

TCEQ INTERAGENCY TRANSMITTAL MEMO

DATE: 2/5/09

TO: LaDonna Castañuela  
Chief Clerk  
Building F, MC105

FROM: Erin Selvera  
Environmental Law Division  
Building A, MC 173

CHIEF CLERKS OFFICE

2009 FEB - 5 PM 4: 32

TEXAS  
COMMISSION  
ON ENVIRONMENTAL  
QUALITY

Attached: Agenda Backup Documents

Agenda Date: March 11, 2009  
Applicant: Madison Bell Partners, LLP  
Proposed Permit No.: 83378 and PSD-TX-1105  
Program: Air  
TCEQ Docket No.: 2008-1786-AIR

Documents with this transmittal are indicated below:

- Final Draft Permit, including any special provisions or conditions
- Maximum Allowable Emission Rate Table (MAERT)
- The summary of the technical review of the permit application.
- The compliance summary of the applicant.
- Modeling Audit Report

## SPECIAL CONDITIONS

Permit Number 83378 and PSD-TX-1105

### EMISSION STANDARDS AND OPERATING SPECIFICATIONS

1. This permit covers only those sources of emissions listed in the attached table entitled "Emission Sources-Maximum Allowable Emission Rates," and those sources are limited to the emission limits and other conditions specified in that attached table. Compliance with the annual emission limits shall be based on throughput for a rolling 12-month year rather than the calendar year. This permit authorizes start-up and shutdown activities which comply with the emission limits in the maximum allowable emission rates table (MAERT).
2. Each turbine's normal operating range is from 65 to 100 percent of base load except for periods of start-up, shutdown, or maintenance periods. Cold start-up events shall not exceed five hours in duration. Warm start-up events shall not exceed three hours in duration. Shutdown events shall not exceed one hour in duration. A cold start-up event is defined as a start-up after a unit has received no fuel flow for a period of 24-hours or more. A warm start-up, shutdown or maintenance event is defined as a start-up which is not a cold start-up.

Reduced load operation (i.e. operation at less than 65% of base load) not associated with start-up, shutdown, or maintenance is authorized, provided the  $\text{NO}_x$  and carbon monoxide (CO) maximum pounds per hour (lbs/hr) emission rates specified in the MAERT for Emission Point Nos. (EPNs) CTDB1-A, CTDB1-B, CTDB2-A and CTDB2-B are not exceeded.

Combustion turbines identified as EPNs CTDB1-A, CTDB1-B, CTDB2-A and CTDB2-B will meet current BACT (best available control technology) performance standards when operating in combined cycle. Nitrogen oxide ( $\text{NO}_x$ ) emissions will not exceed 2 ppm on a rolling 24-hour basis and carbon monoxide (CO) emissions will not exceed 17.5 ppm @ 15 percent  $\text{O}_2$ .

The  $\text{NO}_x$  concentrations measured by the continuous emission monitoring system (CEMS) shall be corrected to 15 percent oxygen ( $\text{O}_2$ ). The  $\text{NO}_x$  concentrations of this permit condition are subject to the following additional specifications:

- A. A valid hour consists of a minimum of four, and normally 60, approximately equally-spaced data points.
- B. Emissions occurring during start-up, shutdown and reduced load operations are not included.

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- C. Excess emissions caused by malfunction are not included.
  - D. Up to ten hourly values in any calendar year may be excluded from selected daily averages, if the value is above 2.0 ppm NO<sub>x</sub> because of rapid shifts in electrical load and resulting exhaust flow or NO<sub>x</sub> concentration, that make it impossible for the emission controller to maintain the desired NO<sub>x</sub> set point.
3. Fuel for the gas turbines and heat recovery steam generating (HRSG) duct burners authorized by this permit shall be limited to firing pipeline-quality, sweet natural gas containing no more than 0.5 grain total sulfur per 100 dscf (dry standard cubic foot) on an annual basis.

The Firewater Pump and Emergency Diesel Generator (EPNs FWP1 and EG1) are authorized to fire diesel fuel containing no more than 0.05 weight percent sulfur and each are limited to a maximum of 120 non-emergency hours of operation annually.

4. Opacity of emissions from any one stack authorized by this permit shall not exceed 5 percent averaged over a six-minute period. During periods of start-up, shutdown, or maintenance, the opacity shall not exceed 15 percent. Opacity shall be determined by the U.S. Environmental Protection Agency (EPA) Reference Method 9 during the initial determination of compliance stack sampling. Continuous demonstration of compliance with this special condition is not required.
5. Upon request by the Executive Director of the Texas Commission on Environmental Quality (TCEQ) or any air pollution control program having jurisdiction, the holder of this permit shall provide a sample and/or an analysis of the fuel-fired in the gas turbines and duct burners or shall allow air pollution control agency representatives to obtain a sample for analysis.

AQUEOUS AMMONIA (NH<sub>3</sub>)

6. Concentrations of NH<sub>3</sub> from EPNs CTDB1-A, CTDB1-B, CTDB2-A and CTDB2-B shall not exceed 7 ppmvd when corrected to 15 percent O<sub>2</sub> on a one-hour rolling average.
7. The permit holder shall maintain prevention and protection measures for the NH<sub>3</sub> storage system which includes (but is not limited to) the following:
- A. The NH<sub>3</sub> storage tank area will be marked and secured so as to protect the NH<sub>3</sub> storage tank from accidents that could cause a rupture.

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8. In addition to the requirements of Special Condition No. 7, the permit holder shall maintain the piping and valves in NH<sub>3</sub> service as follows:
- A. All operating practices and procedures relating to the handling and storage of NH<sub>3</sub> shall conform to the safety recommendations specified for that compound by guidelines of the American National Standards Institute and the Compressed Gas Association.
  - B. Audio, olfactory, and visual checks for NH<sub>3</sub> leaks within the operating area shall be made on a weekly basis.
  - C. As soon as practicable, following the detection of a leak, plant personnel shall take one or more of the following actions:
    - (1) Locate and isolate the leak, if necessary.
    - (2) Commence repair or replacement of the leaking component.
    - (3) Use a leak collection or containment system to control the leak until repair or replacement can be made if immediate repair is not possible.

FEDERAL APPLICABILITY

9. These facilities shall comply with applicable requirements of the EPA regulations in 40 CFR Part 60 on Standards of Performance for New Stationary Sources promulgated for:
- A. Applicable General Conditions, Subpart A.
  - B. The emergency generators are subject to the applicable requirements of Subpart III, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.
  - C. The duct burners and gas turbines are subject to the applicable requirements of Subpart KKKK title Standards of Performance for Stationary Combustion Turbines.

If any condition of this permit is more stringent than the regulations so incorporated, then for the purposes of complying with this permit, the permit shall govern and be the standard by which compliance shall be demonstrated.

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INITIAL DETERMINATION OF COMPLIANCE

10. Sampling ports and platforms shall be incorporated into the design of all exhaust stacks according to the specifications set forth in the attachment entitled "Chapter 2, Stack Sampling Facilities." Alternate sampling facility designs may be submitted for approval by the TCEQ Waco Regional Director or the TCEQ Compliance Support Division in Austin.
11. The holder of this permit shall perform stack sampling and other testing if requested by the TCEQ Waco Regional Director to establish the actual quantities of air contaminants being emitted into the atmosphere from EPNs CTDB1-A, CTDB1-B, CTDB2-A and CTDB2-B. Sampling shall be conducted in accordance with the appropriate procedures of the TCEQ Sampling Procedures Manual and in accordance with the appropriate EPA Reference Methods.

Fuel sampling using the methods and procedures of 40 CFR § 60.334(h) may be conducted in lieu of stack sampling for SO<sub>2</sub>. If fuel sampling is used, compliance with New Source Performance Standards (NSPS), Subpart KKKK, SO<sub>2</sub> limits shall be based on 100 percent conversion of the sulfur in the fuel to SO<sub>2</sub>. Any deviations from those procedures must be approved by the Executive Director of the TCEQ prior to sampling. The TCEQ Executive Director or his designated representative shall be afforded the opportunity to observe all such sampling.

