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**STATE OF CALIFORNIA**
**ENERGY RESOURCES CONSERVATION**
**AND DEVELOPMENT COMMISSION**

| | | |
|---|---|---|
| **In the Matter of:** | ) | **Docket No. 85-AFC-5C** |
| **CALPINE KING CITY COGENERATION** | ) | **Order No.** |
| | ) | |
| | ) | |
| **Calpine King City CoGen, LLC** | ) | **ORDER APPROVING** |
| | ) | **a Petition to Amend** |
| | ) | **the Commission Final Decision** |
| | ) | |

On February 23, 2011, Calpine filed a petition with the California Energy Commission (Energy Commission) requesting to amend the Final Decision for the King City Cogeneration (KCC) project. KCC proposed to delete language that limits the combustion turbine to one start up and one shutdown per day, allowing the facility to come back on line and subsequently shut down again in an unanticipated event. The petition also proposed to add language exempting the two auxiliary boilers from certain emission limits during boiler tuning, and exempting the combustion turbine from specified emission limits during defined tuning and testing periods. In a subsequent request, KCC proposed additional revisions/modifications to several conditions.

The nominal 130 MW natural gas fired power plant consists of one 85.7 MW electrical output “Frame 7” combustion turbine generator, one 37.6 MW steam turbine generator, two auxiliary boilers, and one heat recovery steam generator. The KCC was certified by the Energy Commission in its original decision dated June 1987, and has been in commercial operation since 1989. The facility is located in the city of King City, California, in Monterey County approximately 50 miles south of the city of Salinas on State Highway 101.

## STAFF RECOMMENDATION

Energy Commission staff reviewed the petition, finds that it complies with the requirements of Title 20, section 1769(a) of the California Code of Regulations, and recommends approval of Calpine’s petition to modify the KCC and add/revise/amend Air Quality Conditions of Certification **AQ-3, AQ-6, AQ-9, AQ-10, AQ-17, AQ-18, AQ-19, AQ-21, AQ-22, AQ-23, AQ-24, AQ-25, AQ-28, AQ-29, AQ-30, AQ-31, AQ-32, AQ-33, AQ-34, AQ-35, AQ-37, AQ-40, AQ-44, AQ-50, AQ-52, AQ-53, AQ-54, and AQ-55.**

## ENERGY COMMISSION FINDINGS

Based on staff's analysis, the Energy Commission concludes that the proposed modification(s) will not result in any significant impacts to public health and safety, or to the environment. The Energy Commission finds that:

- The proposed modification(s) would not change the findings in the Energy Commission's Final Decision pursuant to Title 20, California Code of Regulations, section 1755;
- There would be no new or additional unmitigated, significant environmental impacts associated with the proposed modification(s);
- The facility would remain in compliance with all applicable laws, ordinances, regulations, and standards;
- The modification(s) proposed in the petition have the potential to increase short term emissions; however, the changes would not result in an exceedance of the ambient air quality standards and would not cause an undue negative consequence on air quality:
- The proposed modification(s) would be beneficial to the public, because the facility would be free to perform the necessary testing and tuning activities that would result in the least polluting and most efficient operation possible; and
- The proposed modification(s) are justified because there has been a substantial change in circumstances since the Energy Commission certification, in that there is a need to conduct required testing and tuning consistent with revisions made by the MBUAPCD to their Title V Operating Permit.

## CONCLUSION AND ORDER

The California Energy Commission hereby adopts staff's recommendations and approves the following changes to the Commission Decision for the Calpine King City Cogeneration Facility. New language is shown as **bold and underlined**, and deleted language is shown in ~~strikethrough~~.

## CONDITIONS OF CERTIFICATION

**AQ-1:** Before implementing any major change in the Air Pollution Control (APC) systems identified in Determination of Compliance (DOC) Conditions 8, 15, and 16, the Emissions Monitoring Systems (EMS) identified in DOC Conditions 17 through 24, or if any changes to any Conditions of Certification related to air quality are proposed, ~~Basic American Foods~~ **the project owner** shall submit the proposed change to the Monterey Bay Unified Air Pollution Control District (MBUAPCD **or District**) and the ~~CEC~~ **Energy Commission** for approval. Examples of major changes are the use of alternative APC systems, EMS, or equipment, or a major change in the performance criteria specified in the referenced DOC Conditions.

**Verification:** One hundred and twenty (120) days before implementing any major change, ~~Basic American Foods~~ **the project owner** shall submit to the MBUAPCD and the ~~CEC~~ **California Energy Commission's Compliance Project Manager (CPM)** the

design details of the proposed change and a discussion of the potential change in air emissions from the project. ~~Basic American Foods~~ **The project owner** shall receive written approval from the ~~CEC~~ **Energy Commission** prior to implementing any major change.

**AQ-2:** ~~Basic American Foods~~ **The project owner** shall report any minor change in the APC systems identified in DOC Conditions 8, 15, and 16, or the EMS identified in DOC Conditions 17 through 24, to the MBUAPCD and ~~CEC~~ **Energy Commission** staff. Examples of minor changes are modifications grade during initial start up of the facility to ensure compliance with applicable emission limitations or use of alternative hardware to meet the required performance criteria.

**Verification:** ~~Basic American Foods~~ **The project owner** shall notify the MBUAPCD and the ~~CEC staff~~ **CPM** in writing ~~forty-eight (48)~~ hours in advance of making any minor change, whenever possible, but in no event later than ~~seven (7)~~ working days after implementing the change.

**AQ-3:** ~~Basic American Foods shall obtain a Prevention of Significant Deterioration (PSD) permit or an exemption from the MBUAPCD and comply with said permit.~~ **Deleted.**

~~**Verification:** Within 30 days of receipt of the PSD permit or exemption from MBUAPCD, Basic American Foods shall submit a copy of the PSD permit or exemption to the CEC staff.~~

**AQ-4:** All areas disturbed by on-site or off-site construction, and under ~~Basic American Foods~~ **the project owner's** responsibility, shall be properly treated for dust control by water application, or the use of another dust palliative, with the intent of minimizing fugitive dust emissions. If any dust palliative other than water is proposed, ~~Basic American Foods~~ **the project owner** shall obtain approval from the MBUAPCD.

