention to these comments and look forward to a revised Permit to Operate issued by the SCAQMD.

Sincerely,

A handwritten signature in blue ink that reads "S. O'Kane". The signature is stylized and cursive.

Stephen O'Kane
Manager
AES Huntington Beach, LLC

cc: Robert Mason/CH2M
Melissa Foster/Stoel Rives
Jerry Salamy/CH2M
John Heiser/CEC