The holder of this permit is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at his expense.

- A. The TCEQ Waco Regional Office shall be contacted as soon as testing is scheduled but not less than 30 days prior to sampling to schedule a pretest meeting. The notice shall include:
  - (1) Date for pretest meeting.
  - (2) Date sampling will occur.
  - (3) Name of firm conducting sampling.
  - (4) Type of sampling equipment to be used.
  - (5) Method or procedure to be used in sampling.
  - (6) Procedure used to determine turbine loads during and after the sampling period.

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The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for submitting the test reports.

A written proposed description of any deviation from sampling procedures specified in permit conditions or TCEQ or EPA sampling procedures shall be made available to the TCEQ prior to the pretest meeting. The TCEQ Waco Regional Director or the TCEQ Compliance Support Division in Austin shall approve or disapprove of any deviation from specified sampling procedures.

Requests to waive testing for any air contaminant specified in this condition shall be submitted to the TCEQ Office of Permitting, Remediation, and Registration, Air Permits Division. Test waivers and alternate or equivalent procedure proposals for NSPS testing which must have EPA approval shall be submitted to the TCEQ Compliance Support Division in Austin.

- B. Air contaminants and diluents from the turbines to be sampled and analyzed include (but are not limited to) NO<sub>x</sub>, CO, VOC, SO<sub>2</sub>, NH<sub>3</sub>, formaldehyde, opacity, and O<sub>2</sub>. [As noted above, fuel sampling using the methods and procedures of 40 CFR § 60.334(h) may be conducted in lieu of stack sampling for SO<sub>2</sub>].
- C. Each turbine shall be tested at a minimum and maximum load of the permitted operating range that is defined in Special Condition No. 2 for the atmospheric conditions which exist during testing. The duct burners shall be tested at their maximum firing rate while the turbine is operating as close to maximum load as possible. Each tested turbine load shall be identified in the sampling report. The permit holder shall present at the pretest meeting the manner in which stack sampling will be executed in order to demonstrate compliance with emission standards found in 40 CFR Part 60, Subpart KKKK.
- D. Sampling as required by this condition shall occur within 60 days after achieving the maximum production but no later than 180 days after initial start-up of each unit. Additional sampling shall occur as may be required by the TCEQ or EPA.
- E. Within 60 days after the completion of the testing and sampling required herein, three copies of the sampling reports shall be distributed as follows:

One copy to the EPA Region 9 Office, Dallas.

One copy to the TCEQ Waco Regional Office.

One copy to the TCEQ Austin Compliance Support Division.

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CONTINUOUS DETERMINATION OF COMPLIANCE

12. The holder of this permit shall install, calibrate, maintain, and operate a CEMS to measure and record the concentrations of NO<sub>x</sub>, CO, and diluent gases (O<sub>2</sub> or carbon dioxide [CO<sub>2</sub>]), from each Exhaust Stack (EPNs CTDB1-A, CTDB1-B, CTDB2-A and CTDB2-B).
  - A. The CEMS shall meet the design and performance specifications, pass the field tests, and meet the installation requirements and the data analysis and reporting requirements specified in the applicable Performance Specification Nos. 1 through 9, 40 CFR Part 60, Appendix B, or an acceptable alternative. If there are no applicable performance specifications in 40 CFR Part 60, Appendix B, contact the TCEQ Office of Permitting, Remediation, and Registration, Air Permits Division in Austin for requirements to be met. The CEMS shall comply with the following requirements:  
The holder of this permit shall assure that the CEMS meets the applicable quality-assurance requirements specified in 40 CFR Part 60, Appendix F, Procedure 1, or an acceptable alternative. Relative accuracy exceedances, as specified in 40 CFR Part 60, Appendix F, § 5.2.3, and any CEMS downtime and all cylinder gas audit exceedances of ±15 percent accuracy shall be reported semiannually to the TCEQ Waco Regional Director, and necessary corrective action shall be taken. Supplemental stack concentration measurements may be required at the discretion of the TCEQ Waco Regional Director.
  - B. The monitoring data shall be reduced to hourly average values at least once everyday, using a minimum of four equally-spaced data points from each one-hour period. At least two valid data points shall be generated during the hourly period in which zero and span is performed.
  - C. All monitoring data and quality-assurance data shall be maintained by the source for a period of five years and shall be made available to the TCEQ Executive Director or designated representative upon request. The hourly average data from the CEMS may be used to determine compliance with the conditions of this permit. Hourly average concentrations from EPNs CTDB1-A, CTDB1-B, CTDB2-A and CTDB2-B shall be summed to tons per year (TPY) each month and used to determine compliance with the emission limits of this permit.

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- D. The TCEQ Waco Regional Office shall be notified at least 21 days prior to any required relative accuracy test audit in order to provide them the opportunity to observe the testing.
- E. If applicable, the CEMS for the boiler and turbines/duct burner stacks may be required to meet the design and performance specifications, pass the field tests, and meet the installation requirements and data analysis and reporting requirements specified in the applicable performance specifications in 40 CFR Part 75, Appendix A. The requirements of 40 CFR Part 75, Appendix A and B, respectively, are deemed an acceptable alternative to the performance specifications and quality assurance requirements of 40 CFR Part 60 for the NO<sub>x</sub> and O<sub>2</sub> CEMS.
13. If any emission monitor fails to meet specified performance, it shall be repaired or replaced as soon as reasonably possible.
14. The holder of this permit shall additionally install, calibrate, maintain, and operate continuous monitoring systems to monitor and record the average hourly natural gas consumption of the gas turbines and the duct burners. The systems shall be accurate to  $\pm 5.0$  percent of the unit's maximum flow.
15. The holder of this permit shall either measure, or develop a program to calculate, the total mass flow rate through the HRSG stacks to ensure continuous compliance with the emission limitations specified in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates." The permit holder shall calculate hourly mass emissions in lbs/hr using the measured or calculated exhaust flow rate and the measured concentrations of NO<sub>x</sub> and CO from the CEMS required in Special Condition No. 12. The hourly calculated values will be cumulatively added during each hour of the month and stored on a computer hard drive and on computer disk or other TCEQ-accepted computer media. Records of this information shall also be available in a form suitable for inspection.
16. The NH<sub>3</sub> concentration in each Exhaust Stack (EPNs CTDB1-A, CTDB1-B, CTDB2-A and CTDB2-B) shall be tested or calculated according to one of the methods listed below and shall be tested or calculated according to frequency listed below. Testing for NH<sub>3</sub> slip is only required on days when the SCR unit is in operation.
- A. The holder of this permit may install, calibrate, maintain, and operate a CEMS to measure and record the concentrations of NH<sub>3</sub>. The NH<sub>3</sub> concentrations shall be corrected and reported in accordance with Special Condition No. 6.