**Verification:** ~~Basic American Foods~~ **The project owner** shall make the construction site available to the MBUAPCD and the ~~CEC staff~~ **CPM** for inspection and monitoring.

**AQ-5:** The MBUAPCD shall monitor all activities related to site preparation and construction, and monitor operation of the ~~Basic American Foods American 1 Cogeneration P~~**p**roject to ensure compliance with the Conditions of Certification contained in the Commission Decision relating to Air Quality. The MBUAPCD shall perform all duties and functions normally performed by the MBUAPCD and shall have the authority to issue a Permit to Operate. The conditions of the Permit to Operate will be consistent with the Certification Conditions in the Commission Decision.

**Verification:** The MBUAPCD and ~~the CEC~~ **Energy Commission** staff ~~wall~~ **will**, at the request of either party, meet to review the status of project compliance. ~~The CEC~~ **Energy Commission** staff shall be allowed to review the MBUAPCD's enforcement and project files except for trade secrets as defined in MBUAPCD rules. ~~Basic American Foods~~ **The project owner** shall submit to the ~~CEC~~ **CPM** a report on the status of

compliance for each condition related to air quality in the Commission Decision on the ~~Basic American Foods American 1 Cogeneration~~ project. These reports shall be submitted quarterly during construction and during the first two years of operation, and shall be submitted annually thereafter.

**AQ-6:** Emissions of carbon monoxide in the turbine exhaust discharge to the atmosphere shall not exceed 10 ppmv calculated as a three hour rolling clock average at 15 percent $O_2$, dry. This limit shall not apply during start-up, which is not to exceed ~~five (5)~~ hours, or shutdown, which is not to exceed ~~two (2)~~ hours. SCR catalytic controls, steam injection and good engineering practices shall be used to the fullest extent practical during start-up to minimize pollutant emissions.

**Verification:** The terms of this condition shall be monitored as described in DOC Condition 17.

**AQ-7:** The annual emissions of the gas turbine shall not exceed 130 tons per year of NOx and 82 tons per year of CO.

**Verification:** The terms of this Condition shall be monitored as described in DOC Conditions 17, 19, 29, and 30.

**AQ-8:** The maximum annual NOx emission cap for the combined or individual operation of the gas turbine and/or the boiler(s) shall not exceed 133.40 tons per year.

**Protocol**: The ~~owner/operator~~ **project owner** shall monitor and record in a log on site for each month of operation, the following information for natural gas and oil firings: 1) the hours of simultaneous operation of either one or both boilers with the gas turbine; and 2) the total number of tons of NOx emission from the operation of the turbine and/or boilers.

**Verification:** The ~~owner/operator~~ **project owner** shall submit an Annual Compliance Report to the MBUAPCD and the ~~CEC~~ CPM prior to the time of operating permit renewal. Records will be available on-site for both the District and ~~CEC~~ **Energy Commission** review for a period of three years. The terms of this condition shall be monitored as described in DOC conditions 17, 19, 29 and 30.

**AQ-9:** **Deleted.**~~Within 60 days after achieving the maximum auxiliary boiler operating conditions, but not later than 180 days after initial start up, performance tests shall be conducted in accordance with the MBUAPCD test procedures, and written results of the performance tests shall be provided to the District within 30 days after testing. A testing protocol shall be submitted to the District 30 days prior to testing, and the District shall be notified at least 10 days prior to the actual testing date so that a District representative can be present to observe. The performance test shall be done on each auxiliary boiler at 50 percent load and shall include, but will not be limited to, a test of the exhaust stream directly before the oxidation catalyst and in the auxiliary boiler exhaust stack for:~~

~~a. Carbon Monoxide, ppm at 3 percent O2 and lb/hr.~~
~~b. Non-methane Hydrocarbons, ppm and lb/hr.~~
~~c. Oxides of Nitrogen, ppm at 3 percent O2 and lb/hr.~~
~~d. Oxides of Sulfur, ppm at 3 percent O2 and lb/hr. and a test of the exhaust stack for:~~
~~e. Particulates, gr/sdcf and lb/hr. and the following process parameter:~~
~~f. Natural gas consumption.~~

**Verification:** ~~Basic American Foods shall submit for approval a performance test protocol to the MBUAPCD and CEC staff 30 days before beginning testing of the auxiliary boilers. Basic American Foods shall notify the District at least 10 days before the test date and shall submit to the MBUAPCD and CEC staff a written report on the results of such performance test no later than 30 days after the test is concluded.~~

**AQ-10:** DOC Condition 1: The gas turbine pollutant mass emission rates in the exhaust discharged to the atmosphere shall not exceed the following limits:

| Pollutant | lb/hr | lb/day |
|---|---|---|
| NOx | 30.1 | 722 |
| CO | 20.0 | 480 |
| $NH_3$ | 13.9 | 334 |
| TSP | 2.5 | 60 |
| NMHC | 1.0 | 24 |
| $SO_2$ | 0.~~49~~**5** | 12 |

These limits shall not apply during start up, which is not to exceed ~~five (5)~~ hours, or shut down, which is not to exceed ~~two (2)~~ hours, or during periods of oil firing. SCR catalytic controls, steam injection, and good engineering practices shall be used to the fullest extent practical during start up to minimize pollutant emissions.

**Verification:** The terms of this Condition shall be monitored as described in DOC Conditions 17, 19 through 21, and 25.

**AQ-11:** DOC Condition 2: While firing on natural gas the emissions of oxides of nitrogen, as $NO_2$, in the turbine exhaust discharged to the atmosphere shall not exceed 9 ppmvd, calculated as a clock hour average at 15 percent $O_2$ dry. This limit shall not apply during start-up, which is not to exceed ~~five (5)~~ hours, or shutdown, which is not to exceed ~~two (2)~~ hours. SCR catalytic controls, steam injection and good engineering practices shall be used to the fullest extent practical during start-up to minimize pollutant emissions.