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- B. As an approved alternative, the  $\text{NH}_3$  slip may be measured using a sorbent or stain tube device specific for  $\text{NH}_3$  measurement in the 5 to 10 ppm range. The frequency of sorbent or stain tube testing shall be daily for the first 60 days of operation, after which, the frequency may be reduced to weekly testing if operating procedures have been developed to prevent excess amounts of  $\text{NH}_3$  from being introduced in the SCR unit and when operation of the SCR unit has been proven successful with regard to controlling  $\text{NH}_3$  slip. Daily sorbent or stain tube testing shall resume when the catalyst is within 30 days of its useful life expectancy. These results shall be recorded and used to determine compliance with Special Condition No. 6.
- C. As an approved alternative to sorbent or stain tube testing or an  $\text{NH}_3$  CEMS, the permit holder may install and operate a second  $\text{NO}_x$  CEMS probe located between the duct burners and the SCR, upstream of the stack  $\text{NO}_x$  CEMS, which may be used in association with the SCR efficiency and  $\text{NH}_3$  injection rate to estimate  $\text{NH}_3$  slip. This condition shall not be construed to set a minimum  $\text{NO}_x$  reduction efficiency on the SCR unit. These results shall be recorded and used to determine compliance with Special Condition No. 6.
- D. If the sorbent or stain tube testing indicates an ammonia slip concentration which exceeds 5 parts per million (ppm) at any time, the permit holder shall begin  $\text{NH}_3$  testing by either the Phenol-Nitroprusside Method, the Indophenol Method, or EPA Conditional Test Method (CTM) 27 on a quarterly basis in addition to the weekly sorbent or stain tube testing. The quarterly testing shall continue until such time as the SCR unit catalyst is replaced; or if the quarterly testing indicates  $\text{NH}_3$  slip is four ppm or less, the Phenol-Nitroprusside/Indophenol/CTM 27 tests may be suspended until sorbent or stain tube testing again indicate five ppm  $\text{NH}_3$  slip or greater. These results shall be recorded and used to determine compliance with Special Condition No. 6.
- E. As an approved alternative to sorbent or stain tube testing,  $\text{NH}_3$  CEMS, or a second  $\text{NO}_x$  CEMS, the permit holder may install and operate a dual stream system of  $\text{NO}_x$  CEMS at the exit of the SCR. One of the exhaust streams would be routed, in an unconverted state, to one  $\text{NO}_x$  CEMS, and the other exhaust stream would be routed through a  $\text{NH}_3$  converter to convert  $\text{NH}_3$  to  $\text{NO}_x$  and then to a second  $\text{NO}_x$  CEMS. The  $\text{NH}_3$  slip concentration shall be calculated from the delta between the two  $\text{NO}_x$  CEMS readings (converted and unconverted). These results shall be recorded and used to determine compliance with Special Condition No. 6.

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- F. Any other method used for measuring NH<sub>3</sub> slip shall require prior approval from the TCEQ Austin Compliance Support Division.

RECORDKEEPING REQUIREMENTS

- 17. The following records shall be kept at the plant for the life of the permit. All records required in this permit shall be made available at the request of personnel from the TCEQ, EPA, or any air pollution control agency with jurisdiction.
  - A. A copy of this permit.
  - B. Permit application dated October 31, 2007, and subsequent representations submitted to the TCEQ.
  - C. A complete copy of the testing reports and records of the initial performance testing completed pursuant to Special Condition No. 11 to demonstrate initial compliance.
  - D. Stack sampling results or other air emissions testing (other than CEMS data) that may be conducted on units authorized under this permit after the date of issuance of this permit.
  - E. A startup and shutdown plan required by Special Condition No. 20. The plan shall include detailed procedures for review of relevant operating parameters of the turbines, duct burners, and associated air pollution control equipment during startup and shutdown to make adjustments and corrections to reduce or eliminate any excess emissions, following manufacture's recommendations as appropriate.
- 18. The following information shall be maintained by the holder of this permit in a form suitable for inspection for a period of five years after collection and shall be made immediately available upon request to representatives of the TCEQ, EPA, or any local air pollution control program having jurisdiction:
  - A. The NO<sub>x</sub>, CO, and diluent gases, O<sub>2</sub> or CO<sub>2</sub>, CEMS emissions data to demonstrate compliance with the emission rates listed in the maximum allowable emission rates table (MAERT).
  - B. Raw data files of all CEMS data including calibration checks and adjustments and maintenance performed on these systems.

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- C. Records of the hours of operation of the firewater pumps and emergency diesel generators.
- D. Records of fuel sampling conducted pursuant to 40 CFR Part 60, Subpart KKKK.
- E. Records of NH<sub>3</sub> emissions sampling and calculations pursuant to Special Condition No. 16.
- F. Written records of any accidental releases, spills, or venting of NH<sub>3</sub> and the corrective action taken.
- G. Written records of maintenance performed to any piping and valves in NH<sub>3</sub> service pursuant to Special Condition No. 8.
- H. Records to identify the times when emissions data have been excluded from the calculation of average concentration because of startup and shutdown events pursuant to Special Condition No. 2 along with the justification for excluding data, and/or when the emission limits of Scenario 3 of the attached MAERT are in effect. The records will list maintenance activities that are performed, if applicable.

## REPORTING

- 19. The holder of this permit shall submit to the TCEQ Waco Regional Office and the Air Enforcement Branch of the EPA in Dallas semiannual reports as described in 40 CFR § 60.7. Such reports are required for each emission unit which is required to be continuously monitored pursuant to this permit.

## START-UP AND SHUT DOWN

- 20. The holder of this permit shall operate the turbines and associated air pollution control equipment in accordance with good air pollution control practice to minimize emissions during startup and shutdown, by operating in accordance with a written start-up and shutdown plan.

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21. The emission limits in Special Condition #2 do not apply when CTDB1-A, CTDB1-B, CTDB2-A and CTDB2-B are operating at reduced load or during Startup/Shutdown conditions. During these operations, CTDB1-A, CTDB1-B, CTDB2-A and CTDB2-B shall comply with the emission limits specified on the maximum allowable emission rates table (MAERT). Start-up/Shutdown and reduced load operations are limited to less than 1,570 hours per year for each combustion turbine.

DRAFT

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit Numbers 83378 and PSD-TX-1105

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

AIR CONTAMINANTS DATA

| Emission Point No. (1)   | Source Name (2)  | Air Contaminant Name (3)       | Emission Rates * |       |
|--|------------------|--------------------------------|------------------|-------|
|  |                  |                                | lb/hr            | TPY** |
| <b>SCENARIO 1: GENERAL ELECTRIC PG7121 (EA) AND 165 MMBTU/HR DUCT BURNER</b> |                  |                                |                  |       |
| CTDB1-A  | CT/HRSG Unit 1-A | NO <sub>x</sub>                | 9.5              | ---   |
|  |                  | CO                             | 56.8             | ---   |
|  |                  | SO <sub>2</sub>                | 1.95             | ---   |
|  |                  | PM/PM <sub>10</sub>            | 12.2             | ---   |
|  |                  | VOC                            | 3.7              | ---   |
|  |                  | H <sub>2</sub> SO <sub>4</sub> | 0.22             | ---   |
|  |                  | Pb                             | 0.0007           | ---   |
|  |                  | NH <sub>3</sub>                | 12.3             | ---   |
|  |                  | HAPs                           | 1.01             | ---   |
| CTDB1-B  | CT/HRSG Unit 1-B | NO <sub>x</sub>                | 9.5              | ---   |
|  |                  | CO                             | 56.8             | ---   |
|  |                  | SO <sub>2</sub>                | 1.95             | ---   |
|  |                  | PM/PM <sub>10</sub>            | 12.2             | ---   |
|  |                  | VOC                            | 3.7              | ---   |
|  |                  | H <sub>2</sub> SO <sub>4</sub> | 0.22             | ---   |
|  |                  | Pb                             | 0.0007           | ---   |
|  |                  | NH <sub>3</sub>                | 12.3             | ---   |
|  |                  | HAPs                           | 1.01             | ---   |
| CTDB2-A  | CT/HRSG Unit 2-A | NO <sub>x</sub>                | 9.5              | ---   |
|  |                  | CO                             | 56.8             | ---   |
|  |                  | SO <sub>2</sub>                | 1.95             | ---   |
|  |                  | PM/PM <sub>10</sub>            | 12.2             | ---   |
|  |                  | VOC                            | 3.7              | ---   |
|  |                  | H <sub>2</sub> SO <sub>4</sub> | 0.22             | ---   |
|  |                  | Pb                             | 0.0007           | ---   |
|  |                  | NH <sub>3</sub>                | 12.3             | ---   |
|  |                  | HAPs                           | 1.01             | ---   |

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

| Emission Point No. (1) | Source Name (2)  | Air Contaminant Name (3)       | Emission Rates * |       |
|------------------------|------------------|--------------------------------|------------------|-------|
|                        |                  |                                | lb/hr            | TPY** |
| CTDB2-B                | CT/HRSG Unit 2-B | NO <sub>x</sub>                | 9.5              | ---   |
|                        |                  | CO                             | 56.8             | ---   |
|                        |                  | SO <sub>2</sub>                | 1.95             | ---   |
|                        |                  | PM/PM <sub>10</sub>            | 12.2             | ---   |
|                        |                  | VOC                            | 3.7              | ---   |
|                        |                  | H <sub>2</sub> SO <sub>4</sub> | 0.22             | ---   |
|                        |                  | Pb                             | 0.0007           | ---   |
|                        |                  | NH <sub>3</sub>                | 12.3             | ---   |
|                        | HAPs             | 1.01                           | ---              |       |