**Verification:** The terms of this Condition shall be monitored as described in DOC Condition 17 and 25.

**AQ-12:** DOC Condition 3: Emissions of ammonia in the turbine exhaust discharged to the atmosphere shall not exceed 10 ppmv calculated as a three hour rolling clock average at 15 percent $O_2$, dry.

**Verification:** The terms of this Condition shall be monitored as described in DOC Conditions 20, 25, and 27.

**AQ-13:** DOC Condition 4: The gas turbine shall only be fired on natural gas, except that No. 2 fuel oil may be used during periods of natural gas curtailment by the utility, or in the event of natural gas supply malfunction or disruption. In any event, No. 2 fuel oil shall not be used for more than 240 hours per year.

**Verification:** The terms of this Condition shall be monitored as described in DOC Condition 29.

**AQ-14:** DOC Condition 5: During periods of No. 2 fuel oil firing, the gas turbine pollutant mass emission rates in the exhaust discharged to the atmosphere shall not exceed the following limits:

| Pollutant | lb/hr | lb/day |
|---|---|---|
| $SO_2$ | 48.38 | 1161 |
| CO | 22.0 | 528 |
| NOx | 47.8 | 1147 |
| $NH_3$ | 13.9 | 334 |
| ~~TSP~~**PM10** | 10.0 | 240 |
| NMHC | 1.0 | 24 |

These limits shall not apply during start up, which is not to exceed ~~five (5)~~ hours, or shut down, which is not to exceed ~~two (2)~~ hours. SCR catalytic controls, steam injection, and good engineering practices shall be used to the fullest extent practical during start up to minimize pollutant emissions.

**Verification:** The terms of this Condition shall be monitored as described in DOC Conditions 18 and 26.

**AQ-15:** DOC Condition 6: While firing on No.2 fuel oil the emissions of oxides of nitrogen, as $NO_2$, in the turbine exhaust discharged to the atmosphere shall not exceed 15 ppmvd, calculated as a clock hour average at 15 percent $O_2$ dry. This limit shall not apply during start-up, which is not to exceed ~~five (5)~~ hours, or shutdown, which is not to exceed ~~two (2)~~ hours. SCR catalytic controls, steam injection and good engineering practices shall be used to the fullest extent practical during start-up to minimize pollutant emissions.

**Verification:** The terms of this Condition shall be monitored as described in DOC Conditions 17 and 25.

**AQ-16:** DOC Condition 7: ~~Basic American Foods~~ **The project owner** shall submit a turbine start-up protocol for both hot and cold start-up, which details the procedures that will be used to minimize the pollutant emissions, prior to the initial start-up, and shall amend this protocol based on operating experience.

**Verification:** ~~Basic American Foods~~ **The project owner** shall submit a turbine start up protocol to the MBUAPCD and ~~CEC staff~~ **CPM** at least 60 days before the initial start up of the gas turbine. ~~Basic~~ **The project owner** will provide the ~~CEC staff~~ **CPM** a copy of

the MBUAPCD's comments on the protocol and a revised protocol, based on operating experience, 30 days after receiving comments from the MBUAPCD and ~~CEC staff~~ **Energy Commission**~~.~~

**AQ-17:** **Deleted.**~~DOC Condition 8: Details of the selective catalytic reduction (SCR) system, including but not limited to manufacturer, catalyst type, linear velocity, catalyst volume, ammonia injection rate; ammonia injection grid parameters, must be submitted to the Air Pollution Control District and receive District approval prior to starting construction.~~

**Verification:** ~~Basic American Foods shall submit to the MBUAPCD the SCR system design details 120 days before construction begins. Basic American Foods shall submit to the CEC staff the MBUAPCD's approval 15 days after receipt of District approval.~~**.**

**AQ-18:** DOC Condition 9: During periods of natural gas firing, the auxiliary boiler pollutant mass emission rates in the exhaust discharged to the atmosphere shall not exceed the following limits from each boiler:

| Pollutant | lb/hr |
|---|---|
| NOx | 7.25 |
| CO | 2.65 |
| ~~TSP~~**PM10** | 0.6**0**~~3~~ |
| NMHC | 0.20 |
| $SO_2$ | 0.085 |

**The emission limits shall not apply during boiler shutdown, for a period not to exceed 30 minutes, or during cold start up, for a period not to exceed 30 minutes. During boiler shutdown or start up, and during operations at or below 40 percent load, procedures incorporating good engineering practices shall be utilized to the fullest extent practical to minimize all pollutant emissions.**

**Verification: The project owner shall maintain appropriate logs of start up and shutdown operation time periods as required by the above condition. Logs shall be maintained on site for 5 years and made available to the District and the CPM at any time.** The terms of this Condition shall be monitored as described in DOC Conditions 18 and 26 **(AQ-27 and AQ-35).**

**AQ-19:** DOC Condition 10: During periods of natural gas firing, the emissions of oxides of nitrogen, as $NO_2$, in the auxiliary boiler exhaust discharged to the atmosphere shall not exceed the following concentrations, calculated as a **clock** ~~one~~ hour average at 3% $O_2$, dry:

- At boiler loads greater than 40 percent 40 ppmvd
- At boiler loads 40 percent or less 100 ppmvd

**The emission limits shall not apply during boiler shutdown, for a period not to exceed 30 minutes, or during cold start up, for a period not to exceed 30 minutes. During boiler shutdown or start up, and during operations at or below 40 percent load, procedures incorporating good**

**engineering practices shall be utilized to the fullest extent practical to minimize all pollutant emissions.**

**Verification: The project owner shall maintain appropriate logs of start up and shutdown operation time periods as required by the above condition. Logs shall be maintained on site for 5 years and made available to the District and the CPM at any time.** The terms of this Condition shall be monitored as described in DOC Conditions 18 and 26.

**AQ-20:** DOC Condition 11: The auxiliary boilers shall be fired on natural gas, except that No. 2 fuel oil may be used during training/testing, or periods of natural gas curtailment by the utility, or in the event of natural gas supply malfunction or disruption not within the control of the **project owner** ~~BAF Energy, Inc~~. In any event, No. 2 fuel oil shall not be used for more than 240 hours per year per boiler.

**Protocol**: Training/testing of the auxiliary boilers shall be allowed only under the following conditions:

a. Only one boiler may be tested in a calendar day,

b. The District has the authority to postpone training/testing of the auxiliary boilers due to adverse ambient air-quality conditions.

c. Each boiler may be used for training/testing on fuel oil a maximum of ~~two (2)~~ times per calendar year, and

d. Individual training/testing episodes on fuel oil shall not exceed ~~two (2)~~ full-load equivalent hours.

**Verification:** The District shall be notified a minimum of 30 calendar days prior to the date of training/testing on No.2 fuel oil. ~~Basic American foods~~ **The project owner** shall submit the fuel oil firing records to the District at the time of permit renewal, and shall submit the records ~~to the CEC~~ in the~~ir~~ annual Compliance Report to the ~~CEC~~ CPM.

**AQ-21:** DOC Condition 12: During periods of No. 2 oil firing the auxiliary boiler pollutant mass emission rates in the exhaust discharged to the atmosphere shall not exceed the following limits, per boiler:

| Pollutant | lb/hr |
|---|---|
| NOx | 13.8 |
| CO | 2.85 |
| TSP | 12.65 |
| NMHC | 0.25 |
| $SO_2$ | 7.5**5**~~4~~ |

**The emission limits shall not apply during boiler shutdown, for a period not to exceed 30 minutes, or during cold start up, for a period not to exceed 30 minutes. During boiler shutdown or start up, and during operations at or below 40 percent load, procedures incorporating good engineering practices shall be utilized to the fullest extent practical to minimize all pollutant emissions.**

**Verification: The project owner shall maintain appropriate logs of start up and shutdown operation time periods as required by the above condition. Logs shall be maintained on site for 5 years and made available to the District and the CPM at any time.** The terms of this Condition shall be monitored as described in DOC Conditions 18 and 26.

**AQ-22:** DOC Condition 13: During periods of No. 2 fuel oil firing at boiler loads greater than 40 percent, the emission~~s~~ **concentration** of oxides of nitrogen, as NO2, in the auxiliary boiler exhaust discharged to the atmosphere shall not exceed 69 ppmvd, calculated as a ~~one~~ **clock** hour average at 3% O2 dry.

**The emission limits shall not apply during boiler shutdown, for a period not to exceed 30 minutes, or during cold start up, for a period not to exceed 30 minutes. During boiler shutdown or start up, and during operations at or below 40 percent load, procedures incorporating good engineering practices shall be utilized to the fullest extent practical to minimize all pollutant emissions.**

**Verification: The project owner shall maintain appropriate logs of start up and shutdown operation time periods as required by the above condition. Logs shall be maintained on site for 5 years and made available to the District and the CPM at any time.** The terms of this Condition shall be monitored as described in DOC Conditions 18 and 26 **(AQ-27 and AQ-35).**

**AQ-23:** DOC Condition 14: The sulfur content of any No. 2 oil used as fuel in the turbine or auxiliary boilers shall not exceed 0.05 percent by weight. All fuel received must be certified to contain 0.05 percent sulfur, or less, by weight.

**Verification:** ~~Basic American Foods~~ **The project owner** shall obtain and maintain records certifying the sulfur content of the fuel oil. These records shall be made available to the MBUAPCD on request and shall be provided to the MBUAPCD at the time of the annual permit renewal.

**AQ-24:** **Deleted.**~~DOC Condition 15: Details of the auxiliary boiler oxidation catalyst system, including but not limited to manufacturer, catalyst type, linear velocity, and catalyst volume must be submitted to the Air Pollution Control District and receive District approval prior to starting construction.~~

~~**Verification:** Basic American Foods shall submit to the MBUAPCD the oxidation catalyst system design details 120 days before construction begins. Basic American Foods shall submit to the CEC staff the MBUAPCD's approval 15 days after receipt of District approval.~~

**AQ-25:** **Deleted.**~~DOC Condition 16: Details of the auxiliary boiler low NOx burners and flue gas recirculation system must be submitted to the Air Pollution Control District and receive District approval prior to starting construction.~~

~~**Verification:** Basic American Foods shall submit to the MBUAPCD the low-NOx burners and flue gas recirculation system design details 120 days before construction~~

~~begins. Basic American Foods shall submit to the CEC staff the MBUAPCD's approval 15 days after receipt of District approval.~~**.**

**AQ-26:** DOC Condition 17: A continuous monitoring system must be installed, calibrated, and operated to measure the HRSG exhaust stack for NOx, CO, and O~~2~~$_2$. The system shall continuously record the measured concentrations, and shall calculate and continuously record the NOx and CO concentrations corrected to a value of 15 percent O~~2~~$_2$, dry, and NOx and CO mass emission rates in pounds per hour. District approval for the system installation must be received prior to installation.

**Verification:** ~~Basic American Foods~~ **The project owner** shall submit a continuous monitoring plan for the gas turbine to the MBUAPCD and ~~CEC staff~~ **CPM** staff 90 days before installing the monitoring system, but not later than 180 days before beginning operation of the facility. ~~Basic American Foods~~ **The project owner** shall submit to the ~~CEC staff~~ **CPM** a copy of MBUAPCD's comments on the plan, and approval or disapproval of the plan within 10 days of receipt from the MBUAPCD.

**AQ-27:** DOC Condition 18: A continuous monitoring system must be installed, calibrated, and operated to measure the auxiliary boiler exhaust for NOx, CO, and O2. The system shall continuously record the measured concentrations, and shall calculate and continuously record the NOx and CO concentrations corrected to a value of 3 percent O~~2~~$_2$, dry, and NOx and CO mass emission rates in pounds per hour. District approval for the system installation must be received prior to installation.

**Verification:** ~~Basic American Foods~~ **The project owner** shall submit a continuous monitoring plan for the auxiliary boilers to the MBUAPCD and ~~CEC staff~~ **CPM** 90 days before installing the monitoring system, but not later than 180 days before beginning operation of the facility. ~~Basic American Foods~~ **The project owner** shall submit to the ~~CEC staff~~ **CPM** a copy of MBUAPCD's comments on the plan, and approval or disapproval of the plan within 10 days of receipt from the MBUAPCD.