**SCENARIO 2: GENERAL ELECTRIC PG7121 (EA) OPERATING WITHOUT DUCT BURNER**

|         |                  |                                |        |     |
|---------|------------------|--------------------------------|--------|-----|
| CTDB1-A | CT/HRSG Unit 1-A | NO <sub>x</sub>                | 8.2    | --- |
|         |                  | CO                             | 43.6   | --- |
|         |                  | SO <sub>2</sub>                | 1.70   | --- |
|         |                  | PM/PM <sub>10</sub>            | 10.3   | --- |
|         |                  | VOC                            | 2.1    | --- |
|         |                  | H <sub>2</sub> SO <sub>4</sub> | 0.20   | --- |
|         |                  | Pb                             | 0.0006 | --- |
| CTDB1-B | CT/HRSG Unit 1-B | NO <sub>x</sub>                | 8.2    | --- |
|         |                  | CO                             | 43.6   | --- |
|         |                  | SO <sub>2</sub>                | 1.70   | --- |
|         |                  | PM/PM <sub>10</sub>            | 10.3   | --- |
|         |                  | VOC                            | 2.1    | --- |
|         |                  | H <sub>2</sub> SO <sub>4</sub> | 0.20   | --- |
|         |                  | Pb                             | 0.0006 | --- |
| CTDB2-A | CT/HRSG Unit 2-A | NO <sub>x</sub>                | 8.2    | --- |
|         |                  | CO                             | 43.6   | --- |
|         |                  | SO <sub>2</sub>                | 1.70   | --- |
|         |                  | PM/PM <sub>10</sub>            | 10.3   | --- |
|         |                  | VOC                            | 2.1    | --- |
|         |                  | H <sub>2</sub> SO <sub>4</sub> | 0.20   | --- |
|         |                  | Pb                             | 0.0006 | --- |

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

| Emission Point No. (1) | Source Name (2)  | Air Contaminant Name (3)       | Emission Rates * |       |
|------------------------|------------------|--------------------------------|------------------|-------|
|                        |                  |                                | lb/hr            | TPY** |
| CTDB2-B                | CT/HRSG Unit 2-B | NO <sub>x</sub>                | 8.2              | ---   |
|                        |                  | CO                             | 43.6             | ---   |
|                        |                  | SO <sub>2</sub>                | 1.70             | ---   |
|                        |                  | PM/PM <sub>10</sub>            | 10.3             | ---   |
|                        |                  | VOC                            | 2.1              | ---   |
|                        |                  | H <sub>2</sub> SO <sub>4</sub> | 0.20             | ---   |
|                        |                  | Pb                             | 0.0006           | ---   |

SCENARIO 3: GENERAL ELECTRIC PG7121 (EA) DURING START UP & SHUT DOWN

|         |                  |                                |         |     |
|---------|------------------|--------------------------------|---------|-----|
| CTDB1-A | CT/HRSG Unit 1-A | NO <sub>x</sub>                | 600.0   | --- |
|         |                  | CO                             | 1,000.0 | --- |
|         |                  | VOC                            | 60.0    | --- |
|         |                  | SO <sub>2</sub>                | 1.7     | --- |
|         |                  | PM/PM <sub>10</sub>            | 10.5    | --- |
|         |                  | H <sub>2</sub> SO <sub>4</sub> | 0.2     | --- |
|         |                  | NH <sub>3</sub>                | 10.8    | --- |
|         |                  | HCHO                           | 0.3     | --- |
|         |                  | Toluene                        | 0.2     | --- |
| CTDB1-B | CT/HRSG Unit 1-B | NO <sub>x</sub>                | 600.0   | --- |
|         |                  | CO                             | 1,000.0 | --- |
|         |                  | VOC                            | 60.0    | --- |
|         |                  | SO <sub>2</sub>                | 1.7     | --- |
|         |                  | PM/PM <sub>10</sub>            | 10.5    | --- |
|         |                  | H <sub>2</sub> SO <sub>4</sub> | 0.2     | --- |
|         |                  | NH <sub>3</sub>                | 10.8    | --- |
|         |                  | HCHO                           | 0.3     | --- |
| Toluene | 0.2              | ---                            |         |     |

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

| Emission Point No. (1) | Source Name (2)  | Air Contaminant Name (3)       | Emission Rates * |       |
|------------------------|------------------|--------------------------------|------------------|-------|
|                        |                  |                                | lb/hr            | TPY** |
| CTDB2-A                | CT/HRSG Unit 2-A | NO <sub>x</sub>                | 600.0            | ---   |
|                        |                  | CO                             | 1,000.0          | ---   |
|                        |                  | VOC                            | 60.0             | ---   |
|                        |                  | SO <sub>2</sub>                | 1.7              | ---   |
|                        |                  | PM/PM <sub>10</sub>            | 10.5             | ---   |
|                        |                  | H <sub>2</sub> SO <sub>4</sub> | 0.2              | ---   |
|                        |                  | NH <sub>3</sub>                | 10.8             | ---   |
|                        |                  | HCHO                           | 0.3              | ---   |
|                        |                  | Toluene                        | 0.2              | ---   |
| CTDB2-B                | CT/HRSG Unit 2-B | NO <sub>x</sub>                | 600.0            | ---   |
|                        |                  | CO                             | 1,000.0          | ---   |
|                        |                  | VOC                            | 60.0             | ---   |
|                        |                  | SO <sub>2</sub>                | 1.7              | ---   |
|                        |                  | PM/PM <sub>10</sub>            | 10.5             | ---   |
|                        |                  | H <sub>2</sub> SO <sub>4</sub> | 0.2              | ---   |
|                        |                  | NH <sub>3</sub>                | 10.8             | ---   |
|                        |                  | HCHO                           | 0.3              | ---   |
|                        |                  | Toluene                        | 0.2              | ---   |

**COMBINED ANNUAL EMISSIONS FOR ALL FOUR GENERAL ELECTRIC PG7121 (EA) UNITS AND 165 MMBTU/HR DUCT BURNER**

|         |                   |                                |     |        |
|---------|-------------------|--------------------------------|-----|--------|
| CTDB1-A | CT/HRSG Unit 1-A  | NO <sub>x</sub> (5)            | --- | 196.0  |
| CTDB1-B | 1-B, 2-A, AND 2-B | CO (5)                         | --- | 1124.0 |
| CTDB2-A |                   | SO <sub>2</sub>                | --- | 26.96  |
| CTDB2-B |                   | PM/PM <sub>10</sub>            | --- | 193.0  |
|         |                   | VOC                            | --- | 43.48  |
|         |                   | H <sub>2</sub> SO <sub>4</sub> | --- | 3.08   |
|         |                   | Pb                             | --- | 0.0096 |
|         |                   | NH <sub>3</sub>                | --- | 168.8  |
|         |                   | HAPs                           | --- | 12.6   |

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

| Emission Point No. (1) | Source Name (2)          | Air Contaminant Name (3) | Emission Rates * |          |
|------------------------|--------------------------|--------------------------|------------------|----------|
|                        |                          |                          | lb/hr            | TPY**    |
| EG1                    | Emergency Generator      | NO <sub>x</sub>          | 27.30            | 1.64     |
|                        |                          | CO                       | 7.25             | 0.44     |
|                        |                          | VOC                      | 0.77             | 0.05     |
|                        |                          | SO <sub>2</sub>          | 0.43             | 0.03     |
|                        |                          | PM                       | 0.59             | 0.04     |
|                        |                          | PM <sub>10</sub>         | 0.49             | 0.03     |
|                        |                          | HAPs                     | 1.45E-02         | 8.72E-04 |
| FWP1                   | Fire Water Pump          | NO <sub>x</sub>          | 11.22            | 0.67     |
|                        |                          | CO                       | 2.42             | 0.15     |
|                        |                          | VOC                      | 0.89             | 0.05     |
|                        |                          | SO <sub>2</sub>          | 0.13             | 0.01     |
|                        |                          | PM                       | 0.79             | 0.05     |
|                        |                          | PM <sub>10</sub>         | 0.79             | 0.05     |
|                        |                          | HAPs                     | 1.68E-02         | 1.01E-03 |
| CT1                    | Cooling Tower for Unit 1 | PM                       | 4.2              | 18.4     |
|                        |                          | PM <sub>10</sub>         | 2.1              | 9.2      |
| CT2                    | Cooling Tower for Unit 2 | PM                       | 4.2              | 18.4     |
|                        |                          | PM <sub>10</sub>         | 2.1              | 9.2      |

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

- (1) Emission point identification - either specific equipment designation or emission point number from a plot plan.
- (2) Specific point source names. For fugitive sources, use an area name or fugitive source name.
- (3) Exempt Solvent - Those carbon compounds or mixtures of carbon compounds used as solvents which have been excluded from the definition of volatile organic compound.

NO<sub>x</sub> - total oxides of nitrogen

SO<sub>2</sub> - sulfur dioxide

PM - particulate matter, suspended in the atmosphere, including PM<sub>10</sub> and PM<sub>2.5</sub>

PM<sub>10</sub> - particulate matter equal to or less than 10 microns in diameter

PM<sub>2.5</sub> - particulate matter equal to or less than 2.5 microns in diameter

CO - carbon monoxide

HAPs - hazardous air pollutants as listed in § 112(b) of the Federal Clean Air Act or Title 40 Code of Federal Regulations Part 63, Subpart C

- (4) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate.
- (5) Includes emissions from start-up and shutdown.

\* Emission rates are based on and the facilities are limited by the following maximum operating schedule:

24 Hrs/day 7 Days/week 52 Weeks/year or 8,760 Hrs/year

\*\* Compliance with annual emission limits is based on a rolling 12-month period.

# PRELIMINARY DETERMINATION SUMMARY

Madison Bell Partners LP  
Permit Number 83378 and PSD-TX-1105

## I. APPLICANT

Madison Bell Partners LP  
403 Corporate Woods Drive  
Magnolia, Texas 77354

## II. PROJECT LOCATION

Natural gas-fired power generation facility located approximately 6 miles southwest of Madisonville via US 190 West. After Cottonwood, turn south on CR 413 and site is ½ mile on the left.

Magnolia, Texas 77354

## III. PROJECT DESCRIPTION

Madison Bell Energy Center (MBEC) proposes to construct a natural gas-fired power generation facility at a site in Madison County, Texas. The project would include four natural gas-fired combustion turbines (GE F7EA) and four heat recovery steam generators (HRSGs) with provisions for duct firing. The proposed project will operate the combustion turbines in combined cycle mode. The combined nominal generating capacity of the plant is approximately 550 MW in combined cycle mode.

## IV. EMISSIONS

Emission sources from the proposed project consists of four 75-MW combustion turbines, four heat recovery steam generators with provisions for duct firing, two 125-MW steam turbines, one diesel fuel-fired emergency generator, one diesel fuel-fired emergency firewater pump, two mechanical draft cooling towers and water treatment storage facilities. The emissions are combustion products from burning natural gas with ammonia injection to control emissions: Nitrogen Oxides (NO<sub>x</sub>), Particulate Matter less than 10 microns in diameter (PM<sub>10</sub>), Volatile Organic Compounds (VOC), Sulfur Dioxide (SO<sub>2</sub>), Carbon Monoxide (CO) and ammonia (NH<sub>3</sub>). Some of the oxidized sulfur is likely to convert to sulfuric acid (H<sub>2</sub>SO<sub>4</sub>).

Total maximum emissions from the project are as follows:

| Pollutant                      | Potential to emit (tpy) |
|--------------------------------|-------------------------|
| NO <sub>x</sub>                | 334.9                   |
| CO                             | 1,018.1                 |
| PM/PM <sub>10</sub>            | 230.9/212.5             |
| SO <sub>2</sub>                | 27.2                    |
| VOC                            | 45.2                    |
| H <sub>2</sub> SO <sub>4</sub> | 3.1                     |

**V. FEDERAL APPLICABILITY**

The proposed Madison Bell Energy Center (MBEC) site will be located in Madison County. This county is presently designated as either better than national standards or unclassifiable/attainment for all criteria pollutants. Therefore, MBEC is not subject to the federal nonattainment NSR review requirements. The proposed facility is projected to emit NO<sub>x</sub>, CO and PM/PM<sub>10</sub> in greater than significant amounts.

The annual emissions of criteria pollutants for the proposed project are as follows.

| Criteria Pollutants (tons per year) |         |                     |      |                 |                                |
|-------------------------------------|---------|---------------------|------|-----------------|--------------------------------|
| NO <sub>x</sub>                     | CO      | PM/PM <sub>10</sub> | VOC  | SO <sub>2</sub> | H <sub>2</sub> SO <sub>4</sub> |
| 334.9                               | 1,018.1 | 230.9               | 45.2 | 27.2            | 3.1                            |

The net emissions increase of the criteria pollutants for the proposed project is as follows:

| Net Project Increases in Criteria Pollutants in tons per year (PSD Threshold) |               |                     |           |                 |                                |
|---|---------------|---------------------|-----------|-----------------|--------------------------------|
| NO <sub>x</sub>   | CO            | PM/PM <sub>10</sub> | VOC       | SO <sub>2</sub> | H <sub>2</sub> SO <sub>4</sub> |
| 334.9 (40)  | 1,018.1 (100) | 230.9 (15)          | 45.2 (40) | 27 (40)         | 3.1 (7)                        |

**VI. CONTROL TECHNOLOGY REVIEW**

The BACT analysis includes start-up and shutdown emissions and the numerical emission limits in the draft permit reflect this analysis. Although the units may not meet the ppmvd BACT limits during start-up and shutdown, they will meet the mass emission limits (lb/hr)

and start-up and shutdown times will be limited by Special Condition No.21. Typical start-up, operation and shutdown of the combustion turbines and associated air pollution control equipment are conducted in accordance with manufacturer's recommendations to minimize emissions and maximize efficiencies. Because start-up and shutdown represent unique operating circumstances, BACT includes a requirement to implement a process for minimizing emissions during these periods. The draft permit incorporates not only numerical limits on emissions during start-up and shutdown and a limit on the number of hours of start-up and shutdown time, but operational requirements to minimize emissions using good air pollution control procedures and practices.

After analysis of the EPA's RACT/BACT/LAER clearing house, it was determined that the company's original proposal of 5 ppm for NO<sub>x</sub> BACT should be reduced to 2ppm in accordance with nation-wide NO<sub>x</sub> BACT levels

#### **NO<sub>x</sub> BACT**

Dry-Low NO<sub>x</sub> (DLN) burner technology in both the combustion turbine and duct burners followed by selective catalytic reduction (SCR) technology will control NO<sub>x</sub> emissions to 2 ppmvd while operating in combined cycle mode.

#### **CO BACT**

Good combustion practices will control CO emissions from each combined cycle turbine and duct burner set to a level of 17.5 ppmvd @ 15% oxygen while operating in combined cycle mode which is in line with recent RACT/BACT/LAER clearing house data.

#### **VOC BACT**

Good combustion practices will control VOC emissions from each combustion turbine to a level of 2.5 ppmvd @ 15% oxygen while operating in combined cycle mode.

#### **PM, PM<sub>10</sub>, SO<sub>2</sub> & H<sub>2</sub>SO<sub>4</sub> BACT**

The exclusive firing of clean, low-sulfur pipeline-quality natural gas (0.5 gr S/100 scf) and good combustion practices will minimize PM, PM<sub>10</sub>, SO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> emissions. Drift eliminators with a drift loss rate of 0.001% will be used to control PM/PM<sub>10</sub> emissions from the cooling tower.

### NH<sub>3</sub>

Emissions of NH<sub>3</sub> will be controlled to 7 ppmvd through proper monitoring and operation of the SCR systems during combined cycle operation.