**AQ-28:** DOC Condition 19: A continuous monitoring system must be installed and operated to monitor and record the fuel consumption and the mass ratio of steam to fuel being fired in the turbine. This system must be accurate to within +/- 5 percent.

**Verification:** ~~Basic American Foods~~ **The project owner** shall maintain records of continuous fuel consumption and the steam to fuel mass ratio monitoring. These records shall be maintained on file for at least ~~two~~ **5** years and shall be made available to the MBUAPCD and ~~CEC~~ **Energy Commission** staff upon request.

**AQ-29:** DOC Condition 20: The ammonia emissions shall be monitored by the using the following ammonia slip calculation:

NH~~3~~$_3$ slip (ppmvd @15% O~~2~~$_2$) = ((NH~~3~~$_3$ fed ppm – (NOx in ppm – NOx out ppm)) * ((20.9 – 15)/(20.9-O~~2~~$_2$)))/* b

Where:
NH3 fed in ppm = ((NH~~3~~$_3$ injection rate, lb/hr * a)/(Q*Fd*4.4096E-8))

((20.9 – O~~2~~**2**%)/20.9))

4.4096E-8 = (K-factor constant) corrects for the molecular weight of ammonia

a = Ammonia Concentration (in % by weight/100)
b = Correction Factor based on source test data
Q = Fuel Flow mmbtu/hr
Fd = 8710 scf/mmbtu

**Verification:** ~~Basic American Foods~~ **The project owner** shall maintain records of ammonia emissions. These records shall be maintained on file for at least ~~two~~ **5** years and shall be made available to the MBUAPCD and ~~CEC~~ **Energy Commission** staff upon request.

**AQ-30:** DOC Condition 21: Instrumentation shall be installed to measure SCR catalyst inlet temperature and pressure differential across the SCR catalyst.

**Verification:** ~~Basic American Foods~~ **The project owner** shall maintain records of the measured inlet temperature and pressure differences across the SCR catalyst. These records shall be maintained on file for at least ~~two~~ **5** years and shall be made available to the District and ~~CEC~~ **Energy Commission** staff upon request.

**AQ-31:** DOC Condition 22: Instrumentation shall be installed to measure the auxiliary boiler oxidation catalyst inlet temperature and pressure differences across the oxidation Catalyst.

**Verification:** ~~Basic American Foods~~ **The project owner** shall maintain records of the measured inlet temperature and pressure differences across the auxiliary boiler oxidation catalyst. These records shall be maintained on file for at least ~~two~~ **5** years and shall be made available to the District and ~~CEC~~ **Energy Commission** staff upon request.

**AQ-32:** **Deleted.**~~DOC Condition 23: Four sampling ports must be provided in the turbine exhaust stack, 8 to 10 duct diameters downstream and 2 duct diameters upstream of any flow disturbance, 90 degrees apart and shall consist of 4 inch NPT couplings welded to the stack and with 4 inch pipe plugs. A 5 foot wide sampling platform or other means of providing safe access to the sampling ports must be installed. The location of the sampling ports and platform must be approved by the Air Pollution Control District prior to installation.~~

~~**Verification:** Basic American Foods shall submit the location of the sampling ports and platform for the gas turbine to the MBUAPCD and CEC 90 days before installation. Basic American Foods shall submit to the CEC staff a copy of MBUAPCD's comments on the locations, and approval or disapproval of the locations within 10 days of receipt from the MBUAPCD.~~

**AQ-33:** **Deleted.**~~DOC Condition 24: Four sampling ports must be provided in the auxiliary boiler exhaust stack, 8 to 10 duct diameters downstream and 2 duct~~

~~diameters upstream of any flow disturbance, 90 degrees apart and shall consist of 4 inch NPT couplings welded to the stack and with 4 inch pipe plugs. A sampling platform or other means of providing safe access to the sampling ports must be installed. The location of the sampling parts and platform must be approved by the Air Pollution Control District prior to installation.~~

**Verification:** ~~Basic American Foods shall submit the location of the sampling ports and platform for the auxiliary boilers to the MBUAPCD and CEC staff 90 days before installation. Basic American Foods shall submit to the CEC a copy of MBUAPCD's comments on the locations, and approval or disapproval of the locations within 10 days of receipt from the MBUAPCD.~~

**AQ-34:** DOC Condition 25: An annual compliance test shall be conducted prior to January 1 of each year in accordance with the MBUAPCD test procedures, and the written results of the compliance test shall be provided to the District within ~~sixty~~ **60** days after testing. A testing protocol shall be submitted to the District 30 days prior to testing and the District shall be notified at least 10 days prior to the actual testing day so that a District observer can be present. The performance test shall include, but will not be limited to, a test of the exhaust stream directly after the turbine and in the exhaust stack for:

a. Oxides of Nitrogen, ppm at 15 percent O2 dry and lb/hr.
b. Carbon Monoxide, ppm at 15 percent O2, dry and lb/hr.
~~c. Oxides of Sulfur, ppm and lb/hr.~~
~~and a test of the exhaust stack for:~~
~~d. Particulates and particle size distribution, gr/sdcf and lb/hr.~~
~~e~~**c**. Ammonia, ppm at 15 percent O2, dry and lb/hr.
~~f~~**d**. Volatile Organic Compounds: ppm and lb/hr.

**and the following process parameters:**

~~g~~**e**. Natural gas consumption.
~~h~~**f**. Electricity generated during the test.
~~i~~**g**. Ammonia injected.
~~j~~**h**. Steam injection rate and steam to fuel ratio.