## VII. AIR QUALITY ANALYSIS

Air dispersion modeling was performed in accordance with the Texas Commission on Environmental Quality (TCEQ) and EPA guidelines. The project's maximum off-property GLCs are as follows:

| Pollutant        | Averaging Period | Project GLC (µg/m <sup>3</sup> ) | De Minimis (µg/m <sup>3</sup> ) |
|------------------|------------------|----------------------------------|---------------------------------|
| PM <sub>10</sub> | 24-hour          | 4.9                              | 5                               |
|                  | annual           | 0.9                              | 1                               |
| CO               | 1-hour           | 270                              | 2000                            |
|                  | 8-hour           | 105                              | 500                             |
| NO <sub>2</sub>  | annual           | 0.6                              | 1                               |

## VIII. NATIONAL AMBIENT AIR QUALITY STANDARDS ANALYSIS

For the preliminary analysis, the maximum predicted impacts of NO<sub>2</sub> (as NO<sub>x</sub>), CO, and PM<sub>10</sub> were compared to their respective *de minimis* levels. The annual maximum predicted impact concentrations of NO<sub>2</sub>, one-hour and eight-hour concentrations of CO, and the 24-hour and annual concentrations of PM<sub>10</sub> were below the *de minimis* levels so no further analysis was required. The PSD NAAQS Analysis demonstrated that emissions of PM<sub>10</sub>, NO<sub>2</sub> (as NO<sub>x</sub>), and CO will not cause nor contribute to an exceedance of the NAAQS.

## IX. INCREMENT ANALYSIS

The PSD Increment Analysis was not required because the pollutants are below *de minimis* levels.

**X. AIR QUALITY MONITORING**

Air dispersion modeling was performed in accordance with the Texas Commission on Environmental Quality (TCEQ) and EPA guidelines. A significance analysis was initially conducted to determine if full impact analysis would be required. The modeling results indicated that a full impacts analysis to demonstrate compliance with the NAAQS and PSD increment values is not required for PM/PM<sub>10</sub>, CO or NO<sub>x</sub>.

**XI. ADDITIONAL IMPACTS ANALYSIS**

The impacts from the proposed project and associated growth are not expected to produce adverse impacts on soils, vegetation, or visibility. Predicted impacts are below the corresponding NAAQS and PSD Increment requirements, which indicate that there will not be harmful effects on soils and vegetation.

There are no Class I Areas within 100 km of the plant. Therefore, a Class I Area impact analysis is not required.

**XII. AIR TOXICS REVIEW**

A modeling evaluation, using full dispersion modeling, of Madison Bell's emissions was conducted to demonstrate that the state property line regulations would not be jeopardized. The following table summarizes the regulatory standards and results:

| Pollutant                      | Averaging Period | Total GLC (µg/m <sup>3</sup> ) | State Standard (µg/m <sup>3</sup> ) |
|--------------------------------|------------------|--------------------------------|-------------------------------------|
| H <sub>2</sub> SO <sub>4</sub> | 1-hour           | 0.1                            | 50                                  |
|                                | 24-hour          | 0.06                           | 15                                  |
| SO <sub>2</sub>                | 1-hour           | 13                             | 1021                                |

A State Effects Evaluation Analysis was performed for non-criteria pollutants to demonstrate that the public health and welfare are protected. The EPA's AMS/EPA Regulatory Model (AERMOD) was used to predict the maximum ground level concentrations of non-criteria pollutants expected to be emitted from the site. The following table is a summary of predicted maximum concentrations for formaldehyde, ammonia, and toluene.

| Pollutant & CAS#        | Averaging Time | GLCmax<br>( $\mu\text{g}/\text{m}^3$ ) | ESL<br>( $\mu\text{g}/\text{m}^3$ ) |
|-------------------------|----------------|--|-------------------------------------|
| Formaldehyde<br>50-00-0 | 1-hour         | 0.18                                   | 15                                  |
| Ammonia<br>7664-41-7    | 1-hour         | 5.68                                   | 170                                 |
| Toluene<br>108-88-3     | 1-hour         | 0.16                                   | 1,880                               |

### XIII. CONCLUSION

Madison Bell Partners LP, has proposed BACT for the proposed construction of a natural gas-fired power generation facility. Modeling analysis indicates that the proposed project will not violate the NAAQS or have any adverse impacts on soils, vegetation, or Class I Areas. The Executive Director of the TCEQ proposes a preliminary determination of approval for Madison Bell Partners LP to start construction on the project, as proposed.

*Review Analysis & Technical Review*

Permit No. 83378

Regulated Entity No. RN105372379

Page 1

**Construction Permit  
Review Analysis & Technical Review**

|                   |   |                         |             |
|-------------------|---|-------------------------|-------------|
| Company:          | Madison Bell Partners LP                    | Permit No.:             | 83378       |
| City:             | Madisonville                                | Record No.:             | 134178      |
| County:           | Madison                                     | Account No.:            | OC0007J     |
| Project Type:     | Initial Issuance                            | Regulated Entity No.:   | RN105372379 |
| Project Reviewer: | Ms. Bridget Malone                          | Customer Reference No.: | CN603265943 |
| Facility Name:    | Natural Gas-fired Power Generation Facility |                         |             |

**Authorization Checklist**

Will a new policy/precedent be established? (ED signature required if yes) ..... No

Is a state or local official opposed to the permit?(ED signature required if yes) ..... No

Is waste or tire derived fuel involved? (ED signature required if yes)..... No

Are waste management facilities involved?(ED signature required if yes) ..... No

Will action on this application be posted on the Executive Director's agenda? ..... Yes

Have any changes to the application or subsequent proposals been required to increase protection  
of public health and the environment during the review? ..... No

If yes, please identify any permit conditions or permit limits in the Project Overview.

**Project Overview**

Madison Bell Energy Center (MBEC) proposes to construct a natural gas-fired power generation facility at a site in Madison County, Texas. The project would include four natural gas-fired combustion turbines (GE F7EA) and four heat recovery steam generators (HRSGs) with provisions for duct firing. The proposed project will operate the combustion turbines in combined cycle mode. The combined nominal generating capacity of the plant is approximately 550 MW in combined cycle mode.

**Compliance History**

In compliance with 30 TAC Chapter 60, a compliance history report was prepared on:.....

Was an evaluation for Federal Orders conducted on this company? ..... Yes

Was the application received after September 1, 2002? ..... Yes

    If yes, what was the site rating? 3.01                      Company rating? 3.01

Is the permit recommended to be denied or has the permit changed on the basis  
of compliance history or rating? ..... No

**Public Notice Information**

§39.403 Public notification required? ..... Yes

    A. Date application received: 10/31/2007 Date Administrative Complete:..... 11/30/2007

    B. Small Business source? ..... No

§39.418 C. Date 1st Public Notice /Admin Complete/Legislators letters mailed: ..... 11/30/2007

§39.603 D. Pollutants: PM, PM10, NOx, CO, VOC, Pb, SO2, H2SO4

    E. Date Published: 12/19/2007 in Madisonville Meteor  
    Date Affidavits/Copies received: 2/1/2008

    F. Bilingual notice required? ..... No

§39.604 G. Certification of Sign Posting / Application availability..... 1/19/2008

    H. Public Comments Received? No  
    Meeting requested? No Meeting held? n/a  
    Hearing requested? Yes Hearing held?  
    Was/were the request(s) withdrawn?                      Date:  
    Replies to Comments sent to OCC:.....  
    Consideration of Comments:

§39.419 2nd Public Notification required? ..... Yes

    A. Date 2nd Public Notice mailed: ..... 05/20/2008

## Review Analysis & Technical Review

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Regulated Entity No. RN105372379

- B. Preliminary determination.....
- §39.603 C. Pollutants: PM, PM10, NOx, CO, VOC, Pb, SO2, H2SO4
- D. Date Published: 05/21/2008 in Madisonville Meteor  
Date Affidavits/Copies received:
- E. Bilingual notice required? ..... No
- F. Public Comments Received?  
Meeting requested? ..... Meeting held?  
Hearing requested? ..... Hearing held?  
Was/were the request(s) withdrawn?                      Date:
- §39.420 G. Consideration of Comments:  
RTC, Technical Review & Draft Permit Conditions sent to OCC: .....  
Request for Reconsideration Received?
- H. Final action:        Letters enclosed? .....