**Verification:** The project owner shall submit for approval a performance test protocol to the MBUAPCD and ~~CEC staff~~ **CPM** 30 days before beginning testing of the gas turbine. The project owner shall submit to the MBUAPD and ~~CEC staff~~**CPM** a written report on the results of such performance tests within ~~sixty~~ **60** days after testing. **During years NO.2 fuel oil is combusted in the turbine additional testing will be required including testing for Sox and PM10. Written notice of the compliance test shall be provided to the MBUAPCD and CPM 10 days prior to the test so that an observer can be present.**

**AQ-35:** DOC Condition 26: ~~Within 60 days after achieving the maximum auxiliary boiler operating conditions, but not later than 180 days after initial start up, performance tests shall be conducted~~ **An annual compliance test shall be conducted on each auxiliary boiler prior to January 1 of each year,** in

accordance with the MBUAPCD test procedures, and written results of the ~~performance~~ **compliance** tests shall be provided to the District within ~~30~~ **60** days after testing. A testing protocol shall be submitted to the District 30 days prior to testing and District notification at least 10 days prior to the actual testing date shall be provided so that a District observer can be present. The ~~performance~~ **compliance** test shall include, but will not be limited to, a test of the exhaust stream directly before the oxidation catalyst and in the auxiliary boiler exhaust stack for:

a. Carbon Monoxide, ppm at 3 percent O2 and lb/hr.
~~b. Non-methane Hydrocarbons, ppm and lb/hr.~~
~~c~~**b**. Oxides of Nitrogen, ppm at 3 percent O2 and lb/hr.
~~d. Oxides of Sulfur, ppm at 3 percent O2 and lb/hr.~~
~~and a test of the exhaust stack for:~~
~~e. Particulates and particle size distribution, gr/sdcf and lb/hr.~~

**and the following process parameters:**

~~f~~**c**. Natural gas consumption

**Verification:** ~~Basic American Foods~~ **The project owner** shall submit for approval a ~~performance~~ **compliance** test protocol to the MBUAPCD and ~~CEC staff~~ **CPM** 30 days before beginning testing of the auxiliary boilers. ~~Basic American Foods~~ **The project owner** shall submit to the MBUAPCD and ~~CEC staff~~ **CPM** a written report on the result of such ~~performance~~ **compliance** tests within ~~30~~ **60** days after testing. Written notice of the ~~performance~~ **compliance** test shall be provided to the MBUAPCD **and CPM** 10 days prior to the test so that an observer can be present.

**AQ-36:** DOC Condition 27: The project owner shall conduct quarterly tests in the first year, and on an annual basis to determine turbine stack discharge ammonia emissions. Tests shall be conducted in accordance with MBUAPCD test procedures and the District shall be notified at least seven (7) days prior to testing. The test results shall be submitted to the District within sixty days after testing.

**Verification:** ~~Basic American Foods~~ **The project owner** shall submit to the MBUAPCD the results of the quarterly tests within thirty days of completing the tests. ~~Basic American Foods~~ **The project owner** shall provide the ~~CEC staff~~ **CPM** with a summary of the test results in the quarterly or annual compliance report. ~~Basic American Foods~~ **The project owner** shall provide written notification to MBUAPCD and the ~~CEC staff~~ **CPM** 7 days prior to conducting the test so that an observer may be present.

**AQ-37:** **Deleted.**~~DOC Condition 3 Basic American Foods shall~~

~~a. Secure the NOx Emission Reduction Credits (ERC) purchased from AMSTAR Corp., and shall surrender them to the District, finalizing this acquisition of offsets as follows:~~

~~1. BAF Energy shall cause AMSTAR Corp., or its grantee, Spreckles Sugar Company, to submit to the District its ERC transfer request no later than 60 days from the issuance of the Authorities to~~

~~Construct for the auxiliary boilers or as extended by the APCO for good cause shown.~~

~~2. BAF Energy shall surrender to the District the ERCs transferred to it from the date it receives notice from the District of the completion of the transfer.~~

~~b. Commit to this project any emission reductions of any kind achieved at either the BAF Energy Cogeneration plant, the boilers, or the Basic American Foods plant in King City, or acquired from any other source, for credit to this project as further offsets. This requirement shall terminate at the anniversary of the issuance of the Authorities to Construct in 1991, or upon the complete offsetting of the project's emissions by BAF Energy, whichever is earlier. BAF Energy will thus be ineligible to bank any ERC's until either of these events occurs. In the event of shutdown of the cogeneration plant, its emissions will be eligible for banking only to the extent they have been offset.~~

~~**Verification:** Basic American Foods shall submit to the MBUAPCD and CEC an emission offset package which contains the necessary offsets for the project 45 days before construction begins.~~

**AQ-38:** DOC Condition 29: ~~Basic American Foods~~ **The project owner** shall monitor and record all periods of oil firing in a log maintained on site and shall submit a summary of this data on an annual basis, at the time of permit renewal.

**Verification:** ~~Basic American Foods~~ **The project owner** shall submit the fuel oil firing records to MBUAPCD at the time of permit renewal, and shall submit the records to the ~~CEC~~ **CPM** in the~~ir~~ annual compliance report ~~to the CEC staff~~.

**AQ-39:** DOC Condition 30: ~~Basic American Foods~~ **The project owner** shall monitor and record all start-up, shut-down and operational profiles in a log maintained on site.

**Verification:** ~~Basic American Foods~~ **The project owner** shall submit the start-up and shut-down records to MBUAPCD upon request, and shall submit the records to the ~~CEC staff~~ **CPM** in the~~ir~~ annual compliance report ~~to the CEC staff~~.

**AQ-40:** **Deleted.**~~DOC Condition 31: The turbine shall undergo no more than one start-up and one shut-down per day.~~

~~**Verification:** The terms of this Condition shall be monitored as described in DOC Condition 30.~~

**AQ-41:** DOC Condition 32: Operation must be conducted in compliance with all data and specifications submitted with the application.

**Verification:** ~~Basic American Foods~~ **The project owner** shall submit, in its quarterly or annual compliance report to the ~~CEC staff~~ **CPM**, a statement on the status of compliance with DOC Condition 32.

**AQ-42:** DOC Condition 33: Equipment must be properly maintained and kept in good operating condition.

**Verification:** ~~Basic American Foods~~ **The project owner** shall provide the MBUAPCD and CEC staff access to the project site to inspect all equipment. ~~Basic American Foods~~ **The project owner** shall submit, in its quarterly or annual compliance report to the ~~CEC staff~~ **CPM**, a statement on the status of compliance with DOC Condition 33.

**AQ-43:** DOC Condition 34: The equipment must not be operated unless it is vented to air pollution control equipment which is in full use.

**Verification:** ~~Basic American Foods~~ **The project owner** shall submit, in its quarterly or annual compliance report to the ~~CEC staff~~ **CPM**, a statement on the status of compliance with DOC Condition 34.

**AQ-44:** DOC Condition 35: ~~Basic American Foods~~ **The project owner** shall cause to be operated an ambient monitoring station at a site approved by the Air Pollution Control Officer, for ~~$NO_2$,~~ PM10, and $O_3$ and standard meteorological parameters on a continuous basis, in accordance with the EPA requirement contained in 40 CFR 58, and **as deemed necessary** in accordance with the California Air Resources Board guidelines ~~as deemed necessary,~~**. The monitoring station instrumentation shall be compatible with the District's daily data retrieval polling methods.**

**The operation of the air monitoring station shall continue** for the life of the project or until the Air Pollution Control Officer determines that good cause exists to discontinue the monitoring of a pollutant. **Good cause includes adequate technical justification submitted by the permitted that successfully proves that the continuation of all or part of the monitoring requirement is no longer necessary.**

Data gathered pursuant to this Condition shall be reported ~~to the Air Pollution Control District~~ on a monthly basis, no later than ~~30~~ **45** days from the end of the month during which the data is collected.

**Verification:** ~~Basic American Foods shall submit to the MBUAPCD and CEC staff for approval 90 days before initial start up of the facility, an ambient monitoring plan. Basic American Foods shall submit to the CEC staff CPM MBUAPCD's approval of the plan 15 days after receipt. Basic American Foods~~ **The project owner shall make the results of the monthly reports summarizing the entire operation of the station available to the CPM if requested. The project owner** shall submit ~~to the MBUAPCD the results of the monitoring on a monthly basis, no later than 30 days from the end of the month during which the data is collected, and summarize the results~~ **an annual data summary** report and status of the monitoring in the annual compliance report to the ~~CEC staff~~ **CPM. Any modification to the current air monitoring station cooperation agreement shall be submitted within 45 days to the CPM**.

**AQ-45:** DOC Condition 36: Any authorized representative of the ~~Monterey Bay Unified Air Pollution Control District~~ **MBUAPCD** shall be permitted:

a. to enter upon those premises where the source is located or in which any records are required to be kept under the terms and conditions of the Authority to Construct:

b. to have access to and copy any records required to be kept under the terms and conditions of this Authority to Construct;

c to inspect any equipment, operation, or process described or required in this Authority to Construct; and

d. to sample emissions from the source.

**Verification:** ~~Basic American Foods~~ **The project owner** shall provide the MBUAPCD and ~~CEC~~ **Energy Commission** staff access to the project site. ~~Basic American Foods~~ **The project owner** shall submit, in its quarterly or annual compliance report to the ~~CEC~~ **CPM**, a statement on the status of compliance with DOC condition 36.

**AQ-46:** DOC Condition 37: Ten (10) Proctor and Schwartz three stage vegetable dryers may not be fired with fossil-fuel upon start-up of the gas turbine or auxiliary boiler(s).

**Verification:** ~~Basic~~ **The project owner** shall submit to the ~~CEC-~~CPM a copy of the amended permit(s) to operate for the ten dryers by May 15, 1989.

**AQ-47:** The gas turbine and the auxiliary boilers must not be operated simultaneously for more than 6 full load equivalent hours during any 24-hour period.

**Verification:** ~~Basic~~ **The project owner** shall monitor and record all periods of simultaneous operation of the auxiliary boilers and gas turbine. The record shall include the hours of operation and percent of capacity of the auxiliary boilers. ~~Basic~~ **The project owner** shall maintain a log of these records on site and submit the records to MBUAPCD at the time of renewal of the permit. Basic shall submit the records to the ~~CEC staff~~ **CPM** in the~~ir~~ annual compliance report ~~to the CEC~~.

**AQ-48:** ~~Basic~~ **The project owner** shall purchase a cooling tower with a guaranteed drift rate not to exceed 0.002 percent of the flow rate of the circulating cooling water.

**Verification:** ~~Basic~~ **The project owner** shall submit to the MBUAPCD and the ~~CEC staff~~ **CPM** the cooling tower manufacturer's design specifications and guaranteed drift rate at least 60 days prior to the construction of the cooling tower, and shall receive the MBUAPCD's and ~~CEC~~ **Energy Commission** staff's written approval prior to beginning construction of the cooling tower

**AQ-49:** ~~Basic~~ **The project owner** shall install and operate a flow meter to monitor the circulating cooling water flow rate, or equivalent method for measuring flow may be used as approved by the MBUAPCD.

**Verification:** ~~Basic~~ **The project owner** shall submit to the MBUAPCD a circulating cooling water flow rate monitoring plan at least 60 days before installation. The plan shall include, but not be limited to, the method of monitoring, reporting frequency, and the calibration techniques.

**AQ-50:** ~~Basic~~ **The project owner** shall conduct monthly compliance tests to measure the total dissolved solids (TDS) concentration of the cooling tower circulating water.

**Verification:** ~~Basic~~ **The project owner** shall submit the test results to the MBUAPCD and to the ~~CEC staff~~ **CPM** on a quarterly basis. ~~Basic~~ **The project owner** shall maintain the monitoring records on site for ~~two~~ **5** years and shall make them available to the MBUAPCD and ~~CEC~~ **Energy Commission** staff upon request.