### Emission Controls

- §116.111(a)(2)(G) Is the facility expected to perform as represented in the application?..... Yes
- §116.140 Permit Fee: \$75000                      Fee certification provided? ..... Yes

### Sampling and Testing

- §116.111(a)(2)(A)(i) Are the emissions expected to comply with all TCEQ air quality rules and regulations, and the intent of the Texas Clean Air Act? ..... Yes
- §116.111(a)(2)(B) Will emissions be measured? ..... Yes  
Method: CEMS, Recordkeeping

### Federal Program Applicability

- §116.111(a)(2)(D) Compliance with applicable NSPS expected? ..... Yes  
Subparts A, IIII, and KKKK
- §116.111(a)(2)(E) Compliance with applicable NESHAP expected?.....n/a
- §116.111(a)(2)(F) Compliance with applicable MACT expected?.....n/a
- §116.111(a)(2)(H) Is nonattainment review required? ..... No
- A. Is the site located in a nonattainment area?..... No  
If no, skip to 116.111(2)(I). If yes, continue.
- 116.111(a)(2)(I) Is PSD applicable?..... Yes
  - A. Is the site a federal major source (100/250 tons/yr)? ..... Yes
  - B. Is the project a federal major source by itself? ..... Yes
  - C. Is the project a federal major modification? ..... Yes
    - 1. Did project emission increases, without decreases, for pollutant of concern, minus the two-year average actual emissions trigger netting? ..... Yes
    - 2. Was contemporaneous increase significant?..... Yes
    - 3. Change excluded by 40 CFR 52.21(b)(2)(iii)? ..... Yes  
If yes to B.2 or B.3 above, explain:

### Mass Cap and Trade Applicability

- §116.111(a)(2)(L) Is Mass Cap and Trade applicable?..... No  
Did the proposed facility, group of facilities, or account obtain allowances to operate? .....n/a

### Title V Applicability

- §122.10(13)(A) Is the site a major source under FCAA Section 112(b)? ..... Yes
    - (i). The site emits 10 tons or more of any single HAP?..... No
    - (ii). The site emits 25 tons or more of a combination ..... No
  - §122.10(13)(C) Does the site emit 100 tons or more of any air pollutant? ..... Yes
  - §122.10(13)(D) Is the site a non-attainment major source? ..... No
- Note: Fugitive emissions are not included in total emissions unless the site is named in 30 TAC 122.10(13)(C).

## Review Analysis & Technical Review

Permit No. 83378  
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Regulated Entity No. RN105372379

### Process Description

Four GE PG7121(EA) combine cycle turbines firing natural gas will directly generate 75 MW; each has a 165 MMBtu/hr duct burner and a heat recovery steam generator. Two HRSG's will turn one 125 MW steam turbine and the other two will turn another 125 MW steam turbine. The turbine may operate without the duct burner.

Other sources consist of one 750-kW diesel fuel-fired electrical generator, one 300-hp diesel-fired engine to drive an emergency firewater pump, and two 8-cell cooling water towers.

### Sources, Controls, Source Reduction and BACT [§116.111(a)(2)(C)]

#### NO<sub>x</sub> BACT

Dry-Low NO<sub>x</sub> (DLN) burner technology in both the combustion turbine and duct burners followed by selective catalytic reduction (SCR) technology will control NO<sub>x</sub> emissions to 2 ppmvd while operating in combined cycle mode.

#### CO BACT

Good combustion practices will control CO emissions from each combined cycle turbine and duct burner set to a level of 17.5 ppmvd @ 15% oxygen while operating in combined cycle mode which is in line with recent RACT/BACT/LAER clearing house data.

#### VOC BACT

Good combustion practices will control VOC emissions from each combustion turbine to a level of 2.5 ppmvd @ 15% oxygen while operating in combined cycle mode.

#### PM, PM<sub>10</sub>, SO<sub>2</sub> & H<sub>2</sub>SO<sub>4</sub> BACT

The exclusive firing of clean, low-sulfur pipeline-quality natural gas (0.5 gr S/100 scf) and good combustion practices will minimize PM, PM<sub>10</sub>, SO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> emissions. Drift eliminators will be used to control PM/PM<sub>10</sub> emissions from the cooling tower.

#### NH<sub>3</sub>

Emissions of NH<sub>3</sub> will be controlled to 7 ppmvd though proper monitoring and operation of the SCR systems during combined cycle operation.

### Impacts Evaluation

1. Was modeling done? Yes                      Type? AERMOD
2. Will GLC of any air contaminant cause violation of NAAQS? ..... No
3. Is this a sensitive location with respect to nuisance? ..... No
4. Is the site within 3000 feet of any school? ..... No
5. Toxics Evaluation:

A modeling evaluation, using full dispersion modeling, of Madison Bell's emissions was conducted to demonstrate that the state property line regulations would not be jeopardized. The following table summarizes the regulatory standards and results:

| Pollutant                      | Averaging Period | Total GLC (µg/m <sup>3</sup> ) | State Standard (µg/m <sup>3</sup> ) |
|--------------------------------|------------------|--------------------------------|-------------------------------------|
| H <sub>2</sub> SO <sub>4</sub> | 1-hour           | 0.1                            | 50                                  |
|                                | 24-hour          | 0.06                           | 15                                  |
| SO <sub>2</sub>                | 1-hour           | 13                             | 1021                                |

A State Effects Evaluation Analysis was performed for non-criteria pollutants to demonstrate that the public health and welfare are protected. The EPA's AMS/EPA Regulatory Model (AERMOD) was used to predict the maximum ground level concentrations of non-criteria pollutants expected to be emitted from the site. The following table is a summary of predicted maximum concentrations for formaldehyde, ammonia, and toluene.

## Review Analysis & Technical Review

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| Pollutant & CAS#        | Averaging Time | GLCmax<br>( $\mu\text{g}/\text{m}^3$ ) | ESL<br>( $\mu\text{g}/\text{m}^3$ ) |
|-------------------------|----------------|--|-------------------------------------|
| Formaldehyde<br>50-00-0 | 1-hour         | 0.18                                   | 15                                  |
| Ammonia<br>7664-41-7    | 1-hour         | 5.68                                   | 170                                 |
| Toluene<br>108-88-3     | 1-hour         | 0.16                                   | 1,880                               |

**Miscellaneous**

1. Is applicant in agreement with special conditions?..... Yes  
 Company representative? .....John Shrock
2. Emission reductions from source reduction or pollution prevention ..... No
3. Emissions reductions resulting from the application of BACT required by state rules, avoidance of potential impacts problems, and voluntary reductions ..... Yes
4. Other permit(s) affected by this action? ..... Yes  
 If YES, list permit number(s) and actions required or taken: PSD-TX-1105

---

Project Reviewer

Date

Team Leader/Section Manager/Backup

Date

## Compliance History Report

|   |  |                      |                   |
|---|--|----------------------|-------------------|
| Customer/Respondent/Owner-Operator:   | CN603265943    Madison Bell Partners LP  | Classification: HIGH | Rating: 0.00      |
| Regulated Entity:   | RN105372379    MADISON BELL ENERGY CENTER  | Classification: HIGH | Site Rating: 0.00 |
| ID Number(s):   | AIR NEW SOURCE PERMITS                      PERMIT   |                      | 83378             |
|   | AIR NEW SOURCE PERMITS                      EPA ID   |                      | PSDTX1105         |
| Location:   | APPROX 6 MI SW OF MADISONVILLE VIA US 190 W<br>AFTER COTTONWOOD TURN S ON CR 413 SITE IS 0.5 MI<br>ON LEFT |                      |                   |
| TCEQ Region:  | REGION 09 - WACO   |                      |                   |
| Date Compliance History Prepared:   | February 02, 2009  |                      |                   |
| Agency Decision Requiring Compliance History:   | Permit - Issuance, renewal, amendment, modification, denial, suspension, or revocation of a permit.        |                      |                   |
| Compliance Period:  | October 31, 2002 to February 02, 2009  |                      |                   |
| TCEQ Staff Member to Contact for Additional Information Regarding this Compliance History |  |                      |                   |
| Name:   | Ms. Bridget Malone   | Phone:               | 239 - 4286        |