**AQ-51:** ~~Basic~~ **The project owner** shall design and operate the cooling tower so that the PM10 emissions from the cooling tower does not exceed 20 pounds per day. The PM10 emissions shall be calculated as the product of circulating cooling tower flow rate times TDS concentration times the circulating cooling water drift rate, as follows:

(PM10 in lbs/day) = (flow rate in gpm) x (TDS in ppm) x (drift loss = 0.002 percent) x (conversion factor = 0.012)

**Verification:** The terms of this Condition shall be monitored as described in Conditions 49 and 50.

**AQ-52:** ~~Basic~~ **The project owner** may request approval from MBUAPCD and ~~CEC~~ **Energy Commission** staff for revisions to the PM10 daily emission limit from the cooling tower after the first year of operation provided that ~~Basic~~ **The project owner** can substantiate that the actual PM10 monitored pursuant to DOC Condition 35 shows a lower background 24-hours ambient concentration than the assumed existing value of 42 ug/m3.

**Verification:** The terms of this Condition shall be monitored as described in DOC Condition 35. ~~Basic~~ **The project owner** shall submit its request for approval of revising the TSP daily emission limit to MBUAPCD and ~~CEC staff~~ **CPM** no sooner than one year after start of operation. The request shall include ambient air quality monitoring data and justification for the requested revision.

**AQ-52:** **Deleted.**~~BAF Energy shall tender a growth allowance program funding fee to the District in the amount of $60,000, payable within 60 days of the issuance of the Authorities to Construct (AC), and $60,000 plus an increase each year based on the California Consumer Price Index, each year thereafter for three (3) years, on the anniversary date of the AC. (The last payment will be due on the AC anniversary date in 1990).~~

~~a. BAF Energy has acquired additional offsets for its cogeneration project in accordance with Condition 37 (b) above. The growth allowance value of any such additional offsets shall be deducted from the back end of any remaining growth allowance funding fee. The growth allowance value of additional offsets for this project is determined by dividing the annual funding fee by the total unoffset emissions of the project. Or,~~

~~b. An intervening rulemaking action or other action results in the District's receipt of significant additional funding for the unoffset emission growth allowance provided to BAF Energy for this project.~~

~~**Verification:** The MBUAPCD shall submit to the CEC Compliance Project Manager, BAF Energy, and the Air Resources Board (if they so desire), on a quarterly basis, a report describing accomplishments resulting from the position funded by this condition. The quarterly reports will continue to be due for the term of the position as specified above (Condition 52).~~

**AQ-53:** **Deleted.** ~~The emission limits contained in Conditions 19 and 22 shall not apply during boiler shutdown, for a period not to exceed 30 minutes, or during cold start up, for a period not to exceed 30 minutes. During boiler shutdown or start up, and during operations at or below 40 percent load, procedures incorporating good engineering practices shall be utilized to the fullest extent practical to minimize all pollutant emissions.~~

~~**Verification:** The project owner shall maintain appropriate logs of start up and shutdown operation time periods as required by the above condition. Logs shall be maintained on site for two years and made available to the District and the CPM at any time.~~

**AQ-53:** Cumulative emissions, including emissions generated during Start-ups and Shutdown, from all equipment at Calpine King City Cogen and the Gilroy Energy Center shall not exceed the following quarterly and annual limits:

| | NOx (lb.) | CO (lb.) | PM10 (lb.) | VOC (lb.) | $SO_2$ (lb.) |
|---|---|---|---|---|---|
| **1st Quarter** | 72,452 | 58,445 | 12,071 | 4,762 | 1,748 |
| **2nd Quarter** | 73,178 | 59,095 | 12,204 | 4,815 | 1,768 |
| **3rd Quarter** | 73,905 | 59,744 | 12,339 | 4,868 | 1,787 |
| **4th Quarter** | 73,905 | 59,744 | 12,339 | 4,868 | 1,787 |
| **Annual** | 293,440 | 237,028 | 48,953 | 19,313 | 7,090 |

**Protocol**: The total quarterly emission for NOx and CO shall be reported based on actual recorded CEM data. Quarterly emission of SOx (as $SO_2$), PM10 and VOC (as methane) shall be reported as follows:

Volume of natural gas consumed x Emission rate (lb/MMft$^3$) + Start/Stop Increment

Note: 1) Emissions rate (lb/MMft$^3$) is established by latest source test
2) Start/Stop Increment for each is event is:

| Pollutant | Hot Start (lbs) | Cold Start (lbs) | Shutdown (lbs) |
|---|---|---|---|
| **NOx** | 27.8 | 381.8 | 22.9 |
| **CO** | 59.5 | 149.4 | 41.3 |
| **SOx (as $SO_2$)** | 0 | 0 | 0 |
| **PM10** | 0 | 0 | 0 |
| **VOC** | 0.8 | 1.5 | 1.5 |

Note: During periods of oil firing as allowed for on the permits for the Frame 7 Turbine and the ~~B~~**b**oilers, the allowable emissions are increased by the incremental hourly limit for oil firing versus the natural gas hourly limit for all hours the equipment was actually operated on fuel oil.

**Verification:** The ~~owner/operator~~ **project owner** shall report the actual emissions to the District for each calendar quarter within ~~30 (thirty)~~ **45** days from the end of that quarter. The ~~owner/operator~~ **project owner** shall submit the four quarterly actual emissions reports to the CPM as part of the annual report.

**AQ-54 The emission limits contained in Conditions of Certification AQ-6, AQ-10, AQ-11 and AQ-12 shall not apply during periods of combustor tuning, balancing, or non-Air District regulatory mandated performance testing. These periods shall not exceed 100 hours per year per turbine.**

**Verification: The project owner shall notify the District prior to initiating any of these activities, and shall monitor and record all periods of these activities in a log maintained on-site and shall submit a summary of this data to the District and CPM on an annual basis.**

**AQ-55 The emission limits contained in Conditions of Certification AQ-18, AQ-19 and AQ-21 shall not apply during periods of boiler tuning. Boiler tuning shall not exceed 50 hours per year per boiler.**

**Verification: The project owner shall notify the District prior to initiating any of these activities, and shall monitor and record all periods of boiler tuning in a log maintained on-site and shall submit a summary of this data to the District and CPM on an annual basis.**

**IT IS SO ORDERED.**

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of an Order duly and regularly adopted at a meeting of the California Energy Commission held on **November 17, 2014**.

AYE:
NAY:
ABSENT:
ABSTAIN

Harriet Kallemeyn,
Secretariat