### Site Compliance History Components

- |  |       |
|--|-------|
| 1. Has the site been in existence and/or operation for the full five year compliance period? | Yes   |
| 2. Has there been a (known) change in ownership of the site during the compliance period?    | No    |
| 3. If Yes, who is the current owner?   | N/A   |
| 4. If Yes, who was/were the prior owner(s)?  | _____ |
| 5. When did the change(s) in ownership occur?  | N/A   |
| 6. Rating Date: 9/1/2008 Repeat Violator: NO   |       |

### Components (Multimedia) for the Site :

- A. Final Enforcement Orders, court judgements, and consent decrees of the state of Texas and the federal government.  
N/A
- B. Any criminal convictions of the state of Texas and the federal government.  
N/A
- C. Chronic excessive emissions events.  
N/A
- D. The approval dates of investigations. (CCEDS Inv. Track. No.)
 

|   |            |          |
|---|------------|----------|
| 1 | 12/18/2007 | (612339) |
| 2 | 10/29/2008 | (705927) |
- E. Written notices of violations (NOV). (CCEDS Inv. Track. No.)  
N/A
- F. Environmental audits.  
N/A
- G. Type of environmental management systems (EMSs).  
N/A
- H. Voluntary on-site compliance assessment dates.  
N/A
- I. Participation in a voluntary pollution reduction program.  
N/A
- J. Early compliance.

N/A

Sites Outside of Texas

N/A

# Texas Commission on Environmental Quality

## INTEROFFICE MEMORANDUM

To: Bridget Malone  
Combustion/Coatings Section

Date: April 23, 2008

Thru: Lori Wilson, Team Leader  
Air Dispersion Modeling Team (ADMT)

From: Dan Jamieson and Justin Cherry  
ADMT

Subject: Modeling Audit - Madison Bell Partners L.P. (RN105372379)

- 1.0 Project Identification Information.  
Permit Application Number: 83378  
NSR Project Number: 134178  
ADMT Project Number: 2783  
NSRP Document Number: 359399  
County: Madison

Modeling Report: Submitted by Environmental Consulting & Technology, Inc. (ECT), March 2008, on behalf of Madison Bell Partners L.P. Additional modeling files and supporting documentation were received April 2008.

- 2.0 Report Summary. The modeling analysis is acceptable for all review types and pollutants. The results are summarized below. The GLCmax for the Health Effects pollutants are located within 50 meters of the property line.

The applicant conducted modeling for PM. Effective June 11<sup>th</sup>, 2006, 1-hr and 3-hr Reg. I standards were repealed and are no longer reviewed.

| Pollutant                      | Averaging Time | GLCmax ( $\mu\text{g}/\text{m}^3$ ) | Standard ( $\mu\text{g}/\text{m}^3$ ) |
|--------------------------------|----------------|-------------------------------------|---------------------------------------|
| SO <sub>2</sub>                | 1-hr           | 13                                  | 1021                                  |
| H <sub>2</sub> SO <sub>4</sub> | 1-hr           | 0.1                                 | 50                                    |
|                                | 24-hr          | 0.06                                | 15                                    |

| Pollutant & CAS#        | Averaging Time | GLCmax ( $\mu\text{g}/\text{m}^3$ ) | ESL ( $\mu\text{g}/\text{m}^3$ ) |
|-------------------------|----------------|-------------------------------------|----------------------------------|
| Formaldehyde<br>50-00-0 | 1-hr           | 0.2                                 | 15                               |

| Table 2. Site-wide Modeling Results for Health Effects |                |                                     |                                  |
|--|----------------|-------------------------------------|----------------------------------|
| Pollutant & CAS#                                       | Averaging Time | GLCmax ( $\mu\text{g}/\text{m}^3$ ) | ESL ( $\mu\text{g}/\text{m}^3$ ) |
| Ammonia<br>7664-41-7                                   | 1-hr           | 6                                   | 170                              |
| Toluene<br>108-88-3                                    | 1-hr           | 0.1                                 | 1880                             |

| Table 3. Modeling Results for PSD AOI |                |                                     |   |
|---------------------------------------|----------------|-------------------------------------|---|
| Pollutant                             | Averaging Time | GLCmax ( $\mu\text{g}/\text{m}^3$ ) | De Minimis ( $\mu\text{g}/\text{m}^3$ ) |
| PM <sub>10</sub>                      | 24-hr          | 4.7                                 | 5                                       |
|                                       | Annual         | 0.9                                 | 1                                       |
| NO <sub>2</sub>                       | Annual         | 0.6                                 | 1                                       |
| CO                                    | 1-hr           | 270                                 | 2000                                    |
|                                       | 8-hr           | 105                                 | 500                                     |

| Table 4. PSD Ambient Air Quality Analysis for Ozone |                |           |                  |                |
|---|----------------|-----------|------------------|----------------|
| Pollutant   | Averaging Time | Monitor   | Background (ppb) | Standard (ppb) |
| O <sub>3</sub>                                      | 1-hr           | 483091037 | 83               | 120            |
|   |                | 483390078 | 95               |                |

Background concentrations for O<sub>3</sub> were obtained from the EPA AIRS database for monitors in McLennan and Montgomery Counties. Background concentrations were obtained from monitors 483091037 at 4472 Mazanec Road, McLennan County, Texas and 483390078 at 9472 A Highway 1484, Montgomery County, Texas. The maximum background concentrations from 2007 were used. The background concentrations are a conservative estimate of background concentrations in Madison County since reported actual NO<sub>2</sub> and VOC emissions from stationary sources are higher in McLennan and Montgomery Counties than in Madison County. Mobile source emissions are expected to be higher in McLennan and Montgomery Counties than in Madison County due to greater populations.

An ozone analysis was performed by the applicant following the current TCEQ guidance.

The applicant performed an Additional Impacts Analysis as part of the PSD air quality analysis. The Additional Impacts Analysis is appropriate.

3.0 Land Use. Medium roughness and elevated terrain were used in the modeling analysis. These selections are consistent with the topographic map, DEMs, and aerial photography. The selection of medium roughness is reasonable.

4.0 Modeling Emissions Inventory. The modeled emission point source parameters and rates are consistent with the modeling report. The source characterization used to represent the sources is appropriate.

Maximum allowable hourly emission rates were used for the short-term averaging time analyses, and annual average emission rates were used for the annual averaging time analyses.

5.0 Building Wake Effects (Downwash). Input data to Building Profile Input Program Prime (Version 04274) are consistent with the aerial photography, plot plan, and the modeling report.

6.0 Meteorological Data.  
Surface Station and ID: Waco, Texas (Station #: 13959)  
Upper Air Station and ID: Longview, Texas (Station #: 3951)  
Meteorological Dataset: 1987-1991 for PSD; 1988 for State Reviews

7.0 Receptor Grid. The grid modeled was sufficient in density and spatial coverage to capture representative maximum ground-level concentrations.

8.0 Model Used and Modeling Techniques. AERMOD (Version 07026) was used in a refined screening mode.

Sixteen different operating scenarios were evaluated for the combustion turbines and heat recovery steam generators emission units (CTs/HRSGs). The scenarios varied based on ambient temperature (0°F, 68°F, 92°F), percent load (100%, 75%, 65%), duct burner firing operation, and inlet fogging operation. These scenarios were selected to evaluate the extreme ranges of operation to identify the maximum predicted concentrations for all operating scenarios.

Modeling was conducted using source groups to identify the maximum predicted concentrations from all 16 operating scenarios of the CTs/HRSGs and ancillary equipment for each pollutant. The maximum predicted concentrations associated with the worst case scenario were reported in the above results.

To account for limited conversion of NO<sub>x</sub> to NO<sub>2</sub>, a 0.75 factor was multiplied with the maximum predicted concentration. This is the EPA national default value as referenced in Appendix W to 40 CFR 51.